

694 – 6000 MHz

Catalogue 2014

**Base Station Antennas, Filters, Combiners
and Amplifiers for Mobile Communications**



KATHREIN

Antennen · Electronic

Photo on title page: Kathrein mobile communication products are connecting people all over the world.

Catalogue Issue 01/2014

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.de

Calculation of Wind Loading on Kathrein Base Station Antennas

In 1998 the co-ordinating committee of the Standardisation Group for Building Standards decided that during the harmonisation process of European standards, the DIN-Standards shall be modified and republished based on the European Pre-Standards.

As a result of this harmonisation process the new edition of DIN 1055 Part 4 was finally published in 2005. This standard defines the worst case loading example created by natural wind forces on bearing structures and their individual elements. The standard thereby defines the principles for calculating the maximum loading and for confirming the bearing capacity of structures in general.

One of the major changes in the calculation of the wind load under DIN 1055-4 is the definition of the value cf_0 . Due to these changes in the calculation formula within the standard, the calculated wind load of some Base Station Antennas is higher than previously specified on earlier data sheets.

During 2009 Kathrein has migrated to calculating and specifying all wind loads in accordance with DIN 1055-4 (similar to the European Standard EN 1991-1-4) on the online data sheets. If the wind load has been calculated under the updated standard then this will be explicitly mentioned on the data sheet.

The physical dimensions of our products have not been modified unless otherwise specified, nor has the actual wind loading surface area of the antennas increased in any way.

RoHS

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



“Quality leads the way”

As the world's oldest and largest antenna manufacturer, we live up to claim “Quality leads the way” on a daily basis. One of the fundamental principles is to always be on the lookout for the best solution for our customers.

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.

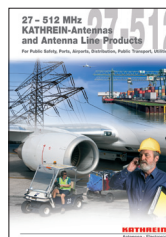
790 ... 960 MHz	XPol
1710 ... 2690 MHz	XPol
790 ... 960 MHz	XXPol
1710 ... 2690 MHz	XXPol XXXPol 4XPol
698 – 894 MHz 1710 – 2170 MHz	XPol (iRCU) XXPol (iRCU)
790 ... 960 MHz 1710 ... 2690 MHz	XXPol
698 ... 960 MHz 1710 ... 2690 MHz	XXXPol
698 ... 960 MHz 1710 ... 2690 MHz	4XPol 5XPol 6XPol
694 ... 2690 MHz	VPol
Omni	VPol, XPol
Indoor	VPol, VXPoI, VHPoI
RET	Remote Electrical Tilt-System
Electrical Accessories	Splitters and Tappers
Mechanical Accessories	Clamps, Downtilt Kits, ...

List of available Catalogues for Mobile Communication Antennas and Accessories

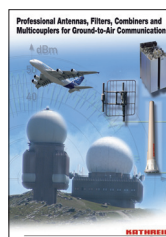
694 – 6000 MHz Base Station Antennas, Filters, Combiners and Amplifiers for Mobile Communications



27 – 512 MHz KATHREIN-Antennas and Antenna Line Products



Professional Antennas, Filters, Combiners and Multicouplers for Ground-to-Air Communications



Antennas for Trains and Buses



The listed catalogues are also available on CD-ROM



All the listed catalogues and further product information can be found via direct link in the barcode or on our homepage: www.kathrein.de

In addition, you will find a list of Kathrein's International Representatives for your local contact.

For technical inquiries or orders please contact: mobilcom@kathrein.de

Not longer in the catalogue 2014	Comments / Replacement
XPol 790...960 MHz	
739619v01	
739620v01	
80010202v02	Replaced by 80010303v02
80010207v01	Replaced by 80010303v02
80010203v02	Replaced by 80010634v01
80010294v02	Replaced by 80010634v01
80010204v02	Replaced by 80010305v02
80010215v01	Replaced by 80010306v02
80010208v01	Replaced by 80010306v02
80010307v01	Replaced by 80010306v02
80010217v01	Replaced by 80010310v01
80010300v01	Replaced by 80010310v01
XPol 1710...2690 MHz	
80010621v01	Replaced by 80010621v02
742214v01	Replaced by 742215v01
80010439v01	Replaced by 80010378
741984v01	
80010375	
80010360	
85010010	
XXPol / XXXPol 1710...2690 MHz	
80010644	Replaced by 80010644v01
80010622	Replaced by 80010622v01
742235v01	Replaced by 80010652
XXXPol 698...960 / 1710...2690 MHz	
80010691	Replaced by 80010691v01
4XPol / 5XPol / 6XPol 698...960 / 1710...2690 MHz	
80010892	Replaced by 80010892v01
VPol 790...2690 MHz	
735727	
736854	
738445	Replaced by 738447
738446	Replaced by 738448
VPol, XPol 790...2700 MHz	
80010850	
VPol, VXPoI, VHPoI 790...6000 MHz	
738446	Replaced by 738448
Remote Electrical Tilt (RET)	
86010148	Replaced by 86010148v01
86010026	Replaced by 8601006
Electrical Accessories 380...3800 MHz	
K63236001	Replaced by 86010160

Please note: New type numbers in the catalogue 2014 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 2014 unless otherwise announced. According information can be found on our webpage.

Summary of Antenna Types, RET-Products and Accessories

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

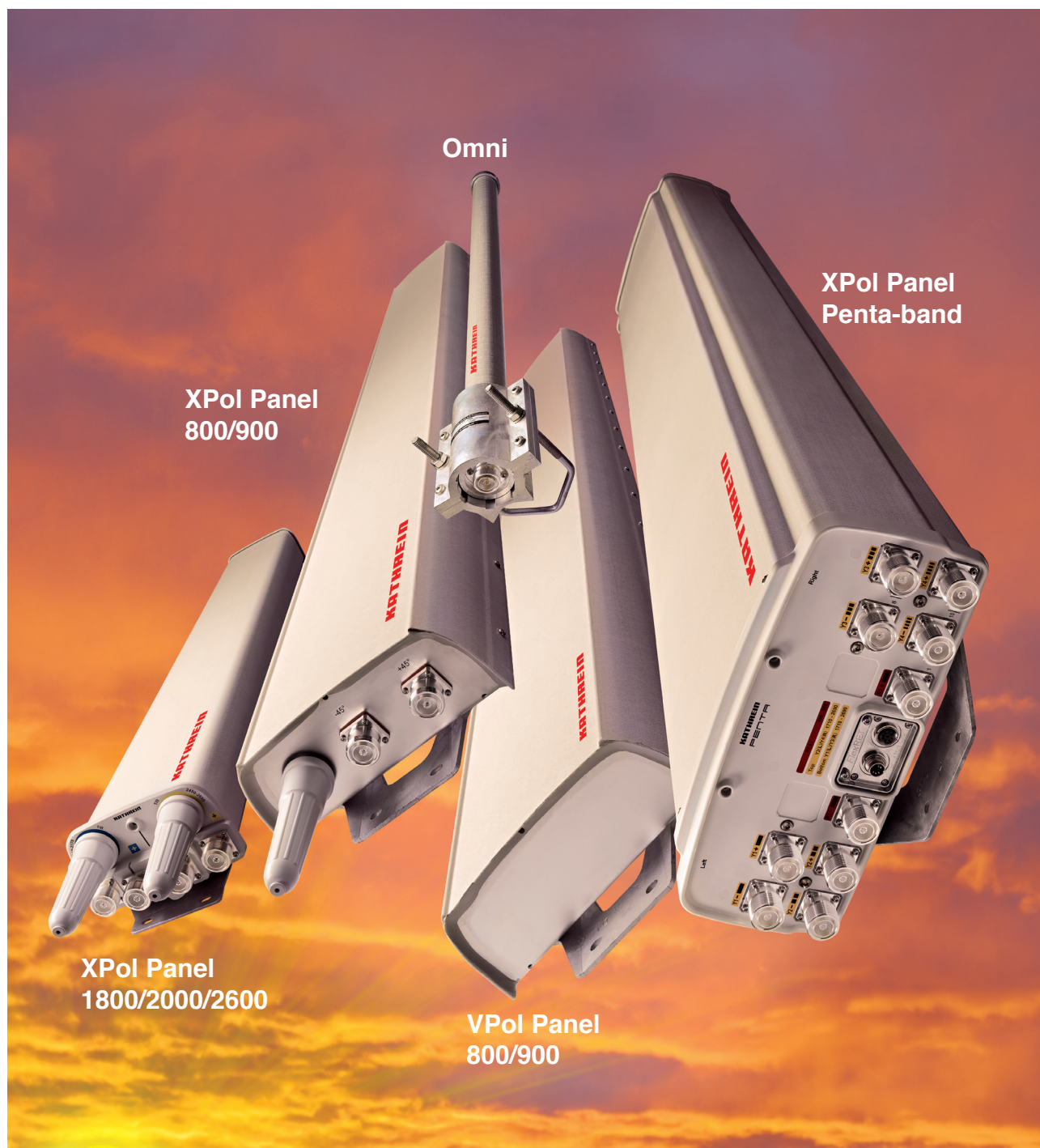
Type No.	Page	Type No.	Page	Type No.	Page	Type No.	Page
730...		738450	142	742272v03	105	800104..	
730376v02	132	738546	196	742290	138	80010425v01	31
730378v02	133	738908	206	742317	201	80010430	164
				742351v01	26	80010431	167
731...				742352v01	61	80010442	154
731651	196	741...				80010456v02	19
		741573	163	800100..		80010465	158
732...		741790	153	80010046v01	139	80010485v01	88
732327	197	741990v01	38			80010486v01	93
				800101..			
734...				80010111	151	800105..	
734360	205	742...		80010121v01	94	80010504v01	32
734361	205	742033	201	80010122v01	95	80010510v01	59
734362	205	742034	201	80010123v03	96	80010516v01	47
734363	205	742113	203	80010125	41	80010517v01	48
734364	205	742192v01	137	80010126	155		
734365	205	742196v01	29			800106..	
		742213v01	35	800102..		80010605	39
736...		742215v01	31	80010249	162	80010606v01	40
736347	147	742218v01	27	80010274	150	80010621v02	33
736349	148	742222v01	80	80010290v02	106	80010622v01	58
736350	145	742223v02	82	80010291v02	107	80010634v01	20
		742224v02	86	80010292v03	108	80010642	18
737...		742225v02	92			80010643	18
737398	207	742226v01	79	800103..		80010644v01	56
737978	198	742236v01	57	80010303v02	20	80010647v01	49
		742237	55	80010305v02	21	80010651	34
738...		742263	201	80010306v02	21	80010652	60
738187	152	742264v02	81	80010308v01	22	80010664	83
738192	146	742265v02	84	80010309v01	22	80010665v01	87
738440	212	742266v02	89	80010310v01	23	80010666	91
738447	136	742270v03	103	80010368	134	80010667	44
738448	136	742271v03	104	80010378	36	80010668	45

Summary of Antenna Types, RET-Products and Accessories

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
80010669	46	80010753	78	85010060	202	86010103	188
80010674	109	80010761	28	85010061	202	86010104	188
80010675v01	110	80010764v01	69	85010075	204	86010105	188
80010676	111	80010765v01	70	85010076	204	86010130	186
80010677	159	80010766v01	71	85010077	209	86010131	186
80010679	37	80010771	85	85010080	179	86010136	189
80010681	30	80010772	90			86010137	189
80010682	54			860...		86010138	189
80010684	128	800108..		86010002	181	86010148v01	174
80010685v01	129	80010804	126	86010006	177	86010149	75
80010686v01	130	80010805	127	86010007	179	86010150	190
80010691v01	112	80010816	50	86010008	179	86010151	190
80010692v01	113	80010817	51	86010009	179	86010152	190
80010697	100	80010825	124	86010010	179	86010153	175
80010698	101	80010826	125	86010011	179	86010154	180
80010699	102	80010828v01	135	86010012	179	86010156	176
		80010846	168	86010013	179	86010157	210 + 211
800107..		80010847	169	86010014	179	86010160	192
80010709	165	80010865	114 + 115	86010015	179		
80010710	166	80010866	116 + 117	86010017	187	K61...	
80010711	28	80010892v01	120 + 121	86010018	187	K61335	208
80010721v01	72	80010899	122 + 123	86010019	187		
80010722v01	73			86010023	191	K75...	
80010723v01	74	850...		86010029	179	K751161	143
80010727	62	85010002	196	86010030	182	K7515641	144
80010728	63	85010003	196	86010031	183		
80010734v01	66	85010008	199	86010032	179		
80010735v01	67	85010014	200	86010033	179		
80010736v01	68	85010015	200	86010046	178		
80010744	55	85010016	200	86010054	179		
80010747	149	85010017	200	86010100	188		
80010748	160	85010058	201	86010101	188		
80010749	161	85010059	201	86010102	188		

Antenna Designs:
Antenna Families
Harmony of Design and Technology



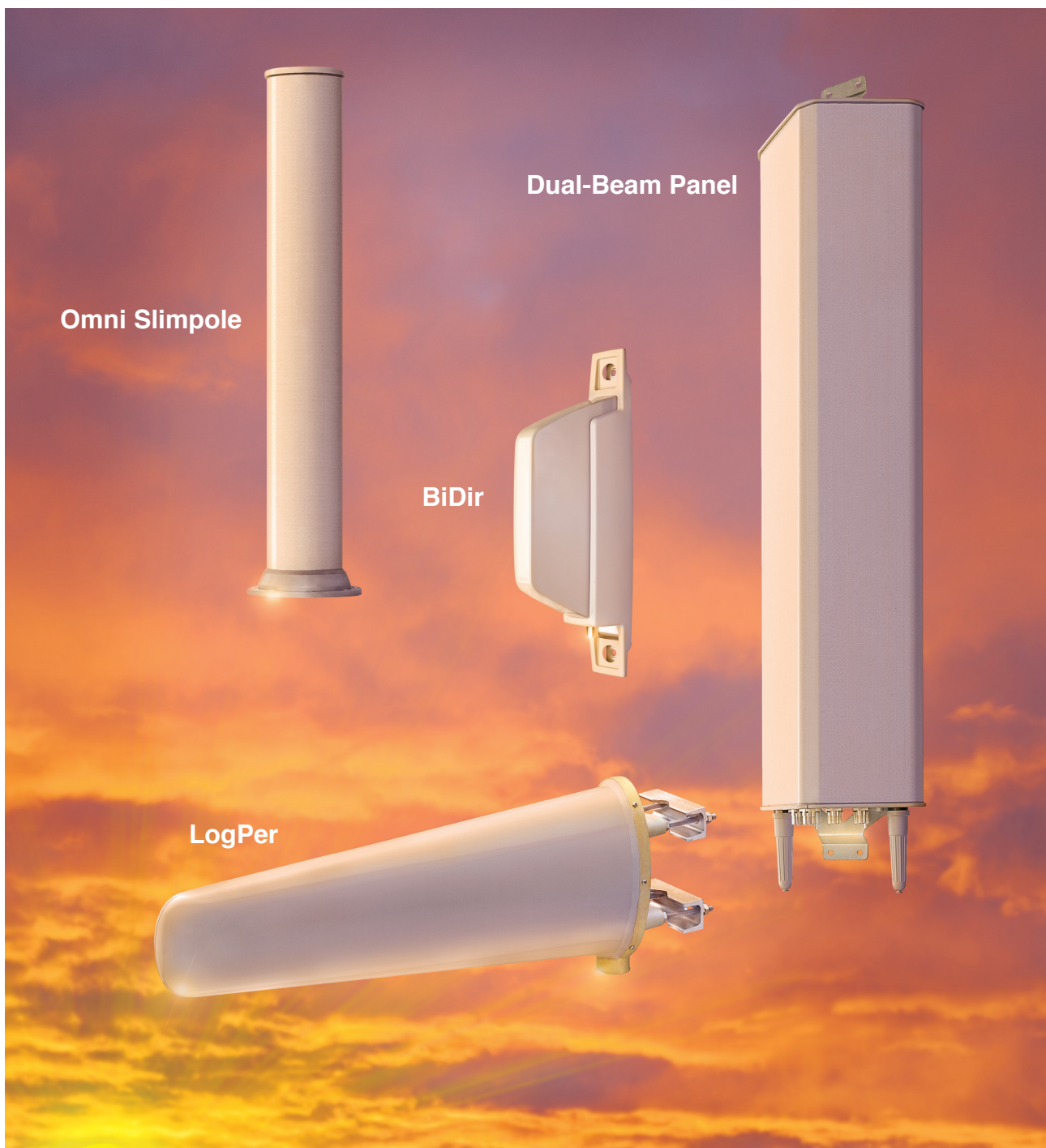
Directional Antenna Designs: Special Directional Antennas For Particular Applications

Antennas for

- tunnel use
- railway use
- micro cells (small cells)
- high gain link for repeaters

The distinguishing features of these special versions, e.g. log. periodic antennas, are:

- very small half-power beam width (high gain)
- high sidelobe suppression
- also Dual-band and Multi-band versions
- bidirectional horizontal pattern.



Antenna Designs: Antenna Families / RET-system Distinguishing features

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.
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 fulfil the stated 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 or even controlled by remote electrical tilt system (RET).
Low intermodulation products (typ. <–150 dBc)	After many years of experience in the construction of antennas and after intensive research into the effects of intermodulation, we have been able to optimize the 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 dB.

Superior squint

Squint, also often referred to as “Pattern Symmetry”, gives the symmetry of the pattern over the whole frequency range measured at the 3 dB points. Interferences and nulls in the network may be the result of bad values. In contrast to the vertical squint which is usually good, excellent squint values of the horizontal pattern are hard to reach.

Kathreins superior values of $\pm 5\%$ of the half-power beam width are in line with the requirements from system suppliers.

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.

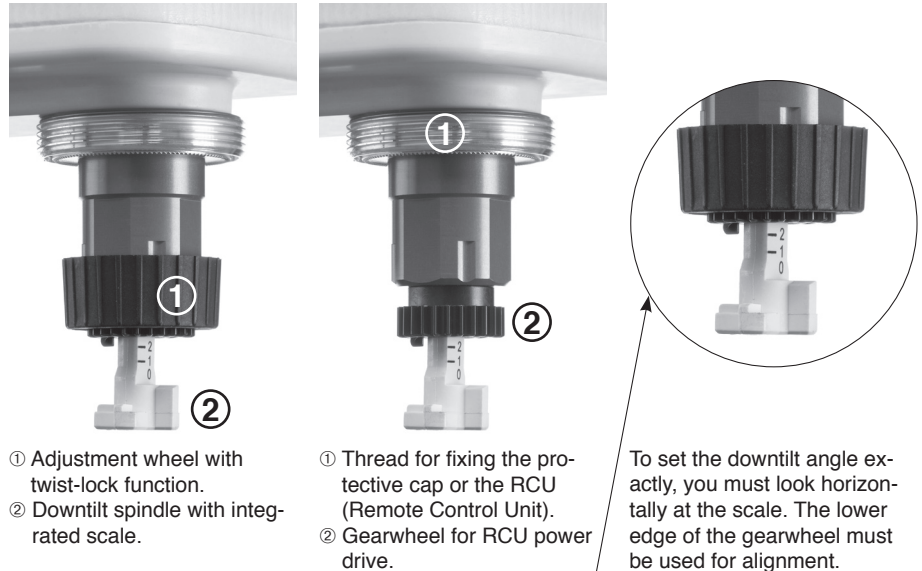
Downtilting of Antennas with external RCU: Downtilt Possibilities

Mechanical downtilt

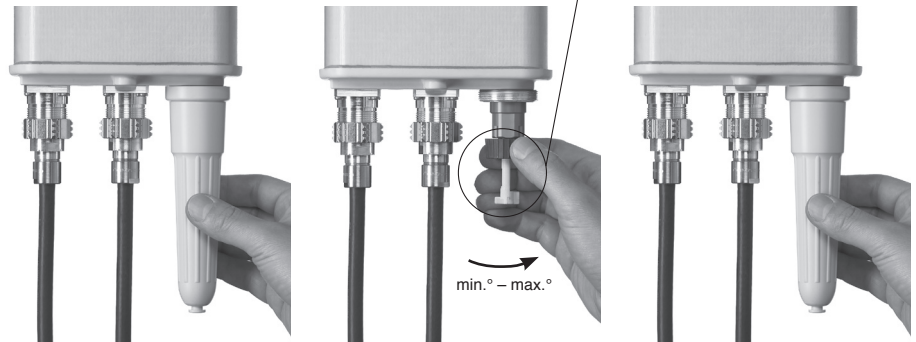
For further technical information please see “Mechanical Accessories”, page 195.

Electrical downtilt

Description of the adjustment mechanism (protective cap removed):



Manual adjustment procedure:



Remove the protective cap.

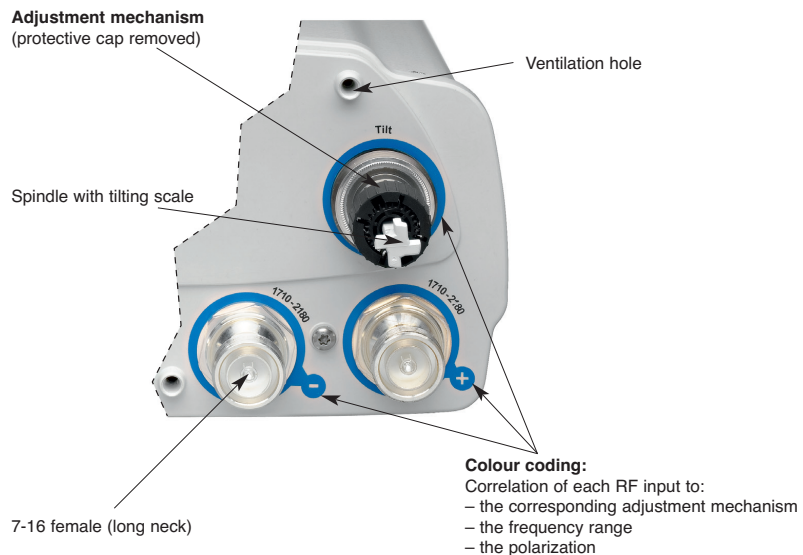
Set downtilt angle by rotating the adjustment wheel.

Screw on the protective cap again.

In case of no tilt adjustment, the protective cap shall not be removed during operation of the antenna.

Remote Electrical Tilt (RET) For further technical information please see “RET”, pages 172 and 173.

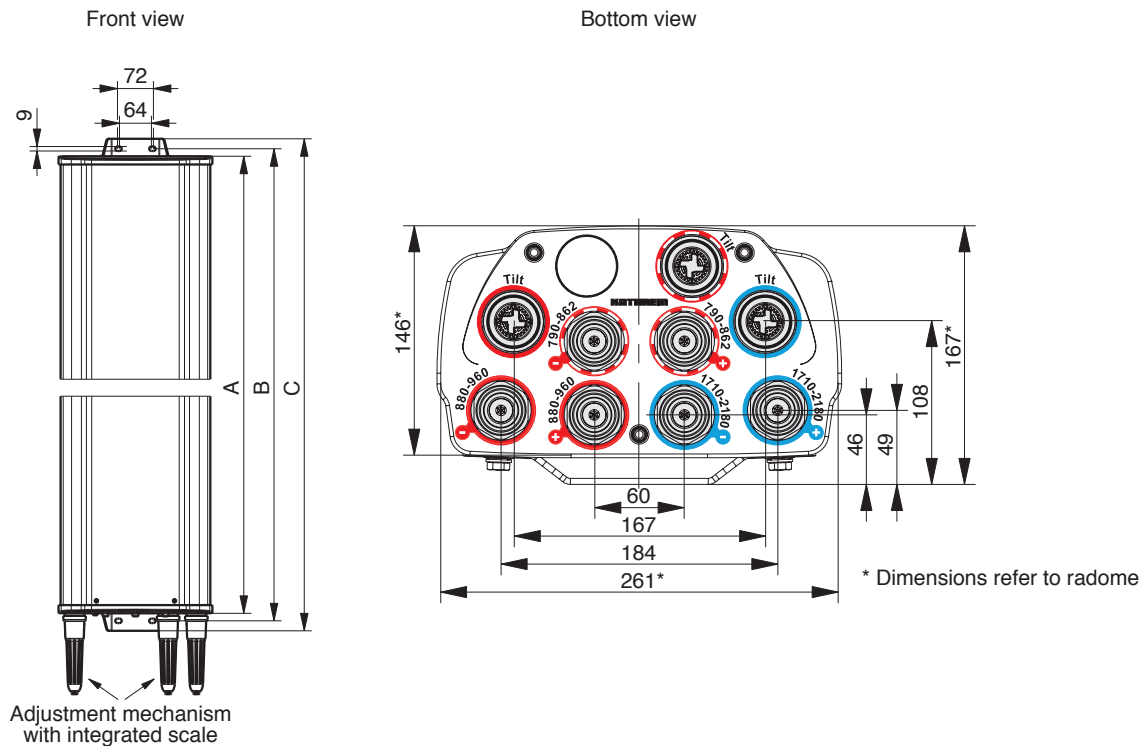
Description of bottom end cap (exemplary picture):



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.de
- Mobile Communication Systems
- Product overview
- Product search

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






According to AISG, the frequencies shall be marked like shown in the following table:

Frequency / MHz (exemplarily)	Colour	Colour code Abbreviation
698–960	Red	R
698–894	Red	R
790–960	Red	R
1710–1880	Blue	B
1710–2170 / 2180 / 2200	Blue	B
2490–2690	Yellow	Y
1710–2690	Yellow	Y



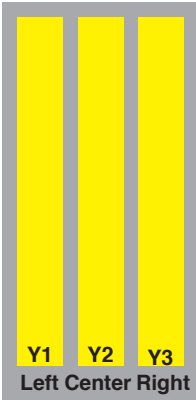

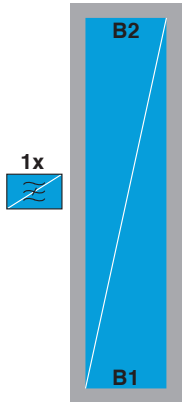

In line with this, we are introducing a system in order to better illustrate the physical design of our antennas. Based on the AISG colour coding, every antenna system is displayed corresponding to its frequency range. Each system is additionally marked by its colour code abbreviation as well as an identification 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 790–862 / 880–960 MHz		2. Filter Highband 1 1710–1880 / 1920–2170 MHz		3. Filter Highband 2 1710–2170 / 2490–2690 MHz	
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Some examples shall demonstrate the symbolic antenna illustration:

<p>1. Single-Band Antenna</p> <p>1 Low-Band Array</p> <p>e.g. 698–960 or 790–960 MHz</p>		<p>2. Dual-Band Antenna</p> <p>1 Low-Band / 1 High-Band Array interleaved</p> <p>e.g. 698–960 / 1710–2690 or 790–960 / 1710–2690 MHz</p>	
<p>3. Triple-Band Antenna</p> <p>3 High-Bands side-by-side (“multi-array”)</p> <p>e.g. 3 x 1710–2690 MHz</p>		<p>4. Triple-Band Antenna</p> <p>1 Low-Band Array interleaved with 2 High-Band Arrays, High-Band stacked</p> <p>e.g. 698–960 / 2 x 1710–2690 MHz</p>	
<p>5. Dual-Band Antenna</p> <p>2 High-Bands filtered</p> <p>e.g. 1710–1880 / 1920–2170 MHz</p>		<p>6. Triple-Band Antenna</p> <p>1 Low-Band interleaved with 2 filtered High-Bands</p> <p>e.g. 790–960 / 1710–2170 / 2490–2690 MHz</p>	

XXPol Panel 870–960/1710–1880 C 65°/60° 17/18dBi 2°–8°T/2°T

Polarization(s):
 (X) Dual +45°/–45°
 (V) Vertical

Antenna Family

Frequency Range(s)

Integrated Combiner

Horizontal
Half-power Beam Width(s)

Gain Value(s)

Variable / Fixed Electrical Tilt(s)

Summary – Directional Antennas

XPol

790...960 MHz

Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)	
XPol Panel	790-960 30° 18dBi 0°T	80010642	1298	rearside	18	A
XPol Panel	790-960 30° 21dBi 0°T	80010643	2254	rearside	18	A
XPol Panel	790-960 30° 20.5dBi 0°-10°T	80010456v02	2254	rearside	19	A
XPol Panel	790-960 65° 15dBi 0°-14°T	80010303v02	1294	bottom	20	A
XPol Panel	790-960 65° 16.5dBi 0°-10°T	80010634v01	1934	rearside	20	A
XPol Panel	790-960 65° 17.5dBi 0°-8°T	80010305v02	2254	rearside	21	A
XPol Panel	790-960 65° 17.5dBi 0°-10°T	80010306v02	2574	bottom	21	A
XPol Panel	790-960 85° 13.5dBi 0°-14°T	80010308v01	1294	bottom	22	A
XPol Panel	790-960 85° 15dBi 0°-10°T	80010309v01	1934	rearside	22	A
XPol Panel	790-960 85° 16dBi 0°-10°T	80010310v01	2574	bottom	23	A

1) Configuration Types – further details on page 14 and 15.

Type A



Panel Dual Polarization Half-power Beam Width

790–960

X

30°

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XPoL Panel 790–960 30° 18dBi 0°T

Type No.	80010642		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.5 dBi	2 x 17.6 dBi	2 x 18 dBi
Horizontal Pattern:			
Half-power beam width	33°	32°	30°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maidirection 0°	25 dB	25 dB	25 dB
Tracking, Avg.	1.0 dB		
Squint	±1.0°		
Vertical Pattern:			
Half-power beam width	14.5°	14.0°	12.8°
Sidelobe suppression for first sidelobe above main beam	≥ 14 dB	≥ 13 dB	≥ 12 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rear side: 970 / 180 / 1160 N		
Height/width/depth	1298 / 576 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



XPoL Panel 790–960 30° 21dBi 0°T

Type No.	80010643		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° T	2 x 20.2 dBi	2 x 20.4 dBi	2 x 20.8 dBi
Horizontal Pattern:			
Half-power beam width	33°	32°	30°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maidirection 0°	Typically: 30 dB	Typically: 26 dB	Typically: 23 dB
Tracking, Avg.	2.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	8.4°	8.2°	7.4°
Sidelobe suppression for first sidelobe above main beam	> 15 dB	> 15 dB	> 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rear side: 1760 / 330 / 2040 N		
Height/width/depth	2254 / 576 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	20.5 kg / 22.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Panel
Dual Polarization
Half-power Beam Width

790–960

X

30°

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XPol Panel 790–960 30° 20.5dBi 0°–10°T

Type No.	80010456v02		
	<i>clamps included</i>		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° T	2 x 20.0 dBi	2 x 20.2 dBi	2 x 20.5 dBi
Horizontal Pattern:			
Half-power beam width	33°	32°	30°
Front-to-back ratio, copolar	> 28 dB	> 29 dB	> 30 dB
Cross polar ratio Maindirection 0°	Typically: 25 dB	Typically: 23 dB	Typically: 20 dB
Tracking, Avg.	2.5 dB		
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	0.5° ... 5° ... 10° T > 16 ... 13 ... 13 dB	0.5° ... 5° ... 10° T > 18 ... 18 ... 17 dB	0.5° ... 5° ... 10° T > 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1760 / 330 / 2040 N		
Height/width/depth	2254 / 576 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	22 kg / 24 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Panel Dual Polarization Half-power Beam Width

790–960

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 790–960 65° 15dBi 0°–14°T

Type No.	80010303v02		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
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	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio			
Maindirection	0°	Typically: 25 dB	Typically: 25 dB
Sector	±60°	> 10 dB	> 10 dB
Vertical Pattern:			
Half-power beam width	15.7°	15.5°	15°
Electrical tilt	0°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above horizon	0° ... 7° ... 14° T 15 ... 14 ... 15 dB	0° ... 7° ... 14° T 18 ... 15 ... 15 dB	0° ... 7° ... 14° T 18 ... 15 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1 x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 440 / 210 / 610 N		
Height/width/depth	1294 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	8.5 kg / 10.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



XPol Panel 790–960 65° 16.5dBi 0°–10°T

Type No.	80010634v01		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
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°)	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio			
Maindirection	0°	Typically: 20 dB	Typically: 20 dB
Sector	±60°	> 10 dB	> 10 dB
Tracking, Avg.	0.5 dB		
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	0° ... 5° ... 10° T 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1 x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 680 / 310 / 900 N		
Height/width/depth	1934 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Panel Dual Polarization Half-power Beam Width

790–960

X

65°

KATHREIN
Antennen · Electronic

XPoI Panel 790–960 65° 17.5dBi 0°–8°T

Type No.	80010305v02		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	16.8 ... 17 ... 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	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio			
Maindirection	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
Sector	Typically: > 10 dB	Typically: > 10 dB	Typically: > 10 dB
Tracking, Avg.	0.5 dB		
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	0° ... 2° ... 4° ... 8° T 18 ... 18 ... 18 ... 16 dB	0° ... 2° ... 4° ... 8° T 18 ... 18 ... 18 ... 16 dB	0° ... 2° ... 4° ... 8° T 20 ... 18 ... 17 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 800 / 390 / 1090 N		
Height/width/depth	2254 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11.5 kg / 13.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



XPoI Panel 790–960 65° 17.5dBi 0°–10°T

Type No.	80010306v02		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	17.0 ... 17.1 ... 17.0	17.1 ... 17.2 ... 17.1	17.3 ... 17.4 ... 17.3
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°
Horizontal Pattern:			
Half-power beam width	68°	66°	65°
Front-to-back ratio (180°±30°)	> 24 dB	> 25 dB	> 25 dB
Cross polar ratio			
Maindirection	Typically: 23 dB	Typically: 23 dB	Typically: 25 dB
Sector	Typically: > 10 dB	Typically: > 10 dB	Typically: > 10 dB
Tracking, Avg.	1.0 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	7.7°	7.5°	7.3°
Electrical tilt	0.5°–9.5°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T ≥ 17 ... 14 ... 14 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 15 ... 15 dB	0.5° ... 5° ... 9.5° T ≥ 20 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female (long neck)		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 940 / 440 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	14 kg / 16 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Panel Dual Polarization Half-power Beam Width

790–960

X

85°

KATHREIN
Antennen · Electronic

XPoI Panel 790–960 85° 13.5dBi 0°–14°T

Type No.	80010308v01		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	13.2 ... 13.3 ... 13.2	13.3 ... 13.4 ... 13.3	13.4 ... 13.5 ... 13.4
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°
Horizontal Pattern:			
Half-power beam width	86°	85°	83°
Front-to-back ratio (180°±0°)	> 24 dB	> 24 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 20 dB	> 22 dB	> 24 dB
Cross polar ratio	Typically: 20 dB	Typically: 20 dB	Typically: 20 dB
Sector	0° ±60°	> 10 dB	> 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	16°	15.5°	15°
Electrical tilt	0°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 7° ... 14° T ≥ 17 ... 16 ... 15 dB	0° ... 7° ... 14° T ≥ 17 ... 17 ... 16 dB	0° ... 7° ... 14° T ≥ 17 ... 16 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 430 / 200 / 590 N		
Height/width/depth	1294 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	9 kg / 11 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



XPoI Panel 790–960 85° 15dBi 0°–10°T

Type No.	80010309v01		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
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°)	> 25 dB	> 25 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 21 dB	> 21 dB	> 21 dB
Cross polar ratio	Typically: 23 dB	Typically: 22 dB	Typically: 22 dB
Sector	0° ±60°	> 10 dB	> 10 dB
Tracking, Avg.	0.5 dB		
Squint	±3.0°		
Vertical Pattern:			
Half-power beam width	10.1°	9.8°	9.6°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam:	0° ... 5° ... 10° T ≥ 15 ... 15 ... 14 dB	0° ... 5° ... 10° T ≥ 15 ... 15 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 18 ... 18 dB
Avg.:	≥ 19 ... 19 ... 19 dB	≥ 20 ... 20 ... 20 dB	≥ 22 ... 22 ... 22 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	1x, Position bottom, continuously adjustable		
Wind load	Frontal / lateral / rearside: 680 / 310 / 900 N (at 150 km/h)		
Height/width/depth	1934 / 259 / 99 mm		
Category of mounting hardware	M (Medium)		
Weight	11.5 kg / 13.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Panel
Dual Polarization
Half-power Beam Width

790–960

X

85°

KATHREIN
 Antennen · Electronic

XPol Panel 790–960 85° 16dBi 0°–10°T

Type No.	80010310v01		
	clamps included		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
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°)	> 24 dB	> 24 dB	> 26 dB
Front-to-back ratio (180°±30°)	> 20 dB	> 22 dB	> 24 dB
Cross polar ratio 0°	Typically: 20 dB	Typically: 20 dB	Typically: 20 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB
Tracking, Avg.	0.5 dB		
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	0.5° ... 5° ... 9.5° T ≥ 18 ... 14 ... 14 dB	0.5° ... 5° ... 9.5° T ≥ 18 ... 17 ... 16 dB	0.5° ... 5° ... 9.5° T ≥ 17 ... 16 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 950 / 420 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	14 kg / 16 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.

Summary – Directional Antennas

XPol

1710...2690 MHz

Dual Polarization +45°/–45°

Type	Type No.	Height [mm]	Connector position	Page	1)
XPol Panel	1710–2170 30° 21dBi 0°–8°T	742351v01	1304	bottom	26 B
XPol Panel	1710–2170 45° 19.5dBi 0°–8°T	742218v01	1306	bottom	27 B
XPol Panel	1710–2690 65° 9.5dBi 0°T	80010711	155	bottom or top	28 C
XPol Panel	1710–2690 65° 12dBi 4°T	80010761	278	bottom	28 C
XPol Panel	1710–2170 65° 16dBi 0°T	742196v01	735	bottom or top	29 B
XPol Panel	1710–2690 65° 16.5dBi 0°–12°T	80010681	851	bottom	30 C
XPol Panel	1710–2200 65° 18.3dBi 0°T	80010425v01	1302	bottom	31 B
XPol Panel	1710–2200 65° 18dBi 0°–10°T	742215v01	1314	bottom	31 B
XPol Panel	1710–2200 65° 18dBi 0°–15°T ESLS	80010504v01	1387	bottom	32 B
XPol Panel	1710–2690 65° 18dBi 2°–14°T ESLS	80010621v02	1452	bottom	33 C
XPol Panel	1710–2690 65° 19dBi 0°–6°T	80010651	1670	bottom	34 C
XPol Panel	1710–2200 65° 19.5dBi 0°–6°T	742213v01	1954	bottom	35 B
XPol Panel	1710–2200 62° 21.2dBi 0°–6°T HE	80010378	2548	bottom	36 B
XPol Panel	1710–2690 85° 17dBi 2°–10°T	80010679	1388	bottom	37 C
XPol Panel	1710–2170 90° 18dBi 0°–6°T	741990V01	1942	bottom	38 B

Antennas with Dual-Beam

XXPol Panel	1710–2200 40° (–30°) 17dBi 2°–14°T	80010605	698	bottom	39	B / B
	1710–2200 40° (+30°) 17dBi 2°–14°T					
XXPol Panel	1710–2200 45° (–30°) 19.5dBi 0°–10°T	80010606V01	1314	bottom	40	B / B
	1710–2200 45° (+30°) 19.5dBi 0°–10°T					

Tri-Sector Slimpole Antenna

XPol Tri-Sector Slimpole	1710–2690 80° 10dBi 0°T	80010125	694	bottom	41	C / C / C
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New or changed product

1) Configuration Types – further details on page 14 and 15.

Type B



Type C



Abbreviations:

ESLS: Enhanced Side Lobe Suppression (above or below horizon)
HE: High Efficiency (Antennas with high gain compared to length)

Multi-band Panel Dual Polarization Half-power Beam Width

1710–2170

X

30°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2170 30° 21dBi 0°–8°T

Type No.	742351v01			clamps included
Frequency range	1710 – 1880 MHz	1710–2170 1850 – 1990 MHz	1920 – 2170 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	
Gain	2 x 20.2 dBi	2 x 20.5 dBi	2 x 20.7	
Horizontal Pattern:				
Half-power beam width	36°	35°	33°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio				
Main direction	Typically: 20 dB	Typically: 20 dB	Typically: 20 dB	
Sector	0° ±60° > 10 dB	> 10 dB	> 10 dB	
Sidelobe suppression	> 14 dB	> 14 dB	> 14 dB	
Tracking, Avg.		0.5 dB		
Squint		±1.0°		
Vertical Pattern:				
Half-power beam width	7.4°	7.0°	6.7°	
Electrical tilt	0°–8°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° T 18 ... 17 ... 16 dB	0° ... 4° ... 8° T 18 ... 18 ... 17 dB	0° ... 4° ... 8° T 18 ... 17 ... 16 dB	
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 540 / 135 / 640 N			
Height/width/depth	1304 / 299 / 69 mm			
Category of mounting hardware	M (Medium)			
Weight	14 kg / 14 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2170

X

45°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2170 45° 19.5dBi 0°–8°T

Type No.	742218v01			clamps included
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	
Gain	2 x 19 dBi	2 x 19.5 dBi	2 x 19.6 dBi	
Horizontal Pattern:				
Half-power beam width	47°	45°	44°	
Front-to-back ratio (180°±30°)	Copolar: > 27 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 27 dB Total power: > 25 dB	
Cross polar ratio Maindirection 0° Sector ±30°	Typically: 18 dB > 13 dB	Typically: 18 dB > 13 dB	Typically: 18 dB > 13 dB	
Sidelobe suppression	> 18 dB	> 18 dB	> 18 dB	
Tracking, Avg.	0.5 dB			
Squint	±1.5°			
Vertical Pattern:				
Half-power beam width	7.3°	7.0°	6.7°	
Electrical tilt	0°–8°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 2° ... 5° ... 8° T 17 ... 17 ... 15 ... 15 dB	0° ... 2° ... 5° ... 8° T 18 ... 18 ... 17 ... 17 dB	0° ... 2° ... 5° ... 8° T 18 ... 18 ... 15 ... 15 dB	
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 450 / 145 / 490 N			
Height/width/depth	1306 / 199 / 69 mm			
Category of mounting hardware	M (Medium)			
Weight	11 kg / 13 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2690

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2690 65° 9.5dBi 0°T

Type No.	80010711			
	<i>clamps included</i>			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	8.7 dBi	9.2 dBi	9.6 dBi	9.8 dBi
Horizontal Pattern:				
Half-power beam width	Approx. 67°	Approx. 62°	Approx. 55°	Approx. 53°
Front-to-back ratio, copolar (180°±30°)	> 24 dB	> 24 dB	> 22 dB	> 22 dB
Cross polar ratio 0°	Typically: 20 dB	Typically: 20 dB	Typically: 24 dB	Typically: 24 dB
Cross polar ratio sector corner ±60°	> 10 dB	> 9 dB	> 8 dB	> 8 dB
Vertical Pattern:				
Half-power beam width	Approx. 66°	Approx. 60°	Approx. 55°	Approx. 53°
VSWR	< 1.5			
Isolation, between ports	> 27 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	150 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom or top			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 50 / 13 / 55 N			
Max. wind velocity	200 km/h			
Height/width/depth	155 / 155 / 69 mm			
Category of mounting hardware	L (Light)			
Weight	1.5 kg (tension bands incl.)			
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter			



XPol Panel 1710–2690 65° 12dBi 4°T

Type No.	80010761			
	<i>clamps included</i>			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11 dBi	2 x 11.5 dBi	2 x 12.2 dBi	2 x 12.7 dBi
Horizontal Pattern:				
Half-power beam width	67°	65°	60°	58°
Front-to-back ratio, copolar	> 30 dB	> 28 dB	> 28 dB	> 27 dB
Cross polar ratio Mairdirection 0°	Typically: > 20 dB	Typically: > 20 dB	Typically: > 20 dB	Typically: > 20 dB
Sector ±60°	> 8 dB	> 8 dB	> 8 dB	> 8 dB
Vertical Pattern:				
Half-power beam width	36°	31°	25°	25°
Electrical tilt	3°, fixed	3°, fixed	4°, fixed	4°, fixed
VSWR	< 1.5			
Isolation, between ports	> 28 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	150 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 75 / 17 / 75 N			
Height/width/depth	278 / 154 / 69 mm			
Category of mounting hardware	L (Light)			
Weight	1.8 kg (tension bands incl.)			
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter			



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2170

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2170 65° 16dBi 0°T

Type No.	742196v01		
	<i>clamps included</i>		
	1710–2170		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 15.3 dBi	2 x 15.6 dBi	2 x 15.8 dBi
Horizontal Pattern:			
Half-power beam width	67°	66°	64°
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection Sector	0° ±60° Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±1.5°		
Vertical Pattern:			
Half-power beam width	12.6°	11.8°	11°
Sidelobe suppression for first sidelobe above horizon	> 14 dB	> 16 dB	> 14 dB
VSWR	< 1.4		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom or top		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 185 / 65 / 220 N		
Height/width/depth	735 / 155 / 69 mm		
Category of mounting hardware	L (Light)		
Weight	4.5 kg (tension bands incl.)		
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter		



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2690

X

65°

KATHREIN

Antennen · Electronic

XPol Panel 1710–2690 65° 16.5dBi 0°–12°T

Type No.	80010681			
	<i>clamps included</i>			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 15.5 dBi	2 x 16.3 dBi	2 x 16.7 dBi	2 x 16.7 dBi
Horizontal Pattern:				
Half-power beam width	67°	64°	60°	60°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 23 dB	> 23 dB
Cross polar ratio Sector 0° ±60°	Typically: 25 dB > 10 dB	Typically: 28 dB > 8 dB	Typically: 28 dB > 8 dB	Typically: 28 dB > 11 dB
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	0° ... 6° ... 12° T ≥ 12 ... 13 ... 15 dB	0° ... 6° ... 12° T ≥ 13 ... 14 ... 15 dB	0° ... 6° ... 12° T ≥ 13 ... 14 ... 16 dB	0° ... 6° ... 12° T ≥ 15 ... 15 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	250 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 210 / 60 / 220 N			
Height/width/depth	851 / 155 / 70 mm			
Category of mounting hardware	L (Light)			
Weight	5 kg / 5.2 kg (clamps incl.)			
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter			



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 18.3dBi 0°T

Type No.	80010425v01			clamps included
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	
Gain	2 x 17.9 dBi	2 x 18.1 dBi	2 x 18.3 dBi	
Horizontal Pattern:				
Half-power beam width	67°	66°	64°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio Sector 0° ±60°	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	
Tracking, Avg.	0.5 dB			
Squint	±1.5°			
Vertical Pattern:				
Half-power beam width	6.6°	6.2°	5.8°	
Electrical tilt	0°, fixed			
Sidelobe suppression for first sidelobe above main beam	> 14 dB	> 15 dB	> 16 dB	
First null-fill below main beam	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	
VSWR	< 1.4			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 115 / 390 N			
Height/width/depth	1302 / 155 / 69 mm			
Category of mounting hardware	M (Medium)			
Weight	7 kg / 9 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			



XPol Panel 1710–2200 65° 18dBi 0°–10°T

Type No.	742215v01			clamps included
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	17.7 ... 17.8 ... 17.6	18.0 ... 18.2 ... 17.9	18.1 ... 18.2 ... 18.0	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	
Horizontal Pattern:				
Half-power beam width	68°	66°	64°	
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	
Tracking, Avg.	0.5 dB			
Squint	±1.5°			
Vertical Pattern:				
Half-power beam width	7.1°	6.8°	6.4°	
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 17 ... 17 dB	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 17 ... 17 dB	0° ... 4° ... 8° ... 10° T 18 ... 18 ... 17 ... 17 dB	
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 330 / 90 / 340 N			
Height/width/depth	1314 / 154 / 70 mm			
Category of mounting hardware	L (Light)			
Weight	5.2 kg / 7.2 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2200

X

65°

KATHREIN

Antennen · Electronic

XPol Panel 1710–2200 65° 18dBi 0°–15°T ESLS

Type No.	80010504v01			
	1710–2200			
Frequency range	1710 – 1880 MHz	1880 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 17.5 dBi	2 x 17.6 dBi	2 x 17.7 dBi	2 x 17.8 dBi
Horizontal Pattern:				
Half-power beam width	68°	66°	64°	62°
Front-to-back ratio (180°±30°)	≥ 25 dB	≥ 25 dB	≥ 25 dB	≥ 25 dB
Cross polar ratio Sector 0°	22 dB	22 dB	24 dB	26 dB
±60°	≥ 10 dB	≥ 10 dB	≥ 10 dB	≥ 10 dB
Tracking, Avg.	1.0 dB			
Squint	±2.0°			
Vertical Pattern:				
Half-power beam width	7.9°	7.5°	7.2°	7.0°
Electrical tilt	0°–15°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam	0° ... 5° ... 10° ... 15° T ≥ 17 ... 20 ... 18 ... 17 dB	0° ... 5° ... 10° ... 15° T ≥ 16 ... 20 ... 18 ... 17 dB	0° ... 5° ... 10° ... 15° T ≥ 16 ... 20 ... 18 ... 17 dB	0° ... 5° ... 10° ... 15° T ≥ 15 ... 20 ... 18 ... 15 dB
– within 0°–20° sector above horizon	≥ 16 ... 18 ... 18 ... 16 dB	≥ 16 ... 18 ... 17 ... 16 dB	≥ 15 ... 18 ... 17 ... 16 dB	≥ 15 ... 16 ... 16 ... 15 dB
Null-fill at 0° tilt	21 dB	20 dB	19 dB	18 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 360 / 100 / 370 N			
Height/width/depth	1387 / 155 / 69 mm			
Category of mounting hardware	L (Light)			
Weight	6.5 kg / 8.5 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

clamps included



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2690

X

65°

KATHREIN

Antennen · Electronic

XPol Panel 1710–2690 65° 18dBi 2°–14°T ESLS

Type No.	80010621v02			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
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°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Sector	Typically: 25 dB > 10 dB	Typically: 24 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB			
Vertical Pattern:				
Half-power beam width	6.7°	6.0°	5.3°	5.0°
Electrical tilt	2°–14°, continuously adjustable			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	2° ... 8° ... 14° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 14 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	400 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1x, Position bottom, continuously adjustable			
Wind loa (at 150 km/h)	Frontal / lateral / rearside: 370 / 100 / 380 N			
Height/width/depth	1452 / 154 / 70 mm			
Category of mounting hardware	M (Medium)			
Weight	6.5 kg / 8.5 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

clamps
included



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2690

X

65°

KATHREIN

Antennen · Electronic

XPol Panel 1710–2690 65° 19dBi 0°–6°T

Type No.	80010651			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2170 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	2 x 18.5 dBi	2 x 19.0 dBi	2 x 19.4 dBi	2 x 19.5 dBi
Horizontal Pattern:				
Half-power beam width	67°	63°	60°	58°
Front-to-back ratio (180°±30°)	> 28 dB	> 28 dB	> 25 dB	> 25 dB
Cross polar ratio Sector 0° ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 28 dB > 10 dB
Tracking, Avg.	1.5 dB			
Squint	±3°			
Vertical Pattern:				
Half-power beam width	5.4°	4.9°	4.3°	4.0°
Electrical tilt	0°–6°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 3° ... 6° T ≥ 18 ... 18 ... 17 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Connector position	Bottom			
Adjustment mechanism	1x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 430 / 115 / 440 N			
Height/width/depth	1670 / 155 / 70 mm			
Category of mounting hardware	M (Medium)			
Weight	7 kg / 9 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

clamps
included



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2200

X

65°

KATHREIN
Antennen · Electronic

XPol Panel 1710–2200 65° 19.5dBi 0°–6°T

Type No.	742213v01		
	clamps included		
Frequency range	1710 – 1880 MHz	1710–2200 1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 19 dBi	2 x 19.2 dBi	2 x 19.5 dBi
Horizontal Pattern:			
Half-power beam width	67°	65°	63°
Front-to-back ratio (180°±30°)	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.0°		
Vertical Pattern:			
Half-power beam width	4.7°	4.5°	4.3°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 16 ... 15 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 17 ... 16 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1 x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 510 / 140 / 510 N		
Height/width/depth	1954 / 155 / 70 mm		
Category of mounting hardware	M (Medium)		
Weight	9 kg / 11 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		



Panel
Dual Polarization
Half-power Beam Width

1710–2200

X

62°

KATHREIN
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XPol Panel 1710–2200 62° 21.2dBi 0°–6°T

Type No.	80010378		
Frequency range	1710 – 1880 MHz	1710–2200 1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 20.6 dBi	2 x 21.1 dBi	2 x 21.2 dBi
Horizontal Pattern:			
Half-power beam width	65°	62°	60°
Front-to-back ratio (180°±30°)	> 30 dB	> 28 dB	> 28 dB
Cross polar ratio Sector 0° ±60°	25 dB > 10 dB	23 dB > 10 dB	23 dB > 10 dB
Tracking, Avg.	1.0 dB		
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	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 17 ... 17 ... 17 dB
Null-fill at 0° tilt	20 dB	20 dB	20 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1 x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 660 / 260 / 730 N		
Height/width/depth	2548 / 155 / 89 mm		
Category of mounting hardware	M (Medium)		
Weight	13 kg / 15 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

clamps
included



**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2690

X

85°

KATHREIN

Antennen · Electronic

Preliminary Issue

XPol Panel 1710–2690 85° 17dBi 2°–10°T

Type No.	80010679			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 2° tilt	2 x 16.4 dBi	2 x 16.6 dBi	2 x 17.0 dBi	2 x 17.2 dBi
Horizontal Pattern:				
Half-power beam width	83°	84°	85°	83°
Front-to-back ratio (180°±30°)	> 25 dB	> 24 dB	> 23 dB	> 22 dB
Cross polar ratio Sector 0° ±60°	Typically: 24 dB > 12 dB	Typically: 25 dB > 12 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB
Vertical Pattern:				
Half-power beam width	6.9°	6.5°	6.1°	5.5°
Electrical tilt	2°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	2° ... 6° ... 10° T ≥ 17 ... 18 ... 18 dB	2° ... 6° ... 10° T ≥ 18 ... 18 ... 17 dB	2° ... 6° ... 10° T ≥ 17 ... 17 ... 17 dB	2° ... 6° ... 10° T ≥ 18 ... 18 ... 18 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	2 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	1 x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 360 / 100 / 370 N			
Max. wind velocity	200 km/h			
Height/width/depth	1388 / 155 / 69 mm			
Category of mounting hardware	M (Medium)			
Weight	4.6 kg / 6.6 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

clamps
included



Multi-band Panel Dual Polarization Half-power Beam Width

1710–2170

X

90°

KATHREIN
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XPol Panel 1710–2170 90° 18dBi 0°–6°T

Type No.	741990v01		
	clamps included		
Frequency range	1710 – 1880 MHz	1710–2170 1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.7 dBi	2 x 18 dBi	2 x 18.2 dBi
Horizontal Pattern:			
Half-power beam width	88°	88°	88°
Front-to-back ratio, copolar total power	> 25 dB > 25 dB	> 25 dB > 25 dB	> 25 dB > 25 dB
Cross polar ratio Main direction Sector	0° ±60° Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB	Typically: 20 dB > 10 dB
Tracking, Avg.	0.5 dB		
Squint	±2.5°		
Vertical Pattern:			
Half-power beam width	4.9°	4.7°	4.5°
Electrical tilt	0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 2° ... 4° ... 6° T 17 ... 17 ... 17 ... 17 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 18 ... 18 dB	0° ... 2° ... 4° ... 6° T 18 ... 18 ... 18 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	1 x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 510 / 185 / 610 N		
Height/width/depth	1942 / 155 / 69 mm		
Category of mounting hardware	M (Medium)		
Weight	11 kg / 13 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Dual-Beam Panel

Dual Polarization

Half-power Beam Width

1710–2200	1710–2200
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X	X
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40°	40°
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KATHREIN

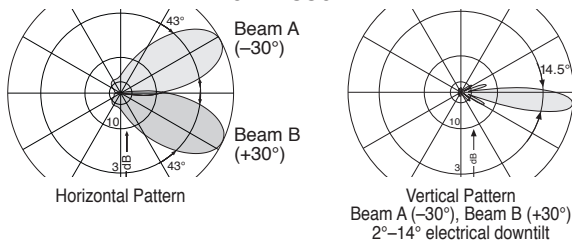
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XXPol Panel 1710–2200/1710–2200 40°(-30°)/40°(+30°) 17/17dBi 2°–14°/2°–14°T

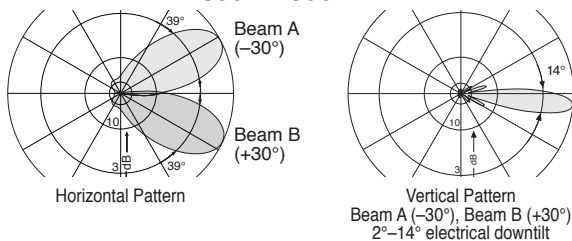
Type No.	80010605		
	clamps included		
	1710–2200		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Azimuth direction	Beam A (-30°), Beam B (+30°)		
Polarization	+45°, -45°; +45°, -45°	+45°, -45°; +45°, -45°	+45°, -45°; +45°, -45°
Gain	2° ... 7° ... 14° T 16.5 ... 16.5 ... 16.2 dBi	2° ... 7° ... 14° T 17.0 ... 16.8 ... 16.5 dBi	2° ... 7° ... 14° T 17.5 ... 17.4 ... 16.8 dBi
Horizontal Pattern:			
Half-power beam width (offset beams ±30°)	43°	40°	37°
Front-to-back ratio	Copolars: > 30 dB Total power: > 25 dB		
Cross polar ratio			
Main direction -30°; +30° Sector -60°; 0°; 0°; +60°	Typically: 15 dB > 8 dB	Typically: 15 dB > 8 dB	Typically: 15 dB > 8 dB
Sidelobe suppression for sidelobes beside main beam	> 18 dB		
Vertical Pattern:			
Half-power beam width	14.5°	14°	13°
Electrical tilt	2°–14°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	> 16 dB		
VSWR	< 1.5		
Isolation, between ports	> 28 dB		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Max. power per input	200 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 400 / 115 / 450 N		
Height/width/depth	698 / 380 / 150 mm		
Category of mounting hardware	M (Medium)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



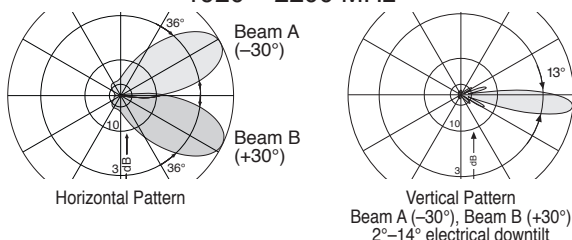
1710 – 1880 MHz



1850 – 1990 MHz



1920 – 2200 MHz



Dual-Beam Panel

Dual Polarization

Half-power Beam Width

1710–2200	1710–2200
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X	X
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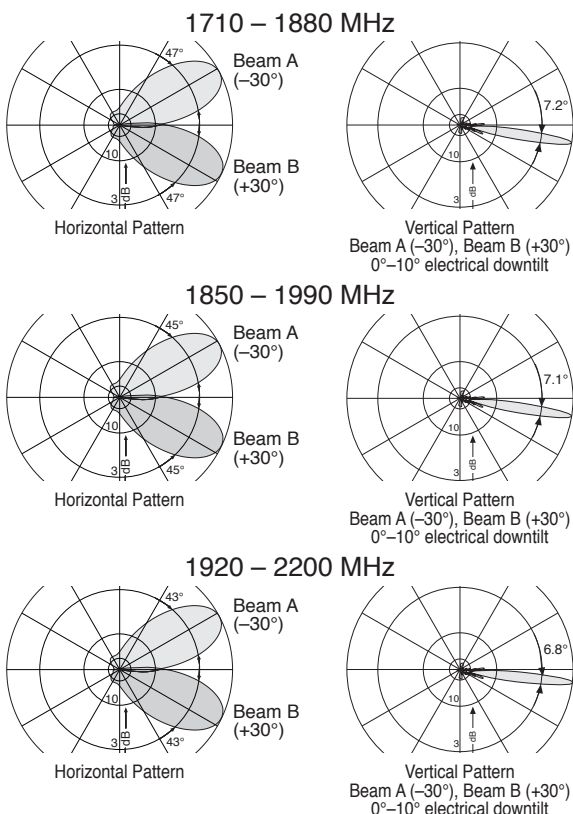
45°	45°
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KATHREIN

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XXPol Panel 1710–2200/1710–2200 45°(-30°)/45°(+30°) 19.5/19.5dBi 0°–10°/0°–10°T

Type No.	80010606v01			clamps included
	1710–2200			
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz	
Azimuth direction	Beam A (-30°), Beam B (+30°)			
Polarization	+45°, -45°; +45°, -45°	+45°, -45°; +45°, -45°	+45°, -45°; +45°, -45°	
Gain	4 x 19 dBi	4 x 19.3 dBi	4 x 19.5 dBi	
Horizontal Pattern:				
Half-power beam width (offset beams ±30°)	47°	41°	43°	
Front-to-back ratio	Copolar: > 30 dB Total power: > 25 dB			
Cross polar ratio				
Main direction -30°; +30°	Typically: 18 dB	Typically: 17 dB	Typically: 16 dB	
Sector -60°; 0°; 0°; +60°	> 13 dB	> 13 dB	> 13 dB	
Sidelobe suppression for sidelobes beside main beam	> 18 dB			
Vertical Pattern:				
Half-power beam width	7.2°	7.1°	6.8°	
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	> 18 dB			
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)			
Max. power per input	200 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 710 / 200 / 820 N			
Height/width/depth	1314 / 380 / 150 mm			
Category of mounting hardware	M (Medium)			
Weight	19 kg / 21 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

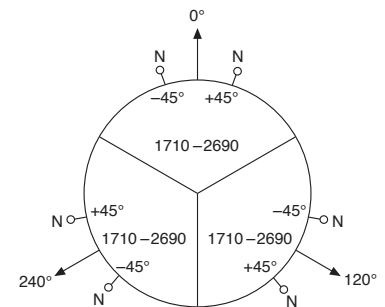
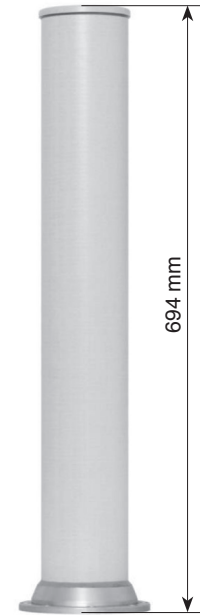


Tri-Sector Slimpole Antenna	0°	120°	240°
Frequency Range	1710–2690	1710–2690	1710–2690
Dual Polarization	X	X	X
Half-power Beam Width	80°	80°	80°

KATHREIN
Antennen · Electronic

XPol Tri-Sector Slimpole 1710–2690 80° 10dBi 0°T

Type No.	80010125				Electrical datas per sector
	1710–2690				
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2170 – 2490 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain	2 x 9.5 dBi	2 x 10 dBi	2 x 10.5 dBi	2 x 11 dBi	
Horizontal Pattern:					
Half-power beam width	80°	78°	75°	73°	
Front-to-back ratio, copolar	> 30 dB	> 28 dB	> 28 dB	> 27 dB	
Cross polar ratio					
Maindirection	0°	Typically: 20 dB	Typically: 20 dB	Typically: 20 dB	Typically: 20 dB
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Vertical Pattern:					
Half-power beam width	44°	42°	35°	31°	
Electrical tilt	0°, fixed				
VSWR	< 1.5				
Isolation, between ports	> 25 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	100 W (at 50 °C ambient temperature)				
Input	6 x N-connector female				
Connector position	Bottom				
Weight	2.3 kg				
Wind load	50 N (at 150 km/h)				
Max. wind velocity	200 km/h				
Mechanical interface	Flange connection 8 x M6 at a graduated diameter of 136 mm (Evenness of the opposite surface: 0.5 mm)				
Height / diameter	694 / 100 mm				





Summary – Directional Antennas

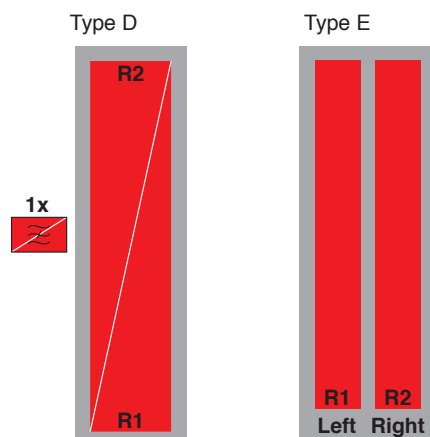
XXPol

790...960 MHz

Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)				
XXPol Panel	790–862	65°	14.5dBi	0°–12°T	80010667	1355	bottom	44	D
	880–960	65°	15dBi	0°–12°T					
XXPol Panel	790–862	65°	16dBi	0°–10°T	80010668	1934	bottom	45	D
	880–960	65°	16.5dBi	0°–10°T					
XXPol Panel	790–862	65°	17dBi	0°–8°T	80010669	2574	bottom	46	D
	880–960	65°	17.5dBi	0°–8°T					
XXPol Panel	824–960	60°	16dBi	0°–10°T	80010516v01	2024	rearside	47	E
	824–960	60°	16dBi	0°–10°T					
XXPol Panel	824–960	65°	17dBi	0°–8°T	80010517v01	2631	rearside	48	E
	824–960	65°	17dBi	0°–8°T					
XXPol Panel	790–960	65°	17.5dBi	0°–8°T	80010647v01	2254	rearside	49	E
	790–960	65°	17.5dBi	0°–8°T					
XXPol Panel	790–960	90°	15dBi	0°–10°T	80010816	1934	rearside	50	E
	790–960	90°	15dBi	0°–10°T					
XXPol Panel	790–960	90°	16dBi	0°–8°T	80010817	2631	rearside	51	E
	790–960	90°	16dBi	0°–8°T					

1) Configuration Types – further details on page 14 and 15.



Dual-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960
X	X
65°	65°

KATHREIN
 Antennen · Electronic

XXPol Panel 790–862/880–960 65°/65° 14.5/15dBi 0°–12°/0°–12°T

Type No.	80010667 <i>clamps included</i>	
	790–862	880–960
Frequency range	790 – 862 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Average gain (dBi)	14.3 ... 14.4 ... 14.1	14.8 ... 15.0 ... 14.6
Tilt	0° ... 6° ... 12°	0° ... 6° ... 12°
Horizontal Pattern:		
Half-power beam width	68°	64°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB
Cross polar ratio		
Main direction 0°	20 dB	20 dB
Sector ±60°	> 10 dB	> 10 dB
Vertical Pattern:		
Half-power beam width	15.2°	13.9°
Electrical tilt, continuously adjustable	0°–12°	0°–12°
Sidelobe suppression for first sidelobe above main beam	0° ... 6° ... 12° T ≥ 17 ... 16 ... 15 dB	0° ... 6° ... 12° T ≥ 17 ... 15 ... 15 dB
VSWR	< 1.5	
Isolation: Intrasystem	> 28 dB, Typ. > 30 dB	
Isolation: Intersystem	> 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	350 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom, continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 630 / 220 / 730 N	
Height/width/depth	1355 / 303 / 99 mm	
Category of mounting hardware	M (Medium)	
Weight	14 kg / 16 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



Dual-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960
X	X
65°	65°

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XXPol Panel 790–862/880–960 65°/65° 16/16.5dBi 0°–10°/0°–10°T

Type No.	80010668	
	790–862	880–960
Frequency range	790 – 862 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Average gain (dBi)	15.9 ... 16.0 ... 15.8	16.3 ... 16.6 ... 16.1
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°
Horizontal Pattern:		
Half-power beam width	67°	63°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB
Cross polar ratio		
Main direction 0°	23 dB	25 dB
Sector ±60°	> 10 dB	> 10 dB
Vertical Pattern:		
Half-power beam width	10°	9.7°
Electrical tilt, continuously adjustable	0°–10°	0°–10°
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 17 ... 16 ... 16 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 16 dB
VSWR	< 1.5	
Isolation: Intrasystem	> 28 dB, Typ. > 30 dB	
Isolation: Intersystem	> 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	400 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom, continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 920 / 320 / 1050 N	
Height/width/depth	1934 / 303 / 99 mm	
Category of mounting hardware	M (Medium)	
Weight	18 kg / 20 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter	

clamps included



Dual-band Panel
Dual Polarization
Half-power Beam Width

790–862	880–960
X	X
65°	65°

KATHREIN
 Antennen · Electronic

XXPol Panel 790–862/880–960 65°/65° 17/17.5dBi 0°–8°/0°–8°T

Type No.	80010669	
	790–862	880–960
Frequency range	790 – 862 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°
Average gain (dBi)	16.6 ... 16.9 ... 16.6	17.1 ... 17.4 ... 17.1
Tilt	0° ... 4° ... 8°	0° ... 4° ... 8°
Horizontal Pattern:		
Half-power beam width	67°	63°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB
Cross polar ratio		
Main direction 0°	> 25 dB	> 23 dB
Sector ±60°	> 10 dB	> 10 dB
Vertical Pattern:		
Half-power beam width	7.7°	7.2°
Electrical tilt, continuously adjustable	0°–8°	0°–8°
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° T ≥ 18 ... 15 ... 15 dB	0° ... 4° ... 8° T ≥ 18 ... 16 ... 15 dB
VSWR	< 1.5	
Isolation: Intrasystem	> 28 dB, Typ. > 30 dB	
Isolation: Intersystem	> 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	350 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom, continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1270 / 430 / 1430 N	
Height/width/depth	2574 / 303 / 99 mm	
Category of mounting hardware	H (Heavy)	
Weight	21 kg / 23 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter	

clamps included



2-Multi-band Panel

Dual Polarization

Half-power Beam Width

824–960

824–960

X

X

60°

60°

KATHREIN

Antennen · Electronic

XXPol Panel 824–960/824–960 60°/60° 16/16dBi 0°–10°/0°–10°T

Type No.	80010516v01	
	clamps included	
	824–960	
Frequency range	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain at 0° tilt	4 x 15.5 dBi	4 x 15.7 dBi
Horizontal Pattern:		
Half-power beam width	60°	58°
Front-to-back ratio	> 25 dB	> 25 dB
Cross polar ratio	Typically: 15 dB	Typically: 16 dB
Sector	0° ±60°	Typically: 16 dB > 10 dB
Vertical Pattern:		
Half-power beam width	9.8°	9.3°
Electrical tilt	0°–10°, continuously adjustable	
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 14 ... 15 ... 15 dB	0° ... 5° ... 10° T ≥ 14 ... 15 ... 15 dB
VSWR	< 1.5	
Isolation, between ports	Typically: > 25 dB	Typically: > 28 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Rearside, pointing downwards	
Adjustment mechanism	2x, Position bottom continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 910 / 300 / 1150 N	
Height/width/depth	2024 / 374 / 169 mm	
Category of mounting hardware	H (Heavy)	
Weight	23 kg / 25 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



2-Multi-band Panel Dual Polarization Half-power Beam Width

824–960

824–960

X

X

65°

65°

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Antennen · Electronic

XXPol Panel 824–960/824–960 65°/65° 17/17dBi 0°–8°/0°–8°T

Type No.	80010517v01	
	clamps included	
	824–960	
Frequency range	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain at 0° tilt	4 x 16.5 dBi	4 x 16.7 dBi
Horizontal Pattern:		
Half-power beam width	66°	61°
Front-to-back ratio	> 25 dB	> 25 dB
Cross polar ratio	Typically: 16 dB	Typically: 17 dB
Sector	0° ±60° > 8 dB	> 10 dB
Vertical Pattern:		
Half-power beam width	7.2°	6.8°
Electrical tilt	0°–8°, continuously adjustable	
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° T ≥ 15 ... 15 ... 15 dB	0° ... 4° ... 8° T ≥ 15 ... 16 ... 15 dB
VSWR	< 1.5	
Isolation, between ports	Typically: > 25 dB	> 28 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)	
Max. power per input	500 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female	
Connector position	Rearside, pointing downwards	
Adjustment mechanism	2x, Position bottom, continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1210 / 400 / 1540 N	
Height/width/depth	2631 / 374 / 169 mm	
Category of mounting hardware	H (Heavy)	
Weight	28 kg / 30 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter	



2-Multi-band Panel Dual Polarization Half-power Beam Width

790–960

790–960

X

X

65°

65°

KATHREIN

Antennen · Electronic

XXPol Panel 790–960/790–960 65°/65° 17.5/17.5dBi 0°–8°/0°–8°T

Type No.	80010647v01		
	clamps included		
	790–960		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
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	> 27 dB	> 27 dB	> 27 dB
Cross polar ratio			
Main direction	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
Sector	Typically: > 10 dB	Typically: > 10 dB	Typically: > 10 dB
Tracking, Avg.	1.0 dB		
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.	0° ... 3° ... 6° ... 8° T 18 ... 18 ... 16 ... 15 dB	0° ... 3° ... 6° ... 8° T 18 ... 18 ... 16 ... 15 dB	0° ... 3° ... 6° ... 8° T 18 ... 18 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	400 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Rearside		
Adjustment mechanism	2x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1760 / 330 / 2040 N		
Height/width/depth	2254 / 576 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	24 kg / 26 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



**Dual-band Panel
Dual Polarization
Half-power Beam Width**

790–960	790–960
X	X
90°	90°

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XXPol Panel 790–960/790–960 90°/90° 15/15dBi 0°–10°/0°–10°T

Type No.	80010816			clamps included
	790–960			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	14.5 ... 14.5 ... 14.3	14.6 ... 14.8 ... 14.5	14.8 ... 15.0 ... 14.8	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	
Horizontal Pattern:				
Half-power beam width	93°	90°	87°	
Front-to-back ratio (180°±0°)	> 24 dB	> 24 dB	> 25 dB	
Front-to-back ratio (180°±30°)	> 20 dB	> 21 dB	> 22 dB	
Cross polar ratio	Typically: 20 dB	Typically: 20 dB	Typically: 18 dB	
Sector	0° > 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:				
Half-power beam width	10.5°	10.2°	10°	
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 18 ... 15 ... 14 dB	0° ... 5° ... 10° T ≥ 18 ... 17 ... 16 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	
VSWR	< 1.5			
Isolation, between ports	> 25 dB, Typ. > 27 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	400 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Rearside			
Adjustment mechanism	2x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 910 / 380 / 1150 N			
Height/width/depth	1934 / 374 / 106 mm			
Category of mounting hardware	H (Heavy)			
Weight	18 kg / 20 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			



**Dual-band Panel
Dual Polarization
Half-power Beam Width**

790–960	790–960
X	X
90°	90°

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XXPol Panel 790–960/790–960 90°/90° 16/16dBi 0°–8°/0°–8°T

Type No.	80010817			clamps included
	790–960			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (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°)	> 24 dB	> 24 dB	> 25 dB	
Front-to-back ratio (180°±30°)	> 20 dB	> 21 dB	> 22 dB	
Cross polar ratio Sector	Typically: 20 dB 0° ±60° > 10 dB	Typically: 20 dB > 10 dB	Typically: 18 dB > 10 dB	
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	0° ... 4° ... 8° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 15 dB	
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 27 dB, Intersystem: > 27 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	400 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1270 / 400 / 1710 N			
Height/width/depth	2631 / 374 / 106 mm			
Category of mounting hardware	H (Heavy)			
Weight	23 kg / 25 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			



Summary – Directional Antennas

XXPol, XXXPol, 4XPol

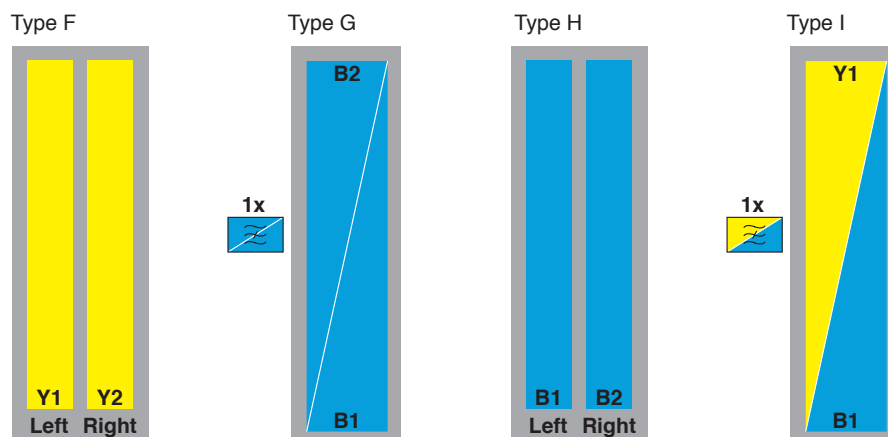
1710...2690 MHz

XXPol – Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)
XXPol Panel 1710–2690 65° 16.5dBi 0°–12°T 1710–2690 65° 16.5dBi 0°–12°T	80010682	855	bottom	54	F
XXPol Panel 1710–1880 65° 17.5dBi 2°–10°T 1920–2170 60° 18dBi 2°–10°T	80010744	1410	bottom	55	G
XXPol Panel 1710–2170 65° 18dBi 0°–8°T 1710–2170 65° 18dBi 0°–8°T	742237	1147	bottom	55	H
XXPol Panel 1710–2170 65° 18dBi 2°–14°T 2490–2690 60° 18dBi 2°–14°T	80010644v01	1442	bottom	56	I
XXPol Panel 1710–2200 65° 18dBi 0°–10°T 1710–2200 65° 18dBi 0°–10°T	742236V01	1319	bottom	57	H
XXPol Panel 1710–2690 65° 18dBi 2°–14°T ESLS 1710–2690 65° 18dBi 2°–14°T	80010622v01	1471	bottom	58	F
XXPol Panel 1710–2200 65° 18dBi 0°–15°T ESLS 1710–2200 65° 18dBi 0°–15°T	80010510V01	1389	bottom	59	H
XXPol Panel 1710–2690 65° 19dBi 0°–10°T 1710–2690 65° 19dBi 0°–10°T	80010652	1668	bottom	60	F
XXPol Panel 1710–2180 90° 16.5dBi 0°–10°T 1710–2180 90° 16.5dBi 0°–10°T	742352V01	1319	bottom	61	H

New or changed product

1) Configuration Types – further details on page 14 and 15.



Summary – Directional Antennas

XXPol, XXXPol, 4XPol

1710...2690 MHz

XXXPol – Dual Polarization +45°/–45°

Type	Type No.	Height [mm]	Connector position	Page	1)		
XXXPol Panel	1710–2690	65° 18dBi 2°–14°T	80010727	1475	bottom	62	J
	1710–2690	65° 18dBi 2°–14°T					
	1710–2690	65° 18dBi 2°–14°T					

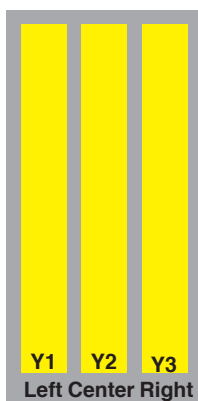
4XPol – Dual Polarization +45°/–45°

4XPol Panel	1710–2170	65° 17.5dBi 2°–12°T	80010728	1471	bottom	63	K
	1710–2170	65° 17.5dBi 2°–12°T					
	2490–2690	60° 18dBi 2°–14°T					
	2490–2690	60° 18dBi 2°–14°T					

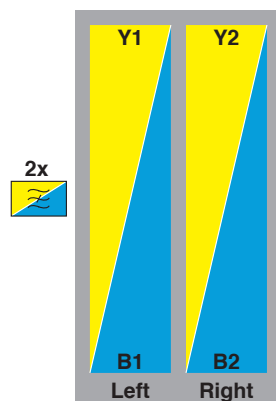
New or changed product

1) Configuration Types – further details on page 14 and 15.

