

CATALOGUE 2017

690–6000 MHz

Base Station Antennas
and Antenna Line Products



KATHREIN

Who we are and what we stand for

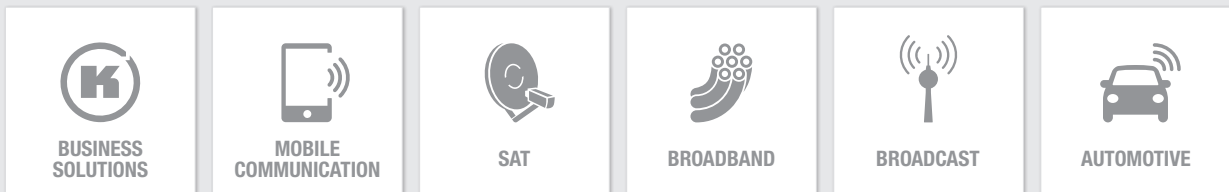
Kathrein is a leading international specialist for reliable, high-quality communication technologies.

We are an innovation and technology leader in today's connected world. Our ability to provide solutions and systems enables people all over the world to communicate, access information and use media, whether at home, at the office or on the road.

We cover a broad spectrum: from mobile communication and RFID solutions, to satellite reception, broadband and broadcast technology, to transmission and reception systems in vehicles.

As a hidden champion and family-owned enterprise, we have been working on the technologies of tomorrow since 1919. We take pride in our dedicated employees and our passion for customers and quality.

Our Solutions



Find out more about us at www.kathrein.com

Catalogue Issue 01/2017

All data published in previous catalogue issues hereby becomes invalid.

We reserve the right to make alterations in accordance with the requirements of our customers, therefore for binding data please check valid data sheets on our homepage: www.kathrein.com

Please check our homepage for new antenna releases which are not part of this actual printed catalogue.

Please also see additional information on inside back cover.



Our quality assurance system and our environmental management system apply to the entire company and are certified by TÜV according to EN ISO 9001 and EN ISO 14001.



Our products are compliant to the EU Directive RoHS as well as to other environmentally relevant regulations (e.g. REACH).

Base Station Antennas

LB (Lowband) ≤ 960 MHz
HB (Highband) > 960 MHz

> XPol	2 Ports	1 x LB 1 x HB 1 x LB 1 x HB	2 Ports
	4 Ports	2 x LB 1 x LB 1 x HB 2 x HB 2 x 3.5 GHz	4 Ports
	6 Ports	1 x LB 2 x HB 2 x LB 1 x HB 3 x LB 3 x HB	6 Ports
	8 Ports	1 x LB 3 x HB 2 x LB 2 x HB 4 x HB	8 Ports
	10 Ports	1 x LB 4 x HB 2 x LB 3 x HB 3 x LB 2 x HB	10 Ports
	12 Ports	2 x LB 4 x HB	12 Ports
> Small Cell and Special Design			Small Cell
> VPol			VPol
> Omni			Omni
> Indoor			Indoor
> RET	RCU, Control Devices, Site Sharing, Accessories		RET
> Electrical Accessories	Splitters, Tappers		Electr. Acc.
> Mounting Accessories	Hardware, Tools, Protection Caps		Mounting

Summary of Antenna Types, RET-Products and Accessories

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The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
731...		742215v01	31	80010305v02	21	80010684	130 + 131
731651	286	742222v01	36 + 37	80010306v02	22	80010685v01	132 + 133
		742226v01	52 + 53	80010309v01	23	80010691v01	100 + 101
732...		742236v01	75	80010310v01	24	80010692v01	102 + 103
732327	290	742263	296	80010368	229	80010697	114 + 115
		742264v02	54 + 55	80010378	35	80010698	116 + 117
734...		742265v02	58 + 59			80010699	118 + 119
734360	303	742266v02	62 + 63	800104..			
734361	303	742270v03	110 + 111	80010430	246		
734362	303	742271v03	112 + 113	80010431	253	800107..	
734363	303	742290	231	80010456v02	18	80010709	250
734364	303	742317	296	80010465	242	80010710	251
734365	303					80010711	216
		782...		800105..		80010712	252
736...		78211293	314	80010504v01	32	80010713	222
736347	238	78211297	314	80010510v01	76	80010714	222
						80010715	50 + 51
737...		800100..				80010728	168 + 169
737398	308	80010046v01	232	800106..		80010734v01	25
737978	291			80010605	80	80010735v01	26
		800101..		80010606v01	81 + 82	80010736v01	27
738...		80010122v01	66 + 67	80010621v02	33	80010745	214
738192	237	80010123v03	68 + 69	80010634v01	20	80010746	214
738440	312	80010125	223	80010644v01	74	80010748	247
738447	230	80010126	212	80010647v01	48	80010749	248
738448	230	80010128	213	80010651	34	80010753	217
738546	286			80010652	79	80010761	29
738908	307	800102..		80010656	83 + 84	80010764v01	70
		80010235	225	80010664	56 + 57	80010765v01	71
741...		80010249	249	80010665v01	60 + 61	80010766v01	72
741573	245	80010274	239	80010666v01	64 + 65	80010767	134 + 135
		80010290v02	94 + 95	80010674	90 + 91	80010768	136 + 137
742...		80010291v02	96 + 97	80010675v01	92 + 93	80010769	138 + 139
742033	296	80010292v03	98 + 99	80010677	244	80010775	224
742034	296			80010678	28	80010776	224
742113	299	800103..		80010681	30	80010798	190 – 192
742192v02	228	80010303v02	19	80010682	73	80010799	193 – 195

Summary of Antenna Types, RET-Products and Accessories

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
800108..		80010991	202 – 205	85010076	300	86010033	265
80010804	140 + 141	80010992	206 – 209	85010077	313	86010046	264
80010805	142 + 143			85010080	265	86010054	265
80010817	49	80011...		85010085	311	86010101	277
80010825	154 – 156	80011867	150 + 151	85010087	301	86010103	277
80010826	157 + 158	80011868	152 + 153	85010096	287	86010105	277
80010828v01	233			85010097	288	86010130	274
80010843	220	80020...		85010098	295	86010131	274
80010844	221	80020100	215	85010099	293	86010136	278
80010846	254	80020125	223	85010101	289	86010137	278
80010847	255	80020126	212	85010102	297	86010138	278
80010864	104 + 105	80020249	249	85010103	302	86010148v01	260
80010865	106 + 107	80020448	230	85010104	298	86010149	262
80010866	108 + 109	80020622	77 + 78	85010108	302	86010150	280
80010867	144 + 145	80020709	250	85010200	304	86010151	280
80010868	146 + 147	80020710	251	85010201	305	86010152	280
80010869	148 + 149	80020727	122 + 123	85010205	306	86010153v01	261
80010874	172 + 173	80020872	127 – 129			86010154	266
80010875	174 + 175	80020892	179 – 181	860...		86010155	267
80010880	218 + 219	80020899	199 – 201	86010002	270	86010156	263
80010882	243			86010007	265	86010157	310 + 311
80010887	41	816...		86010008	265	86010160	282
80010888	42	81610014	314	86010009	265	86010162	268
80010889	43			86010010	265	86010163	269
80010891	176 – 178	850...		86010011	265	86020017	276
80010898	196 – 198	85010002	286	86010012	265	86020018	276
		85010003	286	86010013	265	86020019	276
800109..		85010008	292	86010014	265	86020136	279
80010901	44 + 45	85010014	294	86010015	265	86020137	279
80010902	46 + 47	85010015	294	86010017	275	86020138	279
80010904	120 + 121	85010016	294	86010018	275	86020160	282
80010922	85 + 86	85010017	294	86010019	275		
80010964	159 – 161	85010058	296	86010023	281	K61...	
80010965	162 – 164	85010059	296	86010029	265	K61335	309
80010966	165 – 167	85010060	298	86010030	271		
80010968	185 – 187	85010061	298	86010031	272	K75...	
80010972	182 – 184	85010075	300	86010032	265	K751161	236





According to AISG, the frequencies shall be marked like shown in the following table. The upper edge of the frequency range is used to select the colour code.

Frequency Range / MHz Defined by AISG	Frequency Range / MHz Examples	Colour	Colour Code Abbreviation
380 – 1000	698–960	Red	R
	698–894	Red	R
	790–960	Red	R
1001 – 1700	1427–1518	Green	G
1701 – 2300	1350–2200	Blue	B
	1710–1880	Blue	B
	1710–2180	Blue	B
	1920–2170	Blue	B
2301 – 4000	2490–2690	Yellow	Y
	1695–2690	Yellow	Y
	1427–2690	Yellow	Y
	3300–3800	Yellow	Y



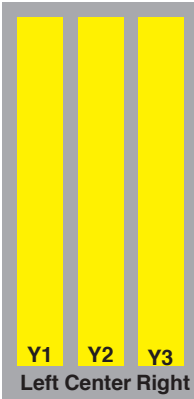

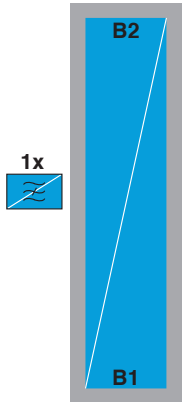
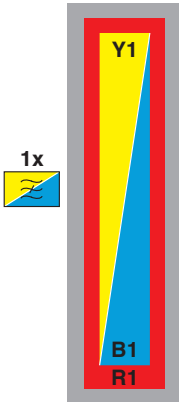
In line with this, we have invented a system in order to better illustrate the physical design of our antennas. Based on the AISG colour coding, every antenna system is displayed corresponding to its frequency range. Each system is additionally marked by its colour code abbreviation as well as an identification number (e.g. “R1” for the first lowband system) called “Array ID”. For multi-array antennas, also the position marking is indicated as stipulated by AISG (“left” / “right” / “center”).

The respective symbols are displayed on each type index of panel antennas in the catalogue.

In case an ultra-broadband dipole array is used for two or three independent system, internal filters can be used in order to divide the bands. Those filters are illustrated by the following symbols:

1. Filter Lowband e.g. 790–862 / 880–960 MHz or 698–803 / 824–960 MHz		2. Filter Highband 1 1710–1880 / 1920–2170 MHz	
3. Filter Highband 2 1710–2170 / 2490–2690 MHz		4. Filter L-Band 1427–1518 / 1695–2180 MHz	

Some examples shall demonstrate the symbolic antenna illustration:

<p>1. 2-Port Antenna</p> <p>1 Lowband Array</p> <p>e.g. 698–960 or 790–960 MHz</p>		<p>2. 4-Port Antenna</p> <p>1 Lowband / 1 Highband Array interleaved</p> <p>e.g. 698–960 / 1710–2690 or 790–960 / 1710–2690 MHz</p>	
<p>3. 6-Port Antenna</p> <p>3 Highbands side-by-side (“multi-array”)</p> <p>e.g. 3 x 1710–2690 MHz</p>		<p>4. 6-Port Antenna</p> <p>1 Lowband Array interleaved with 2 Highband Arrays, Highband stacked</p> <p>e.g. 698–960 / 2 x 1710–2690 MHz</p>	
<p>5. 4-Port Antenna</p> <p>2 Highbands filtered</p> <p>e.g. 1710–1880 / 1920–2170 MHz</p>		<p>6. 6-Port Antenna</p> <p>1 Lowband interleaved with 2 filtered Highbands</p> <p>e.g. 790–960 / 1710–2170 / 2490–2690 MHz</p>	

Configuration Type A



80010303v02 80010734v01
 80010305v02 80010735v01
 80010306v02 80010736v01
 80010309v01
 80010310v01
 80010456v02
 80010634v01
 80010643

Configuration Type B



742213v01
 742215v01
 742351v01
 80010378
 80010504v01
 80010605
 80010606v01

Configuration Type C



80010125 80010761
 80010621v02 80010843
 80010651 80020100
 80010656
 80010678
 80010681
 80010711

Configuration Type D



80010887
 80010888
 80010889

Configuration Type E



80010647v01
 80010816
 80010817
 80010901
 80010902

Configuration Type F



80010652
 80010682
 80010922
 80020622

Configuration Type H



742236v01
 80010510v01

Configuration Type I



80010644v01

Configuration Type J



80020727

Configuration Type K



80010728

Configuration Type L



742222v01 80010123v03
 742226v01 80010764v01
 742264v02 80010765v01
 742265v02 80010766v01
 742266v02
 80010121v01
 80010122v01

Configuration Type M



80010664
 80010665v01
 80010666v01
 80010715
 80010753

Configuration Type N



80010697
 80010698
 80010699

Configuration Type O



742270v03
 742271v03

Configuration Type P



80010290v02
 80010291v02
 80010292v03

Configuration Type Q



80010674
 80010675v01

Configuration Type R



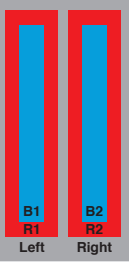
80010691v01
 80010692v01

Configuration Type S



80010864
 80010865
 80010866

Configuration Type T



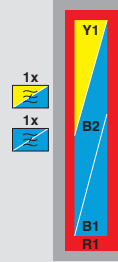
80010825
80010826

Configuration Type U



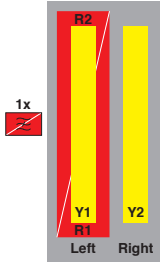
80010804
80010805

Configuration Type V



80010684
80010685v01
80010686v01

Configuration Type W



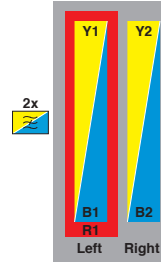
80010767
80010768
80010769
80010867
80010868
80010869
80011867
80011868

Configuration Type X



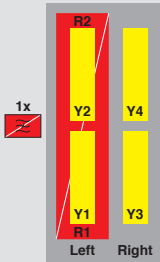
80010891
80020892

Configuration Type Y



80010874
80010875

Configuration Type Z



80010798
80010799
80010898
80020899

Configuration Type AA



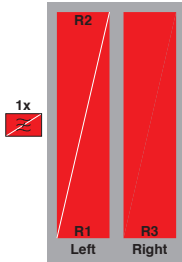
80020872

Configuration Type AB



80010964
80010965
80010966

Configuration Type AD



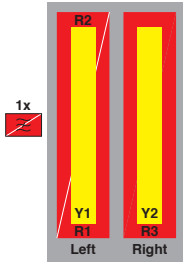
80010904

Configuration Type AE



80010972

Configuration Type AF



80010968

Configuration Type AG



80010991
80010992

Antenna Designs:

Antenna Families / RET-system

Distinguishing features

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Design	Compact size and elegant design are the distinguishing features of Kathrein's antenna families.
Radome	The radomes cover the internal antenna components. The fiberglass material guarantees optimum performance with regards to stability, strength, UV resistance, painting and weather protection. The colour of the radome of outdoor panel antennas is similar to RAL 7035.
Environmental influences	Kathrein antenna designs are based on fundamental engineering knowledge and also on our decades of practical experience, during which the various constructions and materials used have proved their outstanding reliability.
Environmental conditions	Kathrein cellular antennas are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E. The antennas exceed this standard with regards to the following items: – Low temperature: –55 °C – High temperature (dry): +60 °C
Environmental tests	Kathrein antennas are designed according to the specifications as defined in ETS 300 019-2-4. The homogenous design of Kathreins antenna families uses identical modules and materials. Extensive tests have been performed on typical samples and modules. The vibration test has been adapted relating to frequency and acceleration to the conditions of mast mounted antennas.
Impedance	Standard Impedance for all products is 50 Ω unless otherwise stated.
Great variety of half-power beam width, gain values, electrical downtilt	According to the antenna type selected, customers can choose from different half-power beam widths, gain values and electrical downtilts for panel antennas. Downtilts are either fixed or adjustable and controlled by remote electrical tilt system (RET).
Low intermodulation products (typ. <–153 dBc)	With many years of experience in the construction of antennas and intensive research into the effects of intermodulation, we offer optimized material and technology used for antennas (the given value refers to 3rd order products measured with 2 carriers of 20 W each).
Excellent tracking	Tracking states the symmetry between the +45° and –45° polarized horizontal pattern. Bad tracking values lead to interferences in the network and reduced diversity performance. Kathreins special Tracking compensation reduces the average value measured at $\pm 60^\circ$ to < 2–3 dB.

Antenna Designs:

Antenna Families / RET-system

Distinguishing features

Multi-array design

Besides standard single array antennas, Kathrein designs antennas providing multiple antenna arrays in one radome. These multi-array antennas do not only supply a future-proof multiplicity of diverse frequency bands for various technologies, but are also well-prepared for different MIMO-applications. The Kathrein portfolio contains a high variety of design solutions like interleaved and side-by-side antenna types or combinations of both as well as filter realizations.

Excellent grounding

The antennas are DC grounded according EN 50083-1.

Multi-functional installation hardware

Depending on the type, the antennas are equipped with up to 2 attachment points. Panels can be wall-mounted without any additional hardware. For mast-mounting, brackets and mechanical downtilt kits are available. To assist the installation technicians in aligning the panels, an azimuth adjustment tool can be supplied (see Mechanical Accessories).

MTBF Statement

Traditionally, passive components like antennas cannot be well calculated due to the lack of a sufficient number of components in the MTBF library. Unfortunately, this constraint results in a very inaccurate calculation. Thus, such results are technically questionable and unrealistic.

In essence, antennas are made out of mechanical parts that do not show any failure rates. Only available failure rates can be calculated into an MTBF value. Consequently such components cannot be listed in any MTBF library.

Remote Electrical Tilt System AISG Compliancy

Kathrein hereby states that RET devices, as far as the functionality and features are described within the AISG / 3GPP standard, are compliant with the standard.

NGMN-P-BASTA

All antennas which are measured according to the specifications given in NGMN-P-BASTA White Paper Version 9.6 are clearly marked in the data sheet. Kathrein is changing over more and more data sheets to NGMN-P-BASTA. The latest data sheets can be found on our homepage.

RET RFID Functionality

Kathrein's latest Remote Control Unit (RCU) is equipped with an internal RFID reader. Most of our antennas are equipped with RFID tags in their spindles. With this, all relevant antenna data can automatically be read out by the RCU. Further information as well as an up-to-date list of the antennas can be found on our homepage. The according data sheets are marked by a RFID sign.

4.3-10 Connectors

Partly, Kathrein's latest mobile communication antennas and antenna line products are equipped with 4.3-10 connectors.

The advantages of this connector are:

- Reduced dimensions on the bottom plate for more installation space
- Improved PIM stability and performance
- Easier installation, lower tightening torque

The universal 4.3-10 jack can be used with 3 different connector types (screw type, push-pull type and hand screw type).

Downtilting of Antennas with external RCU: Downtilt Possibilities

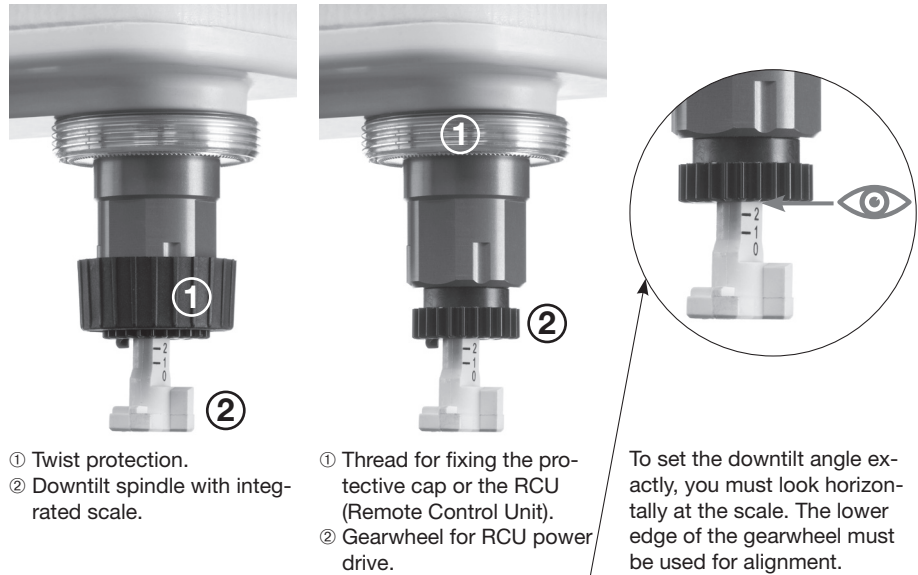
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Mechanical downtilt

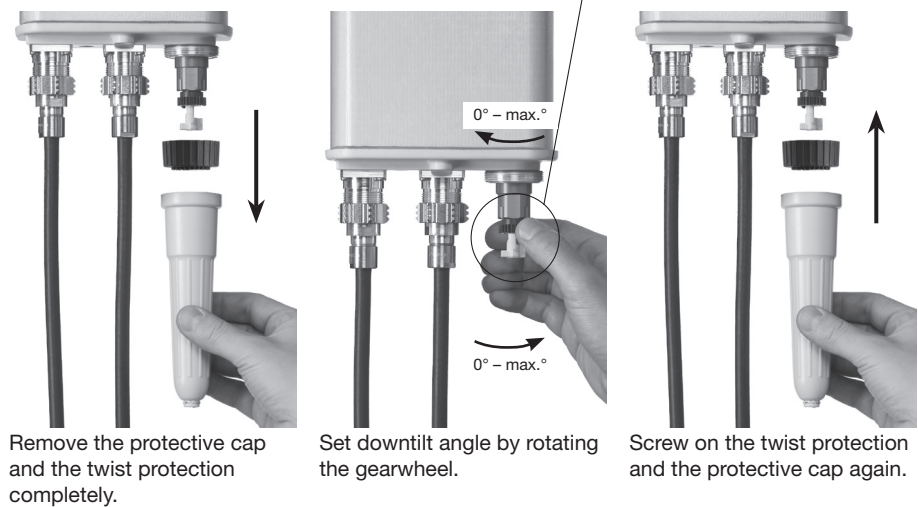
For further technical information please see “Mechanical Accessories”, page 285.

Electrical downtilt

Description of the adjustment mechanism (protective cap removed):



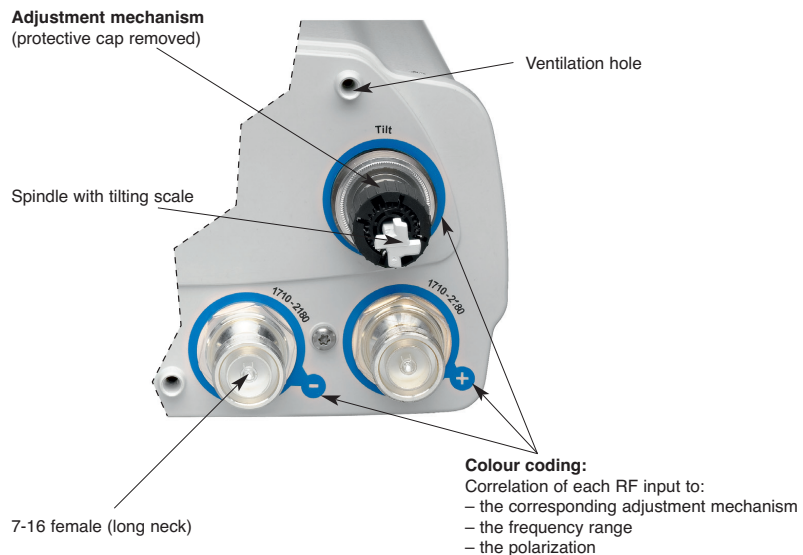
Manual adjustment procedure:



Remote Electrical Tilt (RET)

For further technical information please see “RET”, pages 258 and 259.

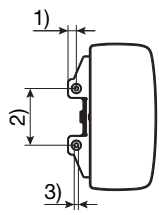
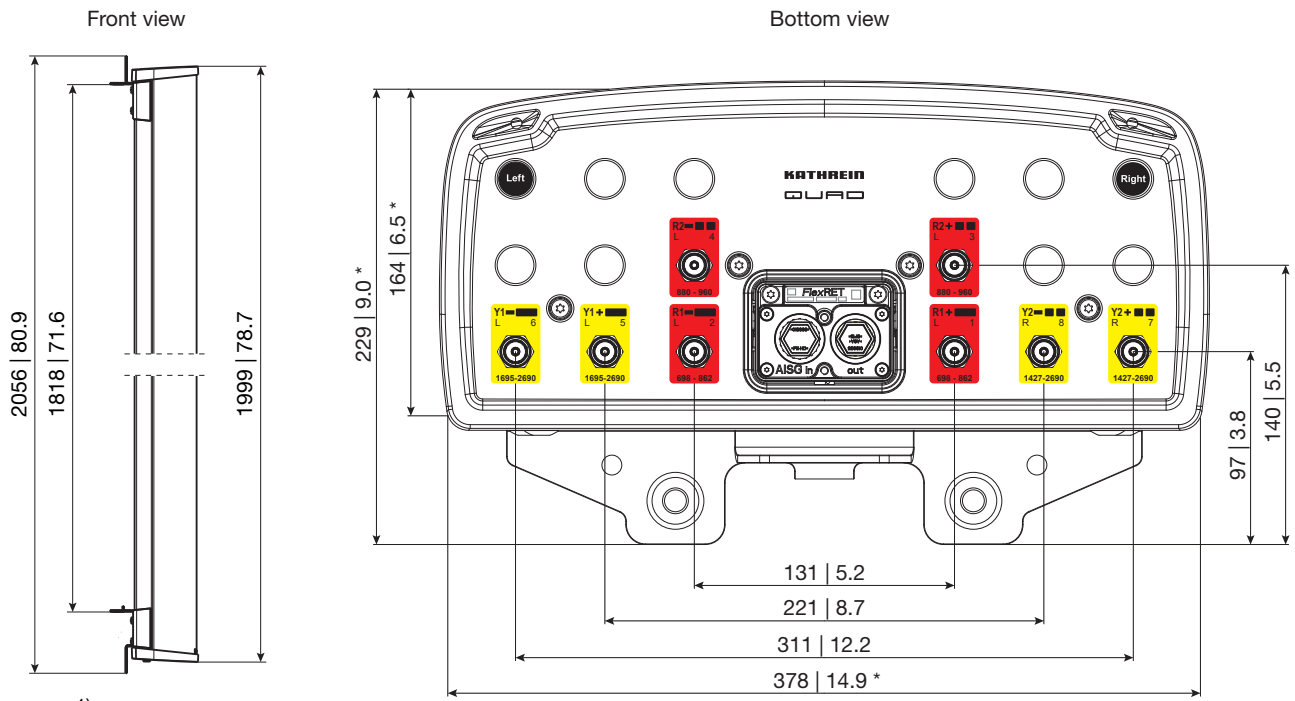
Description of bottom end cap (exemplary picture):



Antenna dimensions and detailed connector position can be found on our current data sheets. Please refer to the information on our latest data sheets which are available on our homepage:

www.kathrein.com
 → Mobile Communication

An example is shown below of how the antenna dimensions are displayed on our data sheets:



- 1) 22 | 0.9
- 2) 150 | 5.9
- 3) ∅ 11 | 0.4

All dimensions in mm | inches

* Dimensions refer to radome

4-Port Antenna 870–960/1710–1880 C 65°/60° 17/18dBi 2°–8°T/2°T

Number of Ports	
Family	
Frequency Range(s)	
Integrated Combiner	
Horizontal Half-power Beam Width(s)	
Gain Value(s)	
Variable / Fixed Electrical Tilt(s)	

Catalogue 2017 –>
Alterations to the Catalogue of 2016

Not longer in the catalogue 2017	Comments / Replacement
XPol 2 Ports	
80010643	80010456v02
742351v01	80010678
742213v01	80010651
XPol 4 Ports	
80010816	
80010121v01	
80010744	
80010622v01	80020622
XPol 6 Ports	
80010727	80020727
XPol 8 Ports	
80010686v01	80020872
80010872	80020872
XPol 10 Ports	
80010892v01	80020892
XPol 12 Ports	
80010899	80020899
Omni	
738450	K751161
80010747	Already phased out by end of 2015
741790	
Remote Electrical Tilt (RET)	
86010153	86010153v01
Electrical Accessories (Splitters and Tappers)	
86010100	86010101
86010102	86010103
86010104	86010105

Please note: New type numbers in the catalogue 2017 are shown and coloured in the respective register of the different antenna families.

All phased out types will be available on request until end of 2017 unless otherwise announced.
According information can be found on our webpage.

Summary – Directional Antennas

2 Ports

Dual Polarization $\pm 45^\circ$

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Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
1 x Lowband									
2-Port Antenna	790–960	30°	20.5dBi	0.5°–10°T	80010456v02	2254	7-16, rearside	18	A
2-Port Antenna	790–960	65°	15dBi	0°–14°T	80010303v02	1294	7-16, bottom	19	A
2-Port Antenna	790–960	65°	16.5dBi	0°–10°T	80010634v01	1934	7-16, rearside	20	A
2-Port Antenna	790–960	65°	17.5dBi	0°–8°T	80010305v02	2254	7-16, rearside	21	A
2-Port Antenna	790–960	65°	17.5dBi	0.5°–9.5°T	80010306v02	2574	7-16, bottom	22	A
2-Port Antenna	790–960	85°	15dBi	0°–10°T	80010309v01	1934	7-16, rearside	23	A
2-Port Antenna	790–960	85°	16dBi	0.5°–9.5°T	80010310v01	2574	7-16, bottom	24	A
2-Port Antenna iRCU	698–894	65°	15dBi	0°–16°T	80010734v01	1355	7-16, bottom	25	A
2-Port Antenna iRCU	698–894	65°	16dBi	0°–10°T	80010735v01	1934	7-16, bottom	26	A
2-Port Antenna iRCU	698–894	65°	17dBi	0.5°–9.5°T	80010736v01	2438	7-16, bottom	27	A

1) Configuration Types – further details on page 6–9.

Type A



Summary – Directional Antennas

2 Ports

Dual Polarization $\pm 45^\circ$

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2 Ports

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)
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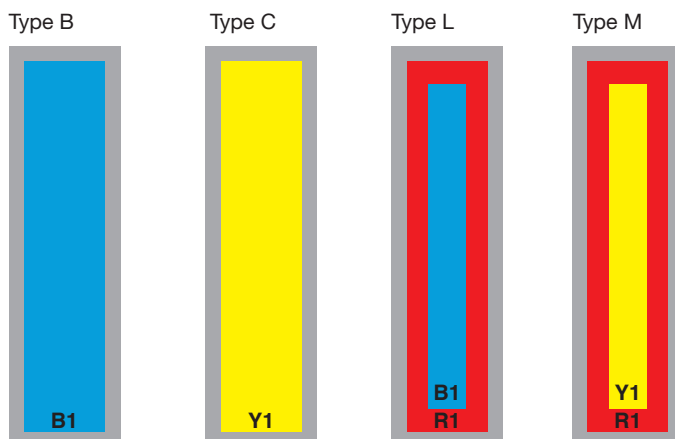
1 x Highband

2-Port Antenna	1695–2690	35°	19.5dBi	2°–10°T	80010678	1272	7-16, bottom	28	C
2-Port Antenna	1710–2690	65°	9.5dBi	0°T	80010711	155	7-16, bottom or top	216	C
2-Port Antenna	1710–2690	65°	12dBi	4°T	80010761	278	7-16, bottom	29	C
2-Port Antenna	1710–2690	65°	16.5dBi	0°–12°T	80010681	851	7-16, bottom	30	C
2-Port Antenna	1695–2200	65°	18dBi	0°–10°T	742215v01	1314	7-16, bottom	31	B
2-Port Antenna	1710–2200	65°	18dBi	0°–15°T	ESLS 80010504v01	1387	7-16, bottom	32	B
2-Port Antenna	1710–2690	65°	18dBi	2°–14°T	ESLS 80010621v02	1452	7-16, bottom	33	C
2-Port Antenna	1710–2690	65°	19dBi	0°–6°T	80010651	1670	7-16, bottom	34	C
2-Port Antenna	1710–2200	62°	21.2dBi	0°–6°T	HE 80010378	2548	7-16, bottom	35	B

1 x Lowband | 1 x Highband

2-Port Antenna	790–960 1710–2690	C	65° 65°	8dBi 9dBi	0°T 0°T	80010753	334	7-16, bottom	217	M
2-Port Antenna	790–960 1710–2170	C	65° 60°	12dBi 14dBi	0°T 0°T	742222v01	579	7-16, bottom or top	36 + 37	L

1) Configuration Types – further details on page 6–9.



Abbreviations:
iRCU: integrated Remote Control Unit
ESLS: Enhanced Side Lobe Suppression (above or below horizon)
HE: High Efficiency (Antennas with high gain compared to length)
C: Integrated Combiner

2-Port Antenna R1
Frequency Range 790–960
HPBW 30°

KATHREIN

2-Port Antenna 790–960 30° 20.5dBi 0.5°–10°T



Type No.		80010456v02		
Lowband		R1		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Gain at 0° T	dBi	2 x 20.0	2 x 20.2	2 x 20.5
Horizontal Pattern:				
Half-power beam width	°	33	32	30
Front-to-back ratio, copolar	dB	> 28	> 29	> 30
Cross polar ratio Maindirection	0° dB	Typically: 25	Typically: 23	Typically: 20
Tracking, Avg.	dB	2.5		
Squint	°	±2.0		
Vertical Pattern:				
Half-power beam width	°	9.1	8.8	8.5
Electrical tilt	°	0.5–10, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0.5 ... 5 ... 10 > 16 ... 13 ... 13	0.5 ... 5 ... 10 > 18 ... 18 ... 17	0.5 ... 5 ... 10 > 18 ... 16 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	1415 318
		Maximal:	1555 350
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	2254 / 576 / 99 88.7 / 22.7 / 3.9	
Category of mounting hardware	H (Heavy)		
Weight	kg lb	22 / 24 (clamps incl.) 28.5 / 52.9 (clamps incl.)	
Packing size	mm inches	2500 x 600 x 150 98.4 x 23.6 x 5.9	
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

2-Port Antenna

R1

Frequency Range

790–960

HPBW

65°

KATHREIN

2 Ports

2-Port Antenna 790–960 65° 15dBi 0°–14°T



Type No.	80010303v02			
Lowband	R1			
	790–960			
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	14.5 ... 14.4 ... 14.3	14.7 ... 14.5 ... 14.4	15 ... 14.8 ... 14.7
Tilt	°	0 ... 7 ... 14	0 ... 7 ... 14	0 ... 7 ... 14
Horizontal Pattern:				
Half-power beam width	°	67	66	65
Front-to-back ratio, copolar	dB	> 24	> 25	> 25
Cross polar ratio	dB	Typically: 25	Typically: 25	Typically: 25
Main direction	0°			
Sector	±60°	> 10	> 10	> 10
Vertical Pattern:				
Half-power beam width	°	15.7	15.5	15
Electrical tilt	°	0–14, continuously adjustable		
Sidelobe suppression for first sidelobe above horizon	°T dB	0 ... 7 ... 14 15 ... 14 ... 15	0 ... 7 ... 14 18 ... 15 ... 15	0 ... 7 ... 14 18 ... 15 ... 15
Impedance	Ω	50 Ω		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. effective power per port	W	300 (at 50 °C ambient temperature)		
Max. effective power for the antenna		600 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	405 91
		Maximal:	445 100
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	1294 / 256 / 99 50.9 / 10.1 / 3.9	
Category of mounting hardware	M (Medium)		
Weight	kg lb	8.5 / 10.7 (clamps incl.) 18.7 / 23.6 (clamps incl.)	
Packing size	mm inches	1596 x 272 x 127 62.8 x 10.7 x 5.0	
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

2-Port Antenna R1
Frequency Range 790–960
HPBW 65°

KATHREIN

2-Port Antenna 790–960 65° 16.5dBi 0°–10°T



Type No.		80010634v01		
Lowband		R1		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Gain	dBi	16.2 ... 16.4 ... 16.2	16.3 ... 16.6 ... 16.3	16.6 ... 16.8 ... 16.6
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:				
Half-power beam width	°	69	68	65
Front-to-back ratio (180°±30°)	dB	> 24	> 25	> 25
Cross polar ratio				
Main direction	0°	Typically: 20	Typically: 20	Typically: 20
Sector	±60°	> 10	> 10	> 10
Tracking, Avg.	dB	0.5		
Squint	°	±1.5		
Vertical Pattern:				
Half-power beam width	°	10	9.9	9.7
Electrical tilt	°	0–10, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 5 ... 10 18 ... 18 ... 18	0 ... 5 ... 10 18 ... 18 ... 18	0 ... 5 ... 10 18 ... 18 ... 18
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	400 (at 50 °C ambient temperature)		



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Rearside	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 645 145 Maximal: 710 160
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1934 / 259 / 99 76.1 / 10.2 / 3.9
Category of mounting hardware	M (Medium)	
Weight	kg lb	11 / 13 (clamps incl.) 24.2 / 28.7 (clamps incl.)
Packing size	mm inches	2216 x 272 x 147 87.2 x 10.7 x 5.8
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

R1

Frequency Range

790–960

HPBW

65°

KATHREIN

2 Ports

2-Port Antenna 790–960 65° 17.5dBi 0°–8°T



Type No.	80010305v02			
Lowband	R1			
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	16.8 ... 17.0 ... 16.7	16.9 ... 17.1 ... 16.9	17.2 ... 17.4 ... 17.0
Tilt	°	0 ... 4 ... 8	0 ... 4 ... 8	0 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	69	67	65
Front-to-back ratio, copolar	dB	> 25	> 25	> 25
Cross polar ratio				
Main direction	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	Typically: > 10	Typically: > 10	Typically: > 10
Tracking, Avg.	dB	0.5		
Squint	°	±2.5		
Vertical Pattern:				
Half-power beam width	°	9.1	8.8	8.5
Electrical tilt	°	0–8, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 2 ... 4 ... 8 18 ... 18 ... 18 ... 16	0 ... 2 ... 4 ... 8 18 ... 18 ... 18 ... 16	0 ... 2 ... 4 ... 8 20 ... 18 ... 17 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. effective power per port	W	400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		800 (at 50 °C ambient temperature)		

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Rearside	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 770 173 Maximal: 845 190
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2254 / 259 / 99 88.7 / 10.2 / 3.9
Category of mounting hardware	M (Medium)	
Weight	kg lb	11.5 / 13.5 (clamps incl.) 25.4 / 29.8 (clamps incl.)
Packing size	mm inches	2536 x 272 x 147 99.8 x 10.7 x 3.9
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

R1

Frequency Range

790–960

HPBW

65°

KATHREIN

2-Port Antenna 790–960 65° 17.5dBi 0.5°–9.5°T



Type No.	80010306v02			
Lowband	R1			
		790–960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	17.1	17.2	17.4
Gain over all Tilts	dBi	17.1 ± 0.4	17.2 ± 0.2	17.4 ± 0.2
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.7	68 ± 1.6	65 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 22
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 23
Cross Polar Discrimination over Sector	dB	> 12.5	> 12.5	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.9 ± 0.4	7.8 ± 0.3	7.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.5 – 9.5		
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18
Cross Polar Isolation	dB	> 30		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	2 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 895 201 Maximal: 980 220
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2574 / 259 / 99 101.3 / 10.2 / 3.9
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	14.0 / 16.2 (clamps incl.) 30.9 / 35.7 (clamps incl.)
Packing Size	mm inches	2876 / 272 / 127 113.2 / 10.7 / 5.0
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

R1

Frequency Range

790–960

HPBW

85°

KATHREIN

2 Ports

2-Port Antenna 790–960 85° 15dBi 0°–10°T



Type No.		80010309v01		
Lowband		R1		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average Gain	dBi	14.8 ... 15.0 ... 14.6	14.9 ... 15.1 ... 14.7	14.8 ... 15.2 ... 15.0
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:				
Half-power beam width	°	85	85	83
Front-to-back ratio (180°±0°)	dB	> 25	> 25	> 26
Front-to-back ratio (180°±30°)	dB	> 21	> 21	> 21
Cross polar ratio	0°	Typically: 23	Typically: 22	Typically: 22
Sector	±60°	> 10	> 10	> 10
Tracking, Avg.	dB	0.5		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	10.1	9.8	9.6
Electrical tilt	°	0–10, continuously adjustable		
Sidelobe suppression	°T	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
for first sidelobe above main beam:	dB	≥ 15 ... 15 ... 14	≥ 15 ... 15 ... 15	≥ 18 ... 18 ... 18
Avg.:	dB	≥ 19 ... 19 ... 19	≥ 20 ... 20 ... 20	≥ 22 ... 22 ... 22
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	400 (at 50 °C ambient temperature)		

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Rearside	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 645 145 Maximal: 710 160
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1934 / 259 / 99 76.1 / 10.2 / 3.9
Category of mounting hardware	M (Medium)	
Weight	kg lb	11.5 / 13.5 (clamps incl.) 25.4 / 29.8 (clamps incl.)
Packing size	mm inches	2216 x 292 x 147 87.2 x 10.7 x 5.0
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna R1
Frequency Range 790–960
HPBW 85°

KATHREIN

2-Port Antenna 790–960 85° 16dBi 0.5°–9.5°T

Type No.		80010310v01		
Lowband		R1		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	15.8 ... 15.6 ... 15.4	16.0 ... 15.9 ... 15.8	16.2 ... 16.2 ... 16.2
Tilt	°	0.5 ... 5 ... 9.5	0.5 ... 5 ... 9.5	0.5 ... 5 ... 9.5
Horizontal Pattern:				
Half-power beam width	°	86	85	83
Front-to-back ratio (180°±0°)	dB	> 24	> 24	> 26
Front-to-back ratio (180°±30°)	dB	> 20	> 22	> 24
Cross polar ratio	0°	Typically: 20	Typically: 20	Typically: 20
Sector	±60°	> 10	> 10	> 10
Tracking, Avg.	dB	0.5		
Squint	°	±3.5		
Vertical Pattern:				
Half-power beam width	°	8.1	7.9	7.6
Electrical tilt	°	0.5–9.5, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0.5 ... 5 ... 9.5 ≥ 18 ... 14 ... 14	0.5 ... 5 ... 9.5 ≥ 18 ... 17 ... 16	0.5 ... 5 ... 9.5 ≥ 17 ... 16 ... 16
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –153 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		



Mechanical specifications			
Input		2 x 7-16 female	
Connector position		Bottom	
Adjustment mechanism		1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	895 201
		Maximal:	980 221
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	2574 / 259 / 99 101.3 / 10.2 / 3.9	
Category of mounting hardware		H (Heavy)	
Weight	kg lb	14.0 / 16.2 (clamps incl.) 30.9 / 35.7 (clamps incl.)	
Packing size	mm inches	2876 / 272 / 127 113.2 / 10.7 / 5.0	
Scope of supply		Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna Frequency Range HPBW

Integrated replaceable Remote Control Unit

R1

698–894

65°

iRCU

KATHREIN



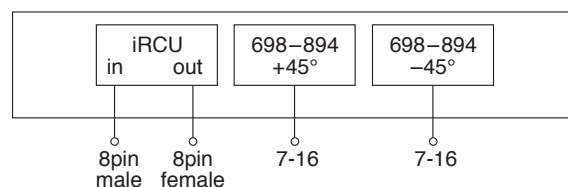
2 Ports

2-Port Antenna iRCU 698–894 65° 15dBi 0°–16°T

Type No.	80010734v01		
A) Antenna specifications	R1		
	698–894		
Frequency range	MHz	698 – 806	824 – 894
Polarization	°	+45, –45	+45, –45
Gain	dBi	14.2	14.8
Horizontal Pattern:			
Half-power beam width	°	68	65
Front-to-back ratio	dB	Copolar: > 30 Average: 32	Copolar: > 30 Average: 33
Cross polar ratio	dB	Typically: > 24	Typically: > 23
Main direction	0°	> 10, Avg. 15	> 10, Avg. 16
Sector	±60°		
Vertical Pattern:			
Half-power beam width	°	16	14.8
Electrical tilt	°	0–16, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	°T	0 ... 8 ... 16	0 ... 8 ... 16
Average:	dB	16 ... 17 ... 17	18 ... 17 ... 16
	dB	16 ... 19 ... 20	20 ... 20 ... 20
Impedance	Ω	50	
VSWR		< 1.5	
Isolation, between ports	dB	> 30	
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)	
Max. power per input	W	500 (at 50 °C ambient temperature)	
Input		2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female	
Connector position		Bottom	
Wind load	N lbf	Frontal: 505 114 (at 150 km/h) 1300 292 (at 150 mph)	Maximal: 555 125 (at 150 km/h) 1430 321 (at 150 mph)
Max. wind velocity	km/h mph	241 150	
Height/width/depth	mm inches	1355 / 303 / 99 53.3 / 11.9 / 3.9	
Category of mounting hardware		M (Medium)	
Weight	kg lb	11 / 13.2 (clamps incl.) 24.2 / 29.1 (clamps incl.)	
Packing size	mm inches	1430 x 315 x 115 56.3 x 12.4 x 4.5	
Scope of supply		Panel and 2 units of clamps 42 – 115 mm 1.7–4.5 inches diameter	



iRCU specifications (86010149) see page 262



2-Port Antenna Frequency Range HPBW

R1

698–894

65°

Integrated replaceable Remote Control Unit

iRCU

KATHREIN

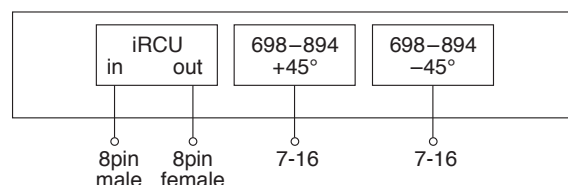


2-Port Antenna iRCU 698–894 65° 16dBi 0°–10°T

Type No.		80010735v01	
A) Antenna specifications		R1	
		698–894	
Frequency range	MHz	698 – 806	824 – 894
Polarization	°	+45, –45	+45, –45
Gain	dBd	13.35	13.85
	dBi	15.5	16
Horizontal Pattern:			
Half-power beam width	°	67	65
Front-to-back ratio	dB	Copolar: > 30 Average: 35	Copolar: > 30 Average: 35
Cross polar ratio	dB	Typically: > 25	Typically: > 25
		> 11, Avg. 15	> 11, Avg. 15
Vertical Pattern:			
Half-power beam width	°	11.3	10
Electrical tilt	°	0–10, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	°T	0 ... 5 ... 10	0 ... 5 ... 10
	dB	16 ... 17 ... 17	18 ... 17 ... 16
	Average: dB	16 ... 19 ... 20	20 ... 20 ... 20
Impedance	Ω	50	
VSWR		< 1.5	
Isolation, between ports	dB	> 30	
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)	
Max. power per input	W	500 (at 50 °C ambient temperature)	
Input		2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female	
Connector position		Bottom	
Wind load	N lbf	Frontal: 750 169 (at 150 km/h)	1935 436 (at 150 mph)
		Maximal: 825 185 (at 150 km/h)	2130 479 (at 150 mph)
Max. wind velocity	km/h mph	241	
		150	
Height/width/depth	mm inches	1934 / 303 / 99	
		76.1 / 11.9 / 3.9	
Category of mounting hardware		H (Heavy)	
Weight	kg lb	14 / 16 (clamps incl.)	
		30.9 / 35.3 (clamps incl.)	
Packing size	mm inches	2136 x 317 x 127	
		84.1 x 12.5 x 5	
Scope of supply		Panel and 2 units of clamps 42 – 115 mm 1.7–4.5 inches diameter	



iRCU specifications (86010149) see page 262



2-Port Antenna Frequency Range HPBW

R1

698–894

65°

Integrated replaceable Remote Control Unit

iRCU

KATHREIN



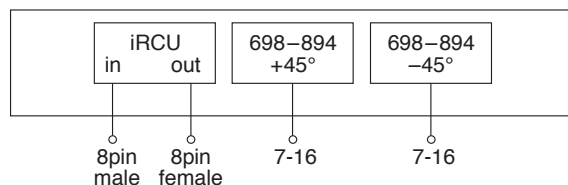
2 Ports

2-Port Antenna iRCU 698–894 65° 17dBi 0.5°–9.5°T

Type No.	80010736v01		
A) Antenna specifications	R1		
		698–894	
Frequency range	MHz	698 – 806	824 – 894
Polarization	°	+45, –45	+45, –45
Gain	dBd dBi	14.25 16.4	14.85 17
Horizontal Pattern:			
Half-power beam width	°	67	68
Front-to-back ratio	dB	Copolar: > 30 Average: 35	Copolar: > 30 Average: 35
Cross polar ratio	dB	Typically: > 25	Typically: > 20
Main direction	0°	> 11, Avg. 15	> 11, Avg. 15
Sector	±60°		
Vertical Pattern:			
Half-power beam width	°	9.5	8.6
Electrical tilt	°	0.5–9.5, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	°T	0.5 ... 5 ... 9.5	0.5 ... 5 ... 9.5
Average:	dB	16 ... 16 ... 16	18 ... 18 ... 17
	dB	18 ... 18 ... 17	20 ... 20 ... 20
Impedance	Ω	50	
VSWR		< 1.5	
Isolation, between ports	dB	> 30	
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)	
Max. power per input	W	500 (at 50 °C ambient temperature)	
Input		2 x 7-16 female iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female	
Connector position		Bottom	
Wind load	N lbf	Frontal: 980 220 (at 150 km/h) Maximal: 1080 242 (at 150 km/h)	2525 568 (at 150 mph) 2775 624 (at 150 mph)
Max. wind velocity	km/h mph	241 150	
Height/width/depth	mm inches	2438 / 303 / 99 96 / 11.9 / 3.9	
Category of mounting hardware		H (Heavy)	
Weight	kg lb	17 / 19 (clamps incl.) 37.5 / 41.9 (clamps incl.)	
Packing size	mm inches	2600 x 315 x 115 102.4 x 12.4 x 4.5	
Scope of supply		Panel and 2 units of clamps 42 – 115 mm 1.7–4.5 inches diameter	



iRCU specifications (86010149) see page 262



2-Port Antenna

Y1

Frequency Range

1695–2690

HPBW

35°

KATHREIN

2-Port Antenna 1695–2690 35° 19.5dBi 2°–10°T



Type No.		80010678				
Highband		Y1, connector 1–2				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	18.6	19.2	19.4	19.8	19.6
Gain over all Tilts	dBi	18.5 ± 0.4	19.1 ± 0.3	19.4 ± 0.3	19.7 ± 0.5	19.5 ± 0.9
Horizontal Pattern:						
Azimuth Beamwidth	°	43 ± 3.1	39 ± 1.7	38 ± 1.3	36 ± 0.7	33 ± 0.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 21	> 23	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 21	> 20	> 11
Cross Polar Discrimination over Sector	dB	> 15.0	> 16.5	> 16.5	> 13.0	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.5	7.3 ± 0.2	7.1 ± 0.3	6.4 ± 0.3	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 21	> 22	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 19	> 19	> 18	> 14
Cross Polar Isolation	dB	> 28				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.



Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	400 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	2 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 410 92 Maximal: 450 101
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1272 / 235 / 69 50.1 / 9.3 / 2.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	9.2 / 11.4 (clamps incl.) 20.3 / 25.1 (clamps incl.)
Packing Size	mm inches	1617 / 257 / 103 63.7 / 10.1 / 4.1
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna Y1
Frequency Range 1710-2690
HPBW 65°

KATHREIN

2 Ports

2-Port Antenna 1710-2690 65° 12dBi 4°T

Type No.		80010761			
Highband		Y1			
		1710-2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 11	2 x 11.5	2 x 12.2	2 x 12.7
Horizontal Pattern:					
Half-power beam width	°	67	65	60	58
Front-to-back ratio, copolar	dB	> 30	> 28	> 28	> 27
Cross polar ratio					
Main direction	0°	Typically: > 20	Typically: > 20	Typically: > 20	Typically: > 20
Sector	±60°	> 8	> 8	> 8	> 8
Vertical Pattern:					
Half-power beam width	°	36	31	25	25
Electrical tilt	°	3, fixed	3, fixed	4, fixed	4, fixed
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 28			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. power per input	W	150 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 55 12 Maximal: 55 12
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	278 / 154 / 69 10.9 / 6.1 / 2.7
Category of mounting hardware	L (Light)	
Weight	kg lb	1.8 (tension bands incl.) 4.0 (tension bands incl.)
Packing size	mm inches	375 x 172 x 92 14.8 x 6.8 x 39.1
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm 1.8 – 4.9 inches diameter	

2-Port Antenna

Frequency Range **1710-2690**

HPBW **65°**

KATHREIN



2-Port Antenna 1710-2690 65° 16.5dBi 0°-12°T

Type No.		80010681			
Highband		Y1			
		1710-2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain at 0° tilt	dBi	2 x 15.5	2 x 16.3	2 x 16.7	2 x 16.7
Horizontal Pattern:					
Half-power beam width	°	67	64	60	60
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 23	> 23
Cross polar ratio	0°	Typically: 25	Typically: 28	Typically: 28	Typically: 28
Sector	±60°	> 10	> 8	> 8	> 11
Vertical Pattern:					
Half-power beam width	°	10.8	9.9	8.8	8.4
Electrical tilt	°	0-12, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	°T	0 ... 6 ... 12	0 ... 6 ... 12	0 ... 6 ... 12	0 ... 6 ... 12
	dB	≥ 12 ... 13 ... 15	≥ 13 ... 14 ... 15	≥ 13 ... 14 ... 16	≥ 15 ... 15 ... 17
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. power per input	W	250 (at 50 °C ambient temperature)			

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 140 31 Maximal: 155 35
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	851 / 155 / 70 33.5 / 6.1 / 2.8
Category of mounting hardware	L (Light)	
Weight	kg lb	5 / 5.2 (clamps incl.) 11.0 / 11.5 (clamps incl.)
Packing size	mm inches	1146 x 172 x 92 45.1 x 6.8 x 3.6
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm 1.8 – 4.9 inches diameter	

2-Port Antenna

B1

Frequency Range

1695–2200

HPBW

65°

KATHREIN

2 Ports

2-Port Antenna 1695–2200 65° 18dBi 0°–10°T



Type No.	742215v01		
Highband	B1		
	1695–2200		
Frequency Range	MHz	1695 – 1880	1920 – 2200
Gain at mid Tilt	dBi	17.5	18.2
Gain over all Tilts	dBi	17.5 ± 0.4	18.1 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	68 ± 2.0	63 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 25	> 28
Cross Polar Discrimination over Sector	dB	> 13.0	> 10.5
Azimuth Beam Squint	°	0.5 ± 1.5	0.5 ± 1.2
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0
Vertical Pattern:			
Elevation Beamwidth	°	7.1 ± 0.3	6.4 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0	
Tilt Accuracy	°	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 21	> 20
Cross Polar Isolation	dB	> 30	
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)	



Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	500 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	2 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 225 51 Maximal: 250 56
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1314 / 155 / 70 51.7 / 6.1 / 2.8
Category of Mounting Hardware	L (Light)	
Weight	kg lb	6.5 / 8.7 (clamps incl.) 14.3 / 19.2 (clamps incl.)
Packing Size	mm inches	1595 / 172 / 92 62.8 / 6.8 / 3.6
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

2-Port Antenna

B1

Frequency Range

1710–2200

HPBW

65°

KATHREIN

2-Port Antenna 1710–2200 65° 18dBi 0°–15°T ESLS



Type No.		80010504v01			
Highband		B1			
		1710–2200			
Frequency range	MHz	1710 – 1880	1880 – 1990	1920 – 2170	2000 – 2200
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain at 0° tilt	dBi	2 x 17.5	2 x 17.6	2 x 17.7	2 x 17.8
Horizontal Pattern:					
Half-power beam width	°	68	66	64	62
Front-to-back ratio (180°±30°)	dB	≥ 25	≥ 25	≥ 25	≥ 25
Cross polar ratio	0°	22	22	24	26
Sector	±60°	≥ 10	≥ 10	≥ 10	≥ 10
Tracking, Avg.	dB	1.0			
Squint	dB	±2.0			
Vertical Pattern:					
Half-power beam width	°	7.9	7.5	7.2	7.0
Electrical tilt	°	0–15, continuously adjustable			
Sidelobe suppression	°T	0 ... 5 ... 10 ... 15	0 ... 5 ... 10 ... 15	0 ... 5 ... 10 ... 15	0 ... 5 ... 10 ... 15
– for first sidelobe above main beam	dB	≥ 17 ... 20 ... 18 ... 17	≥ 16 ... 20 ... 18 ... 17	≥ 16 ... 20 ... 18 ... 17	≥ 15 ... 20 ... 18 ... 15
– within 0°–20° sector above horizon	dB	≥ 16 ... 18 ... 18 ... 16	≥ 16 ... 18 ... 17 ... 16	≥ 15 ... 18 ... 17 ... 16	≥ 15 ... 16 ... 16 ... 15
Null-fill at 0° tilt	°	21	20	19	18
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< –153 (2 x 43 dBm carrier)			
Max. power per input	W	300 (at 50 °C ambient temperature)			

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 240 54 Maximal: 265 59
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1387 / 155 / 69 54.6 / 6.1 / 2.7
Category of mounting hardware	L (Light)	
Weight	kg lb	6.5 / 8.5 (clamps incl.) 14.3 / 18.7 (clamps incl.)
Packing size	mm inches	1655 x 172 x 92 65.2 x 6.8 x 3.6
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	



2-Port Antenna Y1
Frequency Range 1710-2690
HPBW 65°

KATHREIN

2 Ports

2-Port Antenna 1710-2690 65° 18dBi 2°-14°T ESLS



Type No.		80010621v02			
Highband		Y1			
		1710-2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	17.4 ... 17.6 ... 17.5	17.9 ... 18.2 ... 18.1	18.4 ... 18.5 ... 18.5	18.5 ... 19.0 ... 18.5
Tilt	°	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
Horizontal Pattern:					
Half-power beam width	°	68	63	59	58
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25	> 25
Cross polar ratio	0°	Typically: 25	Typically: 24	Typically: 25	Typically: 25
Sector	±60°	> 10	> 10	> 10	> 10
Tracking, Avg.	dB	1.5			
Vertical Pattern:					
Half-power beam width	°°	6.7	6.0	5.3	5.0
Electrical tilt		2-14, continuously adjustable			
Sidelobe suppression	°T	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
- for first sidelobe above main beam	dB	≥ 18 ... 18 ... 18	≥ 18 ... 18 ... 18	≥ 18 ... 18 ... 18	≥ 18 ... 18 ... 18
- within 0°-20° sector above horizon	dB	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 14
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. effective power per port	W	250 (at 50 °C ambient temperature)			
Max. effective power for the antenna		500 (at 50 °C ambient temperature)			

Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 250 57 Maximal: 275 62
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1452 / 154 / 70 57.2 / 6.0 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	6.5 / 8.5 (clamps incl.) 4.3 / 18.7 (clamps incl.)
Packing size	mm inches	1725 x 172 x 92 7.9 x 6.8 x 3.6
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

2-Port Antenna Y1
Frequency Range 1710-2690
HPBW 65°

KATHREIN

2-Port Antenna 1710-2690 65° 19dBi 0°-6°T



Type No.		80010651			
Highband		Y1			
		1710-2690			
Frequency range	MHz	1710 – 1990	1920 – 2170	2170 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain at 0° tilt	dB	2 x 18.5	2 x 19.0	2 x 19.4	2 x 19.5
Horizontal Pattern:					
Half-power beam width	°	67	63	60	58
Front-to-back ratio (180°±30°)	dB	> 28	> 28	> 25	> 25
Cross polar ratio	0°	Typically: 25	Typically: 25	Typically: 25	Typically: 28
Sector	±60°	> 10	> 10	> 10	> 10
Tracking, Avg.	dB	1.5			
Squint	°	±3			
Vertical Pattern:					
Half-power beam width	°	5.4	4.9	4.3	4.0
Electrical tilt	°	0-6, continuously adjustable			
Sidelobe supression for first sidelobe above main beam	°T	0 ... 3 ... 6	0 ... 3 ... 6	0 ... 3 ... 6	0 ... 3 ... 6
	dB	≥ 18 ... 18 ... 17	≥ 18 ... 18 ... 16	≥ 18 ... 18 ... 16	≥ 18 ... 18 ... 17
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. power per input	W	300 (at 50 °C ambient temperature)			



Mechanical specifications			
Input		2 x 7-16 female	
Connector position		Bottom	
Adjustment mechanism		1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 295 66	Maximal: 325 73
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	1670 / 155 / 70 65.5 / 6.1 / 2.8	
Category of mounting hardware		M (Medium)	
Weight	kg lb	7 / 9 (clamps incl.) 15.4 / 19.8 (clamps incl.)	
Packing size	mm inches	1934 x 172 x 92 76.1 x 6.8 x 3.6	
Scope of supply		Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

2-Port Antenna B1
Frequency Range 1710–2200
HPBW 62°

KATHREIN

2 Ports

2-Port Antenna 1710–2200 62° 21.2dBi 0°–6°T

Type No.		80010378		
Highband		B1		
		1710–2200		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Polarization	°	+45, –45	+45, –45	+45, –45
Gain	dBi	2 x 20.6	2 x 21.1	2 x 21.2
Horizontal Pattern:				
Half-power beam width	°	65	62	60
Front-to-back ratio (180°±30°)	dB	> 30	> 28	> 28
Cross polar ratio	0°	25	23	23
Sector	±60°	> 10	> 10	> 10
Tracking, Avg.	dB	1.0		
Squint	°	±2.5		
Vertical Pattern:				
Half-power beam width	°	3.7	3.5	3.3
Electrical tilt	°	0–6, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 3 ... 6 18 ... 18 ... 17	0 ... 3 ... 6 18 ... 17 ... 17	0 ... 3 ... 6 17 ... 17 ... 17
Null-fill at 0° tilt	dB	20	20	20
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	300 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	485 109
		Maximal:	535 120
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	2548 / 155 / 89 100.3 / 6.1 / 3.5	
Category of mounting hardware	M (Medium)		
Weight	kg lb	13 / 15 (clamps incl.) 28.7 / 33.1 (clamps incl.)	
Packing size	mm inches	2816 x 173 x 113 110.9 x 6.8 x 4.4	
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

2-Port Antenna

R1 **B1**

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Frequency Range

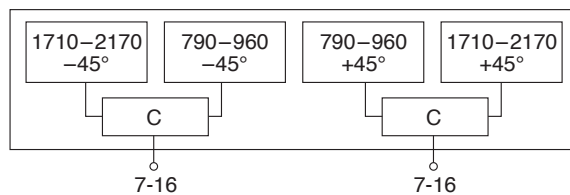
790-960 1710-2170

HPBW

65° 60°

2-Port Antenna 790-960/1710-2170 C 65°/60° 12/14dBi 0°/0°T

Type No.		742222v01		
Lowband		R1		
		790-960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	11.1	11.4	11.8
Horizontal Pattern:				
Half-power beam width	°	68	67	65
Front-to-back ratio (180°±30°)	dB	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60°	dB Typically: 25 > 10	Typically: 25 > 10	Typically: 25 > 10
Vertical Pattern:				
Half-power beam width	°	34	33	30
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	250 (at 50 °C ambient temperature)		
Integrated combiner		The insertion loss is included in the given antenna gain values.		



742222v01

Highband		B1		
		1710-2170		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2170
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	12.5	13.3	13.6
Horizontal Pattern:				
Half-power beam width	°	66	60	60
Front-to-back ratio (180°±30°)	dB	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60°	dB Typically: 18 > 10	Typically: 18 > 10	Typically: 20 > 10
Vertical Pattern:				
Half-power beam width	°	20	18	17.5
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	200 (at 50 °C ambient temperature)		
Integrated combiner		The insertion loss is included in the given antenna gain values.		

Mechanical specifications			
Input		2 x 7-16 female	
Connector position*		Bottom or top	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 125 28	Maximal: 135 30
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	579 / 262 / 139 22.8 / 10.3 / 5.5	
Category of mounting hardware		M (Medium)	
Weight	kg lb	7.5 / 9.5 (clamps incl.) 16.5 / 20.9 (clamps incl.)	
Packing size	mm inches	756 x 282 x 172 29.8 x 11.1 x 6.8	
Scope of supply		Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

* Inverted mounting:
Connector position top: Change drain hole screw.

Summary – Directional Antennas

4 Ports

Dual Polarization $\pm 45^\circ$

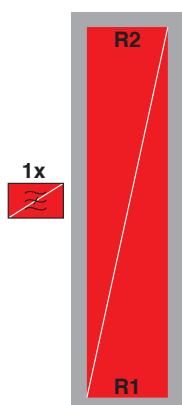
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Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband									
4-Port Antenna	698–862 880–960	65° 65°	14.5dBi 15dBi	2°–16°T 2°–16°T	80010887	1459	4.3-10, bottom	41	D
4-Port Antenna	698–862 880–960	65° 65°	15.5dBi 16dBi	2°–12°T 2°–12°T	80010888	1999	4.3-10, bottom	42	D
4-Port Antenna	698–862 880–960	65° 65°	16.5dBi 17dBi	1°–10°T 1°–10°T	80010889	2438	4.3-10, bottom	43	D
4-Port Antenna	698–960 698–960	65° 65°	15.5dBi 15.5dBi	2°–12°T 2°–12°T	80010901	1999	4.3-10, bottom	44 + 45	E
4-Port Antenna	698–960 698–960	65° 65°	16.5dBi 16.5dBi	1°–10°T 1°–10°T	80010902	2438	4.3-10, bottom	46 + 47	E
4-Port Antenna	790–960 790–960	65° 65°	17.5dBi 17.5dBi	0°–8°T 0°–8°T	80010647v01	2254	7-16, rearside	48	E
4-Port Antenna	790–960 790–960	90° 90°	16dBi 16dBi	0°–8°T 0°–8°T	80010817	2631	7-16, bottom	49	E

New or changed product

1) Configuration Types – further details on page 6–9.

Type D



Type E



Summary – Directional Antennas

4 Ports

Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)			
1 x Lowband 1 x Highband								
4-Port Antenna	698–960 1695–2690	65° 65°	10.5dBi 13.5dBi	2°T 2°T	80010715 603	4.3-10, bottom	50 + 51	M
4-Port Antenna	790–960 1710–2170	65° 60°	12dBi 14dBi	0°T 0°T	742226v01 579	7-16, bottom or top	52 + 53	L
4-Port Antenna	790–960 1710–2180	65° 65°	14.5dBi 17.5dBi	0°–14°T 2°–8°T	742264v02 1334	7-16, bottom	54 + 55	L
4-Port Antenna	790–960 1710–2690	65° 65°	15dBi 17.5dBi	0°–16°T 2°–10°T	80010664 1403	7-16, bottom	56 + 57	M
4-Port Antenna	790–960 1710–2180	65° 65°	16dBi 18.5dBi	0.5°–9.5°T 0°–6°T	742265v02 1933	7-16, bottom	58 + 59	L
4-Port Antenna	790–960 1710–2690	65° 65°	16dBi 18.5dBi	0°–10°T 2°–8°T	80010665v01 1997	7-16, bottom	60 + 61	M
4-Port Antenna	790–960 1710–2180	65° 65°	17dBi 18.5dBi	0°–7°T 0°–6°T	742266v02 2533	7-16, bottom	62 + 63	L
4-Port Antenna	698–960 1710–2690	65° 65°	17dBi 18.5dBi	1.5°–10°T 2°–8°T	80010666v01 2622	7-16, bottom	64 + 65	M
4-Port Antenna	790–960 1710–2180	90° 90°	15dBi 18dBi	0°–10°T 0°–6°T	80010122v01 1917	7-16, bottom	66 + 67	L
4-Port Antenna	790–960 1710–2180	90° 90°	16.5dBi 18dBi	0.5°–7°T 0°–6°T	80010123v03 2635	7-16, bottom	68 + 69	L
4-Port Antenna iRCU	698–894 1710–2200	65° 65°	15dBi 17.5dBi	0°–16°T 0°–10°T	80010764v01 1403	7-16, bottom	70	L
4-Port Antenna iRCU	698–894 1695–2170	65° 65°	16dBi 18.5dBi	0°–10°T 0°–10°T	80010765v01 1918	7-16, bottom	71	L
4-Port Antenna iRCU	698–894 1710–2170	65° 65°	17dBi 18.5dBi	0°–10°T 0°–10°T	80010766v01 2438	7-16, bottom	72	L

New or changed product

1) Configuration Types – further details on page 6–9.

Type L



Type M



Summary – Directional Antennas

4 Ports

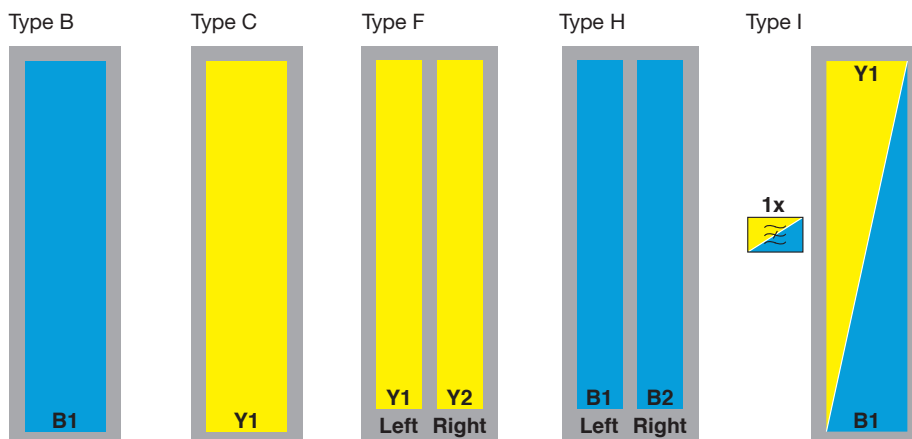
Dual Polarization $\pm 45^\circ$

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Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Highband									
4-Port Antenna	1695–2690	65°	16.5dBi	0°–12°T	80010682	855	7-16, bottom	73	F
	1695–2690	65°	16.5dBi	0°–12°T					
4-Port Antenna	1710–2170	65°	18dBi	2°–14°T	80010644v01	1442	7-16, bottom	74	I
	2490–2690	60°	18dBi	2°–14°T					
4-Port Antenna	1710–2200	65°	18dBi	0°–10°T	742236v01	1319	7-16, bottom	75	H
	1710–2200	65°	18dBi	0°–10°T					
4-Port Antenna	1710–2200	65°	18dBi	0°–15°T	80010510v01	1389	7-16, bottom	76	H
	1710–2200	65°	18dBi	0°–15°T					
4-Port Antenna	1695–2690	65°	18dBi	2°–14°T	80020622	1471	4.3-10, bottom	77 +	F
	1695–2690	65°	18dBi	2°–14°T					
4-Port Antenna	1695–2690	65°	19dBi	0°–10°T	80010652	1668	7-16, bottom	79	F
	1695–2690	65°	19dBi	0°–10°T					
2 x Highband Special Design									
4-Port MicroCell	1695–2690	85°	7.5dBi	0°T	80010843	526	4.3-10, bottom and top	220	C/C
	1695–2690	85°	7.5dBi	0°T					
4-Port Dual-Beam	1710–2200	40° (–30°)	17dBi	2°–14°T	80010605	698	7-16, bottom	80	B/B
	1710–2200	40° (+30°)	17dBi	2°–14°T					
4-Port Dual-Beam	1710–2200	45° (–30°)	19.5dBi	0°–10°T	80010606v01	1314	7-16, bottom	81 +	B/B
	1710–2200	45° (+30°)	19.5dBi	0°–10°T					
4-Port Dual-Beam	1695–2690	35° (–30°)	19.5dBi	2°–10°T	80010656	1254	7-16, bottom	83 +	C/C
	1695–2690	35° (+30°)	19.5dBi	2°–10°T					
2 x 3.5 GHz									
4-Port Antenna	3300–3800	65°	17.5dBi	2°–12°T	80010922	970	4.3-10, bottom	85 +	F
	3300–3800	65°	17.5dBi						

New or changed product

1) Configuration Types – further details on page 6–9.



Abbreviations:
iRCU: integrated Remote Control Unit
SLS: Enhanced Side Lobe Suppression (above or below horizon)
C: integrated Combiner

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698–862 880–960

HPBW

65° 65°

4-Port Antenna 698–862/880–960 65°/65° 14.5/15dBi 2°–16°/2°–16°T



FlexRET

Type No.		80010887		
Lowbands		R1, connector 1–2		R2, connector 3–4
		698–862		880–960
Frequency Range	MHz	698 – 806	790 – 862	880 – 960
Gain at mid Tilt	dBi	14.2	14.6	15.0
Gain over all Tilts	dBi	14.1 ± 0.5	14.5 ± 0.6	14.8 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	64 ± 2.7	62 ± 3.6	61 ± 1.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.0	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	14.6 ± 1.5	13.2 ± 0.7	12.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 16.0		2.0 – 16.0
Tilt Accuracy	°	< 0.7	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 14	> 14
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 15
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2)		> 28 (R2 // R1)
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–4	W	800 (at 50 °C ambient temperature)		



4 Ports

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 470 106 Maximal: 545 123
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1459 / 377 / 169 57.4 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	22.0 / 24.2 (clamps incl.) 48.5 / 53.4 (clamps incl.)
Packing Size	mm inches	1620 / 397 / 212 63.8 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698–862 880–960

HPBW

65° 65°

4-Port Antenna 698–862/880–960 65°/65° 15.5/16dBi 2°–12°/2°–12°T



FlexRET

Type No.		80010888		
Lowbands		R1, connector 1–2		R2, connector 3–4
		698–862		880–960
Frequency Range	MHz	698 – 806	790 – 862	880 – 960
Gain at mid Tilt	dBi	15.5	15.9	16.4
Gain over all Tilts	dBi	15.4 ± 0.5	15.8 ± 0.3	16.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 2.7	63 ± 1.0	61 ± 1.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26
Cross Polar Discrimination at Boresight	dB	> 24	> 26	> 23
Vertical Pattern:				
Elevation Beamwidth	°	10.7 ± 0.7	10.0 ± 0.5	9.1 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		2.0 – 12.0
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 20	> 22
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 20	> 19
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2)		> 28 (R2 // R1)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–4	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 203 Maximal: 905 203
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	29.9 / 34.9 (clamps incl.) 65.9 / 76.9 (clamps incl.)
Packing Size	mm inches	2200 / 412 / 255 86.6 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698–862 880–960

HPBW

65° 65°

4-Port Antenna 698–862/880–960 65°/65° 16.5/17dBi 1°–10°/1°–10°T



FlexRET

Type No.		80010889		
Lowbands		R1, connector 1–2		R2, connector 3–4
		698–862		880–960
Frequency Range	MHz	698 – 806	790 – 862	880 – 960
Gain at mid Tilt	dBi	16.1	16.7	17.4
Gain over all Tilts	dBi	16.1 ± 0.5	16.7 ± 0.4	17.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	65 ± 2.2	62 ± 1.5	59 ± 1.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 23	> 25
Cross Polar Discrimination at Boresight	dB	> 25	> 25	> 23
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 1.5	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	8.9 ± 0.7	8.0 ± 0.6	7.3 ± 0.6
Electrical Downtilt continuously adjustable	°	1.0 – 10.0		1.0 – 10.0
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 15	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 14	> 15
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 30 (R1 // R2)		> 30 (R2 // R1)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1140 256 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 378 / 164 96.0 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	35.6 / 40.6 (clamps incl.) 78.5 / 89.5 (clamps incl.)
Packing Size	mm inches	2640 / 412 / 255 103.9 / 16.2 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

4-Port Antenna

R1
R2

KATHREIN

Frequency Range

698-960
698-960

HPBW

65°
65°

4-Port Antenna 698-960/698-960 65°/65° 15.5/15.5dBi 2°-12°/2°-12°T

Type No.		80010901			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.4	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.5	> 11.5	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.4	10.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



FlexRET



80010901

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.3	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Cross Polar Discrimination over Sector	dB	> 8.0	> 12.5	> 13.0	> 13.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	41.0 / 46.0 (clamps incl.) 90.4 / 101.4 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

698-960 698-960

HPBW

65° 65°

4-Port Antenna 698-960/698-960 65°/65° 16.5/16.5dBi 1°-10°/1°-10°T



FlexRET

Type No.		80010902			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.1	16.4	16.5
Gain over all Tilts	dBi	15.6 ± 0.4	16.1 ± 0.3	16.3 ± 0.3	16.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	65 ± 2.3	65 ± 2.6	64 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 10.0	> 9.5	> 10.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	9.7 ± 0.7	9.0 ± 0.5	8.8 ± 0.5	8.3 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010902

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.3	16.6
Gain over all Tilts	dBi	15.5 ± 0.5	16.0 ± 0.5	16.3 ± 0.4	16.5 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	65 ± 2.6	64 ± 3.0	63 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 26
Cross Polar Discrimination over Sector	dB	> 9.5	> 10.5	> 10.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 0.5	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	9.9 ± 0.7	9.0 ± 0.7	8.6 ± 0.4	8.1 ± 0.5
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1400 315 Maximal: 1405 316
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 508 / 175 96.0 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	47.0 / 52.0 (clamps incl.) 103.6 / 114.6 (clamps incl.)
Packing Size	mm inches	2635 / 542 / 268 103.7 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and 1 unit of clamps for 55-115 mm 2.2-4.5 inches diameter	

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

790–960 790–960

HPBW

65° 65°

4-Port Antenna 790–960/790–960 65°/65° 17.5/17.5dBi 0°–8°/0°–8°T



Type No.		80010647v01		
Lowbands		R1; R2		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	16.9 ... 17.1 ... 17.0	17.0 ... 17.2 ... 17.1	17.3 ... 17.4 ... 17.1
Tilt	°	0 ... 4 ... 8	0 ... 4 ... 8	0 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	66	65	64
Front-to-back ratio, copolar	dB	> 27	> 27	> 27
Cross polar ratio	dB			
Main direction	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	Typically: > 10	Typically: > 10	Typically: > 10
Tracking, Avg.	dB	1.0		
Squint	°	±2.5		
Vertical Pattern:				
Half-power beam width	°	9.1	9.0	8.5
Electrical tilt	°	0–8, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	°T dB	0 ... 3 ... 6 ... 8 18 ... 18 ... 16 ... 15	0 ... 3 ... 6 ... 8 18 ... 18 ... 16 ... 15	0 ... 3 ... 6 ... 8 18 ... 18 ... 16 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	400 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	4 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	1415 318
		Maximal:	1555 350
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	2254 / 576 / 99 88.7 / 22.7 / 3.9	
Category of mounting hardware	H (Heavy)		
Weight	kg lb	24 / 26 (clamps incl.) 52.9 / 57.3 (clamps incl.)	
Packing size	mm inches	2500 x 600 x 150 98.4 x 23.6 x 5.9	
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

4-Port Antenna

R1 **R2**

KATHREIN

Frequency Range

790-960 790-960

HPBW

90° 90°

4-Port Antenna 790-960/790-960 90°/90° 16/16dBi 0°-8°/0°-8°T



Type No.		80010817		
Lowbands		R1; R2		
		790-960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain (dBi)	dBi	15.4 ... 15.4 ... 15.0	15.7 ... 15.7 ... 15.4	16.0 ... 16.1 ... 15.9
Tilt	°	0 ... 4 ... 8	0 ... 4 ... 8	0 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	93	90	87
Front-to-back ratio (180°±0°)	dB	> 24	> 24	> 25
Front-to-back ratio (180°±30°)	dB	> 20	> 21	> 22
Cross polar ratio Sector	0° ±60°	Typically: 20 > 10	Typically: 20 > 10	Typically: 18 > 10
Vertical Pattern:				
Half-power beam width	°	7.4	7.2	6.9
Electrical tilt	°	0-8, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 4 ... 8 ≥ 17 ... 17 ... 15	0 ... 4 ... 8 ≥ 17 ... 17 ... 15	0 ... 4 ... 8 ≥ 17 ... 17 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	Intrasystem: > 27, Intersystem: > 27		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port	W	400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		1200 (at 50 °C ambient temperature)		



4 Ports

Mechanical specifications			
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	840 189
		Maximal:	925 208
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	2631 / 374 / 106 104.0 / 14.7 / 4.2	
Category of mounting hardware	H (Heavy)		
Weight	kg lb	23 / 25 (clamps incl.) 50.7 / 55.1 (clamps incl.)	
Packing size	mm inches	3055 x 133 x 388 120.0 x 5.2 x 15.3	
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

4-Port Antenna

R1	Y1
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KATHREIN

Frequency Range

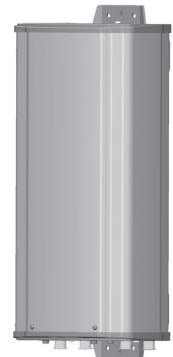
698-960	1695-2690
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HPBW

65°	65°
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4-Port Antenna 698-960/1695-2690 65°/65° 10.5/13.5dBi 2°/2°T

Type No.		80010715		
Lowband		R1, connector 1-2		
		698-960		
Frequency range	MHz	698 - 824 MHz	824 - 894 MHz	880 - 960 MHz
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	10.1	10.6	10.7
Horizontal Pattern:				
Half-power beam width	°	70	69	69
Front-to-back ratio	dB	> 23	> 25	> 25
Total power, ± 30°				
Cross polar ratio				
Maindirection	0°	Typically: 25	Typically: 28	Typically: 28
Sector	±60°	> 8	> 10	> 10
Vertical Pattern:				
Half-power beam width	°	40	36	35
Electrical tilt	°	2, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 27, typ. > 30	> 30	> 28, typ. > 30
Isolation: Intersystem	dB	> 26, typ. > 30 (R1 // Y1)		
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. effective power per port	W	250 (at 50 °C ambient temperature)		
Max. effective power for the antenna		400 (at 50 °C ambient temperature)		



80010715

Highband		Y1, connector 3-4				
		1695-2690				
Frequency range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	13.1	13.7	13.7	13.8	13.6
Horizontal Pattern:						
Half-power beam width	°	62	55	55	55	68
Front-to-back ratio						
Total power, ± 30°	dB	> 26	> 27	> 27	> 27	> 25
Cross polar ratio						
Main direction	0°	Typically: 25	28	28	25	28
Sector	±60°	> 10	> 10	> 10	> 10	> 10
Vertical Pattern:						
Half-power beam width	°	17.6	16.7	15.9	14.5	12.4
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation: Intrasystem	dB	> 26, typ. > 31			> 30, typ. > 31	
Isolation: Intersystem	dB	> 30 (Y1 // R1)				
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)				
Max. effective power per port	W	200 (at 50 °C ambient temperature)				
Max. effective power for the antenna	W	400 (at 50 °C ambient temperature)				
Total power for the antenna	W	800 (at 50 °C ambient temperature)				

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector position	Bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 110 25 Maximal: 170 38
Max. wind velocity	km/h mph	241 150
Height/width/depth	mm inches	603 / 300 / 152 23.7 / 11.8 / 6.0
Category of mounting hardware	M (Medium)	
Weight	kg lb	8.5 / 10.7 (clamps incl.) 18.7 / 23.6 (clamps incl.)
Packing size	mm inches	845 x 325 x 193 33.3 x 12.8 x 7.6
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range 790–960 1710–2170

HPBW 65° 60°

4-Port Antenna 790–960/1710–2170 65°/60° 12/14dBi 0°/0°T

Type No.		742226v01		
Lowband		R1		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Gain	dBi	2 x 11.1	2 x 11.4	2 x 11.8
Horizontal Pattern:				
Half-power beam width		68	67	65
Front-to-back ratio (180°±30°)	dB	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60° dB	Typically: 25 > 10	Typically: 25 > 10	Typically: 25 > 10
Tracking, Avg.	dB	1.0		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	34	33	30
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790–960 // 1710–2170 MHz)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		



742226v01

Highband		B1		
		1710–2170		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2170
Polarization	°	+45, –45	+45, –45	+45, –45
Gain	dBi	2 x 12.8	2 x 13.3	2 x 13.6
Horizontal Pattern:				
Half-power beam width	°	66	60	60
Front-to-back ratio (180°±30°)	dB	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60°	dB Typically: 16 > 10	dB Typically: 18 > 10	dB Typically: 20 > 10
Tracking, Avg.	dB	0.5		
Squint	°	±1.5		
Vertical Pattern:				
Half-power beam width	°	20	18	17.5
Electrical tilt	°	0, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790–960 // 1710–2170 MHz)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	200 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	4 x 7-16 female		
Connector position	Bottom or top		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	125 28
		Maximal:	135 30
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	579 / 262 / 139 22.8 / 10.3 / 5.5	
Category of mounting hardware	M (Medium)		
Weight	kg lb	7.5 / 9.5 (clamps incl.) 16.5 / 20.9 (clamps incl.)	
Packing size	mm inches	756 x 282 x 172 29.8 x 11.1 x 6.8	
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

* Inverted mounting:
Connector position top: Change drain hole screw.

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range 790–960 1710–2180

HPBW 65° 65°

4-Port Antenna 790–960/1710–2180 65°/65° 14.5/17.5dBi 0°–14°/0°–8°T

Type No.		742264v02		
Lowband		R1, connector 1–2		
		790–960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.1	14.2	14.3
Gain over all Tilts	dBi	14.1 ± 0.2	14.2 ± 0.3	14.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.1	68 ± 1.2	67 ± 1.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 28
Cross Polar Discrimination at Boresight	dB	> 24	> 26	> 26
Cross Polar Discrimination over Sector	dB	> 13.0	> 12.5	> 12.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	16.7 ± 0.6	16.2 ± 0.9	15.4 ± 0.9
Electrical Downtilt continuously adjustable	°	0.0 – 14.0		
Tilt Accuracy	°	< 0.5	< 0.5	< 0.7
First Upper Side Lobe Suppression	dB	> 15	> 17	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1)		
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–2	W	600 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

742264v02

Highband		B1, connector 3-4		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	17.3	17.5	17.5
Gain over all Tilts	dBi	17.2 ± 0.3	17.4 ± 0.2	17.4 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	61 ± 2.1	59 ± 2.7	59 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 28	> 26
Cross Polar Discrimination at Boresight	dB	> 27	> 27	> 28
Cross Polar Discrimination over Sector	dB	> 12.5	> 16.0	> 13.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0
Vertical Pattern:				
Elevation Beamwidth	°	7.4 ± 0.3	7.1 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	0.0 – 8.0		
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 13	> 13
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 3-4	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 45
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 310 70 Maximal: 340 76
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1334 / 261 / 146 52.5 / 10.3 / 5.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	16.0 / 18.2 (clamps incl.) 35.3 / 40.1 (clamps incl.)
Packing Size	mm inches	1646 / 282 / 182 64.8 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range 790–960 1710–2690

HPBW 65° 65°

4-Port Antenna 790–960/1710–2690 65°/65° 15/17.5dBi 0°–16°/2°–10°T



Type No.		80010664		
Lowband		R1, connector 1–2		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	14.5 ... 14.4 ... 14.2	14.6 ... 14.5 ... 14.3	14.8 ... 14.6 ... 14.4
Tilt	°	0 ... 8 ... 16	0 ... 8 ... 16	0 ... 8 ... 16
Horizontal Pattern:				
Half-power beam width	°	69	68	67°
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio				
Maindirection	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	> 10	> 9	> 8
Horizontal Pattern:				
Half-power beam width	°	16.5	16.0	15.5
Electrical tilt	°	0–16, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	° T dB	0 ... 8 ... 16 16 ... 15 ... 15	0 ... 8 ... 16 16 ... 15 ... 15	0 ... 8 ... 16 15 ... 15 ... 14
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 30 (698–960 // 1710–2690 MHz)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. effective power per port	W	300 (at 50 °C ambient temperature)		
Max. effective power for the antenna		600 (at 50 °C ambient temperature)		



80010664

Highband		Y1, connector 3-4				
		1710-2690				
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.2 ... 17.3 ... 16.8	17.4 ... 17.4 ... 16.9	17.6 ... 17.7 ... 17.0	17.0 ... 16.8 ... 16.0	17.2 ... 17.3 ... 16.7
Tilt	°	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10
Horizontal Pattern:						
Half-power beam width	°	63	64	66	73	65
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 28	> 29	> 26	> 25
Cross polar ratio						
Main direction	0°	Typically: 18	20	20	23	23
Sector	±60°	> 9	> 10	> 10	> 10	> 8
Horizontal Pattern:						
Half-power beam width	°	6.2	5.8	5.6	5.4	4.8
Electrical tilt	°	2-10, continuously adjustable				
Sidelobe suppression for first sidelobe above main beam	°T dB	2 ... 6 ... 10 14 ... 15 ... 16	2 ... 6 ... 10 14 ... 15 ... 17	2 ... 6 ... 10 15 ... 16 ... 17	2 ... 6 ... 10 17 ... 18 ... 18	2 ... 6 ... 10 15 ... 17 ... 18
Impedance	Ω	50				
VSWR		< 1.5				
Isolation: Intrasystem	dB	> 28				> 30
Isolation: Intersystem	dB	> 30 (790-960 // 1710-2690 MHz)				
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)				
Max. effective power per port	W	200 (at 50 °C ambient temperature)				
Max. effective power for the antenna		400 (at 50 °C ambient temperature)				

Mechanical specifications		
Input	4 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	2 x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 260 58 Maximal: 415 93
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	1403 / 300 / 152 55.2 / 11.8 / 6.0
Category of mounting hardware	M (Medium)	
Weight	kg lb	18 / 20 (clamps incl.) 39.7 / 44.1 (clamps incl.)
Packing size	mm inches	1726 x 322 x 190 68.0 x 12.7 x 7.5
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range 790–960 1710–2180

HPBW 65° 65°

4-Port Antenna 790–960/1710–2180 65°/65° 16/18.5dBi 0.5°–9.5°/0°–6°T



Type No.		742265v02		
Lowband		R1, connector 1–2		
		790–960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.6	15.8	15.9
Gain over all Tilts	dBi	15.6 ± 0.3	15.8 ± 0.3	15.9 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 0.9	68 ± 1.1	67 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27
Cross Polar Discrimination at Boresight	dB	> 27	> 27	> 28
Cross Polar Discrimination over Sector	dB	> 14.0	> 14.0	> 13.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	10.9 ± 0.5	10.6 ± 0.3	10.1 ± 0.5
Electrical Downtilt continuously adjustable	°	0.5 – 9.5		
Tilt Accuracy	°	< 0.3	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 15	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

742265v02

Highband		B1, connector 3-4		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.6	18.8	18.8
Gain over all Tilts	dBi	18.5 ± 0.3	18.6 ± 0.3	18.6 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	62 ± 3.3	60 ± 2.3	59 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 28	> 27
Cross Polar Discrimination at Boresight	dB	> 27	> 30	> 30
Cross Polar Discrimination over Sector	dB	> 13.0	> 17.0	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.2	4.7 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 3-4	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 45
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 475 107 Maximal: 525 118
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1933 / 261 / 146 76.1 / 10.3 / 5.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	20.0 / 22.2 (clamps incl.) 44.1 / 48.9 (clamps incl.)
Packing Size	mm inches	2256 / 282 / 182 88.8 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range

790-960 1710-2690

HPBW

65° 65°

4-Port Antenna 790-960/1710-2690 65°/65° 16/18.5dBi 0°-10°/2°-8°T



Type No.		80010665v01		
Lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.1	16.2	16.2
Gain over all Tilts	dBi	15.9 ± 0.3	16.1 ± 0.2	16.1 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 0.9	68 ± 1.2	67 ± 0.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 23	> 23	> 20
Cross Polar Discrimination over Sector	dB	> 9.5	> 10.0	> 11.0
Vertical Pattern:				
Elevation Beamwidth	°	10.1 ± 0.4	9.9 ± 0.3	9.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.5	< 0.5	< 0.6
First Upper Side Lobe Suppression	dB	> 16	> 18	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 18	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R1 // Y1)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010665v01

Highband		Y1, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.2	18.5	18.8	18.8	18.7
Gain over all Tilts	dBi	18.1 ± 0.5	18.4 ± 0.2	18.7 ± 0.5	18.7 ± 0.6	18.5 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.4	63 ± 2.7	61 ± 3.6	62 ± 5.7	64 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 27	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 14	> 19	> 20	> 18	> 20
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.5	> 10.0	> 10.0	> 11.5
Vertical Pattern:						
Elevation Beamwidth	°	5.0 ± 0.3	4.7 ± 0.2	4.4 ± 0.3	3.8 ± 0.2	3.5 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 8.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 16	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (R1 // Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	24.0 / 26.2 (clamps incl.) 52.9 / 57.8 (clamps incl.)
Packing Size	mm inches	2316 / 322 / 190 91.2 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range

790-960 1710-2180

HPBW

65° 65°

4-Port Antenna 790-960/1710-2180 65°/65° 17/18.5dBi 0°-7°/0°-6°T



Type No.		742266v02		
Lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.7	17.0	17.2
Gain over all Tilts	dBi	16.7 ± 0.3	16.9 ± 0.3	17.1 ± 0.2
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.2	68 ± 1.1	66 ± 1.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 28	> 31	> 33
Cross Polar Discrimination over Sector	dB	> 12.5	> 13.0	> 13.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.9 ± 0.2	7.7 ± 0.3	7.3 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 7.0		
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 17	> 17
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



742266v02

Highband		B1, connector 3-4		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.6	18.8	18.8
Gain over all Tilts	dBi	18.5 ± 0.3	18.7 ± 0.3	18.7 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	63 ± 2.0	60 ± 3.0	59 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 28	> 25
Cross Polar Discrimination at Boresight	dB	> 30	> 29	> 26
Cross Polar Discrimination over Sector	dB	> 14.5	> 16.5	> 14.0
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 0.5	< 1.0
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.3	4.7 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 17	> 17
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 3-4	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 45
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 645 145 Maximal: 710 160
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2533 / 261 / 146 99.7 / 10.3 / 5.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	24.0 / 26.2 (clamps incl.) 52.9 / 57.8 (clamps incl.)
Packing Size	mm inches	2856 / 282 / 182 112.4 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **Y1**

KATHREIN

Frequency Range

698-960 1710-2690

HPBW

65° 65°

4-Port Antenna 698-960/1710-2690 65°/65° 17/18.5dBi 1.5°-10°/2°-8°T



Type No.		80010666v01			
Lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.0	16.6	16.9	17.1
Gain over all Tilts	dBi	16.0 ± 0.5	16.5 ± 0.4	16.8 ± 0.4	17.0 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.2	68 ± 1.0	68 ± 0.9	67 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 23	> 22	> 22	> 21
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.5	> 9.5	> 8.5
Vertical Pattern:					
Elevation Beamwidth	°	8.4 ± 0.7	7.7 ± 0.4	7.5 ± 0.4	7.0 ± 0.3
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 16	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010666v01

Highband		Y1, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.0	18.5	18.8	18.6	19.0
Gain over all Tilts	dBi	18.0 ± 0.4	18.5 ± 0.4	18.7 ± 0.4	18.5 ± 0.7	18.8 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.4	62 ± 2.9	62 ± 2.2	60 ± 4.8	60 ± 2.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 27	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 15	> 18	> 20	> 16	> 21
Cross Polar Discrimination over Sector	dB	> 8.0	> 11.0	> 11.0	> 10.0	> 9.5
Vertical Pattern:						
Elevation Beamwidth	°	5.0 ± 0.4	4.7 ± 0.2	4.4 ± 0.4	3.9 ± 0.2	3.5 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 8.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 20	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 16	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (R1 // Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 530 119 Maximal: 845 190
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2622 / 300 / 152 103.2 / 11.8 / 6.0
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	29.0 / 31.2 (clamps incl.) 63.9 / 68.8 (clamps incl.)
Packing Size	mm inches	2951 / 322 / 190 116.2 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range

790–960 1710–2180

HPBW

90° 90°

4-Port Antenna 790–960/1710–2180 90°/90° 15/18dBi 0°–10°/0°–6°T



Type No.		80010122v01		
Lowband		R1, connector 1–2		
		790–960		
Frequency range	MHz	790 – 862	824 – 896	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	14.8 ... 14.8 ... 14.8	14.8 ... 15.0 ... 14.8	14.9 ... 15.1 ... 14.9
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:				
Half-power beam width	°	88	87	88
Front-to-back ratio (180°±30°)	dB	> 23	> 23	> 23
Cross polar ratio		Typically:	Typically:	Typically:
Main direction	0°	18	18	20
Sector	±60°	> 10	> 10	> 13
	±60°	avg. 16	avg. 16	avg. 19
Vertical Pattern:				
Half-power beam width	°	11.0	10.9	10.5
Electrical tilt	°	0–10, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 5 ... 10 18 ... 16 ... 14	0 ... 5 ... 10 16 ... 16 ... 15	0 ... 5 ... 10 16 ... 16 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790–960 // 1710–2180 MHz)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		
Total power		1000 (at 50 °C ambient temperature)		



80010122v01

Highband		B1, connector 3-4		
		1710-2180		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.7 ... 17.8 ... 17.7	17.7 ... 18.0 ... 17.6	17.6 ... 17.8 ... 17.4
Tilt	°	0 ... 3 ... 6	0 ... 3 ... 6	0 ... 3 ... 6
Horizontal Pattern:				
Half-power beam width	°	82	85	90
Front-to-back ratio (180°±30°)	dB	> 23	> 23	> 23
Cross polar ratio	dB	Typically:	Typically:	Typically:
Maindirection		17	16	15
Sector		> 10	> 12	> 10
		avg. 17	avg. 19	avg. 19
Vertical Pattern:				
Half-power beam width	°	5.5	5.2	5.0
Electrical tilt	°	0-6, continuously adjustable		
Min. sidelobe supression for first sidelobe above main beam	°T dB	0 ... 3 ... 6 18 ... 18 ... 16	0 ... 3 ... 6 18 ... 18 ... 16	0 ... 3 ... 6 18 ... 16 ... 16
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790-960 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		
Total power		500 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	4 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	475 107
		Maximal:	520 117
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	1917 / 262 / 149 75.5 / 10.3 / 5.9	
Category of mounting hardware	M (Medium)		
Weight	kg lb	27 / 29 (clamps incl.) 59.5 / 63.9 (clamps incl.)	
Packing size	mm inches	2249 x 304 x 204 88.5 x 12.0 x 8.0	
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

4-Port Antenna

R1 **B1**

KATHREIN

Frequency Range

790–960 1710–2180

HPBW

90° 90°

4-Port Antenna 790–960/1710–2180 90°/90° 16.5/18dBi 0.5°–7°/0°–6°T



Type No.		80010123v03		
Lowband		R1, connector 1–2		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	16.1 ... 16.2 ... 16.1	16.3 ... 16.4 ... 16.3	16.5 ... 16.6 ... 16.5
Tilt	°	0.5 ... 4 ... 7	0.5 ... 4 ... 7	0.5 ... 4 ... 7
Horizontal Pattern:				
Half-power beam width	°	86	86	86
Front-to-back ratio, copolar	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction		18	18	20
Sector	dB	> 10	> 10	> 13
		avg. 16	avg. 16	avg. 19
Tracking, Avg.	dB	0.5		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	7.3	7.2	6.9
Electrical tilt	°	0.5–7, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam	°T dB	0.5 ... 4 ... 7 15 ... 14 ... 14	0.5 ... 4 ... 7 15 ... 14 ... 14	0.5 ... 4 ... 7 15 ... 14 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790–960 // 1710–2180 MHz)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	500 (at 50 °C ambient temperature)		
Total power		1000 (at 50 °C ambient temperature)		



80010123v03

Highband		B1, connector 3-4		
		1710-2180		
Frequency range	MHz	1710 - 1880	1850 - 1990	1920 - 2180
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.8 ... 17.7 ... 17.4	18.0 ... 17.9 ... 17.4	17.9 ... 17.8 ... 17.3
Tilt	°	0 ... 3 ... 6	0 ... 3 ... 6	0 ... 3 ... 6
Horizontal Pattern:				
Half-power beam width	°	84	85	88
Front-to-back ratio (180°±30°)	dB	> 23	> 23	> 23
Cross polar ratio	dB	Typically:	Typically:	Typically:
Maindirection 0°		16	16	15
Sector ±60°		> 10	> 12	> 10
	±60°	avg. 16	avg. 17	avg. 18
Tracking, Avg.	dB	0.5		
Squint	°	±3.0		
Vertical Pattern:				
Half-power beam width	°	4.8	4.5	4.2
Electrical tilt	°	0-6, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 3 ... 6 18 ... 17 ... 16	0 ... 3 ... 6 18 ... 17 ... 17	0 ... 3 ... 6 18 ... 16 ... 17
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 42 (790-960 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		
Total power		500 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	4 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment Mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	680 153
		Maximal:	750 169
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	2635 / 262 / 149 103.7 / 10.3 / 5.9	
Category of mounting hardware	H (Heavy)		
Weight	kg lb	33.0 / 35.0 (clamps incl.) 72.8 / 77.2 (clamps incl.)	
Packing size	mm inches	2966 x 282 x 182 116.8 x 11.1 x 7.2	
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

4-Port Antenna Frequency Range HPBW

R1	B1
698–894	1710–2200
65°	65°
iRCU	iRCU

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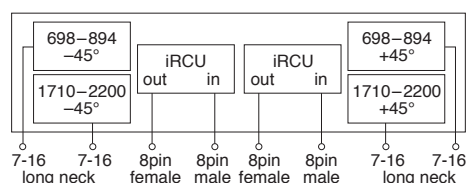
Integrated replaceable Remote Control Unit

4-Port Antenna iRCU 698–894/1710–2200 65°/65° 15/17.5dBi 0°–16°/0°–10°T

Type No.	80010764v01				
Antenna specifications	R1, connector 1–2		B1, connector 3–4		
	698–894		1710–2200		
Frequency range	MHz	698 – 806	824 – 894	1710 – 1755 2110 – 2200	1850 – 1990
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	14.3	14.8	17.3	17.5
Horizontal Pattern:					
Half-power beam width	°	68	65	61	60
Front-to-back ratio	dB	Copolar: > 30 Average: 32	Copolar: > 27 Average: 30	Copolar: > 30 Average: 34	Copolar: > 30 Average: 34
Cross polar ratio	dB	Typically: > 25 > 10, Avg. 15	Typically: > 25 > 8, Avg. 14	Typically: > 25 > 8, Avg. 14	Typically: > 25 > 10, Avg. 16
Tracking, Avg.	dB	1.5	1.5	2.0	1.0
Squint	°	±2.5	±4.0	±4.0	±1.5
Vertical Pattern:					
Half-power beam width	°	15	13.5	7.5	7.5
Electrical tilt	°	0–16, continuously adjustable		0–10, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	°T	0 ... 8 ... 16	0 ... 8 ... 16	0 ... 5 ... 10	0 ... 5 ... 10
Average:	dB	17 ... 16 ... 16	18 ... 16 ... 16	18 ... 18 ... 17	18 ... 18 ... 17
	dB	19 ... 19 ... 18	22 ... 20 ... 20	20 ... 20 ... 20	20 ... 20 ... 20
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	Intrasystem: > 30, Intersystem: > 35			
Intermodulation IM3	dBc	< –150 dBc (2 x 43 dBm carrier)			
Max. effective power per port	W	300 (at 50 °C ambient temperature)		250 (at 50 °C ambient temperature)	
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		900 (at 50 °C ambient temperature)	
Input		4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position		Bottom			
Wind load	N lbf	Frontal: 260	58 (at 150 km/h)	670	150 (at 150 mph)
		Maximal: 415	93 (at 150 km/h)	1070	240 (at 150 mph)
Max. wind velocity	km/h mph	241 150			
Height/width/depth	mm inches	1403 / 300 / 152 55.2 / 11.8 / 6.0			
Category of mounting hardware		M (Medium)			
Weight	kg lb	18.5 / 20.5 (clamps incl.) 40.8 / 45.2 (clamps incl.)			
Packing size	mm inches	1616 x 322 x 190 63.6 x 12.7 x 7.5			
Scope of supply		Panel, 2 units of iRCU and 2 units of clamps 42–115 mm 1.7–4.5 inches diameter			



iRCU specifications (86010149) see page 262



4-Port Antenna Frequency Range HPBW

R1	B1
698–894	1695–2170
65°	65°
iRCU	iRCU

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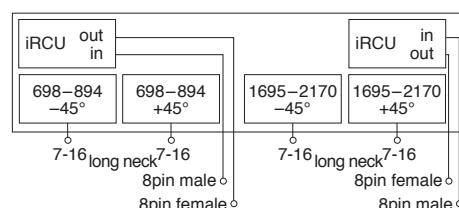
4 Ports

4-Port Antenna iRCU 698–894/1695–2170 65°/65° 16/18.5dBi 0°–10°/0°–10°T

Type No.		80010765v01			
Antenna specifications		R1, connector 1–2		B1, connector 3–4	
		698–894		1695–2170	
Frequency range	MHz	698 – 806	824 – 894	1695 – 1755 2110 – 2170	1850 – 1990
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	15.3	15.8	18	18.5
Horizontal Pattern:					
Half-power beam width	°	68	65	63	62
Front-to-back ratio	dB	Copolar: > 30 Average: 34	Copolar: > 30 Average: 34	Copolar: > 27 Average: 34	Copolar: > 27 Average: 34
Cross polar ratio Maindirection Sector	0° ±60°	dB Typically: > 25 > 10, Avg. 16	dB Typically: > 20 > 10, Avg. 14	dB Typically: > 25 > 8, Avg. 15	dB Typically: > 30 > 10, Avg. 15
Tracking, Avg.	dB	1.0	1.5	1.5	1.0
Squint	°	±2.5	±3.0	±3.0	±2.5
Vertical Pattern:					
Half-power beam width	°	11.8	10.8	5.8	5.8
Electrical tilt	°	0–10, continuously adjustable		0–10, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	°T	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Average:	dB	16 ... 16 ... 18	18 ... 18 ... 16	18 ... 18 ... 18	18 ... 18 ... 18
	dB	18 ... 20 ... 20	20 ... 22 ... 20	20 ... 22 ... 20	20 ... 22 ... 20
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	Intrasystem: > 30, Intersystem: > 35			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. effective power per port	W	400 (at 50 °C ambient temperature)		250 (at 50 °C ambient temperature)	
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		900 (at 50 °C ambient temperature)	
Input		4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position		Bottom			
Wind load	N lbf	Frontal: 370 283 (at 150 km/h)	950 214 (at 150 mph)		
		Maximal: 590 133 (at 150 km/h)	1525 342 (at 150 mph)		
Max. wind velocity	km/h mph	241 150			
Height/width/depth	mm inches	1918 / 300 / 152 75.5 / 11.8 / 6.0			
Category of mounting hardware		H (Heavy)			
Weight	kg lb	23.5 / 25.7 (clamps incl.) 51.8 / 56.6 (clamps incl.)			
Packing size	mm inches	2166 x 322 x 190 85.3 x 12.7 x 7.5			
Scope of supply		Panel, 2 units of iRCU and 2 units of clamps 42–115 mm 1.7–4.5 inches diameter			



iRCU specifications (86010149) see page 262



4-Port Antenna Frequency Range HPBW

R1	B1
698–894	1710–2170
65°	65°
iRCU	iRCU

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Integrated replaceable Remote Control Unit

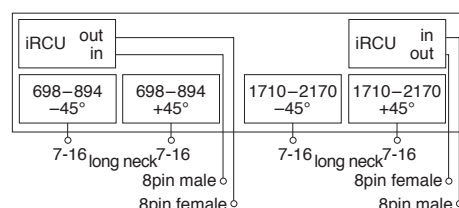


4-Port Antenna iRCU 698–894/1710–2170 65°/65° 17/18.5dBi 0°–10°/0°–10°T

Type No.		80010766v01			
Antenna specifications		R1, connector 1–2		B1, connector 3–4	
		698–894		1710–2170	
Frequency range	MHz	698 – 806	824 – 894	1710 – 1755 2110 – 2170	1850 – 1990
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	16.4	16.8	18	18.5
Horizontal Pattern:					
Half-power beam width	°	68	65	63	62
Front-to-back ratio	dB	Copolar: > 30 Average: 34	Copolar: > 30 Average: 34	Copolar: > 27 Average: 34	Copolar: > 27 Average: 34
Cross polar ratio	dB	Typically: > 25 > 10, Avg. 15	Typically: > 20 > 10, Avg. 12	Typically: > 25 > 8, Avg. 15	Typically: > 30 > 10, Avg. 15
Tracking, Avg.	dB	1.0		1.5	
Squint	°	±2.5		±3.0	
Vertical Pattern:					
Half-power beam width	°	9.5	8.7	5.8	5.8
Electrical tilt	°	0–10, continuously adjustable		0–10, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	°T	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Average:	dB	16 ... 16 ... 16	18 ... 18 ... 16	18 ... 18 ... 18	18 ... 18 ... 18
	dB	18 ... 20 ... 18	20 ... 20 ... 20	20 ... 22 ... 20	20 ... 22 ... 20
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	Intrasystem: > 30, Intersystem: > 35			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. effective power per port	W	400 (at 50 °C ambient temperature)		250 (at 50 °C ambient temperature)	
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		900 (at 50 °C ambient temperature)	
Input		4 x 7-16 female (long neck) iRCU in: 2 x 8pin male iRCU out: 2 x 8pin female			
Connector position		Bottom			
Wind load	N lbf	Frontal: 485 109 (at 150 km/h)	1250 281 (at 150 mph)		
		Maximal: 780 175 (at 150 km/h)	2005 451 (at 150 mph)		
Max. wind velocity	km/h mph	241 150			
Height/width/depth	mm inches	2438 / 300 / 152 96.0 / 11.8 / 6.0			
Category of mounting hardware		H (Heavy)			
Weight	kg lb	26.5 / 28.7 (clamps incl.) 58.3 / 63.3 (clamps incl.)			
Packing size	mm inches	2656 x 320 x 190 99.88 x 12.6 x 7.5			
Scope of supply		Panel, 2 units of iRCU and 2 units of clamps 42–115 mm 1.7–4.5 inches diameter			



iRCU specifications (86010149) see page 262



4-Port Antenna

Y1 Y2

KATHREIN

Frequency Range 1695–2690 1695–2690

HPBW 65° 65°



4-Port Antenna 1695–2690/1695–2690 65°/65° 16.5/16.5dBi 0°–12°/0°–12°T

Type No.	80010682				
Highbands	Y1; Y2				
	1695–2690				
Frequency range	MHz	1695 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain at 0° tilt	dBi	4 x 15.8	4 x 16.2	4 x 16.6	4 x 16.7
Horizontal Pattern:					
Half-power beam width	°	65	64	60	61
Front-to-back ratio, copolar	dB	> 30	> 30	> 30	> 28
Cross polar ratio	0°	Typically: 25	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	> 8	> 8	> 10	> 10
Vertical Pattern:					
Half-power beam width	°	11	10	9	8.7
Electrical tilt	°	0–12, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	°T	0 ... 6 ... 12	0 ... 6 ... 12	0 ... 6 ... 12	0 ... 6 ... 12
	dB	≥ 12 ... 13 ... 15	≥ 13 ... 14 ... 16	≥ 13 ... 15 ... 16	≥ 15 ... 15 ... 17
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. eff. power per port	W	200 (at 50 °C ambient temperature)			
Max. eff. power for the antenna		600 (at 50 °C ambient temperature)			



4 Ports

Mechanical specifications			
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2 x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	375 84
		Maximal:	410 92
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	855 / 323 / 71 33.7 / 12.7 / 2.8	
Category of mounting hardware	M (Medium)		
Weight	kg lb	11 / 13 (clamps incl.) 24.3 / 28.7 (clamps incl.)	
Packing size	mm inches	1146 x 337 x 112 45.1 x 13.3 x 4.4	
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

4-Port Antenna

B1 **Y1**

KATHREIN

Frequency Range **1710–2170** **2490–2690**

HPBW **65°** **60°**

4-Port Antenna 1710–2170/2490–2690 65°/60° 18/18dBi 2°–14°/2°–14°T



Type No.		80010644v01		
Highbands		B1, connector 1–2		Y1, connector 3–4
		1710–2170		2490–2690
Frequency range	MHz	1710 – 1990	1920 – 2170	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45
Gain	dBi	2 x 17.5	2 x 18.0	2 x 17.7
Horizontal Pattern:				
Half-power beam width	°	68	65	61
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio	0°	Typically: 25	Typically: 25	Typically: 25
Sector	±60°	> 10	> 10	> 10
Tracking, Avg.	dB	< 1.5		
Vertical Pattern:				
Half-power beam width	°	6.8	6.1	4.8
Electrical tilt, continuously adjustable	°	2–14		2–14
Sidelobe suppression	°T	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
– for first sidelobe above main beam	dB	≥ 18 ... 18 ... 16	≥ 18 ... 18 ... 17	≥ 18 ... 18 ... 16
– within 0°–20° sector above horizon	dB	≥ 17 ... 17 ... 16	≥ 17 ... 17 ... 16	≥ 17 ... 16 ... 12
Impedance	Ω	50		50
VSWR		< 1.5		< 1.5
Isolation: Intrasystem	dB	> 30		> 30
Isolation: Intersystem	dB	> 30		> 30
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		< –150 (2 x 43 dBm carrier)
Max. effective power per port	W	200 (at 50 °C ambient temperature)		
Max. effective power for the antenna		600 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	4 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	255 57
		Maximal:	280 63
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	1442 / 155 / 89 56.8 / 6.1 / 3.5	
Category of mounting hardware	M (Medium)		
Weight	kg lb	10 / 12 (clamps incl.) 22.1 / 26.5 (clamps incl.)	
Packing size	mm inches	1795 x 182 x 137 70.1 x 7.2 x 5.4	
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

4-Port Antenna

B1 **B2**

KATHREIN

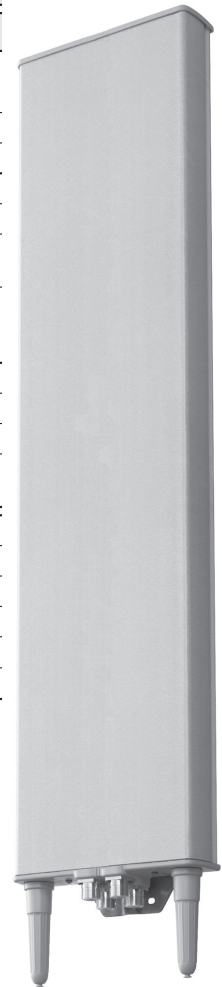
Frequency Range **1710-2200** **1710-2200**

HPBW **65°** **65°**

4-Port Antenna 1710-2200/1710-2200 65°/65° 18/18dBi 0°-10°/0°-10°T



Type No.	742236v01			
Highbands	B1; B2			
		1710-2200		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	17.6	17.8	18
Horizontal Pattern:				
Half-power beam width	°	64	64	62
Front-to-back ratio	dB	Copolar: > 30 Total power: > 25	Copolar: > 30 Total power: > 25	Copolar: > 30 Total power: > 25
Cross polar ratio Maindirection Sector	dB 0° ±60°	Typically: 25 > 10	Typically: 25 > 10	Typically: 25 > 10
Vertical Pattern:				
Half-power beam width	°	7	6.8	6.5
Electrical tilt	°	0-10, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 5 ... 10 20 ... 18 ... 16	0 ... 5 ... 10 20 ... 18 ... 16	0 ... 5 ... 10 16 ... 18 ... 16
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 30		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		
Max. eff. power per antenna	W	800 (at 50 °C ambient temperature)		



4 Ports

Mechanical specifications			
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2 x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	550 124
		Maximal:	605 136
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	1319 / 323 / 71 51.9 / 12.7 / 2.8	
Category of mounting hardware	M (Medium)		
Weight	kg lb	15 / 17.2 (clamps incl.) 33.1 / 37.9 (clamps incl.)	
Packing size	mm inches	1600 x 337 x 112 63.0 x 13.3 x 4.4	
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

4-Port Antenna

B1
B2

KATHREIN

Frequency Range

1710–2200
1710–2200

HPBW

65°
65°

4-Port Antenna 1710–2200/1710–2200 65°/65° 18/18dBi 0°–15°/0°–15°T ESLS



Type No.		80010510v01			
Highbands		B1; B2			
		1710–2200			
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2000 – 2200
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain at 0° tilt	dBi	17.5	17.6	17.7	17.8
Horizontal Pattern:					
Half-power beam width	°	65	63	62	62
Front-to-back ratio (180°±30°)	dB	≥ 30	≥ 30	≥ 30	≥ 28
Cross polar ratio	0°	24	24	24	26
Sector	±60°	≥ 9	≥ 9	> 10	≥ 10
Vertical Pattern:					
Half-power beam width	°	7.9	7.5	7.2	6.9
Electrical tilt	°	0–15, continuously adjustable			
Sidelobe suppression	°T	0 ... 5 ... 10 ... 15	0 ... 5 ... 10 ... 15	0 ... 5 ... 10 ... 15	0 ... 5 ... 10 ... 15
– for first sidelobe above main beam	dB	≥ 17 ... 20 ... 18 ... 17	≥ 16 ... 20 ... 18 ... 18	≥ 15 ... 19 ... 18 ... 17	≥ 14 ... 18 ... 18 ... 16
– within 0°–20° sector above horizon		≥ 16 ... 18 ... 18 ... 16	≥ 16 ... 17 ... 17 ... 16	≥ 15 ... 17 ... 17 ... 16	≥ 14 ... 16 ... 16 ... 15
Null-fill at 0° tilt	dB	23	22	21	20
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< –153 (2 x 43 dBm carrier)			
Max. power per input	W	250 (at 50 °C ambient temperature)			
Max. effective power per antenna	W	800 (at 50 °C ambient temperature)			



Mechanical specifications		
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 580 130 Maximal: 635 148
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	1389 / 323 / 71 54.7 / 12.7 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	17 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing size	mm inches	1686 x 337 x 112 66.4 x 13.3 x 4.4
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

4-Port Antenna

Y1 **Y2**

KATHREIN

Frequency Range 1695–2690 1695–2690

HPBW 65° 65°

4-Port Antenna 1695–2690/1695–2690 65°/65° 18/18dBi 2°–14°/2°–14°T ESLS



Type No.		80020622			
Left side, highband		Y1, connector 1–2			
		1695–2690			
Frequency Range	MHz	1695 – 1880	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	18.0	18.6	18.8
Gain over all Tilts	dBi	17.3 ± 0.4	17.9 ± 0.4	18.3 ± 0.4	18.6 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 3.2	63 ± 2.6	60 ± 3.5	56 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 26	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 22	> 18
Cross Polar Discrimination over Sector	dB	> 12.5	> 10.0	> 9.5	> 13.0
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.5	6.1 ± 0.5	5.2 ± 0.3	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 14.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 20	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 17	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (Y1 // Y2)			
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)			
Max. Effective Power Port 1–2	W	500 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Data sheet continued on next page.

80020622

Right side, highband		Y2, connector 3-4			
		1695-2690			
Frequency Range	MHz	1695 – 1880	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.2	17.9	18.6	18.9
Gain over all Tilts	dBi	17.1 ± 0.4	17.8 ± 0.5	18.4 ± 0.4	18.7 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	68 ± 3.8	64 ± 4.1	59 ± 2.6	55 ± 2.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 22	> 19
Cross Polar Discrimination over Sector	dB	> 13.5	> 11.0	> 9.5	> 12.0
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.4	6.0 ± 0.5	5.2 ± 0.3	4.8 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 14.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 19	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 17	> 17	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (Y1 // Y2)			
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	500 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	-45, +45
Max. Effective Power for the Antenna	W	700 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 565 127 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1471 / 275 / 86 57.9 / 10.8 / 3.4
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	13.0 / 14.5 (clamps incl.) 28.7 / 32.0 (clamps incl.)
Packing Size	mm inches	1791 / 298 / 119 70.5 / 11.7 / 4.7
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

Y1 **Y2**

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Frequency Range **1695–2690** **1695–2690**

HPBW **65°** **65°**

4-Port Antenna 1695–2690/1695–2690 65°/65° 19/19dBi 0°–10°/0°–10°T



Type No.		80010652			
Highbands		Y1; Y2			
		1695–2690			
Frequency range	MHz	1695 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	18.2 ... 18.4 ... 18.0	18.7 ... 18.9 ... 18.4	18.8 ... 19.0 ... 18.3	18.7 ... 19.0 ... 18.3
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:					
Half-power beam width	°	65	65	62	65
Front-to-back ratio, copolar	dB	> 30	> 26	> 28	> 26
Cross polar ratio	0°	Typically: 22	Typically: 22	Typically: 22	Typically: 20
Sector	±60°	> 10	> 10	> 10	> 10
Vertical Pattern:					
Half-power beam width	°	5.5	5.0	4.3	4.0
Electrical tilt	°	0–10, continuously adjustable			
Sidelobe suppression	° T	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
for first sidelobe above main beam	dB	≥ 18 ... 16 ... 15	≥ 18 ... 16 ... 15	≥ 18 ... 16 ... 15	≥ 18 ... 15 ... 15
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)			
Max. effective power per port	W	250 (at 50 °C ambient temperature)			
Max. effective power for the antenna		500 at 50 °C ambient temperature)			



4 Ports

Mechanical specifications		
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2 x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 705 158 Maximal: 775 174
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1668 / 315 / 71 65.7 / 12.4 / 2.8
Category of mounting hardware	M (Medium)	
Weight	kg lb	17 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing size	mm inches	1961 x 337 x 112 77.2 x 14.8 x 4.4
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

4-Port Dual-Beam B1 B2
Frequency Range 1710–2200 1710–2200
HPBW 40° 40°

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4-Port Dual-Beam Antenna 1710–2200/1710–2200 40°(-30°)/40°(+30°) 17/17dBi
2°–14°/2°–14°T



Type No.		80010605		
Highbands		B1, B2		
		1710–2200		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Azimuth direction		Beam A (-30°), Beam B (+30°)		
Polarization	°	+45, -45	+45, -45	+45, -45
Gain at mid tilt	dBi	16.3	16.8	17.3
Gain over all tilts	dBi	16.2 ± 0.7	16.7 ± 0.5	17.1 ± 0.8
Horizontal Pattern:				
Half-power beam width (offset beams ±30°)	°	43	40	37
Front-to-back ratio	dB	Copolar: > 30 Total power: > 25		
Cross polar ratio				
Main direction	-30°; +30°	Typically: 15	Typically: 15	Typically: 15
Sector	-60°; 0°; 0°; +60°	> 8	> 8	> 8
Sidelobe suppression for sidelobes beside main beam	dB	> 18		
Vertical Pattern:				
Half-power beam width	°	14.5	14	13
Electrical tilt	°	2–14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	dB	> 16		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation, between ports	dB	> 28		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	200 (at 50 °C ambient temperature)		
Max. power for the antenna	W	600 (at 50 °C ambient temperature)		



Mechanical specifications			
Input	4 x 7-16 female		
Connector Position	bottom		
Adjustment Mechanism	2x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	260 58
		Maximal:	280 63
Max. Wind Velocity	km/h mph	200 124	
Height / Width / Depth	mm inches	698 / 380 / 150 27.5 / 15.0 / 5.9	
Category of Mounting Hardware	M (Medium)		
Weight	kg lb	12.0 / 14.2 (clamps incl.) 26.5 / 31.3 (clamps incl.)	
Packing Size	mm inches	1080 / 402 / 172 42.5 / 15.8 / 6.8	
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter		

4-Port Dual-Beam B1 B2
Frequency Range 1710–2200 1710–2200
HPBW 45° 45°

KATHREIN

**4-Port Dual-Beam Antenna 1710–2200/1710–2200 45°(-30°)/45°(+30°) 19.5/19.5dBi
 0°-10°/0°-10°T**



Type No.		80010606v01		
Left side, highband		B1, connector 1–2		
		1710–2200		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Gain at mid Tilt	dBi	19.0	19.1	19.4
Gain over all Tilts	dBi	18.9 ± 0.2	19.0 ± 0.2	19.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	47 ± 1.1	46 ± 1.1	44 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 26
Cross Polar Discrimination over Sector	dB	> 9.0	> 8.5	> 10.5
Azimuth Beam Squint	°	-0.5 ± 1.2	0.0 ± 1.2	0.0 ± 0.9
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.5	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.2 ± 0.1	7.0 ± 0.1	6.7 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 22	> 19
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B1 // B2)		
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–2	W	400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Data sheet continued on next page.

80010606v01

Right side, highband		B2, connector 3-4		
		1710-2200		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2200
Gain at mid Tilt	dBi	19.0	19.1	19.4
Gain over all Tilts	dBi	18.9 ± 0.2	19.0 ± 0.2	19.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	48 ± 1.6	47 ± 1.5	44 ± 2.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 26	> 26
Cross Polar Discrimination over Sector	dB	> 9.0	> 9.5	> 10.0
Azimuth Beam Squint	°	0.0 ± 1.4	0.5 ± 1.2	1.0 ± 0.8
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	7.2 ± 0.1	7.0 ± 0.1	6.7 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 22	> 20
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B1 // B2)		
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)		
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 445 100 Maximal: 485 109
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1314 / 380 / 150 51.7 / 15.0 / 5.9
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	19.0 / 21.2 (clamps incl.) 41.9 / 46.7 (clamps incl.)
Packing Size	mm inches	1696 / 402 / 172 66.8 / 15.8 / 6.8
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Dual-Beam Y1 Y2
Frequency Range 1695–2690 1695–2690
HPBW 35° 35°

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**4-Port Dual-Beam Antenna 1695–2690/1695–2690 35°(-30°)/35°(+30°) 19.5/19.5dBi
 2°–10°/2°–10°T**



Type No.		80010656				
Left side, highband		Y1, connector 1–2				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.7	19.2	19.5	19.7	19.5
Gain over all Tilts	dBi	18.6 ± 0.5	19.1 ± 0.3	19.4 ± 0.4	19.6 ± 0.5	19.4 ± 1.1
Horizontal Pattern:						
Azimuth Beamwidth	°	41 ± 1.8	38 ± 1.7	37 ± 1.2	36 ± 2.0	33 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 23	> 24	> 23
Cross Polar Discrimination over Sector	dB	> 15.0	> 16.5	> 17.0	> 13.5	> 8.0
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.6	7.4 ± 0.2	7.1 ± 0.3	6.4 ± 0.4	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.5	< 0.3	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 19	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 1–2	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Data sheet continued on next page.

80010656

Right side, highband		Y2, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	18.6	19.1	19.4	19.7	19.6
Gain over all Tilts	dBi	18.5 ± 0.5	19.0 ± 0.5	19.3 ± 0.5	19.6 ± 0.6	19.5 ± 1.0
Horizontal Pattern:						
Azimuth Beamwidth	°	41 ± 1.9	38 ± 2.3	37 ± 1.3	35 ± 1.0	33 ± 1.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 20	> 22	> 25	> 23
Cross Polar Discrimination over Sector	dB	> 15.0	> 16.5	> 17.0	> 13.5	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	7.8 ± 0.6	7.4 ± 0.3	7.1 ± 0.4	6.4 ± 0.4	5.8 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.7	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 20	> 20	> 19	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	2x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 430 97 Maximal: 465 105
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1254 / 380 / 150 49.4 / 15.0 / 5.9
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	17.0 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing Size	mm inches	1696 / 402 / 172 66.8 / 15.8 / 6.8
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

4-Port Antenna

Y1 **Y2**

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Frequency Range 3300–3800 3300–3800

HPBW 65° 65°

4-Port Antenna 3300–3800/3300–3800 65°/65° 17.5/17.5dBi 2°–12°T



Type No.		80010922	
Left side, highband		Y1, connector 1–2	
		3300–3800	
Frequency Range	MHz	3300 – 3590	3600 – 3800
Gain at mid Tilt	dBi	17.5	17.6
Gain over all Tilts	dBi	17.3 ± 0.4	17.4 ± 0.5
Horizontal Pattern:			
Azimuth Beamwidth	°	66 ± 4.6	63 ± 4.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 21
Cross Polar Discrimination over Sector	dB	> 12.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	6.0 ± 0.3	5.6 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0 (Y1 + Y2 simultaneously)	
Tilt Accuracy	°	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 24	> 23
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18
Cross Polar Isolation	dB	> 25, typ. > 28	
Port to Port Isolation	dB	> 27, typ. > 30 (Y1 // Y2)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Port 1–2	W	300 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



4 Ports

Data sheet continued on next page.

80010922

Right side, highband		Y2, connector 3-4	
		3300-3800	
Frequency Range	MHz	3300 – 3590	3600 – 3800
Gain at mid Tilt	dBi	17.5	17.8
Gain over all Tilts	dBi	17.3 ± 0.5	17.6 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	67 ± 3.8	63 ± 4.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25
Cross Polar Discrimination over Sector	dB	> 12.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	5.9 ± 0.4	5.6 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 12.0 (Y1 + Y2 simultaneously)	
Tilt Accuracy	°	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 22	> 22
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 17
Cross Polar Isolation	dB	> 25, typ. > 28	
Port to Port Isolation	dB	> 27, typ. > 30 (Y2 // Y1)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Port 3-4	W	300 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	400 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	1x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 235 53 Maximal: 255 57
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	970 / 179 / 76 38.2 / 7.0 / 3.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	5.4 / 7.6 (clamps incl.) 11.9 / 16.7 (clamps incl.)
Packing Size	mm inches	1320 / 190 / 95 52.0 / 7.5 / 3.7
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

Summary – Directional Antennas

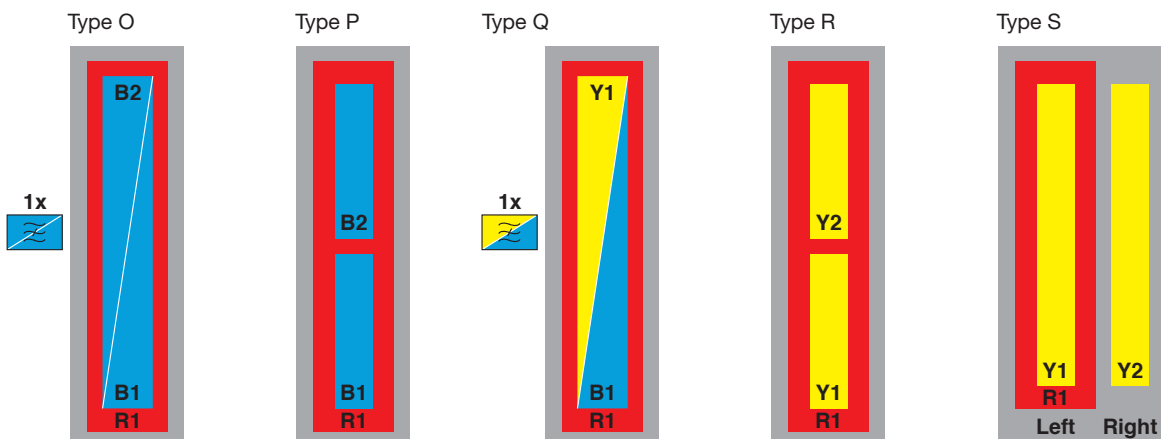
6 Ports

Dual Polarization $\pm 45^\circ$

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Type	Type No.	Height [mm]	Connector female, type and position	Page	1)					
1 x Lowband 2 x Highband										
6-Port Antenna	790–960	65°	15dBi	0°–16°T	80010674	1403	7-16, bottom	90 +	91	Q
	1710–2170	65°	17dBi	2°–10°T						
	2490–2690	65°	16.5dBi	2°–10°T						
6-Port Antenna	790–960	65°	16dBi	0°–10°T	80010675v01	1997	7-16, bottom	92 +	93	Q
	1710–2170	65°	18dBi	2°–8°T						
	2490–2690	65°	18dBi	2°–8°T						
6-Port Antenna	790–960	65°	15dBi	0°–14°T	80010290v02	1540	7-16, bottom	94 +	95	P
	1710–2180	65°	15dBi	0°–14°T						
	1710–2180	65°	15dBi	0°–14°T						
6-Port Antenna	790–960	65°	16.5dBi	2°–14°T	80010291v02	2058	7-16, bottom	96 +	97	P
	1710–2180	65°	16.5dBi	0°–14°T						
	1710–2180	65°	16.5dBi	0°–14°T						
6-Port Antenna	790–960	65°	17.5dBi	2°–10°T	80010292v03	2598	7-16, bottom	98 +	99	P
	1710–2180	65°	17.5dBi	0°–10°T						
	1710–2180	65°	17dBi	0°–10°T						
6-Port Antenna	698–960	65°	16dBi	1°–12°T	80010691v01	1997	7-16, bottom	100 +	101	R
	1710–2690	65°	16dBi	2°–12°T						
	1710–2690	65°	16dBi	2°–12°T						
6-Port Antenna	698–960	65°	17dBi	1.5°–10°T	80010692v01	2622	7-16, bottom	102 +	103	R
	1710–2690	65°	17dBi	0°–10°T						
	1710–2690	65°	17dBi	2°–10°T						
6-Port Antenna	698–960	65°	14.5dBi	2°–16°T	80010864	1402	7-16, bottom	104 +	105	S
	1695–2690	65°	17.5dBi	2.5°–12°T						
	1695–2690	65°	18dBi	2.5°–12°T						
6-Port Antenna	698–960	65°	16dBi	2°–12°T	80010865	1921	7-16, bottom	106 +	107	S
	1695–2690	65°	18dBi	2.5°–12°T						
	1695–2690	65°	18dBi	2.5°–12°T						
6-Port Antenna	698–960	65°	17dBi	1°–10°T	80010866	2441	7-16, bottom	108 +	109	S
	1710–2690	65°	18dBi	2.5°–12°T						
	1710–2690	65°	18dBi	2.5°–12°T						
6-Port Antenna	790–960	65°	15dBi	0°–14°T	742270v03	1384	7-16, bottom	110 +	111	O
	1710–1880	65°	17dBi	0°–8°T						
	1920–2170	65°	17dBi	0°–8°T						
6-Port Antenna	790–960	65°	16.5dBi	0°–10°T	742271v03	1933	7-16, bottom	112 +	113	O
	1710–1880	65°	18dBi	0°–6°T						
	1920–2170	65°	18dBi	0°–6°T						

1) Configuration Types – further details on page 6–9.



Summary – Directional Antennas

6 Ports

Dual Polarization $\pm 45^\circ$

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Type	Type No.	Height [mm]	Connector female, type and position	Page	1)
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2 x Lowband | 1 x Highband

6-Port Antenna	790–862	65°	14dBi	0°–14°T	80010697	1332	7-16, bottom	114	N
	880–960	65°	14dBi	0°–14°T				+	
	1710–2180	65°	17dBi	0°–8°T				115	
6-Port Antenna	790–862	65°	15.5dBi	0°–10°T	80010698	1932	7-16, bottom	116	N
	880–960	65°	16dBi	0°–10°T				+	
	1710–2180	65°	18.5dBi	0°–6°T				117	
6-Port Antenna	790–862	65°	16.5dBi	0°–7°T	80010699	2532	7-16, bottom	118	N
	880–960	65°	17dBi	0°–7°T				+	
	1710–2180	65°	18.5dBi	0°–6°T				119	

3 x Lowband

6-Port Antenna	698–862	65°	15dBi	2°–12°T	80010904	1999	4.3-10, bottom	120	AD
	880–960	65°	15.5dBi	2°–12°T				+	
	698–960	65°	15.5dBi	2°–12°T				121	

3 x Highband

6-Port Antenna	1710–2690	65°	18dBi	2°–14°T	80020727	1475	4.3-10, bottom	122	J
	1710–2690	65°	18dBi	2°–14°T				+	
	1710–2690	65°	18dBi	2°–14°T				123	

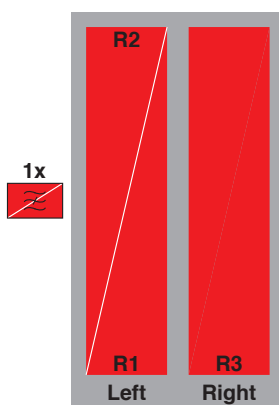
3 x Highband Special Design

6-Port Tri-Sector Slimpole	1710–2690	80°	10dBi	0°T	80010125	691	N, bottom	223	C/C/C
6-Port Tri-Sector Slimpole	1710–2690	80°	10dBi	0°T	80020125	691	4.3-10, bottom	223	C/C/C

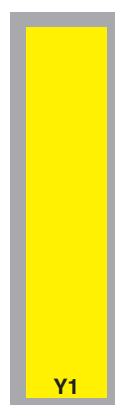
New or changed product

1) Configuration Types – further details on page 6–9.

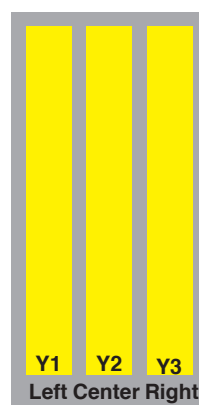
AD



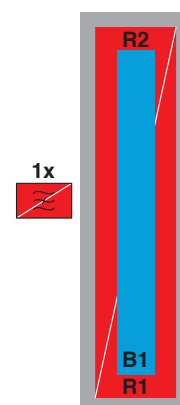
Type C



Type J



Type N



6-Port Antenna

R1 **B1** **Y1**

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Frequency Range

790-960 1710-2170 2490-2690

HPBW

65° 65° 65°

6-Port Antenna 790-960/1710-2170/2490-2690 65°/65°/65° 15/17/16.5dBi
0°-16°/2°-10°/2°-10°T



Type No.		80010674		
Lowband		R1, connector 1-2		
		790-960		
Frequency range	MHz	790 - 862	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	14.5 ... 14.4 ... 14.2	14.6 ... 14.5 ... 14.3	14.8 ... 14.6 ... 14.4
Tilt	°	0 ... 8 ... 16	0 ... 8 ... 16	0 ... 8 ... 16
Horizontal Pattern:				
Half-power beam width	°	69	68	67
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction	0°	25	25	23
Sector	±60°	> 10	> 9	> 8
Vertical Pattern:				
Half-power beam width	°	16.5	16.0	15
Electrical tilt	°	0-16, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam	° T dB	0 ... 8 ... 16 16 ... 15 ... 15	0 ... 8 ... 16 16 ... 15 ... 15	0 ... 8 ... 16 15 ... 15 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 30 (790-960 // 1710-2170 // 2490-2690 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port		300 (at 50 °C ambient temperature)		
Max. effective power port 1-2		600 (at 50 °C ambient temperature)		
Max. effective power for the antenna	W	900 (at 50 °C ambient temperature)		



80010674

Highbands		B1, connector 3-4			Y1, connector 5-6
		1710-2170			2490-2690
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.0 ... 17.0 ... 16.6	17.2 ... 17.2 ... 16.8	17.2 ... 17.2 ... 16.7	16.3 ... 16.6 ... 15.8
Tilt	°	2 ... 5 ... 10	2 ... 5 ... 10	2 ... 5 ... 10	2 ... 5 ... 10
Horizontal Pattern:					
Half-power beam width	°	63	63	65	65
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:	Typically:
Main direction	0°	18	21	23	23
Sector	±60°	> 9	> 9	> 10	> 8
Vertical Pattern:					
Half-power beam width	°	6.2	5.8	5.°	4.8
Electrical tilt	°	2–10, continuously adjustable			2–10, continuously adjustable
Min. sidelobe suppression for first sidelobe above main beam	° T dB	2 ... 5 ... 10° 14 ... 14 ... 15	2 ... 5 ... 10 14 ... 15 ... 16	2 ... 5 ... 10 14 ... 16 ... 17	2 ... 5 ... 10 14 ... 16 ... 17
Impedance	Ω	50			50
VSWR		< 1.5			< 1.5
Isolation: Intrasystem	dB	> 28			> 30
Isolation: Intersystem	dB	> 30 (790–960 // 1710–2170 // 2490–2690 MHz)			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. effective power per port		150 (at 50 °C ambient temperature)			
Max. effective power port 3-6		400 (at 50 °C ambient temperature)			
Max. effective power for the antenna	W	900 (at 50 °C ambient temperature)			

Mechanical specifications		
Input	6 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 260 58 Maximal: 415 93
Max. wind velocity	km/h mph	200 124
Height / width / depth	mm inches	1403 / 300 / 152 55.2 / 11.8 / 6.0
Category of mounting hardware	M (Medium)	
Weight	kg lb	20 / 22 (clamps incl.) 44.1 / 48.5 (clamps incl.)
Packing size	mm inches	1726 x 322 x 190 68.0 x 12.7 x 7.5
Scope of supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna

R1 **B1** **Y1**

KATHREIN

Frequency Range

790-960 1710-2170 2490-2690

HPBW

65° 65° 65°

6-Port Antenna 790-960/1710-2170/2490-2690 65°/65°/65° 16/18/18dBi
0°-10°/2°-8°/2°-8°T



Type No.		80010675v01		
Lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.0	16.2	16.2
Gain over all Tilts	dBi	15.9 ± 0.4	16.1 ± 0.3	16.1 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	68 ± 1.0	68 ± 1.0	67 ± 0.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 27
Cross Polar Discrimination over Sector	dB	> 9.0	> 9.5	> 11.0
Vertical Pattern:				
Elevation Beamwidth	°	10.2 ± 0.3	10.0 ± 0.3	9.6 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.4	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 15	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R1 // B1 // Y1)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010675v01

Highbands		B1, connector 3-4			Y1, connector 5-6
		1710-2170			2490-2690
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Gain at mid Tilt	dBi	18.1	18.2	18.4	17.9
Gain over all Tilts	dBi	18.0 ± 0.4	18.1 ± 0.2	18.3 ± 0.5	17.8 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	64 ± 5.9	64 ± 2.5	62 ± 3.9	63 ± 4.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 22
Cross Polar Discrimination over Sector	dB	> 7.5	> 11.0	> 10.5	> 10.0
Vertical Pattern:					
Elevation Beamwidth	°	4.9 ± 0.2	4.6 ± 0.2	4.4 ± 0.3	3.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 8.0			2.0 – 8.0
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 18	> 18	> 16
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 30 (R1 // B1 // Y1)			
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-6	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	26.0 / 28.2 (clamps incl.) 57.3 / 62.2 (clamps incl.)
Packing Size	mm inches	2361 / 322 / 190 93.0 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1 **B1** **B2**

KATHREIN

Frequency Range

790–960 1710–2180 1710–2180

HPBW

65° 65° 65°

6-Port Antenna 790–960/1710–2180/1710–2180 65°/65°/65° 15/15/15dBi
0°–14°/0°–14°/0°–14°T



Type No.		80010290v02		
Lowband		R1		
		790–960		
Frequency range	MHz	790 – 866	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain:	dBi	14.4 ... 14.3 ... 14.0	14.6 ... 14.4 ... 14.2	14.9 ... 14.7 ... 14.4
Tilt	°	0 ... 7 ... 14	0 ... 7 ... 14	0 ... 7 ... 14
Horizontal Pattern:				
Half-power beam width	°	69	68	67
Front-to-back ratio (180°±30°)	dB	> 25 dB		
Cross polar ratio		Typically:		
Main direction	0°	25		
Sector	±60°	> 10		
Vertical Pattern:				
Half-power beam width	°	14.7	14.3	13.9
Electrical tilt	°	0–14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 7 ... 14 17 ... 16 ... 16	0 ... 7 ... 14 18 ... 16 ... 16	0 ... 7 ... 14 18 ... 17 ... 16
Impedance	Ω	50	50	50
VSWR		< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	dB	> 30	> 30	> 30
Isolation: Intersystem	dB	> 35 (790–960 // 1710–2180 MHz) > 30 (1710–2180 // 1710–2180 MHz)		
Intermodulation IM3	dBc	< -150 dBc (2 x 43 dBm carrier)		
Max. effective power per port	W	300 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		



80010290v02

Highbands		B1; B2		
		1710-1880	1710-2180	1710-2180
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain: 1710-2180 MHz (Syst. bottom)	dBi	14.5 ... 14.5 ... 14.2	14.8 ... 14.8 ... 14.5	15.1 ... 14.8 ... 14.4
1710-2180 MHz (Syst. top)	dBi	14.0 ... 14.0 ... 13.7	14.4 ... 14.3 ... 13.9	14.9 ... 14.8 ... 14.2
Tilt	°	0 ... 7 ... 14	0 ... 7 ... 14	0 ... 7 ... 14
Horizontal Pattern:				
Half-power beam width	°	67	63	60
Front-to-back ratio (180°±30°)	dB	> 25		
Cross polar ratio		Typically:		
Main direction	0°	20		
Sector	±60°	> 10		
Vertical Pattern:				
Half-power beam width	°	13.8	13.2	12.6
Electrical tilt	°	0-14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 7 ... 14 18 ... 16 ... 15	0 ... 7 ... 14 18 ... 17 ... 17	0 ... 7 ... 14 18 ... 16 ... 17
Impedance	Ω	50	50	50
VSWR		< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	dB	> 30	> 30	> 30
Isolation: Intersystem	dB	> 35 (790-960 // 1710-2180 MHz) > 30 (1710-2180 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port	W	250 (at 50 °C ambient temperature)		
Max. effective power for the antenna	W	900 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	6 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	3x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	370 83
		Maximal:	405 91
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	1540 / 262 / 149 60.6 / 10.3 / 5.9	
Category of mounting hardware	M (Medium)		
Weight	kg lb	21 / 23 (clamps incl.) 46.3 / 50.7 (clamps incl.)	
Packing size	mm inches	1866 x 282 x 182 73.5 x 11.1 x 7.2	
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

6-Port Antenna

R1 **B1** **B2**

KATHREIN

Frequency Range

790-960 1710-2180 1710-2180

HPBW

65° 65° 65°

6-Port Antenna 790-960/1710-2180/1710-2180 65°/65°/65° 16.5/16.5/16.5dBi
2°-14°/0°-14°/0°-14°T



Type No.		80010291v02		
Lowband		R1, connector 1-2		
		790-960		
Frequency range	MHz	790 - 866	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain:	dBi	16.2 ... 16.0 ... 15.7	16.3 ... 16.1 ... 15.8	16.4 ... 16.2 ... 15.8
Tilt	°	2 ... 8 ... 14	2 ... 8 ... 14	2 ... 8 ... 14
Horizontal Pattern:				
Half-power beam width	°	68	67	65
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction	0°	25	25	25
Sector	±60°	> 10	> 10	> 10
Tracking	dB	1.0		
Vertical Pattern:				
Half-power beam width	°	10	9.7	9.3
Electrical tilt	°	2-14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	2 ... 8 ... 14 17 ... 17 ... 15	2 ... 8 ... 14 17 ... 17 ... 16	2 ... 8 ... 14 17 ... 17 ... 16
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 35 (790-960 // 1710-2180 MHz) > 30 (1710-2180 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. effective power per port	W	400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		



80010291v02

Highbands		B1, connector 3-4; B2, connector 5-6		
		1710-2180	1710-2180	
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain:				
1710-2180 MHz	B1: dBi	15.9 ... 15.9 ... 15.5	16.2 ... 16.2 ... 15.7	16.3 ... 16.3 ... 15.8
1710-2180 MHz	B2: dBi	15.8 ... 15.8 ... 15.4	16.1 ... 16.1 ... 15.4	16.3 ... 16.2 ... 15.5
Tilt	°	0 ... 7 ... 14	0 ... 7 ... 14	0 ... 7 ... 14
Horizontal Pattern:				
Half-power beam width	°	65	64	60
Front-to-back ratio (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction	0°	18	19	20
Sector	±60°	> 10	> 10	> 10
Tracking		1.0		
Vertical Pattern:				
Half-power beam width	°	9.5	9	8.7
Electrical tilt	°	0-14, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	°T dB	0 ... 7 ... 14 18 ... 17 ... 17	0 ... 7 ... 14 18 ... 17 ... 17	0 ... 7 ... 14 18 ... 17 ... 17
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 35 (790-960 // 1710-2180 MHz) > 30 (1710-2180 // 1710-2180 MHz)		
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. effective power per port	W	250 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		

Mechanical specifications		
Input	6 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 515 115 Maximal: 565 127
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	2058 / 262 / 149 81.0 / 10.3 / 5.9
Category of mounting hardware	M (Medium)	
Weight	kg lb	27 / 29 (clamps incl.) 59.5 / 63.9 (clamps incl.)
Packing size	mm inches	2385 x 282 x 182 93.9 x 11.1 x 7.2
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	B1	B2
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KATHREIN

Frequency Range

790–960	1710–2180	1710–2180
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HPBW

65°	65°	65°
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6-Port Antenna 790–960/1710–2180/1710–2180 65°/65°/65° 17.5/17.5/17dBi
2°–10°/0°–10°/0°–10°T



Type No.		80010292v03		
Lowband		R1, connector 1–2		
		790–960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	17.1	17.3	17.4
Gain over all Tilts	dBi	17.0 ± 0.3	17.2 ± 0.3	17.3 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.1	68 ± 1.3	66 ± 1.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 28
Cross Polar Discrimination at Boresight	dB	> 25	> 25	> 27
Cross Polar Discrimination over Sector	dB	> 14.0	> 14.5	> 12.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	7.9 ± 0.3	7.6 ± 0.3	7.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 10.0		
Tilt Accuracy	°	< 0.1	< 0.1	< 0.2
First Upper Side Lobe Suppression	dB	> 14	> 15	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 36 (R1 // B1, B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1–2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Lower highband		B1, connector 3–4		
		1710–2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	17.2	17.3	17.3
Gain over all Tilts	dBi	17.1 ± 0.4	17.2 ± 0.3	17.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	64 ± 2.6	62 ± 2.4	62 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 29	> 26
Cross Polar Discrimination at Boresight	dB	> 31	> 30	> 29
Cross Polar Discrimination over Sector	dB	> 12.0	> 12.5	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 1.0
Vertical Pattern:				
Elevation Beamwidth	°	7.6 ± 0.4	7.2 ± 0.5	6.8 ± 0.6
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.6	< 0.7	< 0.6
First Upper Side Lobe Suppression	dB	> 14	> 17	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 36 (B1 // R1, B2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 3–4	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010292v03

Upper highband		B2, connector 5–6		
		1710–2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	16.7	16.8	17.0
Gain over all Tilts	dBi	16.5 ± 0.3	16.6 ± 0.3	16.8 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 3.1	63 ± 4.0	61 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 30	> 27
Cross Polar Discrimination at Boresight	dB	> 30	> 30	> 28
Cross Polar Discrimination over Sector	dB	> 14.5	> 14.0	> 11.0
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	7.6 ± 0.3	7.2 ± 0.4	6.9 ± 0.5
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.4	< 0.5	< 0.6
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 36 (B2 // R1, B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 5–6	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 36
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 665 149 Maximal: 730 164
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2598 / 261 / 146 102.3 / 10.3 / 5.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	27.0 / 29.2 (clamps incl.) 59.5 / 64.3 (clamps incl.)
Packing Size	mm inches	2902 / 284 / 184 114.3 / 11.2 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna

R1 **Y1** **Y2**

KATHREIN

Frequency Range

698-960 1710-2690 1710-2690

HPBW

65° 65° 65°

6-Port Antenna 698-960/1710-2690/1710-2690 65°/65°/65° 16/16/16dBi
1°-12°/2°-12°/2°-12°T



Type No.		80010691v01			
Lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.3	15.6	15.9	16.2
Gain over all Tilts	dBi	15.2 ± 0.4	15.6 ± 0.3	15.8 ± 0.5	16.1 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.2	69 ± 1.1	68 ± 1.1	67 ± 1.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 28
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.0	> 10.5	> 9.5
Vertical Pattern:					
Elevation Beamwidth	°	10.8 ± 0.9	10.1 ± 0.5	9.9 ± 0.7	9.2 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 12.0			
Tilt Accuracy	°	< 0.6	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 18	> 17	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 18	> 17	> 18
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 32 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Lower highband		Y1, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.4	15.8	15.8	15.3	16.3
Gain over all Tilts	dBi	15.4 ± 0.5	15.8 ± 0.3	15.8 ± 0.4	15.3 ± 0.7	16.2 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 5.8	61 ± 4.5	62 ± 2.9	64 ± 8.0	60 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 24	> 24	> 23
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 9.0	> 7.5	> 8.0
Vertical Pattern:						
Elevation Beamwidth	°	10.9 ± 0.8	10.0 ± 0.8	9.4 ± 0.8	8.4 ± 0.9	7.7 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.6	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 15	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 15	> 15	> 19
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 32 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010691v01

Upper highband		Y2, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.1	15.4	15.4	15.1	15.6
Gain over all Tilts	dBi	15.1 ± 0.5	15.4 ± 0.3	15.3 ± 0.4	15.1 ± 0.5	15.5 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	60 ± 6.1	60 ± 4.0	61 ± 4.4	62 ± 6.3	60 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 26	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.0	> 8.5	> 6.5	> 8.5
Vertical Pattern:						
Elevation Beamwidth	°	10.9 ± 0.7	10.2 ± 0.5	9.6 ± 0.8	8.4 ± 0.6	7.8 ± 0.7
Electrical Downtilt continuously adjustable	°	2.0 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.3	< 0.3	< 0.5
First Upper Side Lobe Suppression	dB	> 19	> 19	> 19	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 19	> 15	> 14	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 32 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 32
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88 Maximal: 620 139
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	25.0 / 27.2 (clamps incl.) 55.1 / 60.0 (clamps incl.)
Packing Size	mm inches	2316 / 322 / 190 91.2 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1710-2690	1710-2690
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HPBW

65°	65°	65°
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6-Port Antenna 698-960/1710-2690/1710-2690 65°/65°/65° 17/17/17dBi
1.5°-10°/0°-10°/2°-10°T



Type No.	80010692v01				
Lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.2	16.7	16.9	17.2
Gain over all Tilts	dBi	16.1 ± 0.5	16.7 ± 0.3	16.8 ± 0.3	17.1 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.2	68 ± 1.1	68 ± 0.9	66 ± 1.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 23	> 23
Cross Polar Discrimination over Sector	dB	> 9.0	> 9.5	> 10.0	> 8.0
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7	8.0 ± 0.5	7.8 ± 0.4	7.2 ± 0.5
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 18	> 18	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	>32 (R1 // Y1 // Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Lower highband	Y1, connector 3-4					
	1710-2690					
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.7	16.8	16.8	17.1
Gain over all Tilts	dBi	16.5 ± 0.6	16.7 ± 0.3	16.6 ± 0.4	16.6 ± 0.9	16.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 3.8	63 ± 5.1	65 ± 3.6	59 ± 7.2	61 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 25	> 24	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 20	> 17	> 20
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.0	> 9.5	> 8.0	> 10.5
Vertical Pattern:						
Elevation Beamwidth	°	7.6 ± 0.4	7.5 ± 0.3	7.1 ± 0.6	6.1 ± 0.3	6.0 ± 0.2
Electrical Downtilt continuously adjustable	°	0.0 – 10.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.4	< 0.6	< 0.3
First Upper Side Lobe Suppression	dB	> 13	> 16	> 17	> 15	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	>32 (R1 // Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010692v01

Upper highband		Y2, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.7	16.6	16.6	17.0
Gain over all Tilts	dBi	16.5 ± 0.5	16.6 ± 0.4	16.5 ± 0.3	16.4 ± 0.9	16.7 ± 0.8
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 3.7	64 ± 6.7	65 ± 5.5	63 ± 5.7	65 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 15	> 20	> 21	> 19	> 14
Cross Polar Discrimination over Sector	dB	> 6.0	> 9.5	> 9.5	> 7.0	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	6.5 ± 0.4	6.2 ± 0.2	6.0 ± 0.3	5.3 ± 0.3	4.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 10.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 20	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	>32 (R1 // Y1 // Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 32
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on ngmn-P-BASTA requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 530 119 Maximal: 845 190
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2622 / 300 / 152 103.2 / 11.8 / 6.0
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	31.0 / 33.2 (clamps incl.) 68.3 / 73.2 (clamps incl.)
Packing Size	mm inches	2951 / 322 / 190 116.2 / 12.7 / 7.5
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°
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6-Port Antenna 698-960/1695-2690/1695-2690 65°/65°/65° 14.5/17.5/18dBi
2°-16°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80010864			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	13.5	14.0	14.2	14.5
Gain over all Tilts	dBi	13.5 ± 0.3	14.0 ± 0.4	14.2 ± 0.3	14.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	72 ± 3.2	70 ± 2.7	68 ± 2.4	67 ± 2.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 23	> 23	> 24	> 22
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 7.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 1.5	< 2.0	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	17.4 ± 1.1	16.2 ± 1.1	15.7 ± 0.7	14.9 ± 0.8
Electrical Downtilt continuously adjustable	°	2.0 – 16.0			
Tilt Accuracy	°	< 0.6	< 0.8	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 15	> 16	> 16	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 22	> 20	> 20	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.5	17.6	17.2	17.6
Gain over all Tilts	dBi	17.2 ± 0.6	17.5 ± 0.3	17.5 ± 0.3	17.1 ± 0.4	17.5 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.0	62 ± 3.3	66 ± 6.8	64 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 28	> 26	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 23	> 18	> 15
Cross Polar Discrimination over Sector	dB	> 7.0	> 9.0	> 10.5	> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.5	< 2.5	< 2.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.4	6.3 ± 0.3	6.0 ± 0.5	5.3 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 18	> 19	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 14	> 14	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010864

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.2	17.5	17.8	18.2	18.3
Gain over all Tilts	dBi	17.2 ± 0.4	17.4 ± 0.3	17.7 ± 0.4	18.1 ± 0.3	18.1 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 2.4	63 ± 3.2	63 ± 2.9	61 ± 2.0	61 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 23	> 23	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 22	> 24	> 24	> 20	> 18
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.0	> 13.0	> 7.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.4	6.4 ± 0.4	5.5 ± 0.3	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 21	> 21	> 22	> 18	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 15	> 15	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 450 101 Maximal: 520 117
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1402 / 377 / 169 55.2 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	25.0 / 27.2 (clamps incl.) 55.1 / 59.9 (clamps incl.)
Packing Size	mm inches	1602 / 397 / 212 63.1 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1 **Y1** **Y2**

KATHREIN

Frequency Range

698-960 1695-2690 1695-2690

HPBW

65° 65° 65°

6-Port Antenna 698-960/1695-2690/1695-2690 65°/65°/65° 16/18/18dBi
2°-12°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010865			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.2	15.7	15.9	16.2
Gain over all Tilts	dBi	15.2 ± 0.5	15.6 ± 0.3	15.8 ± 0.4	16.1 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 2.3	68 ± 2.1	67 ± 2.0	67 ± 1.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 23	> 22	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.0	> 9.0	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	10.8 ± 1.1	9.8 ± 0.4	9.5 ± 0.6	8.9 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 17	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // Y1 , Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.7	17.9	17.6	18.1
Gain over all Tilts	dBi	17.2 ± 0.5	17.6 ± 0.3	17.7 ± 0.3	17.5 ± 0.5	17.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.2	62 ± 2.6	61 ± 2.4	63 ± 6.1	66 ± 6.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 26	> 23	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 24	> 18	> 15
Cross Polar Discrimination over Sector	dB	> 7.5	> 8.5	> 10.5	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.5	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.3	5.6 ± 0.4	4.9 ± 0.2	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1
First Upper Side Lobe Suppression	dB	> 19	> 17	> 17	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 13	> 13	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010865

Right side, highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.3	17.5	17.8	18.2	18.1
Gain over all Tilts	dBi	17.3 ± 0.3	17.5 ± 0.3	17.8 ± 0.4	18.1 ± 0.3	17.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 2.9	66 ± 2.8	66 ± 2.6	65 ± 1.8	68 ± 4.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 15	> 19	> 18	> 17	> 19
Cross Polar Discrimination over Sector	dB	> 10.5	> 15.0	> 14.5	> 10.0	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 0.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.5	5.6 ± 0.3	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 19	> 25	> 25	> 19	> 21
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 15	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1921 / 377 / 169 75.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	30.0 / 32.2 (clamps incl.) 66.1 / 70.9 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	Y1	Y2
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KATHREIN

Frequency Range

698-960	1710-2690	1710-2690
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HPBW

65°	65°	65°
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6-Port Antenna 698-960/1710-2690/1710-2690 65°/65°/65° 17/18/18dBi
1°-10°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010866				
Left side, lowband		R1, connector 1-2				
		698-960				
Frequency Range	MHz	698 – 820	790 – 862	824 – 894	880 – 960	
Gain at mid Tilt	dBi	16.3	16.8	17.0	17.3	
Gain over all Tilts	dBi	16.2 ± 0.5	16.8 ± 0.4	17.0 ± 0.3	17.3 ± 0.2	
Horizontal Pattern:						
Azimuth Beamwidth	°	67 ± 2.4	65 ± 1.4	65 ± 0.9	64 ± 1.3	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 26	> 27	
Cross Polar Discrimination at Boresight	dB	> 24	> 25	> 25	> 26	
Cross Polar Discrimination over Sector	dB	> 6.5	> 7.0	> 9.0	> 10.0	
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.5	< 2.0	< 2.0	
Vertical Pattern:						
Elevation Beamwidth	°	8.7 ± 0.7	7.9 ± 0.5	7.6 ± 0.4	7.2 ± 0.4	
Electrical Downtilt continuously adjustable	°	1.0 – 10.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4	< 0.4	
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 18	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 15	> 15	> 16	
Cross Polar Isolation	dB	> 30				
Port to Port Isolation	dB	> 30 (R1 // Y1 , Y2)				
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.9	17.9	17.3	18.1
Gain over all Tilts	dBi	17.3 ± 0.5	17.8 ± 0.3	17.8 ± 0.3	17.2 ± 0.2	17.9 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.5	62 ± 3.0	62 ± 2.6	69 ± 4.9	63 ± 6.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 24	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 22	> 24	> 19	> 16
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.5	> 11.0	> 8.5	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.5	< 2.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.1	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 19	> 18	> 17	> 16	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 14	> 13	> 14	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010866

Right side, highband		Y2, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.7	18.0	18.4	18.6
Gain over all Tilts	dBi	17.4 ± 0.3	17.6 ± 0.3	17.9 ± 0.5	18.3 ± 0.3	18.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.3	62 ± 2.0	61 ± 1.9	60 ± 1.7	58 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 25	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 21	> 16	> 16
Cross Polar Discrimination over Sector	dB	> 16.0	> 16.0	> 13.0	> 8.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.3	< 0.3	< 0.4	< 0.2
First Upper Side Lobe Suppression	dB	> 21	> 24	> 23	> 19	> 23
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 15	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 830 187 Maximal: 960 216
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2441 / 377 / 169 96.1 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	35.0 / 37.2 (clamps incl.) 77.1 / 81.9 (clamps incl.)
Packing Size	mm inches	2641 / 397 / 212 104.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

6-Port Antenna

R1	B1	B2
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KATHREIN

Frequency Range

790-960	1710-1880	1920-2170
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HPBW

65°	65°	65°
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**6-Port Antenna 790-960/1710-1880/1920-2170 65°/65°/65° 15/17/17dBi
0°-14°/0°-8°/0°-8°T**

Type No.		742270v03		
Lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.3	14.5	14.6
Gain over all Tilts	dBi	14.3 ± 0.2	14.4 ± 0.3	14.6 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 1.0	68 ± 1.6	67 ± 1.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 24	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 13.5	> 13.0	> 12.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.5
Vertical Pattern:				
Elevation Beamwidth	°	16.8 ± 0.5	16.4 ± 0.9	15.6 ± 0.9
Electrical Downtilt continuously adjustable	°	0.0 – 14.0		
Tilt Accuracy	°	< 0.6	< 0.5	< 0.7
First Upper Side Lobe Suppression	dB	> 15	> 17	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1 // B2)		
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-2	W	600 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

742270v03

Highbands		B1, connector 3–4	B2, connector 5–6
Frequency Range	MHz	1710–1880	1920–2170
Gain at mid Tilt	dBi	17.1	17.1
Gain over all Tilts	dBi	17.0 ± 0.4	17.0 ± 0.5
Horizontal Pattern:			
Azimuth Beamwidth	°	62 ± 3.1	60 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 24
Cross Polar Discrimination at Boresight	dB	> 26	> 25
Cross Polar Discrimination over Sector	dB	> 12.5	> 13.0
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	7.5 ± 0.3	6.8 ± 0.6
Electrical Downtilt continuously adjustable	°	0.0 – 8.0	0.0 – 8.0
Tilt Accuracy	°	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 15
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 45 (R1 // B1 // B2) > 30 (B1 // B2)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Port 3–6	W	400 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 325 73 Maximal: 355 80
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1384 / 261 / 146 54.5 / 10.3 / 5.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	19.0 / 21.2 (clamps incl.) 41.9 / 46.7 (clamps incl.)
Packing Size	mm inches	1696 / 282 / 182 66.8 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna

R1 **B1** **B2**

KATHREIN

Frequency Range

790-960 1710-1880 1920-2170

HPBW

65° 65° 65°

6-Port Antenna 790-960/1710-1880/1920-2170 65°/65°/65° 16.5/18/18dBi
0°-10°/0°-6°/0°-6°T



Type No.		742271V03		
Lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.9	16.1	16.2
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.3	16.2 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	69 ± 0.9	68 ± 1.2	67 ± 1.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 28
Cross Polar Discrimination at Boresight	dB	> 24	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 14.0	> 13.5	> 13.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	10.9 ± 0.6	10.6 ± 0.4	10.0 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 15	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 45 (R1 // B1 // B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



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Highbands		B1, connector 3–4	B2, connector 5–6
Frequency Range	MHz	1710–1880	1920–2170
Gain at mid Tilt	dBi	18.3	18.3
Gain over all Tilts	dBi	18.1 ± 0.3	18.2 ± 0.4
Horizontal Pattern:			
Azimuth Beamwidth	°	62 ± 3.3	60 ± 3.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 28	> 26
Cross Polar Discrimination at Boresight	dB	> 27	> 28
Cross Polar Discrimination over Sector	dB	> 13.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0
Vertical Pattern:			
Elevation Beamwidth	°	5.0 ± 0.3	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0	0.0 – 6.0
Tilt Accuracy	°	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 16
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 45 (R1 // B1 // B2) > 30 (B1 // B2)	
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)	
Max. Effective Power Port 3–6	W	400 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 475 107 Maximal: 525 118
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1933 / 261 / 146 76.1 / 10.3 / 5.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	24.0 / 26.2 (clamps incl.) 52.9 / 57.7 (clamps incl.)
Packing Size	mm inches	2256 / 282 / 182 88.8 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna

R1	R2	B1
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KATHREIN

Frequency Range

790-862	880-960	1710-2180
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HPBW

65°	65°	65°
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6-Port Antenna 790-862/880-960/1710-2180 65°/65°/65° 14/14/17dBi
0°-14°/0°-14°/0°-8°T



Type No.		80010697	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	13.8	14.1
Gain over all Tilts	dBi	13.7 ± 0.4	14.0 ± 0.5
Horizontal Pattern:			
Azimuth Beamwidth	°	69 ± 1.3	68 ± 1.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 22
Cross Polar Discrimination at Boresight	dB	> 23	> 20
Cross Polar Discrimination over Sector	dB	> 9.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	16.2 ± 0.7	15.0 ± 0.8
Electrical Downtilt continuously adjustable	°	0.0 - 14.0	0.0 - 14.0
Tilt Accuracy	°	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 16
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 38 (R1, R2 // B1) > 28 (R1 // R2)	
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)	
Max. Effective Power Port 1-4	W	700 (at 50 °C ambient temperature)	



Values based on NGMN-P-BASTA (version 9.6) requirements.

80010697

Highband		B1, connector 5–6		
			1710–2180	
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	17.0	17.2	17.2
Gain over all Tilts	dBi	16.9 ± 0.4	17.0 ± 0.3	17.0 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	63 ± 5.6	61 ± 4.8	61 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 28	> 26
Cross Polar Discrimination at Boresight	dB	> 18	> 19	> 20
Cross Polar Discrimination over Sector	dB	> 8.5	> 9.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	7.4 ± 0.3	7.1 ± 0.3	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	0.0 – 8.0		
Tilt Accuracy	°	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 19	> 19
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 38 (R1, R2 // B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 5–6	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 245 55 Maximal: 395 89
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1332 / 300 / 152 52.4 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	21.0 / 23.2 (clamps incl.) 46.3 / 51.1 (clamps incl.)
Packing Size	mm inches	1641 / 322 / 190 64.6 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna

R1 **R2** **B1**

KATHREIN

Frequency Range

790-862 880-960 1710-2180

HPBW

65° 65° 65°

6-Port Antenna 790-862/880-960/1710-2180 65°/65°/65° 15.5/16/18.5dBi
0°-10°/0°-10°/0°-6°T



Type No.		80010698	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	15.4	15.9
Gain over all Tilts	dBi	15.3 ± 0.2	15.8 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	69 ± 1.3	67 ± 1.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27
Cross Polar Discrimination at Boresight	dB	> 23	> 25
Cross Polar Discrimination over Sector	dB	> 14.0	> 13.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.0
Vertical Pattern:			
Elevation Beamwidth	°	11.3 ± 0.5	10.1 ± 0.6
Electrical Downtilt continuously adjustable	°	0.0 - 10.0	0.0 - 10.0
Tilt Accuracy	°	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 16
Cross Polar Isolation	dB	> 30	> 30
Port to Port Isolation	dB	> 38 (R1 // B1) > 28 (R1 // R2)	> 38 (R2 // B1) > 28 (R2 // R1)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010698

Highband		B1, connector 5–6		
		1710–2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.6	18.8	18.7
Gain over all Tilts	dBi	18.5 ± 0.4	18.7 ± 0.3	18.6 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	63 ± 2.9	61 ± 3.1	60 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 29	> 26
Cross Polar Discrimination at Boresight	dB	> 28	> 29	> 28
Cross Polar Discrimination over Sector	dB	> 13.5	> 17.0	> 12.0
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 0.5	< 0.5
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.3	4.8 ± 0.2	4.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 15	> 17	> 16
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 38 (B1 // R1, R2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 5–6	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 475 107 Maximal: 520 117
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1932 / 261 / 146 76.1 / 10.3 / 5.7
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	23.0 / 25.2 (clamps incl.) 50.7 / 55.5 (clamps incl.)
Packing Size	mm inches	2256 / 282 / 182 88.8 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna

R1 **R2** **B1**

KATHREIN

Frequency Range

790-862 880-960 1710-2180

HPBW

65° 65° 65°

6-Port Antenna 790-862/880-960/1710-2180 65°/65°/65° 16.5/17/18.5dBi
0°-7°/0°-7°/0°-6°T



Type No.		80010699	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	16.6	17.0
Gain over all Tilts	dBi	16.5 ± 0.2	16.9 ± 0.3
Horizontal Pattern:			
Azimuth Beamwidth	°	69 ± 1.1	66 ± 1.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 26	> 26
Cross Polar Discrimination over Sector	dB	> 13.0	> 14.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5
Vertical Pattern:			
Elevation Beamwidth	°	8.0 ± 0.3	7.3 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 - 7.0	0.0 - 7.0
Tilt Accuracy	°	< 1.0	< 0.3
First Upper Side Lobe Suppression	dB	> 12	> 14
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 38 (R1, R2 // B1)	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)	
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)	

Values based on NGMN-P-BASTA (version 9.6) requirements.



80010699

Highband		B1, connector 5–6		
		1710–2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.5	18.7	18.7
Gain over all Tilts	dBi	18.4 ± 0.4	18.5 ± 0.3	18.5 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	64 ± 2.4	61 ± 3.3	61 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 29	> 28	> 26
Cross Polar Discrimination at Boresight	dB	> 33	> 31	> 31
Cross Polar Discrimination over Sector	dB	> 13.5	> 15.0	> 13.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 0.5	< 0.5
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.2	4.8 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 18	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 38 (B1 // R1, R2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 5–6	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	3x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 645 145 Maximal: 710 160
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2532 / 261 / 146 99.7 / 10.3 / 5.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	26.0 / 28.2 (clamps incl.) 57.3 / 62.1 (clamps incl.)
Packing Size	mm inches	2856 / 282 / 182 112.4 / 11.1 / 7.2
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

6-Port Antenna	R1	R2	R3
Frequency Range	698-862	880-960	698-960
HPBW	65°	65°	65°

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Preliminary Issue

6-Port Antenna 698-862/880-960/698-960 65°/65°/65° 15/15.5/15.5dBi
2°-12°/2°-12°/2°-12°T



FlexRET

Type No.		80010904		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	14.6	15.2	15.6
Gain over all Tilts	dBi	14.6 ± 0.5	15.2 ± 0.4	15.5 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	62 ± 5.4	61 ± 4.2	60 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 23
Vertical Pattern:				
Elevation Beamwidth	°	12.0 ± 0.8	11.0 ± 0.8	10.3 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.4	< 0.6	< 0.6
First Upper Side Lobe Suppression	dB	> 15	> 16	> 14
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 27 (R1 // R3) > 30 (R1 // R2)		> 30 (R2 // R1, R3)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		



Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R3, connector 5-6			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R3 // R1) > 30 (R3 // R2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 5-6	W	800 (at 50 °C ambient temperature)			

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	55.0 / 60.0 (clamps incl.) 121.2 / 132.2 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

6-Port Antenna

Y1	Y2	Y3
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KATHREIN

Frequency Range

1710-2690	1710-2690	1710-2690
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HPBW

65°	65°	65°
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Preliminary Issue

6-Port Antenna 1710-2690/1710-2690/1710-2690 65°/65°/65° 18/18/18dBi
2°-14°/2°-14°/2°-14°T



FlexRET



Type No.		80020727				
Left system		Y1, connector 1-2				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	18.2	18.3	18.5	18.5
Gain over all Tilts	dBi	17.5 ± 0.5	18.2 ± 0.3	18.2 ± 0.2	18.4 ± 0.4	18.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	67 ± 4.3	64 ± 2.3	62 ± 2.3	59 ± 2.9	57 ± 3.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 24	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 25	> 25	> 25	> 27	> 20
Cross Polar Discrimination over Sector	dB	> 12.0	> 10.0	> 9.0	> 8.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.4 ± 0.3	6.1 ± 0.5	5.3 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 20	> 20	> 18	> 19
Cross Polar Isolation	dB	> 30				
Port to Port Isolation	dB	> 30 (Y1 // Y2, Y3)				
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)				
Max. Effective Power Port 1-2	W	500 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Center system		Y2, connector 3-4				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.8	18.0	18.1	18.0
Gain over all Tilts	dBi	17.2 ± 0.4	17.8 ± 0.4	17.9 ± 0.3	17.8 ± 0.5	17.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	68 ± 7.0	62 ± 4.9	61 ± 3.4	63 ± 2.5	59 ± 3.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 25	> 24
Cross Polar Discrimination at Boresight	dB	> 26	> 28	> 30	> 29	> 24
Cross Polar Discrimination over Sector	dB	> 10.5	> 9.5	> 10.5	> 9.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.5	< 2.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.4	6.4 ± 0.3	6.1 ± 0.4	5.3 ± 0.2	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.4	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 24	> 22	> 22	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // Y1, Y3)				
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	500 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Right system		Y3, connector 5-6				
		1710-2690				
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	18.2	18.3	18.5	18.6
Gain over all Tilts	dBi	17.6 ± 0.5	18.1 ± 0.3	18.2 ± 0.3	18.4 ± 0.5	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	68 ± 3.9	65 ± 2.3	64 ± 2.8	58 ± 4.2	57 ± 2.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 24	> 23	> 22
Cross Polar Discrimination at Boresight	dB	> 24	> 24	> 25	> 25	> 21
Cross Polar Discrimination over Sector	dB	> 13.0	> 10.5	> 9.5	> 8.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.5	6.4 ± 0.3	6.1 ± 0.4	5.3 ± 0.2	4.8 ± 0.2
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.4	< 0.4	< 0.5
First Upper Side Lobe Suppression	dB	> 19	> 23	> 23	> 21	> 21
Cross Polar Isolation	dB	> 30				
Port to Port Isolation	dB	> 30 (Y3 // Y1, Y2)				
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	500 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	800 (at 50 °C ambient temperature)

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	6 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 755 170 Maximal: 830 187
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1475 / 378 / 103 58.1 / 14.9 / 4.1
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	18.0 / 20.2 (clamps incl.) 39.7 / 44.5 (clamps incl.)
Packing Size	mm inches	2000 / 549 / 120 78.7 / 21.6 / 4.7
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

Summary – Directional Antennas

8 Ports

Dual Polarization $\pm 45^\circ$

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Type	Type No.	Height [mm]	Connector female, type and position	Page	1)
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1 x Lowband | 3 x Highband

8-Port Antenna	698–960	65°	17dBi	1.5°–10°T	80020872	2693	4.3-10, bottom	127	AA
	1695–2690	65°	17.5dBi	2.5°–12°T				–	
	1695–2690	65°	18dBi	2.5°–12°T				129	
	1695–2690	65°	17.5dBi	2.5°–12°T					
8-Port Antenna	790–960	65°	15dBi	0°–16°T	80010684	1403	7-16, bottom	130	V
	1710–1880	65°	16.5dBi	2°–10°T				+	
	1920–2170	65°	16.5dBi	2°–10°T				131	
	2490–2690	65°	17dBi	2°–10°T					
8-Port Antenna	790–960	65°	16dBi	0°–10°T	80010685v01	1997	7-16, bottom	132	V
	1710–1880	65°	17.5dBi	2°–8°T				+	
	1920–2170	65°	18dBi	2°–8°T				133	
	2490–2690	65°	18dBi	2°–8°T					

2 x Lowband | 2 x Highband

8-Port Antenna	698–803	65°	14dBi	2°–16°T	80010767	1448	4.3-10, bottom	134	W
	824–960	65°	14.5dBi	2°–16°T				+	
	1695–2690	65°	17.5dBi	2.5°–12°T				135	
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–803	65°	15dBi	2°–12°T	80010768	1910	4.3-10, bottom	136	W
	824–960	65°	16dBi	2°–12°T				+	
	1695–2690	65°	18dBi	2.5°–12°T				137	
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–803	65°	16dBi	1.5°–10°T	80010769	2429	4.3-10, bottom	138	W
	824–960	65°	17dBi	1.5°–10°T				+	
	1695–2690	65°	18dBi	2.5°–12°T				139	
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	790–862	65°	14.5dBi	0°–14°T	80010804	1503	7-16, bottom	140	U
	880–960	65°	15dBi	0°–14°T				+	
	1710–2170	65°	17dBi	2°–10°T				141	
	2490–2690	65°	17dBi	2°–10°T					
8-Port Antenna	790–862	65°	16dBi	0°–10°T	80010805	1997	7-16, bottom	142	U
	880–960	65°	16dBi	0°–10°T				+	
	1710–2170	65°	18dBi	2°–8°T				143	
	2490–2690	65°	18dBi	2°–8°T					
8-Port Antenna	698–862	65°	14.5dBi	2°–16°T	80010867	1459	7-16, bottom	144	W
	880–960	65°	15dBi	2°–16°T				+	
	1695–2690	65°	17.5dBi	2.5°–12°T				145	
	1695–2690	65°	18.5dBi	2.5°–12°T					

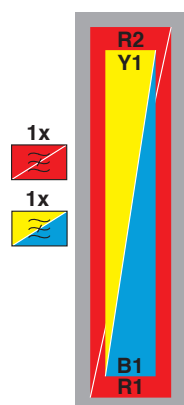
New or changed product

1) Configuration Types – further details on page 6–9.

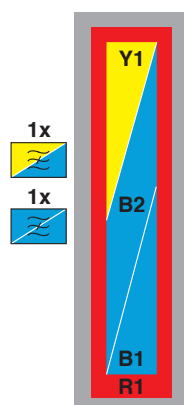
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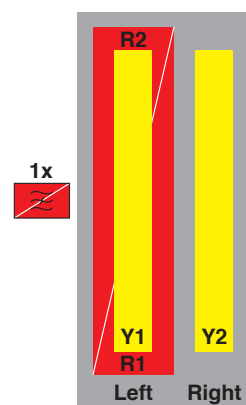
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Type V



Type W



Summary – Directional Antennas

8 Ports

Dual Polarization $\pm 45^\circ$

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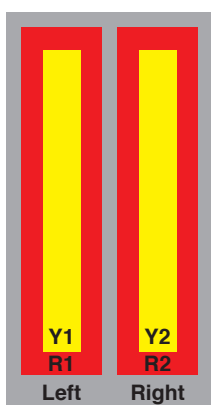
Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 2 x Highband									
8-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80010868	1921	7-16, bottom	146 + 147	W
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	16.5dBi	1.5°–10°T	80010869	2441	7-16, bottom	148 + 149	W
	880–960	65°	17dBi	1.5°–10°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	14.5dBi	2°–16°T	80011867	1499	4.3-10, bottom	150 + 151	W
	880–960	65°	15dBi	2°–16°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1427–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80011868	1999	4.3-10, bottom	152 + 153	W
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1427–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	790–960	65°	16dBi	0°–10°T	80010825	1934	7-16, bottom	154 – 156	T
	790–960	65°	16dBi	0°–10°T					
	1710–2180	60°	18.5dBi	0°–6°T					
	1710–2180	60°	18.5dBi	0°–6°T					
8-Port Antenna	790–960	65°	17dBi	0°–8°T	80010826	2399	7-16, bottom	157 + 158	T
	790–960	65°	17dBi	0°–8°T					
	1710–2180	60°	18.5dBi	0°–6°T					
	1710–2180	60°	18.5dBi	0°–6°T					
8-Port Antenna	698–960	65°	14dBi	2°–16°T	80010964	1499	4.3-10, bottom	159 – 161	AB
	698–960	65°	14dBi	2°–16°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
8-Port Antenna	698–960	65°	15.5dBi	2°–12°T	80010965	1999	4.3-10, bottom	162 – 164	AB
	698–960	65°	15.5dBi	2°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
8-Port Antenna	698–960	65°	16.5dBi	1°–10°T	80010966	2438	4.3-10, bottom	165 – 167	AB
	698–960	65°	16.5dBi	1°–10°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
4 x Highband									
8-Port Antenna	1710–2170	65°	17.5dBi	2°–11°T	80010728	1471	7-16, bottom	168 + 169	K
	1710–2170	65°	17.5dBi	2°–11°T					
	2490–2690	60°	18dBi	2°–14°T					
	2490–2690	60°	18dBi	2°–14°T					

8 Ports

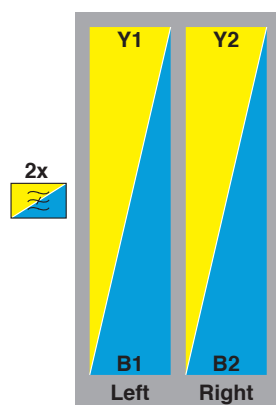
New or changed product

1) Configuration Types – further details on page 6–9.

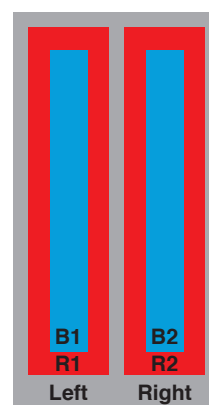
Type AB



Type K



Type T



8-Port Antenna

R1	Y1	Y2	Y3
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Frequency Range

698-960	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-960/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°
17/17.5/18/17.5dBi 1.5°-10°/2.5°-12°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80020872			
Lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	16.3	16.8	17.0	17.3
Gain over all Tilts	dBi	16.3 ± 0.4	16.8 ± 0.3	17.0 ± 0.4	17.3 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ± 1.7	68 ± 1.7	68 ± 1.8	66 ± 1.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 8.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	8.6 ± 0.6	7.9 ± 0.4	7.6 ± 0.5	7.1 ± 0.4
Electrical Downtilt continuously adjustable	°	1.5 - 10.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // Y1, Y2, Y3)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			



8 Ports

Values based on NGMN-P-BASTA (version 9.6) requirements.

Lower highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2170	2300 - 2400	2500 - 2690
Gain at mid Tilt	dBi	17.1	17.5	17.5	17.3	17.8
Gain over all Tilts	dBi	17.1 ± 0.5	17.4 ± 0.3	17.5 ± 0.4	17.3 ± 0.4	17.6 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.9	62 ± 2.8	62 ± 3.2	61 ± 6.6	63 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 21	> 23
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.0	> 11.5	> 9.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.5	6.4 ± 0.6	5.6 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 15	> 15	> 14	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // R1) > 30 (Y1 // Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80020872

Upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.4	17.6	17.9	18.2	18.4
Gain over all Tilts	dBi	17.4 ± 0.4	17.6 ± 0.2	17.8 ± 0.4	18.1 ± 0.3	18.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.0	66 ± 2.0	66 ± 1.5	66 ± 2.2	65 ± 4.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 23	> 22	> 25
Cross Polar Discrimination over Sector	dB	> 11.0	> 14.0	> 14.5	> 11.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 0.5	< 1.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 24	> 23	> 19	> 21
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R1) > 30 (Y2 // Y1, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.1	17.3	17.5	17.6
Gain over all Tilts	dBi	16.9 ± 0.3	17.1 ± 0.3	17.3 ± 0.4	17.4 ± 0.2	17.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.5	65 ± 1.5	65 ± 1.4	66 ± 1.7	66 ± 4.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25	> 26
Cross Polar Discrimination over Sector	dB	> 10.0	> 14.5	> 14.5	> 11.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 0.5	< 0.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.2 ± 0.4	6.7 ± 0.4	6.3 ± 0.5	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 24	> 23	> 20	> 19
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y3 // R1) > 30 (Y3 // Y1, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020872

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	42.0 / 44.2 (clamps incl.) 92.6 / 97.4 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

8-Port Antenna

R1	B1	B2	Y1
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Frequency Range

790–960	1710–1880	1920–2170	2490–2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 790–960/1710–1880/1920–2170/2490–2690 65°/65°/65°/65°
15/16.5/16.5/17dBi 0°–16°/2°–10°/2°–10°/2°–10°T



Type No.		80010684		
Lowband		R1, connector 1–2		
		790–960		
Frequency range	MHz	790 – 862	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Average gain	dBi	14.5 ... 14.4 ... 14.1	14.6 ... 14.5 ... 14.2	14.8 ... 14.6 ... 14.2
Tilt	°	0 ... 8 ... 16	0 ... 8 ... 16	0 ... 8 ... 16
Horizontal Pattern:				
Half-power beam width	°	69	68	67
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Main direction	0°	25	25	23
Sector	±60°	> 10	> 9	> 9
Vertical Pattern:				
Half-power beam width	°	16.5	16.0	15.0
Electrical tilt	°	0–1°, continuously adjustable		
Sidelobe suppression	° T	0 ... 8 ... 16	0 ... 8 ... 16	0 ... 8 ... 16
– for first sidelobe above main beam	dB	17 ... 15 ... 16	17 ... 15 ... 17 dB	16 ... 15 ... 16
– within 0°–20° sector above horizon	dB	17 ... 15 ... 15	17 ... 15 ... 16 dB	16 ... 15 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 30 (790–960 // 1710–1880 // 1710–2170 // 2490–2690 MHz)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. effective power per port		300 (at 50 °C ambient temperature)		
Max. effective power port 1–2	W	600 (at 50 °C ambient temperature)		
Max. effective power for the antenna		800 (at 50 °C ambient temperature)		



80010684

Highbands		B1, connector 3-4	B2, connector 5-6	Y1, connector 7-8
		1710-1880	1920-2170	2490-2690
Frequency range	MHz	1710 - 1880	1920 - 2170	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	16.1 ... 16.3 ... 16.1	16.3 ... 16.5 ... 16.1	16.5 ... 17.1 ... 16.6
Tilt	°	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10
Horizontal Pattern:				
Half-power beam width	°	65°	64°	63°
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:
Maindirection	0°	18	21	23
Sector	±60°	> 10	> 10	> 10
Vertical Pattern:				
Half-power beam width	°	6.8	6.0	4.8
Electrical tilt	°	2-10, continuously adjustable	2-10, continuously adjustable	2-10, continuously adjustable
Sidelobe suppression	° T	2 ... 6 ... 10	2 ... 6 ... 10	2 ... 6 ... 10
- for first sidelobe above main beam	dB	16 ... 15 ... 16	15 ... 16 ... 17	15 ... 16 ... 17
- within 0°-20° sector above horizon	dB	15 ... 15 ... 16	15 ... 16 ... 15	15 ... 17 ... 14
Impedance	Ω	50	50	50
VSWR		< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	dB	> 28 dB	> 28 dB	> 28 dB
Isolation: Intersystem	dB	> 30 dB (790-960 // 1710-2170 // 2490-2690 MHz)		
Intermodulation IM3	dBc	< -150 dBc (2 x 43 dBm carrier)		
Max. effective power per port		150 (at 50 °C ambient temperature)		
Max. effective power port 3-8		400 (at 50 °C ambient temperature)		
Max. effective power for the antenna	W	800 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	8 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment mechanism	4x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	260 58
		Maximal:	415 93
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	1403 / 300 / 152 55.2 / 11.8 / 6.0	
Category of mounting hardware	M (Medium)		
Weight	kg lb	23 / 25 (clamps incl.) 50.7 / 55.1 (clamps incl.)	
Packing size	mm inches	1726 x 322 x 190 68.0 x 12.7 x 7.5	
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

8-Port Antenna

R1	B1	B2	Y1
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KATHREIN

Frequency Range

790-960	1710-1880	1920-2170	2490-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 790-960/1710-1880/1920-2170/2490-2690 65°/65°/65°/65°
16/17.5/18/18dBi 0°-10°/2°-8°/2°-8°/2°-8°T



Type No.		80010685v01		
Lowband		R1, connector 1-2		
		790-960		
Frequency range	MHz	790 - 862	824 - 894	880 - 960
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	15.9 ... 15.9 ... 15.6	16.0 ... 16.0 ... 15.7	16.0 ... 16.1 ... 15.8
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:				
Half-power beam width	°	67	66	65
Front-to-back ratio, copolar (180°±30°)	dB	> 27	> 27	> 27
Cross polar ratio		Typically:	Typically:	Typically:
Main direction 0°	dB	27	27	22
Sector ±60°	dB	> 10	> 10	> 10
Vertical Pattern:				
Half-power beam width	°	10.1°	9.9°	9.5°
Electrical tilt	°	0-10, continuously adjustable		
Sidelobe suppression	° T	0 ... 5 ... 10	0 ... 5 ... 10	0 ... 5 ... 10
- for first sidelobe above main beam	dB	17 ... 15 ... 15	18 ... 15 ... 16	18 ... 16 ... 15
- within 0°-20° sector above horizon	dB	17 ... 15 ... 15	18 ... 15 ... 15	18 ... 15 ... 15
Impedance	Ω	50		
VSWR		< 1.5		
Isolation: Intrasystem	dB	> 30		
Isolation: Intersystem	dB	> 32 (1710-1880 // 1920-2170 MHz) > 32 (790-960 // 1710-2170 MHz) > 32 (2490-2690 // 790-960 ... 1710-2170 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port		400 (at 50 °C ambient temperature)		
Max. effective power Port 1-2	W	800 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		



80010685v01

Highbands		B1, connector 3-4	B2, connector 5-6	Y1, connector 7-8
		1710-1880	1920-2170	2490-2690
Frequency range	MHz	1710 - 1880	1920 - 2170	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.5 ... 17.6 ... 17.4	17.8 ... 18.0 ... 17.5	17.5 ... 18.0 ... 17.8
Tilt	°	2 ... 4 ... 8	2 ... 4 ... 8	2 ... 4 ... 8
Horizontal Pattern:				
Half-power beam width	°	62	63	63
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 27	> 26
Cross polar ratio		Typically:	Typically:	Typically:
Maindirection	0°	18	23	24
Sector	±60°	> 10	> 10	> 10
Vertical Pattern:				
Half-power beam width	°	4.9	4.3	3.5
Electrical tilt	°	2-8, continuously adjustable	2-8, continuously adjustable	2-8, continuously adjustable
Sidelobe suppression	° T	2 ... 4 ... 8	2 ... 4 ... 8	2 ... 4 ... 8
- for first sidelobe above main beam	dB	15 ... 17 ... 18	15 ... 17 ... 18	15 ... 17 ... 18
- within 0°-20° sector above horizon	dB	15 ... 16 ... 16	15 ... 17 ... 16	15 ... 17 ... 15
Impedance	Ω	50	50	50
VSWR		< 1.5	< 1.5	< 1.5
Isolation: Intrasystem	dB	> 28 dB	> 28 dB	> 28 dB
Isolation: Intersystem	dB	> 32 (1710-1880 // 1920-2170 MHz) > 32 (790-960 // 1710-2170 MHz) > 32 (2490-2690 // 790-960 ... 1710-2170 MHz)		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. effective power per port	W	150 (at 50 °C ambient temperature)		
Max. effective power Port 1-2		400 (at 50 °C ambient temperature)		
Max. effective power for the antenna		900 (at 50 °C ambient temperature)		

Mechanical specifications			
Input	8 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment mechanism	4x, Position bottom continuously adjustable		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88	Maximal: 620 139
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6	
Category of mounting hardware	M (Medium)		
Weight	kg lb	29 / 31 (clamps incl.) 63.9 / 68.3 (clamps incl.)	
Packing size	mm inches	2316 x 322 x 190 91.2 x 12.7 x 7.5	
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter		

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-803	824-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-803/824-960/1695-2690/1695-2690 65°/65°/65°/65°
14/14.5/17.5/18dBi 2°-16°/2°-16°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010767			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-960	
Frequency Range	MHz	698 - 803		824 - 894	880 - 960
Gain at mid Tilt	dBi	13.9		14.7	14.8
Gain over all Tilts	dBi	13.8 ± 0.4		14.5 ± 0.5	14.6 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.7		62 ± 2.5	61 ± 3.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 24	> 26
Cross Polar Discrimination at Boresight	dB	> 19		> 21	> 19
Cross Polar Discrimination over Sector	dB	> 7.5		> 6.0	> 6.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5		< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	14.4 ± 1.1		12.6 ± 0.7	11.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 16.0		2.0 - 16.0	
Tilt Accuracy	°	< 0.7		< 0.7	< 0.6
First Upper Side Lobe Suppression	dB	> 14		> 14	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15		> 14	> 16
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1, Y2) > 30 (R2 // Y1)	
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.1	17.5	17.4	17.0	17.7
Gain over all Tilts	dBi	17.0 ± 0.5	17.4 ± 0.3	17.4 ± 0.4	16.9 ± 0.4	17.6 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	61 ± 2.1	62 ± 3.1	66 ± 6.0	62 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 25	> 18	> 17
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.5	> 10.5	> 8.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.4	6.3 ± 0.3	6.0 ± 0.5	5.3 ± 0.4	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 14	> 14	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // Y2, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010767

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.6	17.9	18.4	18.6
Gain over all Tilts	dBi	17.3 ± 0.3	17.6 ± 0.2	17.9 ± 0.5	18.3 ± 0.4	18.4 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.9	62 ± 1.4	61 ± 1.5	59 ± 2.2	57 ± 3.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 23	> 25	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 23	> 25	> 24	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 15.5	> 17.0	> 14.5	> 7.5	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.4	6.5 ± 0.3	6.2 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 19	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 17	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R2) > 30 (Y2 // Y1, R1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 470 106 Maximal: 545 123
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1448 / 377 / 169 57.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	29.0 / 31.2 (clamps incl.) 63.9 / 68.8 (clamps incl.)
Packing Size	mm inches	1656 / 397 / 212 65.2 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-803	824-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-803/824-960/1695-2690/1695-2690 65°/65°/65°/65°
15/16/18/18dBi 2°-12°/2°-12°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010768			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-960	
Frequency Range	MHz	698 - 803	824 - 894	880 - 960	
Gain at mid Tilt	dBi	15.2	15.8	16.1	
Gain over all Tilts	dBi	15.1 ± 0.4	15.7 ± 0.4	16.0 ± 0.3	
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 1.6	63 ± 1.7	62 ± 2.4	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 26	> 26	
Cross Polar Discrimination at Boresight	dB	> 24	> 24	> 23	
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 6.5	
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 2.0	
Vertical Pattern:					
Elevation Beamwidth	°	10.7 ± 0.6	9.6 ± 0.4	9.2 ± 0.4	
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4	
First Upper Side Lobe Suppression	dB	> 16	> 19	> 20	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 19	> 18	
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.3	17.8	17.9	17.6	18.3
Gain over all Tilts	dBi	17.3 ± 0.6	17.8 ± 0.3	17.8 ± 0.4	17.5 ± 0.5	18.2 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.9	60 ± 2.6	60 ± 2.1	65 ± 6.8	61 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 27	> 27	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 25	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 10.0	> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.5	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 14	> 14	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010768

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	17.7	18.0	18.4	18.4
Gain over all Tilts	dBi	17.5 ± 0.3	17.7 ± 0.2	17.9 ± 0.5	18.3 ± 0.4	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	61 ± 3.4	61 ± 1.4	61 ± 1.5	59 ± 2.6	58 ± 3.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 21	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.0	> 13.0	> 7.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 2.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.3	6.6 ± 0.3	6.2 ± 0.5	5.5 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 17	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1910 / 377 / 169 75.2 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	35.0 / 37.2 (clamps incl.) 77.2 / 82.0 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-803	824-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-803/824-960/1695-2690/1695-2690 65°/65°/65°/65°
16/17/18/18dBi 1.5°-10°/1.5°-10°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80010769			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-960	
Frequency Range	MHz	698 - 803	824 - 894	880 - 960	
Gain at mid Tilt	dBi	15.9	16.5	16.8	
Gain over all Tilts	dBi	15.9 ± 0.5	16.5 ± 0.4	16.8 ± 0.2	
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 3.1	66 ± 1.6	64 ± 2.3	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 25	> 26	
Cross Polar Discrimination at Boresight	dB	> 25	> 27	> 25	
Cross Polar Discrimination over Sector	dB	> 7	> 8.5	> 9.5	
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7	7.6 ± 0.3	7.2 ± 0.3	
Electrical Downtilt continuously adjustable	°	1.5 - 10.0	1.5 - 10.0		
Tilt Accuracy	°	< 0.4	< 0.2	< 0.2	
First Upper Side Lobe Suppression	dB	> 16	> 16	> 18	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 18	
Cross Polar Isolation	dB	> 30	> 30		
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)	> 28 (R2 // R1) > 30 (R2 // Y1, Y2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.3	17.8	17.9	17.5	18.2
Gain over all Tilts	dBi	17.2 ± 0.6	17.7 ± 0.3	17.8 ± 0.3	17.4 ± 0.4	18.1 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.8	61 ± 2.4	61 ± 2.1	66 ± 6.3	63 ± 6.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 27	> 26	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 24	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 8.0	> 9.5	> 8.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.5	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.1	< 0.1
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 14	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010769

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	17.8	18.0	18.4	18.5
Gain over all Tilts	dBi	17.5 ± 0.3	17.7 ± 0.3	17.9 ± 0.5	18.3 ± 0.4	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	61 ± 1.7	61 ± 1.4	60 ± 2.4	59 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 21	> 18	> 17
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 13.0	> 7.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.3	6.5 ± 0.3	6.2 ± 0.4	5.5 ± 0.5	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 18	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 825 185 Maximal: 955 215
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2429 / 377 / 169 95.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	40.0 / 42.2 (clamps incl.) 88.2 / 93.0 (clamps incl.)
Packing Size	mm inches	2641 / 397 / 212 104.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	B1	Y1
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KATHREIN

Frequency Range

790-862	880-960	1710-2170	2490-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 790-862/880-960/1710-2170/2490-2690 65°/65°/65°/65°
14.5/15/17/17dBi 0°-14°/0°-14°/2°-10°/2°-10°T



Type No.		80010804	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency Range	MHz	790 - 862	880 - 960
Gain at mid Tilt	dBi	14.5	15.0
Gain over all Tilts	dBi	14.3 ± 0.3	14.8 ± 0.5
Horizontal Pattern:			
Azimuth Beamwidth	°	68 ± 1.6	67 ± 1.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 22
Vertical Pattern:			
Elevation Beamwidth	°	13.8 ± 0.6	12.2 ± 0.8
Electrical Downtilt continuously adjustable	°	0.0 - 14.0	0.0 - 14.0
Tilt Accuracy	°	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 15	> 19
Cross Polar Isolation	dB	> 30	
Port to Port Isolation	dB	> 30 (R1, R2 // B1, Y1) > 28 (R1 // R2)	
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)	
Max. Effective Power Port 1-4	W	700 (at 50 °C ambient temperature)	



Values based on NGMN-P-BASTA (version 9.6) requirements.

80010804

Highbands		B1, connector 5–6			Y1, connector 7–8
		1710–2170			2490–2690
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.0	17.1	17.1
Gain over all Tilts	dBi	16.8 ± 0.4	16.9 ± 0.4	17.0 ± 0.4	16.8 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	61 ± 3.5	63 ± 3.4	61 ± 4.8	63 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 23	> 21
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.4	6.2 ± 0.4	5.8 ± 0.5	4.6 ± 0.1
Electrical Downtilt continuously adjustable	°	2.0 – 10.0			2.0 – 10.0
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 21	> 18	> 17	> 14
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 28 (B1 // Y1) > 28 (Y1 // B1) > 30 (B1, Y1 // R1, R2)			
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Port 5–8	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	4x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 280 63 Maximal: 445 100
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1503 / 300 / 152 59.2 / 11.8 / 6.0
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	24.0 / 26.2 (clamps incl.) 52.9 / 57.7 (clamps incl.)
Packing Size	mm inches	1826 / 322 / 190 71.9 / 12.7 / 7.5
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

8-Port Antenna

R1	R2	B1	Y1
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KATHREIN

Frequency Range

790-862	880-960	1710-2170	2490-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 790-862/880-960/1710-2170/2490-2690 65°/65°/65°/65°
16/16/18/18dBi 0°-10°/0°-10°/2°-8°/2°-8°T



Type No.		80010805	
Lowbands		R1, connector 1-2	R2, connector 3-4
		790-862	880-960
Frequency range	MHz	790 - 862 MHz	880 - 960 MHz
Polarization	°	+45, -45	+45, -45
Average gain	dBi	15.6 ... 15.7 ... 15.2	15.8 ... 15.9 ... 15.5
Tilt	°	0 ... 5 ... 10	0 ... 5 ... 10
Horizontal Pattern:			
Half-power beam width	°	67	65
Front-to-back ratio, copolar (180°±30°)	dB	> 27	> 27
Cross polar ratio		Typically:	Typically:
Main direction	0°	22	22
Sector	±60°	> 10	> 10
Vertical Pattern:			
Half-power beam width	°	10.1	9.6
Electrical tilt	°	0-10, continuously adjustable	0-10, continuously adjustable
Sidelobe suppression for first sidelobe above main beam	°T	0 ... 5 ... 10	0 ... 5 ... 10
	dB	18 ... 15 ... 15	18 ... 18 ... 16
Impedance	Ω	50	50
VSWR		< 1.5	< 1.5
Isolation: Intrasystem	dB	> 30	> 30
Isolation: Intersystem	dB	> 30 (790...960 // 1710-2170 MHz // 2490-2690 MHz) > 28, typ. > 30 (790-862 // 880-960 MHz)	
Intermodulation IM3	dBc	< -150 dBc (2 x 43 dBm carrier)	
Max. effective power per port		400 (at 50 °C ambient temperature)	
Max. effective power port 1-4	W	800 (at 50 °C ambient temperature)	
Max. effective power for the antenna		900 (at 50 °C ambient temperature)	



80010805

Highbands		B1, connector 5-6			Y1, connector 7-8
		1710-2170			2490-2690
Frequency range	MHz	1710 - 1880	1850 - 1990	1920 - 2170	2490 - 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Average gain	dBi	17.7 ... 17.9 ... 17.7	17.7 ... 17.9 ... 17.7	17.8 ... 18.0 ... 17.5	17.2 ... 17.8 ... 17.5
Tilt	°	2 ... 5 ... 8	2 ... 5 ... 8	2 ... 5 ... 8	2 ... 5 ... 8
Horizontal Pattern:					
Half-power beam width	°	64	65	65	62
Front-to-back ratio, copolar (180°±30°)	dB	> 25	> 25	> 25	> 25
Cross polar ratio		Typically:	Typically:	Typically:	Typically:
Main direction	0°	18	22	23	25
Sector	±60°	> 10	> 10	> 10	> 10
Vertical Pattern:					
Half-power beam width	°	4.7	4.5	4.3	3.5
Electrical tilt	°	2-8, continuously adjustable			2-8, continuously adjustable
Min. sidelobe suppression for first sidelobe above main beam	°T dB	2 ... 5 ... 8 18 ... 18 ... 17	2 ... 5 ... 8 18 ... 17 ... 17	2 ... 5 ... 8 18 ... 18 ... 18	2 ... 5 ... 8 18 ... 18 ... 18
Impedance	Ω	50			50
VSWR		< 1.5			< 1.5
Isolation: Intrasystem	dB	> 28			> 28
Isolation: Intersystem	dB	> 30 (790...960 // 1710-2170 MHz // 2490-2690 MHz) > 28 Typ. > 30 (790-862 // 880-960 MHz)			
Intermodulation IM3	dBc	< -150 dBc (2 x 43 dBm carrier)			
Max. effective power per port		150 (at 50 °C ambient temperature)			
Max. effective power port 5-8		400 (at 50 °C ambient temperature)			
Max. effective power for the antenna	W	900 (at 50 °C ambient temperature)			

Mechanical specifications		
Input	8 x 7-16 female (long neck)	
Connector position	Bottom	
Adjustment mechanism	4x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 390 88 Maximal: 620 139
Max. wind velocity	km/h mph	200 124
Height/width/depth	mm inches	1997 / 300 / 152 78.6 / 11.8 / 6
Category of mounting hardware	M (Medium)	
Weight	kg lb	30 / 32 (clamps incl.) 66.1 / 70.5 (clamps incl.)
Packing size	mm inches	2316 x 322 x 190 91.2 x 12.7 x 7.5
Scope of supply	Panel and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-862	880-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-862/880-960/1695-2690/1695-2690 65°/65°/65°/65°
14.5/15/17.5/18.5dBi 2°-16°/2°-16°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010867		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 – 806	790 – 862	880 – 960
Gain at mid Tilt	dBi	14.0	14.5	14.9
Gain over all Tilts	dBi	13.9 ± 0.5	14.3 ± 0.5	14.7 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	67 ± 3.7	63 ± 3.4	61 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 26
Cross Polar Discrimination at Boresight	dB	> 20	> 22	> 21
Cross Polar Discrimination over Sector	dB	> 7.0	> 6.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	14.6 ± 1.6	13.3 ± 0.7	11.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 16.0		2.0 – 16.0
Tilt Accuracy	°	< 0.7	< 0.7	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 15	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 14	> 15
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1, Y2) > 30 (R2 // Y1)
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.2	17.6	17.5	17.1	17.7
Gain over all Tilts	dBi	17.1 ± 0.6	17.5 ± 0.3	17.5 ± 0.4	17.1 ± 0.4	17.6 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	61 ± 2.1	62 ± 2.6	64 ± 7.0	62 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 25	> 24	> 24
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 25	> 20	> 18
Cross Polar Discrimination over Sector	dB	> 8.5	> 10.5	> 11.0	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.5	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.7 ± 0.5	6.4 ± 0.3	6.0 ± 0.5	5.3 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 19	> 16	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 14	> 14	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010867

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.4	17.7	18.0	18.5	18.6
Gain over all Tilts	dBi	17.4 ± 0.4	17.6 ± 0.3	17.9 ± 0.5	18.4 ± 0.4	18.5 ± 0.3
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.4	62 ± 1.8	61 ± 1.5	59 ± 2.0	57 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 23	> 25	> 24	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 15.5	> 17.5	> 14.5	> 8.0	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.4	6.5 ± 0.3	6.2 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 17	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R2) > 30 (Y2 // R1, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 470 106 Maximal: 545 123
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1459 / 377 / 169 57.4 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	29.0 / 31.0 (clamps incl.) 63.9 / 68.3 (clamps incl.)
Packing Size	mm inches	1658 / 397 / 212 65.3 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-862	880-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-862/880-960/1695-2690/1695-2690 65°/65°/65°/65°
15.5/16/18/18dBi 2°-12°/2°-12°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010868		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	15.0	15.4	15.9
Gain over all Tilts	dBi	14.9 ± 0.5	15.3 ± 0.5	15.8 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	71 ± 2.5	68 ± 2.5	66 ± 1.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.5	< 2.5
Vertical Pattern:				
Elevation Beamwidth	°	11.0 ± 0.9	10.0 ± 0.6	9.4 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 18	> 18
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.4	17.8	17.9	17.6	18.3
Gain over all Tilts	dBi	17.3 ± 0.5	17.7 ± 0.3	17.8 ± 0.3	17.5 ± 0.4	18.1 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.2	61 ± 3.0	60 ± 2.5	65 ± 5.0	61 ± 5.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24	> 24
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.0	> 9.5	> 9.0	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 1.5	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 19	> 18	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 14	> 14	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010868

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.7	18.0	18.4	18.4
Gain over all Tilts	dBi	17.3 ± 0.4	17.6 ± 0.3	17.9 ± 0.4	18.3 ± 0.3	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.4	63 ± 3.2	62 ± 2.9	60 ± 2.0	60 ± 2.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 23	> 24	> 23	> 25
Cross Polar Discrimination over Sector	dB	> 15.5	> 14.5	> 13.0	> 7.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.4 ± 0.4	5.5 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 21	> 22	> 17	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 16	> 15	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1921 / 377 / 169 75.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	35.0 / 37.2 (clamps incl.) 77.1 / 81.9 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-862	880-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-862/880-960/1695-2690/1695-2690 65°/65°/65°/65°
16.5/17/18/18dBi 1.5°-10°/1.5°-10°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010869		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	16.0	16.4	17.0
Gain over all Tilts	dBi	15.9 ± 0.4	16.3 ± 0.4	16.9 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	68 ± 2.8	66 ± 2.2	64 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 6.5	> 7.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.5	< 2.0
Vertical Pattern:				
Elevation Beamwidth	°	8.7 ± 0.6	8.0 ± 0.5	7.2 ± 0.3
Electrical Downtilt continuously adjustable	°	1.5 - 10.0		1.5 - 10.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 15	> 19
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 15	> 17
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.4	17.8	17.9	17.5	18.1
Gain over all Tilts	dBi	17.3 ± 0.5	17.8 ± 0.3	17.8 ± 0.3	17.4 ± 0.4	17.9 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.2	61 ± 2.8	61 ± 2.5	66 ± 5.1	63 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24	> 24
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.0	> 10.0	> 9.0	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 1.5	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.4	5.9 ± 0.2	5.6 ± 0.4	4.9 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 15	> 14	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010869

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.7	17.9	18.5	18.4
Gain over all Tilts	dBi	17.3 ± 0.4	17.7 ± 0.3	17.9 ± 0.4	18.4 ± 0.3	18.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.8	62 ± 2.9	62 ± 2.8	59 ± 2.3	60 ± 2.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.0	> 13.5	> 8.0	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.4 ± 0.4	5.5 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 21	> 22	> 18	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 16	> 15	> 15	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 830 187 Maximal: 960 216
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2441 / 377 / 169 96.1 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	40.0 / 42.0 (clamps incl.) 88.2 / 92.6 (clamps incl.)
Packing Size	mm inches	2641 / 397 / 212 104.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-862	880-960	1695-2690	1427-2690
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HPBW

65°	65°	65°	65°
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Preliminary Issue

8-Port Antenna 698-862/880-960/1695-2690/1427-2690 65°/65°/65°/65°
14.5/15/18/18dBi 2°-16°/2°-16°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80011867		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	791 - 862	880 - 960
Gain at mid Tilt	dBi	14.0	14.6	14.9
Gain over all Tilts	dBi	13.9 ± 0.6	14.4 ± 0.7	14.7 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	72 ± 6.0	66 ± 5	67 ± 6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 22	> 25
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 20
Cross Polar Discrimination over Sector	dB	> 7	> 6	> 7
Azimuth Beam Port-to-Port Tracking	dB	< 2	< 2	< 2
Vertical Pattern:				
Elevation Beamwidth	°	14.3 ± 1.2	13.2 ± 1.0	11.9 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 16.0		2.0 - 16.0
Tilt Accuracy	°	< 0.6	< 0.6	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 16	> 16
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2170	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	17.1	17.6	17.5	17.4	17.9
Gain over all Tilts	dBi	17.1 ± 0.6	17.5 ± 0.3	17.5 ± 0.4	17.4 ± 0.5	17.8 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.0	62 ± 3	62 ± 3	57 ± 6	59 ± 7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27	> 24	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 8	> 10	> 10	> 8	> 8
Cross Polar Discrimination over Sector	dB	> 16	> 23	> 24	> 20	> 18
Azimuth Beam Port-to-Port Tracking	dB	< 2	< 2	< 2	< 3	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	6.8 ± 0.4	6.4 ± 0.3	6.1 ± 0.5	5.2 ± 0.3	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 19	> 20	> 15	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // Y2, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8					
		1427-2690					
Frequency Range	MHz	1427 – 1496	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.3	17.3	17.5	17.9	18	18
Gain over all Tilts	dBi	16.3 ± 0.3	17.3 ± 0.4	17.5 ± 0.4	17.8 ± 0.4	18 ± 0.3	18 ± 0.3
Horizontal Pattern:							
Azimuth Beamwidth	°	70 ± 3	64 ± 3	63 ± 3	63 ± 3	65 ± 3	60 ± 3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 23	> 24	> 23	> 25
Cross Polar Discrimination at Boresight	dB	> 20	> 20	> 20	> 20	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 15	> 13	> 11	> 11	> 9	> 8
Azimuth Beam Port-to-Port Tracking	dB	< 2	< 1	< 1	< 1	< 2	< 2
Vertical Pattern:							
Elevation Beamwidth	°	8.8 ± 0.3	7.3 ± 0.3	6.8 ± 0.3	6.4 ± 0.4	5.5 ± 0.4	5.0 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0					
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 16	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 15	> 15	> 15	> 15	> 15
Cross Polar Isolation	dB	> 28					
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)					
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)					
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)					

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 665 149 Maximal: 665 149
Max. Wind Velocity	km/h mph	240 149
Height / Width / Depth	mm inches	1499 / 378 / 164 59.0 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	30.0 / 35.0 (clamps incl.) 66.1 / 77.1 (clamps incl.)
Packing Size	mm inches	1681 / 402 / 248 66.2 / 15.8 / 9.8
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-862	880-960	1695-2690	1427-2690
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HPBW

65°	65°	65°	65°
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Preliminary Issue

8-Port Antenna 698-862/880-960/1695-2690/1427-2690 65°/65°/65°/65°
15.5/16/17.5/18dBi 2°-12°/2°-12°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80011868		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	791 - 862	880 - 960
Gain at mid Tilt	dBi	15.2	15.6	16.0
Gain over all Tilts	dBi	15.1 ± 0.5	15.6 ± 0.3	15.8 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.3	63 ± 3.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 24	> 27
Vertical Pattern:				
Elevation Beamwidth	°	10.6 ± 0.7	9.7 ± 0.5	9.1 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 19	> 21
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 19	> 19
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1, R2 // Y1, Y2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2500 - 2690
Gain at mid Tilt	dBi	17.4	18.0	18.2	17.9	18.2
Gain over all Tilts	dBi	17.3 ± 0.5	17.9 ± 0.4	18.1 ± 0.4	17.8 ± 0.4	18.1 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	62 ± 3.4	61 ± 2.6	59 ± 4.4	61 ± 6.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 27	> 25	> 24	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.3 ± 0.3	5.8 ± 0.3	5.5 ± 0.4	4.9 ± 0.2	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 17	> 16	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 15	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8						
		1427-2690						
Frequency Range	MHz	1428 – 1496	1492 – 1518	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.3	16.5	17.3	17.7	17.9	17.9	18.2
Gain over all Tilts	dBi	16.3 ± 0.3	16.5 ± 0.2	17.3 ± 0.3	17.6 ± 0.3	17.9 ± 0.3	17.9 ± 0.4	18.0 ± 0.6
Horizontal Pattern:								
Azimuth Beamwidth	°	73 ± 6.0	67 ± 5.1	66 ± 4.8	66 ± 3.4	66 ± 2.8	68 ± 2.9	62 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 26	> 26	> 26	> 27	> 24
Vertical Pattern:								
Elevation Beamwidth	°	8.6 ± 0.3	8.6 ± 0.2	7.2 ± 0.4	6.7 ± 0.3	6.3 ± 0.5	5.6 ± 0.4	5.1 ± 0.4
Electrical Downtilt continuously adjustable	°	2.5 – 12.0						
Tilt Accuracy	°	< 0.4	< 0.4	< 0.6	< 0.6	< 0.6	< 0.7	< 0.6
First Upper Side Lobe Suppression	dB	> 19	> 19	> 19	> 20	> 20	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 18	> 18	> 19	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28						
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)						
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)						
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)						

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 905 203 Maximal: 905 203
Max. Wind Velocity	km/h mph	240 149
Height / Width / Depth	mm inches	1999 / 378 / 164 78.7 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	36.0 / 41.0 (clamps incl.) 79.3 / 90.3 (clamps incl.)
Packing Size	mm inches	2200 / 383 / 255 86.6 / 15.1 / 10.0
Scope of Supply	Panel, FlexRET and clamps for 55-115 mm 2.2-4.5 inches diameter	

8-Port Antenna

R1	R2	B1	B2
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KATHREIN

Frequency Range

790-960	790-960	1710-2180	1710-2180
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HPBW

65°	65°	60°	60°
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8-Port Antenna 790-960/790-960/1710-2180/1710-2180 65°/65°/60°/60°
16/16/18.5/18.5dBi 0°-10°/0°-10°/0°-6°/0°-6°T



Type No.		80010825		
Left side, lowband		R1, connector 1-2		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.0	16.1
Gain over all Tilts	dBi	15.6 ± 0.4	15.8 ± 0.4	15.9 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 2.2	64 ± 2.3	62 ± 3.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 28	> 27
Cross Polar Discrimination at Boresight	dB	> 24	> 24	> 22
Cross Polar Discrimination over Sector	dB	> 11.5	> 10.5	> 10.0
Vertical Pattern:				
Elevation Beamwidth	°	11.2 ± 0.6	10.7 ± 0.7	10.0 ± 0.7
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.2	< 0.3	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 19	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R1 // R2, B1, B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)		



Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4		
		790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	15.9	16.1
Gain over all Tilts	dBi	15.5 ± 0.4	15.7 ± 0.3	15.9 ± 0.4
Horizontal Pattern:				
Azimuth Beamwidth	°	66 ± 2.1	65 ± 1.6	62 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27
Cross Polar Discrimination at Boresight	dB	> 28	> 26	> 25
Cross Polar Discrimination over Sector	dB	> 11.5	> 11.5	> 10.0
Vertical Pattern:				
Elevation Beamwidth	°	11.3 ± 0.6	10.8 ± 0.7	10.0 ± 0.7
Electrical Downtilt continuously adjustable	°	0.0 – 10.0		
Tilt Accuracy	°	< 0.3	< 0.2	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 20	> 15
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (R2 // R1, B1, B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010825

Left side, highband		B1, connector 5-6		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.6	18.8	18.6
Gain over all Tilts	dBi	18.5 ± 0.3	18.7 ± 0.3	18.5 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	59 ± 2.4	57 ± 1.9	60 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 27	> 27	> 25
Cross Polar Discrimination over Sector	dB	> 14.5	> 16.5	> 11.0
Vertical Pattern:				
Elevation Beamwidth	°	4.9 ± 0.2	4.7 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 12	> 17	> 19
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B1 // R1, R2, B2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 5-6	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		B2, connector 7-8		
		1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.5	18.8	18.8
Gain over all Tilts	dBi	18.4 ± 0.4	18.7 ± 0.3	18.6 ± 0.5
Horizontal Pattern:				
Azimuth Beamwidth	°	60 ± 2.9	57 ± 2.2	59 ± 4.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 27	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 25	> 27	> 26
Cross Polar Discrimination over Sector	dB	> 15.5	> 15.5	> 10.5
Vertical Pattern:				
Elevation Beamwidth	°	5.0 ± 0.2	4.7 ± 0.2	4.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 12	> 17	> 18
Cross Polar Isolation	dB	> 30		
Port to Port Isolation	dB	> 30 (B2 // R1, R2, B1)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)		
Max. Effective Power Port 7-8	W	500 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

80010825

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	4x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1230 277 Maximal: 1355 305
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1934 / 576 / 133 76.1 / 22.7 / 5.2
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	32.0 / 34.2 (clamps incl.) 70.5 / 75.3 (clamps incl.)
Packing Size	mm inches	2202 / 634 / 159 86.7 / 25.0 / 6.3
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

8-Port Antenna

R1	R2	B1	B2
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KATHREIN

Frequency Range

790-960	790-960	1710-2180	1710-2180
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HPBW

65°	65°	60°	60°
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8-Port Antenna 790-960/790-960/1710-2180/1710-2180 65°/65°/60°/60°
17/17/18.5/18.5dBi 0°-8°/0°-8°/0°-6°/0°-6°T



Type No.		80010826					
Lowbands		R1			R2		
		790-960			790-960		
Frequency Range	MHz	790 – 862	824 – 894	880 – 960	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.6	16.8	16.7	16.5	16.8	16.8
Gain over all Tilts	dBi	16.5 ± 0.3	16.6 ± 0.2	16.6 ± 0.3	16.5 ± 0.4	16.6 ± 0.2	16.6 ± 0.3
Horizontal Pattern:							
Azimuth Beamwidth	°	65 ± 2.3	64 ± 2.0	62 ± 2.4	66 ± 2.8	64 ± 2.2	63 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 28	> 25	> 26	> 27
Cross Polar Discrimination at Boresight	dB	> 31	> 32	> 29	> 30	> 30	> 29
Cross Polar Discrimination over Sector	dB	> 15.0	> 13.5	> 12.0	> 15.0	> 14.0	> 11.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Vertical Pattern:							
Elevation Beamwidth	°	8.1 ± 0.3	7.9 ± 0.3	7.5 ± 0.3	8.0 ± 0.3	7.8 ± 0.3	7.5 ± 0.3
Electrical Downtilt continuously adjustable	°	0.0 – 8.0			0.0 – 8.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 16	> 17	> 16
Cross Polar Isolation	dB	> 30			> 30		
Port to Port Isolation	dB	> 30 (R1//R2//B1//B2)			> 30 (R1//R2//B1//B2)		
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			400 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



8 Ports

Highbands		B1			B2		
		1710-2180			1710-2180		
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2180	1710 – 1880	1850 – 1990	1920 – 2180
Gain at mid Tilt	dBi	18.4	18.5	18.4	18.4	18.6	18.6
Gain over all Tilts	dBi	18.3 ± 0.3	18.4 ± 0.4	18.2 ± 0.5	18.3 ± 0.4	18.5 ± 0.5	18.4 ± 0.5
Horizontal Pattern:							
Azimuth Beamwidth	°	60 ± 2.4	57 ± 2.5	59 ± 3.4	60 ± 2.9	57 ± 2.1	58 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 25	> 24	> 25	> 26	> 26
Cross Polar Discrimination at Boresight	dB	> 28	> 28	> 24	> 28	> 27	> 24
Cross Polar Discrimination over Sector	dB	> 16.0	> 15.5	> 10.0	> 15.0	> 14.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 0.5	< 1.0	< 1.5	< 0.5	< 1.0	< 1.5
Vertical Pattern:							
Elevation Beamwidth	°	5.0 ± 0.3	4.7 ± 0.2	4.5 ± 0.4	5.0 ± 0.3	4.7 ± 0.2	4.5 ± 0.4
Electrical Downtilt continuously adjustable	°	0.0 – 6.0			0.0 – 6.0		
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 14	> 14	> 14	> 14	> 15	> 15
Cross Polar Isolation	dB	> 30			> 30		
Port to Port Isolation	dB	> 30 (R1//R2//B1//B2)			> 30 (R1//R2//B1//B2)		
Max. Effective Power per Port	W	250 (at 50 °C ambient temperature)			250 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80010826

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	-45, +45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	4x, Position bottom continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1550 348 Maximal: 1705 305
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2399 / 576 / 133 94.4 / 22.7 / 5.2
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	39.0 / 41.2 (clamps incl.) 86.0 / 90.8 (clamps incl.)
Packing Size	mm inches	2576 / 600 / 170 101.4 / 23.6 / 6.7
Scope of Supply	Panel and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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Preliminary Issue

8-Port Antenna 698-960/698-960/1695-2690/1695-2690 65°/65°/65°/65°
14/14/17.5/17.5dBi 2°-16°/2°-16°/2.5°-12°/2.5°-12°T



FlexRET

Type No.	80010964				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	13.6	14.2	14.3	14.6
Gain over all Tilts	dBi	13.6 ± 0.6	14.2 ± 0.3	14.3 ± 0.3	14.5 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64.6 ± 4.2	62.5 ± 2.4	62.0 ± 2.4	59.3 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21.5	> 22.5	> 25.2	> 25.3
Vertical Pattern:					
Elevation Beamwidth	°	17.8 ± 1.8	16.2 ± 1.0	15.8 ± 0.8	14.7 ± 1.1
Electrical Downtilt continuously adjustable	°	2.0 - 16.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.8	< 0.8
First Upper Side Lobe Suppression	dB	> 17.3	> 15.8	> 15.2	> 14.6
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	600 (at 50 °C ambient temperature)			



8 Ports

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband	R2, connector 3-4				
	698-960				
Frequency Range	MHz	698 - 806	791 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	13.4	14.1	14.3	14.3
Gain over all Tilts	dBi	13.4 ± 0.5	14.0 ± 0.5	14.2 ± 0.3	14.3 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	64.1 ± 5.6	61.8 ± 2.9	61.5 ± 2.9	59.5 ± 3.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20.6	> 23.6	> 26.1	> 25.5
Vertical Pattern:					
Elevation Beamwidth	°	17.6 ± 1.5	16.1 ± 1.3	15.5 ± 0.7	14.6 ± 0.9
Electrical Downtilt continuously adjustable	°	2.0 - 16.0			
Tilt Accuracy	°	< 1.1	< 0.8	< 0.8	< 1.1
First Upper Side Lobe Suppression	dB	> 17.9	> 14.9	> 14.6	> 15.6
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	600 (at 50 °C ambient temperature)			

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80010964

Preliminary Issue

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.3	17.5	17.7	17.2
Gain over all Tilts	dBi	16.9 ± 0.3	17.3 ± 0.4	17.4 ± 0.4	17.7 ± 0.8	17.1 ± 0.9
Horizontal Pattern:						
Azimuth Beamwidth	°	64.4 ± 4.0	62.7 ± 4.9	60.3 ± 4.5	53.6 ± 4.5	55.6 ± 8.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23.8	> 25.3	> 25.2	> 27.2	> 23.2
Vertical Pattern:						
Elevation Beamwidth	°	6.8 ± 0.3	6.4 ± 0.2	6.0 ± 0.5	5.2 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.3	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 15.6	> 16.5	> 15.7	> 14.6	> 14.2
Cross Polar Isolation	dB	> 26, typically > 30 dB				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.8	17.2	17.3	17.6	17.0
Gain over all Tilts	dBi	16.8 ± 0.4	17.2 ± 0.5	17.2 ± 0.6	17.6 ± 0.9	17.0 ± 1.0
Horizontal Pattern:						
Azimuth Beamwidth	°	67.0 ± 4.7	63.7 ± 6.7	60.7 ± 6.8	54.6 ± 6.0	53.9 ± 9.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24.2	> 25.3	> 25.1	> 26.2	> 22.0
Vertical Pattern:						
Elevation Beamwidth	°	6.8 ± 0.3	6.4 ± 0.3	6.0 ± 0.5	5.3 ± 0.3	4.7 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16.1	> 16.3	> 15.2	> 15.8	> 13.8
Cross Polar Isolation	dB	> 26, typically > 30 dB				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 835 188 Maximal: 840 189
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1499 / 508 / 175 59.0 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	38.0 / 43.0 (clamps incl.) 83.8 / 94.8 (clamps incl.)
Packing Size	mm inches	1700 / 542 / 268 66.9 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-960/698-960/1695-2690/1695-2690 65°/65°/65°/65°
15.5/15.5/18/18dBi 2°-12°/2°-12°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80010965			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.4	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.4	10.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.3	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010965

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	17.9	18.3	18.1	18.1
Gain over all Tilts	dBi	17.5 ± 0.4	17.8 ± 0.4	18.1 ± 0.5	18.0 ± 0.6	18.0 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.1	65 ± 4.1	62 ± 7.2	56 ± 4.1	57 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.1	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 16	> 18	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	18.0	18.3	18.2	17.9
Gain over all Tilts	dBi	17.4 ± 0.4	17.8 ± 0.4	18.1 ± 0.6	18.0 ± 0.7	17.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.7	66 ± 4.7	62 ± 7.8	57 ± 3.8	59 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.4	5.9 ± 0.3	5.5 ± 0.5	4.8 ± 0.3	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 15	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80010965

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	44.3 / 49.3 (clamps incl.) 97.6 / 108.6 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

8-Port Antenna

R1	R2	Y1	Y2
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KATHREIN

Frequency Range

698-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°
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8-Port Antenna 698-960/698-960/1695-2690/1695-2690 65°/65°/65°/65°
16.5/16.5/18/18dBi 1°-10°/1°-10°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80010966			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.1	16.4	16.5
Gain over all Tilts	dBi	15.6 ± 0.4	16.1 ± 0.3	16.3 ± 0.3	16.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	65 ± 2.3	65 ± 2.6	64 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 25
Cross Polar Discrimination over Sector	dB	> 10.0	> 9.5	> 10.0	> 11.5
Vertical Pattern:					
Elevation Beamwidth	°	9.7 ± 0.7	9.0 ± 0.5	8.7 ± 0.5	8.3 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



8 Ports

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.3	16.6
Gain over all Tilts	dBi	15.5 ± 0.6	16.0 ± 0.5	16.3 ± 0.4	16.5 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	65 ± 2.6	64 ± 3.0	63 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 26
Cross Polar Discrimination over Sector	dB	> 9.5	> 10.5	> 10.0	> 11.5
Vertical Pattern:					
Elevation Beamwidth	°	9.8 ± 0.6	9.0 ± 0.7	8.6 ± 0.4	8.1 ± 0.5
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 20
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80010966

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.6	18.0	18.3	18.1	17.9
Gain over all Tilts	dBi	17.5 ± 0.4	17.9 ± 0.4	18.1 ± 0.5	18.0 ± 0.6	17.8 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 4.9	64 ± 5.0	62 ± 5.4	57 ± 5.7	61 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Cross Polar Discrimination over Sector	dB	> 8.5	> 11.5	> 10.0	> 7.5	> 9.0
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 19	> 17	> 19	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.5	17.9	18.2	18.3	18.1
Gain over all Tilts	dBi	17.4 ± 0.5	17.8 ± 0.4	18.0 ± 0.6	18.2 ± 0.6	17.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 3.0	66 ± 5.5	63 ± 6.9	56 ± 7.1	57 ± 7.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 27	> 25
Cross Polar Discrimination over Sector	dB	> 9.5	> 11.0	> 10.0	> 9.5	> 10.5
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.6 ± 0.4	4.9 ± 0.4	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 19	> 18
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010966

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1400 315 Maximal: 1405 316
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2438 / 508 / 175 96.0 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	52.0 / 57.0 (clamps incl.) 114.6 / 125.7 (clamps incl.)
Packing Size	mm inches	2635 / 542 / 268 103.7 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

8-Port Antenna

B1	B2	Y1	Y2
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KATHREIN

Frequency Range

1710-2170	1710-2170	2490-2690	2490-2690
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HPBW

65°	65°	60°	60°
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8-Port Antenna 1710-2170/1710-2170/2490-2690/2490-2690 65°/65°/60°/60°
17.5/17.5/18/18dBi 2°-11°/2°-11°/2°-14°/ 2°-14° T



FlexRET



Type No.		80010728			
		B1, connector 1-2		Y1, connector 5-6	
		1710-2170		2490-2690	
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.8	17.8	18.1
Gain over all Tilts	dBi	17.2 ± 0.4	17.7 ± 0.3	17.7 ± 0.3	17.8 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.4	63 ± 3.1	56 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 26	> 26	> 24
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 22	> 25
Cross Polar Discrimination over Sector	dB	> 13.5	> 12.5	> 10.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.0	< 1.0
Vertical Pattern:					
Elevation Beamwidth	°	6.7 ± 0.4	6.3 ± 0.3	5.9 ± 0.5	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 11.0			2.0 – 14.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 17	> 16
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B1 // B2, Y1, Y2)		> 30 (Y1 // B1, B2, Y2)	
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2 + Port 5-6	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010728

		B2, connector 3–4			Y2, connector 7–8
		1710–2170			2490–2690
Frequency Range	MHz	1710 – 1880	1850 – 1990	1920 – 2170	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.8	17.8	17.9
Gain over all Tilts	dBi	17.2 ± 0.4	17.7 ± 0.3	17.7 ± 0.2	17.6 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.8	64 ± 2.3	63 ± 3.1	56 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 26	> 26	> 23
Cross Polar Discrimination at Boresight	dB	> 21	> 21	> 21	> 23
Cross Polar Discrimination over Sector	dB	> 14.5	> 12.0	> 11.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 0.5	< 1.5
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.4	6.3 ± 0.3	6.0 ± 0.4	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.0 – 11.0			2.0 – 14.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 17	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 17	> 16	> 16
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B2 // B1, Y1, Y2)			> 30 (Y2 // B1, B2, Y1)
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)			
Max. Effective Power Port 3–4 + Port 7–8	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	700 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	8 x 7-16 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 570 128 Maximal: 625 141
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	1471 / 275 / 103 57.9 / 10.8 / 4.1
Category of Mounting Hardware	M (Medium)	
Weight	kg lb	17.0 / 19.2 (clamps incl.) 37.5 / 42.3 (clamps incl.)
Packing Size	mm inches	1666 / 298 / 136 65.6 / 11.7 / 5.4
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

Summary – Directional Antennas

10 Ports

Dual Polarization $\pm 45^\circ$

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
1 x Lowband 4 x Highband									
10-Port Antenna	698–960	65°	15dBi	2°–16°T	80010874	1499	4.3-10, bottom	172 + 173	Y
	1695–2180	65°	17dBi	2.5°–12°T					
	2490–2690	65°	17dBi	2.5°–12°T					
	1695–2180	65°	17.5dBi	2.5°–12°T					
	2490–2690	65°	18dBi	2.5°–12°T					
10-Port Antenna	698–960	65°	16dBi	2°–12°T	80010875	1921	7-16, bottom	174 + 175	Y
	1695–2180	65°	17.5dBi	2.5°–12°T					
	2490–2690	65°	17.5dBi	2.5°–12°T					
	1695–2180	65°	17.5dBi	2.5°–12°T					
	2490–2690	65°	18dBi	2.5°–12°T					
10-Port Antenna	698–960	65°	16dBi	2°–12°T	80010891	1995	4.3-10, bottom	176 – 178	X
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	17dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
10-Port Antenna	698–960	65°	17dBi	1.5°–10°T	80020892	2693	4.3-10, bottom	179 – 181	X
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					

2 x Lowband | 3 x Highband

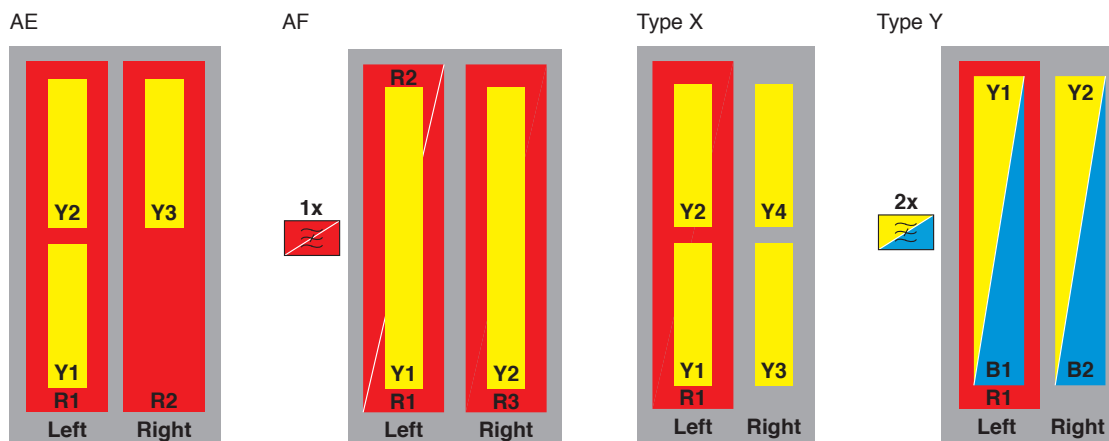
10-Port Antenna	698–960	65°	16.5dBi	1°–10°T	80010972	2671	4.3-10, bottom	182 – 184	AE
	698–960	65°	16.5dBi	1°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					

3 x Lowband | 2 x Highband

10-Port Antenna	698–862	65°	15dBi	2°–12°T	80010968	1999	4.3-10, bottom	185 – 187	AF
	880–960	65°	15.5dBi	2°–12°T					
	698–960	65°	15.5dBi	2°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					

New or changed product

1) Configuration Types – further details on page 6–9.



10-Port Antenna

R1	B1	Y1	B2	Y2
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Frequency Range

698–960	1695–2180	2490–2690	1695–2180	2490–2690
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HPBW

65°	65°	65°	65°	65°
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10-Port Antenna 698–960/1695–2180/2490–2690/1695–2180/2490–2690 65°/65°/65°/65°/65°
15/17/17/17.5/18dBi 2°–16°/2.5°–12°/2.5°–12°/2.5°–12°/2.5°–12°T



FlexRET



Type No.		80010874			
Left side, lowband		R1, connector 1–2			
		698–960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.2	14.6	14.8	15.0
Gain over all Tilts	dBi	14.1 ± 0.5	14.5 ± 0.6	14.7 ± 0.6	14.8 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	63 ± 3.8	62 ± 2.6	61 ± 1.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 27
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 23	> 21
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.0	> 7.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.5	< 1.5	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	14.1 ± 1.2	12.9 ± 0.6	12.5 ± 0.7	11.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 16.0			
Tilt Accuracy	°	< 0.6	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 12	> 14	> 13	> 14
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 13	> 14
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 28 (R1 // B2, Y2) > 30 (R1 // B1, Y1)			
Max. Effective Power per Port	W	300 (at 50 °C ambient temperature)			
Max. Effective Power Port 1–2	W	600 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highbands		B1, connector 3–4			Y1, connector 7–8
		1695–2180			2490–2690
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2490 – 2690
Gain at mid Tilt	dBi	16.4	16.9	17.1	17.0
Gain over all Tilts	dBi	16.3 ± 0.6	16.8 ± 0.4	17.0 ± 0.5	16.7 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 5.9	59 ± 2.5	57 ± 3.6	61 ± 6.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 27	> 26
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 22	> 15
Cross Polar Discrimination over Sector	dB	> 8.0	> 8.5	> 10.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 3.0	< 2.5	< 1.5	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	6.8 ± 0.3	6.5 ± 0.3	6.2 ± 0.5	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 13	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 30 (B1 // R1, Y1, B2, Y2) > 30 (Y1 // R1, B1, B2, Y2)			
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Port 3–4 + Port 7–8	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010874

Right side, highbands		B2, connector 5–6			Y2, connector 9–10
		1695–2180			2490–2690
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.2	17.4	18.0
Gain over all Tilts	dBi	16.9 ± 0.3	17.1 ± 0.3	17.3 ± 0.5	17.9 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	66 ± 2.3	66 ± 2.7	62 ± 2.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 23	> 25
Cross Polar Discrimination at Boresight	dB	> 20	> 20	> 21	> 15
Cross Polar Discrimination over Sector	dB	> 14.0	> 12.5	> 12.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.0	< 2.0	< 1.0
Vertical Pattern:					
Elevation Beamwidth	°	6.9 ± 0.4	6.5 ± 0.4	6.2 ± 0.6	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.3	< 0.3	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 16	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 15	> 15	> 15
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 30 (B2 // R1, B1, Y1, Y2) > 30 (Y2 // R1, B1, B2, Y2)			
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Port 5–6 + Port 9–10	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 665 149 Maximal: 665 149
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1499 / 378 / 164 59.0 / 14.9 / 6.5
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	31.0 / 36.0 (clamps incl.) 68.3 / 79.3 (clamps incl.)
Packing Size	mm inches	1681 / 402 / 248 66.2 / 15.8 / 9.8
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

10-Port Antenna Frequency Range HPBW

R1	B1	Y1	B2	Y2
698–960	1695–2180	2490–2690	1695–2180	2490–2690
65°	65°	65°	65°	65°

10-Port Antenna 698–960/1695–2180/2490–2690/1695–2180/2490–2690 65°/65°/65°/65°/65°
16/17.5/17.5/17.5/18dBi 2°–12°/2.5°–12°/2.5°–12°/2.5°–12°/2.5°–12°T



FlexRET

Type No.		80010875			
Left side, lowband		R1, connector 1–2			
		698–960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.1	15.6	15.8	16.1
Gain over all Tilts	dBi	15.1 ± 0.5	15.6 ± 0.3	15.7 ± 0.4	16.0 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ± 2.0	67 ± 1.5	67 ± 1.3	65 ± 2.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 21	> 21	> 21	> 20
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	11.0 ± 1.1	10.1 ± 0.4	9.8 ± 0.6	9.3 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 18	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 19	> 17	> 17
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 30 (R1 // B1, Y1, B2, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1–2	W	800 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highbands		B1, connector 3–4			Y1, connector 7–8
		1695–2180			2490–2690
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.7	17.8	17.6
Gain over all Tilts	dBi	17.2 ± 0.5	17.6 ± 0.3	17.7 ± 0.4	17.4 ± 0.6
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.5	60 ± 2.9	58 ± 2.4	61 ± 4.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 22	> 25	> 17
Cross Polar Discrimination over Sector	dB	> 7.0	> 8.0	> 9.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 1.5	< 2.0	< 2.5
Vertical Pattern:					
Elevation Beamwidth	°	6.0 ± 0.4	5.5 ± 0.3	5.2 ± 0.4	4.1 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 18	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B1 // R1, Y1, B2, Y2)			> 30 (Y1 // R1, B1, B2, Y2)
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Port 3–4 + Port 7–8	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010875

Right side, highbands		B2, connector 5–6			Y2, connector 9–10
		1695–2180			2490–2690
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.5	17.8	18.1
Gain over all Tilts	dBi	17.3 ± 0.3	17.5 ± 0.3	17.7 ± 0.5	18.0 ± 0.4
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.2	61 ± 2.2	61 ± 2.1	58 ± 3.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 26	> 27	> 27	> 24
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 21	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 14.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 0.5	< 0.5	< 3.0
Vertical Pattern:					
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.2 ± 0.5	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0			2.5 – 12.0
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 18	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 14
Cross Polar Isolation	dB	> 28			> 28
Port to Port Isolation	dB	> 30 (B2 // R1, B1, Y1, Y2)			> 30 (Y2 // R1, B1, Y1, B2)
Max. Effective Power per Port	W	150 (at 50 °C ambient temperature)			
Max. Effective Power Port 5–6 + Port 9–10	W	400 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 30
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	900 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 7-16 female long neck	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 630 142 Maximal: 730 164
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1921 / 377 / 169 75.6 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	32.0 / 34.2 (clamps incl.) 70.5 / 75.3 (clamps incl.)
Packing Size	mm inches	2121 / 397 / 212 83.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

10-Port Antenna

R1	Y1	Y2	Y3	Y4
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Frequency Range

698-960	1695-2690	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°
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10-Port Antenna 698-960/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°
16/16/16/17/16.5dBi 2°-12°/2°-14°/2°-14°/2°-14°/2°-14°T



FlexRET

Type No.		80010891			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	15.9	16.0	16.3
Gain over all Tilts	dBi	15.4 ± 0.4	15.8 ± 0.3	15.9 ± 0.3	16.2 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.3	64 ± 1.6	64 ± 1.1	63 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 26	> 28
Vertical Pattern:					
Elevation Beamwidth	°	10.6 ± 0.7	9.8 ± 0.5	9.5 ± 0.4	9.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.5	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 15	> 17	> 20	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 17	> 18	> 17
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // Y4) > 30 (R1 // Y1, Y2, Y3)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



Left side, lower highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.5	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	58 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 21	> 19	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 20	> 20	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010891

Left side, upper highband		Y2, connector 5-6				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.3	56 ± 3.9	58 ± 5.3	62 ± 4.0	65 ± 7.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.5	8.7 ± 0.4	8.2 ± 0.7	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 18	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 7-8				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.3	16.5	16.9	17.3	17.2
Gain over all Tilts	dBi	16.2 ± 0.4	16.5 ± 0.3	16.8 ± 0.5	17.1 ± 0.4	16.9 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	64 ± 3.3	63 ± 2.6	60 ± 2.1	60 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.7	8.9 ± 0.4	8.5 ± 0.6	7.5 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 19	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

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Right side, upper highband		Y4, connector 9–10				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.9	16.5
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.3	16.8 ± 0.3	16.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.5	61 ± 2.3	58 ± 3.1	59 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.0 ± 0.5	8.6 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 17	> 17	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9–10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 660 148 Maximal: 760 171
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 377 / 169 78.5 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	34.0 / 36.2 (clamps incl.) 74.9 / 79.7 (clamps incl.)
Packing Size	mm inches	2196 / 397 / 212 86.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

10-Port Antenna

R1	Y1	Y2	Y3	Y4
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Frequency Range

698-960	1695-2690	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°
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10-Port Antenna 698-960/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°
17/17.5/17/18/17.5dBi 1.5°-10°/2.5°-12°/2.5°-12°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80020892			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	16.3	16.8	17.0	17.3
Gain over all Tilts	dBi	16.3 ± 0.4	16.8 ± 0.3	17.0 ± 0.4	17.3 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ± 1.7	68 ± 1.7	68 ± 1.8	66 ± 1.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 23	> 23	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 7.5	> 7.5	> 8.0	> 7.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.0
Vertical Pattern:					
Elevation Beamwidth	°	8.6 ± 0.6	7.9 ± 0.4	7.6 ± 0.5	7.1 ± 0.4
Electrical Downtilt continuously adjustable	°	1.5 – 10.0			
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 16	> 15
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 28 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			



10 Ports

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 3-4				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.1	17.5	17.5	17.3	17.8
Gain over all Tilts	dBi	17.1 ± 0.5	17.4 ± 0.3	17.5 ± 0.4	17.3 ± 0.4	17.6 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.9	62 ± 2.8	62 ± 3.2	61 ± 6.6	63 ± 5.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 21	> 23
Cross Polar Discrimination at Boresight	dB	> 16	> 22	> 22	> 19	> 19
Cross Polar Discrimination over Sector	dB	> 8.0	> 10.0	> 11.5	> 9.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.5	6.4 ± 0.6	5.6 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 15	> 15	> 15	> 14	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y1 // R1) > 30 (Y1 // Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 3-4	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80020892

Left side, upper highband		Y2, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.9	17.0	16.7	17.1
Gain over all Tilts	dBi	16.5 ± 0.5	16.8 ± 0.3	16.9 ± 0.4	16.6 ± 0.4	16.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.9	62 ± 3.6	62 ± 4.1	64 ± 7.6	60 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 22	> 22
Cross Polar Discrimination at Boresight	dB	> 16	> 23	> 22	> 19	> 19
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5	> 12.0	> 8.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 2.0	< 1.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y2 // R1) > 30 (Y2 // Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.6	17.9	18.2	18.4
Gain over all Tilts	dBi	17.4 ± 0.4	17.6 ± 0.2	17.8 ± 0.4	18.1 ± 0.3	18.2 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 3.0	66 ± 2.0	66 ± 1.5	66 ± 2.2	65 ± 4.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 23	> 22	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 20	> 18	> 16	> 18
Cross Polar Discrimination over Sector	dB	> 11.0	> 14.0	> 14.5	> 11.5	> 9.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 0.5	< 1.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 24	> 23	> 19	> 21
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y3 // R1) > 30 (Y3 // Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020892

Right side, upper highband		Y4, connector 9–10				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.1	17.3	17.5	17.6
Gain over all Tilts	dBi	16.9 ± 0.3	17.1 ± 0.3	17.3 ± 0.4	17.4 ± 0.2	17.4 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 2.5	65 ± 1.5	65 ± 1.4	66 ± 1.7	66 ± 4.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 15	> 19	> 18	> 16	> 18
Cross Polar Discrimination over Sector	dB	> 10.0	> 14.5	> 14.5	> 11.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 0.5	< 0.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.2 ± 0.4	6.7 ± 0.4	6.3 ± 0.5	5.6 ± 0.4	5.0 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 24	> 23	> 20	> 19
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 28 (Y4 // R1) > 30 (Y4 // Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9–10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	42.5 / 44.7 (clamps incl.) 93.7 / 98.5 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42–115 mm 1.7–4.5 inches diameter	

10-Port Antenna

R1	R2	Y1	Y2	Y3
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Frequency Range

698-960	698-960	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°
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Preliminary Issue

10 Port Antenna 698-960/698-960/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°
16.5/16.5/17.5/17.5/17.5dBi 1°-10°/1°-10°/2.5°-12°/2.5°-12°/2.5°-12°



FlexRET

Type No.		80010972			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.6	16.1	16.3	16.5
Gain over all Tilts	dBi	15.5 ± 0.5	16.0 ± 0.5	16.2 ± 0.5	16.4 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	65 ± 4	65 ± 3	64 ± 3	63 ± 2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 22	> 23	> 23	> 23
Cross Polar Discrimination over Sector	dB	> 10	> 9.5	> 10	> 11.5
Vertical Pattern:					
Elevation Beamwidth	°	9.5 ± 0.5	9 ± 0.5	8.5 ± 0.5	8 ± 0.5
Electrical Downtilt continuously adjustable	°	1 – 10			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 18	> 18	> 18	> 20
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 17	> 16
Cross Polar Isolation	dB	> 26			
Port to Port Isolation	dB	> 27 (R1 // R2) > 28 (R1 // Y1, Y2, Y3) typ. > 30			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			



Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.2	16.5
Gain over all Tilts	dBi	15.4 ± 0.5	15.9 ± 0.5	16.1 ± 0.5	16.4 ± 0.5
Horizontal Pattern:					
Azimuth Beamwidth	°	65 ± 4	65 ± 4	64 ± 4	62 ± 3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 22	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 20	> 22	> 23	> 22
Cross Polar Discrimination over Sector	dB	> 10.5	> 9.5	> 10	> 11
Vertical Pattern:					
Elevation Beamwidth	°	9.5 ± 0.5	9 ± 0.5	8.5 ± 0.5	8 ± 0.5
Electrical Downtilt continuously adjustable	°	1 – 10			
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 18	> 20	> 17	> 17
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 16	> 15	> 16
Cross Polar Isolation	dB	> 26			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2, Y3)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.9	17.3	17.5	17.1	17.1
Gain over all Tilts	dBi	16.8 ± 0.5	17.1 ± 0.5	17.4 ± 0.5	17.0 ± 0.5	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4	65 ± 5	63 ± 5	59 ± 5	59 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 24	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 19	> 22	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 9	> 11	> 8	> 9.0
Vertical Pattern:						
Elevation Beamwidth	°	7.5 ± 0.5	7 ± 0.5	6.5 ± 0.5	6 ± 0.5	5.5 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 15	> 15	> 15	> 14
Cross Polar Isolation	dB	> 26				
Port to Port Isolation	dB	> 30 (Y1 // Y2, Y3, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17	17.3	17.5	17.0	17.0
Gain over all Tilts	dBi	17 ± 0.5	17.2 ± 0.5	17.4 ± 0.5	17.0 ± 0.5	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.7	63 ± 3.7	62 ± 2.9	60 ± 5	60 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 24	> 16	> 15
Cross Polar Discrimination over Sector	dB	> 7.5	> 10	> 10.5	> 7	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.5 ± 0.5	6.0 ± 0.5	5.5 ± 0.5	5.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 16	> 17	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 14	> 14	> 14
Cross Polar Isolation	dB	> 26				
Port to Port Isolation	dB	> 30 (Y2 // Y1, Y3, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

Right side, lower highband		Y3, connector 9–10				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17	17.3	17.5	17.0	17.0
Gain over all Tilts	dBi	17 ± 0.5	17.2 ± 0.5	17.4 ± 0.5	17.0 ± 0.5	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.7	63 ± 3.7	62 ± 2.9	60 ± 5	60 ± 5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 24	> 25
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 24	> 16	> 15
Cross Polar Discrimination over Sector	dB	> 7.5	> 10	> 10.5	> 7	> 7.5
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.5 ± 0.5	6.0 ± 0.5	5.5 ± 0.5	5.0 ± 0.5
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
First Upper Side Lobe Suppression	dB	> 17	> 16	> 17	> 16	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 14	> 14	> 14	> 14	> 14
Cross Polar Isolation	dB	> 26				
Port to Port Isolation	dB	> 30 (Y3 // Y1, Y2, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9–10	W	400 (at 50 °C ambient temperature)				

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1300 (at 50 °C ambient temperature)

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1545 347 Maximal: 1555 350
Max. Wind Velocity	km/h mph	240 150
Height / Width / Depth	mm inches	2671 / 508 / 175 105.2 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	55 / 60 (clamps incl.) 126.3 / 137.3 (clamps incl.)
Packing Size	mm inches	2870 / 542 / 268 113.0 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

10-Port Antenna

R1	R2	R3	Y1	Y2
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Frequency Range

698-862	880-960	698-960	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°
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Preliminary Issue

10-Port Antenna 698-862/880-960/698-960/1695-2690/1695-2690 65°/65°/65°/65°/65° 15/15.5/15.5/18/18dBi 2°-12°/2°-12°/2°-12°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80010968		
Left side, lowbands		R1, connector 1-2		R2, connector 3-4
		698-862		880-960
Frequency Range	MHz	698 - 806	790 - 862	880 - 960
Gain at mid Tilt	dBi	14.6	15.2	15.6
Gain over all Tilts	dBi	14.6 ± 0.5	15.2 ± 0.4	15.5 ± 0.3
Horizontal Pattern:				
Azimuth Beamwidth	°	62 ± 5.4	61 ± 4.2	60 ± 2.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 23
Vertical Pattern:				
Elevation Beamwidth	°	12.0 ± 0.8	11.0 ± 0.8	10.3 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 - 12.0		2.0 - 12.0
Tilt Accuracy	°	< 0.4	< 0.6	< 0.6
First Upper Side Lobe Suppression	dB	> 15	> 16	> 14
Cross Polar Isolation	dB	> 30		> 30
Port to Port Isolation	dB	> 27 (R1 // R3) > 30 (R1 // R2, Y1, Y2)		> 30 (R2 // R1, R3, Y1, Y2)
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)		
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)		

Values based on NGMN-P-BASTA (version 9.6) requirements.



10 Ports

Right side, lowband		R3, connector 5-6			
		698-960			
Frequency Range	MHz	698 - 806	790 - 862	824 - 894	880 - 960
Gain at mid Tilt	dBi	14.8	15.4	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 - 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R3 // R1) > 30 (R3 // R2, Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 5-6	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

Left side, highband		Y1, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	17.9	18.3	18.1	18.1
Gain over all Tilts	dBi	17.5 ± 0.4	17.8 ± 0.3	18.1 ± 0.5	18.1 ± 0.5	18.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.1	65 ± 4.1	62 ± 7.2	56 ± 4.1	57 ± 5.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 26	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.1	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 17	> 18	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, R3, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	18.0	18.3	18.2	17.9
Gain over all Tilts	dBi	17.5 ± 0.5	17.8 ± 0.5	18.1 ± 0.6	18.1 ± 0.6	17.9 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 5.2	66 ± 5.3	62 ± 8.7	57 ± 3.8	59 ± 8.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.5	4.8 ± 0.3	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 16	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, R3, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9-10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010968

Preliminary Issue

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	10 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	55.0 / 60.0 (clamps incl.) 121.2 / 132.2 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

Summary – Directional Antennas

12 Ports

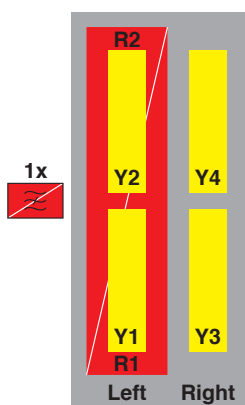
Dual Polarization $\pm 45^\circ$

Type	Type No.	Height [mm]	Connector female, type and position	Page	1)				
2 x Lowband 4 x Highband									
12-Port Antenna	698–803	65°	15dBi	2°–12°T	80010798	1995	4.3-10, bottom	190 – 192	Z
	824–894	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	17dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
12-Port Antenna	698–803	65°	16dBi	1.5°–10°T	80010799	2693	4.3-10, bottom	193 – 195	Z
	824–894	65°	17dBi	1.5°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
12-Port Antenna	698–862	65°	15.5dBi	2°–12°T	80010898	1995	4.3-10, bottom	196 – 198	Z
	880–960	65°	16dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	17dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
12-Port Antenna	698–862	65°	16.5dBi	1.5°–10°T	80020899	2693	4.3-10, bottom	199 – 201	Z
	880–960	65°	17dBi	1.5°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	18dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
12-Port Antenna	698–960	65°	15.5dBi	2°–12°T	80010991	1999	4.3-10, bottom	202 – 205	AG
	698–960	65°	15.5dBi	2°–12°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
	1695–2690	65°	16dBi	2°–14°T					
	1695–2690	65°	16.5dBi	2°–14°T					
12-Port Antenna	698–960	65°	16.5dBi	1°–10°T	80010992	2671	4.3-10, bottom	206 – 209	AG
	698–960	65°	16.5dBi	1°–10°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					
	1695–2690	65°	17.5dBi	2.5°–12°T					
	1695–2690	65°	17dBi	2.5°–12°T					

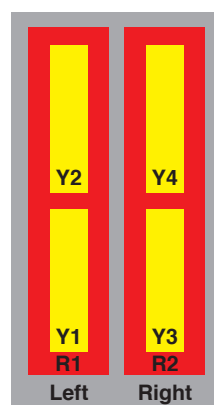
New or changed product

1) Configuration Types – further details on page 6–9.

Type Z



Type AG



12-Port Antenna Dual Polarization HPBW

R1	R2	Y1	Y2	Y3	Y4
698-803	824-894	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 698-803/824-894/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°/65°
15/16/16/16.5/17/16.5dBi 2°-12°/2°-12°/2°-14°/2°-14°/2°-14°/2°-14°T



FlexRET



Type No.		80010798			
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-894	
Frequency Range	MHz	698 – 803		824 – 894	
Gain at mid Tilt	dBi	15.2		15.8	
Gain over all Tilts	dBi	15.1 ± 0.4		15.7 ± 0.4	
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 1.6		62 ± 1.7	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 26	
Cross Polar Discrimination at Boresight	dB	> 24		> 24	
Cross Polar Discrimination over Sector	dB	> 7.0		> 7.0	
Azimuth Beam Port-to-Port Tracking	dB	< 1.5		< 1.5	
Vertical Pattern:					
Elevation Beamwidth	°	10.7 ± 0.6		9.6 ± 0.4	
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		2.0 – 12.0	
Tilt Accuracy	°	< 0.4		< 0.5	
First Upper Side Lobe Suppression	dB	> 16		> 18	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16		> 18	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1, Y4) > 30 (R2 // Y1, Y2, Y3)	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.5	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	56 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Cross Polar Discrimination at Boresight	dB	> 17	> 20	> 24	> 20	> 22
Cross Polar Discrimination over Sector	dB	> 6.5	> 10.0	> 10.0	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.0	< 2.0	< 2.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 21	> 19	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 20	> 20	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010798

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.3	56 ± 3.9	58 ± 5.3	62 ± 4.0	65 ± 7.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Cross Polar Discrimination at Boresight	dB	> 16	> 21	> 24	> 15	> 15
Cross Polar Discrimination over Sector	dB	> 7.0	> 8.5	> 9.5	> 7.0	> 7.0
Azimuth Beam Port-to-Port Tracking	dB	< 2.5	< 2.5	< 1.5	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.5	8.7 ± 0.4	8.2 ± 0.7	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 18	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.3	16.5	16.9	17.3	17.2
Gain over all Tilts	dBi	16.2 ± 0.4	16.5 ± 0.3	16.8 ± 0.5	17.1 ± 0.4	16.9 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	64 ± 3.3	63 ± 2.6	60 ± 2.0	60 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 23
Cross Polar Discrimination at Boresight	dB	> 25	> 26	> 25	> 20	> 15
Cross Polar Discrimination over Sector	dB	> 16.0	> 16.0	> 14.5	> 8.5	> 10.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 1.0	< 1.0	< 2.0	< 3.5
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.7	8.9 ± 0.4	8.5 ± 0.6	7.5 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 19	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9-10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80010798

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.9	16.5
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.3	16.8 ± 0.3	16.3 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.5	61 ± 2.3	58 ± 3.1	58 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Cross Polar Discrimination at Boresight	dB	> 21	> 23	> 21	> 16	> 15
Cross Polar Discrimination over Sector	dB	> 13.5	> 14.5	> 12.5	> 6.5	> 8.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 1.0	< 1.0	< 1.0	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.0 ± 0.5	8.5 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 17	> 18	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 11-12	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 660 148 Maximal: 760 171
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 377 / 169 78.5 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	37.0 / 39.2 (clamps incl.) 81.5 / 86.3 (clamps incl.)
Packing Size	mm inches	2196 / 397 / 212 86.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna Dual Polarization HPBW

R1	R2	Y1	Y2	Y3	Y4
698-803	824-894	1695-2690	1695-2690	1695-2690	1695-2690
65°	65°	65°	65°	65°	65°

12-Port Antenna 698-803/824-894/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°/65°
16/17/17.5/17/18/17.5dBi 1.5°-10°/1.5°-10°/2.5°-12°/2.5°-12°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80010799			
Lowbands		R1, connector 1-2		R2, connector 3-4	
		698-803		824-894	
Frequency Range	MHz	698 - 806		824 - 894	
Gain at mid Tilt	dBi	15.9		16.5	
Gain over all Tilts	dBi	15.9 ± 0.5		16.5 ± 0.4	
Horizontal Pattern:					
Azimuth Beamwidth	°	69 ± 3.1		66 ± 1.6	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21		> 25	
Cross Polar Discrimination at Boresight	dB	> 25		> 27	
Cross Polar Discrimination over Sector	dB	> 6.5		> 8.5	
Azimuth Beam Port-to-Port Tracking	dB	< 2.0		< 2.0	
Vertical Pattern:					
Elevation Beamwidth	°	8.7 ± 0.7		7.6 ± 0.3	
Electrical Downtilt continuously adjustable	°	1.5 - 10.0		1.5 - 10.0	
Tilt Accuracy	°	< 0.4		< 0.2	
First Upper Side Lobe Suppression	dB	> 16		> 16	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15		> 16	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1// Y1, Y2, Y3, Y4)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	16.9	17.2	17.3	16.7	17.2
Gain over all Tilts	dBi	16.8 ± 0.5	17.1 ± 0.3	17.2 ± 0.4	16.6 ± 0.4	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.6	62 ± 3.6	62 ± 4.2	64 ± 7.3	60 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 21	> 22
Cross Polar Discrimination at Boresight	dB	> 16	> 23	> 22	> 19	> 18
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.5	> 11.5	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 1.5	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 12	> 13	> 13	> 13	> 13
Cross Polar Isolation	dB	> 26 (1695 - 1710 MHz) > 28 (1710 - 2690 MHz)				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285



12 Ports

80010799

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.9	16.9	16.3	16.9
Gain over all Tilts	dBi	16.5 ± 0.5	16.9 ± 0.4	16.9 ± 0.4	16.2 ± 0.3	16.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.6	63 ± 3.7	62 ± 2.9	66 ± 5.8	62 ± 5.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 24	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 15	> 22	> 25	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5	> 10.5	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.5	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.5 ± 0.3	6.1 ± 0.5	5.5 ± 0.4	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 15	> 16	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 11	> 13	> 13	> 13	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.7	17.7	18.0	18.1	18.3
Gain over all Tilts	dBi	17.6 ± 0.3	17.7 ± 0.3	17.9 ± 0.5	18.0 ± 0.3	18.1 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.5	62 ± 1.6	62 ± 1.5	61 ± 1.5	59 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 21	> 17	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 13.5	> 8.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 22	> 21	> 18	> 22
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 15	> 16	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9-10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010799

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.4	17.5	17.7	17.8	17.9
Gain over all Tilts	dBi	17.3 ± 0.3	17.4 ± 0.2	17.6 ± 0.4	17.7 ± 0.3	17.7 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.8	62 ± 1.8	61 ± 1.9	60 ± 1.8	58 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 24	> 24	> 25	> 24
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19	> 16	> 17
Cross Polar Discrimination over Sector	dB	> 16.0	> 17.0	> 14.5	> 8.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.7 ± 0.5	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 24	> 23	> 18	> 23
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 15	> 16	> 15	> 16	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 11-12	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	49 / 51.2 (clamps incl.) 108.0 / 112.8 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna	R1	R2	Y1	Y2	Y3	Y4
Frequency Range	698-862	880-960	1695-2690	1695-2690	1695-2690	1695-2690
HPBW	65°	65°	65°	65°	65°	65°

12-Port Antenna 698-862/880-960/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°/65°
15.5/16/16/16.5/17/16.5dBi 2°-12°/2°-12°/2°-14°/2°-14°/2°-14°/2°-14°T



FlexRET



Type No.		80010898			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-862		880-960	
Frequency Range	MHz	698 – 806	790 – 862	880 – 960	
Gain at mid Tilt	dBi	15.3	15.7	16.0	
Gain over all Tilts	dBi	15.2 ± 0.5	15.6 ± 0.4	15.9 ± 0.3	
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.1	64 ± 2.3	63 ± 3.8	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 23	> 27	
Vertical Pattern:					
Elevation Beamwidth	°	10.6 ± 0.7	9.7 ± 0.5	9.1 ± 0.5	
Electrical Downtilt continuously adjustable	°	2.0 – 12.0		2.0 – 12.0	
Tilt Accuracy	°	< 0.5	< 0.5	< 0.4	
First Upper Side Lobe Suppression	dB	> 16	> 19	> 21	
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 19	> 18	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1, Y4) > 30 (R2 // Y1, Y2, Y3)	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.3	15.8	15.9	15.5	16.4
Gain over all Tilts	dBi	15.2 ± 0.6	15.7 ± 0.4	15.8 ± 0.3	15.6 ± 0.6	16.3 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	63 ± 4.5	62 ± 2.9	64 ± 6.9	56 ± 5.5
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	10.6 ± 0.8	10.1 ± 0.5	9.7 ± 0.8	8.4 ± 0.4	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.3	< 0.4	< 0.3	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 21	> 19	> 16	> 15
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 20	> 20	> 19	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80010898

Left side, upper highband		Y2, connector 7-8				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.0	16.4	16.3	15.6	15.9
Gain over all Tilts	dBi	15.9 ± 0.7	16.3 ± 0.5	16.2 ± 0.6	15.6 ± 0.5	15.7 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	59 ± 5.3	56 ± 3.9	58 ± 5.3	62 ± 4.0	65 ± 7.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 26	> 26	> 25	> 26
Vertical Pattern:						
Elevation Beamwidth	°	9.2 ± 0.5	8.7 ± 0.4	8.2 ± 0.7	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 17	> 19	> 19	> 20	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 16	> 16	> 16	> 18	> 14
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.2	16.5	16.9	17.3	17.1
Gain over all Tilts	dBi	16.2 ± 0.4	16.5 ± 0.3	16.8 ± 0.5	17.1 ± 0.4	16.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.1	64 ± 3.3	63 ± 2.6	60 ± 2.0	60 ± 4.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.7	8.9 ± 0.4	8.5 ± 0.6	7.5 ± 0.4	6.8 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 17	> 18	> 19	> 19	> 18
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 17	> 18	> 17	> 17	> 17
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9-10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80010898

Right side, upper highband		Y4, connector 11-12				
		1695 – 2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.4	16.8	16.4
Gain over all Tilts	dBi	15.8 ± 0.4	16.1 ± 0.2	16.4 ± 0.3	16.7 ± 0.3	16.2 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 2.6	62 ± 2.5	61 ± 2.3	58 ± 3.1	58 ± 3.4
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 25	> 25	> 21
Vertical Pattern:						
Elevation Beamwidth	°	9.6 ± 0.6	9.0 ± 0.5	8.5 ± 0.6	7.5 ± 0.5	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.4	< 0.5	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 18	> 18	> 17	> 17	> 16
Upper Side Lobe Suppression, 20° Sector above Main Beam	dB	> 18	> 18	> 17	> 18	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 11-12	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1000 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 660 148 Maximal: 760 171
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1995 / 377 / 169 78.5 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	37.0 / 39.2 (clamps incl.) 81.6 / 86.4 (clamps incl.)
Packing Size	mm inches	2196 / 397 / 212 86.5 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna

R1	R2	Y1	Y2	Y3	Y4
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Frequency Range

698-862	880-960	1695-2690	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°	65°
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12-Port Antenna 698-862/880-960/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°/65°
16.5/17/17.5/17/18/17.5dBi 1.5°-10°/1.5°-10°/2.5°-12°/2.5°-12°/2.5°-12°/2.5°-12°T



FlexRET

Type No.		80020899			
Left side, lowbands		R1, connector 1-2		R2, connector 3-4	
		698-862		880-960	
Frequency Range	MHz	698 - 806	790 - 862	880 - 960	
Gain at mid Tilt	dBi	16.0	16.3	16.9	
Gain over all Tilts	dBi	15.9 ± 0.3	16.2 ± 0.4	16.9 ± 0.3	
Horizontal Pattern:					
Azimuth Beamwidth	°	71 ± 2.5	70 ± 2.2	67 ± 3.7	
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	
Cross Polar Discrimination at Boresight	dB	> 22	> 22	> 21	
Cross Polar Discrimination over Sector	dB	> 7.0	> 7.0	> 7.0	
Azimuth Beam Port-to-Port Tracking	dB	< 2.0	< 2.0	< 2.0	
Vertical Pattern:					
Elevation Beamwidth	°	8.6 ± 0.6	7.9 ± 0.5	7.1 ± 0.4	
Electrical Downtilt continuously adjustable	°	1.5 - 10.0		1.5 - 10.0	
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	
First Upper Side Lobe Suppression	dB	> 17	> 16	> 16	
Cross Polar Isolation	dB	> 30		> 30	
Port to Port Isolation	dB	> 28 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)		> 28 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)	
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.