Type J



Type K



Abbreviations:

ESLS: Enhanced Side Lobe Suppression (above or below horizon)

**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2690	1710–2690
X	X
65°	65°

KATHREIN
Antennen · Electronic

XXPol Panel 1710–2690/1710–2690 65°/65° 16.5/16.5dBi 0°–12°/0°–12°T

Type No.	80010682			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain at 0° tilt	4 x 15.8 dBi	4 x 16.2 dBi	4 x 16.6 dBi	4 x 16.7 dBi
Horizontal Pattern:				
Half-power beam width	65°	64°	60°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 28 dB
Cross polar ratio Sector	Typically: 25 dB 0° ±60° > 8 dB	Typically: 25 dB > 8 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
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	0° ... 6° ... 12° T ≥ 12 ... 13 ... 15 dB	0° ... 6° ... 12° T ≥ 13 ... 14 ... 16 dB	0° ... 6° ... 12° T ≥ 13 ... 15 ... 16 dB	0° ... 6° ... 12° T ≥ 15 ... 15 ... 17 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	250 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 440 / 100 / 460 N			
Height/width/depth	855 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	11 kg / 13 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

clamps
included



Multi-band Panel

Dual Polarization

Half-power Beam Width

1710...(1880)...2170

1710...(1920)...2170

X

X

65°

60° / 65°

KATHREIN

Antennen · Electronic

XXPol Panel 1710–1880/1920–2170 65°/60° 17.5/18dBi 2°–10°/2°–10°T

Type No.	80010744 <i>clamps included</i>	
Frequency range	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°
Gain	2 x 17.5 dBi	2 x 18 dBi
Horizontal Pattern:		
Half-power beam width	65°	59°
Front-to-back ratio (180°±30°)	Copolar: > 28 dB Total power: > 25 dB	Copolar: > 28 dB Total power: > 25 dB
Cross polar ratio	Typically: 25 dB	Typically: 25 dB
Maindirection 0°	> 10 dB	> 10 dB
Sector ±60°		
Tracking, Avg.	0.6 dB	0.6 dB
Squint	±1.5°	±1.5°
Vertical Pattern:		
Half-power beam width	6.6°	5.9°
Electrical tilt, continuously adjustable	2°–10°	2°–10°
Sidelobe suppression for first sidelobe above main beam	2° ... 6° ... 10° T 18 ... 16 ... 16 dB	2° ... 6° ... 10° T 18 ... 16 ... 16 dB
VSWR	< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB	> 30 dB
Isolation: Intersystem	> 30 dB	
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc
Max. power per input	200 W*	200 W*
Input	4 x 7-16 female	
Connector position	Bottom	
Adjustment mechanism	2x, Position bottom, continuously adjustable	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 370 / 145 / 400 N	
Height/width/depth	1410 / 155 / 89 mm	
Category of mounting hardware	M (Medium)	
Weight	9 kg / 11 kg (clamps incl.)	
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter	

* (at 50 °C ambient temperature)



XXPol Panel 1710–2170/1710–2170 65°/65° 18/18dBi 0°–8°/0°–8°T

Type No.	742237 <i>clamps included</i>		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 17.5 dBi	4 x 17.7 dBi	4 x 18 dBi
Horizontal Pattern:			
Half-power beam width	65°	63°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio	Avg.: 25 dB	Avg.: 25 dB	Avg.: 25 dB
Maindirection 0°	> 10 dB	> 10 dB	> 10 dB
Sector ±60°			
Vertical Pattern:			
Half-power beam width	8.3°	8°	7.5°
Electrical tilt	0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam, Avg.	0° ... 4° ... 8° T 20 ... 20 ... 18 dB	0° ... 4° ... 8° T 20 ... 20 ... 18 dB	0° ... 4° ... 8° T 20 ... 20 ... 18 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	250 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 590 / 135 / 610 N		
Height/width/depth	1147 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	12.5 kg / 14.5 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2170	2490–2690
X	X
65°	60°

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XXPol Panel 1710–2170/2490–2690 65°/60° 18/18dBi 2°–14°/2°–14°T

Type No.	80010644v01		
	1710–2170		2490–2690
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 17.5 dBi	2 x 18.0 dBi	2 x 17.7 dBi
Horizontal Pattern:			
Half-power beam width	68°	65°	61°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Sector 0° ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	< 1.5 dB		
Vertical Pattern:			
Half-power beam width	6.8°	6.1°	4.8°
Electrical tilt, continuously adjustable	2°–14°		2°–14°
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	2° ... 8° ... 14° T ≥ 18 ... 18 ... 16 dB ≥ 17 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 17 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 16 dB ≥ 17 ... 16 ... 12 dB
VSWR	< 1.5		< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB
Isolation: Intersystem	> 30 dB		> 30 dB
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		< –150 dBc (2 x 43 dBm carrier)
Max. power per input Total power	200 W* 400 W*		200 W* 400 W*
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 380 / 145 / 410 N		
Height/width/depth	1442 / 155 / 89 mm		
Category of mounting hardware	M (Medium)		
Weight	10 kg / 12 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

**clamps
included**



**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2200	1710–2200
X	X
65°	65°

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XXPol Panel 1710–2200/1710–2200 65°/65° 18/18dBi 0°–10°/0°–10°T

Type No.	742236v01		
	clamps included		
	1710–2200		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2200 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain	4 x 17.6 dBi	4 x 17.8 dBi	4 x 18 dBi
Horizontal Pattern:			
Half-power beam width	64°	64°	62°
Front-to-back ratio	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB	Copolar: > 30 dB Total power: > 25 dB
Cross polar ratio Maindirection Sector	0° ±60° Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
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	0° ... 5° ... 10° T 20 ... 18 ... 16 dB	0° ... 5° ... 10° T 20 ... 18 ... 16 dB	0° ... 5° ... 10° T 16 ... 18 ... 16 dB
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 660 / 155 / 690 N		
Height/width/depth	1319 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	15 kg / 17 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2690	1710–2690
X	X
65°	65°

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XXPol Panel 1710–2690/1710–2690 65°/65° 18/18dBi 2°–14°/2°–14°T ESLS

Type No.	80010622v01			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	17.4 ... 17.5 ... 17.6	17.7 ... 18.0 ... 17.9	18.0 ... 18.5 ... 18.1	18.4 ... 18.6 ... 18.1
Tilt	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°
Horizontal Pattern:				
Half-power beam width	67°	64°	59°	57°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Sector 0° ±60°	Typically: 24 dB > 10 dB	Typically: 24 dB > 10 dB	Typically: 24 dB > 8 dB	Typically: 22 dB > 10 dB
Tracking Avg.	1.5 dB			
Vertical Pattern:				
Half-power beam width	6.7°	6.0°	5.3°	5.0°
Electrical tilt	2°–14°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam within 0°–20° sector above horizon	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 17 ... 17 ... 15 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 17 ... 17 ... 14 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 690 / 165 / 690 N			
Height/width/depth	1471 / 275 / 86 mm			
Category of mounting hardware	M (Medium)			
Weight	13 kg / 15 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

**clamps
included**



**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2200	1710–2200
X	X
65°	65°

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XXPol Panel 1710–2200/1710–2200 65°/65° 18/18dBi 0°–15°/0°–15°T ESLS

Type No.	80010510v01			
	1710–2200			
Frequency range	1710 – 1880 MHz	1880 – 1990 MHz	1920 – 2170 MHz	2000 – 2200 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain at 0° tilt	4 x 17.5 dBi	4 x 17.6 dBi	4 x 17.7 dBi	4 x 17.8 dBi
Horizontal Pattern:				
Half-power beam width	65°	63°	62°	62°
Front-to-back ratio (180°±30°)	≥ 30 dB	≥ 30 dB	≥ 30 dB	≥ 28 dB
Cross polar ratio	0°	24 dB	24 dB	24 dB
Sector	±60°	≥ 9 dB	≥ 9 dB	> 10 dB
Vertical Pattern:				
Half-power beam width	7.9°	7.5°	7.2°	7.0°
Electrical tilt	0°–15°, continuously adjustable			
Sidelobe suppression	0° ... 5° ... 10° ... 15° T	0° ... 5° ... 10° ... 15° T	0° ... 5° ... 10° ... 15° T	0° ... 5° ... 10° ... 15° T
– for first sidelobe above main beam	≥ 17 ... 20 ... 18 ... 17 dB	≥ 16 ... 20 ... 18 ... 18 dB	≥ 15 ... 19 ... 18 ... 17 dB	≥ 14 ... 18 ... 18 ... 16 dB
– within 0°–20° sector above horizon	≥ 16 ... 18 ... 18 ... 16 dB	≥ 16 ... 17 ... 17 ... 16 dB	≥ 15 ... 17 ... 17 ... 16 dB	≥ 14 ... 16 ... 16 ... 15 dB
Null-fill at 0° tilt	23 dB	22 dB	21 dB	20 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 700 / 160 / 720 N			
Height/width/depth	1389 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	17 kg / 19 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

clamps included



**Multi-band Panel
Dual Polarization
Half-power Beam Width**

1710–2690	1710–2690
X	X
65°	65°

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XXPol Panel 1710–2690/1710–2690 65°/65° 19/19dB_i 0°–10°/0°–10°T

Type No.	80010652			
	clamps included			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
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	> 30 dB	> 26 dB	> 28 dB	> 26 dB
Cross polar ratio Sector 0° ±60°	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 22 dB > 10 dB	Typically: 20 dB > 10 dB
Vertical Pattern:				
Half-power beam width	5.5°	5.0°	4.3°	4.0°
Electrical tilt	0°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 16 ... 15 dB	0° ... 5° ... 10° T ≥ 18 ... 15 ... 15 dB
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	300 W (at 50 °C ambient temperature)			
Connector position	Bottom			
Adjustment mechanism	2x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 830 / 320 / 880 N			
Height/width/depth	1668 / 323 / 71 mm			
Category of mounting hardware	M (Medium)			
Weight	17 kg / 19 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			



2-Multi-band Panel

Dual Polarization

Half-power Beam Width

1710–2180	1710–2180
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X	X
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90°	90°
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XXPol Panel 1710–2180/1710–2180 90°/90° 16.5/16.5dBi 0°–10°/0°–10°T

Type No.	742352v01		
	clamps included		
	1710–2180		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°	+45°, –45°; +45°, –45°
Gain (average)	16.1 ... 16.3 ... 16.0 dBi	16.2 ... 16.4 ... 16.1 dBi	16.5 ... 16.7 ... 16.2 dBi
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°
Horizontal Pattern:			
Half-power beam width	88°	90°	88°
Front-to-back ratio	Copolar: > 24 dB Total power: > 24 dB	Copolar: > 24 dB Total power: > 24 dB	Copolar: > 24 dB Total power: > 24 dB
Cross polar ratio Maindirection Sector	0° ±60° Typically: 15 dB > 8 dB	Typically: 15 dB > 7.5 dB	Typically: 15 dB > 7 dB
Tracking, Avg.	0.5 dB		
Squint	2.5°		
Vertical Pattern:			
Half-power beam width	7.4°	7°	6.5°
Electrical tilt	0°–10°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam	0° ... 4° ... 8° ... 10° T 18 ... 17 ... 16 ... 15 dB	0° ... 4° ... 8° ... 10° T 18 ... 17 ... 16 ... 15 dB	0° ... 4° ... 8° ... 10° T 17 ... 17 ... 16 ... 15 dB
VSWR	< 1.5		
Isolation: Intrasystem	> 30 dB		
Isolation: Intersystem	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	2x, Position bottom, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 660 / 155 / 690 N		
Height/width/depth	1319 / 323 / 71 mm		
Category of mounting hardware	M (Medium)		
Weight	17 kg / 19 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter		



Triple Array Panel Dual Polarization HPBW

1710–2690	1710–2690	1710–2690
X	X	X
65°	65°	65°

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XXXPol Panel 1710–2690/1710–2690/1710–2690 65°/65°/65° 18/18/18dBi 2°–14°/2°–14°/2°–14°T

Type No.	80010727				clamps included	
Left and right side	Y1, connector 1–2; Y3, connector 5–6					
	1710–2690					
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz		
Polarization	+45°, –45°		+45°, –45°		+45°, –45°	
Gain (dBi)	17.3 ... 17.5 ... 17.4	18.0 ... 18.3 ... 18.2	17.9 ... 18.5 ... 18.3	18.2 ... 18.5 ... 17.9		
Tilt	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°		
Horizontal Pattern:						
Half-power beam width	66°	63°	58°	57°		
Front-to-back ratio (180°±30°)	> 25 dB		> 25 dB		> 25 dB	
Cross polar ratio Sector 0° ±60°	Typically: 25 dB > 10 dB	Typically: 26 dB > 8 dB	Typically: 28 dB > 8 dB	Typically: 26 dB > 10 dB		
Tracking Avg.	1.0 dB					
Vertical Pattern:						
Half-power beam width	6.7°	6.1°	5.3°	5.0°		
Electrical tilt	2°–14°, continuously adjustable, for each system independently					
Sidelobe suppression for first sidelobe above main beam within 0°–20° sector above horizon	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 17 ... 15 ... 13 dB	
VSWR	< 1.5					
Isolation, Intrasystem	> 30 dB					
Isolation, Intersystem	> 30 dB					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input	250 W (at 50 °C ambient temperature)					
Total power Y1, Y2, Y3	800 W (at 50 °C ambient temperature)					

Center system	Y2, connector 3–4					
	1710–2690					
Frequency range	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz		
Polarization	+45°, –45°		+45°, –45°		+45°, –45°	
Gain (dBi)	17.0 ... 17.3 ... 17.2	17.7 ... 18.0 ... 17.9	17.3 ... 18.0 ... 17.7	17.8 ... 17.9 ... 17.4		
Tilt	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°		
Horizontal Pattern:						
Half-power beam width	65°	61°	63°	60°		
Front-to-back ratio (180°±30°)	> 25 dB		> 26 dB		> 25 dB	
Cross polar ratio Sector 0° ±60°	Typically: 25 dB > 10 dB	Typically: 26 dB > 10 dB	Typically: 25 dB > 8 dB	Typically: 23 dB > 8 dB		
Tracking Avg.	1.5 dB					
Vertical Pattern:						
Half-power beam width	6.7°	6.1°	5.3°	5.0°		
Electrical tilt	2°–14°, continuously adjustable, for each system independently					
Sidelobe suppression for first sidelobe above main beam within 0°–20° sector above horizon	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 18 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 17 ... 16 ... 15 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 17 ... 15 ... 13 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 16 ... 14 ... 12 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 17 dB ≥ 16 ... 14 ... 12 dB	
VSWR	< 1.5					
Isolation, Intrasystem	> 28 dB					
Isolation, Intersystem	> 30 dB					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Max. power per input	250 W (at 50 °C ambient temperature)					
Total power Y1, Y2, Y3	800 W (at 50 °C ambient temperature)					
Input	6 x 7-16 female					
Connector position	Bottom					
Adjustment mechanism	FlexRET, continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 860 / 200 / 860 N					
Height/width/depth	1475 / 378 / 103 mm					
Category of mounting hardware	M (Medium)					
Weight	18 kg / 20 kg (clamps incl.)					
Scope of supply	Panel, FlexRET and 2 units of clamps for 42 – 115 mm diameter					



Multi-band Panel Dual Polarization HPBW

1710-2170	1710-2170	2490-2690	2490-2690
X	X	X	X
65°	65°	60°	60°

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Preliminary Issue

4XPol Panel 1710-2170/1710-2170/2490-2690/2490-2690 65°/65°/60°/60° 17.5/17.5/18/18dBi
2°-12°/2°-12°/2°-14°/ 2°-14° T

Type No.	80010728		
	1710-2170		2490-2690
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, -45°	+45°, -45°	+45°, -45°
Gain at 0° tilt	2 x 17 dBi	2 x 17.4 dBi	2 x 18.0 dBi
Horizontal Pattern:			
Half-power beam width	65°	63°	58°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio Sector 0° ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Vertical Pattern:			
Half-power beam width	6.7°	6.0°	4.9°
Electrical tilt, contin. adjustable	2°-12°		2°-14°
Sidelobe suppression – for first sidelobe above main beam – within 0°-20° sector above horizon	2° ... 7° ... 12° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	2° ... 7° ... 12° T ≥ 18 ... 18 ... 18 dB ≥ 17 ... 17 ... 16 dB	2° ... 8° ... 14° T ≥ 18 ... 18 ... 16 dB ≥ 17 ... 17 ... 17 dB
VSWR	< 1.5		< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB
Isolation: Intersystem	Typically: > 30 dB (1710-2170 // 2490-2960 MHz)		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		< -150 dBc (2 x 43 dBm carrier)
Max. power per input Total power	200 W* 400 W*		200 W* 400 W*
Input	8 x 7-16 female		
Connector position	Bottom		
Adjustment mechanism	FlexRET, continuously adjustable		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 680 / 200 / 680 N		
Height/width/depth	1471 / 275 / 103 mm		
Category of mounting hardware	M (Medium)		
Weight (approx.)	20 kg / 22 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		

clamps included





Summary – Directional Antennas

XPol, XXPoI (iRCU)

698...894 / 1710...2170 MHz

XPol

Type	Type No.	Height [mm]	Connector position	Page	1)
XPol Panel iRCU 698–894 65° 15dBi 0°–16°T	80010734v01	1355	bottom	66	A
XPol Panel iRCU 698–894 65° 16dBi 0°–10°T	80010735v01	1934	bottom	67	A
XPol Panel iRCU 698–894 65° 17dBi 0.5°–9.5°T	80010736v01	2438	bottom	68	A

XXPoI

XXPoI Panel iRCU 698–894 1710–2170	65° 15dBi 0°–16°T	80010764v01	1403	bottom	69	L
	65° 17.5dBi 0°–10°T					
XXPoI Panel iRCU 698–894 1710–2170	65° 16dBi 0°–10°T	80010765v01	1918	bottom	70	L
	65° 18.5dBi 0°–10°T					
XXPoI Panel iRCU 698–894 1710–2170	65° 17dBi 0°–10°T	80010766v01	2438	bottom	71	L
	65° 18.5dBi 0°–10°T					
XXPoI Panel iRCU 698–894 1710–2170	85° 14dBi 0°–16°T	80010721v01	1394	bottom	72	L
	85° 16.5dBi 0°–10°T					
XXPoI Panel iRCU 698–894 1710–2170	85° 15dBi 0°–10°T	80010722v01	1828	bottom	73	L
	85° 17.5dBi 0°–10°T					
XXPoI Panel iRCU 698–894 1710–2170	85° 16dBi 0°–10°T	80010723v01	2368	bottom	74	L
	85° 17.5dBi 0°–10°T					

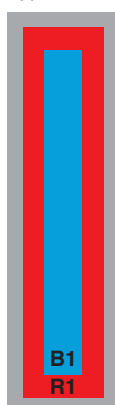
iRCU specifications (86010149) see page 75

1) Configuration Types – further details on page 14 and 15.

Type A



Type L



Abbreviations:
iRCU: integrated Remote Control Unit

Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894

X

65°

iRCU

0°–16°

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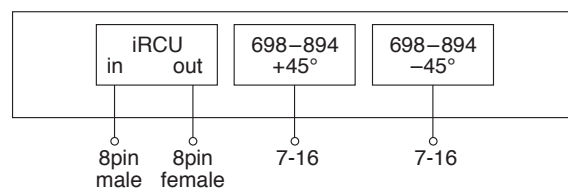


XPoI Panel iRCU 698–894 65° 15dBi 0°–16°T

Type No.	80010734v01		clamps included
A) Antenna specifications			
	698–894		
Frequency range	698 – 806 MHz	824 – 894 MHz	
Polarization	+45°, –45°	+45°, –45°	
Gain	12.05 dBd / 14.2 dBi	12.65 dBd / 14.8 dBi	
Horizontal Pattern:			
Half-power beam width	68°	65°	
Front-to-back ratio	Copolar: > 30 dB Average: 32 dB	Copolar: > 30 dB Average: 33 dB	
Cross polar ratio			
Maindirection	0°	Typically: > 24 dB	Typically: > 23 dB
Sector	±60°	> 10 dB, Avg. 15 dB	> 10 dB, Avg. 16 dB
Vertical Pattern:			
Half-power beam width	16°	14.8°	
Electrical tilt	0°–16°, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam:	0° ... 8° ... 16° T 16 ... 17 ... 17 dB	0° ... 8° ... 16° T 18 ... 17 ... 16 dB	
Average:	16 ... 19 ... 20 dB	20 ... 20 ... 20 dB	
Impedance	50 Ω		
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (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	Frontal: 620 N (at 150 km/h) Lateral: 200 N (at 150 km/h) Rearside: 710 N (at 150 km/h)	1550 N (at 150 mph) 500 N (at 150 mph) 1770 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)		
Height/width/depth	1355 / 303 / 99 mm (53.3 / 11.9 / 3.9 inches)		
Category of mounting hardware	M (Medium)		
Weight	11 kg (24 lbs) / 13 kg (27 lbs) (clamps incl.)		
Packing size	1430 x 315 x 115 mm (56.3 x 12.4 x 4.5 inches)		
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter		



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894

X

65°

iRCU

0°–10°

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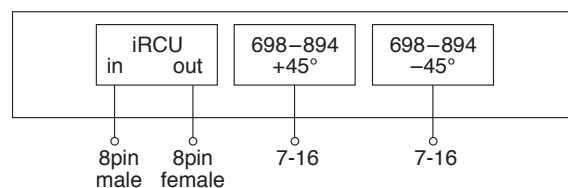


XPol Panel iRCU 698–894 65° 16dBi 0°–10°

Type No.	80010735v01		clamps included
A) Antenna specifications			
Frequency range	698 – 806 MHz		824 – 894 MHz
Polarization	+45°, –45°		+45°, –45°
Gain	13.35 dBd / 15.5 dBi		13.85 dBd / 16 dBi
Horizontal Pattern:			
Half-power beam width	67°		65°
Front-to-back ratio	Copolar: > 30 dB Average: 35 dB		Copolar: > 30 dB Average: 35 dB
Cross polar ratio	Typically: > 25 dB		Typically: > 25 dB
Main direction	0°		0°
Sector	±60°		±60°
Vertical Pattern:			
Half-power beam width	11.3°		10°
Electrical tilt	0°–10°, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam:	0° ... 5° ... 10° T 16 ... 17 ... 17 dB		0° ... 5° ... 10° T 18 ... 17 ... 16 dB
Average:	16 ... 19 ... 20 dB		20 ... 20 ... 20 dB
Impedance	50 Ω		
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (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	Frontal: 900 N (at 150 km/h) 2260 N (at 150 mph) Lateral: 310 N (at 150 km/h) 760 N (at 150 mph) Rearside: 1030 N (at 150 km/h) 2580 N (at 150 mph)		
Max. wind velocity	241 km/h (150 mph)		
Height/width/depth	1934 / 303 / 99 mm (76.1 / 11.9 / 3.9 inches)		
Category of mounting hardware	H (Heavy)		
Weight	14 kg (30.9 lbs) / 16 kg (35.3 lbs) (clamps incl.)		
Packing size	2136 x 317 x 127 mm (84.1 x 12.5 x 5 inches)		
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter		



iRCU specifications (86010149) see page 75



Multi-band Panel

698–894

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Dual Polarization

X

Half-power Beam Width

65°

Integrated replaceable Remote Control Unit

iRCU

Adjustable Electrical Downtilt

0.5°–9.5°

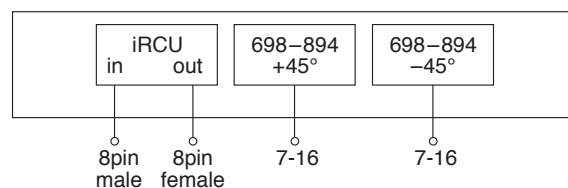


XPoI Panel iRCU 698–894 65° 17dBi 0.5°–9.5°T

Type No.	80010736v01		clamps included
A) Antenna specifications			
	698–894		
Frequency range	698 – 806 MHz	824 – 894 MHz	
Polarization	+45°, –45°	+45°, –45°	
Gain	14.25 dBd / 16.4 dBi	14.85 dBd / 17 dBi	
Horizontal Pattern:			
Half-power beam width	67°	68°	
Front-to-back ratio	Copolar: > 30 dB Average: 35 dB	Copolar: > 30 dB Average: 35 dB	
Cross polar ratio			
Maindirection	0°	Typically: > 20 dB	
Sector	±60°	Typically: > 11 dB, Avg. 15 dB	
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:	0.5° ... 5° ... 9.5° T	0.5° ... 5° ... 9.5° T	
Average:	16 ... 16 ... 16 dB	18 ... 18 ... 17 dB	
	18 ... 18 ... 17 dB	20 ... 20 ... 20 dB	
Impedance	50 Ω		
VSWR	< 1.5		
Isolation, between ports	> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (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	Frontal: 1160 N (at 150 km/h) Lateral: 390 N (at 150 km/h) Rearside: 1380 N (at 150 km/h)	2900 N (at 150 mph) 970 N (at 150 mph) 3450 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)		
Height/width/depth	2438 / 303 / 99 mm (96 / 11.9 / 3.9 inches)		
Category of mounting hardware	H (Heavy)		
Weight	17 kg (37.5 lbs) / 19 kg (41.9 lbs) (clamps incl.)		
Packing size	2600 x 315 x 115 mm (102.4 x 12.4 x 4.5 inches)		
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter		



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894 1710–2170

X X

65° 65°

iRCU iRCU

0°–16° 0°–10°

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Antennen · Electronic

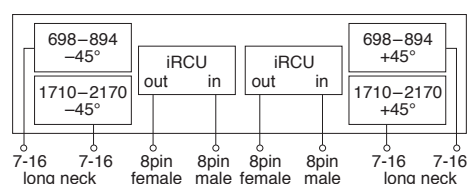


XXPol Panel iRCU 698–894/1710–2170 65°/65° 15/17.5dBi 0°–16°/0°–10°T

Type No.	80010764v01			
clamps included				
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	12.15 dBd / 14.3 dBi	12.65 dBd / 14.8 dBi	17.3 dBi	17.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	61°	60°
Front-to-back ratio	Copolar: > 30 dB Average: 32 dB	Copolar: > 27 dB Average: 30 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB
Cross polar ratio				
Main direction	Typically: > 25 dB	Typically: > 25 dB	Typically: > 25 dB	Typically: > 25 dB
Sector	0° ±60° > 10 dB, Avg. 15 dB	> 8 dB, Avg. 14 dB	> 8 dB, Avg. 14 dB	> 10 dB, Avg. 16 dB
Tracking, Avg.	1.5 dB	1.5 dB	2.0 dB	1.0 dB
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:	0° ... 8° ... 16° T 17 ... 16 ... 16 dB	0° ... 8° ... 16° T 18 ... 16 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 17 dB	0° ... 5° ... 10° T 18 ... 18 ... 17 dB
Average:	19 ... 19 ... 18 dB	22 ... 20 ... 20 dB	20 ... 20 ... 20 dB	20 ... 20 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasytem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female			
Connector position	Bottom			
Wind load	Frontal:	690 N (at 150 km/h)	1710 N (at 150 mph)	
	Lateral:	260 N (at 150 km/h)	640 N (at 150 mph)	
	Rearside:	710 N (at 150 km/h)	1770 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1403 / 300 / 152 mm (55.2 / 11.8 / 6 inches)			
Category of mounting hardware	M (Medium)			
Weight	18.5 kg (40.8 lbs) / 20.5 kg (45.2 lbs) (clamps incl.)			
Packing size	1646 x 322 x 190 mm (64.8 x 12.7 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894 1710–2170

X X

65° 65°

iRCU iRCU

0°–10° 0°–10°

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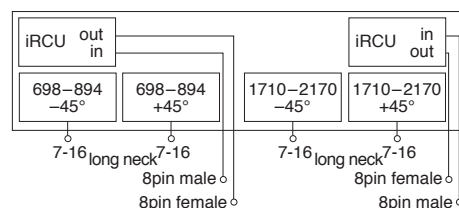


XXPol Panel iRCU 698–894/1710–2170 65°/65° 16/18.5dBi 0°–10°/0°–10°T

Type No.	80010765v01			
clamps included				
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	13.15 dBd / 15.3 dBi	13.65 dBd / 15.8 dBi	18 dBi	18.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	63°	62°
Front-to-back ratio	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB
Cross polar ratio				
Main direction	Typically: > 25 dB	Typically: > 20 dB	Typically: > 25 dB	Typically: > 30 dB
Sector	0° ±60° > 10 dB, Avg. 16 dB	> 10 dB, Avg. 14 dB	> 8 dB, Avg. 15 dB	> 10 dB, Avg. 15 dB
Tracking, Avg.	1.0 dB	1.5 dB	1.5 dB	1.0 dB
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:	0° ... 5° ... 10° T 16 ... 16 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB
Average:	18 ... 20 ... 20 dB	20 ... 22 ... 20 dB	20 ... 22 ... 20 dB	20 ... 22 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (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	Frontal:	950 N (at 150 km/h)	2380 N (at 150 mph)	
	Lateral:	360 N (at 150 km/h)	890 N (at 150 mph)	
	Rearside:	980 N (at 150 km/h)	2460 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1918 / 300 / 152 mm (75.5 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	23.5 kg (51.8 lbs) / 25.5 kg (56.2 lbs) (clamps incl.)			
Packing size	2166 x 322 x 190 mm (85.3 x 12.7 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894 1710–2170

X X

65° 65°

iRCU iRCU

0°–10° 0°–10°

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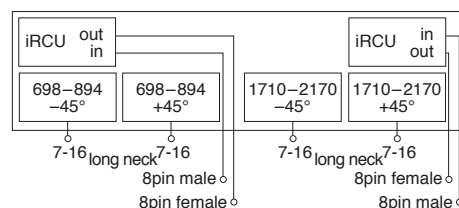


XXPol Panel iRCU 698–894/1710–2170 65°/65° 17/18.5dBi 0°–10°/0°–10°T

Type No.	80010766v01			
clamps included				
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	14.25 dBi / 16.4 dBi	14.65 dBi / 16.8 dBi	18 dBi	18.5 dBi
Horizontal Pattern:				
Half-power beam width	68°	65°	63°	62°
Front-to-back ratio	Copolar: > 30 dB Average: 34 dB	Copolar: > 30 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB	Copolar: > 27 dB Average: 34 dB
Cross polar ratio				
Main direction	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°
	Typically: > 25 dB > 10 dB, Avg. 15 dB	Typically: > 20 dB > 10 dB, Avg. 12 dB	Typically: > 25 dB > 8 dB, Avg. 15 dB	Typically: > 30 dB > 10 dB, Avg. 15 dB
Tracking, Avg.	1.0 dB		1.5 dB	
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:	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 5° ... 10° T
Average:	16 ... 16 ... 16 dB 18 ... 20 ... 18 dB	18 ... 18 ... 16 dB 20 ... 20 ... 20 dB	18 ... 18 ... 18 dB 20 ... 22 ... 20 dB	18 ... 18 ... 18 dB 20 ... 22 ... 20 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (at 50 °C ambient temperature)	
Input	4 x 7-16 female (long neck) iRCU in: 1 x 8pin male iRCU out: 1 x 8pin female			
Connector position	Bottom			
Wind load	Frontal:	1270 N (at 150 km/h)	3170 N (at 150 mph)	
	Lateral:	470 N (at 150 km/h)	1160 N (at 150 mph)	
	Rearside:	1320 N (at 150 km/h)	3310 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	2438 / 300 / 152 mm (96 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	26.5 kg (58.3 lbs) / 28.5 kg (62.7 lbs) (clamps incl.)			
Packing size	2656 x 320 x 190 mm (99.88 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894 1710–2170

X X

85° 85°

iRCU iRCU

0°–16° 0°–10°

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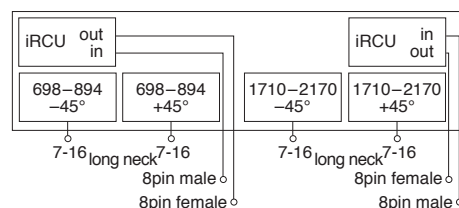


XXPol Panel iRCU 698–894/1710–2170 85°/85° 14/16.5dBi 0°–16°/0°–10°T

Type No.	80010721v01			
clamps included				
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	11.35 dBd / 13.5 dBi	11.85 dBd / 14 dBi	16.5 dBi	16.5 dBi
Horizontal Pattern:				
Half-power beam width	85°	85°	88°	85°
Front-to-back ratio	Copolar: > 25 dB Average: 32 dB	Copolar: > 25 dB Average: 28 dB	Copolar: > 25 dB Average: 26 dB	Copolar: > 25 dB Average: 27 dB
Cross polar ratio				
Main direction	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°
	Typically: > 20 dB > 10 dB, Avg. 14 dB	Typically: > 22 dB > 10 dB, Avg. 15 dB	Typically: > 15 dB > 10 dB, Avg. 12 dB	Typically: > 15 dB > 8 dB, Avg. 12 dB
Tracking, Avg.	1.5 dB		0.5 dB	
Squint	±4.5°		±4.0°	
Vertical Pattern:				
Half-power beam width	16.5°	15.1°	6.7°	6.7°
Electrical tilt	0°–16°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	0° ... 8° ... 16° T 18 ... 16 ... 18 dB	0° ... 8° ... 16° T 18 ... 18 ... 17 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 18 dB
Average:	20 ... 19 ... 19 dB	22 ... 20 ... 20 dB	22 ... 22 ... 19 dB	22 ... 22 ... 22 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasytem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (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	Frontal:	670 N (at 150 km/h)	1680 N (at 150 mph)	
	Lateral:	250 N (at 150 km/h)	610 N (at 150 mph)	
	Rearside:	700 N (at 150 km/h)	1740 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	1394 / 300 / 152 mm (54.9 / 11.8 / 6.0 inches)			
Category of mounting hardware	M (Medium)			
Weight	21 kg (46.2 lbs) / 23 kg (50.6 lbs) (clamps incl.)			
Packing size	1616 x 322 x 190 mm (63.6 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894	1710–2170
X	X
85°	85°
iRCU	iRCU
0°–10°	0°–10°

KATHREIN

Antennen · Electronic

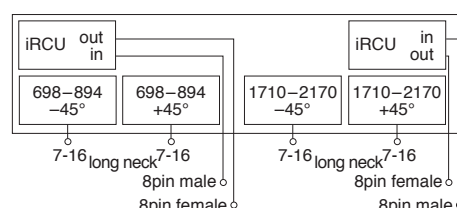


XXPol Panel iRCU 698–894/1710–2170 85°/85° 15/17.5dBi 0°–10°/0°–10°T

Type No.	80010722v01				clamps included
A) Antenna specifications					
	698–894		1710–2170		
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain	12.5 dBd / 14.65 dBi	13 dBd / 15.15 dBi	17 dBi	17.5 dBi	
Horizontal Pattern:					
Half-power beam width	85°	85°	85°	85°	
Front-to-back ratio	Copolar: > 28 dB Average: 31 dB	Copolar: > 27 dB Average: 29 dB	Copolar: > 25 dB Average: 28 dB	Copolar: > 25 dB Average: 28 dB	
Cross polar ratio					
Main direction	0°				
Sector	±60°	Typically: > 22 dB > 10 dB, Avg. 16 dB	Typically: > 24 dB > 10 dB, Avg. 16 dB	Typically: > 18 dB > 8 dB, Avg. 12 dB	Typically: > 18 dB > 8 dB, Avg. 12 dB
Tracking, Avg.		0.5 dB		0.5 dB	
Squint		±4.0°		±4.5°	
Vertical Pattern:					
Half-power beam width	12.1°	11°	5.5°	5.5°	
Electrical tilt	0°–10°, continuously adjustable		0°–10°, continuously adjustable		
Min. sidelobe suppression for first sidelobe above main beam:	0° ... 5° ... 10° T 16 ... 16 ... 18 dB	0° ... 5° ... 10° T 15 ... 18 ... 18 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB	
Average:	17 ... 19 ... 21 dB	16 ... 19 ... 22 dB	18 ... 18 ... 18 dB	17 ... 17 ... 18 dB	
Impedance	50 Ω				
VSWR	< 1.5				
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (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	Frontal:	900 N (at 150 km/h)	2260 N (at 150 mph)		
	Lateral:	330 N (at 150 km/h)	830 N (at 150 mph)		
	Rearside:	940 N (at 150 km/h)	2350 N (at 150 mph)		
Max. wind velocity	241 km/h (150 mph)				
Height/width/depth	1828 / 300 / 152 mm (71.9 / 11.8 / 6.0 inches)				
Category of mounting hardware	H (Heavy)				
Weight	26 kg (57.3 lbs) / 28 kg (61.7 lbs) (clamps incl.)				
Packing size	2050 x 322 x 190 mm (80.7 x 12.6 x 7.5 inches)				
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter				



iRCU specifications (86010149) see page 75



Multi-band Panel

Dual Polarization

Half-power Beam Width

Integrated replaceable Remote Control Unit

Adjustable Electrical Downtilt

698–894 1710–2170

X X

85° 85°

iRCU iRCU

0°–10° 0°–10°

KATHREIN

Antennen · Electronic

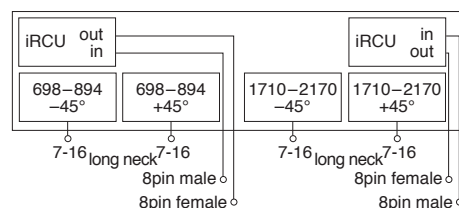


XXPol Panel iRCU 698–894/1710–2170 85°/85° 16/17.5dBi 0°–10°/0°–10°T

Type No.	80010723v01			
clamps included				
A) Antenna specifications				
	698–894		1710–2170	
Frequency range	698 – 806 MHz	824 – 894 MHz	1710 – 1755 MHz 2110 – 2170 MHz	1850 – 1990 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	13.5 dBd / 15.65 dBi	14 dBd / 16.15 dBi	17.5 dBi	17.5 dBi
Horizontal Pattern:				
Half-power beam width	85°	85°	85°	85°
Front-to-back ratio	Copolar: > 28 dB Average: 31 dB	Copolar: > 27 dB Average: 29 dB	Copolar: > 25 dB Average: 28 dB	Copolar: > 25 dB Average: 28 dB
Cross polar ratio				
Main direction	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°
	Typically: > 22 dB > 10 dB, Avg. 16 dB	Typically: > 24 dB > 10 dB, Avg. 16 dB	Typically: > 18 dB > 10 dB, Avg. 12 dB	Typically: > 18 dB > 8 dB, Avg. 12 dB
Tracking, Avg.	0.5 dB		0.5 dB	
Squint	±4.0°		±4.5°	
Vertical Pattern:				
Half-power beam width	9.5°	8.5°	5.5°	5.5°
Electrical tilt	0°–10°, continuously adjustable		0°–10°, continuously adjustable	
Min. sidelobe suppression for first sidelobe above main beam:	0° ... 5° ... 10° T 16 ... 16 ... 18 dB	0° ... 5° ... 10° T 15 ... 18 ... 18 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB	0° ... 5° ... 10° T 16 ... 16 ... 16 dB
Average:	17 ... 19 ... 21 dB	16 ... 19 ... 22 dB	18 ... 18 ... 18 dB	17 ... 17 ... 18 dB
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	Intrasystem: > 30 dB, Intersystem: > 35 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)		300 W (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	Frontal:	1210 N (at 150 km/h)	3040 N (at 150 mph)	
	Lateral:	450 N (at 150 km/h)	1130 N (at 150 mph)	
	Rearside:	1270 N (at 150 km/h)	3170 N (at 150 mph)	
Max. wind velocity	241 km/h (150 mph)			
Height/width/depth	2368 / 300 / 152 mm (93.2 / 11.8 / 6.0 inches)			
Category of mounting hardware	H (Heavy)			
Weight	31 kg (68.2 lbs) / 33 kg (72.6 lbs) (clamps incl.)			
Packing size	2596 x 322 x 190 mm (102.2 x 12.6 x 7.5 inches)			
Scope of supply	Panel and 2 units of clamps 42 – 115 mm diameter			



iRCU specifications (86010149) see page 75



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 lbs), 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

Summary – Directional Antennas

XXPol

790...960 / 1710...2690 MHz

Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)
XXPol Panel 790-960 C 65° 8dBi 0°T 1710-2690 65° 9dBi 0°T	80010753	334	bottom	78	M
XXPol Panel 790-960 65° 12dBi 0°T 1710-2170 60° 14dBi 0°T	742226v01	579	bottom or top	79	L
XXPol Panel 790-960 C 65° 12dBi 0°T 1710-2170 60° 14dBi 0°T	742222v01	579	bottom or top	80	L
XXPol Panel 790-960 65° 14.5dBi 0°-14°T 1710-2180 65° 17.5dBi 0°-8°T	742226v02	1334	bottom	81	L
XXPol Panel 790-960 C 65° 14.5dBi 0°-14°T 1710-2180 65° 17.5dBi 0°-8°T	742223v02	1334	bottom	82	L
XXPol Panel 790-960 65° 15dBi 0°-16°T 1710-2690 65° 17.5dBi 2°-10°T	80010664	1403	bottom	83	M
XXPol Panel 790-960 65° 16dBi 0.5°-9.5°T 1710-2180 65° 18.5dBi 0°-6°T	742265v02	1933	bottom	84	L
XXPol Panel 790-960 65° 16dBi 0°-10°T 1710-2180 65° 18.5dBi 0°-6°T	80010771	1934	rearside	85	L
XXPol Panel 790-960 C 65° 16dBi 0.5°-9.5°T 1710-2180 65° 18.5dBi 0°-6°T	742224v02	1933	bottom	86	L
XXPol Panel 790-960 65° 16dBi 0°-10°T 1710-2690 65° 18.5dBi 2°-8°T	80010665v01	1997	bottom	87	M
XXPol Panel 790-960 65° 16.5dBi 2°-14°T 1710-2180 65° 18.5dBi 4°-14°T	80010485v01	2038	bottom	88	L

Summary – Directional Antennas

XXPol

790...960 / 1710...2690 MHz

Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)
XXPol Panel 790–960 65° 17dBi 0°–7°T 1710–2180 65° 18.5dBi 0°–6°T	742266v02	2533	bottom	89	L
XXPol Panel 790–960 65° 17dBi 0°–8°T 1710–2180 65° 18.5dBi 0°–6°T	80010772	2399	rearside	90	L
XXPol Panel 790–960 65° 17dBi 0.5°–9.5°T 1710–2690 65° 18.5dBi 0°–6°T	80010666	2622	bottom	91	M
XXPol Panel 790–960 C 65° 17dBi 0°–7°T 1710–2180 65° 18.5dBi 0°–6°T	742225v02	2533	bottom	92	L
XXPol Panel 790–960 65° 17.5dBi 4°–12°T 1710–2180 65° 18.5dBi 4°–14°T	80010486v01	2516	bottom	93	L
XXPol Panel 790–960 90° 13.5dBi 0.5°–12.5°T 1710–2180 90° 16.5dBi 0.5°–10°T	80010121v01	1384	bottom	94	L
XXPol Panel 790–960 90° 15dBi 0°–10°T 1710–2180 90° 18dBi 0°–6°T	80010122v01	1917	bottom	95	L
XXPol Panel 790–960 90° 16.5dBi 0.5°–7°T 1710–2180 90° 18dBi 0°–6°T	80010123v03	2635	bottom	96	L

1) Configuration Types – further details on page 14 and 15.

Type L



Type M



Abbreviations:
C: Integrated Combiner

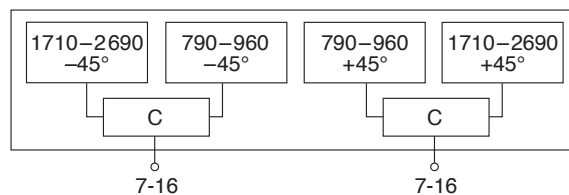
Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2690
X	X
65°	65°

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XXPol Panel 790–960/1710–2690 C 65°/65° 8/9dBi

Type No.	80010753							clamps included
	790–960			1710–2690				
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1990 MHz	1920 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	2 x 7.8 dBi	2 x 8.0 dBi	2 x 8.5 dBi	2 x 7.8 dBi	2 x 8.9 dBi	2 x 8.7 dBi	2 x 8.2 dBi	
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								
Maindirection	Typically: 15 dB	Typically: 18 dB	Typically: 20 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	
Sector	Typically: 8 dB	Typically: 8 dB	Typically: 8 dB	Typically: 10 dB	Typically: 10 dB	Typically: 10 dB	Typically: 10 dB	
Vertical Pattern:								
Half-power beam width	65°			75°	60°	60°	65°	
Impedance	50 Ω							
VSWR	< 1.5							
Isolation: Intrasystem	> 30 dB			> 30 dB		> 27 dB	> 25 dB	
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)							
Max. power	250 W (at 50 °C ambient temperature)				100 W (at 50 °C ambient temperature)			
Max. power per combined input	350 W (at 50 °C ambient temperature)							
Input	2 x 7-16 female							
Connector position	Bottom							
Wind load (at 150 km/h)	Frontal / lateral / rearside: 110 / 55 / 145 N							
Max. wind velocity	200 km/h							
Height/width/depth	334 / 260 / 145 mm							
Category of mounting hardware	L (Light)							
Weight	2.8 kg (tension bands incl.)							
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter							



Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2170
X	X
65°	60°

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XXPol Panel 790–960/1710–2170 65°/60° 12/14dBi 0°/0°T

Type No.	742226v01					
	790–960			1710–2170		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11.1 dBi	2 x 11.4 dBi	2 x 11.8 dBi	2 x 12.8 dBi	2 x 13.3 dBi	2 x 13.6 dBi
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	66°	60°	60°
Front-to-back ratio [dB] (180°±30°)	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 16 dB > 10 dB	Typically: 18 dB > 10 dB
Tracking, Avg.	1.0 dB			0.5 dB		
Squint	±3.0°			±1.5°		
Vertical Pattern:						
Half-power beam width	34°	33°	30°	20°	18°	17.5°
Electrical tilt	0°, fixed			0°, fixed		
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 42 dB (790–960 // 1710–2170 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power	250 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female					
Connector position	Bottom or top					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 200 / 90 / 250 N					
Height/width/depth	579 / 262 / 139 mm					
Category of mounting hardware	M (Medium)					
Weight	7.5 kg / 9.5 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					

clamps
included



Dual-band Panel Dual Polarization Half-power Beam Width

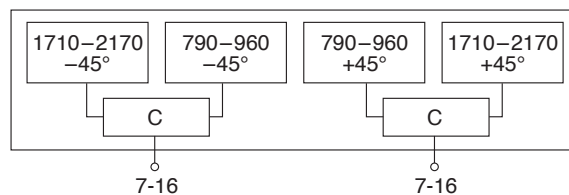
790–960	1710–2170
X	X
65°	60°

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XXPol Panel 790–960/1710–2170 C 65°/60° 12/14dBi 0°/0°T

Type No.	742222v01					
	790–960			1710–2170		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 11.1 dBi	2 x 11.4 dBi	2 x 11.8 dBi	2 x 12.5 dBi	2 x 13.3 dBi	2 x 13.6 dBi
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	66°	60°	60°
Front-to-back ratio [dB] (180°±30°)	Copolar: > 23 Total power: > 20	Copolar: > 23 Total power: > 20	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22	Copolar: > 25 Total power: > 22
Cross polar ratio Maindirection Sector	0° ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 18 dB > 10 dB	Typically: 18 dB > 10 dB
Vertical Pattern:						
Half-power beam width	34°	33°	30°	20°	18°	17.5°
Electrical tilt	0°, fixed			0°, fixed		
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power	250 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)		
Input	2 x 7-16 female					
Connector position	Bottom or top					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 200 / 90 / 250 N					
Height/width/depth	579 / 262 / 139 mm					
Category of mounting hardware	M (Medium)					
Weight	7.5 kg / 9.5 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter					
Integrated combiner	The insertion loss is included in the given antenna gain values.					

clamps included



Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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XXPol Panel 790–960/1710–2180 65°/65° 14.5/17.5dBi 0°–14°/0°–8°T

Type No.	742264v02					
	790–960			1710–2180		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	14.1 ... 14.1 ... 13.7	14.3 ... 14.2 ... 13.8	14.5 ... 14.4 ... 13.9	17.1 ... 17.3 ... 17.1	17.2 ... 17.4 ... 17.1	17.3 ... 17.5 ... 17.2
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 4° ... 8°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	62°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 32 dB	> 32 dB	> 32 dB
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
Main direction 0°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Tracking, Avg.	1.0 dB			0.5 dB		
Squint	±2.0°			±3.0°		
Vertical Pattern:						
Half-power beam width	16.5°	16°	15.3°	7.4°	7.1°	6.7°
Electrical tilt	0°–14°, continuously adjustable			0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 7° ... 14° T 17 ... 16 ... 15 dB	0° ... 7° ... 14° T 19 ... 18 ... 18 dB	0° ... 7° ... 14° T 17 ... 18 ... 17 dB	0° ... 4° ... 8° T 17 ... 17 ... 16 dB	0° ... 4° ... 8° T 15 ... 15 ... 15 dB	0° ... 4° ... 8° T 16 ... 16 ... 15 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 45 dB, Typ. > 50 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)		
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	2x, Position bottom, continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 560 / 260 / 600 N					
Height/width/depth	1334 / 261 / 146 mm					
Category of mounting hardware	M (Medium)					
Weight	16 kg / 18 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					

clamps included



Dual-band Panel Dual Polarization Half-power Beam Width

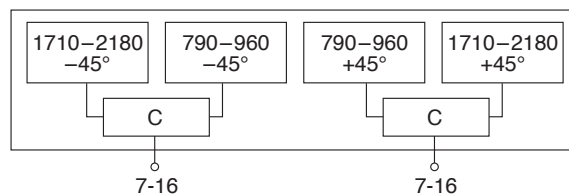
790–960	1710–2180
X	X
65°	65°

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XXPol Panel 790–960/1710–2180 C 65°/65° 14.5/17.5dBi 0°–14°/0°–8°T

Type No.	742223v02				
	790–960		1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	14.1 ... 14.1 ... 13.7	14.5 ... 14.4 ... 13.9	17.1 ... 17.3 ... 17.1	17.2 ... 17.4 ... 17.1	17.3 ... 17.5 ... 17.2
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 4° ... 8°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	62°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 32 dB	> 32 dB	> 32 dB
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
Main direction	0°				
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Tracking, Avg.	1.0 dB		0.5 dB		
Squint	±2.0°		±3.0°		
Vertical Pattern:					
Half-power beam width	16.5°	15.3°	7.4°	7.1°	6.7°
Electrical tilt	0°–14°, continuously adjustable		0°–8°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 7° ... 14° T 17 ... 16 ... 15 dB	0° ... 7° ... 14° T 17 ... 18 ... 17 dB	0° ... 4° ... 8° T 17 ... 17 ... 16 dB	0° ... 4° ... 8° T 15 ... 15 ... 15 dB	0° ... 4° ... 8° T 16 ... 16 ... 15 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	250 W*		200 W*		
Total power per combined input	450 W*				
Input	2 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	2x, Position bottom, continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 560 / 260 / 600 N				
Height/width/depth	1334 / 261 / 146 mm				
Category of mounting hardware	M (Medium)				
Weight	15.5 kg / 17.5 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				

clamps included



* (at 50 °C ambient temperature)

Dual-band Panel Dual Polarization Half-power Beam Width

790–960

1710–2690

X

X

65°

65°

KATHREIN

Antennen · Electronic

XXPol Panel 790–960/1710–2690 65°/65° 15/17.5dBi 0°–16°/2°–10°T

Type No.	80010664								clamps included
	790–960			1710–2690					
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+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	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	0° ... 8° ... 16°	0° ... 8° ... 16°	0° ... 8° ... 16°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	
Horizontal Pattern:									
Half-power beam width	69°	68°	67°	63°	64°	66°	73°	65°	
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 28 dB	> 29 dB	> 26 dB	> 25 dB	
Cross polar ratio									
Main direction 0°	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 18 dB	20 dB	20 dB	23 dB	23 dB	
Sector ±60°	> 10 dB	> 9 dB	> 8 dB	> 9 dB	> 10 dB	> 10 dB	> 10 dB	> 8 dB	
Vertical Pattern:									
Half-power beam width	16.5°	16.0°	15.5°	6.2°	5.8°	5.6°	5.4°	4.8°	
Electrical tilt	0°–16°, continuously adjustable			2°–10°, continuously adjustable					
Sidelobe suppression for first sidelobe above main beam	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 15 ... 15 ... 14 dB	2° ... 6° ... 10° T 14 ... 15 ... 16 dB	2° ... 6° ... 10° T 14 ... 15 ... 17 dB	2° ... 6° ... 10° T 15 ... 16 ... 17 dB	2° ... 6° ... 10° T 17 ... 18 ... 18 dB	2° ... 6° ... 10° T 15 ... 17 ... 18 dB	
VSWR	< 1.5								
Isolation: Intrasystem	> 30 dB			> 28 dB					> 30 dB
Isolation: Intersystem	> 30 dB (790–960 // 1710–2690)								
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)								
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)					
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)					
Input	4 x 7-16 female (long neck)								
Connector position	Bottom								
Adjustment mechanism	2x, Position bottom, continuously adjustable								
Wind load (at 150 km/h)	Frontal / lateral / rearside: 690 / 270 / 720 N								
Height/width/depth	1403 / 300 / 152 mm								
Category of mounting hardware	M (Medium)								
Weight	18 kg / 20 kg (clamps incl.)								
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter								



Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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XXPol Panel 790–960/1710–2180 65°/65° 16/18.5dBi 0.5°–9.5°/0°–6°T

Type No.	742265v02						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	15.6 ... 15.5 ... 15.3	15.9 ... 15.8 ... 15.5	16.1 ... 16.0 ... 15.6	18.2 ... 18.5 ... 18.3	18.5 ... 18.7 ... 18.3	18.5 ... 18.7 ... 18.3	
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	65°	65°	61°	
Front-to-back ratio, copolar	> 27 dB	> 28 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	
Main direction	0°						
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Tracking, Avg.		1.5 dB			0.5 dB		
Squint		±2.5°			±2.5°		
Vertical Pattern:							
Half-power beam width	10.9°	10.6°	10°	5.0°	4.8°	4.6°	
Electrical tilt	0.5°–9.5°, continuously adjustable			0°–6°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam avg.	0.5° ... 5° ... 9.5° T ≥ 15 ... 16 ... 17 dB	0.5° ... 5° ... 9.5° T ≥ 15 ... 17 ... 19 dB	0.5° ... 5° ... 9.5° T ≥ 15 ... 18 ... 19 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	
VSWR	< 1.5			< 1.5			
Isolation: Intrasystem	> 30 dB			> 30 dB			
Isolation: Intersystem	> 45 dB, Typ. > 50 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 380 / 910 N						
Height/width/depth	1933 / 261 / 146 mm						
Category of mounting hardware	M (Medium)						
Weight	20 kg / 22 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2180
X	X
65°	65°

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XXPol Panel 790–960/1710–2180 65°/65° 16/18.5dBi 0°–10°/0°–6°T

Type No.	80010771						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	15.4 ... 15.5 ... 15.2	15.5 ... 15.8 ... 15.3	15.8 ... 16.0 ... 15.4	18.3 ... 18.5 ... 18.2	18.5 ... 18.7 ... 18.3	18.2 ... 18.6 ... 18.2	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	69°	67°	65°	65°	62°	62°	
Front-to-back ratio, copolar	> 27 dB	> 28 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	
Main direction	0°	0°	0°	0°	0°	0°	
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Tracking, Avg.	1.5 dB			0.5 dB			
Squint	±3.0°			±2.5°			
Vertical Pattern:							
Half-power beam width	11°	10.7°	10°	5.0°	4.8°	4.6°	
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 5° ... 10° ≥ 17 ... 17 ... 17 dB	0° ... 5° ... 10° ≥ 17 ... 17 ... 18 dB	0° ... 5° ... 10° ≥ 17 ... 17 ... 16 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Isolation: Intersystem	> 30 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Max. power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female						
Connector position	Rearside						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rear side: 680 / 380 / 890 N						
Height/width/depth	1934 / 260 / 140 mm						
Category of mounting hardware	M (Medium)						
Weight	15 kg / 17 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

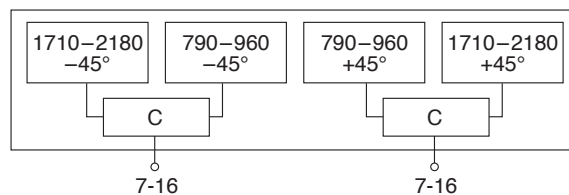
790–960	1710–2180
X	X
65°	65°

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XXPol Panel 790–960/1710–2180 C 65°/65° 16/18.5dBi 0.5°–9.5°/0°–6°T

Type No.	742224v02				
	790–960		1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	15.6 ... 15.5 ... 15.3	16.1 ... 16.0 ... 15.6	18.2 ... 18.5 ... 18.3	18.5 ... 18.7 ... 18.3	18.5 ... 18.7 ... 18.3
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 27 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection Sector	0° Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.5 dB		0.5 dB		
Squint	±2.5°		±2.5°		
Vertical Pattern:					
Half-power beam width	10.9°	10°	5.0°	4.8°	4.6°
Electrical tilt	0.5°–9.5°, continuously adjustable		0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0.5° ... 5° ... 9.5° T ≥ 15 ... 16 ... 17 dB	0.5° ... 5° ... 9.5° T ≥ 15 ... 18 ... 19 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	250 W*		200 W*		
Total power per combined input	450 W*				
Input	2 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	2x, Position bottom, continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 380 / 910 N				
Height/width/depth	1933 / 261 / 146 mm				
Category of mounting hardware	M (Medium)				
Weight	20 kg / 22 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				

clamps
included



* (at 50 °C ambient temperature)

Panel Dual Polarization Half-power Beam Width

790–960

1710–2690

X

X

65°

65°

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Antennen · Electronic

XXPol Panel 790–960/1710–2690 65°/65° 16/18.5dBi 0°–10°/2°–8°T

Type No.	80010665v01								
	790–960			1710–2690					
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	16.1 ... 16.1 ... 15.6	16.1 ... 16.2 ... 15.8	16.1 ... 16.2 ... 15.8	18.2 ... 18.3 ... 18.0	18.4 ... 18.4 ... 18.1	18.7 ... 18.7 ... 18.2	18.9 ... 18.7 ... 18.0	18.2 ... 18.7 ... 18.4	18.4
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°
Horizontal Pattern:									
Half-power beam width	68°	67°	65°	63°	63°	62°	61°	63°	
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 25 dB	> 26 dB	> 26 dB	> 25 dB	> 26 dB	
Cross polar ratio	Typically: 28 dB	Typically: 27 dB	Typically: 23 dB	Typically: 18 dB	Typically: 22 dB	Typically: 23 dB	Typically: 20 dB	Typically: 25 dB	
Main direction	0°								
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:									
Half-power beam width	10.0°	9.8°	9.5°	5.0°	4.8°	4.4°	3.9°	3.5°	
Electrical tilt	0°–10°, continuously adjustable			2°–8°, continuously adjustable					
Sidelobe suppression	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 5° ... 10° T	2° ... 5° ... 8° T	2° ... 5° ... 8° T	2° ... 5° ... 8° T	2° ... 5° ... 8° T	2° ... 5° ... 8° T	2° ... 5° ... 8° T
– for first sidelobe above main beam	19 ... 15 ... 17 dB	19 ... 17 ... 18 dB	18 ... 16 ... 17 dB	17 ... 18 ... 19 dB	18 ... 18 ... 19 dB	18 ... 18 ... 19 dB	18 ... 18 ... 18 dB	17 ... 18 ... 19 dB	19 dB
– within 0°–20° sector above horizon	18 ... 15 ... 16 dB	18 ... 16 ... 15 dB	18 ... 16 ... 14 dB	16 ... 16 ... 17 dB	17 ... 16 ... 18 dB	17 ... 17 ... 16 dB	18 ... 18 ... 15 dB	16 ... 18 ... 14 dB	14 dB
VSWR	< 1.5								
Isolation: Intrasystem	> 30 dB			> 28 dB					
Isolation: Intersystem	> 30 dB (790–960 // 1710–2690 MHz)								
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)								
Max. power per input	500 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)					
Total power	1000 W (at 50 °C ambient temperature)			400 W (at 50 °C ambient temperature)					
Input	4 x 7-16 female (long neck)								
Connector position	Bottom								
Adjustment mechanism	2x, Position bottom, continuously adjustable								
Wind load (at 150 km/h)	Frontal / lateral / rearside: 990 / 380 / 1030 N								
Height/width/depth	1997 / 300 / 152 mm								
Category of mounting hardware	M (Medium)								
Weight	24 kg / 26 kg (clamps incl.)								
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter								



Dual-band Panel Dual Polarization Half-power Beam Width

790–960

1710–2180

X

X

65°

65°

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Antennen · Electronic

XXPol Panel 790–960/1710–2180 65°/65° 16.5/18.5dBi 2°–14°/4°–14°T

Type No.	80010485v01						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+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	18.0 ... 18.2 ... 17.7	18.4 ... 18.5 ... 17.8	18.7 ... 18.6 ... 18.0	
Tilt	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°	4° ... 9° ... 14°	4° ... 9° ... 14°	4° ... 9° ... 14°	
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	66°	64°	60°	
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 20 dB	Typically: 20 dB	Typically: 21 dB	
Main direction	0°						
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:							
Half-power beam width	10°	9.7°	9.3°	5°	4.7°	4.5°	
Electrical tilt	2°–14°, continuously adjustable			4°–14°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	2° ... 8° ... 14° T 17 ... 17 ... 15 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	4° ... 9° ... 14° T 20 ... 18 ... 15 dB	4° ... 9° ... 14° T 19 ... 18 ... 15 dB	4° ... 9° ... 14° T 18 ... 17 ... 15 dB	
Impedance	50 Ω						
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 35 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)						
Max. power per input	400 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	800 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 750 / 380 / 900 N						
Height/width/depth	2038 / 262 / 139 mm						
Category of mounting hardware	M (Medium)						
Weight	24 kg / 26 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

790–960

1710–2180

X

X

65°

65°

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XXPol Panel 790–960/1710–2180 65°/65° 17/18.5dBi 0°–7°/0°–6°T

Type No.	742266v02						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	16.6 ... 16.6 ... 16.5	17.0 ... 16.9 ... 16.7	17.0 ... 17.1 ... 16.9	18.2 ... 18.5 ... 18.3	18.5 ... 18.7 ... 18.3	18.5 ... 18.7 ... 18.3	
Tilt	0° ... 3° ... 7°	0° ... 3° ... 7°	0° ... 3° ... 7°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	65°	65°	61°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	
Main direction	0°	0°	0°	0°	0°	0°	
Sector	±60°	±60°	±60°	±60°	±60°	±60°	
Tracking, Avg.	1.0 dB			0.5 dB			
Squint	±2.5°			±2.5°			
Vertical Pattern:							
Half-power beam width	8.0°	7.7°	7.2°	5.0°	4.8°	4.6°	
Electrical tilt	0°–7°, continuously adjustable			0°–6°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 3° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 3° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 3° ... 7° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	
VSWR	< 1.5			< 1.5			
Isolation: Intrasystem	> 30 dB			> 30 dB			
Isolation: Intersystem	> 45 dB, Typ. > 50 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N						
Height/width/depth	2533 / 261 / 146 mm						
Category of mounting hardware	H (Heavy)						
Weight	24 kg / 26 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

790–960 1710–2180

X X

65° 65°

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XXPol Panel 790–960/1710–2180 65°/65° 17/18.5dBi 0°–8°/0°–6°T

Type No.	80010772					
	790–960			1710–2180		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	16.6 ... 16.8 ... 16.6	16.8 ... 17.0 ... 16.7	16.8 ... 17.0 ... 16.7	18.4 ... 18.5 ... 18.0	18.5 ... 18.7 ... 18.1	18.4 ... 18.6 ... 18.0
Tilt	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°
Horizontal Pattern:						
Half-power beam width	68°	67°	65°	65°	62°	62°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:
Main direction	0°	0°	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°	±60°	±60°
Tracking, Avg.	1.5 dB			0.5 dB		
Squint	±3.0°			±2.5°		
Vertical Pattern:						
Half-power beam width	8.0°	7.9°	7.6°	5.0°	4.8°	4.6°
Electrical tilt	0°–8°, continuously adjustable			0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 3° ... 6° T	0° ... 3° ... 6° T	0° ... 3° ... 6° T
	≥ 16 ... 17 ... 16 dB	≥ 15 ... 17 ... 18 dB	≥ 15 ... 17 ... 18 dB	≥ 17 ... 16 ... 15 dB	≥ 17 ... 16 ... 15 dB	≥ 17 ... 16 ... 15 dB
VSWR	< 1.5			< 1.5		
Isolation: Intrasystem	> 30 dB			> 30 dB		
Isolation: Intersystem	> 30 dB (790–960 // 1710–2180 MHz)					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)		
Max. power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)		
Input	4 x 7-16 female					
Connector position	Rearside					
Adjustment mechanism	2x, Position bottom, continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rear side: 840 / 480 / 1160 N					
Height/width/depth	2399 / 260 / 140 mm					
Category of mounting hardware	H (Heavy)					
Weight	17 kg / 19 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					

clamps included



Panel
Dual Polarization
Half-power Beam Width

790–960	1710–2690
X	X
65°	65°

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XXPol Panel 790–960/1710–2690 65°/65° 17/18.5dBi 0.5°–9.5°/0°–6°T

Type No.	80010666							clamps included
	790–960			1710–2690				
Frequency range	790 – 866 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	16.8 ... 16.7 ... 16.5	17.0 ... 17.0 ... 16.8	17.1 ... 17.2 ... 17.0	18.5 ... 18.4 ... 18.1	18.5 ... 18.4 ... 18.1	18.8 ... 18.7 ... 18.2	18.2 ... 18.3 ... 18.0	
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:								
Half-power beam width	68°	67°	65°	62°	63°	62°	63°	
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically: 24 dB	Typically: 23 dB	Typically: 22 dB	Typically: 18 dB	Typically: 22 dB	Typically: 23 dB	Typically: 25 dB	
Main direction 0°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:								
Half-power beam width	7.5°	7.4°	7.1°	4.5°	4.4°	4.1°	3.5°	
Electrical tilt	0.5°–9.5°, continuously adjustable			0°–6°, continuously adjustable				
Min. sidelobe supression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T 18 ... 16 ... 14 dB	0.5° ... 5° ... 9.5° T 18 ... 17 ... 15 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 17 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	
VSWR	< 1.5							
Isolation: Intrasystem	> 30 dB			> 28 dB				
Isolation: Intersystem	> 30 dB (790–960 // 1710–2690 MHz)							
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)							
Max. power per input	500 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)				
Total power	1000 W (at 50 °C ambient temperature)			400 W (at 50 °C ambient temperature)				
Input	4 x 7-16 female (long neck)							
Connector position	Bottom							
Adjustment mechanism	2x, Position bottom, continuously adjustable							
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1270 / 490 / 1320 N							
Height/width/depth	2622 / 300 / 152 mm							
Category of mounting hardware	H (Heavy)							
Weight	29 kg / 31 kg (clamps incl.)							
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter							



Dual-band Panel Dual Polarization Half-power Beam Width

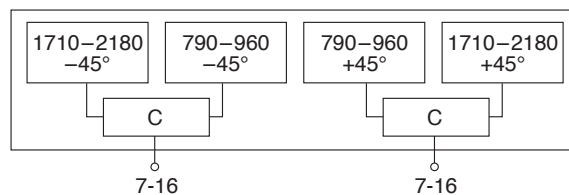
790–960	1710–2180
X	X
65°	65°

KATHREIN
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XXPol Panel 790–960/1710–2180 C 65°/65° 17/18.5dBi 0°–7°/0°–6°T

Type No.	742225v02				
	790–960		1710–2180		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	16.6 ... 16.6 ... 16.5	17.0 ... 17.1 ... 16.9	18.2 ... 18.5 ... 18.3	18.5 ... 18.7 ... 18.3	18.5 ... 18.7 ... 18.3
Tilt	0° ... 3° ... 7°	0° ... 3° ... 7°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°
Horizontal Pattern:					
Half-power beam width	68°	65°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio	Typically: 30 dB	Typically: 30 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
Maindirection	0°				
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB
Tracking, Avg.	1.0 dB		0.5 dB		
Squint	±2.5°		±2.5°		
Vertical Pattern:					
Half-power beam width	7.7°	7.2°	5.0°	4.8°	4.6°
Electrical tilt	0°–7°, continuously adjustable		0°–6°, continuously adjustable		
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 4° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 7° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	250 W*		200 W*		
Total power per combined input	450 W*				
Input	2 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	2x, Position bottom, continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N				
Height/width/depth	2533 / 261 / 146 mm				
Category of mounting hardware	H (Heavy)				
Weight	24 kg / 26 kg (clamps incl.)				
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter				
Integrated combiner	The insertion loss is included in the given antenna gain values.				

clamps included



* (at 50 °C ambient temperature)

Dual-band Panel Dual Polarization Half-power Beam Width

790–960

1710–2180

X

X

65°

65°

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XXPol Panel 790–960/1710–2180 65°/65° 17.5/18.5dBi 4°–12°/4°–14°T

Type No.	80010486v01						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	16.8 ... 16.7 ... 16.6	17.0 ... 16.8 ... 16.8	17.2 ... 17.0 ... 16.8	17.8 ... 18.1 ... 17.5	18.3 ... 18.3 ... 17.8	18.7 ... 18.7 ... 18.0	
Tilt	4° ... 8° ... 12°	4° ... 8° ... 12°	4° ... 8° ... 12°	4° ... 9° ... 14°	4° ... 9° ... 14°	4° ... 9° ... 14°	
Horizontal Pattern:							
Half-power beam width	68°	67°	66°	66°	64°	61°	
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	
Main direction 0°	23 dB	24 dB	25 dB	18 dB	18 dB	20 dB	
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:							
Half-power beam width	7.5°	7.4°	7.2°	5°	4.8°	4.6°	
Electrical tilt	4°–12°, continuously adjustable			4°–14°, continuously adjustable			
Sidelobe suppression	4° ... 8° ... 12° T	4° ... 8° ... 12° T	4° ... 8° ... 12° T	4° ... 9° ... 14° T	4° ... 9° ... 14° T	4° ... 9° ... 14° T	
– for first sidelobe above main beam	18 ... 17 ... 16 dB	19 ... 18 ... 18 dB	19 ... 18 ... 18 dB	20 ... 18 ... 16 dB	19 ... 19 ... 16 dB	18 ... 18 ... 18 dB	
– within 0°–20° sector above horizon	15 ... 15 ... 14 dB	16 ... 15 ... 14 dB	16 ... 15 ... 14 dB	17 ... 17 ... 15 dB	17 ... 17 ... 15 dB	17 ... 17 ... 15 dB	
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 45 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)						
Max. power per input	400 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	800 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 920 / 460 / 1150 N						
Height/width/depth	2516 / 262 / 139 mm						
Category of mounting hardware	H (Heavy)						
Weight	28 kg / 30 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

790–960

1710–2180

X

X

90°

90°

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XXPol Panel 790–960/1710–2180 90°/90° 13.5/16.5dBi 0.5°–12.5°/0.5°–10°T

Type No.	80010121v01						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	13.4 ... 13.4 ... 13.1	13.6 ... 13.6 ... 13.4	13.9 ... 13.8 ... 13.5	16.4 ... 16.4 ... 16.2	16.4 ... 16.5 ... 16.0	16.4 ... 15.9 ... 15.3	
Tilt	0.5° ... 6° ... 12.5°	0.5° ... 6° ... 12.5°	0.5° ... 6° ... 12.5°	0.5° ... 5° ... 10°	0.5° ... 5° ... 10°	0.5° ... 5° ... 10°	
Horizontal Pattern:							
Half-power beam width	88°	86°	88°	82°	85°	90°	
Front-to-back ratio, copolar	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB	
Cross polar ratio	Typically: 17 dB	Typically: 18 dB	Typically: 20 dB	Typically: 17 dB	Typically: 16 dB	Typically: 15 dB	
Main direction	0°						
Sector	±60°	> 10 dB	> 13 dB	> 10 dB	> 12 dB	> 10 dB	
	±60°	avg. 16 dB	avg. 19 dB	avg. 17 dB	avg. 19 dB	avg. 19 dB	
Vertical Pattern:							
Half-power beam width	15.0°	14.5°	14.0°	7.0°	6.6°	6.4°	
Electrical tilt	0.5°–12.5°, continuously adjustable			0.5°–10°, continuously adjustable			
Min. sidelobe suppression for first sidelobe above main beam: average:	0.5° ... 6° ... 12.5° T 16 ... 14 ... 14 dB 20 ... 19 ... 16 dB	0.5° ... 6° ... 12.5° T 16 ... 15 ... 14 dB 20 ... 18 ... 17 dB	0.5° ... 6° ... 12.5° T 18 ... 16 ... 16 dB 22 ... 20 ... 20 dB	0.5° ... 5° ... 10° T 17 ... 17 ... 16 dB 20 ... 20 ... 18 dB	0.5° ... 5° ... 10° T 17 ... 18 ... 16 dB 21 ... 22 ... 17 dB	0.5° ... 5° ... 10° T 18 ... 16 ... 16 dB 20 ... 20 ... 16 dB	
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 42 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 420 / 260 / 620 N						
Height/width/depth	1384 / 262 / 149 mm						
Category of mounting hardware	M (Medium)						
Weight	21 kg / 23 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2180
X	X
90°	90°

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XXPol Panel 790–960/1710–2180 90°/90° 15/18dBi 0°–10°/0°–6°

Type No.	80010122v01						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 896 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+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	17.7 ... 17.8 ... 17.7	17.7 ... 18.0 ... 17.6	17.6 ... 17.8 ... 17.4	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	88°	87°	88°	82°	85°	90°	
Front-to-back ratio (180°±30°)	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB	> 23 dB	
Cross polar ratio Maindirection 0°	Typically: 18 dB	Typically: 18 dB	Typically: 20 dB	Typically: 17 dB	Typically: 16 dB	Typically: 15 dB	
Sector ±60°	> 10 dB avg. 16 dB	> 10 dB avg. 16 dB	> 13 dB avg. 19 dB	> 10 dB avg. 17 dB	> 12 dB avg. 19 dB	> 10 dB avg. 19 dB	
Vertical Pattern:							
Half-power beam width	11.0°	10.9°	10.5°	5.5°	5.2°	5.0°	
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable			
Min. sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° T 18 ... 16 ... 14 dB	0° ... 5° ... 10° T 16 ... 16 ... 15 dB	0° ... 5° ... 10° T 16 ... 16 ... 15 dB	0° ... 3° ... 6° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB	
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 42 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 580 / 360 / 870 N						
Height/width/depth	1917 / 262 / 149 mm						
Category of mounting hardware	M (Medium)						
Weight	27 kg / 29 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Dual-band Panel Dual Polarization Half-power Beam Width

790–960	1710–2180
X	X
90°	90°

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XXPol Panel 790–960/1710–2180 90°/90° 16.5/18dBi 0.5°–7°/0°–6°T

Type No.	80010123v03						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+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	17.8 ... 17.7 ... 17.4	18.0 ... 17.9 ... 17.4	17.9 ... 17.8 ... 17.3	
Tilt	0.5° ... 4° ... 7°	0.5° ... 4° ... 7°	0.5° ... 4° ... 7°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	86°	86°	86°	84°	85°	88°	
Front-to-back ratio, copolar	> 25 dB	> 25 dB	> 25 dB	> 23 dB	> 23 dB	> 23 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	
Main direction	0°	0°	0°	0°	0°	0°	
Sector	±60°	±60°	±60°	±60°	±60°	±60°	
	> 10 dB	> 10 dB	> 13 dB	> 10 dB	> 12 dB	> 10 dB	
	avg. 16 dB	avg. 16 dB	avg. 19 dB	avg. 16 dB	avg. 17 dB	avg. 18 dB	
Tracking, Avg.	0.5 dB			0.5 dB			
Squint	±3.0°			±3.0°			
Vertical Pattern:							
Half-power beam width	7.3°	7.2°	6.9°	4.8°	4.5°	4.2°	
Electrical tilt	0.5°–7°, continuously adjustable			0°–6°, continuously adjustable			
Min. sidelobe suppression for first sidelobe above main beam	0.5° ... 4° ... 7° T 15 ... 14 ... 14 dB	0.5° ... 4° ... 7° T 15 ... 14 ... 14 dB	0.5° ... 4° ... 7° T 15 ... 14 ... 15 dB	0° ... 3° ... 6° T 18 ... 17 ... 16 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 16 ... 17 dB	
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 45 dB (790–960 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	4 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	2x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 840 / 510 / 1260 N						
Height/width/depth	2635 / 262 / 149 mm						
Category of mounting hardware	H (Heavy)						
Weight	33 kg / 35 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						





Summary – Directional Antennas

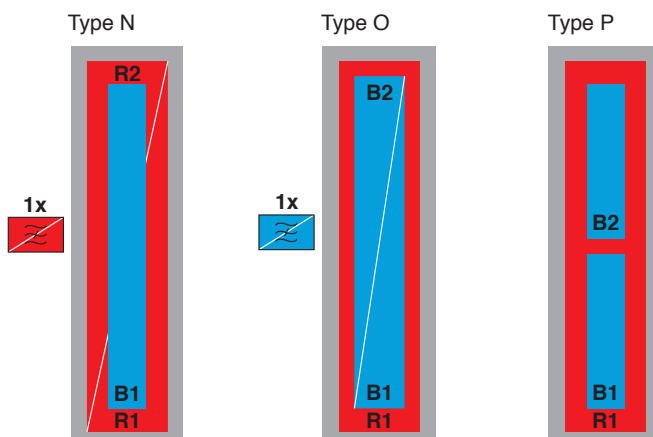
XXXPol

698...960 / 1710...2690 MHz

Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)				
XXXPol Panel	790–862	65°	14dBi	0°–14°T	80010697	1332	bottom	100	N
	880–960	65°	14dBi	0°–14°T					
	1710–2180	65°	17dBi	0°–8°T					
XXXPol Panel	790–862	65°	15.5dBi	0°–10°T	80010698	1932	bottom	101	N
	880–960	65°	16dBi	0°–10°T					
	1710–2180	65°	18.5dBi	0°–6°T					
XXXPol Panel	790–862	65°	16.5dBi	0°–7°T	80010699	2532	bottom	102	N
	880–960	65°	17dBi	0°–7°T					
	1710–2180	65°	18.5dBi	0°–6°T					
XXXPol Panel	790–960	65°	15dBi	0°–14°T	742270v03	1384	bottom	103	O
	1710–1880	65°	17dBi	0°–8°T					
	1920–2170	65°	17dBi	0°–8°T					
XXXPol Panel	790–960	65°	16.5dBi	0°–10°T	742271v03	1933	bottom	104	O
	1710–1880	65°	18dBi	0°–6°T					
	1920–2170	65°	18dBi	0°–6°T					
XXXPol Panel	790–960	65°	17.5dBi	0°–7°T	742272v03	2533	bottom	105	O
	1710–1880	65°	18dBi	0°–6°T					
	1920–2170	65°	18dBi	0°–6°T					
XXXPol Panel	790–960	65°	15dBi	0°–14°T	80010290v02	1540	bottom	106	P
	1710–2180	65°	15dBi	0°–14°T					
	1710–2180	65°	15dBi	0°–14°T					
XXXPol Panel	790–960	65°	16.5dBi	2°–14°T	80010291v02	2058	bottom	107	P
	1710–2180	65°	16.5dBi	0°–14°T					
	1710–2180	65°	16.5dBi	0°–14°T					
XXXPol Panel	790–960	65°	17.5dBi	2°–10°T	80010292v03	2598	bottom	108	P
	1710–2180	65°	17.5dBi	0°–10°T					
	1710–2180	65°	17dBi	0°–10°T					

1) Configuration Types – further details on page 14 and 15.



Summary – Directional Antennas

XXXPol

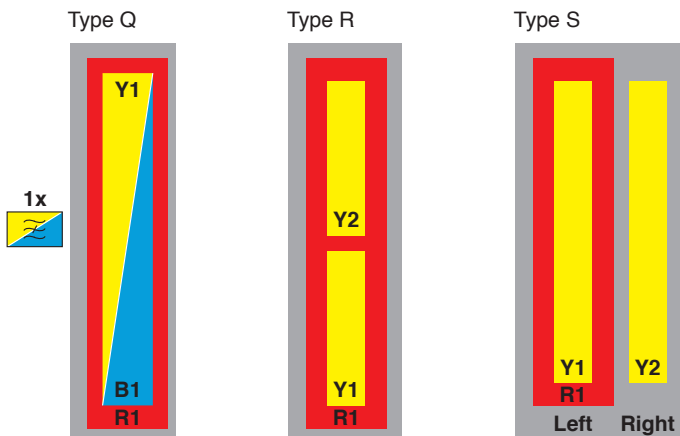
698...960 / 1710...2690 MHz

Dual Polarization +45°/-45°

Type	Type No.	Height [mm]	Connector position	Page	1)	
XXXPol Panel 790–960 1710–2170 2490–2690	65° 15dBi 0°–16°T 65° 17dBi 2°–10°T 65° 16.5dBi 2°–10°T	80010674	1403	bottom	109	Q
XXXPol Panel 790–960 1710–2170 2490–2690	65° 16dBi 0°–10°T 65° 18dBi 2°–8°T 65° 18dBi 2°–8°T	80010675v01	1997	bottom	110	Q
XXXPol Panel 790–960 1710–2170 2490–2690	65° 17dBi 0.5°–9.5°T 65° 18dBi 0°–6°T 65° 18dBi 0°–6°T	80010676	2622	bottom	111	Q
XXXPol Panel 790–960 1710–2690 1710–2690	65° 16dBi 1°–12°T 65° 16dBi 2°–12°T 65° 16dBi 2°–12°T	80010691v01	1997	bottom	112	R
XXXPol Panel 698–960 1710–2690 1710–2690	65° 17dBi 1.5°–10°T 65° 17dBi 0°–10°T 65° 17dBi 2°–10°T	80010692v01	2622	bottom	113	R
XXXPol Panel 698-960 1710-2690 1710-2690	65° 16dBi 2°–12°T 65° 18dBi 2.5°–12°T 65° 18dBi 2.5°–12°T	80010865	1921	bottom	114 + 115	S
XXXPol Panel 698-960 1710-2690 1710-2690	65° 17dBi 1°–10°T 65° 18dBi 2.5°–12°T 65° 18dBi 2.5°–12°T	80010866	2441	bottom	116 + 117	S

New or changed product

1) Configuration Types – further details on page 14 and 15.