12 Ports

Left side, lower highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 - 1880	1850 - 1990	1920 - 2180	2300 - 2400	2490 - 2690
Gain at mid Tilt	dBi	16.9	17.2	17.3	16.7	17.2
Gain over all Tilts	dBi	16.8 ± 0.4	17.1 ± 0.3	17.2 ± 0.4	16.6 ± 0.4	17.0 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 3.4	62 ± 3.6	62 ± 4.2	64 ± 7.3	60 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 24	> 21	> 22
Cross Polar Discrimination at Boresight	dB	> 17	> 23	> 22	> 19	> 18
Cross Polar Discrimination over Sector	dB	> 8.0	> 9.5	> 11.5	> 8.5	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.5	< 2.0	< 1.5	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.3 ± 0.5	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.4	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 - 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.3	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 16	> 17	> 16	> 15	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Data sheet continued on next page.

For more information about additional mounting accessories please refer to page 285

80020899

Left side, upper highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	16.6	16.9	16.9	16.3	16.9
Gain over all Tilts	dBi	16.6 ± 0.5	16.9 ± 0.4	16.9 ± 0.4	16.2 ± 0.3	16.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 3.7	63 ± 3.7	62 ± 2.9	66 ± 5.8	62 ± 5.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 24	> 25	> 23
Cross Polar Discrimination at Boresight	dB	> 15	> 22	> 25	> 18	> 16
Cross Polar Discrimination over Sector	dB	> 7.5	> 9.5	> 10.5	> 8.0	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 2.5	< 2.0	< 2.5	< 2.0
Vertical Pattern:						
Elevation Beamwidth	°	7.0 ± 0.5	6.5 ± 0.3	6.1 ± 0.5	5.5 ± 0.4	4.9 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.3	< 0.2	< 0.3	< 0.3
First Upper Side Lobe Suppression	dB	> 14	> 15	> 16	> 16	> 15
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.7	17.7	18.0	18.1	18.3
Gain over all Tilts	dBi	17.6 ± 0.3	17.7 ± 0.3	17.9 ± 0.5	18.0 ± 0.3	18.1 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.5	62 ± 1.6	62 ± 1.5	61 ± 1.5	59 ± 3.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 25	> 26	> 25
Cross Polar Discrimination at Boresight	dB	> 21	> 22	> 21	> 17	> 16
Cross Polar Discrimination over Sector	dB	> 15.5	> 16.0	> 13.5	> 8.0	> 9.0
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.6 ± 0.4	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.3	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 22	> 21	> 18	> 22
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9-10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

80020899

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.3	17.5	17.7	17.8	17.9
Gain over all Tilts	dBi	17.3 ± 0.3	17.4 ± 0.2	17.6 ± 0.4	17.7 ± 0.3	17.7 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 2.9	62 ± 1.8	61 ± 1.9	60 ± 1.8	58 ± 3.2
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 24	> 24	> 25	> 24
Cross Polar Discrimination at Boresight	dB	> 20	> 21	> 19	> 16	> 17
Cross Polar Discrimination over Sector	dB	> 16.0	> 17.0	> 14.5	> 8.5	> 8.5
Azimuth Beam Port-to-Port Tracking	dB	< 1.0	< 0.5	< 1.0	< 1.5	< 2.5
Vertical Pattern:						
Elevation Beamwidth	°	7.1 ± 0.4	6.7 ± 0.3	6.3 ± 0.4	5.7 ± 0.5	5.0 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 20	> 24	> 23	> 18	> 23
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 11-12	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

12 Ports

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 28
Passive Intermodulation	dBc	< -150 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	1100 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 930 209 Maximal: 1075 242
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	2693 / 377 / 169 106.0 / 14.8 / 6.7
Category of Mounting Hardware	H (Heavy)	
Weight	kg lb	49.0 / 51.2 (clamps incl.) 108.0 / 112.8 (clamps incl.)
Packing Size	mm inches	2896 / 397 / 212 114.0 / 15.6 / 8.3
Scope of Supply	Panel, FlexRET and 2 units of clamps for 42-115 mm 1.7-4.5 inches diameter	

12-Port Antenna

R1	R2	Y1	Y2	Y3	Y4
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Frequency Range

698-960	698-960	1695-2690	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°	65°
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Preliminary Issue

12-Port Antenna 698-960/698-960/1695-2690/1695-2690/1695-2690/1695-2690 65°/65°/65°/65°/65°/65°
15.5/15.5/16/16.5/16/16.5dBi 2°-12°/2°-12°/2°-14°/2°-14°/2°-14°/2°-14°T



FlexRET

Type No.	80010991				
Left side, lowband	R1, connector 1-2				
	698-960				
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.5	15.4 ± 0.3	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.5	10.1 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.8	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			



Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband	R2, connector 3-4				
	698-960				
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.6	< 0.6	< 0.6	< 0.4
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.5	15.8	16.0	15.6	15.9
Gain over all Tilts	dBi	15.5 ± 0.4	15.7 ± 0.5	15.9 ± 0.5	15.6 ± 0.8	15.8 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.5	66 ± 6.1	63 ± 6.6	61 ± 7.6	58 ± 5.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 21	> 23
Vertical Pattern:						
Elevation Beamwidth	°	10.7 ± 0.6	10.1 ± 0.5	9.5 ± 0.7	8.5 ± 0.6	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.5	< 0.4
First Upper Side Lobe Suppression	dB	> 21	> 21	> 20	> 20	> 18
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	>30 (Y1 // R1, R2, Y2, Y3, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.0	16.3	16.6	16.4	16.1
Gain over all Tilts	dBi	15.9 ± 0.5	16.3 ± 0.6	16.5 ± 0.7	16.3 ± 0.9	16.0 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 6.6	62 ± 7.5	60 ± 7.3	57 ± 6.5	62 ± 8.8
Front-to-Back Ratio, Total Power, ± 30°	dB	> 21	> 25	> 26	> 23	> 24
Vertical Pattern:						
Elevation Beamwidth	°	9.3 ± 0.9	8.6 ± 0.4	8.2 ± 0.6	7.3 ± 0.4	6.6 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.2	< 0.2	< 0.2	< 0.4
First Upper Side Lobe Suppression	dB	> 19	> 19	> 20	> 18	> 19
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	>30 (Y2 //R1 ,R2 ,Y1 ,Y3 , Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9–10				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.5	15.7	15.8	15.8	15.8
Gain over all Tilts	dBi	15.5 ± 0.5	15.7 ± 0.5	15.9 ± 0.6	15.7 ± 0.9	15.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	66 ± 4.0	66 ± 7.8	65 ± 7.3	59 ± 8.0	60 ± 9.0
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 25	> 23	> 22
Vertical Pattern:						
Elevation Beamwidth	°	10.7 ± 0.7	10.0 ± 0.6	9.5 ± 0.8	8.5 ± 0.6	7.7 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.3	< 0.3	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 20	> 21	> 21	> 17	> 18
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	>30 (Y3 // R1, R2, Y1, Y2, Y4)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9–10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y4, connector 11–12				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	15.9	16.2	16.5	16.7	16.1
Gain over all Tilts	dBi	15.8 ± 0.5	16.1 ± 0.6	16.4 ± 0.7	16.6 ± 0.9	16.0 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 6.8	64 ± 7.8	61 ± 7.8	54 ± 6.7	64 ± 10.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 24	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	9.5 ± 0.9	8.7 ± 0.5	8.2 ± 0.6	7.1 ± 0.3	6.8 ± 0.6
Electrical Downtilt continuously adjustable	°	2.0 – 14.0				
Tilt Accuracy	°	< 0.4	< 0.2	< 0.2	< 0.2	< 0.3
First Upper Side Lobe Suppression	dB	> 20	> 20	> 20	> 20	> 17
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	>30 (Y4 // R1, R2, Y1, Y2, Y3)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 11–12	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 26
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1300 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1130 254 Maximal: 1140 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	45.8 / 50.8 (clamps incl.) 100.9 / 111.9 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

12-Port Antenna

R1	R2	Y1	Y2	Y3	Y4
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Frequency Range

698-960	698-960	1695-2690	1695-2690	1695-2690	1695-2690
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HPBW

65°	65°	65°	65°	65°	65°
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Preliminary Issue

12-Port Antenna 698-960/698-960/1695-2690/1695-2690/1695-2690/1695-2690
 65°/65°/65°/65°/65°/65° 16.5/16.5/17.5/17/17.5/17dBi
 1°-10°/1°-10°/2.5°-12°/2.5°-12°/2.5°-12°/2.5°-12°T



FlexRET



Type No.		80010992			
Left side, lowband		R1, connector 1-2			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.7	16.1	16.4	16.5
Gain over all Tilts	dBi	15.7 ± 0.4	16.1 ± 0.3	16.3 ± 0.3	16.4 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	66 ± 2.9	65 ± 2.3	65 ± 2.6	64 ± 2.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 23	> 24	> 25
Vertical Pattern:					
Elevation Beamwidth	°	9.7 ± 0.7	9.0 ± 0.5	8.7 ± 0.5	8.3 ± 0.4
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.4
First Upper Side Lobe Suppression	dB	> 16	> 18	> 18	> 20
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y3, Y4) > 28 (R1 // Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1-2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lowband		R2, connector 3-4			
		698-960			
Frequency Range	MHz	698 – 806	791 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	15.5	16.0	16.3	16.6
Gain over all Tilts	dBi	15.5 ± 0.5	16.0 ± 0.5	16.3 ± 0.4	16.5 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	67 ± 3.5	65 ± 2.6	64 ± 3.0	63 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 23	> 24	> 26
Vertical Pattern:					
Elevation Beamwidth	°	9.8 ± 0.6	9.0 ± 0.7	8.6 ± 0.4	8.1 ± 0.5
Electrical Downtilt continuously adjustable	°	1.0 – 10.0			
Tilt Accuracy	°	< 0.4	< 0.4	< 0.4	< 0.3
First Upper Side Lobe Suppression	dB	> 18	> 21	> 20	> 20
Cross Polar Isolation	dB	> 28			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2, Y3, Y4)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3-4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5-6				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.0	17.3	17.6	17.1	17.0
Gain over all Tilts	dBi	17.0 ± 0.4	17.3 ± 0.4	17.5 ± 0.5	17.0 ± 0.4	16.9 ± 0.5
Horizontal Pattern:						
Azimuth Beamwidth	°	63 ± 4.9	63 ± 5.3	60 ± 6.0	60 ± 5.5	61 ± 7.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 25	> 25	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	7.4 ± 0.3	6.9 ± 0.3	6.5 ± 0.5	5.8 ± 0.3	5.2 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 20	> 19	> 18	> 17
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y2 // Y1, Y3, Y4, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5-6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, highband		Y2, connector 7-8				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	16.9	17.4	17.5	17.1	17.0
Gain over all Tilts	dBi	16.9 ± 0.6	17.3 ± 0.4	17.5 ± 0.5	17.1 ± 0.5	16.9 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.7	62 ± 5.4	60 ± 5.8	58 ± 4.6	60 ± 4.3
Front-to-Back Ratio, Total Power, ± 30°	dB	> 25	> 25	> 26	> 24	> 23
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.6	6.3 ± 0.3	5.9 ± 0.5	5.2 ± 0.2	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 16	> 16	> 15	> 15	> 15
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y2 // Y1, Y3, Y4, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7-8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, lower highband		Y3, connector 9-10				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.1	17.3	17.7	17.3	16.9
Gain over all Tilts	dBi	17.0 ± 0.5	17.3 ± 0.5	17.6 ± 0.7	17.1 ± 0.5	16.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	64 ± 5.0	64 ± 7.5	60 ± 9.1	56 ± 5.8	59 ± 8.6
Front-to-Back Ratio, Total Power, ± 30°	dB	> 23	> 24	> 25	> 22	> 22
Vertical Pattern:						
Elevation Beamwidth	°	7.4 ± 0.4	6.8 ± 0.4	6.4 ± 0.6	5.7 ± 0.2	5.1 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 16	> 16
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y3 // Y1, Y2, Y4, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 9-10	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Right side, upper highband		Y4, connector 11-12				
		1695-2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2170	2300 – 2400	2500 – 2690
Gain at mid Tilt	dBi	17.1	17.4	17.6	17.2	17.1
Gain over all Tilts	dBi	17.0 ± 0.6	17.4 ± 0.4	17.5 ± 0.5	17.1 ± 0.5	16.9 ± 0.6
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 5.2	61 ± 4.3	60 ± 4.7	57 ± 4.4	61 ± 6.9
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 25	> 26	> 26	> 23
Vertical Pattern:						
Elevation Beamwidth	°	6.9 ± 0.6	6.3 ± 0.3	6.0 ± 0.5	5.2 ± 0.3	4.8 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2
First Upper Side Lobe Suppression	dB	> 17	> 17	> 17	> 16	> 17
Cross Polar Isolation	dB	> 26, typically 30				
Port to Port Isolation	dB	> 30 (Y4 // Y1, Y2, Y3, R1, R2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 11-12	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	$^{\circ}$	+45, -45
Max. Effective Power for the Antenna	W	1300 (at 50 °C ambient temperature)

Preliminary values estimated based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input	12 x 4.3-10 female	
Connector Position	bottom	
Adjustment Mechanism	FlexRET, continuously adjustable	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 1605 361 Maximal: 1615 363
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	2671 / 508 / 175 105.2 / 20.0 / 6.9
Category of Mounting Hardware	XH (X-Heavy)	
Weight	kg lb	52.1 / 57.1 (clamps incl.) 114.8 / 125.8 (clamps incl.)
Packing Size	mm inches	2870 / 542 / 268 113.0 / 21.3 / 10.6
Scope of Supply	Panel, FlexRET and clamps for 55–115 mm 2.2–4.5 inches diameter	

Summary – Small Cell Antennas Special Design Antennas

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page				
Omnidirectional								
1-Port Omni	1695–2700	360°	2dBi 0°T	80010431	115	N, bottom or top	253	
2-Port Omni Slimpole	1710–2690	360°	5dBi 0°T	80010126	691	N, bottom	212	
2-Port Omni Slimpole	1710–2690	360°	5dBi 0°T	80020126	691	4.3-10, bottom	212	
4-Port Omni Slimpole	1695–2690 1695–2690	360° 360°	5dBi 0°T 5dBi 0°T	80010128	691	4.3-10, bottom	213	
4-Port Omni	698–960 1695–2690	360° 360°	6dBi 2°T 9dBi 2°T	GPS 80010745 80010746	626	7-16, bottom	214	
1-Sector								
1-Port LogPer	690–2690	67°	11dBi 0°T	742192v02	300	7-16, bottom	228	
1-Port Antenna	1710–2180	12°	18.5dBi 0°T	80010368	299	7-16, side	229	
1-Port Yagi	790–960 1710–2170	C 38° 28°	14dBi 0°T 15.5dBi 0°T	80010828v01	170	7-16, rear side	233	
2-Port Inside Connect Antenna	1695–2690	75°	8dBi 0°T	80020100	121.5	4.3-10, back	215	
2-Port Antenna	1710–2690	65°	9.5dBi 0°T	80010711	155	7-16, bottom or top	216	
2-Port Antenna	790–960 1710–2690	C 65° 65°	8dBi 0°T 9dBi 0°T	80010753	334	7-16, bottom	217	
6-Port Antenna	698–960 1695–2690 1695–2690	80° 75° 75°	7dBi 0°T 7.5dBi 0°T 7.5dBi 0°T	GPS GLONASS	80010880	610	4.3-10, bottom	218 + 219

New or changed product

Summary – Small Cell Antennas Special Design Antennas

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page			
2-Sector							
1-Port BiDir	694–960/1710–2690	65°	5dBi 0°T	738447	428	7-16, bottom	230
1-Port BiDir	694–960/1710–2690	65°	5dBi 0°T	738448	428	N, bottom	230
1-Port BiDir	694–960/1710–2690	65°	5dBi 0°T	80020448	428	4.3-10, bottom	230
4-Port MicroCell	1695–2690 1695–2690	85° 85°	7.5dBi 0°T 7.5dBi 0°T	80010843	526	4.3-10, bottom and top	220
8-Port MicroCell	1695–2690 1695–2690 1695–2690 1695–2690	85° 85° 85° 85°	7dBi 0°T 7dBi 0°T 7dBi 0°T 7dBi 0°T	80010844	750	4.3-10, bottom and top	221
8-Port Two-Sector Antenna	698–960 1695–2690	65° 65°	11dBi 2°T 13dBi 2°T	80010713 80010714	626	7-16, bottom	222
Tri-Sector							
6-Port Tri-Sector Slimpole	1710–2690	80°	10dBi 0°T	80010125	691	N, bottom	223
6-Port Tri-Sector Slimpole	1710–2690	80°	10dBi 0°T	80020125	691	4.3-10, bottom	223
12-Port Tri-Sector Antenna	698–960 1695–2690	65° 65°	11dBi 2°T 13dBi 2°T	80010775 80010776	626	7-16, bottom	224
Street Connect							
2-Port Street Connect	1695–2690	360°	6dBi 0°T	80010235	∅ 375	4.3-10, bottom	225

New or changed product

Small Cell

Abbreviations:
C: Integrated Combiner

Omni Slimpole Antenna Dual Polarization HPBW

1710–2690

X

360°

KATHREIN

2-Port Omni Slimpole 1710–2690 360° 5dBi

Type No.		80010126 / 80020126			
		1710–2690			
Frequency range	MHz	1710 – 1990	1920 – 2170	2170 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	2 x 5	2 x 5	2 x 5	2 x 5
Horizontal Pattern:					
Half-power beam width		Omni	Omni	Omni	Omni
Deviation from circularity	dB	±1	±1	±1.5	±1.5
Vertical Pattern:					
Half-power beam width	°	42	40	36	33
Electrical tilt	°	0, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 30			
Intermodulation IM3	dBc	80010126: < –150 (2 x 43 dBm carrier) 80020126: < –153 (2 x 43 dBm carrier)			
Max. power per input	W	100 (at 50 °C ambient temperature)			



Mechanical specifications		80010126	80020126
Input		2 x N female	2 x 4.3-10 female
Connector position		Bottom	
Weight	kg lb	2.3 5.1	
Wind load (at 150 km/h)	N lbf	50 11.2	
Max. wind velocity	km/h mph	200 124	
Mechanical interface		Flange connection 8 x M6 at a graduated diameter of 136 mm 5.4 inches. Evenness of the opposite surface: 0.5 mm 0.02 inches	
Packing size	mm inches	740 x 220 x 220 29.1 x 8.7 x 8.7	742 x 220 x 219 29.2 x 8.7 x 8.6
Height / diameter	mm inches	691 / 100 27.2 / 3.9	

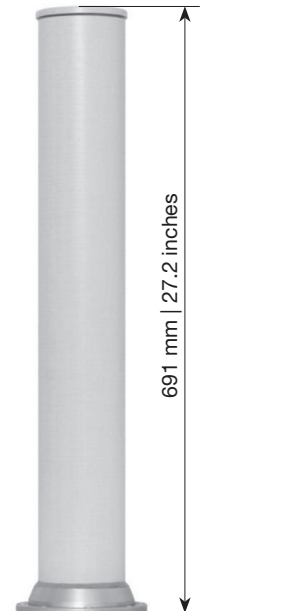
4-Port Omni Slimpole Antenna 1695-2690 1695-2690
Dual Polarization X X
HPBW 360° 360°

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Preliminary Issue

4-Port Omni Slimpole 1695-2690/1695-2690 360°/360° 5/5dBi

Type No.		80010128			
		1695-2690			
Frequency range	MHz	1695 – 1990	1920 – 2170	2170 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	4 x 4.5	4 x 4.5	4 x 5	4 x 5
Horizontal Pattern:					
Half-power beam width		Omni	Omni	Omni	Omni
Deviation from circularity	dB	±1.0	±1.0	±1.0	±1.0
Vertical Pattern:					
Half-power beam width	°	27	26	22	19
Electrical tilt	°	0, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 25			
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	50 (at 50 °C ambient temperature)			



Small Cell

Mechanical specifications		
Input	4 x 4.3-10 female	
Connector position	Bottom	
Wind load (at 150 km/h)	N lbf	50 11.2
Max. wind velocity	km/h mph	200 124
Mechanical interface	Flange connection 8 x M6 at a graduated diameter of 136 mm 5.4 inches. Evenness of the opposite surface: 0.5 mm 0.02 inches	
Height / diameter	mm inches	691 / 100 27.2 / 3.9

4-Port Omni Antenna

Frequency Range
HPBW

R1	Y1
698–960	1695–2690
360°	360°

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4-Port Omni 698–960/1695–2690 360°/360° 6/9dBi 2°/2°T with GPS

Type No.	80010745		80010746	
Radome Colour	Brown		Grey	
Lowband	R1			
	698–960			
Frequency range	MHz	698 – 824	824 – 894	880 – 960
Polarization	°	+45, –45	+45, –45	+45, –45
Gain	dBi	5.0	6.0	6.5
Horizontal Pattern:				
Half-power beam width	°	360 (with 1–8 dB nulls, typically)		
Vertical Pattern:				
Half-power beam width	°	42	37.5	34
Electrical tilt	°	2, fixed		
Impedance	Ω	50		
VSWR		< 1.5	< 1.6	< 1.5
Isolation	Intrasystem Intersystem	dB		
		> 26, typ. 30 > 28 (R1 // Y1)		
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		



Highband	Y1					
	1695–2690					
Frequency range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2200 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45	+45, –45
Gain	dBi	9.0	9.0	9.0	9.0	9.5
Horizontal Pattern:						
Half-power beam width	°	360 (with 6–16 dB nulls, typically)				
Vertical Pattern:						
Half-power beam width	°	18.4	17.5	16.5	14.5	13.5
Electrical tilt	°	2, fixed				
Impedance	Ω	50 Ω				
VSWR		< 1.55		< 1.6		< 1.55
Isolation	Intrasystem Intersystem	dB				
		> 25, typ. 28 > 40 (Y1 // R1)				
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)				
Max. power per input	W	200 (at 50 °C ambient temperature)				

GPS specifications		
Frequency range	MHz	1575.42 ± 3
LNA gain	dB	27 typical
Pre-amp filtering	dB	–30 at ± 100 MHz
Polarization		Right-hand circular
H-plane beam width		Omni
E-plane half-power beam width	°	105
Connector		N female
DC power	Vdc	+3–5.5, 18–25 mA Through N output connector
Temperature range	° C	–35 to +70

Mechanical specifications		
Input	4 x 7-16 connector female	
Connector position	Bottom	
Weight	kg lb	18.1 39.9
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	138 32
Max. wind velocity	km/h mph	242 150
Mechanical interface	Hex nut (requires a 1½" wrench) Torque setting: 122 Nm 90 lbf·ft	
Packing size	mm inches	755 x 480 x 480 29.7 / 18.9 / 18.9
Height / diameter	mm inches	626 / 407 24.6 / 16

Inside Connect

2-Port Antenna

Y1

Frequency Range

1695–2690

Dual Polarization

X

HPBW

75°

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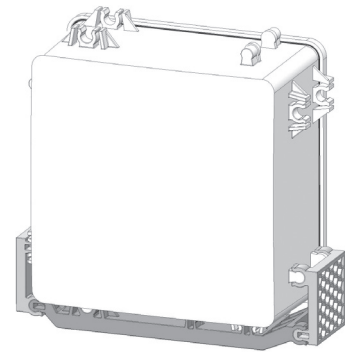
Preliminary Issue

2-Port Inside Connect Antenna 1695–2690 75° 8dBi

Type No.		80020100
Use Case		integration into enclosure (e. g. street furniture)
Highband		Y1
		1695–2690
Frequency range	MHz	1695 – 2690
Polarization	°	+45, –45
Gain	dBi	max. 8
Horizontal Pattern:		
Half-power beam width	°	75 (±5)
Front-to-back ratio, copolar (180°±30°)	dB	typ. > 25
Cross polar ratio 0°	dB	typ. > 24
Cross polar ratio over sector ±60°	dB	> 10
Vertical Pattern:		
Half-power beam width	°	75 (±5)
Impedance	Ω	50
VSWR		1965 – 1920 MHz: < 1.8 1920 – 2690 MHz: < 1.7
Isolation, between ports	dB	> 25
Intermodulation IM3	dBc	< –150 (2 x 43 dBm carrier)
Max. power per input	W	40 (at 50 °C ambient temperature)
Max. power per antenna	W	40 (at 50 °C ambient temperature)

Material:

Reflector: Aluminum.
Radome: ASA/PC, colour: White.



Mechanical specifications		
Input		2 x 4.3-10 female
Connector position		back
Operating temperature range	°C	–20 ... 70
Fire load	kWh	1.4
Fire protection		UL 94-V2
Height / width / depth incl. modular mounting parts	mm inches	121.5 / 124 / 74 4.8 / 4.9 / 2.9
Category of mounting hardware		see accessory parts and mounting options
Weight	kg lb	0.4 0.9
Packing size	mm inches	155 x 155 x 80 6.1 x 6.1 x 3.1
Protection class		IP 66
Scope of supply		Antenna and mounting parts
Mounting interface		Screw M6, max. screw head height: 6 mm 0.24 inches, max. screw head diameter: 13.5 mm 0.53 inches

Further mounting parts (please order separately)

Type No.	Description
85010205	Package with mounting parts

2-Port Antenna Y1
Frequency Range 1710-2690
HPBW 65°

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2-Port Antenna 1710-2690 65° 9.5dBi

Type No.		80010711			
High band		Y1			
		1710-2690			
Frequency range	MHz	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	8.7	9.2	9.6	9.8
Horizontal Pattern:					
Half-power beam width	°	Approx. 67	Approx. 62	Approx. 55	Approx. 53
Front-to-back ratio, copolar (180°±30°)	dB	> 24	> 24	> 22	> 22
Cross polar ratio 0°	dB	Typically: 20	Typically: 20	Typically: 24	Typically: 24
Cross polar ratio sector corner ±60°	dB	> 10	> 9	> 8	> 8
Vertical Pattern:					
Half-power beam width	°	Approx. 66	Approx. 60	Approx. 55	Approx. 53
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 27			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Max. power per input	W	100 (at 50 °C ambient temperature)			
Max. power per antenna	W	150 (at 50 °C ambient temperature)			



Mechanical specifications			
Input		2 x 7-16 female	
Connector position *		Bottom or top	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	35 8
		Maximal:	35 8
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	155 / 155 / 69 6.1 / 6.1 / 2.7	
Category of mounting hardware		L (Light)	
Weight	kg lb	1.5 (tension bands incl.) 3.3 (tension bands incl.)	
Packing size	mm inches	257 x 172 x 92 10.1 x 6.8 x 3.6	
Scope of Supply		Panel and 1 unit of tension bands for 45-125 mm 1.8-4.9 inches diameter	

* Inverted mounting:
 Connector position top: Change drain hole screw

2-Port Antenna

R1 **Y1**

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Frequency Range

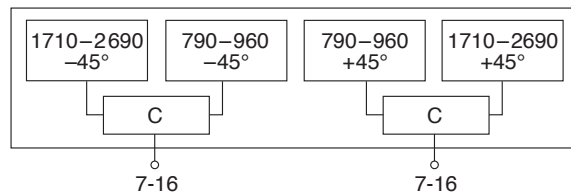
790–960 1710–2690

HPBW

65° 65°

2-Port Antenna 790–960/1710–2690 C 65°/65° 8/9dBi

Type No.		80010753						
		R1			Y1			
		790–960			1710–2690			
Frequency range	MHz	790 – 862	824 – 894	880 – 960	1710 – 1990	1920 – 2200	2200 – 2490	2490 – 2690
Polarization	°	+45, –45	+45, –45	+45, –45	+45, –45	+45, –45	+45, –45	+45, –45
Average gain (dBi)	dBi	2 x 7.8	2 x 8.0	2 x 8.5	2 x 7.8	2 x 8.9	2 x 8.7	2 x 8.2
Horizontal Pattern:								
Half-power beam width	°	67			65	55	60	62
Front-to-back ratio	dB	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25	Copolar: > 25
Cross polar ratio	dB	Typically: 15	Typically: 18	Typically: 20	Typically: 25	Typically: 25	Typically: 25	Typically: 25
Maindirection	0°	> 8	> 8	> 8	> 10	> 10	> 10	> 10
Sector	±60°							
Vertical Pattern:								
Half-power beam width	°	65			75	60	60	65
Impedance	Ω	50						
VSWR		< 1.5						
Isolation: Intrasystem	dB	> 30			> 30		> 27	> 25
Intermodulation IM3	dBc	< –150 dBc (2 x 43 dBm carrier)						
Max. effective power per port	W	200 (at 50 °C ambient temperature)			100 (at 50 °C ambient temperature)			
Max. effective power for the antenna	W	300 (at 50 °C ambient temperature)						



Small Cell

Mechanical specifications			
Input	2 x 7-16 female		
Connector position	Bottom		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	100 22
		Maximal:	110 25
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	334 / 260 / 136 13.1 / 10.2 / 5.4	
Category of mounting hardware	L (Light)		
Weight	kg lb	2.8 (tension bands incl.) 6.2 (tension bands incl.)	
Packing size	mm inches	495 x 272 x 157 19.5 x 10.7 x 6.2	
Scope of Supply	Panel and 1 unit of tension bands for 45–125 mm 1.8–4.9 inches diameter		

6-Port Antenna

R1	Y1	Y2
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Frequency Range

698–960	1695–2690	1695–2690
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HPBW

80°	75°	75°
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Preliminary Issue

6-Port Antenna 698–960/1695–2690/1695–2690 80°/75°/75° 7/7.5/7.5dBi with GPS/GLONASS

Type No.	80010880			
Lowband	R1, connector 1–2			
		698–960		
Frequency Range	MHz	698 – 790	790 – 860	860 – 960
Gain	dBi	6.5	7	7.5
Horizontal Pattern:				
Azimuth Beamwidth	°	80 ... 95	75 ... 90	70 ... 85
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 20	> 20
Cross Polar Discrimination at Boresight	dB	> 20	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 8	> 8	> 8
Vertical Pattern:				
Elevation Beamwidth	°	80 ... 95	75 ... 90	70 ... 85
Electrical Downtilt continuously adjustable	°	0, fixed		
VSWR		< 2.2		
Return Loss	dB	> 8.5		
Cross Polar Isolation	dB	≥ 25		
Max. Effective Power per Port	W	20		
Max. Effective Power Port 1–2	W	40		



Highbands	Y1, Y2, connector 3–6				
		1695–2690			
Frequency Range	MHz	1695 – 1990	1920 – 2170	2170 – 2490	2490 – 2690
Gain	dBi	7	7	7.5	7.5
Horizontal Pattern:					
Azimuth Beamwidth	°	70 ... 85	65 ... 80	65 ... 80	65 ... 80
Front-to-Back Ratio, Total Power, ± 30°	dB	> 20	> 20	> 20	> 20
Cross Polar Discrimination at Boresight	dB	> 20	> 20	> 20	> 20
Cross Polar Discrimination over Sector	dB	> 10	> 10	> 10	> 10
Vertical Pattern:					
Elevation Beamwidth	°	65 ... 80	65 ... 80	65 ... 80	65 ... 80
Electrical Downtilt continuously adjustable	°	0, fixed			
VSWR		< 2.0			
Return Loss	dB	> 9.5			
Cross Polar Isolation	dB	≥ 25			
Port to Port Isolation	dB	≥ 25			
Max. Effective Power per Port	W	20			
Max. Effective Power Port 3–6	W	40			

Active GPS / GLONASS / BEIDOU Module		
Frequency Range	MHz	1550 – 1610
Polarization		RHCP
Peak Antenna Gain	dBi	min. 3
LNA Gain	BEIDOU: GPS: GLONASS:	1561 MHz: 23 ±2 15775.42 MHz: 23 ±2 1602 MHz: 23 ±2
Noise Figure	dB	Typical: 1.0 (max. 1.5)
VSWR (LNA + Ant)		Max. 2.0 : 1
Voltage Range	V	2.5 – 5.5
Current	mA	Typical: 7 (max. 10)
Operating Temperature	°C	-40 ... +80

Electrical specifications, all systems		
Impedance	Ω	50
Interband Isolation	dB	20
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization	°	+45, -45
Max. Effective Power for the Antenna	W	50

Mechanical specifications		
Connector Type	4.3-10 female for RF and SMA for GPS	
Connector Quantity	6 (4.3-10) +1 (active GPS / GLONASS / BEIDOU)	
Connector Position	bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 140 31 Maximal: 155 35
Max. Wind Velocity	km/h mph	200 124
Height / Width / Depth	mm inches	610 / 299 / 85 24.0 / 11.8 / 3.3
Weight	kg lb	approx. 4.4 approx. 9.7
Packing Size	mm inches	tbd
Protection Class	IP 67	
Fire Retardance	UL 94 HB	

4-Port Micro Cell Antenna 1695–2690 1695–2690

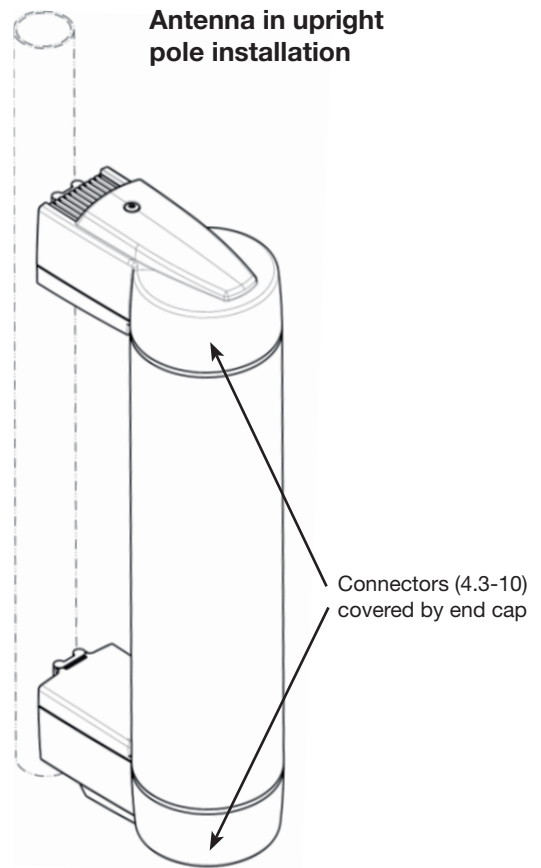
Dual Polarization X X

HPBW 85° 85°

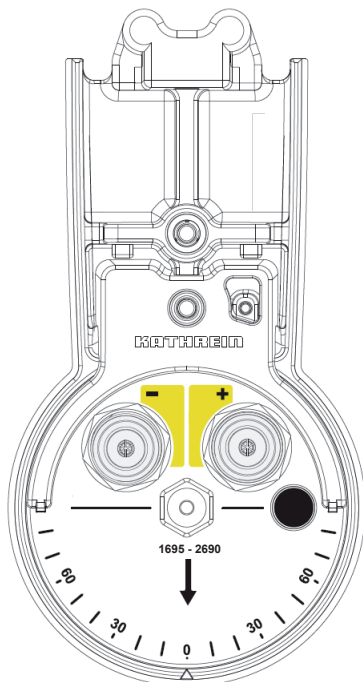
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4-Port MicroCell 1695–2690 85°/85° 7.5/7.5dBi 0°T

Type No.		80010843
Use case		Flexible Indoor Coverage Flexible Street Level Micro Cell Coverage Not for Macro Site Installation Pole and wall mounting
Electrical data		Per sector
		1695–2690
Frequency range	MHz	1695 – 2690
Polarization	°	+45, –45
Gain	dBi	7.5
Horizontal Pattern:		
Half-power beam width	°	85
Cross polar ratio	0° 60°	dB ≥ 18 typ. ≥ 8 typ.
Vertical Pattern:		
Half-power beam width	°	80
Electrical tilt (upright installation)	°	0, fixed
Impedance	Ω	50 Ω
VSWR		1695–1710 MHz: < 1.6 1710–2200 MHz: < 1.5 2200–2690 MHz: < 1.6
Isolation, between all ports	dB	≥ 25 (Intra- / Intersystem)
Intermodulation IM3	dBc	< –153 (2 x 43 dBm carrier)
Max. power per input	W	50 (at 50 °C ambient temperature)



Top view / connector view



Mechanical specifications		
Input	4 x 4.3-10 female (2 x top, 2 x bottom, covered by end cap)	
Adjustment mechanism	Two continuously rotatable antenna modules (radiator and reflector) within the radome (set by hand)	
Tilt adjustment mechanism (installation at right angle)	Set by hand Continuously for each sector (0° ... 360°)	
Azimuth adjustment mechanism (upright installation)	Set by hand Continuously for each sector (0° ... 360°)	
IP Protection class	IP65	
Wind load (at 150 km/h)	N lbf	25 5.6
Max. wind velocity	km/h mph	160 99.4
Feeder cables	Max. ¼" High Flex (bending radius ≤ 25 mm ≤ 1.0 inches) push pull and handscrew type, angular connector required	
Allowed diameter of mounting pole	mm inches	≥ 40 ≥ 1.6
Max. distance wall/pole when mounted	mm inches	190 7.5
Height / diameter	mm inches	526 / 100 20.7 / 3.9
Category of mounting hardware	L (Light)	
Weight	kg lb	2.0 4.4
Packing size	mm inches	547 / 242 / 174 21.5 / 9.5 / 6.9

8-Port

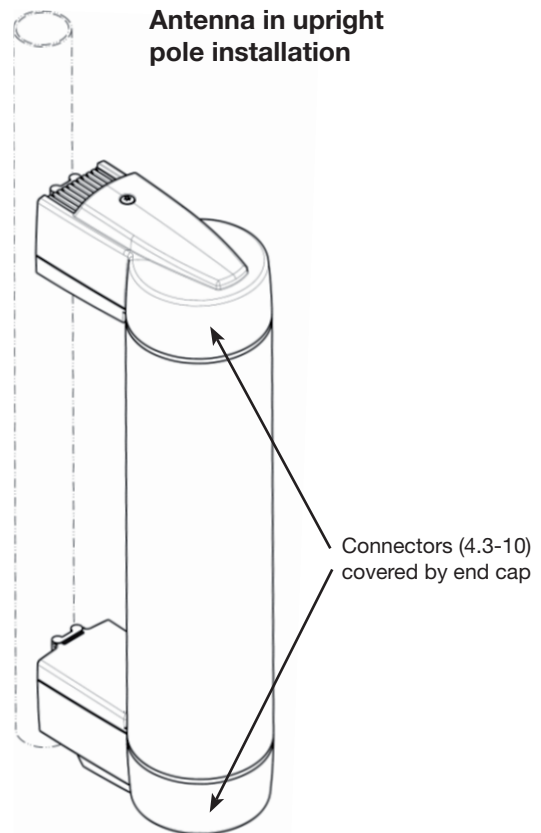
Micro Cell Antenna 1695-2690 1695-2690 1695-2690 1695-2690

Dual Polarization X X X X

HPBW 85° 85° 85° 85°

**8-Port MicroCell 1695-2690/1695-2690/1695-2690/1695-2690
85°/85°/85°/85° 7/7/7/7dBi 0°T**

Type No.		80010844
Use case		Flexible Indoor Coverage Flexible Street Level Micro Cell Coverage Not for Macro Site Installation Pole and wall mounting
Electrical data		Per sector
		1695-2690
Frequency range	MHz	1695 – 2690
Polarization	°	+45, -45
Gain	dBi	7
Horizontal Pattern:		
Half-power beam width	°	85
Vertical Pattern:		
Half-power beam width	°	80
Electrical tilt (upright installation)	°	0, fixed
Impedance	Ω	50 Ω
VSWR		1695-1710 MHz: < 1.6 1710-2200 MHz: < 1.5 2200-2690 MHz: < 1.6
Isolation, between all ports	dB	≥ 25 (Intra- / Intersystem)
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)
Max. power per input	W	50 (at 50 °C ambient temperature)



Mechanical specifications		
Input	8 x 4.3-10 female (4 x top, 4 x bottom, covered by end cap)	
Adjustment mechanism	Two continuously rotatable antenna modules (radiator and reflector) within the radome (set by hand)	
Tilt adjustment mechanism (installation at right angle)	Set by hand Continuously for each sector (0° ... 360°)	
Azimuth adjustment mechanism (upright installation)	Set by hand Continuously for each sector (0° ... 360°)	
IP Protection class	IP65	
Max. wind velocity	km/h mph	160 99.4
Feeder cables	Max. ¼" High Flex (bending radius ≤ 25 mm ≤ 1.0 inches) push pull and handscrew type, angular connector required	
Allowed diameter of mounting pole	mm inches	≥ 40 ≥ 1.6
Max. distance wall/pole when mounted	mm inches	190 7.5
Height / diameter	mm inches	750 / 100 29.5 / 3.9
Category of mounting hardware	L (Light)	

8-Port Two-Sector Frequency Range HPBW

0°	180°	0°	180°
698-960	698-960	1695-2690	1695-2690
65°	65°	65°	65°

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8-Port Two-Sector Antenna 698-960/1695-2690 65°/65° 11/13dBi 2°/2°T with GPS

Type No.	80010713		80010714	
Radome Colour	Brown		Grey	
Low band		Electrical data per sector		
		698-960		
Frequency range	MHz	698 – 824	824 – 894	880 – 960
Polarization	°	+45, -45	+45, -45	+45, -45
Gain	dBi	10.0	10.6	11.0
Horizontal Pattern:				
Half-power beam width	°	70	67	65
Front-to-back ratio, copolar	dB	> 26	> 28	> 28
Cross polar ratio Maindirection Sector	0° ±60°	Typically: 20 > 8	Typically: 30 > 8	Typically: 30 > 8
Vertical Pattern:				
Half-power beam width	°	42	38	34
Electrical tilt	°	2, fixed		
Impedance	Ω	50		
VSWR		< 1.5		
Isolation	Intrasystem Intersystem	> 25		> 25
		> 26, typ. 30 (698-894 // 1695-2690)		> 23, typ. 30 (880-960 // 1695-2690)
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)		
Max. power per input	W	250 (at 50 °C ambient temperature)		
Max. effective power for the antenna	W	800 (at 50 °C ambient temperature)		



High band		Electrical data per sector				
		1695-2690				
Frequency range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	13.3	13.3	13.5	13.5	14.0
Horizontal Pattern:						
Half-power beam width	°	60	60	60	58	60
Front-to-back ratio, copolar	dB	> 30	> 30	> 30	> 30	> 30
Cross polar ratio Maindirection Sector	0° ±60°	Typically: 25 > 8	Typically: 25 > 8	Typically: 25 > 10	Typically: 25 > 10	Typically: 25 > 6
Vertical Pattern:						
Half-power beam width	°	17.8	17.5	16.5	14.4	13.4
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.5				
Isolation	Intrasystem Intersystem	> 25			> 28	> 28
		> 30 (1695-2690 // 698-960)				
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)				
Max. power per input	W	200 (at 50 °C ambient temperature)				
Max. effective power for the antenna	W	800 (at 50 °C ambient temperature)				

GPS specifications		
Frequency range	MHz	1575.42 ± 3
LNA gain	dB	27 typical
Pre-amp filtering	dB	-30 at ± 100 MHz
Polarization		Right-hand circular
H-plane beam width		Omni
E-plane half-power beam width	°	105
Connector		N female
DC power	Vdc	+3-5.5, 18-25 mA Through N output connector
Temperature range	° C	- 35 to + 70

Mechanical specifications		
Input	8 x 7-16 connector female	
Connector position	Bottom	
Weight	kg lb	15.7 34.6
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	138 32
Max. wind velocity	km/h mph	242 150
Packing size	mm inches	755 x 480 x 480 29.7 / 18.9 / 18.9
Height / diameter	mm inches	626 / 407 24.6 / 16

Tri-Sector Slimpole Antenna

0°	120°	240°
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Frequency Range

1710-2690	1710-2690	1710-2690
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Dual Polarization

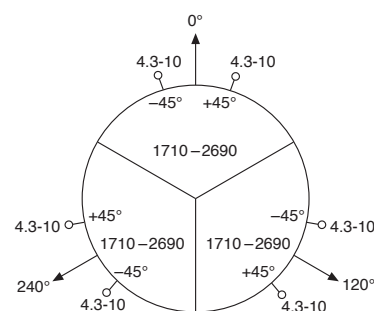
X	X	X
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HPBW

80°	80°	80°
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6-Port Tri-Sector Slimpole 1710-2690 80° 10dBi 0°T

Type No.	80010125 / 80020125				Electrical datas per sector
	1710-2690				
Frequency range	MHz	1710 – 1990	1920 – 2170	2170 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 9.5	2 x 10	2 x 10.5	2 x 11
Horizontal Pattern:					
Half-power beam width	°	80	78	75	73
Front-to-back ratio, copolar	dB	> 30	> 28	> 28	> 27
Cross polar ratio	dB	Typically: 20	Typically: 20	Typically: 20	Typically: 20
Main direction	0°	> 10	> 10	> 10	> 10
Sector	±60°				
Vertical Pattern:					
Half-power beam width	°	44	42	35	31
Electrical tilt	°	0, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation, between ports	dB	> 25			
Intermodulation IM3	dBc	80010125: < -150 (2 x 43 dBm carrier) 80020125: < -153 (2 x 43 dBm carrier)			
Max. power per input	W	100 (at 50 °C ambient temperature)			



Mechanical specifications		80010125	80020125
Input		6 x N female	6 x 4.3-10 female
Connector position		Bottom	
Weight	kg lb	2.3 5.1	
Wind load (at 150 km/h)	N lbf	50 11.2	
Max. wind velocity	km/h mph	200 124	
Mechanical interface		Flange connection 8 x M6 at a graduated diameter of 136 mm 5.4 inches. Evenness of the opposite surface: 0.5 mm 0.02 inches	
Packing size	mm inches	740 x 220 x 220 29.1 x 8.7 x 8.7	742 x 220 x 219 29.2 x 8.7 x 8.6
Height / diameter	mm inches	691 / 100 27.2 / 3.9	

12-Port Tri-Sector Antenna	0°	120°	240°	0°	120°	240°
Frequency Range	698-960	698-960	698-960	1695-2690	1695-2690	1695-2690
Dual Polarization	X	X	X	X	X	X
HPBW	65°	65°	65°	65°	65°	65°

12-Port Tri-Sector Antenna 698-960/1695-2690 65°/65° 11/13dBi 2°/2°T with GPS

Type No.		80010775		80010776	
Radome Colour		Brown		Grey	
Lowband		Electrical data per sector			
		698-960			
Frequency range	MHz	698 – 824	824 – 894	880 – 960	
Polarization	°	+45, -45	+45, -45	+45, -45	
Gain	dBi	2 x 10.0	2 x 10.6	2 x 11.0	
Horizontal Pattern:					
Half-power beam width	°	73	67	65	
Front-to-back ratio, copolar	dB	> 26	> 26	> 30	
Cross polar ratio Maindirection Sector	0° ±60°	Typically: 19 > 10	Typically: 30 > 8	Typically: 30 > 8	
Vertical Pattern:					
Half-power beam width	°	42	40	36	
Electrical tilt	°	2, fixed			
Impedance	Ω	50			
VSWR		< 1.5			
Isolation	Intrasystem Intersystem	dB		dB	
		> 25 > 26, typ. 30 (698-894 // 1695-2690)		> 25 > 23, typ. 30 (880-960 // 1695-2690)	
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)			
Max. power per input	W	250 (at 50 °C ambient temperature)			
Max. power for the antenna	W	900 (at 50 °C ambient temperature)			



Highband		Electrical data per sector				
		1695-2690				
Frequency range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2200 – 2490	2490 – 2690
Polarization	°	+45, -45	+45, -45	+45, -45	+45, -45	+45, -45
Gain	dBi	2 x 13.5	2 x 13.5	2 x 13.2	2 x 13.5	2 x 14.0
Horizontal Pattern:						
Half-power beam width	°	60	60	60	60	60
Front-to-back ratio, copolar	dB	> 30	> 30	> 30	> 30	> 30
Cross polar ratio Maindirection Sector	0° ±60°	Typically: 25 > 9	Typically: 25 > 9	Typically: 25 > 8	Typically: 25 > 8	Typically: 25 > 8
Vertical Pattern:						
Half-power beam width	°	18	17.5	16.5	14.5	14
Electrical tilt	°	2, fixed				
Impedance	Ω	50				
VSWR		< 1.55		< 1.6	< 1.5	
Isolation	Intrasystem Intersystem	dB				
		> 28 > 30 (1695-2690 // 698-960)				
Intermodulation IM3	dBc	< -153 (2 x 43 dBm carrier)				
Max. power per input	W	200 (at 50 °C ambient temperature)				

GPS specifications		
Frequency range	MHz	1575.42 ± 3
LNA gain	dB	27 typical
Pre-amp filtering	dB	-30 at ± 100 MHz
Polarization		Right-hand circular
H-plane beam width		Omni
E-plane half-power beam width	°	105
Connector		N female
DC power	Vdc	+3-5.5, 18-25 mA Through N output connector
Temperature range	° C	-35 to +70

Mechanical specifications		
Input	12 x 7-16 connector female	
Connector position	Bottom	
Weight	kg lb	19.2 42.3
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	138 32
Max. wind velocity	km/h mph	242 150
Packing size	mm inches	755 x 480 x 480 29.7 / 18.9 / 18.9
Height / diameter	mm inches	626 / 407 24.6 / 16

Street Connect 2-Port Antenna Frequency Range Dual Polarization HPBW

Y1
1695-2690
W
360°

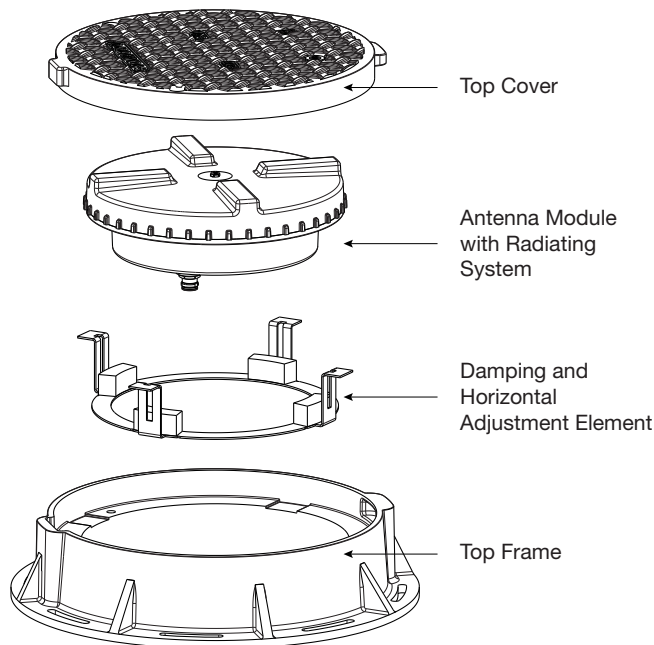
KATHREIN

2-Port Street Connect Antenna 1695-2690 360° 6dBi

Type No.	80010235					
Use Case	In-Ground Installation, High traffic urban areas					
High band	Y1, connector 1-2					
Frequency Range	MHz	1695-2690				
Max. Gain (Free Space)	dBi	1695 - 1880	1850 - 1990	1920 - 2200	2300 - 2490	2490 - 2690
Horizontal Pattern		Quasi Omni Max. Deviation from Circularity ±6 dB	Quasi Omni Max. Deviation from Circularity ±6 dB	Quasi Omni Max. Deviation from Circularity ±5 dB	Quasi Omni Max. Deviation from Circularity ±5 dB	Quasi Omni Max. Deviation from Circularity ±6 dB
Vertical Pattern		Four main lobes above ground level	Four main lobes above ground level	Six main lobes above ground level	Four main lobes above ground level	Four main lobes above ground level
Isolation (Port 1 // Port 2)	dB	1695 - 2300 MHz: > 20 2300 - 2690 MHz: > 25				
Max. Effective Power per Port	W	20 (at 50 °C ambient temperature)				

Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.7
Return Loss	dB	> 11.7
Passive Intermodulation	dBc	< -153 (2 x 43 dBm carrier)
Polarization		Dual Vertical
Max. Effective Power for the Antenna	W	40 (at 50 °C ambient temperature)

Mechanical specifications		
Input	2 x 4.3-10 female	
Connector Position	Bottom	
Adjustment Mechanism Horizontal	Set by hand, 9° steps	
Feeder Cables	Push Pull type connector	
Top Cover Diameter / Height	mm inches	375 / 32 14.8 / 1.3
Top Frame Outer / Inner Diameter / Height	mm inches	480 / 315 / 100 18.9 / 12.4 / 3.9
Antenna Modul Diameter / Height	mm inches	310 / 118.2 12.2 / 4.7
Weight Antenna Module	kg lb	3.2 7.1
Weight Complete System	kg lb	13.6 30.0
IP Protection Class	IP 68 (with appropriate feeder cable connector)	
Max. Load Top Cover	kN	50 (without permanent deformation, according EN 124 - Class D400)



Mounting:

Follow the installation guidelines for Polieco Kio D400 / EN 124 top cover and frame. Feeder cable to be installed strain-relieved. Maximum force 5 N per cable. Avoid mounting locations where obstructions may have impact on the antenna performance, e.g. parking cars.

Recommended tightening torque for the cover screws (2x): 50 Nm.

Attention: Please follow the mounting and instruction guidelines carefully. Liability cannot be assumed for damages as a result of unsatisfactory fitting and installation, improper putting into service, incorrect operation and maintenance, as well as any alterations or modifications carried out by the operator and accessory parts by the customer.

Remark:

All electrical values are stated for the complete system with top frame and cover.

Summary – Directional Antennas

VPol

690...2690 MHz

KATHREIN

Type	Type No.	Height [mm]	Connector female, type and position	Page				
Vertical Polarization								
1-Port LogPer	690–2690	67°	11dBi	0°T	742192v02	300	7-16, bottom	228
1-Port Antenna	1710–2180	12°	18.5dBi	0°T	80010368	299	7-16, side	229
1-Port BiDir	694–960/1710–2690	65°	5dBi	0°T	738447	428	7-16, bottom	230
1-Port BiDir	694–960/1710–2690	65°	5dBi	0°T	738448	428	N, bottom	230
1-Port BiDir	694–960/1710–2690	65°	5dBi	0°T	80020448	428	4.3-10, bottom	230
1-Port Antenna	824–960 1710–2170	C 90° 82°	7dBi 7dBi	0°T 0°T	742290	328	7-16, bottom or top	231
1-Port Antenna	824–960 1710–2170	C 90° 82°	10dBi 11dBi	0°T 0°T	80010046v01	662	7-16, bottom or top	232
1-Port Yagi	790–960 1710–2170	C 38° 28°	14dBi 15.5dBi	0°T 0°T	80010828v01	170	7-16, rearside	233

1-Port Logarithmic Periodic Vertical Polarization HPBW

690–2690

V

67°

KATHREIN

1-Port LogPer 690–2690 67° 11dBi

Type No.		742192v02					
Frequency range	MHz	690 – 880	880 – 960	960 – 1695	1695 – 2200	2200 – 2490	2490 – 2690
VSWR		< 1.6	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Gain	dBi	10.1	10.6	11.0	11.0	11.0	11.0
Impedance	Ω	50	50	50	50	50	50
Polarization		Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Front-to-back ratio	db	> 25	> 25	> 25	> 25	> 22	> 25
Half-power beam width	°	horizontal	64	57	53	47	45
		vertical	54	53	50	48	46
Intermodulation IM3 (2 x 43 dBm carrier)	dBc	< -150	< -150	< -150	< -150	< -150	< -150
Max. power	W	300	300	250	200	170	150
Total power	W	500 (at 50 °C ambient temperature)					



Mechanical specifications			
Input	1 x 7-16 female		
Connector position	Bottom		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal Lateral Rearside	20 4 210 47 30 7
Max. wind velocity	km/h mph	241 150	
Height / width / depth	mm inches	300 / 155 / 785 11.8 / 6.1 / 30.9	
Weight	kg lb	5.5 12.1	
Packing size	mm inches	360 x 175 x 1000 14.2 x 6.9 x 39.4	

1-Port Antenna Vertical Polarization HPBW

1710–2180

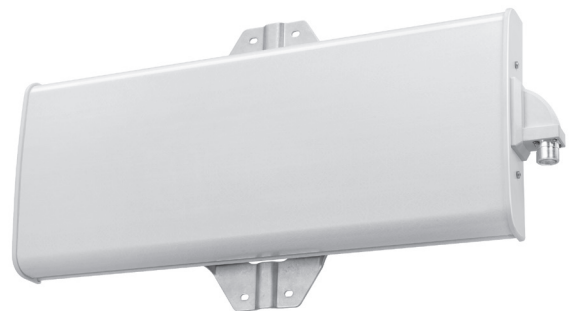
V

12°

KATHREIN

1-Port Antenna 1710–2180 12° 18.5dBi 0°T

Type No.		80010368		
		1710–2180		
Frequency range	MHz	1710 – 1880	1850 – 1990	1920 – 2180
Polarization		Vertical	Vertical	Vertical
Gain	dBi	18.1	18.4	18.7
Horizontal Pattern:				
Half-power beam width	°	13.3	12.8	12
Front-to-back ratio (180°±30°)	dB	> 30	> 30	> 30
Sidelobe suppression	dB	> 18	> 18	> 17
Vertical Pattern:				
Half-power beam width	°	37	36	36
Electrical tilt	°	0, fixed		
Sidelobe suppression for first sidelobe above main beam	dB	> 18	> 18	> 18
Impedance	Ω	50		
VSWR		< 1.5		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power per input	W	300 (at 50 °C ambient temperature)		



VPoI

Mechanical specifications			
Input	1 x 7-16 female		
Connector position	Side (see picture)		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal: 250 56	Maximal: 275 62
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	299 / 743 / 69 11.8 / 29.3 / 2.7	
Weight	kg lb	9 19.8	
Packing size	mm inches	442 x 852 x 124 17.4 x 33.5 x 4.9	

1-Port BiDir Antenna Vertical Polarization HPBW

694–960/1710–2690

V

65°

KATHREIN

1-Port BiDir 694–960/1710–2690 65° 5dBi

Type No.	738447	738448	80020448
Input	1 x 7-16 female	1 x N female	1 x 4.3-10 female
Frequency range	MHz 694 – 960, 1710 – 2690		
VSWR	694 – 960 MHz: < 2.0 1710 – 2690 MHz: < 1.7		
Gain	dBi 694 – 806 MHz: 5.0 806 – 960 MHz: 5.5 1710 – 2690 MHz: 6.5		
Impedance	Ω 50		
Polarization	Vertical		
Intermodulation IM3	dBc < -150 (2 x 43 dBm carrier)		
Max. power (total)	W 200 (at 50 °C ambient temperature)		
Weight	kg 1.1 lb 2.4		
Wind load (at 150 km/h)	N lbf Frontal: 30 6.7 Lateral: 70 15.7 Rearside: 35 7.9		
Max. wind velocity	km/h 200 mph 124		
Packing size	mm 450 x 205 x 110 inches 17.7 x 8.1 x 4.3		
Height/width/depth	mm 428 / 180 / 79 inches 16.9 / 7.1 / 3.1		
Fire load	kWh 4.46		



Mechanical specifications

Input	1 x 7-16 female
Connector position*	Bottom or top
Wind load	Frontal: 165 N (at 150 km/h) Lateral: 55 N (at 150 km/h) Rearside: 190 N (at 150 km/h)
Max. wind velocity	200 km/h
Height/width/depth	662 / 155 / 69 mm
Category of mounting hardware	L (Light)
Weight	5 kg (tension bands incl.)
Packing size	804 x 172 x 92 mm
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter

* Inverted mounting:
Connector position top: Change drain hole screw

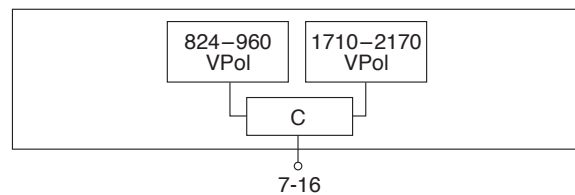
1-Port Antenna Vertical Polarization HPBW Integrated Combiner

824-960	1710-2170
V	V
90°	82°
C	

KATHREIN

1-Port Antenna 824-960/1710-2170 C 90°/82° 7/7dBi

Type No.		742290	
Frequency range	MHz	824 - 960	1710 - 2170
Polarization		Vertical	Vertical
Gain	dBi	7	7
Half-power beam width	°	Horizontal: 90 Vertical: 60	Horizontal: 82 Vertical: 70
Front-to-back ratio		> 18	> 20
Impedance		50	50
VSWR		< 1.5	< 1.5
Intermodulation IM3 (2 x 43 dBm carrier)	dBc	< -150	< -150
Max. power per input	W	100 (at 50 °C ambient temperature)	



VPol

Mechanical specifications			
Input		1 x 7-16 female	
Connector position*		Bottom or top	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	65 14
		Maximal:	65 14
Max. wind velocity	km/h mph	200 124	
Height/width/depth	mm inches	328 / 155 / 69 12.9 / 6.1 / 2.7	
Category of mounting hardware		L (Light)	
Weight	kg lb	2.8 6.2	
Packing size	mm inches	444 x 172 x 92 17.5 x 6.8 x 3.6	

* Inverted mounting:
Connector position top: Change drain hole screw

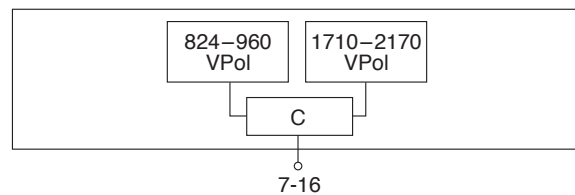
1-Port Antenna Vertical Polarization HPBW Integrated Combiner

824–960	1710–2170
V	V
90°	82°
C	

KATHREIN

1-Port Antenna 824–960/1710–2170 C 90°/82° 10/11dBi

Type No.		80010046v01	
Frequency range	MHz	824 – 960	1710 – 2170
Polarization		Vertical	Vertical
Gain	dBi	10	11
Half-power beam width	°	Horizontal: 90 Vertical: 33	Horizontal: 82 Vertical: 19
Front-to-back ratio	dB	> 18	> 20
Impedance	Ω	50	50
VSWR		< 1.5	< 1.5
Intermodulation IM3 (2 x 43 dBm carrier)	dBc	< -150	< -150
Max. power per input	W	100 (at 50 °C ambient temperature)	



Mechanical specifications			
Input	1 x 7-16 female		
Connector position*	Bottom or top		
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	Frontal:	105 24
		Maximal:	105 24
Max. wind velocity	km/h mph	200 124	
Height / width / depth	mm inches	662 / 155 / 69 26.1 / 6.1 / 2.7	
Category of mounting hardware	L (Light)		
Weight	kg lb	5.0 (tension bands incl.) 11.0 (tension bands incl.)	
Packing size	mm inches	804 x 172 x 92 31.7 x 6.8 x 3.6	
Scope of Supply	Panel and 1 unit of tension bands for 45–125 mm 1.8–4.9 inches diameter		

* Inverted mounting:
Connector position top: Change drain hole screw

**1-Port Yagi Antenna
Dual Polarization
HPBW
Integrated Combiner**

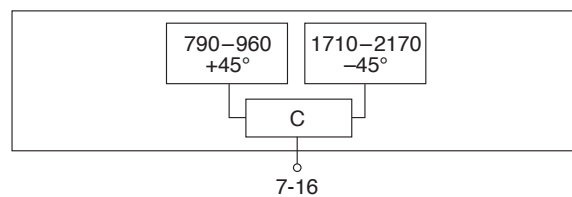
790–960	1710–2170
+45°	–45°
38°	28°
C	

KATHREIN

1-Port Yagi 790–960/1710–2170 C 38°/28° 14/15.5dBi

Type No.		80010828v01			
		790–960		1710–2170	
Frequency range	MHz	790 – 870	870 – 960	1710 – 1880	1920 – 2170
VSWR		< 1.5	< 1.5	< 1.5	< 1.5
Gain (average)	dBi	13	14	13	15.5
Impedance	Ω	50	50	50	50
Polarization	°	+45	+45	–45	–45
Front-to-back ratio	dB	≥ 25	≥ 25	≥ 27	≥ 27
Half-power beam width (avg.)	°	38	32	28	22
		horizontal	38	32	28
Max. power	W	85 (at 50 °C ambient temperature)		15 (at 50 °C ambient temperature)	
Integrated combiner		The insertion loss is included in the given antenna gain values.			

Please note: This antenna is suitable for tunnel applications.



Mechanical specifications		
Input	1 x 7-16 female	
Connector position	Rearside	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	200 45
Max. wind velocity	km/h mph	215 134
Dimensions	mm inches	1184 / Ø 170 46.6 / Ø 6.7
Weight	kg lb	6 / 10 (clamps incl.) 13.2 / 22.0 (clamps incl.)
Packing size	mm inches	1350 x 260 x 220 53.1 x 10.2 x 8.7

VPoI

Summary – Omnidirectional Antennas

VPol

694...2700 MHz

KATHREIN

Type	Type No.	Connector female	Height [mm]	Remarks	Page
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Lowband

1-Port Omni	790–960	360°	2dBi	0°T	K751161	N	348		236
1-Port Omni	806–894	360°	11dBi	0°T	738192	7-16	3237		237
1-Port Omni	870–960	360°	11dBi	0°T	736347	7-16	3033		238

Lowband | Highband

1-Port Omni	694–960/1695–2700	360°	2dBi	0°T	80010846	N	202	indoor/outdoor	254
1-Port Omni	790–960/1695–2700	360°	2dBi	0°T	80010847	N	194	indoor/outdoor	255
2-Port Omni	870–960 1920–2170	360° 360°	9dBi 10dBi	0°T 0°T	80010274	2 x 7-16	3033	separate inputs	239

Highband

1-Port Omni	1695–2700	360°	2dBi	0°T	80010431	N	115	indoor/outdoor	253
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1-Port Omni Antenna Vertical Polarization

790–960

V

KATHREIN

1-Port Omni 790–960 360° 2dBi

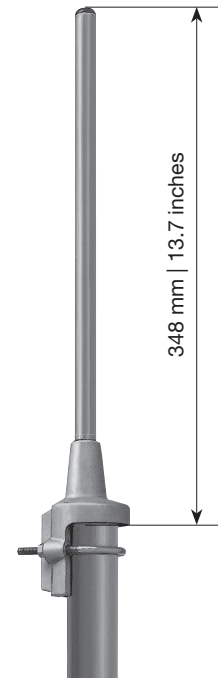
Type No.		K751161 602277
Frequency range	MHz	790 – 960
Polarization		Vertical
Gain	dBi	2
Impedance	Ω	50
VSWR		< 1.5
Intermodulation IM3	dBc	< -150 (2 x 37 dBm carrier)
Max. power	W	100 (at 50 °C ambient temperature)

Mounting: The antenna can be attached in two ways with the supplied mounting kit:

1. On the tip of a tubular mast of 40–54 mm | 1.6–2.1 inches diameter (connecting cable runs inside the mast).
2. Laterally at the tip of a tubular mast of 20–40 mm | 0.8–1.6 inches diameter (connecting cable runs outside the mast).

Material: Radiator: Brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



Mechanical specifications		
Input		7-16 female
Connector position		Bottom
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	17 4
Max. wind velocity	km/h mph	200 124
Height	mm inches	348 13.7
Radome diameter	mm inches	21 0.9
Weight	kg lb	0.74 1.6
Packing size	mm inches	455 x 112 x 97 17.9 x 4.4 x 3.8

1-Port Omni Antenna Vertical Polarization

806–894

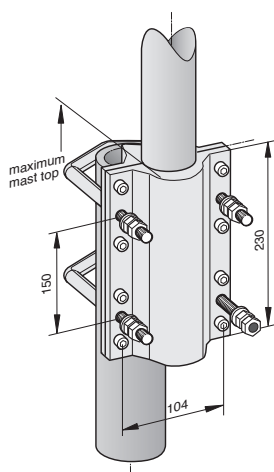
V

KATHREIN

1-Port Omni 806–894 360° 11dBi

Type No.		738192
Frequency range	MHz	806 – 894
Polarization		Vertical
Gain	dBi	11
Impedance	Ω	50
VSWR		< 1.5
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Max. power	W	500 (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm | 2.0 – 3.7 inches diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).
- Material:** Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.
- Grounding:** All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded. The inner conductor is capacitively coupled.
- Lightning protection:** The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μ s), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm² copper.



Mechanical specifications		
Input		7-16 female
Connector position		Bottom
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	230 52
Max. wind velocity	km/h mph	180 112
Height	mm inches	3237 127.4
Radome diameter	mm inches	51 2.0
Weight	kg lb	8.5 18.7
Packing size	mm inches	3516 x 148 x 112 138.4 x 5.8 x 4.4

1-Port Omni Antenna Vertical Polarization

870–960

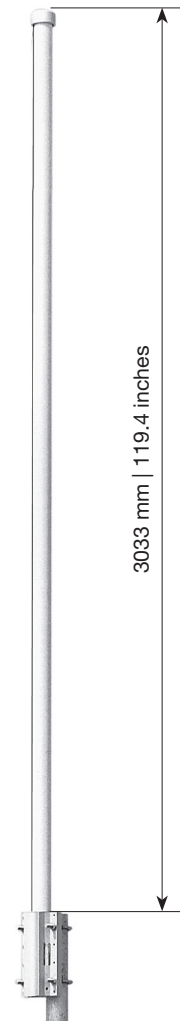
V

KATHREIN

1-Port Omni 870–960 360° 11dBi

Type No.		736347
Frequency range	MHz	870 – 960 MHz
Polarization		Vertical
Gain	dBi	11 dBi
Impedance	Ω	50 Ω
VSWR		< 1.5
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Max. power	W	500 (at 50 °C ambient temperature)

Mounting:	The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 2.0 – 3.7 inches diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).
Material:	Radiator: Copper and brass. Radome: Fiberglass, color: Grey. Base: Weather-proof aluminum. Mounting kit, screws and nuts: Stainless steel.
Anti-static protection:	All metal parts of the antenna as well as the supplied clamp attachment are grounded. The inner conductor is capacitively coupled.
Lightning protection:	The antenna is designed to withstand a lightning current of up to 150 KA (impulse: 10/350 μ s), according to IEC 62305 parts 1–4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm ² copper.



Mechanical specifications		
Input		7-16 female
Connector position		Bottom
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	210 47
Max. wind velocity	km/h mph	200 124
Height	mm inches	3033 119.4
Radome diameter	mm inches	51 2.0
Weight	kg lb	8.0 17.6
Packing size	mm inches	3316 x 148 x 112 130.6 x 5.8 x 4.4

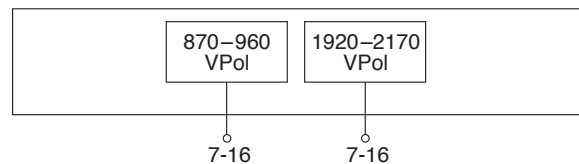
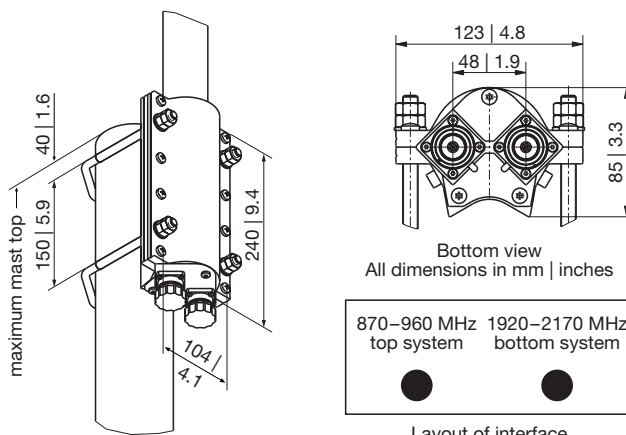
2-Port Omni Antenna 870-960 1920-2170 Vertical Polarization V V

KATHREIN

2-Port Omni 870-960/1920-2170 360°/360° 9/10dBi

Type No.		80010274	
Frequency range	MHz	Top system: 870 – 960 MHz	Bottom system: 1920 – 2170 MHz
Polarization		Vertical	Vertical
Gain	dBi	9	10
Half-power beam width	°	Horizontal: Omni Vertical: 11	Horizontal: Omni Vertical: 9
Isolation, between ports	dB	> 30	
Impedance	Ω	50	
VSWR		< 1.5	< 1.5
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)	
Max. power per input	W	150	100 (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm | 2.0 – 3.7 inches diameter with two U-bolt brackets supplied with the antenna (connecting cable runs outside the mast).
- Material:** Radiator: Copper and brass.
 Radome: Fiberglass, color: Grey.
 Base: Weather-proof aluminum.
 Mounting kit, screws and nuts: Stainless steel.
- Anti-static protection:** All metal parts of the antenna as well as the supplied clamp attachment are grounded. The inner conductors of both systems are coupled capacitively.
- Lightning protection:** The antenna is designed to withstand a lightning current of up to 150 kA (impulse: 10/350 μs), according to IEC 62305 parts 1-4 and VDE 0855-300, and thereby fulfils the requirements of lightning protection class II. Grounding cross-section: 22 mm² copper.



Mechanical specifications		
Input	2 x 7-16 female	
Connector position	Bottom	
Wind load (at Rated Wind Speed: 150 km/h)	N lbf	230 52
Max. wind velocity	km/h mph	200 124
Height	mm inches	3033 119.4
Radome diameter	mm inches	51 2.0
Weight	kg lb	8 17.6
Packing size	mm inches	3380 x 148 x 112 133.1 x 5.8 x 4.4

Omni

Summary – Indoor Antennas

VPol, VXPoI, VHPoI

694...6000 MHz

KATHREIN

Type	Type No.	Connector female	Height [mm]	Page		
Directional 1-Port						
1-Port BiDir	694–960/1710–2690	65° 5dBi	738448	N	428	230
1-Port BiDir	694–960/1710–2690	65° 5dBi	80020448	4.3-10	428	230
1-Port Indoor	790–960/1710–2700	90° C 7dBi	80010465	N	231	242
Directional 2-Port						
2-Port Indoor	694–960/1710–2690	80°/65° C 7dBi	80010882	2 x 4.3-10	399	243
2-Port Indoor	790–960/1710–2700	90° C 7dBi	80010677	2 x N	232	244
Omnidirectional 1-Port						
1-Port Indoor	1710–2700	360° 2dBi	741573	N	∅ 100	245
1-Port Indoor	1710–6000	360° 2dBi	80010430	N	∅ 138	246
1-Port Indoor	876–960/1710–2700	360° 2dBi	80010748	N	∅ 210	247
1-Port Indoor	876–960/1710–2700	360° 2dBi	80010749	N	∅ 215	248
1-Port Indoor	790–960/1425–3800/5150–6000	360° 2dBi	80010249	N	∅ 258	249
1-Port Indoor	790–960/1425–3800/5150–6000	360° 2dBi	80020249	4.3-10	∅ 258	249
Omnidirectional 2-Port						
2-Port Indoor	790–960/1710–2700/2500–2700	360° 2dBi	80010709	2 x N	∅ 258	250
2-Port Indoor	790–960/1710–2700/2500–2700	360° 2dBi	80020709	2 x 4.3-10	∅ 258	250
2-Port Indoor	790–960/1710–2700/1710–2700	360° 2dBi	80010710	2 x N	∅ 380	251
2-Port Indoor	790–960/1710–2700/1710–2700	360° 2dBi	80020710	2 x 4.3-10	∅ 380	251
2-Port Indoor	694–5920	360° 2dBi	80010712	2 x 4.3-10	∅ 320	252
Omnidirectional 1-Port Indoor and Outdoor						
1-Port Omni	1695–2700	360° 2dBi	80010431	N	115	253
1-Port Omni	694–960/1695–2700	360° 2dBi	80010846	N	202	254
1-Port Omni	790–960/1695–2700	360° 2dBi	80010847	N	194	255

New or changed product

Abbreviations:
C: Integrated Combiner

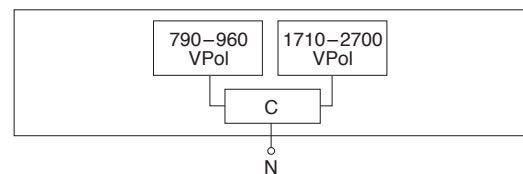
**1-Port Indoor Antenna
Vertical Polarization
HPBW
Integrated Combiner**

790–960	1710–2700
V	V
90°	90°
C	

KATHREIN

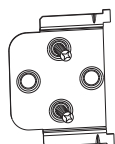
1-Port Indoor 790–960/1710–2700 C 90° 7dBi

Type No.		80010465
Frequency range	MHz	790 – 960 / 1710 – 2700
Polarization		Vertical
Gain	dBi	Approx. 7
Half-power beam width	°	Horizontal: Approx. 90
Impedance	Ω	50
VSWR		790 – 806 MHz: < 2.2 806 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0
Max. power	W	50 (at 50 °C ambient temperature)
Input		Cable RG 223/CU of 1m length, white, with N female connector
Protection class		IP 30
Weight	g lb	500 1.1
Packing size	mm inches	363 x 152 x 62 14.3 x 6.0 x 2.4
Height/width/depth	mm inches	231 / 140 / 50 9.1 / 5.5 / 2.0
Fire load		1.42 kWh

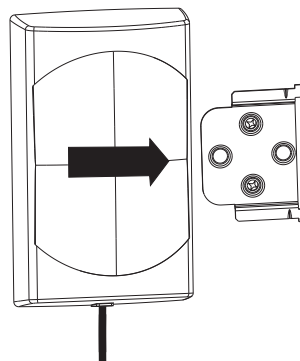


- Material:** Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
Mounting plates: Stainless steel.
- Mounting:** Two holes of 6 mm | 0.24 inches diameter in the mounting plate. Screws are not supplied.
Avoid stressing the cable. No stress on the hexagonal crimp. Minimum cable bending radius: 30 mm | 1.18 inches without tensile load.
Cable must be fixed.
- Available accessories:** Broadband power splitters and tappers (790 – 2700 MHz).

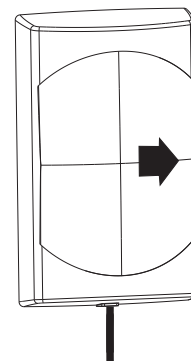
Mounting:



Mount the attachment plate to the wall using two screws of 4 mm | 0.16 inches diameter in the position as indicated.



Align the antenna over the attachment plate.



Pull the antenna to the stop.

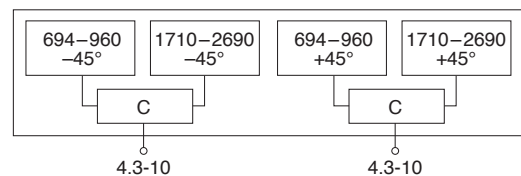
2-Port Indoor Antenna Dual Polarization HPBW Integrated Combiner

694-960	1710-2690
X	X
80°	65°
C	

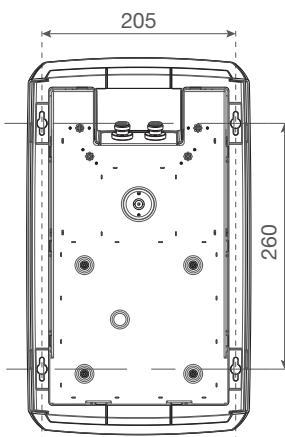
KATHREIN

2-Port Indoor 694-960/1710-2690 C 80°/65° 7dBi

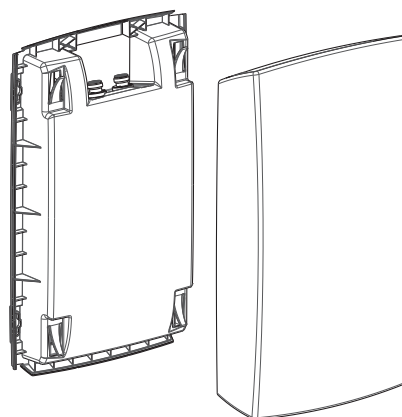
Type No.		80010882	
Frequency range	MHz	694 – 960	1710 – 2690
Polarization	°	+45, -45	+45, -45
Gain	dBi	7	7
Half-power beam width; hor., ver.	°	typ. 80	typ. 65
Impedance	Ω	50	
VSWR		694 – 960 MHz: ≤ 2.2 1710 – 2690 MHz: ≤ 2.2	
Isolation, between ports	dB	694 – 806 MHz: ≥ 16 806 – 960 MHz: ≥ 20 1710 – 2690 MHz: ≥ 20	
Max. power per port	W	20 (at 50 °C ambient temperature)	
Passive Inter-modulation PIM 3	dBc	< -140 (at 2 x 40 dBm carrier)	
Input		2 x 4.3-10 female	
Protection class		IP 30	
Weight	kg	1.6	
Packing size	mm	417 / 281 / 141	
Height/width/depth	mm	399 / 237 / 63	
Operating temperature range	°C	-5 ... +55	
Fire protection classification		UL 94-V2	
Fire load	kWh	5.3	



- Material:** Reflector: Brass.
Radome: ASA / PC, colour: White.
- Mounting:** Position: Wall and ceiling possible.
The antenna is mounted with four screws (4.5 mm nominal diameter, screw head diameter max. 9 mm).
Screws are not supplied.
After antenna mounting install the antenna cover.
- Available accessories:** Broadband power splitters and tappers (380 – 5920 MHz).



Antenna rearside with four drilling holes



Antenna and antenna cover

Indoor

2-Port Indoor Antenna

790–960 1710–2700 1710–2700

KATHREIN

Vertical / Dual Polarization

V X (-45°) X (+45°)

HPBW

90° 90° 90°

Integrated Combiner

C

2-Port Indoor 790–960/1710–2700 C 90° 7dBi

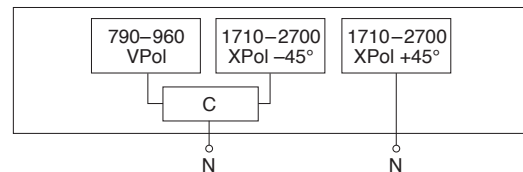
Type No.		80010677	
Frequency range	MHz	790 – 960	1710 – 2700
Polarization		Vertical	+45°, -45°
Gain	dBi	Approx. 7	Approx. 2 x 7
Half-power beam width	°	Horizontal: Approx. 90	
Impedance	Ω	50	
VSWR		< 2.0	
Isolation, between ports	dB	> 25	
Max. power	W	50 (at 50 °C ambient temperature)	
Input		2x Cable RG 223/CU of 1m length, white, with N female connector	
Protection class		IP 30	
Weight	g lb	600 1.32	
Packing size	mm inches	363 x 152 x 62 14.3 x 6.0 x 2.4	
Height/width/depth	mm inches	232 / 140 / 50 9.1 / 5.5 / 2.0	
Fire load		1.6 kWh	



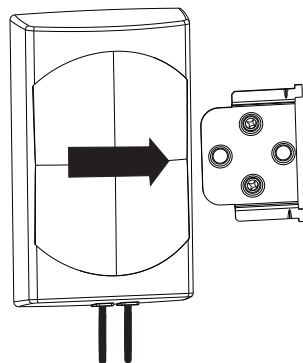
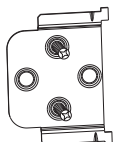
Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
Mounting plates: Stainless steel.

Mounting: Position: Wall and ceiling possible.
Two holes of 6 mm | 0.24 inches diameter in the mounting plate. Screws are not supplied.
Avoid stressing the cable. No stress on the hexagonal crimp. Minimum cable bending radius: 30 mm | 1.18 inches without tensile load.
Cable must be fixed.

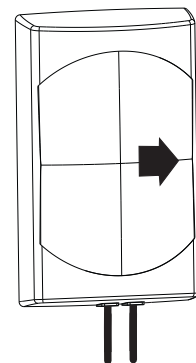
Available accessories: Broadband power splitters and tappers (790 – 2700 MHz).



Mounting:



Align the antenna over the attachment plate.



Pull the antenna to the stop.

Mount the attachment plate to the wall/ceiling using two screws of 4 mm | 0.16 inches diameter in the position as indicated.

1-Port Indoor Antenna Vertical Polarization

1710–2700

V

KATHREIN

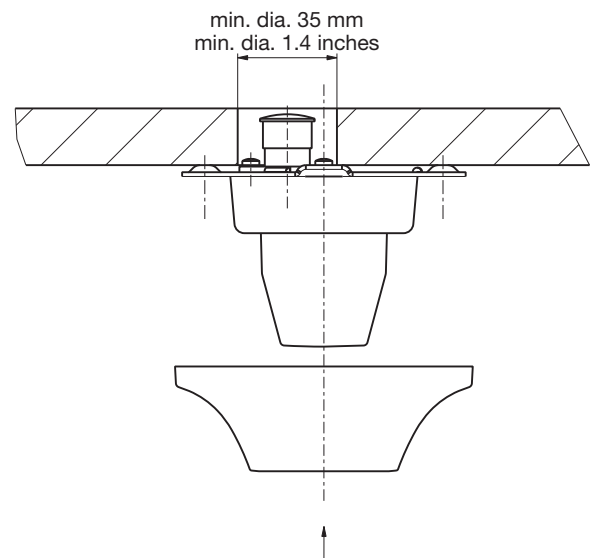
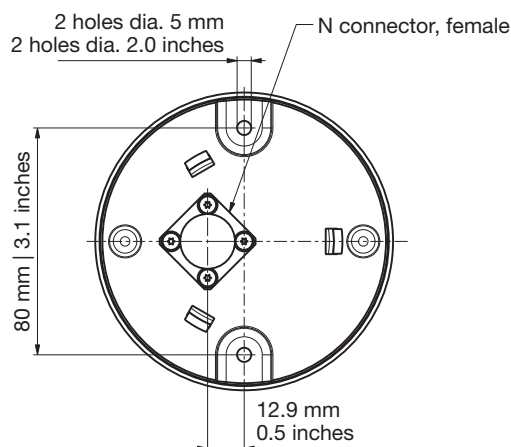
- The antenna can be operated in the total frequency range simultaneously.
- The antenna needs no additional groundplane.

1-Port Indoor 1710–2700 360° 2dBi

Type No.		741573
Frequency range	MHz	1710 – 2700
Polarization		Vertical
Gain	dBi	2
Impedance	Ω	50
VSWR		1710 – 1880 MHz: < 1.6 1850 – 1990 MHz: < 1.6 1920 – 2170 MHz: < 1.6 2170 – 2500 MHz: < 2.0 2500 – 2700 MHz: < 2.2
Intermodulation IM3	dBc	< -140 (2 x 40 dBm carrier)
Max. power	W	50 (at 50 °C ambient temperature)
Input		1 x N female
Protection class		IP 30
Weight	g lb	150 0.33
Diameter	mm inches	100 3.9
Height	mm inches	50 (without connector) 2.0 (without connector)



- Material:** Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
- Mounting:** Holes in the base enable a mounting on the ceiling. Screws are supplied.
For the N connector a hole in the ceiling with a diameter of 35 mm | 1.4 inches is required.
- Grounding:** All metal parts including the inner conductor are DC grounded.
- Available accessories:** Broadband power splitters (694–3800 MHz) and tappers (694–2700 MHz).



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor

1-Port Indoor Antenna Vertical Polarization

1710–6000

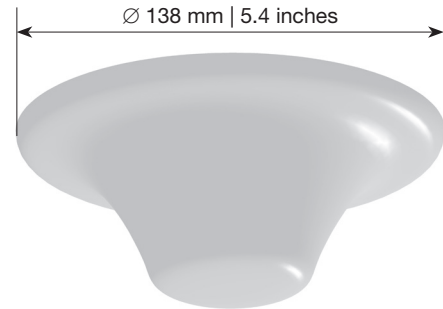
V

KATHREIN

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

1-Port Indoor 1710–6000 360° 2dBi

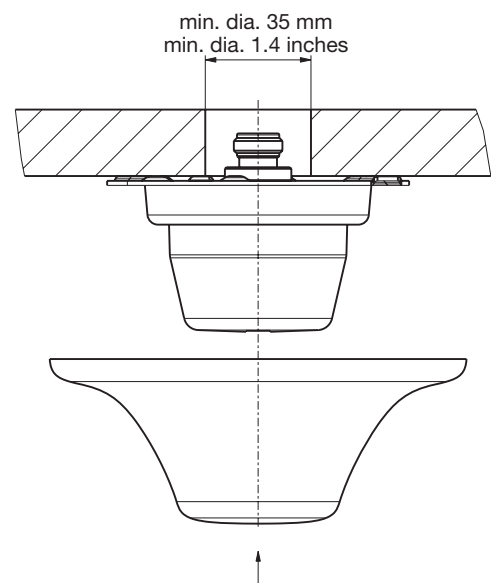
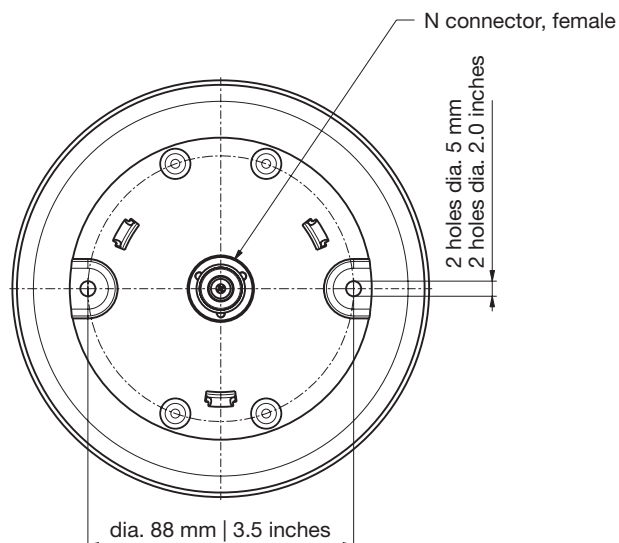
Type No.		80010430
Frequency range	MHz	1710 – 6000
Polarization		Vertical
Gain	dBi	2
Impedance	Ω	50
VSWR		< 1.5
Intermodulation IM3	dBc	1710 – 3800 MHz: < -140 (2 x 40 dBm carrier) 3800 – 6000 MHz: not relevant
Max. power	W	50 (at 50 °C ambient temperature)
Input		1 x N female
Protection class		IP 30
Weight	g lb	133 0.29
Diameter	mm inches	138 5.4
Height	mm inches	56 (without connector) 2.3 (without connector)



Material: Base: Aluminum.
Protective housing: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Holes in the base enable a mounting on the ceiling. Screws are supplied.
For the N connector a hole in the ceiling with a diameter of 35 mm | 1.4 inches is required.

Available accessories: Broadband power splitters (694–3800 MHz) and tappers (380–5920 MHz).



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

1-Port Indoor Omni Antenna

876–960

1710–2700

KATHREIN

Vertical Polarization V

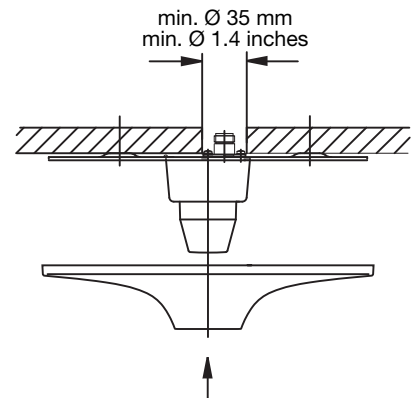
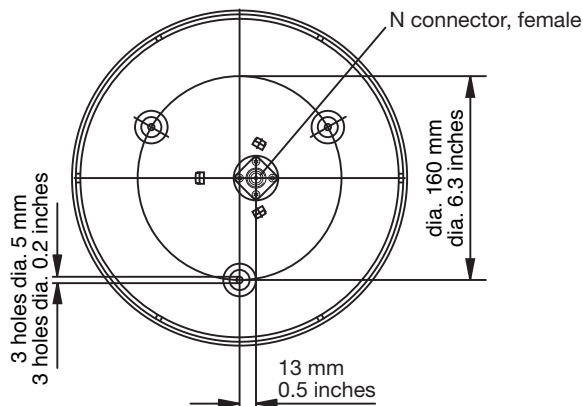
- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

1-Port Indoor 876–960/1710–2700 360° 2dBi

Type No.		80010748
Frequency range	MHz	876 – 960 1710 – 2700
Polarization		Vertical
Gain	dBi	2
Impedance	Ω	50
VSWR		876 – 890 MHz: < 2.0 890 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.6 2170 – 2700 MHz: < 2.0
Intermodulation IM3	dBc	< -140 (2 x 40 dBm carrier)
Max. power	W	50 (at 50 °C ambient temperature)
Input		1 x N female
Protection class		IP 30
Weight	g lb	300 0.66
Diameter	mm inches	210 8.3
Height	mm inches	78 (without connector) 3.1 (without connector)



- Material:** Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
- Mounting:** Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the N connector a hole in the ceiling with a diameter of 35 mm | 1.4 inches is required.
- Grounding:** All metal parts including the inner conductor are DC grounded.
- Available accessories:** Broadband power splitters and tappers (694–2700 MHz).



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor

1-Port Indoor Antenna Vertical Polarization

876–960

1710–2700

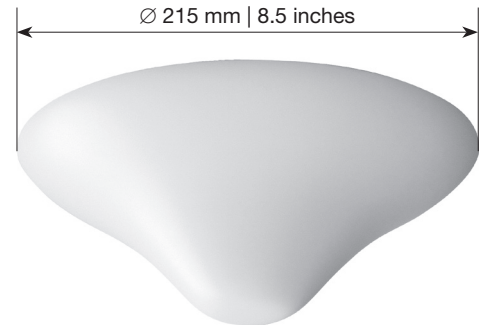
KATHREIN

V

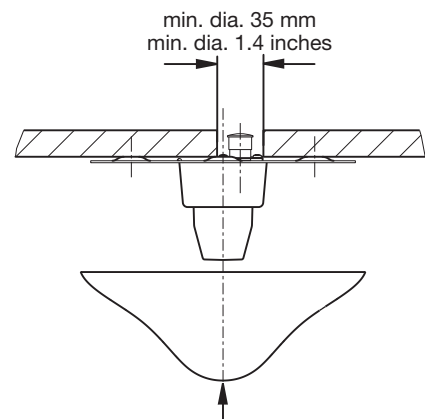
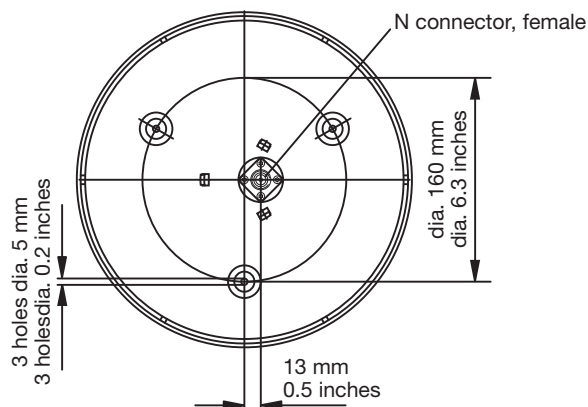
- The antenna needs no additional groundplane.

1-Port Indoor 876–960/1710–2700 360° 2dBi

Type No.		80010749
Frequency range	MHz	876 – 960 1710 – 2700
Polarization		Vertical
Gain	dBi	2
Impedance	Ω	50
VSWR		876 – 890 MHz: < 2.0 890 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.6 2170 – 2700 MHz: < 2.0
Intermodulation IM3	dBc	< -140 (2 x 40 dBm carrier)
Max. power	W	50 (at 50 °C ambient temperature)
Input		1 x N female
Protection class		IP 30
Weight	g lb	340 0.75
Diameter	mm inches	215 8.5
Height	mm inches	85 (without connector) 3.3 (without connector)



- Material:** Base: Aluminum.
Protective housing: High impact polystyrol, colour: White.
Additional painting is possible.
- Mounting:** Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the N connector a hole in the ceiling with a diameter of 35 mm | 1.4 inches is required.
- Grounding:** All metal parts including the inner conductor are DC grounded.
- Available accessories:** Broadband power splitters and tappers (694–2700 MHz).



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

1-Port Indoor Antenna

790-960

1425-3800

5150-6000

KATHREIN

Vertical Polarization

V

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

1-Port Indoor 790-960/1425-3800/5150-6000 360° 2dBi

Type No.		80010249 / 80020249
Frequency range	MHz	790 – 960 1425 – 3800 5150 – 6000
Polarization		Vertical
Gain	dBi	≈ 2
Impedance	Ω	50
VSWR		790 – 806 MHz: < 1.7 806 – 960 MHz: < 1.5 1425 – 1710 MHz: < 2.0 1710 – 2200 MHz: < 1.4 2200 – 3800 MHz: < 1.6 5150 – 5300 MHz: < 2.4 5300 – 6000 MHz: < 2.0
Intermodulation IM3	dBc	790 – 960 MHz: < -140 (2 x 40 dBm carrier) 1710 – 3800 MHz: < -140 (2 x 40 dBm carrier) 5150 – 6000 MHz: not relevant
Protection class		IP 30
Fire load	kWh	2.12

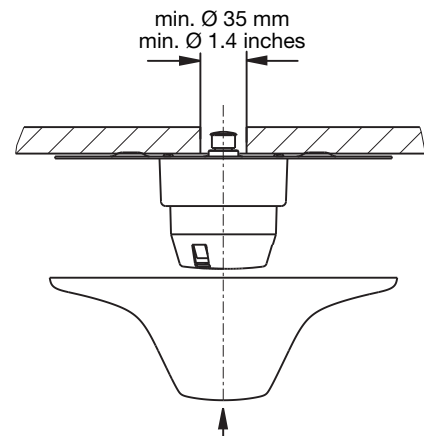
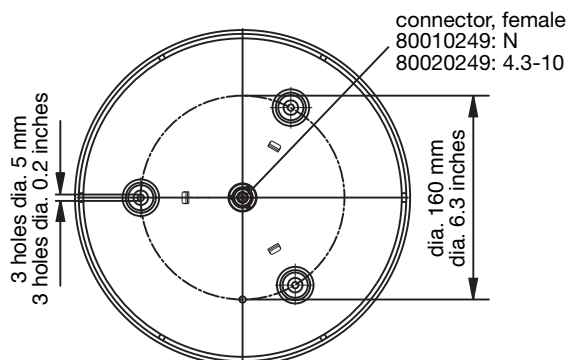


Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the respective connector a hole in the ceiling with a diameter of 35 mm | 1.4 inches is required.

Available accessories: Broadband power splitters and tappers.

Mechanical specifications		80010249	80020249
Input		1 x N female	1 x 4.3-10 female
Weight	g lb	466 1.0	Approx. 500 Approx. 1.1
Packing size	mm inches	277 x 277 x 169 10.9 x 10.9 x 6.7	278 x 278 x 171 10.9 x 10.9 x 6.7
Diameter	mm inches	258 10.2	
Height	mm inches	94 (without connector) 3.7 (without connector)	



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor

2-Port Indoor Omni Antenna Dual Polarization

790-960

1710-2700

2500-2700

KATHREIN

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- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

2-Port Indoor 790 – 960/1710–2700/2500–2700 360° 2dBi

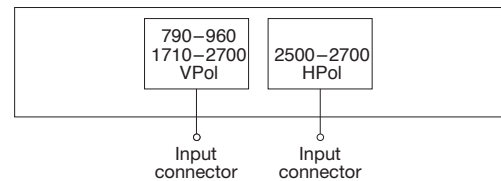
Type No.		80010709 80020709	
Frequency range	MHz	790 – 960 1710 – 2700	2500 – 2700
Polarization		Vertical	Horizontal
Gain	dBi	≈ 2	
Impedance	Ω	50	
VSWR		790 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0	2500 – 2700 MHz: < 2.0
Isolation between Ports	dB	> 30	
Intermodulation IM3	dBc	< -140 (2 x 40 dBm carrier)	
Max. power	W	50 (at 50 °C ambient temperature)	
Protection class		IP 30	
Fire load	kWh	2.16	



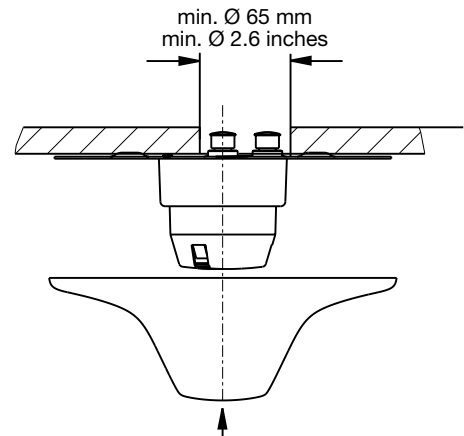
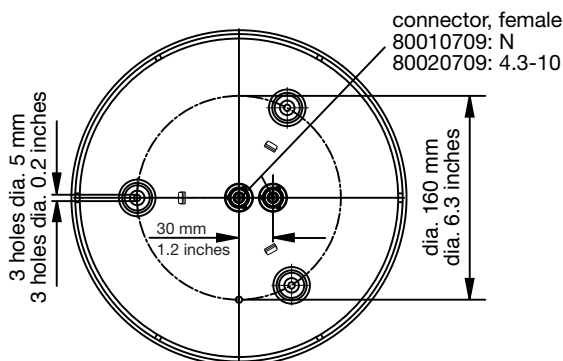
Material: Reflector: Aluminum. Radome: High impact polystyrol, colour: White. Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the respective connectors a hole in the ceiling with a diameter of 65 mm | 2.6 inches is required.

Available accessories: Broadband power splitters and tappers.



Mechanical specifications		80010709	80020709
Input		2 x N female	2 x 4.3-10 female
Weight	g lb	Approx. 50 Approx. 0.11	
Packing size	mm inches	277 x 277 x 169 10.9 x 10.9 x 6.7	278 x 278 x 171 10.9 x 10.9 x 6.7
Diameter	mm inches	258 10.2	
Height	mm inches	94 (without connector) 3.7 (without connector)	



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

2-Port Indoor Omni Antenna Dual Polarization

790-960

1710-2700

1710-2700

KATHREIN

V

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- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

2-Port Indoor 790-960/1710-2700/1710-2700 360° 2dBi

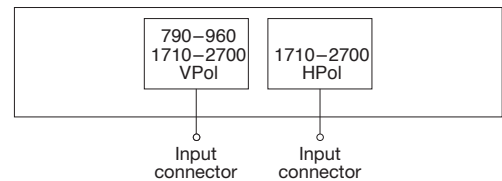
Type No.		80010710 80020710	
Frequency range	MHz	790 – 960 1710 – 2700	1710 – 2700
Polarization		Vertical	Horizontal
Gain	dBi	≈ 2	
Impedance	Ω	50	
VSWR		790 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0	1710 – 2700 MHz: < 2.0
Isolation between Ports	dB	> 30	
Intermodulation IM3	dBc	< -140 (2 x 40 dBm carrier)	
Max. power	W	50 (at 50 °C ambient temperature)	
Protection class		IP 30	
Fire load	kWh	4.41	



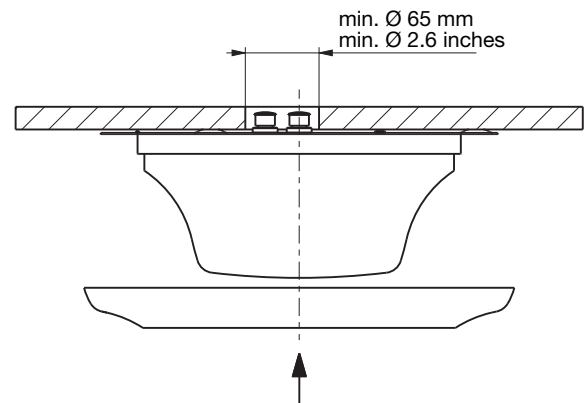
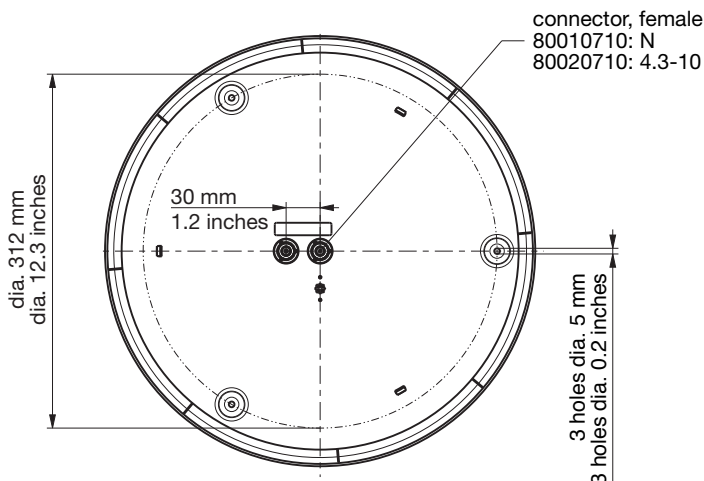
Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.

Mounting: Three holes in the base enable a mounting on the ceiling. Two types of screws are supplied. For the respective connectors a hole in the ceiling with a diameter of 65 mm | 2.6 inches is required.

Available accessories: Broadband power splitters and tappers.



Mechanical specifications		80010710	80020710
Input		2 x N female	2 x 4.3-10 female
Weight	g	1	
	lb	2.2	
Packing size	mm	400 x 400 x 200	387 x 387 x 169
	inches	15.7 x 15.7 x 8.3	15.2 x 15.2 x 6.7
Diameter	mm	380	
	inches	15.0	
Height	mm	118 (without connector)	
	inches	4.6 (without connector)	



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Indoor

2-Port Indoor MIMO Omni Antenna Vertical Polarization

694–5920

694–5920

KATHREIN

V

V

- The antenna can be operated in all indicated frequency ranges simultaneously.

2-Port Indoor 694–5920 360° 2dBi

Type No.		80010712	
Frequency range Port 1 and Port 2	MHz	Port 1 694 – 960 1427 – 1518 1695 – 2690 3400 – 3800 4920 – 5920	Port 2 694 – 960 1427 – 1518 1695 – 2690 3400 – 3800 4920 – 5920
Polarization		Dual Vertical	
Gain, typ.	dBi	2	
Gain, max.	dBi	694 – 960 MHz: 4.0 – 5.5 1427 – 1518 MHz: 5.0 – 5.5 1695 – 2690 MHz: 5.0 – 7.5 3400 – 3800 MHz: 5.5 – 7.0 4920 – 5920 MHz: 7.0 – 8.0	
Impedance	Ω	50	
VSWR		694 – 960 MHz: < 2.0 1427 – 1518 MHz: < 2.0 1695 – 2690 MHz: < 2.0 3400 – 3800 MHz: < 2.0 4920 – 5920 MHz: < 2.0	
Isolation	dB	694 – 960 MHz: > 20 1427 – 1518 MHz: > 20 1695 – 2690 MHz: > 20 3400 – 3800 MHz: > 20 4920 – 5920 MHz: > 20	
Intermodulation IM3 (2 x 40 dBm carrier)	dBc	694 – 960 MHz: < -150 1427 – 1518 MHz: < -150 1695 – 2690 MHz: < -150 3400 – 3800 MHz: < -150 4920 – 5920 MHz: not relevant	
Max. power per input (at 50 °C ambient temperature)	W	694 – 960 MHz: 20 1427 – 1518 MHz: 20 1695 – 2690 MHz: 20 3400 – 3800 MHz: 10 4920 – 5920 MHz: 5	
Max. effektive power for the antenna	W	20 (at 50 °C ambient temperature)	
Input		2 x 4.3-10 female (angular connector required)	
Protection class		IP 30	
Weight	g lb	950 2.1	
Packing size	mm inches	350 x 350 x 150 13.8 x 13.8 x 5.9	
Diameter (antenna module)	mm inches	320 12.6	
Height (antenna module)	mm inches	89 3.5	
Fire load	kWh	3.18	



Material: Reflector: Aluminum.
Radome: ASA/PC blend, colour: White.
Additional painting is possible.

Mounting: – On-ceiling mounting:
Mounting kit 85010200 required
– Concealed antenna installation (ceiling thickness 3 – 35 mm | 0.12 – 1.38 inches):
Mounting kit 85010201 required
– Hidden antenna installation in double layer ceiling, floors or similar – no additional mounting kit required

Accessories (order separately if required)

Type No.	Description
85010200	On-ceiling mounting kit
85010201	Support ring for concealed antenna installation

1-Port Omni Antenna Vertical Polarization Indoor and outdoor use

1695–2700

V

KATHREIN

1-Port Omni 1695–2700 360° 2dBi

Type No.		80010431
Input		1 x N female
Connector position		Bottom or top
Frequency range	MHz	1695 – 2700
VSWR		< 1.8
Gain	dBi	2
Impedance	Ω	50
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Polarization		Vertical
Max. power	W	50 (at 50 °C ambient temperature)
Weight	g	150
	lb	0.33
Radome diameter	mm	20
	inches	0.8
Height	mm	115
	inches	4.5
Fire load	kWh	0.07

- Material:** Radiator: Brass.
Radome: Fiberglass, color: White.
- Mounting:** One hole mounting (16 mm | 0.6 inches diameter) to surfaces of max. 10 mm | 0.4 inches thickness.
- Grounding:** All metal parts of the antenna and the mounting kit are DC grounded. The inner conductor is not DC grounded.



1-Port Omni Antenna Vertical Polarization Indoor and outdoor use

694–960/1695–2700

V

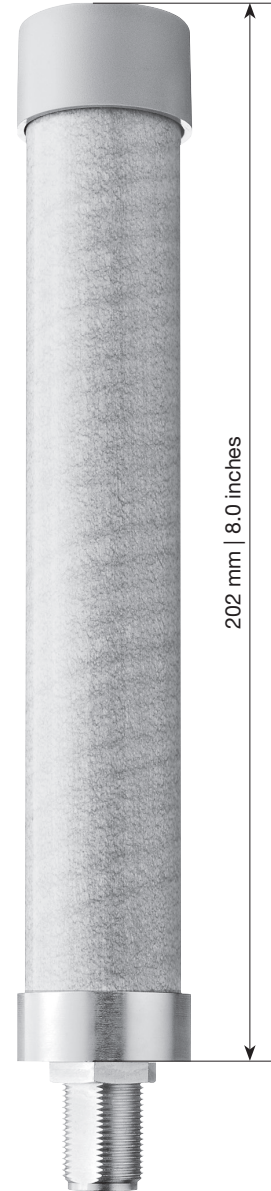
KATHREIN

1-Port Omni 694–960/1695–2700 360° 2dBi

Type No.		80010846			
Input		1 x N female			
Connector position		Bottom or top			
Frequency range	MHz	694 – 960 / 1695 – 2700			
VSWR	MHz	694 – 864 < 2.0	864 – 894 < 2.2	894 – 960 < 2.5	1695 – 2700 < 2.0
Gain	dBi	2			
Impedance	Ω	50			
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)			
Polarization		Vertical			
Max. power	W	50 (at 50 °C ambient temperature)			
Weight	g	210			
	lb	0.46			
Wind load (at 150 km/h)	N	6			
	lbf	1.3			
Radome diameter	mm	30			
	inches	1.2			
Height	mm	202			
	inches	8.0			
Fire load	kWh	0.2			

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm | 0.6 inches diameter) to surfaces of max. 10 mm | 0.4 inches thickness.



1-Port Omni Antenna Vertical Polarization Indoor and outdoor use

790–960

1695–2700

KATHREIN

V

1-Port Omni Omni 790–960/1695–2700 360° 2dBi

Type No.	80010847	
Input	1 x N female	
Connector position	Bottom or top	
Frequency range	MHz	790 – 960 / 1695 – 2700
VSWR	< 2.0	
Gain	dBi	2
Impedance	Ω	50
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)
Polarization	Vertical	
Max. power	W	50 (at 50 °C ambient temperature)
Weight	g	200
	lb	0.44
Wind load (at 150 km/h)	N	6
	lbf	1.3
Radome diameter	mm	30
	inches	1.2
Height	mm	194
	inches	7.6
Fire load	kWh	0.19

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm | 0.6 inches diameter) to surfaces of max. 10 mm | 0.4 inches thickness.



Indoor

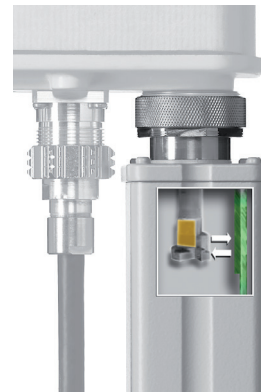
Type		Type No.	Page
Kathrein's Remote Electrical Tilt System			
General Information			258
Data Sheets of RET Components			
Slimline Remote Control Unit (RCU)		86010148v01	260
FlexRET Module		86010153v01	261
iRCU		86010149	262
Antenna Line Configurator (ALC)		86010156	263
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New or changed product

Functionality of Different RET Technologies

RCU with RFID Feature

- External RCU 86010148v01 includes a RFID reader
- Antenna spindles are successively equipped with RFID tags
- The antenna specific data is stored on this tag:
 - ⇒ Type number
 - ⇒ Serial number
 - ⇒ Configuration File
- With power on, the data is read out automatically from the tag by the RCU
- List of all updated antennas on our homepage: www.kathrein.com/rfidspindle



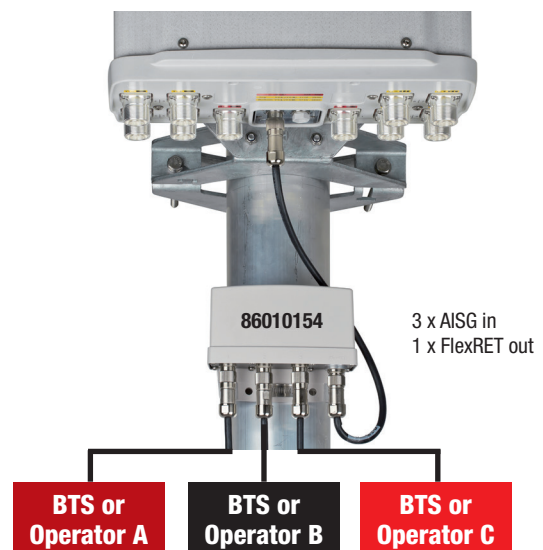
FlexRET

- Integrated RET module inside the antenna (86010153v01)
- Pre-configured with the antenna specific parameters:
 - ⇒ Type number
 - ⇒ Serial number
 - ⇒ Configuration file
- Calibrated ex-factory
- The FlexRET module is exchangeable
 - ⇒ Automatic data transfer in case of exchange with internal RFID tag
 - ⇒ Only calibration is necessary
- Daisy chain possibility with FlexRET antennas and / or external RCUs
- Same module for all antennas
- SingleRET or MultiRET selection possible
- Array allocation possible with special Site Sharing Adapter or Gender Adapter / Port Extender



Site Sharing Adapter

- Needed whenever the AISG control of a FlexRET antenna shall be performed by a higher number of base stations (BTS)
- 2 different realizations available
 - ⇒ 3-way Site Sharing Adapter: Type no. 86010154 – FlexRET control with up to 3 BTS
 - ⇒ 6-way Site Sharing Adapter: Type no. 86010155 – FlexRET control with up to 6 BTS
- Daisy chaining of up to 3 FlexRET antennas
- Additional ALDs can be mounted prior to the Site Sharing Adapter
- Flexible allocation of antenna arrays to the different BTS units using a special software application via PC
- Each BTS can act independently
- Individual password protection of configuration possible
- Configuration can be sent to the Site Sharing Adapter with every AISG control device (BTS or e.g. Kathrein ALC)



Functionality of Different RET Technologies

Gender Adapter (86010162)

- Can be used if 2 base stations (BTS) are interconnected to one common FlexRET antenna
- Mounted on the FlexRET output of the module
- Converts the AISG output to an AISG input
- The allocation of the antenna arrays can easily be performed during the commissioning process via the BTS



Port Extender (86010163)

- Can be used if 2 BTS are interconnected to common FlexRET antennas in daisy chain
- Mounted on the FlexRET module by 2 screws
- Converts 1 FlexRET input and output to 2 FlexRET inputs and outputs
- Daisy chaining with further FlexRET antennas and / or external RCUs
- The allocation of the antenna arrays can easily be performed during the commissioning process via the BTS



Manuals for all our AISG control devices and for the Site Sharing Adapter as well as the corresponding software downloads can be found on our homepage in the section "Technical Documents" respectively "Driver and Software".

For details of the RET system please also see Kathrein's RET brochure.



Kathrein's overall RET system works in accordance with the AISG (Antenna Interface Standards Group) standard and 3GPP (3rd Generation Partnership Project).

Remote Control Unit (RCU) for Kathrein base station antennas with adjustable electrical down-tilt and appropriate mechanical interface.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Compact size
- Prepared for automatic configuration and calibration
- Daisy Chain feasibility
- Suitable for operation under outdoor conditions



Type No.		86010148v01
Protocols		compliant to AISG 1.1 and 3GPP/AISG 2.0
Logical interface ex factory ¹⁾		3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 1, pin 6)
Power consumption	W	< 1 (stand by); < 10 (motor activated)
Connectors ^{2) 3)}		2 x 8 pin connector according to IEC 60130-9; according to AISG Daisy chain in: male; Daisy chain out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	sec	40 (typically, depending on antenna type)
Adjustment cycles		> 50,000
Temperature range	°C	-40 ... +60
Protection class		IP 24
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)
Housing material		Profile: Aluminum anodized; cover: Aluminum die cast coated
Weight	kg lbs	0.5 0.99
Packing size	mm inches	245 x 93 x 102 9.6 x 3.6 x 4
Dimensions (H x W x D)	mm inches	177.5 x 59.5 x 49.5 7.0 x 2.3 x 1.9



¹⁾ The protocol of the logical interface can be switched from 3GPP/AISG 2.0 AISG 1.1 to with a vendor specific command. Start-up operation of the RCU is only possible in a RET system supporting 3GPP/AISG 2.0!

The protocol can also be changed as follows: 3GPP to AISG 1.1: Enter "AISG1" into the additional data field "Installer's ID" and perform a layer 2 reset or a power reset. AISG 1.1 to 3 GPP: Enter "3GPP" into the additional data field "Installer's ID" and perform a layer 7 reset or a power reset. After switching the protocol any other information can be entered into the "Installer's ID" field.

Please note:

If the Primary of the RET system doesn't support the standard of the 'logical interface ex factory', the RCU must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

²⁾ The tightening torque for fixing the connector must be 0.5 – 1.0 Nm. The connector should be tightened by hand or using the torque screwdriver (85010080) as described in the connecting cable data sheet (85010007, ...)

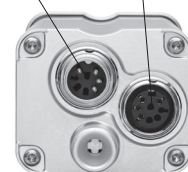
³⁾ The RCU gets the information stored in the antenna after power on automatically if a corresponding antenna is used. In this case, it is not necessary to configure the RCU manually.

- Standards:
- EN 60950-1 (Safety)
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - EN 55022 (Emission)
 - EN 55024 (Immunity)
 - ETS 300019-1-4 (Environmental)
 - UL 60950-1; 1st edition

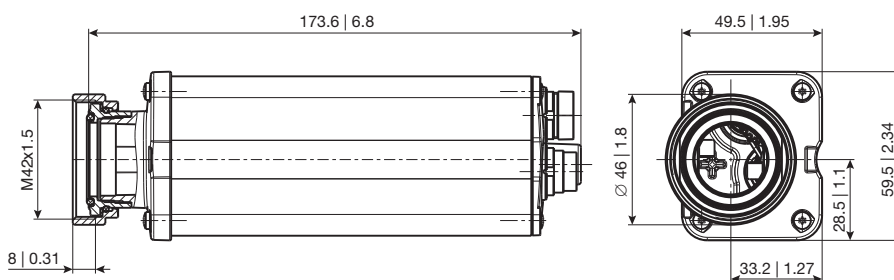
Certification: CE, FCC

Scope of supply: Remote Control Unit
Assembly paste

Daisy chain in (male) Daisy chain out (female)



Bottom view of RCU



All dimensions in mm | inches

A flexible, integrated solution for adjusting the electrical downtilt of Kathrein FlexRET antennas.

- Compliant to 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Two way antenna sharing feasibility
- Daisy Chain feasibility
- Pre-configured



Type No.		86010153v01
Protocols		compliant to 3GPP/AISG 2.0
Logical interface ex factory		3GPP/AISG 2.0
Operates as		Single RETs or Multi RET
Ex factory		Single RETs
Input voltage range	V	10 ... 30 (pin 6)
Power consumption	W	Typically < 1; < 10 (motor activated)
Connectors		2 x 8 pin connector according to IEC 60130-9; according to AISG-C 485 Daisy chain in: male; Daisy chain out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	sec	40 (typically, depending on antenna type)
Adjustment cycles		> 50,000
Temperature range	°C	-40 ... +60
Protection class		IP 24 (installed)
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Housing material		Profile: Aluminum anodized; cover: Aluminum die cast coated
Weight	g lb	350 0.77
Packing size (H x W x D)	mm inches	245 x 93 x 102 9.6 x 3.6 x 4
Dimensions (H x W x D)	mm inches	142 x 71 x 51 5.6 x 2.8 x 2



Please note:

If the Primary which controls the FlexRET system does not support the default ex-factory interface setting, then the FlexRET must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

If the FlexRET of an antenna has to be replaced, the FlexRET gets the information stored in the antenna after power on automatically. It is not necessary to configure the FlexRET manually.

Standards: EN 60950-1 (Safety)
EN 60950-22 (Safety – Equipment installed outdoor)
EN 55022 (Emission)
EN 55024 (Immunity)
ETS 300019-1-4 (Environmental)
UL 60950-1; 1st edition

Certification: CE, FCC

Scope of supply: FlexRET

Optional: **Site Sharing Adapter** (86010154 or 86010155) to create independent logical interfaces at one antenna or site. Makes it possible to operate with more than one independent Node B.

Gender Adapter (86010162) to convert the AISG out (female) to an AISG in (male) port in order to operate one FlexRet with exactly 2 BTS. Detailed information is given in the data sheet of the Gender Adapter.

Port Extender (86010163) to convert the existing AISG input and output in order to operate FlexRet with exactly 2 BTS while maintaining the daisy chain capability. Detailed information is given in the data sheet of the Port Extender.

Please note:

In general, the addressing of the FlexRET is automatically performed. Only in case the FlexRET is manually addressed, the serial number has to be extended by the corresponding colour coding extension (e.g. CSG351234-**R1**). The respective information can be found on the site documentation which is included in the scope of supply.

All FlexRET antennas are equipped with this module. The module does not need to be ordered separately.

RET

Kathrein's 86010149 integrable Remote Control Unit (iRCU) allow operators to control the electrical tilt of compatible antennas without direct access to the antenna.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Field replaceable without dismantling the antenna
- Daisy Chain feasibility



Type No.	86010149
Protocols	Compliant to AISG 1.1 and 3GPP/AISG 2.0
Logical interface ex factory ¹⁾	AISG 2.0/3GPP
Input voltage range	10 ... 30 V (pin 1, pin 6)
Power consumption	< 1 W (stand by); < 10 W (motor activated)
Connectors ²⁾	2 x 8 pin connector according to IEC 60130-9; according to AISG Daisy chain in: male; Daisy chain out: female
Hardware interfaces	RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP
Adjustment time (full range)	40 sec (typically, depending on antenna type)
Adjustment cycles	> 50,000
Temperature range	-40 °C ... +60 °C
Protection class	IP 24
Lightning protection	AISG interface (each pin); 2.5 kA (10/350µs); 8 kA (8/20µs)
Weight	480 g (1.16 lb), 1.0 G lbs
Packing size	245 x 93 x 102 mm, (9.6 x 3.6 x 4 inches)
Dimensions (H x W x D)	170 x 68.5 x 66 mm, (6.68 x 2.7 x 2.6 inches)



¹⁾ The protocol of the logical interface can be switched from 3GPP/AISG 2.0 to AISG 1.1 and vice versa with a vendor specific command.

Please note:

If the Primary of the RET system doesn't support the standard of the 'logical interface ex factory', the iRCU must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

²⁾ The tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!

- Standards EN 60950-1 (Safety)
- EN 55022 (Emission)
- EN 55024 (Immunity)
- ETS 300019-1-4 (Environmental)

Certification: CE, FCC15.107 class B

Scope of supply: Integrable Remote Control Unit

Antenna Line Configurator (ALC) For Antenna Line Devices (ALD)

KATHREIN



Antenna Line Configurator

Type No.	86010156
Connector* to RCU/TMA	1 x 8-pin connector according to IEC 60130-9, female, conforming to AISG RF-connector (SMB male)
Input voltage of ALC	20 – 30 V DC
Display	Touchscreen, sunlight visible
Tiltsensor	Measuring range $\pm 80^\circ$, accuracy $\pm 1^\circ$
Output voltage to RCU's/ TMA's	AISG female pin 6 (24 V DC): 20–30 V DC AISG female pin 1 (12 V DC): 10–15 V DC RF male (at 24 V DC): 10–30 V DC ** RF male (at 12 V DC): 10–15 V DC **
Output power (power supply to RCU's/ TMA's)	AISG female pin 6 (24 V DC) without load on pin 1 (12 V DC) and on RF-plug: ≤ 15 W AISG female Pin 1 (12 V DC) with max. 7.5 W load on pin 6 (24 V DC) and/or on RF plug: ≤ 7.5 W
Current monitoring measurement level	Per branch (12 V, 24 V, RF): 10–1500 mA
Over-current protection	Per branch (12 V, 24 V, RF): < 1500 mA
Interface to RCU/TMA	RS 485 / power supply / RF connector (SMB male)
Protocol to RCU/TMA	HDLC hex-coded command set, conforming to AISG 1.1 and 3GPP / AISG 2.0
Interface	W-LAN (802.11n), USB (1.1 / 2.0)
Max. number of RCU's/TMA's	9/1 pcs., depending on system configuration and length of control cable
Max. length of control cable	200 m / 9 RCU's (in daisy chain configuration) 150 m / 6 RCU's (in splitter configuration)
Internal memory	380 MB
Weight	1 kg
Protection class	IP 54
Temperature range (operating)	$-20 \dots +45$ °C ambient temperature
Temperature range (charging)	$0 \dots +30$ °C ambient temperature
Dimensions (H x W x D)	265 x 102 x 37 mm
Packing size	400 x 280 x 85 mm
Power supply	LiPo-battery (14.8 V, > 2000 mAh)

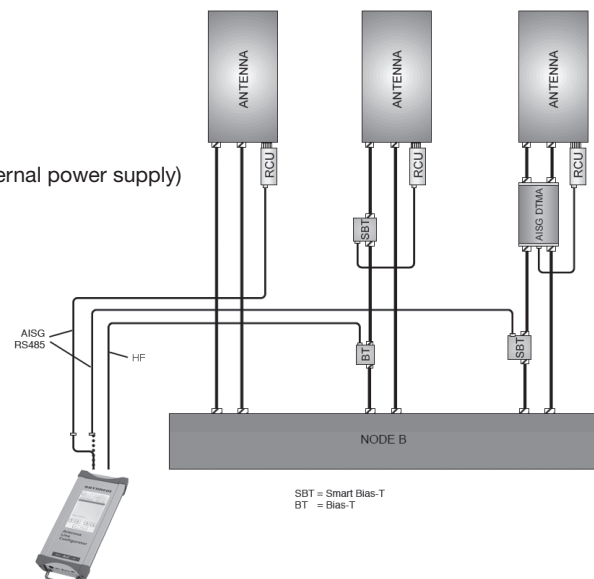


* Tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened').
The connector should be tightened by hand only!
** Switchable with software

Certificate: CE
FCC part 15 class B
UL (for external power adapter)

Standards: EN 60950-22
EN 55022
EN 55024

Scope of supply: ALC
Charging device (can also be used as external power supply)
USB cable
RET cable
HF cable (SMB / 7-16)
Quick Guide
Transport case



RET

Portable Control Adapter (PCA) For Remote Control Unit (RCU) For Tower Mounted Amplifier (TMA)

KATHREIN



Portable Control Adapter

Type No.		86010046	
Connector * to RCU/TMA		1 x 8-pin connector according to IEC 60130-9, female, conforming to AISG RF-connector (SMB male)	
Input voltage of PCA	V DC	24	
Output voltage to RCU's/TMA's	V DC	AISG female pin 6 (24 V DC): 24 ±10% AISG female pin 1 (12 V DC): 14 ±7% RF male (at 24 V DC): 24 ±10% *** RF male (at 12 V DC): 14 ±7% ***	
Output power (power supply to RCU's/TMA's)	W	AISG female pin 6 (24 V DC) without load on pin 1 (12 V DC) and on RF-plug: ≤ 60 AISG female Pin 1 (12 V DC) with max. 30 W load on pin 6 (24 V DC) and/or on RF plug: ≤ 30	
Current monitoring measurement level	mA	Per branch (12 V, 24 V, RF): 10 – 2500	
Over-current protection		Per branch (12 V, 24 V, RF): < 2500	
Interface to RCU/TMA		RS 485 / power supply / RF connector (SMB male)	
Protocol to RCU/TMA		HDLC hex-coded command set, conforming to AISG 1.1 and 3GPP / AISG 2.0	
Interface to PC		USB 1.1/2.0	
Max. number of RCU's/TMA's		27/3 pcs., depending on system configuration and length of control cable	
Max. length of control cable	m ft	9 RCU's (in daisy chain configuration): 200 656.17 6 RCU's (in splitter configuration): 150 492.13	
Weight	g lb	535 1.2 (incl. external power adapter)	
Temperature range	°C	0 ... +55 ambient temperature	
Height x width x depth	mm inches	40 x 95 x 160 1.57 x 3.74 x 6.29	
External power supply **		Input: 90 – 264 V AC, 47 – 63 Hz 24 V DC / 3.0 A	

* Tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened').

The connector should be tightened by hand only!

** If powered via AISG-interface, no external power supply is required.

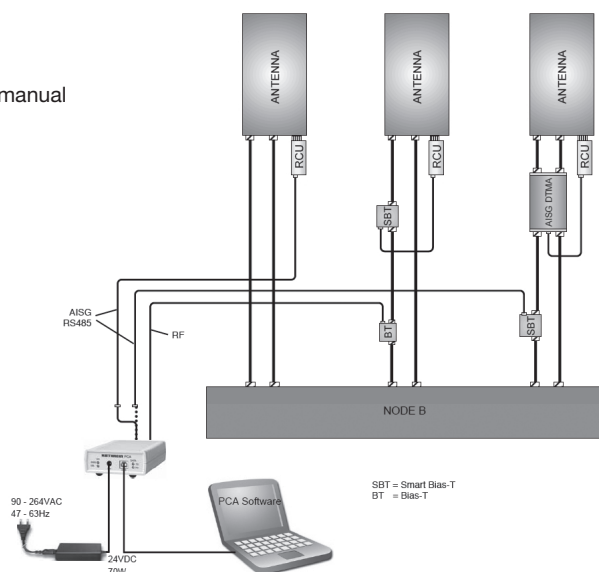
*** Switchable with software

Certificate: CE
FCC part 15 class B
UL (for external power adapter)

Standards: EN 60950-1
EN 55022
EN 55024

System requirements for PCA Software: Windows XP, Win7, Win8, Win10

Scope of supply: PCA
External power supply (24 V DC / 70 W)
USB cable
AC power cable
CD-ROM with PCA software, drivers and manual
Installation guide



SBT = Smart Bias-T
BT = Bias-T

Connecting Cable For Remote Electrical Tilt (RET) System

KATHREIN

For indoor and outdoor use



RET Cable for power supply and control

Type No.	86010007 ...
Connectors	2 x 8 pin connector according IEC 60130-9, female/male
Tightening torque for fixing the connectors	0.5 – 1 Nm (The connector should be tightened by hand or by special torque scredriver)
Construction	Screen 1x twisted pair 100 Ω/1 MHz 2x power supply, 1x ground AWM style 20317 I/II A/B + 20549 + 20233
Rated current	4 A (power supply) (at 50 °C air temperature)
Temperature range	-40 °C to +80 °C, (fixed position)
Protection class	IP 67 (connected)
Cable diameter	8 mm
Flammability	VL 1581 VW-1 CSA FT 1
Colour	Black, similar to RAL 9005

Minimum bending radius: One time 60 mm, several times 120 mm.

The male and female connectors of all Kathrein RET products are compatible components which are designed to operate under the environmental conditions as described in ETS 300 019-1-4 class 4.1 E.

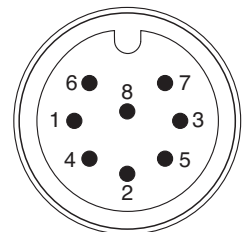
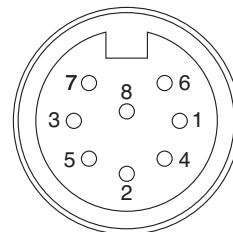


Control Cable

Length	Type No.
0.5 m	86010054
1 m	86010007
2 m	86010008
3 m	86010029
5 m	86010009
10 m	86010010
20 m	86010032
25 m	86010011
40 m	86010012
50 m	86010033
60 m	86010013
80 m	86010014
100 m	86010015

Female

Male



PIN assignment according AISG:

- 1 +13 V DC (+12 V DC nominal)
- 2 not connected
- 3 RS485 B
- 4 not connected
- 5 RS485 A
- 6 +29 V DC (+24 V DC nominal)
- 7 DC Return
- 8 not connected



Optional:

Torque screwdriver for AISG connecting cable (order no. 85010080).
With the torque screwdriver, Kathrein connecting cables can be easily fixed with the recommended torque of 1 Nm.



Old style connector:
Torque screwdriver not usable



New style connector:
Torque screwdriver usable

RET

3-way

Operate a FlexRET system with up to three independent primaries.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Selectable arrangement of arrays
- Possible for up to three FlexRETs (daisy chain)



Type No.		86010154	
Protocols		compliant to AISG 1.1 and 3GPP/AISG 2.0	
Logical interface ex factory		3GPP/AISG 2.0	
Input voltage range	V	10 ... 30 (pin 1, pin 6)	
Power consumption	W	< 3 (stand by); < 12 (motor activated)	
Connectors		4 x 8 pin connector according to IEC 60130-9; according to AISG In: male; Out: female	
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP	
Temperature range	°C	-40 ... +60	
Protection class		IP 54 (installed)	
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)	
Max. cable length (Site Sharing Adapter to last FlexRET Antenna)	m ft	150 492	
Housing material		Cover: Aluminum die cast coated	
Weight	g lb	650 1.4 lb	
Packing size	mm inches	160 x 250 x 100 6.3 x 9.8 x 3.9 inches	
Dimensions (H x W x D)	mm inches	123 x 166 x 62 4.8 x 6.5 x 2.4	



Please note:

The Site Sharing Adapter can exclusively be used with FlexRET antennas. The FlexRET output of the Site Sharing Adapter needs to be directly connected to the FlexRET antenna. For selecting the arrangement of the antenna arrays, a separate software application is available.

The Site Sharing Adapter expands the AISG interface of max. three FlexRETs up to three AISG interfaces for three independent AISG primaries. The alignment of antenna arrays can be configured individually.

Only FlexRET devices from firmware version FW_V02.01.00 are suitable for operation with the Site Sharing Adapter.

- The firmware version can be queried through the AISG command "get information".
- The latest firmware version for FlexRET can be downloaded from the Kathrein website.
- FlexRET Antennas with firmware version FW_V02.00.XX must be updated before the initial setup of the Site Sharing Adapter. The FlexRET device will not be detected otherwise.
- A firmware update can be performed with a corresponding primary (e.g. Node B) or Controller (e.g. Kathrein ALC, -PCA, -CCU).

Standby power for Site Sharing Adapter and FlexRET system is taken by the BTS with the highest DC input voltage. When the motor is in operation, the electrical power is allocated fairly to the base stations, according to the individual input. The Site Sharing Adapter can not be used in combination with an AISG splitter (e.g. 86010002). For the connection of the Site Sharing Adapter and the FlexRETs, a standard AISG cable shall be used.

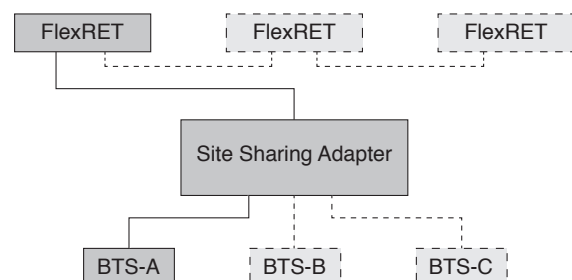
The latest configuration software and the manual with detailed configuration information are provided via our customer portal on www.kathrein.com

Additional earthing may be needed depending on the used installation. Please follow the guidelines given in the manual.

Standards: EN 60950-1 (Safety),
EN 60950-22 (Safety – Equipment installed outdoor)
EN 55022 (Emission),
EN 55024 (Immunity),
ETS 300019-1-4 (Environmental),
UL 60950-1; 1st edition

Certification: CE, FCC

Scope of supply: Site Sharing Adapter, tension band



6-way

Operate a FlexRET system with up to six independent primaries.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Selectable arrangement of arrays
- Possible for up to three FlexRETs (daisy chain)



Type No.		86010155
Protocols		compliant to AISG 1.1 and 3GPP/AISG 2.0
Logical interface ex factory		3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 1, pin 6)
Power consumption	W	< 3 (stand by); < 12 (motor activated)
Connectors		4 x 8 pin connector according to IEC 60130-9; according to AISG In: male; Out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 1, pin 6); DC return (pin 7); according to AISG / 3GPP
Temperature range	°C	-40 ... +60
Protection class		IP 54 (installed)
Lightning protection		AISG interface (each pin) 2.5 kA (10/350 µs) 8 kA (8/20 µs)
Max. cable length (Site Sharing Adapter to last FlexRET Antenna)	m ft	150 492
Housing material		Cover: Aluminum die cast coated
Weight	g lb	1350 3.0 lb
Packing size	mm inches	195 x 360 x 110 7.68 x 14.17 x 4.33
Dimensions (H x W x D)	mm inches	156 x 265 x 65 6.14 x 10.43 x 2.56



Please note:

The Site Sharing Adapter can exclusively be used with FlexRET antennas. The FlexRET output of the Site Sharing Adapter needs to be directly connected to the FlexRET antenna. For selecting the arrangement of the antenna arrays, a separate software application is available.

The Site Sharing Adapter expands the AISG interface of max. three FlexRETs up to three AISG interfaces for six independent primaries. The alignment of antenna arrays can be configured individually.

Only FlexRET devices from firmware version FW_V02.01.00 are suitable for operation with the Site Sharing Adapter.

- The firmware version can be queried through the AISG command "get information".
- The latest firmware version for FlexRET can be downloaded from the Kathrein website.
- FlexRET Antennas with firmware version FW_V02.00.XX must be updated before the initial setup of the Site Sharing Adapter. The FlexRET device will not be detected otherwise.
- A firmware update can be performed with a corresponding primary (e.g. Node B) or Controller (e.g. Kathrein ALC, -PCA, -CCU).

When the motor is in operation, the electrical power is allocated fairly to the base stations, according to the individual input. The Site Sharing Adapter can not be used in combination with an AISG splitter (e.g. 86010002). For the connection of the Site Sharing Adapter and the FlexRETs, a standard AISG cable shall be used.

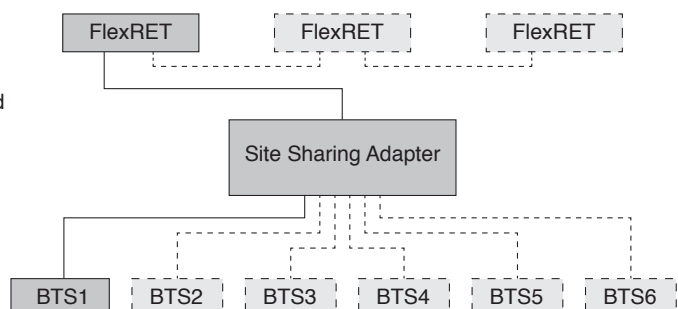
The latest configuration software and the manual with detailed configuration information are provided via our customer portal on www.kathrein.com

Additional earthing may be needed depending on the used installation. Please follow the guidelines given in the manual.

- Standards:
- EN 60950-1 (Safety),
 - EN 60950-22 (Safety – Equipment installed outdoor)
 - EN 55022 (Emission),
 - EN 55024 (Immunity),
 - ETS 300019-1-4 (Environmental),
 - UL 60950-1; 1st edition

Certification: CE, FCC

Scope of supply: Site Sharing Adapter, tension band



RET

Converts the AISG out (female) to an AISG in (male) port in order to operate the FlexRET with two BTS.
Only for FlexRET 86010153v01.



Type No.		86010162
Protocols		compliant to 3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 6)
Connectors		1 x 8 pin connector (male) according to IEC 60130-9; according to AISG C485 1 x 8 pin connector (female) according to IEC 60130-9; according to AISG C485 Female mates with FlexRET
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Temperature range	°C	-40 ... +60
Protection class		IP 67 (installed)
Surge current capability		AISG interface (each pin) in combination with FlexRET 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Housing material		Connector shell: Zinc die cast Ni plated; Contacts: Ag plated
Weight	g lb	45 0.099
Packing size (H x W x D)	mm inches	43 x 20 x 20 1.7 x 0.78 x 0.78
Dimensions (H x W x D)	mm inches	43 x 20 x 20 1.7 x 0.78 x 0.78

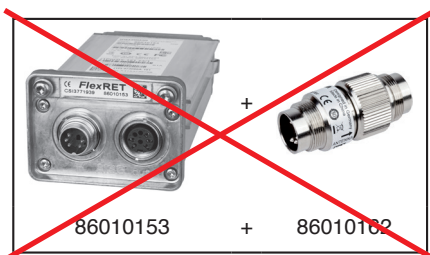
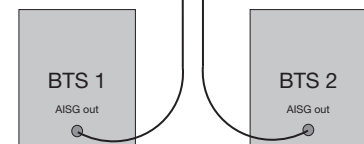
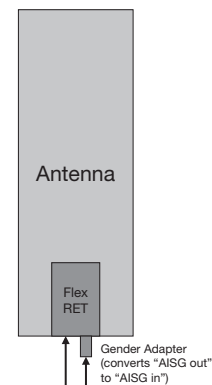


Standards: EN 60950-1 (Safety)
EN 60950-22 (Safety – Equipment installed outdoor)
ETS 300019-1-4 (Environmental)
UL 60950-1; 1st edition

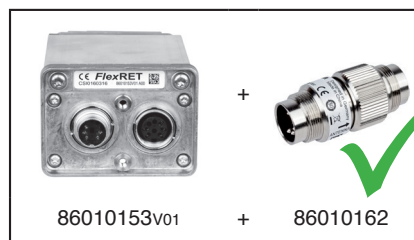
Certification: CE

Scope of supply: Gender Adapter

Notice: The Gender Adapter is solely to be used in combination with the FlexRET module 86010153v01. A combination with other modules, especially with the FlexRET module 86010153, must be avoided since this could lead to unexpected behaviour in the FlexRET module and could cause overvoltage in the primary power supply.
For avoidance of doubt, the combination with any other module, with exception of the FlexRET module 86010153v01, could lead to a damage. In no event will Kathrein, its affiliates and/or subsidiaries be liable for direct, incidental, consequential, special, indirect damages arising from or relating to the combination with another module except FlexRET module 86010153v01. These limitations will apply even if Kathrein has been advised of the possibility of such damages and whether such damages are foreseeable or not.



In combination with 86010153:
Gender Adapter is not usable.



In combination with 86010153v01:
Gender Adapter can be used.

Port Extender allows daisy chaining of FlexRET 86010153v01 when the FlexRET operates with two BTS. G-in and G-out is converting the AISG-out (female) of FlexRET to an AISG-in while maintaining the daisy chain capability on this port. Only for FlexRET 86010153v01.



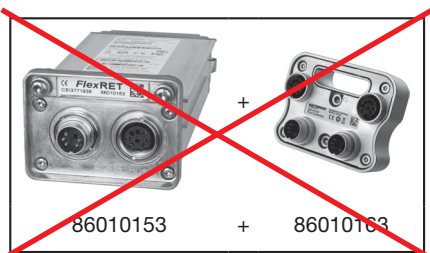
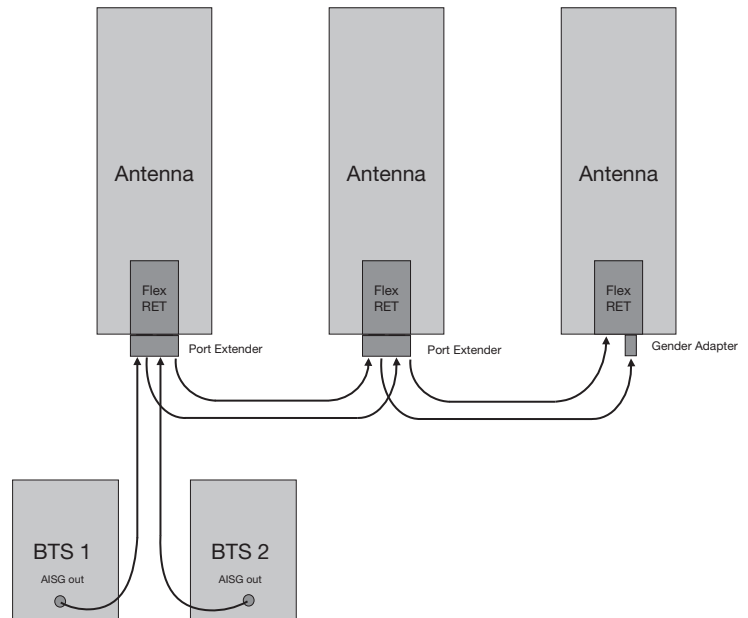
Type No.		86010163
Protocols		compliant to 3GPP/AISG 2.0
Input voltage range	V	10 ... 30 (pin 6)
Connectors		4 x 8 pin connector according to IEC 60130-9; according to AISG C485 Daisy chain in: male; Daisy chain out: female Daisy chain G-in: male; Daisy chain G-out: female
Hardware interfaces		RS 485A/B (pin 5, pin 3); power supply (pin 6); DC return (pin 7); according to AISG / 3GPP
Temperature range	°C	-40 ... +60
Protection class		IP 67 (installed)
Surge current capability		AISG interface (each pin) in combination with FlexRET 2.5 kA (10/350 µs) 8 kA (8/20 µs) according to IEC 61000-4-5
Weight	g lb	160 0.35
Packing size (H x W x D)	mm inches	90 x 70 x 70 3.5 x 2.8 x 2.8
Dimensions (H x W x D)	mm inches	44.5 x 81 x 62 1.8 x 3.2 x 2.4



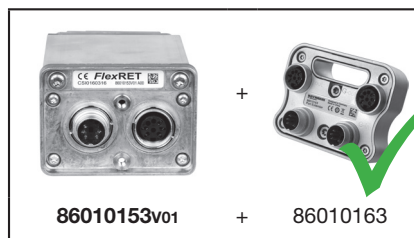
Standards: EN 60950-1 (Safety)
EN 60950-22 (Safety – Equipment installed outdoor)
ETS 300019-1-4 (Environmental)
UL 60950-1; 1st edition

Certification: CE
Scope of supply: Port Extender

Notice:
The Port Extender is solely to be used in combination with the FlexRET module 86010153v01. A combination with other modules, especially with the FlexRET module 86010153, must be avoided since this could lead to unexpected behaviour in the FlexRET module and could cause overvoltage in the primary power supply. For avoidance of doubt, the combination with any other module, with exception of the FlexRET module 86010153v01, could lead to a damage. In no event will Kathrein, its affiliates and/or subsidiaries be liable for direct, incidental, consequential, special, indirect damages arising from or relating to the combination with another module except FlexRET module 86010153v01. These limitations will apply even if Kathrein has been advised of the possibility of such damages and whether such damages are foreseeable or not.



In combination with 86010153:
Port Extender is not usable.



In combination with **86010153v01**:
Port Extender can be used.

DC-Power and Signal Splitter For Remote Electrical Tilt (RET) Indoor and Outdoor Use

KATHREIN

AISG compliant device for splitting of DC-power and control signals from one input to three outputs.

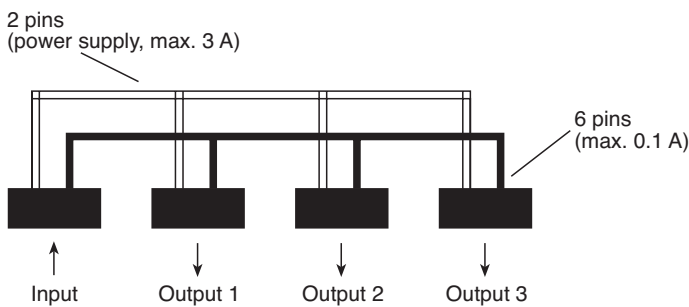


3-way Splitter for RET

Type No.	86010002
Connectors ¹⁾	4 x 8 pin connector according IEC 60130-9, 1 x male, 3 x female
Rated current (power supply)	3 A (at 50 °C)
Max. voltage	60 V
Protection class	IP 65
Weight	250 g
Packing size	114 mm x 117 mm x 117 mm
Height/width/depth	91 mm / 103 mm / 72 mm

¹⁾ The tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!

- Material:** Connector plate: Aluminum.
Cap: Plastic.
- Mounting:** Mast mounting (50 – 145 mm diameter) by clamp.
Wall mounting by screws (not supplied).
- Note:** **Connectors must be situated at the bottom. No inverted mounting possible.**
- Scope of supply:** 3-way Splitter
Clamp (50...145 mm)



Lightning Protection Device (LPD) For Remote Electrical Tilt (RET) Indoor and Outdoor Use

KATHREIN

The device is designed for lightning protection of control cables carrying partial lightning currents up to 25 kA (shield) and 2.5 kA (inner conductor), according IEC 61643-1, IEC 61312-3. Each pin is protected individually.



Lightning Protection Device for RET

Type No.	86010030
Connectors ¹⁾	2 x 8 pin connector according IEC 60130-9, input: male, output: female
SPD-Type	8 x bipolar gas tube
Max. impuls current	25 kA (housing, shield) (10/350 µs) inner conductors: 2.5 kA/pin (10/350 µs)
Max. dynamic overvoltage at spark gap (1 kV/µs)	< 700 V
Static overvoltage (100 V/s)	< 100 V
Grounding	Via mounting plate / clamps at metallic surfaces or via separate cable, min. cross-section 5 mm ² Cu (screw M6)
Max. operation current	4 A at 50 °C
Max. operation voltage	60 V
Protection class	IP 55
Weight	250 g
Packing size	114 mm x 117 mm x 117 mm
Height/width/depth	91 mm / 103 mm / 72 mm

¹⁾ The tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!

Material: Connector plate: Aluminum.
Cap: Plastic.

Mounting: Mast mounting (50 – 145 mm diameter) by clamp.
Wall mounting by screws (not supplied).

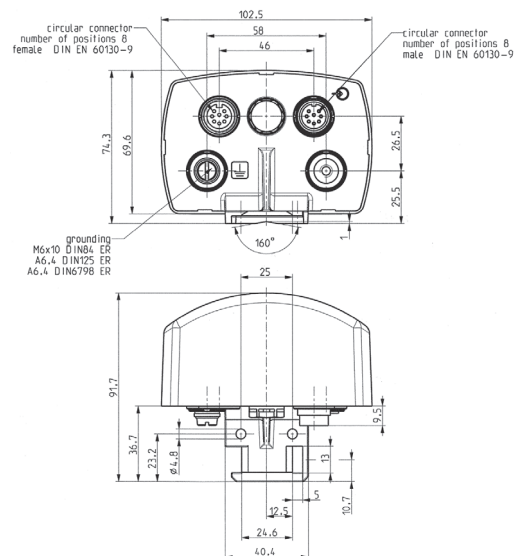
Note: No decoupling elements are integrated. The coordination with additional LPD's (device input) should be checked according to IEC 61312.

Grounding of the device via the mounting plate at metallic surfaces or via additional grounding cable (not included in the delivery extend).

Connectors must be situated at the bottom. No inverted mounting possible.

Important: A control cable with a minimum length of 2 meters is required between Lightning Protection Device and Central Control Unit at the BTS to achieve the required decoupling.

Scope of supply: Lightning Protection Device
Clamp (50 ... 145 mm)



RET

Earthing Clamp For Power Supply and Control Cable For Remote Control Unit (RCU)

KATHREIN

The clamp is designed for lightning protection of control cables according to EN 50164-1

Earthing clamp for RCU power supply and signal cable

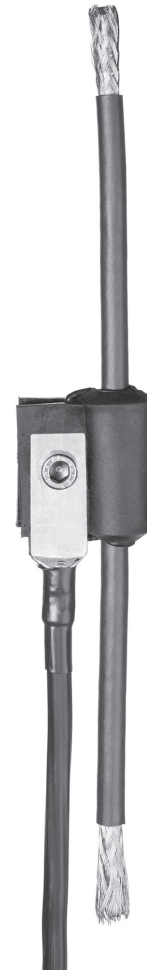
Type No.	86010031
Max. lightning current	20 kA (pulse 10/350 µsec)
Contact resistance	< 3 mΩ
Protection class	IP 68
Grounding	Via stranded grounding wire, 16 mm ² , length 0.5 m, one end terminated with cable eye (10 mm lug)
Packing size	Plastic bag: 210 mm x 210 mm
Weight	160 g

Material:
Body: Stainless steel with vulcanized Ethylene-Propylene-Caoutchouc
Screw: Stainless steel
Skin: Copper alloy
Grounding wire: Copper

Note:
The earthing clamp is suitable only for the Kathrein Power Supply and Signal Cables,
Type No. 86010007 to 86010015, 86010029, 86010032, 86010033, 86010054 to 86010060 or shielded cables with

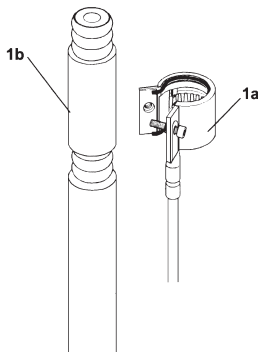
- shield diameter 6.1 mm
- jacket diameter 7.8 mm ±0.3 mm

The kit contains:
1 x Grounding kit body incl. Butyl sealing rope covered with paper
1 x Screw M6 DIN 912
1 x Grounding wire



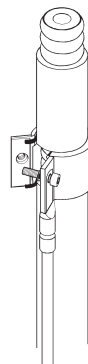
Mounting instructions:

This instruction is written for qualified and experienced personnel. Please read it carefully before starting work. Any liability or responsibility for the result of improper or unsafe installation is disclaimed!

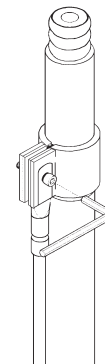


Attention!
Install grounding kit only where the cable runs straight.

Fig. 1a Preassembled grounding kit.
Fig. 1b Clean the plastic jacket at the desired grounding point and cut out a strip of 15 mm with aid of a suitable stripping tool.



Remove covering paper from Butyl sealing.
Wrap the grounding kit body around the cable and align it.



Tighten the screw (> 6 Nm)

Summary – Electrical Accessories

380...5920 MHz

KATHREIN

Type	Type No.	Frequency range	Remark	Max. power	Connector female	Page
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Splitters

2-way Splitter 380–3800	86010130	380 – 3800 MHz	Indoor/Outdoor	200 W	N	274
2-way Splitter 380–3800	86010131	380 – 3800 MHz	Indoor/Outdoor	700 W	7-16	274
2-way Splitter 694–2700	86010017	694 – 2700 MHz	Indoor	100 W	N	275
2-way Splitter 694–3800	86020017	694 – 3800 MHz	Indoor/Outdoor	100 W	4.3-10	276
3-way Splitter 694–2700	86010018	694 – 2700 MHz	Indoor	100 W	N	275
3-way Splitter 694–3800	86020018	694 – 3800 MHz	Indoor/Outdoor	100 W	4.3-10	276
4-way Splitter 694–2700	86010019	694 – 2700 MHz	Indoor	100 W	N	275
4-way Splitter 694–3800	86020019	694 – 3800 MHz	Indoor/Outdoor	100 W	4.3-10	276
2-way Splitter 694–3800	86010101	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	277
3-way Splitter 694–3800	86010103	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	277
4-way Splitter 694–3800	86010105	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	277

Tappers

2-way Tapper 694–2700	7.0/1.0 dB	86010136	694 – 2700 MHz	Indoor	100 W	N	278
2-way Tapper 694–2700	7.0/1.0 dB	86020136	694 – 2700 MHz	Indoor	100 W	4.3-10	279
2-way Tapper 694–2700	10.4/0.4 dB	86010137	694 – 2700 MHz	Indoor	100 W	N	278
2-way Tapper 694–2700	10.4/0.4 dB	86020137	694 – 2700 MHz	Indoor	100 W	4.3-10	279
2-way Tapper 694–2700	15.1/0.1 dB	86010138	694 – 2700 MHz	Indoor	100 W	N	278
2-way Tapper 694–2700	15.1/0.1 dB	86020138	694 – 2700 MHz	Indoor	100 W	4.3-10	279
2-way Tapper 694–2700	7.0/1.0 dB	86010150	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	280
2-way Tapper 694–2700	10.5/0.5 dB	86010151	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	280
2-way Tapper 694–2700	15.3/0.3 dB	86010152	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	280

Continuously adjustable ratio

2-way Tapper 870–960/1710–2500 5.0–15.0dB	86010023	870 – 960 MHz 1710 – 2500 MHz	Indoor	100 W	N	281
Multi-band Tapper 380–960/1695–2700/ 3400–3800/4920–5920 5.0–20.0dB	86010160	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz	Indoor/Outdoor	100 W	N	282
Multi-band Tapper 380–960/1695–2700/ 3400–3800/4920–5920 5.0–20.0dB	86020160	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz	Indoor/Outdoor	100 W	4.3-10	282

New or changed product

Low-loss Power Splitters Multi-band

380–3800

KATHREIN

For indoor and outdoor use.

2-way Splitter 380–3800

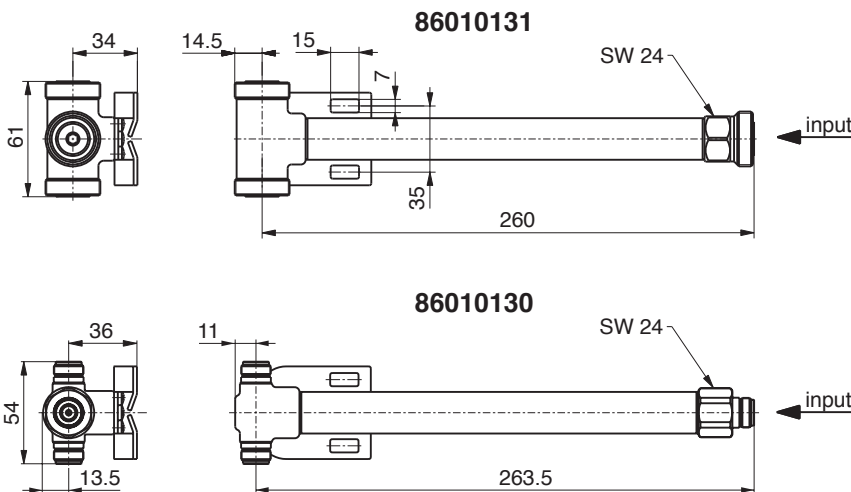
Type No.	86010130	86010131
Connector (female)	N	7-16
Max. power (at 50 °C ambient temperature)	200 W	700 W
For connecting ... antennas	2	
Frequency range	380 – 3800 MHz	
VSWR	< 1.5	
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)	
Impedance	50 Ω	
Insertion loss	< 0.05 dB	
Weight	750 g	870 g
Packing size	300 x 75 x 75 mm	

- Material:** Brass. Surface treatment: CuSnZn3
- Mounting:** Bracket for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).
- DC capability:** DC transmission between all terminations (suitable for remote power supply systems).
- Environmental conditions:** ETS 300 019-1-4 class 4.1 E
– Low temperature: -55 °C
– High temperature (dry): +60 °C
IP 65



86010131

86010130



Clamps (order separately)

Type	Description	Remarks
736801	1 clamp	Mast: 34 – 60 mm diameter
736802	1 clamp	Mast: 60 – 80 mm diameter
736803	1 clamp	Mast: 80 – 100 mm diameter
736804	1 clamp	Mast: 100 – 120 mm diameter
736805	1 clamp	Mast: 120 – 140 mm diameter



736805

Low-loss Power Splitters Multi-band

694–2700

KATHREIN

For indoor use.

2-way Splitter 694–2700

3-way Splitter 694–2700

4-way Splitter 694–2700

Type No.		86010017	86010018	86010019
Frequency range	MHz	694 – 2700		
For connecting ... antennas		2	3	4
Insertion loss	dB	< 0.05		
Impedance	Ω	50		
VSWR	694 – 894 MHz:	< 1.5	< 1.5	< 1.5
	790 – 2500 MHz:	< 1.25	< 1.25	< 1.3
	2500 – 2700 MHz:	< 2.0	< 2.0	< 2.0
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	100 (at 50 °C ambient temperature)		
Connector		N female		
Weight	kg	0.37	0.40	0.43
	lb	0.82	0.88	0.95
Profile cross-section	mm	25 x 25		
	inches	1.0 x 1.0		
Packing size	mm	208 x 73 x 86		
	inches	8.2 x 2.9 x 3.4		
Max. size	mm	204 / 63 / 44		
	inches	8.0 / 2.5 / 1.7		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission between all terminations
(suitable for remote power supply systems).

Environmental conditions: IP 52



Input



Low-loss Power Splitters Multi-band

694–3800

KATHREIN

For indoor and outdoor use.

2-way Splitter 694–3800

3-way Splitter 694–3800

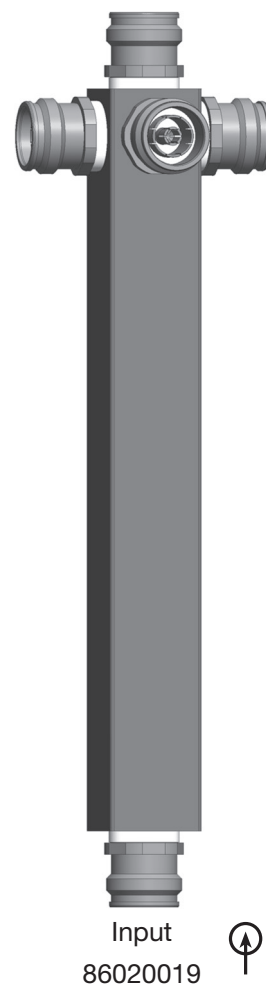
4-way Splitter 694–3800

Type No.		86020017	86020018	86020019
Frequency range	MHz	694 – 3800		
For connecting ... antennas		2	3	4
Insertion loss	dB	< 0.05		
Impedance	Ω	50		
VSWR	694–2100 MHz	< 1.3	< 1.3	< 1.3
	2100–2700 MHz	< 1.3	< 1.4	< 1.3
	2700–3800 MHz	< 1.5	< 1.5	< 1.6
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	100 (at 50 °C ambient temperature)		
Connector		4.3-10 female		
Weight	kg	0.42	0.45	0.48
	lb	0.93	0.99	1.06
Profile cross-section	mm	25 x 25		
	inches	1.0 x 1.0		
Packing size	mm	248 x 73 x 86		
	inches	9.8 x 2.9 x 3.4		
Max. size	mm	237 / 66 / 46		
	inches	9.3 / 2.6 / 1.8		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission between all terminations
(suitable for remote power supply systems).

Environmental conditions: IP 65



Low-loss Power Splitters Multi-band

694–3800

KATHREIN

For indoor and outdoor use.

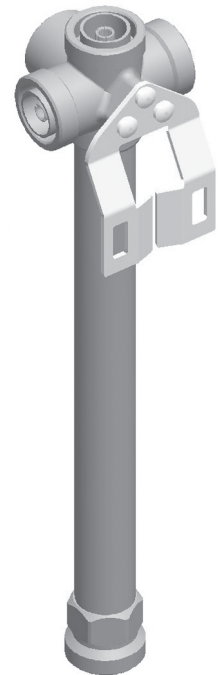
2-way Splitter 694–3800

3-way Splitter 694–3800

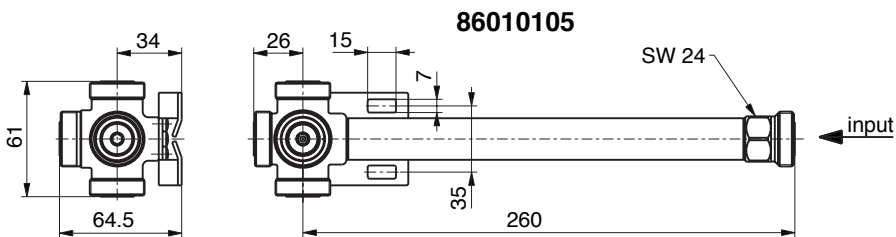
4-way Splitter 694–3800

Type No.	86010101	86010103	86010105
Connector (female)	7-16	7-16	7-16
Max. power (at 50 °C ambient temperature)	700 W	700 W	700 W
For connecting ... antennas	2	3	4
Frequency range	694 – 3800 MHz		
VSWR	694 – 894 MHz: < 1.32 790 – 3800 MHz: < 1.15		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Impedance	50 Ω		
Insertion loss	< 0.05 dB		
Weight	870 g	900 g	960 g
Packing size	300 x 75 x 75 mm		

- Material: Brass. Surface treatment: CuSnZn3
- Mounting: Bracket for wall mounting included in the scope of supply.
For pipe mast mounting use clamps listed below (order separately).
- DC capability: DC transmission between all terminations (suitable for remote power supply systems).
- Environmental conditions: ETS 300 019-1-4 class 4.1 E
– Low temperature: -55 °C
– High temperature (dry): +60 °C
IP 65



86010105



Clamps (order separately)

Type	Description	Remarks
736801	1 clamp	Mast: 34 – 60 mm diameter
736802	1 clamp	Mast: 60 – 80 mm diameter
736803	1 clamp	Mast: 80 – 100 mm diameter
736804	1 clamp	Mast: 100 – 120 mm diameter
736805	1 clamp	Mast: 120 – 140 mm diameter



736805

Low-loss Power Tappers Multi-band

694–2700

KATHREIN

For indoor use.

2-way Tapper 694–2700 7.0 /1.0dB

2-way Tapper 694–2700 10.4/0.4dB

2-way Tapper 694–2700 15.1/0.1dB

Type No.	86010136	86010137	86010138
Frequency range	694 – 2700 MHz		
Tap Loss Input ↔ P ₁	- 1.0 dB	- 0.4 dB	- 0.1 dB
Input ↔ P ₂	- 7.0 dB	- 10.4 dB	- 15.1 dB
For connecting ... antennas	2		
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
VSWR	694 – 790 MHz: < 2.0 790 – 2500 MHz: < 1.5 2500 – 2700 MHz: < 2.0		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Max. power	100 W (at 50 °C ambient temperature)		
Connector	N female		
Weight	500 g		
Profile cross-section	25 x 25 mm		
Packing size	267 x 95 x 111 mm		
Max. size	244 / 64 / 25 mm		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P₁.
P₂ is coupled capacitively.

Environmental conditions: IP 52



Input



Low-loss Power Tappers Multi-band

694–2700

KATHREIN

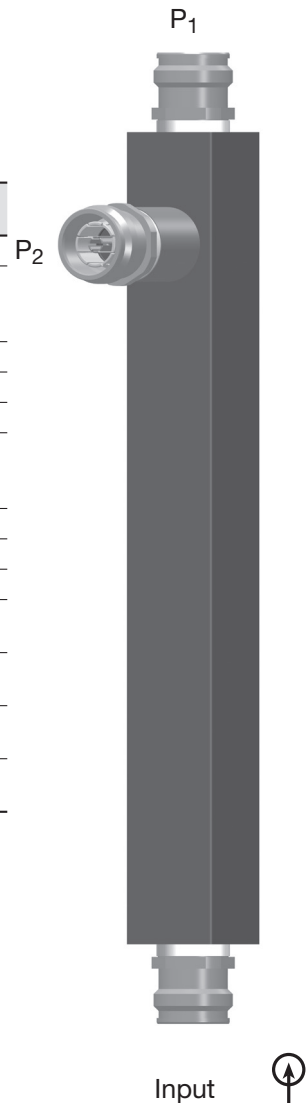
For indoor use.

2-way Tapper 694–2700 7.0 /1.0dB

2-way Tapper 694–2700 10.4/0.4dB

2-way Tapper 694–2700 15.1/0.1dB

Type No.		86020136	86020137	86020138
Frequency range	MHz	694 – 2700 MHz		
Tap Loss	dB	- 1.0	- 0.4	- 0.1
Input ↔ P ₁				
Input ↔ P ₂		- 7.0	- 10.4	- 15.1
For connecting ... antennas		2		
Insertion loss	dB	< 0.05		
Impedance	Ω	50		
VSWR		694 – 790 MHz: < 2.0 790 – 2500 MHz: < 1.5 2500 – 2700 MHz: < 2.0		
Intermodulation IM3	dBc	< -150 (2 x 43 dBm carrier)		
Max. power	W	100 (at 50 °C ambient temperature)		
Connectors		4.3-10 female		
Weight	g	500		
	lb	1.1		
Profile cross-section	mm	25 x 25		
	inches	1.0 x 1.0		
Packing size	mm	267 x 95 x 111		
	inches	10.5 x 3.7 x 4.4		
Max. size	mm	247 / 66 / 25		
	inches	9.7 / 2.6 / 1.0		



Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P₁.
P₂ is coupled capacitively.

Environmental conditions: IP 65

Low-loss Power Tappers Multi-band

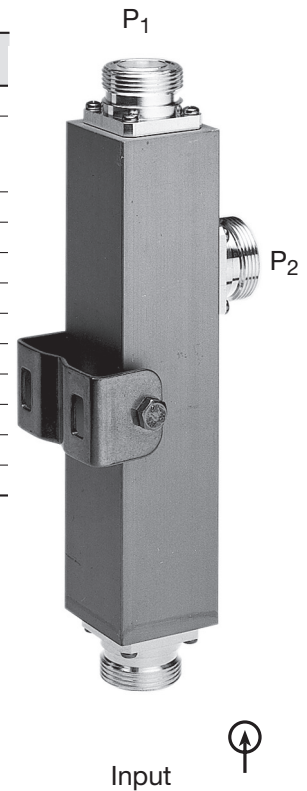
694–2700

KATHREIN

For indoor and outdoor use.

2-way Tapper 694–2700 7.0 /1.0dB
 2-way Tapper 694–2700 10.5/0.5dB
 2-way Tapper 694–2700 15.3/0.3dB

Type No.	86010150	86010151	86010152
Frequency range	694 – 2700 MHz		
Tap Loss			
Input ↔ P ₁	-1.0 dB	-0.5 dB	-0.3 dB
Input ↔ P ₂	-7.0 dB	-10.5 dB	-15.3 dB
For connecting ... antennas	2		
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
VSWR	694 – 2700 MHz: < 1.5		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Connector	7-16 female		
Weight	Approx. 1.3 kg		
Packing size	310 x 93 x 112 mm		
Max. size	244 / 90 / 55 mm		



Material: Housing: Aluminum.
 Inner conductor: Brass.

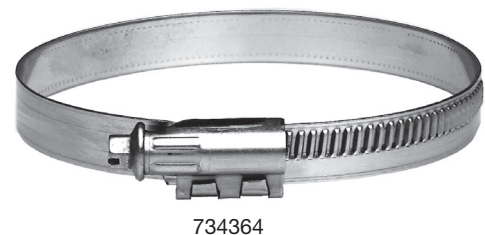
DC capability: DC transmission only between input and port P₁.
 P₂ is coupled capacitively.

Mounting: Bracked for wall mounting included in the scope
 of supply.
 For pipe mast mounting use clamps listed below
 (order separately).

Environmental conditions: IP 65

Clamps (order separately)

Type No.	Description	Remarks
734360	1 tension band	Mast: 34 – 60 mm diameter
734361	1 tension band	Mast: 60 – 80 mm diameter
734362	1 tension band	Mast: 80 – 100 mm diameter
734363	1 tension band	Mast: 100 – 120 mm diameter
734364	1 tension band	Mast: 120 – 140 mm diameter
734365	1 tension band	Mast: 45 – 125 mm diameter



Low-loss Power Tapper Multi-band Continuously Adjustable

870–960 / 1710–2500

KATHREIN

5.0 – 15.0 dB

For indoor use.

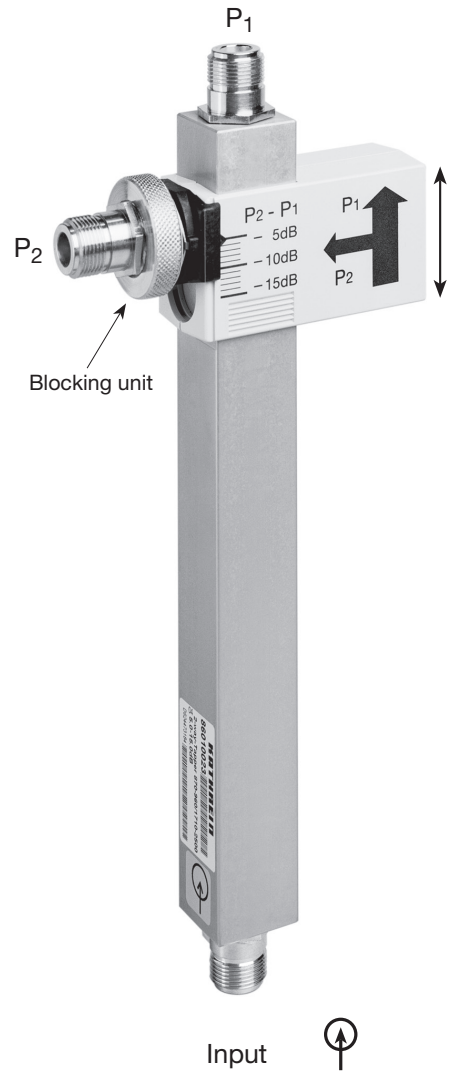
2-way Tapper 870–960/1710–2500 5.0–15.0dB

Type No.	86010023
Frequency range	870 – 960 MHz and 1710 – 2500 MHz
Power ratio between outputs (P ₂ ↔ P ₁)	–5.0 dB to –15.0 dB continuously adjustable
For connecting ... antennas	2
Insertion loss	< 0.1 dB
Impedance	50 Ω
VSWR	< 1.7
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)
Max. power	100 W (at 50 °C ambient temperature)
Connector	N female
Weight	0.5 kg
Profile cross-section	25 x 25 mm
Packing size	277 x 111 x 40 mm
Max. size	263 / 100 / 25 mm

Material: Housing: Aluminum.
Inner conductor: Brass.
Adjustment mechanism: ASA.

DC capability: DC transmission only between input and port P₁.
P₂ is coupled capacitively.

Environmental conditions: IP 52



Splitting table

P ₂ / P ₁ [dB]	Splitting ratio P ₁ / P ₂	Splitting attenuation	
		P _{Input} / P ₁ [dB]	P _{Input} / P ₂ [dB]
–5	3.2	–1.2	–6.2
–6	4	–1.0	–7.0
–7	5	–0.8	–7.8
–8	6.3	–0.6	–8.6
–9	8	–0.5	–9.5
–10	10	–0.4	–10.4
–11	12.6	–0.3	–11.3
–12	15.8	–0.3	–12.3
–13	20	–0.2	–13.2
–14	25.1	–0.2	–14.2
–15	31.6	–0.1	–15.1

Multi-band Low-loss Power Tapper

380-960 / 1695-2700 / 3400-3800 / 4920-5920

KATHREIN

Continuously Adjustable Splitting Ratio

5.0 dB – 20.0 dB

For indoor and outdoor use.

2-way Tapper 380-960/1695-2700/3400-3800/4920-5920

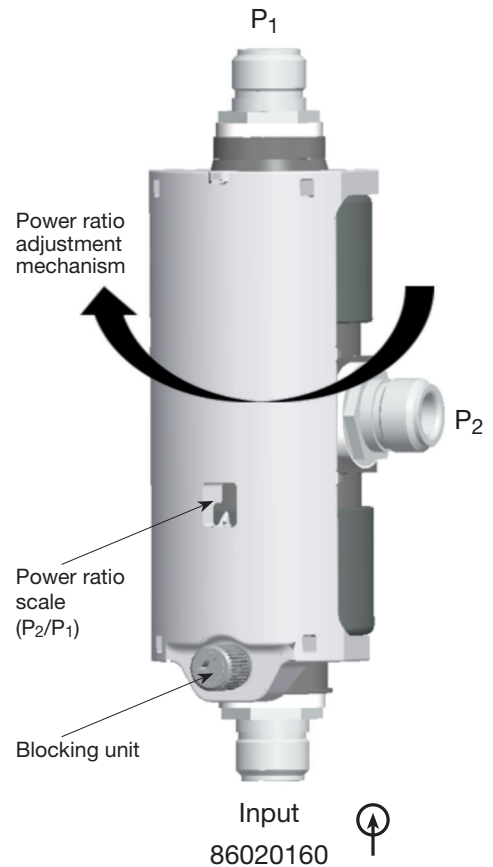
Type No.		86020160	86010160
Frequency range	MHz	380 – 960 1695 – 2700 3400 – 3800 4920 – 5920	
Power ratio between outputs (P_2 / P_1)	dB	-5 to -20 continuously adjustable	
For connecting ... antennas		2	
Insertion loss	dB	380 – 960 MHz: < 0.2 1695 – 2700 MHz: < 0.2 3400 – 3800 MHz: < 0.5 4920 – 5920 MHz: < 0.7	
Impedance	Ω	50	
VSWR		380 – 960 MHz: < 1.5 1695 – 2700 MHz: < 1.5 3400 – 3800 MHz: < 1.7 4920 – 5920 MHz: < 1.7	
Intermodulation IM3	dBc	380 – 960 MHz: < -150 (2 x 43 dBm carrier) 1695 – 2700 MHz: < -150 (2 x 43 dBm carrier) 3400 – 3800 MHz: < -150 (2 x 43 dBm carrier) 4920 – 5920 MHz: not relevant	
Max. power	W	100 (at 50 °C ambient temperature)	
Connector		4.3-10 female	N female
Weight	kg lb	0.5 1.1	
Environmental conditions		Indoor, outdoor use	
Protection class		IP 65	
Profile diameter	mm inches	50 2.0	
Packing size	mm inches	225 x 80 x 62 8.9 x 5.0 x 2.4	190 x 80 x 60 7.5 x 5.0 x 2.4
Max. size (including connectors)	mm inches	160 / 63 / 52 6.3 / 2.5 / 2.0	160 / 70 / 55 6.3 / 2.8 / 2.2

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P_1 .

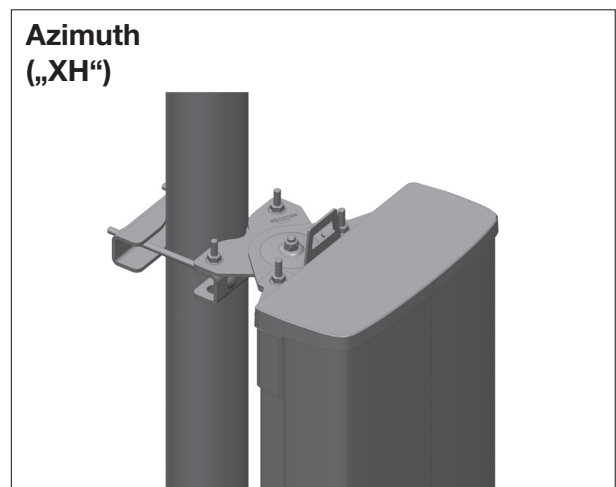
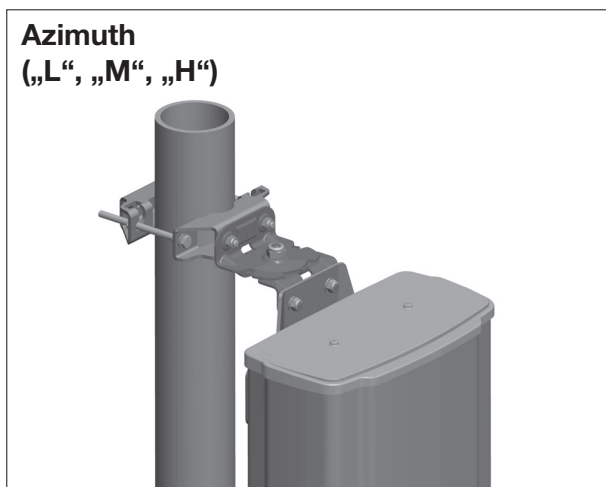
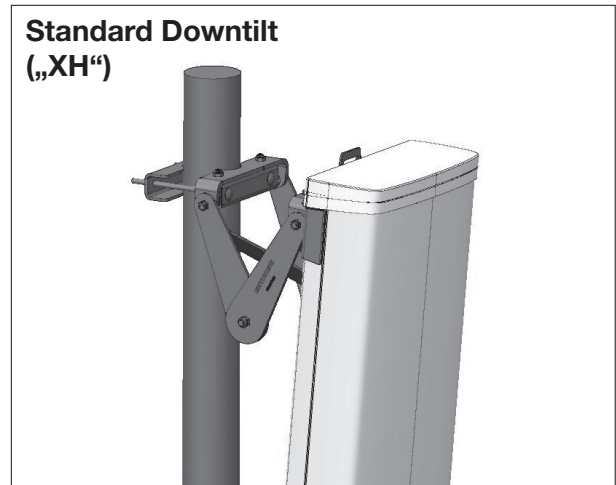
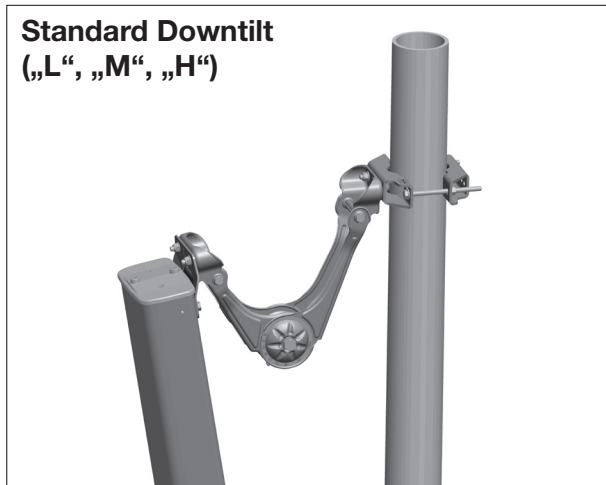
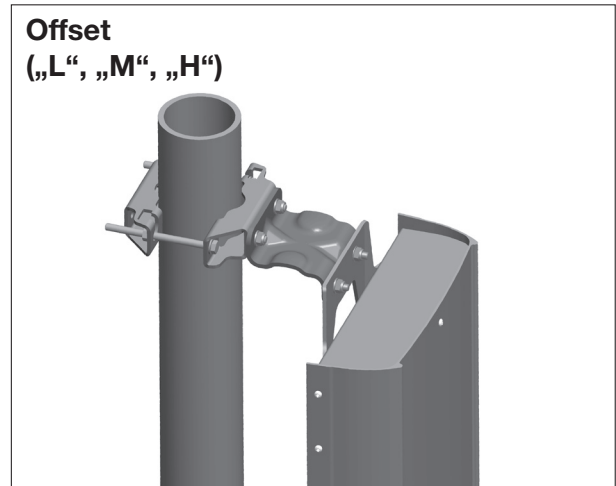
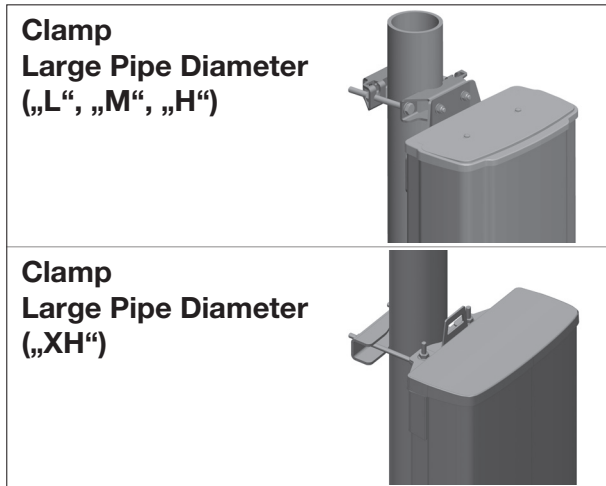
Splitting table (typical values)

P_2 / P_1 [dB]	Splitting ratio P_1 / P_2	Splitting attenuation	
		P_1 / P_{Input} [dB]	P_2 / P_{Input} [dB]
-5	3.2	-1.3	-6.3
-6	4	-1.05	-7.05
-7	5	-0.85	-7.85
-8	6.3	-0.7	-8.7
-9	8	-0.6	-9.6
-10	10	-0.5	-10.5
-11	12.6	-0.4	-11.4
-12	15.8	-0.35	-12.35
-13	20	-0.25	-13.25
-14	25.1	-0.2	-14.2
-15	31.6	-0.15	-15.15
-16	39.8	-0.14	-16.14
-17	50.1	-0.12	-17.12
-18	63.1	-0.11	-18.11
-19	79.4	-0.1	-19.1
-20	100.0	-0.09	-20.09



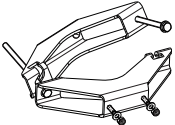



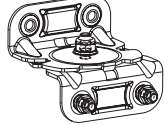
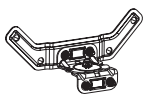
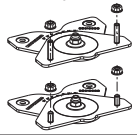
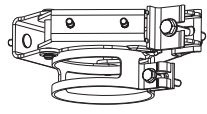
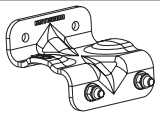
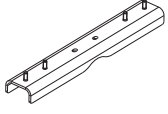

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The hereinafter referred to “wind load category L - M - H - XH” correspond to the defined “category of mounting hardware” given in the respective data sheets.



Product Line of Mounting Parts

KATHREIN

Type	Windload Classification	Pole Diameter in mm	Type No.	Remark	Page	
Clamp 	light / medium	∅ 28 – 60	731651		286	
	light / medium / heavy	∅ 42 – 115	738546			
	light / medium / heavy	∅ 110 – 220	85010002			
		∅ 210 – 380	85010003			
Clamp 	X-heavy	∅ 55 – 115	85010096		287	
	X-heavy	∅ 110 – 220	85010097		288	
	X-heavy	∅ 210 – 380	85010101		289	
Downtilt kit 	light		732327		290	
	light / medium		737978		291	
	heavy		85010008		292	
Downtilt kit 	X-heavy		85010099		293	
Azimuth Adjustment Kit 	light / medium		85010014	Pole mounting adjustment angle ±30° (additional clamp needed)	294	
	heavy		85010015			
Azimuth Adjustment Kit 	light / medium		85010016	Wall mounting adjustment angle ±30°	294	
	heavy		85010017			
Azimuth Adjustment Kit 	X-heavy		85010098		295	
3 Sector Clamp 	light / medium	∅ 88.9	742263		296	
		∅ 88.9	742317			
		∅ 114.3	742033			
		∅ 139.7	742034			
	heavy	∅ 114.3	85010058			
		∅ 139.7	85010059			
X-heavy	∅ 114.3	85010102	297			
Offset 	light / medium		85010060	Clearance between pole and antenna (additional clamp needed)	298	
	heavy		85010061			
	X-heavy		85010104			
2x Panel Mounting Kit 	light / medium	max. Panel width 160		742113	Additional clamp needed	
		max. Panel width 325		85010075		300
		max. Panel width 377		85010087		301
	X-heavy	∅ 110 – 220	max. Panel width 378	85010103		302
		∅ 210 – 380		85010108		
Tension Band 	light	∅ 34 – 60	734360	Please note: Only usable without downtilt kit	303	
		∅ 60 – 80	734361			
		∅ 80 – 100	734362			
		∅ 100 – 120	734363			
		∅ 120 – 140	734364			
		∅ 45 – 125	734365			

New or changed product

Mounting Hardware

Clamps

(Wind Load Category “L”, “M” and “H”)

KATHREIN

Clamps

Type No.	731651	738546	85010002	85010003
Suitable for mast diameter	28 – 60 mm	42 – 115 mm	110 – 220 mm	210 – 380 mm
Antenna – mast distance F	25 – 28 mm	20 – 26 mm	47 – 55 mm	48 – 68 mm
Number of pieces	1 clamp	1 clamp	1 clamp	1 clamp
Material – Clamp	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel
– Screws	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Hot-dip galvanized steel/ Stainless steel	Stainless steel/ Stainless steel
– Nuts	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Weight	0.8 kg	1.1 kg	2.7 kg	4.8 kg

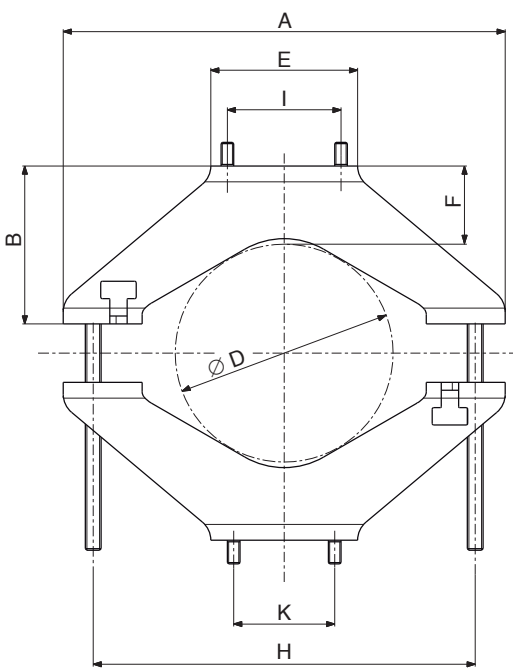
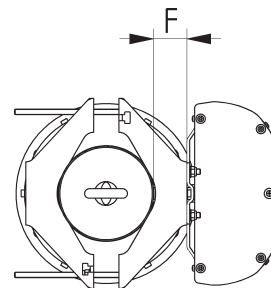
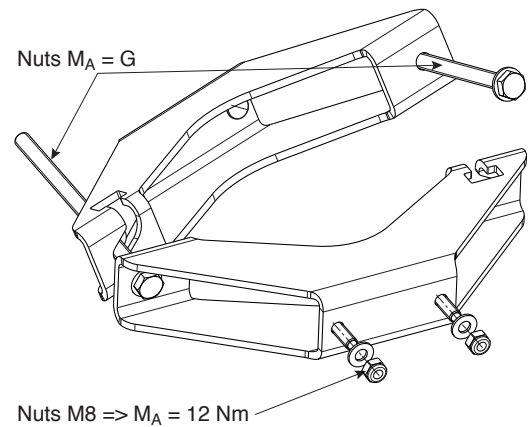
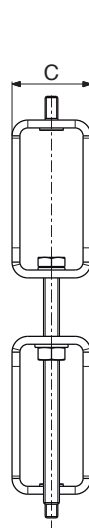


Figure similar to 85010002



Type No.	A	B	C	D	E	F	G	H	I	K
731651	116 mm	40 mm	40 mm	28 – 60 mm	93 mm	25 – 28 mm	20 Nm	84 mm	–	64 mm
738546	152 mm	40 mm	40 mm	42 – 115 mm	93 mm	20 – 26 mm	25 Nm	125 mm	72 mm	64 mm
85010002	280 mm	100 mm	50 mm	110 – 220 mm	93 mm	47 – 55 mm	35 Nm	240 mm	72 mm	64 mm
85010003	442 mm	150 mm	50 mm	210 – 380 mm	150 mm	48 – 68 mm	35 Nm	392 mm	72 mm	64 mm

**Please note: Kathrein does not recommend to use counter nuts.
The additional nuts supplied are only meant as spares.**

Mounting Hardware

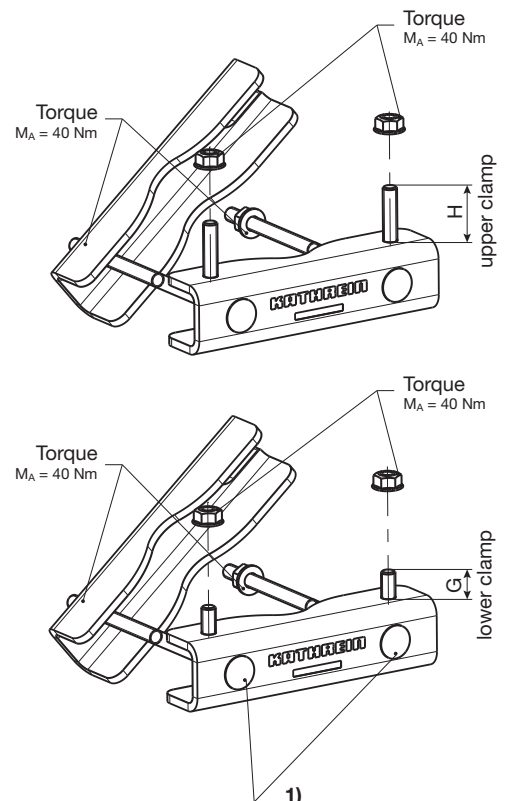
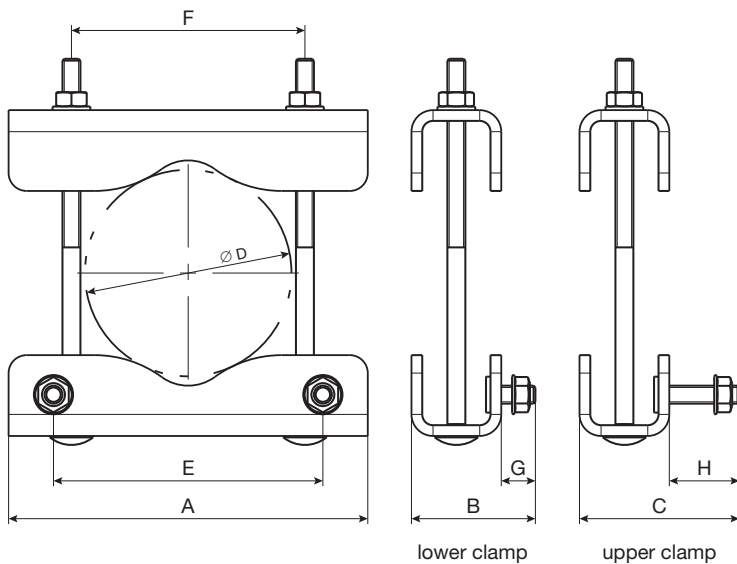
Clamp

(Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010096
Suitable for mast diameter	mm inches	55 – 115 2.2 – 4.5
Scope of supply		1 x lower clamp 1 x upper clamp
Material – Clamp – Screws – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	5.0 11.0



- 1) Attention!**
Square of the screw must be positioned in the square hole before tightening the nut.
- 2)**
All nuts have the same wrench size 17.

	A	B	C	D	E	F	G	H
mm	200	69	89	55 – 115	150	130	(19)	(39)
inches	7.9	2.7	3.5	2.2 – 4.5	5.9	5.1	(0.7)	(1.5)

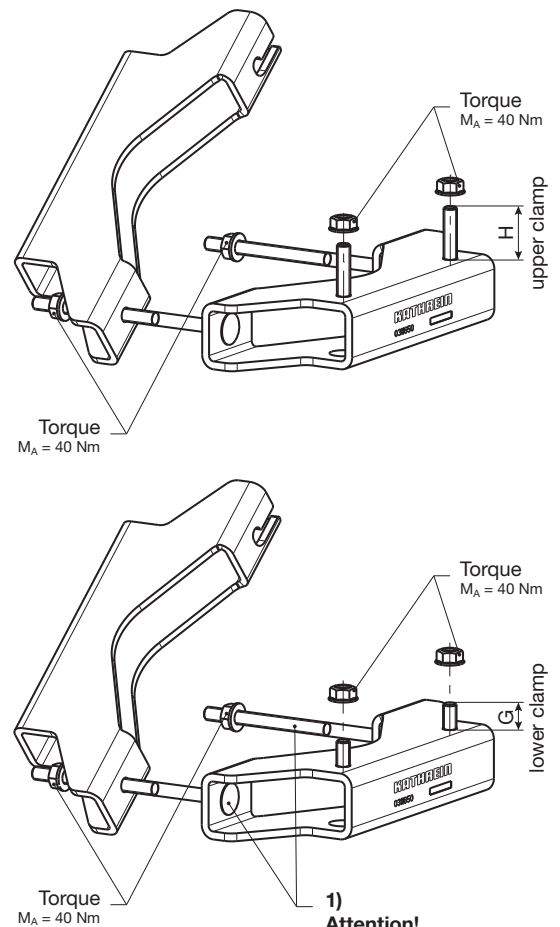
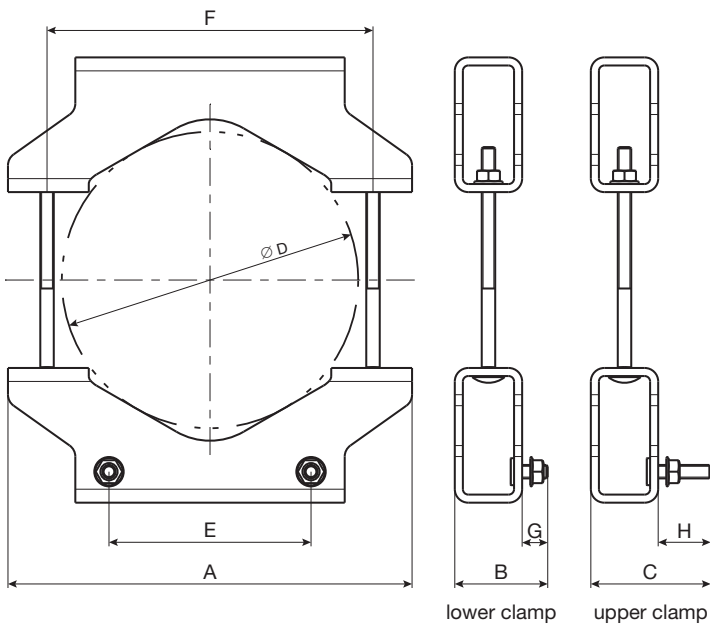
Please note: Kathrein does not recommend to use counter nuts.

Mounting Hardware Clamp (Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010097
Suitable for mast diameter	mm inches	110 – 220 4.3 – 8.7
Scope of supply		1 x lower clamp 1 x upper clamp
Material – Clamp – Screws – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	9.4 20.7



- 1) Attention!**
Square of the screw must be positioned in the square hole before tightening the nut.
- 2)**
All nuts have the same wrench size 17.

	A	B	C	D	E	F	G	H
mm	300	69	89	110 – 220	150	242	(19)	(39)
inches	11.8	2.7	3.5	4.3 – 8.7	5.9	9.5	(0.7)	(1.5)

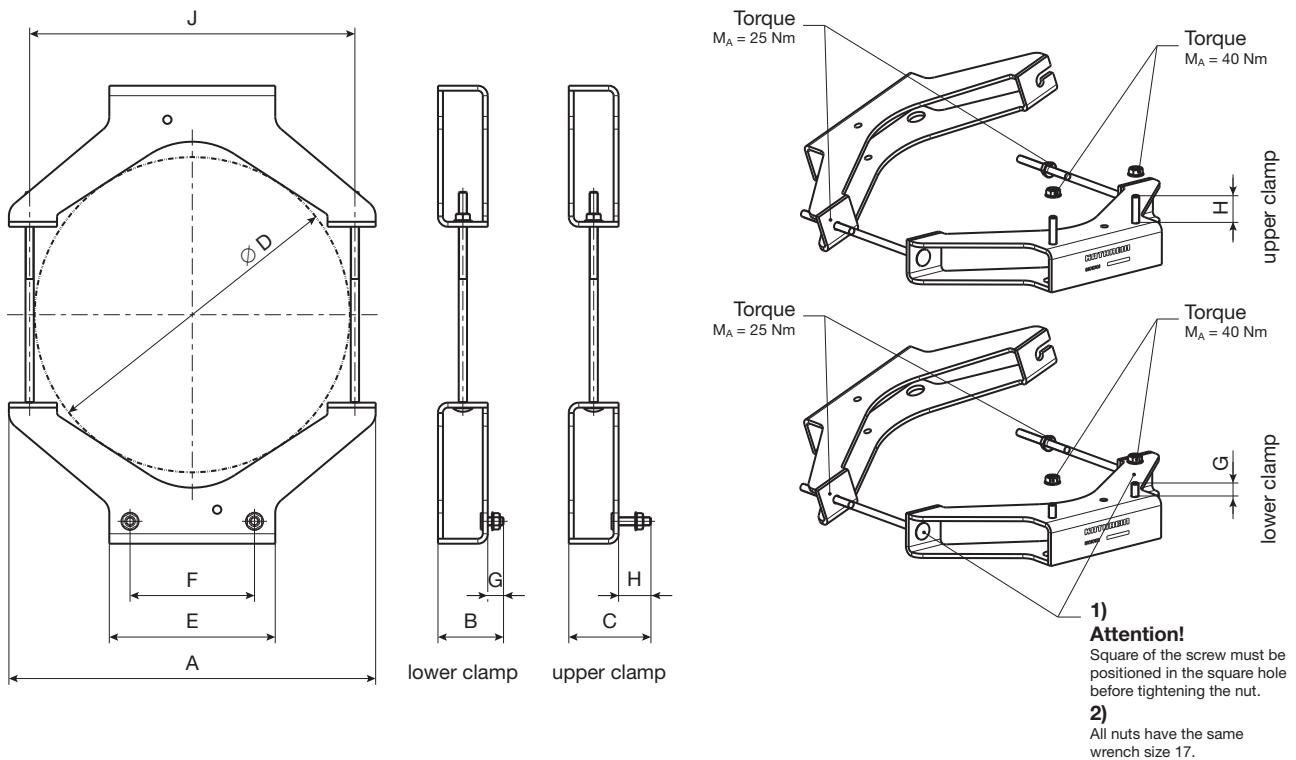
Please note: Kathrein does not recommend to use counter nuts.

Mounting Hardware Clamp (Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010101
Suitable for mast diameter	mm inches	210 – 380 8.27 – 14.96
Scope of supply		1 x upper clamp 1 x lower clamp
Material – Clamp – Screws – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg lb	14.6 32.2



	A	B	C	D	E	F	G	H	J
mm	442	79	99	210 – 380	200	150	19	39	392
inches	17.4	3.1	3.9	8.27 – 14.96	7.87	5.9	0.75	1.54	15.43

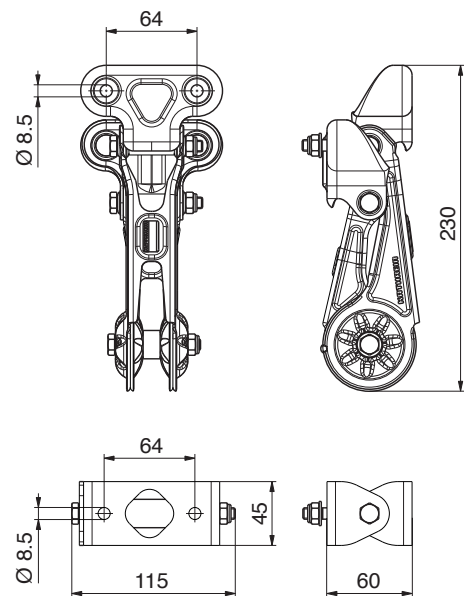
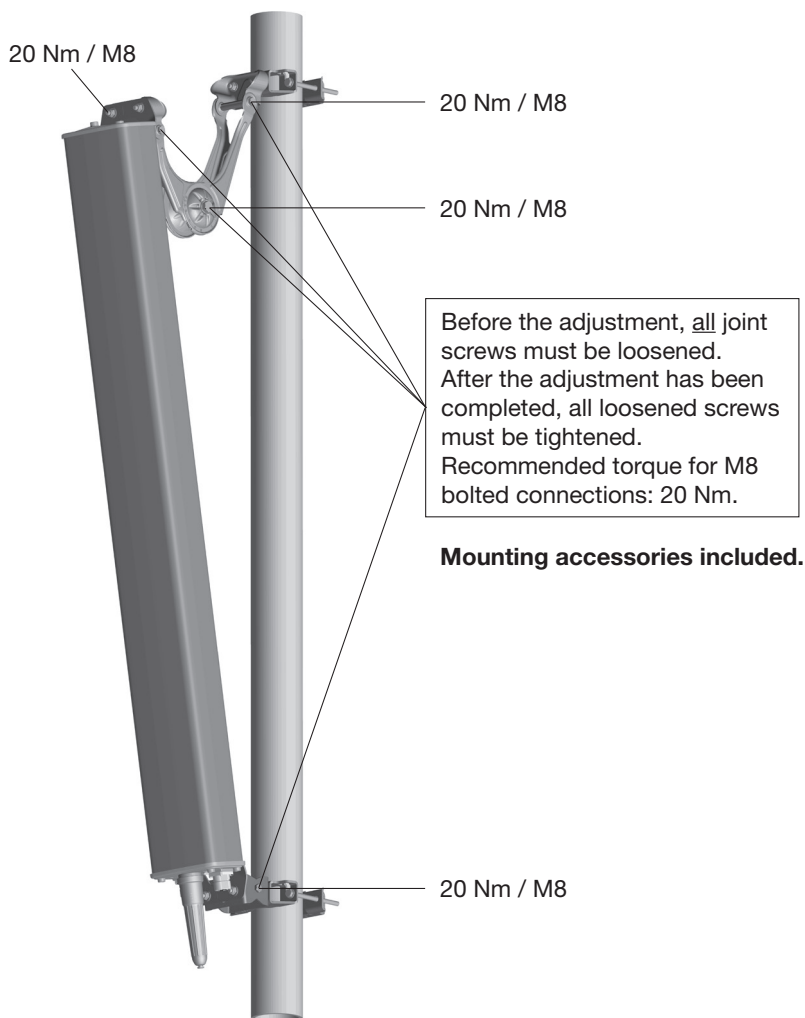
Please note: Kathrein does not recommend to use counter nuts.

Standard Downtilt kit for Panel Antennas (Wind Load Category “L”)

KATHREIN

Downtilt kit

Type No.	732327
Preferred range of use	– Panel antennas with attached mounting plates – Downtilt kit without scale for universal use
Weight	1.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts / washers	Stainless steel



Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by 42 mm.

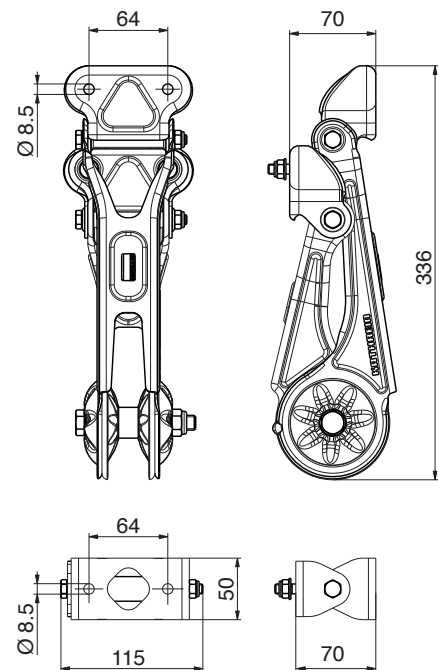
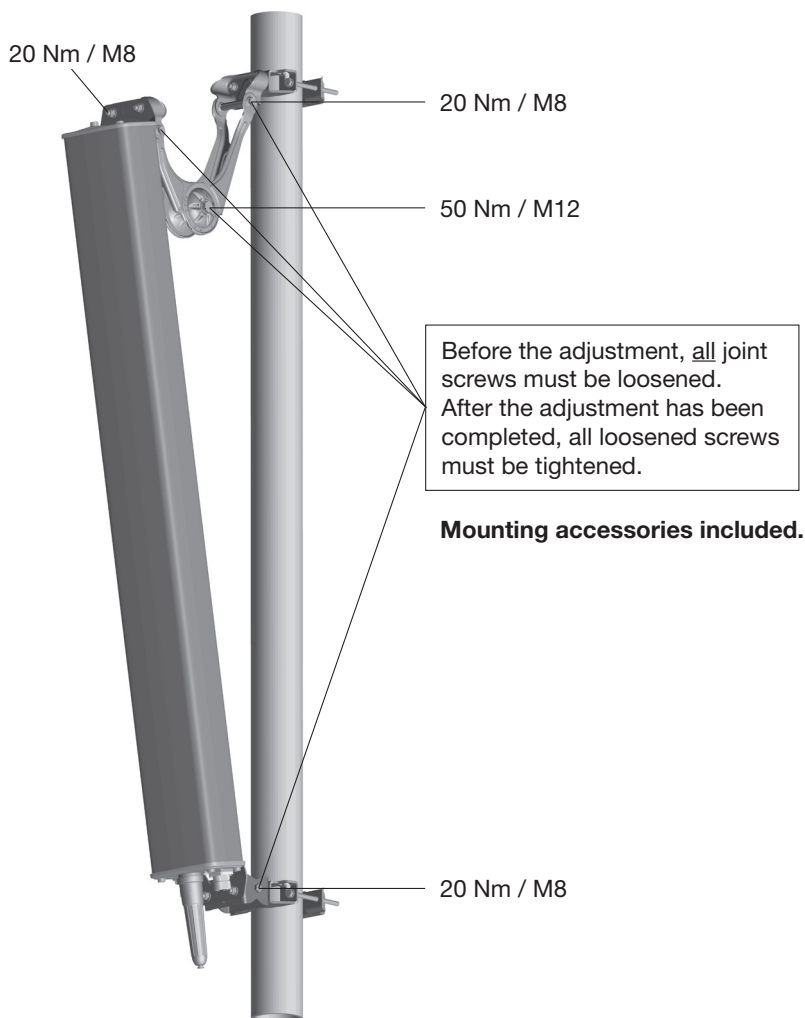
Use the downtilt kit together with the clamps as described in the antenna datasheet.

Standard Downtilt kit for Panel Antennas (Wind Load Category “L” and “M”)

KATHREIN

Downtilt kit

Type No.	737978
Preferred range of use	– Panel antennas with attached mounting plates – Downtilt kit without scale for universal use
Weight	2.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts / washers	Stainless steel



Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by 70 mm.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

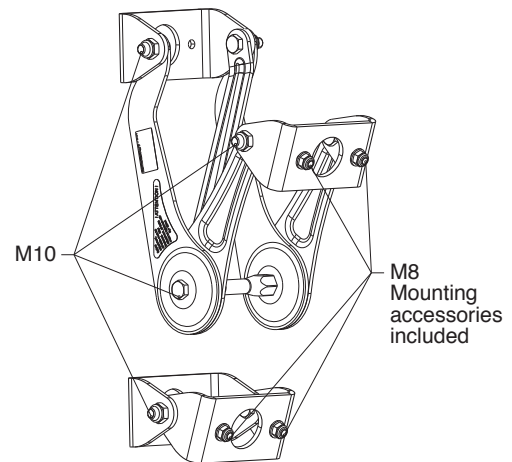
Standard Downtilt kit for Panel Antennas (Wind Load Category “H”)

KATHREIN

**Special downtilt kit for Panel antennas
with a higher wind load.**

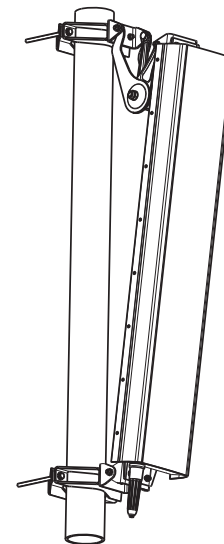
Downtilt kit

Type No.	85010008
Preferred range of use	– Panel antennas with a higher wind load – Panel antennas with attached mounting plates – Downtilt kit without scale for universal use
Weight	4.3 kg
Material	Hot-dip galvanized steel
Screws	Hot-dip galvanized steel / stainless steel
Nuts	Stainless steel



Recommended mast clamps:

Type No.	Description	Mast diameter	Weight approx.	Units per antenna
738546	1 clamp	42 – 115 mm	1.1 kg	2
85010002	1 clamp	110 – 220 mm	2.9 kg	2
85010003	1 clamp	210 – 380 mm	4.8 kg	2

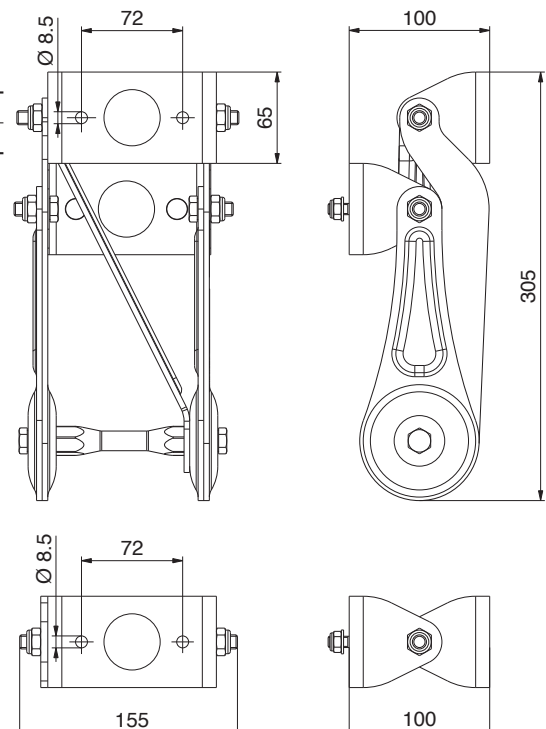


Recommended torque for all bolted connections:

Screw size	Torque
M8	20 Nm
M10	50 Nm

Maximum acceptable load:

Frontal wind load	< 5000 N
Lateral wind load	< 1300 N



Instructions to adjust the required downtilt angle are given in the datasheet or on the reverse side of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by 100 mm.

Use the downtilt kit together with the clamps as described in the antenna datasheet.

Standard Downtilt kit for Panel Antennas (Wind Load Category “XH”)

KATHREIN

Special downtilt kit for Panel antennas with wind load category “XH”.

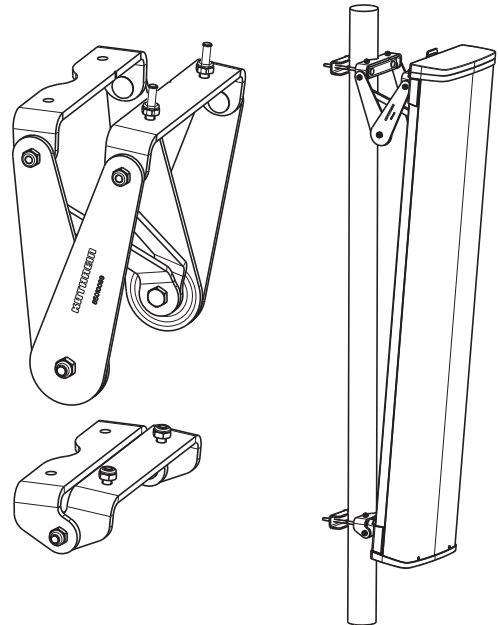
Downtilt kit

Type No.		85010099
Preferred range of use		– Panel antennas with attached mounting plates – Downtilt kit without scale for universal use
Weight	kg lb	10.6 23.4
Material		Hot-dip galvanized steel
Screws		Hot-dip galvanized steel
Nuts		Stainless steel

Attention: The downtilt kit is not to be used together with azimuth kit or offset.

Recommended mast clamps:

Type No.	Description	Mast diameter mm inches	Weight approx. kg lb	Units per antenna
85010096	2 clampes	55 – 115 2.2 – 4.5	5.0 11.0	1
85010097	2 clampes	110 – 220 4.3 – 8.7	9.7 20.7	1



Recommended torque for all bolted connections:

Screw size		Torque
M10	Nm	50
M12	Nm	85

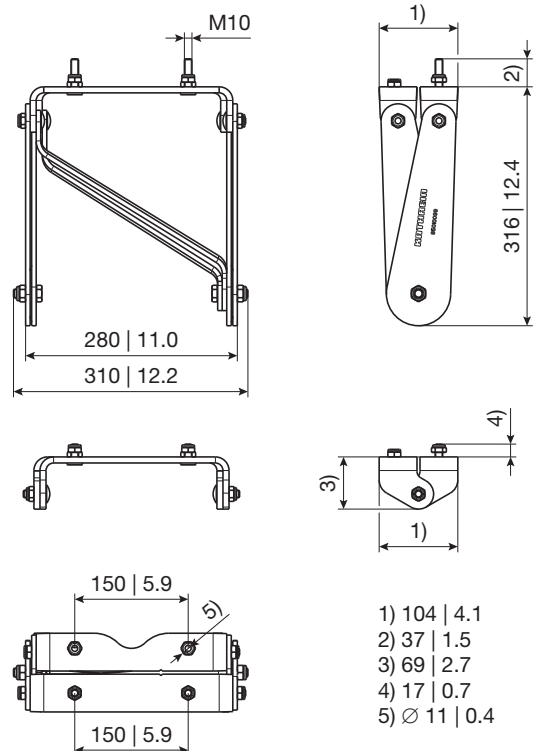
Maximum acceptable load:

Frontal wind load	N lbf	< 6000 2348.9
Lateral wind load	N lbf	< 1950 438.4

Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

Mounting this downtilt kit enlarges the spacing between mast and antenna by 104 mm | 4.1 inches.

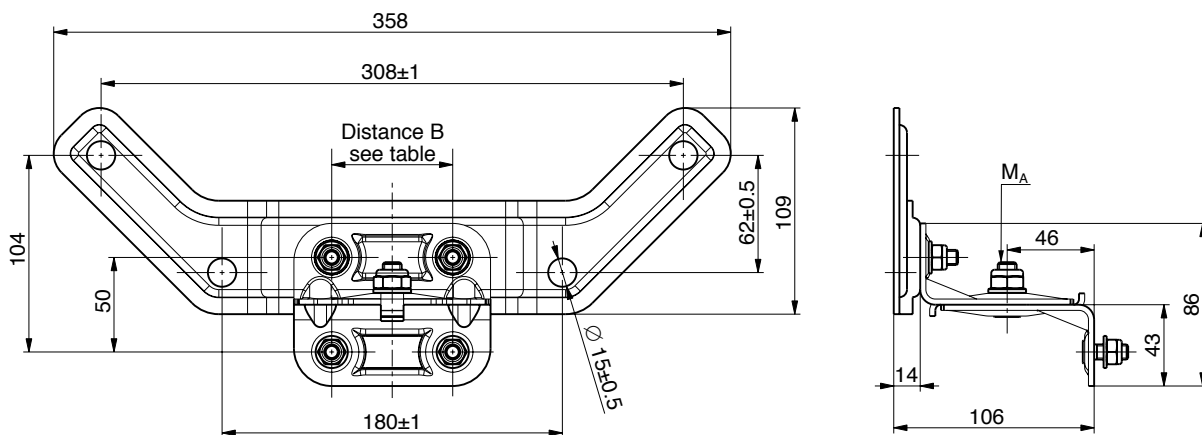
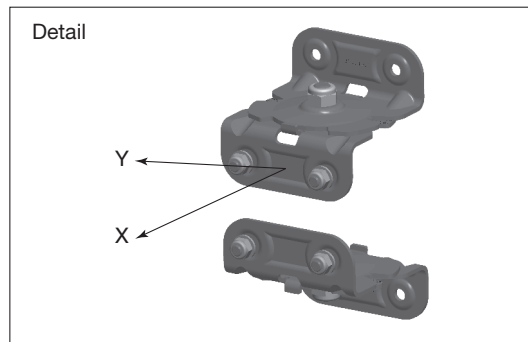
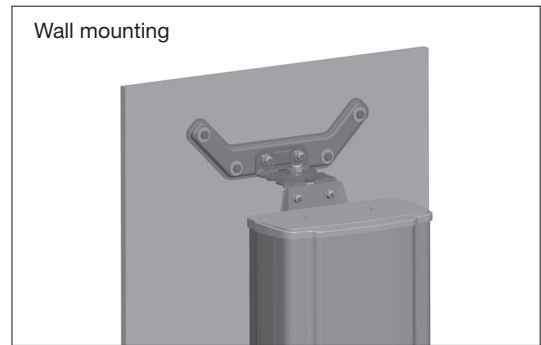
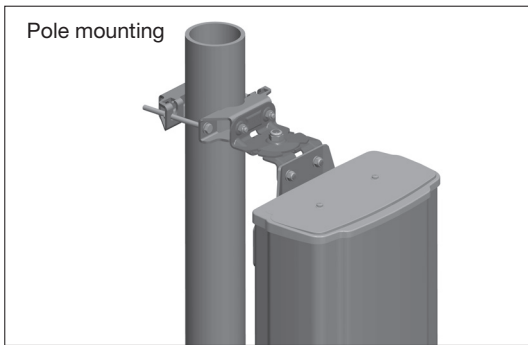
Use the downtilt kit together with the clamps as described in the antenna datasheet.



All dimensions in mm | inches

Mounting Hardware Azimuth Adjustment Kits (Wind Load Category “L”, “M” and “H”)

KATHREIN



The azimuth adjustment kit for pole mounting can be mounted with all suitable clamps, 3-Sector clamps and 2x Panel mounting kits (with the latter only as an interface between mounting kit and antenna).

Type No.	85010014	85010015	85010016	85010017
Suitable for	pole mounting		wall mounting	
Number of pieces	2 brackets	2 brackets	2 brackets	2 brackets
Distance between screws [B]	64 mm	72 mm	64 mm	72 mm
Angular range	± 30°		± 30°	
Weight / kit	approx. 1260 g	approx. 1260 g	approx. 2500 g	approx. 2500 g
Supplied mounting accessories	all screws		Screws and dowels for wall fastening are not supplied, they must be chosen by installer according to on-site requirements.	
Materials	Parts are hot-dip galvanized steel; Captive nuts are stainless steel			
Max. permissible static load / kit				
- X direction	2150 N	5100 N	2150 N	5100 N
- Y direction	760 N	1350 N	760 N	1350 N

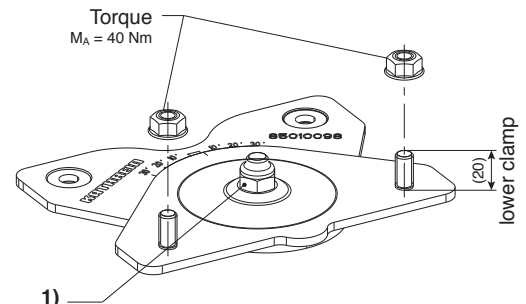
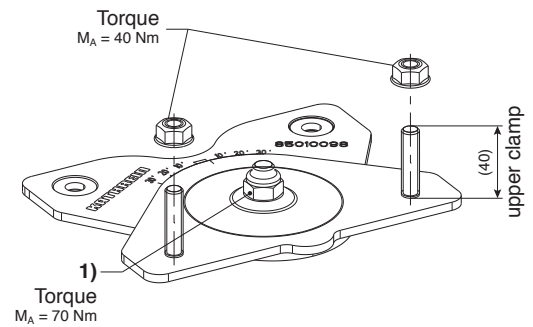
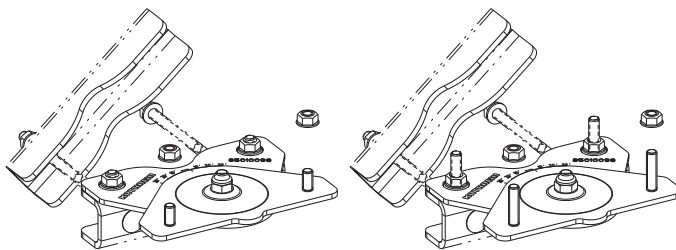
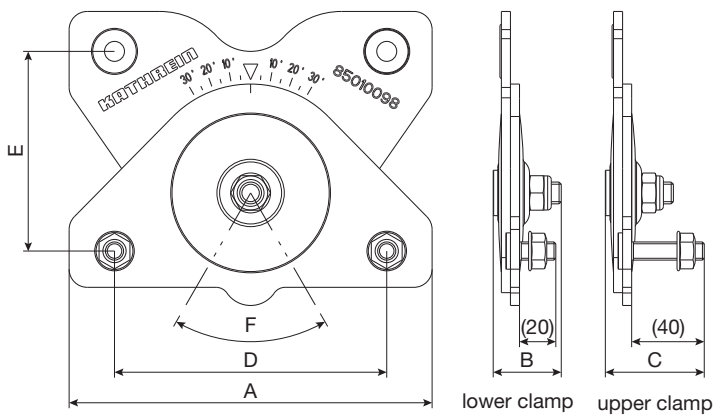
**Recommended torque: Screws M6: 8 Nm; Screws M8: 20 Nm; MoS₂ greased.
Minimum torque MA: 30 Nm; MoS₂ greased**

Mounting Hardware Azimuth Adjustment (Wind Load Category "XH")

KATHREIN

Clamp

Type No.		85010098
Scope of supply		1 x lower clamp 1 x upper clamp
Material – Clamp – Bolts – Nuts		Hot-dip galvanized steel Hot-dip galvanized steel Stainless steel
Weight	kg	3.3
	lb	7.3



Attention!

Do not remove the self-locking nut.
For the azimuth adjustment range loosen only the self-locking nut (one or two rotations) and afterwards tighten it with a torque $M_A = 70 \text{ Nm}$.

	A	B	C	D	E	F
mm	200	37.5	54.5	150	110	$\pm 30^\circ$
inches	7.9	1.48	2.15	5.9	4.3	

Please note:
Kathrein does not recommend to use counter nuts.

Mounting Hardware

3 Sector Clamp Kit

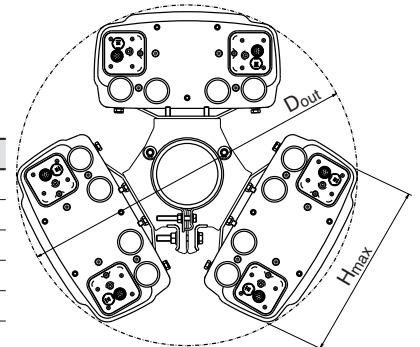
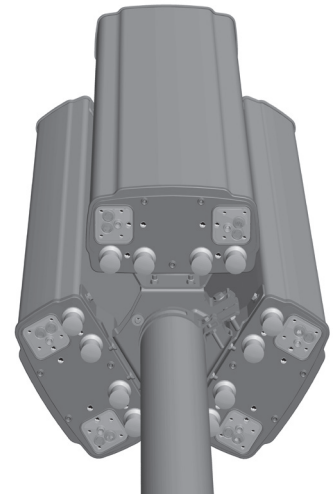
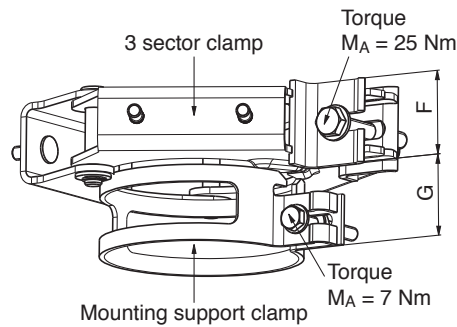
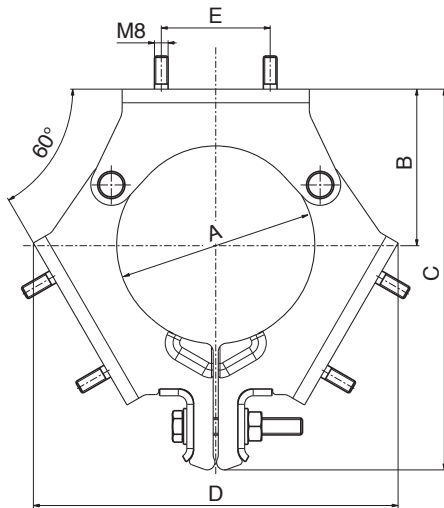
(Wind Load Category “L”, “M” and “H”)

KATHREIN

- Slim and unobstrusive design.
- Nearly cylindrical optical appearance with small outer diameter.
- Suitable for all Panels with an antenna housing width less than 400 mm (H_{max}).

Please note:

Panels with connector position “Rearside” fit only with downtilt kit, azimuth adjustment kit or offset mounted in-between.



Type No.	A	B	C	D	E	F	G	H_{max}	Weight
742263	88.9	65	180	168	64	50	45	280	4 kg
742317	88.9	88	213	199	64	50	45	361	4 kg
742033	114.3	92	217	207	64	50	45	377	4 kg
742034	139.7	100	236	228	64	50	45	400	4 kg
85010058	114.3	92	217	207	72	50	45	377	4 kg
85010059	139.7	100	236	228	72	50	45	400	4 kg

All dimensions in mm.

D_{out} is determined by mounted components.

3 Sector Clamp Kit (Antenna Wind load Category “L” and “M”)

Type No.	742263	742317	742033	742034
Angle between antennas	120°	120°	120°	120°
Suitable for mast diameter	88.9 mm	88.9 mm	114.3 mm	139.7 mm
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material				
- 3 sector clamp	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel
- Mounting support clamp	Aluminum	Aluminum	Aluminum	Aluminum
- Screws / threaded stud	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel	Hot-dip galvanized steel
- Nuts	Stainless steel	Stainless steel	Stainless steel	Stainless steel

3 Sector Clamp Kit (Antenna Wind load Category “H”)

Type No.	85010058	85010059
Angle between antennas	120°	120°
Suitable for mast diameter	114.3 mm	139.7 mm
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material		
- 3 sector clamp	Hot-dip galvanized steel	Hot-dip galvanized steel
- Mounting support clamp	Aluminum	Aluminum
- Screws / threaded stud	Hot-dip galvanized steel	Hot-dip galvanized steel
- Nuts	Stainless steel	Stainless steel

Mounting Hardware

3 Sector Clamp Kit

(Wind Load Category “XH”)

KATHREIN

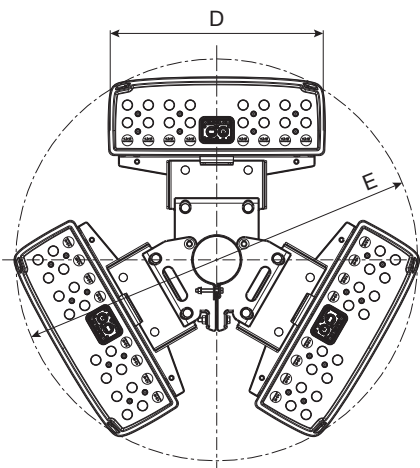
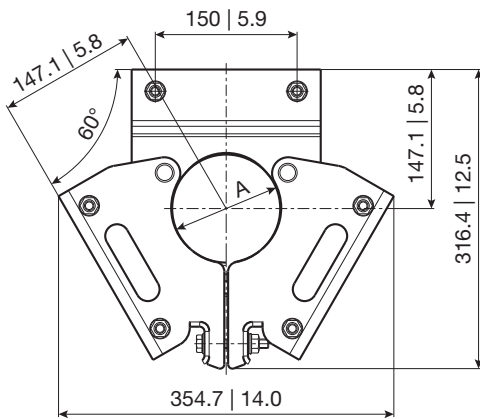
- Nearly cylindrical optical appearance with small outer diameter.
- Suitable for all Panels with an antenna housing width of 508 mm | 20.0 inches (H_{max}).

Please note:

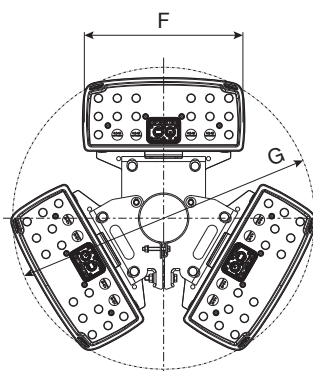
Panels with connector position “Rearside” fit only with downtilt kit, azimuth adjustment kit or offset mounted in-between.

3 Sector Clamp Kit (Antenna Wind load Category “XH”)

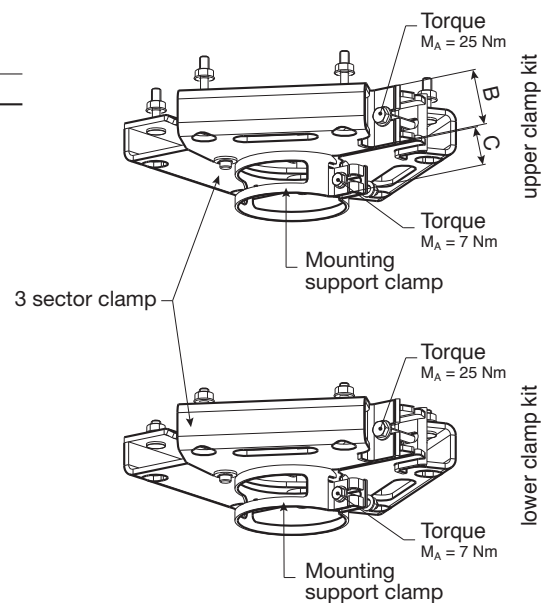
Type No.		85010102
Angle between antennas	°	120
Suitable for mast diameter	mm	114.3
	inches	4.5
Number of pieces		2 x 3 sector clamp 2 x mounting support clamp
Material		
– 3 sector clamp		Hot-dip galvanized steel
– Mounting support clamp		Aluminum
– Screws / threaded stud		Hot-dip galvanized steel
– Nuts		Stainless steel
Weight	kg lb	14.5 31.9



Bottom view with offset



Bottom view without offset



Dimensions	mm	inches
A	∅ 114.3	∅ 4.5
B	62	2.4
C	45	1.8
D	max. 508	max. 20.0
E	∅ 959	∅ 37.8
F	max. 378	max. 14.9
G	∅ 720.3	∅ 28.4

All dimensions in mm | inches

Please note:

Antennas with an antenna housing width 508 mm | 20.0 inches are only suitable in combination with offset 85010104 or downtilt kit 85010099.

A simultaneous combination of downtilt kit and offset ist not permitted.

Possible accessories

85010104	Offset
85010099	Downtilt kit

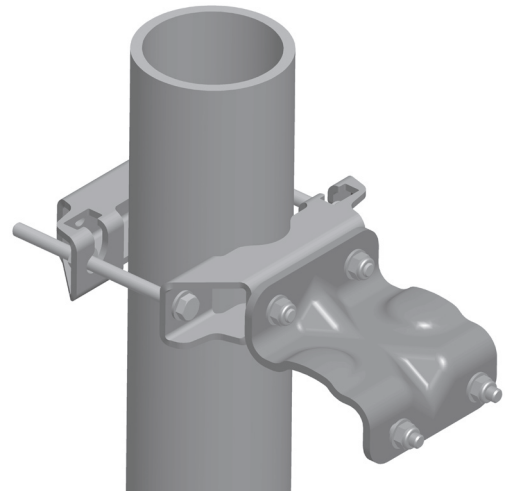
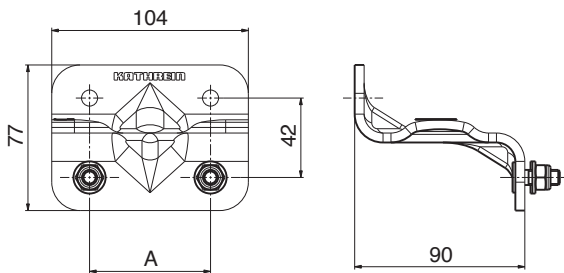
Mounting Hardware Offset for Panel Antennas (Wind Load Category “L”, “M”, “H” and “XH”)

KATHREIN

Type No.	85010060	85010061
Wind load category	“L” and “M”	“H”
Quantity needed per antenna	2 x spacer	
Material: – spacer – nuts	Hot-dip galvanized steel Stainless steel	
Dimension “A”	64 mm	72 mm
Weight	0.65 kg	
Scope of supply	1 x spacer, Fitting accessories	

Recommended torque for M8 bolted connections: 20 Nm

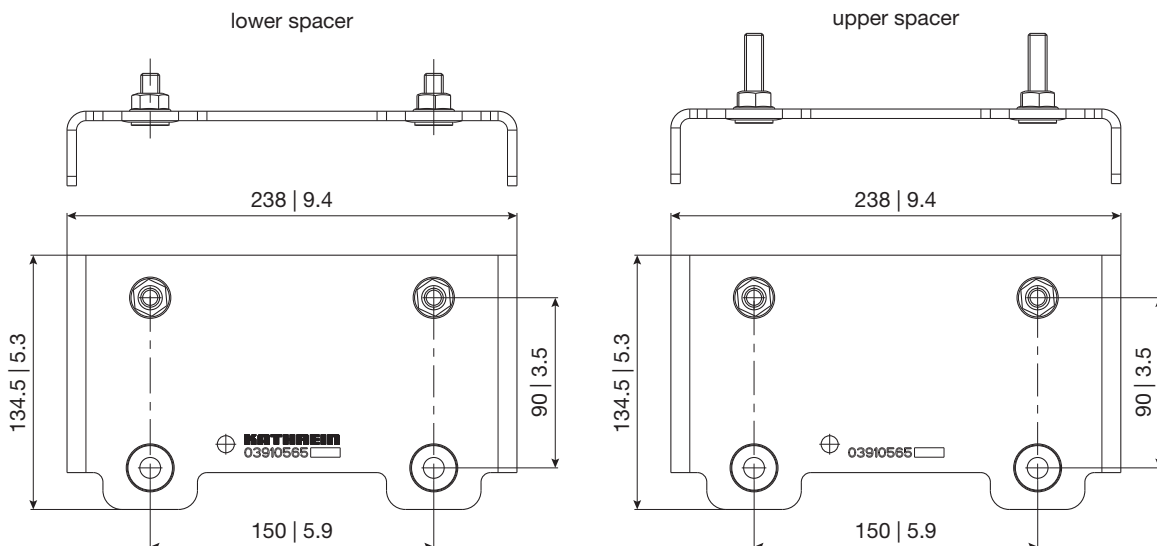
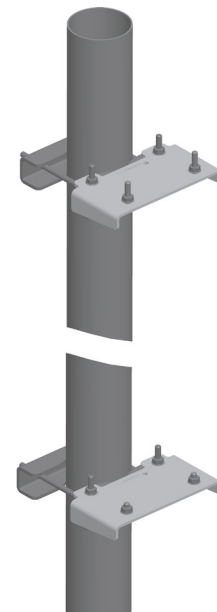
Please use the offset in combination with clamps corresponding to the pole diameter.



Type No.	85010104	
Wind load category	“XH”	
Quantity needed per antenna	1x spacer kit	
Material: – spacer – nuts	Hot-dip galvanized steel Hot-dip galvanized steel	
Weight	kg lb	2.88 6.35
Scope of supply	2 x spacer, Fitting accessories	

Recommended torque for M10 bolted connections: 40 Nm

Please use the offset in combination with clamps corresponding to the pole diameter.



All dimensions in mm | inches

Panel Accessories

2 x Panel Mounting Kit (Wind Load Category “L” and “M”)

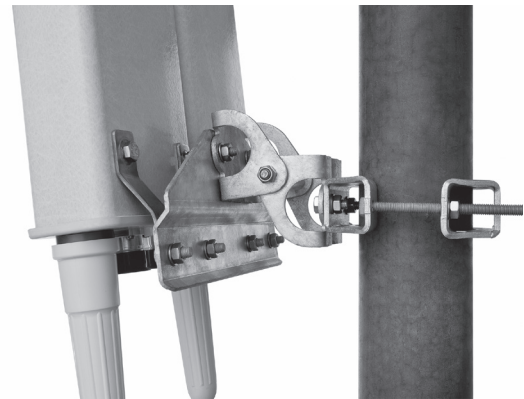
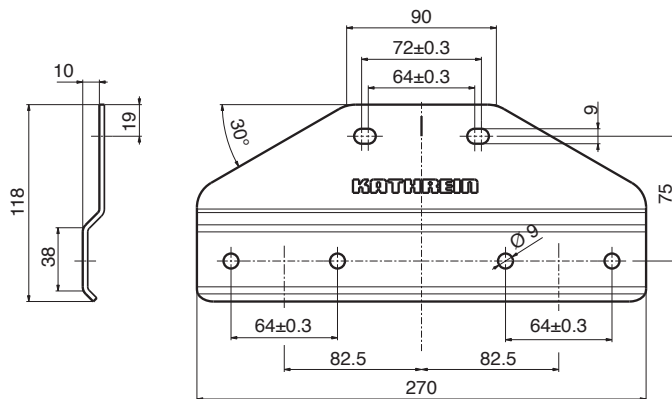
KATHREIN

Use this mounting kit only for Panels with a maximum width of 160 mm.
Wind load category: L (Light) or M (Medium)

2 x Panel Mounting Kit

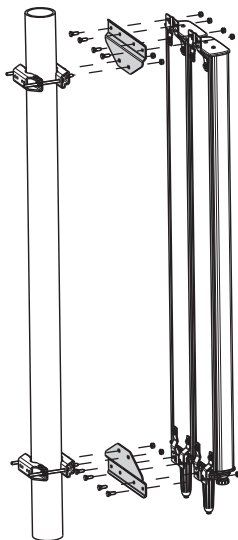
Type No.	742113
Contents	2 x brackets and mounting accessories
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 1.6 kg

Recommended torque for M8 bolted connections: 20 Nm

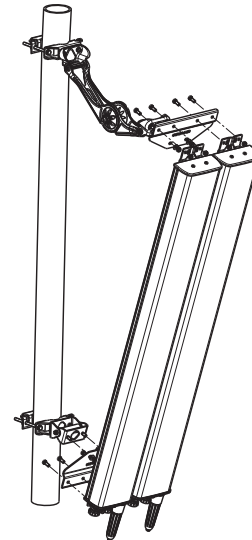


Attention:
This mounting kit can not be used for the antenna 80010644v01.
For this antenna, please use the mounting kit 85010075.

Configuration without mechanical downtilt



Configuration with mechanical downtilt



Use the 2 x Panel Mounting Kit together with the following mounting accessories

Type No.	Description	Remarks	Weight approx.	Units per antenna
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8 kg	2
738546	1 clamp	Mast: 42 – 115 mm diameter	1.1 kg	2
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2
85010060	1 offset	in combination with the clamps	1.3 kg	2
737978	1 downtilt kit	Downtilt angle: depending on antenna height	2.3 kg	1

For a three sector panel arrangement, use the mounting kit type no. 742113 together with the three sector clamp 742317, 742033 or 742034.
Three sector clamp 742263 does not match.

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

2 x Panel Mounting Kit

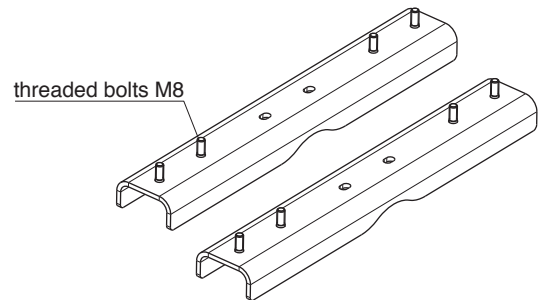
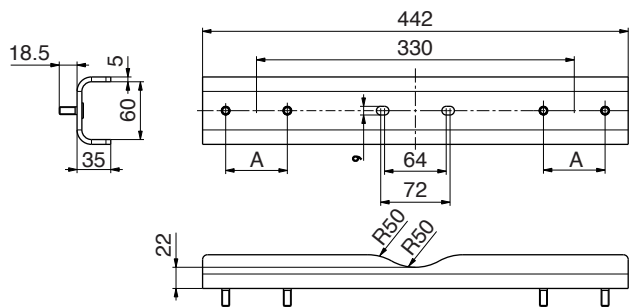
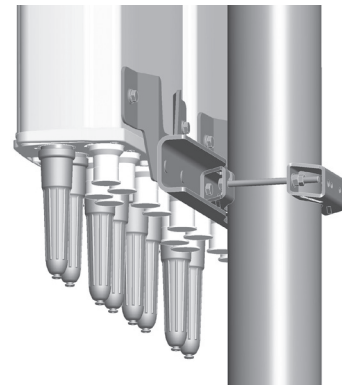
KATHREIN

(Wind Load Category “L”, “M” and “H”)

Use this mounting kit for Panels with a maximum width of 325 mm.

Type No.	85010075	85010076
Contents	2 x brackets and mounting accessories	
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel	
Weight	Approx. 3.3 kg	
Hole distance “A”	64 mm	72 mm
Windload category (Antenna)	“L” and “M”	“H”

Recommended torque for M8 bolted connections: 20 Nm



Configuration without mechanical downtilt	Configuration with mechanical downtilt

Mounting Accessories (order separately)

Clamps (only the listed clamps are allowed!)

Type No.	Description	Remarks	Weight approx.	Units per mounting kit
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2
85010060	1 offset		1.3 kg	4
85010061	1 offset		1.3 kg	4

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

2 x Panel Mounting Kit

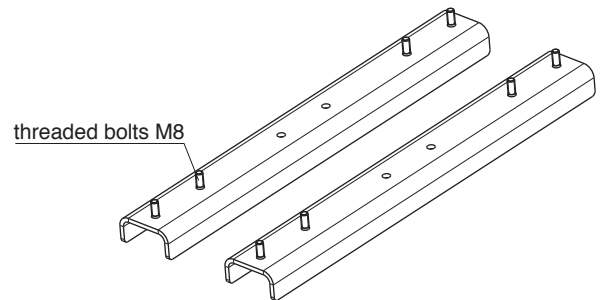
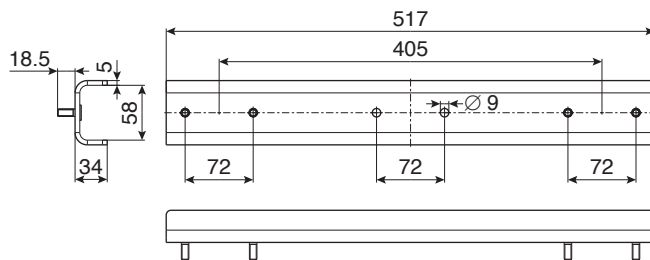
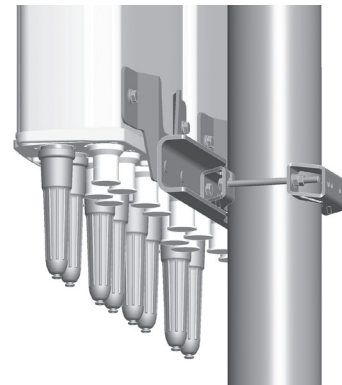
KATHREIN

(Wind Load Category “H”)

Use this mounting kit for Panels with a maximum width of 377 mm.

Type No.	85010087
Contents	2 x brackets and mounting accessories
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 3.3 kg
Hole distance	72 mm
Windload category (Antenna)	“H”

Recommended torque for M8 bolted connections: 20 Nm



Configuration <u>without</u> mechanical downtilt	Configuration <u>with</u> mechanical downtilt

Mounting Accessories (order separately)

Clamps (only the listed clamps are allowed!)

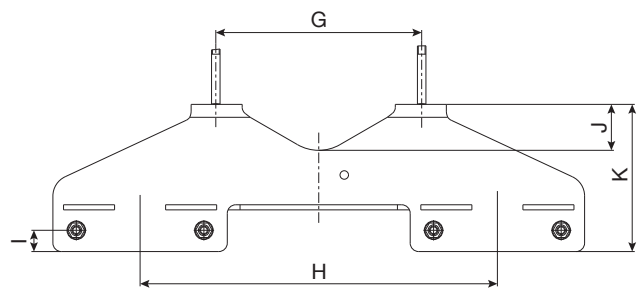
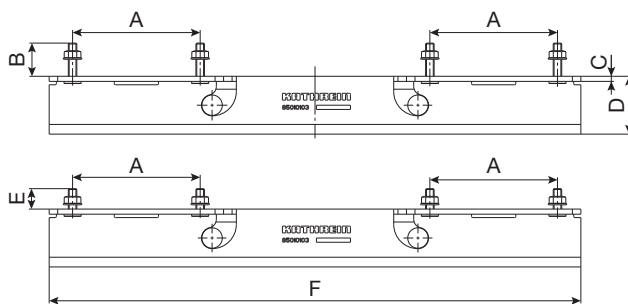
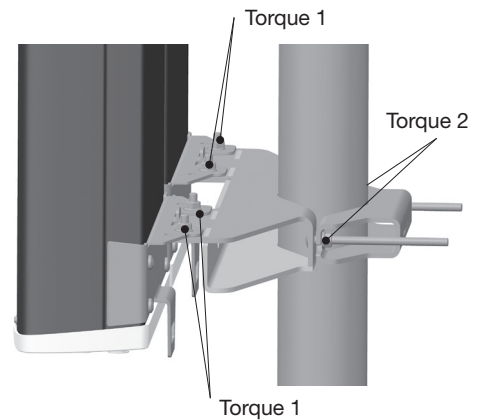
Type No.	Description	Remarks	Weight approx.	Units per mounting kit
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2
85010008	Downtilt kit		4.3 kg	2

The downtilt kit can not be used in combination with any offset (85010060 and 85010061).

(Wind Load Category “XH”)

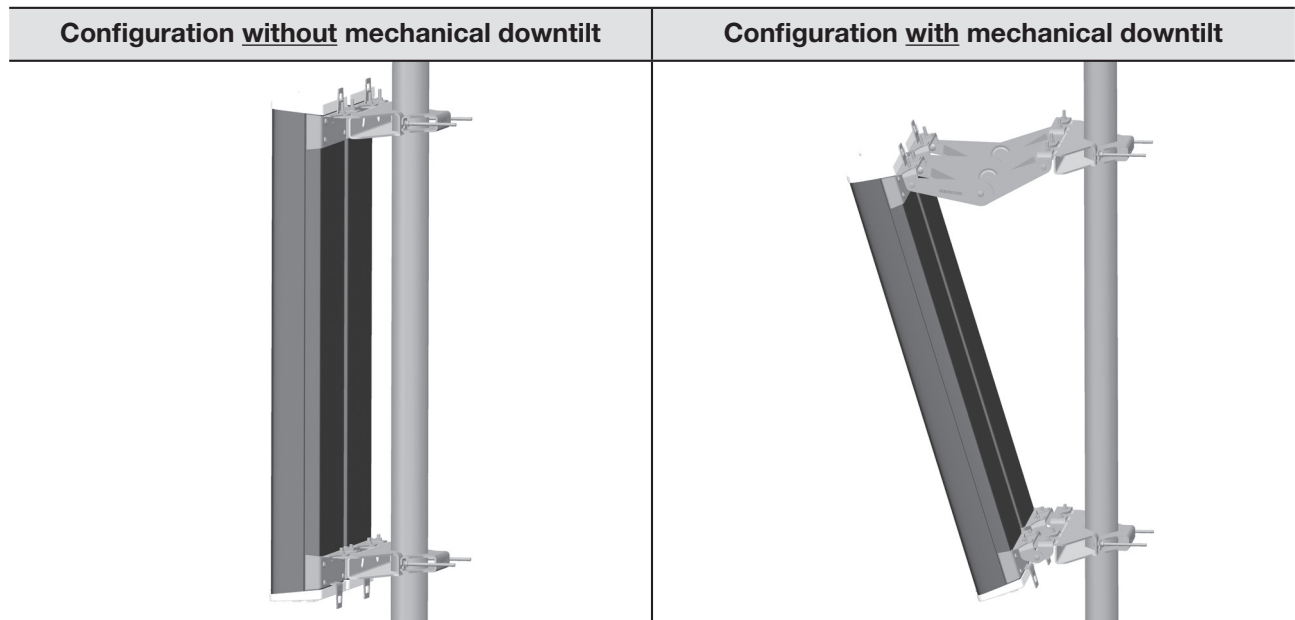
Use this mounting kit for Panels with a maximum width of 378 mm | 14.9 inches

Type No.	85010103		85010108	
Contents	2 x clamps and mounting accessories			
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel			
Weight	kg lb	20.5 45.2	27.5 60.6	
Suitable for mast \varnothing	mm inches	110 – 220 4.3 – 8.7	210 – 380 8.3 – 15.0	
Torque M _A 1	Nm	40	40	
Torque M _A 2		25	40	
Windload category (Antenna)	“XH”			



Type		A	B	C	D	E	F	G	H	I	J	K
85010103	mm	150	39	6	68	24	625	242	420	25	173	54
	inches	5.91	1.54	0.24	2.68	0.84	24.61	9.53	16.54	0.98	6.81	2.13
85010108	mm	150	39	6	68	24	625	392	420	25	221	102
	inches	5.91	1.54	0.24	2.68	0.84	24.61	14.43	16.54	0.98	8.7	4.02

Please note: Kathrein does not recommend to use counter nuts.



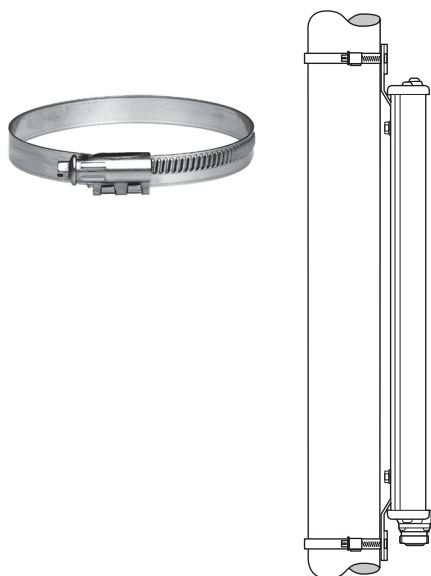
Mounting accessories (order separately)

Type No.	Description	Weight approx. kg lb	Units per mounting kit
85010099	1 downtilt kit	10.6 23.4	2
86010104	1 offset	2.9 6.4	4

Mounting Hardware Tension Band for Panel Antennas (Wind Load Category “L”)

KATHREIN

Type No.	734360	734361	734362	734363	734364	734365
Suitable for mast diameter	34 – 60 mm	60 – 80 mm	80 – 100 mm	100 – 120 mm	120 – 140 mm	45 – 125 mm
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Weight (approx.)	0.06 kg	0.07 kg	0.08 kg	0.09 kg	0.11 kg	0.08 kg



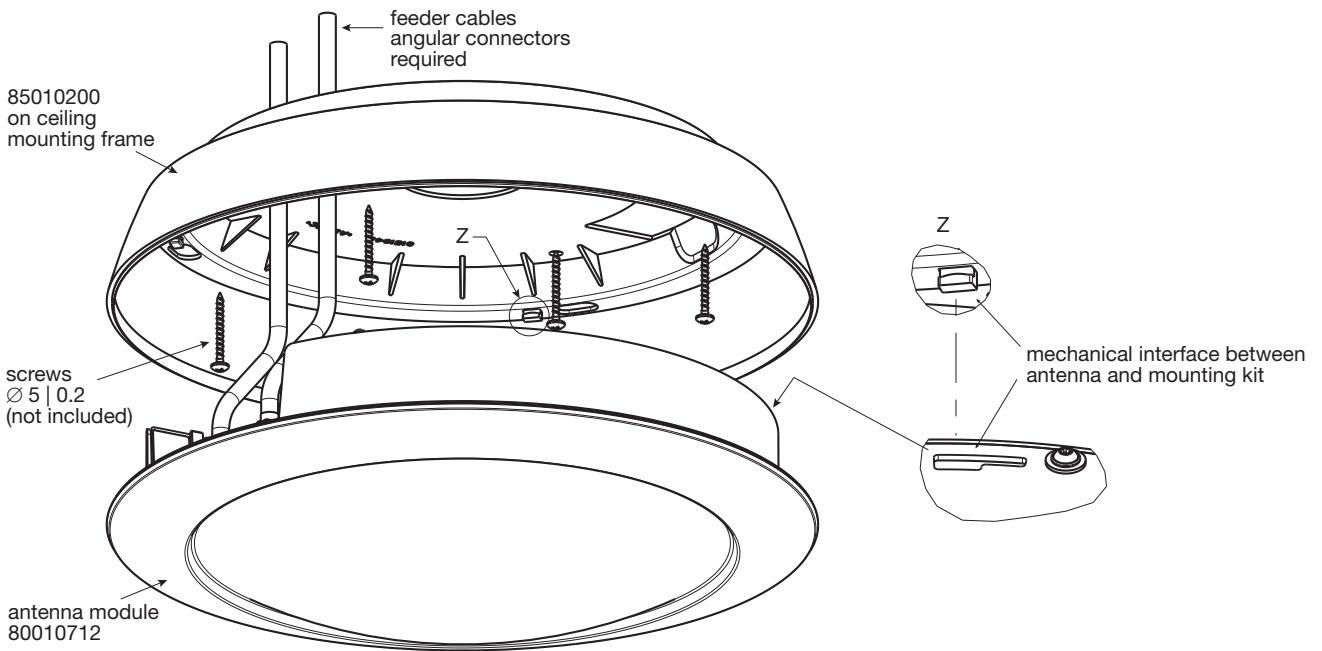
**Please note:
Only usable without downtilt kit!**

Mounting Hardware

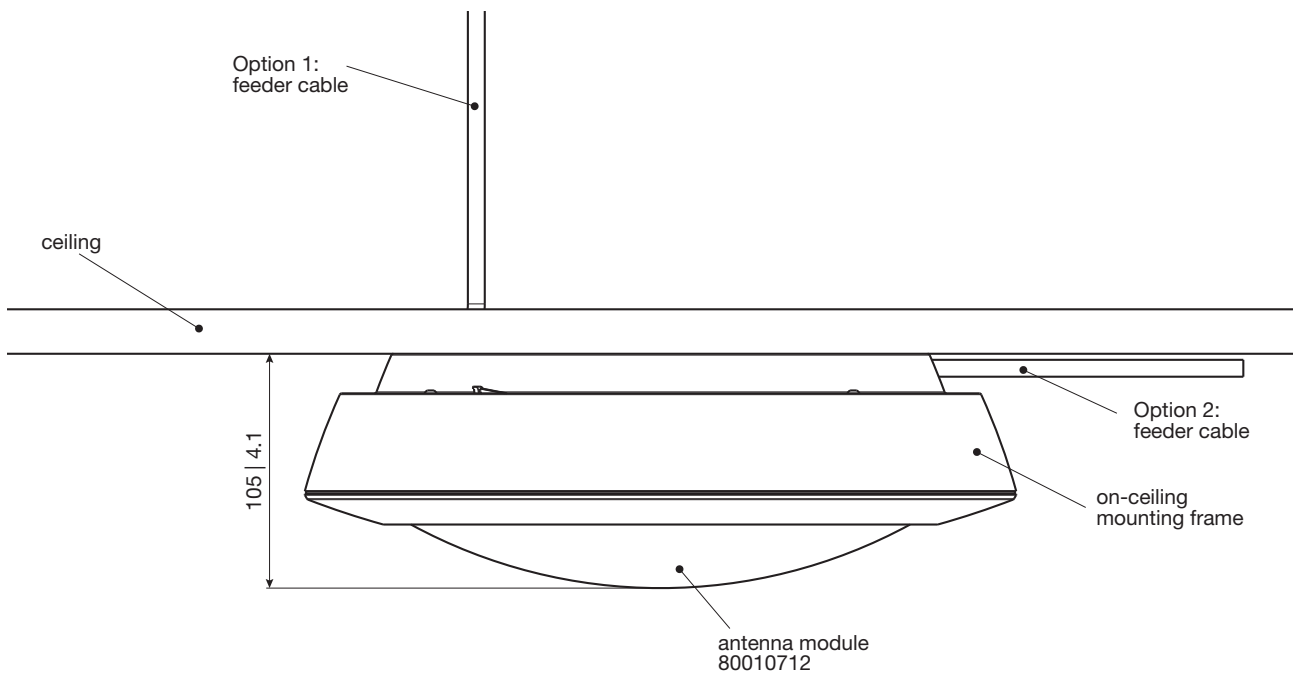
85010200: On-ceiling Mounting Kit for 80010712

KATHREIN

On-ceiling mounting option:



↑
Insert the antenna into the pre-assembled mounting tray 85010200
and turn clockwise until it locks into place.



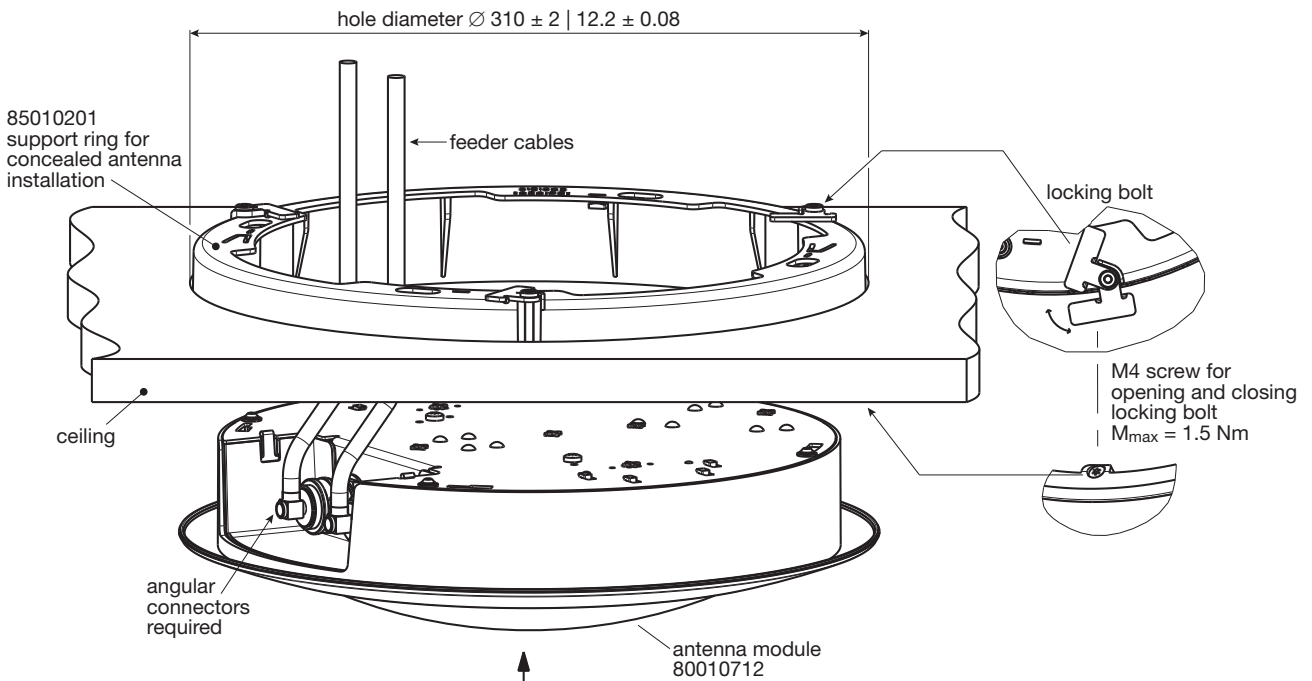
All dimensions in mm | inches

Mounting Hardware

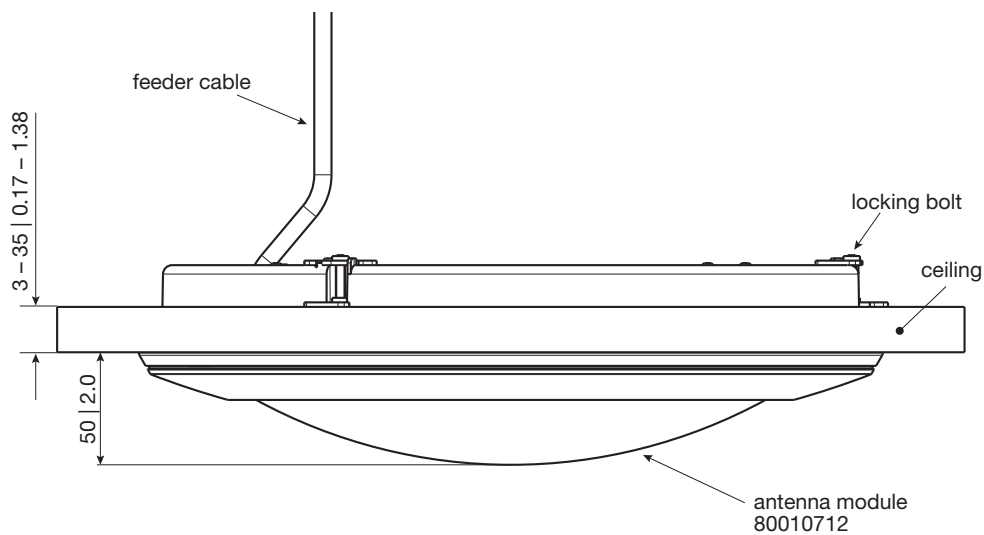
85010201: Support Ring for 80010712

KATHREIN

Concealed antenna installation with support ring:



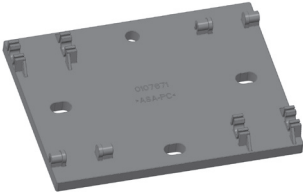
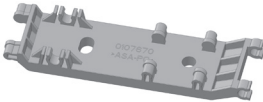
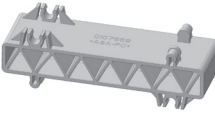

Insert the antenna into the pre-assembled mounting tray 85010201 and turn clockwise until it locks into place.



All dimensions in mm \mid inches

Inside Connect
Accessory parts 85010205
for Antenna 80020100

Modular mounting parts package

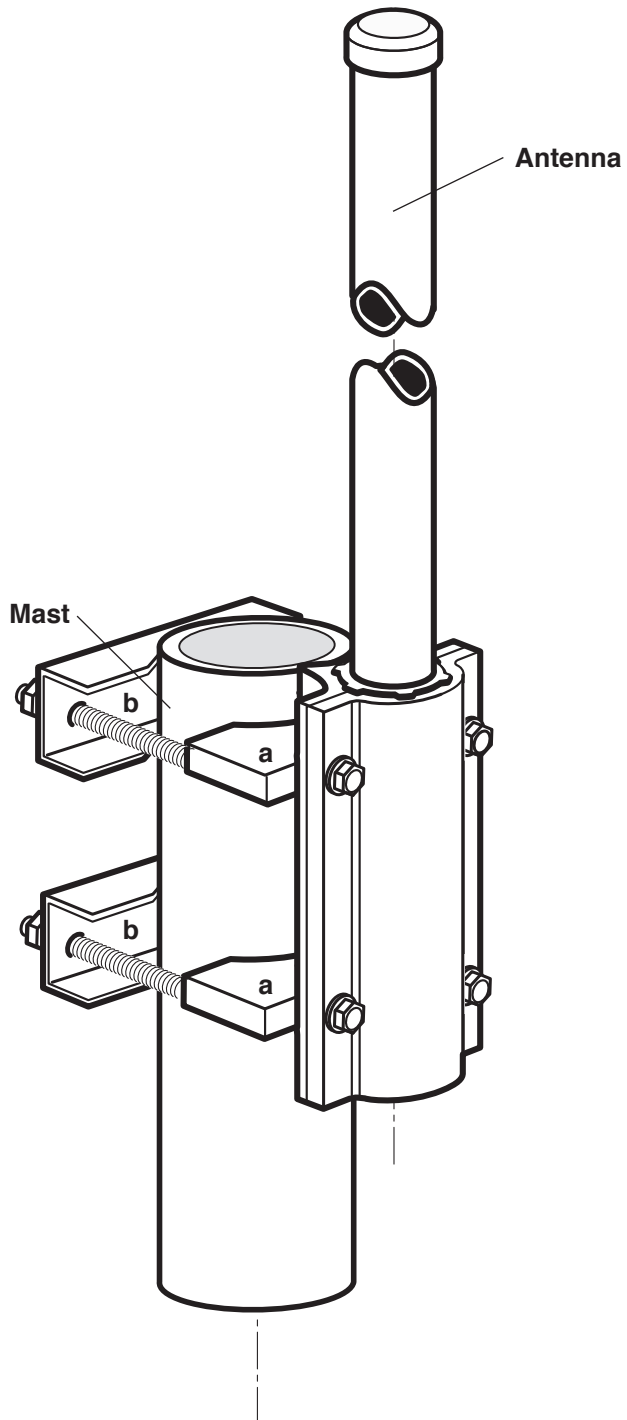
Type No. of the package	85010205	
Modular mounting part	Number of pieces included	Function
	6 pcs.	Back to back installation, mounting and stabilization interface
	3 pcs.	Side by side / stacked installation, mounting and stabilization interface
	4 pcs.	High isolation spacer
	3 pcs.	Additional stabilization element

Side-mounting Clamp Omnidirectional Antennas Large Pipe

KATHREIN

Type No. 738908

For masts of 94 – 125 mm diameter



Side-mounting Bracket Omnidirectional Antennas

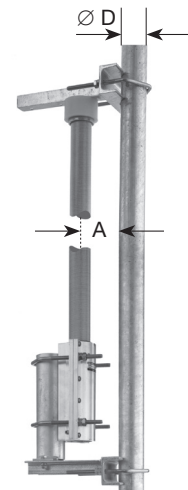
KATHREIN

Type No. 737398

Side-mounted bracket

(for mast diameters of 40 – 105 mm)

Type No.	737398
Fits for antenna type no.	800/900 MHz 736347 738192



Side-mounting is possible for four fixed distances between the tubular mast and the antenna:

800/900 MHz (holes 1 and 3)			UMTS (hole 2)		
<p>A = 100 mm = 0.3 λ A = 160 mm = 0.5 λ A = 240 mm = 0.75 λ</p>			<p>A = 80 mm = 0.5 λ</p>		
Pipe D	Horizontal Radiation Pattern	Spacing A Curve	Pipe D	Horizontal Radiation Pattern	Spacing A Curve
40 mm		100 mm	100 mm		100 mm
		160 mm			160 mm
		240 mm			240 mm
40 mm		80 mm	40 mm		80 mm
100 mm			100 mm		

Side-mounting Brackets Omnidirectional Antennas

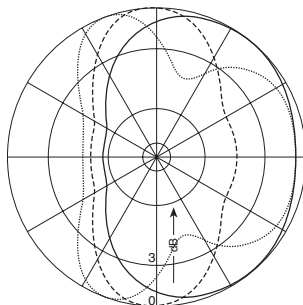
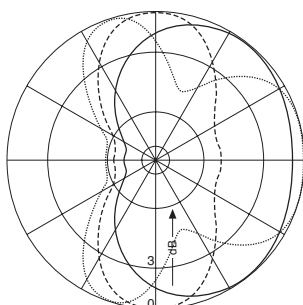
KATHREIN

For mast diameters of 40 – 105 mm

Type No.	K61335
Bracket	At the bottom only
Fits for antenna type no.	K751161

Side mounting is possible for three fixed distances between the tubular mast and the antenna:

- 100 mm = 0.3 λ
- 160 mm = 0.5 λ
- 240 mm = 0.75 λ

Pipe D	Horizontal Radiation Pattern	Spacing A Curve	Additional gain to the nominal value of the antenna gain
40 mm		100 mm	2 dB
		160 mm	3 dB
		240 mm	2 dB
100 mm		100 mm	2.5 dB
		160 mm	3.5 dB
		240 mm	2.5 dB

GPS based Azimuth Adjustment tool to azimuth base station antennas in the field.