Triple-band Panel

790–862 880–960 1710–2180

KATHREIN

Dual Polarization

X X X

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Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–862/880–960/1710–2180 65°/65°/65° 14/14/17dBi 0°–14°/0°–14°/0°–8°T

Type No.	80010697					clamps included
	790–862	880–960	1710–2180			
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	13.9 ... 13.9 ... 13.3	14.2 ... 14.1 ... 13.5	16.7 ... 16.9 ... 16.7	16.9 ... 17.1 ... 16.7	16.9 ... 17.1 ... 16.8	
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 4° ... 8°	0° ... 4° ... 8°	0° ... 4° ... 8°	
Horizontal Pattern:						
Half-power beam width	68°	65°	64°	63°	61°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 32 dB	> 32 dB	> 32 dB	
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	
Maindirection	0°					
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:						
Half-power beam width	16.5°	15.4°	7.4°	7.1°	6.7°	
Electrical tilt continuously adjustable	0°–14°	0°–14°	0°–8°			
Sidelobe suppression for first sidelobe above main beam: average:	0° ... 7° ... 14° T ≥ 17 ... 17 ... 15 dB	0° ... 7° ... 14° T ≥ 17 ... 17 ... 16 dB	0° ... 4° ... 8° T ≥ 17 ... 16 ... 15 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 16 dB	0° ... 4° ... 8° T ≥ 17 ... 17 ... 16 dB	
VSWR	< 1.5	< 1.5	< 1.5			
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB			
Isolation: Intersystem	> 38 dB (790...960 // 1710–2180 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960MHz)					
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc			
Max. power per input	250 W*	250 W*	250 W*			
Total power	500 W*	500 W*	500 W*			
Input	6 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	3x, Position bottom, continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 670 / 260 / 700 N					
Height/width/depth	1332 / 300 / 152 mm					
Category of mounting hardware	M (Medium)					
Weight	21 kg / 23 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					



*(at 50 °C ambient temperature)

Triple-band Panel

790–862

880–960

1710–2180

KATHREIN

Dual Polarization

X

X

X

Antennen · Electronic

Half-power Beam Width

65°

65°

65°

XXXPol Panel 790–862/880–960/1710–2180 65°/65°/65° 15.5/16/18.5dBi 0°–10°/0°–10°/0°–6°T

Type No.	80010698					clamps included
	790–862	880–960	1710–2180			
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	15.1 ... 15.4 ... 15.1	15.6 ... 15.9 ... 15.4	18.2 ... 18.5 ... 18.3	18.5 ... 18.7 ... 18.3	18.5 ... 18.7 ... 18.3	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:						
Half-power beam width	68°	65°	65°	65°	61°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	
Main direction	0°	0°	0°	0°	0°	
Sector	±60°	±60°	±60°	±60°	±60°	
Tracking, Avg.	1.0 dB	1.0 dB	0.5 dB			
Squint	±2.5°	±2.5°	±2.5°			
Vertical Pattern:						
Half-power beam width	11.5°	10.1°	5.0°	4.8°	4.6°	
Electrical tilt, continuously adjustable	0°–10°	0°–10°	0°–6°			
Sidelobe suppression for first sidelobe above main beam: average:	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 3° ... 6° T	0° ... 3° ... 6° T	0° ... 3° ... 6° T	
	≥ 17 ... 17 ... 17 dB	≥ 17 ... 17 ... 16 dB	≥ 18 ... 17 ... 15 dB	≥ 18 ... 18 ... 16 dB	≥ 18 ... 18 ... 16 dB	
VSWR	< 1.5	< 1.5	< 1.5			
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB			
Isolation: Intersystem	> 38 dB (790...960 // 1710–2180 MHz)					
	> 28 dB, Typ. > 30 dB (790–862 // 880–960MHz)					
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc			
Max. power per input	250 W*	250 W*	250 W*			
Total power	500 W*	500 W*	500 W*			
Input	6 x 7-16 female (long neck)					
Connector position	Bottom					
Adjustment mechanism	3x, Position bottom, continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 850 / 380 / 910 N					
Height/width/depth	1932 / 269 / 154 mm					
Category of mounting hardware	M (Medium)					
Weight	23 kg / 25 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					

* (at 50 °C ambient temperature)



Triple-band Panel

790–862 880–960 1710–2180

KATHREIN

Dual Polarization

X X X

Antennen · Electronic

Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–862/880–960/1710–2180 65°/65°/65° 16.5/17/18.5dBi 0°–7°/0°–7°/0°–6°T

Type No.	80010699					clamps included
	790–862	880–960	1710–2180			
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	16.3 ... 16.4 ... 16.2	16.7 ... 16.9 ... 16.6	18.2 ... 18.5 ... 18.3	18.5 ... 18.7 ... 18.3	18.5 ... 18.7 ... 18.3	
Tilt	0° ... 4° ... 7°	0° ... 4° ... 7°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:						
Half-power beam width	68°	65°	65°	65°	61°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 28 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	
Vertical Pattern:						
Half-power beam width	8.3°	7.6°	5.0°	4.8°	4.6°	
Electrical tilt, continuously adjustable	0°–7°	0°–7°	0°–6°			
Sidelobe suppression for first sidelobe above main beam: average:	0° ... 4° ... 7° T ≥ 17 ... 16 ... 16 dB	0° ... 4° ... 7° T ≥ 18 ... 17 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB	
VSWR	< 1.5	< 1.5	< 1.5			
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB			
Isolation: Intersystem	> 38 dB (790...960 // 1710–2180 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960MHz)					
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc	< –150 dBc	< –150 dBc			
Max. power per input Total power	250 W* 500 W*	250 W* 500 W*	250 W* 500 W*			
Connector position	Bottom					
Adjustment mechanism	3x, Position bottom, continuously adjustable					
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N					
Height/width/depth	2532 / 269 / 154 mm					
Category of mounting hardware	H (Heavy)					
Weight	26 kg / 28 kg (clamps incl.)					
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter					

*(at 50 °C ambient temperature)



Triple-band Panel

790–960 1710–1880 1920–2170

KATHREIN

Dual Polarization

X X X

Antennen · Electronic

Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–960/1710–1880/1920–2170 65°/65°/65° 15/17/17dBi 0°–14°/0°–8°/0°–8°T

Type No.	742270v03			
	790–960	1710–1880	1920–2170	clamps included
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	14.4 ... 14.3 ... 14.0	14.8 ... 14.7 ... 14.2	16.8 ... 16.9 ... 16.6	16.9 ... 17.0 ... 16.7
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 4° ... 8°	0° ... 4° ... 8°
Horizontal Pattern:				
Half-power beam width	68°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 32 dB	> 32 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		0.5 dB	0.5 dB
Squint	±2.0°		±3.0°	±3.0°
Vertical Pattern:				
Half-power beam width	16.5°	15.3°	7.4°	6.7°
Electrical tilt, contin. adjust.	0°–14°		0°–8°	0°–8°
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 7° ... 14° T 17 ... 16 ... 15 dB	0° ... 7° ... 14° T 17 ... 18 ... 17 dB	0° ... 4° ... 8° T 17 ... 17 ... 16 dB	0° ... 4° ... 8° T 16 ... 16 ... 15 dB
VSWR	< 1.5		< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB	> 30 dB
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1710–1880 MHz) Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170 MHz)			
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc		< –150 dBc	< –150 dBc
Max. power per input Total power	500 W* 1000 W*		200 W* 400 W*	200 W* 400 W*
Input	6 x 7-16 female (long neck)			
Connector position	Bottom			
Adjustment mechanism	3x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 600 / 270 / 640 N			
Height/width/depth	1384 / 261 / 146 mm			
Category of mounting hardware	M (Medium)			
Weight	19 kg / 21 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

*(at 50 °C ambient temperature)



Triple-band Panel

790–960 1710–1880 1920–2170

KATHREIN

Dual Polarization

X X X

Antennen · Electronic

Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–960/1710–1880/1920–2170 65°/65°/65° 16.5/18/18dBi 0°–10°/0°–6°/0°–6°T

Type No.	742271 v03			
	790–960	1710–1880	1920–2170	clamps included
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	15.9 ... 15.8 ... 15.6	16.4 ... 16.3 ... 15.9	17.8 ... 18.0 ... 17.8	17.9 ... 18.2 ... 17.9
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 3° ... 6°	0° ... 3° ... 6°
Horizontal Pattern:				
Half-power beam width	68°	65°	65°	61°
Front-to-back ratio, copolar	> 27 dB	> 28 dB	> 30 dB	> 30 dB
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB
Main direction	0°	0°	0°	0°
Sector	±60°	> 10 dB	> 10 dB	> 10 dB
Tracking, Avg.	1.5 dB		0.5 dB	0.5 dB
Squint	±2.5°		±2.5°	±2.5°
Vertical Pattern:				
Half-power beam width	10.9°	10°	5.0°	4.6°
Electrical tilt, contin. adjust.	0°–10°		0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 5° ... 10° T ≥ 15 ... 16 ... 17 dB	0° ... 5° ... 10° T ≥ 15 ... 18 ... 19 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5		< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB	> 30 dB
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1710–1880 MHz) Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170 MHz)			
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc		< –150 dBc	< –150 dBc
Max. power per input	300 W*		200 W*	200 W*
Total power	600 W*		400 W*	400 W*
Input	6 x 7-16 female (long neck)			
Connector position	Bottom			
Adjustment mechanism	3x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 860 / 380 / 920 N			
Height/width/depth	1933 / 261 / 146 mm			
Category of mounting hardware	M (Medium)			
Weight	24 kg / 26 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter			

* (at 50 °C ambient temperature)



Triple-band Panel

790–960 1710–1880 1920–2170

KATHREIN

Dual Polarization

X

X

X

Antennen · Electronic

Half-power Beam Width

65°

65°

65°

XXXPol Panel 790–960/1710–1880/1920–2170 65°/65°/65° 17.5/18/18dBi 0°–7°/0°–6°/0°–6°T

Type No.	742272v03			
	790–960	1710–1880	1920–2170	clamps included
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain (dBi)	16.9 ... 16.9 ... 16.8	17.3 ... 17.4 ... 17.2	17.8 ... 18.0 ... 17.8	17.9 ... 18.2 ... 17.9
Tilt	0° ... 3° ... 7°	0° ... 3° ... 7°	0° ... 3° ... 6°	0° ... 3° ... 6°
Horizontal Pattern:				
Half-power beam width	68°	65°	65°	61°
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross polar ratio Maindirection 0° Sector ±60°	Typically: 30 dB > 10 dB	Typically: 30 dB > 10 dB	Typically: 25 dB > 10 dB	Typically: 25 dB > 10 dB
Tracking, Avg.	1.0 dB		0.5 dB	0.5 dB
Squint	±2.5°		±2.5°	±2.5°
Vertical Pattern:				
Half-power beam width	8.0°	7.2°	5.0°	4.6°
Electrical tilt, contin. adjust.	0°–7°		0°–6°	0°–6°
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 4° ... 7° T ≥ 17 ... 17 ... 15 dB	0° ... 4° ... 7° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 17 ... 15 dB	0° ... 3° ... 6° T ≥ 18 ... 18 ... 16 dB
VSWR	< 1.5		< 1.5	< 1.5
Isolation: Intrasystem	> 30 dB		> 30 dB	> 30 dB
Isolation: Intersystem	Typically: > 50 dB (790–960 // 1710–1880 MHz) Typically: > 50 dB (790–960 // 1920–2170 MHz) > 30 dB (1710–1880 // 1920–2170 MHz)			
Intermodulation IM3 (2 x 43 dBm carrier)	< –150 dBc		< –150 dBc	< –150 dBc
Max. power per input Total power	500 W* 1000 W*	250 W* 500 W*	250 W* 500 W*	250 W* 500 W*
Input	6 x 7-16 female (long neck)			
Connector position	Bottom			
Adjustment mechanism	3x, Position bottom, continuously adjustable			
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 500 / 1210 N			
Height/width/depth	2533 / 261 / 146 mm			
Category of mounting hardware	H (Heavy)			
Weight	29 kg / 31 kg (clamps incl.)			
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter			

*(at 50 °C ambient temperature)



Triple-band Panel

Dual Polarization

Half-power Beam Width

790–960	1710–2180	1710–2180	KATHREIN
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X	X	X	Antennen · Electronic
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65°	65°	65°
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XXXPol Panel 790–960/1710–2180/1710–2180 65°/65°/65° 15/15/15dBi 0°–14°/0°–14°/0°–14°T

Type No.	80010290v02						clamps included
	790–960		880–960 MHz	1710–2180		1710–2180	
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+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	14.5 ... 14.5 ... 14.2	14.8 ... 14.8 ... 14.5	15.1 ... 14.8 ... 14.4	
1710–2180 MHz (Syst. bottom)				14.0 ... 14.0 ... 13.7	14.4 ... 14.3 ... 13.9	14.9 ... 14.8 ... 14.2	
1710–2180 MHz (Syst. top)							
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	
Horizontal Pattern:							
Half-power beam width	69°	68°	67°	67°	63°	60°	
Front-to-back ratio (180°±30°)	> 25 dB			> 25 dB			
Cross polar ratio	Typically: 25 dB			Typically: 20 dB			
Main direction	±60°			> 10 dB			
Sector	> 10 dB			> 10 dB			
Vertical Pattern:							
Half-power beam width	14.7°	14.3°	13.9°	13.8°	13.2°	12.6°	
Electrical tilt	0°–14°, continuously adjustable			Syst. bottom: 0°–14°, continuously adjustable Syst. top: 0°–14°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	0° ... 7° ... 14° T 17 ... 16 ... 16 dB	0° ... 7° ... 14° T 18 ... 16 ... 16 dB	0° ... 7° ... 14° T 18 ... 17 ... 16 dB	0° ... 7° ... 14° T 18 ... 16 ... 15 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	0° ... 7° ... 14° T 18 ... 16 ... 17 dB	
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 35 dB (790–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	400 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Input	6 x 7-16 female						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 480 / 300 / 700 N						
Height/width/depth	1540 / 262 / 149 mm						
Category of mounting hardware	M (Medium)						
Weight	21 kg / 23 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Triple-band Panel

790–960 1710–2180 1710–2180

KATHREIN

Dual Polarization

X X X

Antennen · Electronic

Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–960/1710–2180/1710–2180 65°/65°/65° 16.5/16.5/16.5dBi 2°–14°/0°–14°/0°–14°

Type No.	80010291 v02						clamps included
	790–960		1710–2180		1710–2180		
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+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	15.9 ... 15.9 ... 15.5	16.2 ... 16.2 ... 15.7	16.3 ... 16.3 ... 15.8	
1710–2180 MHz (Syst. bottom)				15.8 ... 15.8 ... 15.4	16.1 ... 16.1 ... 15.4	16.3 ... 16.2 ... 15.5	
1710–2180 MHz (Syst. top)							
Tilt	2° ... 8° ... 14°	2° ... 8° ... 14°	2° ... 8° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	0° ... 7° ... 14°	
Horizontal Pattern:							
Half-power beam width	68°	67°	65°	65°	64°	60°	
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 25 dB	Typically: 18 dB	Typically: 19 dB	Typically: 20 dB	
Maindirection 0°							
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Tracking	1.0 dB			1.0 dB			
Vertical Pattern:							
Half-power beam width	10°	9.7°	9.3°	9.5°	9°	8.7°	
Electrical tilt	2°–14°, continuously adjustable			0°–14°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	2° ... 8° ... 14° T 17 ... 17 ... 15 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	2° ... 8° ... 14° T 17 ... 17 ... 16 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	0° ... 7° ... 14° T 18 ... 17 ... 17 dB	
VSWR	< 1.5						
Isolation: Intrasystem	> 30 dB						
Isolation: Intersystem	> 35 dB (790–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)						
Intermodulation IM3	< –153 dBc (2 x 43 dBm carrier)						
Max. power per input	400 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Input	6 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 640 / 400 / 950 N						
Height/width/depth	2058 / 262 / 149 mm						
Category of mounting hardware	M (Medium)						
Weight	27 kg / 29 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Triple-band Panel

Dual Polarization

Half-power Beam Width

790–960	1710–2180	1710–2180	KATHREIN
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X	X	X	Antennen · Electronic
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65°	65°	65°
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XXXPol Panel 790–960/1710–2180/1710–2180 65°/65°/65° 17.5/17.5/17dBi 2°–10°/0°–10°/0°–10°T

Type No.	80010292v03						clamps included
	790–960			1710–2180		1710–2180	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain: (dBi) 1710–2180 MHz (Syst. bottom) 1710–2180 MHz (Syst. top)	17.0 ... 17.0 ... 16.8	17.2 ... 17.2 ... 16.9	17.4 ... 17.4 ... 17.0	17.1 ... 17.2 ... 16.6 16.5 ... 16.7 ... 16.2	17.2 ... 17.4 ... 16.8 16.6 ... 16.8 ... 16.3	17.2 ... 17.3 ... 16.7 16.8 ... 17.0 ... 16.3	
Tilt	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	
Horizontal Pattern:							
Half-power beam width	69°	68°	66°	65°	62°	61°	
Front-to-back ratio, copolar	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio Maindirection Sector	Typically: 0° ±60° ±60° > 10 dB avg. 20 dB	Typically: 25 dB > 10 dB avg. 20 dB	Typically: 25 dB > 10 dB avg. 17 dB	Typically: 25 dB > 10 dB avg. 16 dB	Typically: 25 dB > 10 dB avg. 16 dB	Typically: 25 dB > 10 dB avg. 16 dB	
Tracking, Avg. 1710–2180 MHz (Syst. bottom) 1710–2180 MHz (Syst. top)	1.0 dB			1.0 dB 0.5 dB			
Squint	±3.5°			±3.5°			
Vertical Pattern:							
Half-power beam width	7.8°	7.6°	7.1°	7.6°	7.5°	6.8°	
Electrical tilt	2°–10°, continuously adjustable			0°–10°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam	2° ... 6° ... 10° T 17 ... 16 ... 14 dB	2° ... 6° ... 10° T 18 ... 16 ... 15 dB	2° ... 6° ... 10° T 18 ... 16 ... 15 dB	0° ... 5° ... 10° T 15 ... 16 ... 15 dB	0° ... 5° ... 10° T 16 ... 16 ... 15 dB	0° ... 5° ... 10° T 16 ... 16 ... 14 dB	
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	
Isolation: Intrasystem	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Isolation: Intersystem	> 36 dB (790–960 // 1710–2180 MHz) > 36 dB (1710–2180 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	250 W (at 50 °C ambient temperature)			200 W (at 50 °C ambient temperature)			
Input	6 x 7-16 female						
Connector position	Bottom						
Adjustment mechanism	3x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1210 / 510 / 1270 N						
Height/width/depth	2598 / 261 / 146 mm						
Category of mounting hardware	H (Heavy)						
Weight	27 kg / 29 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Triple-band Panel

790–960 1710–2170 2490–2690

KATHREIN

Dual Polarization

X X X

Antennen · Electronic

Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–960/1710–2170/2490–2690 65°/65°/65° 15/17/16.5dBi 0°–16°/2°–10°/2°–10°

Type No.	80010674							clamps included
	790–960			1710–2170			2490–2690	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+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	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	0° ... 8° ... 16°	0° ... 8° ... 16°	0° ... 8° ... 16°	2° ... 5° ... 10°	2° ... 5° ... 10°	2° ... 5° ... 10°	2° ... 5° ... 10°	
Horizontal Pattern:								
Half-power beam width	69°	68°	67°	63°	63°	65°	65°	
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically: 25 dB	Typically: 25 dB	Typically: 23 dB	Typically: 18 dB	Typically: 21 dB	Typically: 23 dB	Typically: 23 dB	
Main direction 0°	> 10 dB	> 9 dB	> 8 dB	> 9 dB	> 9 dB	> 10 dB	> 8 dB	
Sector ±60°								
Vertical Pattern:								
Half-power beam width	16.5°	16.0°	15°	6.2°	5.8°	5.7°	4.8°	
Electrical tilt, continuously adjust.	0°–16°			2°–10°			2°–10°	
Min. sidelobe suppression for first sidelobe above main beam	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 16 ... 15 ... 15 dB	0° ... 8° ... 16° T 15 ... 15 ... 15 dB	2° ... 5° ... 10° T 14 ... 14 ... 15 dB	2° ... 5° ... 10° T 14 ... 15 ... 16 dB	2° ... 5° ... 10° T 14 ... 16 ... 17 dB	2° ... 5° ... 10° T 14 ... 16 ... 17 dB	
VSWR	< 1.5			< 1.5			< 1.5	
Isolation: Intrasystem	> 30 dB			> 28 dB			> 30 dB	
Isolation: Intersystem	> 30 dB (790–960 // 1710–2170 // 2490–2690MHz)							
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)							
Max. power per input	500 W*			200 W*			200 W*	
Total power	1000 W*			400 W*			400 W*	
Input	6 x 7-16 female (long neck)							
Connector position	Bottom							
Adjustment mechanism	3x, Position bottom, continuously adjustable							
Wind load (at 150 km/h)	Frontal / lateral / rearside: 700 / 270 / 730 N							
Height/width/depth	1403 / 300 / 152 mm							
Category of mounting hardware	M (Medium)							
Weight	20 kg / 22 kg (clamps incl.)							
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter							

* (at 50 °C ambient temperature)



Triple-band Panel

Dual Polarization

Half-power Beam Width

790–960 1710–2170 2490–2690

X X X

65° 65° 65°

KATHREIN

Antennen · Electronic

XXXPol Panel 790–960/1710–2170/2490–2690 65°/65°/65° 16/18/18dBi 0°–10°/2°–8°/2°–8°T

Type No.	80010675v01							clamps included
	790–960		1710–2170			2490–2690		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	16.0 ... 16.0 ... 15.6	16.1 ... 16.2 ... 15.8	16.1 ... 16.2 ... 15.9	18.0 ... 18.1 ... 17.8	18.1 ... 18.1 ... 17.7	18.4 ... 18.4 ... 17.8	17.5 ... 18.0 ... 17.7	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	
Horizontal Pattern:								
Half-power beam width	68°	67°	65°	64°	65°	62°	63°	
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 22 dB	> 24 dB	> 26 dB	> 22 dB	
Cross polar ratio	Typically: 27 dB	Typically: 26 dB	Typically: 23 dB	Typically: 17 dB	Typically: 22 dB	Typically: 23 dB	Typically: 24 dB	
Main direction 0°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:								
Half-power beam width	10.3°	10.1°	9.7°	5.0°	4.7°	4.4°	3.5°	
Electrical tilt, continuously adjust.	0°–10°			2°–8°			2°–8°	
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0° ... 5° ... 10° T 18 ... 15 ... 15 dB	0° ... 5° ... 10° T 19 ... 18 ... 17 dB	0° ... 5° ... 10° T 19 ... 18 ... 18 dB	2° ... 5° ... 8° T 16 ... 18 ... 19 dB	2° ... 5° ... 8° T 18 ... 19 ... 19 dB	2° ... 5° ... 8° T 17 ... 19 ... 19 dB	2° ... 5° ... 8° T 16 ... 18 ... 19 dB	
VSWR	< 1.5			< 1.5			< 1.5	
Isolation: Intrasystem	> 30 dB			> 28 dB			> 28 dB	
Isolation: Intersystem	> 30 dB (790–960 // 1710–2170 // 2490–2690MHz)							
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)							
Max. power per input	500 W*			200 W*			200 W*	
Total power	1000 W*			400 W*			400 W*	
Input	6 x 7-16 female (long neck)							
Connector position	Bottom							
Adjustment mechanism	3x, Position bottom, continuously adjustable							
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N							
Height/width/depth	1997 / 300 / 152 mm							
Category of mounting hardware	M (Medium)							
Weight	26 kg / 28 kg (clamps incl.)							
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter							

* (at 50 °C ambient temperature)



Triple-band Panel

790–960 1710–2170 2490–2690

KATHREIN

Dual Polarization

X X X

Antennen · Electronic

Half-power Beam Width

65° 65° 65°

XXXPol Panel 790–960/1710–2170/2490–2690 65°/65°/65° 17/18/18dBi 0.5°–9.5°/0°–6°/0°–6°T

Type No.	80010676							clamps included
	790–960			1710–2170			2490–2690	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	16.8 ... 16.7 ... 16.5	17.0 ... 17.0 ... 16.8	17.1 ... 17.2 ... 17.0	18.0 ... 18.0 ... 17.6	18.0 ... 18.0 ... 17.5	18.1 ... 18.1 ... 17.4	17.8 ... 17.8 ... 17.6	
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:								
Half-power beam width	68°	67°	65°	62°	63°	62°	63°	
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically: 24 dB	Typically: 23 dB	Typically: 22 dB	Typically: 18 dB	Typically: 22 dB	Typically: 23 dB	Typically: 25 dB	
Main direction 0°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:								
Half-power beam width	7.5°	7.4°	7.1°	4.8°	4.6°	4.4°	3.5°	
Electrical tilt, continuously adjust.	0.5°–9.5°			0°–6°			0°–6°	
Min. sidelobe suppression for first sidelobe above main beam	0.5° ... 5° ... 9.5° T 18 ... 16 ... 14 dB	0.5° ... 5° ... 9.5° T 18 ... 17 ... 15 dB	0.5° ... 5° ... 9.5° T 18 ... 18 ... 16 dB	0° ... 3° ... 6° T 18 ... 16 ... 16 dB	0° ... 3° ... 6° T 18 ... 18 ... 17 dB	0° ... 3° ... 6° T 18 ... 17 ... 17 dB	0° ... 3° ... 6° T 18 ... 18 ... 18 dB	
VSWR	< 1.5							
Isolation: Intrasystem	> 30 dB			> 28 dB				
Isolation: Intersystem	> 30 dB (790–960 // 1710–2170 // 2490–2690MHz)							
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)							
Max. power per input	500 W*			200 W*			200 W*	
Total power	1000 W*			400 W*			400 W*	
Input	6 x 7-16 female (long neck)							
Connector position	Bottom							
Adjustment mechanism	3x, Position bottom, continuously adjustable							
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1380 / 520 / 1490 N							
Height/width/depth	2622 / 300 / 152 mm							
Category of mounting hardware	H (Heavy)							
Weight	31 kg / 33 kg (clamps incl.)							
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter							

* (at 50 °C ambient temperature)



Triple-band Panel

Dual Polarization

Half-power Beam Width

698 – 960

1710 – 2690

1710 – 2690

KATHREIN

X

X

X

Antennen · Electronic

65°

65°

65°

Preliminary Issue

XXXPol Panel 698–960/1710–2690/1710–2690 65°/65°/65° 16/16/16dBi 1°–12°/2°–12°/2°–12°T

Type No.	80010691v01			
clamps included				
Low band				
R1, connector 1–2				
698–960				
Frequency range	698 – 820 MHz	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	15.1 ... 15.4 ... 15.2	15.3 ... 15.6 ... 15.7	15.5 ... 15.9 ... 15.7	15.8 ... 16.2 ... 16.0
Tilt	1° ... 6° ... 12°	1° ... 6° ... 12°	1° ... 6° ... 12°	1° ... 6° ... 12°
Horizontal Pattern:				
Half-power beam width	69°	67°	66°	65°
Front-to-back ratio, copolar (180°±30°)	> 26 dB	> 27 dB	> 26 dB	> 27 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	22 dB	21 dB	21 dB	21 dB
Sector ±60°	> 8 dB	> 9 dB	> 9 dB	> 8 dB
Vertical Pattern:				
Half-power beam width	10.7°	10.1°	9.7°	9.3°
Electrical tilt	1°–12°, continuously adjustable			
Min. sidelobe suppression for – first sidelobe above main beam – sector +20°	1° ... 6° ... 12° 18 ... 16 ... 15 dB 18 ... 16 ... 14 dB	1° ... 6° ... 12° 19 ... 18 ... 15 dB 18 ... 17 ... 14 dB	1° ... 6° ... 12° 19 ... 17 ... 15 dB 18 ... 16 ... 14 dB	1° ... 6° ... 12° 19 ... 17 ... 16 dB 18 ... 17 ... 14 dB
VSWR	< 1.5			
Isolation: Intrasystem	> 30 dB			
Isolation: Intersystem	> 32 dB (698–960 // 1710–2690 MHz) > 32 dB (1710–2690 // 1710–2690MHz)			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			



High band					
Y1, connector 3–4; Y2, connector 5–6					
1710–2690 1710–2690					
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°
1710–2690 MHz	Y1: 15.6 ... 15.4 ... 15.0	15.8 ... 15.8 ... 15.6	15.9 ... 15.8 ... 15.5	15.7 ... 15.2 ... 14.5	16.1 ... 16.3 ... 15.8
1710–2690 MHz	Y2: 15.3 ... 15.1 ... 14.8	15.5 ... 15.4 ... 15.1	15.5 ... 15.4 ... 15.0	15.3 ... 15.1 ... 14.7	15.5 ... 15.6 ... 15.2
Tilt	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	Y1: 63° Y2: 62°	61° 61°	63° 61°	65° 63°	60° 61°
Front-to-back ratio, copolar (180°±30°)	> 24 dB	> 24 dB	> 24 dB	> 23 dB	> 23 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	17 dB	22 dB	22 dB	23 dB	25 dB
Sector ±60°	> 9 dB	> 9 dB	> 8 dB	> 8 dB	> 7 dB
Vertical Pattern:					
Half-power beam width	Y1: 10.9° Y2: 10.9°	10.0° 10.1°	9.4° 9.6°	8.6° 8.5°	7.7° 7.9°
Electrical tilt	2°–12° (Y1), 2°–12° (Y2), continuously adjustable				
Min. sidelobe suppression for – first sidelobe above main beam – sector +20°	2° ... 7° ... 12° T 18 ... 18 ... 17 dB 17 ... 14 ... 14 dB	2° ... 7° ... 12° T 17 ... 18 ... 18 dB 17 ... 16 ... 16 dB	2° ... 7° ... 12° T 17 ... 17 ... 18 dB 17 ... 15 ... 14 dB	2° ... 7° ... 12° T 18 ... 16 ... 16 dB 18 ... 15 ... 14 dB	2° ... 7° ... 12° T 19 ... 17 ... 19 dB 18 ... 16 ... 15 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 32 dB (698–960 // 1710–2690 MHz) > 32 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				

Triple-band Panel Dual Polarization Half-power Beam Width

698 – 960 1710 – 2690 1710 – 2690

KATHREIN

X X X

Antennen · Electronic

65° 65° 65°

XXXPol Panel 698–960/1710–2690/1710–2690 65°/65°/65° 17/17/17dBi 1.5°–10°/0°–10°/2°–10°T

Type No.	80010692v01			
Low band	R1, connector 1–2			
	698–960			
Frequency range	698 – 820 MHz	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	16.1 ... 16.2 ... 16.2	16.5 ... 16.7 ... 16.7	16.8 ... 16.9 ... 16.8	17.0 ... 17.2 ... 17.1
Tilt	1.5° ... 6° ... 10°	1.5° ... 6° ... 10°	1.5° ... 6° ... 10°	1.5° ... 6° ... 10°
Horizontal Pattern:				
Half-power beam width	69°	66°	66°	65°
Front-to-back ratio, copolar (180°±30°)	> 26 dB	> 27 dB	> 27 dB	> 27 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:
Maindirection	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°
Vertical Pattern:				
Half-power beam width	8.5°	7.8°	7.6°	7.1°
Electrical tilt	1.5°–10°, continuously adjustable			
Min. sidelobe suppression for first sidelobe above main beam	17 ... 16 ... 15 dB 1.5° ... 6° ... 10° T	18 ... 16 ... 16 dB 1.5° ... 6° ... 10° T	18 ... 17 ... 17 dB 1.5° ... 6° ... 10° T	18 ... 16 ... 16 dB 1.5° ... 6° ... 10° T
VSWR	< 1.5			
Isolation: Intrasystem	> 30 dB			
Isolation: Intersystem	> 32 dB (698–960 // 1710–2690 MHz) > 32 dB (1710–2690 // 1710–2690MHz)			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			

clamps included



High band	Y1, connector 3–4; Y2, connector 5–6				
	1710–2690		1710–2690		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°
1710–2690 MHz	Y1: 16.6 ... 16.6 ... 16.1	16.7 ... 16.8 ... 16.5	16.7 ... 16.9 ... 16.1	17.2 ... 16.7 ... 15.7	16.7 ... 17.0 ... 16.5
1710–2690 MHz	Y2: 16.5 ... 16.5 ... 16.1	16.3 ... 16.5 ... 16.2	16.3 ... 16.5 ... 16.0	16.5 ... 16.3 ... 15.5	16.2 ... 17.0 ... 16.3
Tilt	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°
Horizontal Pattern:					
Half-power beam width					
Syst. bottom:	63°	61°	62°	60°	63°
Syst. top:	61°	63°	66°	67°	63°
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 26 dB	> 27 dB	> 26 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection	0°	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°	±60°
Vertical Pattern:					
Half-power beam width					
Syst. bottom:	7.6°	7.4°	7.2°	6.1°	5.9°
Syst. top:	6.5°	6.2°	6.0°	5.5°	4.9°
Electrical tilt	0°–10° (Y1), 2°–10° (Y2), continuously adjustable				
Min. sidelobe suppression for first sidelobe above main beam	Y1: 0° ... 5° ... 10° T 17 ... 15 ... 14 dB	0° ... 5° ... 10° T 18 ... 17 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 16 dB	0° ... 5° ... 10° T 18 ... 18 ... 14 dB	0° ... 5° ... 10° T 18 ... 18 ... 15 dB
	Y2: 2° ... 6° ... 10° T 15 ... 17 ... 18 dB	2° ... 6° ... 10° T 16 ... 18 ... 18 dB	2° ... 6° ... 10° T 15 ... 18 ... 18 dB	2° ... 6° ... 10° T 18 ... 18 ... 17 dB	2° ... 6° ... 10° T 16 ... 18 ... 17 dB
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 32 dB (698–960 // 1710–2690 MHz) > 32 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				

Triple-band Panel

Dual Polarization

Half-power Beam Width

698 – 960

1710 – 2690

1710 – 2690

KATHREIN

X

X

X

Antennen · Electronic

65°

65°

65°

XXXPol Panel 698–960/1710–2690/1710–2690 65°/65°/65° 16/18/18dBi 2°–12°/2.5°–12°/2.5°–12°

Type No.	80010865			
Left side, low band	R1, connector 1–2			
	698–960			
Frequency range	698 – 820 MHz	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	15.1 ... 15.3 ... 15.2	15.4 ... 15.7 ... 15.7	15.4 ... 15.9 ... 15.9	15.9 ... 16.2 ... 16.0
Tilt	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°	2° ... 7° ... 12°
Horizontal Pattern:				
Half-power beam width	69°	67°	66°	65°
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 28 dB	> 28 dB	> 28 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:
Maindirection	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°
	> 8 dB	> 8 dB	> 8 dB	> 8 dB
Vertical Pattern:				
Half-power beam width	10.8°	9.9°	9.5°	9.0°
Electrical tilt	2°–12°, continuously adjustable, for each system independently			
Min. sidelobe suppression for first sidelobe above main beam	17 ... 16 ... 15 dB 2° ... 7° ... 12° T	18 ... 17 ... 15 dB 2° ... 7° ... 12° T	18 ... 16 ... 16 dB 2° ... 7° ... 12° T	18 ... 16 ... 16 dB 2° ... 7° ... 12° T
VSWR	< 1.5			
Isolation: Intrasystem	> 30 dB			
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			



Left side, high band	Y1, connector 3–4				
	1710–2690				
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	17.2 ... 17.2 ... 17.0	17.7 ... 17.7 ... 17.5	17.8 ... 17.8 ... 17.5	17.6 ... 17.5 ... 17.1	17.9 ... 17.9 ... 17.4
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	66°	63°	62°	63°	66°
Front-to-back ratio, copolar (180°±30°)	> 26 dB	> 26 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection	0°	0°	0°	0°	0°
Sector	±60°	±60°	±60°	±60°	±60°
	> 8 dB	> 8 dB	> 8 dB	> 8 dB	> 8 dB
Vertical Pattern:					
Half-power beam width	6.4°	5.9°	5.6°	4.9°	4.5°
Electrical tilt	2.5°–12°, continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	16 ... 17 ... 18 dB 2.5° ... 7° ... 12° T	15 ... 16 ... 17 dB 2.5° ... 7° ... 12° T	15 ... 17 ... 18 dB 2.5° ... 7° ... 12° T	15 ... 16 ... 18 dB 2.5° ... 7° ... 12° T	14 ... 16 ... 17 dB 2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				

Type No.	80010865				
Right side, high band	Y2, connector 5-6				
	1710-2690				
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°
Average gain (dBi)	17.2 ... 17.2 ... 17.0	17.4 ... 17.5 ... 17.3	17.7 ... 17.7 ... 17.5	18.1 ... 18.3 ... 18.0	17.9 ... 18.2 ... 17.5
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	65°	66°	65°	64°	65°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 26 dB	> 27 dB	> 25 dB	> 26 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection	0° 17 dB	19 dB	19 dB	17 dB	20 dB
Sector	±60° > 8 dB	> 10 dB	> 10 dB	> 10 dB	> 8 dB
Vertical Pattern:					
Half-power beam width	7.2°	6.7°	6.4°	5.7°	5.1°
Electrical tilt	2.5°–12, continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				
Input	6 x 7-16 female				
Connector position	Bottom				
Adjustment mechanism	FlexRET continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1160 / 390 / 1210 N				
Max. wind velocity	241 km/h				
Height/width/depth	1921 / 377 / 169 mm				
Category of mounting hardware	H (Heavy)				
Weight	30 kg / 32 kg (clamps incl.)				
Packing size	2121 x 397 x 212 mm				
Scope of supply	Panel, FlexRET and 2 units of clamps for 42 – 115 mm diameter				

Triple-band Panel

Dual Polarization

Half-power Beam Width

698 – 960

1710 – 2690

1710 – 2690

KATHREIN

X

X

X

Antennen · Electronic

65°

65°

65°

XXXPol Panel 698–960/1710–2690/1710–2690 65°/65°/65° 17/18/18dBi 1°–10°/2.5°–12°/2.5°–12°T

Type No.	80010866			
Left side, low band	R1, connector 1–2			
	698–960			
Frequency range	698 – 820 MHz	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	16.1 ... 16.3 ... 16.2	16.6 ... 16.8 ... 16.7	16.8 ... 17.0 ... 16.9	17.1 ... 17.3 ... 17.2
Tilt	1° ... 6° ... 10°	1° ... 6° ... 10°	1° ... 6° ... 10°	1° ... 6° ... 10°
Horizontal Pattern:				
Half-power beam width	67°	65°	65°	64°
Front-to-back ratio, copolar (180°±30°)	> 26 dB	> 26 dB	> 28 dB	> 28 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:
Maindirection	0° 24 dB	26 dB	25 dB	26 dB
Sector	±60° > 8 dB	> 8 dB	> 8 dB	> 8 dB
Vertical Pattern:				
Half-power beam width	8.7°	7.9°	7.6°	7.2°
Electrical tilt	1°–10°, continuously adjustable, for each system independently			
Min. sidelobe suppression for first sidelobe above main beam	18 ... 16 ... 15 dB 1° ... 6° ... 10° T	18 ... 17 ... 16 dB 1° ... 6° ... 10° T	18 ... 16 ... 16 dB 1° ... 6° ... 10° T	18 ... 16 ... 16 dB 1° ... 6° ... 10° T
VSWR	< 1.5			
Isolation: Intrasystem	> 30 dB			
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690 MHz)			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			



Left side, high band	Y1, connector 3–4				
	1710–2690				
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain (dBi)	17.4 ... 17.3 ... 17.1	17.9 ... 17.8 ... 17.7	17.9 ... 17.8 ... 17.5	17.3 ... 17.2 ... 16.9	18.0 ... 18.0 ... 17.5
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	65°	63°	62°	68°	63°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 27 dB	> 27 dB	> 26 dB	> 26 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection	0° 17 dB	22 dB	25 dB	19 dB	17 dB
Sector	±60° > 8 dB	> 8 dB	> 10 dB	> 8 dB	> 8 dB
Vertical Pattern:					
Half-power beam width	6.3°	5.8°	5.6°	4.9°	4.5°
Electrical tilt	2.5°–12°, continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	16 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	16 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	15 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	15 ... 17 ... 18 dB 2.5° ... 7° ... 12° T	16 ... 18 ... 18 dB 2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690 MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				

Type No.	80010866				
Right side, high band	Y2, connector 5-6				
	1710-2690				
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°
Average gain (dBi)	17.4 ... 17.4 ... 17.2	17.6 ... 17.7 ... 17.5	17.9 ... 18.0 ... 17.6	18.4 ... 18.4 ... 17.9	18.4 ... 18.5 ... 17.8
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	62°	62°	62°	60°	60°
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 27 dB	> 26 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection	20 dB	20 dB	20 dB	17 dB	17 dB
Sector	> 10 dB	> 10 dB	> 10 dB	> 8 dB	> 8 dB
	0°				
	±60°				
Vertical Pattern:					
Half-power beam width	7.1°	6.6°	6.3°	5.6°	5.0°
Electrical tilt	2.5°–12, continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T	18 ... 18 ... 18 dB 2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				
Input	6 x 7-16 female				
Connector position	Bottom				
Adjustment mechanism	FlexRET, continuously adjustable				
Wind load (at 150 km/h) (approx.)	Frontal / lateral / rearside: 1540 / 520 / 1590 N (at 150 km/h)				
Max. wind velocity	200 km/h				
Height/width/depth	2441 / 377 / 169 mm				
Category of mounting hardware	H (Heavy)				
Weight (approx.)	35 kg / 37 kg (clamps incl.)				
Scope of supply	Panel, FlexRET and 2 units of clamps for 42 – 115 mm diameter				

Summary – Directional Antennas

4XPoI / 5XPoI / 6XPoI

698...960 / 1710...2690 MHz

5XPoI – Dual Polarization +45°/–45°

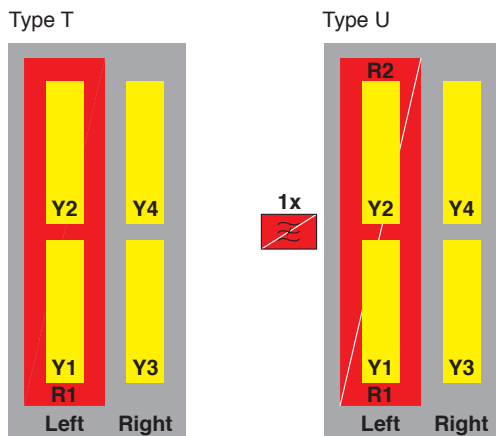
Type	Type No.	Height [mm]	Connector position	Page	1)					
5XPoI Panel	698–960	65°	17dBi	1.5°–10°T	80010892v01	2693	bottom	120 +	121	T
	1710–2690	65°	17.5dBi	2.5°–12°T						
	1710–2690	65°	17dBi	2.5°–12°T						
	1710–2690	65°	18dBi	2.5°–12°T						
	1710–2690	65°	17.5dBi	2.5°–12°T						

6XPoI – Dual Polarization +45°/–45°

6XPoI Panel	698–862	65°	16.5dBi	1.5°–10°T	80010899	2693	bottom	122 +	123	U
	880–960	65°	17dBi	1.5°–10°T						
	1710–2690	65°	17.5dBi	2.5°–12°T						
	1710–2690	65°	17dBi	2.5°–12°T						
	1710–2690	65°	18dBi	2.5°–12°T						
	1710–2690	65°	17.5dBi	2.5°–12°T						

New or changed product

1) Configuration Types – further details on page 14 and 15.



Summary – Directional Antennas

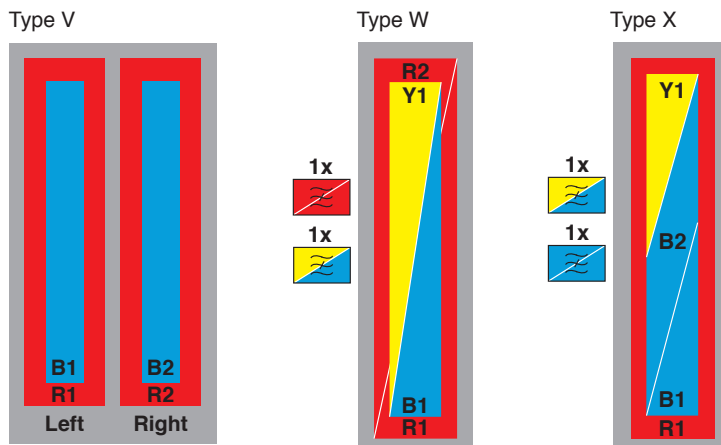
4XPol / 5XPol / 6XPol

698...960 / 1710...2690 MHz

4XPol – Dual Polarization +45°/–45°

Type	Type No.	Height [mm]	Connector position	Page	1)				
4XPol Panel	790–960	65°	16dBi	0°–10°T	80010825	1934	bottom	124	V
	790–960	65°	16dBi	0°–10°T					
	1710–2180	60°	18.5dBi	0°–6°T					
	1710–2180	60°	18.5dBi	0°–6°T					
4XPol Panel	790–960	65°	17dBi	0°–8°T	80010826	2399	bottom	125	V
	790–960	65°	17dBi	0°–8°T					
	1710–2180	60°	18.5dBi	0°–6°T					
	1710–2180	60°	18.5dBi	0°–6°T					
4XPol Panel	790–862	65°	14.5dBi	0°–14°T	80010804	1503	bottom	126	W
	880–960	65°	15dBi	0°–14°T					
	1710–2170	65°	17dBi	2°–10°T					
	2490–2690	65°	17dBi	2°–10°T					
4XPol Panel	790–862	65°	16dBi	0°–10°T	80010805	1997	bottom	127	W
	880–960	65°	16dBi	0°–10°T					
	1710–2170	65°	18dBi	2°–8°T					
	2490–2690	65°	18dBi	2°–8°T					
4XPol Panel	790–960	65°	15dBi	0°–16°T	80010684	1403	bottom	128	X
	1710–1880	65°	16.5dBi	2°–10°T					
	1920–2170	65°	16.5dBi	2°–10°T					
	2490–2690	65°	17dBi	2°–10°T					
4XPol Panel	790–960	65°	16dBi	0°–10°T	80010685v01	1997	bottom	129	X
	1710–1880	65°	17.5dBi	2°–8°T					
	1920–2170	65°	18dBi	2°–8°T					
	2490–2690	65°	18dBi	2°–8°T					
4XPol Panel	790–960	65°	17dBi	0.5°–9.5°T	80010686v01	2622	bottom	130	X
	1710–1880	65°	17.5dBi	2°–8°T					
	1920–2170	65°	18dBi	2°–8°T					
	2490–2690	65°	18dBi	2°–8°T					

1) Configuration Types – further details on page 14 and 15.



Penta-band Panel 698–960 1710–2690 1710–2690 1710–2690 1710–2690 **KATHREIN**
Dual Polarization X X X X X Antennen · Electronic
HPBW 65° 65° 65° 65° 65°

5XPol Panel 698–960/1710–2690/1710–2690/1710–2690/1710–2690 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

Type No.	80010892v01				clamps included
Left side, low band	R1, connector 1–2				
	698–960				
Frequency range	698 – 820 MHz	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	16.3 ... 16.4 ... 16.3	16.6 ... 16.8 ... 16.7	16.9 ... 17.0 ... 16.9	17.2 ... 17.3 ... 17.2	
Tilt	1.5° ... 6° ... 10°	1.5° ... 6° ... 10°	1.5° ... 6° ... 10°	1.5° ... 6° ... 10°	
Horizontal Pattern:					
Half-power beam width	69°	67°	66°	65°	
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 25 dB	> 27 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	
Maindirection	24 dB	24 dB	24 dB	24 dB	
Sector	> 8 dB	> 8 dB	> 8 dB	> 8 dB	
Vertical Pattern:					
Half-power beam width	8.5°	7.8°	7.5°	7.1°	
Electrical tilt	1.5°–10°, continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	18 ... 16 ... 15 dB 1.5° ... 6° ... 10° T	18 ... 17 ... 17 dB 1.5° ... 6° ... 10° T	18 ... 17 ... 17 dB 1.5° ... 6° ... 10° T	18 ... 16 ... 16 dB 1.5° ... 6° ... 10° T	
VSWR	< 1.5				
Isolation: Intrasystem	> 30 dB				
Isolation: Intersystem	> 28 dB, typ. 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	500 W (at 50 °C ambient temperature)				
Total power	1000 W (at 50 °C ambient temperature)				



Left side, high band	Y1, connector 3–4; Y2, connector 5–6				
	1710–2690		1710–2690		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)					
1710–2690 MHz	Y1: 17.1 ... 17.2 ... 16.9	17.6 ... 17.6 ... 17.3	17.6 ... 17.6 ... 17.2	17.3 ... 17.3 ... 16.9	17.4 ... 17.7 ... 17.2
1710–2690 MHz	Y2: 16.5 ... 16.4 ... 16.0	16.8 ... 16.7 ... 16.2	16.7 ... 16.7 ... 16.3	16.4 ... 16.4 ... 16.2	16.6 ... 17.0 ... 16.5
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	64°	63°	64°	63°	64°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection	17 dB	22 dB	22 dB	17 dB	17 dB
Sector	> 8 dB	> 8 dB	> 8 dB	> 8 dB	> 8 dB
Vertical Pattern:					
Half-power beam width	7.3°	6.9°	6.5°	5.7°	5.2°
Electrical tilt	2.5°–12° (Y1), 2.5°–12° (Y2), continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	Y1: 18 ... 16 ... 15 dB	18 ... 16 ... 16 dB	18 ... 17 ... 15 dB	18 ... 18 ... 15 dB	18 ... 16 ... 14 dB
	Y2: 18 ... 16 ... 15 dB	18 ... 16 ... 15 dB	18 ... 16 ... 14 dB	18 ... 18 ... 15 dB	18 ... 17 ... 15 dB
Tilt	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				

Type No.	80010892v01				
Right side, high band	Y3, connector 7–8; Y4, connector 9–10				
	1710–2690		1710–2690		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)					
1710–2690 MHz	Y3: 17.2 ... 17.2 ... 17.1	17.5 ... 17.5 ... 17.3	17.6 ... 17.7 ... 17.5	18.0 ... 18.1 ... 18.0	18.0 ... 18.3 ... 17.7
1710–2690 MHz	Y4: 16.7 ... 16.6 ... 16.5	17.1 ... 17.1 ... 16.9	17.1 ... 17.1 ... 16.9	17.2 ... 17.3 ... 17.2	17.3 ... 17.7 ... 16.9
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	67°	66°	66°	66°	64°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 25 dB	> 26 dB	> 28 dB	> 25 dB
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:
Maindirection 0°	17 dB	19 dB	18 dB	17 dB	18 dB
Sector ±60°	> 9 dB	> 10 dB	> 10 dB	> 9 dB	> 9 dB
Vertical Pattern:					
Half-power beam width	7.2°	6.7°	6.4°	5.6°	5.0°
Electrical tilt	2.5°–12° (Y3), 2.5°–12° (Y4), continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	Y3: 17 ... 18 ... 17 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	17 ... 18 ... 18 dB
	Y4: 17 ... 16 ... 16 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	17 ... 18 ... 18 dB
Tilt	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				
Input	10 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	FlexRET, continuously adjustable				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1710 / 560 / 1760 N				
Height/width/depth	2693 / 377 / 169 mm				
Category of mounting hardware	H (Heavy)				
Weight	44 kg / 46 kg (clamps incl.)				
Scope of supply	Panel, FlexRET and 2 units of clamps for 42 – 115 mm diameter				

Hexa-band Panel Dual Polarization HPBW

698–862	880–960	1710–2690	1710–2690	1710–2690	1710–2690
X	X	X	X	X	X
65°	65°	65°	65°	65°	65°

6XPol Panel 698–862/880–960/1710–2690/1710–2690/1710–2690/1710–2690 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

Type No.	80010899			clamps included
Left side, low band	R1, connector 1–2		R2, connector 3–4	
	698–862		880–960	
Frequency range	698 – 820 MHz		790 – 862 MHz	
Polarization	+45°, –45°		+45°, –45°	
Average gain (dBi)	16.0 ... 16.1 ... 16.0		16.1 ... 16.4 ... 16.3	
Tilt	1.5° ... 6° ... 10°		1.5° ... 6° ... 10°	
Horizontal Pattern:				
Half-power beam width	69°		68°	
Front-to-back ratio, copolar (180°±30°)	> 25 dB		> 25 dB	
Cross polar ratio	Typically: 24 dB		Typically: 24 dB	
Main direction	0°		0°	
Sector	±60°		±60°	
Vertical Pattern:				
Half-power beam width	8.5°		7.8°	
Electrical tilt, contin. adjust., for each system independently	1.5°–10°		1.5°–10°	
Min. sidelobe suppression for first sidelobe above main beam	18 ... 16 ... 15 dB 1.5° ... 6° ... 10° T		18 ... 17 ... 15 dB 1.5° ... 6° ... 10° T	
VSWR	< 1.5			
Isolation: Intrasystem	> 30 dB			
Isolation: Intersystem	> 28 dB, typ. 30 dB (698–862 // 880–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	250 W (at 50 °C ambient temperature)			
Total power	500 W (at 50 °C ambient temperature)			



Left side, high band	Y1, connector 5–6; Y2, connector 7–8				
	1710–2690		1710–2690		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°		+45°, –45°		
Average gain: (dBi)	1710–2690 MHz		1710–2690 MHz		
Y1:	16.8 ... 16.9 ... 16.6	17.3 ... 17.3 ... 17.0	17.3 ... 17.3 ... 16.8	16.6 ... 16.6 ... 16.3	16.8 ... 17.1 ... 16.7
Y2:	16.6 ... 16.5 ... 16.4	17.2 ... 17.0 ... 16.7	17.1 ... 16.8 ... 16.5	16.5 ... 16.2 ... 16.0	17.0 ... 16.9 ... 16.6
Tilt	2.5° ... 7° ... 12°		2.5° ... 7° ... 12°		
Horizontal Pattern:					
Half-power beam width	Y1: 65° Y2: 64°	63° 63°	64° 62°	63° 67°	64° 62°
Front-to-back ratio, copolar (180°±30°)	> 25 dB		> 25 dB		
Cross polar ratio	Typically: 17 dB		Typically: 22 dB		
Main direction	0°		0°		
Sector	±60°		±60°		
Vertical Pattern:					
Half-power beam width	Y1: 7.4° Y2: 7.0°	6.8° 6.5°	6.4° 6.2°	5.7° 5.5°	5.2° 4.9°
Electrical tilt	2.5°–12° (Y1, Y3), 2.5°–12° (Y2, Y4), continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	Y1: 18 ... 17 ... 15 dB Y2: 15 ... 16 ... 15 dB	18 ... 18 ... 16 dB 16 ... 17 ... 17 dB	18 ... 17 ... 14 dB 18 ... 17 ... 16 dB	18 ... 18 ... 14 dB 18 ... 17 ... 17 dB	18 ... 16 ... 15 dB 18 ... 18 ... 15 dB
Tilt	2.5° ... 7° ... 12° T		2.5° ... 7° ... 12° T		
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				

Type No.	80010899				
Right side, high band	Y3, connector 9–10; Y4, connector 11–12				
	1710–2690		1710–2690		
Frequency range	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2300 – 2400 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Average gain: (dBi)					
1710–2690 MHz	Y3: 17.7 ... 17.6 ... 17.4	17.8 ... 17.8 ... 17.7	17.8 ... 17.9 ... 17.6	18.1 ... 18.0 ... 17.7	18.0 ... 18.2 ... 17.5
1710–2690 MHz	Y4: 17.3 ... 17.2 ... 17.1	17.5 ... 17.5 ... 17.3	17.6 ... 17.6 ... 17.3	17.8 ... 17.7 ... 17.4	17.7 ... 17.9 ... 17.2
Tilt	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°	2.5° ... 7° ... 12°
Horizontal Pattern:					
Half-power beam width	62°	62°	62°	60°	60°
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 27 dB	> 26 dB
Cross polar ratio	Typically: 20 dB	Typically: 20 dB	Typically: 20 dB	Typically: 17 dB	Typically: 17 dB
Maindirection 0°	> 10 dB	> 10 dB	> 10 dB	> 8 dB	> 8 dB
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 8 dB	> 8 dB
Vertical Pattern:					
Half-power beam width	7.1°	6.6°	6.3°	5.6°	5.0°
Electrical tilt	2.5°–12° (Syst. bottom), 2.5°–12° (Syst. top), continuously adjustable, for each system independently				
Min. sidelobe suppression for first sidelobe above main beam	Y3: 18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB
	Y4: 18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB	18 ... 18 ... 18 dB
Tilt	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T	2.5° ... 7° ... 12° T
VSWR	< 1.5				
Isolation: Intrasystem	> 28 dB				
Isolation: Intersystem	> 30 dB (698–960 // 1710–2690 MHz) > 30 dB (1710–2690 // 1710–2690MHz)				
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)				
Max. power per input	200 W (at 50 °C ambient temperature)				
Total power	400 W (at 50 °C ambient temperature)				
Input	12 x 7-16 female (long neck)				
Connector position	Bottom				
Adjustment mechanism	FlexRET, continuously adjustable				
Wind load (at 150 km/h) (approx.)	Frontal / lateral / rearside: 1710 / 560 / 1760 N				
Height/width/depth	2693 / 377 / 169 mm				
Category of mounting hardware	H (Heavy)				
Weight (approx.)	49 kg / 51 kg (clamps incl.)				
Scope of supply	Panel, FlexRET and 2 units of clamps for 42 – 115 mm diameter				

2-Dual-band Panel

790–960

790–960

1710–2180

1710–2180

KATHREIN

Dual Polarization

X

X

X

X

Antennen · Electronic

Half-power Beam Width

65°

65°

60°

60°

4XPol Panel 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						clamps included
	790–960			1710–2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Gain (dBi)	15.4 ... 15.7 ... 15.3	15.6 ... 16.0 ... 15.4	15.9 ... 16.1 ... 15.4	18.4 ... 18.5 ... 18.1	18.5 ... 18.7 ... 18.1	18.3 ... 18.5 ... 18.1	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	67°	65°	63°	60°	60°	60°	
Front-to-back ratio, copolar	> 27 dB	> 27 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	
Maindirection	0°	0°	0°	0°	0°	0°	
Sector	±60°	±60°	±60°	±60°	±60°	±60°	
Tracking, Avg.	1.5 dB			0.5 dB			
Squint	±3.0°			±2.5°			
Vertical Pattern:							
Half-power beam width	11°	10.7°	10°	5.0°	4.8°	4.6°	
Electrical tilt	0°–10°, continuously adjustable			0°–6°, continuously adjustable			
Sidelobe suppression for first sidelobe above main beam avg.	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 3° ... 6° T	0° ... 3° ... 6° T	0° ... 3° ... 6° T	
	≥ 17 ... 17 ... 17 dB	≥ 17 ... 17 ... 18 dB	≥ 17 ... 17 ... 16 dB	≥ 16 ... 15 ... 14 dB	≥ 17 ... 16 ... 15 dB	≥ 17 ... 16 ... 15 dB	
VSWR	< 1.5			< 1.5			
Isolation: Intrasystem	> 30 dB			> 30 dB			
Isolation: Intersystem	> 30 dB (790–960 // 790–960 MHz) > 30 dB (790–960 // 1710–2180 MHz) > 30 dB (1710–2180 // 1710–2180 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	8 x 7-16 female						
Connector position	Bottom						
Adjustment mechanism	4x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1540 / 330 / 1790 N						
Height/width/depth	1934 / 576 / 133 mm						
Category of mounting hardware	H (Heavy)						
Weight	36 kg / 38 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



2-Dual-band Panel

790-960

790-960

1710-2180

1710-2180

KATHREIN

Dual Polarization

X

X

X

X

Antennen · Electronic

Half-power Beam Width

65°

65°

60°

60°

4XPol Panel 790-960/790-960/1710-2180/1710-2180 65°/65°/60°/60° 17/17/18.5/18.5dBi 0°-7°/0°-7°/0°-6°/0°-6°T

Type No.	80010826						clamps included
	790-960			1710-2180			
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2180 MHz	
Polarization	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°	+45°, -45°	
Gain (dBi)	16.3 ... 16.5 ... 16.2	16.6 ... 16.8 ... 16.3	16.6 ... 17.0 ... 16.4	18.5 ... 18.5 ... 18.1	18.5 ... 18.5 ... 18.1	18.4 ... 18.5 ... 18.1	
Tilt	0° ... 3° ... 7°	0° ... 3° ... 7°	0° ... 3° ... 7°	0° ... 3° ... 6°	0° ... 3° ... 6°	0° ... 3° ... 6°	
Horizontal Pattern:							
Half-power beam width	67°	65°	63°	60°	60°	60°	
Front-to-back ratio, copolar	> 27 dB	> 27 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	
Maindirection	25 dB	25 dB	25 dB	25 dB	25 dB	25 dB	
Sector	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Tracking, Avg.	1.5 dB			0.5 dB			
Squint	±3.0°			±2.5°			
Vertical Pattern:							
Half-power beam width	7.7°	7.5°	7.2°	5.0°	4.8°	4.6°	
Electrical tilt	0°-7°, continuously adjustable			0°-6°, continuously adjustable			
Sidelobe supression for first sidelobe above main beam avg.	0° ... 3° ... 7° T ≥ 16 ... 17 ... 16 dB	0° ... 3° ... 7° T ≥ 15 ... 17 ... 18 dB	0° ... 3° ... 7° T ≥ 15 ... 17 ... 18 dB	0° ... 3° ... 6° T ≥ 16 ... 15 ... 14 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	0° ... 3° ... 6° T ≥ 17 ... 16 ... 15 dB	
VSWR	< 1.5			< 1.5			
Isolation: Intrasystem	> 30 dB			> 30 dB			
Isolation: Intersystem	> 30 dB (790-960 // 790-960 MHz) > 30 dB (790-960 // 1710-2180 MHz) > 30 dB (1710-2180 // 1710-2180 MHz)						
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)			< -150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			250 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			500 W (at 50 °C ambient temperature)			
Input	8 x 7-16 female						
Connector position	Bottom						
Adjustment mechanism	4x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1930 / 410 / 2200 N						
Height/width/depth	2399 / 576 / 133 mm						
Category of mounting hardware	H (Heavy)						
Weight	39 kg / 41 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						



Quad-band Panel

Dual Polarization

Half-power Beam Width

790–862	880–960	1710–2170	2490–2690
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X	X	X	X
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65°	65°	65°	65°
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4XPol Panel 790–862/880–960/1710–2170/2490–2690 65°/65°/65°/65° 14.5/15/17/17dB_i 0°–14°/0°–14°/2°–10°/2°–10°T

Type No.	80010804						clamps included
	790–862	880–960	1710–2170		2490–2690		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	14.2 ... 14.5 ... 14.1	14.6 ... 15.1 ... 14.5	16.9 ... 17 ... 16.6	17 ... 17.1 ... 16.5	16.9 ... 17 ... 16.5	16.5 ... 17 ... 16.7	
Tilt	0° ... 7° ... 14°	0° ... 7° ... 14°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°	
Horizontal Pattern:							
Half-power beam width	68°	65°	62°	64°	64°	63°	
Front-to-back ratio, copolar (180°±30°)	> 26 dB	> 26 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically:	Typically:	Typically:	Typically:	Typically:	Typically:	
Main direction 0°	25 dB	25 dB	18 dB	21 dB	21 dB	23 dB	
Sector ±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:							
Half-power beam width	13.8°	12.3°	6.8°	6.2°	5.8°	4.6°	
Electrical tilt, continuously adjust.	0°–14°	0°–14°	2°–10°			2°–10°	
Sidelobe suppression for first sidelobe above main beam	0° ... 7° ... 14° 18 ... 18 ... 16 dB	0° ... 7° ... 14° 18 ... 18 ... 18 dB	2° ... 6° ... 10° T 18 ... 18 ... 18 dB	2° ... 6° ... 10° T 16 ... 18 ... 18 dB	2° ... 6° ... 10° T 15 ... 17 ... 18 dB	2° ... 6° ... 10° T 15 ... 15 ... 17 dB	
VSWR	< 1.5	< 1.5	< 1.5			< 1.5	
Isolation: Intrasystem	> 30 dB	> 30 dB	> 28 dB			> 28 dB	
Isolation: Intersystem	> 30 dB (790...960 // 1710–2690 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz) > 28 dB, Typ. > 30 dB (1710–2170 // 2490–2690 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	250 W*	250 W*	200 W*		200 W*		
Total power	500 W*	500 W*	400 W*		400 W*		
Connector position	Bottom						
Adjustment mechanism	4x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 750 / 290 / 780 N						
Height/width/depth	1503 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	24 kg / 26 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						

* (at 50 °C ambient temperature)



Quad-band Panel

Dual Polarization

Half-power Beam Width

790–862	880–960	1710–2170	2490–2690
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X	X	X	X
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65°	65°	65°	65°
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4XPol Panel 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						clamps included
	790–862	880–960	1710–2170		2490–2690		
Frequency range	790 – 862 MHz	880 – 960 MHz	1710 – 1880 MHz	1850 – 1990 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°	
Average gain (dBi)	15.6 ... 15.7 ... 15.2	15.8 ... 15.9 ... 15.5	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	0° ... 5° ... 10°	0° ... 5° ... 10°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°	
Horizontal Pattern:							
Half-power beam width	67°	65°	64°	65°	65°	62°	
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	
Cross polar ratio	Typically: 22 dB	Typically: 22 dB	Typically: 18 dB	Typically: 22 dB	Typically: 23 dB	Typically: 25 dB	
Main direction 0°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Sector ±60°							
Vertical Pattern:							
Half-power beam width	10.1°	9.6°	4.7°	4.5°	4.3°	3.5°	
Electrical tilt, continuously adjust.	0°–10°	0°–10°	2°–8°			2°–8°	
Sidelobe suppression for first sidelobe above main beam	0° ... 5° ... 10° 18 ... 15 ... 15 dB	0° ... 5° ... 10° 18 ... 18 ... 16 dB	2° ... 5° ... 8° 18 ... 18 ... 17 dB	2° ... 5° ... 8° T 18 ... 17 ... 17 dB	2° ... 5° ... 8° T 18 ... 18 ... 18 dB	2° ... 5° ... 8° T 18 ... 18 ... 18 dB	
VSWR	< 1.5	< 1.5	< 1.5			< 1.5	
Isolation: Intrasystem	> 30 dB	> 30 dB	> 28 dB			> 28 dB	
Isolation: Intersystem	> 30 dB (790...960 // 1710–2170 MHz // 2490–2690 MHz) > 28 dB, Typ. > 30 dB (790–862 // 880–960 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	250 W*	250 W*	200 W*			200 W*	
Total power	500 W*	500 W*	400 W*			400 W*	
Connector position	Bottom						
Adjustment mechanism	4x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N						
Height/width/depth	1997 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	30 kg / 32 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 50 – 115 mm diameter						

* (at 50 °C ambient temperature)



Quad-band Panel

Dual Polarization

Half-power Beam Width

790–960 1710–1880 1920–2170 2490–2690

KATHREIN

X X X X

Antennen · Electronic

65° 65° 65° 65°

4XPol Panel 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						clamps included	
	790–960		1710–1880		1920–2170		2490–2690	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz	2490 – 2690 MHz		
Polarization	+45°, –45°		+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	16.1 ... 16.3 ... 16.1	16.3 ... 16.5 ... 16.1	16.5 ... 17.1 ... 16.6		
Tilt	0° ... 8° ... 16°	0° ... 8° ... 16°	0° ... 8° ... 16°	2° ... 6° ... 10°	2° ... 6° ... 10°	2° ... 6° ... 10°		
Horizontal Pattern:								
Half-power beam width	69°	68°	67°	65°	64°	63°		
Front-to-back ratio, copolar (180°±30°)	> 25 dB		> 25 dB		> 25 dB		> 25 dB	
Cross polar ratio	Typically: 25 dB		Typically: 23 dB		Typically: 18 dB		Typically: 23 dB	
Main direction 0°	> 10 dB		> 9 dB		> 10 dB		> 10 dB	
Sector ±60°	> 10 dB		> 9 dB		> 10 dB		> 10 dB	
Vertical Pattern:								
Half-power beam width	16.5°	16.0°	15.0°	6.8°	6.0°	4.8°		
Electrical tilt, continuously adjust.	0°–16°		2°–10°		2°–10°		2°–10°	
Sidelobe suppression for	0° ... 8° ... 16° T	0° ... 8° ... 16° T	0° ... 8° ... 16° T	2° ... 6° ... 10° T	2° ... 6° ... 10° T	2° ... 6° ... 10° T		
– first sidelobe above main beam	17 ... 15 ... 16 dB	17 ... 15 ... 17 dB	16 ... 15 ... 16 dB	16 ... 15 ... 16 dB	15 ... 16 ... 17 dB	15 ... 16 ... 17 dB		
– within 0°–20° sector above horizon	17 ... 15 ... 15 dB	17 ... 15 ... 16 dB	16 ... 15 ... 15 dB	15 ... 15 ... 16 dB	15 ... 16 ... 15 dB	15 ... 17 ... 14 dB		
VSWR	< 1.5		< 1.5		< 1.5		< 1.5	
Isolation: Intrasystem	> 30 dB		> 28 dB		> 28 dB		> 28 dB	
Isolation: Intersystem	> 30 dB (790–960 // 1710–1880 // 1710–2170 // 2490–2690 MHz)							
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)							
Max. power per input	500 W*		150 W*		150 W*		150 W*	
Total power	1000 W*		300 W*		300 W*		300 W*	
Total power	1000 W*		400 W*					
Input	8 x 7-16 female (long neck)							
Connector position	Bottom							
Adjustment mechanism	4x, Position bottom, continuously adjustable							
Wind load (at 150 km/h)	Frontal / lateral / rearside: 700 / 270 / 730 N							
Height/width/depth	1403 / 300 / 152 mm							
Category of mounting hardware	M (Medium)							
Weight	23 kg / 25 kg (clamps incl.)							
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter							

* (at 50 °C ambient temperature)



Quad-band Panel

Dual Polarization

Half-power Beam Width

790–960 1710–1880 1920–2170 2490–2690

X X X X

65° 65° 65° 65°

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4XPol Panel 790–960/1710–1880/1920–2170/2490–2690 65°/65°/65°/65° 16/18/18/18dBi 0°–10°/0°–6°/0°–6°/0°–6°T

Type No.	80010685v01						clamps included
	790–960		1710–1880		1920–2170	2490–2690	
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz	2490 – 2690 MHz	
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+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	17.5 ... 17.6 ... 17.4	17.8 ... 18.0 ... 17.5	17.5 ... 18.0 ... 17.8	
Tilt	0° ... 5° ... 10°	0° ... 5° ... 10°	0° ... 5° ... 10°	2° ... 4° ... 8°	2° ... 4° ... 8°	2° ... 4° ... 8°	
Horizontal Pattern:							
Half-power beam width	67°	66°	65°	62°	63°	63°	
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 27 dB	> 27 dB	> 25 dB	> 27 dB	> 26 dB	
Cross polar ratio	Typically: 27 dB	Typically: 27 dB	Typically: 22 dB	Typically: 18 dB	Typically: 23 dB	Typically: 24 dB	
Main direction	0°						
Sector	±60°	> 10 dB	> 10 dB	> 10 dB	> 10 dB	> 10 dB	
Vertical Pattern:							
Half-power beam width	10.1°	9.9°	9.5°	4.9°	4.3°	3.5°	
Electrical tilt, continuously adjust.	0°–10°						
Sidelobe suppression	2°–8°						
– for first sidelobe above main beam	0° ... 5° ... 10° T	0° ... 5° ... 10° T	0° ... 5° ... 10° T	2° ... 4° ... 8° T	2° ... 4° ... 8° T	2° ... 4° ... 8° T	
– within 0°–20° sector above horizon	17 ... 15 ... 15 dB	18 ... 15 ... 16 dB	18 ... 16 ... 15 dB	15 ... 17 ... 18 dB	15 ... 17 ... 18 dB	15 ... 17 ... 18 dB	
	17 ... 15 ... 15 dB	18 ... 15 ... 15 dB	18 ... 15 ... 15 dB	15 ... 16 ... 16 dB	15 ... 17 ... 16 dB	15 ... 17 ... 15 dB	
VSWR	< 1.5		< 1.5		< 1.5	< 1.5	
Isolation: Intrasystem	> 30 dB		> 28 dB		> 28 dB	> 28 dB	
Isolation: Intersystem	> 32 dB (1710–1880 // 1920–2170 MHz)						
	> 32 dB (790–960 // 1710–2170 MHz)						
	> 32 dB (2490–2690 // 790–960 ... 1710–2170 MHz)						
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)						
Max. power per input	500 W*		200 W*		200 W*	200 W*	
Total power	1000 W*		400 W*				
Input	8 x 7-16 female (long neck)						
Connector position	Bottom						
Adjustment mechanism	4x, Position bottom, continuously adjustable						
Wind load (at 150 km/h)	Frontal / lateral / rearside: 1020 / 390 / 1050 N						
Height/width/depth	1997 / 300 / 152 mm						
Category of mounting hardware	M (Medium)						
Weight	29 kg / 31 kg (clamps incl.)						
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter						

* (at 50 °C ambient temperature)



Quad-band Panel

Dual Polarization

Half-power Beam Width

790–960	1710–1880	1920–2170	2490–2690
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X	X	X	X
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65°	65°	65°	65°
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4XPol Panel 790–960/1710–1880/1920–2170/2490–2690 65°/65°/65°/65° 17/17.5/18/18dBi
0.5°–9.5°/2°–8°/2°–8°/2°–8°T

Type No.	80010686v01			clamps included
Low band	R1, connector 1–2			
	790–960			
Frequency range	790 – 866 MHz	824 – 894 MHz	880 – 960 MHz	
Polarization	+45°, –45°		+45°, –45°	
Average gain (dBi)	16.9 ... 16.9 ... 16.7	17.1 ... 17.1 ... 16.9	17.1 ... 17.2 ... 17.1	
Tilt	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	0.5° ... 5° ... 9.5°	
Horizontal Pattern:				
Half-power beam width	68°	67°	65°	
Front-to-back ratio, copolar (180°±30°)	> 27 dB	> 26 dB	> 26 dB	
Cross polar ratio	Typically: 26 dB	Typically: 26 dB	Typically: 23 dB	
Main direction	0°			
Sector	±60°	> 10 dB	> 10 dB	
Vertical Pattern:				
Half-power beam width	7.5°	7.3°	7.0°	
Electrical tilt, continuously adjust.	0.5°–9.5°			
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	0.5° ... 5° ... 9.5° T 19 ... 18 ... 16 dB	0.5° ... 5° ... 9.5° T 19 ... 19 ... 18 dB	0.5° ... 5° ... 9.5° T 19 ... 19 ... 19 dB	
VSWR	< 1.5			
Isolation: Intrasystem	> 30 dB			
Isolation: Intersystem	> 30 dB (1710–1880 // 1920–2170 MHz) (2490–2690 // 1710–2170 MHz) > 35 dB (790–960 // 1710–2170 ... 2490–2690 MHz)			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	500 W (at 50 °C ambient temperature)			
Total power	1000 W (at 50 °C ambient temperature)			



High band	B1, connector 3–4	B2, connector 5–6	Y1, connector 7–8
	1710–1880	1920–2170	2490–2690
Frequency range	1710 – 1880 MHz	1920 – 2170 MHz	2490 – 2690 MHz
Polarization	+45°, –45°		+45°, –45°
Average gain (dBi)	17.5 ... 17.6 ... 17.4	17.8 ... 18.0 ... 17.4	17.5 ... 17.9 ... 17.5
Tilt	2° ... 5° ... 8°	2° ... 5° ... 8°	2° ... 5° ... 8°
Horizontal Pattern:			
Half-power beam width	63°	63°	65°
Front-to-back ratio, copolar (180°±30°)	> 25 dB	> 27 dB	> 26 dB
Cross polar ratio	Typically: 18 dB	Typically: 23 dB	Typically: 24 dB
Main direction	0°		
Sector	±60°	> 10 dB	> 10 dB
Vertical Pattern:			
Half-power beam width	4.9°	4.3°	3.5°
Electrical tilt, continuously adjust.	2°–8°		
Sidelobe suppression – for first sidelobe above main beam – within 0°–20° sector above horizon	2° ... 5° ... 8° T 15 ... 17 ... 18 dB 15 ... 16 ... 16 dB	2° ... 5° ... 8° T 15 ... 17 ... 18 dB 15 ... 17 ... 16 dB	2° ... 5° ... 8° T 15 ... 17 ... 18 dB 15 ... 17 ... 14 dB
VSWR	< 1.5		
Isolation: Intrasystem	> 28 dB		
Isolation: Intersystem	> 30 dB (1710–1880 // 1920–2170 MHz) (2490–2690 // 1710–2170 MHz) > 35 dB (790–960 // 1710–2170 ... 2490–2690 MHz)		
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)		
Max. power per input	200 W (at 50 °C ambient temperature)	200 W (at 50 °C ambient temperature)	200 W (at 50 °C ambient temperature)
Total power	400 W (at 50 °C ambient temperature)		

Summary – Directional Antennas

VPol

694...2690 MHz

Vertical Polarization

Type					Type No.	Height [mm]	Connector female, type and position	Page
VPol Panel	790–960	65°	18.5dBi	0°T	730376v02	2574	7-16, rearside	132
VPol Panel	790–960	90°	17dBi	0°T	730378v02	2574	7-16, rearside	133

VPol – 800/900 / 1800/1900/2000

VPol Panel	1710–2180	12°	18.5dBi	0°T	80010368	299	7-16, side	134
Dual Yagi	790–960	C 38°	14dBi	0°T	80010828v01	170	7-16, rearside	135
	1710–2170	28°	15.5dBi	0°T				
VPol BiDir	694–960/1710–2690	65°	5dBi	0°T	738447	428	7-16, bottom	136
VPol BiDir	694–960/1710–2690	65°	5dBi	0°T	738448	428	N, bottom	136
VPol LogPer	790–2690	65°	11dBi	0°T	742192v01	300	7-16, bottom	137

VVPol – 800/900 / 1800/1900/2000

VVPol Panel	824–960	C 90°	7dBi	0°T	742290	328	7-16, bottom or top	138
	1710–2170	82°	7dBi	0°T				
VVPol Panel	824–960	C 90°	10dBi	0°T	80010046v01	662	7-16, bottom or top	139
	1710–2170	82°	11dBi	0°T				

New or changed product

Panel
Vertical Polarization
Half-power Beam Width

790–960

V

65°

KATHREIN
 Antennen · Electronic

VPol Panel 790–960 65° 18.5dBi

Type No.	730376v02		
	clamps included		
Frequency range	790 – 862 MHz	824 – 894 MHz	880 – 960 MHz
Polarization	Vertical		
Gain	17.8 dBi	18.0 dBi	18.4 dBi
Horizontal Pattern:			
Half-power beam width	68°	67°	65°
Front-to-back ratio (180°±30°)	> 25 dB	> 25 dB	> 25 dB
Vertical Pattern:			
Half-power beam width	7.4°	7.2°	6.8°
Sidelobe suppression for first sidelobe above horizon	> 17 dB	> 17 dB	> 18 dB
VSWR	< 1.5		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 740 / 330 / 1270 N (at 150 km/h)		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Panel 790–960
Vertical Polarization V
Half-power Beam Width 90°

VPol Panel 790–960 90° 17dBi

Type No.	730378v02		
	clamps included		
Frequency range	790 – 862 MHz	790–960	880 – 960 MHz
Polarization	Vertical		
Gain	16.6 dBi	16.7 dBi	17.0 dBi
Horizontal Pattern:			
Half-power beam width	90°	90°	90°
Front-to-back ratio (180°±30°)	> 22 dB	> 22 dB	> 22 dB
Vertical Pattern:			
Half-power beam width	7.1°	6.9°	6.6°
Sidelobe suppression for first sidelobe above horizon	> 12 dB	> 12 dB	> 12 dB
Impedance	50 Ω		
VSWR	< 1.5		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Max. power per input	500 W (at 50 °C ambient temperature)		
Input	7-16 female		
Connector position	Rearside		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 930 / 410 / 1270 N		
Height/width/depth	2574 / 259 / 99 mm		
Category of mounting hardware	H (Heavy)		
Weight	12 kg / 14 kg (clamps incl.)		
Scope of supply	Panel and 2 units of clamps for 42 – 115 mm diameter		



Multi-band Antenna
Vertical Polarization
Half-power Beam Width

1710–2180

V

12°

KATHREIN
 Antennen · Electronic

VPol Panel 1710–2180 12° 18.5dBi 0°T

Type No.	80010368		
Frequency range	1710 – 1880 MHz	1710–2180 1850 – 1990 MHz	1920 – 2180 MHz
Polarization	Vertical	Vertical	Vertical
Gain	18.1 dBi	18.4 dBi	18.7 dBi
Horizontal Pattern:			
Half-power beam width	13.3°	12.8°	12°
Front-to-back ratio (180°±30°)	> 30 dB	> 30 dB	> 30 dB
Sidelobe suppression	> 18 dB	> 18 dB	> 17 dB
Vertical Pattern:			
Half-power beam width	37°	36°	36°
Electrical tilt	0°, fixed		
Sidelobe suppression for first sidelobe above main beam	> 18 dB	> 18 dB	> 18 dB
VSWR	< 1.5		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Max. power per input	300 W (at 50 °C ambient temperature)		
Input	1 x 7-16 female		
Connector position	Side (see picture)		
Wind load (at 150 km/h)	Frontal / lateral / rearside: 340 / 25 / 400 N		
Height/width/depth	299 / 743 / 69 mm		
Weight	9 kg		



Accessories (order separately)

Type No.	Description	Remarks	Weight approx.	Units per antenna
738546	1 clamp	Mast: 42 – 115 mm diameter	1.1 kg	2 (order separately if required)
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8 kg	2 (order separately if required)
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2 (order separately if required)
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2 (order separately if required)

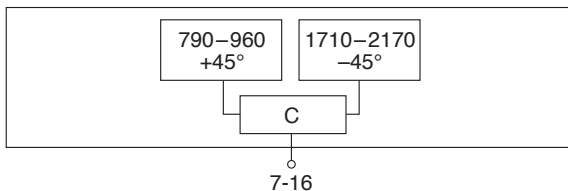
Yagi Multi-band Antenna **790–960** **1710–2170**
Dual Polarization **+45°** **–45°**
Half-power Beam Width **38°** **28°**

KATHREIN
 Antennen · Electronic

Dual Yagi 790–960/1710–2170 C 38°/28° 14/15.5dBi

Type No.	80010828v01			
	790–960		1710–2170	
Frequency range	790 – 870 MHz	870 – 960 MHz	1710 – 1880 MHz	1920 – 2170 MHz
VSWR	< 1.5	< 1.5	< 1.5	< 1.5
Gain (average)	13 dBi	14 dBi	13 dBi	15.5 dBi
Polarization	+45°	+45°	–45°	–45°
Front-to-back ratio	≥ 25 dB	≥ 25 dB	≥ 27 dB	≥ 27 dB
Half-power beam width (avg.)				
horizontal	38°	32°	28°	22°
vertical	38°	32°	28°	22°
Max. power	100 W (at 50 °C ambient temperature)			
Connector position	Rearside			
Weight	6 kg / 10 kg (clamps incl.)			
Wind load	200 N (at 150 km/h)			
Max. wind velocity	215 km/h			
Dimensions	1184 / Ø 170 mm			
Integrated combiner	The insertion loss is included in the given antenna gain values.			

Please note: This antenna is suitable for tunnel applications.



- Material:** **Reflector:** Aluminum, brass. **Radome:** Fiberglass, color: grey.
Base: Weather-proof aluminum. **All screws and nuts:** Stainless steel.
- Mounting:** The antenna can be mounted on a tubular mast with a diameter of 42 to 115 mm, with supplied clamps.
- Grounding:** The metal parts of the antenna including the mounting kit and the inner conductors are DC grounded.
- 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 regard to the following items:
 – Low temperature: –55 °C
 – High temperature (dry): +60 °C
- Environmental tests:** The antenna has passed a pressure test and meets the requirements according to Official Journal of the European Communities L245/171 from 12.09.2002 for the use of the antenna in train tunnels for high speed railways. The antenna exceeds the standard as follows.
 Pressure difference according to L245/171: 10 kPa
 Pressure difference during test: 100 kPa (const. 24 h)

Multi-band Bidirectional Antenna 694–960/1710–2690

Vertical Polarization

Half-power Beam Width

694–960/1710–2690

KATHREIN

V

Antennen · Electronic

65°

VPol BiDir 694–960/1710–2690 65° 5dBi

Type No.	738447	738448
Input	1 x 7-16 female	1 x N female
Frequency range	694 – 960 MHz, 1710 – 2690 MHz	
VSWR	694 – 960 MHz: < 2.0 1710 – 2690 MHz: < 1.7	
Gain	694 – 806 MHz: 5.0 dBi 806 – 960 MHz: 5.5 dBi 1710 – 2690 MHz: 6.5 dBi	
Impedance	50 Ω	
Polarization	Vertical	
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)	
Max. power (total)	200 W (at 50 °C ambient temperature)	
Weight	1.1 kg	
Wind load	Frontal: 30 N (at 150 km/h) Lateral: 70 N (at 150 km/h) Rearside: 35 N (at 150 km/h)	
Max. wind velocity	200 km/h	
Packing size	450 x 205 x 110 mm	
Height/width/depth	428 / 180 / 79 mm	



Material:	Radiator: Tin-plated copper. Reflector: Weather-proof aluminum. Radome: High impact plastic, colour: Grey. All screws and nuts: Stainless steel.
Mounting:	Wall mounting: No additional mounting kit needed. For pipe mast mounting use clamps listed below (order separately).
Ice protection:	The radiating system is protected by the radome. Due to its very sturdy construction, the antenna remains operational even under icy conditions.
Grounding:	All metal parts of the antenna as well as the inner conductor are DC grounded.

Accessories (order separately)

Type No.	Description	Remarks	Weight approx.	Units per antenna
734360	2 clamps	Mast: 34 – 60 mm diameter	60 g	1
734361	2 clamps	Mast: 60 – 80 mm diameter	70 g	1
734362	2 clamps	Mast: 80 – 100 mm diameter	80 g	1
734363	2 clamps	Mast: 100 – 120 mm diameter	90 g	1
734364	2 clamps	Mast: 120 – 140 mm diameter	110 g	1
734365	2 clamps	Mast: 45 – 125 mm diameter	80 g	1

Logarithmic Periodic Vertical Polarization Half-power Beam Width

790–2690

V

65°

KATHREIN
Antennen · Electronic

VPol LogPer 790–2690 65° 11dBi

Type No.	742192v01				
Frequency range	790 – 960 MHz	960 – 1710 MHz	1710 – 2200 MHz	2200 – 2490 MHz	2490 – 2690 MHz
VSWR	< 1.5	< 1.5	< 1.5	< 1.5	< 1.6
Gain	10.8 dBi	11.0 dBi	11.2 dBi	11.0 dBi	10.8 dBi
Impedance	50 Ω	50 Ω	50 Ω	50 Ω	50 Ω
Polarization	Vertical	Vertical	Vertical	Vertical	Vertical
Front-to-back ratio	> 25 dB	> 25 dB	> 25 dB	> 22 dB	> 25 dB
Half-power beam width horizontal vertical	65° 53°	60° 50°	55° 47°	50° 45°	50° 45°
Intermodulation IM3 (2 x 43 dBm carrier)	< -150 dBc	< -150 dBc	< -150 dBc	< -150 dBc	< -150 dBc
Max. power Total power	300 W	250 W	200 W	170 W	150 W
	500 W (at 50 °C ambient temperature)				
Input	1 x 7-16 female				
Connector position	Bottom				
Weight	5.5 kg				
Wind load (at 150 km/h)	Frontal / lateral / rearside: 20 / 210 / 30 N				
Height/width/depth	300 / 155 / 785 mm				

Material:

Radiator: Tin-plated copper.
Reflector screen: Weather-proof aluminum.
Radome: Fiberglass, color: Grey.
All screws and nuts: Stainless steel

Mounting:

The antenna can be mounted on tubular mast with a diameter of 30 – 70 mm with supplied clamps.

Grounding:

All metal parts of the antenna as well as the inner conductor are DC grounded.

Ice protection:

Due to the very sturdy antenna construction and the protection of the radiating system by the radome, the antenna remains operational even under icy conditions.

Pressure test:

The antenna has passed a pressure test according to Official Journal of the European Communities L245/171 from 12.09.2002 for the use of the antenna in train tunnels for high speed railways.
During test the antenna was subject to alternating pressure with a number of 1×10^6 alternations of load.
The antenna exceeds the standard as follows:
Pressure difference according to L245/171: 10 kPa
Pressure difference during test: 20 kPa



Dual-band Panel Vertical Polarization Half-power Beam Width

824–960

1710–2170

V

V

90°

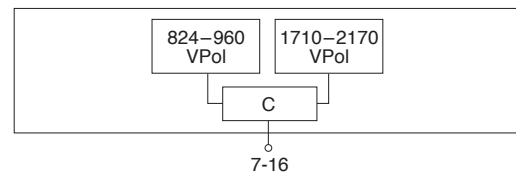
82°

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Antennen · Electronic

VVPol Panel 824–960/1710–2170 C 90°/82° 7/7dBi

Type No.	742290	
Frequency range	824 – 960 MHz	1710 – 2170 MHz
Polarization	Vertical	Vertical
Gain	7 dBi	7 dBi
Half-power beam width	Horizontal: 90° Vertical: 60°	Horizontal: 82° Vertical: 70°
Front-to-back ratio	> 18 dB	> 20 dB
Impedance	50 Ω	50 Ω
VSWR	< 1.5	< 1.5
Intermodulation IM3 (2 x 43 dBm carrier)	< -150 dBc	< -150 dBc
Input	1 x 7-16 female	
Connector position*	Bottom or top	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 90 / 23 / 100 N	
Height/width/depth	328 / 155 / 69 mm	
Category of mounting hardware	L (Light)	
Weight	2.8 kg	



Accessories

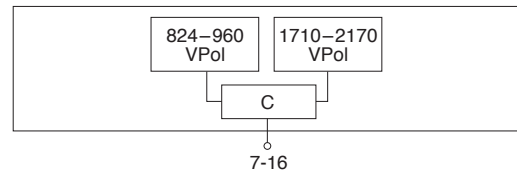
Type No.	Description	Remarks	Weight approx.	Units per antenna
734365	2 tension bands	Mast: 45 – 125 mm diameter	0.08 kg	1 (order separately if required)
734360	2 tension bands	Mast: 34 – 60 mm diameter	0.06 kg	1 (order separately if required)
734361	2 tension bands	Mast: 60 – 80 mm diameter	0.07 kg	1 (order separately if required)
734362	2 tension bands	Mast: 80 – 100 mm diameter	0.08 kg	1 (order separately if required)
734363	2 tension bands	Mast: 100 – 120 mm diameter	0.09 kg	1 (order separately if required)
734364	2 tension bands	Mast: 120 – 140 mm diameter	0.11 kg	1 (order separately if required)
738546	1 clamp	Mast: 42 – 115 mm diameter	1.1 kg	2 (order separately if required)
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8 kg	2 (order separately if required)
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2 (order separately if required)
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2 (order separately if required)
732327	1 downtilt kit	Downtilt angle: 0° – 40°	1.3 kg	1 (order separately if required)

Dual-band Panel
Vertical Polarization
Half-power Beam Width

824–960	1710–2170
V	V
90°	82°

VVPol Panel 824–960/1710–2170 C 90°/82° 10/11dBi

Type No.	80010046v01 <i>clamps included</i>	
Frequency range	824 – 960 MHz	1710 – 2170 MHz
Polarization	Vertical	Vertical
Gain	10 dBi	11 dBi
Half-power beam width	Horizontal: 90° Vertical: 33°	Horizontal: 82° Vertical: 19°
Front-to-back ratio	> 18 dB	> 20 dB
VSWR	< 1.5	< 1.5
Intermodulation IM3 (2 x 43 dBm carrier)	< -150 dBc	< -150 dBc
Max. power per input	100 W (at 50 °C ambient temperature)	
Input	1 x 7-16 female	
Connector position*	Bottom or top	
Wind load (at 150 km/h)	Frontal / lateral / rearside: 165 / 55 / 190 N	
Height/width/depth	662 / 155 / 69 mm	
Category of mounting hardware	L (Light)	
Weight	5 kg (tension bands incl.)	
Scope of supply	Panel and 1 unit of tension bands for 45 – 125 mm diameter	



Accessories

Type No.	Description	Remarks	Weight approx.	Units per antenna
734365	2 tension bands	Mast: 45 – 125 mm diameter	0.08 kg	1 (included in the scope of supply)
734360	2 tension bands	Mast: 34 – 60 mm diameter	0.06 kg	1 (order separately if required)
734361	2 tension bands	Mast: 60 – 80 mm diameter	0.07 kg	1 (order separately if required)
734362	2 tension bands	Mast: 80 – 100 mm diameter	0.08 kg	1 (order separately if required)
734363	2 tension bands	Mast: 100 – 120 mm diameter	0.09 kg	1 (order separately if required)
734364	2 tension bands	Mast: 120 – 140 mm diameter	0.11 kg	1 (order separately if required)
738546	1 clamp	Mast: 42 – 115 mm diameter	1.1 kg	2 (order separately if required)
731651	1 clamp	Mast: 28 – 60 mm diameter	0.8 kg	2 (order separately if required)
85010002	1 clamp	Mast: 110 – 220 mm diameter	2.7 kg	2 (order separately if required)
85010003	1 clamp	Mast: 210 – 380 mm diameter	4.8 kg	2 (order separately if required)
732327	1 downtilt kit	Downtilt angle: 0° – 19°	1.3 kg	1 (order separately if required)



Summary – Omnidirectional Antennas

VPol, XPol

694...2700 MHz

Vertical Polarization

Type	Type No.	Connector female	Height [mm]	Remarks	Page	
VPol Omni	870–960 360° 2dBi 0°T	738450	N	180	indoor/outdoor	142
VPol Omni	790–960 360° 2dBi 0°T	K751161	N	348		143
VPol Omni	890–960 360° 5dBi 0°T	K7515641	N	715		144
VPol Omni	870–960 360° 8dBi 0°T	736350	7-16	1543		145
VPol Omni	806–894 360° 11dBi 0°T	738192	7-16	3237		146
VPol Omni	870–960 360° 11dBi 0°T	736347	7-16	3033		147
VPol Omni	870–960 360° 10.5dBi 5°T	736349	7-16	2954		148
VVPol Omni	790–862 360° 8dBi 0°T 870–960 360° 9dBi 0°T	80010747	2 x 7-16	3237	separate inputs	149
VPol Omni	694–894/1695–2700 360° 2dBi 0°T	80010846	N	202	indoor/outdoor	168
VPol Omni	790–960/1695–2700 360° 2dBi 0°T	80010847	N	194	indoor/outdoor	169
VVPol Omni	870–960 360° 9dBi 0°T 1920–2170 360° 10dBi 0°T	80010274	2 x 7-16	3033	separate inputs	150
VVPol Omni	870–960/1710–1880 360° 2dBi 0°T 1920–2170 360° 2dBi 0°T	80010111	2 x N	493	separate inputs	151
VPol Omni	1710–2700 360° 2dBi 0°T	80010431	N	115		167
VPol Omni	1710–1880 360° 11dBi 0°T	738187	7-16	1568		152
VPol Omni	1920–2170 360° 11dBi 0°T	741790	7-16	1387		153
VPol Omni	2500–2700 360° 11dBi 0°T	80010442	7-16	1132		154

Dual Polarization

XPol Omni	1710–2690 360° 5dBi 0°T	80010126	2 x N	694		155
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New or changed product

Omnidirectional Antenna Vertical Polarization

870–960

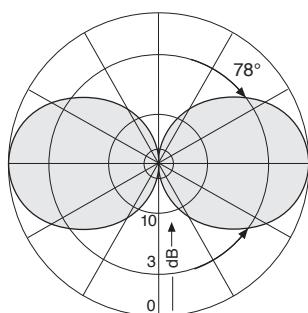
V

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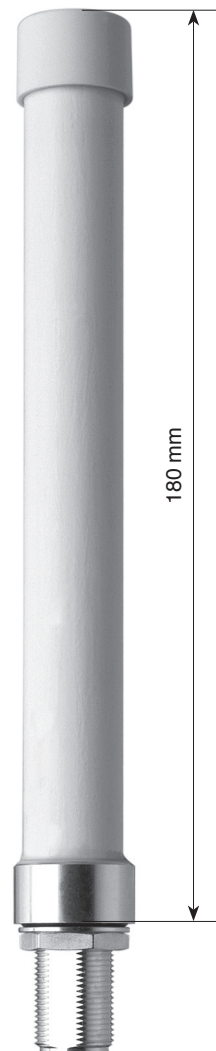
VPol Omni 870–960 360° 2dBi

Type No.	738450
Input	N female
Connector position	Bottom or top
Frequency range	870 – 960 MHz
VSWR	< 1.5
Gain	2 dBi
Impedance	50 Ω
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Polarization	Vertical
Max. power	100 W (at 50 °C ambient temperature)
Weight	200 g
Radome diameter	20 mm
Height	180 mm

- Material:** Radiator: Brass.
Radome: Fiberglass, colour: White.
- Mounting:** One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.
- Grounding:** All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



Vertical Pattern



Omnidirectional Antenna Vertical Polarization

790–960

V

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Antennen · Electronic

VPol Omni 790–960 360° 2dBi

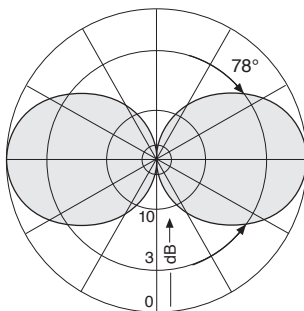
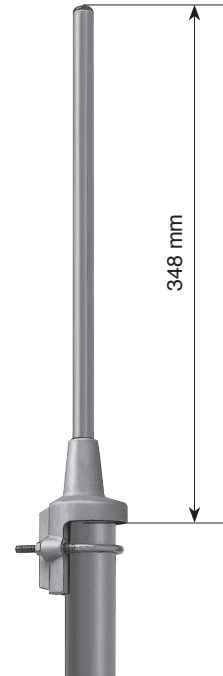
Type No.	K751161
Frequency range	790 – 960 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	100 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached in two ways with the supplied mounting kit:

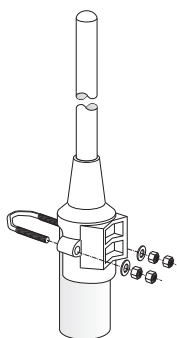
1. On the tip of a tubular mast of 40 – 54 mm diameter (connecting cable runs inside the mast).
2. Laterally at the tip of a tubular mast of 20 – 54 mm diameter (connecting cable runs outside the mast).

Material: Radiator: Brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

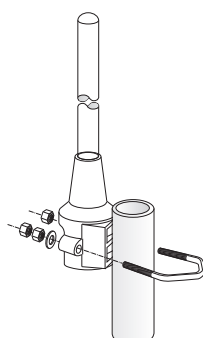
Grounding: All metal parts of the antenna as well as the inner conductor and the mounting kit are DC grounded.



Vertical Pattern



On the tip



Laterally at the tip

Mechanical specifications

Input	N female
Connector position	Bottom
Weight	0.74 kg
Radome diameter	21 mm
Wind load	17 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	455 x 112 x 97 mm
Height	348 mm

Omnidirectional Antenna Vertical Polarization

890–960

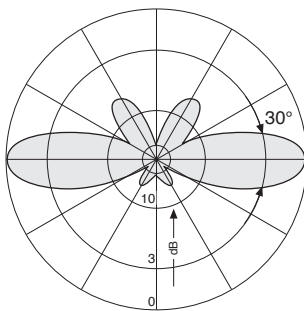
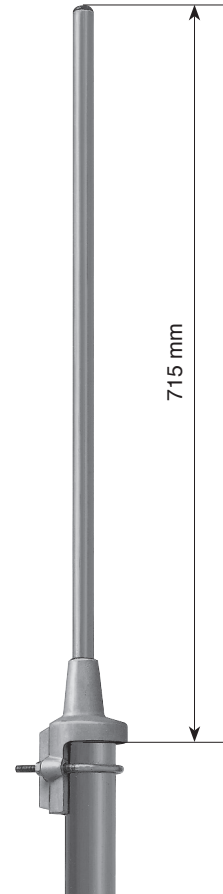
V

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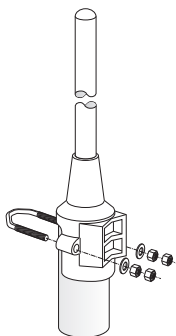
VPol Omni 890–960 360° 5dBi

Type No.	K7515641
Frequency range	890 – 960 MHz
Polarization	Vertical
Gain	5 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	250 W (at 50 °C ambient temperature)

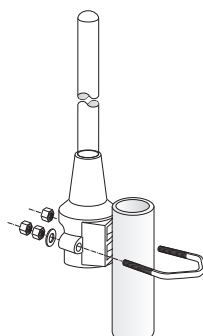
- Mounting:** The antenna can be attached in two ways with the supplied mounting kit:
1. On the tip of a tubular mast of 40 – 54 mm diameter (connecting cable runs inside the mast).
 2. Laterally at the tip of a tubular mast of 20 – 54 mm diameter (connecting cable runs outside the mast).
- Material:** 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.



Vertical Pattern



On the tip



Laterally at the tip

Mechanical specifications

Input	N female
Connector position	Bottom
Weight	0.90 kg
Radome diameter	21 mm
Wind load	20 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	825 x 112 x 97 mm
Height	715 mm

Omnidirectional Antenna Vertical Polarization

870–960

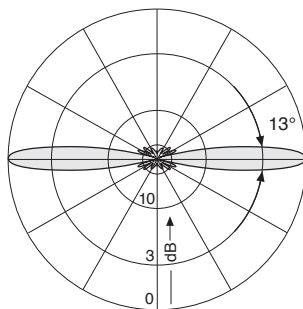
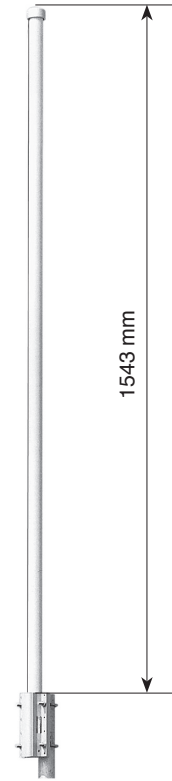
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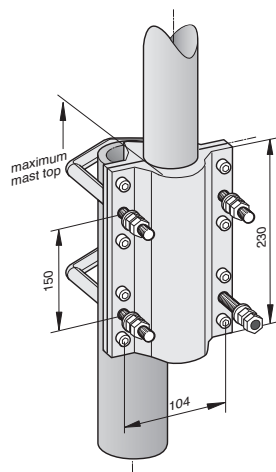
VPol Omni 870–960 360° 8dBi

Type No.	736350
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	8 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern



Mechanical specifications

Input	7-16 female
Connector position	Bottom
Weight	5.5 kg
Radome diameter	51 mm
Wind load	130 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1846 x 148 x 112 mm
Height	1543 mm

Omnidirectional Antenna Vertical Polarization

806–894

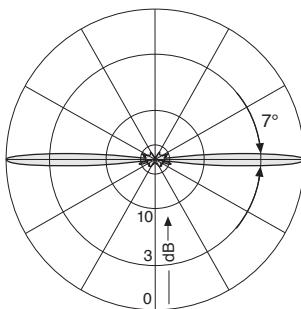
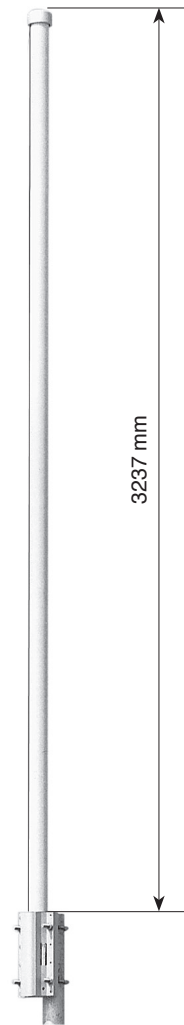
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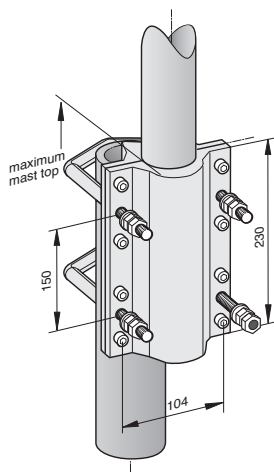
VPol Omni 806–894 360° 11dBi

Type No.	738192
Frequency range	806 – 894 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern



Mechanical specifications

Input	7-16 female
Connector position	Bottom
Weight	8.5 kg
Radome diameter	51 mm
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Packing size	3516 x 148 x 112 mm
Height	3237 mm

Omnidirectional Antenna Vertical Polarization

870–960

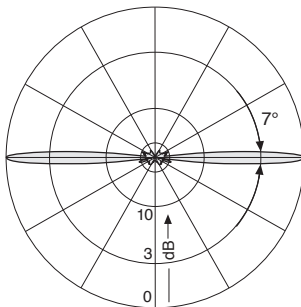
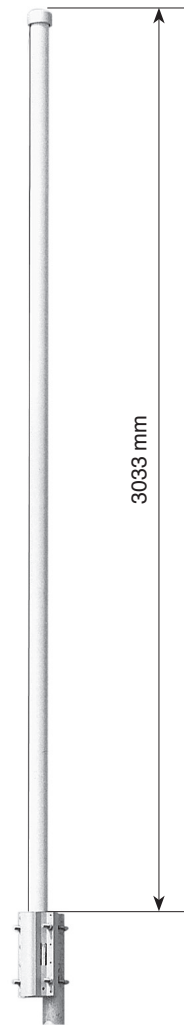
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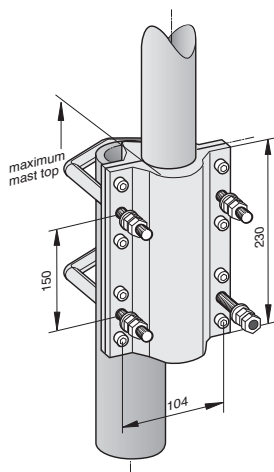
VPol Omni 870–960 360° 11dBi

Type No.	736347
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern



Mechanical specifications

Input	7-16 female
Connector position	Bottom
Weight	8 kg
Radome diameter	51 mm
Wind load	210 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	3316 x 148 x 112 mm
Height	3033 mm

Omnidirectional Antenna Vertical Polarization Fixed Electrical Downtilt

870–960

V

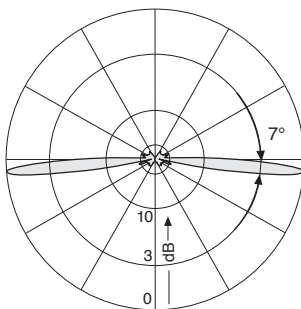
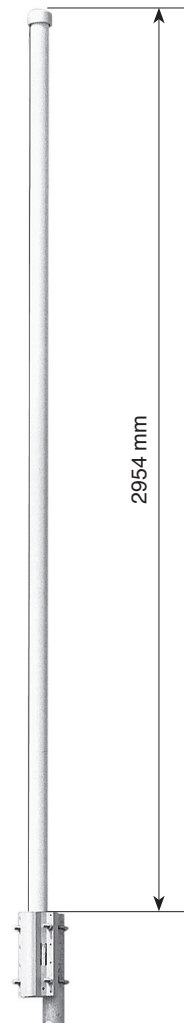
5°

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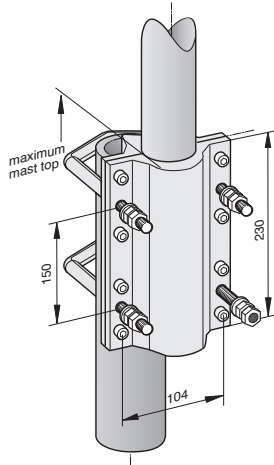
VPol Omni 870–960 360° 10.5dBi 5°T

Type No.	736349
Frequency range	870 – 960 MHz
Polarization	Vertical
Gain	10.5 dBi
Electrical tilt	5°, fixed
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	500 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern
5° electrical downtilt



Mechanical specifications

Input	7-16 female
Connector position	Bottom
Weight	8 kg
Radome diameter	51 mm
Wind load	210 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	3316 x 148 x 112 mm
Height	2954 mm

Dual-band Omni Antenna Vertical Polarization

870–960

790–862

V

V

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VPol Omni 870–960/790–862 360°/360° 9/8dBi

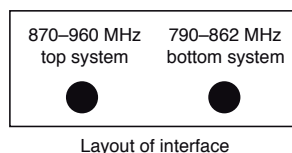
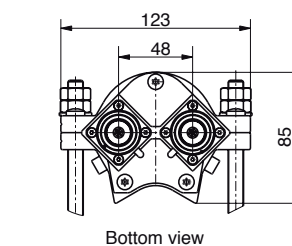
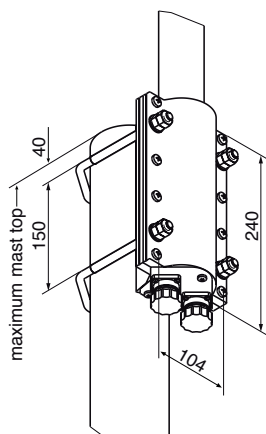
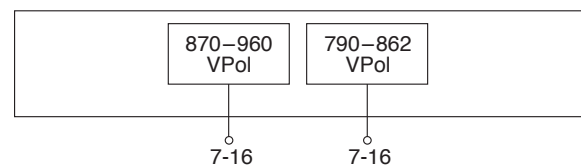
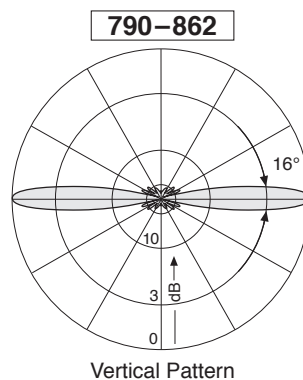
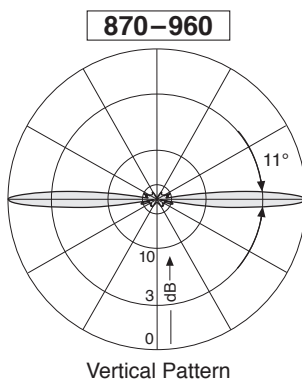
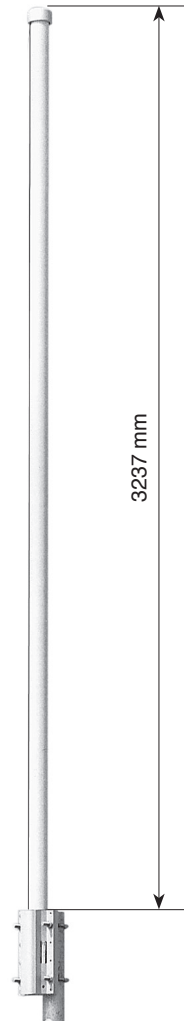
Type No.	80010747	
Frequency range	Top system: 870 – 960 MHz	Bottom system: 790 – 862 MHz
Polarization	Vertical	Vertical
Gain	9 dBi	8 dBi
Half-power beam width	Horizontal: Omni Vertical: 11°	Horizontal: Omni Vertical: 16°
Isolation, between ports	> 30 dB	
Impedance	50 Ω	
VSWR	< 1.5	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)	
Max. power per input	150 W	100 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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
Weight	8 kg
Wind load	230 N (at 150 km/h)
Max. wind velocity	180 km/h
Packing size	3516 x 148 x 112 mm
Height	3237 mm
Radome diameter	51 mm

Dual-band Omni Antenna Vertical Polarization

870–960

1920–2170

V

V

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VPol Omni 870–960/1920–2170 360°/360° 9/10dBi

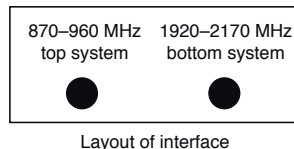
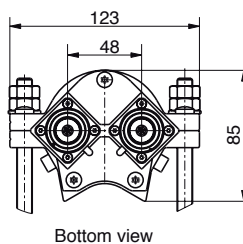
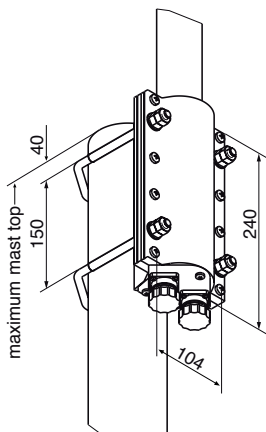
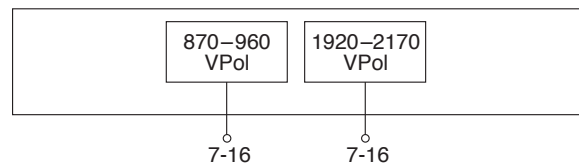
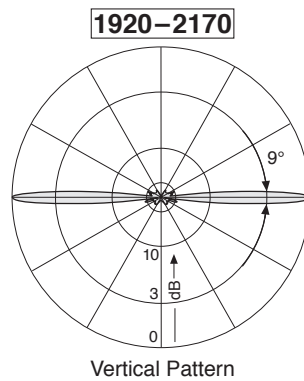
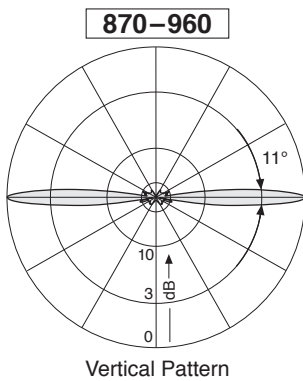
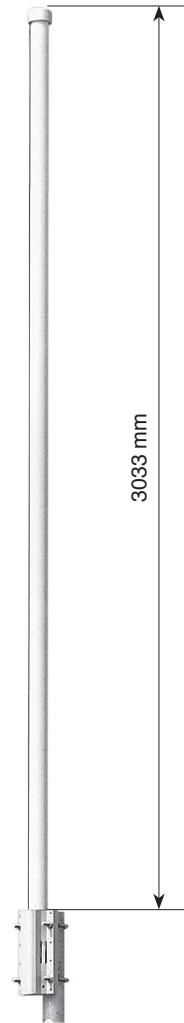
Type No.	80010274	
Frequency range	Top system: 870 – 960 MHz	Bottom system: 1920 – 2170 MHz
Polarization	Vertical	Vertical
Gain	9 dBi	10 dBi
Half-power beam width	Horizontal: Omni Vertical: 11°	Horizontal: Omni Vertical: 9°
Isolation, between ports	> 30 dB	
Impedance	50 Ω	
VSWR	< 1.5	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)	
Max. power per input	150 W	100 W (at 50 °C ambient temperature)

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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
Weight	8 kg
Wind load	230 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	3380 x 148 x 112 mm
Height	3033 mm
Radome diameter	51 mm

Multi-band Omni Antenna

870–960
1710–1880

1920–2170

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Vertical Polarization

V

V

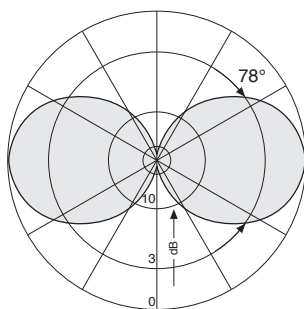
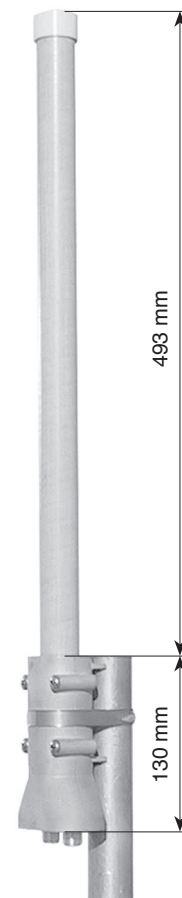
VVPol Omni 870–960/1710–1880/1920-2170 360°/360° 2/2dBi

Type No.	80010111	
Frequency range	Top system: 870 – 960 MHz 1710 – 1880 MHz	Bottom system: 1920 – 2170 MHz
Polarization	Vertical	Vertical
Gain	2 dBi	2 dBi
Isolation, between ports	> 25 dB	> 25 dB
Impedance	50 Ω	50 Ω
VSWR	< 1.5	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)	
Max. power per input	50 W (at 50 °C ambient temperature)	

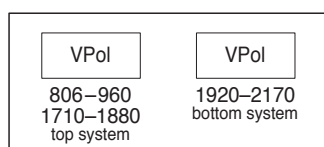
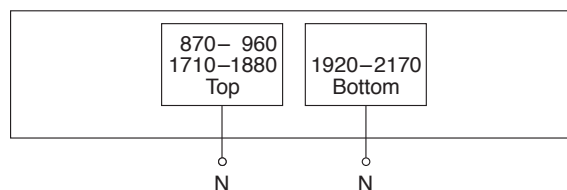
Material: Radiator: Copper and brass.
Radome: Fiberglass, color: Grey.
Base: Weather-proof aluminum.
Mounting kit, screws and nuts: Stainless steel.

Mounting: The antenna can be attached laterally at the tip of a tubular mast of 40 – 70 mm diameter with a mounting clamp supplied with the antenna. The connecting cables (not supplied) run outside the mast.

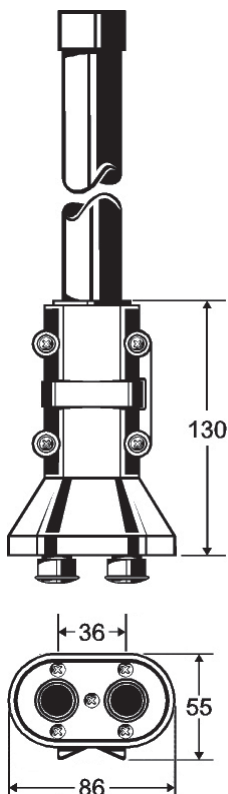
Excellent grounding: The metal parts of the antenna and the mounting kit (exclusive the inner conductor of the upper unit) are DC grounded.



Vertical Pattern



Layout of interface



Bottom view

Mechanical specifications	
Input	2 x N female
Connector position	Bottom
Weight	0.85 kg
Wind load	30 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	665 x 112 x 97 mm
Height	493 mm
Radome diameter	30 mm

Omnidirectional Antenna Vertical Polarization

1710–1880

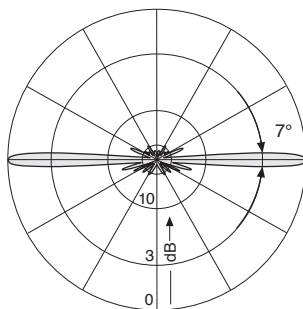
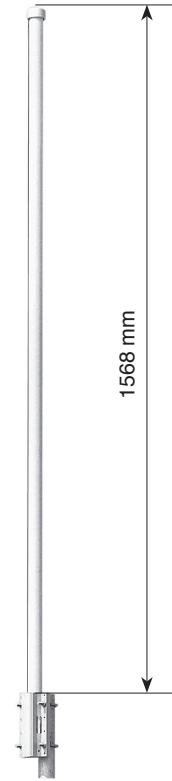
V

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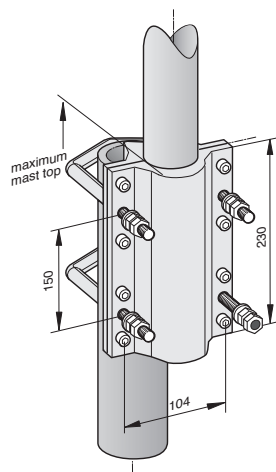
VPol Omni 1710–1880 360° 11dBi

Type No.	738187
Frequency range	1710 – 1880 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	200 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern



Mechanical specifications

Input	7-16 female
Connector position	Bottom
Weight	5.5 kg
Radome diameter	51 mm
Wind load	130 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1846 x 148 x 112 mm
Height	1568 mm

Omnidirectional Antenna Vertical Polarization

1920–2170

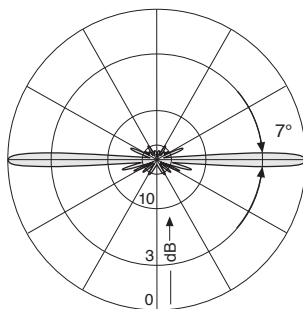
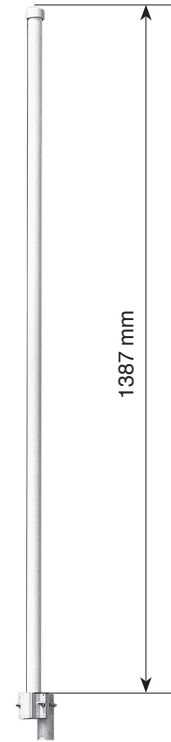
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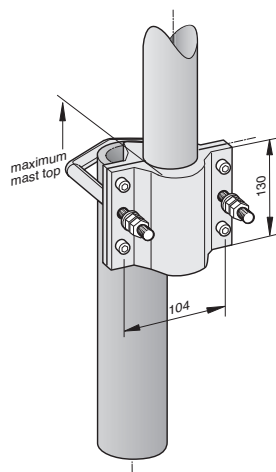
VPol Omni 1920–2170 360° 11dBi

Type No.	741790
Frequency range	1920 – 2170 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	150 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern



Mechanical specifications	
Input	7-16 female
Connector position	Bottom
Weight	5 kg
Radome diameter	51 mm
Wind load	120 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1570 x 148 x 112 mm
Height	1387 mm

Omnidirectional Antenna Vertical Polarization

2500–2700

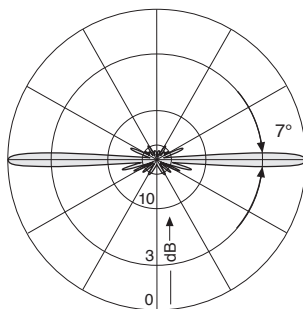
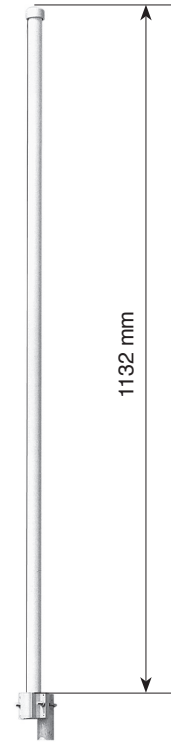
V

KATHREIN
Antennen · Electronic

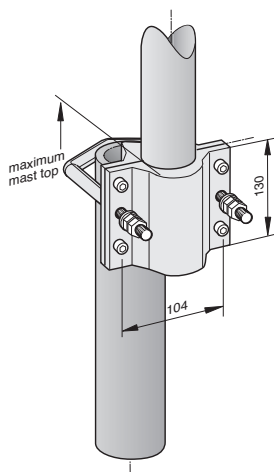
VPol Omni 2500–2700 360° 11dBi 0°T

Type No.	80010442
Frequency range	2500 – 2700 MHz
Polarization	Vertical
Gain	11 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	200 W (at 50 °C ambient temperature)

- Mounting:** The antenna can be attached laterally at the tip of a tubular mast of 50 – 94 mm 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 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.



Vertical Pattern



Mechanical specifications

Input	7-16 female
Connector position	Bottom
Weight	4.5 kg
Radome diameter	51 mm
Wind load	110 N (at 150 km/h)
Max. wind velocity	200 km/h
Packing size	1232 x 148 x 112 mm
Height	1132 mm

Omni Slimpole Antenna Dual Polarization

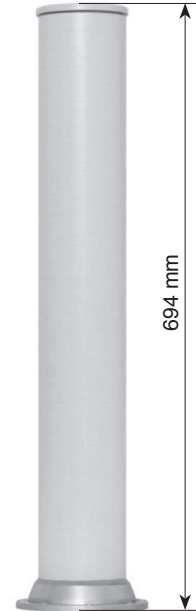
1710–2690

X

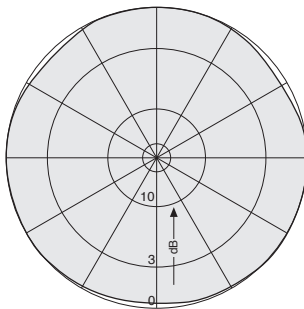
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XPol Omni Slimpole 1710–2690 360° 5dBi

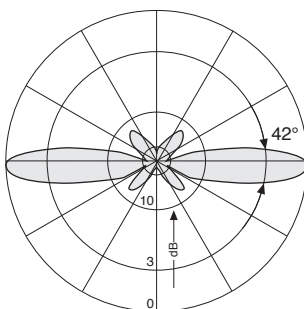
Type No.	80010126			
	1710–2690			
Frequency range	1710 – 1990 MHz	1920 – 2170 MHz	2170 – 2490 MHz	2490 – 2690 MHz
Polarization	+45°, –45°	+45°, –45°	+45°, –45°	+45°, –45°
Gain	2 x 5 dBi	2 x 5 dBi	2 x 5 dBi	2 x 5 dBi
Horizontal Pattern:				
Half-power beam width	Omni	Omni	Omni	Omni
Deviation from circularity	±1 dB	±1 dB	±1.5 dB	±1.5 dB
Vertical Pattern:				
Half-power beam width	42°	40°	36°	33°
Electrical tilt	0°, fixed			
Impedance	50 Ω			
VSWR	< 1.5			
Isolation, between ports	> 30 dB			
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)			
Max. power per input	100 W (at 50 °C ambient temperature)			



1710 – 2690 MHz: +45°/–45° Polarization



Horizontal Pattern



Vertical Pattern
0° electrical downtilt

Mechanical specifications

Input	2 x N-connector female
Connector position	Bottom
Weight	2.3 kg
Wind load	50 N (at 150 km/h)
Max. wind velocity	200 km/h
Mechanical interface	Flange connection 8 x M6 at a graduated diameter of 136 mm Evenness of the opposite surface: 0.5 mm
Packing size	740 x 220 x 220 mm
Height / diameter	694 / 100 mm



Summary – Indoor Antennas

VPol, VXPoI, VHPoI

694...6000 MHz

Vertical Polarization Indoor – Directional

Type	Type No.	Connector female	Height [mm]	Page		
VPol BiDir	694–960/1710–2690	65° 5dBi	738448	N	428	136
VVPoI Indoor	790–960/1710–2700	90° C 7dBi	80010465	N	231	158

Indoor – Directional Dual Polarization

VXPoI Indoor	790–960/1710–2700	90° C 7dBi	80010677	2 x N	232	159
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Indoor – Multi-band Omnidirectional

VPol Indoor	876–960/1710–2700	360° 2dBi	80010748	N	∅ 210	160
VPol Indoor	876–960/1710–2700	360° 2dBi	80010749	N	∅ 215	161
VPol Indoor	790–960/1425–3800/5150–6000	360° 2dBi	80010249	N	∅ 258	162
VPol Indoor	1710–2700	360° 2dBi	741573	N	∅ 100	163
VPol Indoor	1710–6000	360° 2dBi	80010430	N	∅ 138	164

Indoor – Omnidirectional Dual Polarization

VHPoI Indoor	790–960/1710–2700/2500–2700	360° 2dBi	80010709	2 x N	∅ 258	165
VHPoI Indoor	790–960/1710–2700/1710–2700	360° 2dBi	80010710	2 x N	∅ 380	166

Indoor / Outdoor – Single-band

VPol Omni	870–960	360° 2dBi	738450	N	180	142
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Indoor / Outdoor – Dual-band Multi-band

VPol Omni	1710–2700	360° 2dBi	80010431	N	115	167
VPol Omni	694–894/1695–2700	360° 2dBi	80010846	N	202	168
VPol Omni	790–960/1695–2700	360° 2dBi	80010847	N	194	169

New or changed product

**Indoor Multi-band
Directional Antenna
Vertical Polarization
Half-power Beam Width
Integrated Combiner**

790–960 1710–2700

V V

90° 90°

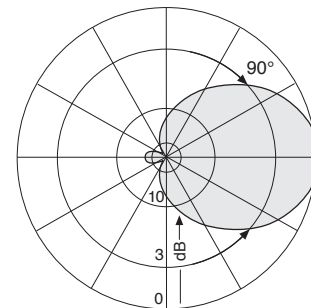
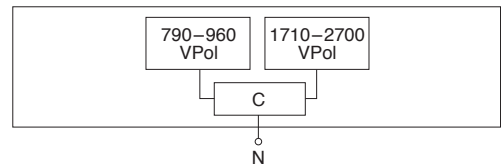
C

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VVPol Indoor 790–960/1710–2700 C 90° 7dBi

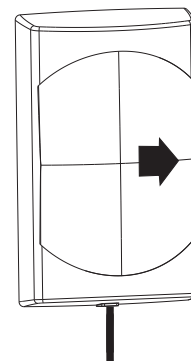
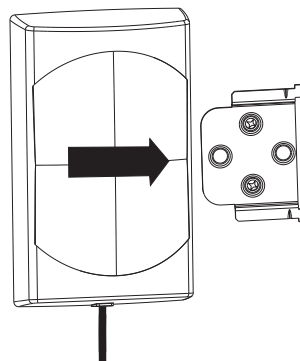
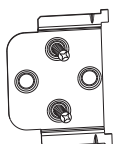
Type No.	80010465
Frequency range	790 – 960 MHz / 1710 – 2700 MHz
Polarization	Vertical
Gain	Approx. 7 dBi
Half-power beam width	Horizontal: Approx. 90°
Impedance	50 Ω
VSWR	790 – 806 MHz: < 2.2 806 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0
Max. power	50 W (at 50 °C ambient temperature)
Input	Cable RG 223/CU of 1m length, white, with N female connector
Protection class	IP 30
Weight	500 g
Packing size	363 x 152 x 62 mm
Height/width/depth	231 / 140 / 50 mm

- Material:** Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
Mounting plates: Stainless steel.
- Mounting:** Two holes of 6 mm 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 without tensile load. Cable must be fixed.
- Grounding:** All metal parts inclusive the inner conductor are DC grounded.
- Available accessories:** Broadband power splitters (694 – 3800 MHz) and tappers (790 – 2500 MHz).



Horizontal Pattern

Mounting:



Mount the attachment plate to the wall using two screws of 4 mm diameter in the position as indicated.

Align the antenna over the attachment plate.

Pull the antenna to the stop.

Indoor Multi-band Directional Antenna

790–960 1710–2700 1710–2700

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Vertical / Dual Polarization

V

X (-45°)

X (+45°)

Half-power Beam Width

90°

90°

90°

Integrated Combiner

C

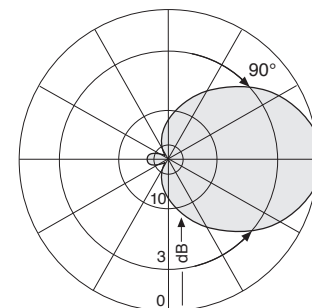
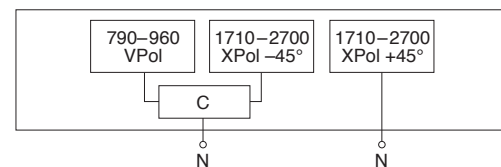
VXPol Indoor 790–960/1710–2700 C 90° 7dBi

Type No.	80010677	
Frequency range	790 – 960 MHz	1710 – 2700 MHz
Polarization	Vertical	+45°, -45°
Gain	Approx. 7 dBi	Approx. 2 x 7 dBi
Half-power beam width	Horizontal: Approx. 90°	
Impedance	50 Ω	
VSWR	< 2.0	
Isolation, between ports	> 25 dB	
Max. power	50 W (at 50 °C ambient temperature)	
Input	2x Cable RG 223/CU of 1m length, white, with N female connector	
Protection class	IP 30	
Weight	600 g	
Packing size	363 x 152 x 62 mm	
Height/width/depth	232 / 140 / 50 mm	

Material: Reflector: Aluminum.
Radome: High impact polystyrol, colour: White.
Additional painting is possible.
Mounting plates: Stainless steel.

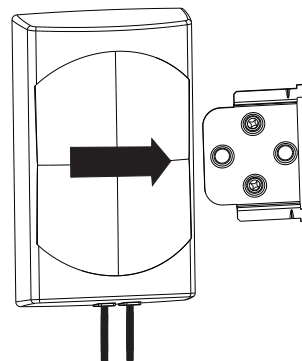
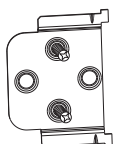
Mounting: Position: Wall and ceiling possible.
Two holes of 6 mm diameter in the mounting plate. Screws are not supplied.
Avoid stressing the cable.
No stress on the hexagonal crimp.
Minimum cable bending radius: 30 mm without tensile load. Cable must be fixed.

Available accessories: Broadband power splitters and tappers (790 – 2700 MHz).

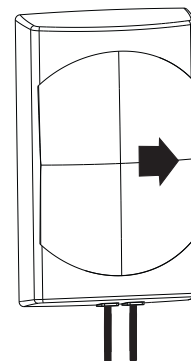


Horizontal Pattern

Mounting:



Align the antenna over the attachment plate.



Pull the antenna to the stop.

Mount the attachment plate to the wall using two screws of 4 mm diameter in the position as indicated.

Indoor Multi-band Omni Antenna Vertical Polarization

876–960

1710–2700

V

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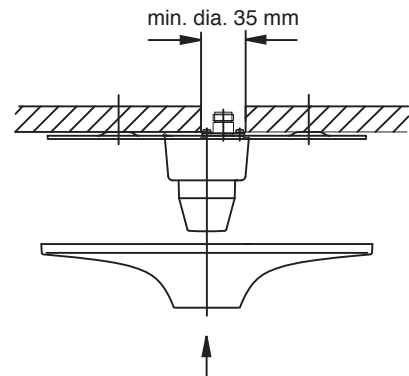
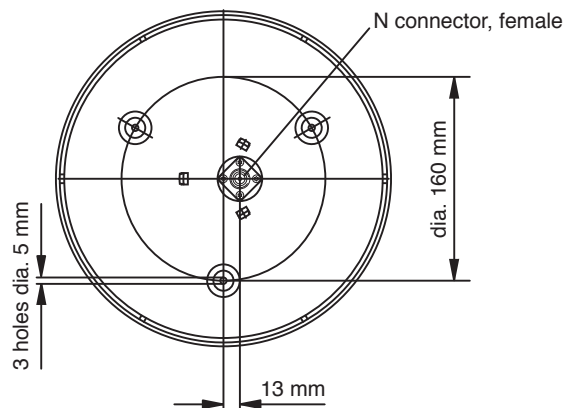
- The antenna needs no additional groundplane.

VPol Indoor 876–960/1710–2700 360° 2dBi

Type No.	80010748
Frequency range	876 – 960 MHz 1710 – 2700 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	876 – 890 MHz: < 2.0 890 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.6 2170 – 2700 MHz: < 2.0
Intermodulation IM3	< -140 dBc (2 x 40 dBm carrier)
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	300 g
Diameter	210 mm
Height	78 mm (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 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 Multi-band Omni Antenna Vertical Polarization

876–960

1710–2700

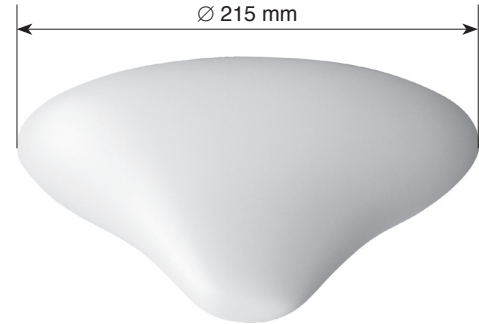
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V

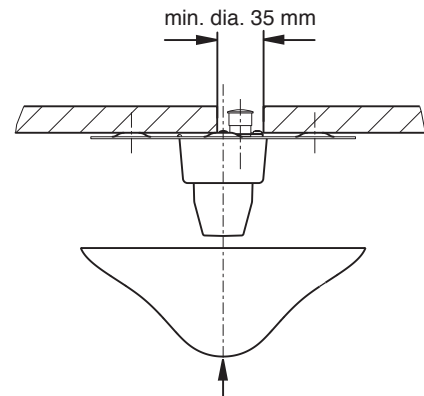
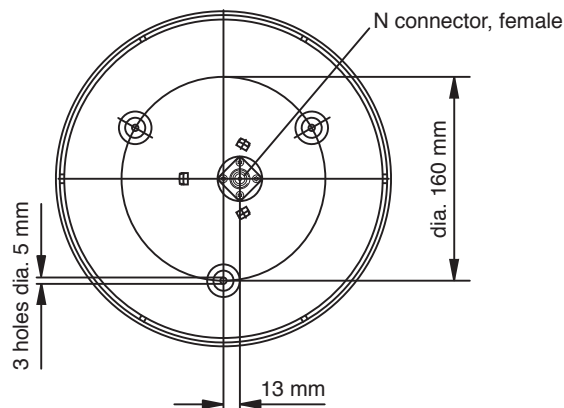
- The antenna needs no additional groundplane.

VPol Indoor 876–960/1710–2700 360° 2dBi

Type No.	80010749
Frequency range	876 – 960 MHz 1710 – 2700 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	876 – 890 MHz: < 2.0 890 – 960 MHz: < 1.7 1710 – 2170 MHz: < 1.6 2170 – 2700 MHz: < 2.0
Intermodulation IM3	< -140 dBc (2 x 40 dBm carrier)
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	340 g
Diameter	215 mm
Height	85 mm (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 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 Multi-band Omni Antenna Vertical Polarization

790–960

1425–3800

5150–6000

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Antennen · Electronic

V

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

VPol Indoor 790–960/1425–3800/5150–6000 360° 2dBi

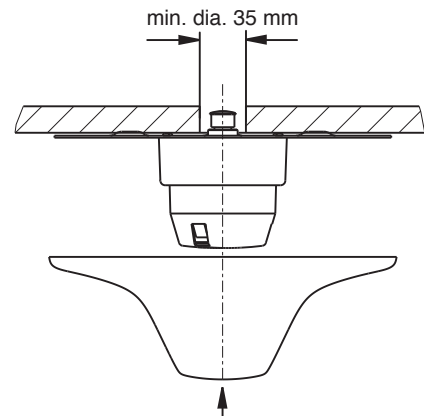
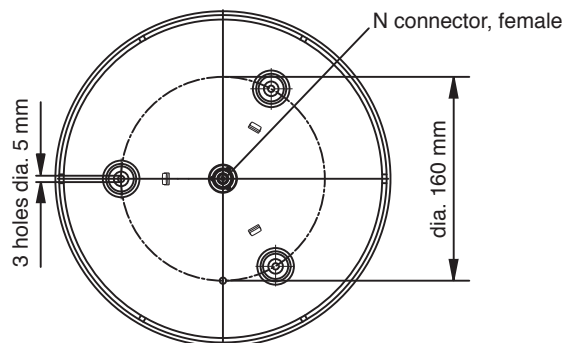
Type No.	80010249
Frequency range	790 – 960 MHz 1425 – 3800 MHz 5150 – 6000 MHz
Polarization	Vertical
Gain	≈ 2 dBi
Impedance	50 Ω
VSWR	790 – 806 MHz: < 1.7 806 – 960 MHz: < 1.5 1425 – 1710 MHz: < 2.0 1710 – 2200 MHz: < 1.4 2200 – 3800 MHz: < 1.6 5150 – 5300 MHz: < 2.4 5300 – 6000 MHz: < 2.0
Intermodulation IM3	< -140 dBc (2 x 40 dBm carrier)
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	466 g
Packing size	277 x 277 x 169 mm
Diameter	258 mm
Height	94 mm (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 is required.

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 Omnidirectional Antenna Vertical Polarization

1710–2700

V

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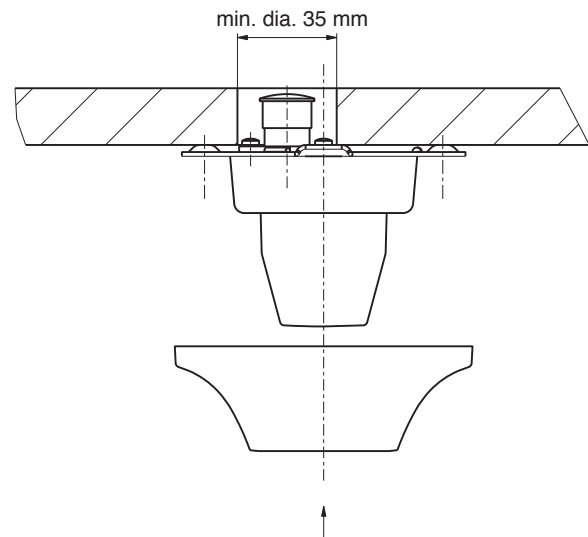
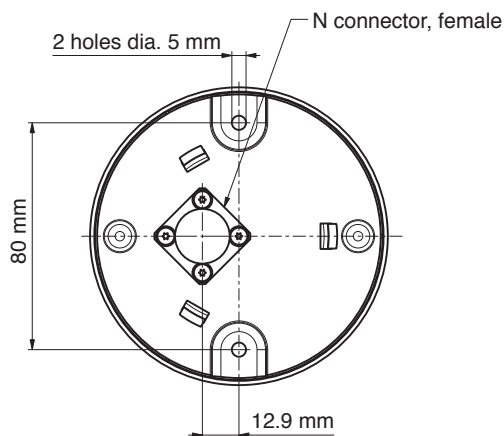
- The antenna can be operated in the total frequency range simultaneously.
- The antenna needs no additional groundplane.

VPol Indoor 1710–2700 360° 2dBi

Type No.	741573
Frequency range	1710 – 2700 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
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	< -140 dBc (2 x 40 dBm carrier)
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	150 g
Diameter	100 mm
Height	50 mm (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 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 Omnidirectional Antenna Vertical Polarization

1710–6000

V

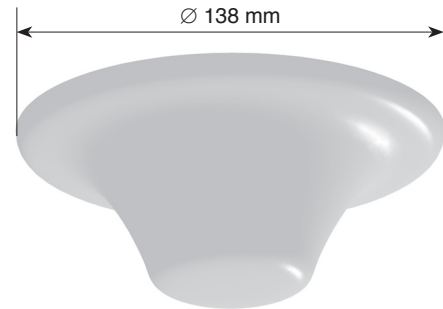
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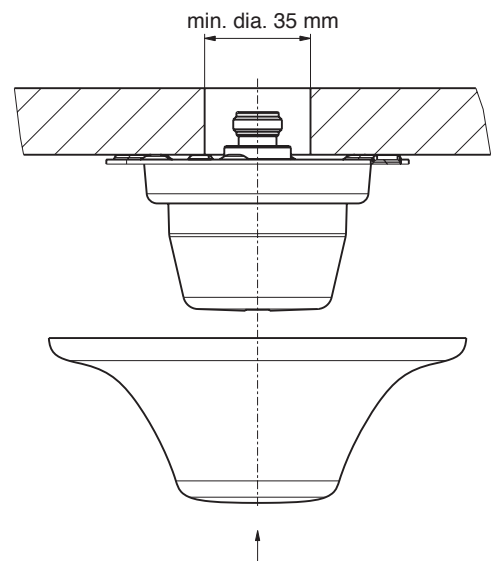
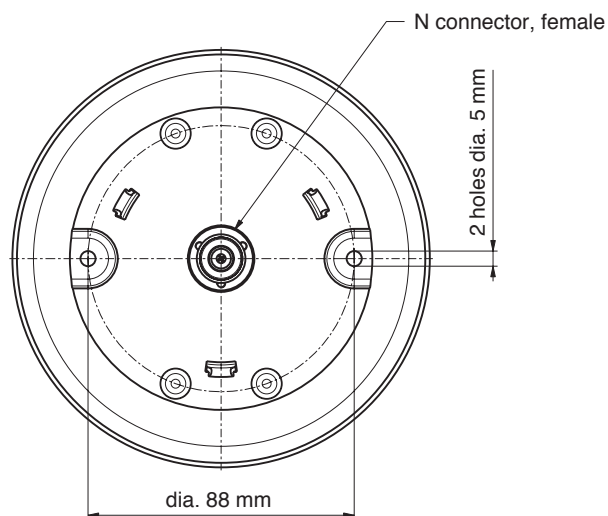
- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

VPol Indoor 1710–6000 360° 2dBi

Type No.	80010430
Frequency range	1710 – 6000 MHz
Polarization	Vertical
Gain	2 dBi
Impedance	50 Ω
VSWR	< 1.5
Intermodulation IM3	< -140 dBc (2 x 40 dBm carrier)
Max. power	50 W (at 50 °C ambient temperature)
Input	1 x N female
Protection class	IP 30
Weight	133 g
Diameter	138 mm
Height	56 mm (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 is required.
- 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 two supplied screws.

Indoor Multi-band Omni Antenna Dual Polarization

790–960 1710–2700 2500–2700

V H

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- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

VHPol Indoor 790 – 960/1710–2700/2500–2700 360° 2dBi

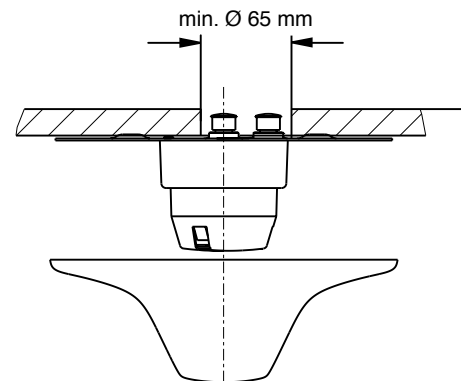
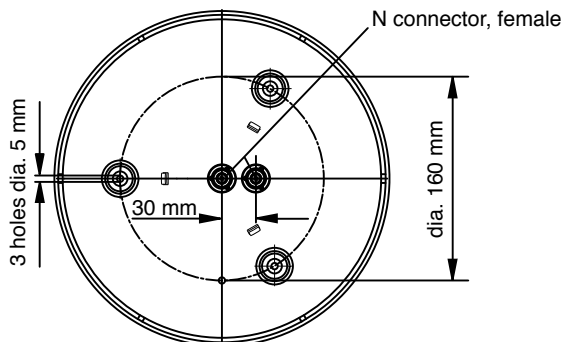
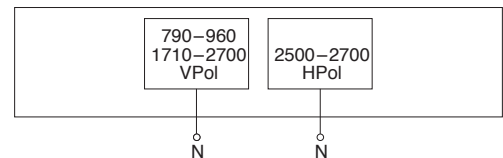
Type No.	80010709	
Frequency range	790 – 960 MHz 1710 – 2700 MHz	2500 – 2700 MHz
Polarization	Vertical	Horizontal
Gain	~ 2 dBi	
Impedance	50 Ω	
VSWR	790 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0	2500 – 2700 MHz: < 2.0
Isolation	> 30 dB	
Intermodulation IM3	< -140 dBc (2 x 40 dBm carrier)	
Max. power	50 W (at 50 °C ambient temperature)	
Input	2 x N female	
Protection class	IP 30	
Weight	Approx. 500 g	
Packing size	277 x 277 x 169 mm	
Diameter	258 mm	
Height	94 mm (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 connectors a hole in the ceiling is required.

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 Multi-band Omni Antenna Dual Polarization

790–960

1710–2700

1710–2700

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Antennen · Electronic

V

H

- The antenna can be operated in all frequency ranges simultaneously.
- The antenna needs no additional groundplane.

VHPol Indoor 790–960/1710–2700/1710–2700 360° 2dBi

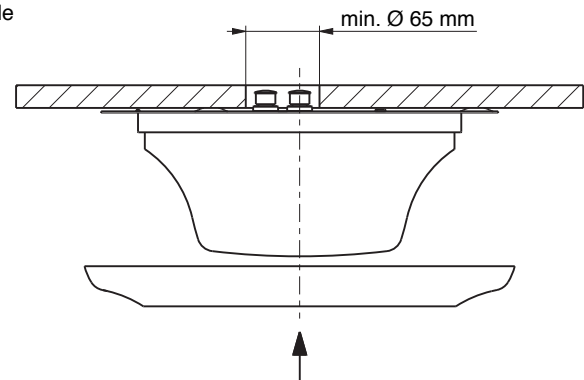
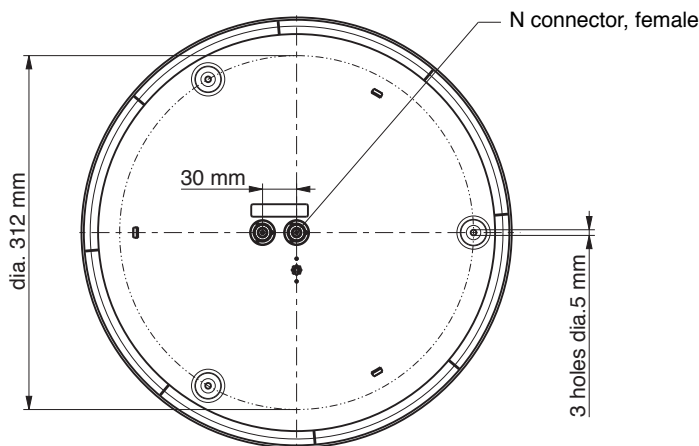
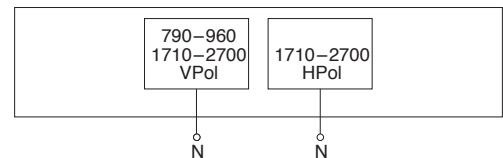
Type No.	80010710	
Frequency range	790 – 960 MHz 1710 – 2700 MHz	1710 – 2700 MHz
Polarization	Vertical	Horizontal
Gain	~ 2 dBi	
Impedance	50 Ω	
VSWR	790 – 960 MHz: < 2.0 1710 – 2700 MHz: < 2.0	1710 – 2700 MHz: < 2.0
Isolation	> 30 dB	
Intermodulation IM3	< -140 dBc (2 x 40 dBm carrier)	
Max. power	50 W (at 50 °C ambient temperature)	
Input	2 x N female	
Protection class	IP 30	
Weight	1 kg	
Packing size	400 x 400 x 200 mm	
Diameter	380 mm	
Height	118 mm (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 connectors a hole in the ceiling is required.

Available accessories: Broadband power splitters and tappers.



Clip the protective housing into position after the antenna has been mounted with the help of the three supplied screws.

Omnidirectional Antenna Vertical Polarization Indoor and outdoor use

1710–2700

V

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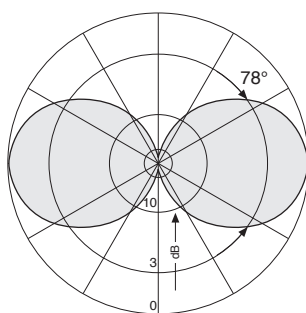
VPol Omni 1710–2700 360° 2dBi

Type No.	80010431
Input	N female
Connector position	Bottom or top
Frequency range	1710 – 2700 MHz
VSWR	< 1.8
Gain	2 dBi
Impedance	50 Ω
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Polarization	Vertical
Max. power	50 W (at 50 °C ambient temperature)
Weight	150 g
Radome diameter	20 mm
Height	115 mm

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.

Grounding: All metal parts of the antenna and the mounting kit are DC grounded. The inner conductor is not DC grounded.



Vertical Pattern

Dual-band Omni Antenna

694–894/1695–2700

Vertical Polarization

V

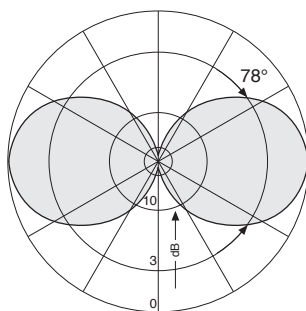
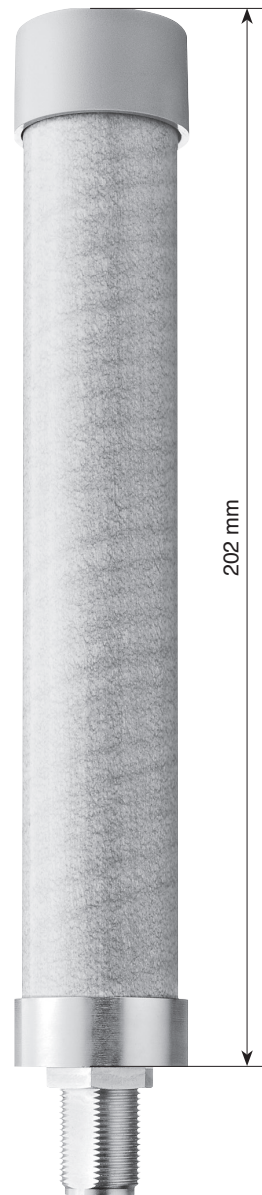
Indoor and outdoor use

VPol Omni 694–894/1695–2700 360° 2dBi

Type No.	80010846		
Input	1 x N female		
Connector position	Bottom or top		
Frequency range	694 – 894 MHz / 1695 – 2700 MHz		
VSWR	694–864 MHz < 2.0	864–894 MHz < 2.2	1695–2700 MHz < 2.0
Gain	2 dBi		
Impedance	50 Ω		
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)		
Polarization	Vertical		
Max. power	50 W (at 50 °C ambient temperature)		
Weight	210 g		
Wind load	6 N (at 150 km/h)		
Radome diameter	30 mm		
Height	202 mm		

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.



Vertical Pattern

Dual-band Omni Antenna

790–960/1695–2700

Vertical Polarization

V

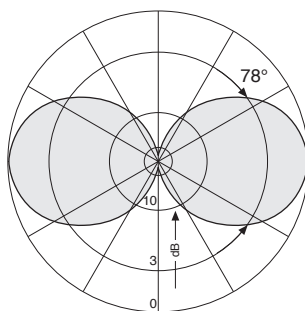
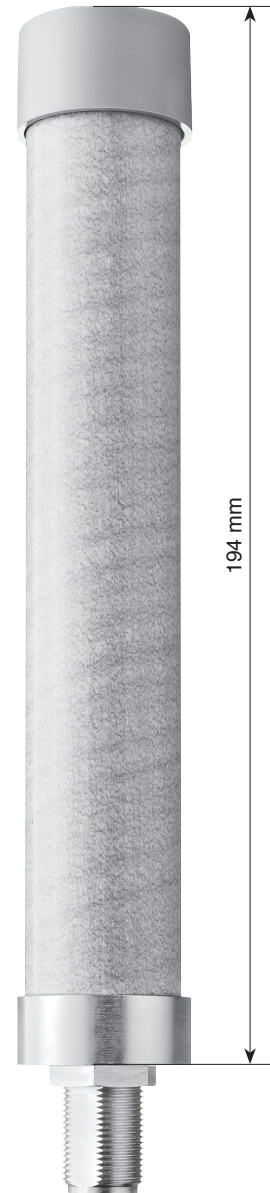
Indoor and outdoor use

VPol Omni 790–960/1695–2700 360° 2dBi

Type No.	80010847
Input	1 x N female
Connector position	Bottom or top
Frequency range	790 – 960 MHz / 1695 – 2700 MHz
VSWR	< 2.0
Gain	2 dBi
Impedance	50 Ω
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Polarization	Vertical
Max. power	50 W (at 50 °C ambient temperature)
Weight	200 g
Wind load	6 N (at 150 km/h)
Radome diameter	30 mm
Height	194 mm

Material: Radiator: Brass.
Radome: Fiberglass, colour: White.

Mounting: One hole mounting (16 mm diameter) to surfaces of max. 10 mm thickness.



Vertical Pattern



Type	Type No.	Page
Kathrein's Remote Electrical Tilt System		
General information		172
Data sheets of RET components		
Slimline Remote Control Unit (RCU)	86010148v01	174
FlexRET Module	86010153	175
Antenna Line Configurator (ALC)	86010156	176
Central Control Unit (CCU) for indoor use	86010006	177
Portable Control Adapter (PCA)	86010046	178
Power Supply and Signal Cable	86010007, ...	179
Torque Screwdriver	85010080	179
Site Sharing Adapter	86010154	180
DC Power and Signal Splitter	86010002	181
Lightning Protection Device	86010030	182
Earthing Clamp	86010031	183
Smart Bias Tee	78211053 / ..54 / ..55 / ..56 78211063 / ..64 / ..65 / ..66	334 – 336

New or changed product

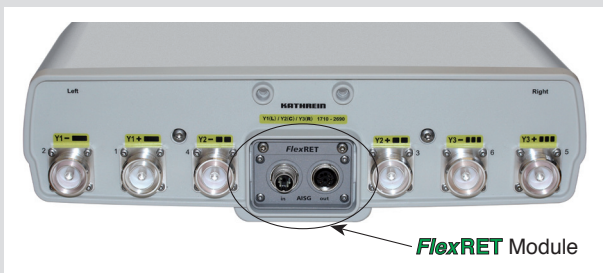
New RET Technologies

Modern mobile communication networks often provide the possibility of remotely controlling the electrical downtilt. Therefore, common antennas need to be equipped with Remote Control Units (RCUs) to be able to change the downtilt without the need to access the sites.

In order to ease the whole installation process, Kathrein is offering certain FlexRET antennas which are equipped with one internal RET control for the adjustment of all bands within the antenna.

FlexRET provides certain features such as:

- ⇒ Pre-configuration ex-factory regarding the specific antenna type (antenna config file, antenna serial no., antenna model no.)
- ⇒ AISG 1.1 and AISG 2.0 / 3GPP compatibility
- ⇒ Exchangeable system
- ⇒ Possibility of switching between SingleRET- (pre-set) and MultiRET-mode
- ⇒ Daisy chain possibility



The most important advantages are:

- ⇒ Only 1 x AISG in and 1 x AISG out (for Daisy chain)
- ⇒ No additional calibration and antenna type configuration on site necessary
- ⇒ Only specific site information needs to be added
- ⇒ Reduction of AISG cables
- ⇒ No external RCUs need to be installed
- ⇒ Possible configuration and installation errors can be avoided



Thereby installation time and costs can be saved and Capex can be decreased.

All future complex Kathrein multi-array antennas will be equipped with the new FlexRET-system. However, there will also be an innovative solution for all existing antennas with external RCUs: the RCU with RFID feature, providing RFID-based communication between the antenna and the RCU.



This upgraded RCU is equipped with an RFID reader. In addition, our antennas will successively be equipped with RFID tags. All relevant antenna data is stored on this tag, namely the antenna configuration file, the antenna serial number and the antenna model number. After mounting the RCU to the antenna, all data stored on the antenna tag is read by the RCU once the power is switched on. Only specific site information needs to be added. Thereby the possibility of installation errors is minimized, resulting in a possible decrease of Opex. In addition, the installation effort and time is decreased which leads to lower Capex.

RET components



Kathrein's overall RET system works in accordance with the AISG (Antenna Interface Standards Group) standard and 3GPP (3rd Generation Partnership Project).

The Kathrein **FlexRET** Module is exchangeable, please ask for more information.

For details of RET system please see Kathrein's RET system brochure



Slimline RCU (Remote Control Unit) with RFID-Feature



Torque screw driver



Site Sharing Adapter



Control Cable



CCU (Central Control Unit)



Lightning Protection Device



ALC (Antenna Line Configurator)



Earthing Clamp



PCA (Portable Control Adapter)



Optional: (for further information see filter part)

Smart Bias Tee



DC Power and Signal Splitter



AISG-DTMA (Double Tower Mounted Amplifier)



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	10 ... 30 V (pin 1, pin 6)
Power consumption	< 1 W (stand by); < 10 W (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)	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 (10/350 μs) 8 kA (8/20 μs)
Housing material	Profile: Aluminum anodized; cover: Aluminum die cast coated
Weight	455 g (0.99 lbs)
Packing size	245 x 93 x 102 mm, (9.6 x 3.6 x 4 inches)
Dimensions (H x W x D)	177.5 x 59.5 x 49.5 mm, (7.0 x 2.3 x 1.9 inches)



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.

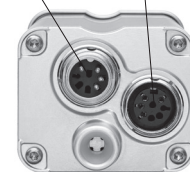
- ²⁾ The tightening torque for fixing the connector must be 0.5 – 1.0 Nm. The connector should be tightened by hand or using the torque screwdriver (85010080) as described in the connecting cable data sheet (85010007, ...)
- ³⁾ The RCU gets the information stored in the antenna after power on automatically 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

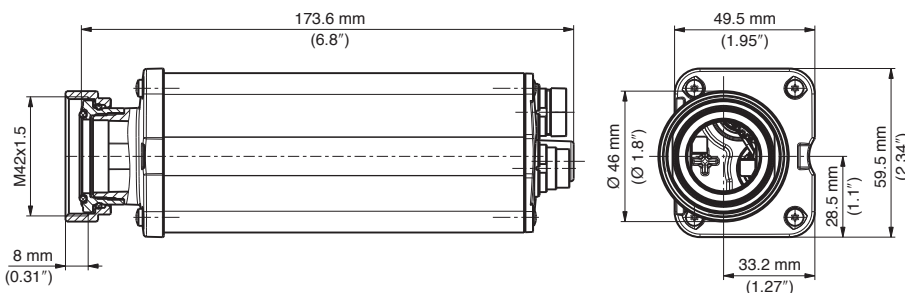
Certification: CE, FCC

Scope of supply: Remote Control Unit
Assembly paste

Daisy chain in (male) Daisy chain out (female)



Bottom view of RCU



A flexible, integrated solution for adjusting the electrical downtilt of Kathrein FlexRET antennas.

- Compliant to AISG 1.1 and 3GPP/AISG 2.0
- Single RETs or Multi RET displayed
- Daisy Chain feasibility
- Pre-configured



Type No.	86010153
Protocols	compliant to AISG 1.1 and 3GPP/AISG 2.0
Logical interface ex factory ¹⁾	3GPP/AISG 2.0
Operates as	Single RETs or Multi RET
Ex factory	Single RETs
Input voltage range	10 ... 30 V (pin 1, pin 6)
Power consumption	< 0.5 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 (installed)
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	350 g (0.77 lbs)
Packing size	245 x 93 x 102 mm, (9.6 x 3.6 x 4 inches)
Dimensions (H x W x D)	142 x 71 x 50.4 mm, (5.6 x 2.8 x 2 inches)



¹⁾ The protocol of the logical interface can be switched from 3GPP/AISG 2.0 to AISG 1.1 with a vendor specific command. Start-up operation of the FlexRET is only possible in a RET system supporting 3GPP/AISG 2.0!

Please note:

If the Primary which controls the FlexRET system does not support the default ex-factory interface setting, then the RCU must be switched to the appropriate standard of the Primary before installation. Please contact Kathrein for further information.

²⁾ 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) to create independent logical interfaces at one antenna or site. Makes it possible to operate with more than one independent Node B.

All FlexRET antennas are equipped with this module. The module does not need to be ordered separately.

Antenna Line Configurator (ALC) For Antenna Line Devices (ALD)

KATHREIN
Antennen · Electronic

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
Tiltensor	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!