- Compatible to all Panel Antennas
- Easy to adapt onto an Antenna
- Compact size
- No cabling necessary

Type No.	86010157
GPS Sensor Specification	
Receiver Type	L1, C/A code, with carrier Phase smoothing
Channels	Two 12-channel, parallel tracking
SBAS Tracking	2-channel, parallel tracking
Used Geodetic System	WGS 84
Update Rate	10 Hz (10 measurement values per sec.)
Horizontal Accuracy	< 1.0 m 95% confidence (DGPS ¹⁾) < 2.5 m 95% confidence
Heading Accuracy ²⁾	± 0.8° (rms)
Tilt Accuracy ³⁾	± 0.25°
Orthometric Hight Accuracy ⁴⁾	± 1 m (rms)
First start	max 12 min. (primary initialisation of almanac)
Cold Start	< 60 s (no almanac or RTC)
Warm Start	< 20 s typical (almanac or RTC)
Heading Fix	< 10 s typical (valid position)
Interface	W-LAN (802.11); RS 232 (optional)
Power Supply	LiPo-Battery (14.8 V, 2200 mAh)
Input Voltage	18 – 28 VDC
Power Consumption	5 W nominal; 36 W charging mode
Protection class	IP 54
Operating Temperature	-10 °C to +50 °C
Storage Temperature	-10 °C to +60 °C
Charging Temperature	0 °C to +35 °C
Certifications	FCC; CE
Dimensions (L x W x H)	580 (900 deployed) x 116 x 65 mm
Weight	3.1 kg



¹⁾ Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity and use of SBAS.

²⁾ Depends on multipath environment, number of satellites in view; satellite geometry, ionospheric activity.

³⁾ After calibration.

⁴⁾ Based on a 40 second time constant.

Tablet Specification	
Model	Fieldbook
Display	
LCD Size	10" TFT LCD
Brightness	Best-in-class sunlight readable Display - ECR 11.19 at 50.000 lux
Max Resolution	1366 (H) x 768 (V)
Touch Screen	Polarized capacitive type
Operating System	Android 4.x
Memory	32 GB eMMC Flash + 1 GB SDRAM
Storage	Micro SD Slot
Communication	
W-LAN	802.11 b/g/n
Bluetooth	Bluetooth 4.0
Modem	3.5 G
RFID	HF RFID; ISO 14443A; ISO 14443B; ISO 15693; NFC
Data Collection	
Barcode	1D laser / 2D imager scan engine
Camera (Back)	5 megapixels CMOS camera
Camera (Front)	1.2 megapixels CMOS camera
I/O Interface	
Audio	1 x 1.5 W speaker; 1 x Digital Mic
Expansion	1 x USB 2.0; 1 x DC Jack
Power	Internal Smart Lithium Polymer battery, 10000 mAh, 3.7 V
Environment	
Operating Temperatur	-10 °C to +40 °C
Storage Temperatur	-10 °C to +60 °C
Drop Survival	1.8 m
Protection class	IP 65 & MIL-STD810G
Certification	CE / FCC / UL
Dimensions (L x W x H)	287 x 189 x 28 mm
Weight	1.1 kg
Scope of Supply	GPS Azimuth Adjustment Tool; Tablet PC; Adapterplates; Charging Device; Storage and carrying bag; Cables
Shipment Dimension (L x W x H)	735 x 300 x 350 mm
Shipment Weight	5.2 kg

The tablet is included in the scope of supply



Please note:

The installation team must be properly qualified and also be familiar with the relevant national safety regulations! Non-observance of these instructions may damage or destroy the devices. Death or severe injuries may occur!

The details given in the product documentation must be carefully followed during the installation and operation of the GPS Azimuth Adjustment Tool (read the product documentation thoroughly before connecting the GPS Azimuth Adjustment Tool to the power supply).

Optional:

Universal mounting support (order no. 85010085) for precise mounting of the GPS Azimuth Adjustment tool on panel antennas.



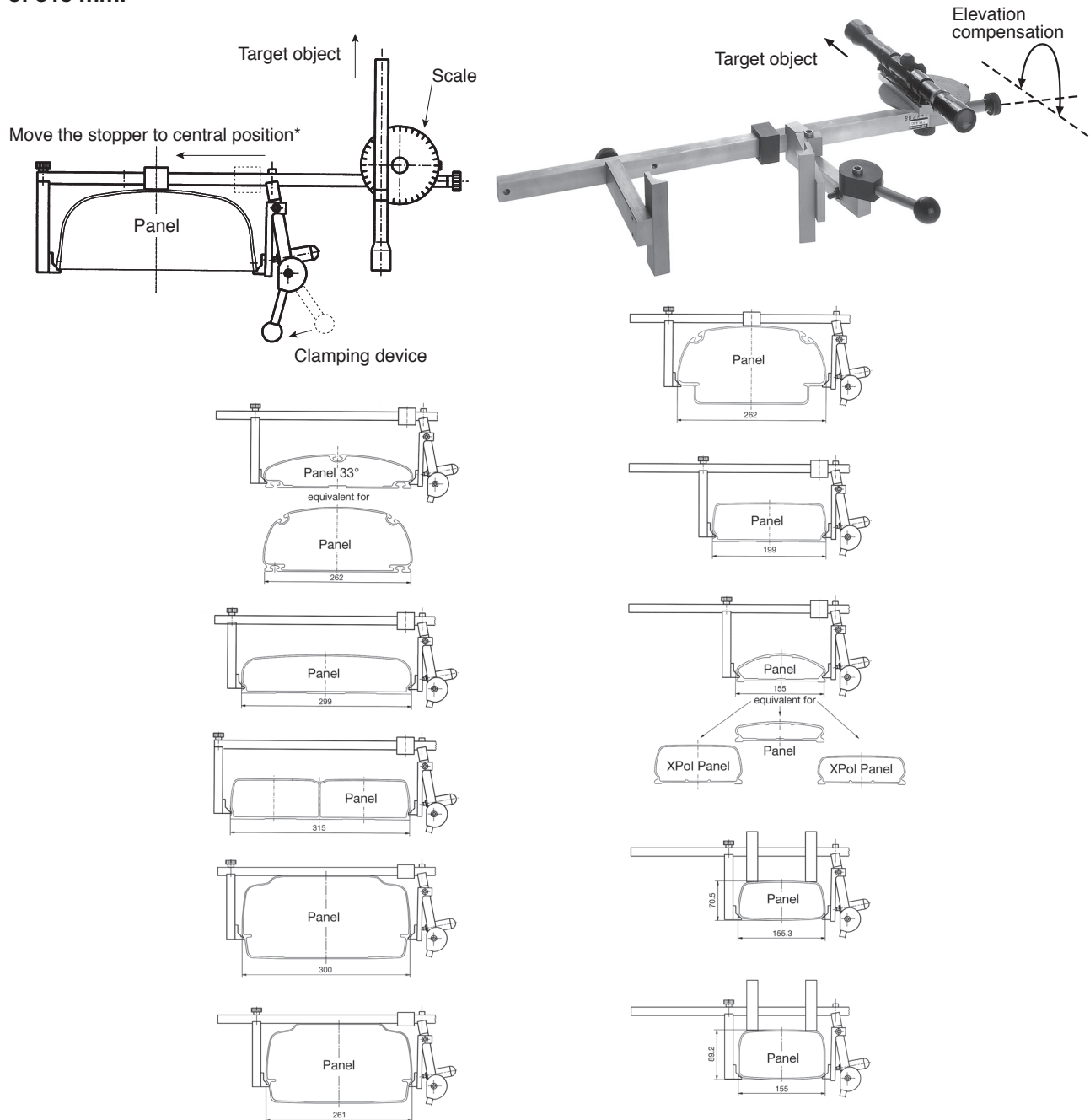
All Panels Accessories Azimuth Adjustment Tool

KATHREIN

Type No. 738440

Precise azimuth adjustment for mast mounted antennas can easily be achieved by using the azimuth adjustment tool.

This tool is suitable to all types of Panels and Tri-Sector Pipe Antennas with a maximum width of 315 mm.



Instruction:

- Use a map to work out the angle between the designed antenna azimuth and target (church, building, mountain peak).
- Set this angle on the scale of the adjustment tool.
- Place the adjustment tool onto the antenna and tighten the clamping device.
- Use the telescope to aim at the target object, if necessary, use elevation compensation.
- Then rotate the antenna until the target object appears in the telescope.

* Observe the position of the stopper when fitting the azimuth adjustment tool.

Installation Tool Set

Type No. 85010077

KATHREIN

Please note: In order not to damage the interfaces, please make sure that only the right tools are used. Tighten the feederline connector interfaces solely by using a common torque-wrench with a suitable wrench width.

Installation of the feederline connector and RCU (optional):
In order to protect the adjustment mechanism, the protective caps have to be attached during feederline installation!



Carefully place the connector and fix the nut using a torque-wrench (according to the manufacturers guidelines).

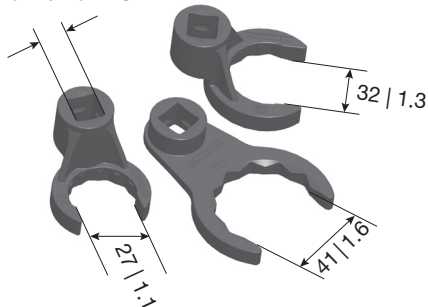


After feederline installation, the optional remote control units (RCUs) can be mounted.

Kathrein installation set: Type No. 85010077 **Set has to be ordered separately!**

Set consists of three spanners of divers width 27, 32 and 41 mm | 1.1, 1.3 and 1.6 inches

1/2" square actuation
according to
DIN 3120 Form C



All dimensions in mm | inches

These tools are suitable for 7-16 connectors with a wrench size of 27 or 32 mm | 1.1 or 1.3 inches, and the RCU attachment nut with a wrench size of 41 mm | 1.6 inches.

Tighten nuts within a torque range of 25 – 33 Nm depending on connector manufacturers' specifications, respectively the RCU nut with a torque range of 15 – 18 Nm.

Protection Caps IP 68 for 7-16 Female Connectors

Technical Data

Type No.		81610014
Material		ABS PC
Application		Indoor or outdoor (IP 68)
Temperature range	°C	-30 ... +95
Weight	g	3
	lb	0.007
Height	mm	16
	inches	0.63
Diameter	mm	32
	inches	1.26
Quantity per pack	pcs	100



Technical Data

Type No.		78211293
Material		Brass, silver-plating
Application		Indoor or outdoor (IP 68)
Temperature range	°C	-65 ... +165
Weight	g	60
	lb	0.132
Height	mm	22
	inches	0.87
Diameter	mm	32
	inches	1.26

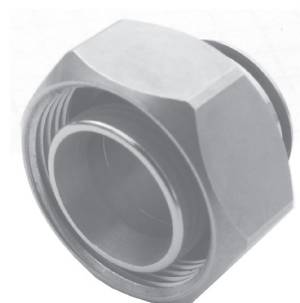


Protection Caps IP 68 for 4.3-10 Female Connectors

Technical Data

Preliminary Issue

Type No.		78211297
Material		Metal
Application		Indoor or outdoor (IP 68)
Temperature range	°C	-65 ... +165
Weight	g	20
	lb	0.044
Height	mm	24.8
	inches	0.97
Diameter	mm	16.5
	inches	0.65



> Multi-Band Combiners

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Multi-Band Combiners

> Same-Band Combiners and Hybrid Combiners

Same-Band Combiner
Duplex Hybrid Combiner
Active Duplex Hybrid Combiner
Hybrid Combiner
3 dB Couplers

Same-Band and Hybrid Combiners

> Filters & System Components

Filters
Smart Bias Tees
DC-Stops
Attenuators
50 Ω Loads

Filters & System Components

> DTMAAs

DTMAAs

Not longer in the catalogue 2017	Comments / Replacement
Filter / Duplexer	
Filter	
78211239, 78211240	
78210392	
78210391	78210390
Duplexer	
78210215	
78210162, 78210164, 78210165, 78210167	
792542, 792544	
78210192, 78210193	
Multi-Band Combiner	
Dual-Band Combiner	
78210341	
78211282, 78211284	78211280 (+external DC Stop)
78211283, 78211285	78211281 (+external DC Stops)
78210305	78211278 (+external DC Stop)
78210306	78211279 (+external DC Stops)
78210469, 78210808	78210778V01 (Double Unit)
78210809	78210770
78210810	78210771
78211320	78211320V01
78211321	78211321V01
78211322	78211322V01
78211323	78211323V01
Triple-Band Combiner	
78211132, 78211134	78211130 (+external DC Stop)
78211133, 78211135	78211131 (+external DC Stops)
78211390	78211400
78211391	78211401
78211392	78211402
78211393	78211403
78211394	78211404
78211395	78211405
78211396	78211406
78211397	78211407
Same-Band and Hybrid Combiner	
Same-Band Combiner	
78211228	78211228V01 or 78211228V03
3 dB Coupler	
793506, 793006	78210525
System Components	
DC-Stop	
793301	78210850V01
Smart Bias Tee	
78211063, 78211064	
50 Ω Loads	
K6226611	K6226111
78410470	
K6226401	

Catalogue 2017 →
Alterations to the Catalogue of 2016

KATHREIN

Not longer in the catalogue 2017	Comments / Replacement
K6226201	K6226301
K6226211	K6226311
K6226207	K6226307
K6226501	
K6226511	
Attenuator	
78410235	791918
78210236	791919
78210237	791920
78210238	791921
DTMAs	
78210874	
78210510	78210510V01
78210511	78210511V01
78210440	78210495 (different gain 12dB)
78210442	78210495 (different gain 12dB)
78210490	78210495 (different gain 12dB)
78210580	78210583 (different CWA current)
78210584	78210583 (different CWA current)
78211103	78211103V01
78211105	78211106V01 / 78211106V02 (no CWA)
78211106	78211106V01 / 78211106V02
78210877	78210877V01
78210876	
78211120	78211245
78210613	78211245 (different gain 12dB)
78211104	78211102 (different CWA current)

Please note: New type numbers in the catalogue 2017 are shown and coloured in the respective register of the different product families.

All phased out types will be available on request until end of 2017 unless otherwise announced. According information can be found on our webpage.

New Products

Summary of Filter, Combiner and Amplifier Types

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
728..		78210623	354, 355	78210864V04	493, 494	78211131	384, 385
728954	326	78210624	354, 355	78210872V01	474	78211141	419, 420
		78210625	354, 355	78210877V01	492	78211142	419, 420
734..		78210626	356, 357	78210880	374, 375	78211143	419, 420
734360	467	78210627	358, 359	78210881	374, 375	78211144	419, 420
734361	467	78210628	358, 359	78210882	374, 375	78211145	499
734362	467	78210630	382, 383	78210883	374, 375	78211180	366, 367
734363	467	78210631	382, 383	78210884	374, 375	78211181	366, 367
734364	467	78210632	382, 383	78210885	374, 375	78211182	366, 367
734365	467	78210633	382, 383	78210887	376, 377	78211183	366, 367
		78210634	382, 383	78210888	376, 377	78211184	366, 367
782102..		78210635	382, 383	78210891	466	78211185	366, 367
78210264	360	78210640	402, 403	78210892	466	78211189	368, 369
78210278	352, 353	78210641	402, 403	78210893	466	78211190	390, 391
78210279	352, 353	78210642	402, 403	78210894	466	78211191	390, 391
		78210643	402, 403			78211192	390, 391
782103..		78210644	402, 403	782109..		78211193	390, 391
78210390	452, 453	78210645	402, 403	78210925	436, 437	78211197	392, 393
78210390V04	452, 453	78210649	404, 405	78210926	438, 439	78211198	392, 393
78210390V05	452, 453	78210660	342, 343	78210936	428, 429		
78210390V12	452, 453	78210661	342, 343	78210970	332, 333	782112..	
78210390V13	452, 453	78210662	342, 343	78210971	332, 333	78211216	421
78210390V14	452, 453	78210663	342, 343	78210972	332, 333	78211228V01	440, 441
78210390V15	452, 453	78210664	342, 343	78210973	332, 333	78211228V03	442, 443
		78210665	342, 343	78210974	332, 333	78211230	430, 431
782104..		78210669	344, 345	78210975	332, 333	78211235	432, 433
78210430	476	78210680	346, 347	78210977	334, 335	78211237	423
78210460	327	78210681	346, 347	78210978	334, 335	78211245	500
78210474	465	78210682	346, 347	78210979	336, 337	78211273V01	495, 496
78210475	462	78210683	346, 347	78210990	490, 491	78211273V04	497, 498
78210484	463					78211275	475
78210495	483	782107..		782110..		78211280	328, 329
		78210700	398, 399	78211000	455	78211281	328, 329
782105..		78210701	398, 399	78211053	456 - 458	78211287	330, 331
78210500	415	78210702	398, 399	78211054	456 - 458	78211288	330, 331
78210502	416	78210703	398, 399	78211055	456 - 458		
78210504	417	78210704	398, 399	78211056	456 - 458	782113..	
78210506	418	78210705	398, 399	78211065	456 - 458	78211320V01	340, 341
78210510V01	477, 478	78210707	400, 401	78211066	456 - 458	78211321V01	340, 341
78210511V01	477, 478	78210708	400, 401	78211091	362, 363	78211322V01	340, 341
78210512	479, 480	78210770	370, 371	78211092	362, 363	78211323V01	340, 341
78210517	481, 482	78210771	370, 371	78211093	362, 363	78211330	504
78210517V02	481, 482	78210778V01	372, 373	78211094	362, 363	78211332	505, 506
78210524	444, 445	78210780	378, 379	78211095	362, 363	78211333	505, 506
78210525	446, 447	78210781	378, 379	78211099	364, 365	78211340	406, 407
78210534	422	78210788V01	380, 381			78211341	406, 407
78210581	484			782111..		78211342	406, 407
78210583	485	782108..		78211102	501, 502	78211343	406, 407
		78210800	362, 363	78211103V01	486, 487	78211347	408, 409
782106..		78210805	424, 425	78211106V01	488, 489	78211348	408, 409
78210620	354, 355	78210850V01	454	78211106V02	488, 489	78211370	434, 435
78210621	354, 355	78210860	503	78211110	426, 427	78211374V04	497, 498
78210622	354, 355	78210863V04	493, 494	78211130	384, 385		

Summary of Filter, Combiner and Amplifier Types

KATHREIN

The articles are listed by type number in numerical order. **New or changed product.**

Type No.	Page	Type No.	Page
782114..		793..	
78211400	394, 395	793554	448
78211401	394, 395		
78211402	394, 395	K6226..	
78211403	394, 395	K6226111	463
78211404	394, 395	K6226217	464
78211405	394, 395	K6226301	464
78211406	394, 395	K6226307	464
78211407	394, 395	K6226311	464
78211408	396, 397	K6226317	464
78211409	396, 397	K6226411	463
78211430	338, 339	K6226507	464
78211431	338, 339		
78211432	338, 339		
78211433	338, 339		
78211434	338, 339		
78211435	338, 339		
78211450	386, 387		
78211451	386, 387		
78211452	386, 387		
78211453	386, 387		
78211454	386, 387		
78211455	386, 387		
78211457	388, 389		
78211458	388, 839		
782115..			
78211510	348, 349		
78211511	348, 349		
78211512	348, 349		
78211513	348, 349		
78211514	348, 349		
78211515	348, 349		
78211517	350, 351		
78211518	350, 351		
78211590	459 - 461		
78211591	459 - 461		
78211592	459 - 461		
78211593	459 - 461		
78211594	459 - 461		
78211595	459 - 461		
78211596	459 - 461		
78211597	459 - 461		
784..			
78410367	463		
791..			
791918	466		
791919	466		
791920	466		
791921	466		

> **Multi-Band Combiners**

- Dual-Band Combiners
- Triple-Band Combiners
- Quad-Band Combiners

Dual-Band Combiners:

Type No.	Frequency [MHz]			Connector Type (female)	Combiner Type	Page
728954	68 - 470		870 - 960	N		326
78210460	50 - 470		790 - 2500	7-16		327
78211280, -281	698 - 806		824 - 960	7-16		328, 329
78211287, -288	698 - 806		824 - 960	7-16	Auto-Sense	330, 331
78210970, -1, -2, -3, -4, -5	790 - 862		880 - 960	7-16		332, 333
78210977, -8	790 - 862		880 - 960	7-16	Auto-Sense	334, 335
78210979	790 - 862		880 - 960	7-16	Cross-Bypass	336, 337
78211430, -1, -2, -3, -4, -5	694 - 862		880 - 960	7-16		338, 339
78211320V01, -1V01, -2V01, -3V01	470 - 960		1695 - 2700	7-16	Auto-Sense	340, 341
78210660, -1, -2, -3, -4, -5	470 - 960		1710 - 2700	7-16		342, 343
78210669	470 - 960		1710 - 2700	7-16	Cross-Bypass	344, 345
78210680, -1, -2, -3	380 - 960		1710 - 2700	7-16		346, 347
78211510, -1, -2, -3, -4, -5	1350 - 2200		2300 - 2690	4.3-10		348, 349
78211517, -8	1350 - 2200		2300 - 2690	4.3-10	Auto-Sense	350, 351
78210278, -9	790 - 1880		1920 - 2170	7-16		352, 353
78210620, -1, -2, -3, -4, -5	1710 - 1880		1920 - 2200	7-16		354, 355
78210626	1710 - 1880		1920 - 2200	7-16	Cross-Bypass	356, 357
78210627, -8	1710 - 1880		1920 - 2200	7-16	Auto-Sense	358, 359
78210264	50 - 2200		2400 - 2500	N		360, 361
78210800, 78211091, -2, -3, -4, -5	1710 - 2180		2400 - 2700	7-16		362, 363
78211099	1710 - 2180		2400 - 2700	7-16	Cross-Bypass	364, 365
78211180, -1, -2, -3	690 - 2180		2400 - 2700	7-16		366, 367
78211184, -5	380 - 2180		2400 - 2700	7-16		366, 367
78211189	690 - 2180		2400 - 2700	7-16	Cross-Bypass	368, 369
78210770, -1	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000		7-16		370, 371
78210778V01	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000		7-16	Auto-Sense	372, 373

Triple-Band Combiners:

Type No.	Frequency [MHz]			Connector Type (female)	Combiner Type	Page
78210880, -1, -2, -3, -4, -5	703 - 788	791 - 862	880 - 960	4.3-10		374, 375
78210887, -8	703 - 788	791 - 862	880 - 960	4.3-10	Auto-Sense	376, 377
78210780, -1	380 - 960	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000	7-16		378, 379
78210788V01	380 - 960	1695 - 1780 / 2095 - 2200	1850 - 1920 / 1930 - 2000	7-16	Auto-Sense	380, 381
78210630, -1, -2, -3, -4, -5	380 - 960	1710 - 1880	1920 - 2170	7-16		382, 383
78211130, -1	790 - 960	1710 - 2180	2490 - 2690	7-16		384, 385
78211450, -1, -2, -3, -4, -5	380 - 960	1350 - 2200	2300 - 2690	4.3-10		386, 387
78211457, -8	380 - 960	1350 - 2200	2300 - 2690	4.3-10	Auto-Sense	388, 389
78211190, -1, -2, -3	791 - 862	880 - 960	1710 - 2690	7-16		390, 391
78211197, -8	791 - 862	880 - 960	1710 - 2690	7-16	Auto-Sense	392, 393
78211400, -1, -2, -3, -4, -5, -6, -7	1710 - 1880	1920 - 2170	2300 - 2700	7-16		394, 395
78211408, -9	1710 - 1880	1920 - 2170	2300 - 2700	7-16	Cross-Bypass	396, 397
78210700, -1, -2, -3, -4, -5	690 - 806	824 - 960	1427 - 3800	4.3-10		398, 399
78210707, -8	690 - 806	824 - 960	1427 - 3800	4.3-10	Auto-Sense	400, 401

Quad-Band Combiners:

Type No.	Frequency [MHz]				Connector Type (female)	Combiner Type	Page
78210640, -1, -2, -3, -4, -5	380 - 960	1710 - 1880	1920 - 2200	2500 - 2690	7-16		402, 403
78210649	380 - 960	1710 - 1880	1920 - 2200	2500 - 2690	7-16	Cross-Bypass	404, 405
78211340, -1, -2, -3	690 - 862	880 - 960	1427 - 1880	1920 - 2690	4.3-10		406, 407
78211347, -8	690 - 862	880 - 960	1427 - 1880	1920 - 2690	4.3-10	Auto-Sense	408, 409

Summary of Multi-Band Combiner Types



Frequency Combinations for Dual-, Triple- and Quad-Band Combiners

Type No.	Frequency / MHz																		
	200	400	600	700	800	850	900	1000	1200	1400	1600	1800	1800 AWS/PCS 2.1	2000	2200	2400	2600	2800	3000
Dual-Band Combiners																			
728954		68 - 470					870 - 970												
78210460		50 - 470											790 - 2500						
78211280, -281, -287, -288			698 - 806				824 - 960												
78210970, -1, -2, -3, -4, -5, -7, -8, -9			790 - 862				880 - 960												
78211430, -1, -2, -3, -4, -5			694 - 862				880 - 960												
78211320V01, -1V01, -2V01, -3V01			470 - 960										1695 - 2700						
78210660, -1, -2, -3, -4, -5, -9			470 - 960										1710 - 2700						
78210680, -1, -2, -3,			380 - 960										1710 - 2700						
78211510, -1, -2, -3, -4, -5, -7, -8													1350 - 2200				2300 - 2690		
78210278, 78210279													790 - 1880						
78210620, -1, -2, -3, -4, -5, -6, -7, -8													1710 - 1880				1920 - 2170		
78210264													50 - 2200				2400 - 2500		
78210800, 78211091, -2, -3, -4, -5, -9													1710 - 2180				2400 - 2700		
78211180, -1, -2, -3, -4, -5, -9													380 (690) - 2180				2400 - 2700		
78210770, 78210771, 78210778V01													1695-1780		1850 - 2000		2095-2200		
Triple-Band Combiners																			
78210880, -1, -2, -3, -4, -5, -7, -8													703 - 788 / 791 - 862 / 880 - 960						
78210780, 78210781, 78210788V01													1695-1780		1850 - 2000		2095-2200		
78210630, -1, -2, -3, -4, -5													1710 - 1880				1920 - 2170		
78211130, 78211131													1710 - 1880				2490 - 2690		
78211450, -1, -2, -3, -4, -5, -7, -8													1350 - 2200				2300 - 2690		
78211190, -1, -2, -3, -7, -8													1710 - 2690						
78211400, -1, -2, -3, -4, -5, -6, -7, -8, -9													1710 - 1880		1920 - 2170		2300 - 2700		
78210700, -1, -2, -3, -4, -5, -7, -8													1427 - 3800						
Quad-Band Combiners																			
78210640, -1, -2, -3, -4, -5, -9													1710 - 1880		1920 - 2200				2500 - 2690
78211340, -1, -2, -3, -7, -8													1427 - 1880				1920 - 2690		

In order to enable the control of ALDs¹⁾ when deploying standard multi-band combiners in mobile communication networks, such combiners are fitted with integrated DC/AISG bypass circuits. Depending on the application, different bypass configurations are available. The correct bypass combination needs to be selected in order to ensure the proper control and configuration of the ALDs.

Kathrein's auto-sense combiners simplify the selection of the correct combiner since there is no need to choose one fixed AISG bypass version. The correct bypass is automatically detected, thereby enabling safe and easy deployment of the auto-sense combiners in universal applications.

How does an auto-sense combiner work?

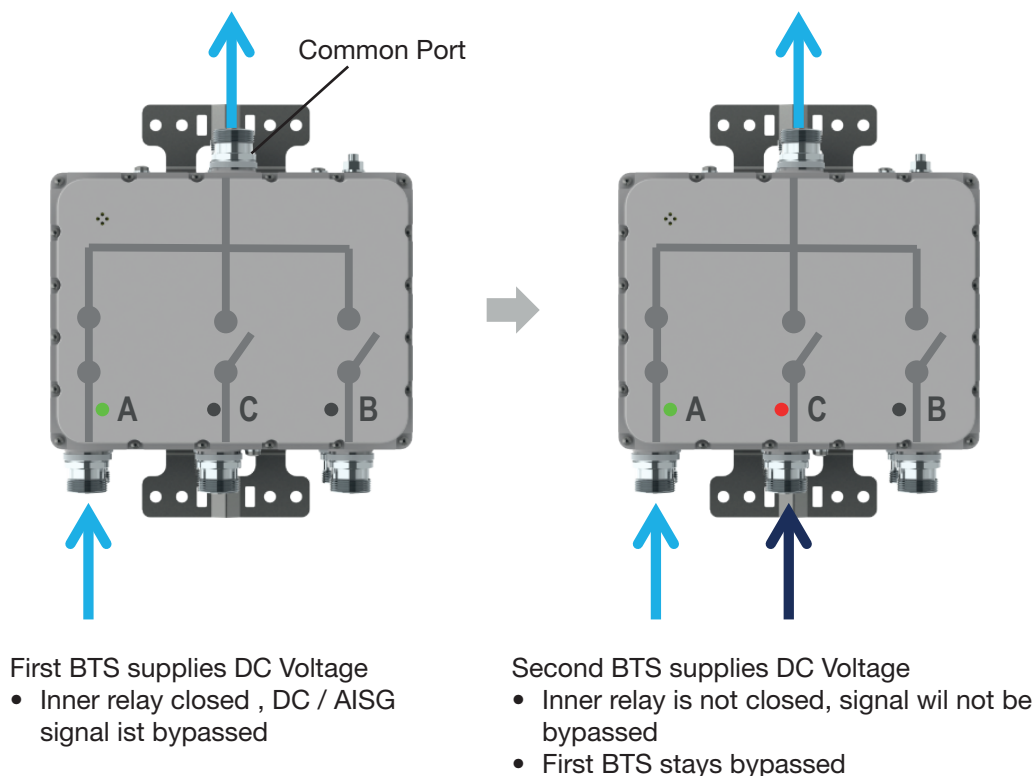
- Automatic detection of DC voltage on the input port
- Short-circuit detection to acknowledge connected ALDs
- DC/AISG signal is bypassed to connected ALDs
- Allocation of the ALDs to the different base stations can be performed on a "first-in and first-out" basis (default) or in a customised fashion

Features / Benefits:

- Prevent installation mistakes (e.g. incorrect cabling and/or DC bypass selection)
- Simplification of type choice: same type for bottom & top, one type for all DC bypass situations
- Reduce warehouse stock
- Reduce ordering logistics and number of parts
- No external DC stops required
- Flexible retrofitting of networks
- LED status indication
- AISG and CWA functionality
- Customised prioritisation of different ports possible

Application example for first in – first out allocation:

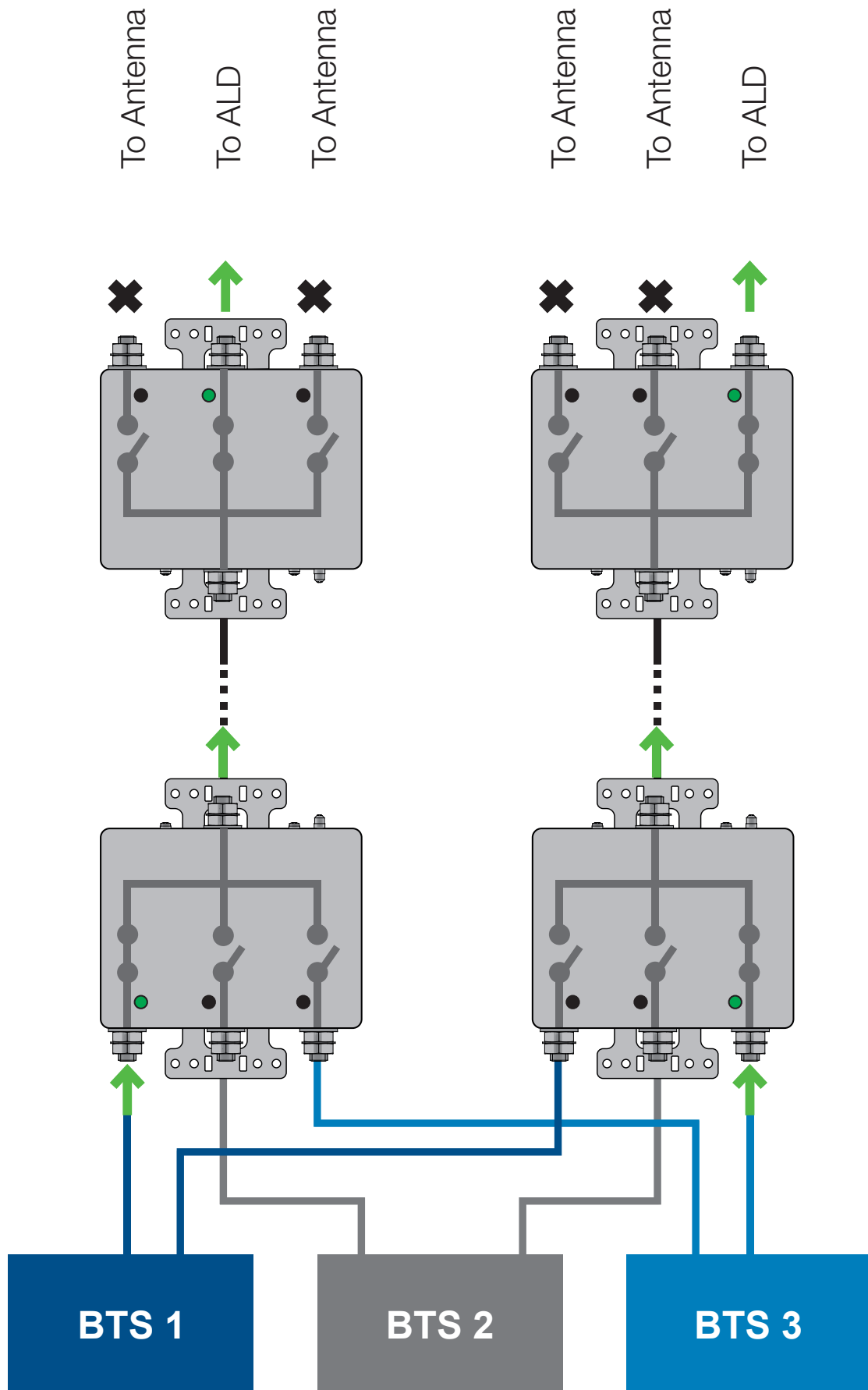
- First BTS supplying DC is connected to the common port
- Further DC signals will not be bypassed



¹⁾ ALD = Antenna Line Device (including where appropriate secondary AISG devices)

Auto-Sense Combiner Functionality & Benefits

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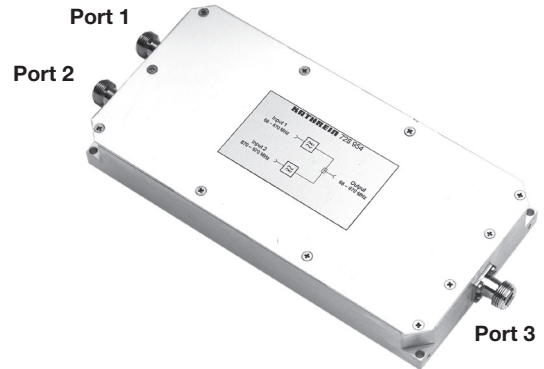
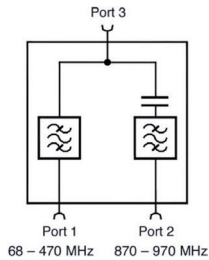
Dual-Band Combiner

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68 – 470 MHz

870 – 970 MHz

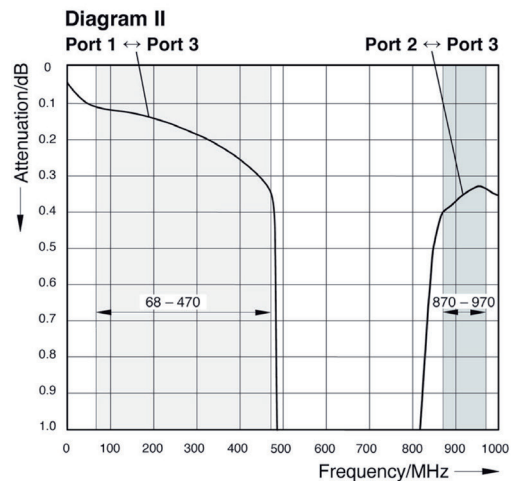
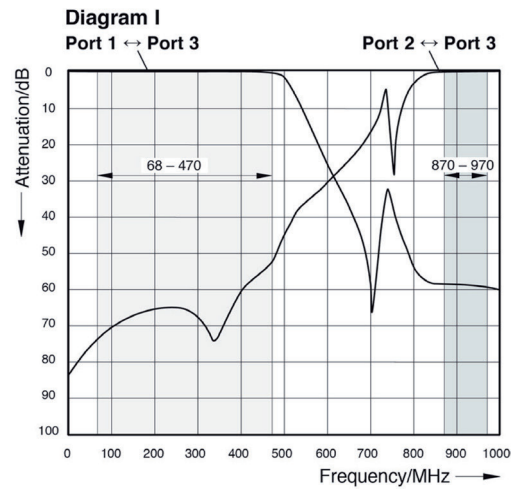
- Designed for inhouse multiband distribution network
- Enables feeder sharing
- DC by-pass between port 1 and port 3
- Built-in DC stop between port 2 and port 3



Technical Data

Type No.	728954
Pass band Band 1 Band 2	68 – 470 MHz 870 – 970 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.5 dB (68 – 470 MHz) < 0.5 dB (870 – 970 MHz)
Isolation Port 1 ↔ Port 2	> 45 dB
VSWR	< 1.2
Impedance	50 Ω
Input power Band 1 Band 2	< 50 W < 50 W
Temperature range	-20 ... +70 °C
Connectors	N female
Application	Indoor
DC transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 3 ↔ Port 2	By-pass (max. 2500mA) Short circuited stop
Weight	0.8 kg
Packing size	285 x 55 x 125 mm
Dimensions (w x h x d)	229.4 x 32 x 111.6 mm (without connectors)

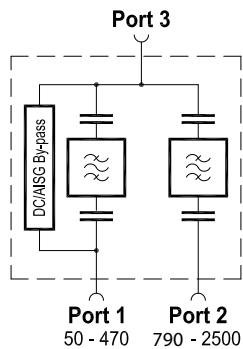
Typical Attenuation Curves



50 – 470 MHz

790 – 2500 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- External DC stop available as an accessory
- **Very low insertion loss**
- **High input power**



Technical Data

Type No.	78210460
Pass band Band 1 Band 2	50 – 470 MHz 790 – 2500 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.15 dB (50 – 470 MHz) < 0.15 dB (790 – 2500 MHz)
Isolation Port 1 ↔ Port 2	> 50 dB (50 – 470 / 790 – 2500 MHz)
VSWR	< 1.25 (50 – 470 / 790 – 960 / 1710 – 2500 MHz)
Impedance	50 Ω
Input power Band 1 / Band 2	< 500 W / < 500 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-55 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	By-pass (max. 2500 mA) Stop
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter)/ Mast mounting: With additional clamp set
Weight	4.0 kg
Packing size	210 x 150 x 440 mm
Dimensions (w x h x d)	122 x 64 x 364.3 mm (including mounting brackets)

- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
 (order separately) can be found in the section “System Components”.

Typical Attenuation Curves

Diagram I

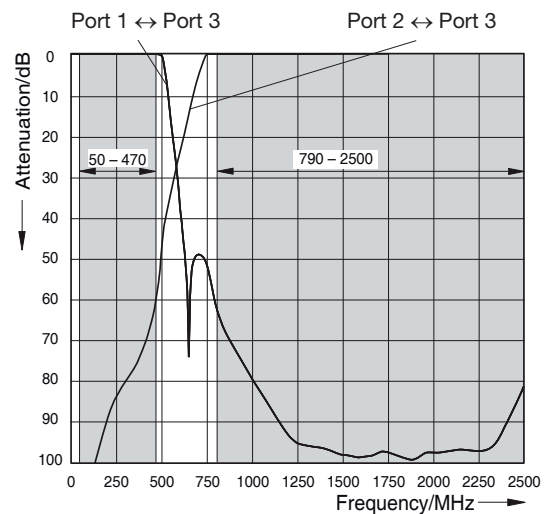
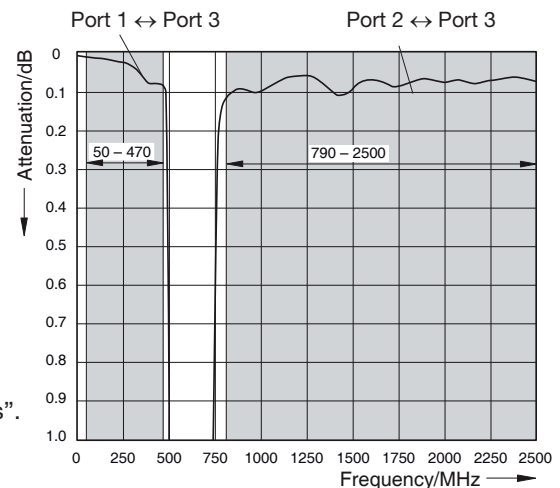


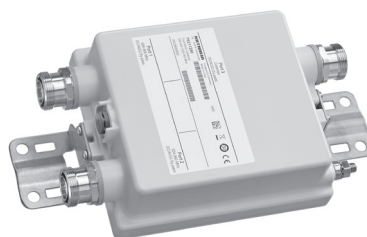
Diagram II



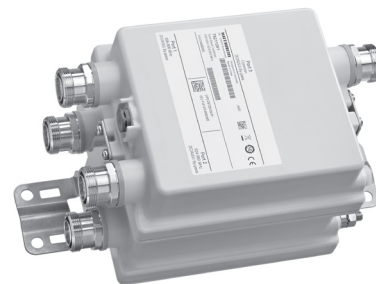
698 – 806 MHz

824 – 960 MHz

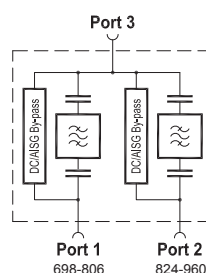
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Low insertion loss**
- **High input power**



Single Unit



Double Unit



Technical Data

Type No.	78211280 Single Unit	
	78211281 Double Unit	
Pass band	[MHz]	
Band 1		698 - 806
Band 2		824 - 960
Insertion loss	[dB]	
Port 1 ↔ Port 3		< 0.3 (698 - 796 MHz); < 0.5 (796 - 806 MHz)
Port 2 ↔ Port 3		< 0.5 (824 - 834 MHz); < 0.3 (834 - 960 MHz)
Isolation	[dB]	
Port 1 ↔ Port 2		> 50
VSWR		< 1.2 (698 - 806 MHz / 824 - 960 MHz)
Impedance	[Ω]	50
Input power	[W]	
Band 1 / Band 2		< 500 / < 500
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)
Temperature range	[°C °F]	-40 ... +60
Connectors		7-16 female (long neck)
Application		Indoor or outdoor (IP 66)
DC/AISG transparency	[mA]	
Port 1 ↔ Port 3		By-pass (max. 2500)
Port 2 ↔ Port 3		By-pass (max. 2500)
Lightning protection	[kA]	3, 10/350 μs pulse
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set
Weight	[kg lb]	Single Unit: 2.4 5.3 / Double Unit: 4.8 10.6
Packing size	[mm in]	Single unit: 365 x 235 x 145 14.4 x 9.3 x 5.7 Double unit: 365 x 235 x 210 14.4 x 9.3 x 8.9
Dimensions (w x h x d)	[mm in]	Single Unit: 153 x 170.5 x 63.2 6.0 x 6.7 x 2.5 Double Unit: 153 x 170.5 x 131.2 6.0 x 6.7 x 5.2 (without connectors, without mounting brackets)

698 – 806 MHz

824 – 960 MHz

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 - 60 mm
734361	60 - 80 mm
734362	80 - 100 mm
734363	100 - 120 mm
734364	120 - 140 mm
734365	45 - 125 mm

Type No.	Description
78210850V01	DC stop
78410367	50-Ohm load



Diagram 1

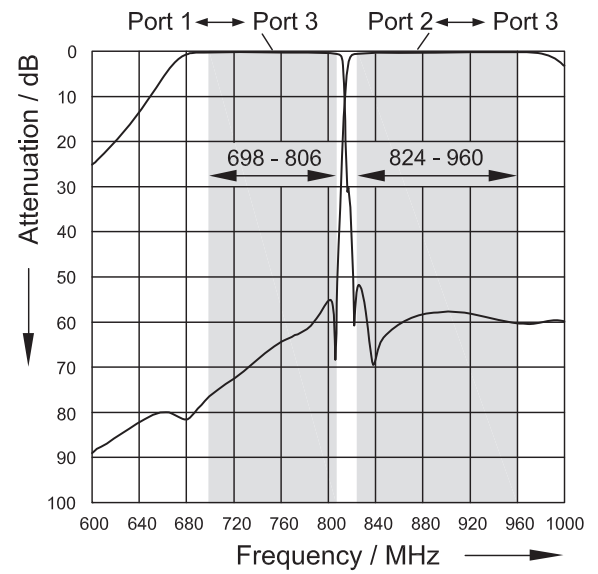
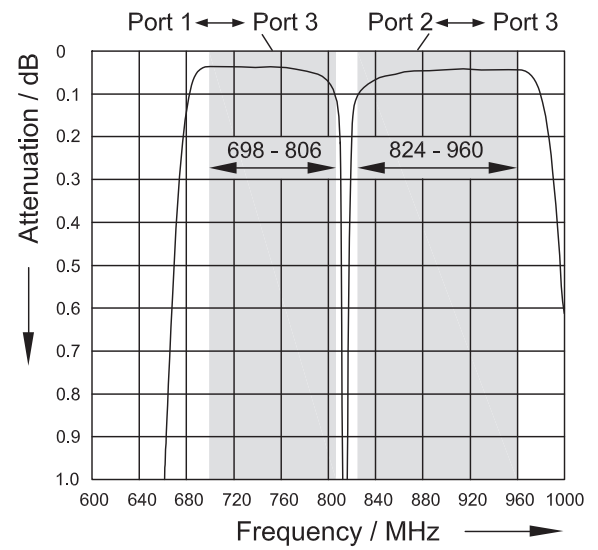


Diagram 2



698 – 806 MHz

824 – 960 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

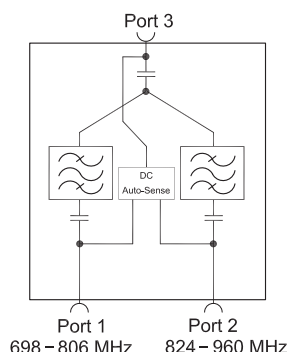
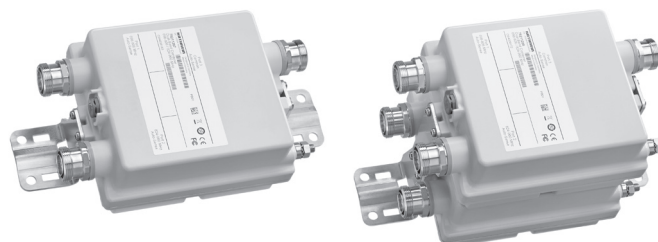
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- Low insertion loss
- High input power



Technical Data

Type No.	78211287 Single Unit	clamps included	78211288 Double Unit
Pass band			
Band 1 [MHz]			698 – 806
Band 2 [MHz]			824 – 960
Insertion loss			
Port 1 ↔ Port 3 [dB]			< 0.3 (698 – 796 MHz); < 0.5 (796 – 806 MHz)
Port 2 ↔ Port 3 [dB]			< 0.5 (824 – 834 MHz); < 0.3 (834 – 960 MHz)
Isolation			
Port 1 ↔ Port 2 [dB]			> 50
VSWR			< 1.2 (698 – 806 MHz / 824 – 960 MHz)
Impedance [Ω]			50
Input power			
Band 1 / Band 2 [W]			< 500 / < 500
Intermodulation products [dBc]			< -160 (3 rd order; with 2 x 20 W)
Temperature range [°C °F]			-40 ... +60 -40 ... +140
Connectors			7-16 female (long neck)
Application			Indoor or outdoor (IP 66)
DC/AISG transparency			
Port 1 ↔ Port 3 [mA]			Auto-sense (max. 2000)
Port 2 ↔ Port 3 [mA]			Auto-sense (max. 2000)
Lightning protection [kA]			3, 10/350 μs pulse
Mounting [mm in]			Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set
Weight [kg lb]			Single Unit: 2.5 5.51 / Double Unit: 5.0 11.02
Packing size [mm in]			Single unit: 365 x 235 x 145 14.37 x 9.25 x 5.71 / Double unit: 365 x 235 x 210 14.37 x 9.25 x 8.27
Dimensions (w x h x d) [mm in]			Single Unit: 153 x 170.5 x 80.5 6.02 x 6.71 x 3.17 Double Unit: 153 x 170.5 x 165.5 6.02 x 6.71 x 6.52 (without connectors, without mounting brackets)

698 – 806 MHz

824 – 960 MHz

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78410367	50-Ohm load



Auto-sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B (lowest)
Port 2	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

Diagram 1

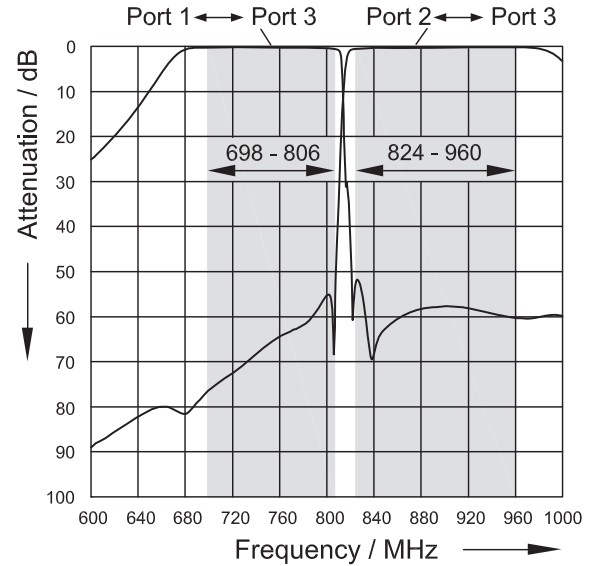
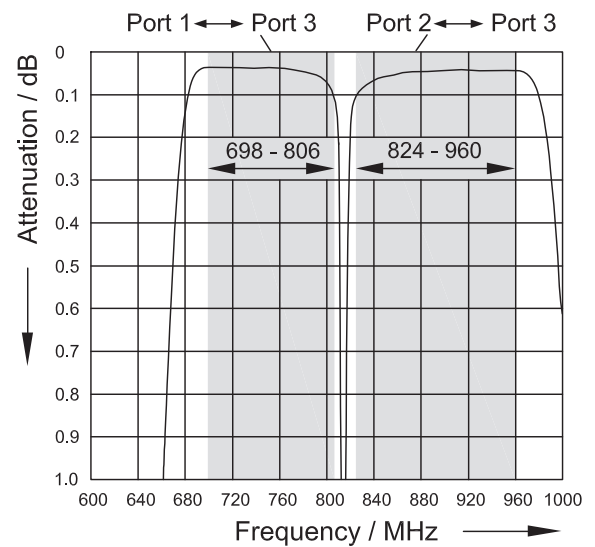


Diagram 2



Dual-Band Combiner

KATHREIN

790 – 862 MHz

880 – 960 MHz

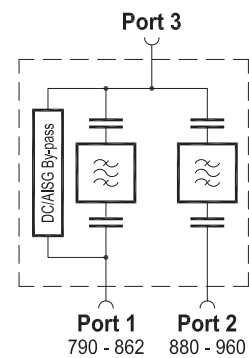
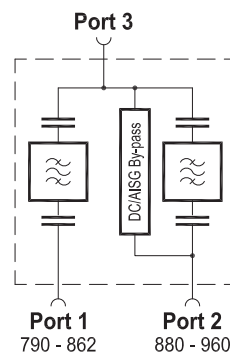
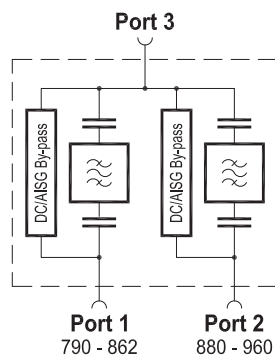
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



78210970, 78210972, 78210974
Single Unit



78210971, 78210973, 78210975
Double Unit



Technical Data

Type No.	78210970 Single Unit	78210972 Single Unit	78210974 Single Unit
	78210971 Double Unit	78210973 Double Unit	78210975 Double Unit
Pass band Band 1 Band 2	790 – 862 MHz 880 – 960 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.4 dB, typically 0.2 dB (790 – 862 MHz) < 0.4 dB, typically 0.2 dB (880 – 960 MHz)		
Isolation Port 1 ↔ Port 2	> 50 dB (790 – 862 MHz / 880 – 960 MHz)		
VSWR	< 1.25 (790 – 862 / 880 – 960 MHz)		
Impedance	50 Ω		
Input power Band 1 / Band 2	< 200 W / < 200 W		
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)		
Temperature range	-40 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor or outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop By-pass (max. 2500 mA)	By-pass (max. 2500 mA) Stop
Lightning protection	3 kA, 10/350 μs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 2.6 kg / Double Unit: 5.1 kg		
Packing size	Single Unit: 392 x 272 x 139 mm / Double Unit: 392 x 272 x 189 mm		
Dimensions (w x h x d)	Single Unit: 177.4 x 52.35 x 209.4 mm / Double Unit: 177.4 x 108.35 x 209.4 mm (without connectors, without mounting brackets)		

790 – 862 MHz

880 – 960 MHz

Typical Attenuation Curves

Diagram I

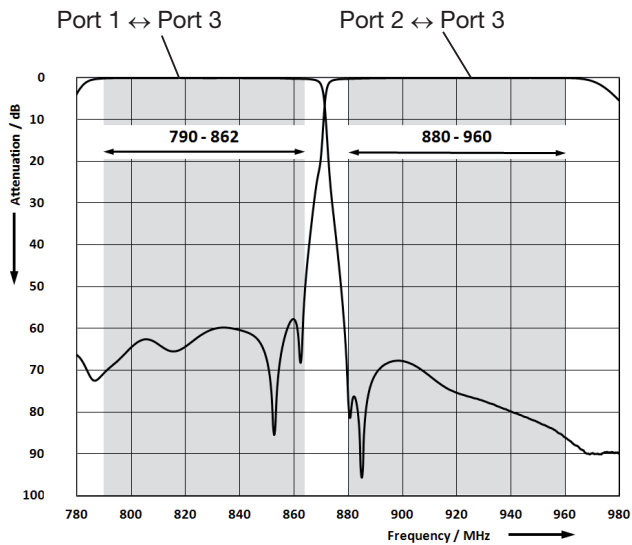
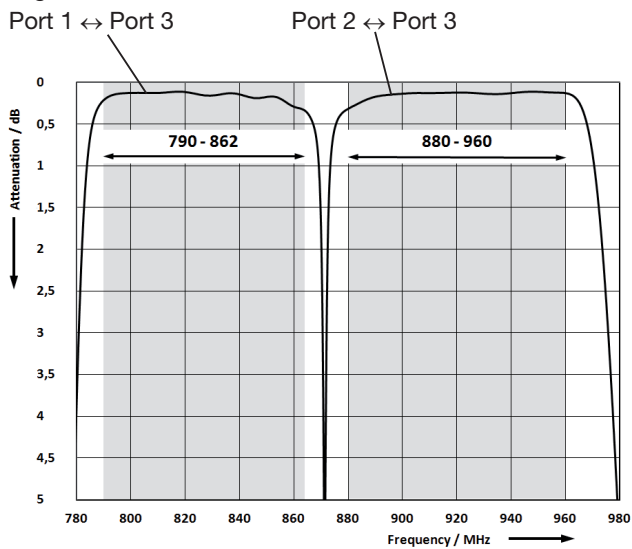


Diagram II



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

790 – 862 MHz

880 – 960 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

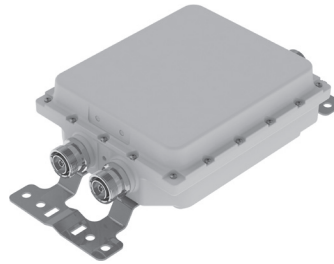
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

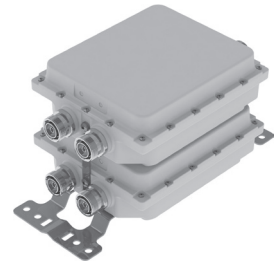
A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

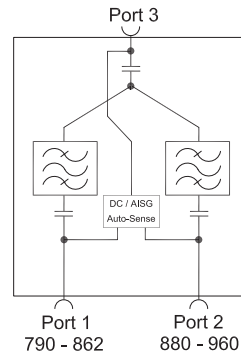
AUTO-SENSE



Single Unit



Double Unit



Technical Data

Type No.	78210977 Single Unit	78210978 Double Unit
Pass band		
Band 1 [MHz]	790 – 862	
Band 2 [MHz]	880 – 960	
Insertion loss		
Port 1 ↔ Port 3 [dB]	< 0.4 (790 – 862 MHz)	
Port 2 ↔ Port 3 [dB]	< 0.4 (880 – 960 MHz)	
Isolation		
Port 1 ↔ Port 2 [dB]	> 50	
VSWR	< 1.25	
Impedance [Ω]	50	
Input power		
Band 1 / Band 2 [W]	< 200 / < 200	
Intermodulation products [dBc]	< -160 (3 rd order; with 2 x 20 W)	
Temperature range [°C °F]	-40 ... +60 -40 ... +140	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency		
Port 1 ↔ Port 3 [mA]	Auto-sense (max. 2000)	
Port 2 ↔ Port 3 [mA]	Auto-sense (max. 2000)	
Lightning protection [kA]	3, 10/350 μs pulse	
Mounting [mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight [kg lb]	Single Unit: Approx. 2.9 6.39 / Double Unit: Approx. 5.75 12.68	
Packing size [mm in]	Single Unit: 392 x 272 x 139 15.43 x 10.71 x 5.47 Double Unit: 392 x 272 x 189 15.43 x 10.71 x 7.44	
Dimensions (w x h x d) [mm in]	Single Unit: 177.4 x 70 x 209.4 6.98 x 2.76 x 8.24 Double Unit: 177.4 x 144 x 209.4 6.98 x 5.67 x 8.24 (without connectors, without mounting brackets)	

790 – 862 MHz

880 – 960 MHz

Accessories (order separately)

Type No.		Clamp set suitable for mast diameter of
734360	[mm in]	34 – 60 1.34 – 2.36
734361	[mm in]	60 – 80 2.36 – 3.15
734362	[mm in]	80 – 100 3.15 – 3.94
734363	[mm in]	100 – 120 3.94 – 4.72
734364	[mm in]	120 – 140 4.72 – 5.51
734365	[mm in]	45 – 125 1.77 – 4.92



Clamp Set

Type No.	Description
78410367	50-Ohm load



50-Ohm load

Auto-sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

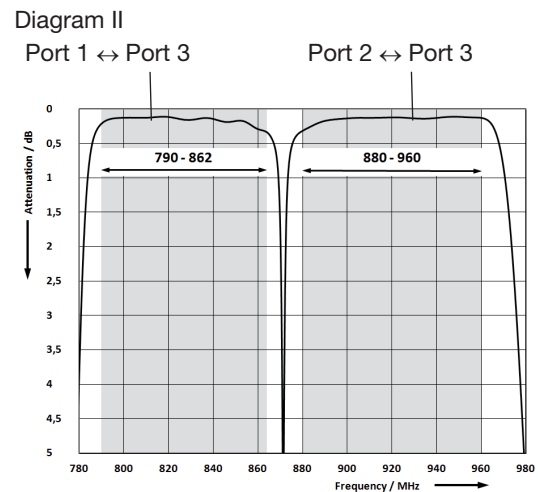
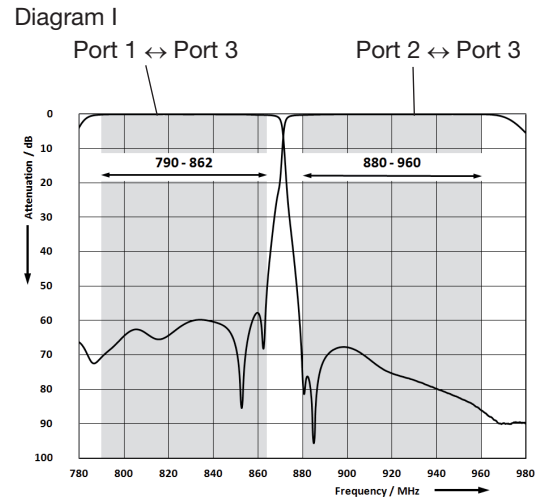
Connector	Priority
Port 1	B (lowest)
Port 2	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Interference Devices at the output ports and bypasses or blocks the DC/AISG signal at each port accordingly.

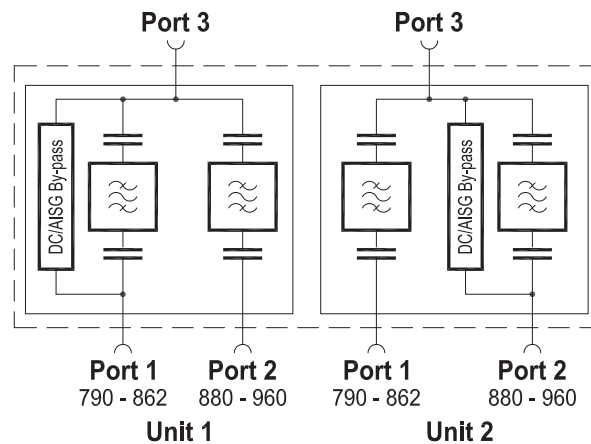
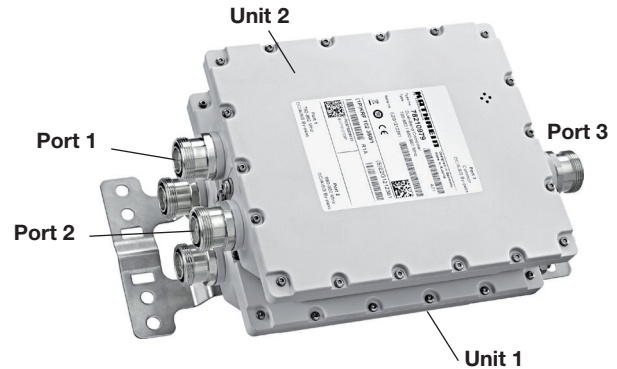
Typical Attenuation Curves



790 – 862 MHz

880 – 960 MHz

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XXPol antennas
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.	78210979 Double Unit	
Pass band		
Band 1	790 – 862 MHz	
Band 2	880 – 960 MHz	
Insertion loss		
Port 1 ↔ Port 3	< 0.4 dB, typically 0.2 dB (790 – 862 MHz)	
Port 2 ↔ Port 3	< 0.4 dB, typically 0.2 dB (880 – 960 MHz)	
Isolation		
Port 1 ↔ Port 2	> 50 dB (790 – 862 MHz / 880 – 960 MHz)	
VSWR	< 1.25 (790 – 862 / 880 – 960 MHz)	
Impedance	50 Ω	
Input power		
Band 1 / Band 2	< 200 W / < 200 W	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency	Unit 1 By-pass (max. 2500 mA) Stop	Unit 2 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 µs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	5.1 kg	
Packing size	384 x 267 x 184 mm	
Dimensions (w x h x d)	177.4 x 209.4 x 108.35 mm (without connectors, without mounting brackets)	

790 – 862 MHz

880 – 960 MHz

Typical Attenuation Curves

Diagram I

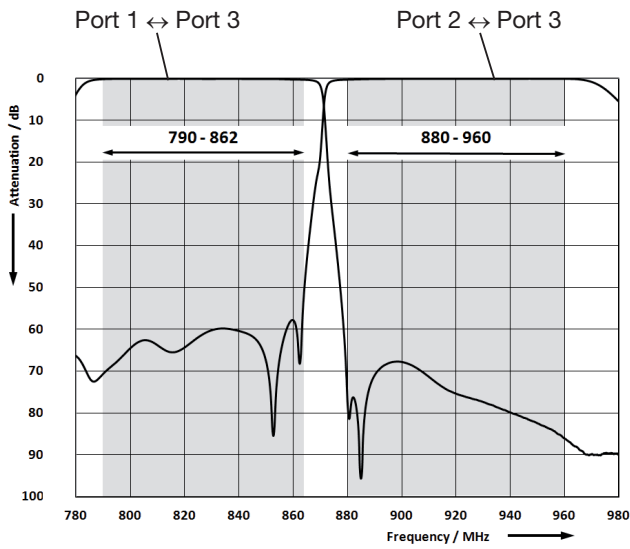
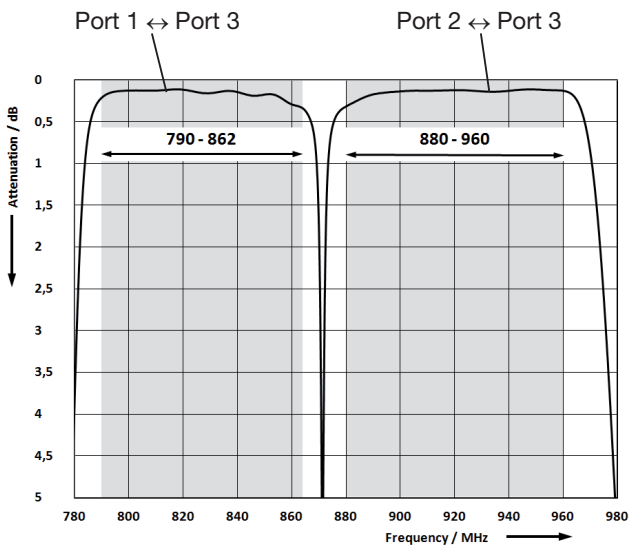
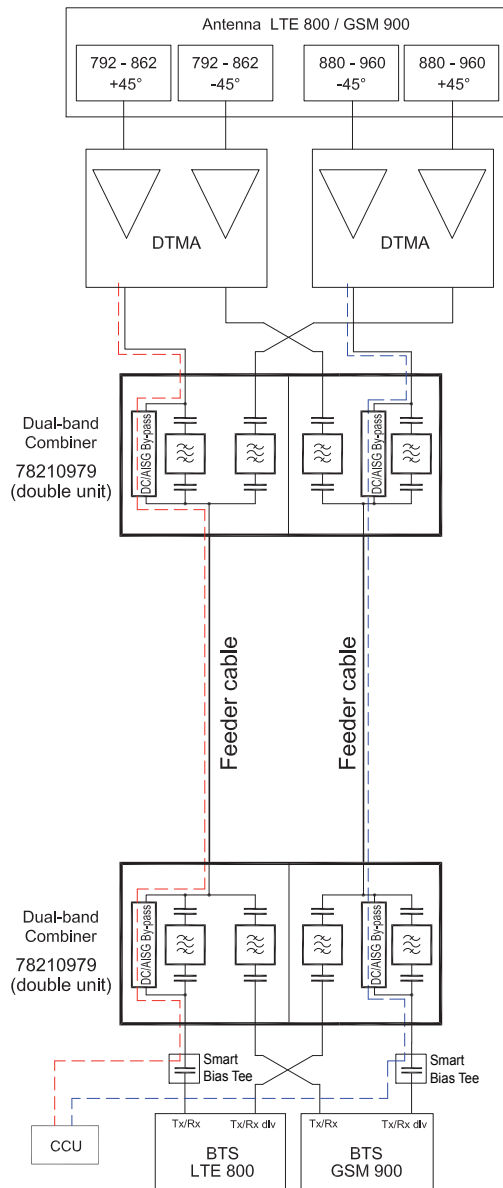


Diagram II



Application Example

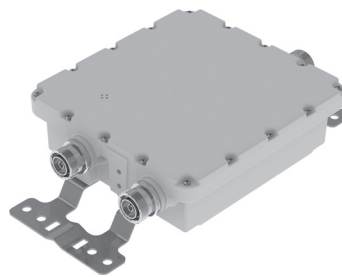


- Clamp set (type no. 734360 – 734365),
 - DC stop (type no. 78210850V01) and
 - 50-Ohm load (type no. 78410367)
- (order separately) can be found in the section “System Components”.

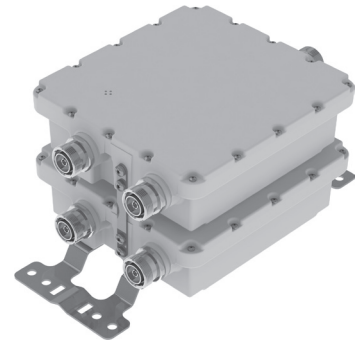
694 - 862 MHz

880 - 960 MHz

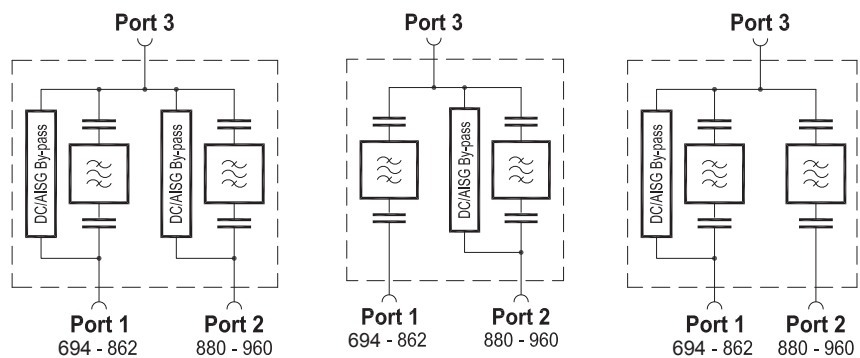
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.	78211430 Single Unit		78211432 Single Unit		78211434 Single Unit	
	78211431 Double Unit		78211433 Double Unit		78211435 Double Unit	
Pass band						
Band 1	[MHz]	694 - 862				
Band 2	[MHz]	880 - 960				
Insertion loss						
Port 1 ↔ Port 3	[dB]	< 0.4, typically 0.2 (694 - 862 MHz)				
Port 2 ↔ Port 3	[dB]	< 0.4, typically 0.2 (880 - 960 MHz)				
Isolation						
Port 1 ↔ Port 2	[dB]	> 45 (694 - 862 MHz / 880 - 960 MHz)				
VSWR	< 1.25 (694 - 862 / 880 - 960 MHz)					
Impedance	[Ω]	50				
Input power						
Band 1 / Band 2	[W]	< 200 / < 200				
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)				
Temperature range	[°C °F]	-40 ... +60 -40 ... -140				
Connectors	7-16 female (long neck)					
Application	Indoor or outdoor (IP 66)					
DC/AISG transparency						
Port 1 ↔ Port 3	[mA]	By-pass (max. 2500)	Stop	By-pass (max. 2500)	By-pass (max. 2500)	Stop
Port 2 ↔ Port 3	[mA]					
Lightning protection	[kA]	3, 10/350 μs pulse				
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set				
Weight	[kg lb]	Single Unit: 3 6.6 / Double Unit: 6 13.2				
Packing size	[mm in]	Single Unit: 400 x 265 x 150 15.7 x 10.4 x 5.9 / Double Unit: 400 x 265 x 220 15.7 x 10.4 x 8.7				
Dimensions (w x h x d)	[mm in]	Single Unit: 200 x 213.5 x 65.5 mm 7.9 x 8.4 x 2.6 Double Unit: 200 x 213.5 x 136.5 7.9 x 8.4 x 5.4 (without connectors, without mounting brackets)				

694 - 862 MHz

880 - 960 MHz

Accessories (order separately)

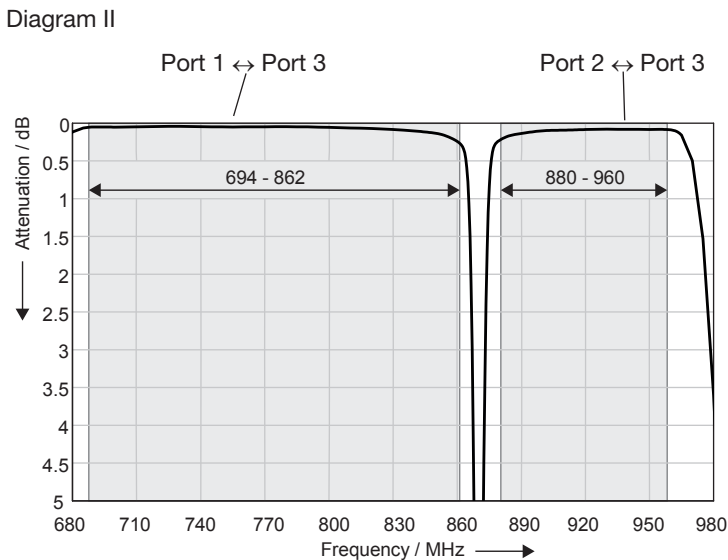
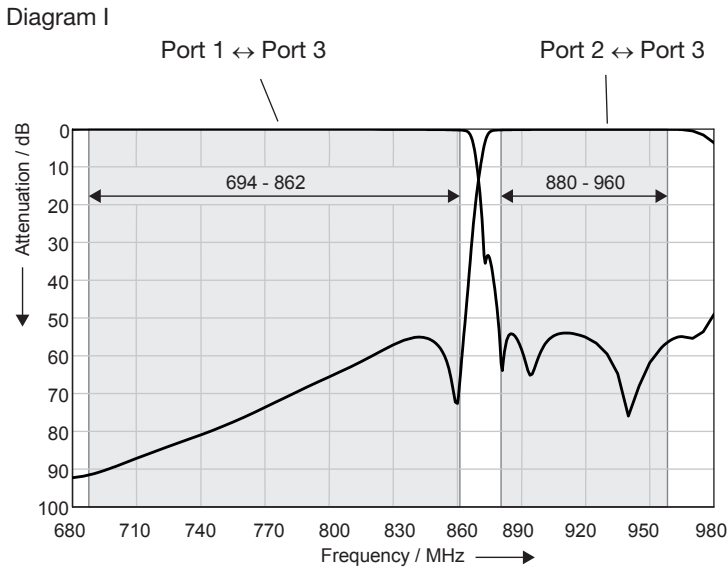
Type No.	Clamp set suitable for mast diameter of
734360	34 - 60 mm
734361	60 - 80 mm
734362	80 - 100 mm
734363	100 - 120 mm
734364	120 - 140 mm
734365	45 - 125 mm



Type No.	Description
78210850V01	DC stop
78410367	50-Ohm load



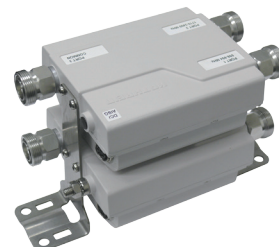
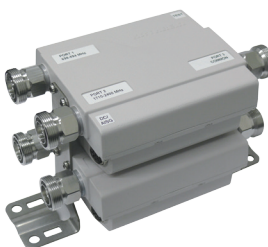
Typical Attenuation Curves



470 – 960 MHz

1695 – 2700 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated smart bias tee with AISG connector
- **BTS version:**
DC/AISG auto-sense for low band port or high band port or AISG port. Test (sniffer) port for low band and high band signals –50...–28 dB
- **ANT version:**
DC stop at low band port and at high band port
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



Technical Data

Type No.		78211320v01 (BTS version) Single Unit	78211322v01 (ANT version) Single Unit
		78211321v01 (BTS version) Double Unit	78211323v01 (ANT version) Double Unit
Pass band			
Band 1	MHz	470 – 960 *	
Band 2	MHz	1695 – 2700 *	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.1 (470 – 960 MHz)	
Port 2 ↔ Port 3	dB	< 0.1 (1695 – 2700 MHz)	
Port 3 ↔ Test (sniffer) port	dB	–50 ... –28 (470 – 960 / 1695 – 2700 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 60 (470 – 894 MHz) / > 50 (894 – 960 / 1695 – 2700 MHz)	
VSWR		< 1.2	
Impedance	Ω	50	
Input power			
Band 1 / Band 2	W	< 500 / < 500	
Intermodulation products	dBc	< –160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	–40 ... +60 / –40 ... +140	
Connectors	RF	7-16 female (long neck)	
	AISG	8-pin male, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, Pin 6: 10-32 V DC, pin 7: DC return, other pins: not connected)	
	Test (sniffer) port	N female (with protection cap IP 66)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3		Auto-sense (max. 2000 mA)	
Port 2 ↔ Port 3		In case of more than one DC/AISG signals see priority table on page 2.	
Port DC/AISG ↔ Port 3		Stop Stop By-pass (max. 2000 mA)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With included clamp set	
Weight	kg lb	Single Unit: 1.5 3.31 / Double Unit: 2.9 6.40	
Dimensions (w x h x d)	mm in	Single Unit: 126 x 145 x 62.5 4.96 x 5.71 x 2.46 Double Unit: 126 x 145 x 128 4.96 x 5.71 x 5.04 (without connectors, without mounting brackets)	

* supported by hardware version A01 or higher
Hardware version can be validated by viewing label on device

Dual-Band Combiner

KATHREIN

470 – 960 MHz

1695 – 2700 MHz

Accessories (included)

Type No.	Clamp set suitable for most diameter of mm in
734365	45 – 125 1.77 – 4.92

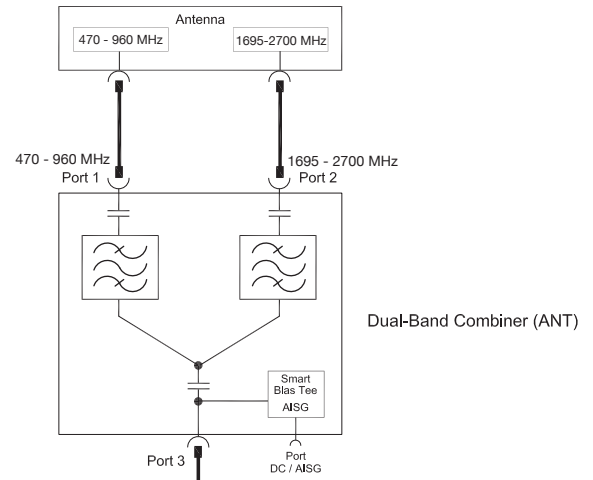


Accessories (order separately)

Type No.	Description
78410367	50-Ohm load



Blockdiagramm



Typical Attenuation Curves

Diagram I (Port 1 ↔ Port 3 / Port 2 ↔ Port 3)

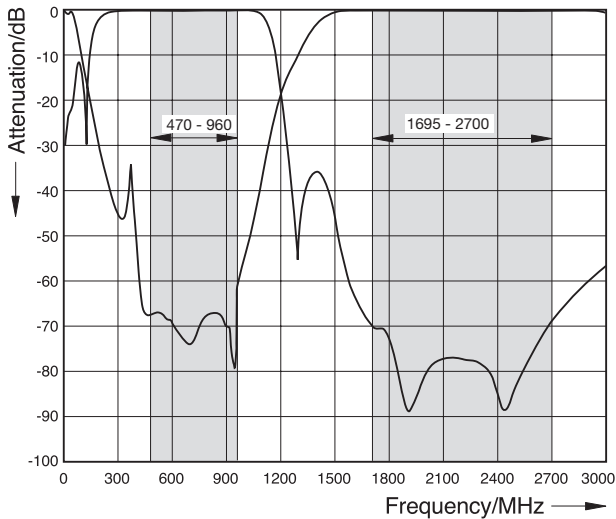
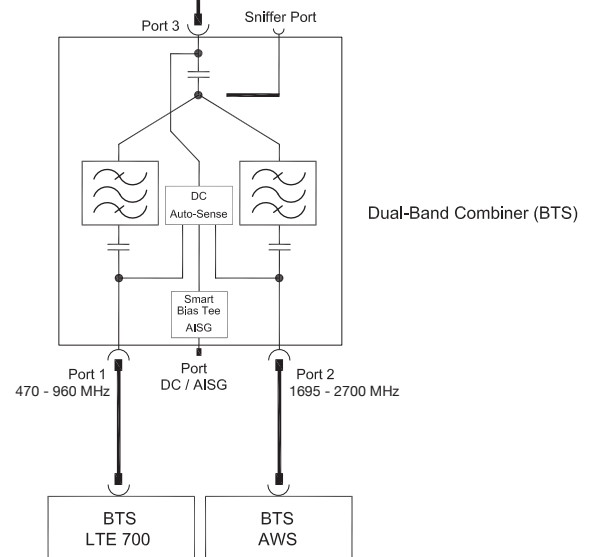
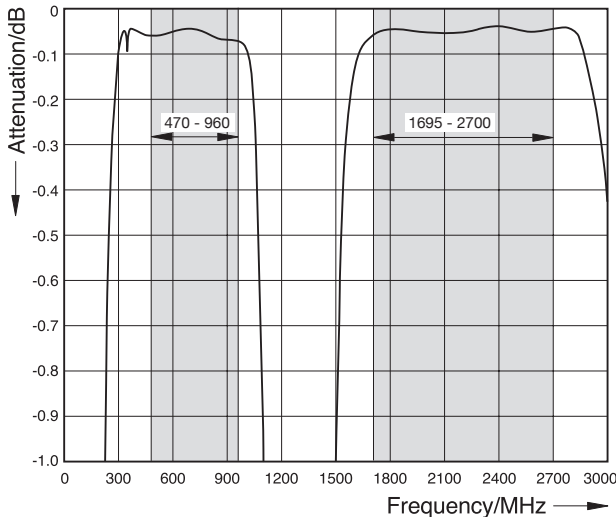


Diagram II (Port 1 ↔ Port 3 / Port 2 ↔ Port 3)



DC/AISG Auto-sense Priority Table (BTS version)

In case DC/AISG signals are applied to two or even three ports simultaneously then the BTS-combiner gives priority to the signals as follows:

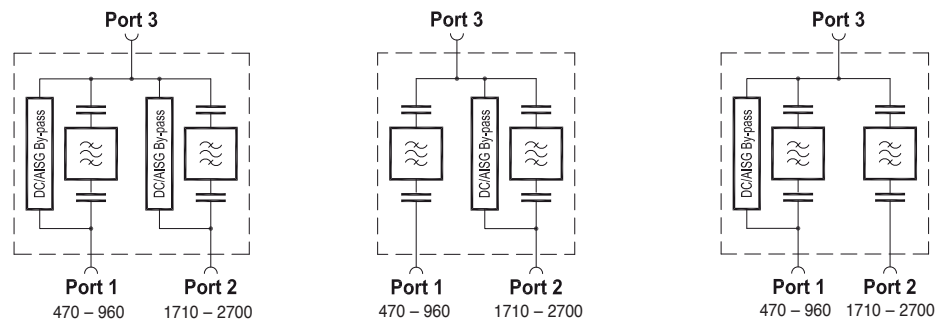
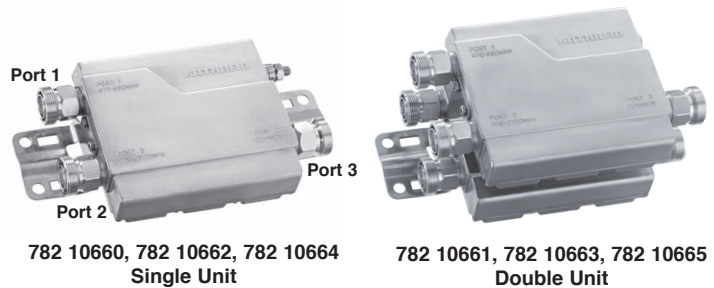
Connector	Priority
Port DC/AISG	1 (highest)
Port 2 (1695 – 2700 MHz)	2
Port 1 (470 – 960 MHz)	3 (lowest)

Multi-Band Combiners

470 – 960 MHz

1710 – 2700 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



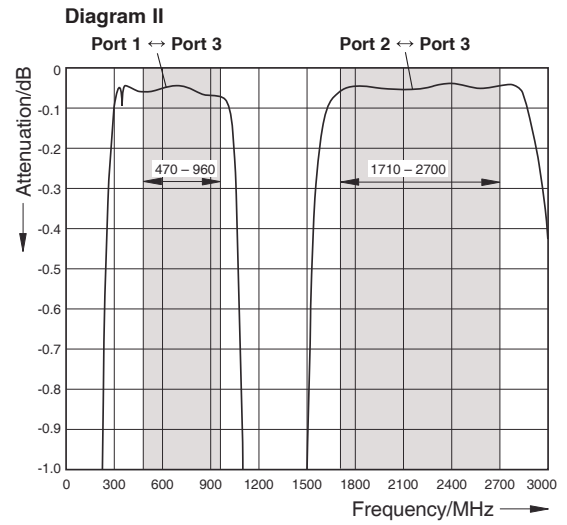
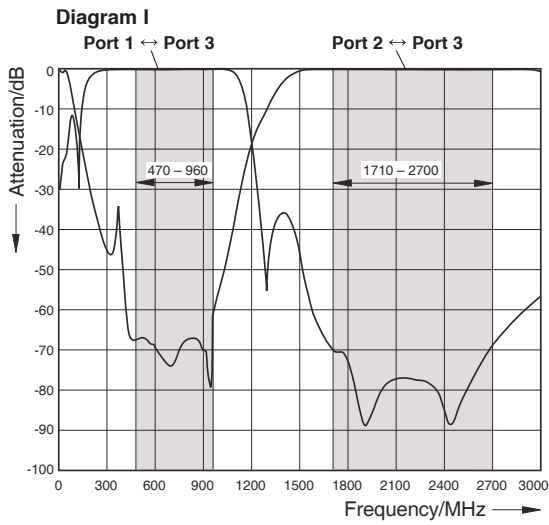
Technical Data

Type No.	78210660 Single Unit	78210662 Single Unit	78210664 Single Unit
	78210661 Double Unit	78210663 Double Unit	78210665 Double Unit
Pass band Band 1 Band 2	470 – 960 MHz 1710 – 2700 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB (470 – 960 MHz) < 0.1 dB (1710 – 2700 MHz)		
Isolation Port 1 ↔ Port 2	> 55 dB (470 – 960 MHz) / > 65 dB (1710 – 2700 MHz)		
VSWR	< 1.2 (470 – 960 / 1710 – 2700 MHz)		
Impedance	50 Ω		
Input power Band 1 / Band 2	< 650 W / < 350 W		
Intermodulation products	< –160 dBc (3 rd order; with 2 x 20 W)		
Temperature range	–55 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor or outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop By-pass (max. 2500 mA)	By-pass (max. 2500 mA) Stop
Lightning protection	3 kA, 10/350 μs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 1.2 kg / Double Unit: 2.4 kg		
Packing size	Single Unit: 285 x 157 x 93 mm / Double Unit: 285 x 157 x 148 mm		
Dimensions (w x h x d)	Single Unit: 126 x 145 x 38 mm / Double Unit: 126 x 145 x 93 mm (without connectors, without mounting brackets)		

470 – 960 MHz

1710 – 2700 MHz

Typical Attenuation Curves

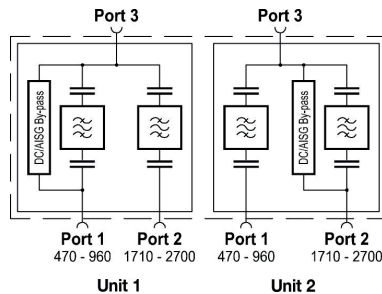
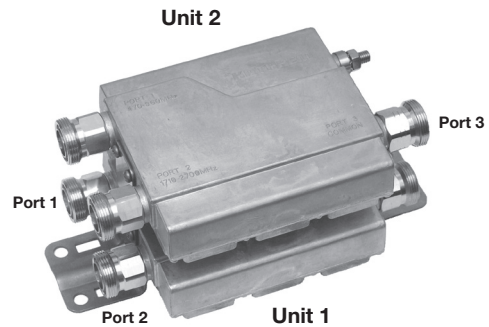


- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

470 – 960 MHz

1710 – 2700 MHz

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



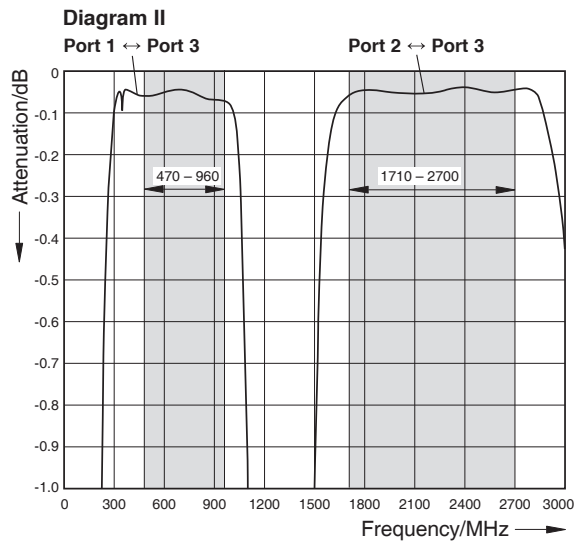
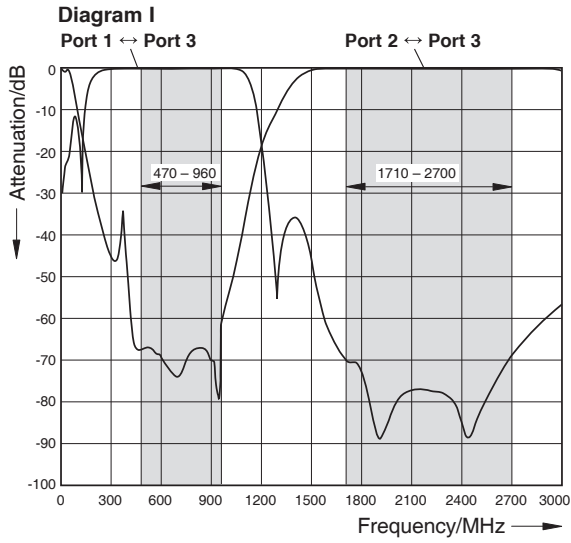
Technical Data

Type No.	78210669 Double Unit	
Pass band Band 1 Band 2	470 – 960 MHz 1710 – 2700 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB (470 – 960 MHz) < 0.1 dB (1710 – 2700 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (470 – 960 MHz) / > 65 dB (1710 – 2700 MHz)	
VSWR	< 1.2 (470 – 960 / 1710 – 2700 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 650 W / < 350 W	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-55 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor <i>or</i> outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	Unit 1 By-pass (max. 2500 mA) Stop	Unit 2 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	2.4 kg	
Packing size	285 x 157 x 148 mm	
Dimensions (w x h x d)	126 x 145 x 93 mm (without connectors, without mounting brackets)	

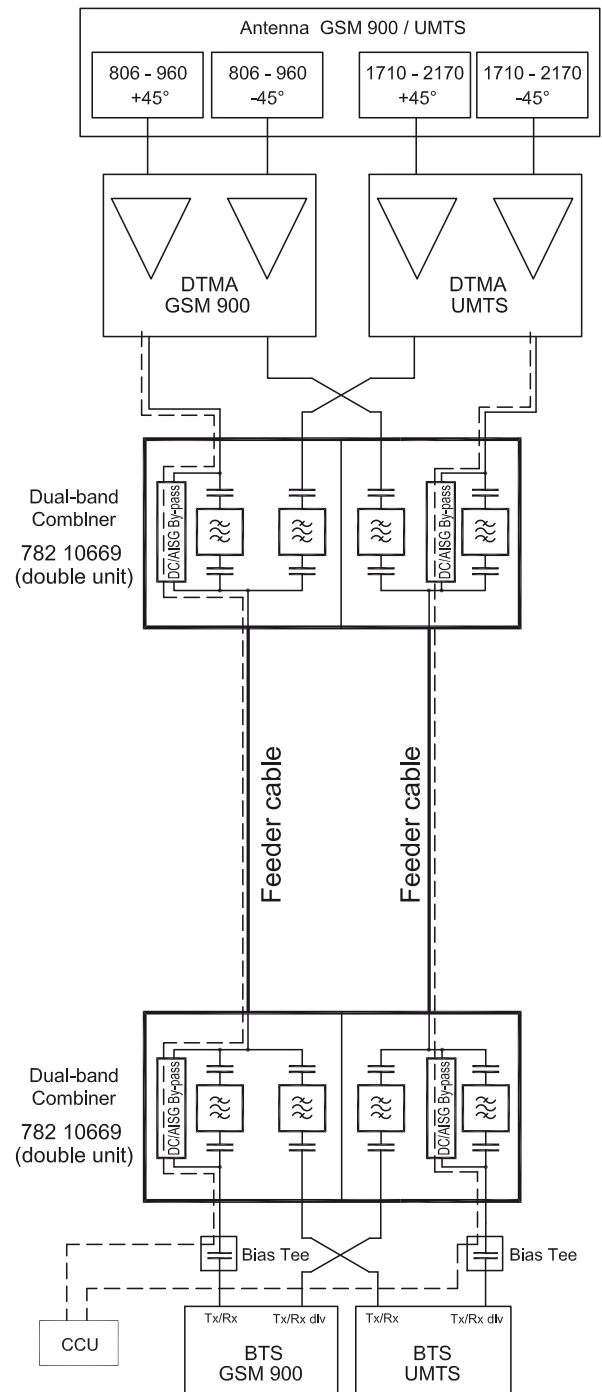
470 – 960 MHz

1710 – 2700 MHz

Typical Attenuation Curves



Application Example

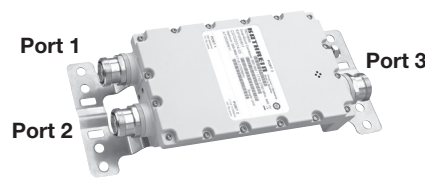


- **Clamp set** (type no. 734360 – 734365),
 - **DC stop** (type no. 78210850V01) and
 - **50-Ohm load** (type no. 78410367)
- (order separately) can be found in the section "System Components".

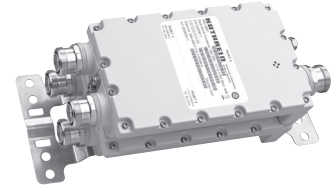
380 – 960 MHz

1710 – 2700 MHz

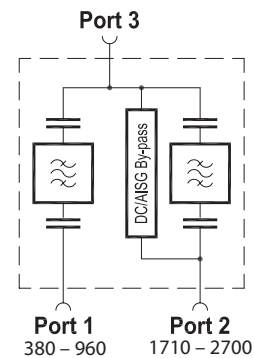
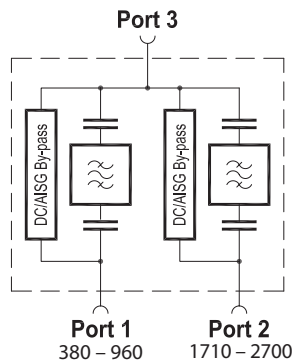
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely low insertion loss**
- **High input power**



78210680, 78210682
Single Unit



78210681, 78210683
Double Unit



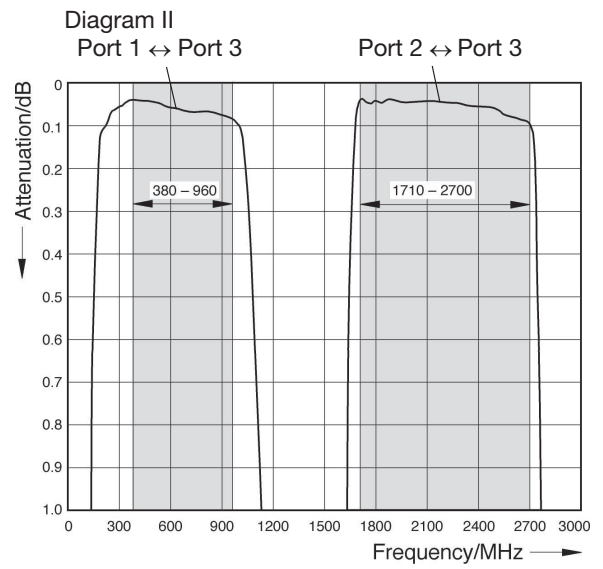
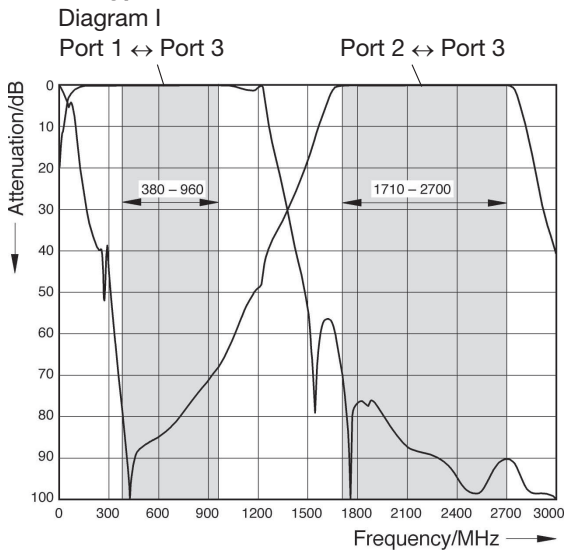
Technical Data

Type No.	78210680 Single Unit	78210682 Single Unit
	78210681 Double Unit	78210683 Double Unit
Pass band Band 1 Band 2	380 – 960 MHz 1710 – 2700 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB (380 – 960 MHz) < 0.1 dB (1710 – 2700 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (380 – 550 MHz) / > 65 dB (550 – 960 MHz) / > 65 dB (1710 – 2700 MHz)	
VSWR	< 1.2 (380 – 960 / 1710 – 2700 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 700 W / < 700 W	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-55 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	Single Unit: 2 kg / Double Unit: 3.9 kg	
Packing size	Single Unit: 365 x 207 x 150 mm / Double Unit: 365 x 207 x 214 mm	
Dimensions (w x h x d)	Single Unit: 117 x 203.46 x 48.8 mm / Double Unit: 117 x 203.46 x 99.3 mm (without connectors, without mounting brackets)	

380 – 960 MHz

1710 – 2700 MHz

Typical Attenuation Curves

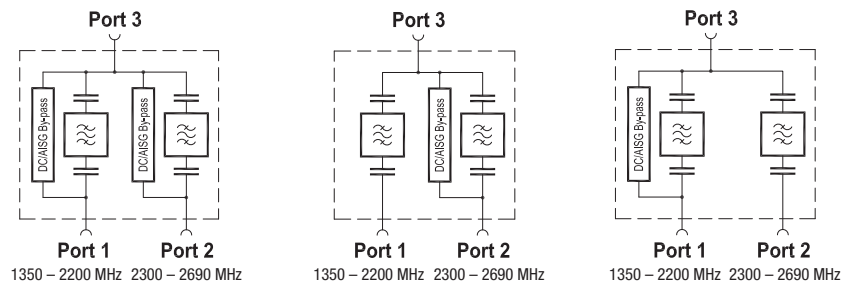
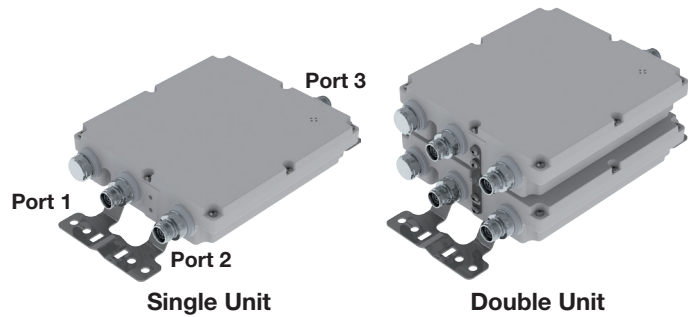


- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

1350 – 2200 MHz

2300 – 2690 MHz

- Designed for co-sitting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection



Technical Data

Type No.	78211510 Single Unit		78211512 Single Unit		78211514 Single Unit	
	78211511 Double Unit		78211513 Double Unit		78211515 Double Unit	
Pass band						
Band 1	[MHz]	1350 – 2200				
Band 2	[MHz]	2300 – 2690				
Insertion loss						
Port 1 ↔ Port 3	[dB]	< 0.2 (1350 – 2200 MHz)				
Port 2 ↔ Port 3	[dB]	< 0.2 (2300 – 2690 MHz)				
Isolation	[dB]	> 50				
VSWR		< 1.25				
Impedance	[Ω]	50				
Input power		< 200 / < 200				
Band 1 / Band 2	[W]					
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)				
Temperature range	[°C °F]	-40 ... +60 -40 ... +140				
Connectors		4.3-10 female (long neck)				
Application		Indoor or outdoor (IP 66)				
DC/AISG transparency						
Port 1 ↔ Port 3	[mA]	By-pass (max. 2500)		Stop		By-pass (max. 2500) Stop
Port 2 ↔ Port 3	[mA]	By-pass (max. 2500)		By-pass (max. 2500)		
Lightning protection	[kA]	3, 10/350 μs pulse				
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set				
Weight	[kg lb]	Single Unit: 3.4 7.5 / Double Unit: 6.7 14.8				
Dimensions (w x h x d)	[mm in]	Single Unit: 196.9 x 214.7 x 51.8 7.75 x 8.45 x 2.04 Double Unit: 196.9 x 214.7 x 107.8 7.75 x 8.45 x 4.24 (without connectors, without mounting brackets)				

1350 – 2200 MHz

2300 – 2690 MHz

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78211000	DC stop
78210484	50-Ohm load



Typical Attenuation Curves

Diagram 1

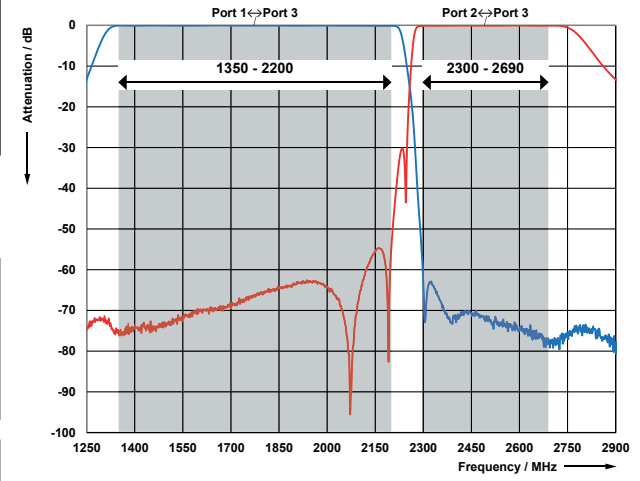
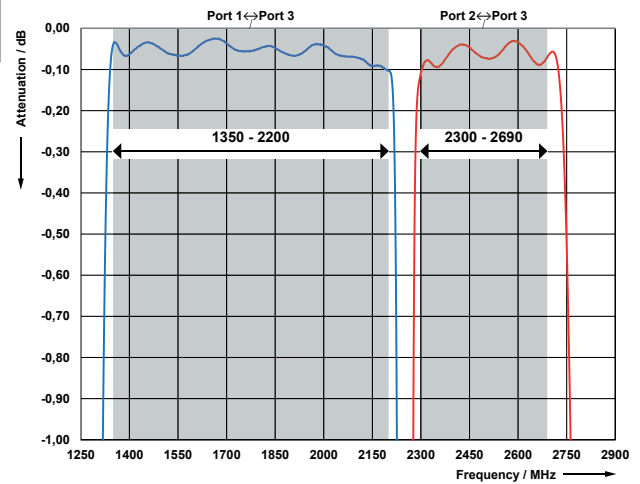


Diagram 2



1350 – 2200 MHz

2300 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

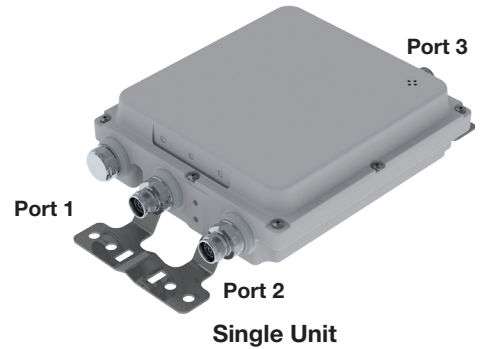
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

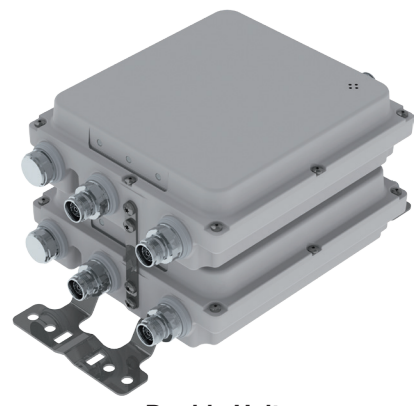
In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

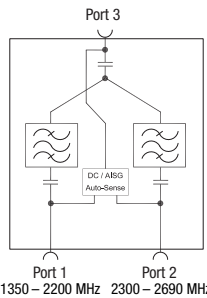
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection



Single Unit



Double Unit



Technical Data

Type No.	78211517 Single unit	clamps included	78211518 Double unit
Pass band			
Band 1 [MHz]			1350 – 2200
Band 2 [MHz]			2300 – 2690
Insertion loss			
Port 1 ↔ Port 3 [dB]			< 0.2 (1350 – 2200)
Port 2 ↔ Port 3 [dB]			< 0.2 (2300 – 2690)
Isolation			
Port 1 ↔ Port 2 [dB]			> 50
VSWR			< 1.25
Impedance [Ω]			50
Input power			
Band 1 / Band 2 [W]			< 200 / < 200
Intermodulation products [dBc]			< -160 (3 rd order; with 2 x 20 W)
Temperature range [°C °F]			-40 ... +60 -40 ... +140
Connectors			4.3-10 female (long neck)
Application			Indoor or outdoor (IP 66)
DC/AISG transparency			
Port 1 ↔ Port 3 [mA]			Auto-sense (max. 2000)
Port 2 ↔ Port 3 [mA]			Auto-sense (max. 2000)
Lightning protection [kA]			3, 10/350 μs pulse
Mounting [mm in]			Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set
Weight [kg lb]			Single Unit: 3.5 7.7 / Double Unit: 6.9 15.2
Dimensions (w x h x d) [mm in]			Single Unit: 196.9 x 214.7 x 67.65 7.75 x 8.45 x 2.66 Double Unit: 196.9 x 214.7 x 138.65 7.75 x 8.45 x 5.45 (without connectors, without mounting brackets)

1350 – 2200 MHz

2300 – 2690 MHz

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78210484	50-Ohm load



Typical Attenuation Curves

Diagram 1

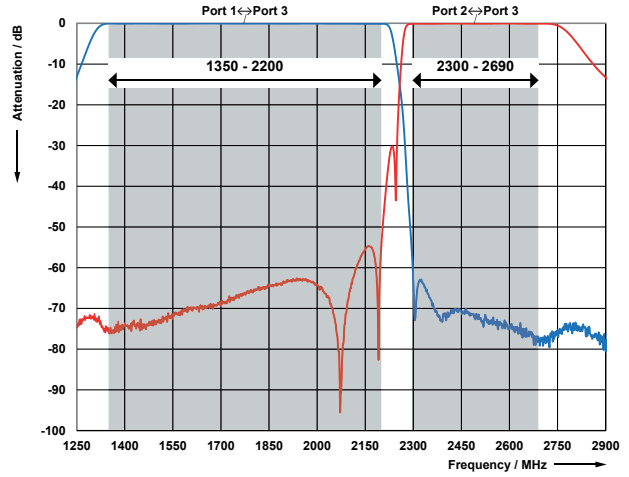
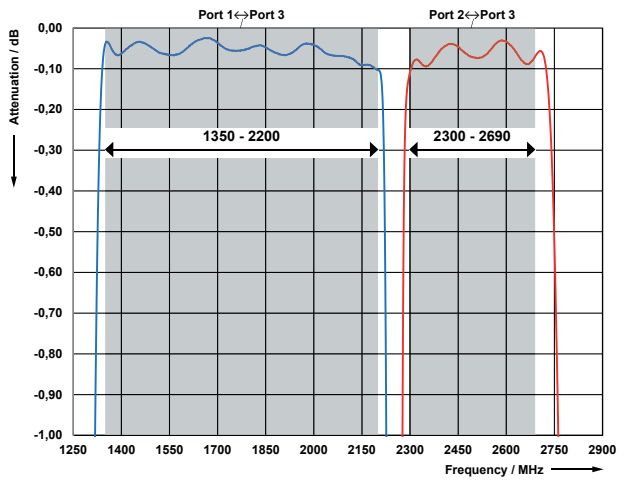


Diagram 2



First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station which supplies the combiner with DC voltage at any input port is bypassed to the common port. The DC from the second base station will be ignored.

Priority Controlled Function

In case DC/AISG signals are applied to two or more ports simultaneously then all DC/AISG signals will be blocked as shown in the logic table below:

Connector	Priority
Port 1	B (lowest)
Port 2	A (highest)

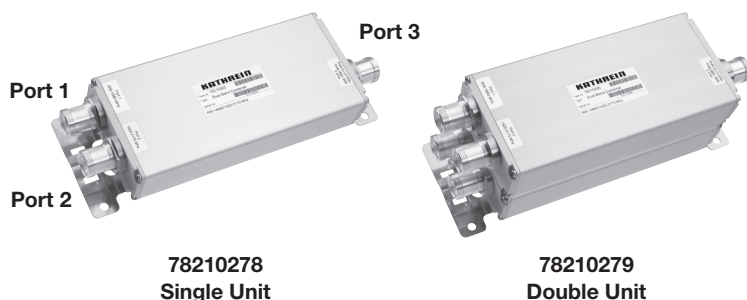
Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/ AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

790 – 1880 MHz

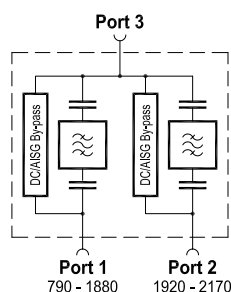
1920 – 2170 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as double unit
- Built-in lightning protection
- External DC stop available as an accessory



78210278
Single Unit

78210279
Double Unit



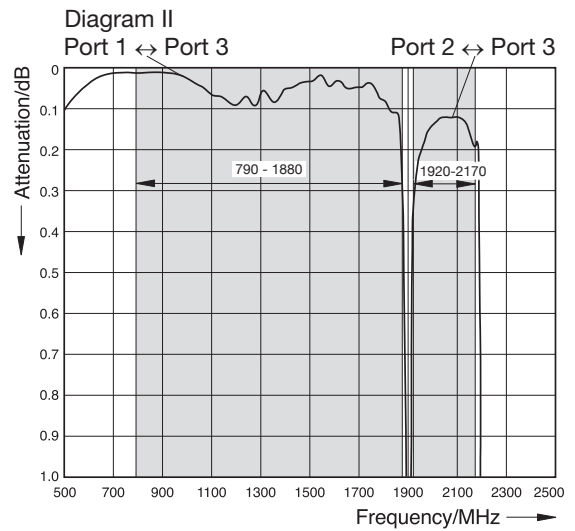
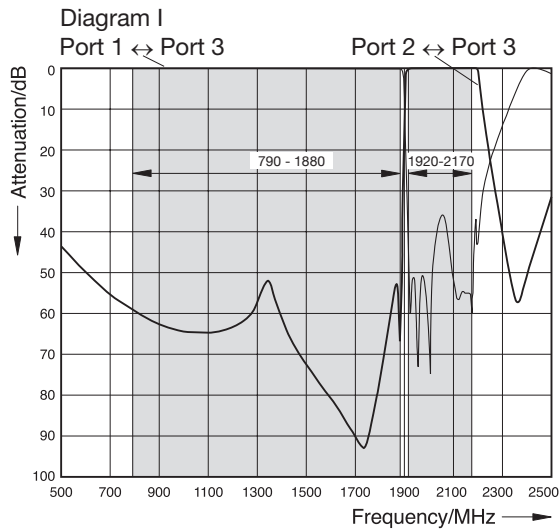
Technical Data

Type No.	78210278 Single Unit	
Type No.	78210279 Double Unit	
Pass band		
Band 1 [MHz]		790 – 1880
Band 2 [MHz]		1920 – 2170
Insertion loss		
Port 1 ↔ Port 3 [dB]		< 0.1, typically 0.05 (790 – 960 MHz) / < 0.4, typically 0.2 (1710 – 1880 MHz)
Port 2 ↔ Port 3 [dB]		< 0.4, typically 0.2 (1920 – 2170 MHz)
Isolation		
Port 1 ↔ Port 2 [dB]		> 55 (790 – 960 MHz) > 55 (1710 – 1880 MHz, 1920 – 1980 MHz, 2110 – 2170 MHz)
VSWR		< 1.2 (790 – 960 MHz) / < 1.25 (1710 – 1880 MHz) / < 1.2 (1920 – 2170 MHz)
Impedance [Ω]		50
Input power		
Band 1 / Band 2 [W]		< 500 / < 500
Intermodulation products [dBc]		< – 160 (2 nd /3 rd order; with 2 x 20 W)
Temperature range [°C F°]		–55 ... +60 –67 ... +140
Connectors		7-16 female (long neck)
Application		Indoor or outdoor (IP 66)
DC/AISG transparency		
Port 1 ↔ Port 3 [mA]		By-pass (max. 2500)
Port 2 ↔ Port 3 [mA]		By-pass (max. 2500)
Lightning protection [kA]		3, 10/350 μs pulse
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight [kg ls]		Single Unit: 3.4 7.5 / Double Unit: 6.6 14.6
Packing size [mm in]		Single Unit: 207 x 437 x 154 8.15 x 17.20 x 6.06 Double Unit: 207 x 437 x 214 8.15 x 17.20 x 8.43
Dimensions (w x h x d) [mm in]		Single Unit: 130 x 269.9 x 43 5.12 x 10.63 x 1.69 Double Unit: 130 x 269.9 x 98.5 5.12 x 10.63 x 3.88 (without connectors, without mounting brackets)

790 – 1880 MHz

1920 – 2170 MHz

Typical Attenuation Curves

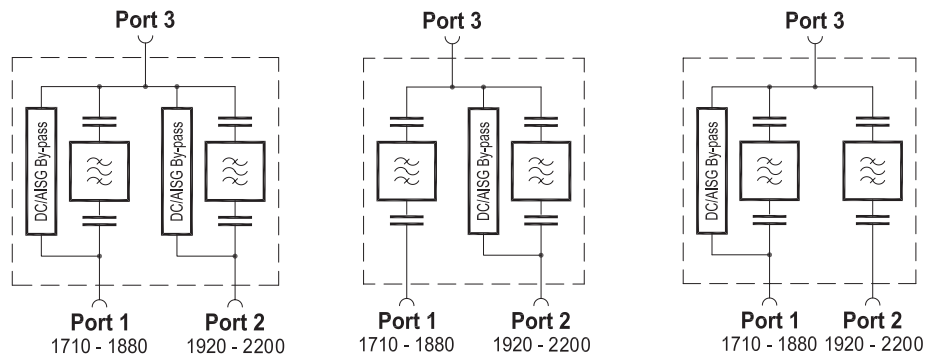
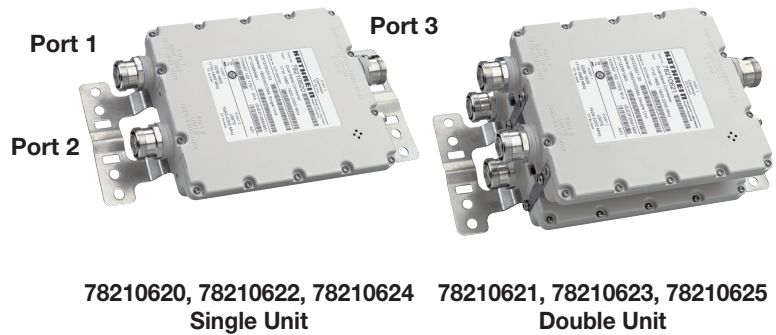


- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

1710 – 1880 MHz

1920 – 2200 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



Technical Data

Type No.		78210620 Single Unit	78210622 Single Unit	78210624 Single Unit
		78210621 Double Unit	78210623 Double Unit	78210625 Double Unit
Pass band Band 1 (GSM 1800) Band 2 (UMTS)	MHz MHz	1710 – 1880 1920 – 2200		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	dB dB	< 0.3 (1710 – 1880 MHz) < 0.3 (1920 – 2200 MHz)		
Isolation Port 1 ↔ Port 2	dB	> 55 (1710 – 1880) / > 50 (1920 – 2200 MHz)		
VSWR		< 1.2 (1710 – 1880) / (1920 – 2200 MHz)		
Impedance	Ω	50		
Input power Band 1 / Band 2	W	< 300 / < 300		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C	-40 ... +60		
Connectors		7-16 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	mA mA	By-pass (max. 2500) By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop
Lightning protection	kA	3, 10/350 μs pulse		
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	kg lb kg lb	Single Unit: 2.2 4.9 Double Unit: 4.3 9.5		
Packing size	mm in mm in	Single Unit: 392 x 272 x 139 15.5 x 10.7 x 5.5 Double Unit: 392 x 272 x 189 15.5 x 10.7 x 7.4		
Dimensions (w x h x d)	mm in mm in	Single Unit: 163.5 x 195.3 x 46 6.4 x 7.7 x 1.8 (without connectors, without mounting brackets) Double Unit: 163.5 x 195.3 x 102 6.4 x 7.7 x 4.0 (without connectors, without mounting brackets)		

1710 – 1880 MHz

1920 – 2200 MHz

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of mm in
734360	34 – 60 1.34 – 2.36
734361	60 – 80 2.36 – 3.15
734362	80 – 100 3.15 – 3.94
734363	100 – 120 3.94 – 4.72
734364	120 – 140 4.72 – 5.51
734365	45 – 125 1.77 – 4.92



Type No.	Description
78210850v01	DC stop
78410367	50-Ohm load



Typical Attenuation Curves

Diagram I

Port 1 ↔ Port 3

Port 2 ↔ Port 3

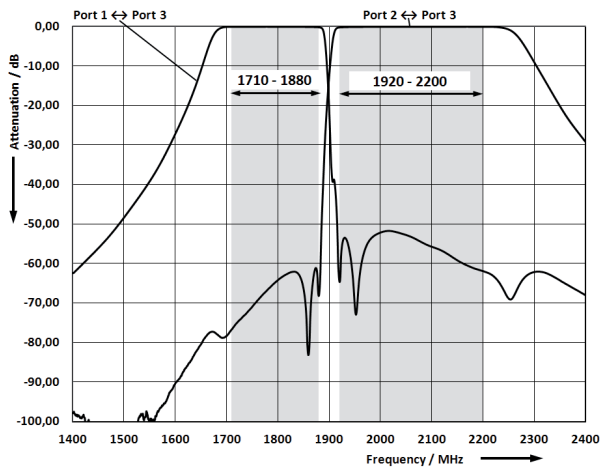
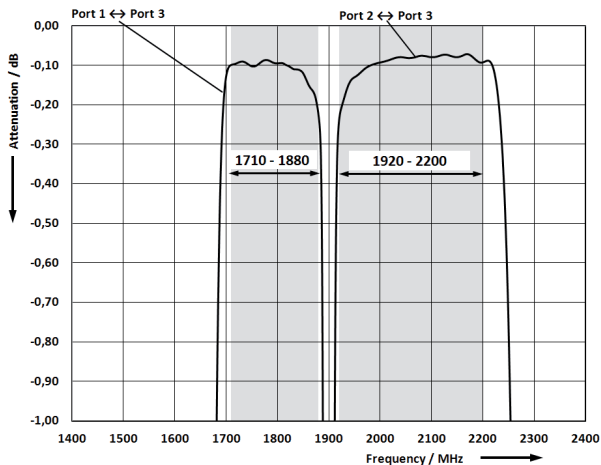


Diagram II

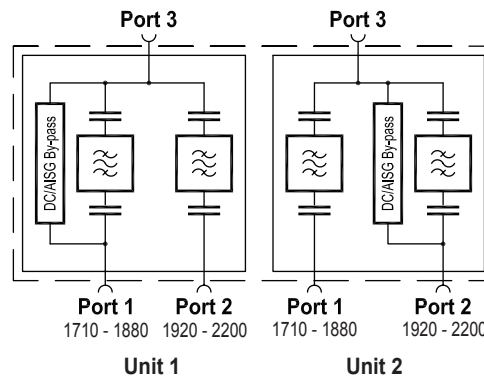
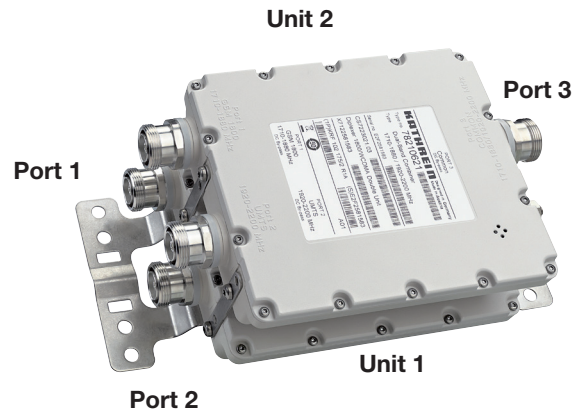
Port 1 ↔ Port 3

Port 2 ↔ Port 3



1710 – 1880 MHz 1920 – 2200 MHz

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection



Technical Data

Type No.		78210626 Double Unit	
Pass band			
Band 1 (GSM 1800)	MHz	1710 – 1880	
Band 2 (UMTS)	MHz	1920 – 2200	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.3 (1710 – 1880 MHz)	
Port 2 ↔ Port 3	dB	< 0.3 (1920 – 2200 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 55 (1710 – 1880 MHz) / > 50 (1920 – 2200 MHz)	
VSWR		< 1.2 (1710 – 1880) / (1920 – 2200 MHz)	
Impedance	Ω	50	
Input power	W		
Band 1 / Band 2		< 300 / < 300	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Unit 1 By-pass (max. 2500)	
Port 2 ↔ Port 3	mA	Unit 2 Stop	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	kg lb	4.3 9.5	
Packing size	mm in	392 x 272 x 189 15.4 x 10.7 x 7.4	
Dimensions (w x h x d)	mm in	163.5 x 195.3 x 102 6.4 x 7.7 x 4.0 (without connectors, without mounting brackets)	

Dual-Band Combiner

KATHREIN

1710 – 1880 MHz 1920 – 2200 MHz

Accessories (order separately)

Type No.	Clamp set suitable for most diameter of mm in
734360	34 – 60 1.34 – 2.36
734361	60 – 80 2.36 – 3.15
734362	80 – 100 3.15 – 3.94
734363	100 – 120 3.94 – 4.72
734364	120 – 140 4.72 – 5.51
734365	45 – 125 1.77 – 4.92



Type No.	Description
7821085V01	DC stop
78410367	50-Ohm load

Typical Attenuation Curves

Diagram I

Port 1 ↔ Port 3 Port 2 ↔ Port 3

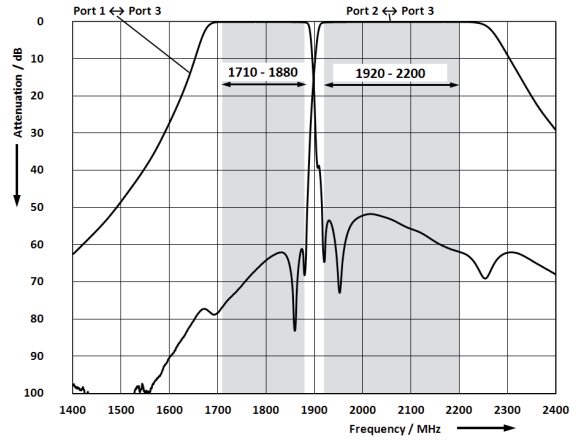
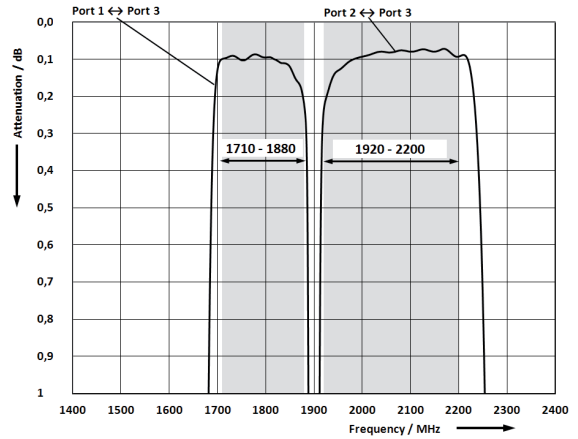
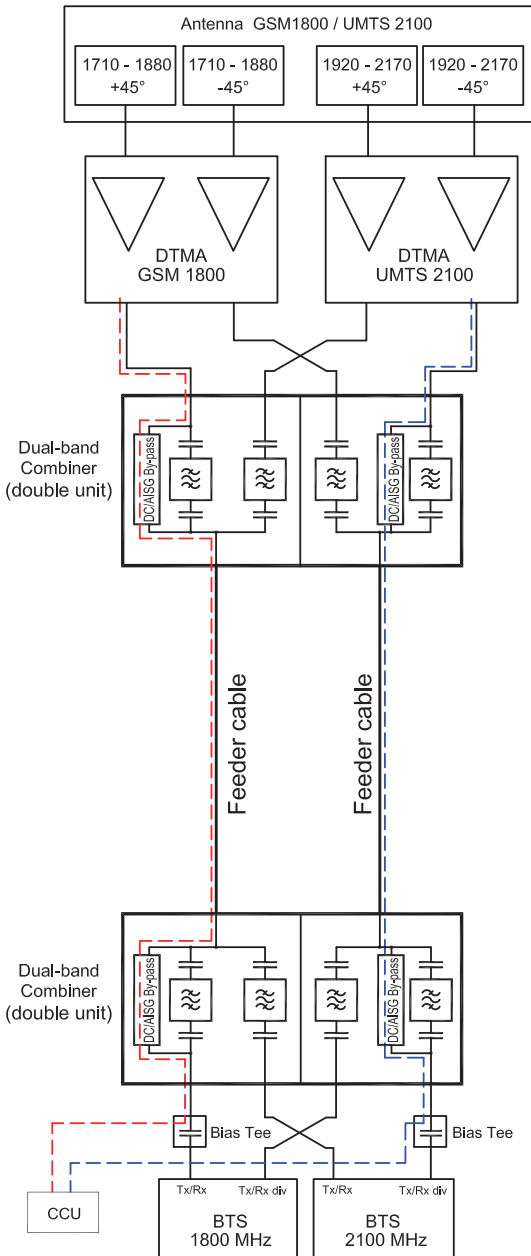


Diagram II

Port 1 ↔ Port 3 Port 2 ↔ Port 3



Application Example



Multi-Band Combiners

1710 – 1880 MHz

1920 – 2200 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

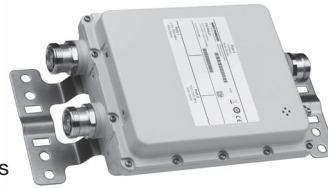
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

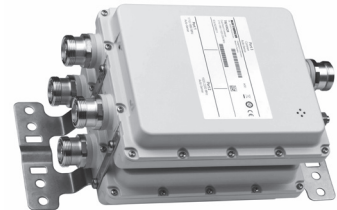
A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

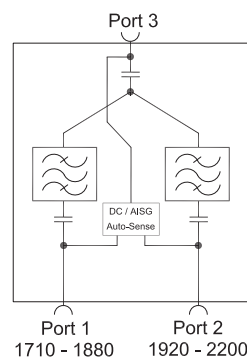
AUTO-SENSE



Single Unit



Double Unit



Technical Data

Type No.		78210627 Single Unit	78210628 Double Unit
Pass band			
Band 1	[MHz]	1710 – 1880	
Band 2	[MHz]	1920 – 2200	
Insertion loss			
Port 1 ↔ Port 3	[dB]	< 0.3 (1710 – 1880 MHz)	
Port 2 ↔ Port 3	[dB]	< 0.3 (1920 – 2200 MHz)	
Isolation			
Port 1 ↔ Port 2	[dB]	> 55 (1710 – 1880 MHz) / > 50 (1920 – 2200 MHz)	
VSWR		< 1.2	
Impedance	[Ω]	50	
Input power			
Band 1 / Band 2	[W]	< 300 / < 300	
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	[°C °F]	-40 ... +60 -40 ... +140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	[mA]	Auto-sense (max. 2000)	
Port 2 ↔ Port 3	[mA]	Auto-sense (max. 2000)	
Lightning protection	[kA]	3, 10/350 μs pulse	
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Grounding		M8 stud	
Weight	[kg lb]	Single Unit: Approx. 2.4 5.29 / Double Unit: Approx. 4.75 10.47	
Packing size	[mm in]	Single Unit: 392 x 272 x 139 15.43 x 10.71 x 5.47 Double Unit: 392 x 272 x 189 15.43 x 10.71 x 7.44	
Dimensions (w x h x d)	[mm in]	Single Unit: 163.5 x 195.3 x 63.2 6.44 x 7.69 x 2.49 Double Unit: 163.5 x 195.3 x 129.2 6.44 x 7.69 x 5.09 (without connectors, without mounting brackets)	

1710 – 1880 MHz

1920 – 2200 MHz

Accessories (order separately)

Type No.		Clamp set suitable for mast diameter of
734360	[mm in]	34 – 60 1.34 – 2.36
734361	[mm in]	60 – 80 2.36 – 3.15
734362	[mm in]	80 – 100 3.15 – 3.94
734363	[mm in]	100 – 120 3.94 – 4.72
734364	[mm in]	120 – 140 4.72 – 5.51
734365	[mm in]	45 – 125 1.77 – 4.92



Type No.	Description
78410367	50-Ohm load



Auto-sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B (lowest)
Port 2	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

Typical Attenuation Curves

Diagram I

Port 1 ↔ Port 3 Port 2 ↔ Port 3

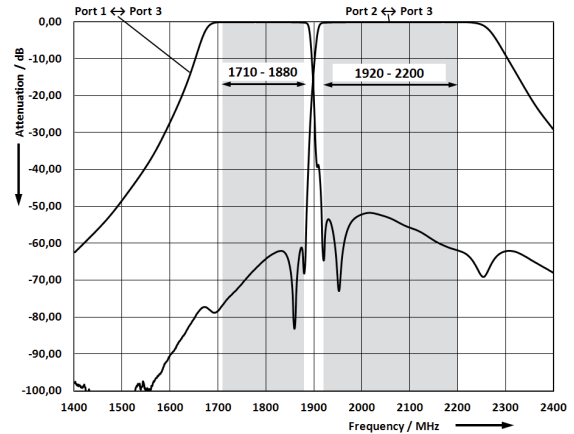
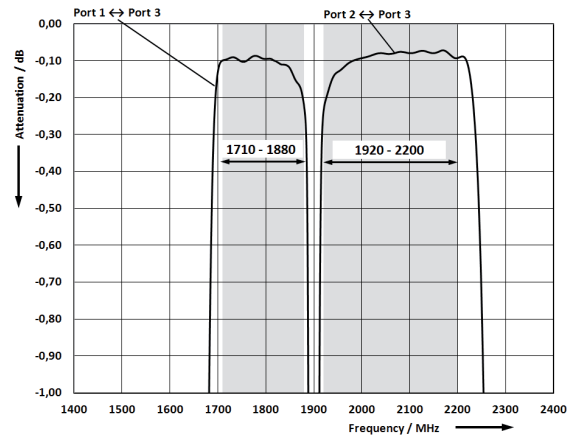


Diagram II

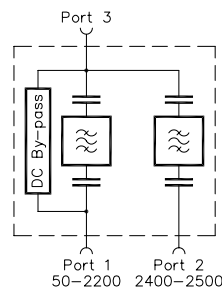
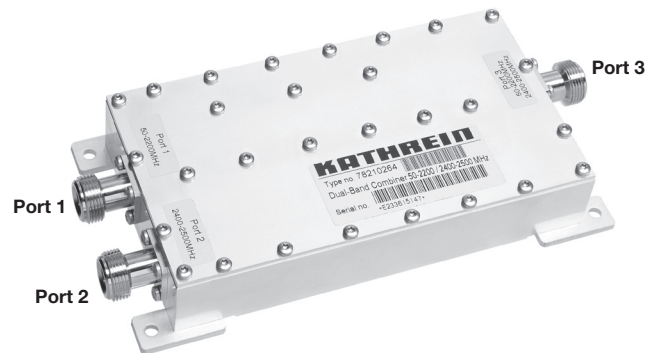
Port 1 ↔ Port 3 Port 2 ↔ Port 3



50 – 2200 MHz

2400 – 2500 MHz

- Designed for inhouse multiband distribution networks
- Enables feeder sharing
- DC by-pass between ports 1 and 3
- Built-in DC stop between port 2 and 3



Technical Data

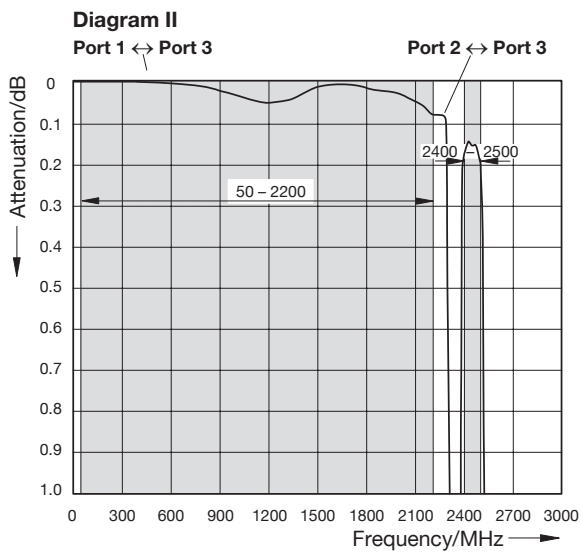
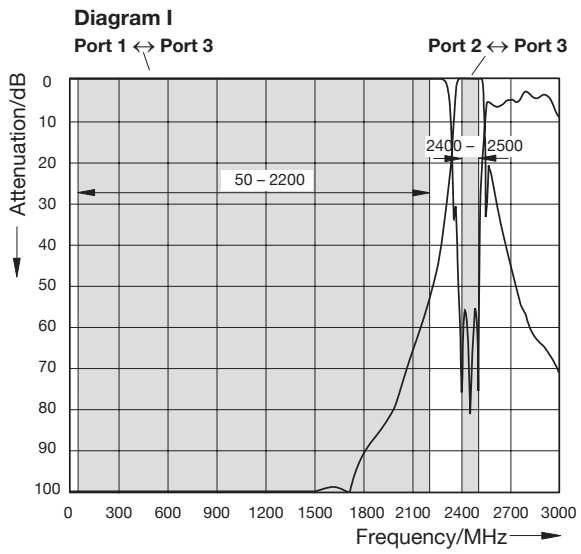
Type No.	78210264	
Pass band		
Band 1	[MHz]	50 – 2200
Band 2	[MHz]	2400 – 2500
Insertion loss		
Port 1 ↔ Port 3	[dB]	< 0.1 (50 – 2200 MHz)
Port 2 ↔ Port 3	[dB]	< 0.2 (2400 – 2500 MHz)
Isolation		
Port 1 ↔ Port 2	[dB]	> 50 (50 – 2200 / 2400 – 2500 MHz)
VSWR		< 1.25 (50 – 2200 / 2400 – 2500 MHz)
Impedance	[Ω]	50
Input power		
Band 1	[W]	< 200
Band 2	[W]	< 200
Intermodulation products	[dBc]	< -150 dBc (3 rd order; with 2 x 20 W)
Temperature range	[°C °F]	-20 ... +55 -4 ... +131
Connectors		N female
Application		Indoor
Special features		Built-in DC stop between ports 2 and 3*
Mounting		With 4 screws (max. 4 mm diameter)
Weight	[kg lb]	0.47 1.0
Packing size	[mm in]	225 x 140 x 75 8.9 x 5.6 x 3.0
Dimensions (w x h x d)	[mm in]	86 x 30.4 x 181.4 3.4 x 1.2 x 7.1 (including connectors and mounting feet)

* DC by-pass between ports 1 and 3 (max. 2500 mA)

50 – 2200 MHz

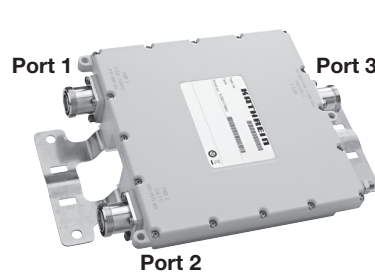
2400 – 2500 MHz

Typical Attenuation Curves

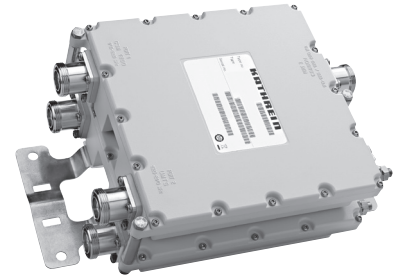


1710 – 2180 MHz 2400 – 2700 MHz

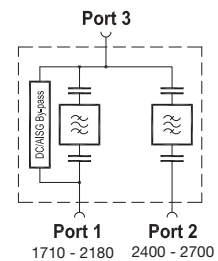
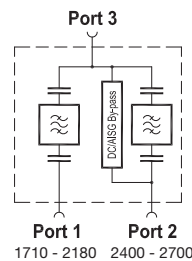
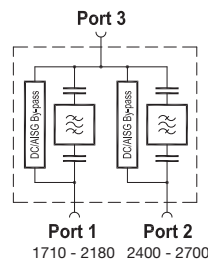
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Very low insertion loss**



78210800, 78211092, 78211094
Single Unit



78211091, 78211093, 78211095
Double Unit



Technical Data

Type No.		78210800 Single Unit	78211092 Single Unit	78211094 Single Unit
		78211091 Double Unit	78211093 Double Unit	78211095 Double Unit
Pass band				
Band 1	MHz	1710 – 2180		
Band 2	MHz	2400 – 2700		
Insertion loss				
Port 1 ↔ Port 3	dB	< 0.15		
Port 2 ↔ Port 3	dB	< 0.15		
Isolation				
Port 1 ↔ Port 2	dB	> 60		
VSWR		< 1.25 (1710 – 2180 / 2400 – 2700)		
Impedance	Ω	50		
Input power				
Band 1 / Band 2	W	< 300 / < 300		
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	°C °F	-40 ... +60 -40 ... +140		
Connectors		7-16 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 3	mA	By-pass (max. 2500)	Stop By-pass (max. 2500)	By-pass (max. 2500) Stop
Port 2 ↔ Port 3	mA			
Lightning protection	kA	3, 10/350 μs pulse		
Mounting	mm in	Wall mounting: With 4 screws (max. diameter 8 0.315) Mast mounting: With additional clamp set		
Weight	mm in	Single Unit: 2.9 6.38 / Double Unit: 5.7 12.54		
Packing size (w x h x d)	mm in	Single Unit: 392 x 272 x 139 15.43 x 10.71 x 5.47 Double Unit: 392 x 272 x 189 15.43 x 10.71 x 7.44		
Dimensions (w x h x d)	mm in	Single Unit: 199 x 199 x 44 7.87 x 7.83 x 1.73 Double Unit: 199 x 199 x 95 7.83 x 7.83 x 3.74 (without connectors, without mounting brackets)		

1710 – 2180 MHz

2400 – 2700 MHz

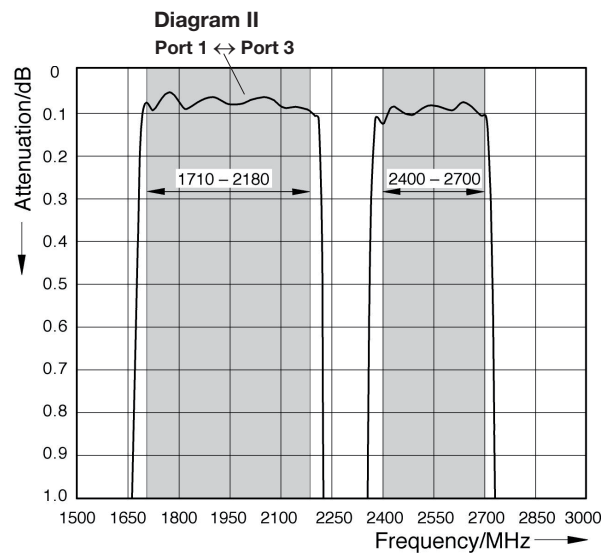
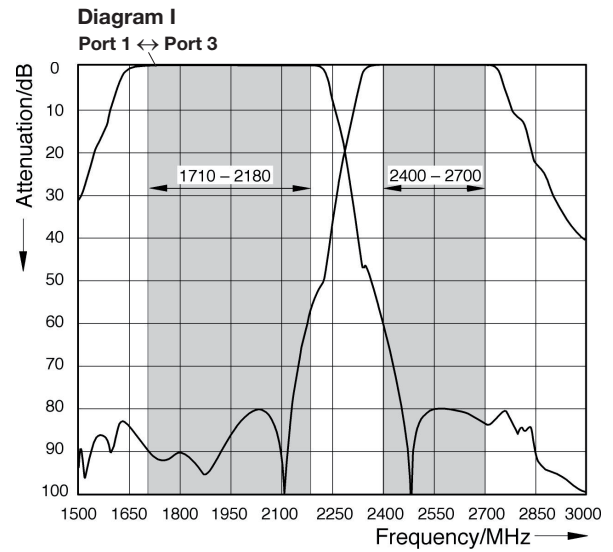
Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of mm in
734360	34 – 60 1.34 – 2.36
734361	60 – 80 2.36 – 3.15
734362	80 – 100 3.15 – 3.94
734363	100 – 120 3.94 – 4.72
734364	120 – 140 4.72 – 5.51
734365	45 – 125 1.77 – 4.92



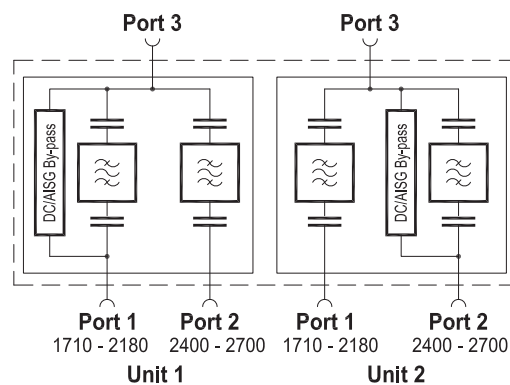
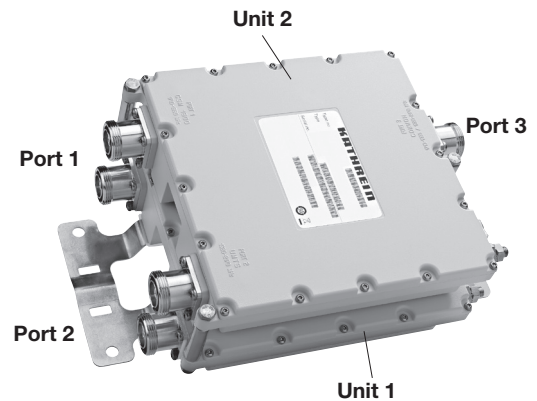
Type No.	Description
78210850V01	DC stop
78410367	50-Ohm load

Typical Attenuation Curves



1710 – 2180 MHz 2400 – 2700 MHz

- Designed to support separate DC/AISG supply for a low-band and high-band DTMA via 2 feeder cables (see application)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection
- Very low insertion loss

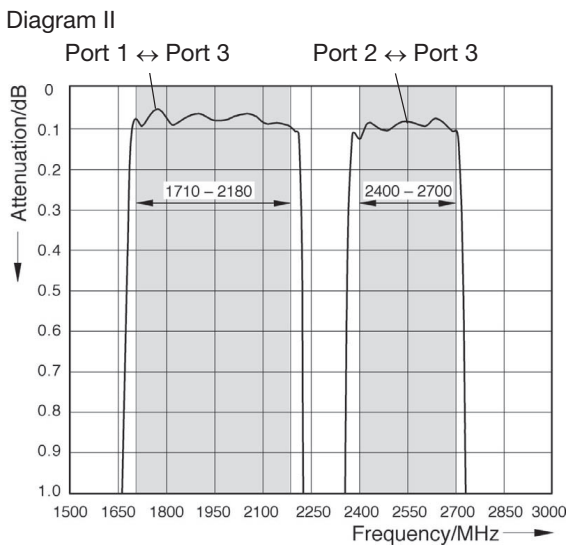
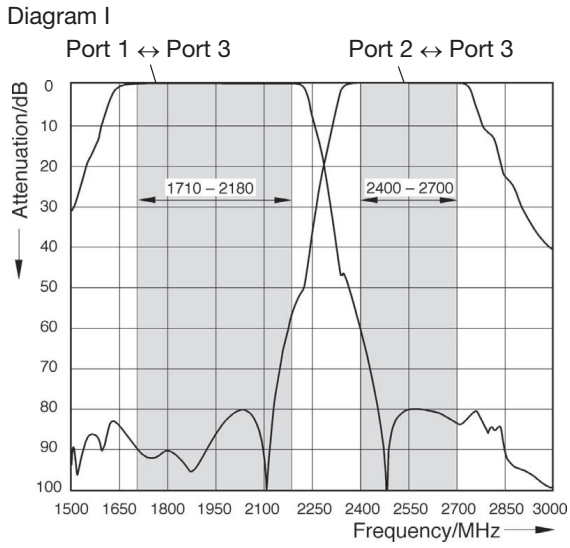


Technical Data

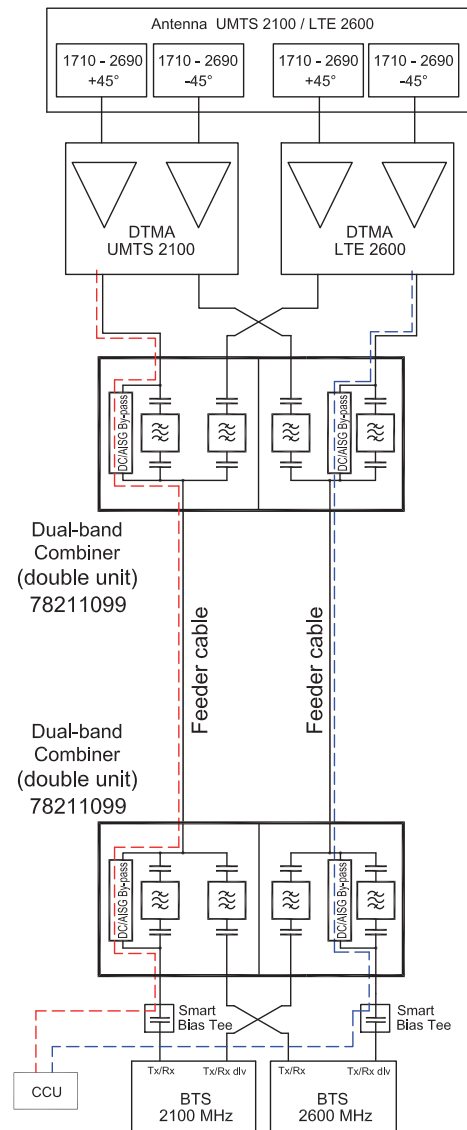
Type No.	78211099 Double Unit	
Pass band Band 1 (GSM 1800) Band 2 (UMTS)	1710 – 2180 MHz 2400 – 2700 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.15 dB < 0.15 dB	
Isolation Port 1 ↔ Port 2	> 60 dB	
VSWR	< 1.25 (1710 – 2180) / (2400 – 2700 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 300 W / < 300 W	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	Unit 1 By-pass (max. 2500 mA) Stop	Unit 2 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	5.7 kg	
Packing size	392 x 272 x 189 mm	
Dimensions (w x h x d)	199 x 199 x 95 mm (without connectors, without mounting brackets)	

1710 – 2180 MHz 2400 – 2700 MHz

Typical Attenuation Curves



Application Example

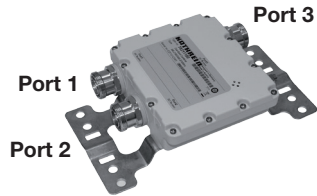


- Clamp set (type no. 734360 – 734365),
 - DC stop (type no. 78210850V01) and
 - 50-Ohm load (type no. 78410367)
- (order separately) can be found in the section “System Components”.