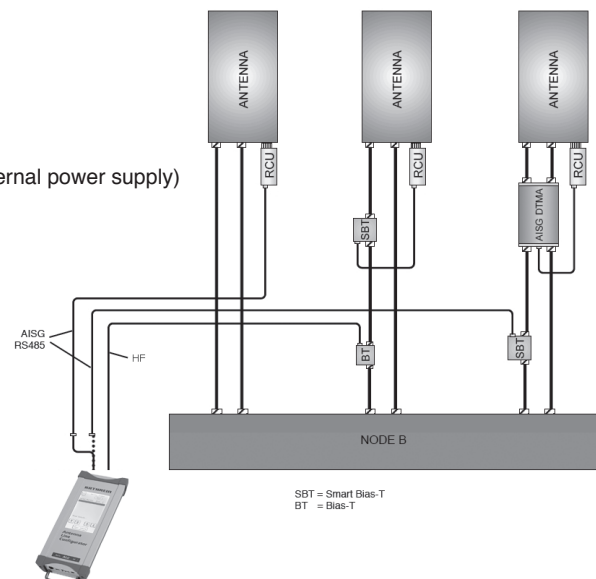
** Switchable with software



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



Central Control Unit (CCU) For Remote Electrical Tilt (RET) and Tower Mounted Amplifier (TMA) Control

For indoor use



Central Control Unit

Type No.	86010006
Connectors ¹⁾ to RCU	3 x 8 pin connector acc. to IEC 60130-9, female, acc. to AISG
Power supply from BTS	DC: -48 V / max. 1.7 A AC: 100 ... 240 V / 50 ... 60 Hz / max. 1.6 A
Power supply to RCU	3 x +29 V DC / max. 1.7 A (in total) 3 x +13 V DC / max. 3.8 A (in total)
Total output power	Max. 50 W
Interface to RCU and TMA	RS 485 / power supply
Protocol to RCU and TMA	HDLC hex-coded command set, acc. to AISG
Interface to BTS	Ethernet (10 Base-T) and RS 232
Protocols to BTS	TCP/IP, PPP, HTTP/HTML, UDP, DHCP, FTP, SNMP, ICMP/PING
Alarm interface to BTS	8 x open collector output, user programmable
Max. number of RCU's and/or TMA's	Up to 27 RCU's in daisy chain and up to 6 DTMA's; depending on cable configuration and max. power
Max. length of control cable	200 m (9 RCU's in daisy chain configuration)
Temperature range	-25 °C ... +55 °C ambient temperature
Packing size	597 mm x 367 mm x 148 mm
Dimensions (h / w / d)	19" 1 HU* (43.6 mm / 483 mm / 250 mm)

* HU = Height Unit

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.

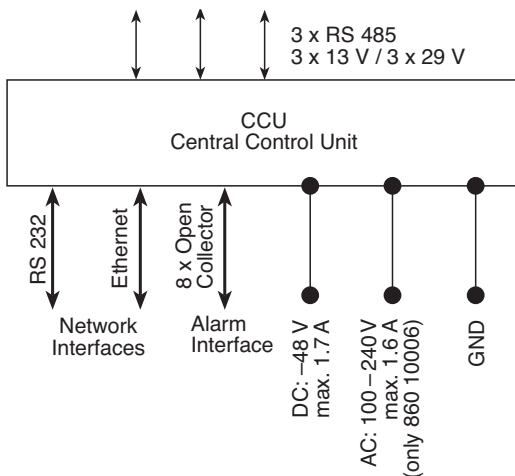
Standards: EN 60950-1
EN 55022
EN 55024
UL 60950-1, 1st edition

Certifications: CE, FCC part 15 class B; UL

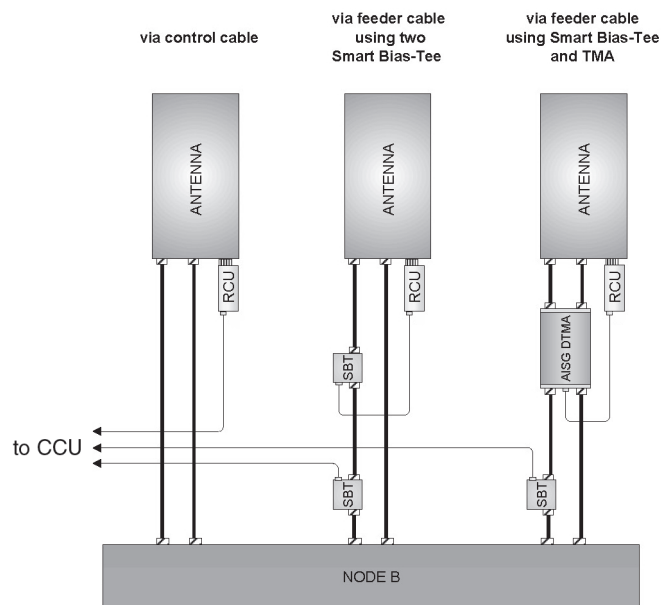
Scope of supply: CCU
RET Manual
DC Cable
AC Power Cords for USA, UK and Germany
Ethernet cable, crossed



CCU Interfaces



Examples of CCU – RCU connections



Portable Control Adapter (PCA) For Remote Control Unit (RCU) For Tower Mounted Amplifier (TMA)

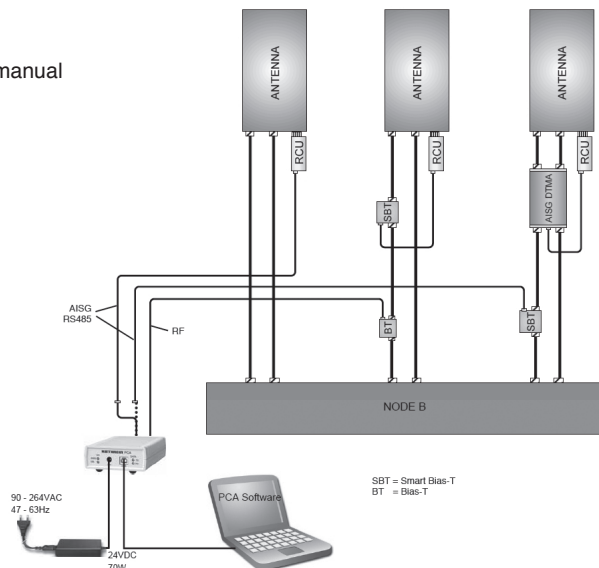


Portable Control Adapter

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	24 V DC
Output voltage to RCU's/TMA's	AISG female pin 6 (24 V DC): 24 V DC \pm 10% AISG female pin 1 (12 V DC): 14 V DC \pm 7% RF male (at 24 V DC): 24 V DC \pm 10% *** RF male (at 12 V DC): 14 V DC \pm 7% ***
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: \leq 60 W AISG female Pin 1 (12 V DC) with max. 30 W load on pin 6 (24 V DC) and/or on RF plug: \leq 30 W
Current monitoring measurement level	Per branch (12 V, 24 V, RF): 10 – 2500 mA
Over-current protection	Per branch (12 V, 24 V, RF): < 2500 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 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	200 m / 9 RCU's (in daisy chain configuration) 150 m / 6 RCU's (in splitter configuration)
Weight	535 g (incl. external power adapter)
Temperature range	0 ... +55 °C ambient temperature
Height x width x depth	40 mm x 95 mm x 160 mm
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 2000; Windows XP, Vista, Win7 (32 bit version)
- 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



Connecting Cable For Remote Electrical Tilt (RET) System

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 screddriver)
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



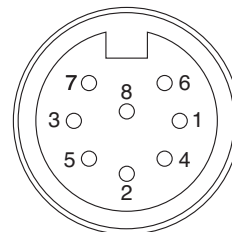
Minimum bending radius: One time 60 mm, several times 120 mm.

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.

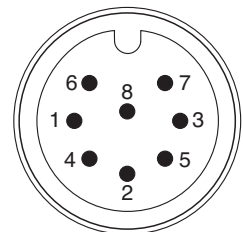
Control Cable

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

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	10 ... 30 V (pin 1, pin 6)
Power consumption	to be defined (tbd)
Connectors ²⁾	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	-40 °C ... +60 °C
Protection class	IP 24 (installed)
Lightning protection	AISG interface (each pin) tbd
Housing material	Cover: Aluminum die cast coated
Weight	tbd
Packing size	tbd
Dimensions (H x W x D)	123 x 166 x 62 mm, (4.8 x 6.5 x 2.4 inches)



Please note:

The Site Sharing Adapter can be used with up to three Kathrein FlexRETs daisy-chained. For selecting the arrangement of the antenna arrays, a separate software application is available.

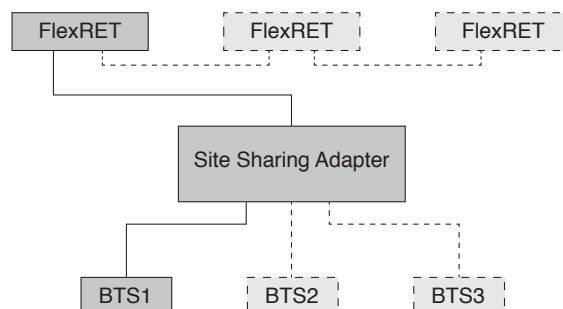
The Site Sharing Adapter expands the AISG interface of max. three FlexRETs up to three AISG interfaces for three independent AISG primaries. The assignment of antenna arrays can be configured individually.

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.

- 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



DC-Power and Signal Splitter For Remote Electrical Tilt (RET) Indoor and Outdoor Use

AISG compliant device for splitting of DC-power and control signals from one input to three outputs.

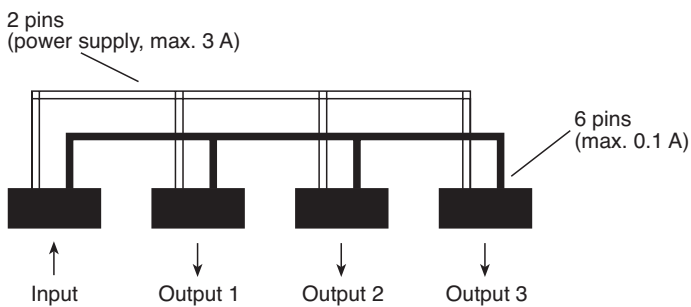


3-way Splitter for RET

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

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 μ s) inner conductors: 2.5 kA/pin (10/350 μ s)
Max. dynamic overvoltage at spark gap (1 kV/ μ s)	< 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).

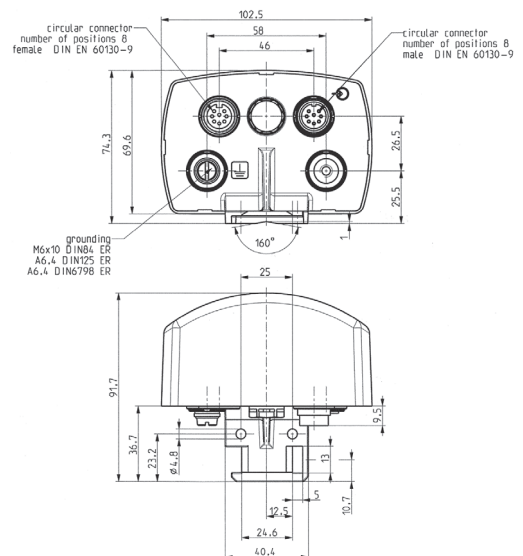
Note: **No decoupling elements are integrated. The coordination with additional LPD's (device input) should be checked according to IEC 61312.**

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)



Earthing Clamp For Power Supply and Control Cable For Remote Control Unit (RCU)

The clamp is designed for lightning protection of control cables according to EN 50164-1

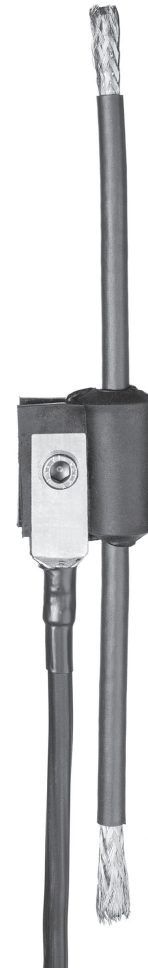
Earthing clamp for RCU power supply and signal cable

Type No.	86010031
Max. lightning current	20 kA (pulse 10/350 μ sec)
Contact resistance	< 3 m Ω
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

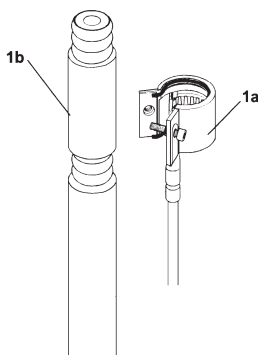
Note:
The earthing clamp is suitable only for the Kathrein Power Supply and Signal Cables,
Type No. 86010007 to 86010015, 86010029, 86010032, 86010033, 86010054 to 86010060 or shielded cables with
– shield diameter 6.1 mm
– jacket diameter 7.8 mm \pm 0.3 mm

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



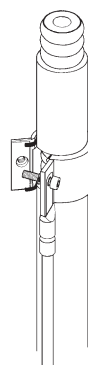
Mounting instructions:

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!

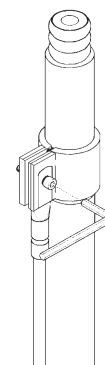


Attention!
Install grounding kit only where the cable runs straight.

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)



Splitters

Type	Type No.	Frequency range	Remark	Max. power	Connector female	Page
2-way Splitter 380–3800	86010130	380 – 3800 MHz	Indoor/Outdoor	200 W	N	186
2-way Splitter 380–3800	86010131	380 – 3800 MHz	Indoor/Outdoor	700 W	7-16	186
2-way Splitter 694–2700	86010017	694 – 2700 MHz	Indoor	100 W	N	187
3-way Splitter 694–2700	86010018	694 – 2700 MHz	Indoor	100 W	N	187
4-way Splitter 694–2700	86010019	694 – 2700 MHz	Indoor	100 W	N	187
2-way Splitter 694–3800	86010100	694 – 3800 MHz	Indoor/Outdoor	200 W	N	188
2-way Splitter 694–3800	86010101	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	188
3-way Splitter 694–3800	86010102	694 – 3800 MHz	Indoor/Outdoor	200 W	N	188
3-way Splitter 694–3800	86010103	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	188
4-way Splitter 694–3800	86010104	694 – 3800 MHz	Indoor/Outdoor	200 W	N	188
4-way Splitter 694–3800	86010105	694 – 3800 MHz	Indoor/Outdoor	700 W	7-16	188

Tappers

2-way Tapper 694–2700	7.0/1.0 dB	86010136	694 – 2700 MHz	Indoor	100 W	N	189
2-way Tapper 694–2700	10.4/0.4 dB	86010137	694 – 2700 MHz	Indoor	100 W	N	189
2-way Tapper 694–2700	15.1/0.1 dB	86010138	694 – 2700 MHz	Indoor	100 W	N	189
2-way Tapper 694–2700	7.0/1.0 dB	86010150	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	190
2-way Tapper 694–2700	10.5/0.5 dB	86010151	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	190
2-way Tapper 694–2700	15.3/0.3 dB	86010152	694 – 2700 MHz	Indoor/Outdoor	500 W	7-16	190

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	191
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	100 W	N	192

New or changed product

Low-loss Power Splitters Multi-band

380–3800

KATHREIN
Antennen · Electronic

For indoor and outdoor use.

2-way Splitter 380–3800

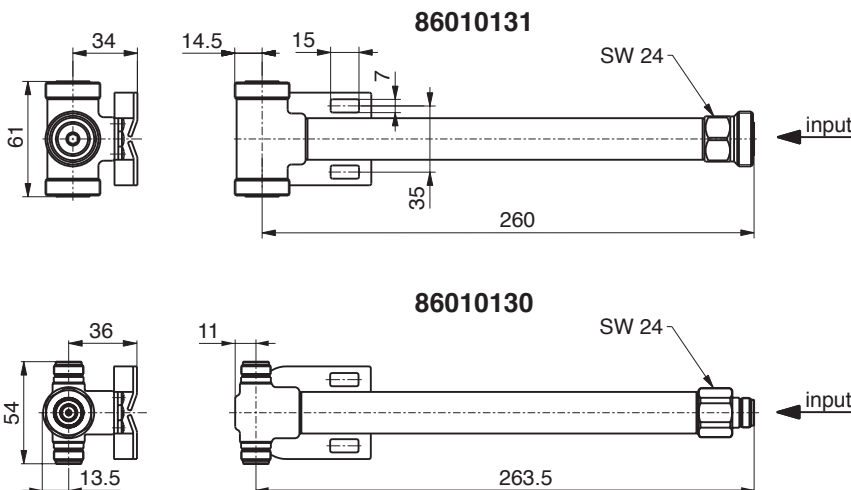
Type No.	86010130	86010131
Connector (female)	N	7-16
Max. power (at 50 °C ambient temperature)	200 W	700 W
For connecting ... antennas	2	
Frequency range	380 – 3800 MHz	
VSWR	< 1.5	
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)	
Impedance	50 Ω	
Insertion loss	< 0.05 dB	
Weight	750 g	870 g
Packing 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

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	694 – 2700 MHz		
For connecting ... antennas	2	3	4
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
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	< -150 dBc (2 x 43 dBm carrier)		
Max. power	100 W (at 50 °C ambient temperature)		
Connector	N female		
Weight	approx. 0.6 kg		
Profile cross-section	25 x 25 mm		
Packing size	242 x 110 x 95 mm		
Max. size	204 / 63 / 44 mm		

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission between all terminations
(suitable for remote power supply systems).

Environmental conditions: IP 52



Input 
86010019

Low-loss Power Splitters Multi-band

694–3800

KATHREIN
Antennen · Electronic

For indoor and outdoor use.

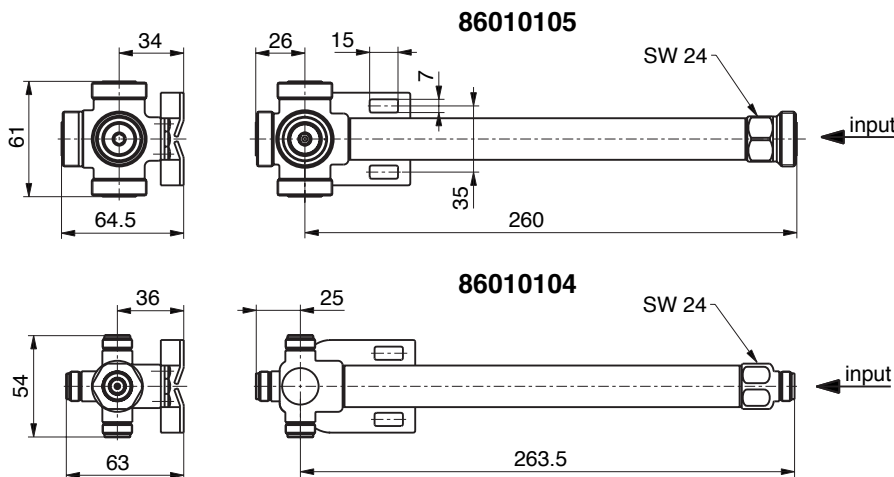
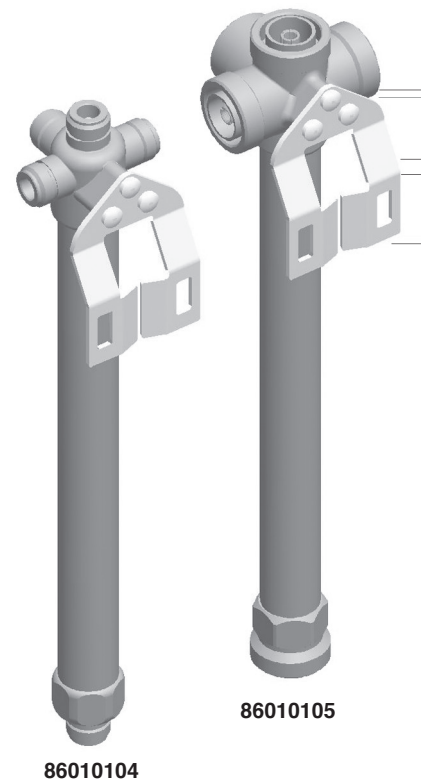
2-way Splitter 694–3800

3-way Splitter 694–3800

4-way Splitter 694–3800

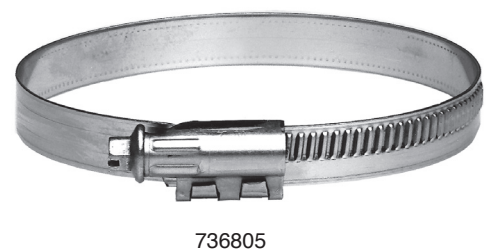
Type No.	86010100	86010101	86010102	86010103	86010104	86010105
Connector (female)	N	7-16	N	7-16	N	7-16
Max. power (at 50 °C ambient temperature)	200 W	700 W	200 W	700 W	200 W	700 W
For connecting ... antennas	2		3		4	
Frequency range	694 – 3800 MHz					
VSWR	694 – 894 MHz: < 1.32 790 – 3800 MHz: < 1.15					
Intermodulation IM3	< –150 dBc (2 x 43 dBm carrier)					
Impedance	50 Ω					
Insertion loss	< 0.05 dB					
Weight	750 g	870 g	760 g	900 g	775 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



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



Low-loss Power Tappers Multi-band

694–2700

KATHREIN
Antennen · Electronic

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	– 1.0 dB	– 0.4 dB	– 0.1 dB
Input ↔ P ₁	– 7.0 dB	– 10.4 dB	– 15.1 dB
Input ↔ P ₂			
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
86010138



Low-loss Power Tappers Multi-band

694–2700

KATHREIN
Antennen · Electronic

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

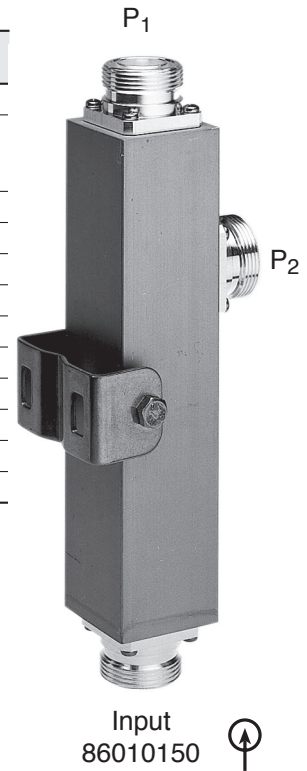
Type No.	86010150	86010151	86010152
Frequency range	694 – 2700 MHz		
Tap Loss			
Input ↔ P ₁	-1.0 dB	-0.5 dB	-0.3 dB
Input ↔ P ₂	-7.0 dB	-10.5 dB	-15.3 dB
For connecting ... antennas	2		
Insertion loss	< 0.05 dB		
Impedance	50 Ω		
VSWR	694 – 2700 MHz: < 1.5		
Intermodulation IM3	< -150 dBc (2 x 43 dBm 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



734364

Low-loss Power Tapper Multi-band Continuously Adjustable

870–960 / 1710–2500

5.0 – 15.0 dB

KATHREIN
Antennen · Electronic

For indoor use.

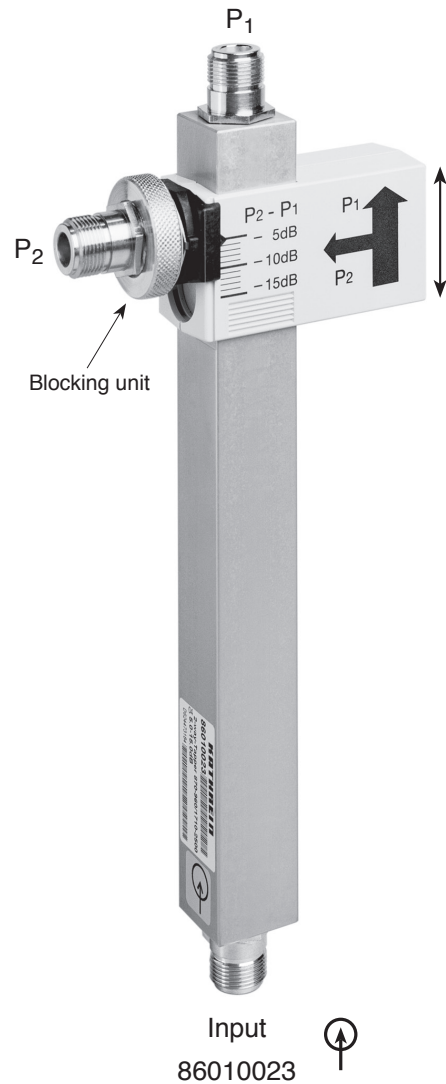
2-way Tapper 870–960/1710–2500 5.0–15.0dB

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

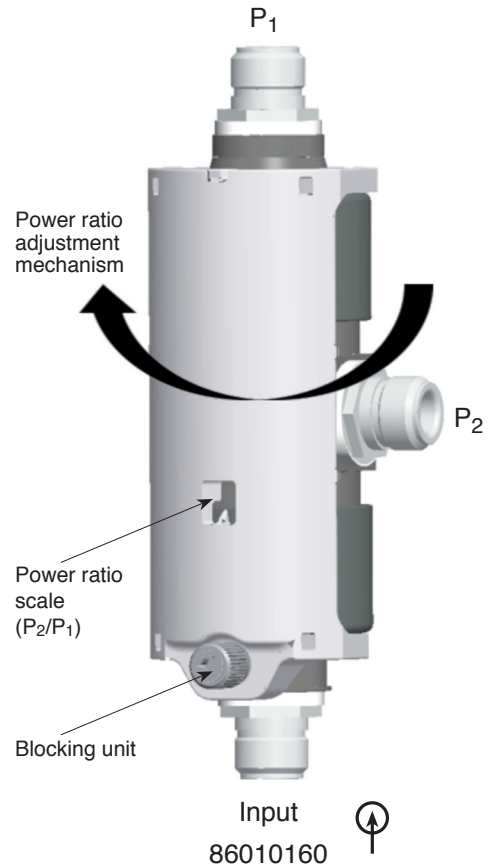
For indoor and outdoor use.

2-way Tapper 380-960/1695-2700/3400-3800/4920-5920

Type No.	86010160
Frequency range	380 – 960 MHz 1695 – 2700 MHz 3400 – 3800 MHz 4920 – 5920 MHz
Power ratio between outputs (P ₂ / P ₁)	-5 dB to -20 dB continuously adjustable
For connecting ... antennas	2
Insertion loss	380 – 960 MHz: < 0.2 dB 1695 – 2700 MHz: < 0.2 dB 3400 – 3800 MHz: < 0.5 dB 4920 – 5920 MHz: < 0.7 dB
Impedance	50 Ω
VSWR	380 – 960 MHz: < 1.5 1695 – 2700 MHz: < 1.5 3400 – 3800 MHz: < 2.0 4920 – 5920 MHz: < 2.3
Intermodulation IM3	< -150 dBc (2 x 43 dBm carrier)
Max. power	100 W (at 50 °C ambient temperature)
Connector	N female
Weight	1.0 kg
Environmental conditions	Indoor, outdoor use
Protection class	IP 65
Profile diameter	50 mm
Packing size	210 x 80 x 60 mm
Max. size	160 / 70 / 55 mm (including connectors)

Material: Housing: Aluminum.
Inner conductor: Brass.

DC capability: DC transmission only between input and port P₁.



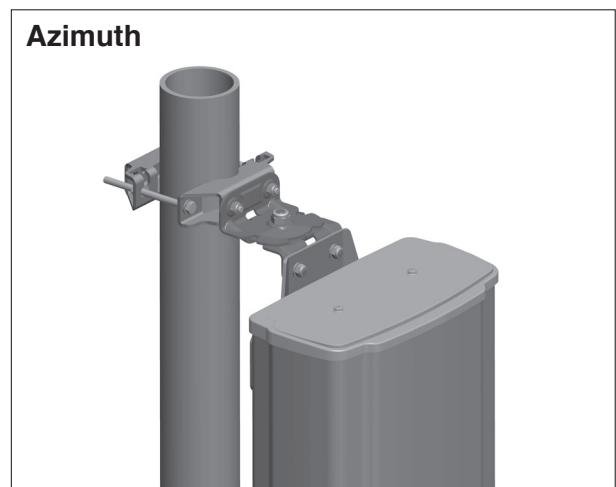
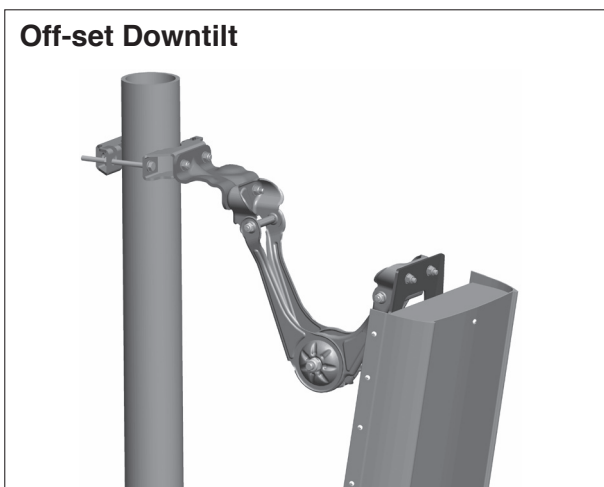
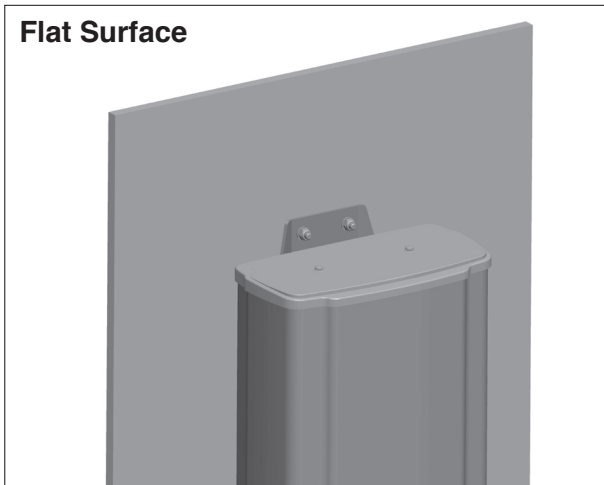
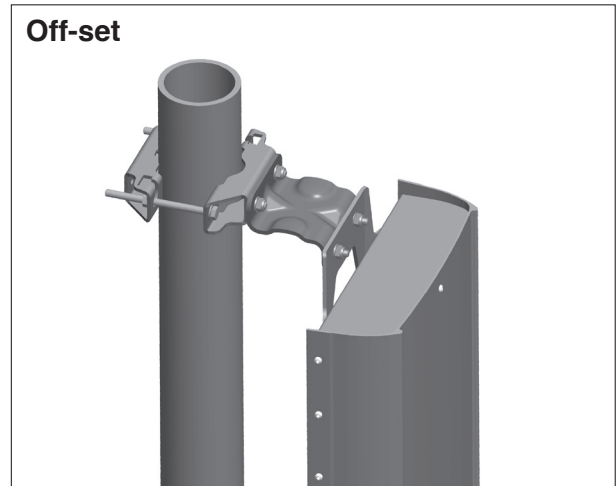
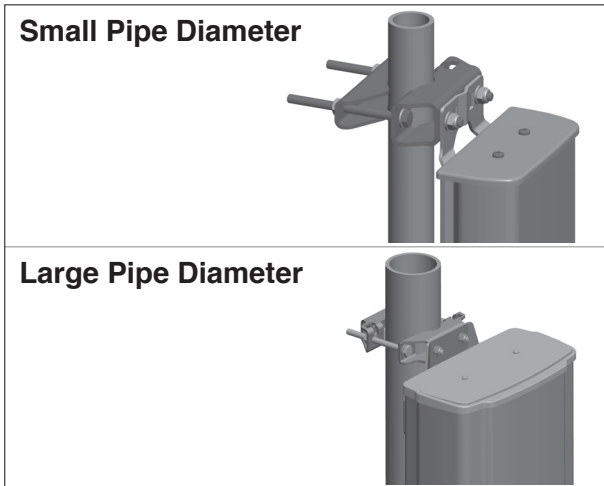
Splitting table

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

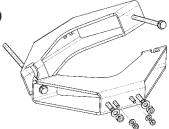



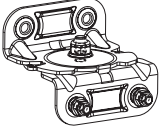

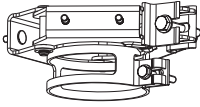

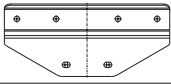
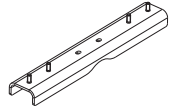

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The hereinafter referred to “wind load category L - M - H” correspond to the defined “category of mounting hardware” given in the respective data sheets.

New or changed product



Product Line of Mounting Parts

Type	Windload Classification	Pole Diameter in mm	Type No.	Remark	Page
Clamp 	light / medium	∅ 28 – 60	731651		196
	light / medium / heavy	∅ 42 – 115	738546		
	light / medium / heavy	∅ 110 – 220	85010002		
		∅ 210 – 380	85010003		
Downtilt kit 	light		732327		197
Downtilt kit 	light / medium		737978		198
Downtilt kit 	heavy		85010008		199
Azimuth Adjustment Kit 	light / medium		85010014	Pole mounting adjustment angle ±30° (additional clamp needed)	200
	heavy		85010015		
Azimuth Adjustment Kit 	light / medium		85010016	Wall mounting adjustment angle ±30°	200
	heavy		85010017		
3 Sector Clamp 	light / medium	∅ 88.9	742263		201
		∅ 88.9	742317		
		∅ 114.3	742033		
		∅ 139.7	742034		
	heavy	∅ 114.3	85010058		
		∅ 139.7	85010059		
Offset 	light / medium		85010060	Clearance between pole and antenna (additional clamp needed)	202
	heavy		85010061		
2x Panel Mounting Kit 	light / medium		742113	Additional clamp needed	203
	light / medium		85010075		204
	heavy		85010076		
Tension Band 	light	∅ 34 – 60	734360	Please note: Only usable without downtilt kit	205
		∅ 60 – 80	734361		
		∅ 80 – 100	734362		
		∅ 100 – 120	734363		
		∅ 120 – 140	734364		
		∅ 45 – 125	734365		

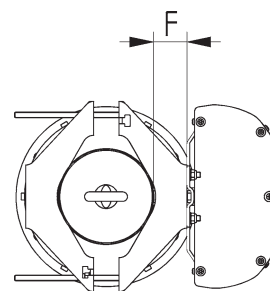
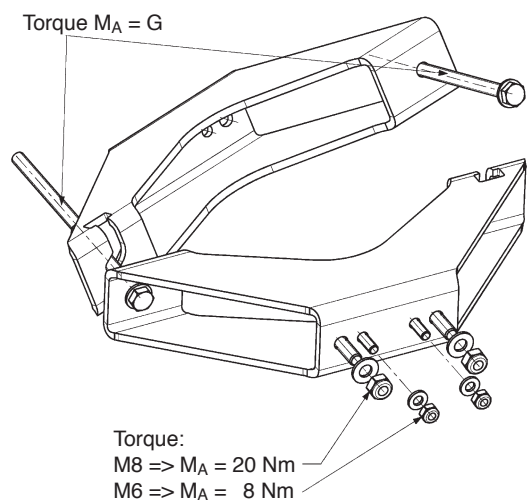
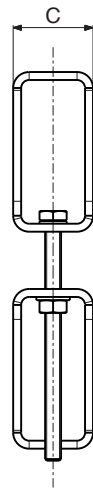
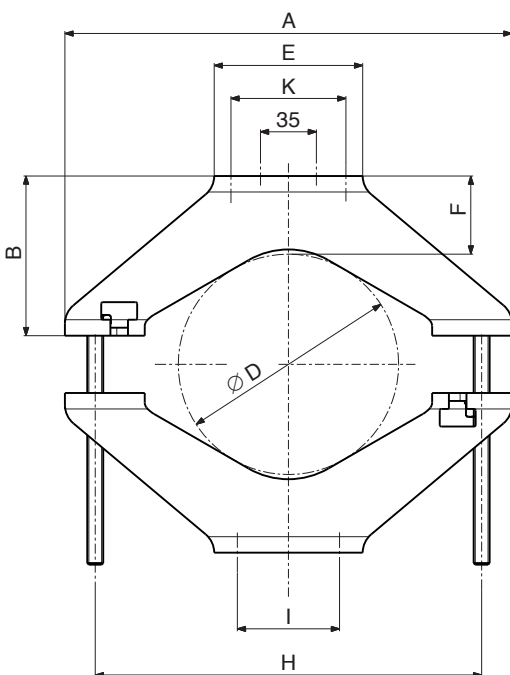
Panel Accessories

Mounting Hardware

Clamps

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



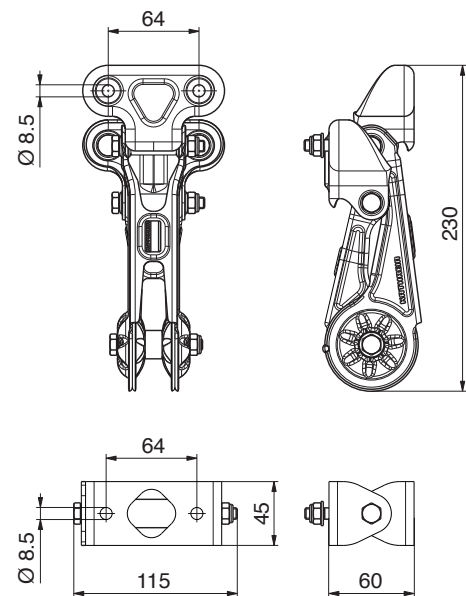
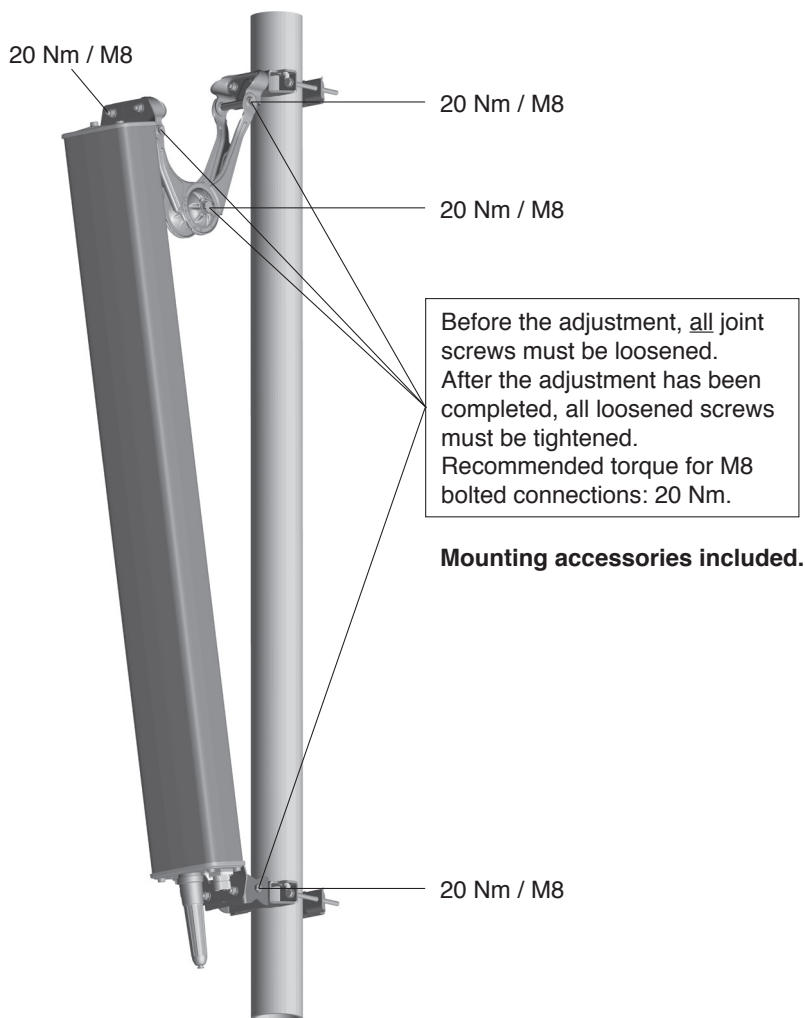
Type No.	A	B	C	D	E	F	G	H	I	K
731651	116 mm	40 mm	40 mm	28 – 60 mm	93 mm	25 – 28 mm	20 Nm	84 mm	–	64 mm
738546	152 mm	40 mm	40 mm	42 – 115 mm	93 mm	20 – 26 mm	25 Nm	125 mm	72 mm	64 mm
85010002	280 mm	100 mm	50 mm	110 – 220 mm	93 mm	47 – 55 mm	35 Nm	240 mm	72 mm	64 mm
85010003	442 mm	150 mm	50 mm	210 – 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.

Standard Downtilt kit for Panel Antennas (Wind load Category “L”)

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.

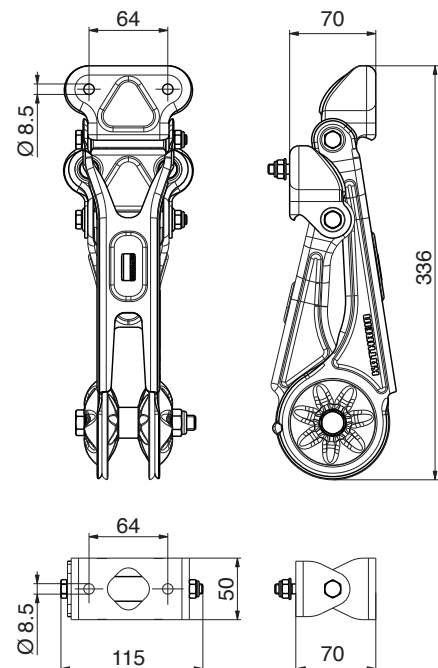
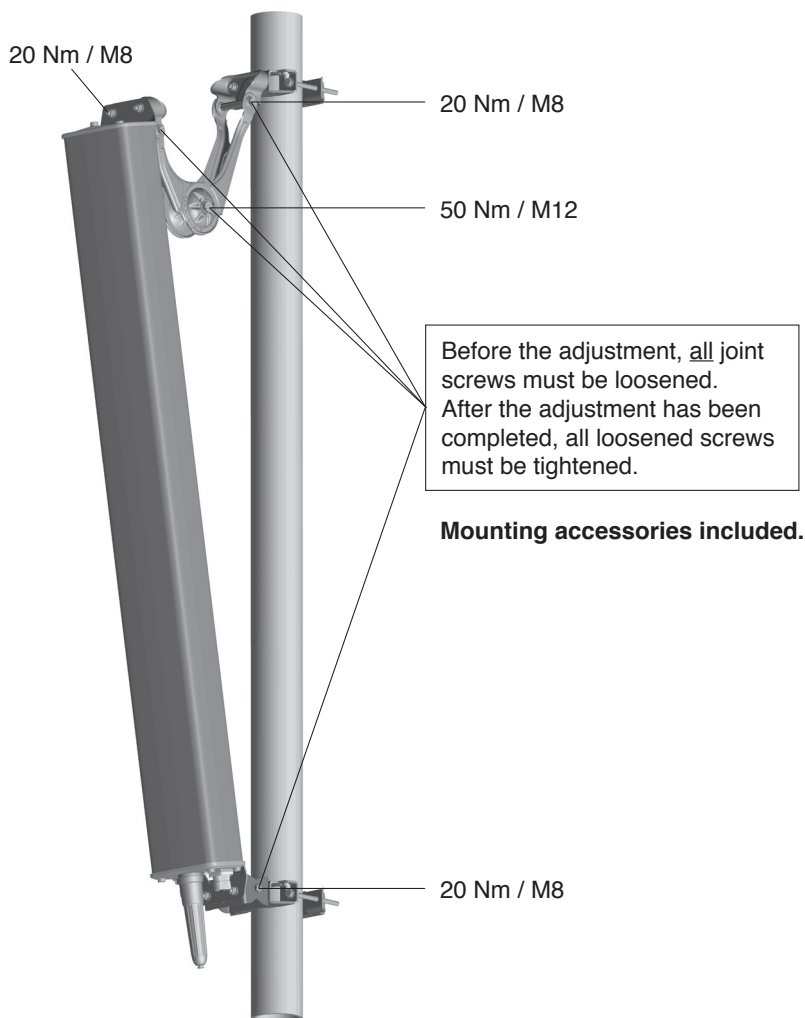
Mounting this downtilt kit enlarges the spacing between mast and antenna by 42 mm.

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”)

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.

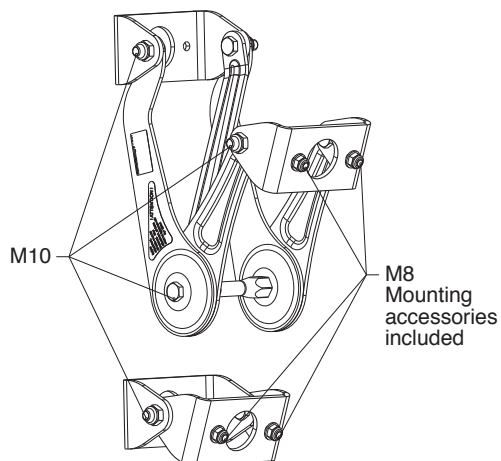
Use the downtilt kit together with the clamps as described in the antenna datasheet.

Standard Downtilt kit for Panel Antennas (Wind load Category “H”)

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

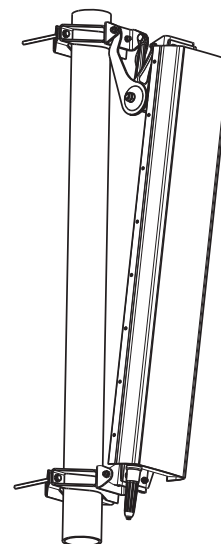


Recommended mast clamps:

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

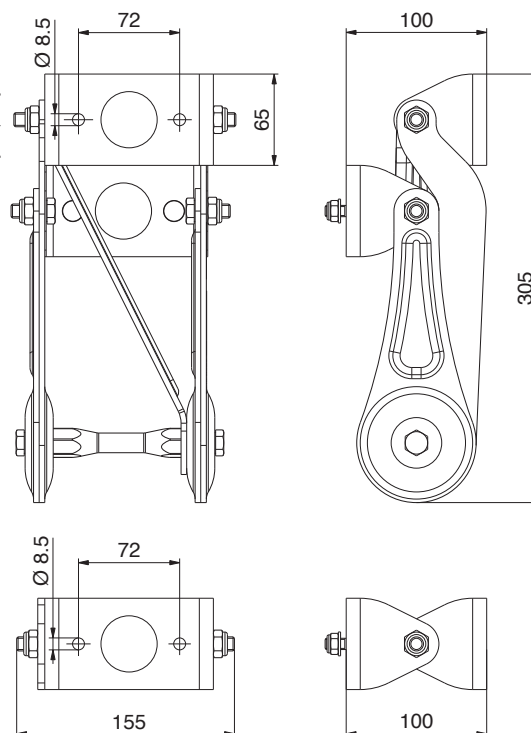
Recommended torque for all bolted connections:

Screw size	Torque
M8	20 Nm
M10	50 Nm



Maximum acceptable load:

Frontal wind load	< 5000 N
Lateral wind load	< 1300 N

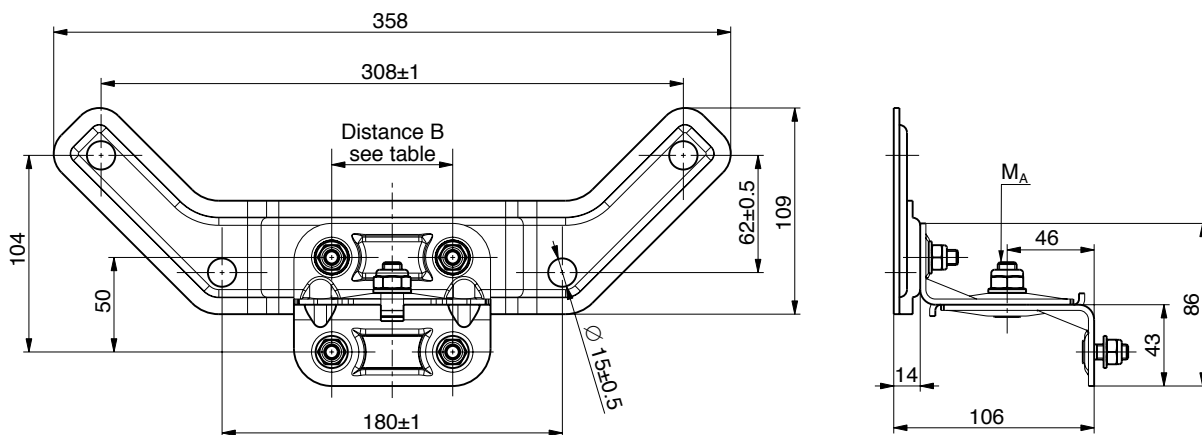
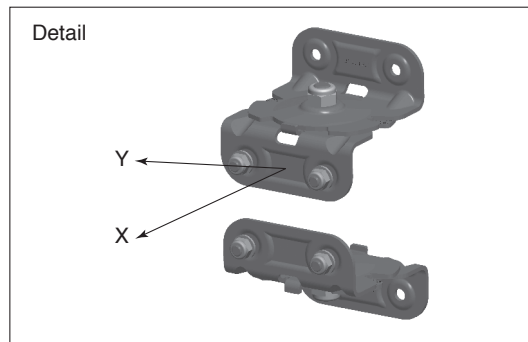
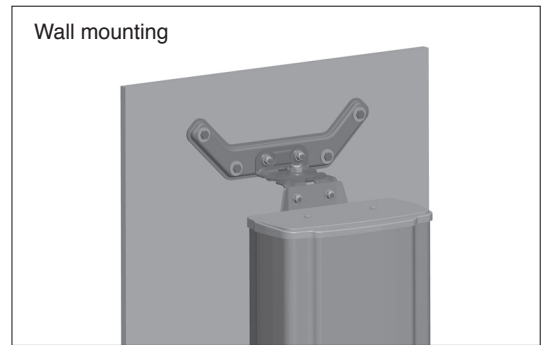
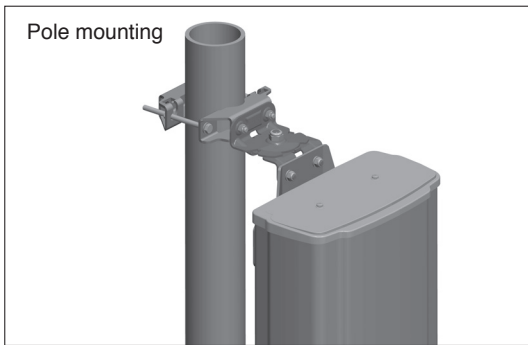


Instructions to adjust the required downtilt angle are given in the datasheet or on the rearside of the antenna.

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.

All Panels Mounting Hardware Azimuth Adjustment Kits



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**

3 Sector Panel Arrangement

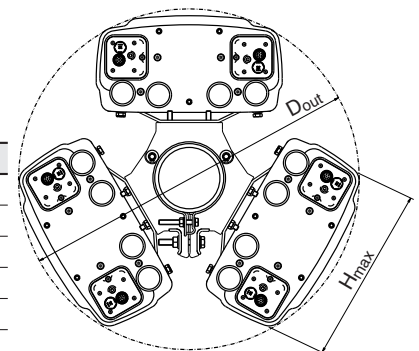
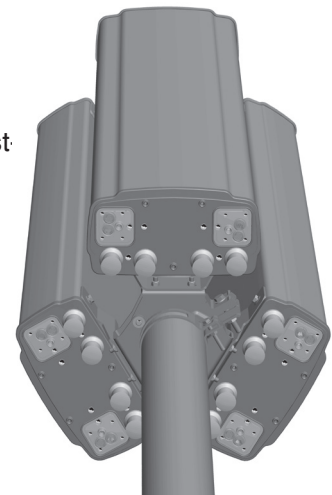
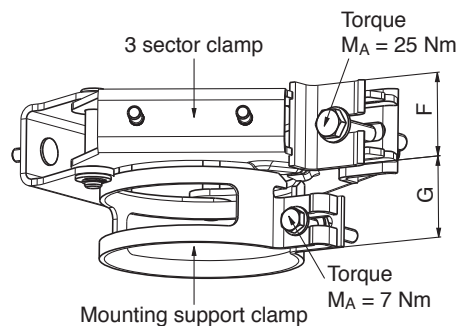
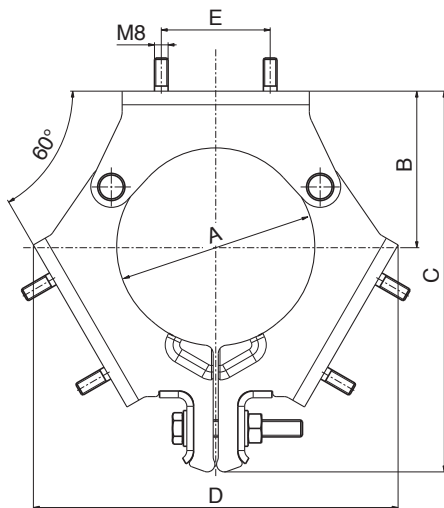
3 Sector Clamp Kit

Mounting Hardware

- Slim and unobtrusive 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	375	4 kg
742034	139.7	100	236	228	64	50	45	400	4 kg
85010058	114.3	92	217	207	72	50	45	375	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”)

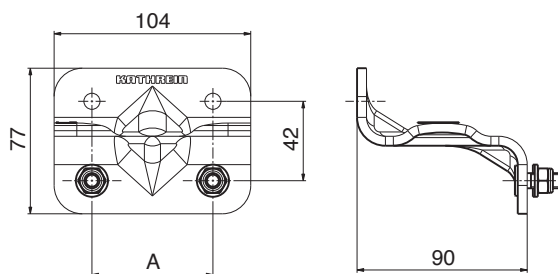
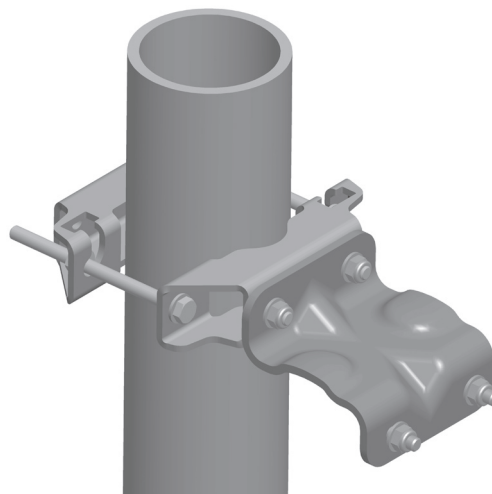
Type No.	85010058	85010059
Angle between antennas	120°	120°
Suitable for mast diameter	114.3 mm	139.7 mm
Number of pieces	2 x 3 sector clamp 2 x mounting support clamp	2 x 3 sector clamp 2 x mounting support clamp
Material		
– 3 sector clamp	Hot-dip galvanized steel	Hot-dip galvanized steel
– Mounting support clamp	Aluminum	Aluminum
– Screws / threaded stud	Hot-dip galvanized steel	Hot-dip galvanized steel
– Nuts	Stainless steel	Stainless steel

Mounting Hardware Offset for Panel Antennas

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.



Mounting accessories (order separately)

Possible clamps in combination with:

85010060

Type No.	Description	Mast diameter	Weight approx.	Units per antenna
731651	1 clamp	28 – 64 mm	0.8 kg	2
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
742263	2 x 3 sector clamp	88.9 mm	4.0 kg	1
742317	2 x 3 sector clamp	88.9 mm	4.0 kg	1
742033	2 x 3 sector clamp	114.3 mm	4.0 kg	1
742034	2 x 3 sector clamp	139.7 mm	4.0 kg	1

85010061

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
85010058	2 x 3 sector clamp	114.3 mm	4.0 kg	1
85010059	2 x 3 sector clamp	139.7 mm	4.0 kg	1

If a downtilt kit is used, please choose the fitting one from the antenna data sheet.

Panel Accessories

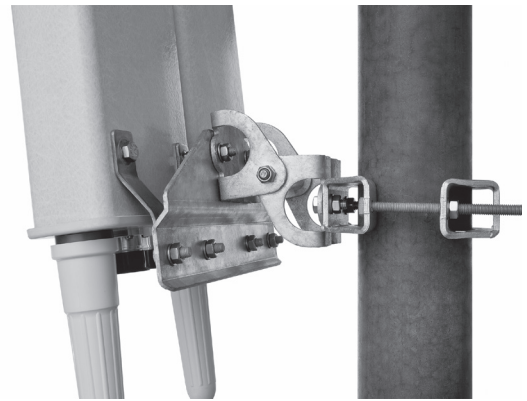
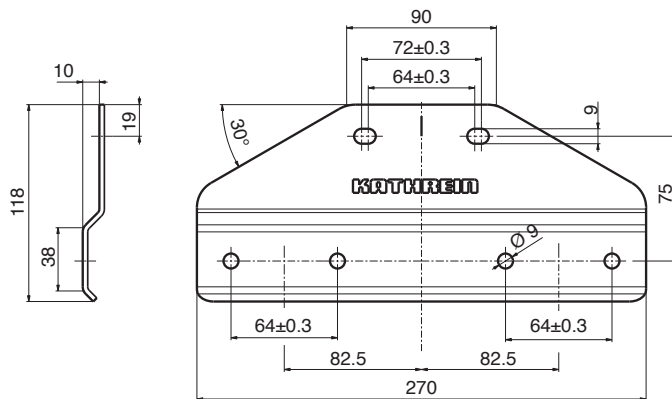
2 x Panel Mounting Kit for Panels width 112 mm and 155 mm

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

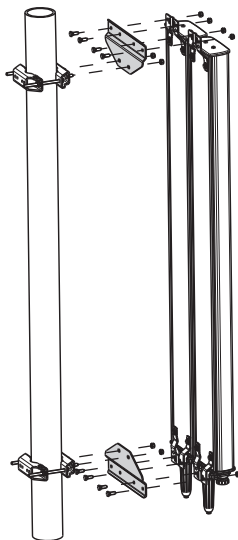
Type No.	742113
Contents	2 x brackets and mounting accessories
Material: – Clamp and screws – Nuts and washers	Hot-dip galvanized steel Stainless steel
Weight	Approx. 1.6 kg

Recommended torque for M8 bolted connections: 20 Nm

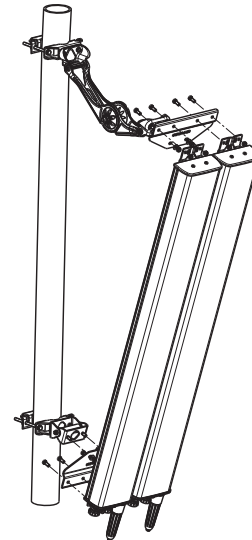


Attention: This mounting kit can not be used for the antennas 80010644v01 and 80010744. For these antennas, please use the mounting kit 85010075.

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 742213, 742033 or 742034. Three sector clamp 742263 does not match.

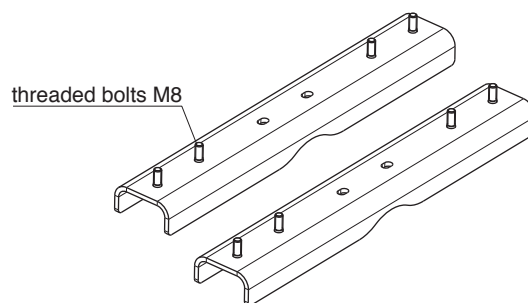
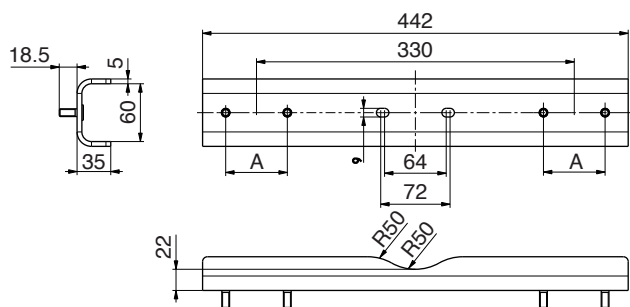
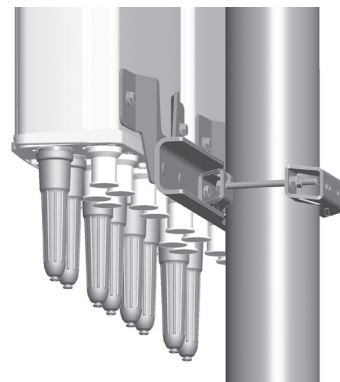
If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

2 x Panel Mounting Kit

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 <u>without</u> mechanical downtilt	Configuration <u>with</u> mechanical downtilt

Mounting Accessories (order separately)

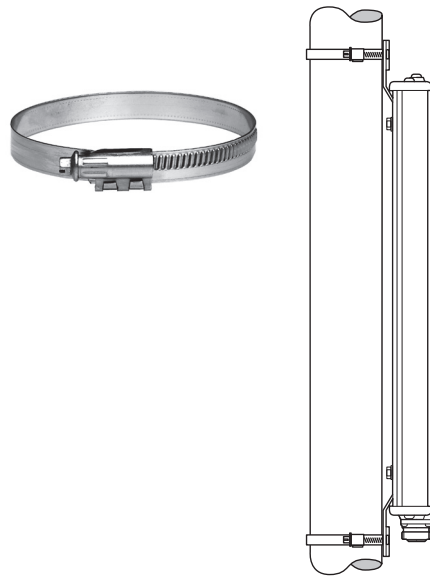
Clamps (only the listed clamps are allowed!)

Type No.	Description	Remarks	Weight approx.	Units per antenna
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	2
85010061	1 offset		1.3 kg	2

If a downtilt kit is used, please choose the fitting one from the antenna datasheet.

Mounting Hardware Tension Band for Panel Antennas (Wind load Category “L”)

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

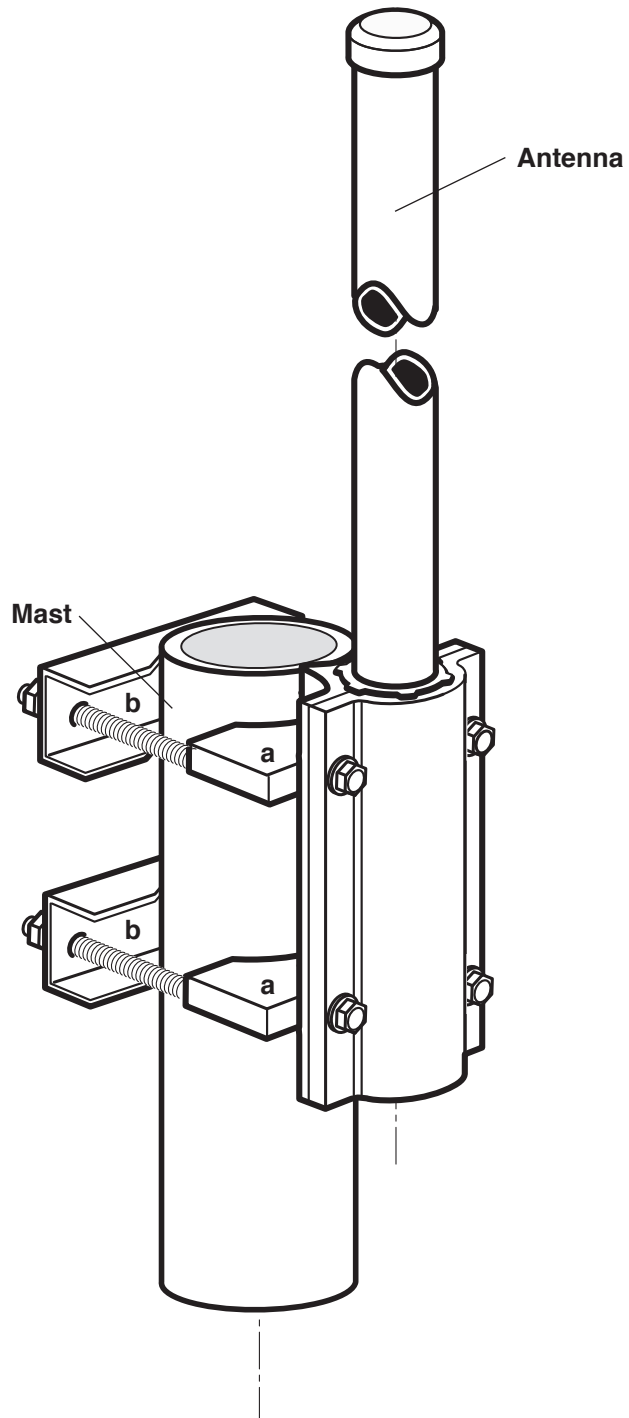


**Please note:
Only usable without downtilt kit!**

Side-mounting Clamp Omnidirectional Antennas Large Pipe

Type No. 738908

For masts of 94 – 125 mm diameter



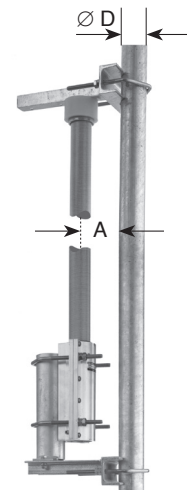
Side-mounting Bracket Omnidirectional Antennas

Type No. 737398

Side-mounted bracket

(for mast diameters of 40 – 105 mm)

Type No.	737398		
Bracket	At the bottom only		
Fits for antenna type no.	800/900 MHz 736347 736349 736350 738192	1800 MHz 738187	UMTS 741790



Side-mounting is possible for four fixed distances between the tubular mast and the antenna:

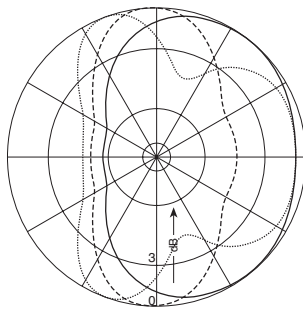
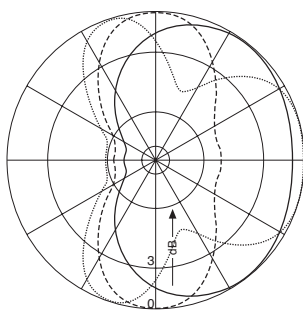
800/900 MHz (holes 1 and 3)			1800/2000 MHz (hole 2)								
A = 100 mm = 0.3 λ			A = 160 mm = 0.5 λ			A = 240 mm = 0.75 λ			A = 80 mm = 0.5 λ		
Pipe D	Horizontal Radiation Pattern	Spacing A Curve	Pipe D	Horizontal Radiation Pattern	Spacing A Curve	Pipe D Curve	Horizontal Radiation Pattern	Spacing A			
40 mm		100 mm	100 mm		100 mm		80 mm				
		160 mm			160 mm						
		240 mm			240 mm						

For mast diameters of 40 – 105 mm

Type No.	K61335
Bracket	At the bottom only
Fits for antenna type no.	K75116.. K75156..

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

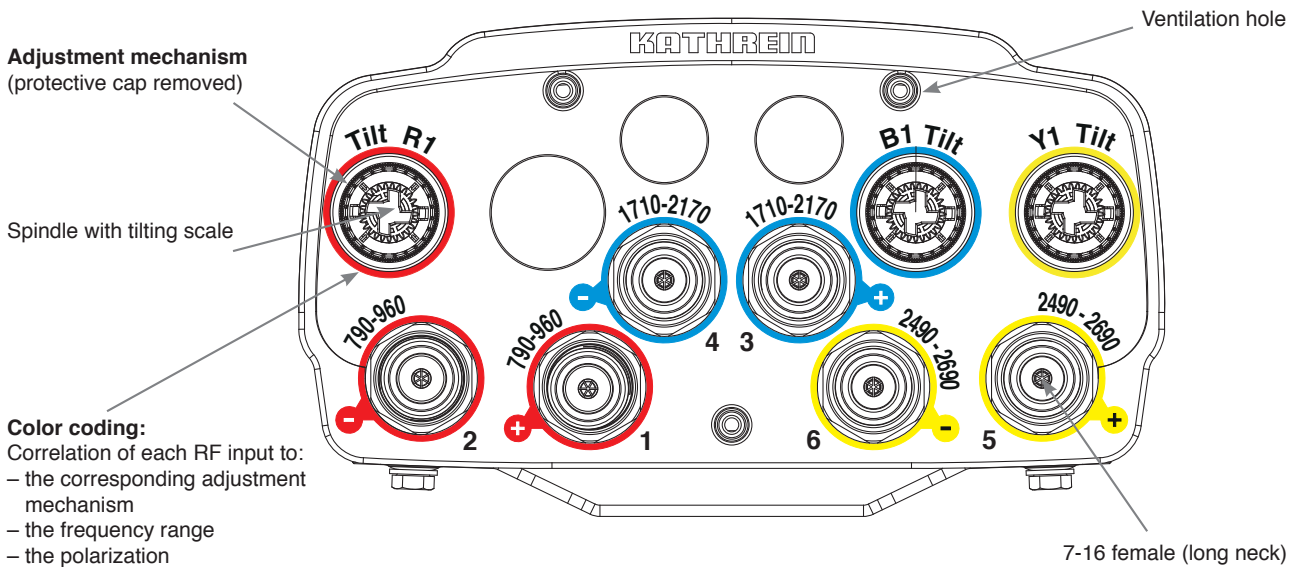
Pipe D	Horizontal Radiation Pattern	Spacing A Curve	Additional gain to the nominal value of the antenna gain
40 mm		100 mm	2 dB
		160 mm	3 dB
		240 mm	2 dB
100 mm		100 mm	2.5 dB
		160 mm	3.5 dB
		240 mm	2.5 dB

General Instructions for Feederline Installation **KATHREIN** for Multi-band Antennas with Kathrein Installation Tool, Type No. 85010077

Antennen · Electronic

Please note: To avoid any damage to the interfaces, please ensure that only suitable tools are used. To tighten the feederline connector interfaces, we strongly recommend using a special Kathrein installation tool (as shown below) in combination with a standard torque-wrench.

Description of bottom end cap (exemplary picture):



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!



For the feederline installation carefully put the connector in place and hand-screw the nut.

Use a torque-wrench to finish installation.

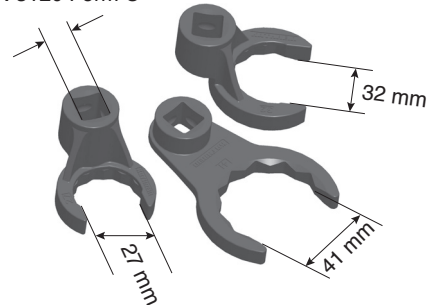
After feederline installation, the optional remote control units (RCU) R1, B1 and Y1 can be mounted if required. For a full description of RCU installation please refer to the respective data sheet.

Kathrein installation set: Type No. 85010077

Set has to be ordered separately!

Set consists of three spanners of 27, 32 and 41 mm width.

1/2" square actuation
according to
DIN 3120 Form C



These tools are suitable for 7-16 connectors with a wrench size of 27 or 32 mm, and the RCU attachment nut with a wrench size of 41 mm.

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.

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	± 0.8°
Pitch/Roll Accuracy ²⁾	± 0.25°
Heave Accuracy ³⁾	30 cm
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
Charing Temperature	0 °C to +45 °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⁾ After calibration.

³⁾ Based on a 40 second time constant.

Type No.	86010157
Tablet Specification	
Model	ICECARE
Display	
LCD Size	7" TFT LCD
Brightness (cd/m ²)	500 cd/m ²
Max Resolution	1024 (H) x 552 (V)
Viewing Angle	60/70/70/70 Deg.
Touch Screen	Projective capacitive type
Operating System	Android 4.x
Memory	4 GB eMMC Flash + 512 MB SDRAM
Storage	SD Slot (max. 32 GB)
Communication	
W-LAN	802.11 b/g/n
Bluetooth	Bluetooth 2.1+EDR
Modem	HSUPA / GPRS / GSM
RFID	HF RFID; ISO 14443A; ISO 14443B; ISO 15693; NFC
Data Collection	
Bacode	1D laser / 2D imager scan engine
Camera (Back)	5 megapixels CMOS camera
Camera (Front)	2 megapixels CMOS camera
I/O Interface	
Audio	1 x 1.5 W speaker; 1 x Digital Mic
Expansion	2 x USB 2.0; 1 x DC Jack
Power	Dual 11.1 V, 1880 mAh, Li-ion battery
Environment	
Operating Temperatur	-10 °C to +40 °C
Storage Temperatur	-10 °C to +60 °C
Drop Survival	1.2 m
Protection class	IP 64
Certification	CE / FCC
Dimensions (L x W x H)	248 x 153 x 36 mm
Weight	0.95 kg
Scope of Supply	GPS Azimuth Adjustment Tool; Tablet PC; Adapterplates; Charging Device; Storage and carrying bag, SD-Card (32GB); Cables
Shipment Dimension (L x W x H)	700 x 350 x 300 mm
Shipment Weight	5.2 kg



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). Country specific guidelines and regulations regarding access, maintenance and optimization of mobile communication sites have to be followed strictly and carefully. Adjustment of an antenna during its operation or the operation of other antennas on the same site may lead to deviations in the measurement, uncorrect results or the complete loss of the GPS-signal.

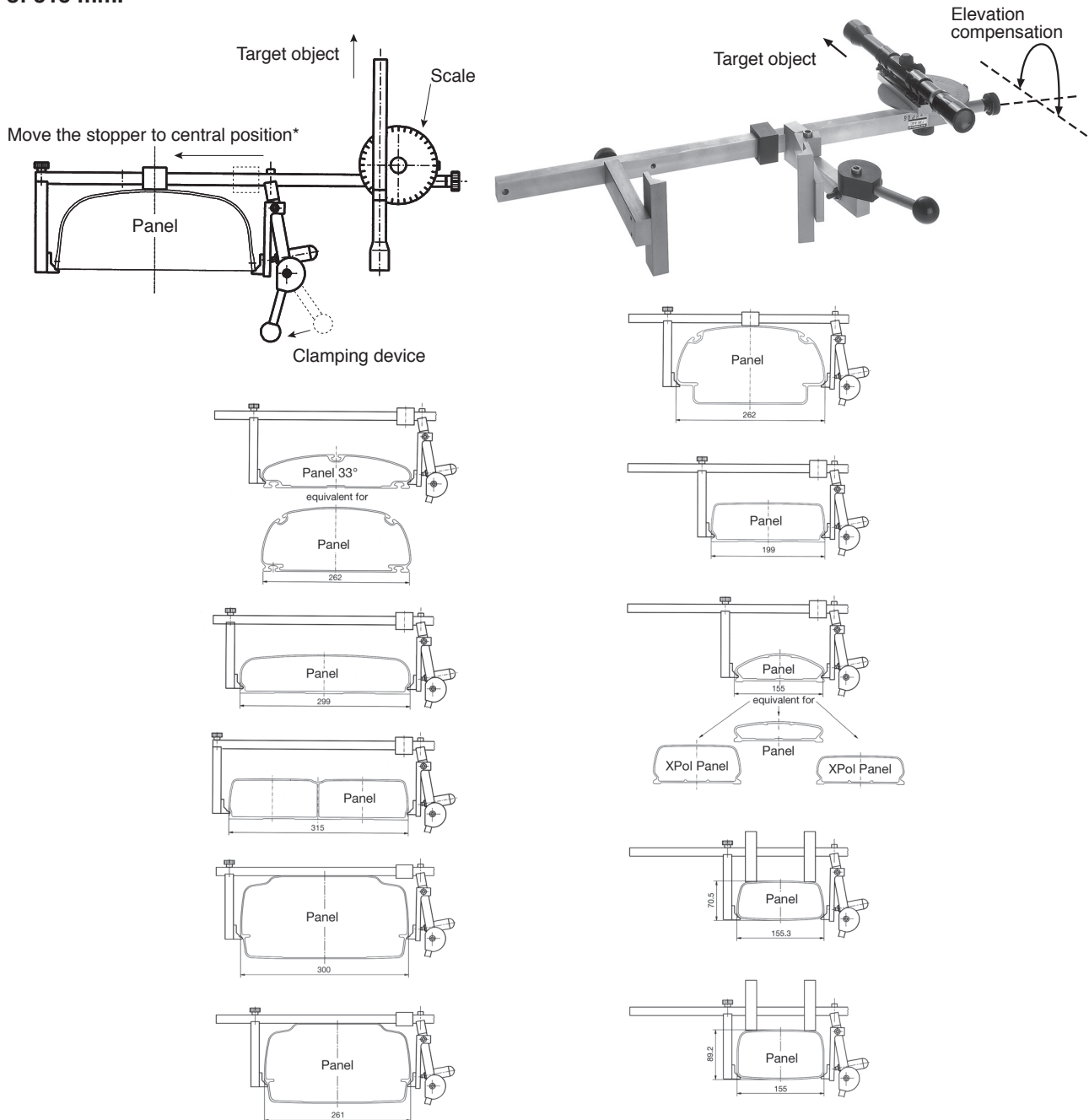
**The tablet is included
in the scope of supply**

All Panels Accessories Azimuth Adjustment Tool

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.

Filters / Duplexers

Multiband Combiners

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Same-Band Combiners Hybrid Combiners

Same-Band Combiner
Duplex Hybrid Combiner
Active Duplex Hybrid Combiner
Hybrid Combiner
3-dB Couplers
Hybrid Ring Junctions

System Components

Bias Tees
Measuring Directional Couplers
DC-Stops
Attenuators
50- Ω Loads
DC-DC Converter

DTMAs

Catalogue 2014 → Alterations to the Catalogue of 2013

Not longer in the catalogue 2014	Comments / Replacement
Multiband Combiners	
78210457	Replaced by 78210460
78210458	Replaced by 78210460
System Components	
78210429	Replaced by 78210578
793304	Replaced by 78210577

Please note: New type numbers in the catalogue 2014 are shown and coloured in the respective register of the different antenna families.

Summary of Filter, Combiner and Amplifier Types

The articles are listed by type number in numerical order.

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78210165	229	78210583	359	78210850V01	331	78211106	362, 363
78210167	230	78210584	359	78210860	374	78211110	302, 303
78210192	233			78210874	349	78211120	368
78210193	233	782106..		78210876	367	78211130	276, 277
		78210612	368	78210877	366	78211131	276, 277
782102..		78210613	369			78211132	276, 277
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78210392	225	78210634	274, 275	78210973	248, 249	78211181	270, 271
		78210635	274, 275	78210974	248, 249	78211182	270, 271
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Summary of Filter, Combiner and Amplifier Types

The articles are listed by type number in numerical order.