380 (690) – 2180 MHz

2400 – 2700 MHz

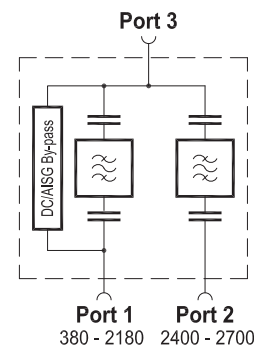
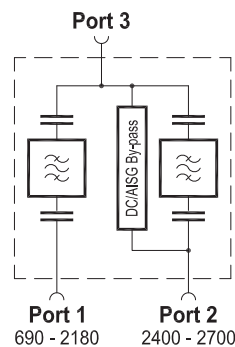
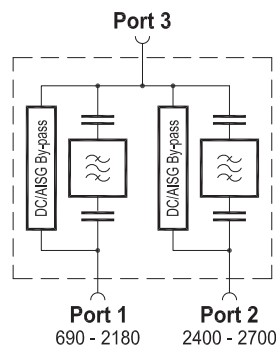
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



78211180, 78211182, 78211184
Single Unit



78211181, 78211183, 78211185
Double Unit



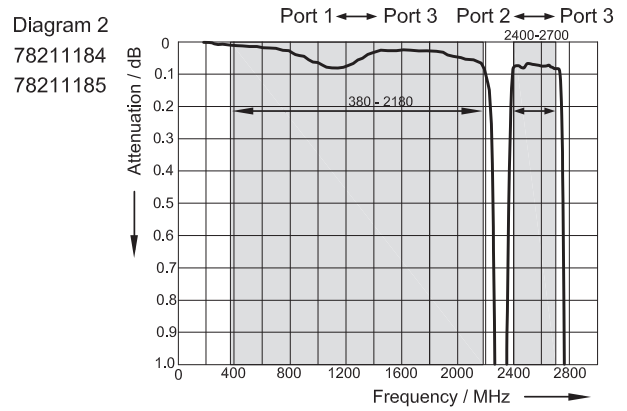
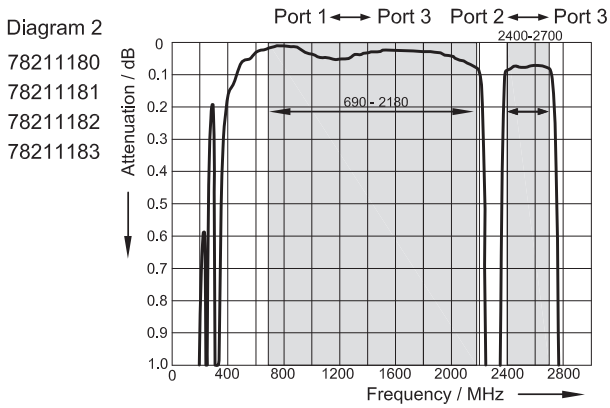
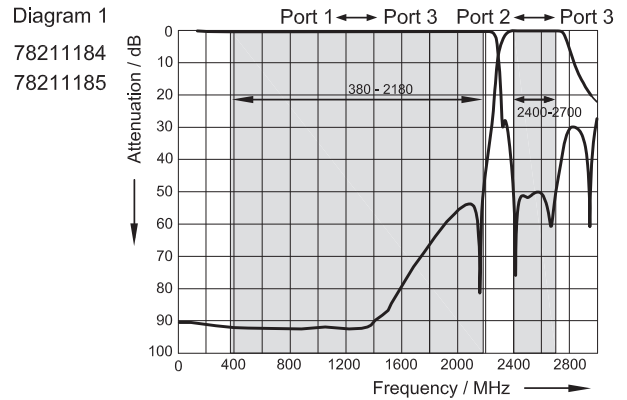
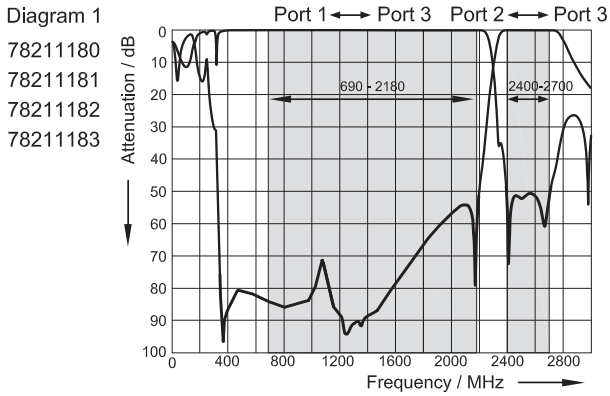
Technical Data

Type No.	78211180 Single Unit	78211182 Single Unit	78211184 Single Unit
	78211181 Double Unit	78211183 Double Unit	78211185 Double Unit
Pass band Band 1 Band 2	690 – 2180 MHz 2400 – 2700 MHz		380 – 2180 MHz 2400 – 2700 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.2 dB (690 – 2180 MHz) typ. 0.1 dB < 0.15 dB (2400 – 2700 MHz) typ. 0.1 dB		< 0.2 dB (380 – 2180 MHz) typ. 0.1 dB < 0.15 dB (2400 – 2700 MHz) typ. 0.1 dB
Isolation Port 1 ↔ Port 2	> 50 dB (690 – 2180 MHz), > 48 dB (2400 – 2700 MHz)		> 50 dB (380 – 2180 MHz), > 48 dB (2400 – 2700 MHz)
VSWR	< 1.22 (690 – 2180 MHz) < 1.2 (2400 – 2700 MHz)		< 1.22 (1500 – 2180 MHz) / < 1.27 (380 – 1500 MHz) < 1.2 (2400 – 2700 MHz)
Impedance	50 Ω		
Input power Band 1 / Band 2	< 500 W / < 500 W		
Intermodulation products	< –160 dBc (3 rd order; with 2 x 20 W)		
Temperature range	–55 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor or outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop By-pass (max. 2500 mA)	By-pass (max. 2500 mA) Stop
Lightning protection	3 kA, 10/350 μs pulse		Without lightning protection
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 1.5 kg / Double Unit: 2.8 kg		
Packing size	Single Unit: 266 x 196 x 130 mm / Double Unit: 266 x 196 x 180 mm		
Dimensions (w x h x d)	Single Unit: 141 x 119 x 48 mm / Double Unit: 141 x 119 x 98.5 mm (without connectors, without mounting brackets)		

380 (690) – 2180 MHz

2400 – 2700 MHz

Typical Attenuation Curves



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section "System Components".

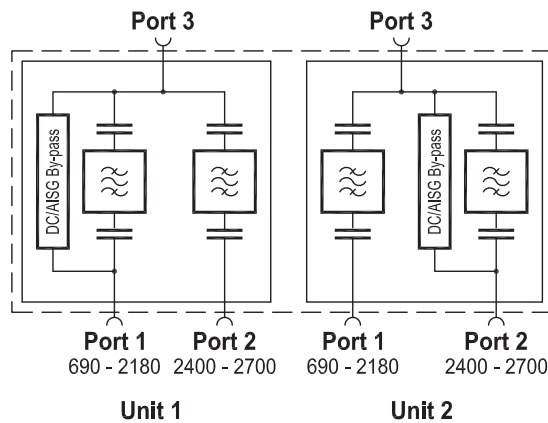
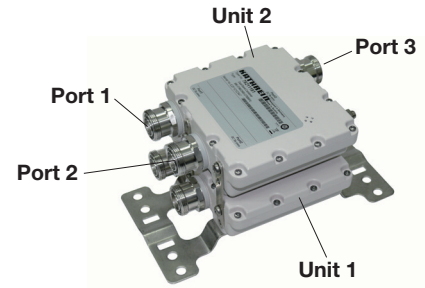
Dual-Band Combiner

KATHREIN

690 – 2180 MHz

2400 – 2700 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection
- External DC stop available as an accessory
- **Extremely small dimensions and low weight**
- **Very low insertion loss**
- **High input power**



Technical Data

Type No.	7821189 Double Unit	
Pass band Band 1 Band 2	690 – 2180 MHz 2400 – 2700 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.2 dB (690 – 2180 MHz) typ. 0.1 dB < 0.15 dB (2400 – 2700 MHz) typ. 0.1 dB	
Isolation Port 1 ↔ Port 2	> 50 dB (690 – 2180 MHz), > 48 dB (2400 – 2700 MHz)	
VSWR	< 1.22 (690 – 2180 MHz) < 1.2 (2400 – 2700 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2	< 500 W / < 500 W	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-55 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3	Unit 1 By-pass (max. 2500 mA) Stop	Unit 2 Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	Without lightning protection
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	2.8 kg	
Packing size	266 x 196 x 180 mm	
Dimensions (w x h x d)	141 x 119 x 98.5 mm (without connectors, without mounting brackets)	

690 – 2180 MHz

2400 – 2700 MHz

Typical Attenuation Curves

Diagram 1

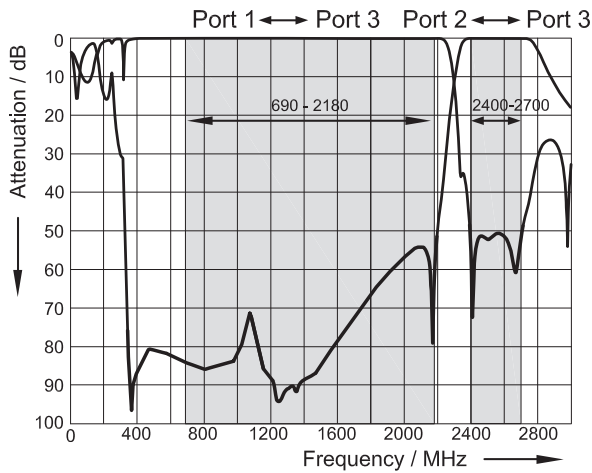
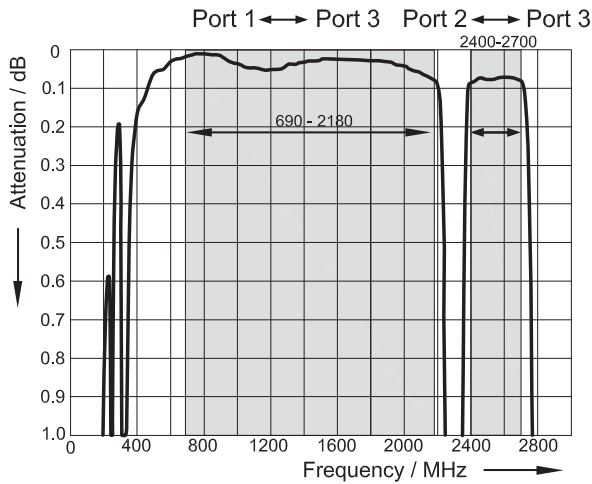
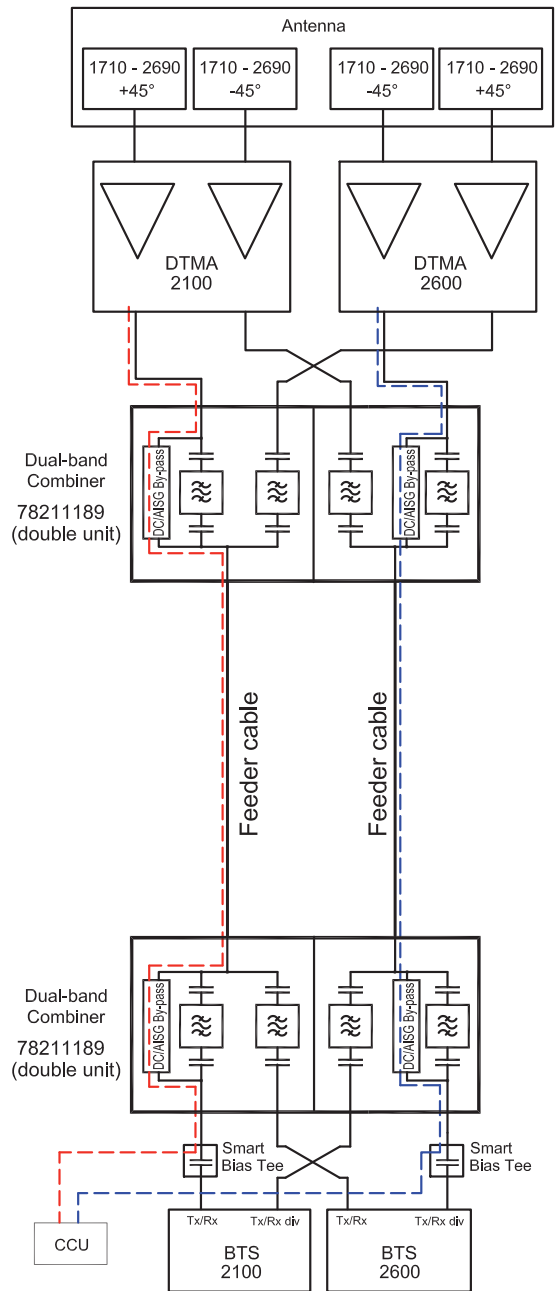


Diagram 2



Application Example

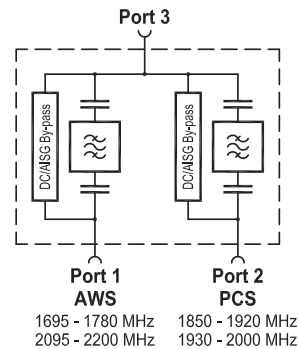
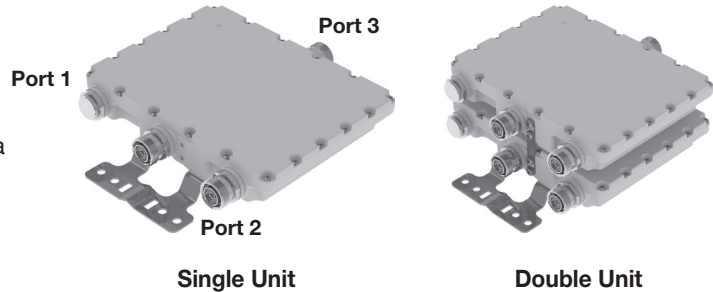


- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



Technical Data

Type No.	78210770 Single unit	clamps included	78210771 Double unit
Pass band			
Band 1 [MHz]	1695 – 1780 (Rx) / 2095 – 2200 (Tx)		
Band 2 [MHz]	1850 – 1920 (Rx) / 1930 – 2000 (Tx)		
Insertion loss			
Port 1 ↔ Port 3 [dB]	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)		
Port 2 ↔ Port 3 [dB]	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)		
Isolation			
Port 1 ↔ Port 2 [dB]	> 50		
VSWR	< 1.25		
Impedance [Ω]	50		
Input power			
Port 1 (AWS) [W]	< 250		
Port 2 (PCS) [W]	< 250		
Intermodulation products [dBc]	< -160 (3 rd order; with 2 x 20 W)		
Temperature range [°C F°]	-40 ... +60 -40 ... +140		
Connectors	7-16 female (long neck)		
Application	Indoor or outdoor (IP 66)		
DC/AISG transparency [mA]	By-pass between all ports (max. 2500)		
Lightning protection [kA]	3, 10/350 μs pulse		
Mounting [mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set		
Weight [kg lb]	Single Unit: 2.9 6.39 / Double Unit: 5.7 12.57		
Dimensions (w x h x d) [mm in]	Single Unit: 244 x 184.5 x 46 9.61 x 7.26 x 1.81 / Double Unit: 244 x 184.5 x 96.5 9.61 x 7.26 x 3.80 (without connectors, without mounting brackets)		

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

Typical Attenuation Curves

Diagram I

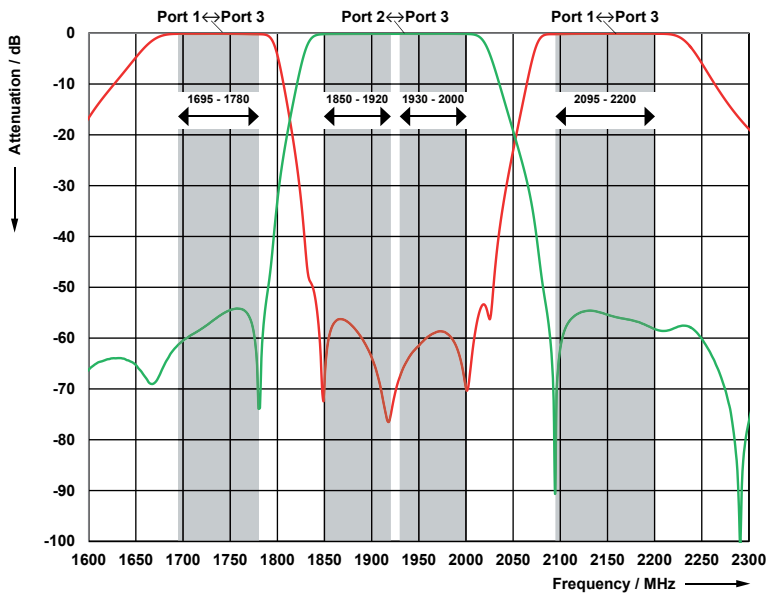
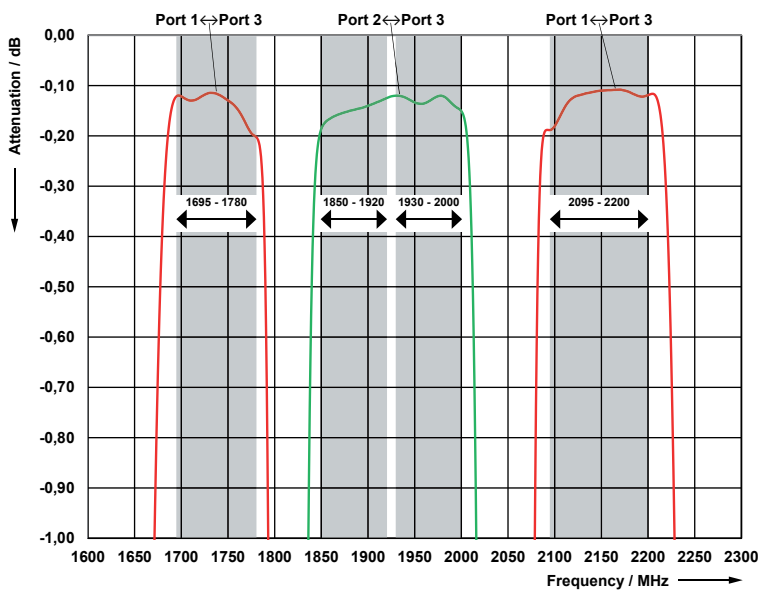


Diagram II



- **Clamp set** (type no. 734360 – 734365),
 - **DC stop** (type no. 78210850V01) and
 - **50-Ohm load** (type no. 78410367)
- (order separately) can be found in the section “System Components”.

1695 – 1780 / 2095 – 2200 MHz **1850 – 1920 / 1930 – 2000 MHz**

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

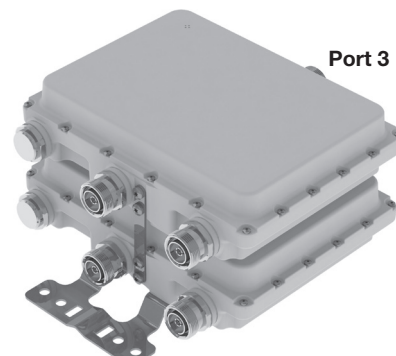
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

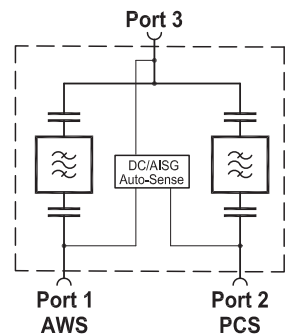
In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in lightning protection



Port 1 AWS **Port 2 PCS**



1695 - 1780 MHz 1850 - 1920 MHz
2095 - 2200 MHz 1930 - 2000 MHz

Technical Data

Type No.		78210778v01 Double unit	
Pass band			
Band 1	MHz	1695 – 1780 (Rx) / 2095 – 2200 (Tx)	
Band 2	MHz	1850 – 1920 (Rx) / 1930 – 2000 (Tx)	
Insertion loss			
Port 1 ↔ Port 3	dB	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)	
Port 2 ↔ Port 3	dB	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 50	
VSWR		< 1.25	
Impedance	Ω	50	
Input power per Band	W	< 250 (operational) / < 500 (survival)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	-40 ... +60 -40 ... +140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 3	mA	Auto-sense (max. 2000)	
DC supply	V DC	7 – 30	
Operating Current	mA	Typ. 6.5	
Voltage drop	V	< 0.15	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight	kg lb	6.1 13.45	
Dimensions (w x h x d)	mm in	244 x 184.5 x 130.1 9.61 x 7.26 x 5.12 (without connectors, without mounting brackets)	

clamps included

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

Accessories (included)

Type No.	Clamp set suitable for most diameter of mm in
734365	45 – 125 1.77 – 4.92

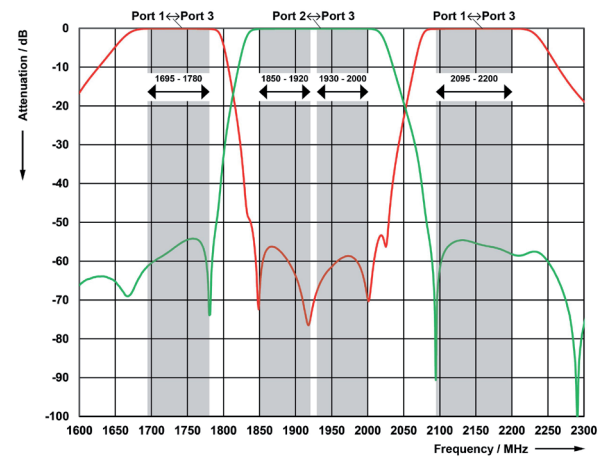


Accessories (order separately)

Type No.	Description
78410367	50-Ohm load



Typical Attenuation Curves Diagram I



Auto-sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

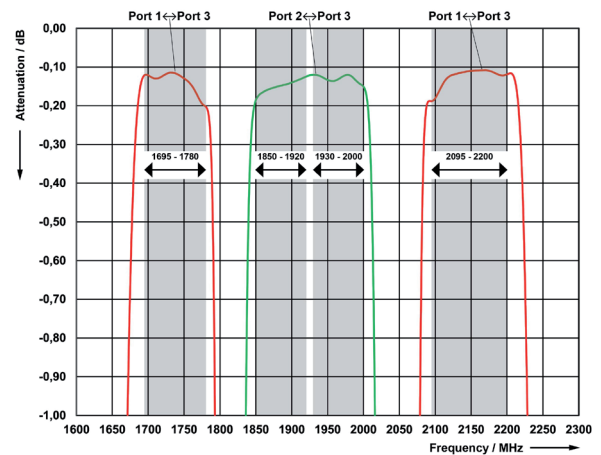
Connector	Priority
Port 1	B (lowest)
Port 2	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

Diagram II



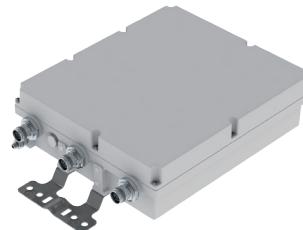
703 – 788 MHz

791 – 862 MHz

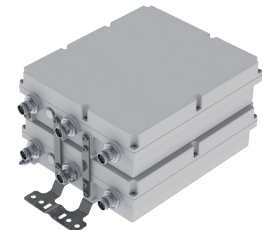
880 – 960 MHz

Preliminary Issue

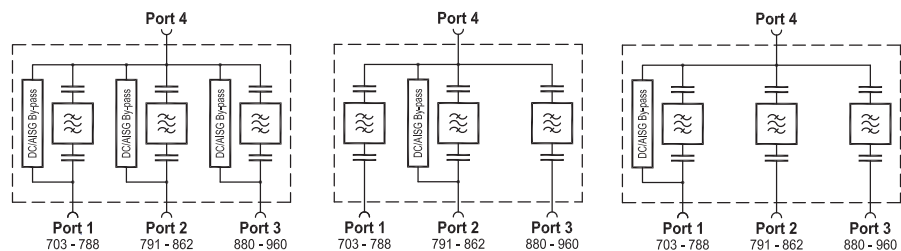
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.	78210880 Single Unit		78210882 Single Unit		78210884 Single Unit	
	78210881 Double Unit		78210883 Double Unit		78210885 Double Unit	
Pass band						
Band 1	[MHz]			703 – 788		
Band 2	[MHz]			791 – 862		
Band 3	[MHz]			880 – 960		
Insertion loss						
Port 1 ↔ Port 4	[dB]	< 0.5 (703 – 780) / < 1.0 (780 – 787) / < 1.5 (787 – 788)				
Port 2 ↔ Port 4	[dB]	< 1.5 (791 – 792) / < 1.0 (792 – 794) / < 0.5 (794 – 862)				
Port 3 ↔ Port 4	[dB]	< 0.5				
Isolation	[dB]	> 40				
VSWR		< 1.25				
Impedance	[Ω]	50				
Input power						
Band 1 / Band 2 / Band 3	[W]	< 200 / < 200 / < 200				
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)				
Temperature range	[°C]	-40 ... +65				
Connectors		4.3-10 female (long neck)				
Application		Indoor or outdoor (IP 66)				
DC/AISG transparency						
Port 1 ↔ Port 4	[mA]	By-pass (max. 2500)	Stop	By-pass (max. 2500)	Stop	By-pass (max. 2500)
Port 2 ↔ Port 4	[mA]					
Port 3 ↔ Port 4	[mA]					
Lightning protection	[kA]	3, 10/350 μs pulse				
Mounting		Wall mounting: With 4 screws (max. 8 0.315 [mm in] diameter) Mast mounting: With additional clamp set				
Weight	[kg lb]	Single unit: 6 13.22 / Double unit: 11.9 26.24				
Packing size	[mm in]	Single Unit: 463 x 320 x 150 18.23 x 12.60 x 5.91 Double Unit: 463 x 320 x 240 18.23 x 12.60 x 9.45				
Dimensions (w x h x d)	[mm in]	Single Unit: 300 x 260 x 85 11.81 x 10.23 x 3.35 / Double Unit: 300 x 260 x 175 11.81 x 10.23 x 6.89 (without connectors, without mounting brackets)				

703 – 788 MHz

791 – 862 MHz

880 – 960 MHz

Preliminary Issue

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78211000	DC stop
78210484	50-Ohm load



Typical Attenuation Curves

Diagram 1

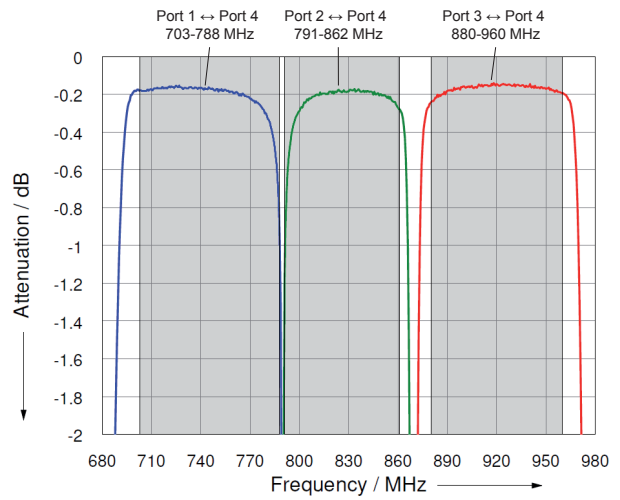
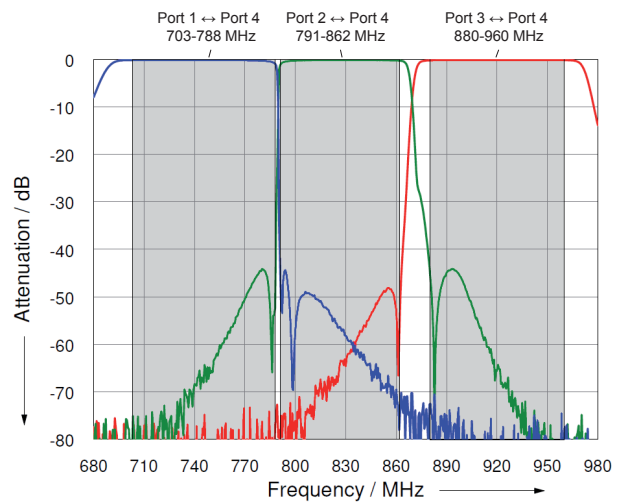


Diagram 2



703 – 788 MHz

791 – 862 MHz

880 – 960 MHz

Preliminary Issue

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

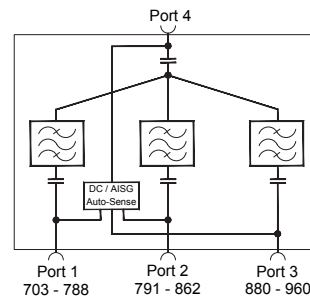
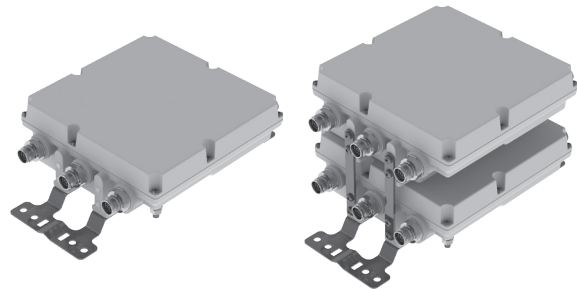
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPoI antennas as a double unit
- Built-in lightning protection



Technical Data

Type No.		78210887 Single Unit	78210888 Double Unit
Pass band			
Band 1	MHz	703 – 788	
Band 2	MHz	791 – 862	
Band 3	MHz	880 – 960	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.5 (703 – 780) / < 1.0 (780 – 787) / < 1.5 (787 – 788)	
Port 2 ↔ Port 4	dB	< 1.5 (791 – 792) / < 1.0 (792 – 794) / < 0.5 (794 – 862)	
Port 3 ↔ Port 4	dB	< 0.5	
Isolation	dB	> 40	
VSWR		< 1.25	
Impedance	Ω	50	
Input power	W	< 200 / < 200 / < 200	
Band 1 / Band 2 / Band 3			
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C	-40 ... +65	
Connectors		4.3-10 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 4	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 4	mA	Auto-sense (max. 2000)	
Port 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Lightning protection	kA	3, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm 0.315 in diameter) Mast mounting: With additional clamp set	
Weight	kg lb	Single Unit: 6 13.22 / Double Unit: 11 26.24	
Packing size	mm in	Single Unit: 463 x 320 x 150 18.23 x 12.60 x 5.91 Double Unit: 463 x 320 x 240 18.23 x 12.60 x 9.45	
Dimensions (w x h x d)	mm in	Single Unit: 300 x 260 x 85 11.81 x 10.23 x 3.35 Double Unit: 300 x 260 x 175 11.81 x 10.23 x 6.89 (without connectors, without mounting brackets)	

703 – 788 MHz 791 – 862 MHz 880 – 960 MHz

Preliminary Issue

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of mm in
734360	34 – 60 1.34 – 2.36
734361	60 – 80 2.36 – 3.15
734362	80 – 100 3.15 – 3.94
734363	100 – 120 3.94 – 4.72
734364	120 – 140 4.72 – 5.51
734365	45 – 125 1.77 – 4.92



Clamp Set

Type No.	Description
78410484	50-Ohm load



50-Ohm load

Auto-Sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B (medium)
Port 2	A (highest)
Port 3	C (lowest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

Typical Attenuation Curves

Diagram 1

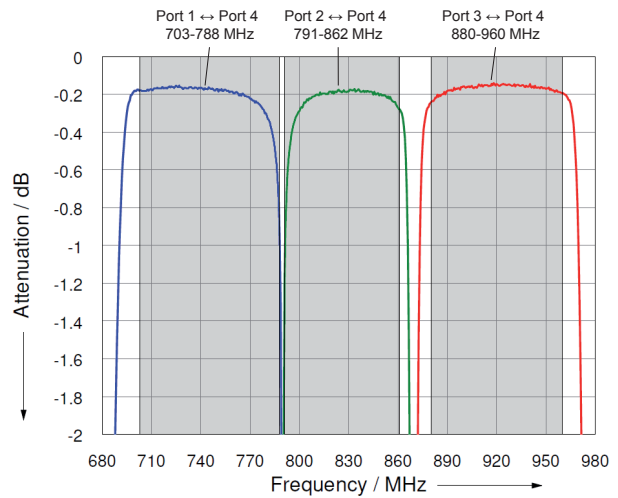
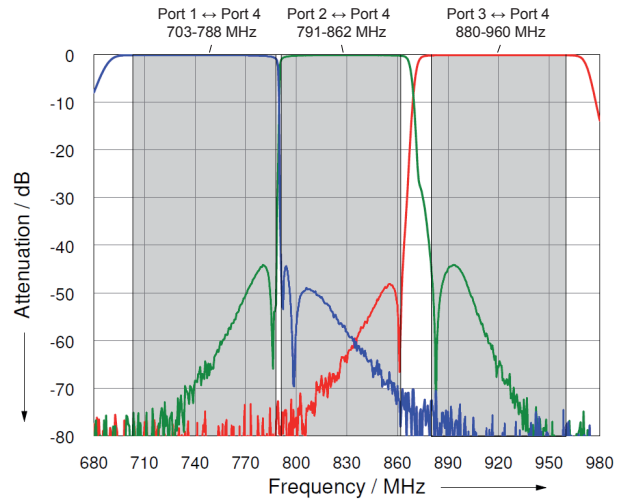


Diagram 2

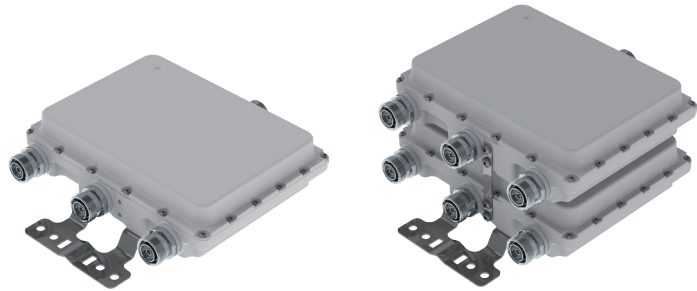


380 – 960 MHz

1695 – 1780 / 2095 – 2200 MHz

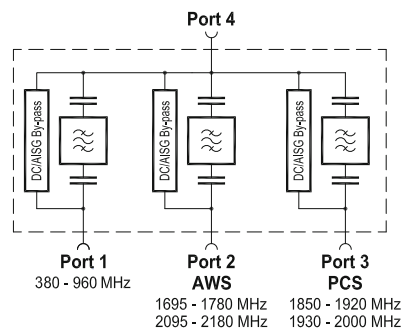
1850 – 1920 / 1930 – 2000 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78210780 Single unit	78210781 Double unit
Pass band			
Band 1	[MHz]	380 – 960	
Band 2	[MHz]	1695 – 1780 (Rx) / 2095 – 2200 (Tx)	
Band 3	[MHz]	1850 – 1920 (Rx) / 1930 – 2000 (Tx)	
Insertion loss			
Port 1 ↔ Port 4	[dB]	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4	[dB]	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)	
Port 3 ↔ Port 4	[dB]	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)	
Isolation			
Port 1 ↔ Port 2	[dB]	> 50 (380 – 960 / 1695 – 1780 / 2095 – 2200 MHz)	
Port 1 ↔ Port 3	[dB]	> 50 (380 – 960 / 1850 – 1920 / 1930 – 2000 MHz)	
Port 2 ↔ Port 3	[dB]	> 50 (1695 – 1780 / 1850 – 1920 / 1930 – 2000 / 2095 – 2200 MHz)	
VSWR		< 1.25	
Impedance	[Ω]	50	
Input power			
Port 1	[W]	< 250	
Port 2 (AWS)	[W]	< 250	
Port 3 (PCS)	[W]	< 250	
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W), exempt from TETRA 360 – 470 MHz < -150 dBc	
Temperature range	[°C °F]	-40 ... +60 -40... 140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency	[mA]	By-pass between all ports (max. 2500)	
Lightning protection	[kA]	3, 10/350 μs pulse	
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With additional clamp set	
Weight	[kg lb]	Single Unit: 3 6.61 / Double Unit: 5.9 13.00	
Dimensions (w x h x d)	[mm in]	Single Unit: 244 x 184.5 x 46 9.61 x 7.26 x 1.81 Double Unit: 244 x 184.5 x 96.5 9.61 x 7.26 x 3.80 (without connectors, without mounting brackets)	

380 – 960 MHz

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

Accessories (order separately)

Type No.		Clamp set suitable for mast diameter of
734360	[mm in]	34 – 60 1.34 – 2.36
734361	[mm in]	60 – 80 2.36 – 3.15
734362	[mm in]	80 – 100 3.15 – 3.94
734363	[mm in]	100 – 120 3.94 – 4.72
734364	[mm in]	120 – 140 4.72 – 5.51
734365	[mm in]	45 – 125 1.77 – 4.92



Type No.	Description
78210850V01	DC stop
78410367	50-Ohm load



Typical Attenuation Curves

Diagram I

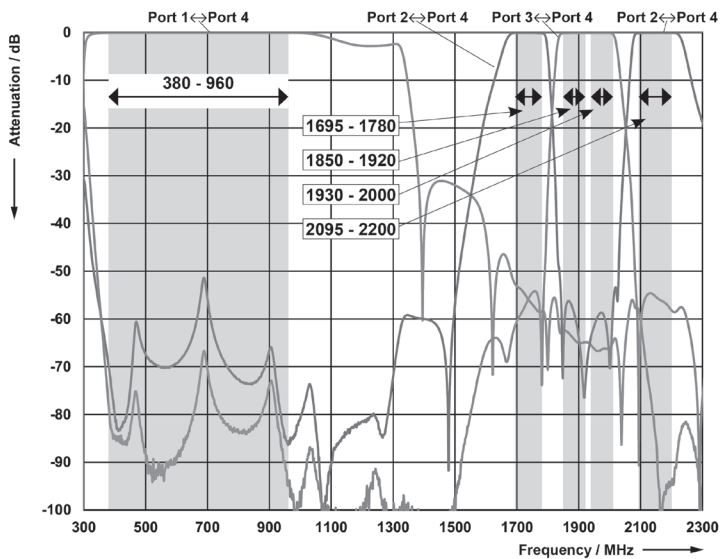
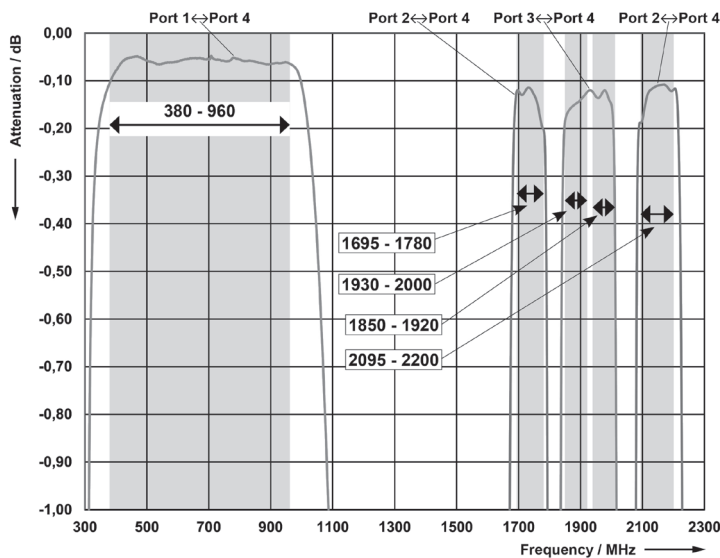


Diagram II



380 – 960 MHz

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

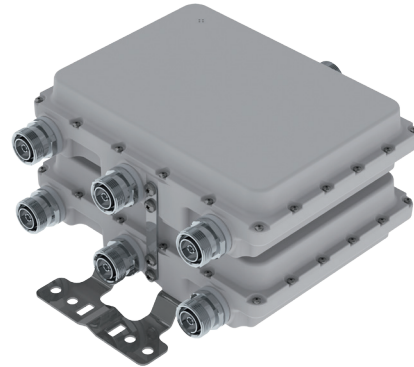
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

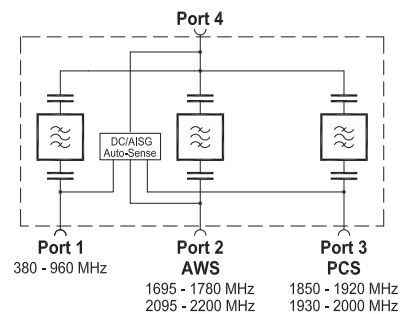
In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in lightning protection



Double Unit



Technical Data

Type No.		78210788v01 Double unit	clamps included
Pass band			
Band 1	MHz	380 – 960	
Band 2	MHz	1695 – 1780 (Rx) / 2095 – 2200 (Tx)	
Band 3	MHz	1850 – 1920 (Rx) / 1930 – 2000 (Tx)	
Insertion loss			
Port 1 ↔ Port 4	dB	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4	dB	< 0.3 (1695 – 1780 / 2095 – 2200 MHz)	
Port 3 ↔ Port 4	dB	< 0.3 (1850 – 1920 / 1930 – 2000 MHz)	
Isolation			
Port 1 ↔ Port 2	dB	> 50 (380 – 960 / 1695 – 1780 / 2095 – 2200 MHz)	
Port 1 ↔ Port 3	dB	> 50 (380 – 960 / 1850 – 1920 / 1930 – 2000 MHz)	
Port 2 ↔ Port 3	dB	> 50 (1695 – 1780 / 1850 – 1920 / 1930 – 2000 / 2095 – 2200 MHz)	
VSWR		< 1.25	
Impedance	Ω	50	
Input power per Band	W	< 250 (operational) / < 500 (survival)	
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C °F	40 ... +60 -40 ... +140	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 4	mA	Auto-sense (max. 2000)	
Port 2 ↔ Port 4	mA	Auto-sense (max. 2000)	
Port 3 ↔ Port 4	mA	Auto-sense (max. 2000)	
Mounting	mm in	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight	kg lb	6.3 13.88	
Dimensions (w x h x d)	mm in	244 x 184.5 x 130.1 9.61 x 7.26 x 5.12 (without connectors, without mounting brackets)	

380 – 960 MHz

1695 – 1780 / 2095 – 2200 MHz

1850 – 1920 / 1930 – 2000 MHz

Accessories (included)

Type No.	Clamp set suitable for most diameter of mm in
734365	45 – 125 1.77 – 4.92



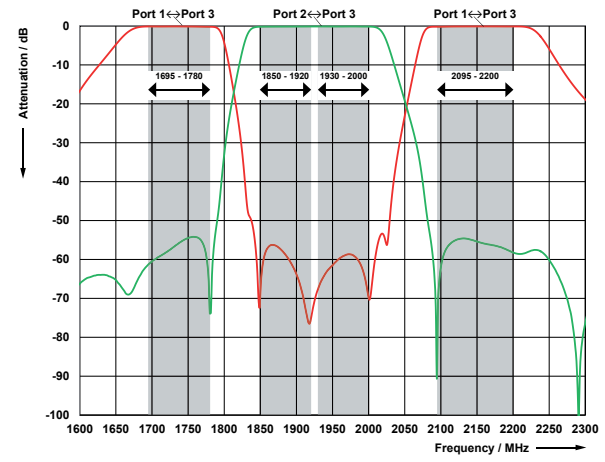
Accessories (order separately)

Type No.	Description
78410367	50-Ohm load



Typical Attenuation Curves

Diagram I



Auto-Sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

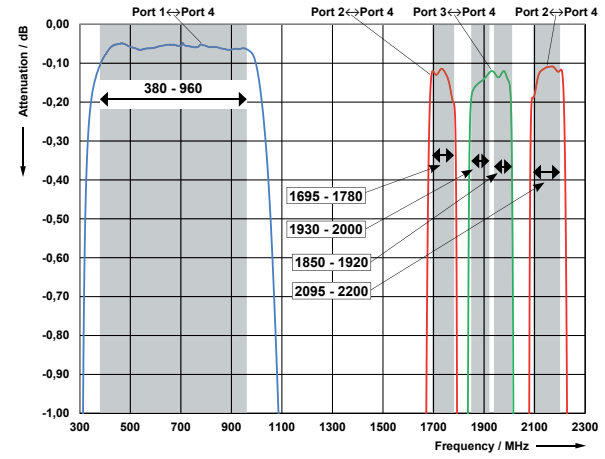
If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B (medium)
Port 2	A (highest)
Port 3	C (lowest)

Diagram II



Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

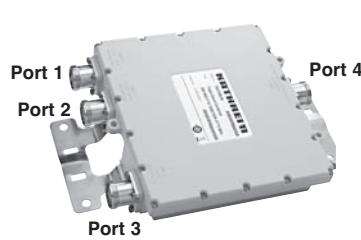
Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

380 – 960 MHz

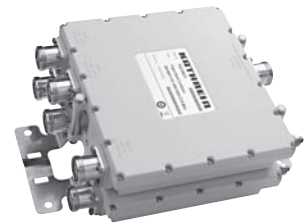
1710 – 1880 MHz

1920 – 2170 MHz

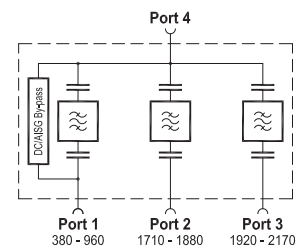
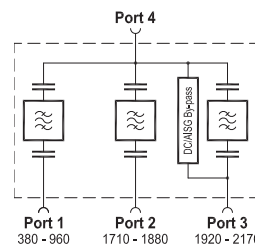
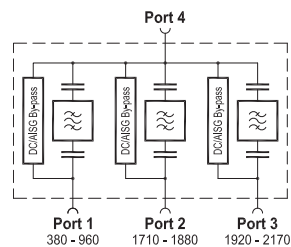
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



78210630, 78210632, 78210634
Single Unit



78210631, 78210633, 78210635
Double Unit



Technical Data

Type No.	78210630 Single Unit	78210632 Single Unit	78210634 Single Unit
	78210631 Double Unit	78210633 Double Unit	78210635 Double Unit
Pass band Band 1 (TETRA ... GSM 900) Band 2 (GSM 1800) Band 3 (UMTS)	380 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz		
Insertion loss Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	< 0.2 dB (380 – 960 MHz) < 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2170 MHz)		
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3	> 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1710 – 1880 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1920 – 2170 MHz) > 50 dB (1710 – 1880 / 1920 – 2170 MHz)		
VSWR	< 1.25 (380 – 960 / 1710 – 1880 / 1920 – 2170 MHz)		
Impedance	50 Ω		
Input power Band 1 / Band 2 / Band 3	< 700 W / < 300 W / < 300 W		
Intermodulation products	< –160 dBc (3 rd order; with 2 x 20 W)		
Temperature range	–40 ... +60 °C		
Connectors	7-16 female (long neck)		
Application	Indoor <i>or</i> outdoor (IP 66)		
DC/AISG transparency Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	By-pass (max. 2500 mA) By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop Stop By-pass (max. 2500 mA)	By-pass (max. 2500 mA) Stop Stop
Lightning protection	3 kA, 10/350 μs pulse		
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set		
Weight	Single Unit: 3.2 kg / Double Unit: 6.3 kg		
Packing size	Single Unit: 392 x 292 x 139 mm / Double Unit: 392 x 292 x 189 mm		
Dimensions (w x h x d)	Single Unit: 219 x 199 x 48 mm / Double Unit: 219 x 199 x 104 mm (without connectors, without mounting brackets)		

380 – 960 MHz

1710 – 1880 MHz

1920 – 2170 MHz

Typical Attenuation Curves

Diagram I

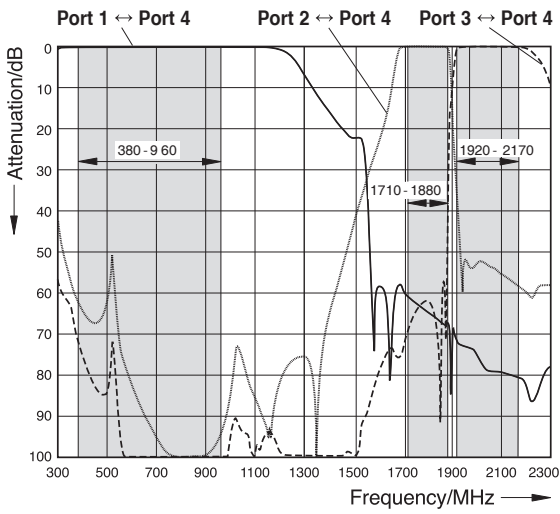
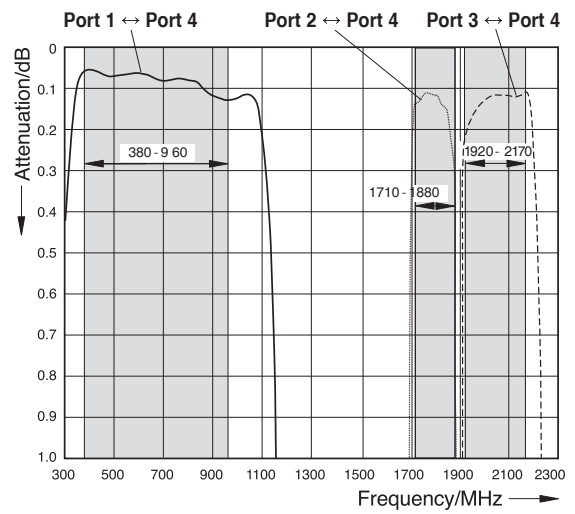


Diagram II



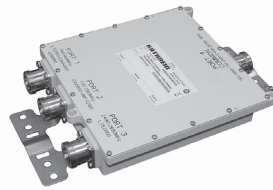
- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

790 – 960 MHz

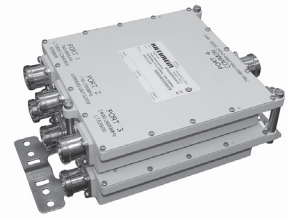
1710 – 2180 MHz

2490 – 2690 MHz

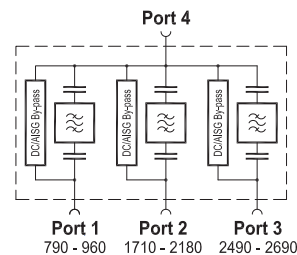
- Designed for co-sitting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection



Single Unit



Double Unit



Technical Data

Type No.	78211130 Single Unit
	78211131 Double Unit
Pass band	Band 1 (LTE 800, GSM 900) Band 2 (GSM 1800, UMTS 2100) Band 3 (LTE 2600)
	790 – 960 MHz 1710 – 2180 MHz 2490 – 2690 MHz
Insertion loss	Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4
	< 0.2 dB (790 – 960 MHz) < 0.2 dB (1710 – 2180 MHz) < 0.2 dB (2490 – 2690 MHz)
Isolation	Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3
	> 50 dB (790 – 960 MHz) > 50 dB (1710 – 2180 MHz) > 50 dB (2490 – 2690 MHz)
VSWR	< 1.25 (790 – 960 / 1710 – 2180 / 2490 – 2690 MHz)
Impedance	50 Ω
Input power	Band 1 / Band 2 / Band 3
	< 300 W / < 300 W / < 300 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4
	By-pass (max. 2500 mA) By-pass (max. 2500 mA) By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	Single unit: 3 kg / Double unit: 5.4 kg
Packing size	Single Unit: 392 x 272 x 140 mm / Double Unit: 392 x 272 x 195 mm
Dimensions (w x h x d)	Single Unit: 199 x 199 x 48 mm / Double Unit: 199 x 199 x 104 mm (without connectors, without mounting brackets)

790 – 960 MHz

1710 – 2180 MHz

2490 – 2690 MHz

Typical Attenuation Curves

Diagramm I

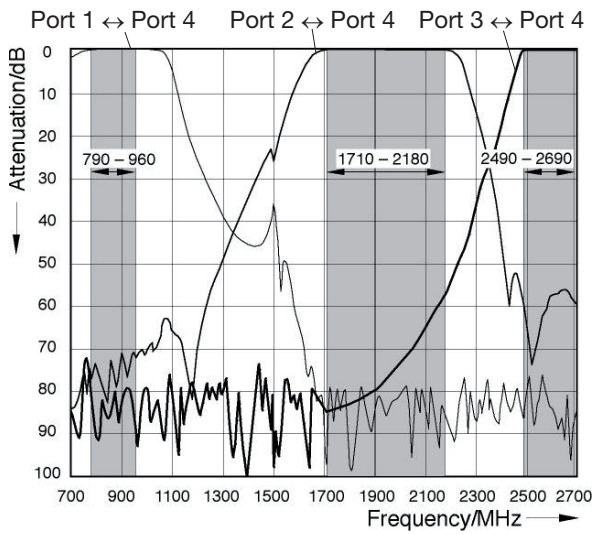
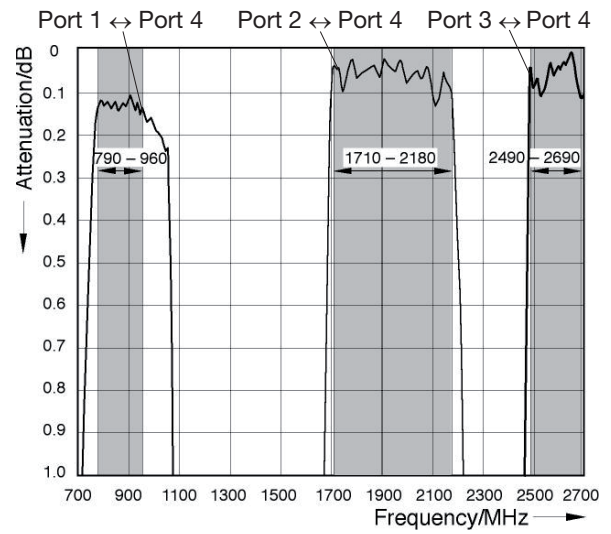


Diagramm II



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section "System Components".

Triple-Band Combiner

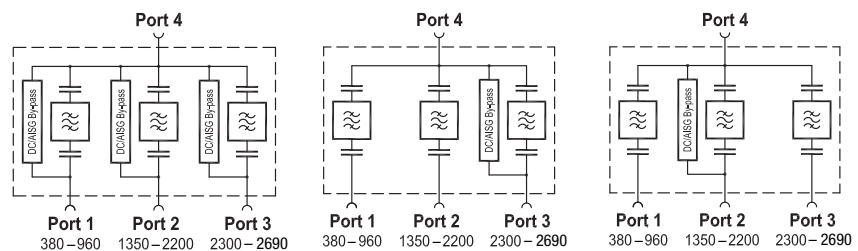
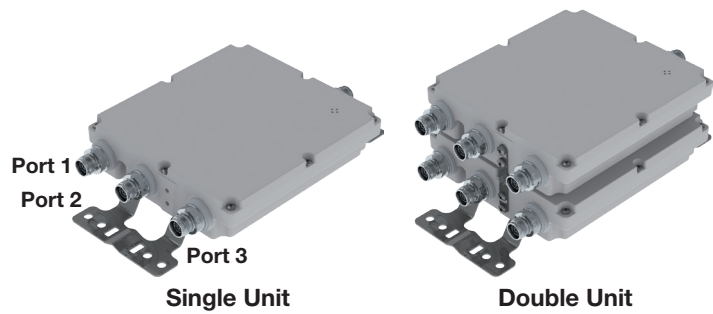
KATHREIN

380 – 960 MHz

1350 – 2200 MHz

2300 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection



Technical Data

Type No.	78211450 Single Unit		78211452 Single Unit		78211454 Single Unit	
	78211451 Double Unit		78211453 Double Unit		78211455 Double Unit	
Pass band						
Band 1	[MHz]			380 – 960		
Band 2	[MHz]			1350 – 2200		
Band 3	[MHz]			2300 – 2690		
Insertion loss						
Port 1 ↔ Port 4	[dB]			< 0.2 (380 – 960 MHz)		
Port 2 ↔ Port 4	[dB]			< 0.2 (1350 – 2200 MHz)		
Port 3 ↔ Port 4	[dB]			< 0.2 (2300 – 2690 MHz)		
Isolation	[dB]			> 50		
VSWR					< 1.25	
Impedance	[Ω]			50		
Input power						
Band 1 / Band 2 / Band 3	[W]			< 300 / < 200 / < 200		
Intermodulation products	[dBc]			< -160 (3 rd order; with 2 x 20 W)		
Temperature range	[°C °F]			-40 ... +60 -40 ... +140		
Connectors					4.3-10 female (long neck)	
Application					Indoor or outdoor (IP 66)	
DC/AISG transparency						
Port 1 ↔ Port 4	[mA]	By-pass (max. 2500)		Stop		
Port 2 ↔ Port 4	[mA]	By-pass (max. 2500)		Stop		
Port 3 ↔ Port 4	[mA]	By-pass (max. 2500)		By-pass (max. 2500)		
Lightning protection	[kA]			3, 10/350 μs pulse		
Mounting	[mm in]			Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set		
Weight	[kg lb]			Single unit: 3.5 7.7 / Double unit: 6.9 15.2		
Dimensions (w x h x d)	[mm in]			Single Unit: 196.9 x 214.7 x 51.8 7.75 x 8.45 x 2.04 Double Unit: 196.9 x 214.7 x 107.8 7.75 x 8.45 x 4.24 (without connectors, without mounting brackets)		

Triple-Band Combiner

KATHREIN

380 – 960 MHz

1350 – 2200 MHz

2300 – 2690 MHz

Accessories (included)

Type No.	Clamp set suitable for most diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78210484	DC stop
78211000	50-Ohm load



Typical Attenuation Curves

Diagram 1

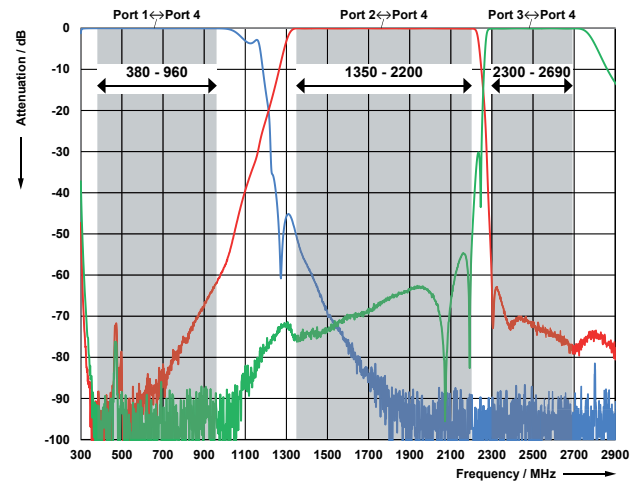
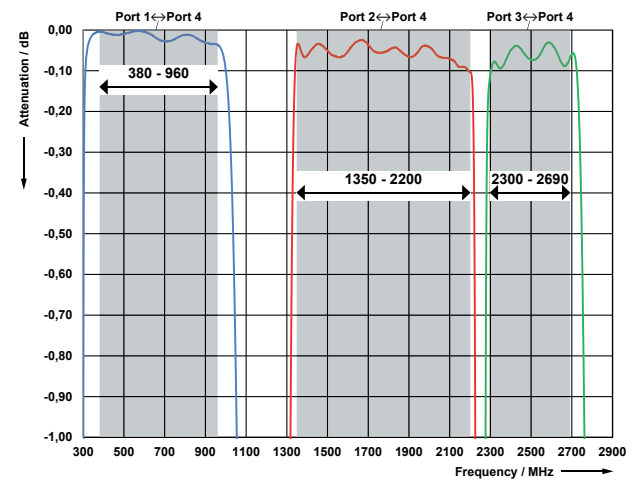


Diagram 2



380 – 960 MHz

1350 – 2200 MHz

2300 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

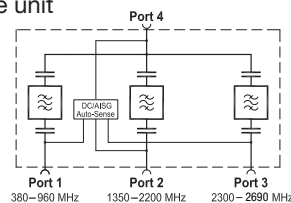
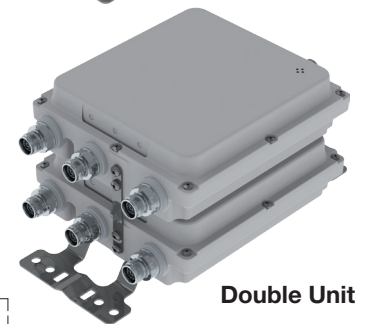
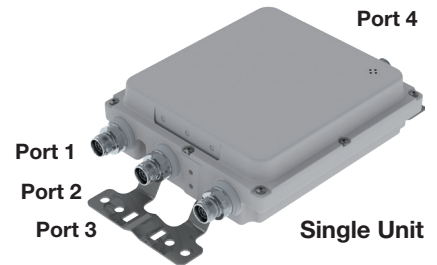
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

AUTO-SENSE



Technical Data

Type No.	78211457 Single Unit	78211458 Double Unit
Pass band		
Band 1 [MHz]	380 – 960	
Band 2 [MHz]	1350 – 2200	
Band 3 [MHz]	2300 – 2690	
Insertion loss		
Port 1 ↔ Port 4 [dB]	< 0.2 (380 – 960 MHz)	
Port 2 ↔ Port 4 [dB]	< 0.2 (1350 – 2200 MHz)	
Port 3 ↔ Port 4 [dB]	< 0.2 (2300 – 2690 MHz)	
Isolation [dB]	> 50	
VSWR	< 1.25	
Impedance [Ω]	50	
Input power		
Band 1 / Band 2 / Band 3 [W]	< 300 / < 200 / < 200	
Intermodulation products [dBc]	< -160 (3 rd order; with 2 x 20 W)	
Temperature range [°C °F]	-40 ... +60 -40 ... +140	
Connectors	4.3-10 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency		
Port 1 ↔ Port 4 [mA]	Auto-sense (max. 2000)	
Port 2 ↔ Port 4 [mA]	Auto-sense (max. 2000)	
Port 3 ↔ Port 4 [mA]	Auto-sense (max. 2000)	
Lightning protection [kA]	3, 10/350 μs pulse	
Mounting [mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set	
Weight [kg lb]	Single Unit: 3.7 8.2 / Double Unit: 7.2 15.9	
Dimensions (w x h x d) [mm in]	Single Unit: 196.9 x 214.7 x 67.65 7.75 x 8.45 x 2.66 / Double Unit: 196.9 x 214.7 x 138.65 7.75 x 8.45 x 5.45 (without connectors, without mounting brackets)	

380 – 960 MHz	1350 – 2200 MHz	2300 – 2690 MHz
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Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78210484	50-Ohm load



Auto-sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)
 If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function
 If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B
Port 2	C (lowest)
Port 3	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Typical Attenuation Curves

Diagram 1

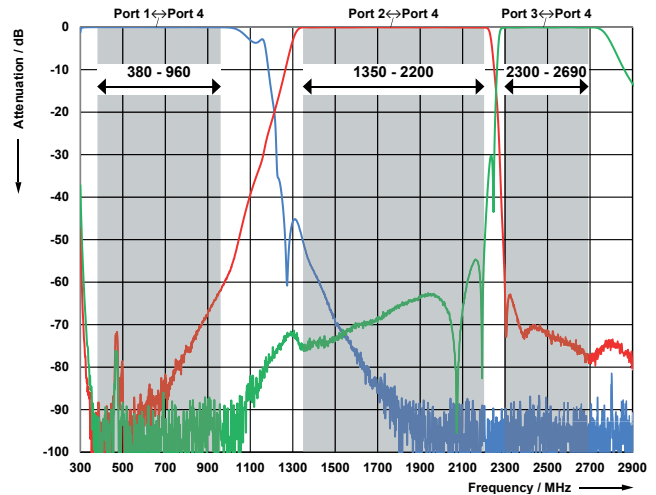
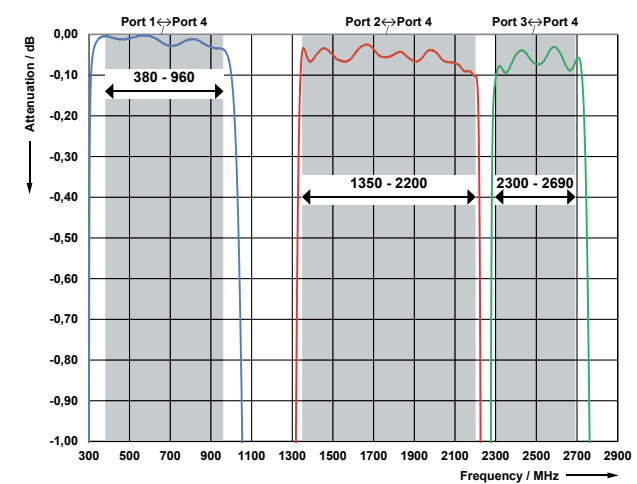


Diagram 2



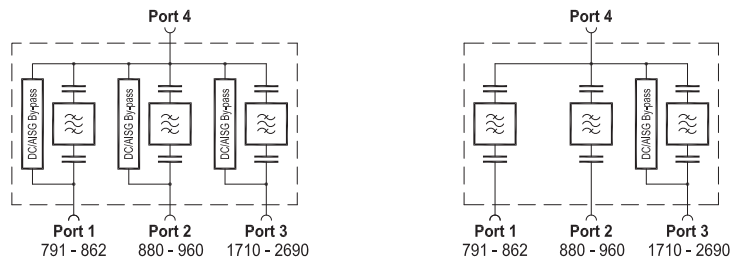
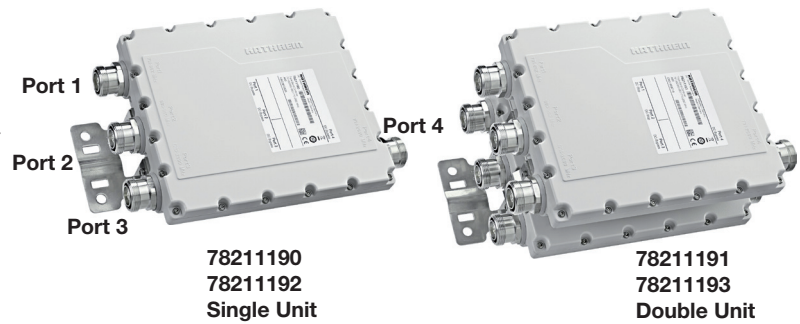
Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/AISG signal at each port accordingly.

791 – 862 MHz

880 – 960 MHz

1710 – 2690 MHz

- Designed for co-sitting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



Technical Data

Type No.	78211190 Single Unit	78211192 Single Unit
	78211191 Double Unit	78211193 Double Unit
Pass band Band 1 Band 2 Band 3	791 – 862 MHz 880 – 960 MHz 1710 – 2690 MHz	
Insertion loss Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	< 0.40 dB typ. 0.3 dB < 0.45 dB typ. 0.3 dB < 0.15 dB typ. 0.1 dB	
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3	> 50 dB (791 – 862 / 880 – 960 MHz) > 50 dB (791 – 862 / 1710 – 2690 MHz) > 50 dB (880 – 960 / 1710 – 2200 / 2500 – 2700 MHz) > 25 dB (2200 – 2500 MHz)	
VSWR	< 1.2	
Impedance	50 Ω	
Input power Band 1 / Band 2 / Band 3	< 300 W / < 300 W / < 300 W	
Intermodulation products	< –160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	By-pass (max. 2500 mA) By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	Single unit: 3.3 kg / Double unit: 6.6 kg	
Packing size (w x h x d)	Single unit: 250 x 385 x 195 mm / Double unit: 270 x 405 x 270 mm	
Dimensions (w x h x d)	Single unit: 181.4 x 212 x 66.5 mm / Double unit: 181.4 x 212 x 137.5 mm (without connectors, without mounting brackets)	

791 – 862 MHz 880 – 960 MHz 1710 – 2690 MHz

Typical Attenuation Curves

Diagram 1

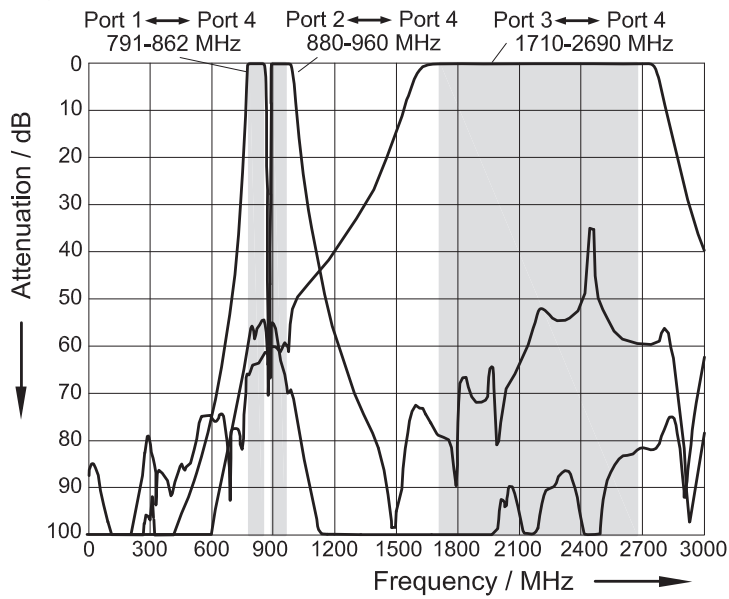
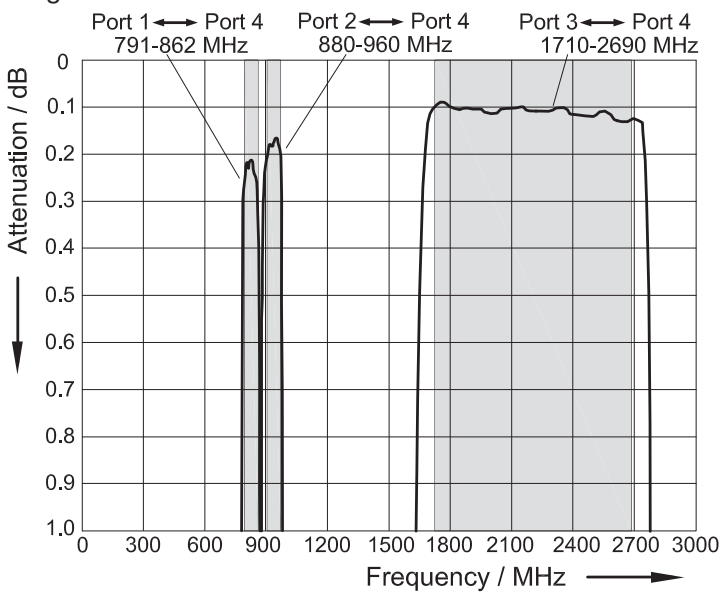


Diagram 2



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

791 – 862 MHz

880 – 960 MHz

1710 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

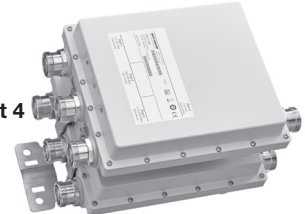
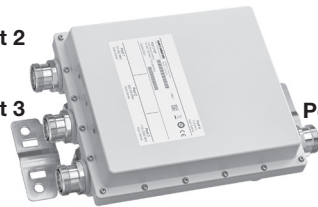
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

Port 1

Port 2

Port 3

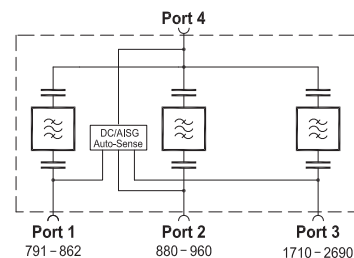
Port 4



AUTO-SENSE

78211197
Single Unit

78211198
Double Unit



Technical Data

Type No.		78211197 Single Unit	78211198 Double Unit
Pass band			
Band 1	[MHz]	791 – 862	
Band 2	[MHz]	880 – 960	
Band 3	[MHz]	1710 – 2690	
Insertion loss			
Port 1 ↔ Port 4	[dB]	< 0.40, typ. 0.3	
Port 2 ↔ Port 4	[dB]	< 0.45, typ. 0.3	
Port 3 ↔ Port 4	[dB]	< 0.15, typ. 0.1	
Isolation			
Port 1 ↔ Port 2	[dB]	> 50 (791 – 862 / 880 – 960 MHz)	
Port 1 ↔ Port 3	[dB]	> 50 (791 – 862 / 1710 – 2690 MHz)	
Port 2 ↔ Port 3	[dB]	> 50 (880 – 960 / 1710 – 2200 / 2500 – 2700 MHz)	> 25 (2200 – 2500 MHz)
VSWR		< 1.2	
Impedance	[Ω]	50	
Input power			
Band 1 / Band 2 / Band 3	[W]	< 300 / < 300 / < 300	
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	[°C]	-40 ... +60	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 4	[mA]	Auto-sense (max. 2000)	
Port 2 ↔ Port 4	[mA]	Auto-sense (max. 2000)	
Port 3 ↔ Port 4	[mA]	Auto-sense (max. 2000)	
Lightning protection	[kA]	3, 10/350 μs pulse	
Mounting	[mm in]	Wall mounting: With 4 screws (max. diameter 8 0.315) Mast mounting: With additional clamp set	
Weight	[kg lb]	Single unit: 3.4 7.50 / Double unit: 6.8 15.0	
Packing size	[mm in]	Single unit: 250 x 385 x 195 9.84 x 15.16 x 7.68 Double unit: 270 x 405 x 270 10.63 x 15.94 x 10.63	
Dimensions (w x h x d)	[mm in]	Single unit: 181.4 x 212 x 84 7.14 x 8.35 x 3.31 / Double unit: 181.4 x 212 x 173.5 7.14 x 8.35 x 6.83 (without connectors, without mounting brackets)	

791 – 862 MHz

880 – 960 MHz

1710 – 2690 MHz

Accessories (order separately)

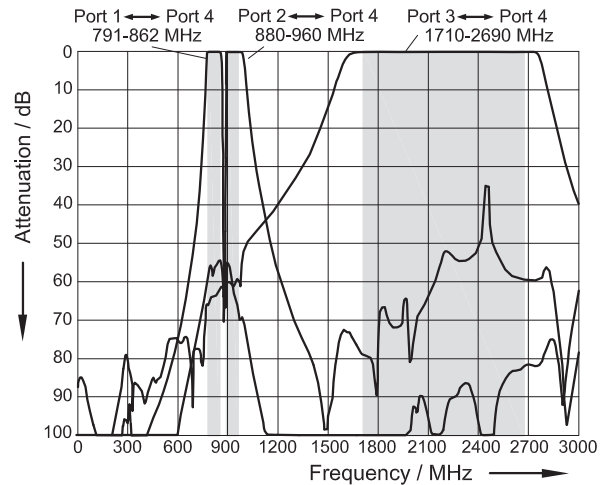
Type No.	Clamp set suitable for most diameter of
734360 [mm in]	34 – 60 1.34 – 2.36
734361 [mm in]	60 – 80 2.36 – 3.15
734362 [mm in]	80 – 100 3.15 – 3.94
734363 [mm in]	100 – 120 3.94 – 4.72
734364 [mm in]	120 – 140 4.72 – 5.51
734365 [mm in]	45 – 125 1.77 – 4.92



Type No.	Description
78410367	50-Ohm load



Typical Attenuation Curves



Auto-sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base Station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

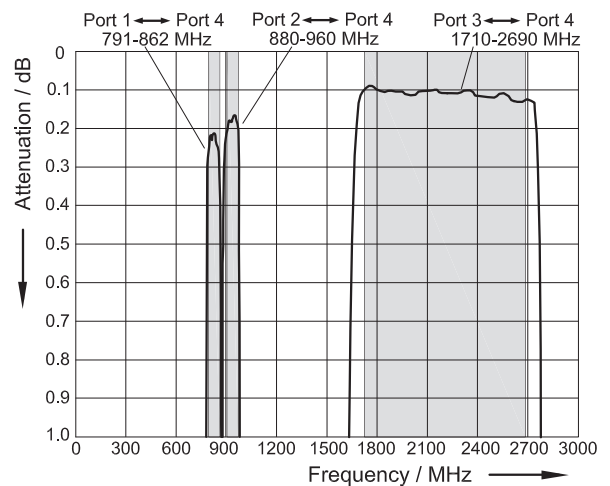
If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B
Port 2	C (lowest)
Port 3	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

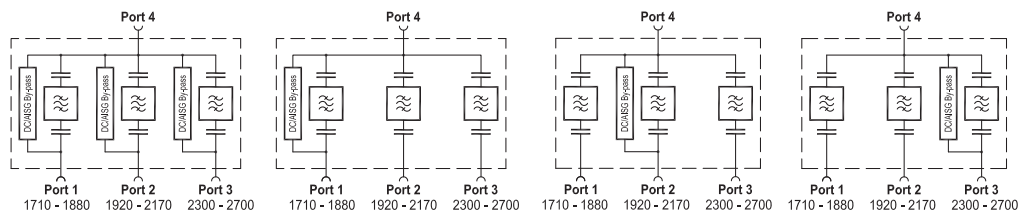
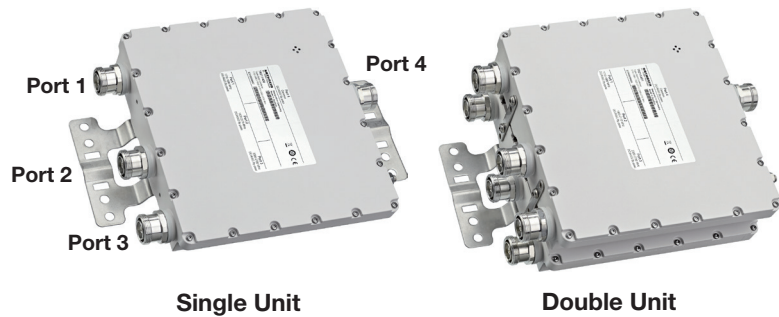


Triple-Band Combiner

KATHREIN

1710 – 1880 MHz 1920 – 2170 MHz 2300 – 2700 MHz

- Designed for co-sitting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



Technical Data

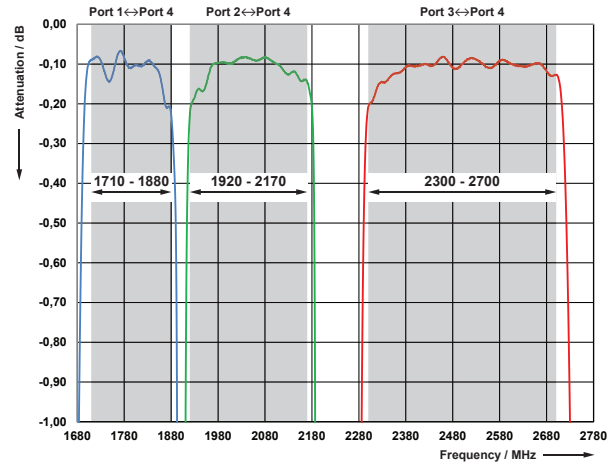
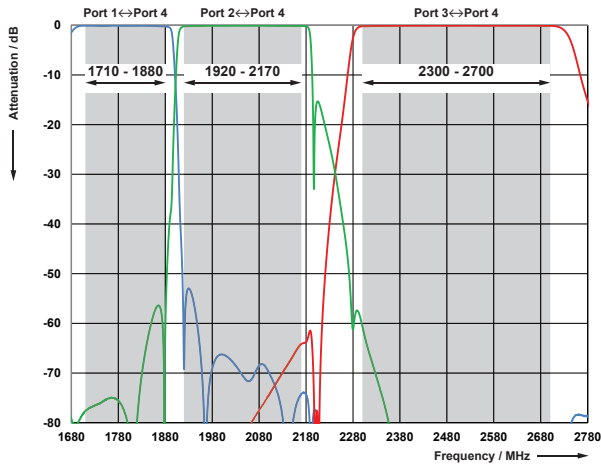
Type No.	78211400 Single Unit	78211402 Single Unit	78211404 Single Unit	78211406 Single Unit
	78211401 Double Unit	78211403 Double Unit	78211405 Double Unit	78211407 Double Unit
Pass band Band 1 (GSM/LTE1800) Band 2 (UMTS2100) Band 3 (2300 ... LTE2600)	1710 – 1880 MHz 1920 – 2170 MHz 2300 – 2700 MHz			
Insertion loss Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	< 0.3 dB (typ. 0.1 dB) < 0.3 dB (typ. 0.1 dB) < 0.3 dB (typ. 0.1 dB)			
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3	> 50 dB (1710 – 1880 / 1920 – 2170 MHz) > 50 dB (1710 – 1880 / 2300 – 2700 MHz) > 50 dB (1920 – 2170 / 2300 – 2700 MHz)			
VSWR	< 1.25			
Impedance	50 Ω			
Input power Band 1 / Band 2 / Band 3	< 300 W / < 300 W / < 300 W			
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)			
Temperature range	-40 ... +60 °C			
Connectors	7-16 female (long neck)			
Application	Indoor or outdoor (IP 66)			
DC/AISG transparency Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	By-pass (max. 2500 mA) By-pass (max. 2500 mA) By-pass (max. 2500 mA)	By-pass (max. 2500 mA) Stop Stop	Stop By-pass (max. 2500 mA) Stop	Stop Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse			
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set			
Weight	Single unit: 3.5 kg / Double unit: 6.9 kg			
Packing size	Single unit: 390 x 310 x 130 mm / Double unit: 390 x 310 x 180 mm			
Dimensions (w x h x d)	Single unit: 235 x 216.5 x 46.45 mm / Double unit: 235 x 216.5 x 96.95 mm (without connectors, without mounting brackets)			

1710 – 1880 MHz

1920 – 2170 MHz

2300 – 2700 MHz

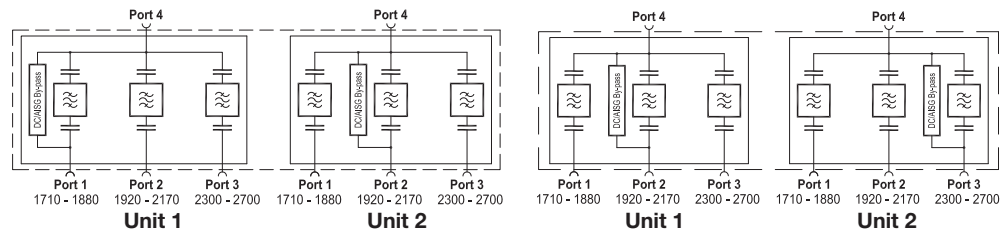
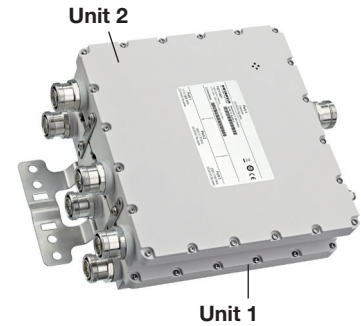
Typical Attenuation Curves



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

1710 – 1880 MHz **1920 – 2170 MHz** **2300 – 2700 MHz**

- Designed for co-sitting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit for XPol antennas
- Built-in lightning protection
- External DC Stop available as an accessory



Technical Data

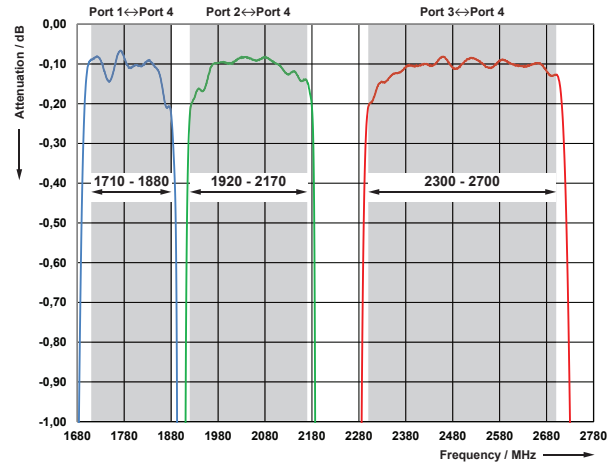
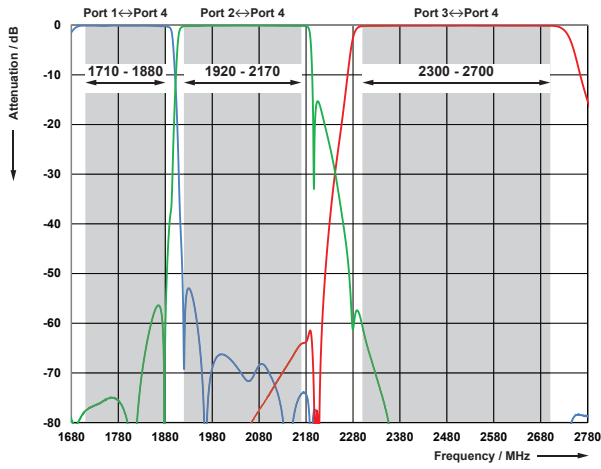
Type No.	78211408 Double Unit		78211409 Double Unit	
Pass band Band 1 (GSM/LTE 1800) Band 2 (UMTS2100) Band 3 (2300 ... LTE 2600)	1710 – 1880 MHz		1920 – 2170 MHz 2300 – 2700 MHz	
Insertion loss Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	< 0.3 dB (typ. 0.1 dB)		< 0.3 dB (typ. 0.1 dB)	
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 2 ↔ Port 3	> 50 dB (1710 – 1880 / 1920 – 2170 MHz)		> 50 dB (1710 – 1880 / 2300 – 2700 MHz) > 50 dB (1920 – 2170 / 2300 – 2700 MHz)	
VSWR	< 1.25			
Impedance	50 Ω			
Input power Band 1 / Band 2 / Band 3	< 300 W / < 300 W / < 300 W			
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)			
Temperature range	-40 ... +60 °C			
Connectors	7-16 female (long neck)			
Application	Indoor or outdoor (IP 66)			
DC/AISG transparency Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4	Unit 1 By-pass (max. 2500 mA) Stop Stop	Unit 2 Stop By-pass (max. 2500 mA) Stop	Unit 1 Stop By-pass (max. 2500 mA) Stop	Unit 2 Stop Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse			
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set			
Weight	6.9 kg			
Packing size	390 x 310 x 180 mm			
Dimensions (w x h x d)	235 x 216.5 x 96.95 mm (without connectors, without mounting brackets)			

1710 – 1880 MHz

1920 – 2170 MHz

2300 – 2700 MHz

Typical Attenuation Curves



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

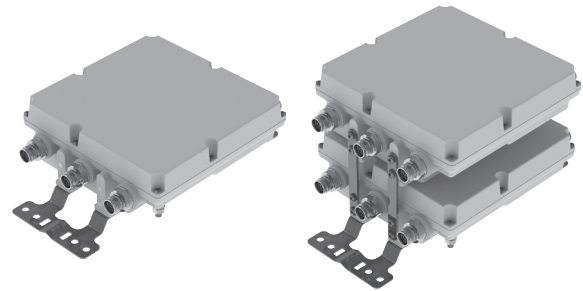
690 – 806 MHz

824 – 960 MHz

1427 – 3800 MHz

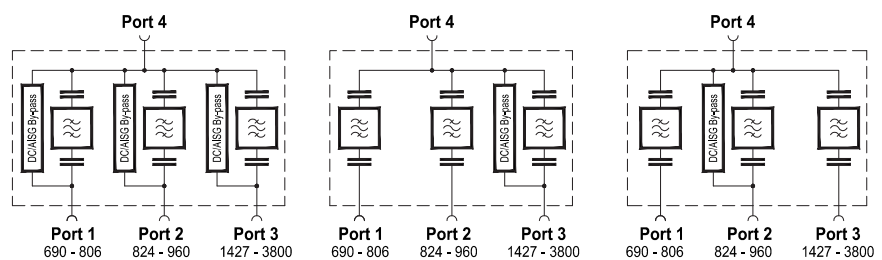
Preliminary Issue

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



Single Unit

Double Unit



Technical Data

Type No.		78210700 Single Unit	78210702 Single Unit	78210704 Single Unit
		78210701 Double Unit	78210703 Double Unit	78210705 Double Unit
Pass band				
Band 1	[MHz]		690 – 806	
Band 2	[MHz]		824 – 960	
Band 3	[MHz]		1427 – 3800	
Insertion loss				
Port 1 ↔ Port 4	[dB]		< 0.5 (690 – 796 MHz); < 0.7 (796 – 806 MHz)	
Port 2 ↔ Port 4	[dB]		< 0.7 (824 – 834 MHz); < 0.5 (834 – 960 MHz)	
Port 3 ↔ Port 4	[dB]		< 0.15 (1427 – 3800 MHz)	
Isolation	[dB]		> 45	
VSWR			< 1.25	
Impedance	[Ω]		50	
Input power				
Band 1 / Band 2 / Band 3	[W]	< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)		
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)		
Temperature range	[°C °F]	-40 ... +60 -40 ... +140		
Connectors		4.3-10 female (long neck)		
Application		Indoor or outdoor (IP 66)		
DC/AISG transparency				
Port 1 ↔ Port 4	[mA]	By-pass (max. 2500)	Stop Stop By-pass (max. 2500)	Stop By-pass (max. 2500) Stop
Port 2 ↔ Port 4	[mA]			
Port 3 ↔ Port 4	[mA]			
Lightning protection	[kA]	3, 10/350 μs pulse		
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set		
Weight	[kg lb]	Single Unit: 5 11.0 / Double Unit: 9.9 21.8		
Packing size	[mm in]	Single Unit: 405 x 295 x 170 15.95 x 11.61 x 6.69 Double Unit: 405 x 295 x 260 15.95 x 11.61 x 10.24		
Dimensions (w x h x d)	[mm in]	Single Unit: 222 x 222 x 86.5 8.7 x 8.7 x 3.4 Double Unit: 222 x 222 x 176 8.7 x 8.7 x 6.9 (without connectors, without mounting brackets)		

690 – 806 MHz

824 – 960 MHz

1427 – 3800 MHz

Preliminary Issue

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78211000	DC stop
78210484	50-Ohm load



Typical Attenuation Curves

Diagram 1

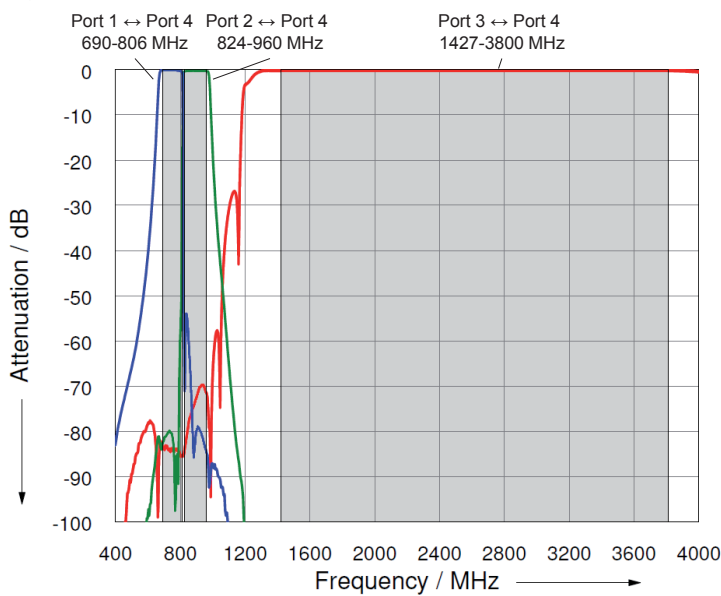
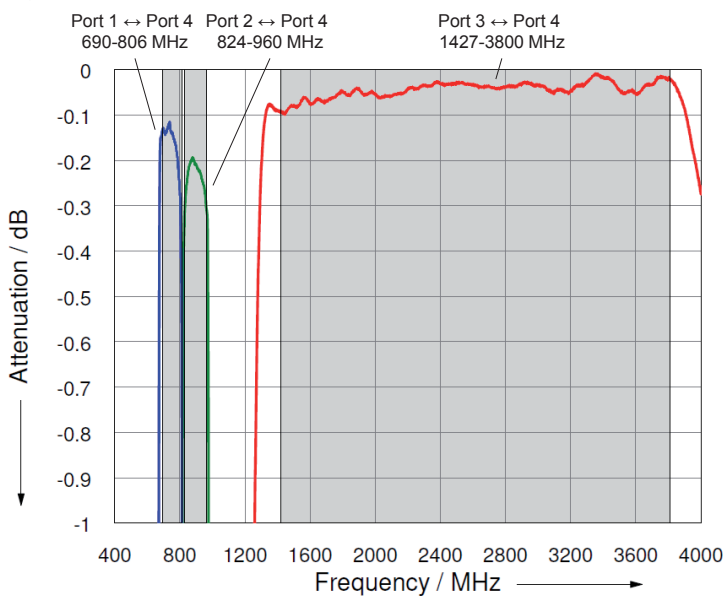


Diagram 2



690 – 806 MHz

824 – 960 MHz

1427 – 3800 MHz

Preliminary Issue

- Designed for co-sitting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

AUTO-SENSE

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

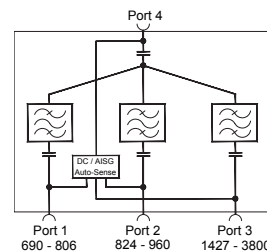
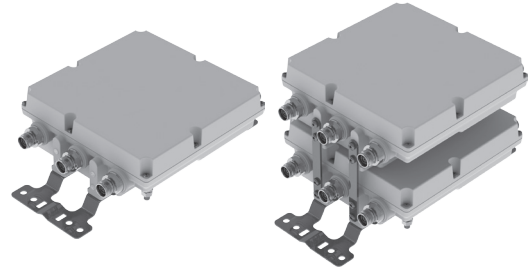
1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

A detailed manual about auto-sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection



Technical Data

Type No.	78210707 Single Unit	clamps included	78210708 Double Unit
Pass band			
Band 1 [MHz]			690 – 806
Band 2 [MHz]			824 – 960
Band 3 [MHz]			1427 – 3800
Insertion loss			
Port 1 ↔ Port 4 [dB]			< 0.5 (690 – 796 MHz); < 0.7 (796 – 806 MHz)
Port 2 ↔ Port 4 [dB]			< 0.7 (824 – 834 MHz); < 0.5 (834 – 960 MHz)
Port 3 ↔ Port 4 [dB]			< 0.15 (1427 – 3800 MHz)
Isolation			> 45
VSWR			< 1.25
Impedance [Ω]			50
Input power			
Band 1 / Band 2 / Band 3 [W]			< 200 / < 200 / < 200 (1427 – 2700 MHz); < 100 (2700 – 3800 MHz)
Intermodulation products [dBc]			< -160 (3 rd order; with 2 x 20 W)
Temperature range [°C °F]			-40 ... +60 -40 ... +140
Connectors			4.3-10 female (long neck)
Application			Indoor or outdoor (IP 66)
DC/AISG transparency			
Port 1 ↔ Port 4 [mA]			Auto-sense (max. 2000)
Port 2 ↔ Port 4 [mA]			Auto-sense (max. 2000)
Port 3 ↔ Port 4 [mA]			Auto-sense (max. 2000)
Lightning protection [kA]			3, 10/350 μs pulse
Mounting [mm in]			Wall mounting: With 4 screws (max. 8 0.315 diameter) / Mast mounting: With included clamp set
Weight [kg lb]			Single Unit: 5 11.0 / Double Unit: 9.9 21.8
Packing Size [mm in]			Single Unit: 405 x 295 x 170 15.95 x 11.61 x 6.69 Double Unit: 405 x 295 x 260 15.95 x 11.61 x 10.24
Dimensions (w x h x d) [mm in]			Single Unit: 222 x 222 x 86.5 8.7 x 8.7 x 3.4 Double Unit: 222 x 222 x 176 8.7 x 8.7 x 6.9 (without connectors, without mounting brackets)

690 – 806 MHz

824 – 960 MHz

1427 – 3800 MHz

Preliminary Issue

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78210484	50-Ohm load



Auto-Sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	B (medium)
Port 2	A (highest)
Port 3	C (lowest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

Typical Attenuation Curves

Diagram 1

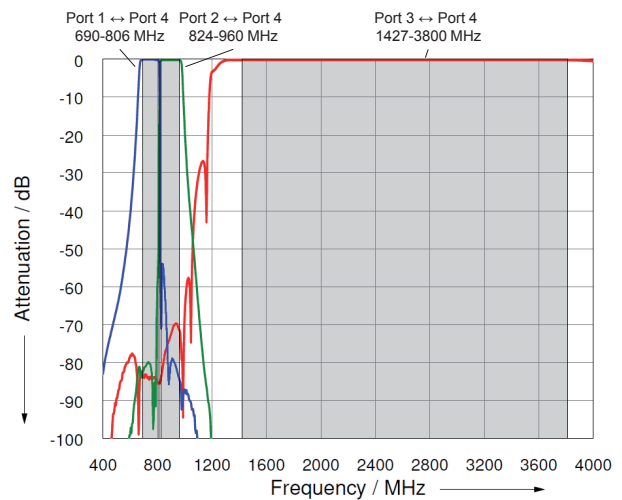
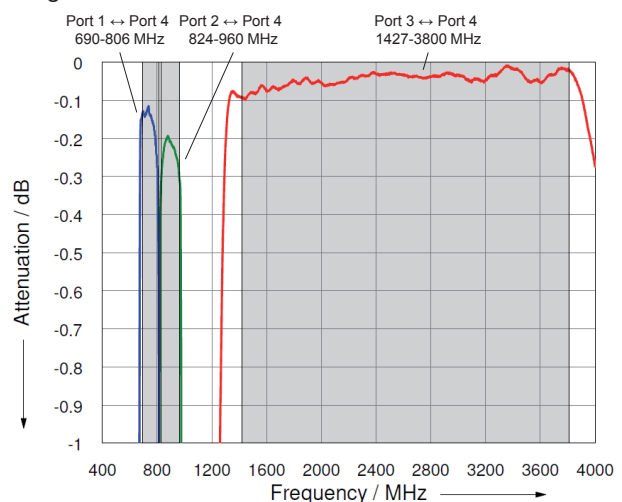


Diagram 2



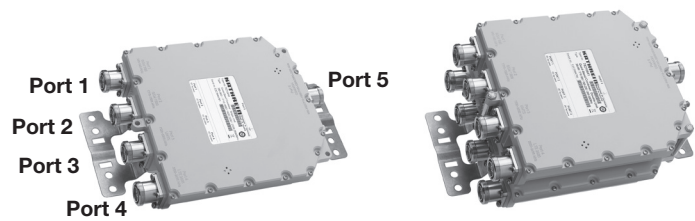
380 – 960 MHz

1710 – 1880 MHz

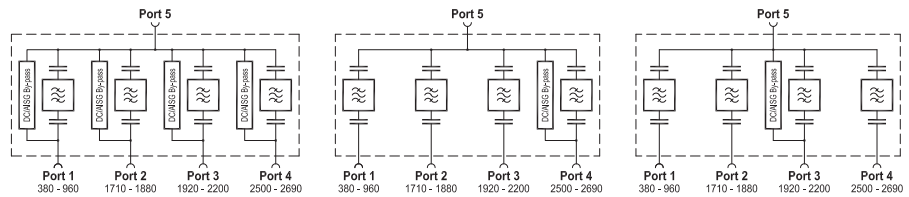
1920 – 2200 MHz

2500 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



78210640, 78210642, 78210644 Single Unit **78210641, 78210643, 78210645** Double Unit



Technical Data

Type No.	78210640 Single Unit	78210642 Single Unit	78210644 Single Unit
	78210641 Double Unit	78210643 Double Unit	78210645 Double Unit
Pass band Band 1 (TETRA ... GSM 900) Band 2 (GSM 1800) Band 3 (UMTS) Band 4 (LTE 2600)		380 – 960 MHz 1710 – 1880 MHz 1920 – 2200 MHz 2500 – 2690 MHz	
Insertion loss Port 1 ↔ Port 5 Port 2 ↔ Port 5 Port 3 ↔ Port 5 Port 4 ↔ Port 5		< 0.2 dB (380 – 960 MHz) < 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2200 MHz) < 0.2 dB (2500 – 2690 MHz)	
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 1 ↔ Port 4 Port 2 ↔ Port 3 Port 2 ↔ Port 4 Port 3 ↔ Port 4		> 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1710 – 1880 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1920 – 2200 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 2500 – 2690 MHz) > 50 dB (1710 – 1880 / 1920 – 2200 MHz) > 50 dB (1710 – 1880 / 2500 – 2690 MHz) > 50 dB (1920 – 2200 / 2500 – 2690 MHz)	
VSWR		< 1.25 (380 – 960 / 1710 – 1880 / 1920 – 2200 / 2500 – 2690 MHz)	
Impedance		50 Ω	
Input power Band 1 / Band 2 / Band 3 / Band 4		< 700 W / < 300 W / < 300 W / < 200 W	
Intermodulation products		< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range		-40 ... +60 °C	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 5 Port 2 ↔ Port 5 Port 3 ↔ Port 5 Port 4 ↔ Port 5	By-pass (max. 2500 mA) By-pass (max. 2500 mA) By-pass (max. 2500 mA) By-pass (max. 2500 mA)	Stop Stop Stop By-pass (max. 2500 mA)	Stop Stop By-pass (max. 2500 mA) Stop
Lightning protection		3 kA, 10/350 μs pulse	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight		Single Unit: 3.8 kg / Double Unit: 7.5 kg	
Packing size		Single Unit: 392 x 292 x 139 mm / Double Unit: 392 x 292 x 189 mm	
Dimensions (w x h x d)		Single Unit: 215 x 228 x 50 mm / Double Unit: 215 x 228 x 106 mm (without connectors, without mounting brackets)	

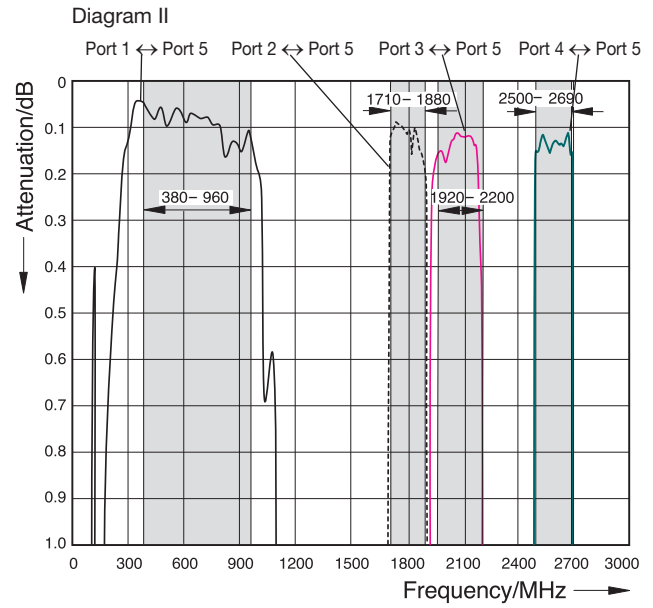
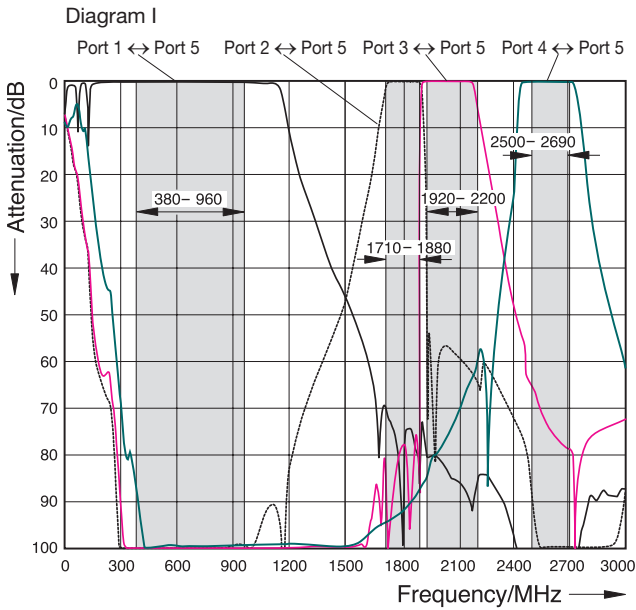
380 – 960 MHz

1710 – 1880 MHz

1920 – 2200 MHz

2500 – 2690 MHz

Typical Attenuation Curves



- **Clamp set** (type no. **734360 – 734365**),
 - **DC stop** (type no. **78210850V01**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section “System Components”.

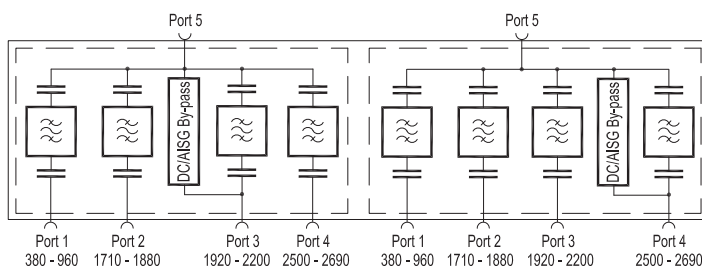
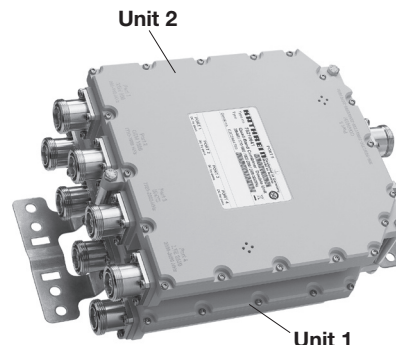
380 – 960 MHz

1710 – 1880 MHz

1920 – 2200 MHz

2500 – 2690 MHz

- Designed to support separate DC/AISG supply for 2100 MHz and 2600 MHz band DTMA via 2 feeder cables (see application example)
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in lightning protection

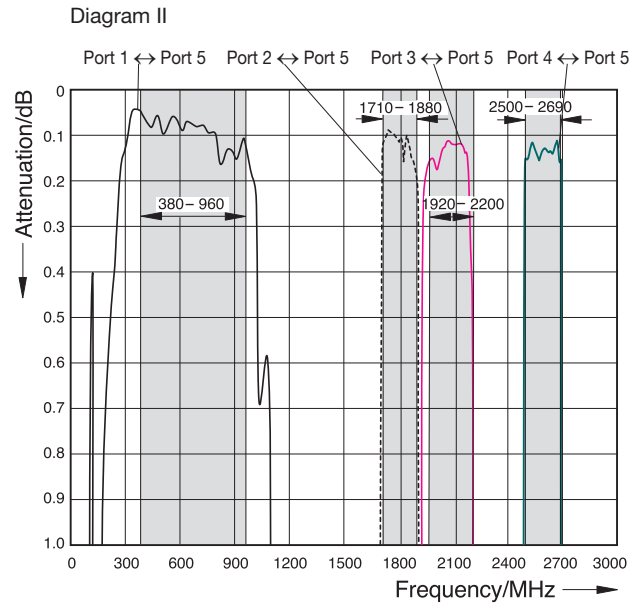
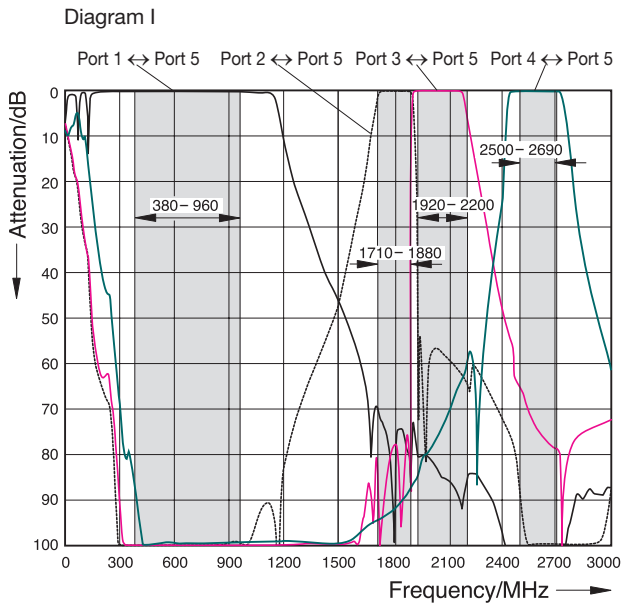


Technical Data

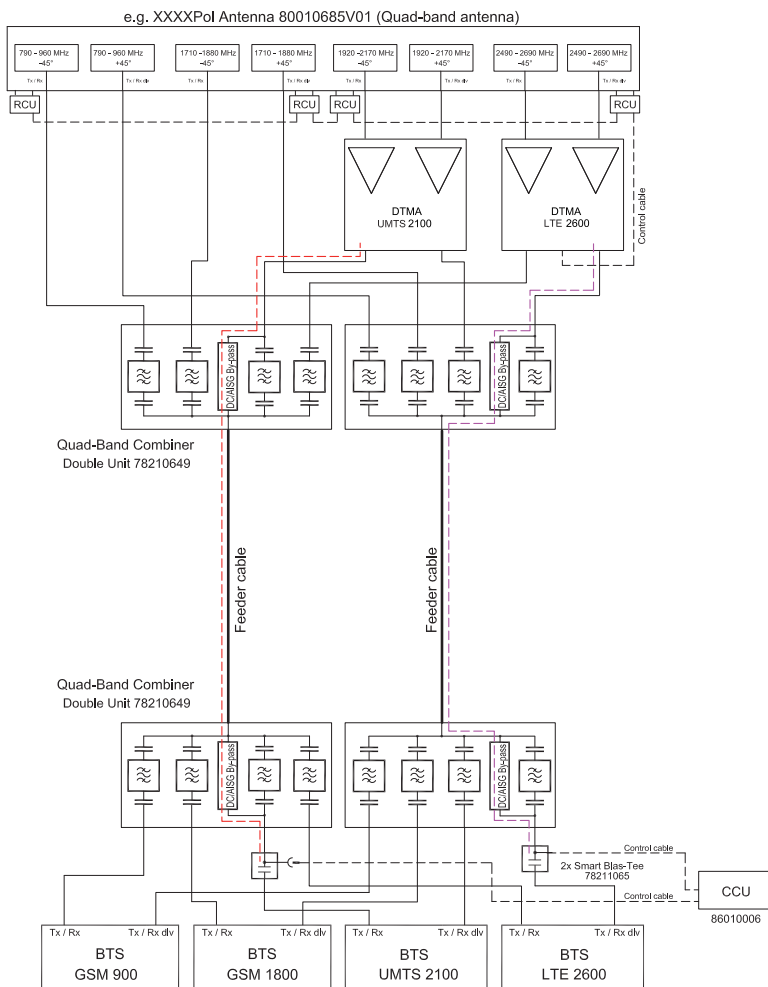
Type No.	78210649 Double Unit	
Pass band Band 1 (TETRA ... GSM 900) Band 2 (GSM 1800) Band 3 (UMTS) Band 4 (LTE 2600)	380 – 960 MHz 1710 – 1880 MHz 1920 – 2200 MHz 2500 – 2690 MHz	
Insertion loss Port 1 ↔ Port 5 Port 2 ↔ Port 5 Port 3 ↔ Port 5 Port 4 ↔ Port 5	< 0.2 dB (380 – 960 MHz) < 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2200 MHz) < 0.2 dB (2500 – 2690 MHz)	
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port 3 Port 1 ↔ Port 4 Port 2 ↔ Port 3 Port 2 ↔ Port 4 Port 3 ↔ Port 4	> 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1710 – 1880 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 1920 – 2200 MHz) > 45 dB (380 – 600 MHz) / > 50 dB (600 – 960 / 2500 – 2690 MHz) > 50 dB (1710 – 1880 / 1920 – 2200 MHz) > 50 dB (1710 – 1880 / 2500 – 2690 MHz) > 50 dB (1920 – 2200 / 2500 – 2690 MHz)	
VSWR	< 1.25 (380 – 960 / 1710 – 1880 / 1920 – 2200 / 2500 – 2690 MHz)	
Impedance	50 Ω	
Input power Band 1 / Band 2 / Band 3 / Band 4	< 700 W / < 300 W / < 300 W / < 200 W	
Intermodulation products	< –160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	–40 ... +60 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 5 Port 2 ↔ Port 5 Port 3 ↔ Port 5 Port 4 ↔ Port 5	Unit 1 Stop Stop By-pass (max. 2500 mA) Stop	Unit 2 Stop Stop Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	7.5 kg	
Packing size	392 x 292 x 189 mm	
Dimensions (w x h x d)	215 x 228 x 106 mm (without connectors, without mounting brackets)	

380 – 960 MHz	1710 – 1880 MHz	1920 – 2200 MHz	2500 – 2690 MHz
---------------	-----------------	-----------------	-----------------

Typical Attenuation Curves



Application Example



- **Clamp set** (type no. **734360 – 734365**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section "System Components".

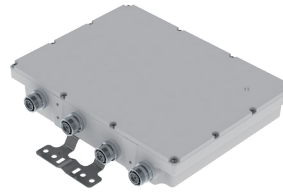
690 – 862 MHz

880 – 960 MHz

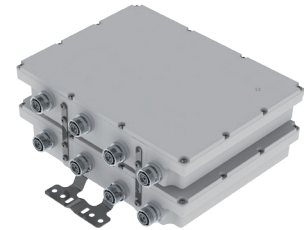
1427 – 1880 MHz

1920 – 2690 MHz

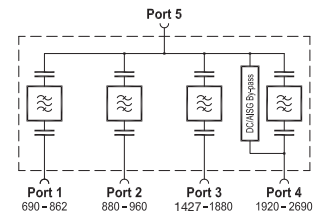
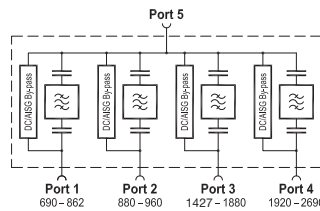
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory



Single Unit



Double Unit



Technical Data

Type No.	78211340 Single Unit		78211342 Single Unit	
	78211341 Double Unit		78211343 Double Unit	
Pass band				
Band 1	[MHz]			690 – 862
Band 2	[MHz]			880 – 960
Band 3	[MHz]			1427 – 1880
Band 4	[MHz]			1920 – 2690
Insertion loss				
Port 1 ↔ Port 5	[dB]			< 0.45, typ. 0.25 (690 – 862 MHz)
Port 2 ↔ Port 5	[dB]			< 0.45, typ. 0.3 (880 – 960 MHz)
Port 3 ↔ Port 5	[dB]			< 0.35, typ. 0.2 (1427 – 1880 MHz)
Port 4 ↔ Port 5	[dB]			< 0.35, typ. 0.3 (1920 – 2690 MHz)
Isolation	[dB]			> 40
VSWR				< 1.25
Impedance	[Ω]			50
Input power				
Band 1 / Band 2 / Band 3 / Band 4	[W]			< 200 / < 200 / < 200 / < 100
Intermodulation products	[dBc]			< -160 (3 rd order; with 2 x 20 W)
Temperature range	[°C °F]			-40 ... +60 -40 ... +140
Connectors				4.3-10 female (long neck)
Application				Indoor or outdoor (IP 66)
DC/AISG transparency				
Port 1 ↔ Port 5	[mA]	By-pass (max. 2500)		Stop
Port 2 ↔ Port 5	[mA]	By-pass (max. 2500)		Stop
Port 3 ↔ Port 5	[mA]	By-pass (max. 2500)		Stop
Port 4 ↔ Port 5	[mA]	By-pass (max. 2500)		By-pass (max. 2500)
Lightning protection	[kA]			3, 10/350 μs pulse
Mounting	[mm in]			Wall mounting: With 4 screws (max. diameter 8 0.315) / Mast mounting: With included clamp set
Weight	[kg lb]			Single Unit: 6.7 14.6 / Double Unit: 13.3 29.3
Packing size	[mm in]			Single Unit: 445 x 425 x 152 17.52 x 16.73 x 5.98 Double Unit: 445 x 425 x 240 17.52 x 16.73 x 9.45
Dimensions (w x h x d)	[mm in]			Single Unit approx.: 357.5 x 271 x 68 14.08 x 10.67 x 2.68 Double Unit approx.: 357.5 x 271 x 141 14.08 x 10.67 x 5.55 (without connectors, without mounting brackets)

Quad-Band Combiner

KATHREIN

690 – 862 MHz

880 – 960 MHz

1427 – 1880 MHz

1920 – 2690 MHz

Accessories (included)

Type No.	Clamp set suitable for most diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78211000	DC stop
78210484	50-Ohm load



Typical Attenuation Curves

Diagram 1

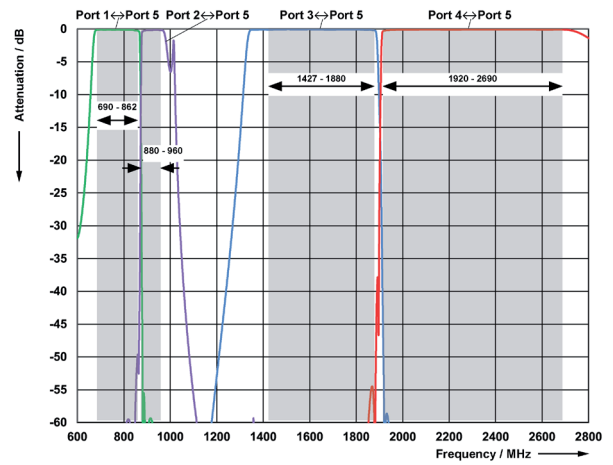
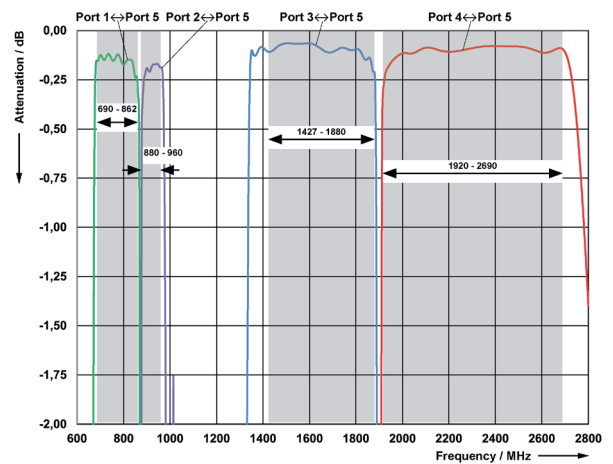


Diagram 2



690 – 862 MHz

880 – 960 MHz

1427 – 1880 MHz

1920 – 2690 MHz

- Designed for co-siting purposes
- Enables feeder sharing
- Integrated auto-sense technology for automatic DC / AISG detection and bypass functionality.

Combine Mode (near BTS):

In combine mode, the auto-sense combiner has the ability to operate in three different functions. These functions define the prioritisation of the DC input signals (more details on next page):

1. First In - First Out Function (Factory default setting)
2. Priority Controlled Function
3. Exclusive User Function

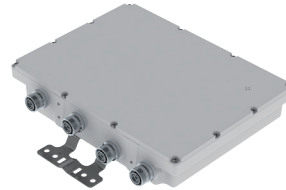
Split Mode (near antenna):

In split mode, the auto-sense combiner automatically detects connected Antenna Line Devices and bypasses or stops the DC / AISG signal accordingly.

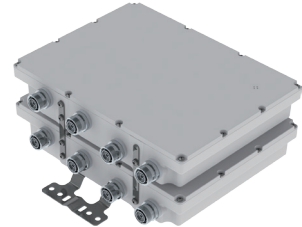
A detailed manual about Auto-Sense technology can be downloaded on our homepage.

- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection

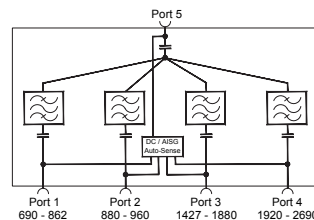
AUTO-SENSE



78211347
Single Unit



78211348
Double Unit



Technical Data

Type No.	78211347 Single Unit	78211348 Double Unit
Pass band		
Band 1 [MHz]	690 – 862	
Band 2 [MHz]	880 – 960	
Band 3 [MHz]	1427 – 1880	
Band 4 [MHz]	1920 – 2690	
Insertion loss		
Port 1 ↔ Port 5 [dB]	< 0.45, typ. 0.25 (690 – 862 MHz)	
Port 2 ↔ Port 5 [dB]	< 0.45, typ. 0.3 (880 – 960 MHz)	
Port 3 ↔ Port 5 [dB]	< 0.35, typ. 0.2 (1427 – 1880 MHz)	
Port 4 ↔ Port 5 [dB]	< 0.35, typ. 0.3 (1920 – 2690 MHz)	
Isolation [dB]	> 40	
VSWR	< 1.25	
Impedance [Ω]	50	
Input power		
Band 1 / Band 2 / Band 3 / Band 4 [W]	< 200 / < 200 / < 200 / < 100	
Intermodulation products [dBc]	< -160 (3 rd order; with 2 x 20 W)	
Temperature range [°C °F]	-40 ... +60 -40 ... +140	
Connectors	4.3-10 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency		
Port 1 ↔ Port 5 [mA]	Auto-sense (max. 2000)	
Port 2 ↔ Port 5 [mA]	Auto-sense (max. 2000)	
Port 3 ↔ Port 5 [mA]	Auto-sense (max. 2000)	
Port 4 ↔ Port 5 [mA]	Auto-sense (max. 2000)	
Lightning protection [kA]	3, 10/350 μs pulse	
Mounting [mm in]	Wall mounting: With 4 screws (max. diameter 8 0.315) / Mast mounting: With included clamp set	
Weight [kg lb]	Single Unit: 6.8 14.9 / Double Unit: 13.5 29.6	
Packing size [mm in]	Single Unit: 445 x 425 x 152 17.52 x 16.73 x 5.98 Double Unit: 445 x 425 x 240 17.52 x 16.73 x 9.45	
Dimensions (w x h x d) [mm in]	Single Unit approx.: 357.5 x 271 x 68 14.08 x 10.67 x 2.68 Double Unit approx.: 357.5 x 271 x 141 14.08 x 10.67 x 5.55 (without connectors, without mounting brackets)	

690 – 862 MHz

880 – 960 MHz

1427 – 1880 MHz

1920 – 2690 MHz

Accessories (included)

Type No.	Clamp set suitable for mast diameter of
734365 [mm in]	45 – 125 1.77 – 4.92



Accessories (order separately)

Type No.	Description
78211000	DC stop
78210484	50-Ohm load



Auto-Sense Combiner Functions for the Interconnection of Different Base Stations (Installation Close to the Base Station – Combine Mode)

First In - First Out Function (Factory Default Setting)

If the First In – First Out function is set, then the first base Station (BTS) which supplies the auto-sense combiner with DC voltage at any input port is bypassed to the common port. The DC from further base stations will be ignored.