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Filters / Duplexers



Filters:

Description	Type No.	Frequency range	Max. input power	Page
Band-pass Filter	78211149	801 - 862 MHz	100 W	222
Band-pass Filter	78211159	801 - 862 MHz	100 W	222
Band-pass Filter	78211249	791 - 862 MHz	100 W	223
Band-pass Filter	78211259	791 - 862 MHz	100 W	223
Band-pass Filter	78211239	791 - 862 MHz	100 W	224
Band-pass Filter	78211240	791 - 862 MHz	100 W	224
Band-pass Filter	78210392	824 - 888 MHz	400 W	225
Band-pass Filter	78210390	890 - 960 MHz	400 W	226, 227
Band-pass Filter	78210391	890 - 960 MHz	400 W	226, 227

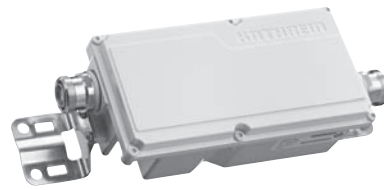
Duplexers:

Description	Type No.	Frequency range	Max. input power	Page
Duplexer	78210215	Low band: 824 - 851 MHz High band: 869 - 896 MHz	400 W	228
Duplexer	78210164	Low band: 890 - 915 MHz High band: 935 - 960 MHz	500 W	229
Duplexer	78210165	Low band: 890 - 915 MHz High band: 935 - 960 MHz	500 W	229
Duplexer	78210162	Low band: 890 - 915 MHz High band: 935 - 960 MHz	500 W	229
Duplexer	78210167	Low band: 880 - 915 MHz High band: 925 - 960 MHz	250 W	230
Duplexer	792542	Low band: 1710 - 1785 MHz High band: 1805 - 1880 MHz	250 W	231
Duplexer	792544	Low band: 1850 - 1910 MHz High band: 1930 - 1990 MHz	300 W	232
Duplexer	78210192	Low band: 1920 - 1980 MHz High band: 2110 - 2170 MHz	250 W	233
Duplexer	78210193	Low band: 1920 - 1980 MHz High band: 2110 - 2170 MHz	250 W	233

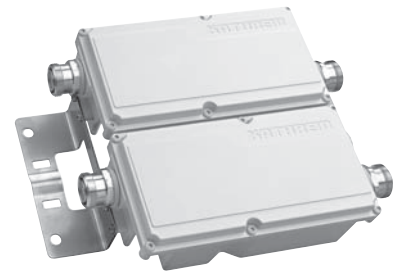
Band-pass Filter

801 - 862 MHz

- Band-pass Filter for LTE800 with DVB-T suppression
- Available as a single unit or for XPol antennas as a double unit
- Wall or mast mounting



78211149



78211159

Typical Attenuation Curves
Diagram I

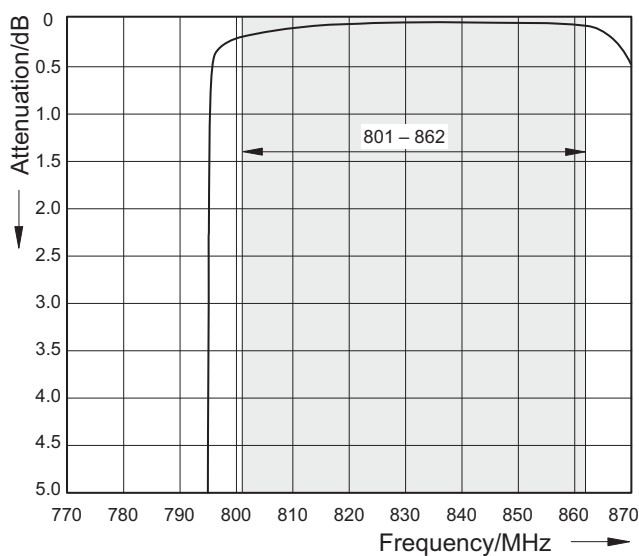
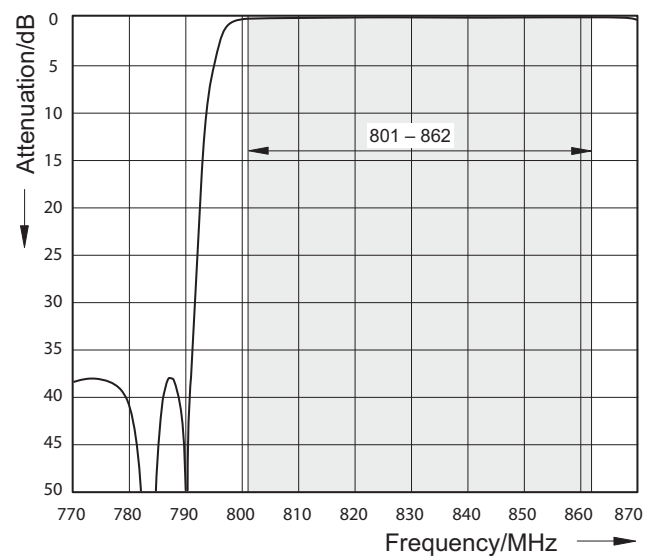


Diagram II



Technical Data

Type No.	78211149 Single Unit	78211159 Double Unit
Pass band	801 - 862 MHz	
Insertion loss	< 0.3 dB (typ. 0.2 dB)	
Stop band attenuation	> 35 dB (470 - 790 MHz)	
VSWR	< 1.2	
Impedance	50 Ω	
Input power	< 100 W	
Intermodulation products	< -160 dBc (with 2 x 20 W)	
Temperature range	-40 ... +65 °C	
DC/AISG	Bypass	
Connectors	7-16 female	
Application	Outdoor (IP 66)	
Weight	1.1 kg	2.2 kg
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Dimensions (w x h x d)	105 x 180 x 60 mm	215 x 180 x 60 mm

- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

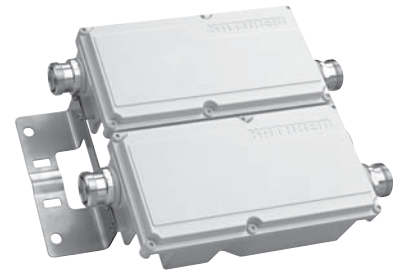
Band-pass Filter

791 - 862 MHz

- Band-pass Filter for LTE800 with DVB-T suppression
- Available as a single unit or for XPol antennas as a double unit
- Wall or mast mounting



78211249



78211259

Typical Attenuation Curves
Diagram I

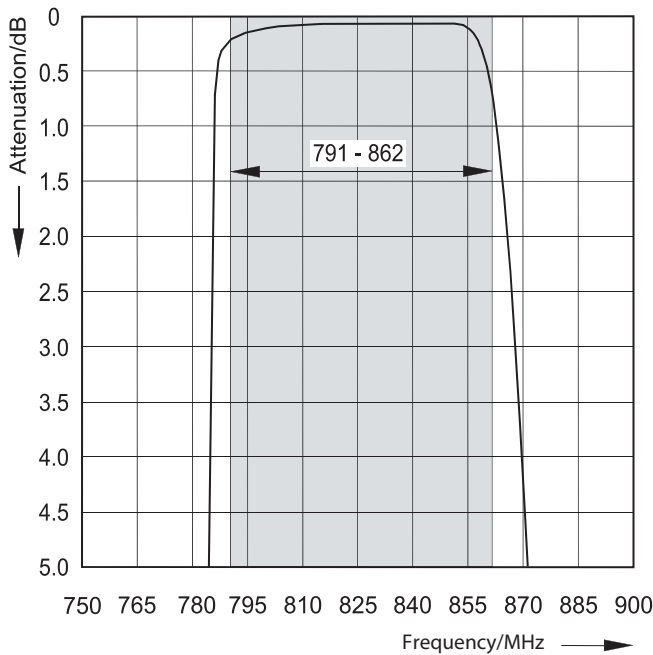
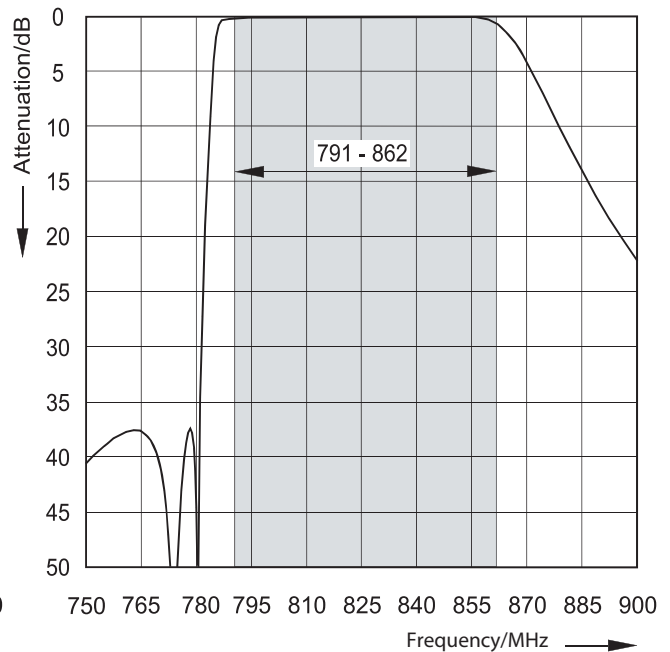


Diagram II



Technical Data

Type No.	78211249 Single Unit	78211259 Double Unit
Pass band	791 - 862 MHz	
Insertion loss	< 0.3 dB (typ. 0.2 dB)	
Stop band attenuation	> 35 dB (470 - 782 MHz)	
VSWR	< 1.2	
Impedance	50 Ω	
Input power	< 100 W	
Intermodulation products	< -160 dBc (with 2 x 20 W)	
Temperature range	-40 ... +65 °C	
DC/AISG	Bypass	
Connectors	7-16 female	
Application	Outdoor (IP 66)	
Weight	1.1 kg	2.2 kg
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Dimensions (w x h x d)	105 x 180 x 60 mm	215 x 180 x 60 mm

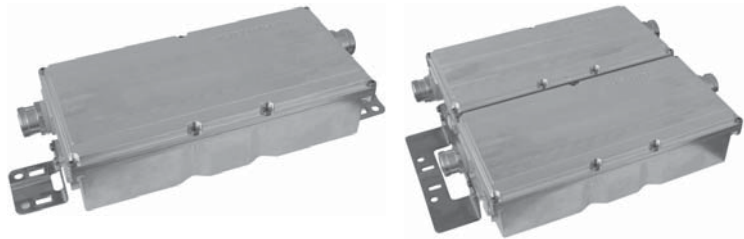
- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

Band-pass Filter

791 - 862 MHz

KATHREIN
Antennen · Electronic

- Band-pass Filter for LTE800 with DVB-T suppression
- Available as a single unit or for XPol antennas as a double unit
- Wall or mast mounting



78211239

78211240

Typical Attenuation Curves
Diagram I

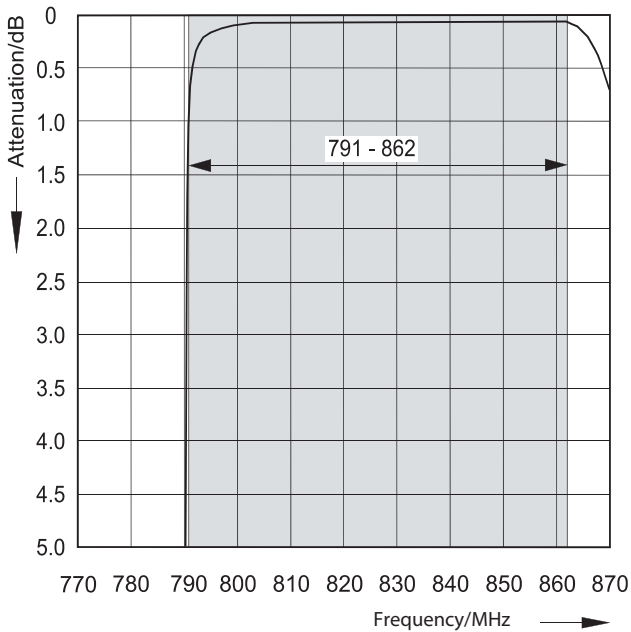
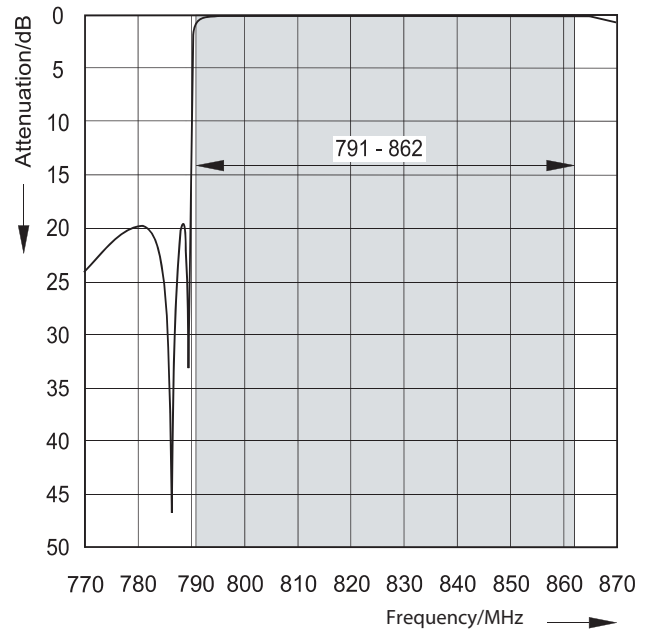


Diagram II



Technical Data

Type No.	78211239 Single Unit	78211240 Double Unit
Pass band	791 - 862 MHz	
Insertion loss	Typically 0.6 dB (max. 1.5 dB)	
Stop band attenuation	> 18 dB (470 - 790 MHz)	
VSWR	< 1.2	
Impedance	50 Ω	
Input power	< 100 W	
Intermodulation products	< -160 dBc (with 2 x 20 W)	
Temperature range	-40 ... +65 °C	
DC/AISG	Bypass	
Connectors	7-16 female	
Application	Outdoor (IP 66)	
Weight	2,9 kg	5,8 kg
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Dimensions (w x h x d)	140 x 291 x 71 mm	285 x 291 x 71 mm

- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

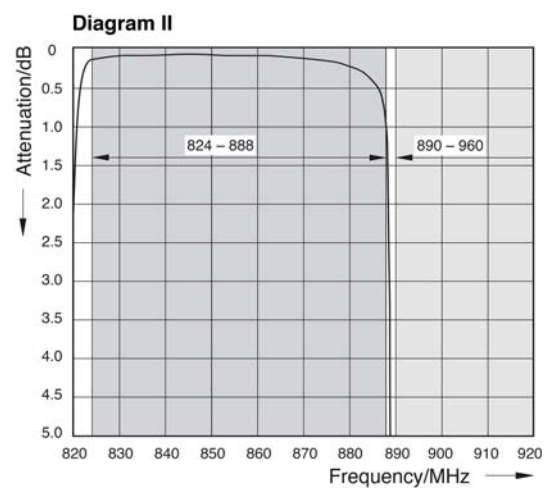
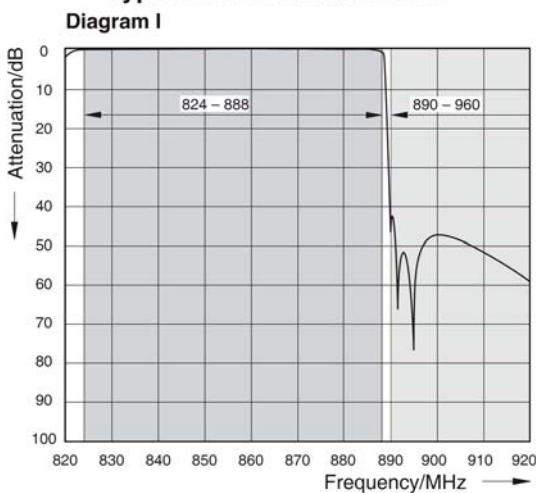
Band-pass Filter

824 – 888 MHz (AMPS/CDMA850)

- AMPS/CDMA850 Tx/RX filter
- Suppression of spurious emissions at adjacent GSM900 Rx frequencys
- Suitable for indoor applications
- Built-in DC stop



Typical Attenuation Curves



Technical Data

Type No.	78210392
Pass band	824 - 888 MHz
Insertion loss	< 0.5 dB (824 - 885 MHz) < 0.8 dB (885 - 886 MHz) < 1.5 dB (886 - 888 MHz)
Stop band attenuation	> 40 dB (890 - 960 MHz)
VSWR	< 1.25
Impedance	50 Ω
Input power	< 400 W (824 - 888 MHz)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	Port 1: 7-16 female (long neck) / Port 2: 7-16 male
Application	Indoor
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)	89 x 73.3 x 308.5 mm (including connectors and mounting feet)

Band-pass Filter

890 – 960 MHz (GSM 900)

- GSM 900 Tx/Rx preselector filter
- Suppression of interfering Tx signals of an adjacent AMPS or CDMA frequency band
- Suitable for indoor and outdoor applications
- Built-in DC stop



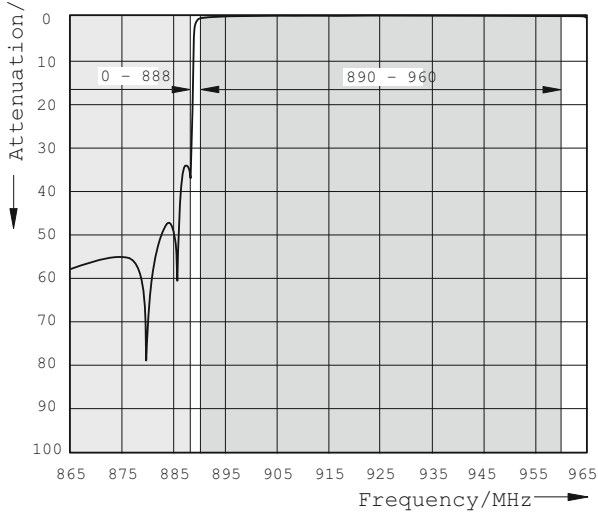
Technical Data

Type No.	Stop band Frequency spacing	78210390 0 - 888 MHz 2 MHz	78210391 0 - 889 MHz 1 MHz
Pass band		890 - 960 MHz	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)	Typ. 4.0 dB (890 - 890.5 MHz) @ -5 ... +45° < 2.5 dB (890.5 - 891 MHz) < 1.5 dB (891 - 892 MHz) < 1.0 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)	> 50 dB (0 - 869 MHz) > 30 dB (869 - 888.75 MHz) > 30 dB (888.75 - 889 MHz) @ -5 ... +45°
VSWR		< 1.25 (890 - 960 MHz)	< 1.3 (891 - 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 x 377 mm (including connectors and mounting feet)	

Band-pass Filter 890 – 960 MHz (GSM 900)

78210390

Typical Attenuation Curves
Diagram I



78210391

Typical Attenuation Curves
Diagram I

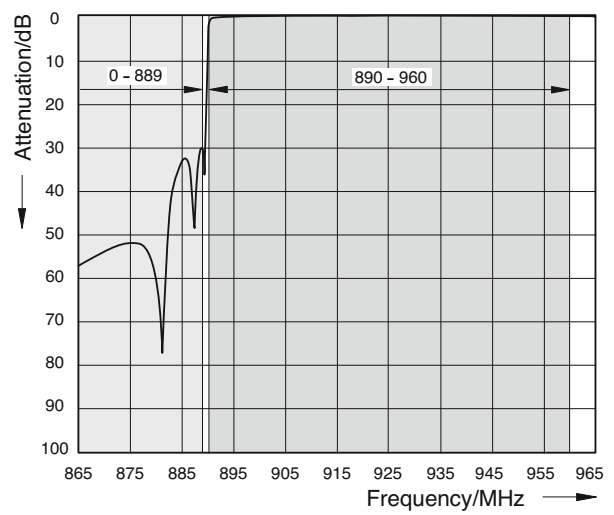


Diagram II

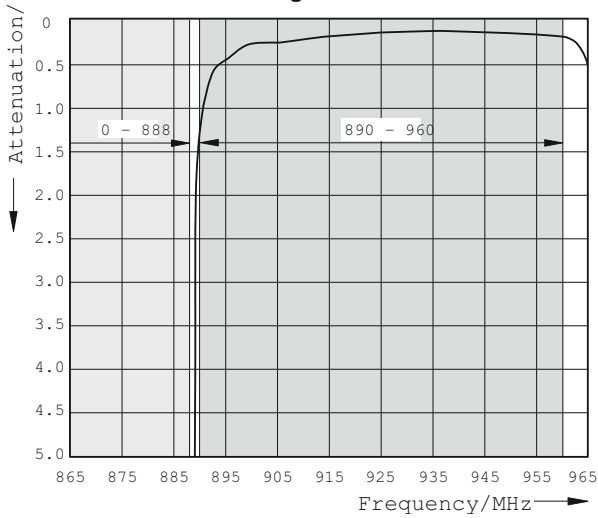
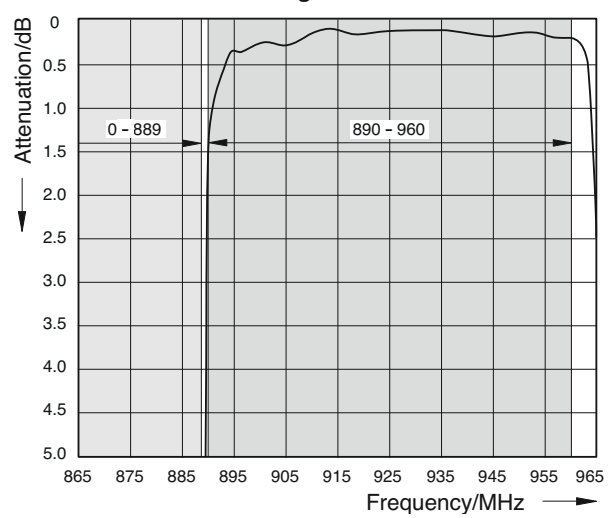


Diagram II



- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

Duplexer

824 – 851 / 869 – 896 MHz

(AMPS A/B-Band)

The Duplexer is designed to combine/split AMPS Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor application
- Built-in DC stop



Typical Attenuation Curves

Diagram I

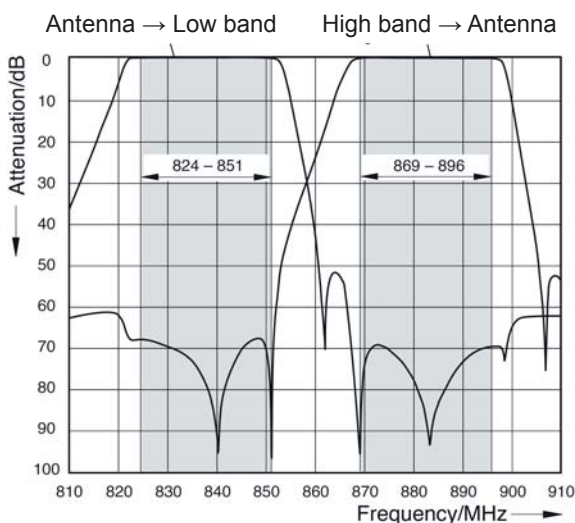
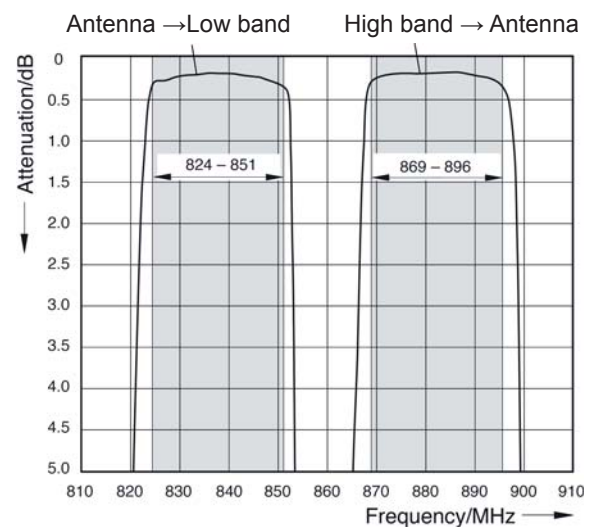


Diagram II



Technical Data

Type No.	78210215 AMPS A/B-Band
Pass band	
Low band	824 - 851 MHz
High band	869 - 896 MHz
Insertion loss	
Antenna ↔ Low band	< 0.5 dB (824 - 851 MHz)
High band ↔ Antenna	< 0.5 dB (869 - 896 MHz)
Isolation	
Low band ↔ High band	> 65 dB (824 - 851 / 869 - 896 MHz)
VSWR	< 1.25 (824 - 851 / 869 - 896 MHz)
Impedance	50 Ω
Input power	< 400 W (high band; with max. 16 carriers)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	2.6 kg
Packing size	309 x 252 x 162 mm
Dimensions (w x h x d)	229 x 80 x 170 mm (including connectors and mounting feet)

Duplexer

890 – 915 / 935 – 960 MHz (GSM)

The Duplexer is designed to combine/split GSM Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- **78210164:** Indoor version with 7-16 female connectors
- **78210165:** Indoor version with 7-16/N female connectors
- **78210162:** Outdoor version with 7-16 female connectors



782 10162 (outdoor)



782 10164 (indoor)



782 10165 (indoor)

Typical Attenuation Curves

Diagram I

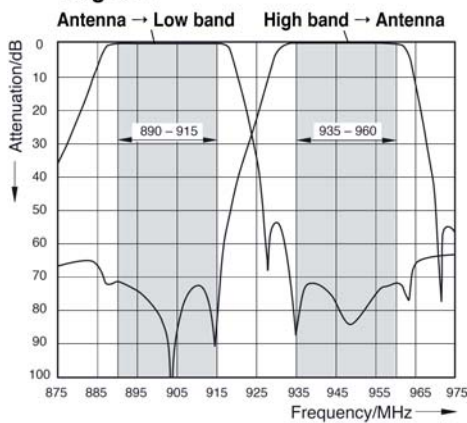
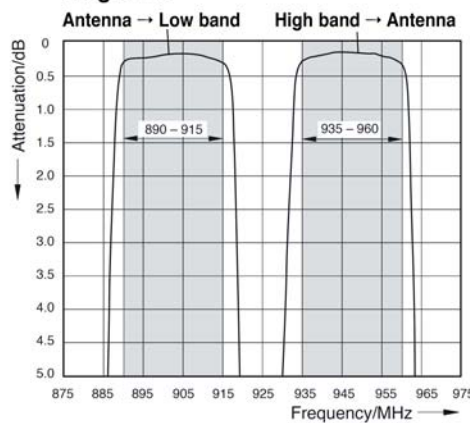


Diagram II



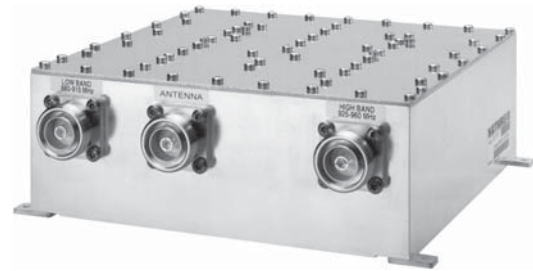
Type No.	78210164	78210165	78210162
Pass band Low band High band		890 - 915 MHz 935 - 960 MHz	
Insertion loss Antenna ↔ Low band High band ↔ Antenna		< 0.5 dB (890 - 915 MHz) < 0.5 dB (935 - 960 MHz)	
Isolation Low band ↔ High band		> 70 dB (890 - 915 / 935 - 960 MHz)	
VSWR		< 1.25 (890 - 915 / 935 - 960 MHz)	
Impedance		50 Ω	
Input power		< 500 W (high band; with max. 16 carriers)	
Intermodulation products		< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range		-20 ... +55 °C	-40 ... +60 °C
Connectors Low band High band Antenna	7-16 female 7-16 female 7-16 female	N female 7-16 female 7-16 female	7-16 female 7-16 female 7-16 female
Application	Indoor	Indoor	Outdoor (IP 66)
Special features	Built-in DC stop between all ports		
Mounting	With 4 screws (max. 4 mm diameter)		Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Weight	2.6 kg		5.5 kg
Packing size	309 x 162 x 252 mm		347 x 294 x 174 mm
Dimensions (w x h x d)	228.6 x 80 x 169.6 mm (including connectors and mounting feet)		238 x 93.5 x 305 mm (including connectors and mounting brackets)

Duplexer

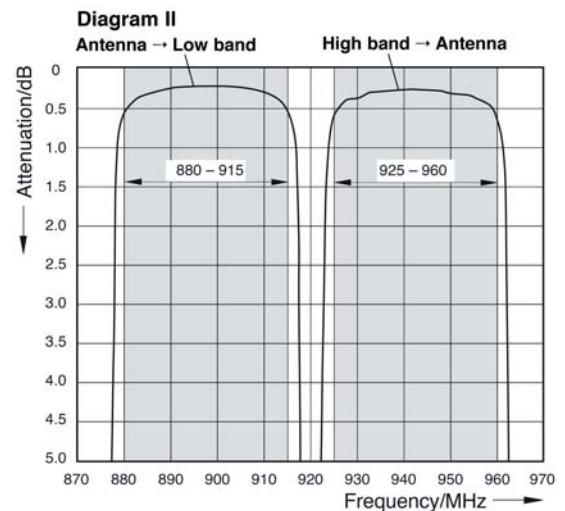
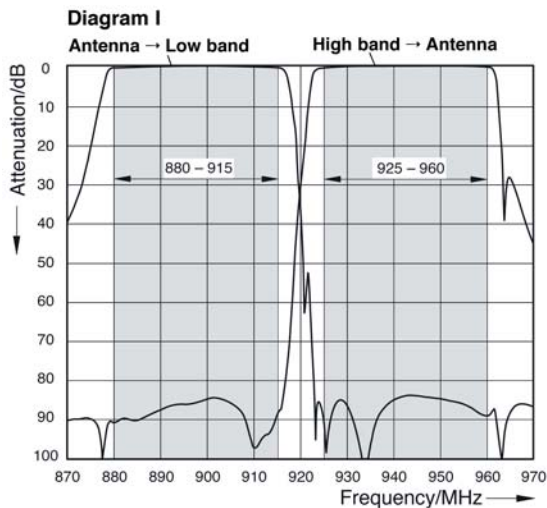
880 - 915 / 925 - 960 MHz (EGSM)

The Duplexer is designed to combine/split EGSM Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC stop



Typical Attenuation Curves



Technical Data

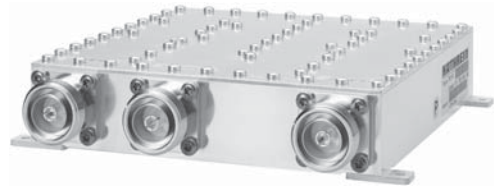
Type No.	782 10167
Pass band	
Low band	880 - 915 MHz
High band	925 - 960 MHz
Insertion loss	
Antenna → Low band	< 0.9 dB (880 - 915 MHz)
High band → Antenna	< 0.9 dB (925 - 960 MHz)
Isolation	
Low band ↔ High band	> 75 dB (880 - 915 / 925 - 960 MHz)
VSWR	< 1.25 (880 - 915 / 925 - 960 MHz)
Impedance	50 Ω
Input power	< 250 W (low band or high band)
Intermodulation products	< -160 dBc (3rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	4.6 kg
Packing size	347 x 297 x 174 mm
Dimensions (w x h x d)	229 x 81 x 260 mm (including connectors and mounting feet)

Duplexer

1710 – 1785 / 1805 – 1880 MHz (GSM 1800)

The Duplexer is designed to combine/split GSM 1800 Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC stop between all ports



Typical Attenuation Curves

Diagram I

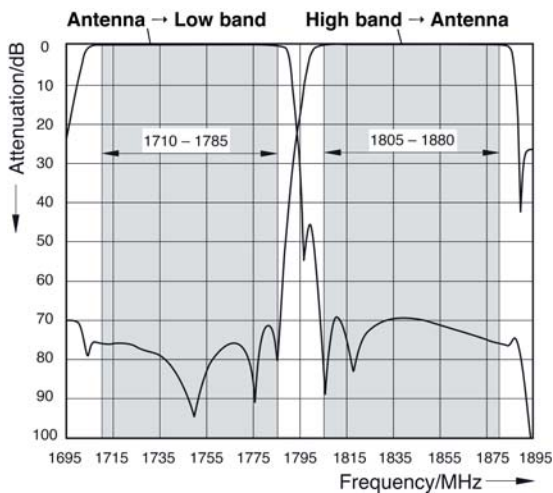
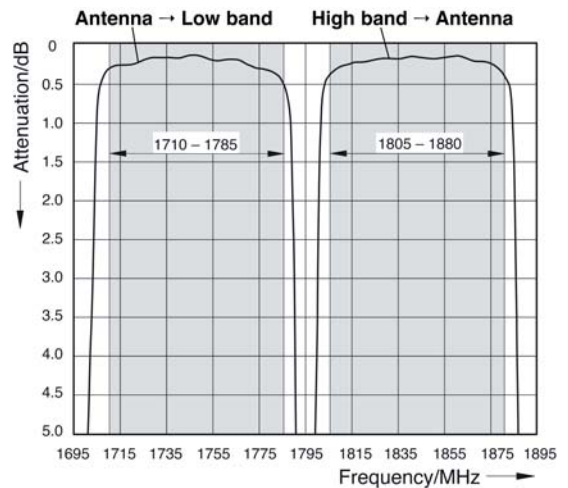


Diagram II



Type No.	792 542
Pass band	
Low band	1710 - 1785 MHz
High band	1805 - 1880 MHz
Insertion loss	
Antenna ↔ Low band	< 0.7 dB (1710 - 1785 MHz)
High band ↔ Antenna	< 0.7 dB (1805 - 1880 MHz)
Isolation	
Low band ↔ High band	> 65 dB (1710 - 1785 / 1805 - 1880 MHz)
VSWR	< 1.25 (1710 - 1785 / 1805 - 1880 MHz)
Impedance	50 Ω
Input power	< 250 W (low band or high band, with max. 8 carriers)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	1.6 kg
Packing size	282 x 252 x 114 mm
Dimensions (w x h x d)	192 x 42.5 x 199.6 mm (including connectors and mounting feet)

Duplexer

1850 – 1910 / 1930 – 1990 MHz (GSM 1900)

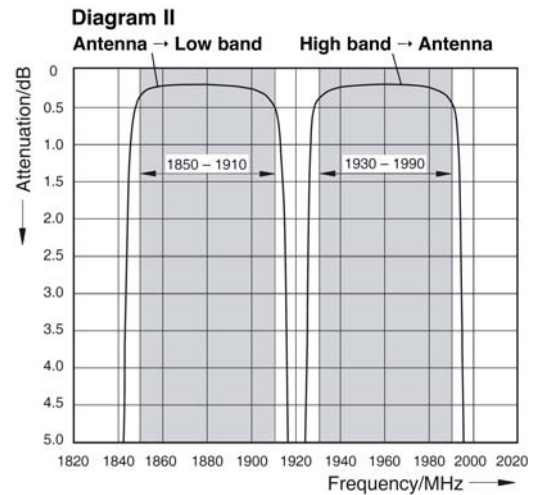
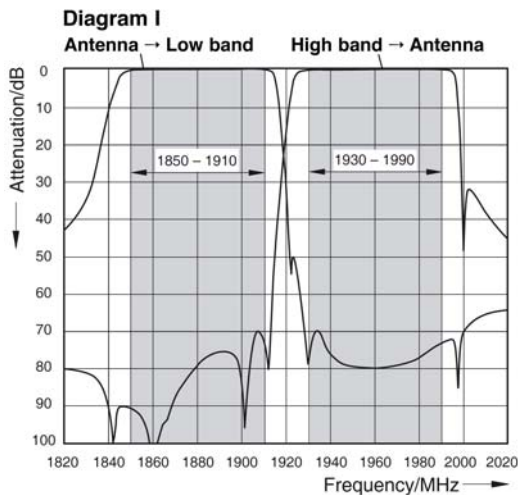
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The Duplexer is designed to combine/split GSM 1900 Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC stop



Typical Attenuation Curves



Technical Data

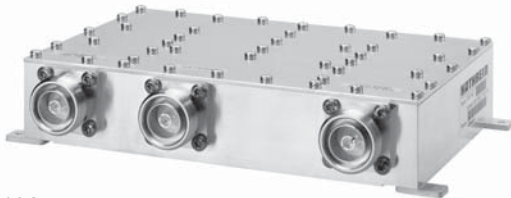
Type No.	792544
Pass band	
Low band	1850 - 1910 MHz
High band	1930 - 1990 MHz
Insertion loss	
Antenna → Low band	< 0.7 dB (1850 - 1910 MHz)
High band → Antenna	< 0.7 dB (1930 - 1990 MHz)
Isolation	
Low band ↔ High band	> 65 dB (1850 - 1910 / 1930 - 1990 MHz)
VSWR	< 1.25 (1850 - 1910 / 1930 - 1990 MHz)
Impedance	50 Ω
Input power	< 300 W (low band or high band)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	1.7 kg
Packing size	282 x 252 x 114 mm
Dimensions (w x h x d)	192 x 42.5 x 199.6 mm (including connectors and mounting feet)

Duplexer

1920 – 1980 / 2110 – 2170 MHz (UMTS)

The Duplexer is designed to combine/split UMTS Tx and Rx signals onto/from one common Tx/Rx antenna in order to save feeder cable and antenna costs.

- Suitable for indoor applications
- Built-in DC stop

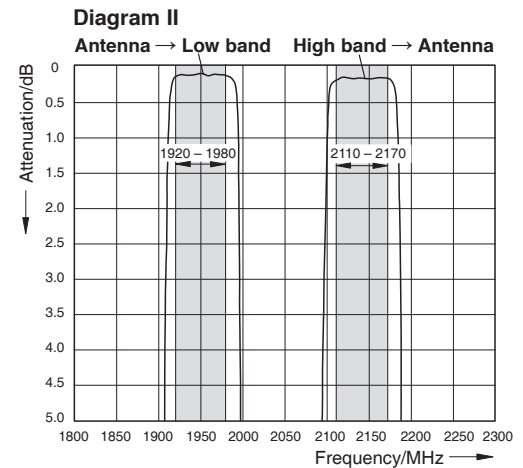
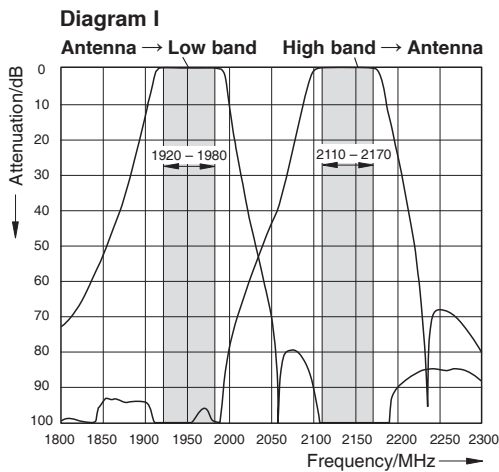


78210192



78210193

Typical Attenuation Curves



Technical Data

Type No.	78210192	78210193
Pass band Low band High band	1920 - 1980 MHz 2110 - 2170 MHz	
Insertion loss Antenna → Low band High band → Antenna	< 0.3 dB (1920 - 1980 MHz) < 0.3 dB (2110 - 2170 MHz)	
Isolation Low band ↔ High band	> 90 dB (1920 - 1980 / 2110 - 2170 MHz)	
VSWR	< 1.25 (1920 - 1980 / 2110 - 2170 MHz)	
Impedance	50 Ω	
Input power	< 250 W (low band or high band)	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-20 ... +55 °C	
Connectors	7-16 female	N female
Application	Indoor	
Special features	Built-in DC stop between all ports	
Mounting	With 4 screws (max. 4 mm diameter)	
Weight	1.67 kg	
Packing size	272 mm x 237 mm x 119 mm	
Dimensions	229 x 47 x 167.6 mm	229 x 47 x 173.4 mm (including connectors and mounting feet)

Multiband Combiners

Dual-Band Combiners
Triple-Band Combiners
Quad-Band Combiners

Multiband Combiners:

Description	Unit	Type No.	Frequency range	By-pass	Max. input power	Page
Dual-Band Combiner	Single	728954	Band 1: 68 - 470 MHz Band 2: 870 - 970 MHz	Band 1: By-pass Band 2: Stop	50 W 50 W	240
Dual-Band Combiner	Single	78210341	Band 1: 824 - 880 MHz Band 2: 890 - 960 MHz	Band 1: Stop Band 2: Stop	400 W 400 W	241
Dual-Band Combiner	Single	78211280	Band 1: 698 - 806 MHz Band 2: 824 - 960 MHz	Band 1: By-pass Band 2: By-pass	500 W 500 W	242, 243
Dual-Band Combiner	Double	78211281	Band 1: 698 - 806 MHz Band 2: 824 - 960 MHz	Band 1: By-pass Band 2: By-pass	500 W 500 W	242, 243
Dual-Band Combiner	Single	78211282	Band 1: 698 - 806 MHz Band 2: 824 - 960 MHz	Band 1: Stop Band 2: By-pass	500 W 500 W	242, 243
Dual-Band Combiner	Double	78211283	Band 1: 698 - 806 MHz Band 2: 824 - 960 MHz	Band 1: Stop Band 2: By-pass	500 W 500 W	242, 243
Dual-Band Combiner	Single	78211284	Band 1: 698 - 806 MHz Band 2: 824 - 960 MHz	Band 1: By-pass Band 2: Stop	500 W 500 W	242, 243
Dual-Band Combiner	Double	78211285	Band 1: 698 - 806 MHz Band 2: 824 - 960 MHz	Band 1: By-pass Band 2: Stop	500 W 500 W	242, 243
Dual-Band Combiner	Single	78211320	Band 1: 698 - 894 MHz Band 2: 1710 - 2400 MHz	Auto-sense	500 W 500 W	244, 245
Dual-Band Combiner	Double	78211321	Band 1: 698 - 894 MHz Band 2: 1710 - 2400 MHz	Auto-sense	500 W 500 W	244, 245
Dual-Band Combiner	Single	78211322	Band 1: 698 - 894 MHz Band 2: 1710 - 2400 MHz	Band 1: Stop Band 2: Stop	500 W 500 W	244, 245
Dual-Band Combiner	Double	78211323	Band 1: 698 - 894 MHz Band 2: 1710 - 2400 MHz	Band 1: Stop Band 2: Stop	500 W 500 W	244, 245
Dual-Band Combiner	Single	78210264	Band 1: 50 - 2200 MHz Band 2: 2400 - 2500 MHz	Band 1: By-pass Band 2: Stop	200 W 200 W	246
Dual-Band Combiner	Single	78210460	Band 1: 50 - 470 MHz Band 2: 790 - 2500 MHz	Band 1: By-pass Band 2: Stop	500 W 500 W	247
Dual-Band Combiner	Single	78210970	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Band 1: By-pass Band 2: By-pass	200 W 200 W	248, 249
Dual-Band Combiner	Double	78210971	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Band 1: By-pass Band 2: By-pass	200 W 200 W	248, 249
Dual-Band Combiner	Single	78210972	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Band 1: Stop Band 2: By-pass	200 W 200 W	248, 249
Dual-Band Combiner	Double	78210973	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Band 1: Stop Band 2: By-pass	200 W 200 W	248, 249
Dual-Band Combiner	Single	78210974	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Band 1: By-pass Band 2: Stop	200 W 200 W	248, 249
Dual-Band Combiner	Double	78210975	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Band 1: By-pass Band 2: Stop	200 W 200 W	248, 249
Dual-Band Combiner	Double	78210979	Band 1: 790 - 862 MHz Band 2: 880 - 960 MHz	Unit 1: Band 1: By-pass Band 2: Stop Unit 2: Band 1: Stop Band 2: By-pass	200 W 200 W	250, 251
Dual-Band Combiner	Single	78210660	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: By-pass Band 2: By-pass	650 W 350 W	252, 253
Dual-Band Combiner	Double	78210661	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: By-pass Band 2: By-pass	650 W 350 W	252, 253
Dual-Band Combiner	Single	78210662	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: Stop Band 2: By-pass	650 W 350 W	252, 253
Dual-Band Combiner	Double	78210663	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: Stop Band 2: By-pass	650 W 350 W	252, 253
Dual-Band Combiner	Single	78210664	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: By-pass Band 2: Stop	650 W 350 W	252, 253
Dual-Band Combiner	Double	78210665	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: By-pass Band 2: Stop	650 W 350 W	252, 253
Dual-Band Combiner	Double	78210669	Band 1: 470 - 960 MHz Band 2: 1710 - 2700 MHz	Unit 1: Band 1: By-pass Band 2: Stop Unit 2: Band 1: Stop Band 2: By-pass	650 W 350 W	254, 255
Dual-Band Combiner	Single	78210680	Band 1: 380 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: By-pass Band 2: By-pass	700 W 700 W	256, 257
Dual-Band Combiner	Double	78210681	Band 1: 380 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: By-pass Band 2: By-pass	700 W 700 W	256, 257
Dual-Band Combiner	Single	78210682	Band 1: 380 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: Stop Band 2: By-pass	700 W 700 W	256, 257
Dual-Band Combiner	Double	78210683	Band 1: 380 - 960 MHz Band 2: 1710 - 2700 MHz	Band 1: Stop Band 2: By-pass	700 W 700 W	256, 257
Dual-Band Combiner	Single	78210278	Band 1: 790 - 1880 MHz Band 2: 1920 - 2170 MHz	Band 1: By-pass Band 2: By-pass	500 W 500 W	258, 259
Dual-Band Combiner	Double	78210279	Band 1: 790 - 1880 MHz Band 2: 1920 - 2170 MHz	Band 1: By-pass Band 2: By-pass	500 W 500 W	258, 259

Multiband Combiners:

Description	Unit	Type No.	Frequency range	By-pass	Max. input power	Page
Dual-Band Combiner	Single	78210305	Band 1: 790 - 1880 MHz Band 2: 1920 - 2170 MHz	Band 1: Stop Band 2: By-pass	500 W 500 W	258, 259
Dual-Band Combiner	Double	78210306	Band 1: 790 - 1880 MHz Band 2: 1920 - 2170 MHz	Band 1: Stop Band 2: By-pass	500 W 500 W	258, 259
Dual-Band Combiner	Single	78210620	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Band 1: By-pass Band 2: By-pass	300 W 300 W	260, 261
Dual-Band Combiner	Double	78210621	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Band 1: By-pass Band 2: By-pass	300 W 300 W	260, 261
Dual-Band Combiner	Single	78210622	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Band 1: Stop Band 2: By-pass	300 W 300 W	260, 261
Dual-Band Combiner	Double	78210623	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Band 1: Stop Band 2: By-pass	300 W 300 W	260, 261
Dual-Band Combiner	Single	78210624	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Band 1: By-pass Band 2: Stop	300 W 300 W	260, 261
Dual-Band Combiner	Double	78210625	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Band 1: By-pass Band 2: Stop	300 W 300 W	260, 261
Dual-Band Combiner	Double	78210626	Band 1: 1710 - 1880 MHz Band 2: 1920 - 2200 MHz	Unit 1: Band 1: By-pass Band 2: Stop Unit 2: Band 1: Stop Band 2: By-pass	300 W 300 W	262, 263
Dual-Band Combiner	Single	78210469	Band 1: 1850 - 1990 MHz Band 2: 1710 - 2155 MHz	DC switchable	250 W 250 W	264
Dual-Band Combiner	Double	78210808	Band 1: 1850 - 1990 MHz Band 2: 1710 - 2155 MHz	DC switchable	250 W 250 W	264
Dual-Band Combiner	Single	78210809	Band 1: 1850 - 1990 MHz Band 2: 1710 - 2155 MHz	Band 1: By-pass Band 2: By-pass	250 W 250 W	265
Dual-Band Combiner	Double	78210810	Band 1: 1850 - 1990 MHz Band 2: 1710 - 2155 MHz	Band 1: By-pass Band 2: By-pass	250 W 250 W	265
Dual-Band Combiner	Single	78210800	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: By-pass	300 W 300 W	266, 267
Dual-Band Combiner	Double	78211091	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: By-pass	300 W 300 W	266, 267
Dual-Band Combiner	Single	78211092	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: Stop Band 2: By-pass	300 W 300 W	266, 267
Dual-Band Combiner	Double	78211093	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: Stop Band 2: By-pass	300 W 300 W	266, 267
Dual-Band Combiner	Single	78211094	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: Stop	300 W 300 W	266, 267
Dual-Band Combiner	Double	78211095	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: Stop	300 W 300 W	266, 267
Dual-Band Combiner	Double	78211099	Band 1: 1710 - 2180 MHz Band 2: 2400 - 2700 MHz	Unit 1: Band 1: By-pass Band 2: Stop Unit 2: Band 1: Stop Band 2: By-pass	300 W 300 W	268, 269
Dual-Band Combiner	Single	78211180	Band 1: 690 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: By-pass	500 W 500 W	270, 271
Dual-Band Combiner	Double	78211181	Band 1: 690 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: By-pass	500 W 500 W	270, 271
Dual-Band Combiner	Single	78211182	Band 1: 690 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: Stop Band 2: By-pass	500 W 500 W	270, 271
Dual-Band Combiner	Double	78211183	Band 1: 690 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: Stop Band 2: By-pass	500 W 500 W	270, 271
Dual-Band Combiner	Single	78211184	Band 1: 380 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: Stop	500 W 500 W	270, 271
Dual-Band Combiner	Double	78211185	Band 1: 380 - 2180 MHz Band 2: 2400 - 2700 MHz	Band 1: By-pass Band 2: Stop	500 W 500 W	270, 271
Dual-Band Combiner	Double	78211189	Band 1: 690 - 2180 MHz Band 2: 2400 - 2700 MHz	Unit 1: Band 1: By-pass Band 2: Stop Unit 2: Band 1: Stop Band 2: By-pass	500 W 500 W	272, 273
Triple-Band Combiner	Single	78210630	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2170 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass	700 W 300 W 300 W	274, 275
Triple-Band Combiner	Double	78210631	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2170 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass	700 W 300 W 300 W	274, 275
Triple-Band Combiner	Single	78210632	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2170 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass	700 W 300 W 300 W	274, 275
Triple-Band Combiner	Double	78210633	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2170 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass	700 W 300 W 300 W	274, 275
Triple-Band Combiner	Single	78210634	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2170 MHz	Band 1: By-pass Band 2: Stop Band 3: Stop	700 W 300 W 300 W	274, 275

Multiband Combiners:

Description	Unit	Type No.	Frequency range	By-pass	Max. input power	Page
Triple-Band Combiner	Double	78210635	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2170 MHz	Band 1: By-pass Band 2: Stop Band 3: Stop	700 W 300 W 300 W	274, 275
Triple-Band Combiner	Single	78211130	Band 1: 790 - 960 MHz Band 2: 1710 - 2180 MHz Band 3: 2490 - 2690 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass	300 W 300 W 300 W	276, 277
Triple-Band Combiner	Double	78211131	Band 1: 790 - 960 MHz Band 2: 1710 - 2180 MHz Band 3: 2490 - 2690 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass	300 W 300 W 300 W	276, 277
Triple-Band Combiner	Single	78211132	Band 1: 790 - 960 MHz Band 2: 1710 - 2180 MHz Band 3: 2490 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass	300 W 300 W 300 W	276, 277
Triple-Band Combiner	Double	78211133	Band 1: 790 - 960 MHz Band 2: 1710 - 2180 MHz Band 3: 2490 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass	300 W 300 W 300 W	276, 277
Triple-Band Combiner	Single	78211134	Band 1: 790 - 960 MHz Band 2: 1710 - 2180 MHz Band 3: 2490 - 2690 MHz	Band 1: Stop Band 2: By-pass Band 3: Stop	300 W 300 W 300 W	276, 277
Triple-Band Combiner	Double	78211135	Band 1: 790 - 960 MHz Band 2: 1710 - 2180 MHz Band 3: 2490 - 2690 MHz	Band 1: Stop Band 2: By-pass Band 3: Stop	300 W 300 W 300 W	276, 277
Triple-Band Combiner	Single	78211190	Band 1: 791 - 862 MHz Band 2: 880 - 960 MHz Band 3: 1710 - 2690 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass	300 W 300 W 300 W	278, 279
Triple-Band Combiner	Double	78211191	Band 1: 791 - 862 MHz Band 2: 880 - 960 MHz Band 3: 1710 - 2690 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass	300 W 300 W 300 W	278, 279
Triple-Band Combiner	Single	78211192	Band 1: 791 - 862 MHz Band 2: 880 - 960 MHz Band 3: 1710 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass	300 W 300 W 300 W	278, 279
Triple-Band Combiner	Double	78211193	Band 1: 791 - 862 MHz Band 2: 880 - 960 MHz Band 3: 1710 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass	300 W 300 W 300 W	278, 279
Quad-Band Combiner	Single	78210640	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 920 - 2200 MHz Band 4: 2500 - 2690 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass Band 4: By-pass	700 W 300 W 300 W 200 W	280, 281
Quad-Band Combiner	Double	78210641	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2200 MHz Band 4: 2500 - 2690 MHz	Band 1: By-pass Band 2: By-pass Band 3: By-pass Band 4: By-pass	700 W 300 W 300 W 200 W	280, 281
Quad-Band Combiner	Single	78210642	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2200 MHz Band 4: 2500 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: Stop Band 4: By-pass	700 W 300 W 300 W 200 W	280, 281
Quad-Band Combiner	Double	78210643	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2200 MHz Band 4: 2500 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: Stop Band 4: By-pass	700 W 300 W 300 W 200 W	280, 281
Quad-Band Combiner	Single	78210644	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2200 MHz Band 4: 2500 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass Band 4: Stop	700 W 300 W 300 W 200 W	280, 281
Quad-Band Combiner	Double	78210645	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2200 MHz Band 4: 2500 - 2690 MHz	Band 1: Stop Band 2: Stop Band 3: By-pass Band 4: Stop	700 W 300 W 300 W 200 W	280, 281
Quad-Band Combiner	Double	78210649	Band 1: 380 - 960 MHz Band 2: 1710 - 1880 MHz Band 3: 1920 - 2200 MHz Band 4: 2500 - 2690 MHz	Unit 1 Band 1: Stop Band 2: Stop Band 3: By-pass Band 4: Stop Unit 2: Band 1: Stop Band 2: Stop Band 3: Stop Band 4: By-pass	700 W 300 W 300 W 200 W	282, 283
SmartPlex Dual-Band Combiner	Double	78210900	Band 1: 380 - 960 MHz Band 2: 1710 - 2690 MHz	Auto sense	500 W 300 W	284, 285
SmartPlex Dual-Band Combiner	Double	78210901	Band 1: 380 - 960 MHz Band 2: 1710 - 2690 MHz	Auto sense	500 W 300 W	284, 285

**New
Products**

Multiband Combiner – Frequency combinations

Dual-Band Combiner, Triple-Band Combiner, Quad-Band Combiner

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Type No.	Frequency / MHz												
	PMR	LTE800	GSM/UMTS900	1200	1400	1600	GSM1800	UMTS2100	WLAN	LTE2600/WiMax	2800	3000	
Dual-Band Combiners													
728954	68 - 470		870 - 970										
78210460	50 - 470		790 - 2500										
78211280, ..1 ..2 ..3 ..4 ..5		698 - 806	824 - 960										
78210341		824 - 880	890 - 960										
78210970, ..1 ..2 ..3 ..4 ..5 ..9		790 - 862	880 - 960										
78211320, ..321 ..322 ..323			698 - 894				1710 - 2400						
78210660, ..1 ..2 ..3 ..4 ..5 ..9		470 - 960					1710 - 2700						
78210680, ..681 ..682 ..683		380 - 960					1710 - 2700						
78210900, 78210901		380 - 960					1710 - 2690						
78210278, ..279 ..305 ..306			790 - 1880				1920 - 2170						
78210620, ..1 ..2 ..3 ..4 ..5 ..6			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			380 - 2180				2400 - 2700						
78210469, ..808 ..809 ..810			1710-1755				1850 - 1990			2110-2155			
Triple-Band Combiners													
78210630, ..1 ..2 ..3 ..4 ..5		380 - 960				1710 - 1880				1920 - 2170			
78211130, ..1 ..2 ..3 ..4 ..5		790 - 960					1710 - 2180			2490 - 2690			
78211190, ..191 ..192 ..193		791 - 862	880 - 960				1710 - 2690						
Quad-Band Combiners													
78210640, ..1 ..2 ..3 ..4 ..5 ..9		380 - 960				1710 - 1880	1920 - 2200			2500 - 2690			

Dual-Band Combiner

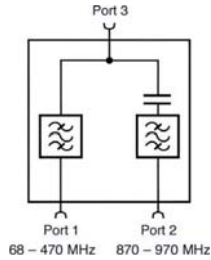
KATHREIN

Antennen · Electronic

68 - 470 MHz
80 / 160 / 400 MHz

870 - 970 MHz
GSM 900

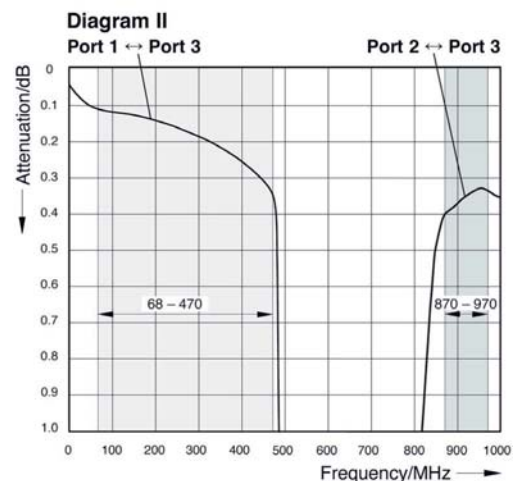
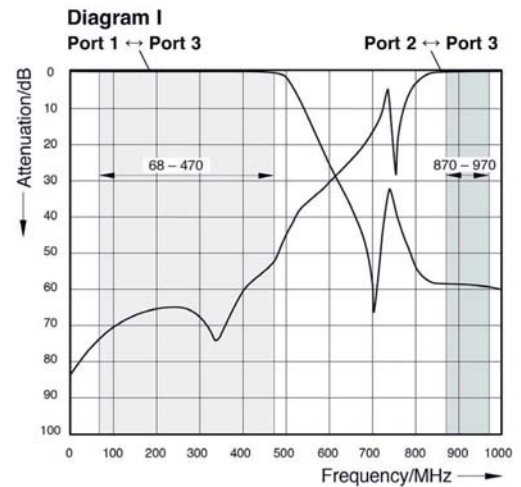
- Designed for inhouse multiband distribution network
- Enables feeder sharing
- DC by-pass between port 1 and port 3
- Built-in DC stop between port 2 and port 3



Technical Data

Type No.	728 954
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



Dual-Band Combiner

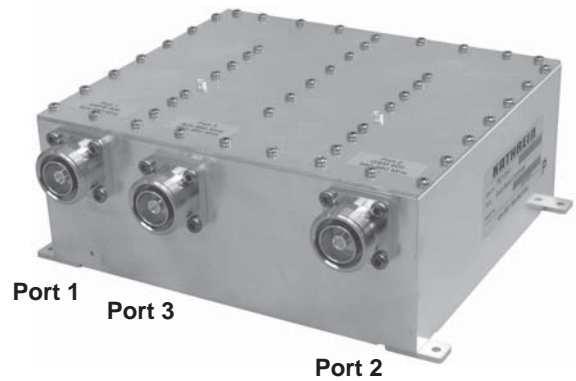
KATHREIN

Antennen · Electronic

824 - 880 MHz
AMPS / CDMA 850

890 - 960 MHz
GSM 900

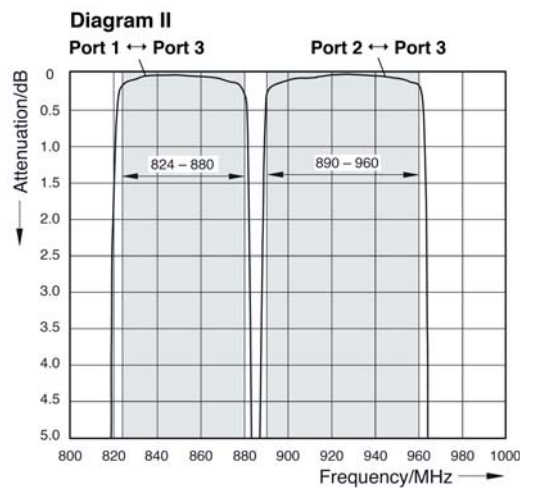
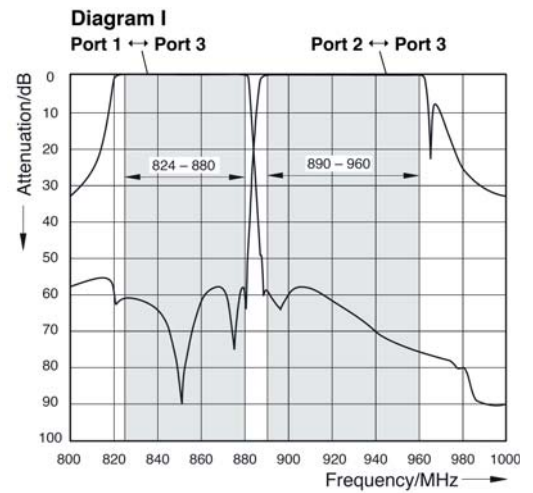
- Designed for co-sitting purposes
- Enables feeder sharing
- Suitable for indoor applications
- Built-in DC stop between all ports



Technical Data

Type No.	78210341
Pass band Band 1 (AMPS / CDMA 800) Band 2 (GSM 900)	824 - 880 MHz 890 - 960 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.6 dB (824 - 880 MHz) < 0.6 dB (890 - 960 MHz)
Isolation Port 1 ↔ Port 2	> 55 dB (824 - 880 / 890 - 960 MHz)
VSWR	< 1.2 (824 - 880 / 890 - 960 MHz)
Impedance	50 Ω
Input power Band 1 Band 2	< 400 W (with max. 8 carriers) < 400 W (with max. 8 carriers)
Intermodulation products	< -160 dBc (3rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	7-16 female
Application	Indoor
Special features	Built-in DC stop between all ports
Mounting	With 4 screws (max. 4 mm diameter)
Weight	3.2 kg
Dimensions (w x h x d)	228 x 85 x 199.3 mm (including connectors and mounting feet)

Typical Attenuation Curves



Dual-Band Combiner

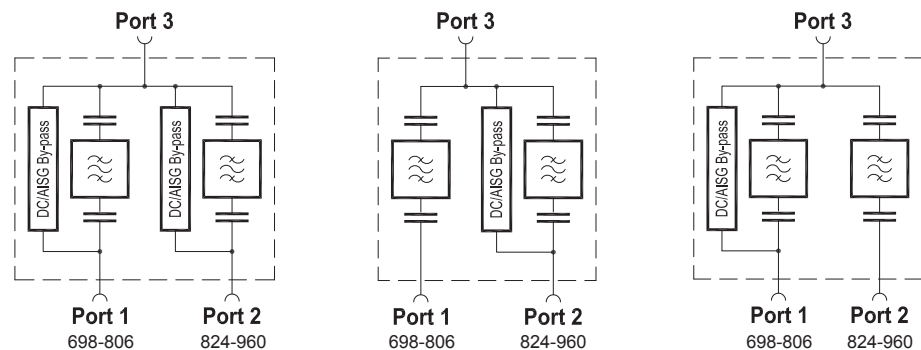
KATHREIN

Antennen · Electronic

698 - 806 MHz
LTE 700

824 - 960 MHz
CDMA 850 / GSM 900

- 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**



Technical Data

Type No.	78211280 Single Unit	78211282 Single Unit	78211284 Single Unit
	78211281 Double Unit	78211283 Double Unit	78211285 Double Unit
Pass band Band 1 Band 2	698 - 806 MHz 824 - 960 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.3 dB (698 - 796 MHz); < 0.5 dB (796 - 806 MHz) < 0.5 dB (824 - 834 MHz); < 0.3 dB (834 - 960 MHz)		
Isolation Port 1 ↔ Port 2	> 50 dB		
VSWR	< 1.2 (698 - 806 MHz / 824 - 960 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	-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		
Dimensions (w x h x d)	Single Unit: 153 x 170.5 x 63.2 mm / Double Unit: 153 x 170.5 x 131.2 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN

Antennen · Electronic

698 - 806 MHz
LTE 700

824 - 960 MHz
CDMA 850 / GSM 900

Typical Attenuation Curves

Diagram 1

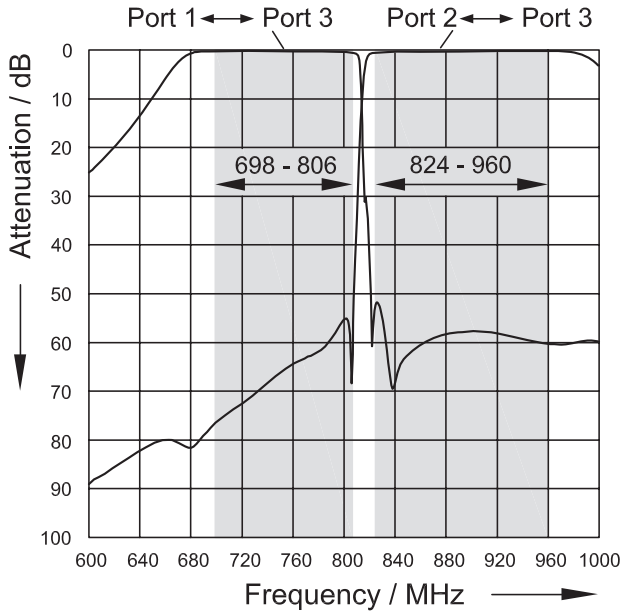
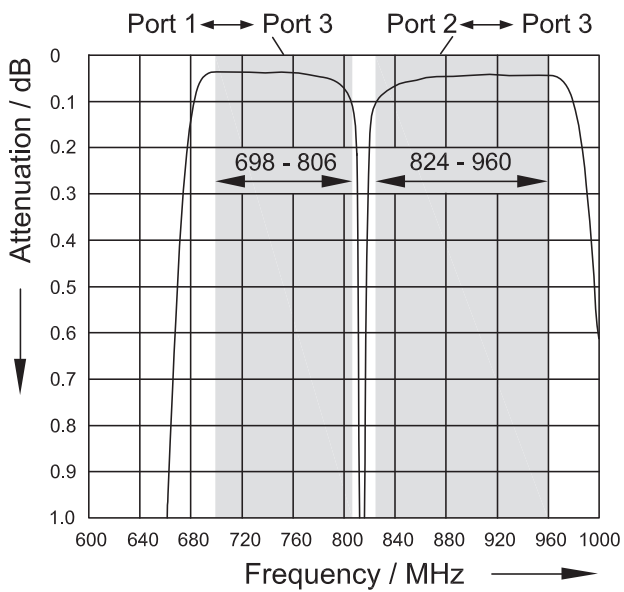


Diagram 2



- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

Dual-Band Combiner

KATHREIN

Antennen · Electronic

698 - 894 MHz
LTE 700 / CDMA 850

1710 - 2400 MHz
PCS 1900 / AWS

- 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 -43...-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**



78211320 Single Unit



78211322 Single Unit



78211321 Double Unit



78211323 Double Unit

Technical Data

Type No.	78211320 (BTS version) Single Unit	78211322 (ANT version) Single Unit
	78211321 (BTS version) Double Unit	78211323 (ANT version) Double Unit
Pass band Band 1 Band 2	698 - 894 MHz 1710 - 2400 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port 3 ↔ Test (sniffer) port	< 0.1 dB (698 - 894 MHz) < 0.1 dB (1710 - 2400 MHz) -43...-28 dB (698-894 / 1710 - 2400 MHz)	< 0.1 dB (698 - 894 MHz) < 0.1 dB (1710 - 2400 MHz) -
Isolation Port 1 ↔ Port 2	> 60 dB (698 - 894 / 1710 - 2400 MHz)	
VSWR	< 1.2 (698 - 894 / 1710 - 2400 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	-40 ... +60 °C	
Connectors RF AISG Test (sniffer) port	7-16 female (long neck) 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) N female (with protection cap IP66)	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 3: RS485B, pin 5: RS485A, Pin 6: 10-32 V DC, pin 7: DC return, other pins: not connected) -
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency Port 1 ↔ Port 3 Port 2 ↔ Port 3 Port DC/AISG ↔ Port 3	Auto-sense (max. 2000 mA)	Stop Stop By-pass (max. 2000 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: 1.5 kg / Double Unit: 2.9 kg	
Dimensions (w x h x d)	Single Unit: 126 x 145 x 62.5 mm / Double Unit: 126 x 145 x 128 mm (without connectors, without mounting brackets)	

Dual-Band Combiner

698 - 894 MHz
LTE 700 / CDMA 850

1710 - 2400 MHz
PCS 1900 / AWS

Typical Attenuation Curves

Diagram I (Port 1 ↔ Port 3 / Port 2 ↔ Port 3)

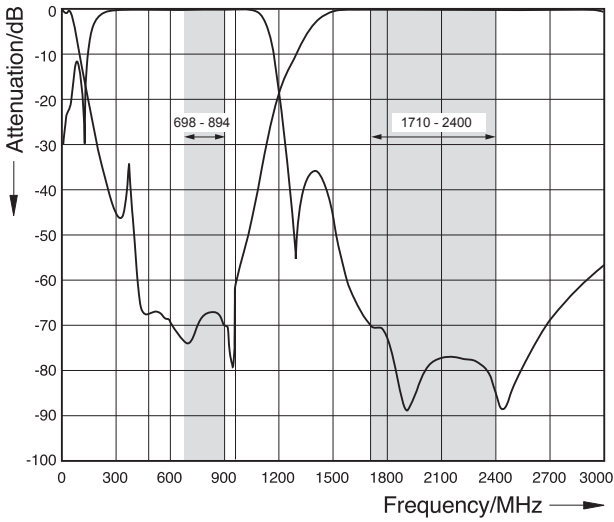
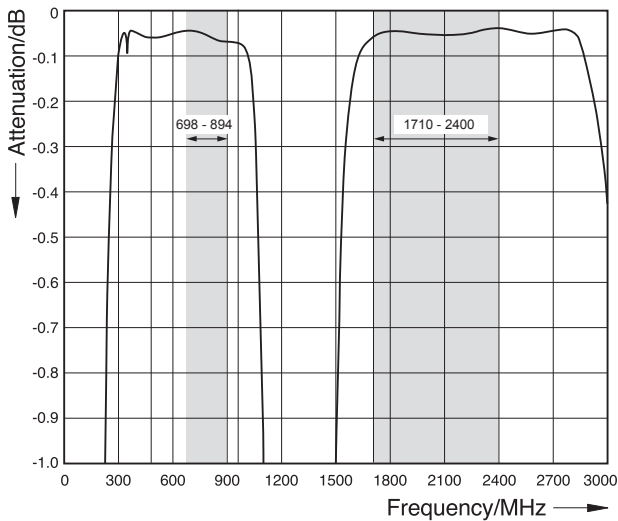
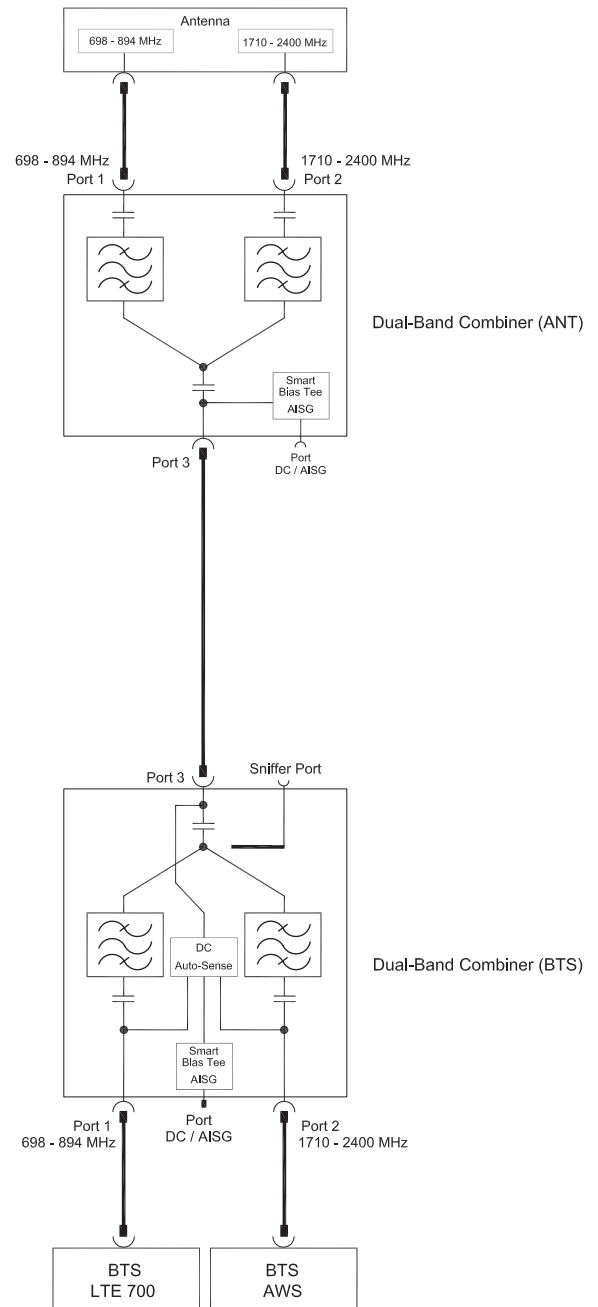


Diagram II (Port 1 ↔ Port 3 / Port 2 ↔ Port 3)



Blockdiagramm



- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

Dual-Band Combiner

KATHREIN

Antennen · Electronic

50 - 2200 MHz
80 / 160 / 400 / 900 / 1800 / UMTS 2100

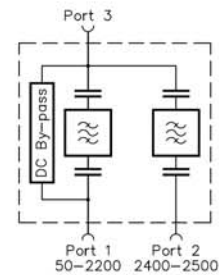
2400 - 2500 MHz
WLAN

- Designed for inhouse multiband distribution networks
- Enables feeder sharing
- DC by-pass between ports 1 and 3
- Build-in DC stop between ports 2 and 3

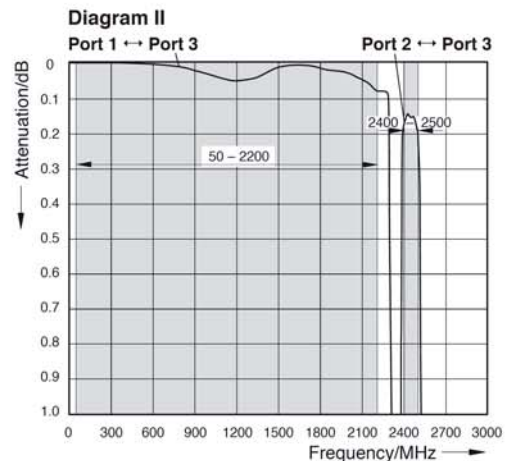
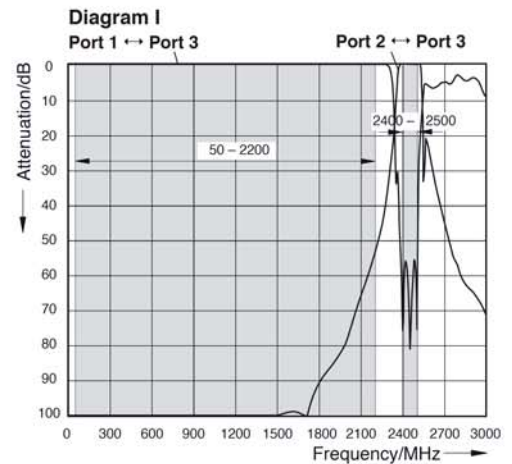


Technical Data

Type No.	782 10264
Pass band Band 1 Band 2	50 - 2200 MHz 2400 - 2500 MHz
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB (50 - 2200 MHz) < 0.2 dB (2400 - 2500 MHz)
Isolation Port 1 ↔ Port 2	> 50 dB (50 - 2200 / 2400 - 2500 MHz)
VSWR	< 1.25 (50 - 2200 / 2400 - 2500 MHz)
Impedance	50 Ω
Input power Band 1 Band 2	< 200 W < 200 W
Intermodulation products	< -150 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +55 °C
Connectors	N female
Application	Indoor
Special features	Built-in DC stop between ports 2 and 3 DC by-pass between ports 1 and 3 (max. 2500 mA)
Mounting	With 4 screws (max. 4 mm diameter)
Weight	0.47 kg
Packing size	225 x 140 x 75 mm
Dimensions (w x h x d)	86 x 30.4 x 181.4 mm (including connectors and mounting feed)



Typical Attenuation Curves



Dual-Band Combiner

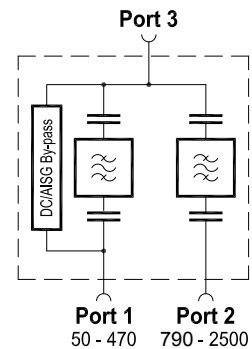
KATHREIN

Antennen · Electronic

50 - 470 MHz
PMR / TETRA / TETRAPOL

790 - 2500 MHz
CDMA 800 / GSM 900 / GSM 1800 / UMTS / WLAN

- 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.	782 10460
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)

Typical Attenuation Curves

Diagram I

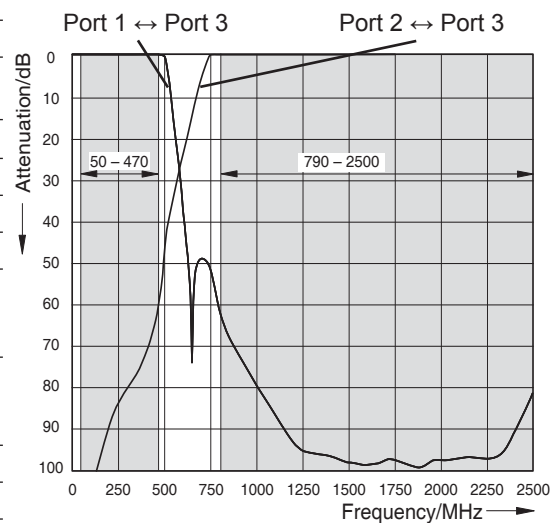
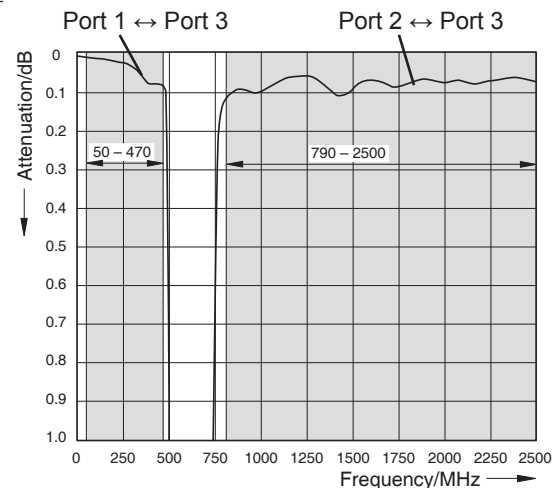


Diagram II



Dual-Band Combiner

KATHREIN

Antennen · Electronic

790 - 862 MHz
LTE 800

880 - 960 MHz
GSM 900

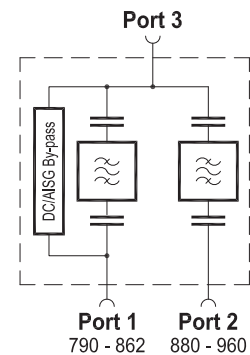
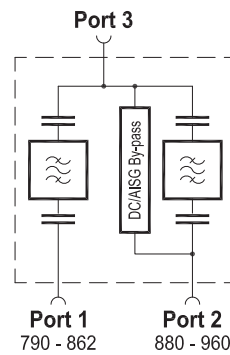
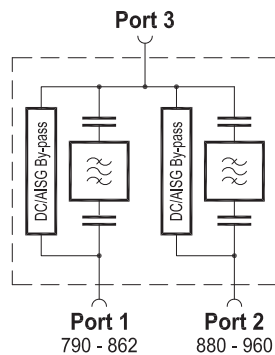
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning 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: 2.7 kg / Double Unit: 5.3 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)		

Dual-Band Combiner

KATHREIN

Antennen · Electronic

790 - 862 MHz
LTE 800

880 - 960 MHz
GSM 900

Typical Attenuation Curves

Diagram I

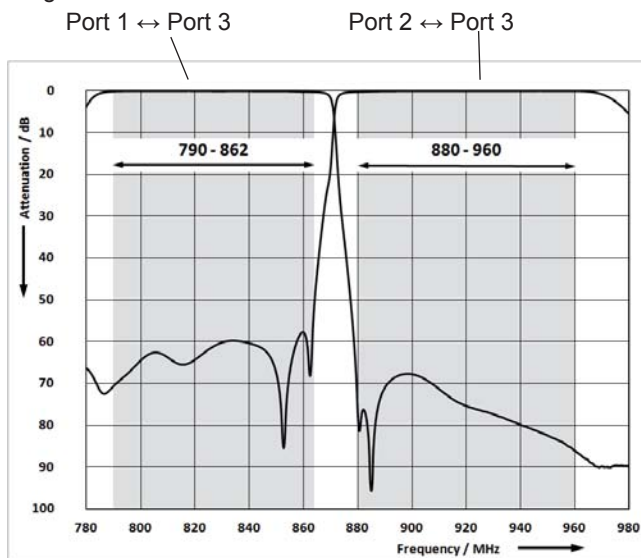
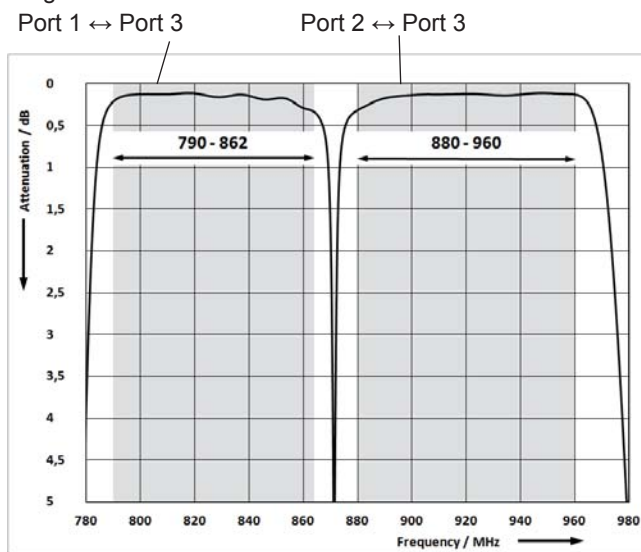


Diagram II



- **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".