Priority Controlled Function

If the priority controlled function shall be used, a corresponding priority table is set ex-factory which needs to be defined by the customer when ordering. One example of a prioritisation table is shown below. In case DC / AISG signals are applied to two or more input ports simultaneously, the BTS with the higher priority will be bypassed to the common port. Any DC signal from a lower prioritised input port will not be bypassed. If the port with the highest priority is not supplied with a DC signal, the DC signal from the BTS with the next lower priority will be connected through to the common port.

Connector	Priority
Port 1	D (lowest)
Port 2	C
Port 3	B
Port 4	A (highest)

Exclusive User Function

If the Exclusive User function is set in the combiner, then the first base station which supplies an appropriate DC voltage at any input port is bypassed to the common port. If a second DC/AISG signal is erroneously fed into the combiner, then none of the DC/AISG signals will be allowed to bypass to the common port.

Please note: If the combiner is mounted near the antenna (split mode), the behaviour is independent of any of the prioritisation functions described above. In this mode, the auto-sense combiner automatically detects Antenna Line Devices at the output ports and bypasses or blocks the DC/ AISG signal at each port accordingly.

Typical Attenuation Curves

Diagram 1

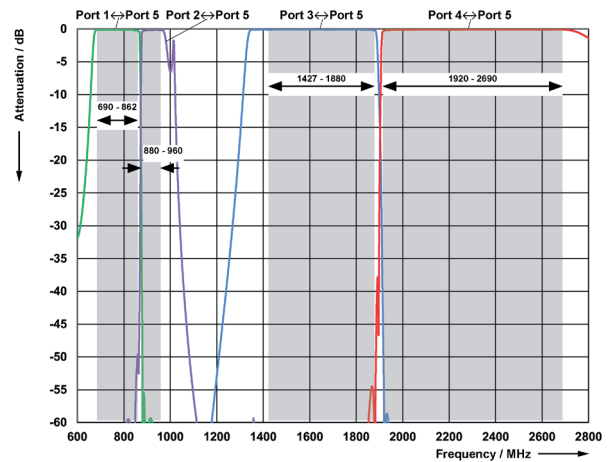
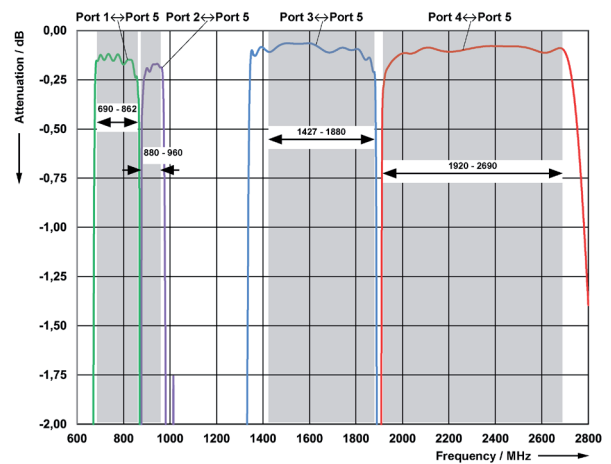


Diagram 2



 **Same-Band Combiners
and Hybrid Combiners**

Same-Band Combiner
Duplex Hybrid Combiner
Active Duplex Hybrid Combiner
Hybrid Combiner
3 dB Couplers

Summary of Same-Band Combiner and Hybrid Combiner Types

KATHREIN

Description	Type No.	Frequency range	Max. input power	Connector	Page
Hybrid Combiner 2:1	78210500	791 – 960 MHz	60 W at each port	7-16	415
Hybrid Combiner 2:1	78210502	1710 – 2170 MHz	60 W at each port	7-16	416
Hybrid Combiner 2:1	78210504	698 – 2690 MHz	60 W at each port	7-16	417
Hybrid Combiner 2:1	78210506	698 – 2690 MHz	150 W at each port	7-16	418
Hybrid Combiner 8:4	78211141	698 – 960 MHz 1710 – 2690 MHz	75 W at each port	7-16	419, 420
Hybrid Combiner 8:4	78211142	1710 – 1880 MHz 1920 – 2170 MHz	75 W at each port	7-16	419, 420
Hybrid Combiner 12:4	78211143	698 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz	50 W at each port	7-16	419, 420
Hybrid Combiner 16:4	78211144	698 – 960 MHz 1710 – 1880 MHz 1920 – 2170 MHz 2500 – 2690 MHz	50 W at each port	7-16	419, 420
Hybrid Combiner 3:3	78211216	548 – 2690 MHz	150 W at each port	4.3-10	421
Hybrid Combiner 4:4	78210534	698 – 2600 MHz	150 W at each port	7-16	422
Same-Band Combiner	78211237	791 – 862 MHz	100 W at each port	7-16	423
Duplex Hybrid Combiner	78210805	Rx: 880 – 915 MHz Tx: 925 – 960 MHz	250 W	7-16	424, 425
Active Duplex Hybrid Combiner	78211110	Rx: 880 – 915 MHz Tx: 925 – 960 MHz	250 W	7-16	426, 427
Same-Band Combiner	78210936	880 – 960 MHz	100 W at each port	7-16	428, 429
Same-Band Combiner	78211230	1710 – 1880 MHz	100 W at each port	7-16	430, 431
Same-Band Combiner	78211235	1730 – 1880 MHz	100 W at each port	7-16	432, 433
Same-Band Combiner	78211370	1710 – 1880 MHz	100 W at each port	7-16	434, 435
Same-Band Combiner	78210925	1920 – 2170 MHz	100 W at each port	7-16	436, 437
Same-Band Combiner	78210926	1920 – 2170 MHz	100 W at each port	7-16	438, 439
Same-Band Combiner	78211228V01	2500 – 2640 MHz	100 W at each port	4.3-10	440, 441
Same-Band Combiner	78211228V03	2500 – 2960 MHz	100 W at each port	4.3-10	442, 443
3-dB Coupler	78210524	698 – 2690 MHz	150 W at each port	7-16	444, 445
3-dB Coupler	78210525	698 – 2690 MHz	1000 W at each port	7-16	446, 447
3-dB Coupler	793554	800 – 2200 MHz	300 W	7-16	448

**New
Products**

Summary of Same-Band Combiner and Hybrid Combiner Types



Frequency Combinations

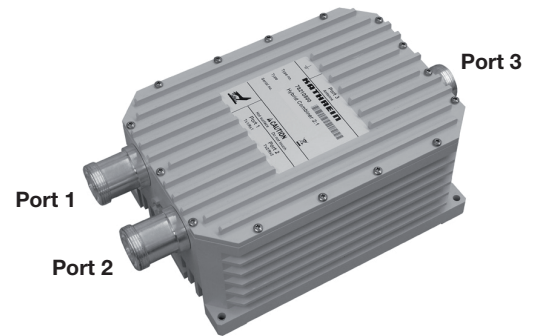
Type No.	Frequency / MHz																
	200	400	600	800	900	850	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Same-Band Combiner																	
78211237																	
78210936																	
78211230																	
78211370																	
78211235																	
78210925																	
78210926																	
78211228V01																	
78211228V03																	
Duplex Hybrid Combiner																	
78210805																	
Activ Duplex Hybrid Combiner																	
78211110																	
Hybrid Combiner																	
78210500, 2:1 (60 W)																	
78210502, 2:1 (60 W)																	
78210504, 2:1 (60 W)																	
78210506, 2:1 (150 W)																	
78210525, 2:2																	
78210524, 2:2																	
793554, 2:2																	
78211216, 3:3																	
78210534, 4:4																	
Hybrid Combiner Systems																	
78211141, 8:4																	
78211142, 8:4																	
78211143, 12:4																	
78211144, 16:4																	

Hybrid Combiner 2:1

791 – 960 MHz

2 x 60 W

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC by-pass between all ports
- External DC stop available as an accessory



Technical Data

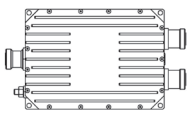
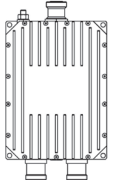
Type No.	78210500
Frequency range	791 - 960 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ±0.5 dB
Port 2 ↔ Port 3	3.1 ±0.5 dB
Port 1 ↔ Port 2	> 23 dB*
VSWR	< 1.15
Impedance	50 Ω
Input power	
Port 1	60 W
Port 2	60 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +55 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	By-pass between all ports (max. 2500 mA) AISG attenuation: 3 dB with external DC stop (see configuration examples) / 6 dB without external DC stop
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set
Weight	3.7 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 199 x 97.5 mm (without connectors)

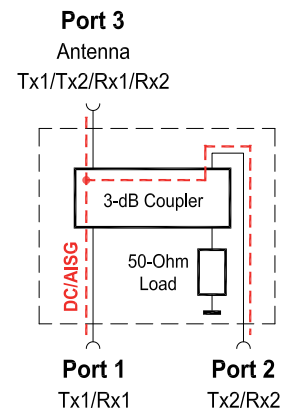
* Valid if all ports are terminated with 50-Ohm loads.

Note:

The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C). If mounted vertically and/or used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	60 W	70 W
+40 °C	70 W	80 W
+25 °C	75 W	85 W



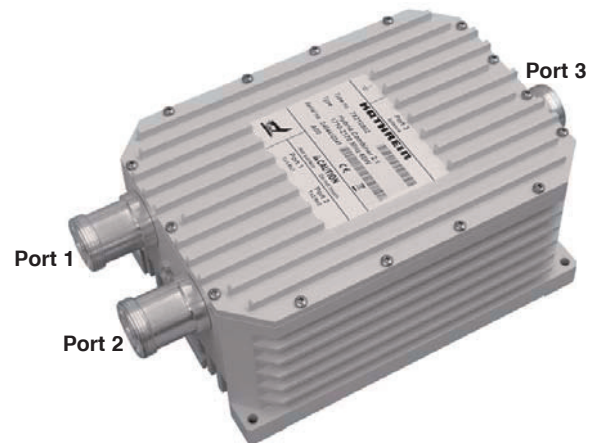
Hybrid Combiner 2:1

1710 – 2170 MHz

2 x 60 W

KATHREIN

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC bypass between all ports
- External DC stop available as an accessory



Technical Data

Type No.	78210502
Frequency range	1710 – 2170 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ±0.5 dB
Port 2 ↔ Port 3	3.1 ±0.5 dB
Port 1 ↔ Port 2	> 22 dB *
VSWR (all ports)	< 1.25
Impedance	50 Ω
Input power	
Port 1	< 60 W
Port 2	< 60 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +55 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	Bypass between all ports (max. 2500 mA) AISG: Attenuation 3 dB with / 6 dB without external DC stop at either Port 1 or Port 2
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set
Weight	3.7 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 256 x 97.5 mm (including connectors)

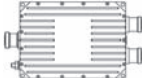
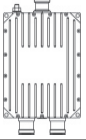
* Valid if all ports are terminated with 50-Ω loads.

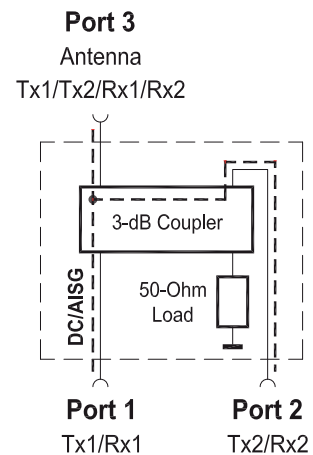
Note:

The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted horizontally, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

If mounted vertically and/or used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	60 W	70 W
+40 °C	70 W	80 W
+25 °C	75 W	85 W



Hybrid Combiner 2:1

698 – 2690 MHz

2 x 60 W

KATHREIN

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- DC bypass between port 1 and port 3



Technical Data

Type No.	78210504
Frequency range	698 – 2690 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ±0.5 dB
Port 2 ↔ Port 3	3.1 ±0.5 dB
Port 1 ↔ Port 2	> 23 dB*
VSWR (all ports)	< 1.2 (698 – 2170 MHz) / < 1.25 (2170 – 2690 MHz)
Impedance	50 Ω
Input power	
Port 1	< 60 W
Port 2	< 60 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +55 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	
Port 1 ↔ Port 3	Bypass (max. 2500 mA)
Port 2 ↔ Port 3	Stop
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	4.3 kg
Packing size	385 x 345 x 168 mm
Dimensions (w x h x d)	264 x 203 x 72.5 mm (without connectors, without mounting brackets)



* Valid if all ports are terminated with 50-Ohm loads.

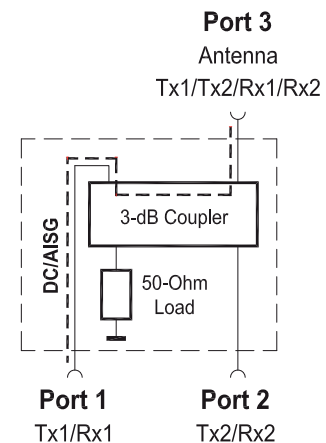
Note:

The input power rating of 60 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

If used at a lower ambient temperature, then a higher input power in accordance with the following table is possible:

Max. input power per port

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	55 W	60 W
+40 °C	70 W	75 W
+25 °C	80 W	85 W



- **Clamp set** (type no. **734360 - 734365**),
- **DC stop** (type no. **78210850V01**) (order separately) can be found in the section "System Components".

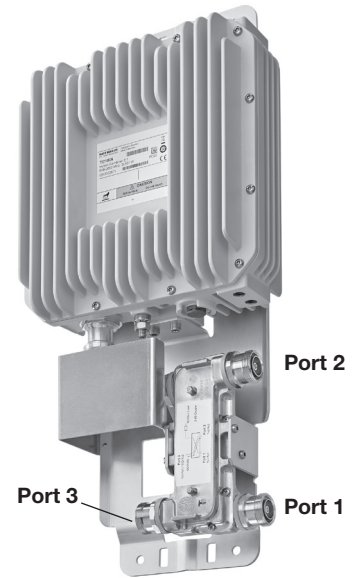
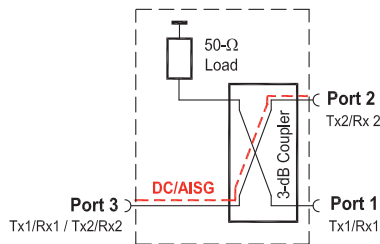
Hybrid Combiner 2 : 1

698 – 2690 MHz

2 x 150 W

KATHREIN

- Designed for the decoupled combining of 2 transmitter or receiver signals onto one common antenna
- The frequency spacing between transmitter signals can be as small as required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- DC by-pass between port 2 and port 3



Technical Data

Type No.	78210506	
Frequency range	[MHz]	698 – 2690
Attenuation		
Port 1 ↔ Port 3	[dB]	3 ±0.6
Port 2 ↔ Port 3	[dB]	3 ±0.6
Port 1 ↔ Port 2	[dB]	> 25*
VSWR (all ports)		< 1.12 (698 – 2690 MHz)
Impedance	[Ω]	50
Input power		
Port 1	[W]	< 150
Port 2	[W]	< 150
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)
Temperature range	[°C]	-40 ... +55
Connectors		7-16 female
Application		Indoor or outdoor (IP 66)
DC/AISG transparency		
Port 1 ↔ Port 3		Stop
Port 2 ↔ Port 3		By-pass (max. 2500 mA)
Mounting	[mm in]	Wall mounting: With 4 screws (diameter max. 8 0.31) / Mast mounting: With additional clamp set
Weight	[kg lbs]	8 17.64
Packing size	[mm in]	545 x 280 x 190 21.46 x 11.02 x 7.48
Dimensions (w x h x d)	[mm in]	235 x 480 x 120 9.25 x 18.90 x 4.72 (without connectors, without mounting brackets)



* Valid if all ports are terminated with 50-Ohm loads.

Note:

The input power rating of 150 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

- **Clamp set** (type no. **734360 - 734365**),
- **DC stop** (type no. **78210850V01**) (order separately) can be found in the section "System Components".

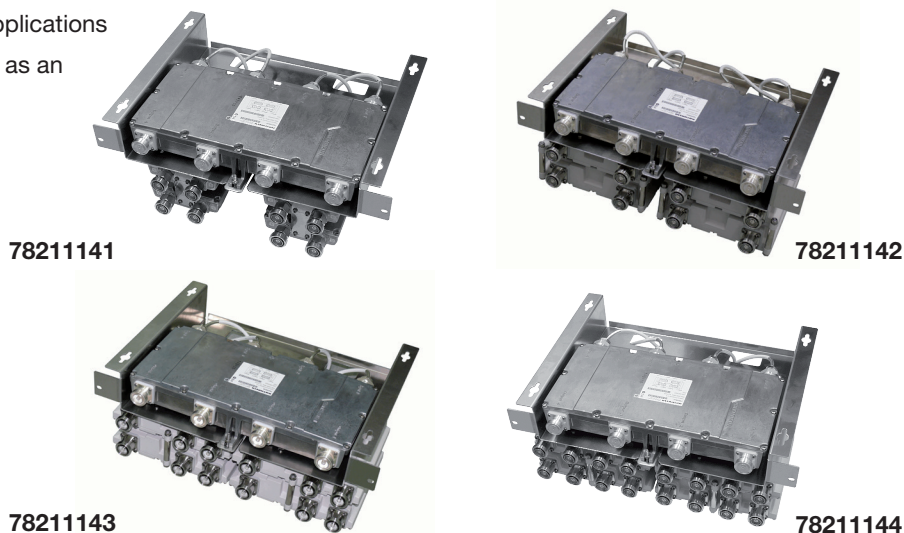
	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	80 W	100 W
+40 °C	110 W	150 W
+25 °C	150 W	100 W

Hybrid Combiner System

8 : 4 / 8 : 4 / 12 : 4 / 16 : 4

KATHREIN

- Point of Interface (POI) for coverage solutions with passive Distributed Antenna Systems (DAS)
- Designed for the decoupled combining of 8/12/16 transmitter or receiver signals and distributing these signals evenly onto 4 antenna outputs.
- Suitable for indoor or outdoor applications
- External 50 Ohm loads available as an accessory



Technical Data

Type No.	78211141 8 : 4	78211142 8 : 4	78211143 12 : 4	78211144 16 : 4
Frequency range				
Band 1	698 - 960 MHz	1710 - 1880 MHz	698 - 960 MHz	698 - 960 MHz
Band 2	1710 - 2690 MHz	1920 - 2170 MHz	1710 - 1880 MHz	1710 - 1880 MHz
Band 3			1920 - 2170 MHz	1920 - 2170 MHz
Band 4				2500 - 2690 MHz
Power distribution loss (excluding insertion loss) Input 1...8/12/16 ↔ Output 1...4	6 ± 0.8 dB			} Typically 6.5 dB
Insertion loss Input 1...8/12/16 ↔ Output 1...4	< 0.7 dB			
Isolation between input ports				
Same bands	> 22 dB *)			
Different bands	> 50 dB			
VSWR (all ports)	< 1.5			
Impedance	50 Ω			
Input power at each input port	< 75 W	< 75 W	< 50 W	< 50 W
Intermodulation products	< -155 dBc (3 rd order; with 2 x 20 W)			
Temperature range	-40 ... +60 °C			
Connectors	7-16 female			
Application	Indoor or Outdoor (IP 66)			
Mounting	Wall mounting: With 4 screws (max. 6 mm diameter) / 19"-drawer			
Weight	12 kg	15 kg	18.5 kg	21.5 kg
Packing size (w x h x d)	570 x 272 x 584 mm			
Dimensions (w x h x d)	19" drawer x 189.5 x 374 mm	19" drawer x 183 x 374 mm	19" drawer x 190 x 374 mm	19" drawer x 187.25 x 374 mm

* Valid if all ports are terminated with 50-Ohm loads

Note:

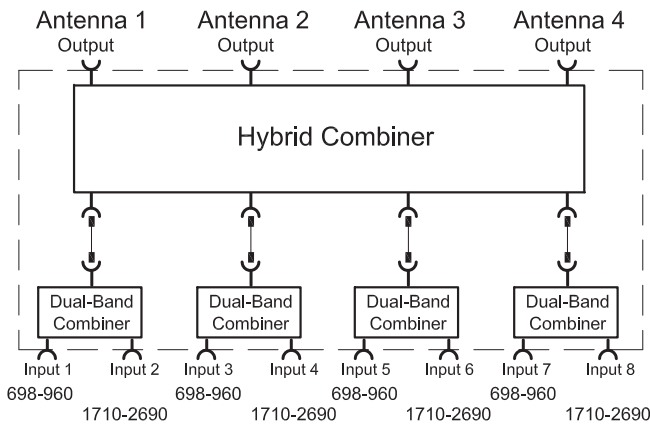
The use of fewer than 8/12/16 inputs or 4 outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein type 78410367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein low intermodulation type 78210474).

Hybrid Combiner

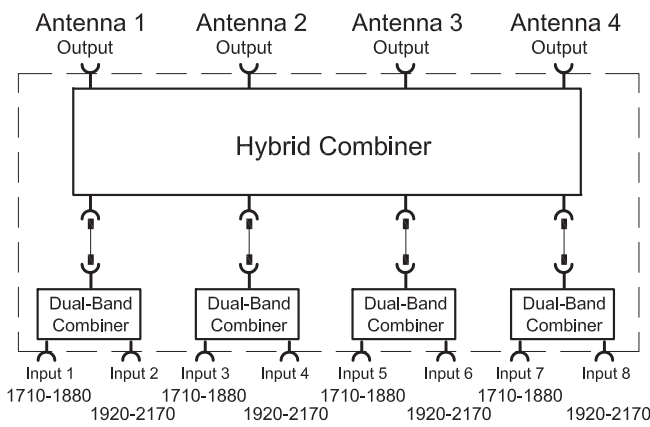
KATHREIN

8 : 4 / 8 : 4 / 12 : 4 / 16 : 4

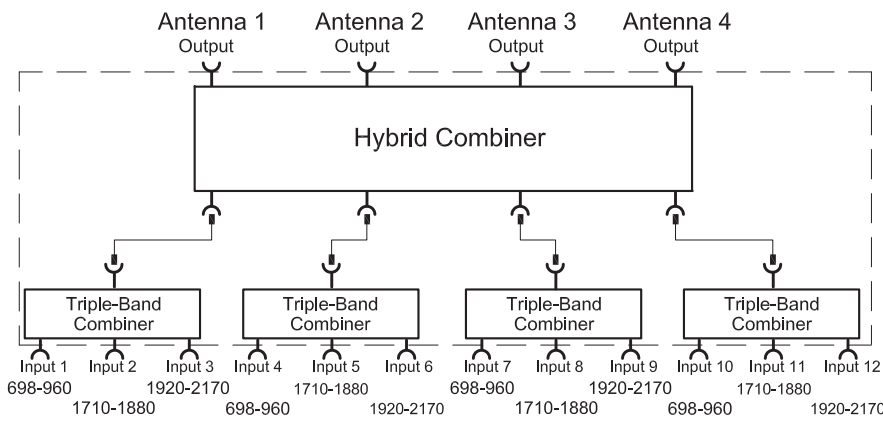
78211141, -2, -3, -4



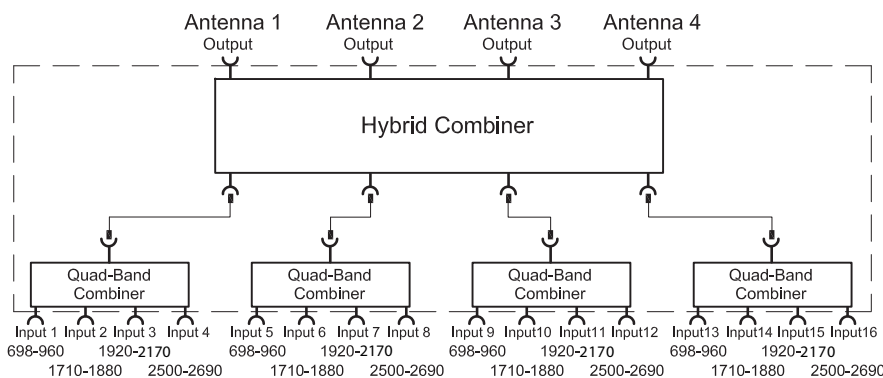
78211141



78211142



78211143



78211144

Hybrid Combiner 3 : 3

548 – 2690 MHz

KATHREIN

Preliminary Issue

- Designed for the decoupled combining of 3 transmitter or receiver signals and distributing these signals equally onto 3 antenna outputs
- Suitable for indoor and outdoor applications
- DC/AISG by-pass
- External DC stop available as an accessory



Same-Band and Hybrid Combiners

Technical Data

Type No.	78211216	
Frequency range	[MHz]	548 – 2690
Insertion loss		
Input 1 ... 3 ↔ Output 1 ... 3	[dB]	4.9 ± -1.9/+2.3 (548 – 698 MHz) 4.9 ± 1.3 (698 – 800 MHz) 4.9 ± 0.9 (800 - 2500 MHz) 4.9 ± 1 (2500 - 2690 MHz)
Isolation		
Input 1 ... 3 ↔ Input 1 ... 3	[dB]	> 25
Output 1 ... 3 ↔ Output 1 ... 3	[dB]	> 25
Directivity	[dB]	> 25
Return loss	[dB]	> 21
Impedance	[Ω]	50
Input power	[W]	< 150 at each input port
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)
Temperature range	[°C]	-40 ... +70
Connectors		4.3-10 female
Application		Indoor or outdoor (IP67)
DC/AISG transparency		Bypass (max. 2500 mA) between Input 1 ↔ Output 3 Input 2 ↔ Output 2 Input 3 ↔ Output 1 External DC stop available as an accessory
Weight	[kg]	approx. 1
Dimensions (w x h x d)	[mm]	176 x 57 x 31 (without connectors)

Note:

VSWR and attenuation values only valid if all ports are terminated with 50-Ohm-loads.

Note:

The use of fewer than 3 inputs or outputs is possible.
Any unused input ports have to be terminated with lowpower 50-Ohm loads, unused output ports have to be terminated with highpower 50-Ohm loads.

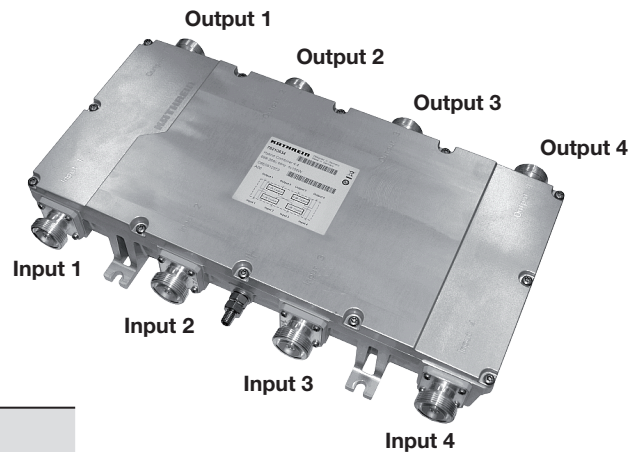
Hybrid Combiner 4:4

698 – 2690 MHz

4 x 150 W

KATHREIN

- Designed for the decoupled combining of 4 transmitter or receiver signals and distributing these signals equally onto 4 antenna outputs
- Suitable for indoor or outdoor applications
- DC/AISG bypass
- External DC stop available as an accessory



Technical Data

Type No.	78210534
Frequency range	698 - 2690 MHz
Insertion loss Input 1...4 ↔ Output 1...4	0.35 ± 0.15 dB
Power distribution loss (excluding insertion loss) Input 1...4 ↔ Output 1...4	6 ± 0.75 dB
	Typically 6.3 dB
Isolation Input 1...4 ↔ Input 1...4 Output 1...4 ↔ Output 1...4	> 20 dB*
VSWR (all ports)	< 1.22 (698 - 2170 MHz) < 1.4, typ. 1.2 (2170 - 2690 MHz)
Impedance	50 Ω
Input power	< 150 W at each input port
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female
Application	Indoor or Outdoor (IP 66)
DC/AISG transparency	Bypass (max. 2500 mA) between Input 1 ↔ Output 4 / Input 2 ↔ Output 2 / Input 3 ↔ Output 3 / Input 4 ↔ Output 1 External DC stop available as an accessory
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With mounting kit
Weight	4.5 kg
Packing size	453 x 125 x 273 mm
Dimensions (w x h x d)	375.9 x 65 x 224.2 mm (with connectors and mounting feet)

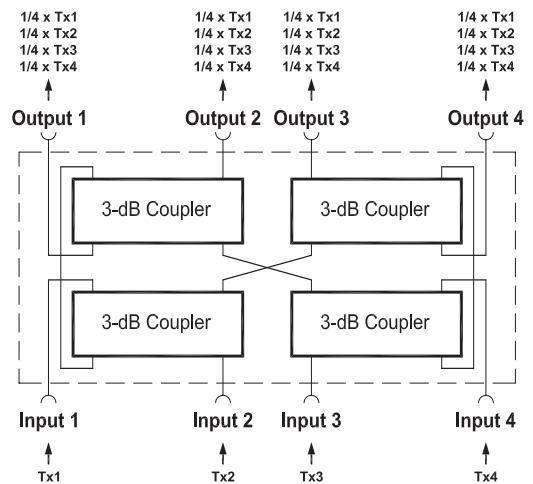
* Valid if all ports are terminated with 50-Ohm loads

Note:

The use of fewer than 4 inputs or outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein type 784 10367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein low-intermodulation type 78210474).

Accessories (order separately)

Type No.	Description
78210850V01	DC stop
78210474	50-Ohm load (80 W)
78410367	50-Ohm load (1.5 W)



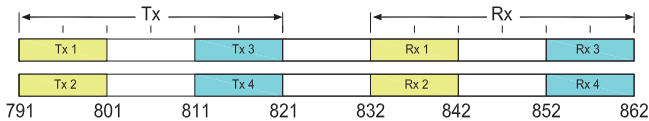
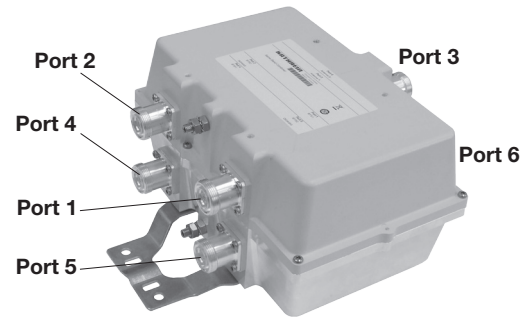
Same-Band Combiner

KATHREIN

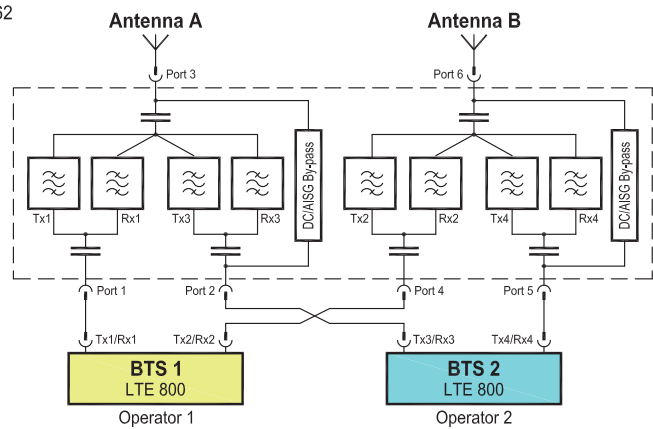
791 – 801 / 832 – 842 MHz

811 – 821 / 852 – 862 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Block Diagram



Same-Band and Hybrid Combiners

Technical Data

Type No.	78211237
Pass band BTS 1 (LTE800 / Operator 1) BTS 2 (LTE800 / Operator 2)	Tx1/Tx2 = 791 – 801 MHz, Rx1/Rx2 = 832 – 842 MHz Tx3/Tx4 = 811 – 821 MHz, Rx3/Rx4 = 852 – 862 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.5 dB (791 – 801 MHz) / < 0.7 dB (832 – 842 MHz) < 0.7 dB (811 – 821 MHz) / < 0.5 dB (852 – 862 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (791 – 801 / 811 – 821 / 832 – 842 / 852 – 862 MHz)
VSWR	< 1.2 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	6.9 kg
Dimensions (w x h x d)	275 x 176 x 140 mm (without connectors, without mounting brackets)

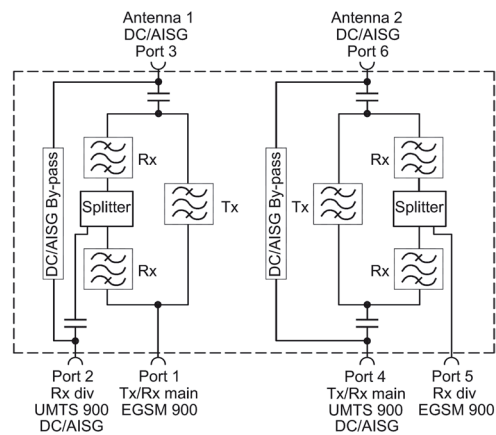
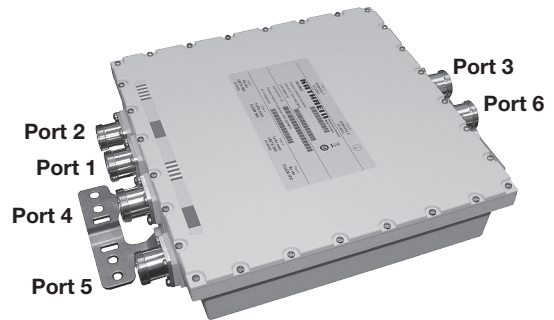
- **Clamp set** (type no. **734360 - 734365**) and
 - **50-Ohm load** (type no. **78410367**)
 (order separately) can be found in the section “System Components”.

Duplex Hybrid Combiner (Same-Band Combiner) **KATHREIN**

880 – 960 MHz

880 – 960 MHz

- Enables antenna and feeder sharing for two base stations in the 900 MHz frequency band
- Very low insertion loss over full EGSM/UMTS 900 Tx bandwidth compared to standard hybrid combiners
- Double unit in one housing for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG bypass for DTMA supply (for UMTS paths only)
- Rx diversity ports protected against incorrectly connected Tx power



Technical Data

Type No.		78210805	
Pass band			
Rx	MHz	880 – 915	
Tx	MHz	925 – 960	
Insertion loss			
Port 1 ↔ Port 3 / Port 4 ↔ Port 6	dB	< 0.4, typically 0.2 (925 – 960 MHz) – see Diagram I and II	
	dB	< 4.3, typically 3.6 (880 – 915 MHz) – see Diagram I and II	
Port 2 ↔ Port 3 / Port 5 ↔ Port 6	dB	< 4.0, typically 3.5 (880 – 915 MHz) – see Diagram III and IV	
Isolation			
Port 1 ↔ Port 2 / Port 4 ↔ Port 5	dB	> 25 (880 - 915 MHz)	
	dB	> 35 (925 - 960 MHz)	
VSWR		< 1.2 (880 - 915 / 925 - 960 MHz)	
Impedance	Ω	50	
Input power	W	Port 1: < 250	Port 2: < 50
	W	Port 4: < 250	Port 5: < 50
Intermodulation products	dBc	< -160 (3 rd order; with 2 x 20 W)	
Temperature range	°C	-40 ... +65	
Connectors		7-16 female (long neck)	
Application		Indoor or outdoor (IP 66)	
DC/AISG transparency			
Port 1 ↔ Port 3 / Port 5 ↔ Port 6		Stop By-pass (max. 2500 mA)	
Port 2 ↔ Port 3 / Port 4 ↔ Port 6			
Lightning protection		3 kA, 10/350 μs pulse	
Mounting		With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	6.5 14.3	
Packing size	mm in	390 x 470 x 160 15.4 x 18.5 x 6.3	
Dimensions (w x h x d)	mm in	287.1 x 278.6 x 71 11.3 x 7.0 x 2.8 (without connectors, without mounting brackets)	

Duplex Hybrid Combiner (Same-Band Combiner) **KATHREIN**

880 – 960 MHz

880 – 960 MHz

Accessories (order separately)

Type No.	Clamp set suitable for most diameter of mm in
734360	34 – 60 1.34 – 2.36
734361	60 – 80 2.36 – 3.15
734362	80 – 100 3.15 – 3.94
734363	100 – 120 3.94 – 4.72
734364	120 – 140 4.72 – 5.51
734365	45 – 125 1.77 – 4.92



Type No.	Description
78210850V01	DC stop
78410367	50-Ohm load 1.5 W / indoor or outdoor

Typical Attenuation Curves

Diagram I Port 1 ↔ Port 3
Port 4 ↔ Port 6

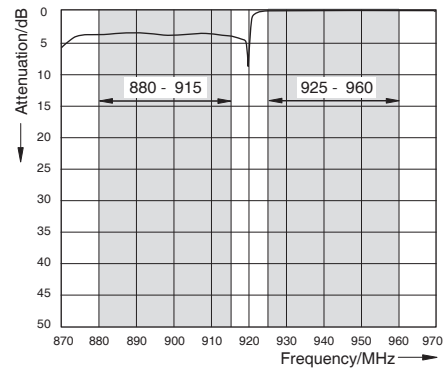


Diagram II Port 1 ↔ Port 3
Port 4 ↔ Port 6

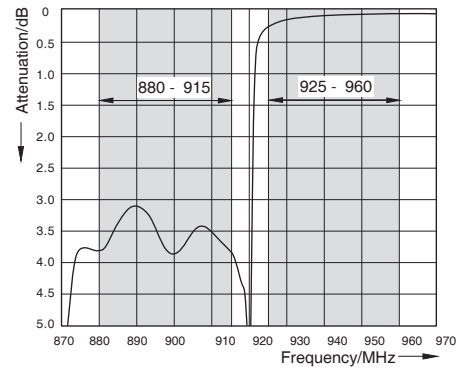


Diagram III Port 2 ↔ Port 3
Port 5 ↔ Port 6

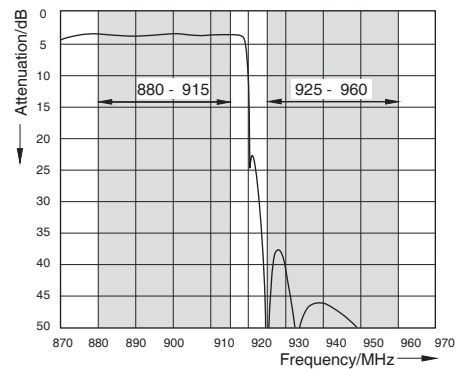
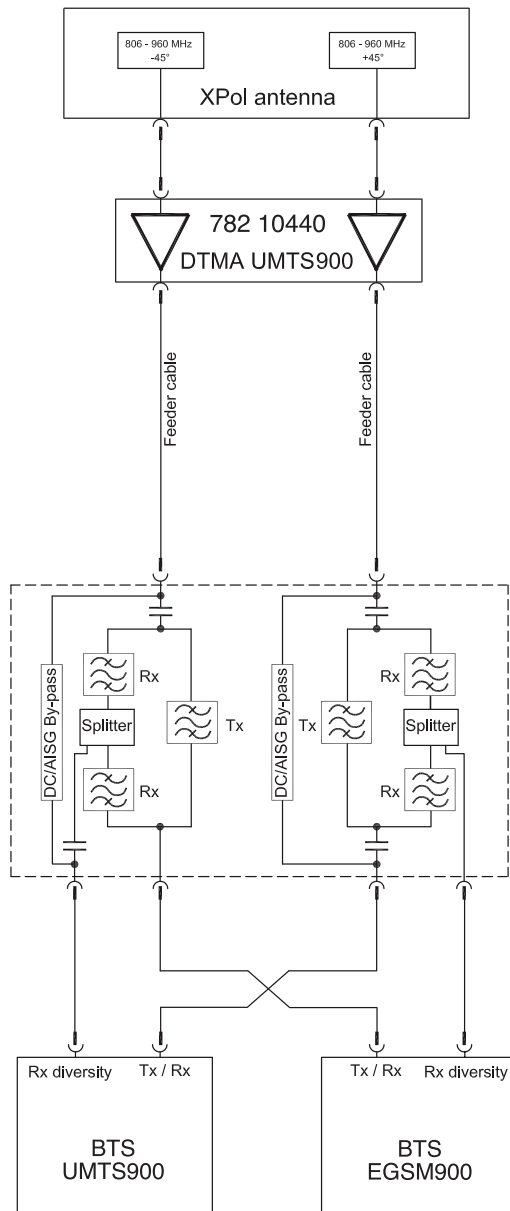
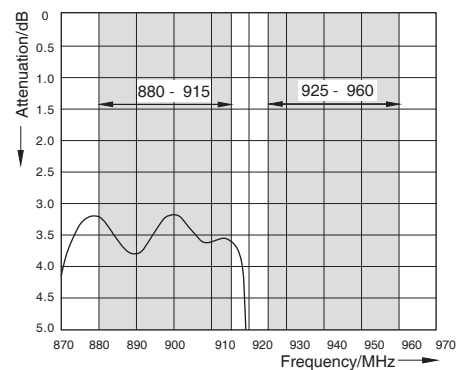


Diagram IV Port 2 ↔ Port 3
Port 5 ↔ Port 6



Application example

Active Duplex Hybrid Combiner (tunable) (Same-Band Combiner)

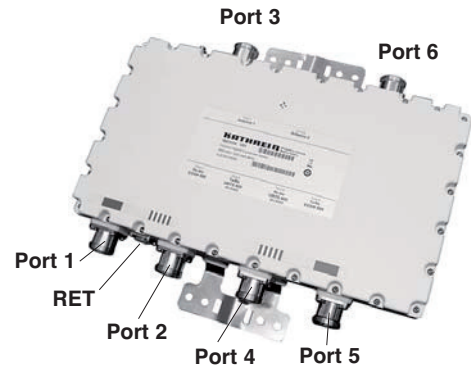
KATHREIN

880 – 915 / 925 – 960 MHz

880 – 915 / 925 – 960 MHz

- Enables antenna and feeder sharing for two base stations in the 900 MHz frequency band
- 12 dB gain over 20 MHz Rx bandwidth (factory tunable)
- Very low insertion loss over 20 MHz Tx bandwidth (factory tunable) compared to standard hybrid combiners
- Double unit in one housing for XPol antennas
- Suitable for indoor or outdoor applications
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode (LNA) to ensure cell operation in case of DC power down
- Built-in lightning protection

RET = Remote Electrical Tilt
AISG = Antenna Interface Standards Group
CWA = Current Window Alarm



Frequency ordering information:

When ordering please specify the required Tx- and Rx-frequencies

Examples of tuning versions:

78211110V01: Rx 880 – 900 MHz, Tx 925 – 945 MHz

78211110V02: Rx 895 – 915 MHz, Tx 940 – 960 MHz

Other frequencies on request.

Technical Data

Type No.		78211110	
Pass band			
Rx	MHz	20 within 880 ... 915 (factory tunable)	
Tx	MHz	20 within 925 ... 960 (factory tunable)	
Tx Insertion loss			
Port 2 ↔ Port 3 / Port 5 ↔ Port 6	dB	< 0.2 (925 – 945 MHz) * – see Diagram I and II	
Isolation			
Port 1 ↔ Port 2 / Port 4 ↔ Port 5	dB	> 25 (880 – 900 MHz)	
	dB	> 65 (925 – 945 MHz)	
Gain	dB	12 nominal	
Gain ripple	dB	±1	
Loss in bypass mode	dB	< 5.5 (DC OFF)	
Return loss	dB	> 18 (DC ON) / > 12 (DC OFF)	
Return loss	dB	< 1.6 (+22 ... +28 °C)	
Output 1-dB compression point	dBm	> 11	
3 rd order intercept point (OIP3)	dBm	> 25 (typically 30 dBm)	
VSWR		< 1.25 (880 – 900 / 925 – 945 MHz) *	
Impedance	Ω	50	
Input power	W	Port 2 < 200 Port 5 < 200	
Intermodulation products	dBc	< -160 (5 th order; with 2 x 20 W)	
Environmental Characteristics			
Operating temperature range	°C	-40 ... +65	
IP rating		IP 67 (see note on page 2)	
MTBF		> 1 000 000 hours (per TMA)	
EMC		According to ETS 300 342-3	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	V	9 – 19	9 – 30
Operating current per TMA (without RET)	mA	80 – 120	Nom. 80 at 9 V Nom. 30 at 30 V
Alarm management	mA	170 – 200	AISG (see note on page 2)
Mechanical Characteristics			
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: not connected)	
Mounting		Wall mounting: with 4 screws (max. 8 diameter) Mast mounting: with additional clamp set	
Weight	kg lb	6.8 15.0	
Packing size		460 x 375 x 135 18.1 x 14.8 x 5.3	
Dimensions (w x h x d)	mm in	369 x 209 x 68 14.5 x 8.2 x 2.7 (without connectors, without mounting brackets)	

* Tuning version 78211110V01: Rx 880 – 900 MHz, Tx 925 – 945 MHz

Active Duplex Hybrid Combiner (tunable) (Same-Band Combiner)

KATHREIN

880 – 915 / 925 – 960 MHz

880 – 915 / 925 – 960 MHz

Accessories (order separately)

Type No.	Clamp set suitable for most diameter of mm in
734360	34 – 60 1.34 – 2.36
734361	60 – 80 2.36 – 3.15
734362	80 – 100 3.15 – 3.94
734363	100 – 120 3.94 – 4.72
734364	120 – 140 4.72 – 5.51
734365	45 – 125 1.77 – 4.92

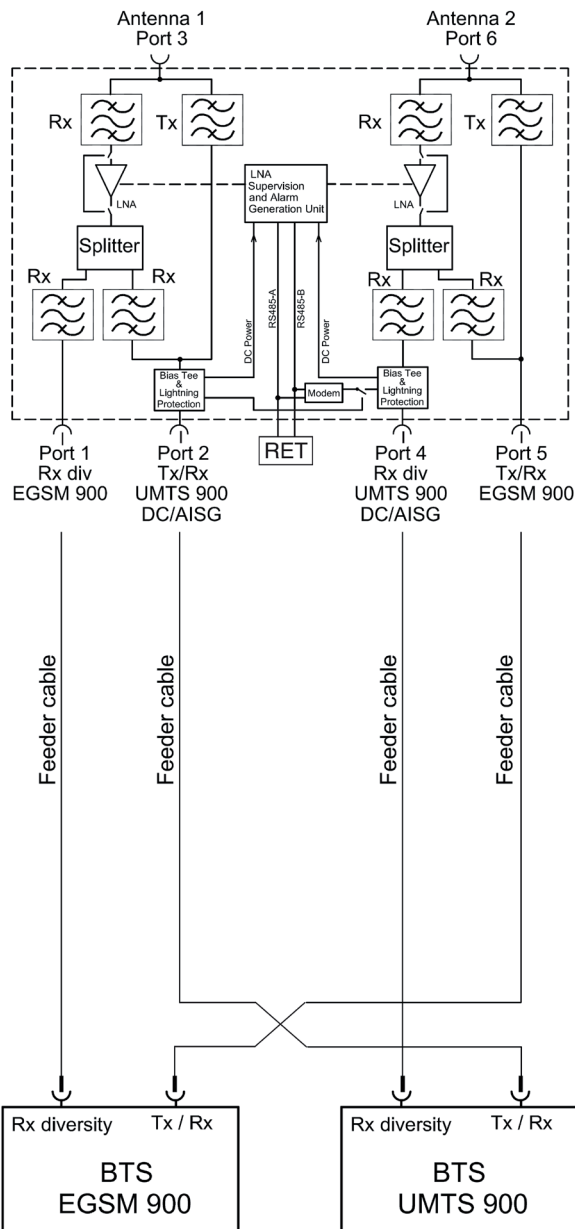
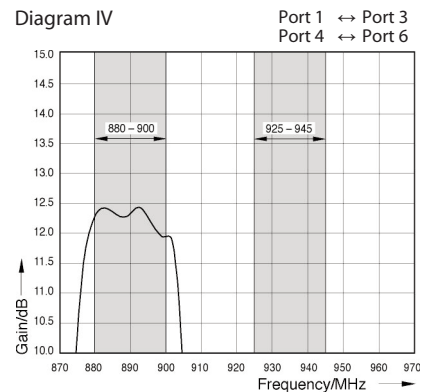
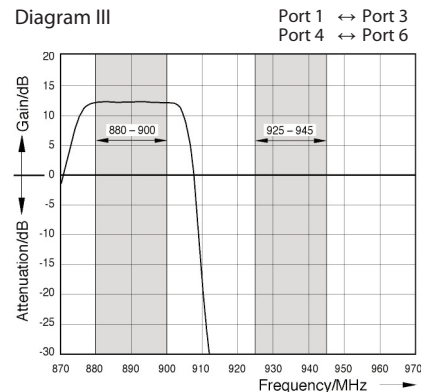
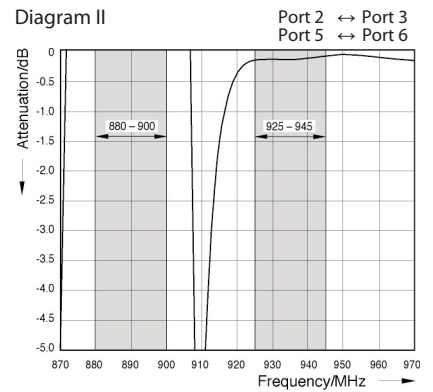
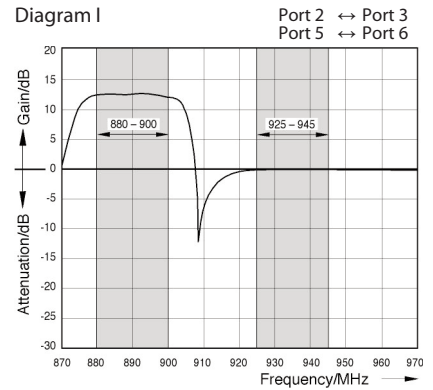


Type No.	Description
78210850v01	DC stop
78410367	50-Ohm load 1.5 W / indoor or outdoor



Typical Attenuation Curves

Tuning example 7821110V01
Rx: 880-900 MHz, Tx: 925-945 MHz

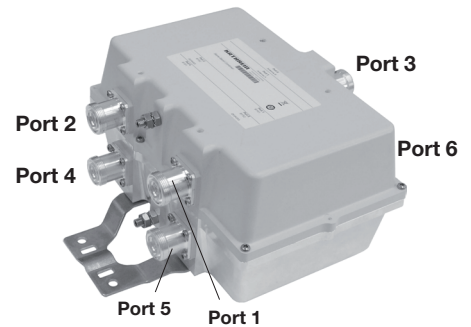


Application example

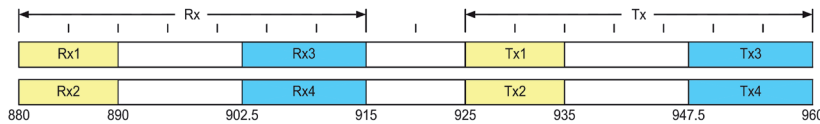
880 – 890 / 925 – 935 MHz

902.5 – 915 / 947.5 – 960 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG bypass for DTMA supply



Tuning Diagram



Technical Data

Type No.	78210936
Pass band BTS 1 (GSM900 / Operator 1) BTS 2 (GSM900 / Operator 2)	Rx1/Rx2 = 880 - 890 MHz, Tx1/Tx2 = 925 - 935 MHz Rx3/Rx4 = 902.5 - 915 MHz, Tx3/Tx4 = 947.5 - 960 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.5 dB, typically 0.3 dB (880 - 890 MHz) / < 0.7 dB, typically 0.4 dB (925 - 935 MHz) < 0.7 dB, typically 0.5 dB (902.5 - 915 MHz) / < 0.5 dB, typically 0.3 dB (947.5 - 960 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (880 - 890 / 902.5 - 915 / 925 - 935 / 947.5 - 960 MHz)
VSWR	< 1.2 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop Bypass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	6.9 kg
Dimensions (w x h x d)	275 x 176 x 140 mm (without connectors, without mounting brackets)

880 – 890 / 925 – 935 MHz

902.5 – 915 / 947.5 – 960 MHz

Typical Attenuation Curves

BTS 1 (GSM 900)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

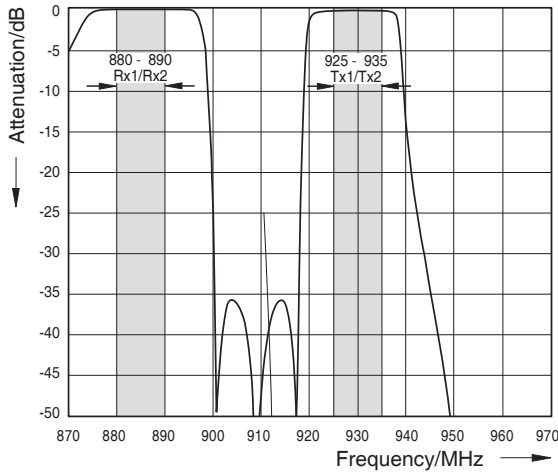
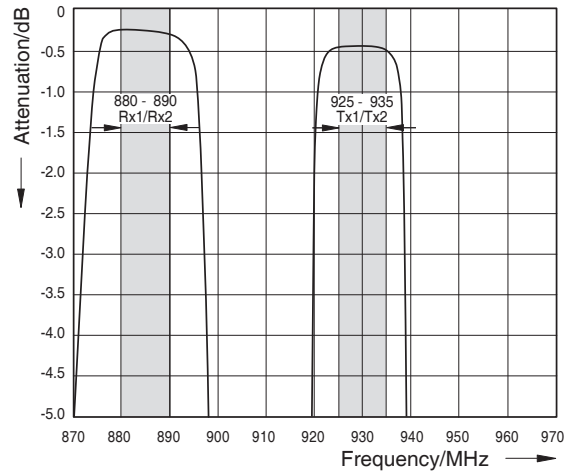


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (GSM 900)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

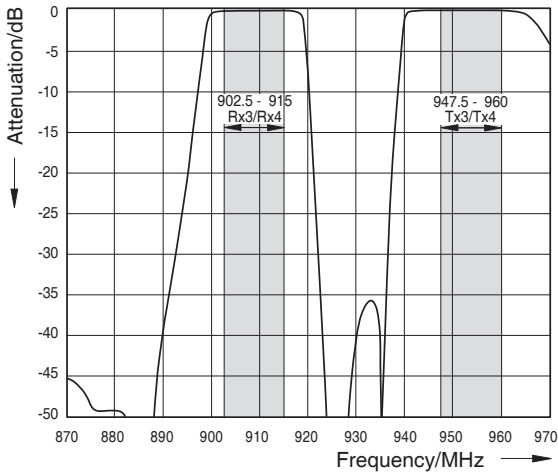
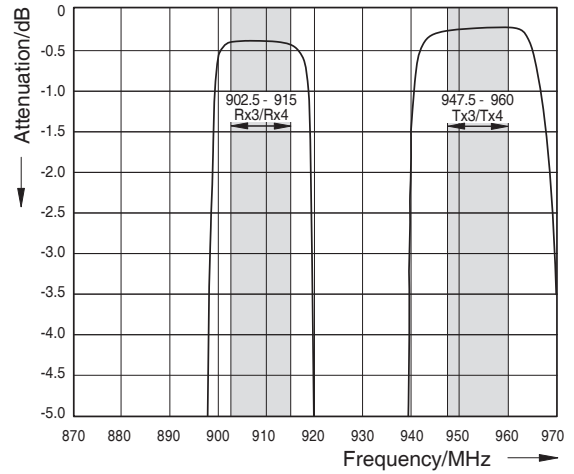
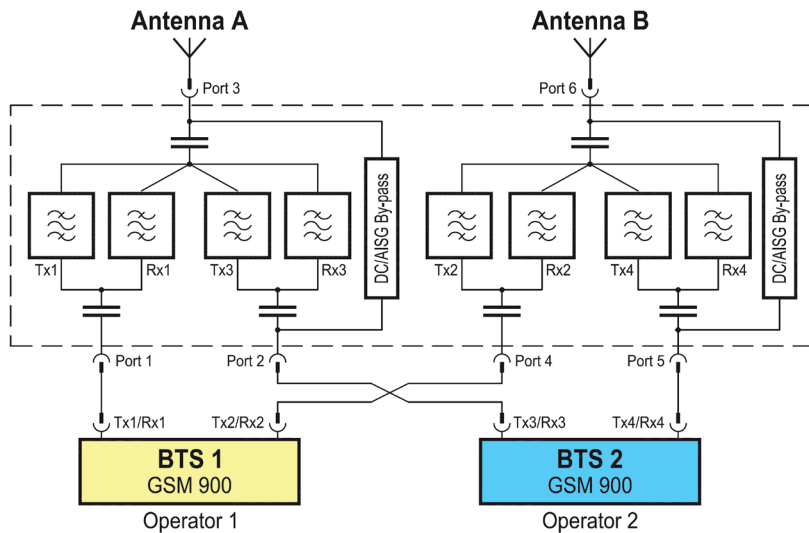


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



Block Diagram



- **Clamp set** (type no. **734360 - 734365**) and
 - **50-Ohm load** (type no. **78410367**)
 (order separately) can be found in the section "System Components".

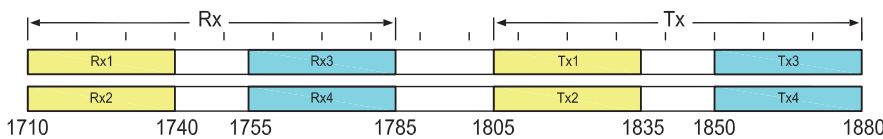
1710 – 1740 / 1805 – 1835 MHz

1755 – 1785 / 1850 – 1880 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Technical Data

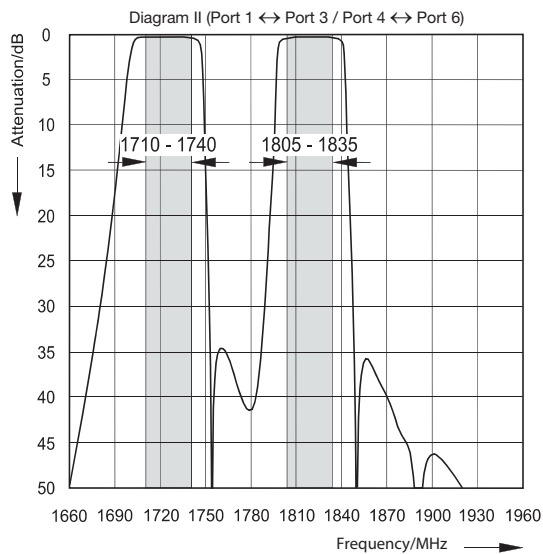
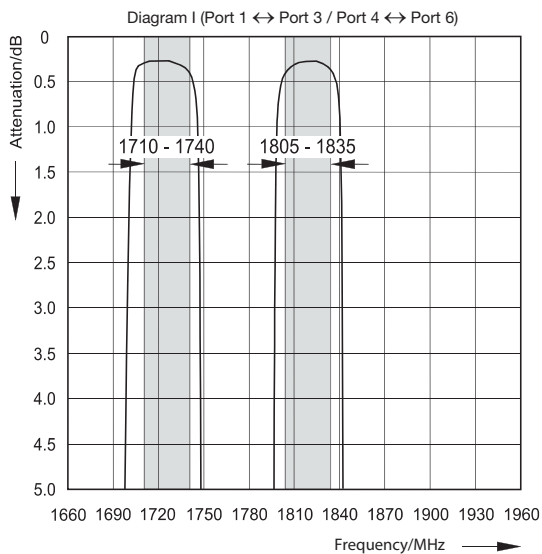
Type No.	78211230
Pass band BTS 1 (LTE/GSM1800 / Operator 1) BTS 2 (LTE/GSM1800 / Operator 2)	Rx1/Rx2 = 1710 – 1740 MHz, Tx1/Tx2 = 1805 – 1835 MHz Rx3/Rx4 = 1755 – 1785 MHz, Tx3/Tx4 = 1850 – 1880 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.6 dB (1710 - 1740 MHz) / < 0.5 dB (1805 - 1835 MHz) < 0.5 dB (1755 - 1785 MHz) / < 0.6 dB (1850 - 1880 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (1710 - 1740 / 1755 - 1785 / 1805 - 1835 / 1850 - 1880 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	5.5 kg
Packing size (w x h x d)	367 x 307 x 185 mm
Dimensions (w x h x d)	250 x 193 x 101 mm (without connectors, without mounting brackets)

1710 – 1740 / 1805 – 1835 MHz

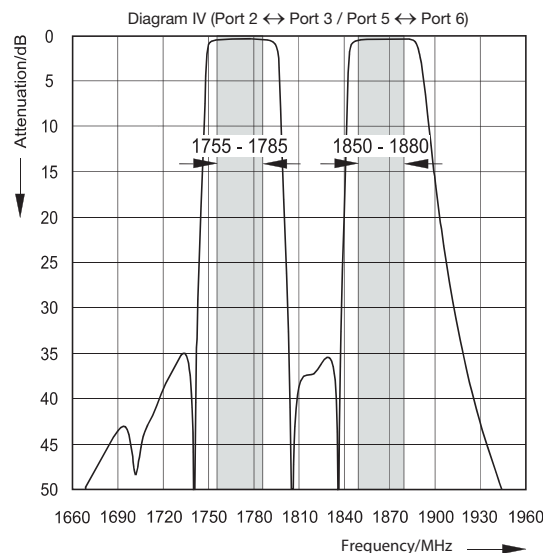
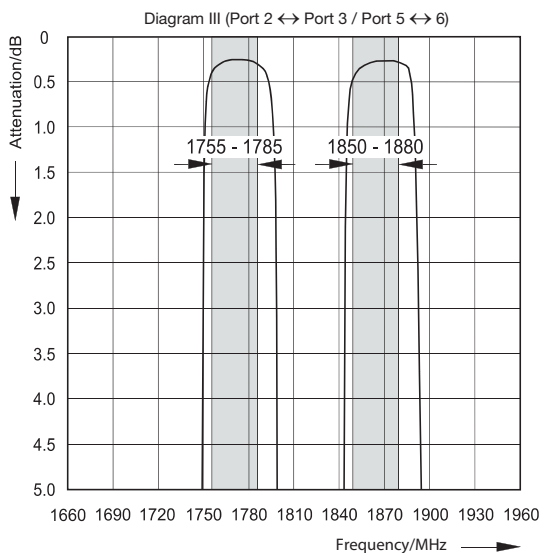
1755 – 1785 / 1850 – 1880 MHz

Typical Attenuation Curves

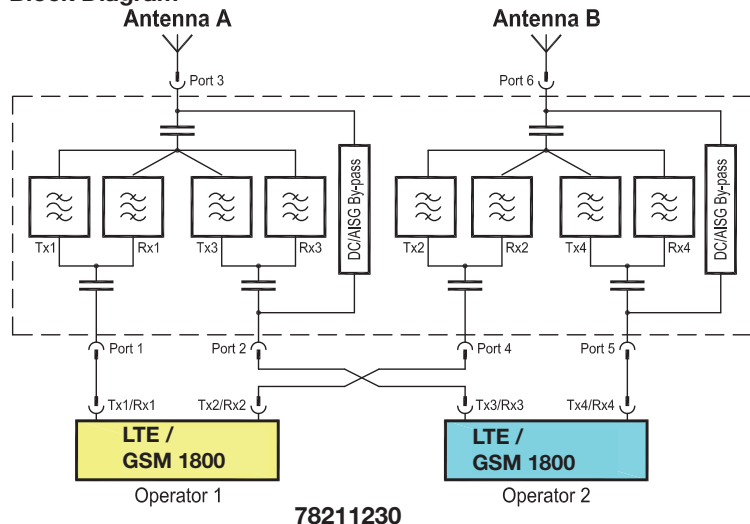
BTS 1 (LTE/GSM 1800)



BTS 2 (LTE/GSM 1800)



Block Diagram



- Clamp set (type no. 734360 - 734365) and
 - 50-Ohm load (type no. 78410367)
 (order separately) can be found in the section "System Components".

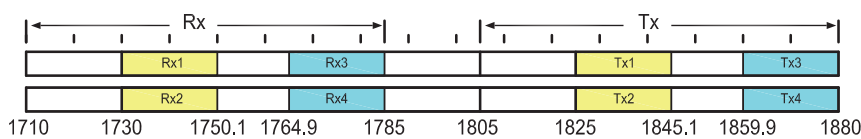
1730 – 1750 / 1825 – 1845 MHz

1765 – 1785 / 1860 – 1880 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Very low Tx/Rx insertion loss compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Technical Data

Type No.	78211235
Pass band BTS 1 (LTE/GSM1800 / Operator 1) BTS 2 (LTE/GSM1800 / Operator 2)	Rx1/Rx2 = 1730 – 1750 MHz, Tx1/Tx2 = 1825 – 1845 MHz Rx3/Rx4 = 1765 – 1785 MHz, Tx3/Tx4 = 1860 – 1880 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.5 dB (1730 – 1750 MHz) / < 0.5 dB (1825 – 1845 MHz) < 0.5 dB (1765 – 1785 MHz) / < 0.5 dB (1860 – 1880 MHz)
Isolation Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 30 dB (1730 – 1750 / 1765 – 1785 / 1825 – 1845 / 1860 – 1880 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	5.5 kg
Packing size (w x h x d)	367 x 307 x 185 mm
Dimensions (w x h x d)	250 x 193 x 101 mm (without connectors, without mounting brackets)

1730 – 1750 / 1825 – 1845 MHz

1765 – 1785 / 1860 – 1880 MHz

Typical Attenuation Curves

BTS 1 (LTE/GSM 1800)

Diagram 1

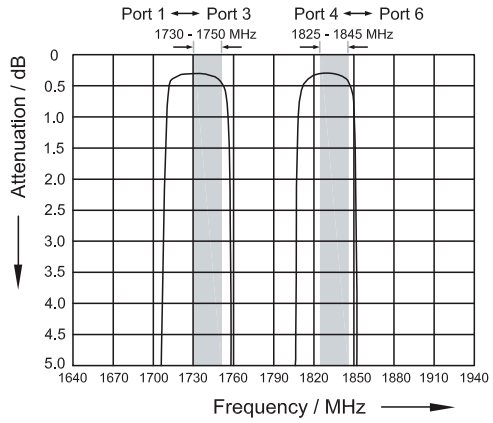
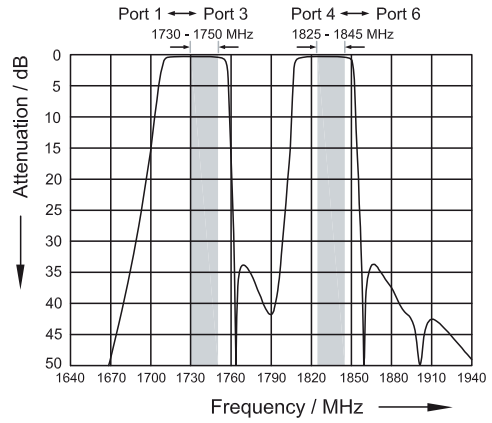


Diagram 2



BTS 2 (LTE/GSM 1800)

Diagram 3

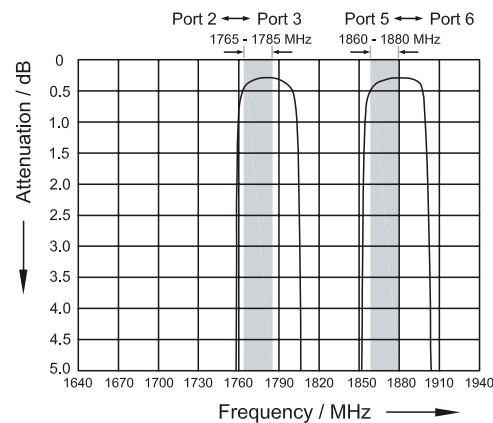
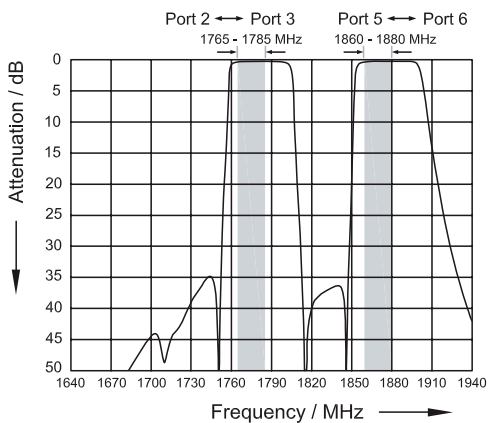
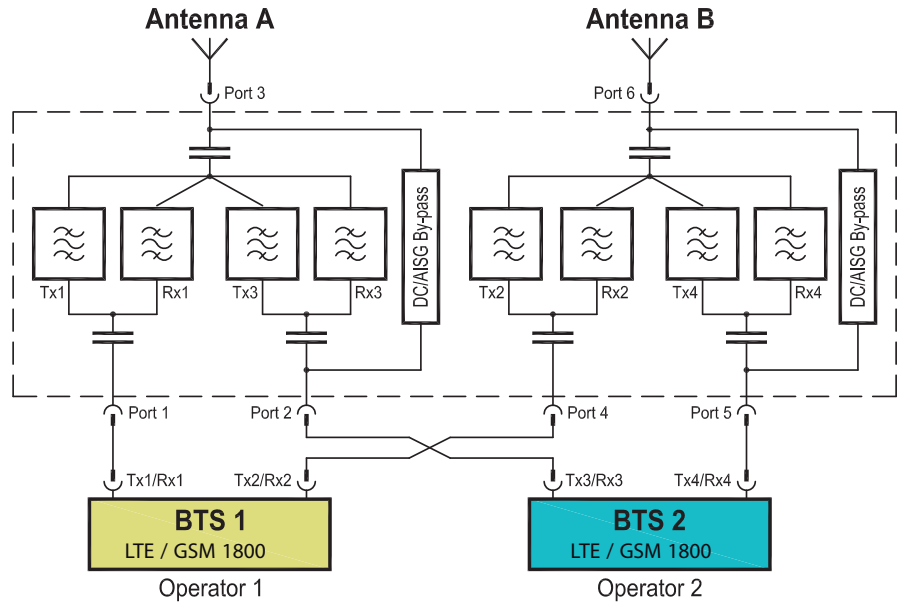


Diagram 4



Block Diagram



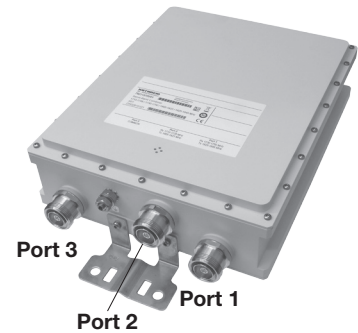
- Clamp set (type no. 734360 - 734365) and
 - 50-Ohm load (type no. 78410367)
 (order separately) can be found in the section "System Components".

Same-Band and Hybrid Combiners

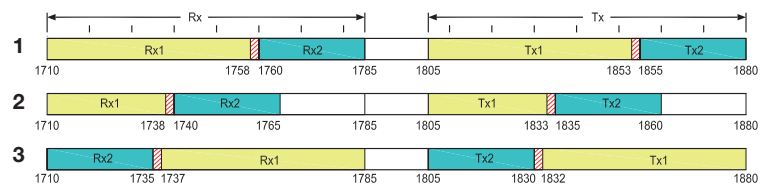
1710 – 1785 / 1805 – 1880 MHz

1710 – 1785 / 1805 – 1880 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Suitable for two operators with frequency allocations within the same frequency band
- Customized 25 MHz Tx/Rx pass-band filters (factory tunable) available for inserting LTE/GSM 1800 base station
- Full pass-band (without LTE/GSM 1800 25 MHz Tx/Rx frequency blocks) available for GSM 1800 base station
- Very low insertion loss over complete GSM Tx/Rx bandwidth compared to standard hybrid combiners
- Single unit
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Examples



- BTS 2 (Rx2, Tx2), max. 25 MHz bandwidth
- BTS 1 (Rx1, Tx1)
- ▨ Guardband (between BTS 1 frequencies and BTS 2 frequencies): min. 2 MHz

Frequency ordering information:

When ordering please specify the required Tx- and Rx frequencies e.g. (tuning example 1)
 Rx1 1710 - 1758 MHz, Rx2 1760 - 1785 MHz
 Tx1 1805 - 1853 MHz, Tx2 1855 - 1880 MHz

Technical Data

Type No.	78211370
Pass band GSM 1800	Rx = 1710 - 1785 / Tx = 1805 - 1880 MHz (without assigned GSM/LTE 1800 25 MHz TX/Rx frequency blocks and 2 MHz guard bands)
GSM/LTE 1800	Rx = 1710 ... 1785 / Tx = 1805 ... 1880 MHz (factory tunable 25 MHz frequency blocks)
Guard band	2 MHz (between Tx1/Rx1 and Tx2/Rx2) – e.g. tuning example 1: Rx1 = 1710 - 1758 MHz and Tx1 = 1805 - 1853 MHz Rx2 = 1760 - 1785 MHz and Tx2 = 1855 - 1880 MHz
Insertion loss Port 1 ↔ Port 3 / Port 2 ↔ Port 3	Rx < 1.5 dB, typ. 0.5 dB / Tx < 1.7 dB, typ. 0.5 dB
Isolation Port 1 ↔ Port 2	> 30 dB (1805 - 1880 MHz) / > 25 dB (1710 - 1785 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2	< 100 W / < 100 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +60 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency (switchable) Port 1 ↔ Port 3 (default) Port 2 ↔ Port 3 (default)	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μs pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: 2 clamps needed
Weight	6.6 kg
Packing size	312 x 487 x 180 mm
Dimensions (w x h x d)	234 x 287 x 81 mm (without connectors, without mounting brackets)

1710 – 1785 / 1805 – 1880 MHz

1710 – 1785 / 1805 – 1880 MHz

Typical Attenuation Curves 78211370V01

Diagram 1 Port 2 ↔ Port 3

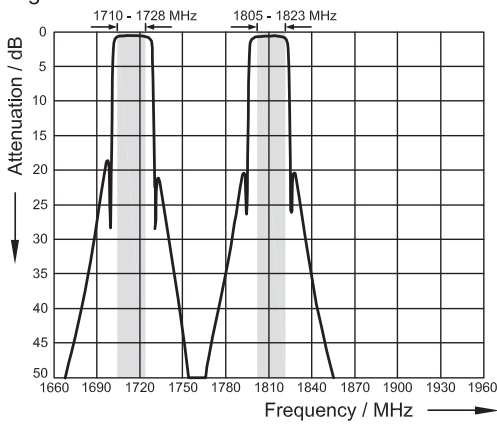


Diagram 3 Port 1 ↔ Port 3

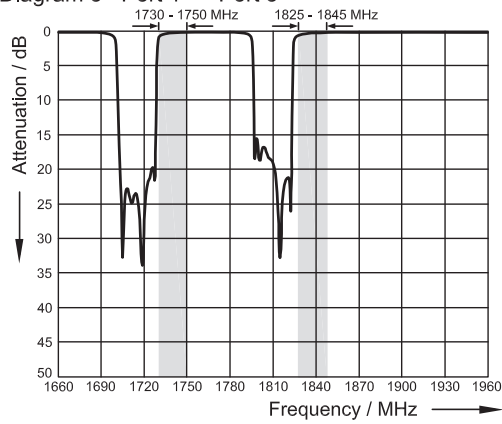


Diagram 2 Port 2 ↔ Port 3

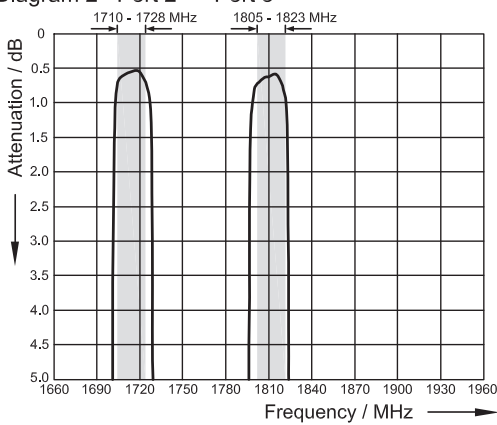
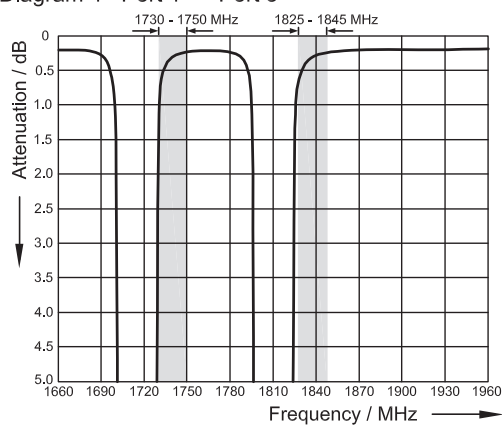
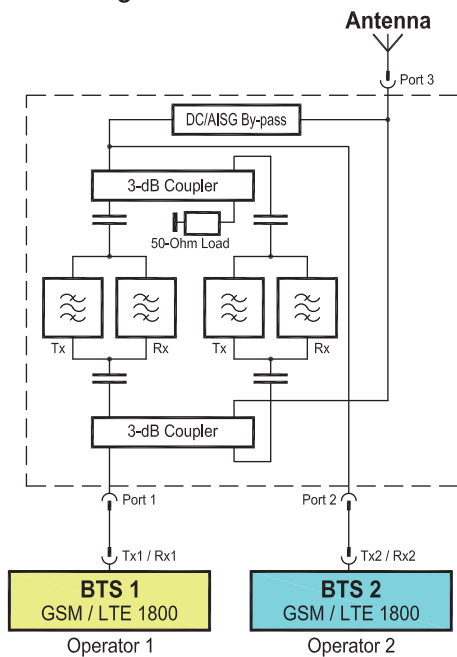


Diagram 4 Port 1 ↔ Port 3



Block Diagram

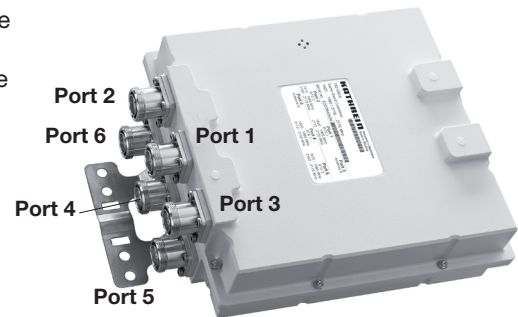


- Clamp set (type no. 734360 - 734365),
 - DC stop (type no. 793301) and
 - 50-Ohm load (type no. 78410367)
- (order separately) can be found in the section "System Components".

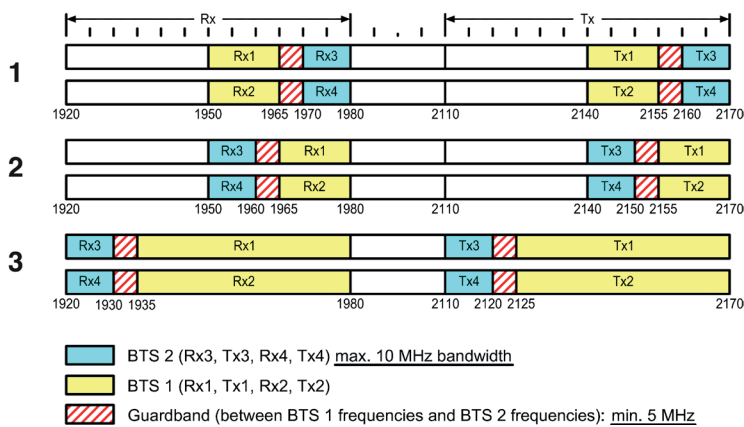
1920 – 1980 / 2110 – 2170 MHz

1920 ... 1980 / 2110 ... 2170 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Customized 10 MHz Tx/Rx bandpass filters (factory tunable) available for inserting a second UMTS 2100 base station
- Full pass-band (without the second UMTS 2100 10 MHz Tx/Rx frequency blocks) available for the first UMTS 2100 base station
- Low insertion loss over complete UMTS 2100 Tx/Rx bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor and outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Examples



Frequency ordering information:

When ordering please specify the required Tx- and Rx-frequencies e.g. (tuning example 1)
 Rx1/Rx2 1950 - 1965 MHz, Rx3/Rx4 1970 - 1980 MHz
 Tx1/Tx2 2140 - 2155 MHz, Tx3/Tx4 2160 - 2170 MHz

Technical Data

Type No.	78210925
Pass band BTS 1 (UMTS 2100)	Rx = 1920 - 1980 / Tx = 2110 - 2170 MHz (without assigned BTS 2 10 MHz Tx/Rx frequency blocks and ± 5 MHz guard bands)
BTS 2 (UMTS 2100)	Rx = 1920 ... 1980 / Tx = 2110 ... 2170 MHz (factory tunable 10 MHz frequency blocks)
Guard band	5 MHz (between Tx1/Tx1 and Tx3/Rx3, between Tx2/Rx2 and Tx4/Rx4 e.g. tuning example 1) Rx1 (Rx2) = 1950 - 1965 and Tx1 (Tx2) = 2140 - 2155 MHz Rx3 (Rx4) = 1970 - 1980 and Tx3 (Rx4) = 2160 - 2170 MHz
Insertion loss Port 1 \leftrightarrow Port 3 / Port 4 \leftrightarrow Port 6 Port 2 \leftrightarrow Port 3 / Port 5 \leftrightarrow Port 6	< 1.2 dB - see diagram I and II for tuning example 1 < 1.2 dB - see diagram III and IV for tuning example 1
Isolation Port 1 \leftrightarrow Port 2 / Port 4 \leftrightarrow Port 5	> 30 dB (1920 - 1980 / 2110 - 2170 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (with 2 x 20 W)
Temperature range	-40 ... +60 $^{\circ}$ C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 \leftrightarrow Port 3 / Port 4 \leftrightarrow Port 6 Port 2 \leftrightarrow Port 3 / Port 5 \leftrightarrow Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μ s pulse
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	7 kg
Packing size	425 x 315 x 180 mm
Dimensions (w x h x d)	243 x 240 x 100 mm (without connectors, without mounting brackets)

1920 – 1980 / 2110 – 2170 MHz

1920 ... 1980 / 2110 ... 2170 MHz

Typical Attenuation Curves

BTS 1 (UMTS 2100)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

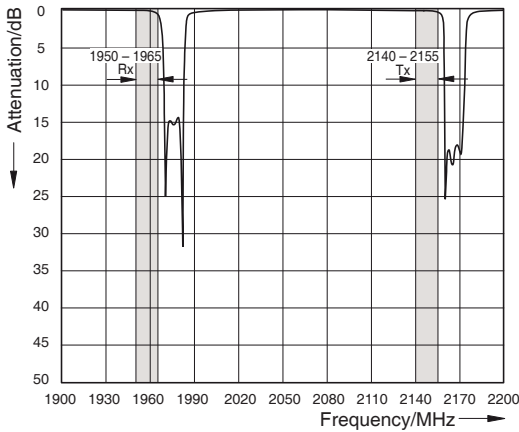
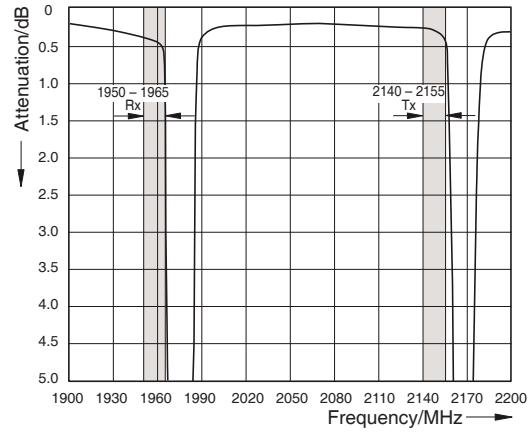


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (UMTS 2100)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

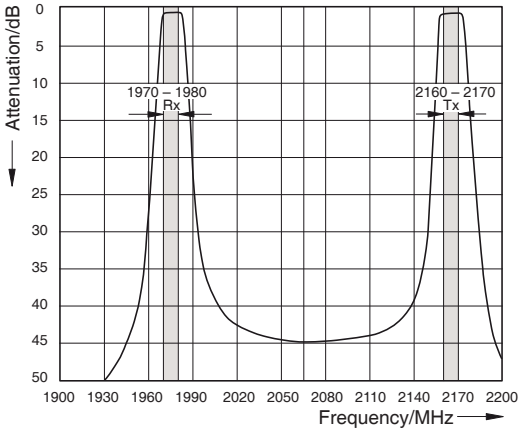
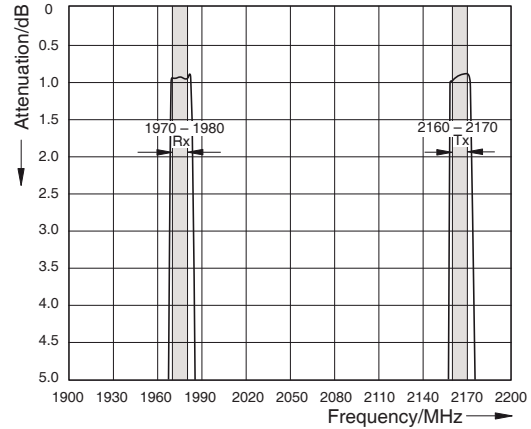
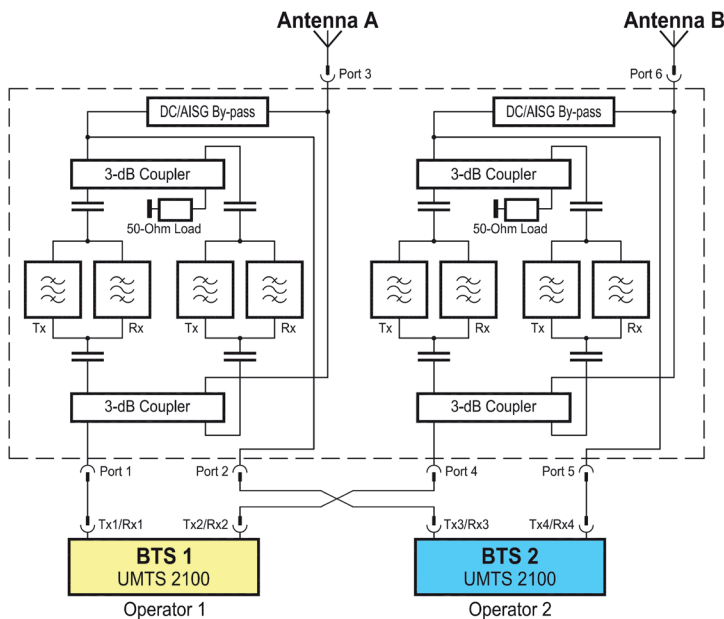


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



Block Diagram

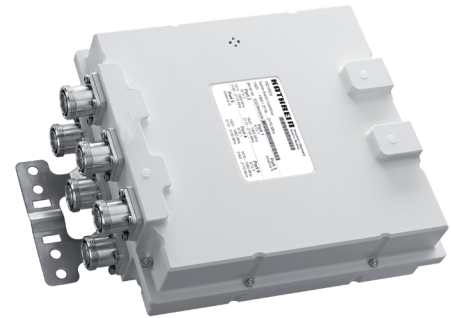


- **Clamp set** (type no. **734360 - 734365**) and
 - **50-Ohm load** (type no. **78410367**)
 (order separately) can be found in the section "System Components".

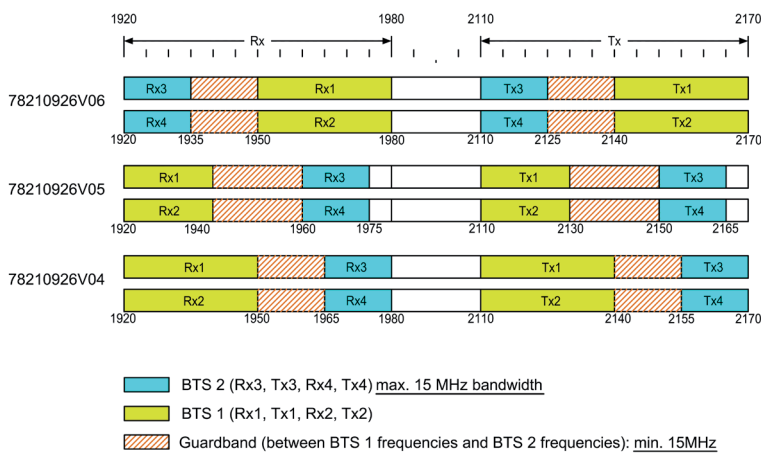
1920 – 1980 / 2110 – 2170 MHz

1920 ... 1980 / 2110 ... 2170 MHz

- Enables antenna and feeder sharing for two base stations in the same frequency band
- Customized 15 MHz Tx/Rx bandpass filters (factory tunable) available for inserting a second UMTS 2100 base station
- Full pass-band (without the second UMTS 2100 15 MHz Tx/Rx frequency blocks) available for the first UMTS 2100 base station
- Low insertion loss over complete UMTS 2100 Tx/Rx bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor and outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Examples



Frequency ordering information:

When ordering please specify the required Tx- and Rx-frequencies e.g. (tuning example 1)

Rx1/Rx2 1935 - 1950 MHz, Rx3/Rx4 1965 - 1980 MHz
Tx1/Tx2 2125 - 2140 MHz, Tx3/Tx4 2155 - 2170 MHz

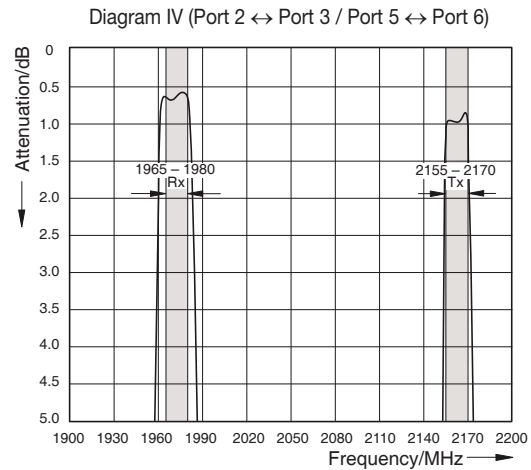
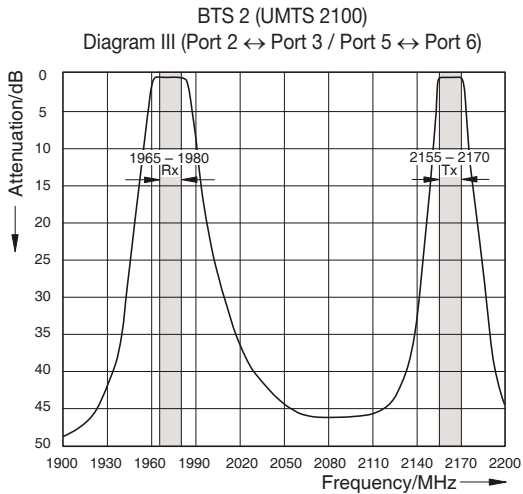
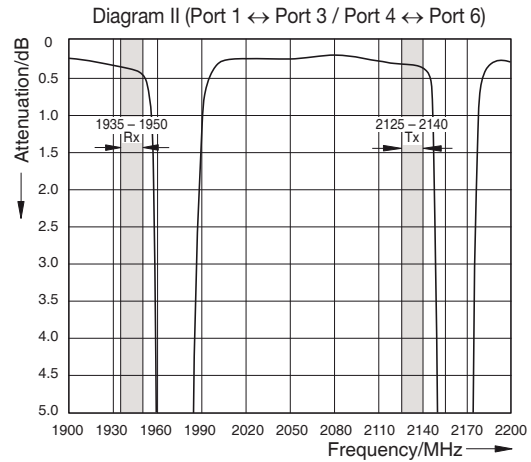
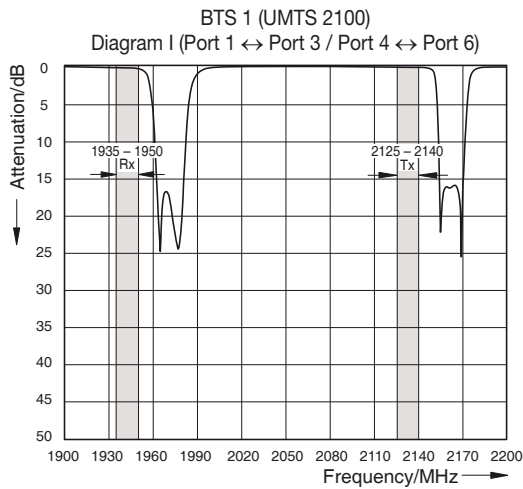
Technical Data

Type No.	78210926
Pass band BTS 1 (UMTS 2100)	Rx = 1920 - 1980 / Tx = 2110 - 2170 MHz (without assigned BTS 2 15 MHz Tx/Rx frequency blocks and \pm 15 MHz guard bands)
BTS 2 (UMTS 2100)	Rx = 1920 ... 1980 / Tx = 2110 ... 2170 MHz (factory tunable 15 MHz frequency blocks)
Guard band	15 MHz (between Tx1/Rx1 and Tx3/Rx3, between Tx2/Rx2 and Tx4/Rx4 e.g. tuning example 1: Rx1 (Rx2) = 1935 - 1950 and Tx1 (Tx2) = 2125 - 2140 MHz Rx3 (Rx4) = 1965 - 1980 and Tx3 (Tx4) = 2155 - 2170 MHz
Insertion loss Port 1 \leftrightarrow Port 3 / Port 4 \leftrightarrow Port 6 Port 2 \leftrightarrow Port 3 / Port 5 \leftrightarrow Port 6	< 1.2 dB < 1.2 dB
Isolation Port 1 \leftrightarrow Port 2 / Port 4 \leftrightarrow Port 5	> 28 dB (1920 - 1980 / 2110 - 2170 MHz)
VSWR	< 1.25 (pass bands)
Impedance	50 Ω
Input power Tx1 / Tx2 / Tx3 / Tx4	< 100 W / < 100 W / < 100 W / < 100 W
Intermodulation products	< -160 dBc (with 2 x 20 W)
Temperature range	-40 ... +60 $^{\circ}$ C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency Port 1 \leftrightarrow Port 3 / Port 4 \leftrightarrow Port 6 Port 2 \leftrightarrow Port 3 / Port 5 \leftrightarrow Port 6	Stop By-pass (max. 2500 mA)
Lightning protection	3 kA, 10/350 μ s pulse
Packing size	425 x 315 x 180 mm
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set
Weight	7 kg
Dimensions (w x h x d)	246 x 256 x 102 mm (without connectors, without mounting brackets)

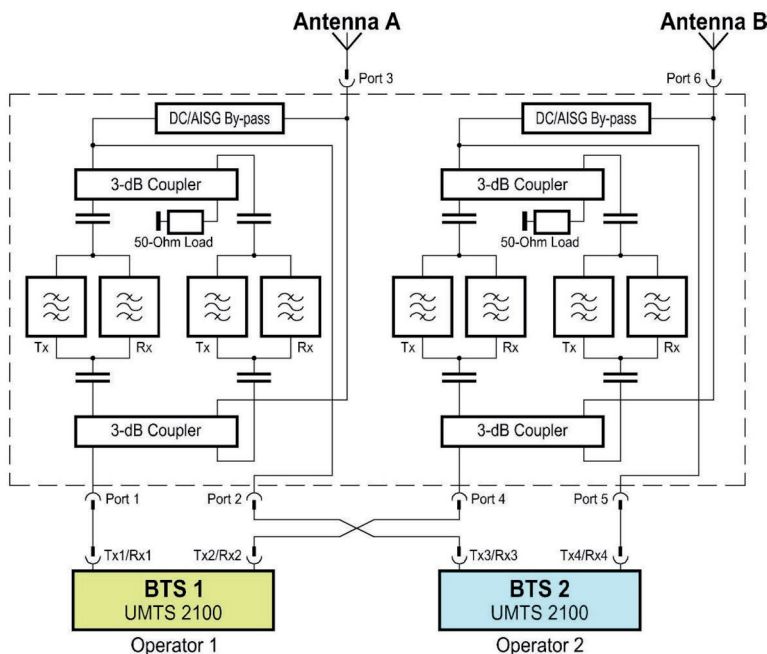
1920 – 1980 / 2110 – 2170 MHz

1920 ... 1980 / 2110 ... 2170 MHz

Typical Attenuation Curves (Tuning Example 1)



Block Diagram

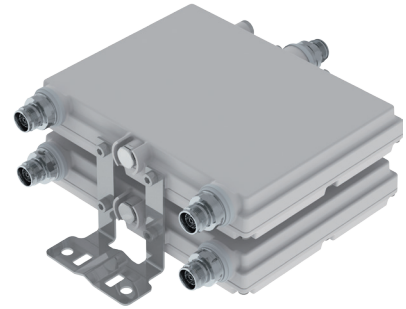


- **Clamp set** (type no. **734360 - 734365**) and
 - **50-Ohm load** (type no. **78410367**)
 (order separately) can be found in the section "System Components".

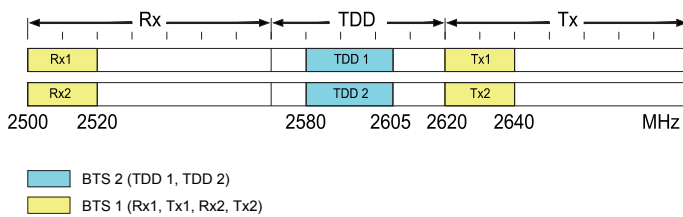
2500 – 2520 / 2620 – 2640 MHz

2580 – 2605 MHz

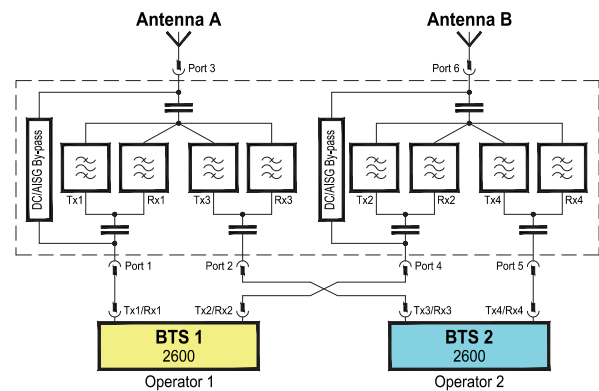
- Enables antenna and feeder sharing for two base stations in the same frequency band
- Low insertion loss over complete LTE 2600 / TDD 2600 bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Block Diagram



Technical Data

Type No.	78211228V01	
Pass band		
BTS 1 (LTE 2600)	[MHz]	Rx = 2500 - 2520 / Tx = 2620 - 2640
BTS 2 (TDD 2600)	[MHz]	TDD = 2580 - 2605
Insertion loss		
Port 1 ↔ Port 3 / Port 4 ↔ Port 6	[dB]	< 1.1
Port 2 ↔ Port 3 / Port 5 ↔ Port 6	[dB]	< 1.1
Isolation		
Port 1 ↔ Port 2 / Port 4 ↔ Port 5	[dB]	> 35
VSWR		< 1.25 (pass bands)
Impedance	[Ω]	50
Input power per port	[W]	< 100
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)
Temperature range	[°C]	-40 ... +60
Connectors		4.3-10 female (long neck)
Application		Indoor or outdoor (IP66)
DC/AISG transparency (switchable)		
Port 1 ↔ Port 3 / Port 4 ↔ Port 6		By-pass (max. 2500 mA)
Port 2 ↔ Port 3 / Port 5 ↔ Port 6		Stop
Lightning protection	[kA]	3 kA, 10/350 μs pulse
Mounting	[mm in]	Wall mounting: With 4 screws (diameter max. 8 0.315) / Mast mounting: With additional clamp set
Weight	[kg lbs]	Approx. 7 15.47
Packing size	[mm in]	345 x 305 x 165 13.58 x 12 x 6.5
Dimensions (w x h x d)	[mm in]	225 x 176 x 88 8.86 x 6.93 x 3.46 (without connectors, without mounting brackets)

2500 – 2520 / 2620 – 2640 MHz

2580 – 2605 MHz

Accessories (order separately)

Type No.		Clamp set suitable for mast diameter of
734360	[mm in]	34 – 60 1.34 – 2.36
734361	[mm in]	60 – 80 2.36 – 3.15
734362	[mm in]	80 – 100 3.15 – 3.94
734363	[mm in]	100 – 120 3.94 – 4.72
734364	[mm in]	120 – 140 4.72 – 5.51
734365	[mm in]	45 – 125 1.77 – 4.92



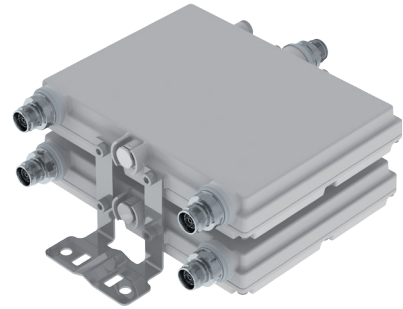
Type No.	Description
78210484	50-Ohm load



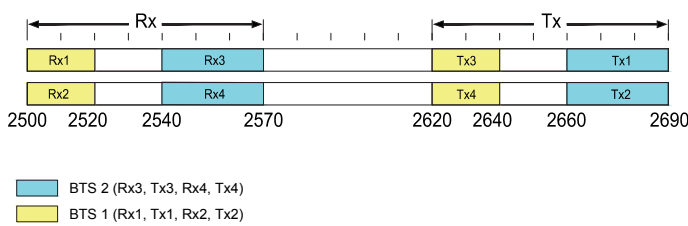
2500 – 2520 / 2620 – 2640 MHz

2540 – 2570 / 2660 – 2690 MHz

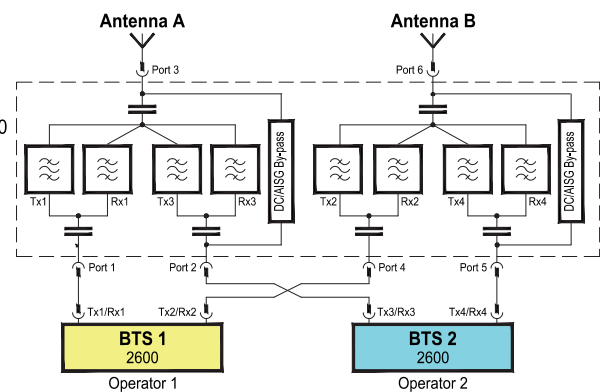
- Enables antenna and feeder sharing for two base stations in the same frequency band
- Low insertion loss over complete LTE 2600 bandwidth compared to standard hybrid combiners
- Double unit for XPol antennas
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply



Tuning Diagram



Block Diagram



Technical Data

Type No.	78211228V03	
Pass band		
BTS 1 (LTE 2600)	[MHz]	Rx = 2500 – 2520 / Tx = 2620 – 2640
BTS 2 (LTE 2600)	[MHz]	Rx = 2540 – 2570 / Tx = 2660 – 2690
Insertion loss		
Port 1 ↔ Port 3 / Port 4 ↔ Port 6	[dB]	< 0.9
Port 2 ↔ Port 3 / Port 5 ↔ Port 6	[dB]	< 0.9
Isolation		
Port 1 ↔ Port 2 / Port 4 ↔ Port 5	[dB]	> 35
VSWR		< 1.25 (pass bands)
Impedance	[Ω]	50
Input power Tx1 / Tx2 / Tx3 / Tx4	[W]	< 100 / < 100 / < 100 / < 100
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)
Temperature range	[°C]	-40 ... +60
Connectors		4.3-10 female (long neck)
Application		Indoor or outdoor (IP66)
DC/AISG transparency (factory switchable)		
Port 1 ↔ Port 3 / Port 4 ↔ Port 6		Stop
Port 2 ↔ Port 3 / Port 5 ↔ Port 6		By-pass (max. 2500 mA)
Lightning protection	[kA]	3 kA, 10/350 μs pulse
Mounting	[mm in]	Wall mounting: With 4 screws (diameter max. 8 0.315) / Mast mounting: With additional clamp set
Weight	[kg lbs]	Approx. 7 15.47
Packing size	[mm in]	345 x 305 x 165 13.58 x 12 x 6.5
Dimensions (w x h x d)	[mm in]	225 x 176 x 88 8.86 x 6.93 x 3.46 (without connectors, without mounting brackets)

2500 – 2520 / 2620 – 2640 MHz

2540 – 2570 / 2660 – 2960 MHz

Accessories (order separately)

Type No.		Clamp set suitable for mast diameter of
734360	[mm in]	34 – 60 1.34 – 2.36
734361	[mm in]	60 – 80 2.36 – 3.15
734362	[mm in]	80 – 100 3.15 – 3.94
734363	[mm in]	100 – 120 3.94 – 4.72
734364	[mm in]	120 – 140 4.72 – 5.51
734365	[mm in]	45 – 125 1.77 – 4.92



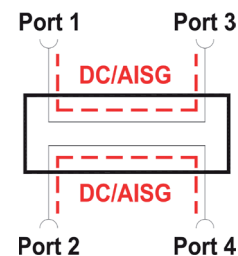
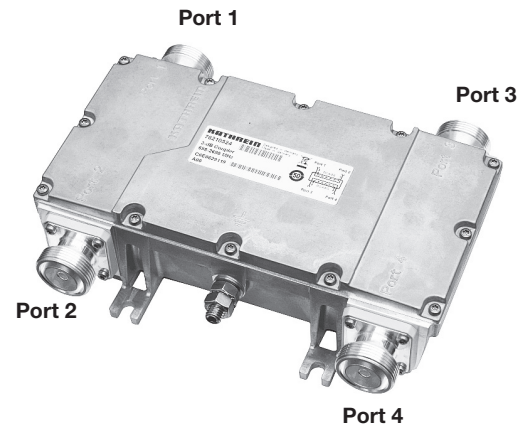
Type No.	Description
78210484	50-Ohm load



3 dB Coupler Hybrid Combiner 2 : 2 698 – 2690 MHz

KATHREIN

- Can be used for the decoupled combining of 2 transmitters onto a common antenna with frequency spacing as narrow as desired (3 dB loss) - see application example 1
- Can be used for the decoupled combining of 2 transmitters onto two antennas with frequency spacing as narrow as desired - see application example 2
- Can be used as a decoupled 2-way splitter - see application example 3
- Suitable for indoor or outdoor applications
- DC/AISG by-pass
- External DC stop available as an accessory



Technical Data

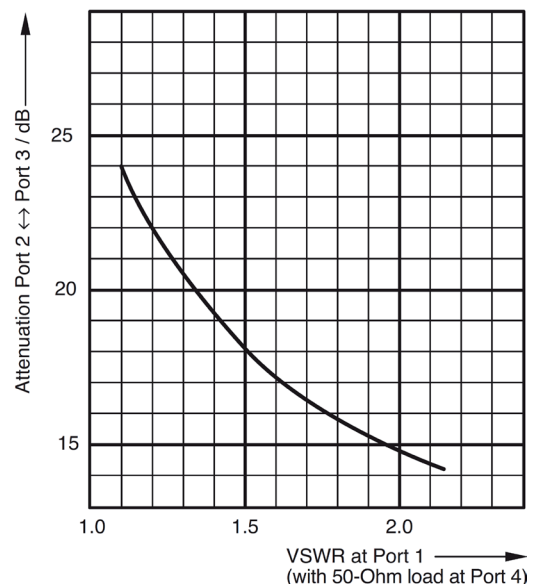
Type No.	78210524
Frequency range	698 - 2690 MHz
Attenuation	
Port 1 ↔ Port 2	3.1 ±0.5 dB
Port 1 ↔ Port 3	3.1 ±0.5 dB
Port 2 ↔ Port 3	See diagram
Directivity	> 20 dB
VSWR	< 1.25
Impedance	50 Ω
Input power	< 150 W at each input port
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +70 °C
Connectors	7-16 female
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	By-pass between Port 1 ↔ Port 3 / Port 2 ↔ Port 4 (max. 2500 mA) External DC stop available as an accessory
Mounting	With 4 screws (max. 6.5 mm diameter)
Weight	1.5 kg
Packing size	268 x 115 x 203 mm
Dimensions (w x h x d)	205.4 x 60 x 104 mm (without connectors and mounting feet)

Note:
VSWR and attenuation values only valid if all ports are terminated with 50-Ohm loads.

- **DC stop** (type no. **78210850V01**) and
- **50-Ohm load** (type no. **78410367** or **78210474**)
(order separately) can be found in the section "System Components".

Diagram

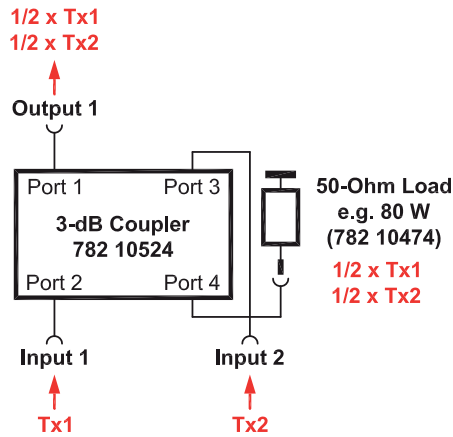
Typical attenuation Port 2 ↔ Port 3 vs. VSWR at Port 1



3 dB Coupler Hybrid Combiner 2 : 2 698 – 2690 MHz

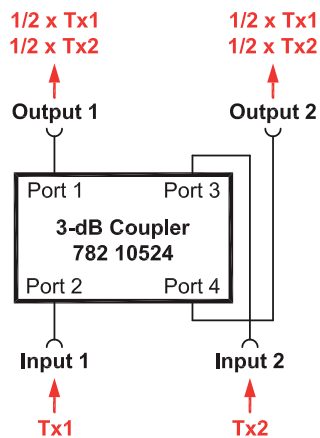
Application Example 1: Hybrid Combiner 2:1

Tx1 and Tx2 signals combined onto **one** output (antenna)
Half the power dissipated in absorber
(suitably dimensioned 50-Ohm load required - to be ordered separately)



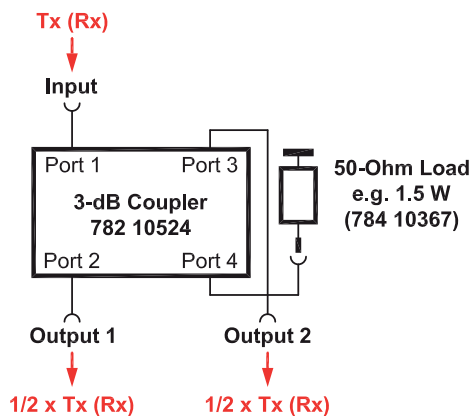
Application Example 2: Hybrid Combiner 2:2

Tx1 and Tx2 signals combined and distributed equally onto **two** outputs (antennas)



Appl. Example 3: Decoupled 2-way Splitter

Tx (or Rx) signal distributed equally onto two outputs
(suitably dimensioned 50-Ohm load required - to be ordered separately)

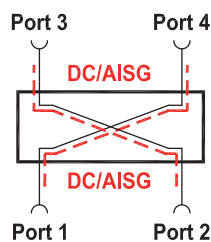
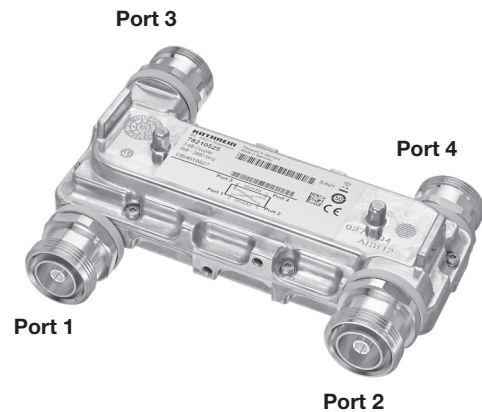


- DC stop (type no. 78210850V01) and
 - 50-Ohm load (type no. 78410367 or 78210474)
 (order separately) can be found in the section "System Components".

3 dB Coupler Hybrid Combiner 2 : 2 698 – 2690 MHz

KATHREIN

- Can be used for the decoupled combining of 2 transmitters onto a common antenna with frequency spacing as narrow as desired (3 dB loss) - see application example 1
- Can be used for the decoupled combining of 2 transmitters onto two antennas with frequency spacing as narrow as desired - see application example 2
- Can be used as a decoupled 2-way splitter - see application example 3
- Can be used as a frequency-independant 90° phase shifter (90° Hybrid)
- Suitable for indoor and outdoor applications
- DC/AISG by-pass
- External DC stop available as an accessory



Technical Data

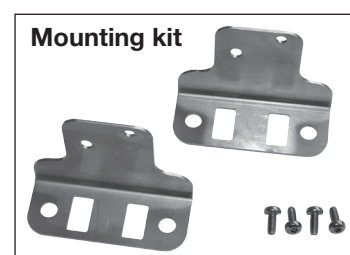
Type No.	78210525
Frequency range	698 – 2690 MHz
Attenuation Port 1 ↔ Port 3 Port 1 ↔ Port 4 Port 1 ↔ Port 2	3 ±0.5 dB 3 ±0.5 dB > 30 dB
Directivity	> 28 dB
Return loss	> 30 dB
Impedance	50 Ω
Input power	< 1000 W at each input port
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +70 °C
Connectors	7-16 female
Application	Indoor or outdoor (IP66)
DC/AISG transparency	By-pass between Port 1 ↔ Port 4 / Port 2 ↔ Port 3 (max. 2500 mA) External DC stop available as an accessory
Weight	0.7 kg
Dimensions (w x h x d)	158 x 55 x 60 mm (without connectors)

Note:

VSWR and attenuation values only valid if all ports are terminated with 50-Ohm-loads.

Accessories (order separately)

Type No.	Description
78210850V01	DC stop
78210474	50-Ohm load (80 W)
78410367	50-Ohm load (1.5 W)
78210526	Mounting kit



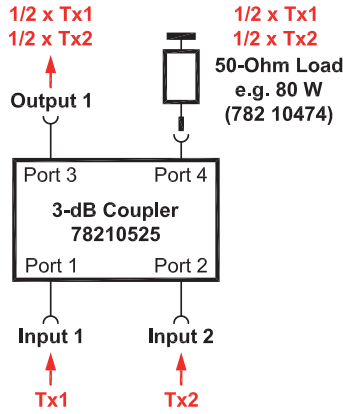
3 dB Coupler

Hybrid Combiner 2 : 2

698 – 2690 MHz

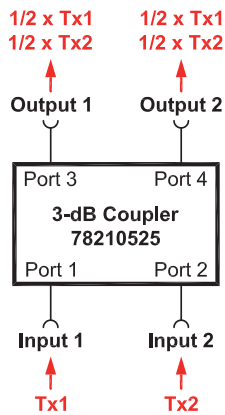
Application Example 1: Hybrid Combiner 2:1

Tx1 and Tx2 signals combined onto **one** output (antenna)
 Half the power dissipated in absorber
 (suitably dimensioned 50-Ohm load required - to be ordered separately)



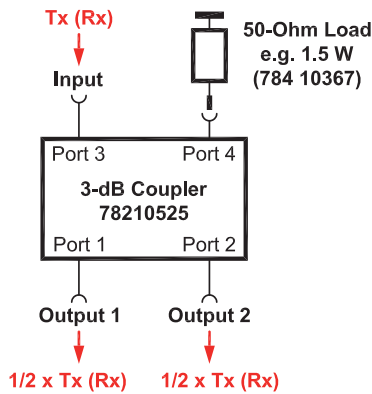
Application Example 2: Hybrid Combiner 2:2

Tx1 and Tx2 signals combined and distributed equally onto **two** outputs (antennas)



Appl. Example 3: Decoupled 2-way Splitter

Tx (or Rx) signal distributed equally onto two outputs
 (suitably dimensioned 50-Ohm load required - to be ordered separately)



3 dB Coupler Hybrid Combiner 2:2 800 – 2200 MHz

KATHREIN

The 3-dB coupler can be used:

- as a decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
- for the decoupled combining of two receivers with frequency spacing as narrow as desired,
- for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
- as a frequency-independent 90° phase shifter,
- as a combiner component.

Function:

The 3-dB coupler has four ports, two of which are decoupled from each other. For example effective power entering into port 1 is distributed into ports 2 and 3. Port 4 is decoupled and without power if ports 2 and 3 are ideally matched. In practice an absorber of suitable power at port 4 is to be planned in accordance with the mismatch of ports 2 and 3. Decoupled combining can be achieved via the diagonally opposite ports 2 and 3 or 1 and 4.

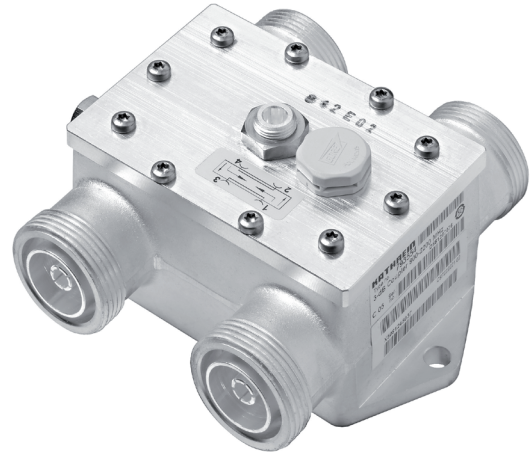
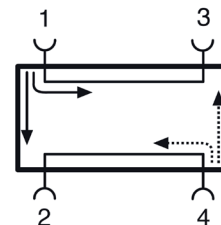
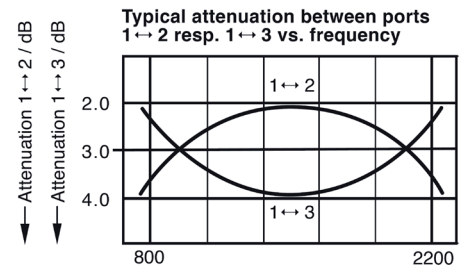


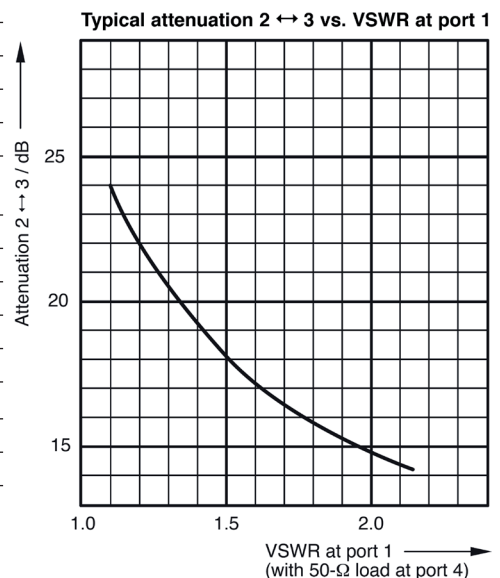
Diagram I



Technical Data

Type No.	793554
Frequency range	800 - 2200 MHz
Attenuation 1 ↔ 2 / ↔ 3	3 ± 1.2 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 20 dB
VSWR	< 1.2
Impedance	50 Ω
Input power	< 300 W total power at two inputs, with max. 200 W at one input
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-30 ... +70 °C
Connectors	7-16 female
Application	Indoor and outdoor (IP66)
Mounting	With 2 screws (max. 5.5 mm diameter)
Weight	1.3 kg
Packing size	160 x 95 x 65 mm
Dimensions (w x h x d)	104.9 x 50.2 x 93.9 mm (including connectors)

Diagram II



Note:

VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads

> **Filters & System Components**

- Filters
- Smart Bias Tees
- DC-Stops
- Attenuators
- 50 Ω Loads

Filters:

Description	Type No.	Frequency range	Connector Type	Max. input power	Page
Band-pass Filter	78210390	890 – 960 MHz	7-16	400 W	452, 453
Band-pass Filter	78210390V04	880 – 945 MHz	7-16	400 W	452, 453
Band-pass Filter	78210390V05	880 – 945 MHz	7-16	400 W	452, 453
Band-pass Filter	78210390V12	910 – 969 MHz	7-16	400 W	452, 453
Band-pass Filter	78210390V13	910 – 969 MHz	7-16	400 W	452, 453
Band-pass Filter	78210390V14	898.5 – 960 MHz	7-16	400 W	452, 453
Band-pass Filter	78210390V15	898.5 – 960 MHz	7-16	400 W	452, 453

System Components:

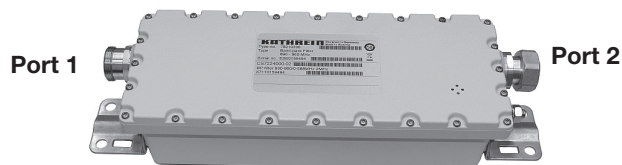
Description	Type No.	Frequency range	Connector Type	Max. input power	Page
DC Stop	78210850V01	250 – 2700 MHz	7-16	750 W	454
DC Stop	78211000	250 – 3800 MHz	4.3-10	500 / 300 W	455
Smart Bias Tee	78211053	690 – 2700 MHz	7-16	750 W	456 - 458
Smart Bias Tee	78211054	690 – 2700 MHz	7-16	750 W	456 - 458
Smart Bias Tee	78211055	690 – 2700 MHz	7-16	750 W	456 - 458
Smart Bias Tee	78211056	690 – 2700 MHz	7-16	750 W	456 - 458
Smart Bias Tee	78211065	690 – 2700 MHz	7-16	750 W	456 - 458
Smart Bias Tee	78211066	690 – 2700 MHz	7-16	750 W	456 - 458
Smart Bias Tee	78211590	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211591	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211592	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211593	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211594	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211595	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211596	690 – 2700 MHz	4.3-10	500 W	459 - 461
Smart Bias Tee	78211597	690 – 2700 MHz	4.3-10	500 W	459 - 461
50 Ω Load	78210475	698 – 2700 MHz	7-16 female	150 W	462
50 Ω Load	78410367	0 – 4000 MHz	7-16 male	1.5 W	463
50 Ω Load	K6226111	0 – 2700 MHz	N male	2 W	463
50 Ω Load	78210484	0 – 7500 MHz	4.3-10 male	2 W	463
50 Ω Load	K6226411	0 – 2700 MHz	N male	10 W	463
50 Ω Load	K6226217	0 – 2700 MHz	7-16 male	25 W	464
50 Ω Load	K6226301	0 – 2700 MHz	N female	50 W	464
50 Ω Load	K6226311	0 – 2700 MHz	N male	50 W	464
50 Ω Load	K6226307	0 – 2700 MHz	7-16 female	50 W	464
50 Ω Load	K6226317	0 – 2700 MHz	7-16 male	50 W	464
50 Ω Load	K6226507	0 – 1000 MHz	7-16 female	100 W	464
50 Ω Load low IM	78210474	698 – 2700 MHz	7-16 female	80 W	465
Attenuator 3 dB	791918	0 – 4000 MHz	N	15 W	466
Attenuator 3 dB	78210891	0 – 4000 MHz	4.3-10	15 W	466
Attenuator 6 dB	791919	0 – 4000 MHz	N	12 W	466
Attenuator 6 dB	78210892	0 – 4000 MHz	4.3-10	15 W	466
Attenuator 10 dB	791920	0 – 4000 MHz	N	10 W	466
Attenuator 10 dB	78210893	0 – 4000 MHz	4.3-10	15 W	466
Attenuator 20 dB	791921	0 – 4000 MHz	N	10 W	466
Attenuator 20 dB	78210894	0 – 4000 MHz	4.3-10	15 W	466
Clamp Set	734360				467
Clamp Set	734361				467
Clamp Set	734362				467
Clamp Set	734363				467
Clamp Set	734364				467
Clamp Set	734365				467

New Products

Band-pass Filter 890 – 960 MHz (GSM 900)

KATHREIN

- GSM 900 Tx/Rx preselector filter
- Suppression of interfering Tx signals of an adjacent AMPS or CDMA frequency band
- Suitable for indoor or outdoor applications
- Built-in DC stop



Single Unit



Double Unit

Technical Data

Type No.	78210390	
Stop band Frequency spacing	0 - 888 MHz 2 MHz	
Pass band	890 - 960 MHz	
Insertion loss	< 1.5 dB (890 - 892 MHz) < 0.8 dB (892 - 893 MHz) < 0.6 dB (893 - 905 MHz) < 0.3 dB (905 - 960 MHz)	
Stop band attenuation	> 50 dB (0 - 880 MHz) > 40 dB (880 - 885 MHz) > 30 dB (885 - 888 MHz)	
VSWR	< 1.25 (890 - 960 MHz)	
Impedance	50 Ω	
Input power	< 400 W (935 - 960 MHz)	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-40 ... +60 °C	
Connectors	Port 1: 7-16 female, long neck / Port 2: 7-16 male	
Application	Indoor or outdoor (IP66)	
DC/AISG transparency Port 1 ↔ Port 2	Stop	
Mounting	With 4 screws (max. 4 mm diameter)	
Weight	2 kg	
Packing size	387 x 137 x 130 mm	
Dimensions (w x h x d)	114 x 84 mm x 377 mm (including connectors and mounting feet)	

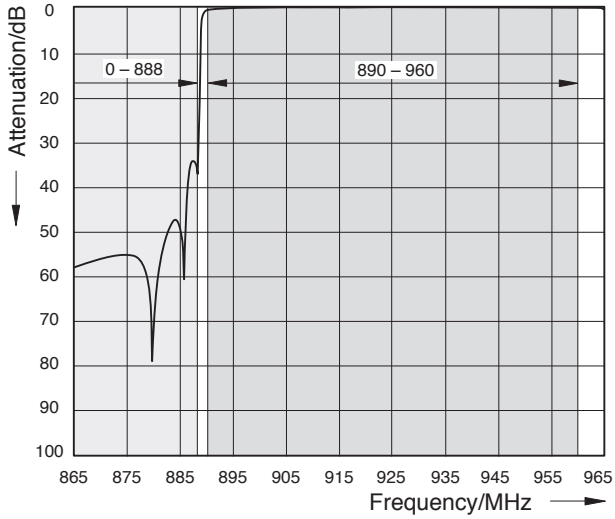
Tuning Variants

	Pass Band	Stop band
78210390V04 (Single Unit) 78210390V05 (Double Unit)	880 - 945 MHz	0 - 878 MHz
78210390V12 (Single Unit) 78210390V13 (Double Unit)	910 - 969 MHz	902 - 904 MHz
78210390V14 (Single Unit) 78210390V15 (Double Unit)	898.5 - 960 MHz	890 - 894

According data sheets can be found on our homepage.
Further tuning variants available on request.

Band-pass Filter 890 – 960 MHz (GSM 900)

78210390
Typical Attenuation Curves
Diagram I



78210390V04
Typical Attenuation Curves
Diagram I

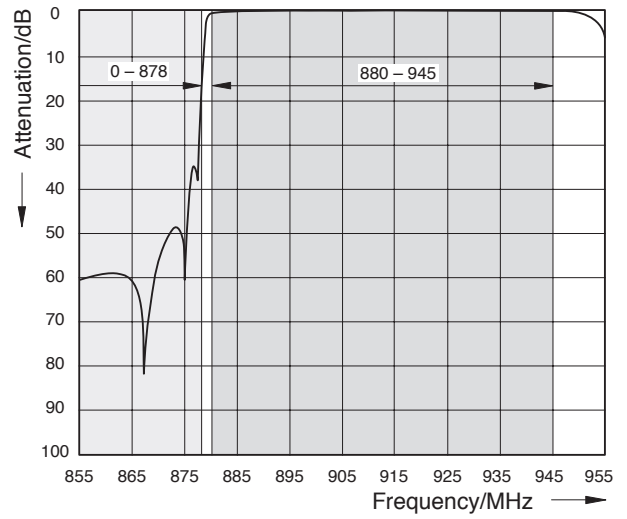


Diagram II

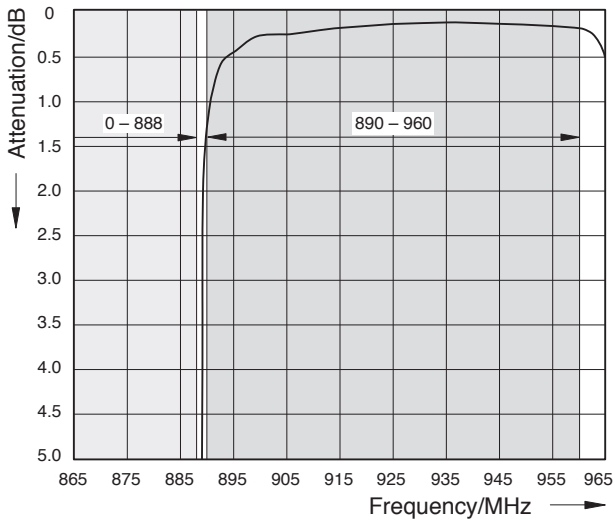
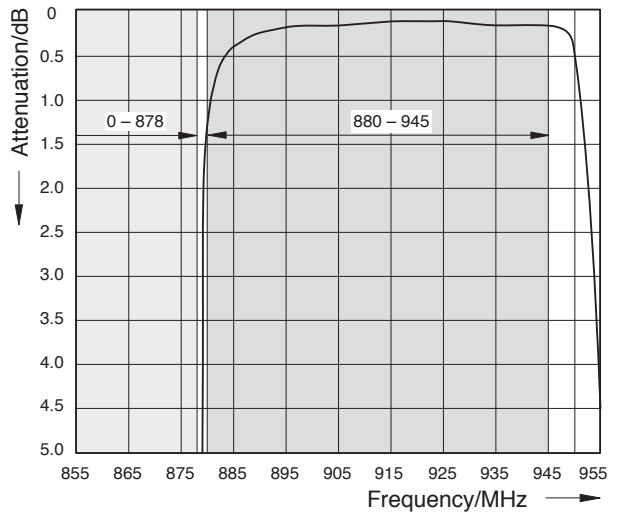


Diagram II

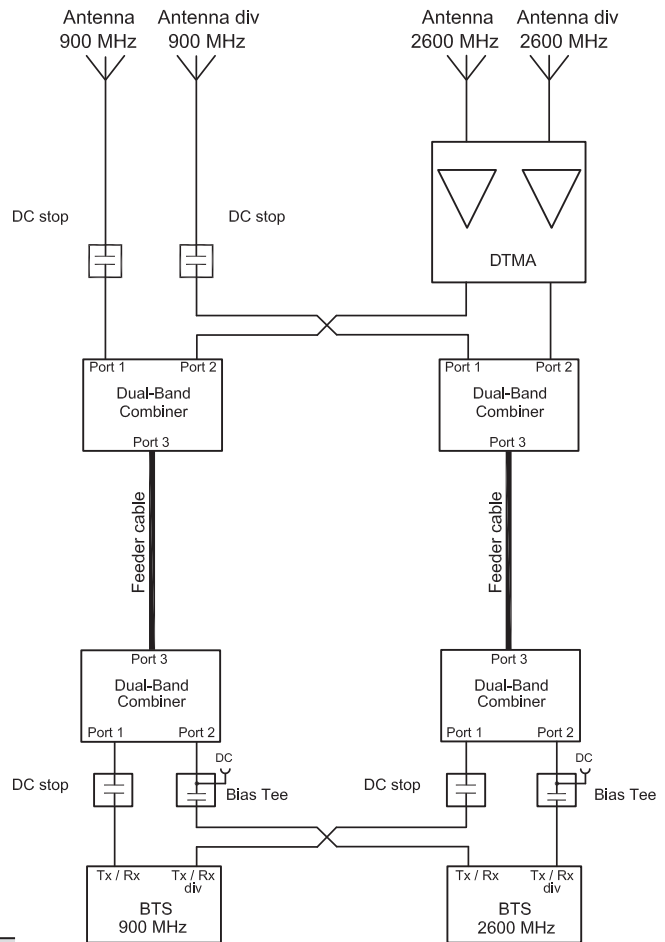


DC Stop

250 – 2700 MHz

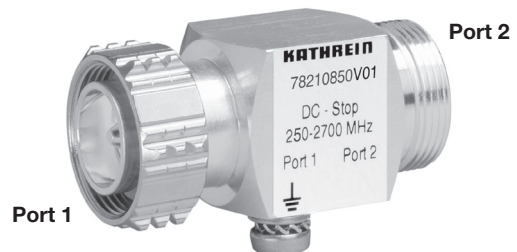
DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Isolation of AISG signals
- Suitable for indoor or outdoor applications



Technical Data

Type No.	78210850V01
Frequency range	250 - 2700 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (250 - 2700 MHz)
Isolation Port 1 ↔ Port 2	DC Stop > 23 dB (AISG 2.176 MHz)
VSWR	< 1.5 (250 - 380 MHz) < 1.25 (380 - 690 MHz) < 1.1 (690 - 2700 MHz)
Impedance	50 Ω
Input power	< 750 W (250 - 2700 MHz)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +70 °C
Connectors	
Port 1	7-16 male
Port 2	7-16 female
Application	Indoor or outdoor (IP 67)
Weight	0.32 kg
Dimensions (w x h x d)	70.4 mm x 39.5 mm x 32 mm (including connectors and earthing screw of 6 mm diameter)

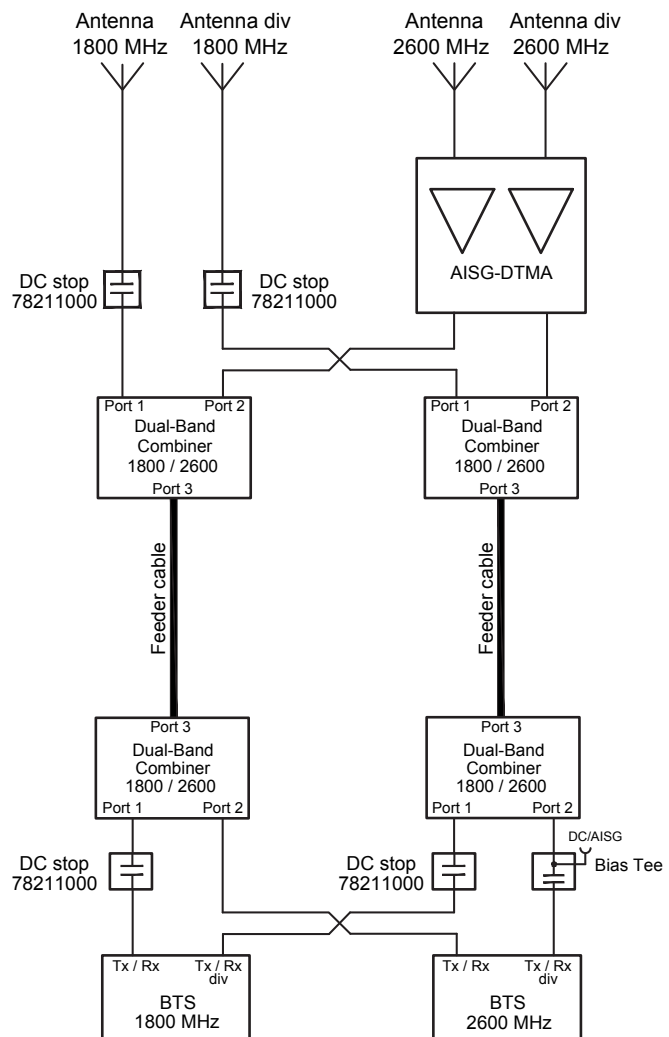


DC Stop

250 – 3800 MHz

DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

- Low RF signal insertion loss
- High DC signal isolation from port 1 to port 2 and vice versa
- Isolation of AISG signals
- Suitable for indoor or outdoor applications

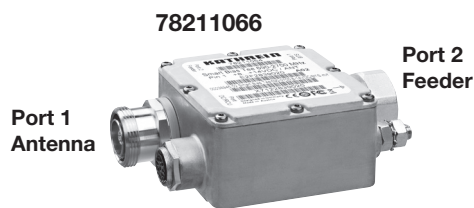
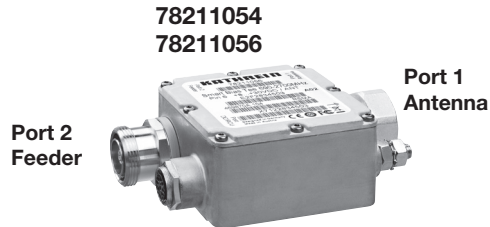


Technical Data

Type No.	78211000	
Frequency range	[MHz]	250 - 3800
Insertion loss	Port 1 ↔ Port 2 [dB]	< 0.1
Isolation	Port 1 ↔ Port 2 [dB]	DC Stop > 23 (AISG 2.176 MHz)
VSWR		< 1.5 (250 - 380 MHz) < 1.25 (380 - 575 MHz) < 1.1 (575 - 3700 MHz) < 1.2 (3700 - 3800 MHz)
Impedance	[Ω]	50
Input power	[W]	< 500 (250 - 2700 MHz) < 300 (2700 - 3800 MHz)
Intermodulation products	[dBc]	< -160 (3 rd order; with 2 x 20 W)
Temperature range	dBc [°C °F]	-40 ... +70 -40 ... +158
Connectors		Port 1: 4.3-10 male Port 2: 4.3-10 female
Application		Indoor or outdoor (IP 67)
Weight	[kg lb]	0.2 0.44
Dimensions (w x Ø)	[mm in]	79.4 x 29 3.13 x 1.14 (including connectors)



Smart Bias Tee 690 – 2700 MHz



Technical Data

Type No.	78211053 +8 ... +14 VDC / BTS	78211054 +8 ... +14 VDC / Antenna	78211055 +8 ... +32 VDC / BTS	78211056 +8 ... +32 VDC / Antenna
Port 1: 7-16 male	BTS	Antenna	BTS	Antenna
Port 2: 7-16 female	Feeder	Feeder	Feeder	Feeder
Type No.			78211065 +8 ... +32 VDC / BTS	78211066 +8 ... +32 VDC / Antenna
Port 1: 7-16 female			BTS	Antenna
Port 2: 7-16 male			Feeder	Feeder
Frequency range	690 - 2700 MHz			
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (690 - 2700 MHz)			
Isolation for DC and RCU signals Port 1 ↔ Port 2 Port 1 ↔ Port DC/RCU Port 2 ↔ Port DC/RCU	> 70 dB > 70 dB > 0 dB			
VSWR	< 1.1 (690 - 2700 MHz)			
Impedance	50 Ω			
Input power Port 1 or Port 2 Port DC/RCU	< 750 W (690 - 2700 MHz) < 2.5 A / +8 ... +14 VDC		< 750 W (690 - 2700 MHz) < 2.5 A / +8 ... +32 VDC	
Power consumption	Typically 0.6 W			
Lightning protection	3 kA, 10/350 μs pulse			
Intermodulation products	< - 160 dBc (3 rd order; with 2 x 20 W)			
Temperature range	-40 ... +60 °C			
Modem carrier frequency	2.176 MHz			
Application	Indoor or outdoor (IP 66)			
Weight	0.8 kg			
Packing size (w x h x d)	167 x 102 x 86 mm			
Dimensions (w x h x d)	81 x 81 x 46 mm (without connectors)			

Smart Bias Tee

690 – 2700 MHz

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The **Smart Bias Tee** combines the performance of a standard Bias Tee with the function of an additional modem (AISG standard) in order to provide either DC voltage as well as remote control signals via an RF feeder cable to a TMA or RCU.