Dual-Band Combiner

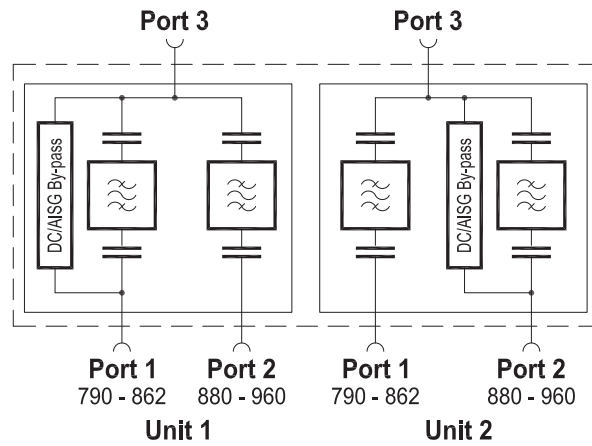
KATHREIN

Antennen · Electronic

790 - 862 MHz
LTE 800

880 - 960 MHz
GSM 900

- 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 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	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	5.3 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)	

Dual-Band Combiner

790 - 862 MHz
LTE 800

880 - 960 MHz
GSM 900

Typical Attenuation Curves

Diagram I

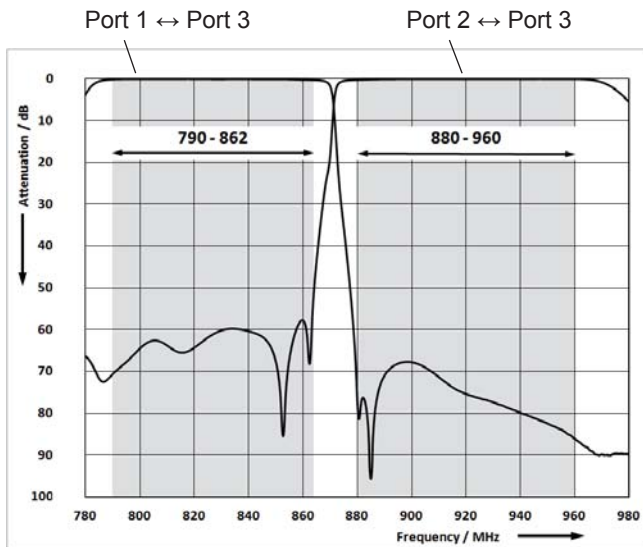
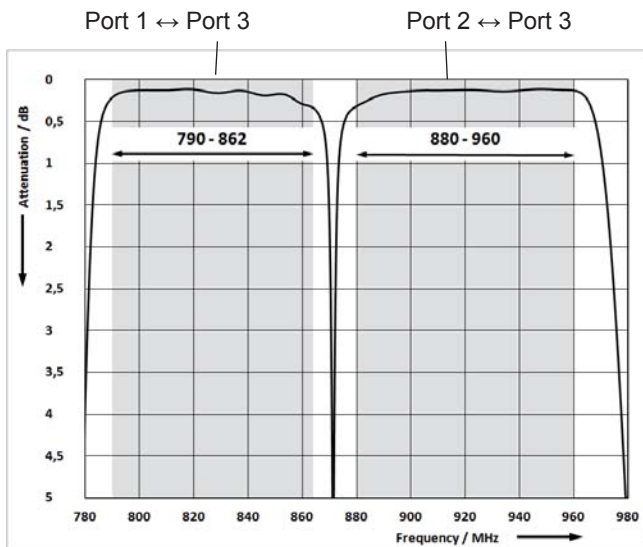
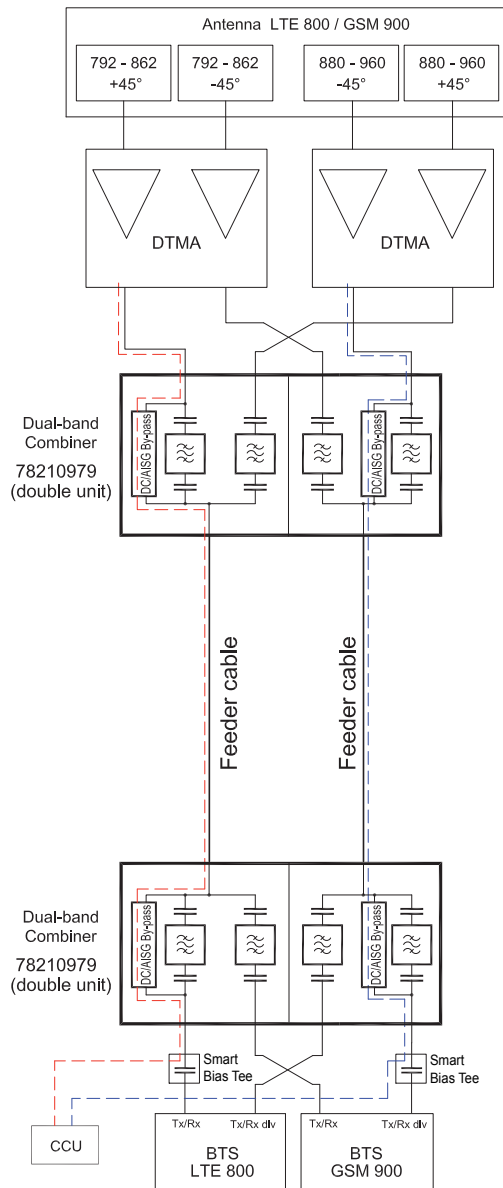


Diagram II



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".

Dual-Band Combiner

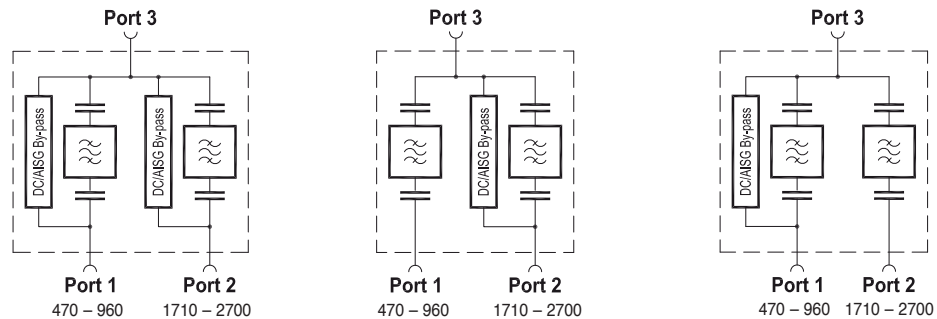
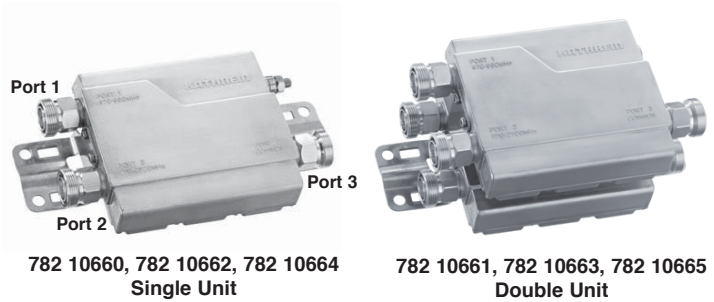
KATHREIN

Antennen · Electronic

470 - 960 MHz
LTE 800 / CDMA 850 / GSM 900

1710 - 2700 MHz
GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

- 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/ASG 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)		

Dual-Band Combiner

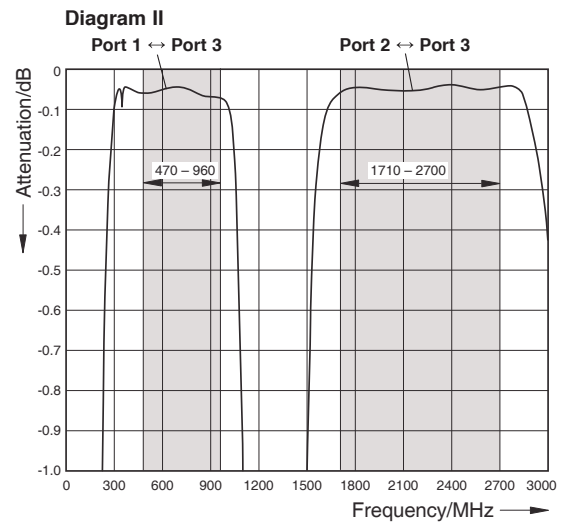
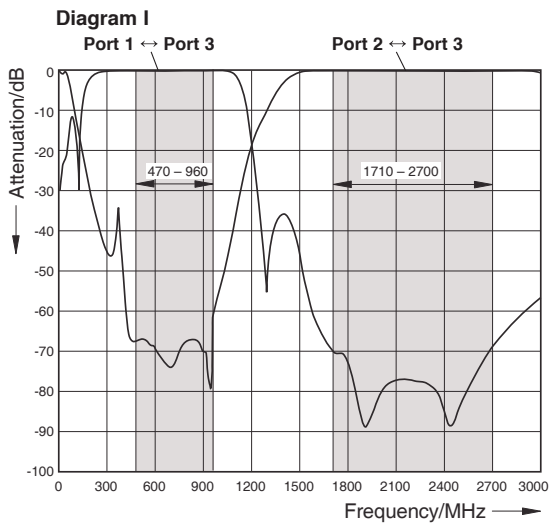
KATHREIN

Antennen · Electronic

470 - 960 MHz
LTE 800 / CDMA 850 / GSM 900

1710 - 2700 MHz
GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

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".

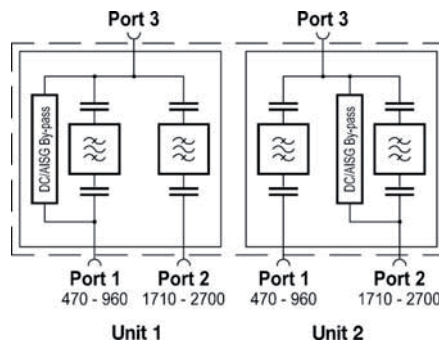
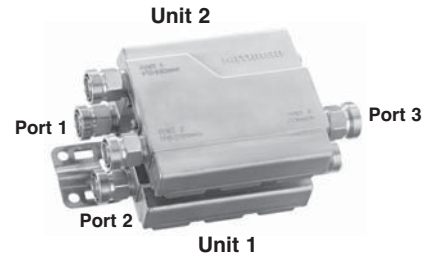
Dual-Band Combiner

KATHREIN

Antennen · Electronic

470 - 960 MHz DVB-H / CDMA 850 / GSM 900	1710 - 2700 MHz GSM 1800 / UMTS 2100 / WiMAX / LTE 2600
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- 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**



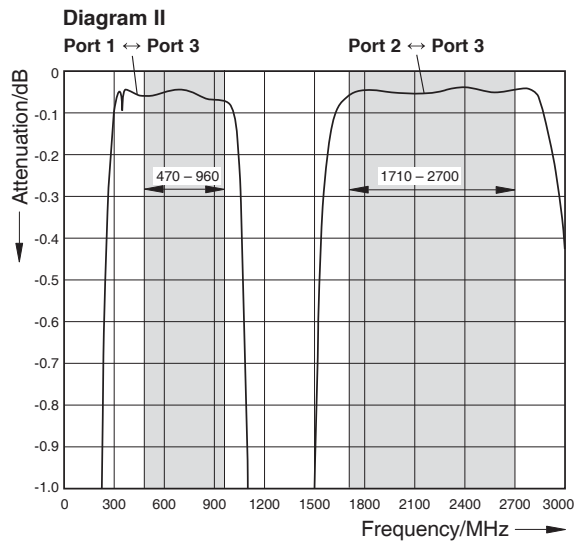
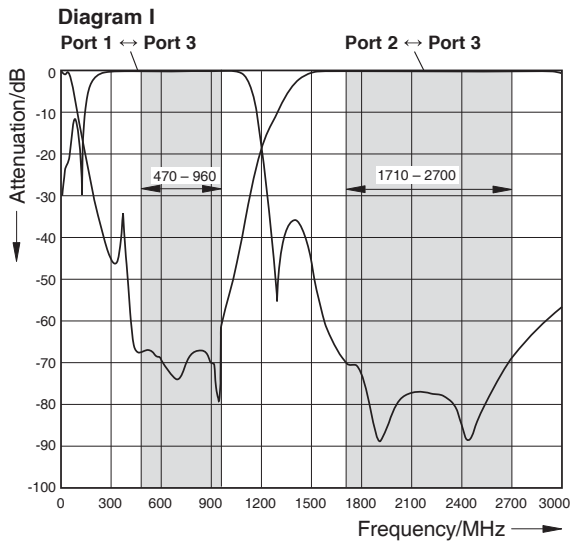
Technical Data

Type No.	78210669 Double Unit	
Pass band		
Band 1	470 - 960 MHz	
Band 2	1710 - 2700 MHz	
Insertion loss		
Port 1 ↔ Port 3	< 0.1 dB (470 - 960 MHz)	
Port 2 ↔ Port 3	< 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	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)	

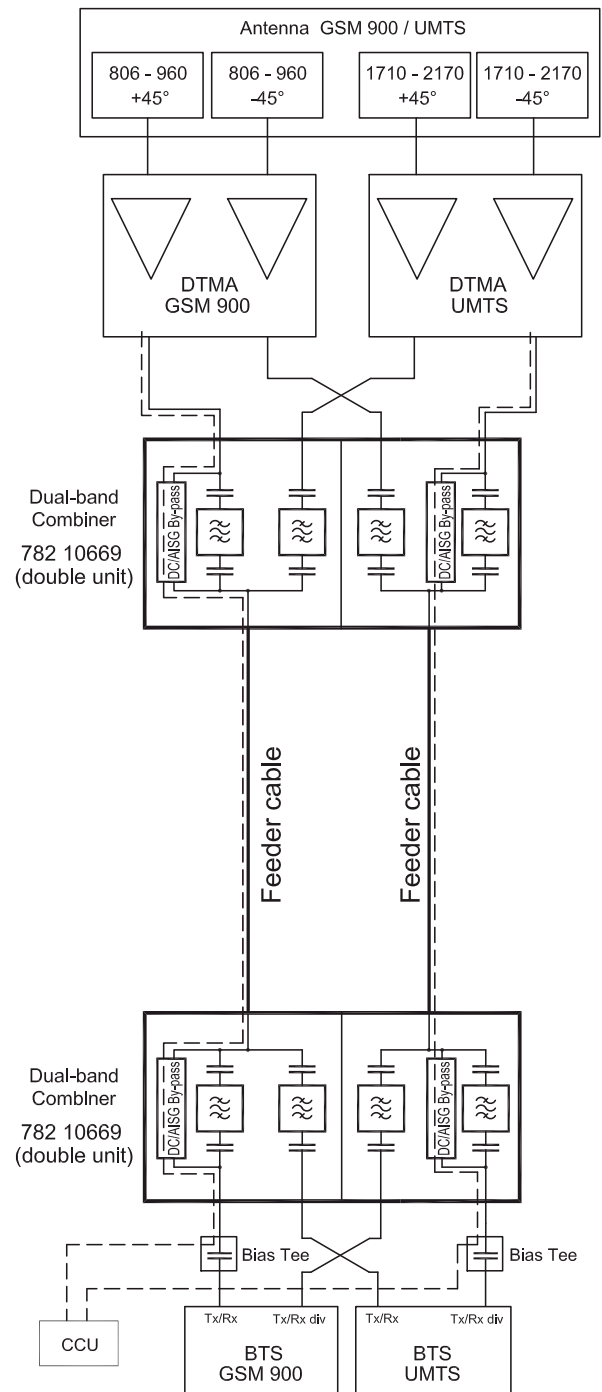
Dual-Band Combiner

470 - 960 MHz DVB-H / CDMA 850 / GSM 900	1710 - 2700 MHz GSM 1800 / UMTS 2100 / WiMAX / LTE 2600
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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".

Dual-Band Combiner

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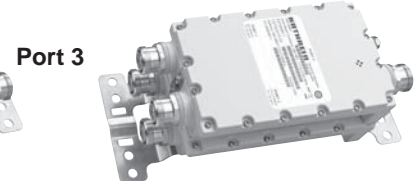
380 - 960 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900

1710 - 2700 MHz
GSM1800 / UMTS 2100 / WiMAX / LTE 2600

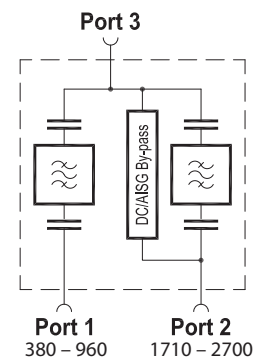
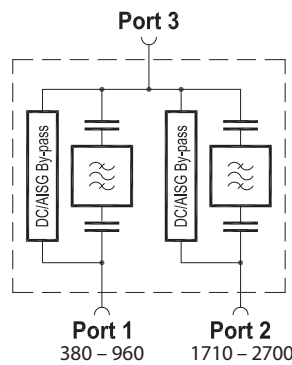
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning 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)	

Dual-Band Combiner

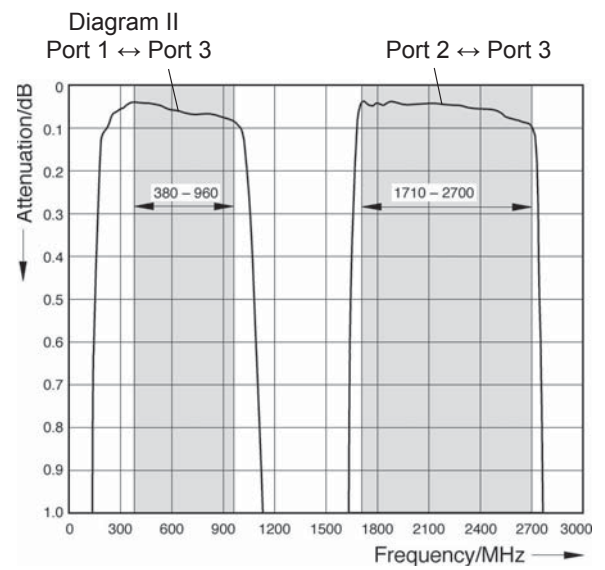
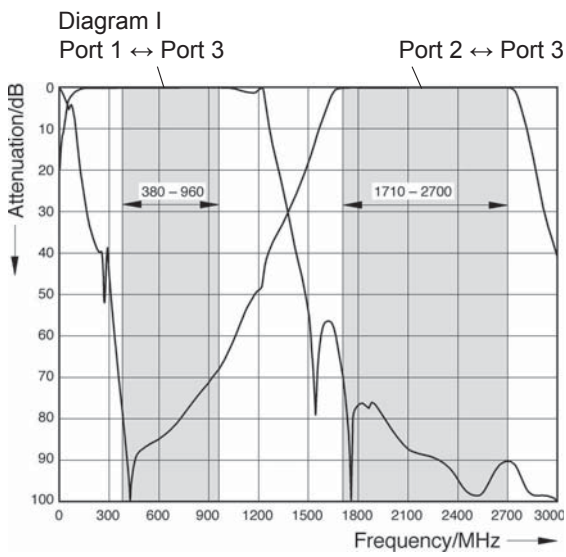
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Antennen · Electronic

380 - 960 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900

1710 - 2700 MHz
GSM 1800 / UMTS 2100 / WiMAX / LTE 2600

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

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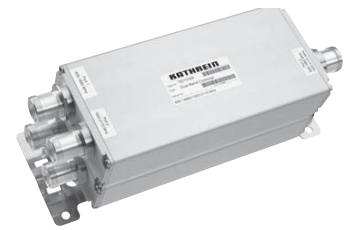
790 - 1880 MHz
LTE 800 / CDMA 850 / GSM 900 / GSM 1800

1920 - 2170 MHz
UMTS 2100

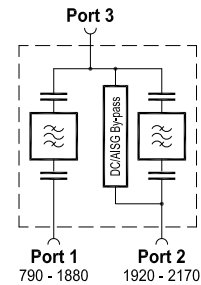
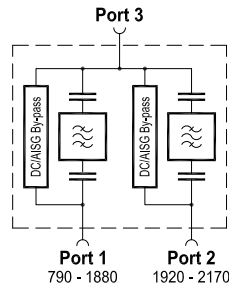
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC Stop available as an accessory



782 10278, 782 10305
Single Unit



782 10279, 782 10306
Double Unit



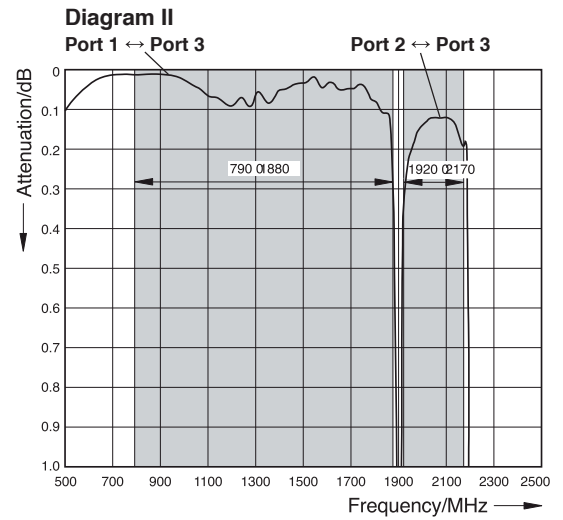
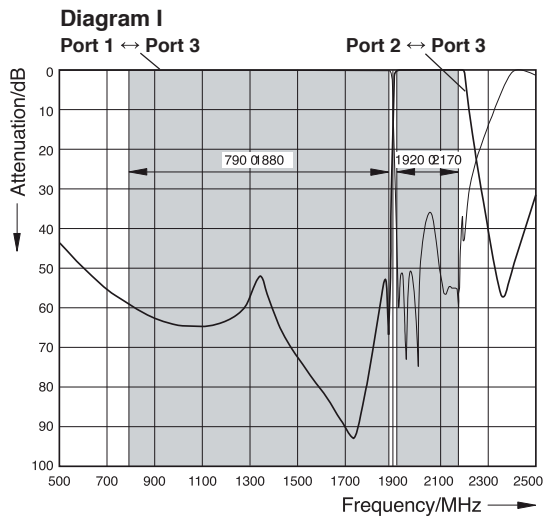
Technical Data

Type No.	782 10278 Single Unit	782 10305 Single Unit
	782 10279 Double Unit	782 10306 Double Unit
Pass band Band 1 Band 2	790 – 1880 MHz 1920 – 2170 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.1 dB, typically 0.05 dB (790 – 960 MHz) / < 0.4 dB, typically 0.2 dB (1710 – 1880 MHz) < 0.4 dB, typically 0.2 dB (1920 – 2170 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (790 – 960 MHz) > 50 dB (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	50 Ω	
Input power Band 1 / Band 2	< 500 W / < 500 W	
Intermodulation products	< –160 dBc (2 nd /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: 3.4 kg / Double Unit: 6.6 kg	
Packing size	Single Unit: 207 x 437 x 154 mm / Double Unit: 207 x 437 x 214 mm	
Dimensions (w x h x d)	Single Unit: 130 x 269.9 x 43 mm / Double Unit: 130 x 269.9 x 98.5 mm (without connectors, without mounting brackets)	

790 - 1880 MHz
 LTE 800 / CDMA 850 / GSM 900 / GSM 1800

1920 - 2170 MHz
 UMTS 2100

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

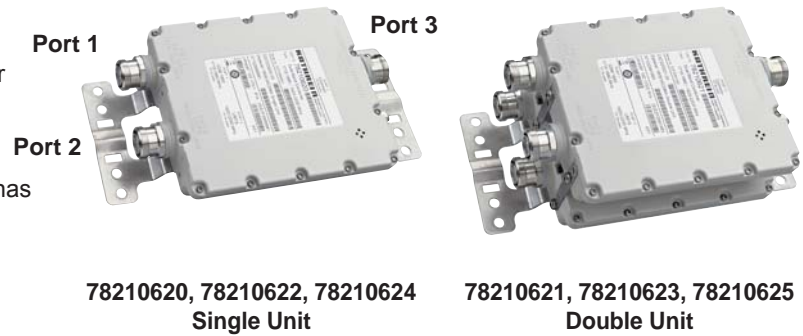
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Antennen · Electronic

1710 - 1880 MHz
GSM 1800

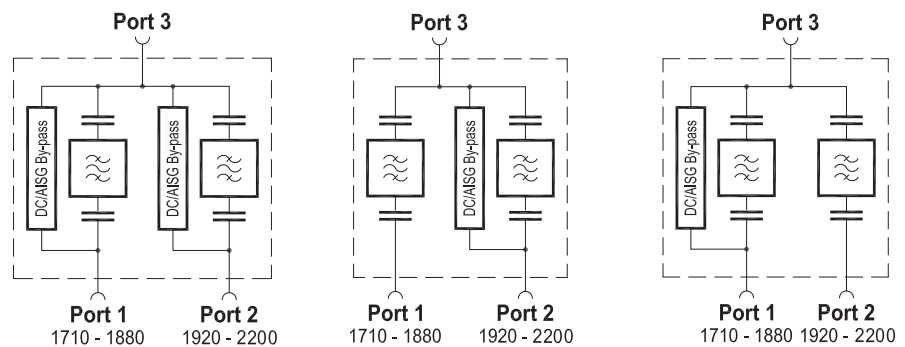
1920 - 2200 MHz
UMTS 2100

- 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



78210620, 78210622, 78210624
Single Unit

78210621, 78210623, 78210625
Double Unit



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)	1710 - 1880 MHz 1920 - 2200 MHz		
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2200 MHz)		
Isolation Port 1 ↔ Port 2	> 55 dB (1710 – 1880) / > 50 dB (1920 – 2200 MHz)		
VSWR	< 1.2 (1710 – 1880) / (1920 – 2200 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	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: 2.2 kg / Double Unit: 4.3 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: 163.5 x 195.3 x 46 mm / Double Unit: 163.5 x 195.3 x 102 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN

Antennen · Electronic

1710 - 1880 MHz
GSM 1800

1920 - 2200 MHz
UMTS 2100

Typical Attenuation Curves

Diagram I

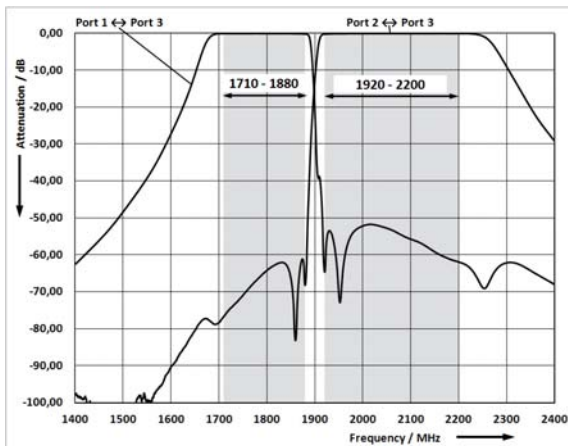
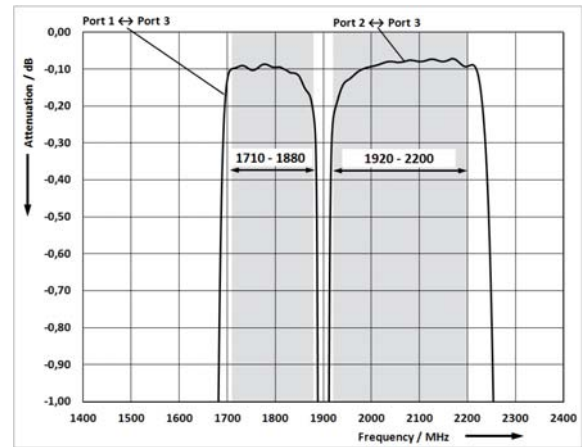


Diagram II



- **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".

Dual-Band Combiner

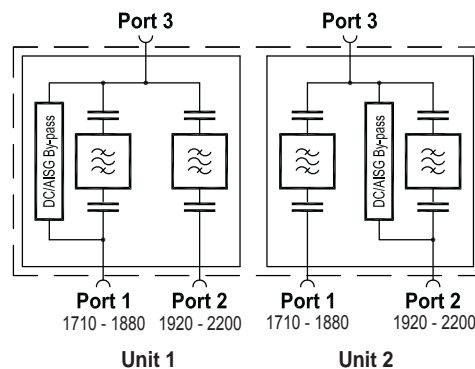
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Antennen · Electronic

1710 - 1880 MHz
GSM 1800

1920 - 2200 MHz
UMTS 2100

- 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) Band 2 (UMTS)	1710 - 1880 MHz 1920 - 2200 MHz	
Insertion loss Port 1 ↔ Port 3 Port 2 ↔ Port 3	< 0.3 dB (1710 – 1880 MHz) < 0.3 dB (1920 – 2200 MHz)	
Isolation Port 1 ↔ Port 2	> 55 dB (1710 – 1880 MHz) / > 50 dB (1920 – 2200 MHz)	
VSWR	< 1.2 (1710 – 1880) / (1920 – 2200 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	4.3 kg	
Packing size	392 x 272 x 189 mm	
Dimensions (w x h x d)	163,5 x 195,3 x 102 mm (without connectors, without mounting brackets)	

Dual-Band Combiner

1710 - 1880 MHz
GSM 1800

1920 - 2200 MHz
UMTS 2100

Typical Attenuation Curves

Diagram I

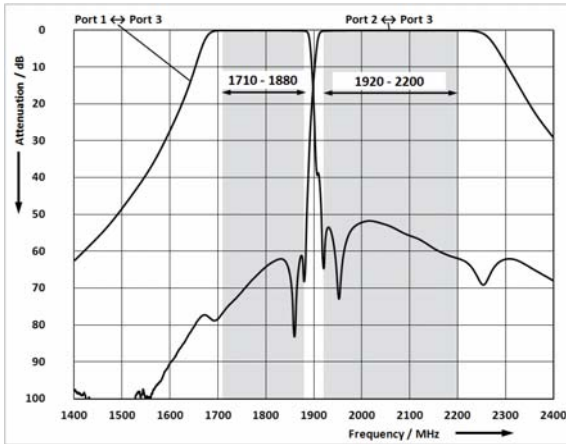
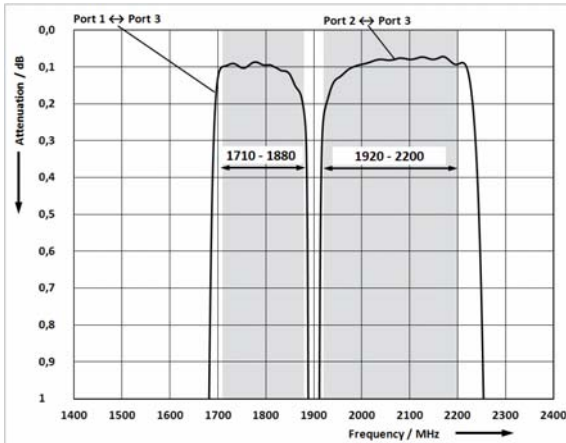
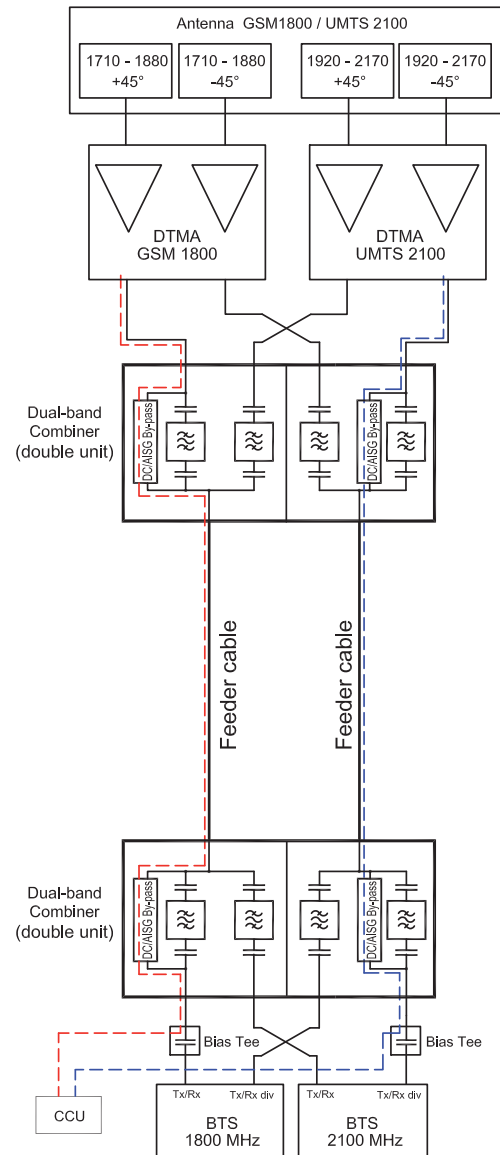


Diagram II



Application Example



- 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".

Dual-Band Combiner

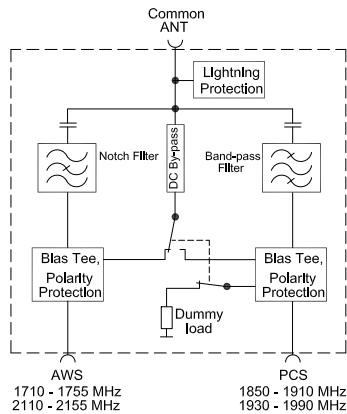
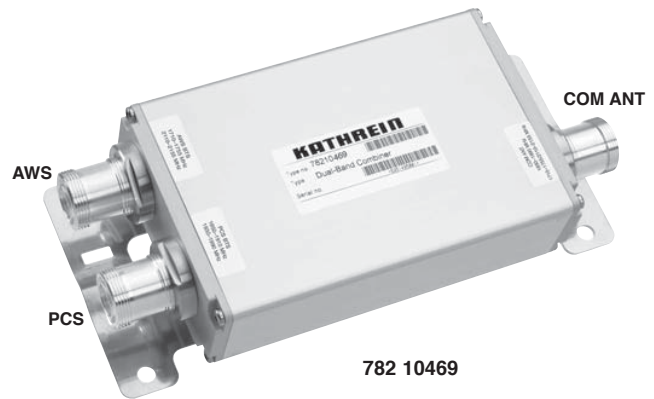
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Antennen · Electronic

1850 - 1910 / 1930 - 1990 MHz
PCS

1710 - 1755 / 2110 - 2155 MHz
AWS

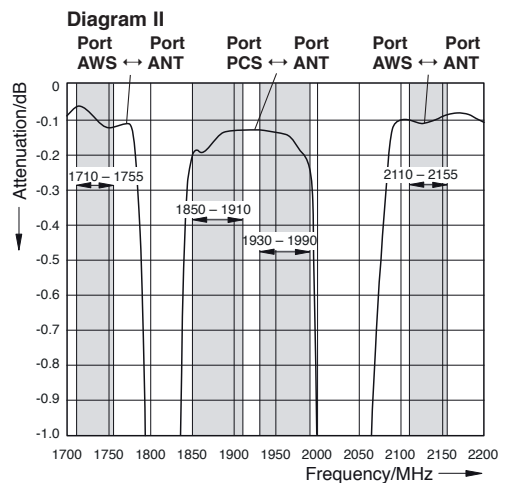
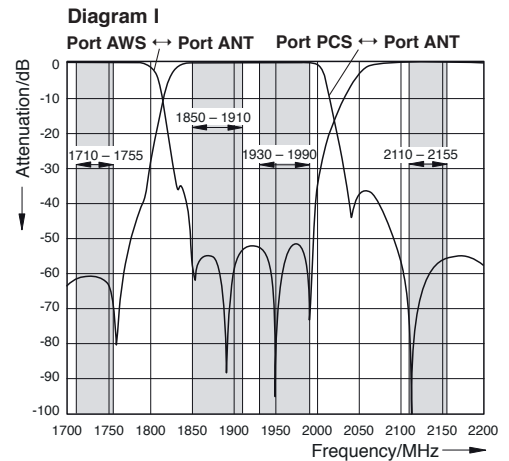
- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor or outdoor applications
- With fault detection and integrated switch for multiple DC power supply



Technical Data

Type No.	782 10469 Single unit	782 10808 Double unit
Pass band PCS AWS	1850 – 1910 (Rx) / 1930 – 1990 (Tx) MHz 1710 – 1755 (Rx) / 2110 – 2155 (Tx) MHz	
Insertion loss Port PCS ↔ Port ANT Port AWS ↔ Port ANT	< 0.3 dB (1850 – 1910 / 1930 – 1990 MHz) < 0.2 dB (1710 – 1755 / 2110 – 2155 MHz)	
Isolation Port PCS ↔ Port AWS	> 50 dB (1850 – 1910 / 1930 – 1990 MHz) > 50 dB (1710 – 1755 / 2110 – 2155 MHz)	
VSWR	< 1.25 (1850 – 1910 / 1930 – 1990 MHz) < 1.25 (1710 – 1755 / 2110 – 2155 MHz)	
Impedance	50 Ω	
Input power Port PCS Port AWS	< 250 W (1850 – 1910 / 1930 – 1990 MHz) < 250 W (1710 – 1755 / 2110 – 2155 MHz)	
Intermodulation products	< –160 dBc (3 rd order; with 2 x 20 W)	
Power supply voltage operational	+10 ... +15 V DC (Port PCS) +10 ... +30 V DC (Port AWS)	
survival	+10 ... +35 V DC	
Polarity protection	–48 V DC (Port PCS, Port AWS)	
Max. Current	1.5 A (Port ANT)	
Power supply current at PCS port operating with dummy load	100 mA ±20mA (+10 ... +15 V DC)	
Lightning protection	8/20 μs, 20 kA; 10/350 μs, 3 kA (Port ANT)	
Temperature range	–40 ... +65 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
Weight	2.5 kg	5 kg
Dimensions (w x h x d)	122 x 296 x 64 mm	122 x 296 x 120 mm (including mounting brackets)

Typical Attenuation Curves



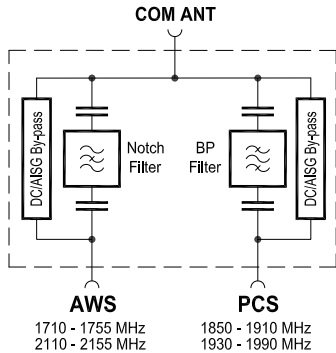
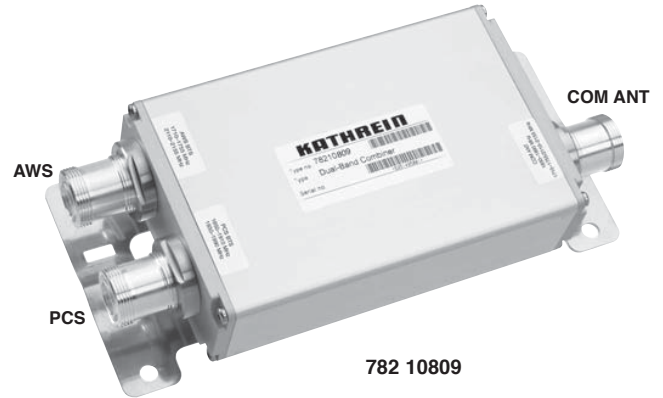
Dual-Band Combiner

KATHREIN

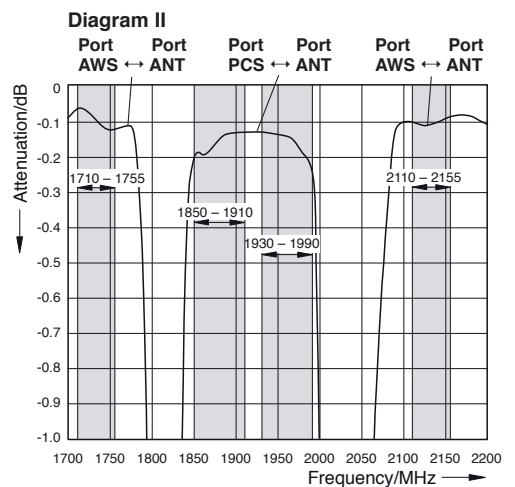
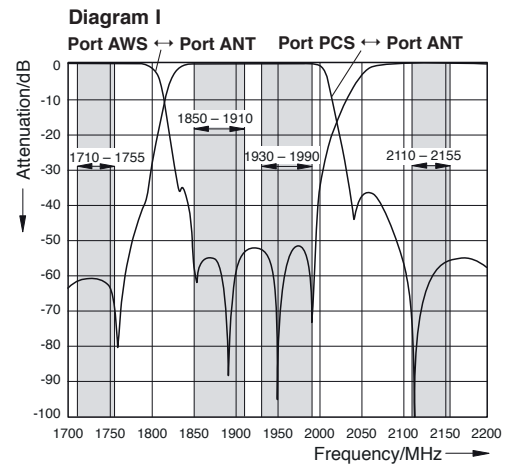
Antennen · Electronic

1850 - 1910 / 1930 - 1990 MHz PCS	1710 - 1755 / 2110 - 2155 MHz AWS
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- Designed for co-siting purposes
- Enables feeder sharing
- Suitable for indoor or outdoor applications
- DC by-pass between all ports
- External DC stop available as an accessory



Typical Attenuation Curves



Technical Data

Type No.	782 10809 Single unit	782 10810 Double unit
Pass band PCS AWS	1850 – 1910 (Rx) / 1930 – 1990 (Tx) MHz 1710 – 1755 (Rx) / 2110 – 2155 (Tx) MHz	
Insertion loss Port PCS ↔ Port ANT Port AWS ↔ Port ANT	< 0.3 dB (1850 – 1910 / 1930 – 1990 MHz) < 0.2 dB (1710 – 1755 / 2110 – 2155 MHz)	
Isolation Port PCS ↔ Port AWS	> 50 dB (1850 – 1910 / 1930 – 1990 MHz) > 50 dB (1710 – 1755 / 2110 – 2155 MHz)	
VSWR	< 1.25 (1850 – 1910 / 1930 – 1990 MHz) < 1.25 (1710 – 1755 / 2110 – 2155 MHz)	
Impedance	50 Ω	
Input power Port PCS Port AWS	< 250 W (1850 – 1910 / 1930 – 1990 MHz) < 250 W (1710 – 1755 / 2110 – 2155 MHz)	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Lightning protection	3 kA, 10/350 μs pulse	
Temperature range	-40 ... +65 °C	
Connectors	7-16 female (long neck)	
Application	Indoor or outdoor (IP 66)	
DC/AISG transparency	By-pass between all ports (max. 2500 mA)	
Weight	2.5 kg	5 kg
Dimensions (w x h x d)	122 x 296 x 64 mm	122 x 296 x 120 mm (including mounting brackets)

Dual-Band Combiner

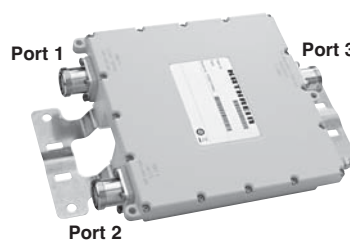
KATHREIN

Antennen · Electronic

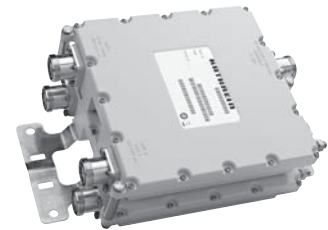
1710 - 2180 MHz
GSM1800 / PCS1900 / AWS / UMTS2100

2400 - 2700 MHz
WLAN / WiMAX / BRS / LTE2600

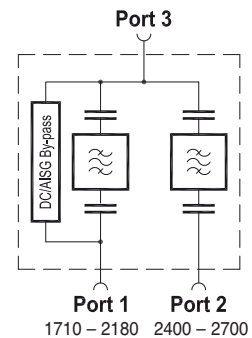
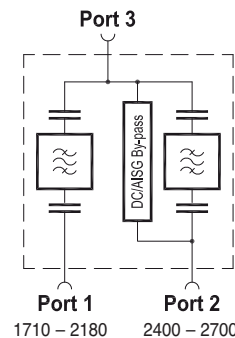
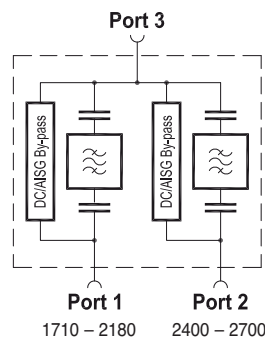
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection
- External DC stop available as an accessory
- **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 Band 2	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	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: 2.9 kg / Double Unit: 5.7 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: 199 x 199 x 44 mm / Double Unit: 199 x 199 x 95 mm (without connectors, without mounting brackets)		

Dual-Band Combiner

KATHREIN

Antennen · Electronic

1710 - 2180 MHz
GSM1800 / PCS1900 / AWS / UMTS2100

2400 - 2700 MHz
WLAN / WiMAX / BRS / LTE2600

Typical Attenuation Curves

Diagram I

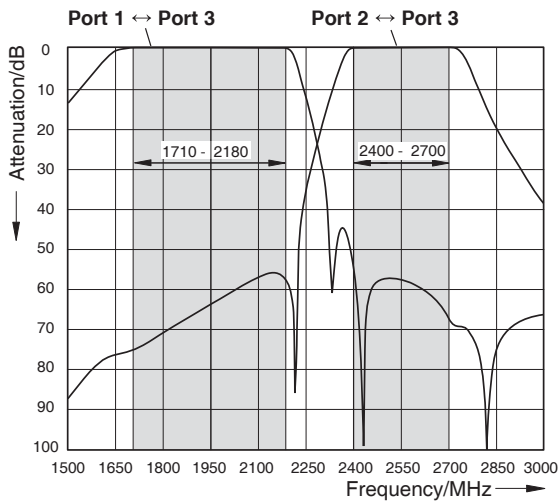
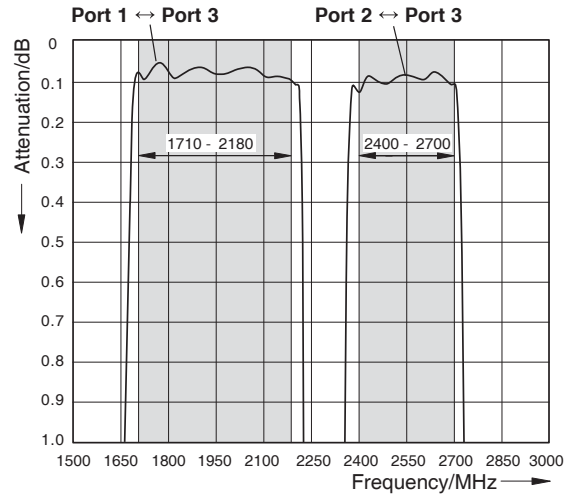


Diagram II



- **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".

Dual-Band Combiner

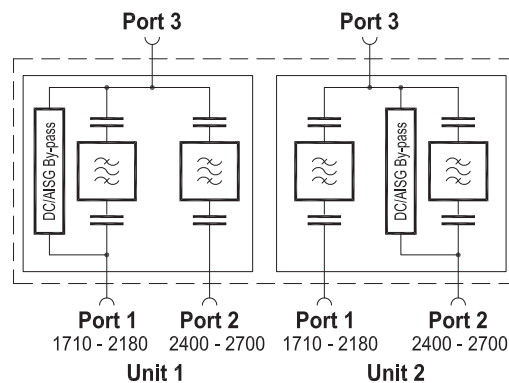
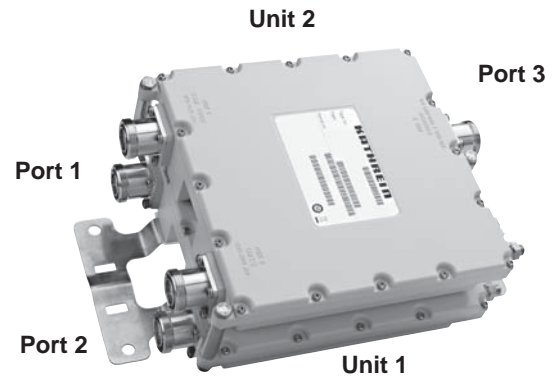
KATHREIN

Antennen · Electronic

1710 - 2180 MHz
GSM 1800 / PCS 1900 / AWS / UMTS 2100

2400 - 2700 MHz
WLAN / WiMAX / BRS / LTE 2600

- 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	< 1.2 (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)	

Dual-Band Combiner

1710 - 2180 MHz
GSM 1800 / PCS 1900 / AWS / UMTS 2100

2400 - 2700 MHz
WLAN / WiMAX / BRS / LTE 2600

Typical Attenuation Curves

Diagram I

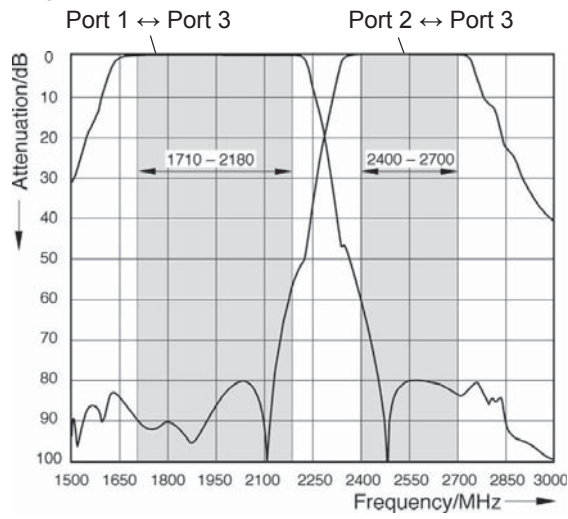
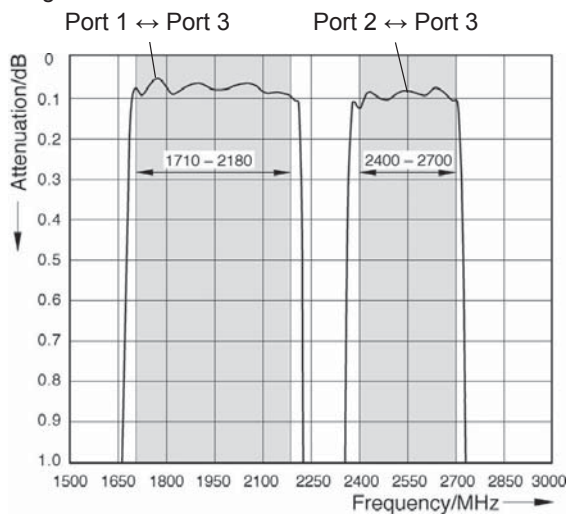
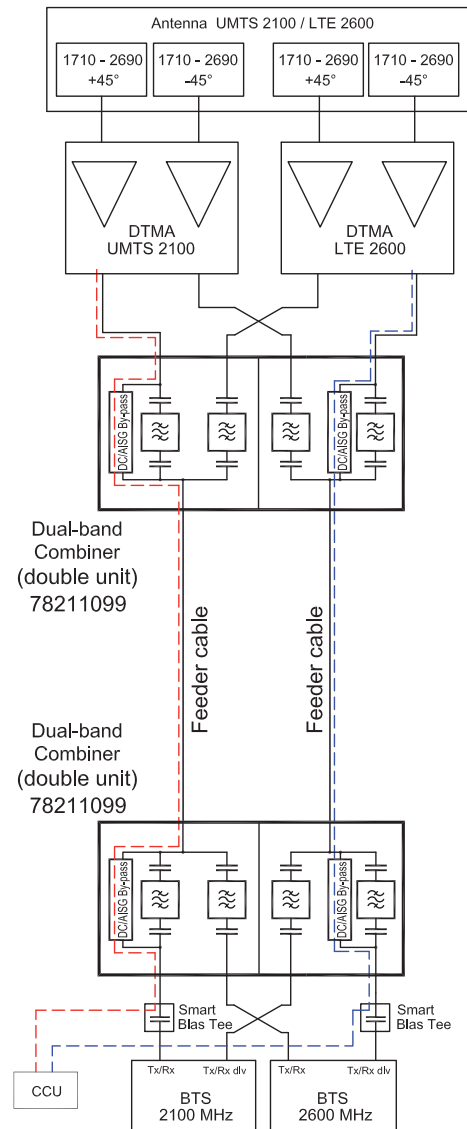


Diagram II



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".

Dual-Band Combiner

KATHREIN

Antennen · Electronic

380 (690) - 2180 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100

2400 - 2700 MHz
WiMAX / LTE 2600

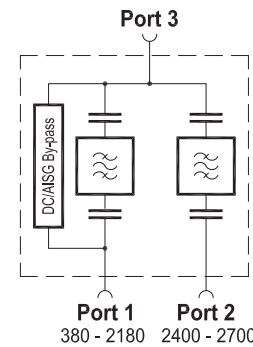
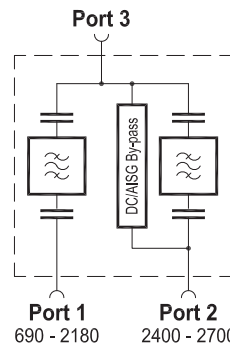
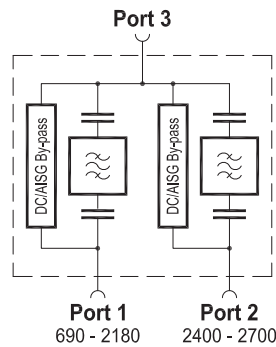
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning 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



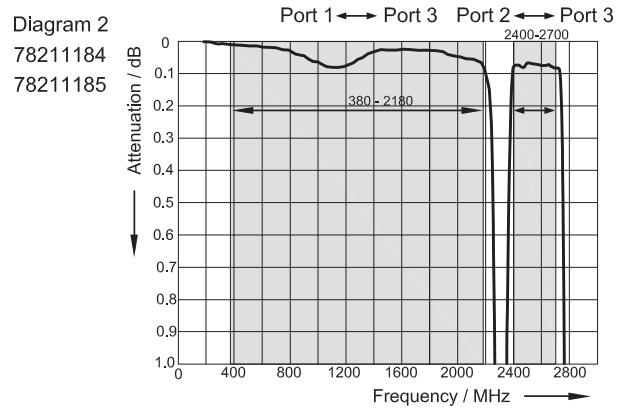
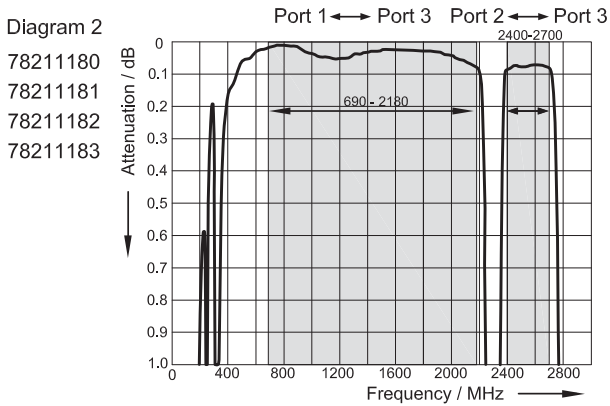
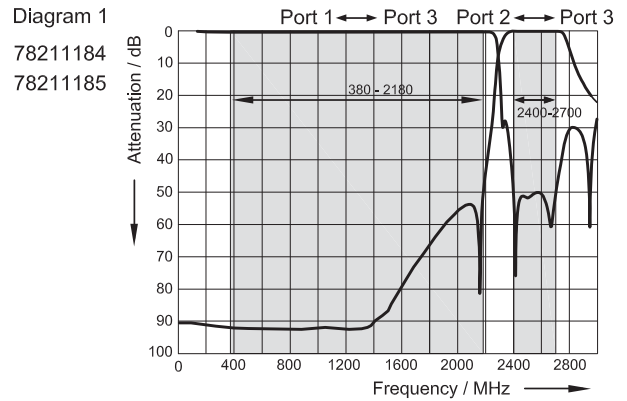
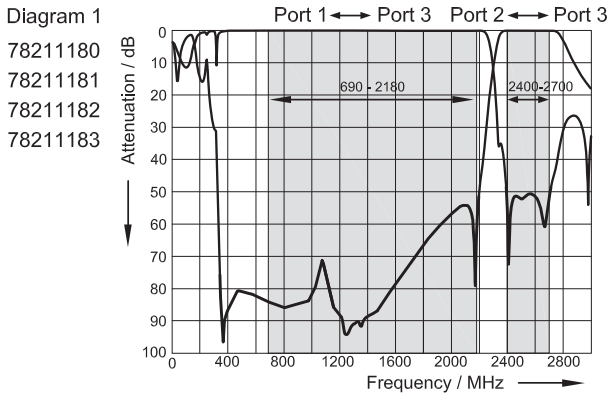
Technical Data

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
 TETRA / LTE 800 / CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100

2400 - 2700 MHz
 WiMAX / LTE 2600

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

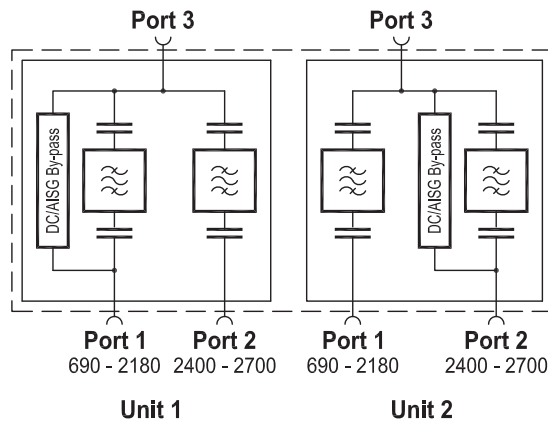
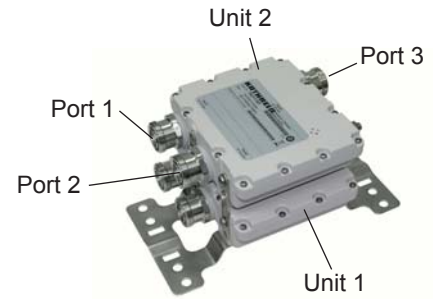
KATHREIN

Antennen · Electronic

690 - 2180 MHz
LTE 800 / CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100

2400 - 2700 MHz
WiMAX / LTE 2600

- 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.	78211189 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 (3rd 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)	

Dual-Band Combiner

690 - 2180 MHz

LTE 800 / CDMA 850 / GSM 900 / GSM 1800 / UMTS 2100

2400 - 2700 MHz

WiMAX / LTE 2600

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Antennen · Electronic

Typical Attenuation Curves

Diagram 1

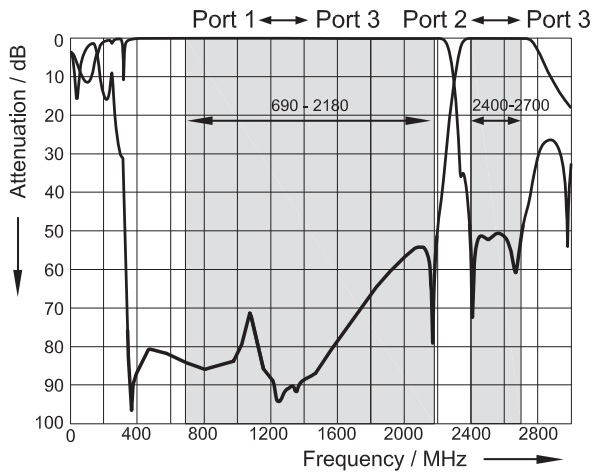
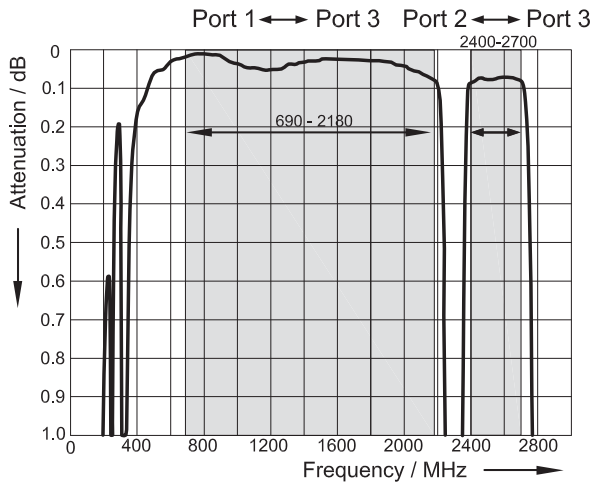
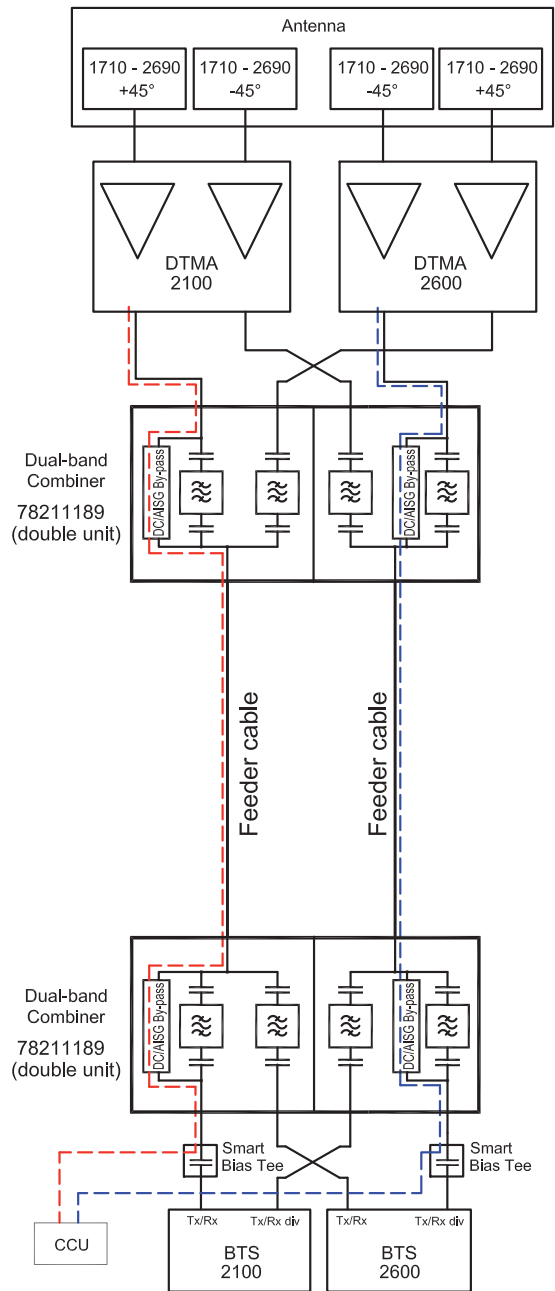


Diagram 2



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".

Triple-Band Combiner

KATHREIN

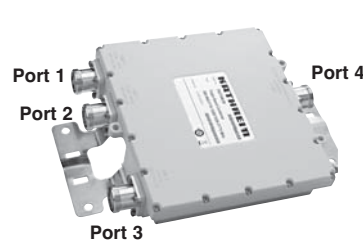
Antennen · Electronic

380 -960 MHz
TETRA, LTE800, CDMA 850, GSM 900

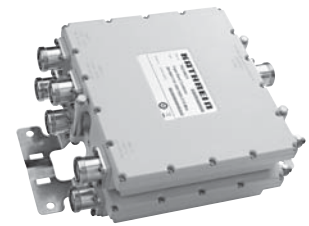
1710 - 1880 MHz
GSM 1800

1920 - 2170 MHz
UMTS 2100

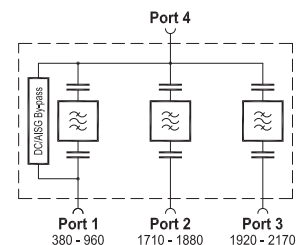
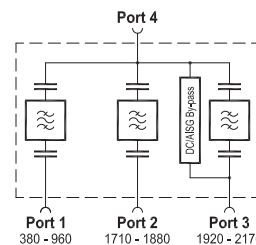
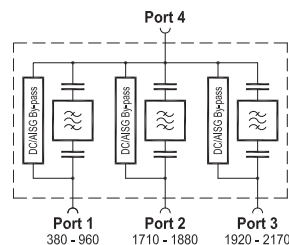
- Designed for co-siting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning 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 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)	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)		

Dual-Band Combiner

KATHREIN

Antennen · Electronic

380 - 960 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900

1710 - 1880 MHz
GSM 1800

1920 - 2170 MHz
UMTS 2100

Typical Attenuation Curves

Diagram I

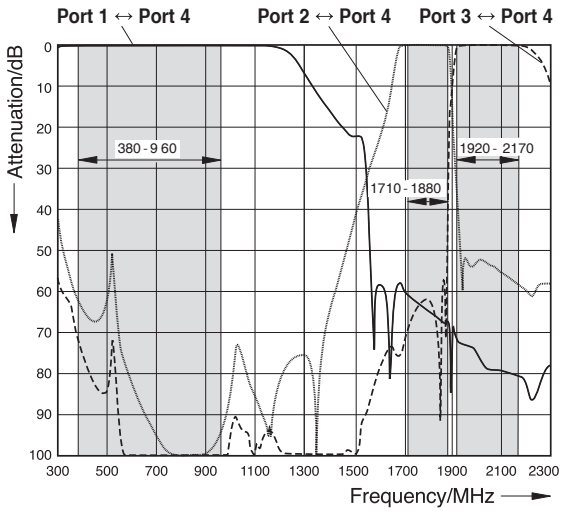
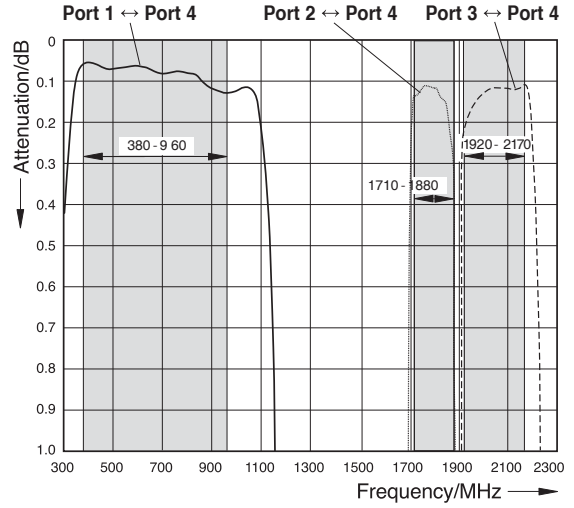


Diagram II



- **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".

Triple-Band Combiner

KATHREIN

Antennen · Electronic

790 - 960 MHz
LTE 800/ CDMA 850 / GSM 900

1710 - 2180 MHz
GSM 1800 / UMTS 2100

2490 - 2690 MHz
LTE 2600

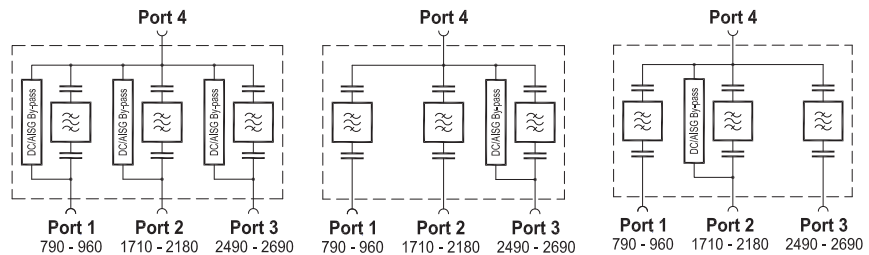
- Designed for co-sitting purposes
- Enables feeder sharing
- Can be used as a combiner near the BTS or in a reciprocal function near the antenna
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Available as a single unit, or for XPol antennas as a double unit
- Built-in lightning protection



**78211130, 78211132, 78211134,
Single Unit**



**78211131, 78211133, 78211135,
Double Unit**



Technical Data

Type No.	78211130 Single Unit	78211132 Single Unit	78211134 Single Unit
	78211131 Double Unit	78211133 Double Unit	78211135 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/ASIS 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)	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 kg / Double unit: 5.4 kg		
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)		

Triple-Band Combiner

KATHREIN

Antennen · Electronic

790 - 960 MHz
LTE 800/ CDMA 850 / GSM 900

1710 - 2180 MHz
GSM 1800 / UMTS 2100

2490 - 2690 MHz
LTE 2600

Typical Attenuation Curves

Diagramm I

Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4

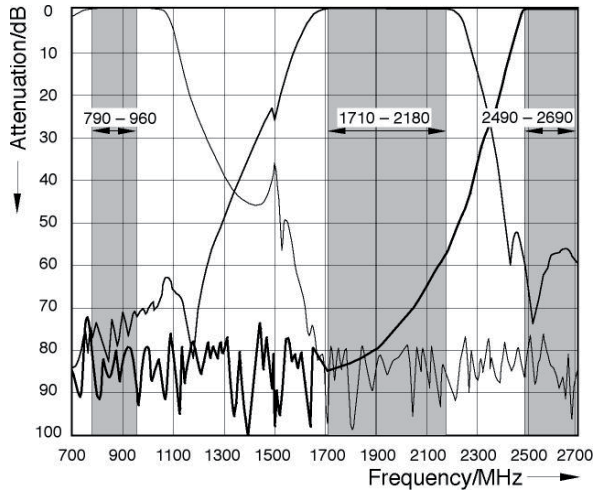
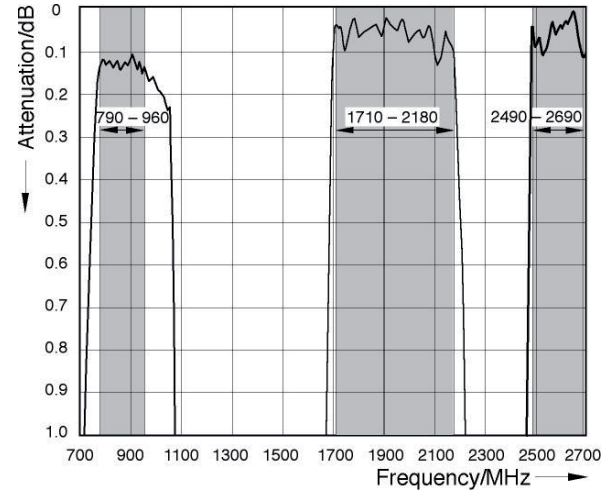


Diagramm II

Port 1 ↔ Port 4 Port 2 ↔ Port 4 Port 3 ↔ Port 4



- **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

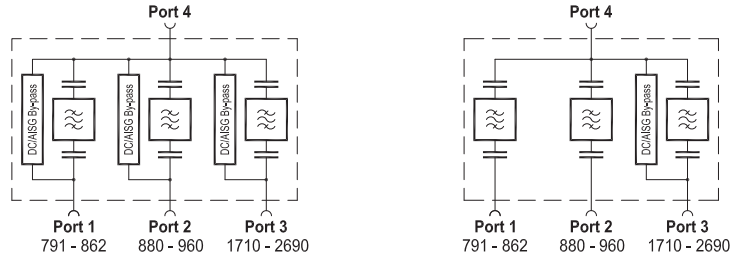
Antennen · Electronic

791 - 862 MHz
LTE 800

880 - 960 MHz
GSM 900

1710 - 2690 MHz
GSM 1800 / UMTS 2100 / LTE 2600

- 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)	

Triple-Band Combiner

KATHREIN

Antennen · Electronic

791 - 862 MHz
LTE 800

880 - 960 MHz
GSM 900

1710 - 2690 MHz
GSM 1800 / UMTS 2100 / LTE 2600

Typical Attenuation Curves

Diagram 1

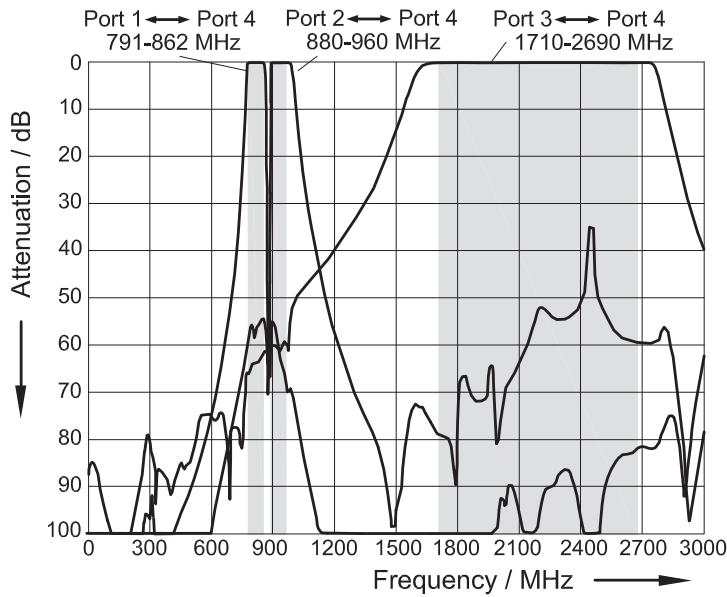
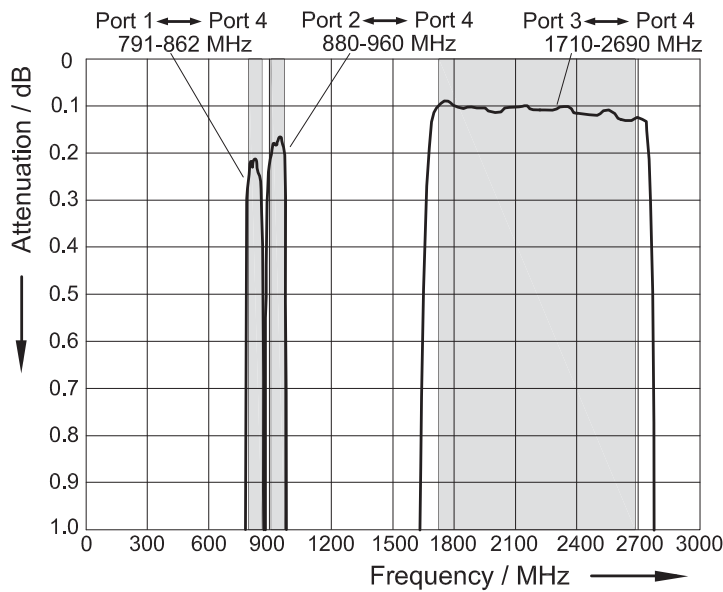


Diagram 2



- **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".

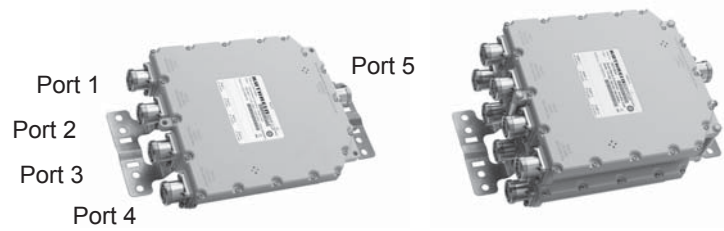
Quad-Band Combiner

KATHREIN

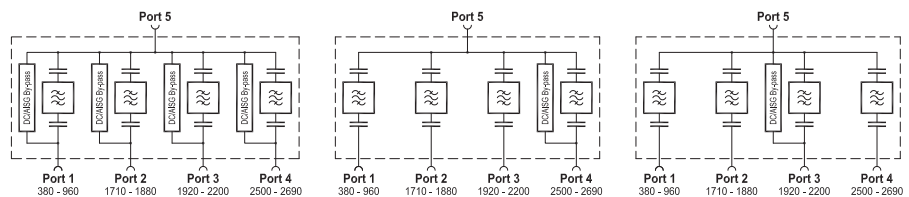
Antennen · Electronic

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600
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- 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)	

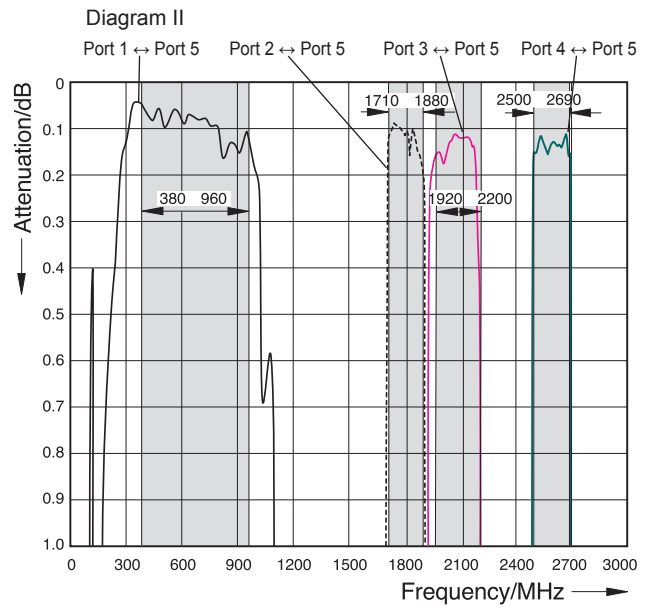
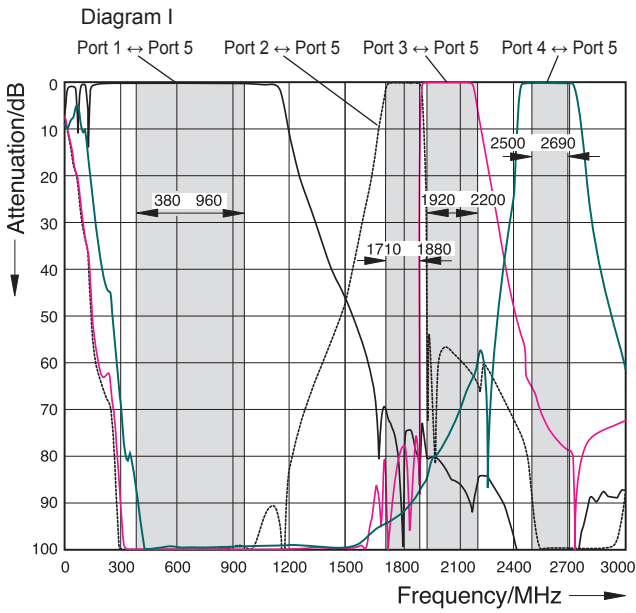
380 - 960 MHz
TETRA / LTE 800 / CDMA 850 / GSM 900

1710 - 1880 MHz
GSM 1800

1920 - 2200 MHz
UMTS 2100

2500 - 2690 MHz
LTE 2600

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".

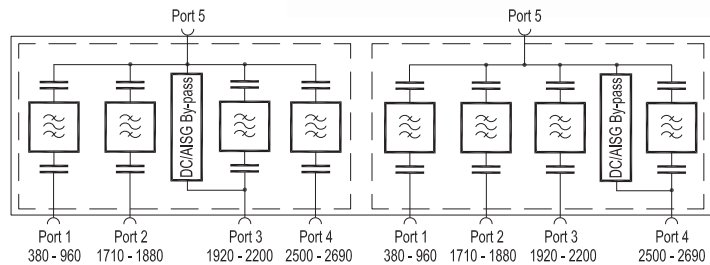
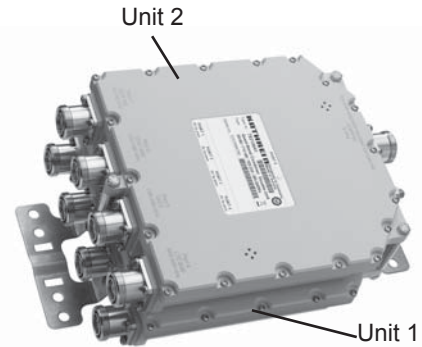
Quad-Band Combiner

KATHREIN

Antennen · Electronic

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600
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- 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)	

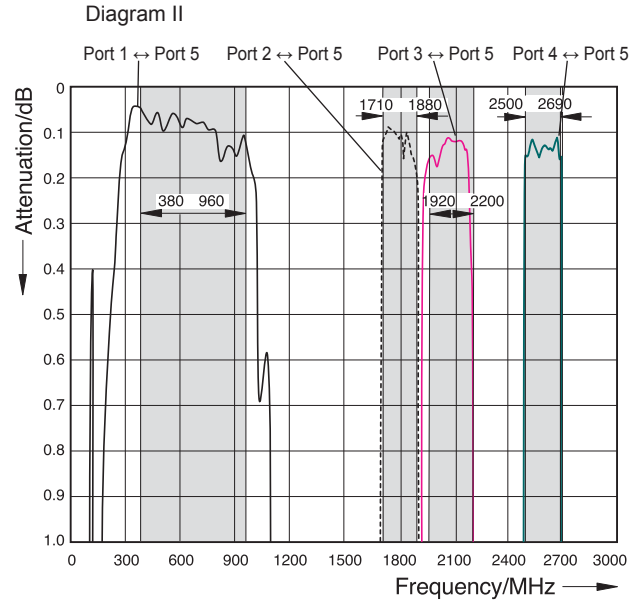
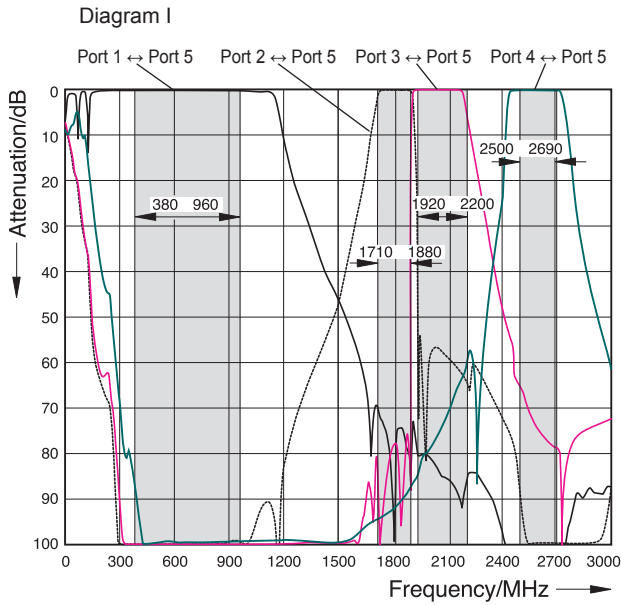
Quad-Band Combiner

KATHREIN

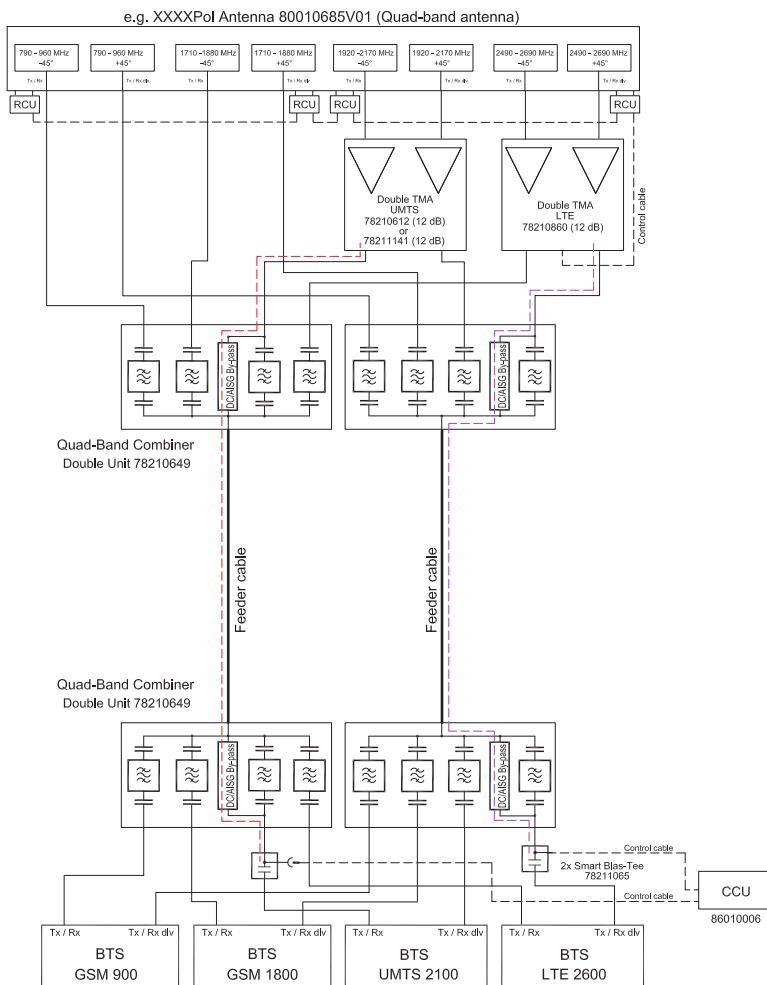
Antennen · Electronic

380 - 960 MHz TETRA / LTE 800 / CDMA 850 / GSM 900	1710 - 1880 MHz GSM 1800	1920 - 2200 MHz UMTS 2100	2500 - 2690 MHz LTE 2600
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Typical Attenuation Curves



Application Example

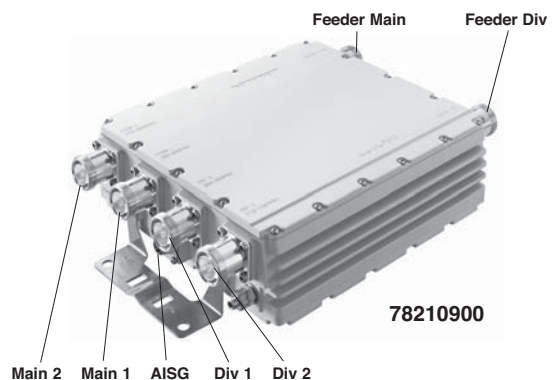
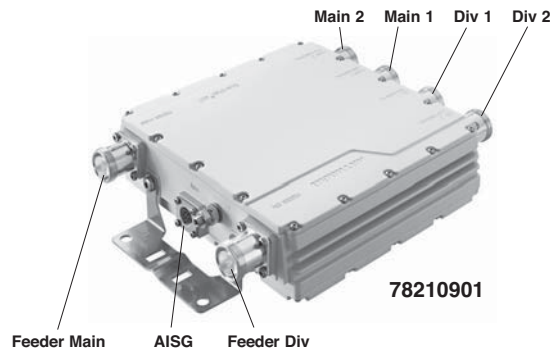


- **Clamp set** (type no. **734360 - 734365**) and
 - **50-Ohm load** (type no. **78410367**)
- (order separately) can be found in the section "System Components".