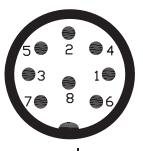
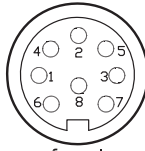
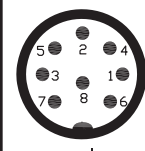
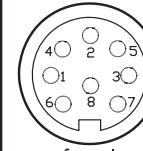
The **Smart Bias Tee** provides low RF signal insertion loss from port 1 to port 2 and vice versa. The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.

- **78211053:**
+8 ... 14 VDC (DC on pin1) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable (**only required for TMAs and RCUs with power supply below 15 VDC**)
- **78211054:**
+8 ... 14 VDC (DC on pin1) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)
- **78211055, 78211065:**
+8 ... 32 VDC (DC on pin6) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable
- **78211056, 78211066:**
+8 ... 32 VDC (DC on pin6) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)

Abbreviations:

RCU	=	Remote Control Unit for remote electrical control of antenna tilt
BTS	=	Base Transceiver Station
TMA	=	Tower Mounted Amplifier
AISG	=	Antenna Interface Standards Group
Port 1	=	Port for BTS or for Antenna
Port 2	=	Port for Feeder Cable
Port DC/RCU	=	Port for DC voltage and Remote Control Unit signals

Pin connections:

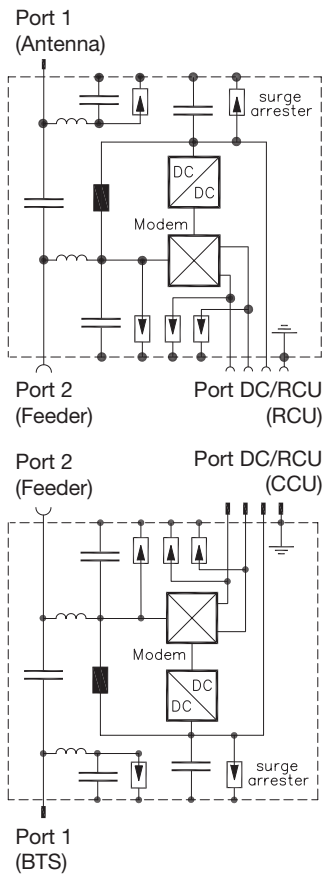
	782 11053	782 11054	782 11055	782 11056
			782 11065	782 11066
8-pin connector (IEC 60130-9)				
	male	female	male	female
Pin 1	+8...+14 VDC in	+8...+14 VDC out	Not connected	Not connected
Pin 2	Not connected	Not connected	Not connected	Not connected
Pin 3	RS485-B	RS485-B	RS485-B	RS485-B
Pin 4	Not connected	Not connected	Not connected	Not connected
Pin 5	RS485-A	RS485-A	RS485-A	RS485-A
Pin 6	Not connected	Not connected	+8...+32 VDC in	+8...+32 VDC out
Pin 7	DC return (grounded)	DC return (grounded)	DC return (grounded)	DC return (grounded)
Pin 8	Not connected	Not connected	Not connected	Not connected

Smart Bias Tee 690 – 2700 MHz

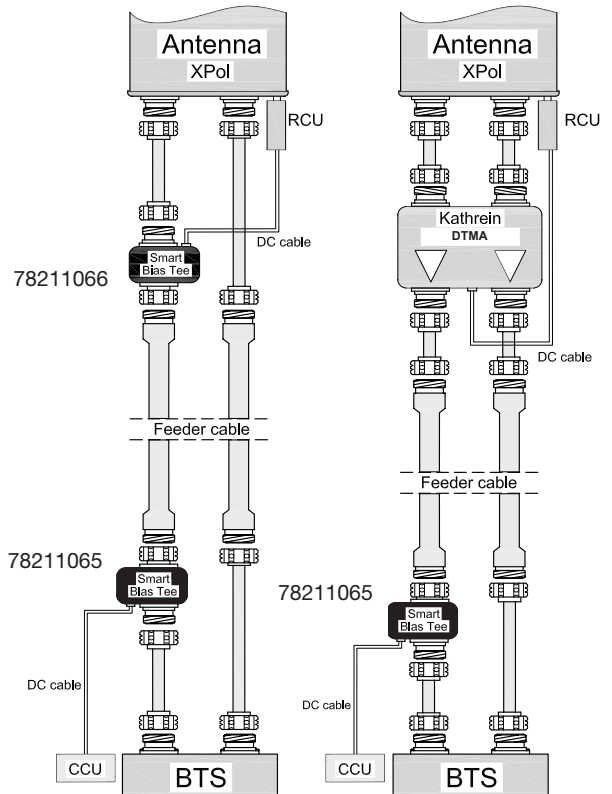
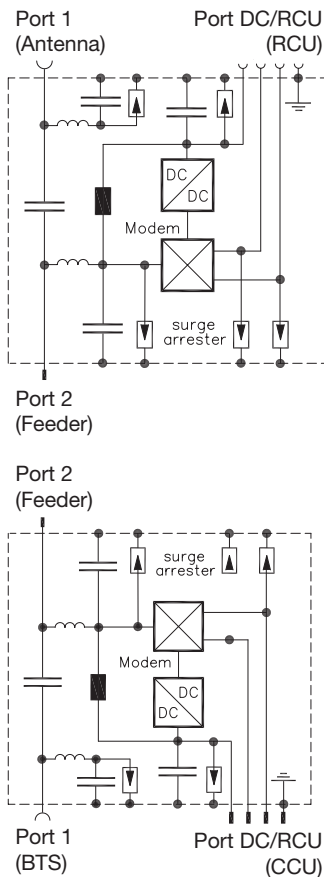
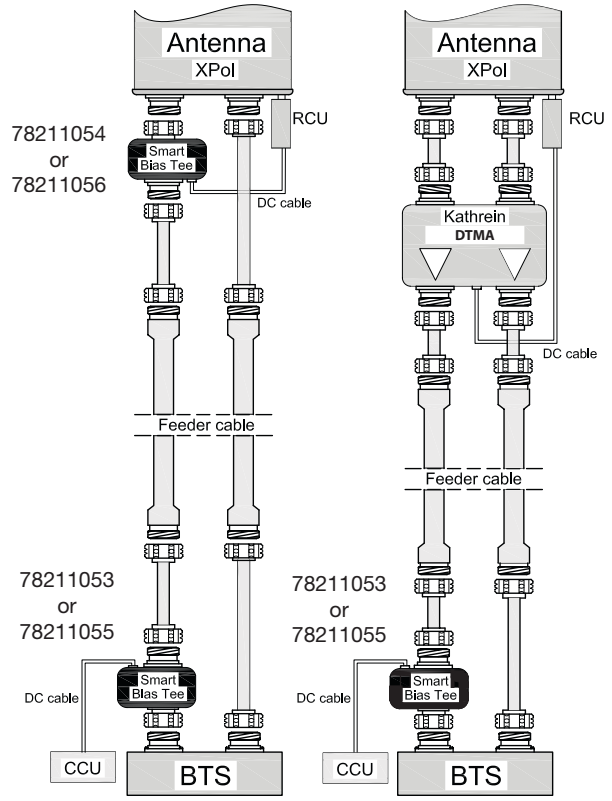
KATHREIN

78211053, -54, -55, -56, -65, -66

Block diagrams:



Application Examples:



Smart Bias Tee 690 – 2700 MHz

KATHREIN



Technical Data

Type No.	78211590 +8 ... +14 VDC / BTS	78211591 +8 ... +14 VDC / Antenna	78211592 +8 ... +32 VDC / BTS	78211593 +8 ... +32 VDC / Antenna
Port 1: 4.3-10 male	BTS	Antenna	BTS	Antenna
Port 2: 4.3-10 female	Feeder	Feeder	Feeder	Feeder
Type No.	78211594 +8 ... +14 VDC / BTS	78211595 +8 ... +14 VDC / Antenna	78211596 +8 ... +32 VDC / BTS	78211597 +8 ... +32 VDC / Antenna
Port 1: 4.3-10 female	BTS	Antenna	BTS	Antenna
Port 2: 4.3-10 male	Feeder	Feeder	Feeder	Feeder
Frequency range [MHz]	690 - 2700			
Insertion loss Port 1 ↔ Port 2 [dB]	< 0.1 (690 - 2700 MHz)			
Isolation for DC and RCU signals Port 1 ↔ Port 2 [dB]	> 70 (DC), > 40 dB 2.176 MHz (AISG signal)			
Port 1 ↔ Port DC/RCU [dB]	> 70			
Port 2 ↔ Port DC/RCU [dB]	> 0			
VSWR	< 1.1 (690 - 2700 MHz)			
Impedance [Ω]	50			
Input power Port 1 or Port 2 [W]	< 500 (690 - 2700 MHz) < 2.5 A / +8 ... +14 VDC		< 500 (690 - 2700 MHz) < 2.5 A / +8 ... +32 VDC	
Power consumption [W]	Typically 0.6			
Lightning protection	3 kA, 10/350 μs pulse			
Intermodulation products [dBc]	< -160 (3 rd order; with 2 x 20 W)			
Temperature range [°C °F]	-40 ... +60 -40 ... +140			
Modem carrier frequency [MHz]	2.176			
Application	Indoor or outdoor (IP 66)			
Weight [kg lb]	0.45 0.99			
Dimensions (w x h x d) [mm in]	81 x 81 x 41.5 3.19 x 3.19 x 1.6			
Packing size (w x h x d) [mm in]	167 x 102 x 86 6.57 x 4.01 x 3.38			

Smart Bias Tee

690 – 2700 MHz

KATHREIN

- **With 4.3-10 connectors**

The **Smart Bias Tee** combines the performance of a standard Bias Tee with the function of an additional modem (AISG standard) in order to provide either DC voltage as well as remote control signals via an RF feeder cable to a TMA or RCU.

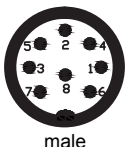
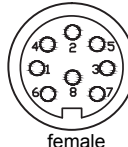
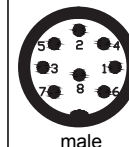
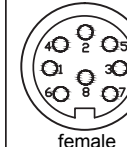
The **Smart Bias Tee** provides low RF signal insertion loss from port 1 to port 2 and vice versa. The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.

- **78211590, 78211594:**
+8 ... 14 VDC (DC on pin1) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable (**only required for TMAs and RCUs with power supply below 15 VDC**)
- **78211591, 78211595:**
+8 ... 14 VDC (DC on pin1) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)
- **78211592, 78211596:**
+8 ... 32 VDC (DC on pin6) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable
- **78211593, 78211597:**
+8 ... 32 VDC (DC on pin6) version for use near the antenna, in order to control an RCU (only required if **no TMA** is in use)

Abbreviations:

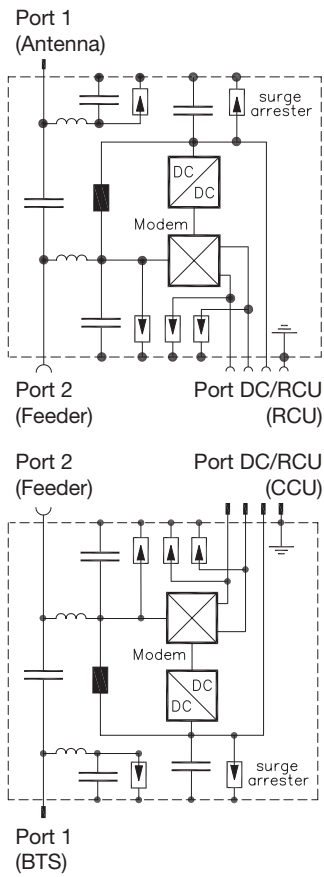
RCU	=	Remote Control Unit for remote electrical control of antenna tilt
BTS	=	Base Transceiver Station
TMA	=	Tower Mounted Amplifier
AISG	=	Antenna Interface Standards Group
Port 1	=	Port for BTS or for Antenna
Port 2	=	Port for Feeder Cable
Port DC/RCU	=	Port for DC voltage and Remote Control Unit signals

Pin connections:

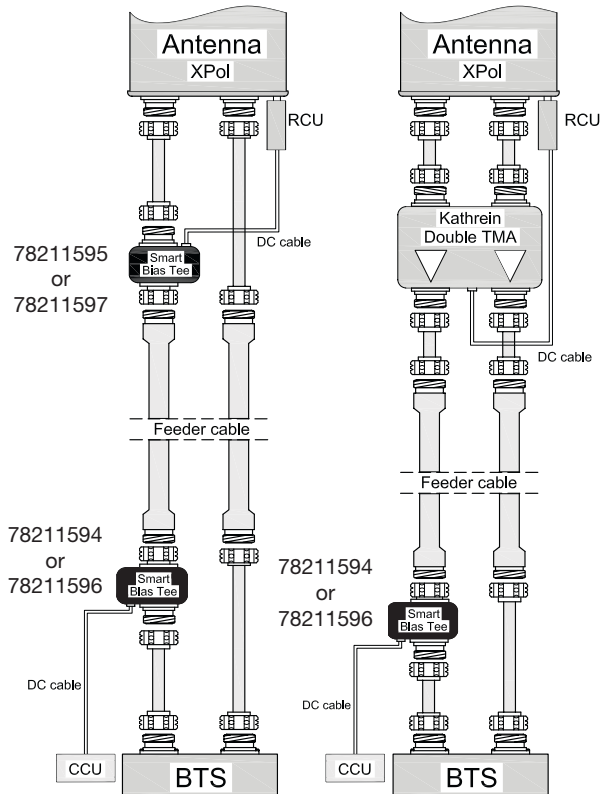
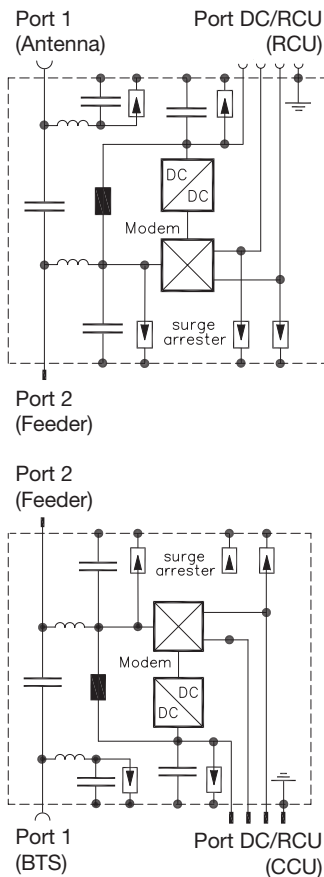
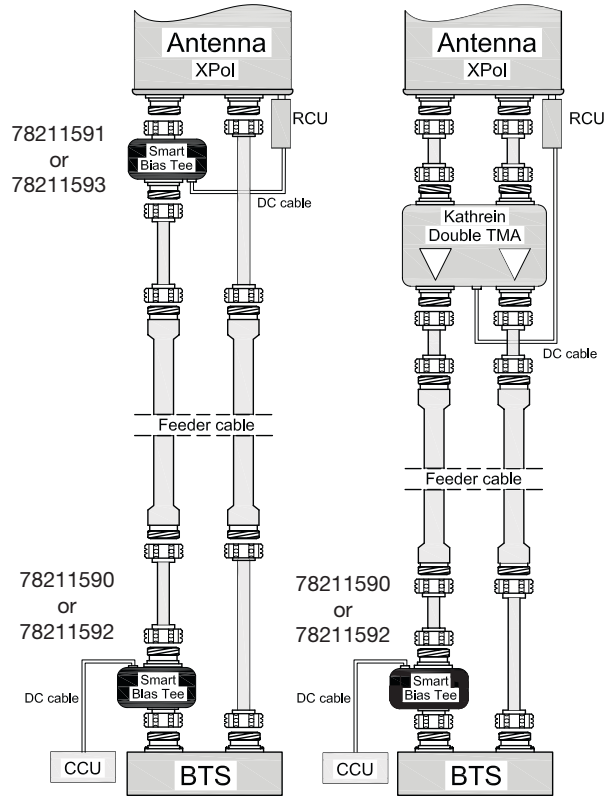
	78211590	78211591	78211592	78211593	
	78211594	78211595	78211596	78211597	
8-pin connector (IEC 60130-9)					
	male	female	male	female	
	Pin 1	+8...+14 VDC in	+8...+14 VDC in	Not connected	Not connected
	Pin 2	Not connected	Not connected	Not connected	Not connected
Pin 3	RS485-B	RS485-B	RS485-B	RS485-B	
Pin 4	Not connected	Not connected	Not connected	Not connected	
Pin 5	RS485-A	RS485-A	RS485-A	RS485-A	
Pin 6	Not connected	Not connected	+8...+32 VDC in	+8...+32 VDC in	
Pin 7	DC return (grounded)	DC return (grounded)	DC return (grounded)	DC return (grounded)	
Pin 8	Not connected	Not connected	Not connected	Not connected	

Smart Bias Tee 690 – 2700 MHz

Block diagrams:



Application Examples:



50-Ohm Load

698 – 2700 MHz

150 W

KATHREIN

- Designed as 50-Ohm termination wherever improved intermodulation performance compared to standard loads is required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in DC stop



Technical Data

Type No.	78210475
Frequency range	698 – 2700 MHz
VSWR	< 1.12
Impedance	50 Ω
Input power	< 150 W
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +55 °C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	Built-in DC stop AISG: Attenuation up to 3 dB when used in a network
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional clamp set (see page 2)
Weight	6 kg
Packing size (w x h x d)	405 x 305 x 195 mm
Dimensions (w x h x d)	235 x 235 x 106.5 mm (without connectors, without mounting brackets)

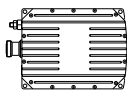
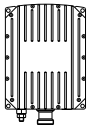
Note:

The RF port connector should always point downwards if mounted outdoors.

The input power rating of 150 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

Max. input power

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	80 W	100 W
+40 °C	110 W	150 W
+25 °C	150 W	180 W

Accessories (order separately)

Type No.	Clamp set suitable for mast diameter of
734360	34 – 60 mm
734361	60 – 80 mm
734362	80 – 100 mm
734363	100 – 120 mm
734364	120 – 140 mm
734365	45 – 125 mm



50-Ohm Load

0 ... 7500 MHz

1.5 ... 10 W

- Standard 50-Ohm terminations for small and medium power
- Suitable for terminating open ports on RF equipment for indoor and/or outdoor applications

1.5 Watt *

Type No.	78410367
Connector	7-16 male
Frequency range [MHz]	0 - 4000
VSWR	0 - 2000 MHz < 1.10 2000 - 4000 MHz < 1.30
Application	Indoor or outdoor (IP65)
Weight [g]	120
Packing size [mm in]	Approx. 50 x 90 x 100 2.0 x 3.5 x 3.9
Dimensions [mm in]	40 / 32 diameter 1.6 / 1.3 diameter



78410367

2.0 Watt *

Type No.	K6226111
Connector	N male
Frequency range [MHz]	0 - 2700
VSWR	0 - 1000 MHz < 1.08 1000 - 2000 MHz < 1.15 2000 - 2700 MHz < 1.20
Application	Indoor
Weight [g]	40
Packing size [mm in]	90 x 60 x 25 3.5 x 2.4 x 1.0
Dimensions [mm in]	33 / 21 diameter 1.3 / 0.8 diameter



K6226111

2.0 Watt *

Type No.	78210484
Connector	4.3-10 male
Frequency range [MHz]	0 - 7500
VSWR	0 - 1000 MHz < 1.07 1000 - 2500 MHz < 1.11 2500 - 7500 MHz < 1.20
Application	Indoor or outdoor
Weight [g lb]	70 0.15
Packing size [mm in]	90 x 60 x 25 3.5 x 2.4 x 1.0
Dimensions [mm in]	30.5 / 26.7 diameter 1.2 / 1.1 diameter



78210484

10 Watt *

Type No.	K6226411
Connector	N male
Frequency range [MHz]	0 - 2700
VSWR	0 - 1000 MHz < 1.08 1000 - 2000 MHz < 1.15 2000 - 2700 MHz < 1.20
Application	Indoor
Weight [g]	Approx. 250
Packing size [mm in]	50 x 90 x 100 2.0 x 3.5 x 3.9
Dimensions [mm in]	40 x 82 x 85 1.6 x 3.2 x 3.3 (including connector)



K6226411

50-Ohm Load

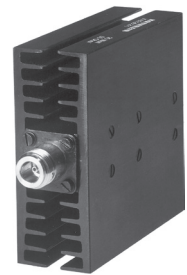
0 ... 2700 MHz

25 ... 100 W

KATHREIN

25 Watt *

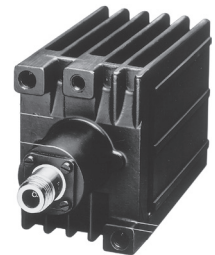
Type No.	K6226217
Connector	7-16 male
Frequency range	0 - 2700 MHz
VSWR	< 1.08
0 - 1000 MHz	< 1.15
1000 - 2000 MHz	< 1.20
2000 - 2700 MHz	< 1.20
Application	Indoor
Weight	Approx. 0.5 kg
Packing size	50 x 100 x 135 mm
Dimensions (w x h x d)	35 x 94 x 124 mm (incl. connector)



K6226201

50 Watt *

Type No.	K6226301	K6226311	K6226307	K6226317
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 - 2700 MHz			
VSWR	< 1.08			
0 - 1000 MHz	< 1.15			
1000 - 2000 MHz	< 1.20			
2000 - 2700 MHz	< 1.20			
Application	Indoor			
Weight	Approx. 0.8 kg			
Packing size	80 x 95 x 145 mm			
Dimensions (w x h x d)	67 x 90 x 130 mm (incl. connector)	67 x 90 x 138 mm (incl. connector)	67 x 90 x 134 mm (incl. connector)	67 x 90 x 133 mm (incl. connector)



K6226301

100 Watt *

Type No.	K6226507
Connector	7-16 female
Frequency range	0 - 1000 MHz
VSWR	< 1.08
0 - 1000 MHz	< 1.08
Application	Indoor
Weight	Approx. 2.4 kg
Packing size	130 x 195 x 180 mm
Dimensions (w x h x d)	114 x 170 x 156 mm (including connector)



K6226501

* Rated power at 40 °C ambient temperature. The max. power rating increases or decreases with falling or rising ambient temperature.

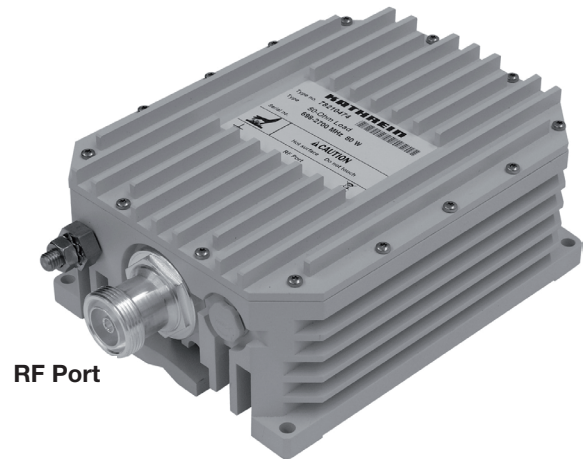
Note: The 50-Ohm load, type 782010474, should be used if intermodulation requirements are of high priority.

50-Ohm Load

698 – 2700 MHz

80 W

- Designed as 50-Ohm termination wherever improved intermodulation performance compared to standard loads is required
- **Excellent intermodulation performance**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Built-in DC stop



RF Port

Technical Data

Type No.	78210474
Frequency range	698 - 2700 MHz
VSWR	< 1.12
Impedance	50 Ω
Input power	< 80 W (see table)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +55 °C
Connector	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency	Built-in DC stop AISG: Attenuation up to 3 dB when used in a network
Mounting	Wall mounting: With 4 screws (max. 6.5 mm diameter) Mast mounting: With additional Clamp set (see data sheet)
Weight	3.1 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 216 x 79.2 mm (including connector)

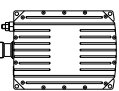
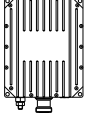
Note:

The RF port connector should always point downwards if mounted outdoors.

The input power rating of 80 W is specified at an ambient temperature of +40 °C with the combiner mounted vertically, without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

The max. power rating increases or decreases with falling or rising ambient temperature and depending on horizontal or vertical mounting in accordance with the following table:

Max. input power

	Mounted horizontally	Mounted vertically
Max. ambient temperature		
+55 °C	50 W	60 W
+40 °C	70 W	80 W
+25 °C	90 W	100 W

Attenuator

10 – 15 W

0 – 4000 MHz

KATHREIN

Air-cooled attenuator for medium power rating

- Signal attenuation for test, measuring or tuning purposes
- Good matching over large frequency range
- Closed metal housing, very stable and RF proof
- Free choice of mounting position due to convection-cooling



Technical Data

Type No.		791918	791919	791920	791921
Attenuation	[dB]	3 ±0.3	6 ±0.3	10 ±0.3	20 ±0.5
Max. power	[W]	15	12	10	10
Frequency range	[MHz]	0 - 4000			
VSWR		< 1.15			
Impedance	[Ω]	50			
Connectors		N			
IP rating		IP65			
Application		Outdoor			
Weight	[g lb]	70 0.15			
Dimensions (L x diameter)	[mm in]	50 x 26 1.97 x 1.02			

Air-Cooled attenuator for medium power rating

- Signal attenuation for test, measuring or tuning purposes
- Good matching over large frequency range
- Closed metall housing, very stable and RF proof
- Free choise of mounting position due to convection-cooling



Technical Data

Type No.		78210891	78210892	78210893	78210894
Attenuation	[dB]	3 ±0.3	6 ±0.3	10 ±0.3	20 ±0.3
Max. power	[W]	15	15	15	15
Frequency range	[MHz]	0 – 4000			
VSWR		< 1.15			
Impdance	[Ω]	50			
Connectors		4.3 – 10			
IP rating		IP65			
Application		Outdoor			
Weight	[g lb]	100 0.22			
Dimensions (L x diameter)	[mm in]	61 x 39.8 2.40 x 1.56			

Type No.	Clamp set suitable for mast diameter of
734360	34 - 60 mm
734361	60 - 80 mm
734362	80 - 100 mm
734363	100 - 120 mm
734364	120 - 140 mm
734365	45 - 125 mm



DTMAs:

Description	Type No.	Frequency range	Connector type (female)	Gain	Page
DTMA-700-12-AISG CWA	78210872V01	UL: 698 - 716 / DL: 728 - 746 MHz	7-16	12 dB	474
DTMA-APT700-12-AISG-CWA	78211275	UL: 703 - 748 / DL: 758 - 803 MHz	7-16	12 dB	475
DTMA-800-12-AISG	78210430	UL: 832 - 862 / DL: 791 - 821 MHz	7-16	12 dB	476
DTMA-800-900-12-AISG-CWA	78210510V01	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	7-16	12 dB	477, 478
DTMA-800-900-12-AISG-CWA	78210511V01	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	7-16	12 dB	477, 478
DTMA-800-900-12-AISG	78210512	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	7-16	12 dB	479, 480
DTMA-800-900-12-AISG-D	78210517	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	7-16	12 dB	481, 482
DTMA-800-900-12-AISG-D	78210517V02	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	7-16	12 dB	481, 482
DTMA-900-12-AISG-CWA	78210495	UL: 880 - 915 / DL: 925 - 960 MHz	7-16	12 dB	483
DTMA-1800-12-AISG	78210581	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	7-16	12 dB	484
DTMA-1800-12-AISG-CWA	78210583	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	7-16	12 dB	485
DTMA-1800-UMTS-12-AISG-CWA	78211103V01	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	7-16	12 dB	486, 487
DTMA-1800-UMTS-12-AISG	78211106V01	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	7-16	12 dB	488, 489
DTMA-1800-UMTS-12-AISG	78211106V02	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	7-16	12 dB	488, 489
DTMA-1800-UMTS-12-AISG-D	78210990	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	7-16	12 dB	490, 491
DTMA-AWS4-12-AISG-CWA	78210877V01	UL: 1695 - 1780 / DL: 2095 - 2200 MHz	7-16	12 dB	492
DTMA-1900-AWS4-12-AISG-CWA	78210863V04	UL: 1695 - 1915 / DL: 1930 - 2200 MHz	4.3-10	12 dB	493, 494
DTMA-1900-AWS4-12-AISG-CWA	78210864V04	UL: 1695 - 1915 / DL: 1930 - 2200 MHz	4.3-10	12 dB	493, 494
DTMA-1900-AWS-BYP400t1000-12-AISG-CWA-Y	78211273V01	UL: 1695 - 1915 / DL: 1930 - 2180 MHz	7-16	12 dB	495, 496
DTMA-1900-AWS4BYP400t1000-12-AISG-CWA-Y	78211273V04	UL: 1695 - 1915 / DL: 1930 - 2200 MHz	4.3-10	12 dB	497, 498
DTMA-1900-AWS4BYP400t1000-12-AISG-CWA-Y	78211374V04	UL: 1695 - 1915 / DL: 1930 - 2200 MHz	4.3-10	12 dB	497, 498
DTMA-UMTS-12-AISG	78211145	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	7-16	12 dB	499
DTMA-UMTS-12-AISG-CWA	78211245	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	7-16	12 dB	500
DTMA-UMTS-BYP1800-12-AISG-CWA	78211102	UL: 1920 - 1980 / DL: 2110 - 2170 MHz Bypass: 1710 - 1880	7-16	12 dB	501, 502
DTMA-2600-12-AISG	78210860	UL: 2500 - 2570 / DL: 2620 - 2690 MHz	7-16	12 dB	503
DTMA-2600-12-AISG	78211330	UL: 2500 - 2570 / DL: 2620 - 2690 MHz	7-16	12 dB	504
DTMA-1800-2600-12-AISG	78211332	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	505, 506
DTMA-1800-2600-12-AISG	78211333	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 2500 - 2570 / DL: 2620 - 2690 MHz	4.3-10	12 dB	505, 506

New Products

UL = Uplink / DL = Downlink

Summary of DTMA Types

Frequency Combinations and Alarming overview

Frequency/MHz	Lower 700 (B12)		APT700 (B28)		DD800 (B20)		CLR850 (B5)		GSM900 (B8)		DCS1800 (B3)		eAWS (B10)		AWS4 (B66)		ePCS1900 (B25)		UMTS2100 (B1)		LTE2600 (B7)				
	RF-Bypass	AISG*	Low CWA	High CWA	RF-Bypass	AISG*	Low CWA	High CWA	RF-Bypass	AISG*	Low CWA	High CWA	RF-Bypass	AISG*	Low CWA	High CWA	RF-Bypass	AISG*	Low CWA	High CWA	RF-Bypass	AISG*	Low CWA	High CWA	
	Connector Typ	Housing Style	2 Antenna Outputs	4 Antenna Outputs																					
78210872V01	7-16	SU	•																						
78211275	7-16	SU		•																					
78210430	7-16	SU	•																						
78210510V01	7-16	SU	•																						
78210511V01	7-16	SU	•																						
78210512	7-16	SU	•																						
78210517 / V02	7-16	SU		•																					
78210495	7-16	SU	•																						
78210581	7-16	SU	•																						
78210583	7-16	SU	•																						
78211103V01	7-16	SU	•																						
78211106V01 / V02	7-16	SU	•																						
78210990	7-16	SU		•																					
78210877V01	7-16	SU	•																						
78210863V04	4.3-10	SU	•																						
78210864V04	4.3-10	DU	•																						
78211273V01	7-16	SU		•																					
78211273V04	4.3-10	SU		•																					
78211374V04	4.3-10	DU		•																					
78211145	7-16	SU	•																						
78211245	7-16	SU	•																						
78211102	7-16	SU	•																						
78210860	7-16	SU	•																						
78211330	7-16	SU	•																						
78211332	4.3-10	SU	•																						
78211333	4.3-10	DU	•																						

• = default; ; SU = Single Unit; DU = Double Unit
 ◦ = new Feature coming soon
 * = AISG2.0 (default) & AISG1.1 (optional)
 Low CWA (Current Window Alarm) = 170 - 200mA; High CWA (Current Window Alarm) = 230 - 295mA
 SU = Single Unit; DU = Double Unit

DTMA Modes

The communication between the base station (BTS) and the DTMA can vary depending on the BTS. To meet the customers' needs, Kathrein has incorporated different communication modes in the DTMA. These modes are only of relevance if multi-band DTMA are used (i.e. more than one band is amplified within one DTMA).

Existing Modes:

The modes are exemplified with demonstrated using the DTMA type 78210517 – multi-band DTMA for 800 + 900 MHz

1. Single Band Mode

- In case the DTMA functionality is controlled by the BTS separately (i.e. each BTS controls one band)
- The DTMA behaves as two single TMAs, each BTS has the control over one TMA (2 AISG signal and DC paths)
- There is one address per band

	BTS 1 (800)	BTS 2 (900)
AISG control	x	x
Address	Serial No. + “_0.8”	Serial No. + “_0.9”

2. Wideband Mode

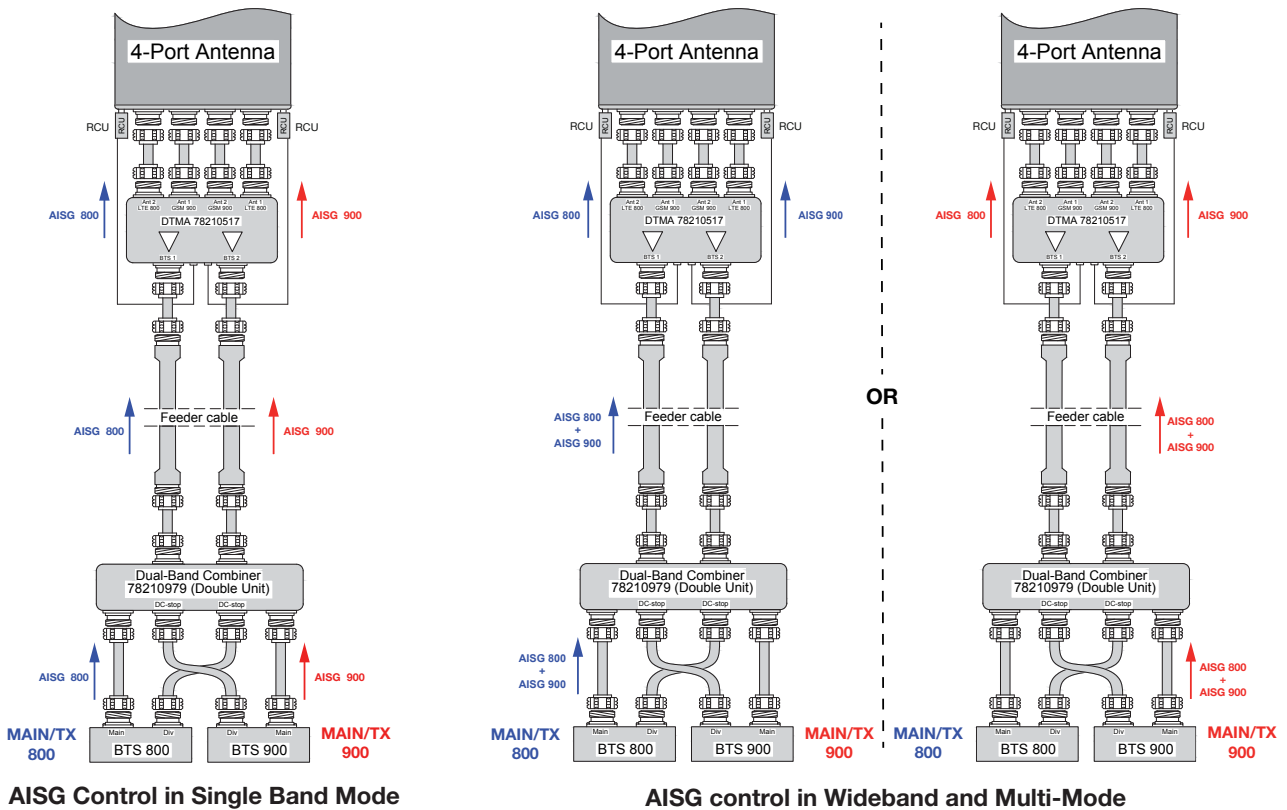
- In case one BTS controls the overall DTMA functionality
- There is one address for the complete DTMA

	BTS 1 (800)	BTS 2 (900)
AISG control	x	
Address	Serial No. + “_WBM_1”	
OR		
AISG control		x
Address		Serial No. + “_0.9”

3. Multi-Mode

- In case one BTS controls the overall DTMA functionality
- There is one address per band

	BTS 1 (800)	BTS 2 (900)
AISG control	x	
Address	(1) Serial No. + “_0.8_1” (2) Serial No. + “_0.9_1”	
OR		
AISG control		x
Address		(1) Serial No. + “_0.8_1” (2) Serial No. + “_0.9_1”



The correct mode of the DTMA needs to be selected based on the according BTS addressing behavior. The standard modes of all DTMA's can be found in the table below. Please ask for different standard modes ex-factory.

The indicated modes can also be switched by inserting a vendor specific switching command into the AISG additional data field "Installation Date" via a software download file provided by Kathrein. For further information, please contact your local Kathrein support.

Modes Overview of DTMA's:

DTMA	Single-Band	Multi-Band	Wide-Band
78211103	-	•	-
78210510V01	-	○	•
78210511V01	-	○	•
78210517V02	○	○	•
78211106V02	○	○	•
78210512	•	○	-
78210517	•	○	○
78210990	•	○	○
78211332	•	○	○
78211333	•	○	○
78210863V04	•	-	-
78210864V04	•	-	-
78211106V01	•	○	○
78211273V01	•	-	-
78211273V04	•	-	-
78211374V04	•	-	-

- Standard Mode
- Available on Request
- Not available

DTMA-700-12-AISG-CWA

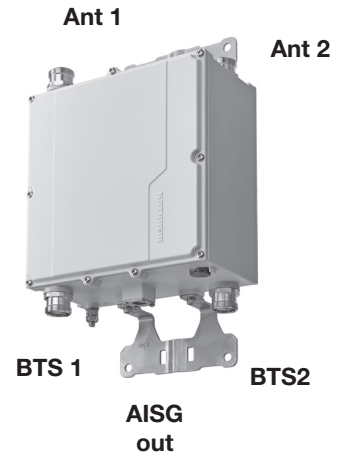
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- For lower SMH block A/B/C
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low Inrush Current
- ATSC attenuation



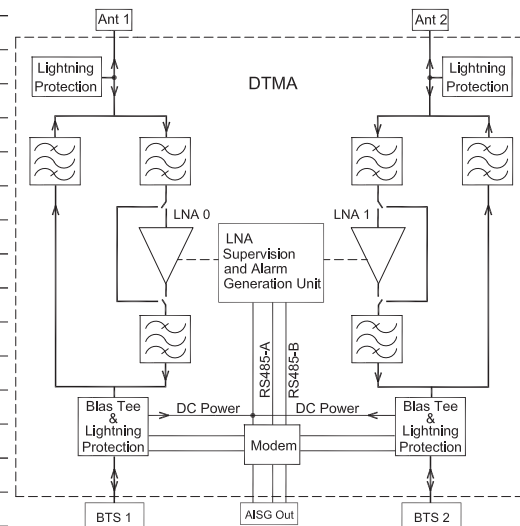
AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm



Technical Data

Type No.	78210872V01	
	DTMA-700-12-AISG-CWA	
	clamps included	
Tx Characteristics		
Frequency range	[MHz]	728 – 746
Insertion loss	[dB]	Typically 0.45
Input power (per input)	[kW]	< 0.2 (+53 dBm)/1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43)
Return loss	[dB]	> 18
Rx Characteristics		
Frequency range	[MHz]	698 – 716
Loss in bypass mode	[dB]	Typically 1.5 (DC OFF)
Return loss	[dB]	> 18 (DC ON) / > 16 (DC OFF)
Gain		12 dB nominal
Noise figure	[dB]	Typically 1.6
3 rd order intercept point (OIP3)	[dBm]	Typically 25
ATSC attenuation	[dB]	> 30 (< 692 MHz)
Environmental Characteristics		
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149
IP rating		IP67
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
	CWA Mode	AISG Mode
DC supply	[V DC]	10 – 19
Operating current	[mA]	90 – 130
Alarm management	[mA]	Nom. 150 at 12 V
		170 – 200
		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	[kg lb]	8.0 17.64
Dimensions (w x h x d)	[mm in]	220 x 220 x 126 8.66 x 8.66 x 4.96 (without connectors, without mounting brackets)

* see note on data sheet



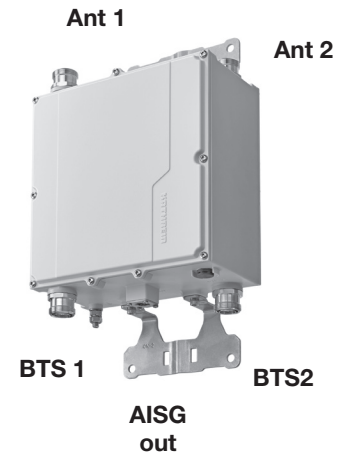
DTMA-APT700-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- For APT 700 MHz (Band 28) with DVB-T suppression
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable



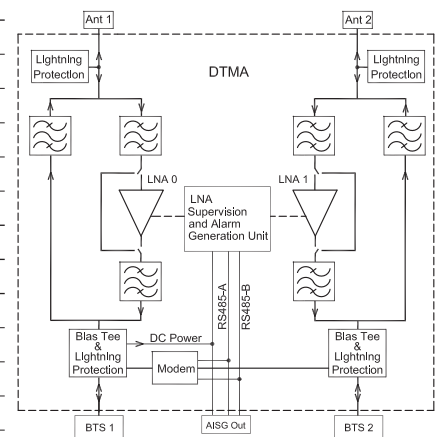
AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm



Technical Data

Type No.	78211275 DTMA-APT700-12-AISG-CWA (12 dB gain)	
Tx Characteristics		
Frequency range	[MHz]	758 – 803
Insertion loss	[dB]	Typically 0.45
Input power (per input)	[W]	< 100 (+50 dBm)
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43 dBm)
Return loss	[dB]	> 18
Rx Characteristics		
Frequency range	[MHz]	703 – 748
Loss in bypass mode	[dB]	Typically 1.6 (DC OFF)
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.3
3 rd order intercept point (OIP3)	[dBm]	Typically 25
DVB-T attenuation	[dB]	> 30 (< 698 MHz)
Environmental Characteristics		
Operating temperature range	[°C F]	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 301 342-3
DC and Alarm Characteristics		
	CWA Mode	AISG Mode
DC supply	[V]	9 – 19
Operating current per TMA	[mA]	80 – 130
Alarm management	[mA]	170 – 200
		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	[mm in]	Wall mounting: With 4 screws (max. diameter 8 0.31) Mast mounting: With additional clamp set
Weight	[kg lb]	8.8 19.40
Dimensions (w x h x d)	[mm in]	220 x 220 x 126 8.66 x 8.66 x 4.96 (without connectors, without mounting brackets)

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-800-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Compact line
- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

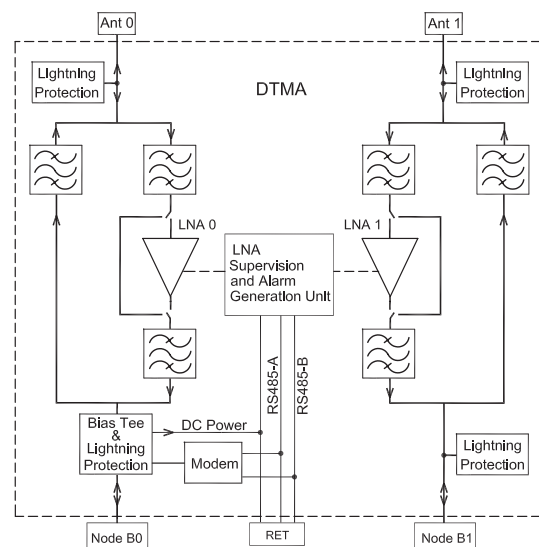


AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	78210430 DTMA-800-12-AISG
Tx Characteristics	
Frequency range	791 - 821 MHz
Insertion loss	Typically 0.25 dB
Ripple	< 0.3 dB
Input power (per input)	< 100 W (+50 dBm) CW
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	832 - 862 MHz
Loss in by-pass mode	Typically 2.0 dB
Return loss	> 16 dB (DC ON)
Gain	12 dB nominal
Noise figure	Typically 1.2 dB
3 rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	
DC supply	10 - 30 V
Operating current per DTMA (without RET)	Nom. 155 mA at 10 V Nom. 60 mA at 30 V
Alarm management	AISG
Mechanical Characteristics	
Material	Aluminium housing
Connectors RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	6.2 kg
Packing size	250 x 450 x 210 mm
Dimensions (w x h x d)	176 x 246.6 x 103.6 mm (without connectors, without mounting brackets)

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-800-900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Supports CWA, Multi-Band and Wide-Band Mode (default)
- DC supply via BTS1, BTS2 or both
- Built-in lightning protection

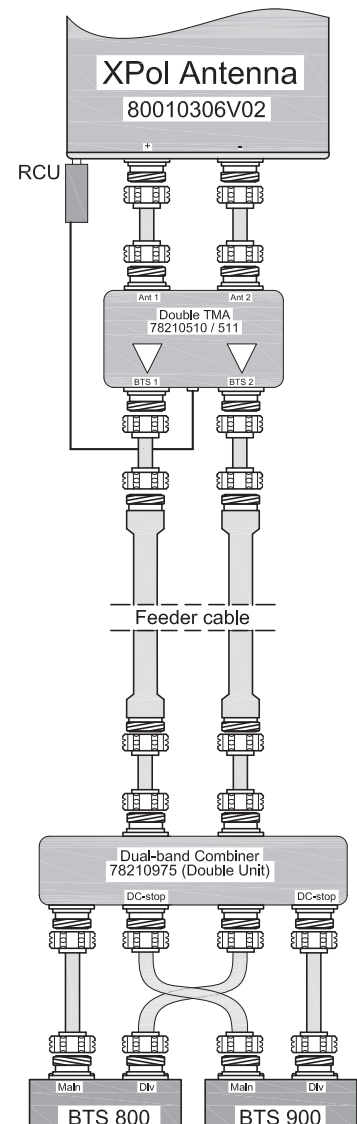


AISG = Antenna Interface Standards Group
CWA = Current Window Alarm
RET = Remote Electrical Tilt

Technical Data

Type No.	CWA alarm 170 – 200 mA	78210510v01 DTMA-800-900-12-AISG-CWA
	CWA alarm 230 – 295 mA	78210511v01 DTMA-800-900-12-AISG-CWA
800 MHz Tx Characteristics		
Frequency range	MHz	791 – 821
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18
800 MHz Rx Characteristics		
Frequency range	MHz	832 – 862
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 14 (DC OFF)
Gain	dB	12 nominal
Noise figure	dB	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25
900 MHz Tx Characteristics		
Frequency range	MHz	925 – 960
Insertion loss	dB	Typically 0.5
Input power (per input and frequency band)	kW	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	dBm	< -117 (2 Tx carriers at +43 dBm)
Return loss	dB	> 18
900 MHz Rx Characteristics		
Frequency range	MHz	880 – 915
Loss in bypass mode	dB	Typically 2.0
Return loss	dB	> 18 (DC ON) / > 14 (DC OFF)
Gain	dB	12 nominal
Noise figure	dBm	Typically 1.5
3 rd order intercept point (OIP3)	dBm	Typically 25

Connector Configuration



DTMAS

DTMA-800-900-12-AISG-CWA

KATHREIN

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

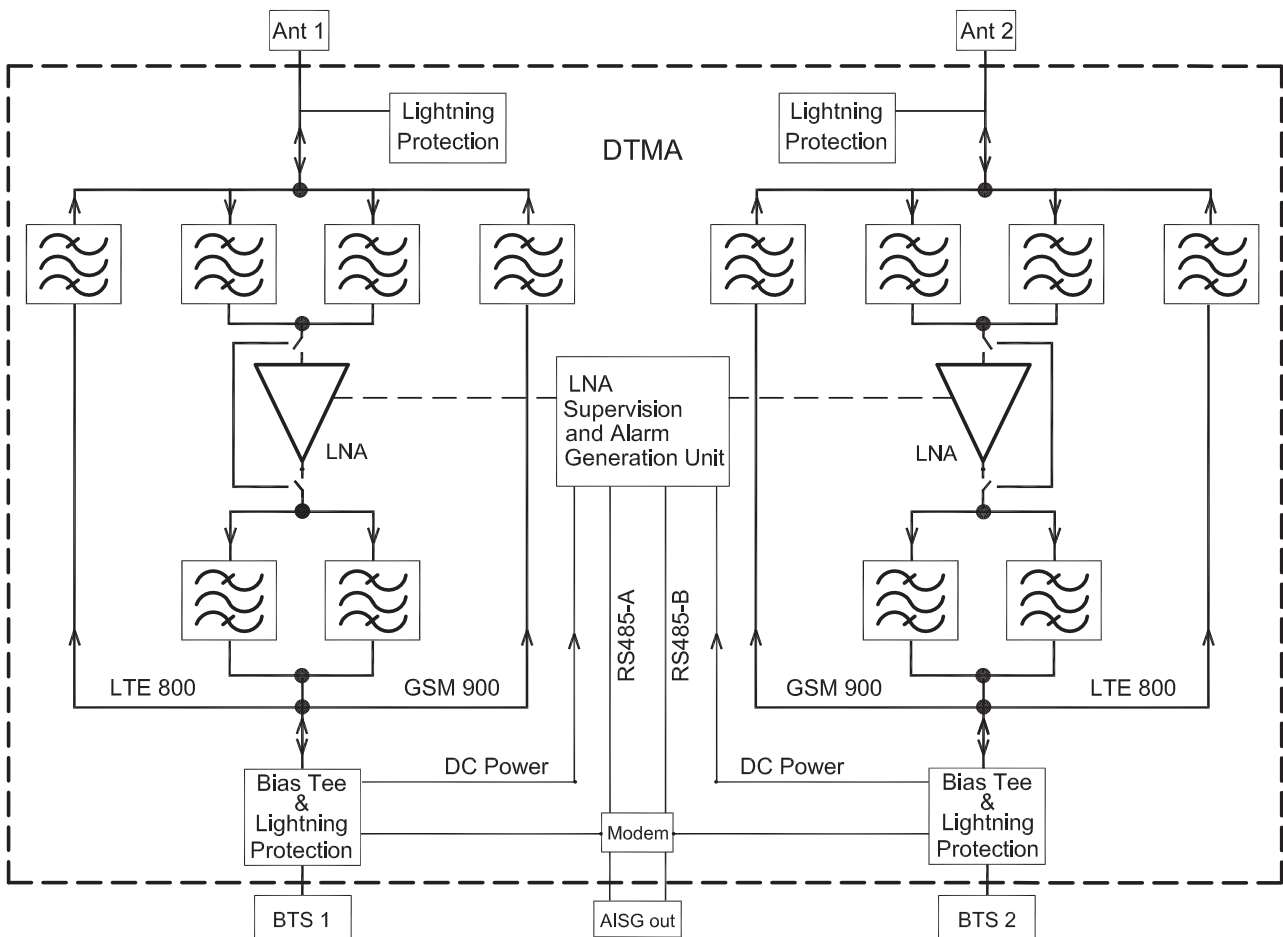
78210510V01 / 78210511V01



Environmental Characteristics			
Operating temperature range	°C °F	-40 ... +65 -40 ... +149	
IP rating		IP 67*	
MTBF	hours	> 1 000 000 (per TMA)	
EMC		According to ETS 300 342-3	
Lightning protection	kA	3, 10/350 µs pulse	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	V DC	9 – 19	9 – 31
Operating current (without RET)		80 – 120 mA	Nom. 300 mA at 10 V Nom. 100 mA at 30 V
Alarm management	mA	78210510V01: 170 – 200 78210511V01: 230 – 295	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	kg lb	11 24.3	
Packing size	mm in	385 x 310 x 235 15.2 x 12.2 x 9.3	
Dimensions (w x h x d)	mm in	230 x 245 x 155 9.1 x 9.6 x 6.1 (without connectors, without mounting brackets)	

* see note on data sheet

Block diagram



DTMA-800-900-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

Technical Data

Type No.	78210512 DTMA-800-900-12-AISG
800 MHz Tx Characteristics	
Frequency range	791 - 821 MHz
Insertion loss	Typically 0.5 dB
Input power (per input and frequency band)	< 180 W (+52.5 dBm) / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
800 MHz Rx Characteristics	
Frequency range	832 - 862 MHz
Loss in bypass mode	Typically 2.0 dB
Return loss	> 18 dB (DC ON) / > 14 dB (DC OFF)
Gain	12 dB nominal
Noise figure	Typically 1.5 dB
3 rd order intercept point (OIP3)	Typically 25 dBm
900 MHz Tx Characteristics	
Frequency range	925 - 960 MHz
Insertion loss	Typically 0.5 dB
Input power (per input and frequency band)	< 180 W (+52.5 dBm) / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
900 MHz Rx Characteristics	
Frequency range	880 - 915 MHz
Loss in bypass mode	Typically 2.0 dB
Return loss	> 18 dB (DC ON) / > 14 dB (DC OFF)
Gain	12 dB nominal
Noise figure	Typically 1.5 dB
3 rd order intercept point (OIP3)	Typically 25 dBm

DTMA-800-900-12-AISG

KATHREIN

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

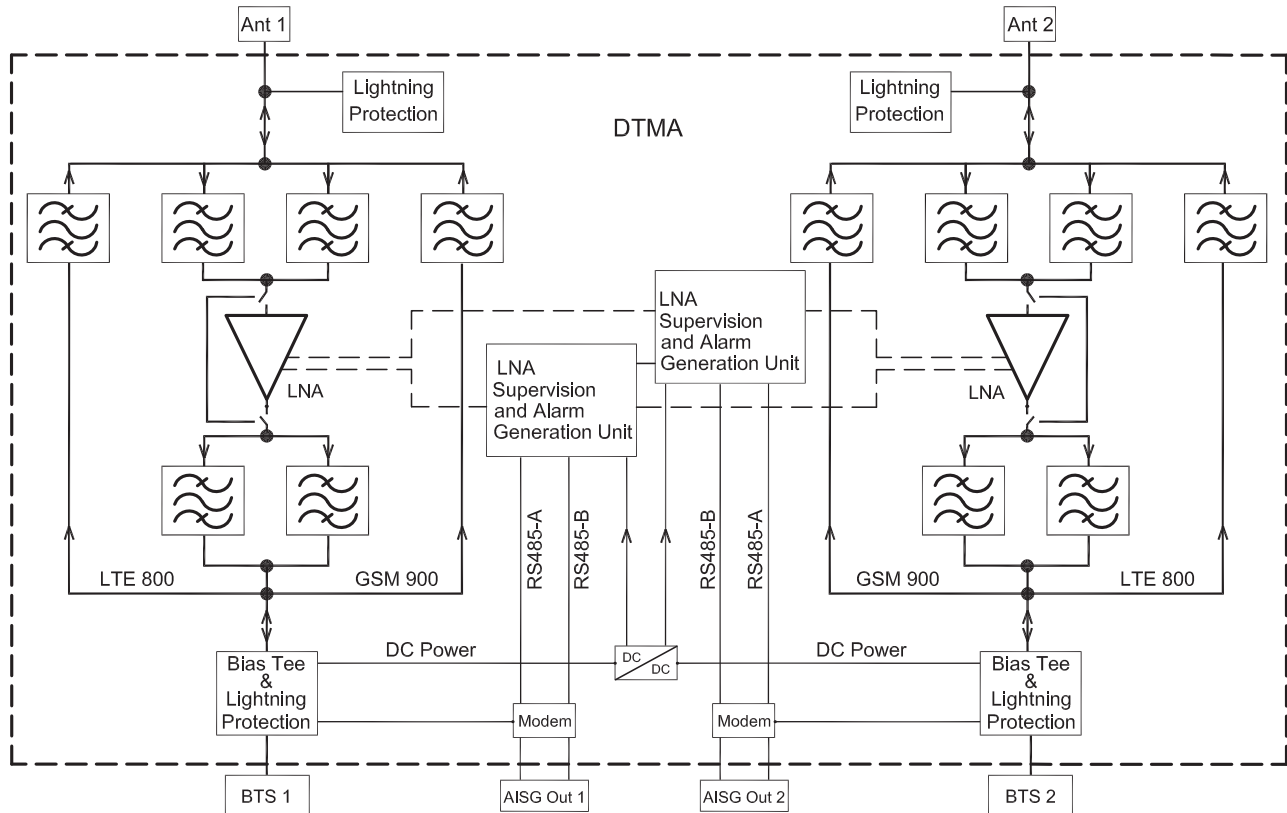
78210512



Environmental Characteristics	
Operating temperature range	-40 ... +65 °C
IP rating	IP67 ¹⁾
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
Lightning protection	3 kA, 10/350 µs pulse
DC and Alarm Characteristics	
AISG Mode	
DC supply	9 - 31 V DC
Operating current per DTMA (without RET)	Nom. 300 mA at 10 V Nom. 100 mA at 30 V
Alarm management	AISG*
Mechanical Characteristics	
Material	Aluminium housing
Connectors	RF AISG out
	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	11 kg
Dimensions (w x h x d)	230 x 245 x 155 mm (without connectors, without mounting brackets)

* See note on data sheet

Block diagram



- Clamp set

(type no. **734360 - 734365**)

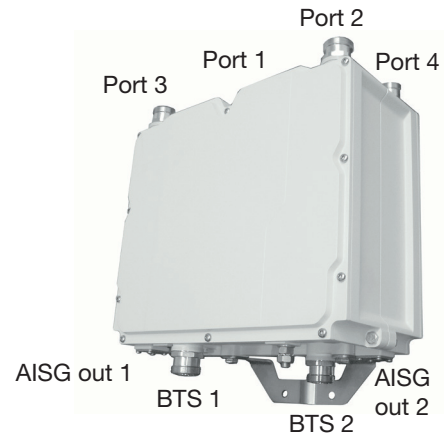
(order separately) can be found in the section "System Components".

DTMA-800-900-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XXPoI antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Supports Multi-Band, Wide-Band (configuration 1 ... 6) and Single-Band Mode (configuration 7, 8 or 9)
- DC supply via BTS 1, BTS 2 or both
- Built-in lightning protection
- Low inrush current
- Auto-Select feature for Multi-Band and Wide-Band Mode

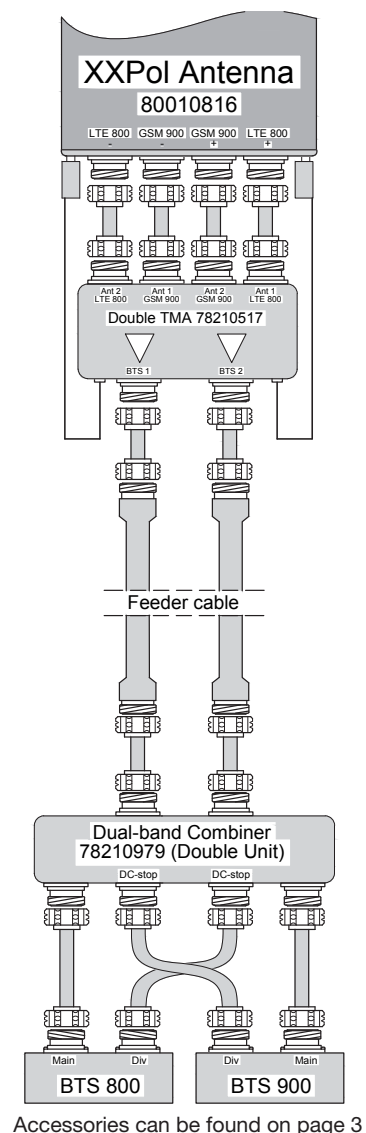


AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78210517 DTMA-800-900-12-AISG-D
	Wide-Band Mode	78210517V02 DTMA-800-900-12-AISG-D
800 MHz Tx Characteristics		
Frequency range	[MHz]	791 – 821
Insertion loss	[dB]	Typically 0.4
Input power (per input)	[kW]	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	[dBm]	< -116 (2 Tx carriers at +43)
Return loss	[dB]	> 18
800 MHz Rx Characteristics		
Frequency range	[MHz]	832 – 862
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.5
3 rd order intercept point (OIP3)	[dBm]	Typically 25
900 MHz Tx Characteristics		
Frequency range	[MHz]	925 – 960
Insertion loss	[dB]	Typically 0.4
Input power (per input)	[kW]	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	[dBm]	< -116 (2 Tx carriers at +43)
Return loss	[dB]	> 18
900 MHz Rx Characteristics		
Frequency range	[MHz]	880 – 915
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.5
3 rd order intercept point (OIP3)	[dBm]	Typically 25

Connector Configuration



DTMAS

DTMA-800-900-12-AISG-D

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Fullband Double Dual Duplex Tower Mounted Amplifier

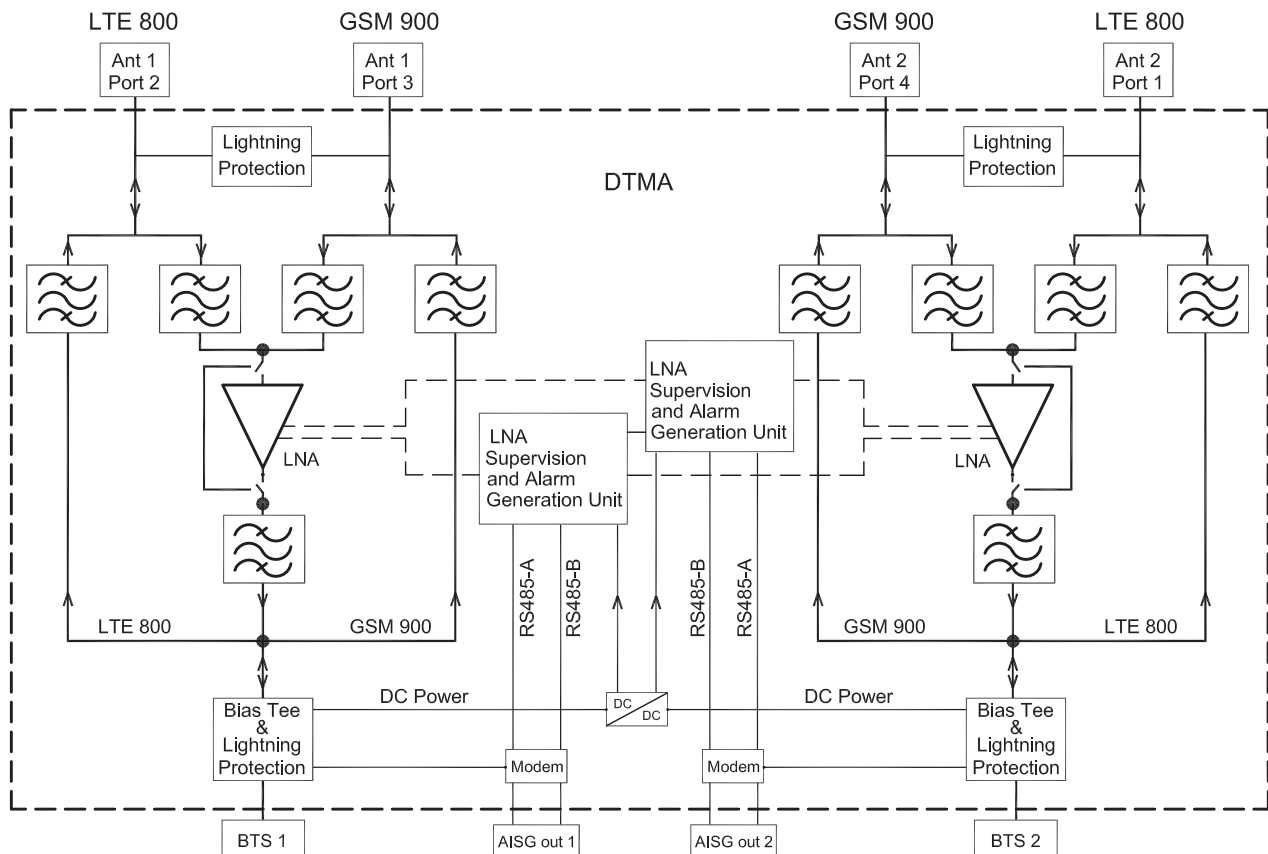
(Masthead Amplifier)

78210517, 78210517V02



Environmental Characteristics		
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149
IP rating		IP67
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
Lightning protection	[kA]	3, 10/350 µs pulse
DC and Alarm Characteristics		AISG Mode
DC supply	[V DC]	10 – 30
Operating current per DTMA (without RET)	[mA]	Nom. 190 at 10 V
	[mA]	Nom. 70 at 30 V
Alarm management		AISG
Mechanical Characteristics		
Material		Aluminium housing
Connectors RF		7-16 female (long neck)
AISG		8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 9 – 31 V DC, pin 7: DC return, other pins: Not connected)
Mounting		Wall mounting: With 4 screws (max. 8 mm 0.315 diameter) Mast mounting: With additional clamps
Weight	[kg lb]	11 24.25
Packing size	[mm in]	440 x 380 x 255 17.3 x 15 x 10
Dimensions (w x h x d)	[mm in]	300 x 258 x 147 11.8 x 10.15 x 5.78 (without connectors, without mounting brackets)

Block diagram



DTMA-900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

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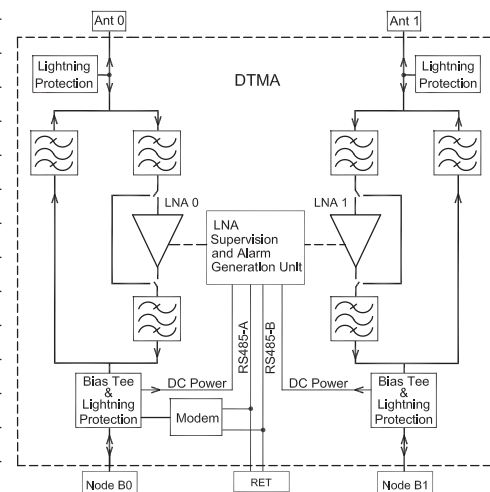
- **Compact line**
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable
- CWA and AISG configuration



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm

Technical Data

Type No.	78210495 DTMA-900-12-AISG-CWA	
Tx Characteristics		
Frequency range	925 - 960 MHz	
Insertion loss	Typically 0.5 dB	
Input power (per input)	< 100 W (+50 dBm) / < 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	880 - 915 MHz	
Loss in bypass mode	Typically 1.8 dB	
Return loss	> 16 dB (DC ON) / > 12 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.5 dB	
3 rd order intercept point (OIP3)	Typically 30 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +55 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics		
	CWA Mode	AISG Mode
DC supply	9 - 19 V DC	10 - 30 V DC
Operating current per DTMA (without RET)	80 - 120 mA	Nom. 155 mA at 10 V Nom. 63 mA at 30 V
Alarm management	170 - 200 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF	7-16 female (long neck)
	AISG	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	6.2 kg	
Packing size	270 x 495 x 190 mm	
Dimensions (w x h x d)	185 x 265 x 105 mm (without connectors, without mounting brackets)	



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

* see note on data sheet

DTMA-1800-12-AISG

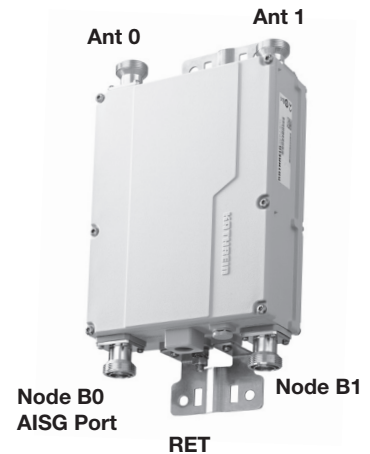
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Compact line
- Double units for easy use with XPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable



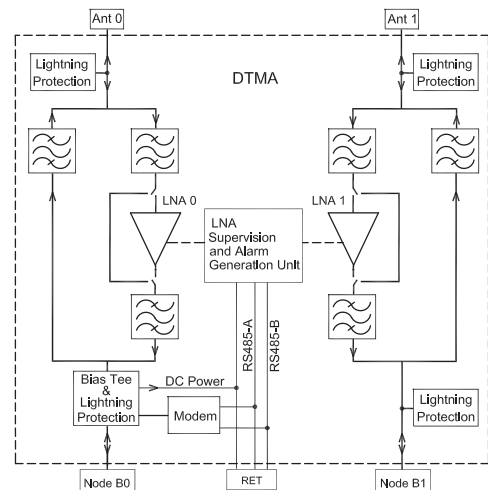
RET = Remote Electrical Tilt
AISG = Antenna Interface Standards Group



Technical Data

Type No.	78210581 DTMA-1800-12-AISG
Tx Characteristics	
Frequency range	1805 - 1880 MHz
Insertion loss	Typically 0.25 dB
Input power (per input)	< 200 W (+53 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	1710 - 1785 MHz
Loss in bypass mode	Typically 1.7 dB
Return loss	> 16 dB (DC ON) / > 12 dB (DC OFF)
Gain	12 dB nominal
Noise figure	Typically 1.0 dB
3 rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	
AISG Mode	
DC supply	10 - 30 V
Operating current per DTMA (without RET)	Nom. 130 mA at 10 V Nom. 50 mA at 30 V
Alarm management	AISG*
Mechanical Characteristics	
Material	Aluminium housing
Connectors	RF: 7-16 female (long neck) AISG: 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	4 kg
Packing size	235 x 405 x 175 mm
Dimensions (w x h x d)	169 x 218 x 74.3 mm (without connectors, without mounting brackets)

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

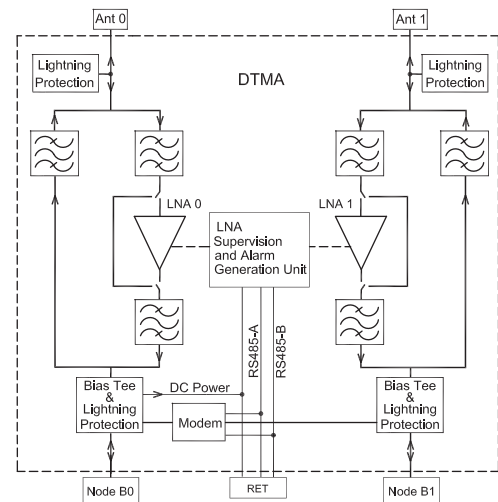
- **Compact line**
- Double units for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable
- CWA and AISG configurations
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection



RET	=	R emote E lectrical T ilt
AISG	=	A ntenna I nterface S tandards G roup
CWA	=	C urrent W indow A larm

Technical Data

Type No.	CWA alarm 170-200 mA	78210583 DTMA-1800-12-AISG-CWA
Tx Characteristics		
Frequency range	1805 - 1880 MHz	
Insertion loss	Typically 0.25 dB	
Input power (per input)	< 200 W (+53 dBm) CW / < 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1710 - 1785 MHz	
Loss in bypass mode	Typically 1.7 dB	
Return loss	> 16 dB (DC ON) / > 12 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.0 dB	
3 rd order intercept point (OIP3)	Typically 30 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics		
	CWA	AISG Mode
DC supply	7 - 19 V	10 - 30 V
Operating current per DTMA (without RET)	80 - 120 mA	Nom. 155 mA at 10 V Nom. 65 mA at 30 V
Alarm management	170-200 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF	7-16 female (long neck)
	AISG	8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	4 kg	
Packing size	405 x 235 x 175 mm	
Dimensions (w x h x d)	218 x 169 x 74.3 mm (without connectors, without mounting brackets)	



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

* see note on data sheet

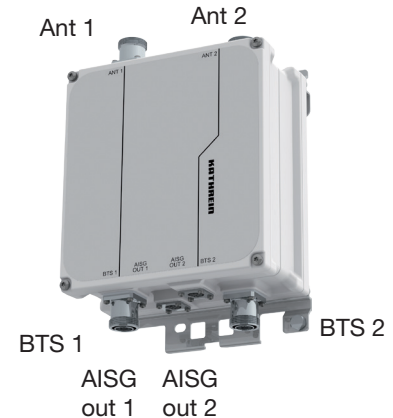
DTMA-1800-UMTS-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

Preliminary Issue

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- DC supply via BTS 1, BTS 2 or both
- Supports CWA and Multi-Band Mode (default)



AISG = Antenna Interface Standards Group
BYP = RF-BYPass
CWA = Current Window Alarm
RET = Remote Electrical Tilt

Technical Data

Type No.	CWA alarm 170 – 200 mA	78211103v01 DTMA-1800-UMTS-12-AISG-CWA
1800 MHz Tx Characteristics		
Frequency range	[MHz]	1805 – 1880
Insertion loss	[dB]	Typically 0.5
Input power (per input and frequency band)	[kW]	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43)
Return loss	[dB]	> 18
1800 MHz Rx Characteristics		
Frequency range	[MHz]	1710 – 1785
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.5
Output 1-dB compression point	[dBm]	> 10
3 rd order intercept point (OIP3)	[dBm]	Typically 25
UMTS Tx Characteristics		
Frequency range	[MHz]	2110 – 2170
Insertion loss	[dB]	Typically 0.4
Input power (per input and frequency band)	[kW]	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43)
Return loss	[dB]	> 18
UMTS Rx Characteristics		
Frequency range	[MHz]	1920 – 1980
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise Figure		Typically 1.4
Output 1-dB compression point	[dBm]	> 10
3 rd order intercept point (OIP3)	[dBm]	Typically 25

Accessories can be found on datasheet

DTMA-1800-UMTS-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

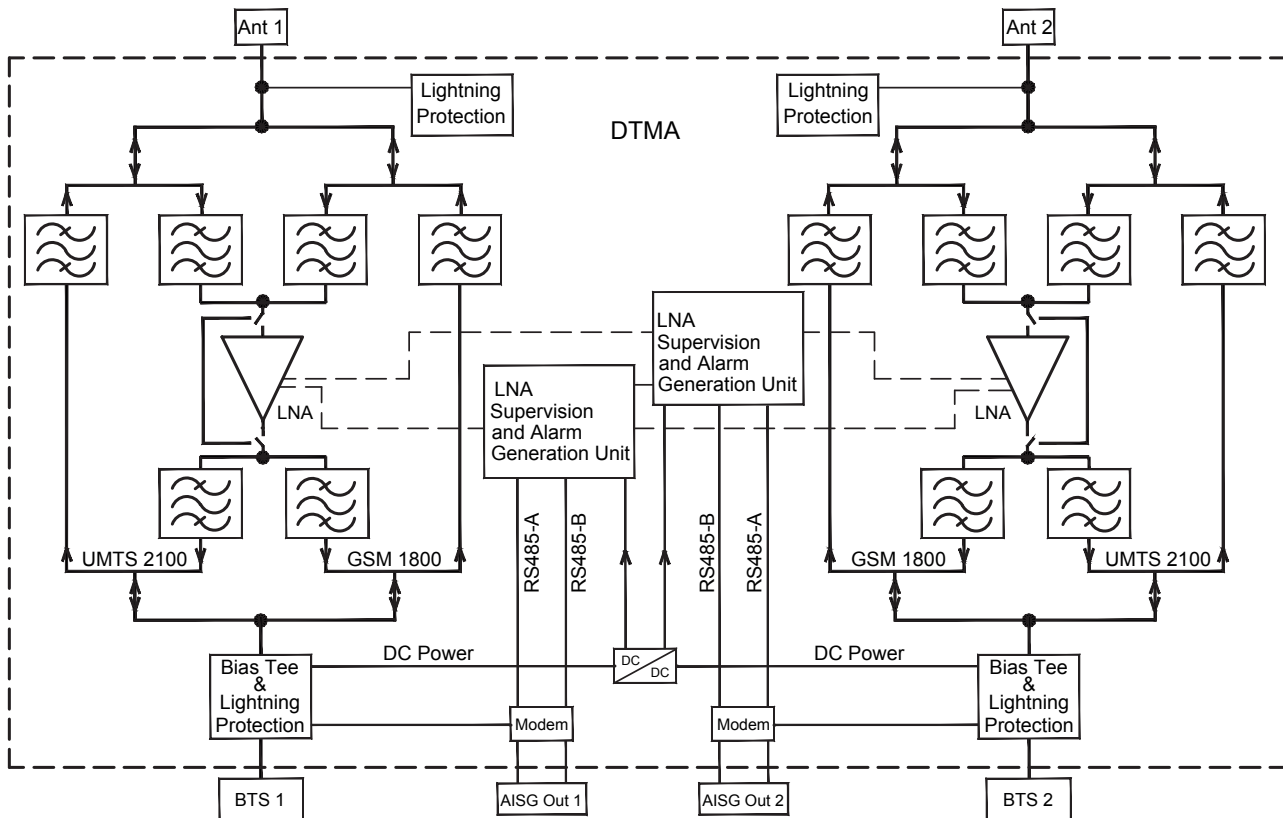
Preliminary Issue



Environmental Characteristics		
Operating temperature range	[°C]	-40 ... +65
IP rating		IP67*
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		CWA Mode
DC supply	[V DC]	9 – 19
Operating current (without RET)	[mA]	80 – 120
Alarm management	[mA]	170 – 200
		AISG Mode
		9 – 31
		Nom. 300 at 10 V Nom. 100 at 30 V
		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.31 diameter) Mast mounting: With additional clamp set
Weight	[kg lb]	8.0 17.64
Dimensions (w x h x d)	[mm in]	209 x 224 x 123.3 8.22 x 8.82 x 4.85 (without connectors, without mounting brackets)

* see note on datasheet

Block diagram



DTMAS

DTMA-1800-UMTS-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double units for easy use with XXPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and 2.0 (default)
- Built-in lightning protection
- Supports Multi-Band, Wide-Band (configuration 1 .. 6) or Single-Band Mode (configuration 7, 8 or 9)
- DC Supply via BTS1, BTS2 or both
- Auto-Select feature for Multi-Band and Wide-Band Mode
- Clamp set 40-140 | 1.6-5.5 [mm | in] included

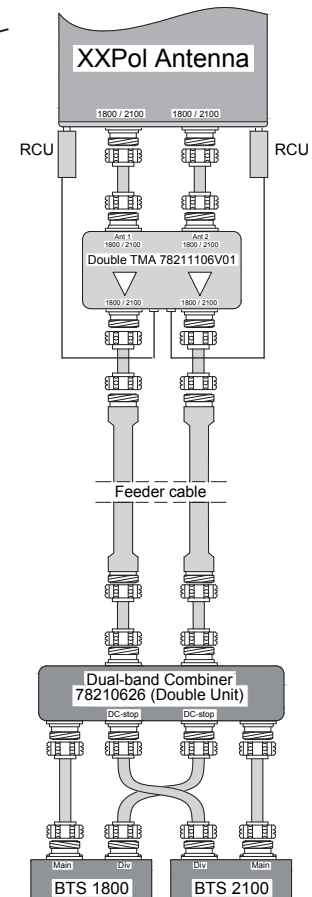


AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	Single-Band Mode	78211106V01 DTMA-1800-UMTS-12-AISG
	Wide-Band Mode	78211106V02 DTMA-1800-UMTS-12-AISG
1800 MHz Tx Characteristics		
Frequency range	[MHz]	1805 – 1880
Insertion loss	[dB]	Typically 0.5
Input power (per input and frequency band)	[kW]	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	[dBm]	< -117 (2 Tx carriers at +43 dBm)
Return loss	[dB]	> 18
1800 Rx Characteristics		
Frequency range	[MHz]	1710 – 1785
Return loss	[dB]	> 18 (DC ON) / > 14 (DC OFF)
Loss in bypass mode	[dB]	Typically 2.0 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.5
Output 1-dB compression point	[dBm]	> 10
3 rd order intercept point (OIP3)	[dBm]	Typically 25
UMTS Tx Characteristics		
Frequency range	[MHz]	2110 – 2170
Insertion loss	[dB]	Typically 0.4
Input power (per input and frequency band)	[kW]	< 0.18 (+52.5 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in RX band	[dBm]	< -117 (2 Tx carriers at +43 dBm)
Return loss	[dB]	> 18
UMTS Rx Characteristics		
Frequency range	[MHz]	1920 – 1980
Return loss	[dB]	> 18 (DC ON) / > 14 (DC OFF)
Loss in bypass mode	[dB]	Typically 2.0 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.4
Output 1-dB compression point	[dBm]	> 10
3 rd order intercept point (OIP3)	[dBm]	Typically 25

clamps included



DTMA-1800-UMTS-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

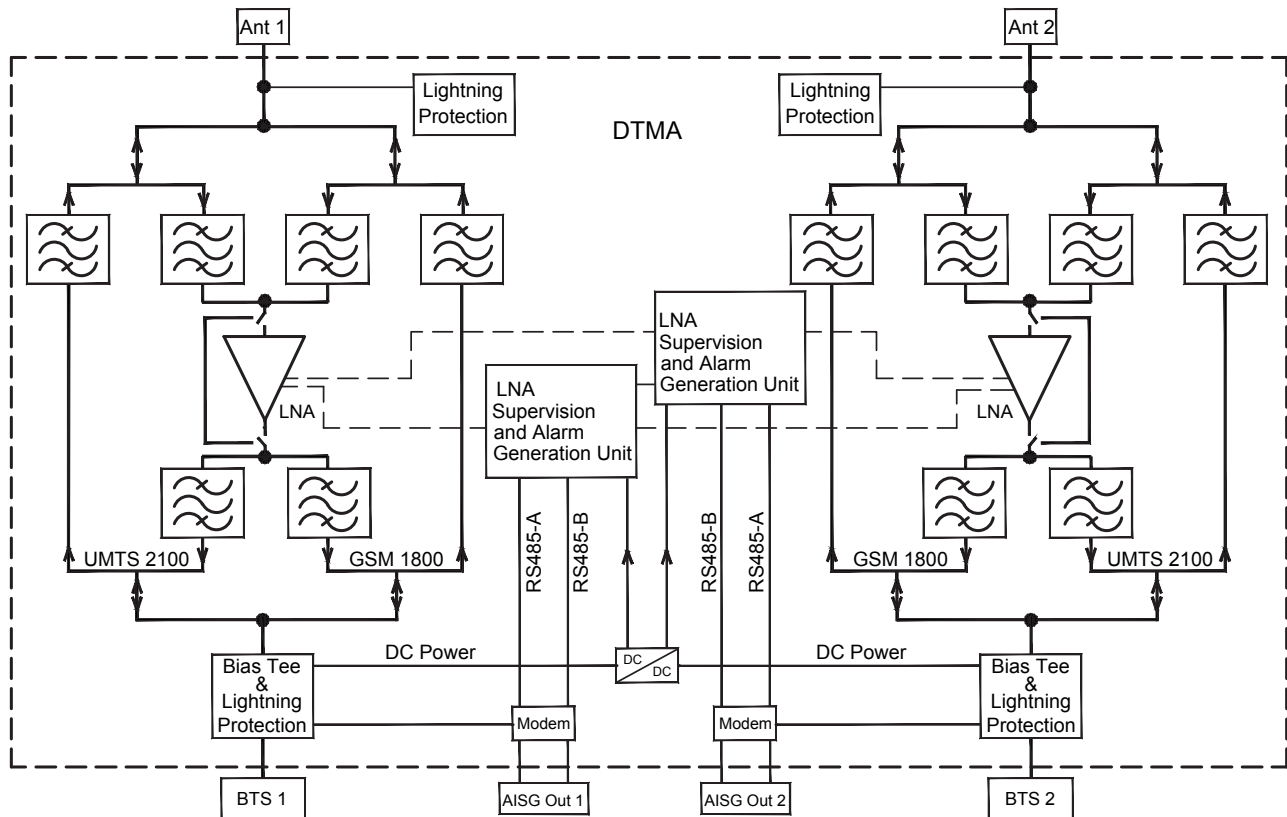
KATHREIN



Environmental Characteristics		
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
DC supply	[V]	10 – 30
Operating current per DTMA (without RET)	[mA]	Nom. 300 at 10 V
	[mA]	Nom. 100 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	7-16 female (long neck), 8-pin female, IEC 60130-9, (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set
Weight	[kg lb]	8.0 17.64
Packing size	[mm in]	360 x 270 x 180 14.2 x 10.6 x 7.1
Dimensions (w x h x d)	[mm in]	209 x 224 x 107 8.22 x 8.82 x 4.29 (without connectors, without mounting brackets)

* see note on data sheet

Block diagram



DTMAS

DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- **Compact line**
- Double units for easy use with XXPol antennas
- Supports AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- DC Supply via Node B0, Node B1 or both

AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt

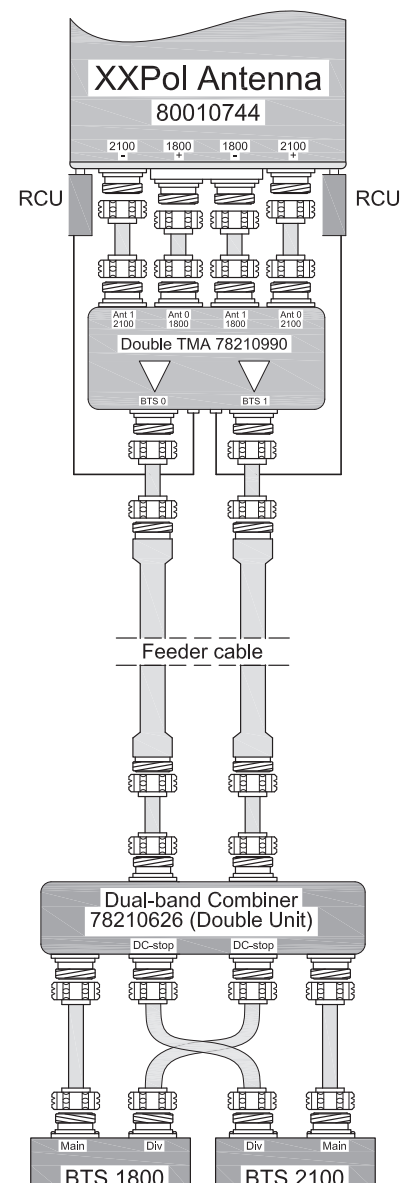
Technical Data

Type No.	78210990 DTMA-1800-UMTS-12-AISG-D	
Tx Characteristics		
Frequency range	1805 - 1880 MHz	2110 - 2170 MHz
Insertion loss	Typically 0.5 dB	Typically 0.3 dB
Input power (per input)	< 100 W (+50 dBm)	
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1710 - 1785 MHz	1920 - 1980 MHz
Return loss	> 16 dB (DC ON) / > 12 dB (DC OFF)	
Loss in bypass mode	Typically 2.3 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.4 dB	
3 rd order intercept point (OIP3)	Typically 30 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics		
DC supply	10 - 30 V	
Operating current per DTMA (without RET)	Nom. 175 mA at 10 V Nom. 65 mA at 30 V	
Alarm management	AISG*	
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) / Mast mounting: With additional clamp set	
Weight	6.5 kg	
Packing size	300 x 435 x 190 mm	
Dimensions (w x h x d)	220 x 220 x 80 mm (without connectors, without mounting brackets)	

* see note on data sheet



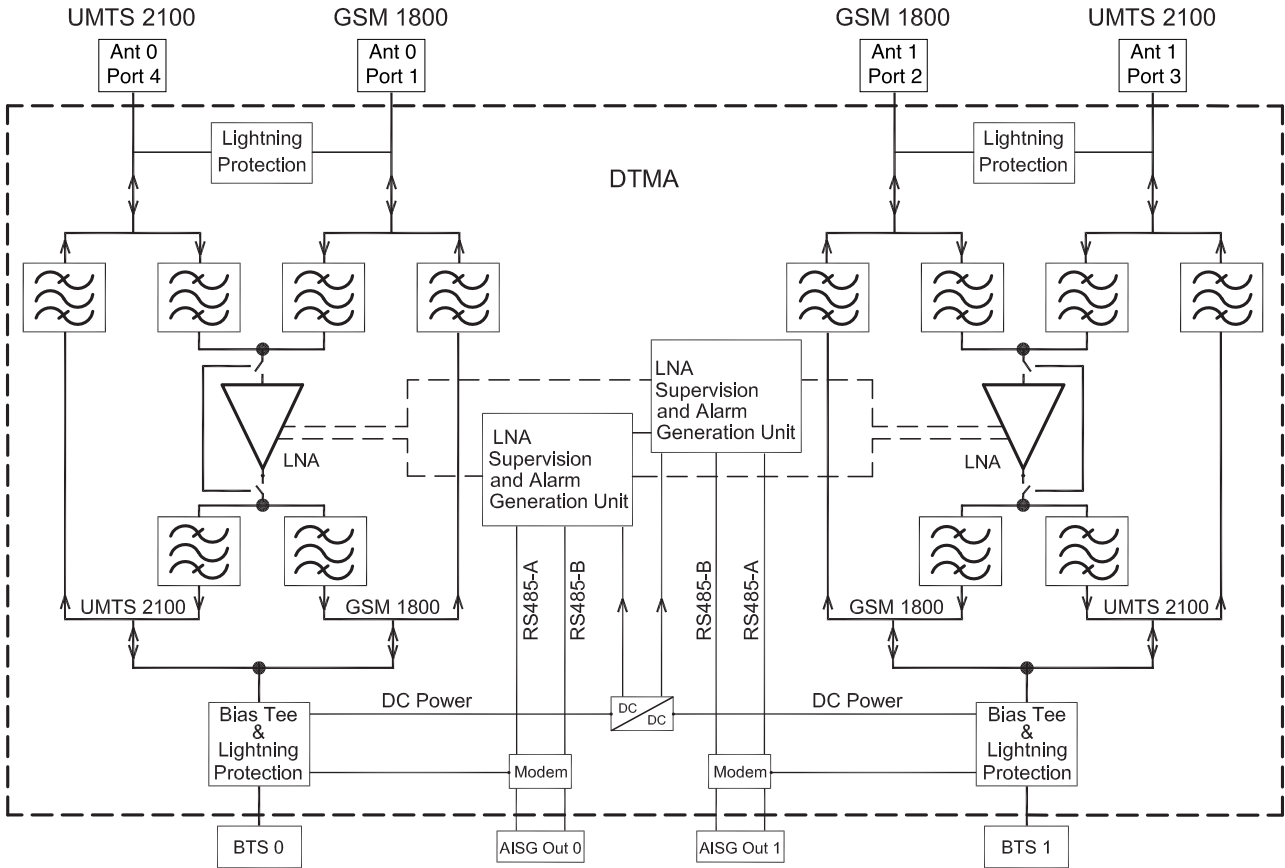
Connector configuration



DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

DTMA-AWS4-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN



- **Compact line**
- Double units for easy use with XPol antennas
- Supports CWA, AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Clamp Set 45 – 125 mm included
- **Low weight**

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
CWA = Current Window Alarm

Technical Data

Type No.	78210877V01 DTMA-AWS4-12-AISG-CWA	
	<i>clamps included</i>	
Tx Characteristics		
Frequency range	[MHz]	2095 – 2200
Insertion loss	[dB]	Typically 0.2
Input power (per input)	[kW]	< 0.1 (+50 dBm) CW / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43 dBm)
Return loss	[dB]	> 18
Rx Characteristics		
Frequency range	[MHz]	1695 – 1780
Loss in by-pass mode	[dB]	Typically 2.0 (DC OFF)
Return loss	[dB]	> 18 (DC ON)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.7
3 rd order intercept point (OIP3)	[dBm]	Typically 30
Environmental Characteristics		
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
	CWA Mode	AISG Mode
DC supply	[V]	7 – 19
Operating current (without RET)	[mA]	Nom. 140 at 10 V Nom. 55 at 30 V
Alarm management	[mA]	170 – 200
		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 30130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set
Weight	[kg lb]	3 6.6
Packing size	[mm in]	217 x 397 x 170 8.5 x 15.6 x 6.7
Dimensions (w x h x d)	[mm in]	138 x 191 x 71.6 5.4 x 7.5 x 2.8 (without connectors, without mounting brackets)



* see note on data sheet

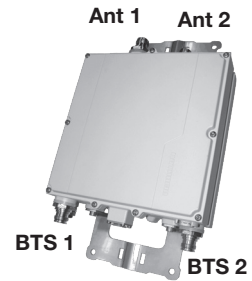
DTMA-1900-AWS4-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- Low Inrush Current
- Clamp Set 45 – 125 | 1.77 – 4.92 [mm | in] included



AISG = Antenna Interface Standards Group
CWA = Current Window Alarm
RET = Remote Electrical Tilt



78210863V04



78210864V04

Technical Data

Type No.	Single Unit	78210863V04 DTMA-1900-AWS4-12-AISG-CWA
	Double Unit	78210864V04 DTMA-1900-AWS4-12-AISG-CWA

1900/AWS Tx Characteristics

Frequency range	[MHz]	1930 – 2200
Insertion loss	[dB]	Typically 0.4
Input power (per input and frequency band)	[kW]	< 0.2 (+53 dBm) / 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43 dBm)
Return loss	[dB]	> 18

1900/AWS Rx Characteristics

Frequency range	[MHz]	1695 – 1915
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.5
3 rd order intercept point (OIP3)	[dBm]	Typically 25

DTMA-1900-AWS4-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

78210863V04 / 78210864V04

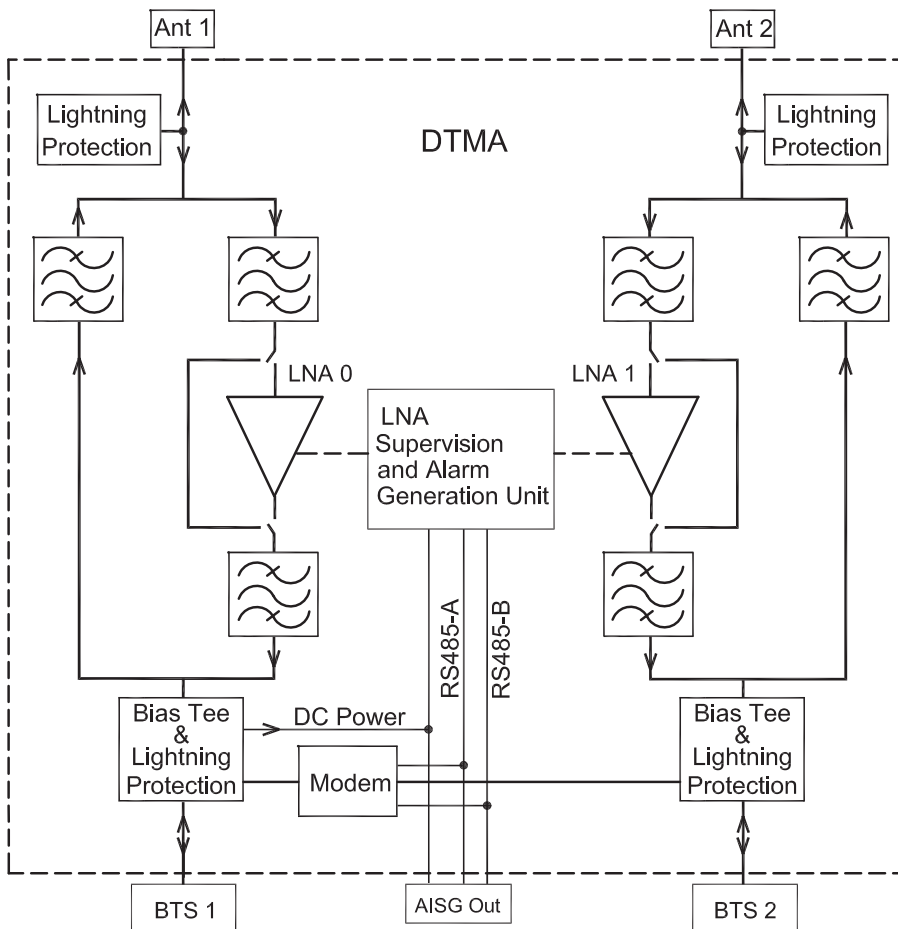
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Environmental Characteristics			
Operating temperature range	[°C °F]	-40 ... +65 -40 ... 149	
IP rating		IP67*	
MTBF	[hours]	> 1 000 000 (per TMA)	
EMC		FCC Part 15	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	[V DC]	10 – 19	10 – 30
Operating current	[mA]	120 – 150	Nom. 170 at 12 V
Alarm management	[mA]	180 – 200	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF	4.3-10 female (long neck) 8-pin female, IEC 60130-9	
AISG out		(Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With included clamp set	
Weight	[kg lb]	Single Unit: 7.3 16.09 / Double Unit: 14.5 31.96	
Dimensions (w x h x d)	[mm in]	Single Unit: 220 x 220 x 83 8.66 x 8.66 x 3.268 Double Unit: 220 x 220 x 171 8.66 x 8.66 x 6.73 (without connectors, without mounting brackets)	

* see note on data sheet

Block Diagram



DTMA-1900-AWS-BYP400t1000-12-AISG-CWA-Y

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XXPol antennas
- RF-Bypass for 400 – 1000 MHz
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- DC/AISG bypass between any BTS port and Port 1 or Port 2
- Low Inrush Current
- Clamp Set 45 – 125 | 1.77 – 4.92 [mm | in] included



AISG = Antenna Interface Standards Group
BYP = RF-BYPass
CWA = Current Window Alarm
RET = Remote Electrical Tilt

Technical Data

Type No.	78211273V01 DTMA-1900-AWS-BYP400t1000-12-AISG-CWA-Y	
1900/AWS Tx Characteristics		
Frequency range [MHz]	1930 – 2180	
Insertion loss [dB]	Typically 0.4	
Input power (per input and frequency band) [kW]	< 0.2 (+53 dBm) / 1.6 (+62 dBm) peak	
Intermodulation products in Rx band [dBm]	< -117 (2 Tx carriers at +43)	
Return loss [dB]	> 18	
1900/AWS Rx Characteristics		
Frequency range [MHz]	1695 – 1915	
Loss in bypass mode [dB]	Typically 2.0	
Return loss [dB]	> 18 (DC ON) / > 12 (DC OFF)	
Gain [dB]	12 nominal	
Noise figure [dB]	Typically 1.5	
3 rd order intercept point (OIP3) [dBm]	Typically 25	
400 – 1000 MHz Bypass Characteristics		
Frequency range [MHz]	400 – 1000	
Insertion loss [dB]	Typically 0.15	
Input power (per input) [W]	< 500 (+57 dBm)	
Intermodulation products [dBm]	< -117 (2 carriers at +43)	
Return loss [dB]	> 18	

clamps included

DTMA-1900-AWS-BYP400t1000-12-AISG-CWA-Y

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

78210273V01

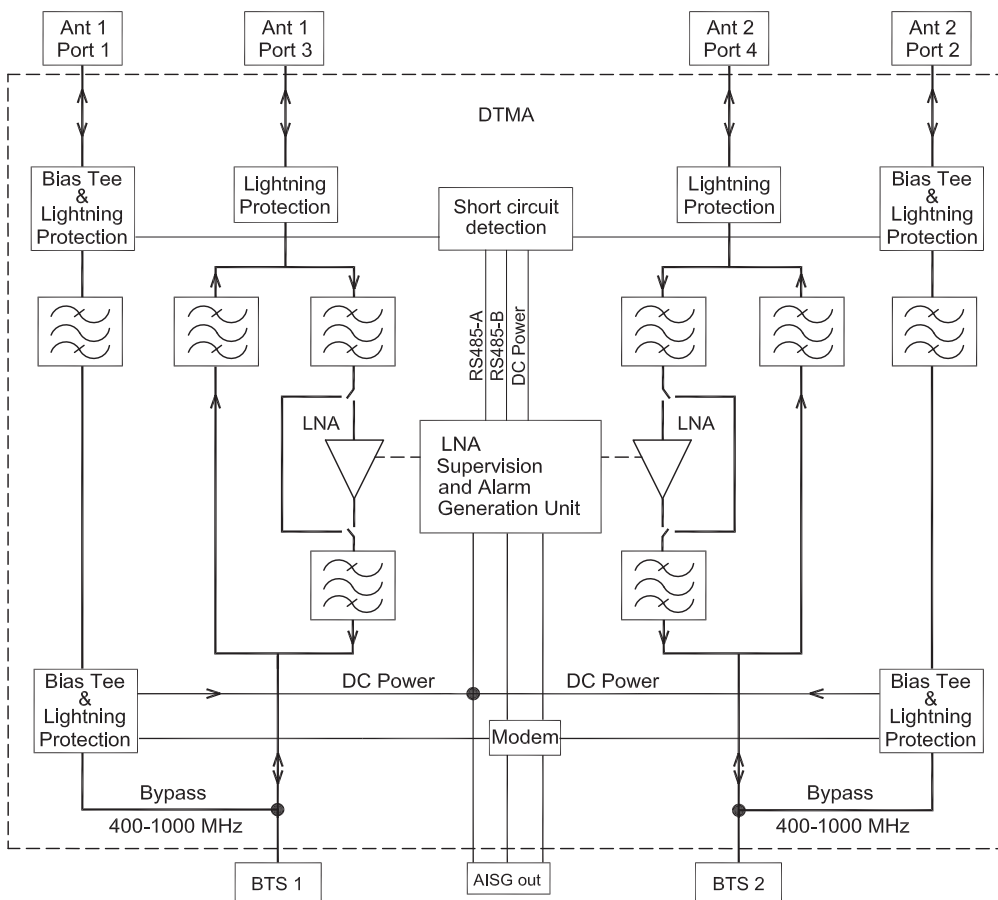
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Environmental Characteristics			
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149	
IP rating		IP67*	
MTBF	[hours]	> 1 000 000 (per TMA)	
EMC		FCC Part 15	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	[V DC]	10 – 19	10 – 30
Operating current	[mA]	120 – 150	Nom. 170 at 12 V
Alarm management	[mA]	180 – 200	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	[mm in]	Wall mounting: With 4 screws (max. 8 0.315 diameter) Mast mounting: With additional clamp set	
Weight	[kg lb]	7.3 16.09	
Dimensions (w x h x d)	[mm in]	220 x 220 x 83 8.66 x 8.66 x 3.268 (without connectors, without mounting brackets)	

* see note on data sheet

Block diagram



DTMA-1900-AWS4-BYP400t1000-12-AISG-CWA-Y

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XXPol antennas
- RF-Bypass for 400 – 1000 MHz
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- DC/AISG bypass between any BTS port and Port 1 or Port 2
- Low Inrush Current
- Clamp Set 45 – 125 | 1.77 – 4.92 [mm | in] included



AISG = Antenna Interface Standards Group
BYP = RF-BYPass
CWA = Current Window Alarm
RET = Remote Electrical Tilt

Technical Data

Type No.	Single Unit	78211273V04 DTMA-1900-AWS4-BYP400t1000-12-AISG-CWA-Y
	Double Unit	78211374V04 DTMA-1900-AWS4-BYP400t1000-12-AISG-CWA-Y

clamps included

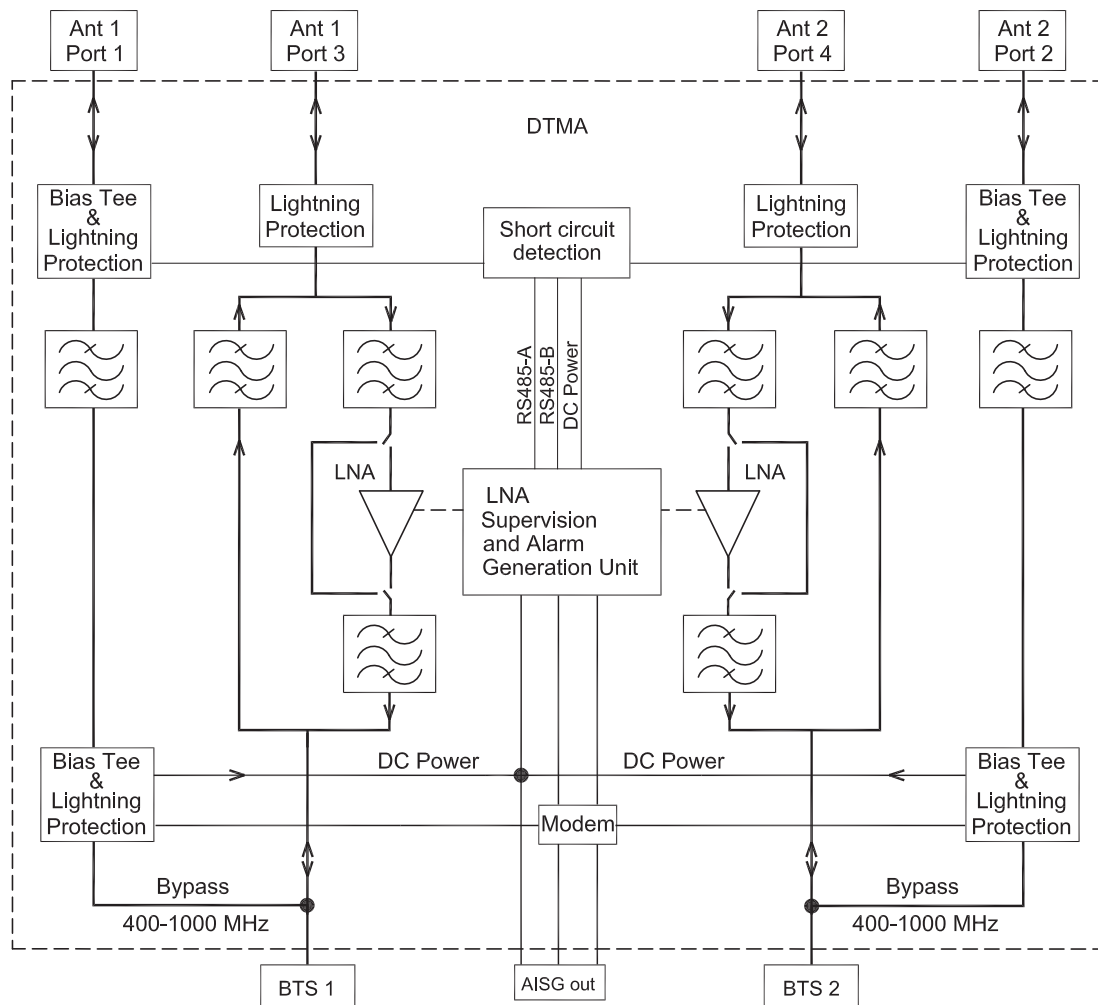
1900/AWS Tx Characteristics		
Frequency range	[MHz]	1930 – 2200
Insertion loss	[dB]	Typically 0.4
Input power (per input and frequency band)	[kW]	< 0.2 (+53 dBm) / 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43)
Return loss	[dB]	> 18
1900/AWS Rx Characteristics		
Frequency range	[MHz]	1695 – 1915
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.5
3 rd order intercept point (OIP3)	[dBm]	Typically 25
400 – 1000 MHz Bypass Characteristics		
Frequency range	[MHz]	400 – 1000
Insertion loss	[dB]	Typically 0.15
Input power (per input)	[W]	< 500 (+57 dBm)
Intermodulation products	[dBm]	< -117 (2 carriers at +43)
Return loss	[dB]	> 18

DTMA-1900-AWS4-BYP400t1000-12-AISG-CWA-Y
Fullband Double Dual Duplex Tower Mounted Amplifier
(Masthead Amplifier)
78210273V04 / 78210374V04



Environmental Characteristics			
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149	
IP rating		IP67*	
MTBF	[hours]	> 1 000 000 (per TMA)	
EMC		FCC Part 15	
DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply	[V DC]	10 – 19	10 – 30
Operating current	[mA]	120 – 150	Nom. 170 at 12 V
Alarm management	[mA]	180 – 200	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG out	4.3-10 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting	[mm in]	Wall mounting: With 4 screws (diameter max. 8 0.315) Mast mounting: With included clamp set	
Weight	[kg lb]	Single Unit: 7.3 16.09 Double Unit: 14.5 31.96	
Dimensions (w x h x d)	[mm in]	Single Unit: 220 x 220 x 83 8.66 x 8.66 x 3.268 Double Unit: 220 x 220 x 171 8.66 x 8.66 x 6.73 (without connectors, without mounting brackets)	

* see note on data sheet



DTMA-UMTS-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- **Compact line**
- Double units for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- AISG setting switchable
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low weight

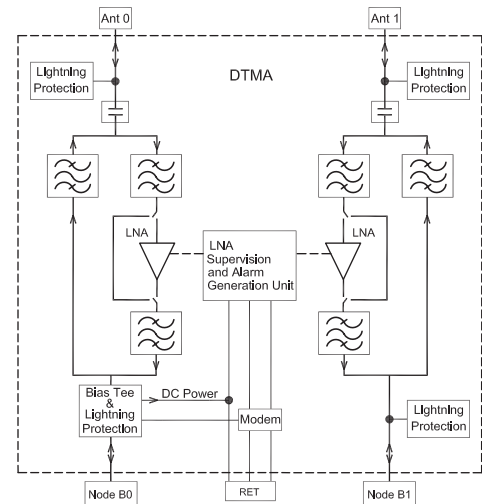


AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	78211145 DTMA-UMTS-12-AISG
Tx Characteristics	
Frequency range	2110 - 2170 MHz
Insertion loss	Typically 0.2 dB
Ripple	< 0.1 dB
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	1920 - 1980 MHz
Loss in by-pass mode	Typically 2.0 dB
Return loss	> 18 dB (DC ON)/ > 12 dB (DC OFF)
Gain	Typically 12 dB
Noise figure	Typically 1.4 dB
3 rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	
AISG Mode	
DC supply	10 - 30 V
Operating current (without RET)	Nom. 130 mA at 10 V Nom. 50 mA at 30 V
Alarm management	AISG*
Mechanical Characteristics	
Material	Aluminium housing
Connectors	RF: 7-16 female (long neck) AISG: 8-pin female, IEC 30130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	3 kg
Packing size	217 x 397 x 170 mm
Dimensions (w x h x d)	138 x 191 x 71.6 mm (without connectors, without mounting brackets)

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-UMTS-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Compact line
- Double units for easy use with XPol antennas
- Supports CWA, AISG 1.1 and 2.0 (default)
- AISG setting switchable as described on data sheet
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low weight

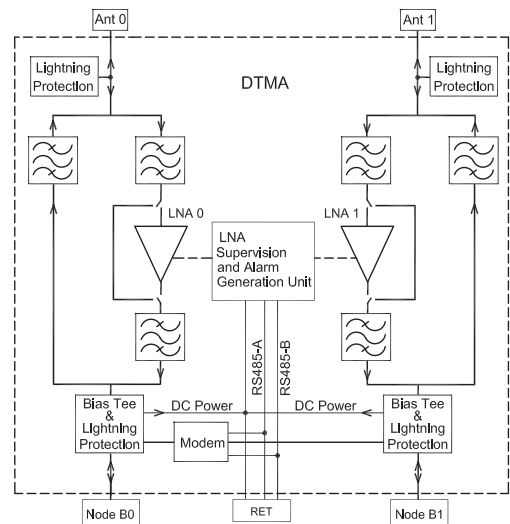
AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm



Technical Data

Type No.	78211245 DTMA-UMTS-12-AISG-CWA	
Tx Characteristics		
Frequency range	2110 - 2170 MHz	
Insertion loss	Typically 0.2 dB	
Ripple	< 0.1 dB	
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1920 - 1980 MHz	
Loss in by-pass mode	Typically 2.0 dB (DC OFF)	
Return loss	> 18 dB (DC ON)	
Gain	Typically 12 dB	
Noise figure	Typically 1.4 dB	
3 rd order intercept point (OIP3)	Typically 30 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics AISG Mode		
DC supply	7 - 19 V	10 - 30 V
Operating current (without RET)	80 - 120 mA	Nom. 130 mA at 10 V Nom. 50 mA at 30 V
Alarm management	170 - 200 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 30130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	3 kg	
Packing size	217 x 397 x 170 mm	
Dimensions (w x h x d)	138 x 191 x 71.6 mm (without connectors, without mounting brackets)	

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-UMTS-BYP1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- RF-Bypass for 1800 MHz
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- AISG setting switchable
- CWA and AISG configuration



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm
BYP	=	RF-BYPass



Technical Data

Type No.	CWA alarm 170 - 200 mA	78211102 DTMA-UMTS-BYP1800-12-AISG-CWA
UMTS 2100 Tx Characteristics		
Frequency range	2110 - 2170 MHz	
Insertion loss	Typically 0.3 dB	
Input power (per input)	< 100 W (+50 dBm)/1.6 kW (+62 dBm) peak	
Intermodulation products in RX band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
UMTS 2100 Rx Characteristics		
Frequency range	1920 - 1980 MHz	
Loss in bypass mode	Typically 2.0 dB	
Return loss	> 18 dB (DC ON) / > 12 dB	
Gain	12 dB nominal	
Noise figure	Typically 1.4 dB	
3 rd order intercept point (OIP3)	Typically 25 dBm	
1800 MHz Bypass Characteristics		
Frequency range 1800	1710 - 1880 MHz	
Insertion loss 1710 - 1880 MHz	Typically 0.2 dB	
Input power (per input)	< 100 W (+50 dBm)	
Intermodulation products in RX band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 301 342-3	

DTMA-UMTS-BYP1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

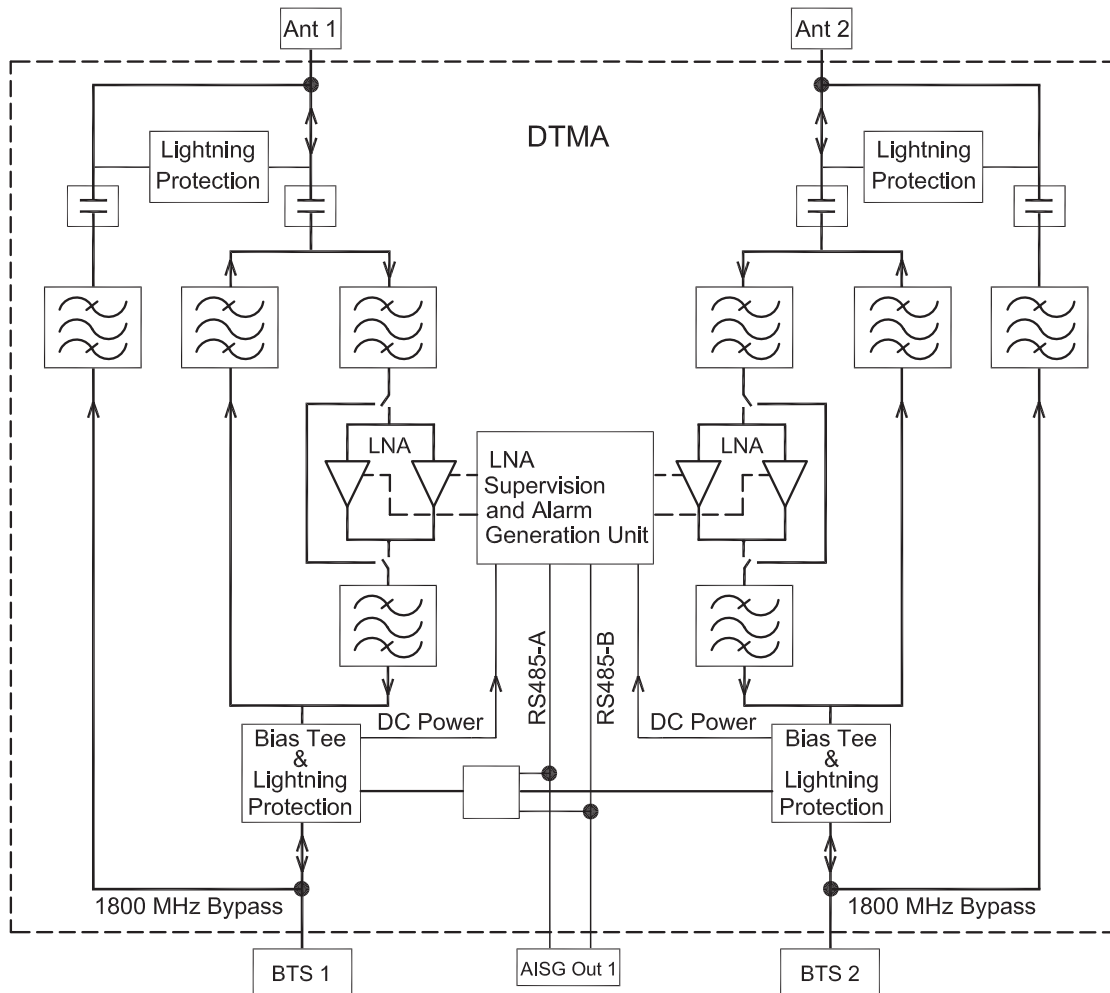
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KATHREIN



DC and Alarm Characteristics		CWA Mode	AISG Mode
DC supply		9 - 19 V DC	9 - 30 V DC
Operating current		80 - 120 mA	Nom. 100 mA at 12 V
Alarm management		170 - 200 mA	AISG*
Mechanical Characteristics			
Material		Aluminium housing	
Connectors	RF AISG out	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: Not connected)	
Mounting		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight		4.0 kg	
Dimensions (w x h x d)		209 x 224 x 55 mm (without connectors, without mounting brackets)	

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- DC/AISG bypass between ports “Node B0 or Node B1” and “Ant 0” for the support of RET integrated antennas (incl. short circuit protection)
- Bypass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

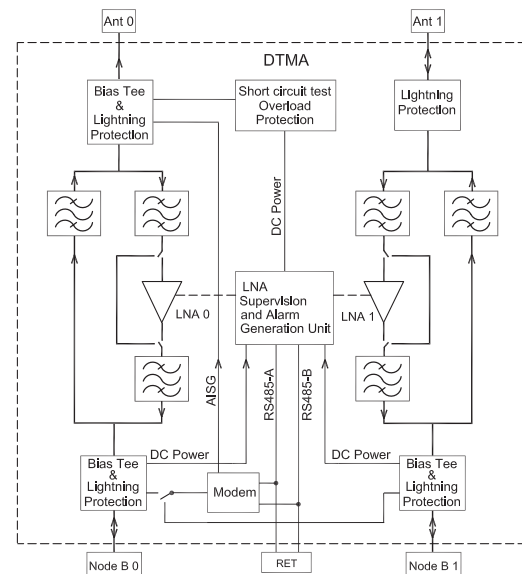
AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt



Technical Data

Type No.	78210860 DTMA-2600-12-AISG (12 dB gain)	
Tx Characteristics		
Frequency range	2620 – 2690 MHz	
Insertion loss	Typically 0.3 dB	
Ripple	< 0.35 dB	
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak	
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	2500 – 2570 MHz	
Loss in bypass mode	Typically 2 dB	
Return loss	> 18 dB (DC ON)	
Gain	12 dB nominal	
Noise figure	Typically 1.2 dB	
Output 1-dB compression point	> 13 dBm	
3rd order intercept point (OIP3)	Typically 30 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67 (see note on data sheet)	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	
DC and Alarm Characteristics		
DC supply	10 – 30 V	
Operating current per DTMA (without RET)	Nom. 175 mA at 10 V DC Nom. 70 mA at 30 V DC	
Alarm management	AISG	
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	3.5 kg	
Packing size	217 x 407 x 144 mm	
Dimensions (w x h x d)	165.3 x 236.4 x 65.1 mm (without connectors, without mounting brackets)	

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section “System Components”.

DTMA-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Compact line
- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low weight

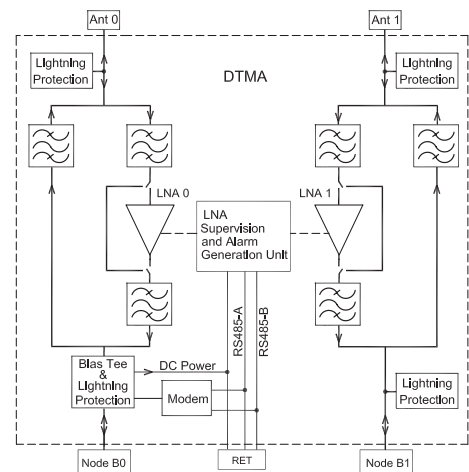


AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	78211330 DTMA-2600-12-AISG
Tx Characteristics	
Frequency range	2620 - 2690 MHz
Insertion loss	Typically 0.3 dB
Input power (per input)	< 100 W (+50 dBm) CW / < 1.6 kW (+62 dBm) peak
Intermodulation products in Rx band	< -117 dBm (2 Tx carriers at +43 dBm)
Return loss	> 18 dB
Rx Characteristics	
Frequency range	2500 - 2570 MHz
Loss in by-pass mode	Typically 1.8 dB
Return loss	> 18 dB (DC ON)
Gain	12 dB nominal
Noise figure	Typically 1.6 dB
Output 1-dB compression point	> 13 dBm
3 rd order intercept point (OIP3)	Typically 30 dBm
Environmental Characteristics	
Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3
DC and Alarm Characteristics	
DC supply	10 - 30 V
Operating current per DTMA (without RET)	Nom. 130 mA at 10 V DC Nom. 50 mA at 30 V DC
Alarm management	AISG
Mechanical Characteristics	
Material	Aluminium housing
Connectors	RF: 7-16 female (long neck) AISG: 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 - 30 V DC, pin 7: DC return, other pins: not connected)
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	3 kg
Packing size	217 x 397 x 170 mm
Dimensions (w x h x d)	138 x 191 x 71.6 mm (without connectors, without mounting brackets)

* see note on data sheet



- Clamp set (type no. 734360 - 734365) (order separately) can be found in the section "System Components".

DTMA-1800-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

- Double unit for easy use with XPol antennas
- Suitable for antenna RET control according to AISG/3GPP standard
- Bypass mode to ensure cell operation in case of DC power down
- Supports AISG 1.1 and AISG 2.0 (default)
- Built-in lightning protection
- Supports Multi-Band, Wide-Band or Single-Band (default; configuration 7, 8 or 9)
- Stacked double units for use with 4 x 4 MIMO
- DC supply via BTS 1, BTS 2 or both



Single Unit



Double Unit

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	Single Unit	78211332 DTMA-1800-2600-12-AISG
	Double Unit	78211333 DTMA-1800-2600-12-AISG

clamps included

1800 MHz Tx Characteristics

Frequency range	[MHz]	1805 – 1880
Insertion loss	[dB]	Typically 0.5
Input power (per input and frequency band)	[kW]	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43)
Return loss	[dB]	> 18

1800 MHz Rx Characteristics

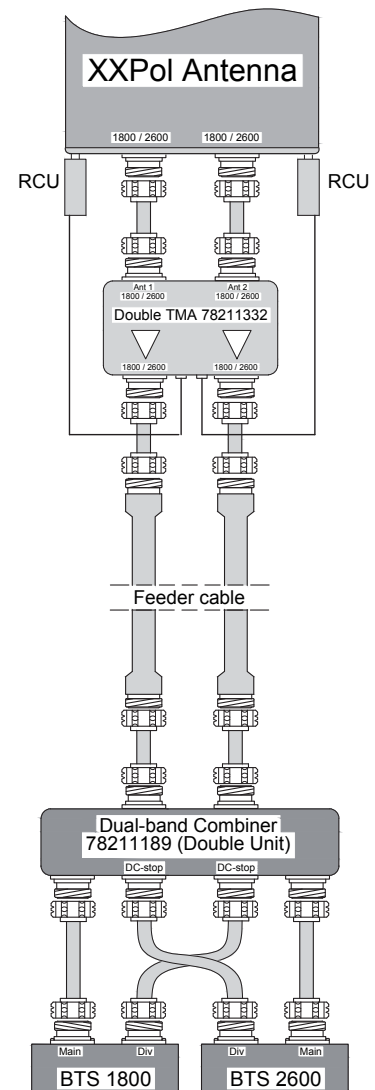
Frequency range	[MHz]	1710 – 1785
Loss in bypass mode	[dB]	Typically 2.5
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.8
Output 1-dB compression point	[dBm]	> 10
3 rd order intercept point (OIP3)	[dBm]	Typically 25

2600 MHz Tx Characteristics

Frequency range	[MHz]	2620 – 2690
Insertion loss	[dB]	Typically 0.4
Input power (per input and frequency band)	[kW]	< 0.1 (+50 dBm) / < 1.6 (+62 dBm) peak
Intermodulation products in Rx band	[dBm]	< -117 (2 Tx carriers at +43)
Return loss	[dB]	> 18

2600 MHz Rx Characteristics

Frequency range	[MHz]	2500 – 2570
Loss in bypass mode	[dB]	Typically 2.0
Return loss	[dB]	> 18 (DC ON) / > 12 (DC OFF)
Gain	[dB]	12 nominal
Noise figure	[dB]	Typically 1.7
Output 1-dB compression point	[dBm]	> 10
3 rd order intercept point (OIP3)	[dBm]	Typically 25



DTMAS

DTMA-1800-2600-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

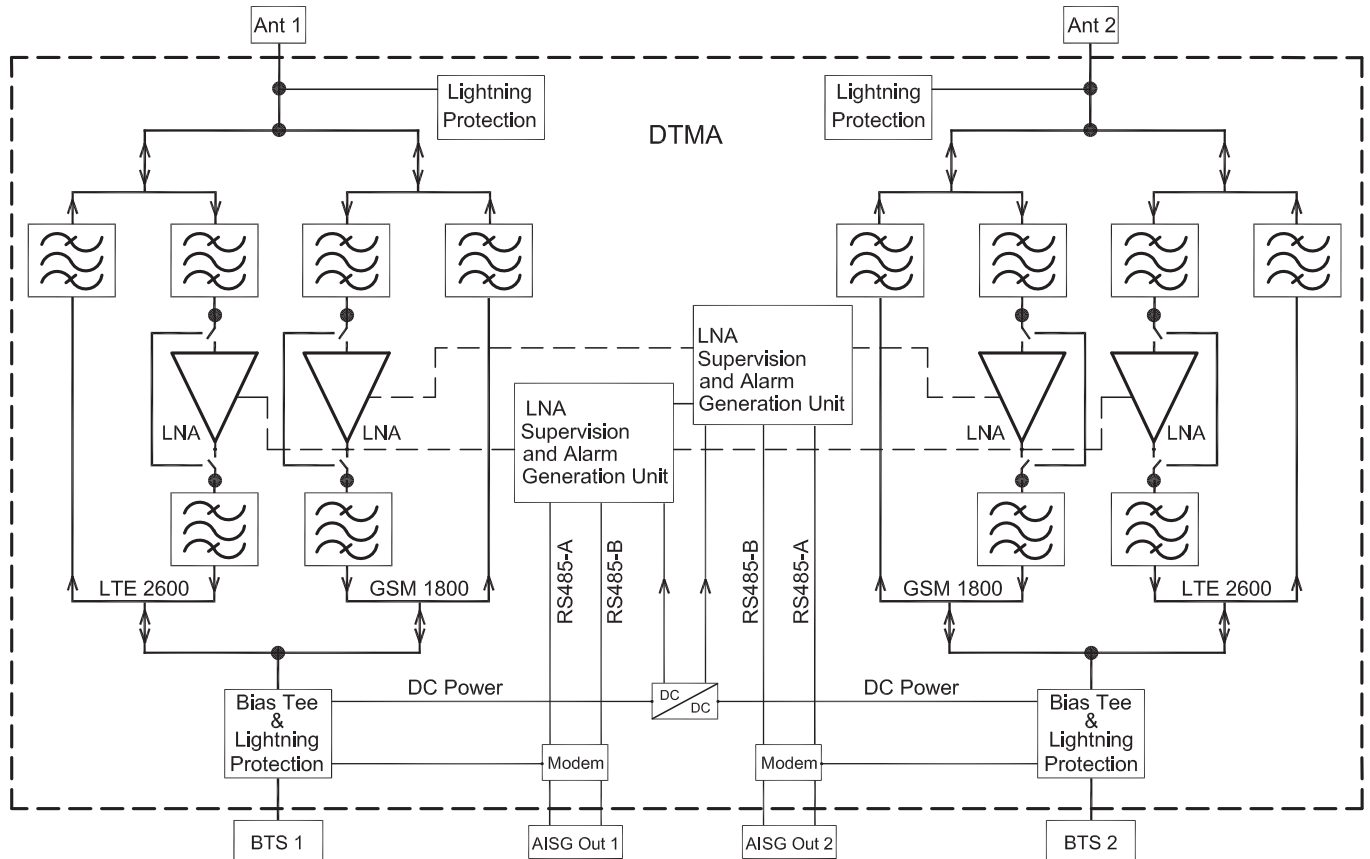
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KATHREIN



Environmental Characteristics		
Operating temperature range	[°C °F]	-40 ... +65 -40 ... +149
IP rating		IP67*
MTBF	[hours]	> 1 000 000 (per TMA)
EMC		According to ETS 300 342-3
DC and Alarm Characteristics		
AISG Mode		
DC supply	[V DC]	10 – 30
Operating current (without RET)	[mA]	Nom. 300 at 10 V Nom. 100 at 30 V
Alarm management		AISG*
Mechanical Characteristics		
Material		Aluminium housing
Connectors	RF AISG out	4.3-10 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, pin 6: 10 – 30 V DC, pin 7: DC return, other pins: Not connected)
Mounting	[mm in]	Wall mounting: With 4 screws (diameter max. 8 0.315) Mast mounting: With additional clamp set
Weight	[kg lb]	Single Unit: 6.5 14.33 / Double Unit: 13 28.66
Dimensions (w x h x d)	[mm in]	Single Unit: 220 x 220 x 83 / 8.66 x 8.66 x 3.27 Double Unit: 220 x 220 x 170 / 8.66 x 8.66 x 6.69 (without connectors, without mounting brackets)

* see note on data sheet



Calculation of Wind Loading on Kathrein Base Station Antennas

In general, the wind loading of antennas is determined based on the standard EN 1991-1-4. This European standard corresponds to the German standard DIN 1055-4.

Because of wind loading tests performed by an independent institute in 2016, in order to determine the data sheet values, Kathrein uses a combination of wind tunnel test results as well as an approved adaptation of the form factor within the scope of the standard.

The indicated values are the frontal and the maximum wind load of the antenna. Due to the latest determination methods, the wind load values are decreased. However, these values are still determined in accordance with the standard EN 1991-1-4. The mechanical design of the antennas remains unaffected.

A detailed description concerning this topic is provided in the White Paper "Base Station Antennas – Wind Loading" which is available on our homepage.

Please note

As a result of more stringent legal regulations and judgements regarding product liability, we are obliged to point out certain risks that may arise when products are used under extraordinary operating conditions. The mechanical design is based on the environmental conditions as stipulated in ETS 300 019-1-4. Wind loads are calculated according to DIN 1055-4.

The antennas may be used at locations where the anticipated peak wind velocity or gust wind speed lies within the maximum wind speed listed in the datasheet. We warrant the mechanical safety and electrical functionality under such conditions. The wind speeds are defined in accordance with the DIN, EN or TIA standards. This warranty makes allowance for the partial safety factors specified in those standards.

Extraordinary operating conditions, such as heavy icing or exceptional dynamic stress (e.g. strain caused by oscillating support structures), may result in the breakage of an antenna or even cause it to fall to the ground. These facts must be considered during the site planning process. The details given in our data sheets have to be followed carefully when installing the antennas and accessories.

It should be noted that the site-specific load acting on an antenna depends on the geographic location, the location-specific factors, the height over ground and how the antenna is mounted on the mast. The site structural engineer is in charge of the correct calculation and interpretation of the wind load at the antenna site.

Site planning and installation must be carried out by qualified and experienced staff. All relevant national safety regulations must be upheld and respected. Incorrect site planning, faulty installation, as well as interfering surroundings on site, may lead to deviations in the electrical parameters compared to those specified in the respective data sheets.

Sales Partners

An actual list of Kathrein's International Sales Partners can be found on our homepage:
www.kathrein.com

For technical information, orders or catalogues
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