380 - 960 MHz
TETRA / LTE 800 / DD / CDMA / GSM 900

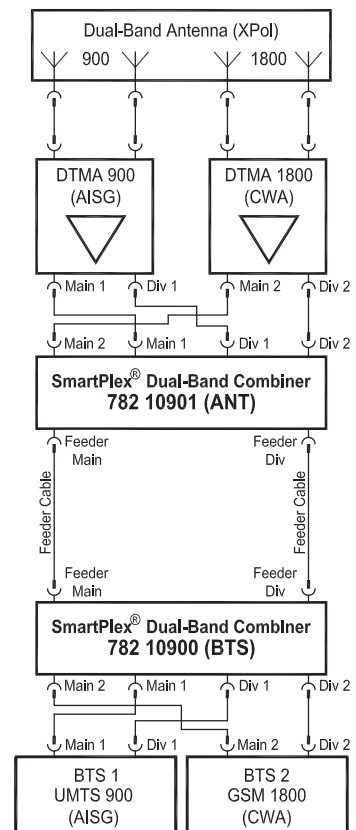
1710 - 2690 MHz
GSM / PCS / AWS / UMTS 2100 / LTE 2600

- Universal multi-protocol dual-band combiner
 - AISG 1.1
 - AISG 2.0
 - 3GPP
 - Current window alarming (CWA)
 - Vendor specific protocols
- Designed for co-siting purposes
- Enables feeder sharing
- **78210900:** For use near the base station (BTS), thereby converting different base station DC voltages into one common feeder DC voltage (**multi-BTS power supply handling**)
- **78210901:** For use near the antenna (ANT), thereby reproducing the base station DC voltages for the antenna line devices
- **Simultaneous** support of antenna line devices (TMAs, RET units)
- **Dynamic DC/AISG by-pass:** Automatic setting on each RF path according to the BTS and antenna line device requirements
- DC power supply either from BTS via RF path, or from an external source via AISG port (782 10900)
- Provides full **Smart Bias Tee functionality**
- Suitable for indoor or outdoor applications
- Wall or mast mounting
- Double unit in one housing for XPol antennas
- Built-in lightning protection
- Very low insertion loss
- High input power



Technical Data

Type No.	78210901 (ANT)	78210900 (BTS)
Pass band Band 1 / Band 2	380 – 960 / 1710 – 2690 MHz	
Insertion loss	< 0.2 dB, typically 0.15 dB (380 – 960 / 1710 – 2690 MHz)	
Isolation Main 1 ↔ Main 2 / Div 1 ↔ Div 2	> 60 dB (380 – 960 / 1710 – 2690 MHz)	
VSWR	< 1.22 (380 – 960 / 1710 – 2690 MHz)	
Impedance	50 Ohm	
Input power Band 1 / Band 2	< 500 W / < 300 W	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-40 ... +60 °C	
Connectors	RF AISG	7-16 female (long neck) 8-pin, IEC 60130-9 (782 10900/901: Male/female) Pin 2: -48V DC (782 10900 only), Pin 3: RS485B, Pin 5: RS485A, Pin 6: Nominal 24 V DC, Pin 7: DC return (78210900/901: Not grounded/grounded), Other pins: Not connected
Power consumption	2 W (idle mode)	
DC supply	782 10900: 7 – 30 V DC (via RF connectors)	
Application	Indoor or outdoor (IP 67)	
DC/AISG transparency	For AISG 1.1, AISG 2.0, 3GPP, vendor specific protocols and for current window alarm (CWA) controlled TMAs	
Lightning protection	3 kA (10/350 µs pulse), 10 kA (8/20 µs pulse)	
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	782 10900: 6.5 kg, 782 10901: 4.9 kg	
Dimensions (w x h x d)	782 10900: 233 x 258 x 79 mm 782 10901: 233 x 223 x 62 mm (without connectors, without mounting brackets)	



Application Example

SmartPlex® Dual-Band Combiner

KATHREIN

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380 - 960 MHz
TETRA / LTE 800 / DD / CDMA / GSM 900

1710 - 2690 MHz
GSM / PCS / AWS / UMTS 2100 / LTE 2600

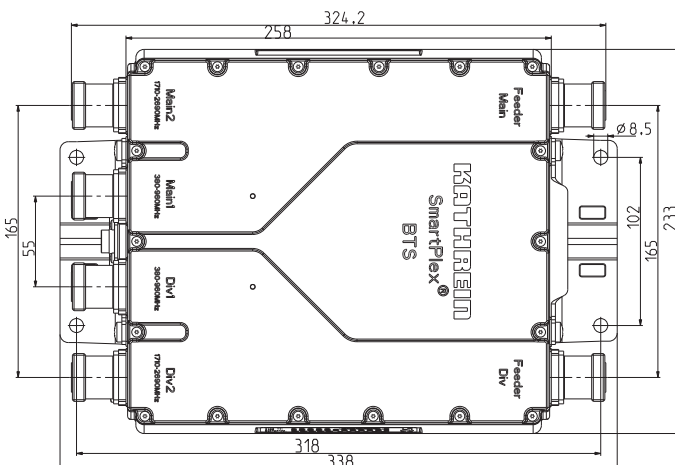
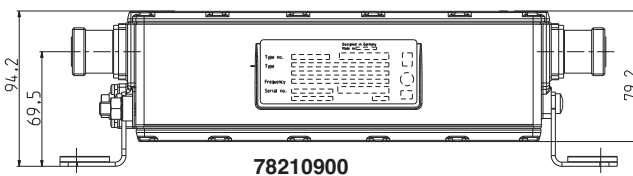
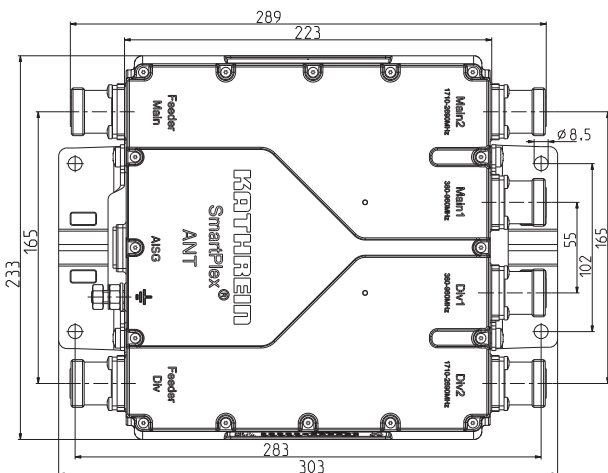
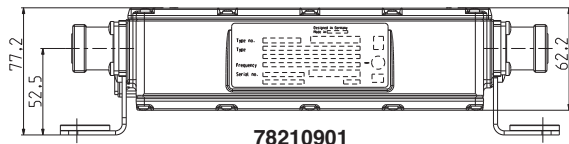
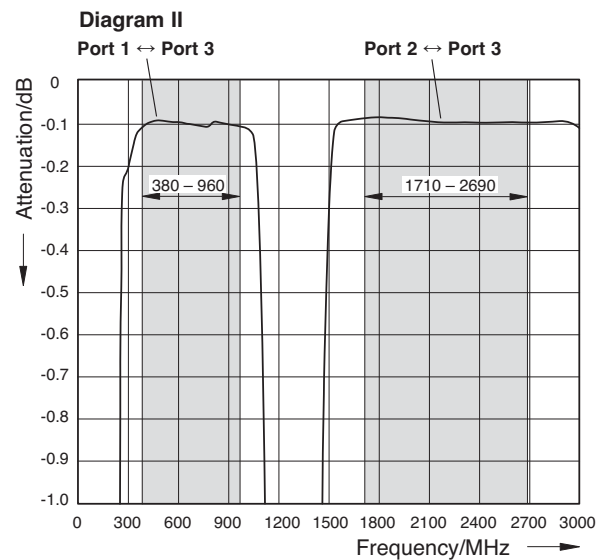
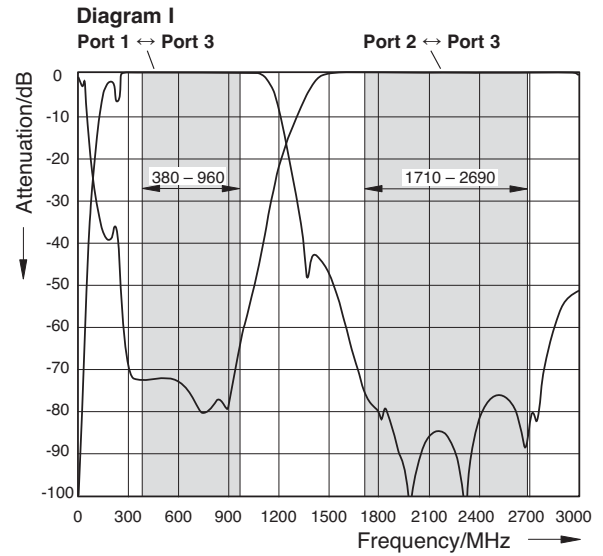
Accessories (order separately)

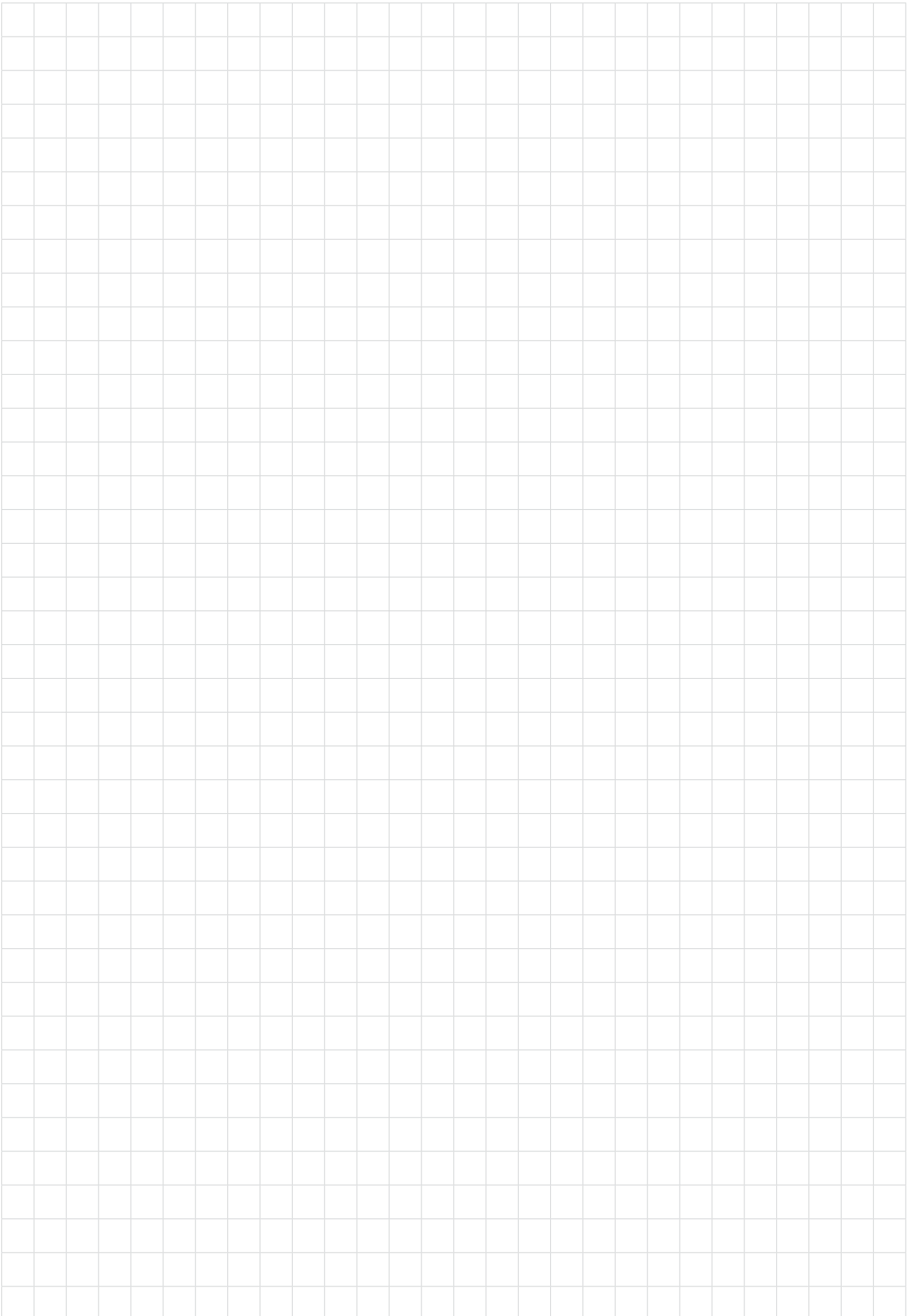
Type No.	Description
78410367	50-Ohm load 1.5 W / indoor or outdoor
78211100	DC cable kit -48 VDC
78211101	DC cable kit +24 VDC

50-Ohm load



Typical Attenuation Curves





Same-Band Combiners Hybrid Combiners

Same-Band Combiner
Duplex Hybrid Combiner
Active Duplex Hybrid Combiner
Hybrid Combiner
3-dB Couplers
Hybrid Ring Junctions



Hybrid Combiners and Couplers:

Description	Type No.	Frequency range	Max. input power	Connector	Page
Hybrid Combiner 2:1	792699	806 - 960 MHz	150 W per Tx/Rx port	7-16	290
Hybrid Combiner 2:1	792702	1700 - 2200 MHz	150 W per Tx/Rx port	7-16	291
Hybrid Combiner 2:1	793555	800 - 2200 MHz	150 W per Tx/Rx port	7-16	292
Hybrid Combiner 2:1	78210500	806 - 960 MHz	60 W at each port	7-16	293
Hybrid Combiner 2:1	78210502	1710 - 2170 MHz	60 W at each port	7-16	294
Hybrid Combiner 2:1	78210504	698 - 2690 MHz	60 W at each port	7-16	295
Hybrid Combiner 8:4	78211141	698 - 960 MHz 1710 - 2690 MHz	75 W	7-16	296, 297
Hybrid Combiner 8:4	78211142	1710 - 1880 MHz 1920 - 2170 MHz	75 W	7-16	296, 297
Hybrid Combiner 12:4	78211143	698 - 960 MHz 1710 - 1880 MHz 1920 - 2170 MHz	50 W	7-16	296, 297
Hybrid Combiner 16:4	78211144	698 - 960 MHz 1710 - 1880 MHz 1920 - 2200 MHz 2500 - 2690 MHz	50 W	7-16	296, 297
Hybrid Combiner 4:4	78210534	698 - 2600 MHz	150 W at each port	7-16	298
Same-Band Combiner	78211237	791 - 862 MHz	100 W at each port	7-16	299
Duplex Hybrid Combiner	78210805	Rx: 880 - 915 MHz Tx: 925 - 960 MHz	250 W	7-16	300, 301
Active Duplex Hybrid Combiner	78211110	Rx: 880 - 915 MHz Tx: 925 - 960 MHz	250 W	7-16	302, 303
Same-Band Combiner	78210930	880 - 960 MHz	100 W at each port	7-16	304, 305
Same-Band Combiner	78210931	880 - 960 MHz	100 W at each port	7-16	306, 307
Same-Band Combiner	78210936	880 - 960 MHz	100 W at each port	7-16	308, 309
Same-Band Combiner	78211230	1710 - 1880 MHz	100 W at each port	7-16	310, 311
Same-Band Combiner	78211235	1730 - 1880 MHz	100 W at each port	7-16	312, 313
Same-Band Combiner	78211370	1710 - 1880 MHz	100 W at each port	7-16	314, 315
Same-Band Combiner	78210925	1920 - 2170 MHz	100 W at each port	7-16	316, 317
Same-Band Combiner	78210926	1920 - 2170 MHz	100 W at each port	7-16	318, 319
3-dB Coupler	78210524	698 - 2690 MHz	150 W at each port	7-16	320, 321
3-dB Coupler	793506	806 - 960 MHz	500 W	7-16	322
3-dB Coupler	793006	1700 - 2200 MHz	300 W	7-16	323
3-dB Coupler	793554	800 - 2200 MHz	300 W	7-16	324
4,7-dB Coupler	78211209	698 - 2690 MHz	150 W at each port	N - female	325
6-dB Coupler	78211210	698 - 2690 MHz	150 W at each port	N - female	325
8-dB Coupler	78211211	698 - 2690 MHz	150 W at each port	N - female	325
10-dB Coupler	78211212	698 - 2690 MHz	150 W at each port	N - female	325
15-dB Coupler	78211213	698 - 2690 MHz	150 W at each port	N - female	325

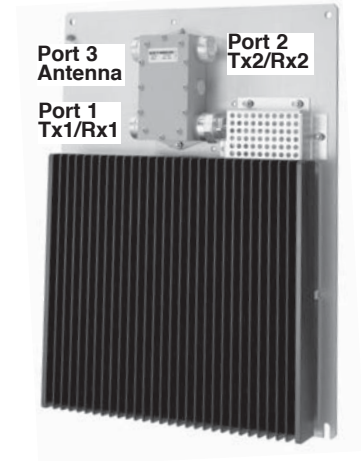
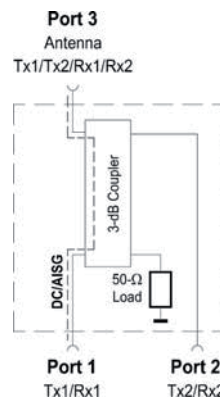
**New
Products**

Hybrid Combiner 2:1

806 - 960 MHz

2 x 150 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 applications
- Wall or 19" rack mounting
- DC bypass between port 1 and port 3
- External DC stop available as an accessory

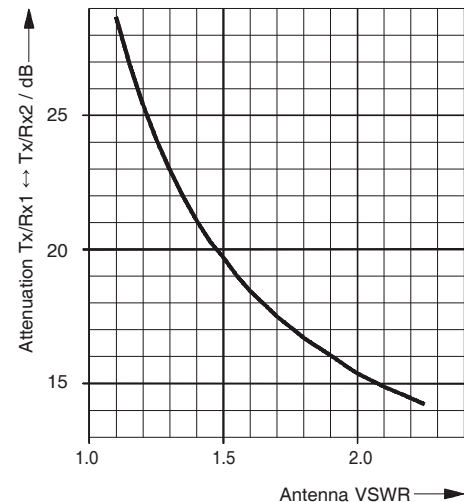


Technical Data

Type No.	792699
Frequency range	806 – 960 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ±0.4 dB
Port 2 ↔ Port 3	3.1 ±0.4 dB
Port 1 ↔ Port 2	> 27 dB *
VSWR (all ports)	< 1.11
Impedance	50 Ω
Input power	
Port 1	< 150 W (with max. 16 signals)
Port 2	< 150 W (with max. 16 signals)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +50 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency	
Port 1 ↔ Port 3	Bypass (max. 2500 mA)
Port 2	Short circuit (External DC stop available as an accessory)
Mounting	Wall mounting: With 4 screws (max. 7 mm diameter) 19" rack mounting: To be inserted on pre-installed 19" sliding bars (2 height units required)
Weight	10.3 kg
Packing size	510 x 410 x 100 mm
Dimensions (w x h x d)	336 x 444 x 64 mm

* Valid if all ports are terminated with 50-Ω loads (see diagram).

Typical attenuation Tx/Rx1 ↔ Tx/Rx2 vs. Antenna VSWR



Note:

The input power rating of 150 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically (see photo), without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

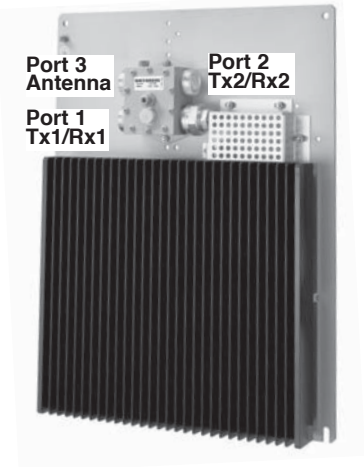
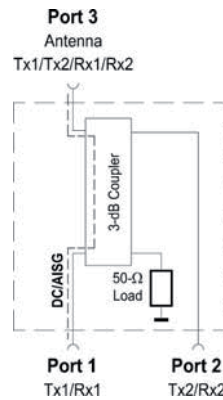
When installed in a 19" rack, it must be ensured that the max. power of 150 W is sufficiently dissipated, so that the ambient temperature does not rise above +50 °C. This can be achieved for example by the additional installation of a correspondingly dimensioned ventilator in the 19" rack or by reducing the maximum input power.

Hybrid Combiner 2:1

1700 - 2200 MHz

2 x 150 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 applications
- Wall or 19'' rack mounting
- DC bypass between port 1 and port 3
- External DC stop available as an accessory

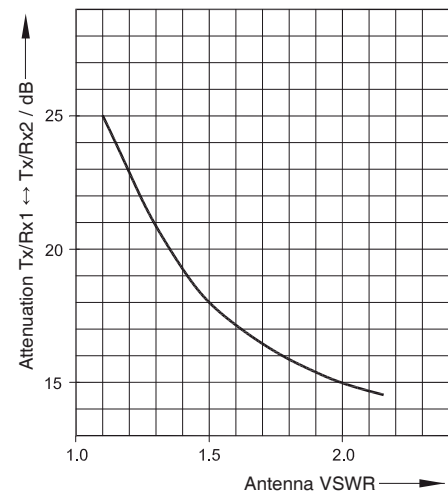


Technical Data

Type No.	792702
Frequency range	1700 – 2200 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ±0.4 dB
Port 2 ↔ Port 3	3.1 ±0.4 dB
Port 1 ↔ Port 2	> 24 dB*
VSWR (all ports)	< 1.15
Impedance	50 Ω
Input power	
Port 1	< 150 W (with max. 16 signals)
Port 2	< 150 W (with max. 16 signals)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +50 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency	
Port 1 ↔ Port 3	Bypass (max. 2500 mA)
Port 2	Short circuit (External DC stop available as an accessory)
Mounting	Wall mounting: With 4 screws (max. 7 mm diameter) 19'' rack mounting: To be inserted on pre-installed 19'' sliding bars (2 height units required)
Weight	9.8 kg
Packing size	510 x 410 x 100 mm
Dimensions (w x h x d)	336 x 444 x 64 mm

* Valid if all ports are terminated with 50-Ω loads (see diagram).

Typical attenuation Tx/Rx1 ↔ Tx/Rx2 vs. Antenna VSWR



Note:

The input power rating of 150 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically (see photo), without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

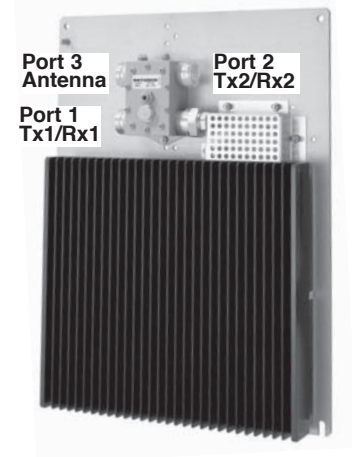
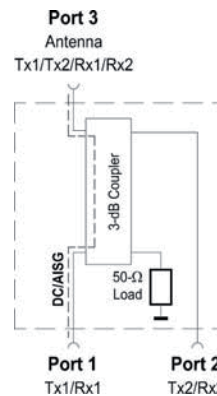
When installed in a 19'' rack, it must be ensured that the max. power of 150 W is sufficiently dissipated, so that the ambient temperature does not rise above +50 °C. This can be achieved for example by the additional installation of a correspondingly dimensioned ventilator in the 19'' rack or by reducing the maximum input power.

Hybrid Combiner 2:1

800 - 2200 MHz

2 x 150 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 applications
- Wall or 19" rack mounting
- DC bypass between port 1 and port 3
- External DC stop available as an accessory

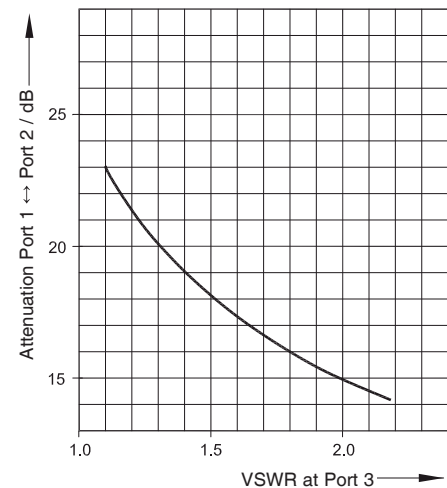


Technical Data

Type No.	793555
Frequency range	800 – 2200 MHz
Attenuation	
Port 1 ↔ Port 3	3.1 ± 1.2 dB
Port 2 ↔ Port 3	3.1 ± 1.2 dB
Port 1 ↔ Port 2	> 22 dB*
VSWR (all ports)	< 1.2
Impedance	50 Ω
Input power	
Port 1	< 150 W (with max. 16 signals)
Port 2	< 150 W (with max. 16 signals)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-20 ... +50 °C
Connectors	7-16 female
Application	Indoor
DC/AISG transparency	
Port 1 ↔ Port 3	Bypass (max. 2500 mA)
Port 2	Short circuit (External DC stop available as an accessory)
Mounting	Wall mounting: With 4 screws (max. 7 mm diameter) 19" rack mounting: To be inserted on pre-installed 19" sliding bars (2 height units required)
Weight	10 kg
Packing size	510 x 410 x 100 mm
Dimensions (w x h x d)	336 x 444 x 58.5 mm

* Valid if all ports are terminated with 50-Ω loads (see diagram)

Typical attenuation Port 1 ↔ Port 2 vs. VSWR at Port 3



Note:

The input power rating of 150 W per port is specified at an ambient temperature of +55 °C with the combiner mounted vertically (see photo), without additional cooling, and while respecting the safety standard EN IEC 60950 (max. surface temperature +90 °C).

When installed in a 19" rack, it must be ensured that the max. power of 150 W is sufficiently dissipated, so that the ambient temperature does not rise above +50 °C. This can be achieved for example by the additional installation of a correspondingly dimensioned ventilator in the 19" rack or by reducing the maximum input power.

- **DC stop** (type no. **793301**) (order separately) can be found in the section "System Components".

Hybrid Combiner 2:1

806 - 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 bypass between all ports
- External DC stop available as an accessory



Technical Data

Type No.	78210500
Frequency range	806 – 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 (all ports)	< 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	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 (see data sheet)
Weight	3.7 kg
Packing size	377 x 232 x 189 mm
Dimensions (w x h x d)	143.6 x 258 x 97.5 mm (including connectors)

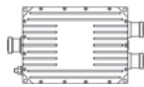
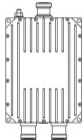
* Valid if all ports are terminated with 50-Ω loads.

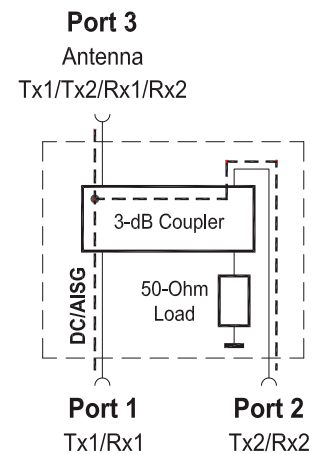
Note:

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

1710 - 2170 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 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)

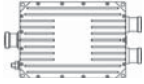
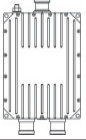
* Valid if all ports are terminated with 50-Ω loads.

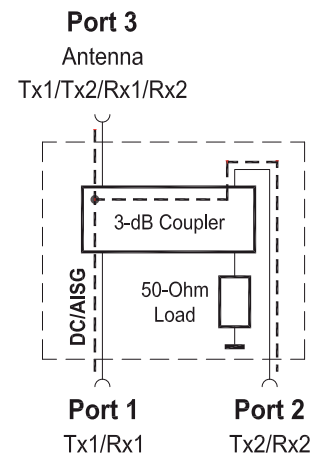
Note:

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

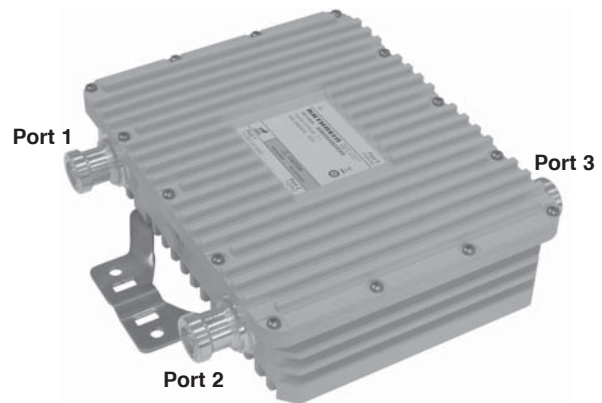


Hybrid Combiner 2:1

698 - 2690 MHz

2 x 60 W

- 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)

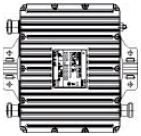
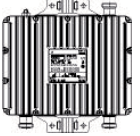
* Valid if all ports are terminated with 50-Ohm loads.

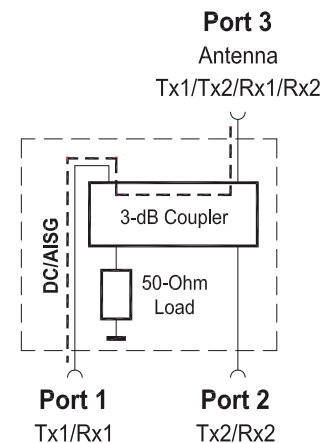
Note:

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



Hybrid Combiner System

8 : 4 / 8 : 4 / 12 : 4 / 16 : 4

- 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



78211141



78211142



78211143



78211144

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	$6 \pm 0.8 \text{ dB}$ } Typically 6.5 dB $< 0.7 \text{ dB}$			
Insertion loss Input 1...8/12/16 ↔ Output 1...4				
Isolation between input ports				
Same bands	$> 22 \text{ dB}^*)$			
Different bands	$> 50 \text{ dB}$			
VSWR (all ports)	< 1.5			
Impedance	50Ω			
Input power at each input port	$< 75 \text{ W}$	$< 75 \text{ W}$	$< 50 \text{ W}$	$< 50 \text{ W}$
Intermodulation products	$< -155 \text{ dBc}$ (3 rd order; with 2 x 20 W)			
Temperature range	$-40 \dots +60 \text{ }^\circ\text{C}$			
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

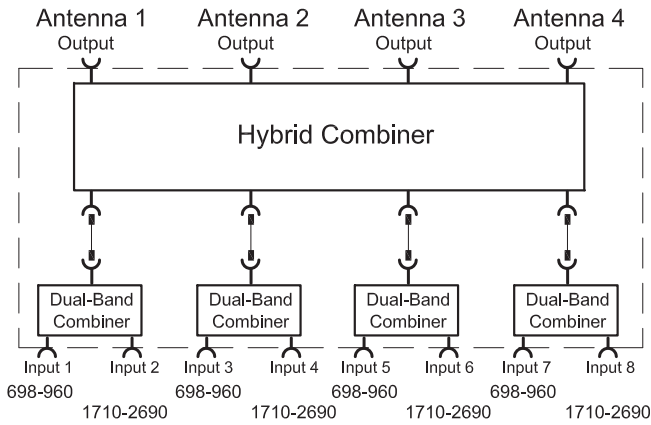
* Valid if all ports are terminated with 50-Ohm loads

Note:

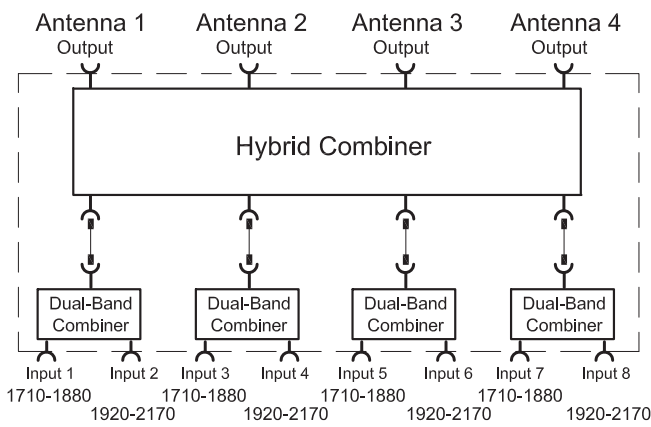
The use of fewer than 8/12/16 inputs or 4 outputs is possible. Any unused input ports have to be terminated with low-power 50-Ohm loads (e.g. Kathrein type 78410367), unused output ports have to be terminated with high-power 50-Ohm loads (e.g. Kathrein low intermodulation type 78210474).

Hybrid Combiner

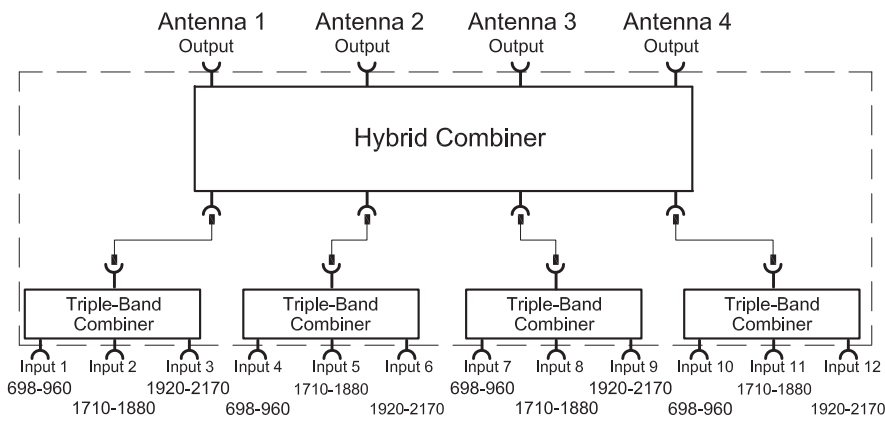
8 : 4 / 8 : 4 / 12 : 4 / 16 : 4



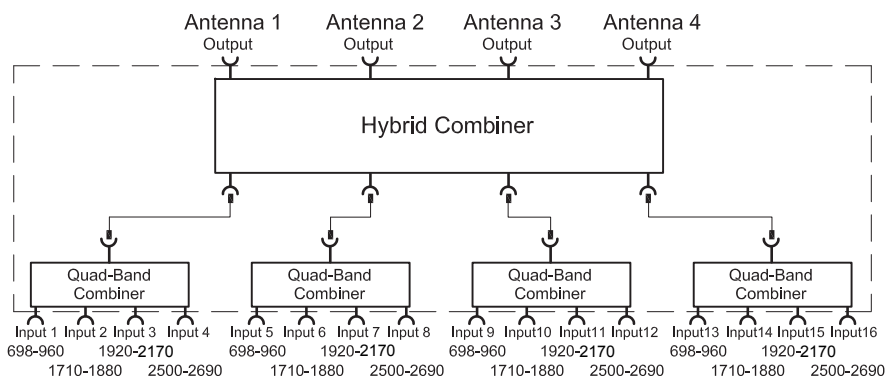
78211141



78211142



78211143



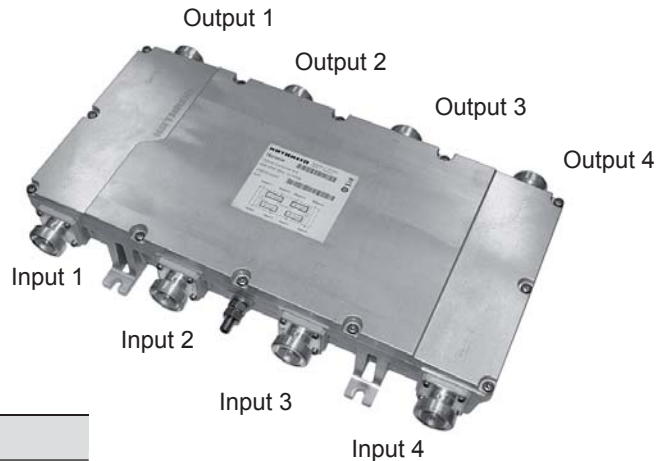
78211144

Hybrid Combiner 4:4

698 – 2690 MHz

4 x 150 W

- 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



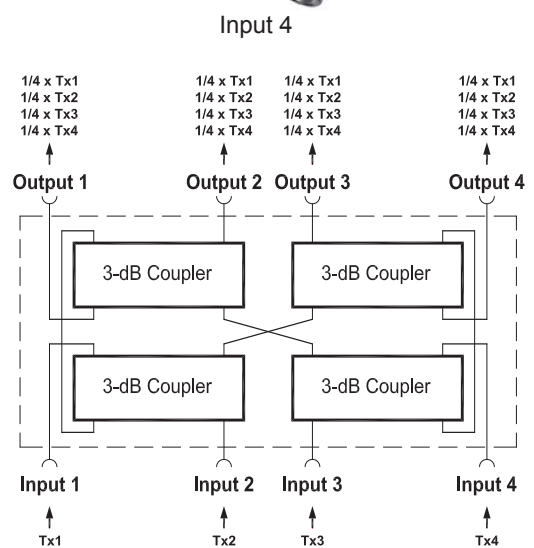
Technical Data

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)
78210535	Mast mounting kit



Same-Band Combiner

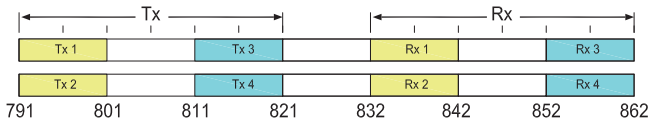
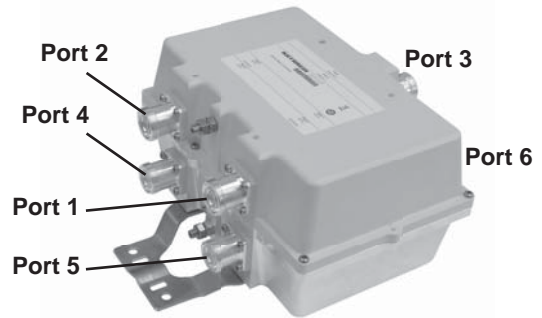
KATHREIN

Antennen · Electronic

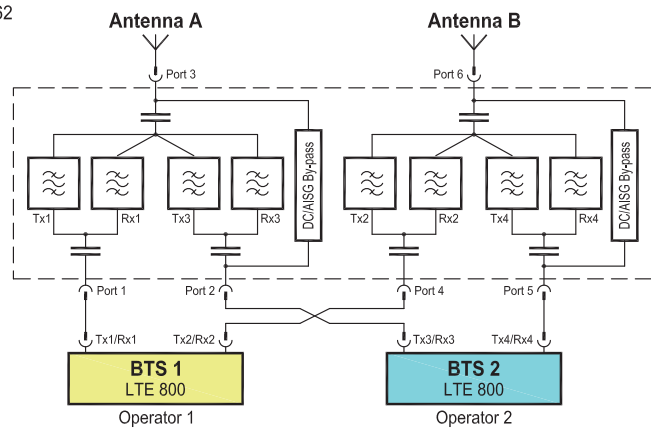
791 – 801 / 832 – 842 MHz
LTE800 (10 MHz Bandwidth)

811 – 821 / 852 – 862 MHz
LTE800 (10 MHz Bandwidth)

- 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



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	< 0.4 dB (791 – 801 MHz) / < 0.6 dB (832 – 842 MHz) < 0.6 dB (811 – 821 MHz) / < 0.4 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”.

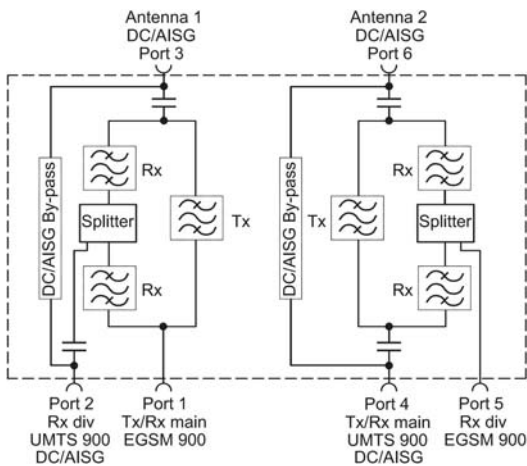
Duplex Hybrid Combiner (Same-Band Combiner) **KATHREIN**

Antennen · Electronic

880 - 960 MHz
EGSM 900

880 - 960 MHz
UMTS 900

- 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	880 - 915 MHz	
Tx	925 - 960 MHz	
Insertion loss		
Port 1 ↔ Port 3 / Port 4 ↔ Port 6	< 0.4 dB, typically 0.2 dB (925 - 960 MHz) - see Diagram I and II	
Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 4.3 dB, typically 3.6 dB (880 - 915 MHz) - see Diagram I and II	
	< 4.0 dB, typically 3.5 dB (880 - 915 MHz) - see Diagram III and IV	
Isolation		
Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 25 dB (880 - 915 MHz)	
	> 35 dB (925 - 960 MHz)	
VSWR	< 1.2 (880 - 915 / 925 - 960 MHz)	
Impedance	50 Ω	
Input power	Port 1: < 250 W Port 4: < 250 W	Port 2: < 50 W Port 5: < 50 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 5 ↔ Port 6	Stop	
Port 2 ↔ Port 3 / Port 4 ↔ Port 6	Bypass (max. 2500 mA)	
Lightning protection	3 kA, 10/350 μs pulse	
Mounting	With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set	
Weight	6.5 kg	
Packing size	390 x 470 x 160 mm	
Dimensions (w x h x d)	287.1 x 278.6 x 71 mm (without connectors, without mounting brackets)	

Duplex Hybrid Combiner (Same-Band Combiner)

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Antennen · Electronic

880 - 960 MHz
EGSM 900

880 - 960 MHz
UMTS 900

Typical Attenuation Curves

Diagram I

Port 1 ↔ Port 3
Port 4 ↔ Port 6

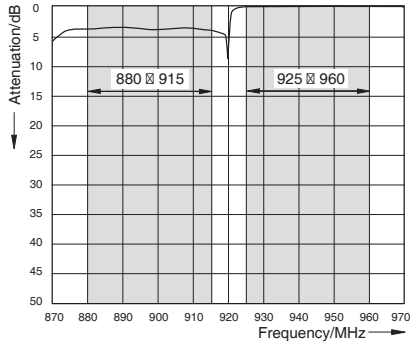


Diagram II

Port 1 ↔ Port 3
Port 4 ↔ Port 6

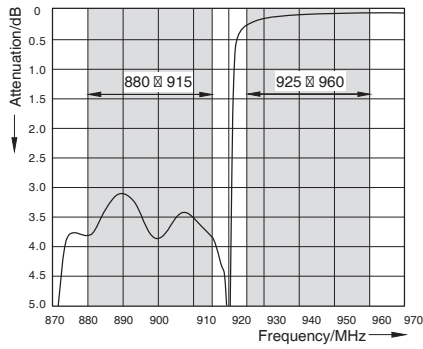


Diagram III

Port 2 ↔ Port 3
Port 5 ↔ Port 6

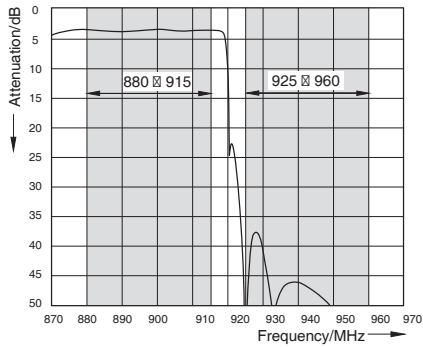
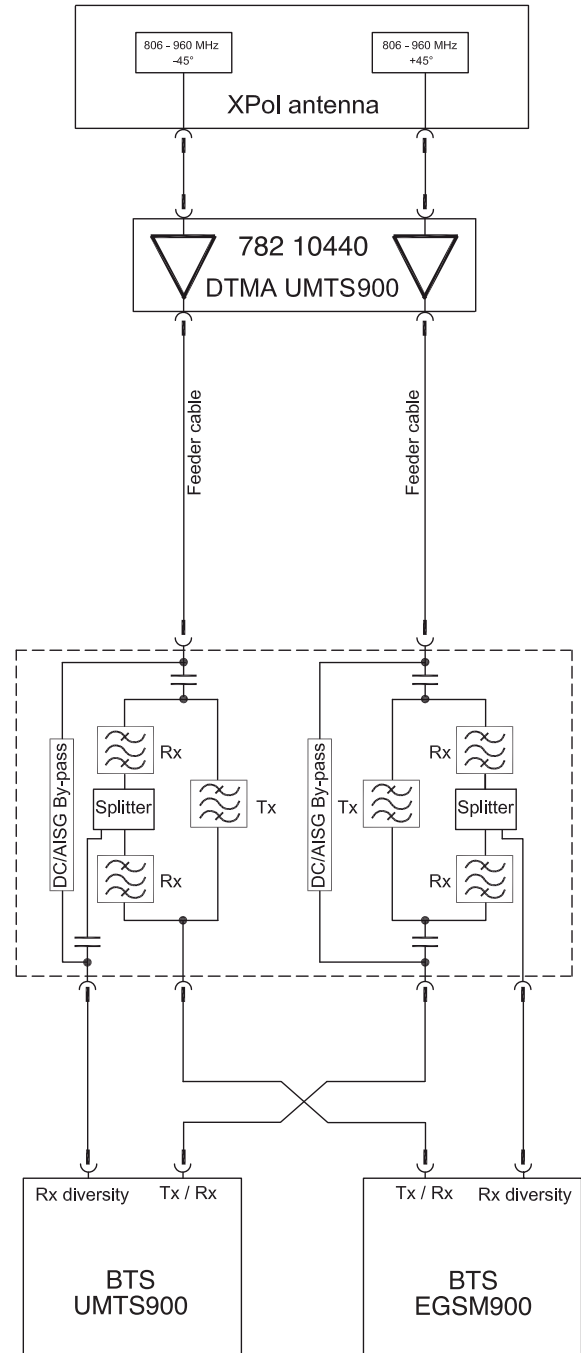
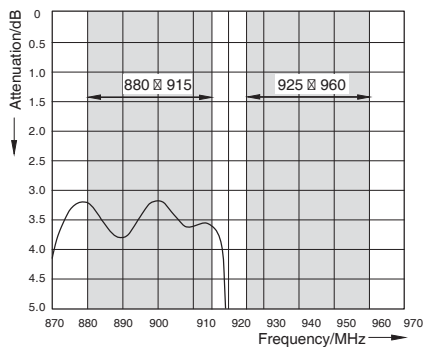


Diagram IV

Port 2 ↔ Port 3
Port 5 ↔ Port 6



Application example

- 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".

Active Duplex Hybrid Combiner (Same-Band Combiner)

KATHREIN

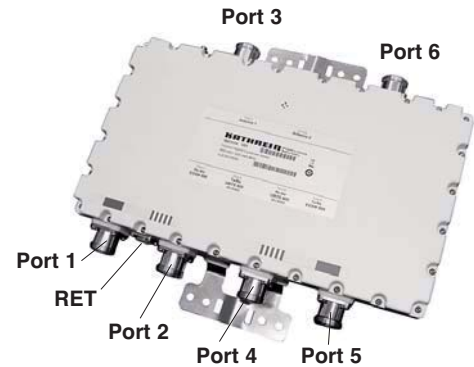
Antennen · Electronic

880 ... 960 MHz
EGSM 900

880 ... 960 MHz
UMTS 900

- 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	20 MHz within 880 ... 915 MHz (factory tunable)	
Tx	20 MHz within 925 ... 960 MHz (factory tunable)	
Tx Insertion loss		
Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.2 dB (925 - 945 MHz) * - see Diagram I and II	
Isolation		
Port 1 ↔ Port 2 / Port 4 ↔ Port 5	> 25 dB (880 - 900 MHz) > 65 dB (925 - 945 MHz)	
Gain	12 dB nominal	
Gain ripple	±1 dB	
Loss in bypass mode	< 5.5 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Noise figure	< 1.6 dB (+22 ... +28 °C)	
Output 1-dB compression point	> 11 dBm	
3 rd order intercept point (OIP3)	> 25 dBm (typically 30 dBm)	
VSWR	< 1.25 (880 - 900 / 925 - 945 MHz) *	
Impedance	50 Ω	
Input power	Port 2 < 200 W Port 5 < 200 W	
Intermodulation products	< -160 dBc (5 th order; with 2 x 20 W)	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67 (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	9 - 19 V	9 - 30 V
Operating current per TMA (without RET)	80 - 120 mA	Nom. 80 mA at 9 V Nom. 30 mA at 30 V
Alarm management	170 - 200 mA	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	6.8 kg	
Packing size	460 x 375 x 135 mm	
Dimensions (w x h x d)	369 x 209 x 68 mm (without connectors, without mounting brackets)	

* Tuning version 78211110V01: Rx 880 - 900 MHz, Tx 925 - 945 MHz

Active Duplex Hybrid Combiner (Same-Band Combiner)

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880 ... 960 MHz
EGSM 900

880 ... 960 MHz
UMTS 900

Typical Attenuation Curves

Tuning example 78211110V01

Rx: 880-900 MHz, Tx: 925-945 MHz

Diagram I

Port 2 ↔ Port 3
Port 5 ↔ Port 6

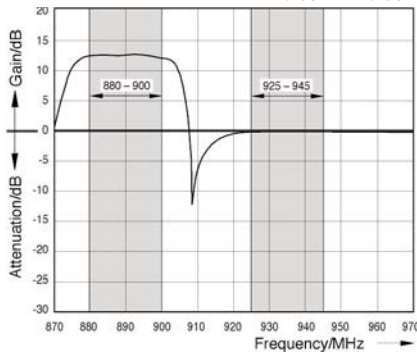


Diagram II

Port 2 ↔ Port 3
Port 5 ↔ Port 6

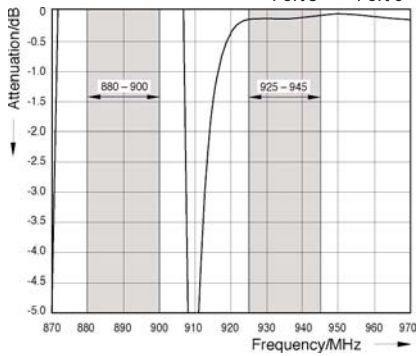


Diagram III

Port 1 ↔ Port 3
Port 4 ↔ Port 6

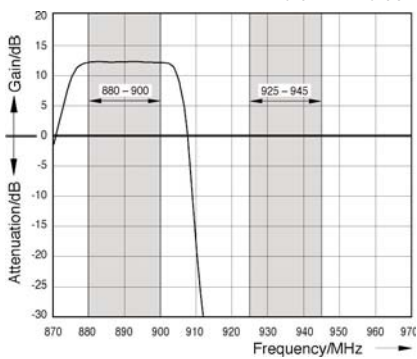
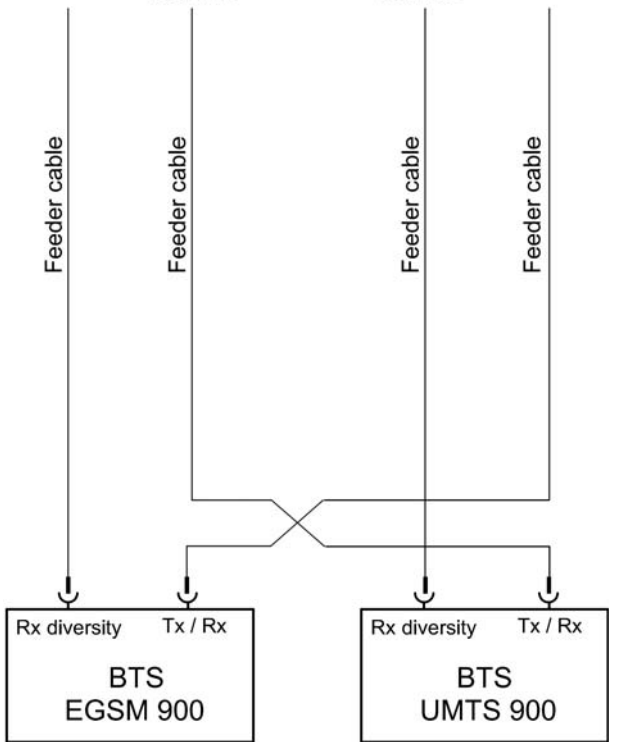
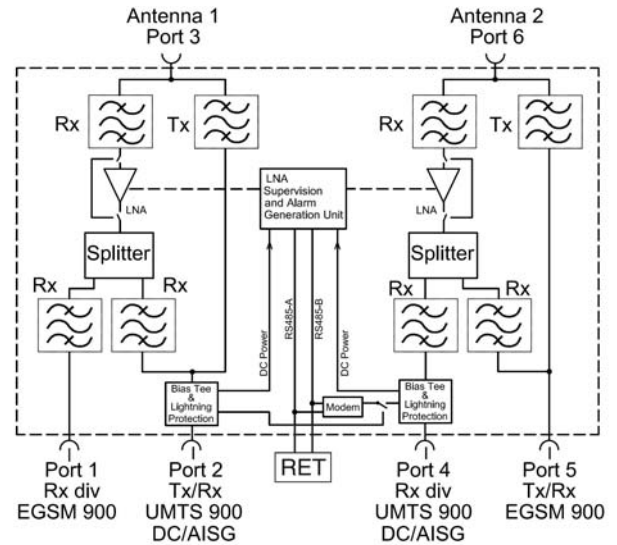
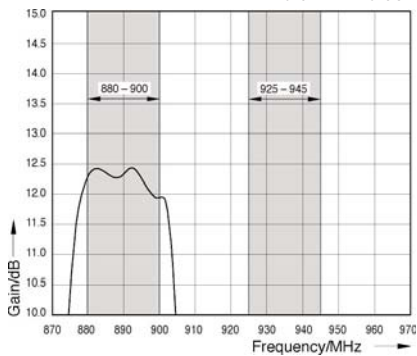


Diagram IV

Port 1 ↔ Port 3
Port 4 ↔ Port 6



Application example

- **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".

Same-Band Combiner

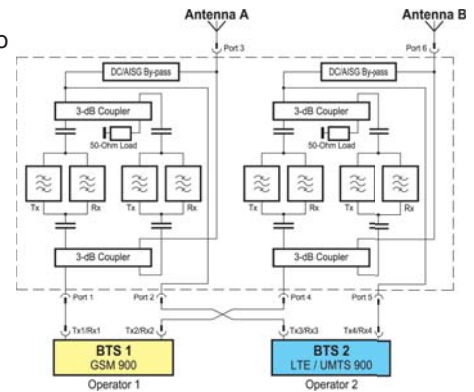
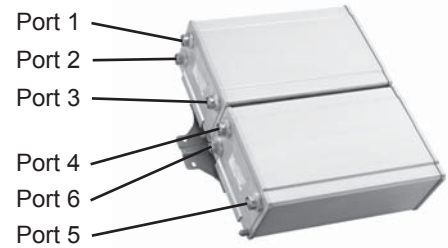
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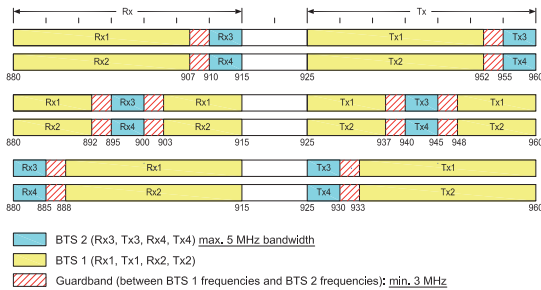
880 - 915 / 925 - 960 MHz
GSM 900

880 - 915 / 925 - 960 MHz
LTE / UMTS 900 (5 MHz Bandwidth)

- 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 5 MHz Tx/Rx pass-band filters (factory tunable) available for inserting LTE/UMTS 900 base station
- Full pass-band (without LTE/UMTS 900 5 MHz Tx/Rx frequency blocks) available for GSM 900 base station
- Very low insertion loss over complete EGSM Tx/Rx 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 Examples



Frequency ordering information:

When ordering please specify the required Tx- and Rxfrequencies e.g. (tuning example 2)

Rx1/Rx2 880 – 892 / 903 – 915 MHz, Rx3/Rx4 895 – 900 MHz

Tx1/Tx2 925 – 937 / 948 – 960 MHz, Tx3/Tx4 940 – 945 MHz

Technical Data

Type No.	78210930
Pass band GSM 900 LTE/UMTS 900	Rx = 880 – 915 / Tx = 925 – 960 MHz (without assigned LTE/UMTS 900 5 MHz TX/Rx frequency blocks and ± 3 MHz guard bands) Rx = 880 ... 915 / Tx = 925 ... 960 MHz (factory tunable 5 MHz frequency blocks)
Guard band	3 MHz (between Tx/Rx1 and Tx/Rx3, between Tx/Rx2 and Tx/Rx4) – e.g. tuning example 2: Rx1 (Rx2) = 880 – 892 / 903 – 915 and Tx1 (Tx2) = 925 – 937 / 948 – 960 MHz Rx3 (Rx4) = 895 – 900 and Tx3 (Tx4) = 940 – 945 MHz
Insertion loss Port 1 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 0.6 dB (typically 0.2 dB) – see diagram I and II for tuning example 2 < 0.6 dB (typically 0.4 dB) – see diagram III and IV for tuning example 2
Isolation Port 1 ↔ Port 2	> 30 dB (880 – 915 / 925 – 960 MHz)
VSWR	< 1.25 (pass bands)
Group delay variation GSM 900 LTE/UMTS 900	< 20 ns (200 kHz) < 50 ns (5 MHz)
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 (default) Port 2 ↔ Port 3 / Port 5 ↔ Port 6 (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	26 kg
Packing size	685 x 645 x 252 mm
Dimensions (w x h x d)	504 x 409 x 158.3 mm (without connectors, without mounting brackets)

880 - 915 / 925 - 960 MHz
GSM 900

880 - 915 / 925 - 960 MHz
LTE / UMTS 900 (5 MHz Bandwidth)

Typical Attenuation Curves (Tuning Example 2)

BTS 1 (GSM 900)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

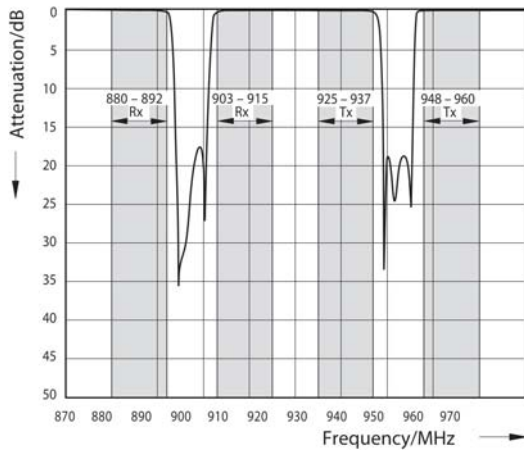
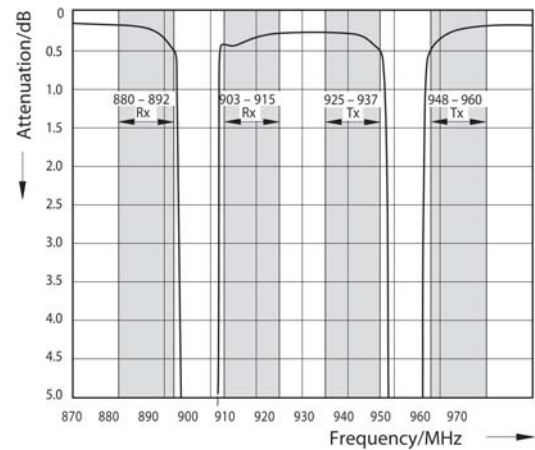


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (LTE/UMTS 900)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

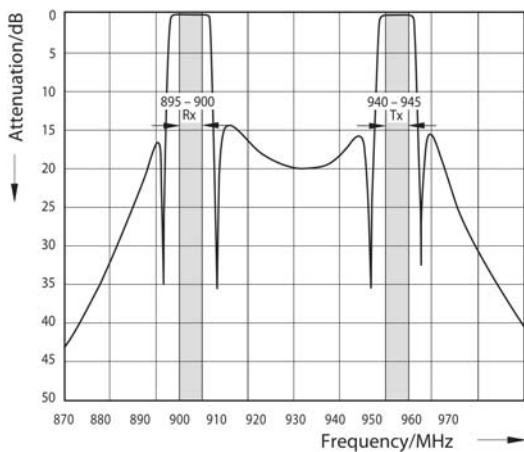
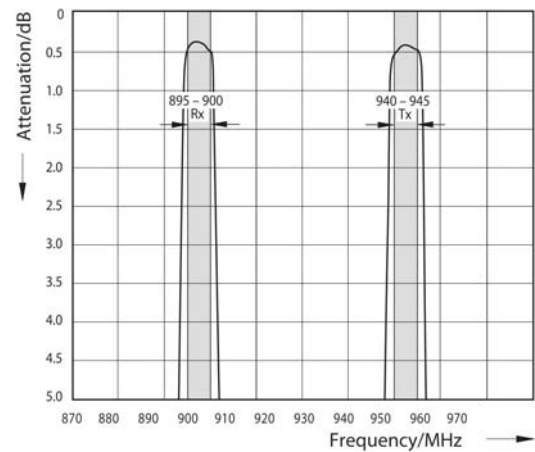


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



Accessories (order separately)

Type No. (Clamp)	731651	738546	85010002	85010003
Suitable for mast diameter	28 - 60 mm	42 - 115 mm	110 - 220 mm	210 - 380 mm
Antenna – mast distance	25 - 28 mm	20 - 26 mm	47 - 55 mm	48 - 68 mm
Number of pieces	1 clamp	1 clamp	1 clamp	1 clamp
Weight	0.8 kg	1.1 kg	2.7 kg	4.8 kg

Type No.	Description
78410367	50-Ohm load

50-Ohm load



Same-Band Combiner

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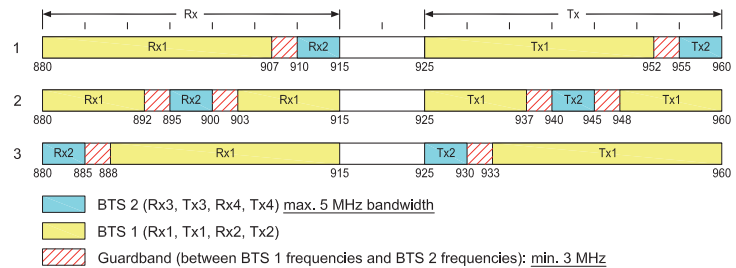
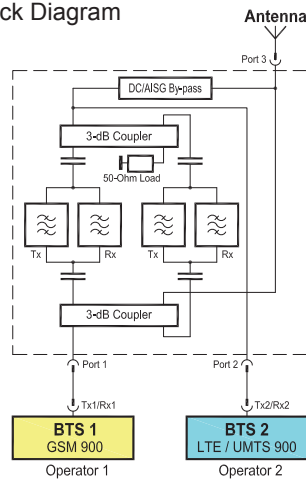
Antennen · Electronic

880 - 915 / 925 - 960 MHz
GSM 900

880 - 915 / 925 - 960 MHz
LTE / UMTS 900 (5 MHz Bandwidth)

- 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 5 MHz Tx/Rx pass-band filters (factory tunable) available for inserting LTE/UMTS 900 base station
- Full pass-band (without LTE/UMTS 900 5 MHz Tx/Rx frequency blocks) available for GSM 900 base station
- Very low insertion loss over complete EGSM Tx/Rx bandwidth compared to standard hybrid combiners
- Single unit
- Suitable for indoor or outdoor applications
- DC/AISG by-pass for DTMA supply

Block Diagram



Frequency ordering information

When ordering please specify the required Tx- and Rx-frequencies e.g. (tuning example 2)
 Rx1 880 - 892 / 903 - 915 MHz, Rx2 895 - 900 MHz
 Tx1 925 - 937 / 948 - 960 MHz, Tx2 940 - 945 MHz

Technical Data

Type No.	78210931
Pass band GSM 900	Rx = 880 - 915 / Tx = 925 - 960 MHz (without assigned LTE/UMTS 900 5 MHz Tx/Rx frequency blocks and ± 3 MHz guard bands)
LTE/UMTS 900	Rx = 880 ... 915 / Tx = 925 ... 960 MHz (factory tunable 5 MHz frequency blocks)
Guard band	3 MHz (between Tx1/Rx1 and Tx2/Rx2) - e.g. tuning example 2: Rx1 = 880 - 892 / 903 - 915 and Tx1 = 925 - 937 / 948 - 960 MHz Rx2 = 895 - 900 and Tx2 = 940 - 945 MHz
Insertion loss Port 1 \leftrightarrow Port 3 Port 2 \leftrightarrow Port 3	< 0.6 dB (typically 0.2 dB) - see diagram I and II for tuning example 2 < 0.6 dB (typically 0.4 dB) - see diagram III and IV for tuning example 2
Isolation Port 1 \leftrightarrow Port 2	> 30 dB (880 - 915 / 925 - 960 MHz)
VSWR	< 1.25 (pass bands)
Group delay variation GSM 900 LTE/UMTS 900	< 20 ns (200 kHz) < 50 ns (5 MHz)
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 $^{\circ}$ C
Connectors	7-16 female (long neck)
Application	Indoor or outdoor (IP 66)
DC/AISG transparency (switchable) Port 1 \leftrightarrow Port 3 (default) Port 2 \leftrightarrow Port 3 (default)	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: 2 clamps needed
Weight	13 kg
Packing size	395 x 685 x 252 mm
Dimensions (w x h x d)	244 x 408 x 144 mm (without connectors, without mounting brackets)

Same-Band Combiner

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880 - 915 / 925 - 960 MHz
GSM 900

880 - 915 / 925 - 960 MHz
LTE / UMTS 900 (5 MHz Bandwidth)

Typical Attenuation Curves (Tuning Example 2)

BTS 1 (GSM 900)

Diagram I (Port 1 ↔ Port 3)

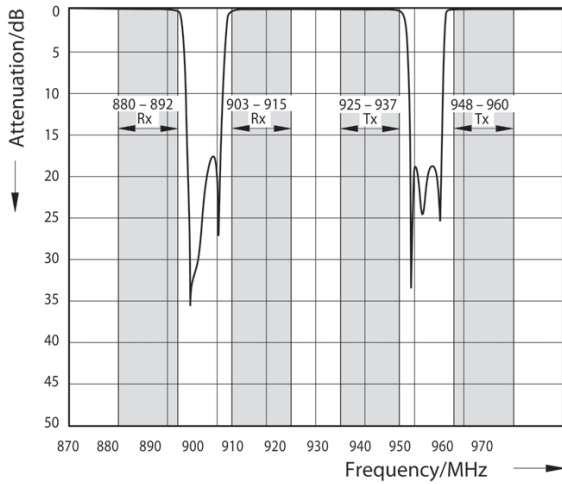
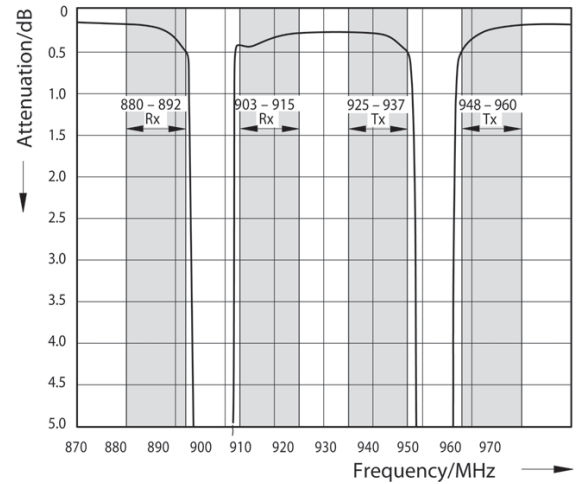


Diagram II (Port 1 ↔ Port 3)



BTS 2 (LTE/UMTS 900)
Diagram III (Port 2 ↔ Port 3)

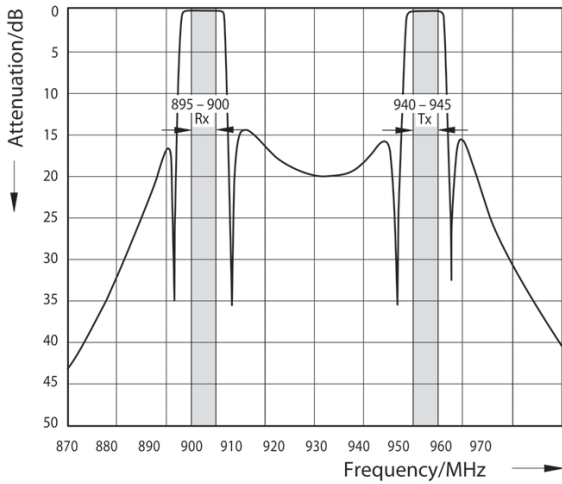
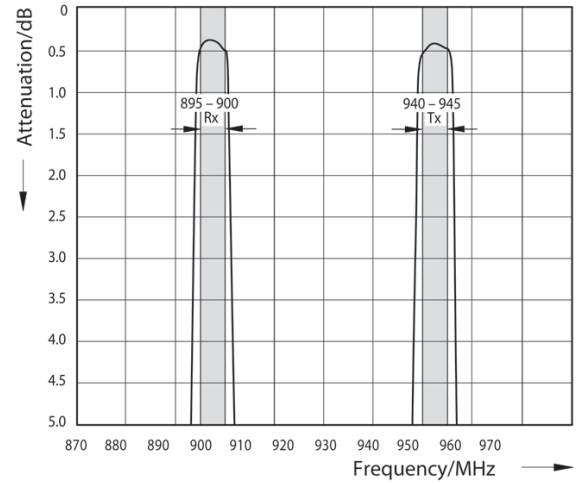


Diagram IV (Port 2 ↔ Port 3)



Accessories (order separately)

Type No. (Clamp)	731651	738546	85010002	85010003
Suitable for mast diameter	28 - 60 mm	42 - 115 mm	110 - 220 mm	210 - 380 mm
Antenna – mast distance	25 - 28 mm	20 - 26 mm	47 - 55 mm	48 - 68 mm
Number of pieces	1 clamp	1 clamp	1 clamp	1 clamp
Weight	0.8 kg	1.1 kg	2.7 kg	4.8 kg

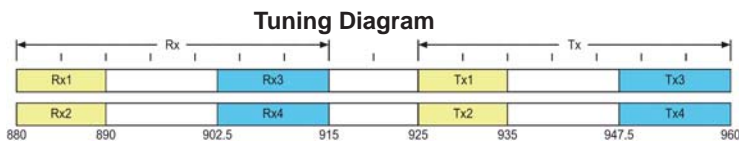
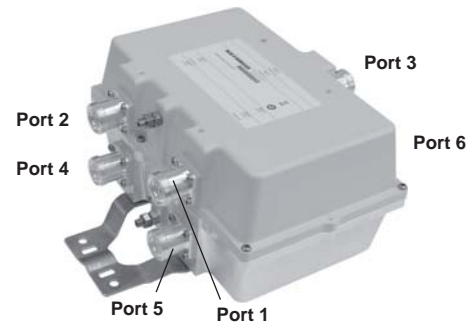
Type No.	Description
78410367	50-Ohm load



880 - 890 / 925 - 935 MHz
GSM 900 (10 MHz Bandwidth)

902,5 - 915 / 947,5 - 960 MHz
GSM 900 (12,5 MHz Bandwidth)

- 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



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)

Same-Band Combiner

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880 - 890 / 925 - 935 MHz
GSM 900 (10 MHz Bandwidth)

902,5 - 915 / 947,5 - 960 MHz
GSM 900 (12,5 MHz Bandwidth)

Typical Attenuation Curves

BTS 1 (GSM 900)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

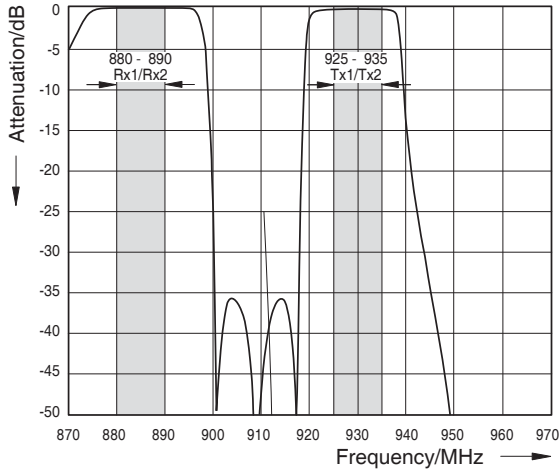
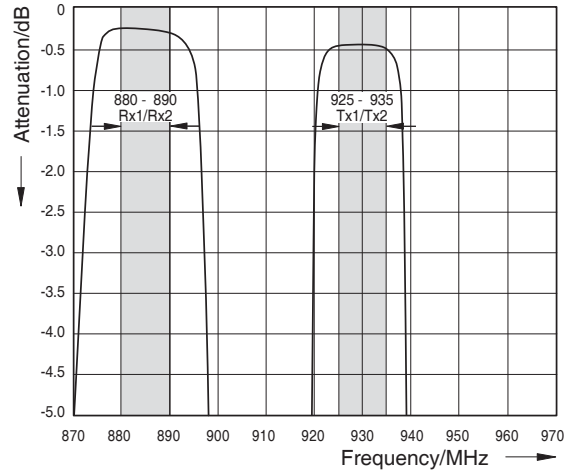


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (GSM 900)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

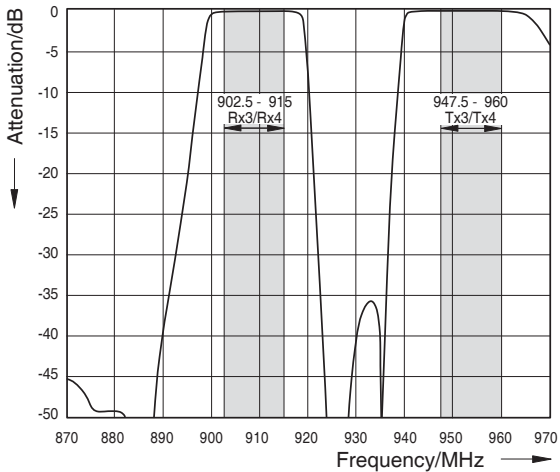
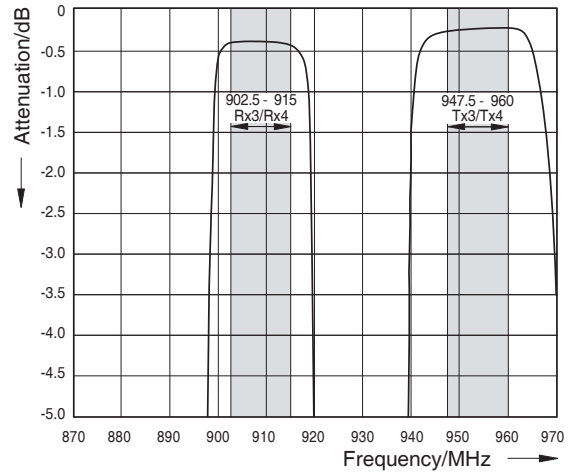
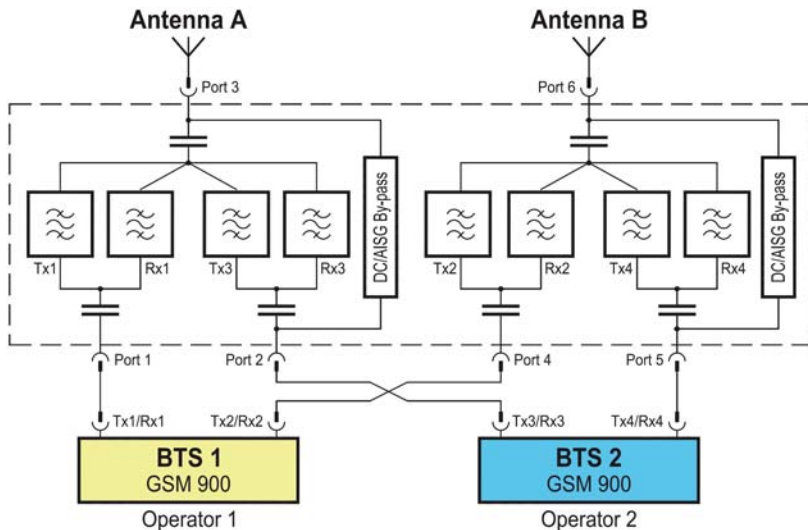


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



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".

Same-Band Combiner

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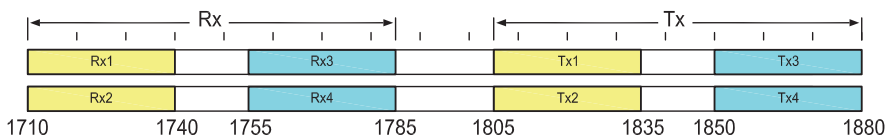
1710 – 1740 / 1805 – 1835 MHz
LTE/GSM1800 (30 MHz Bandwidth)

1755 – 1785 / 1850 – 1880 MHz
LTE/GSM1800 (30 MHz Bandwidth)

- 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)

Same-Band Combiner

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1710 – 1740 / 1805 – 1835 MHz
LTE/GSM1800 (30 MHz Bandwidth)

1755 – 1785 / 1850 – 1880 MHz
LTE/GSM1800 (30 MHz Bandwidth)

Typical Attenuation Curves

BTS 1 (LTE/GSM 1800)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

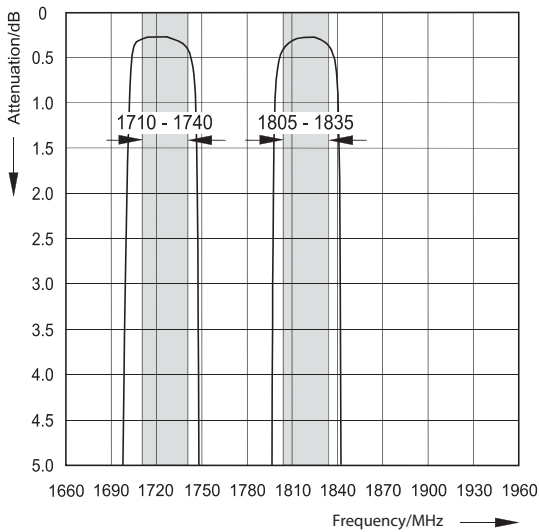
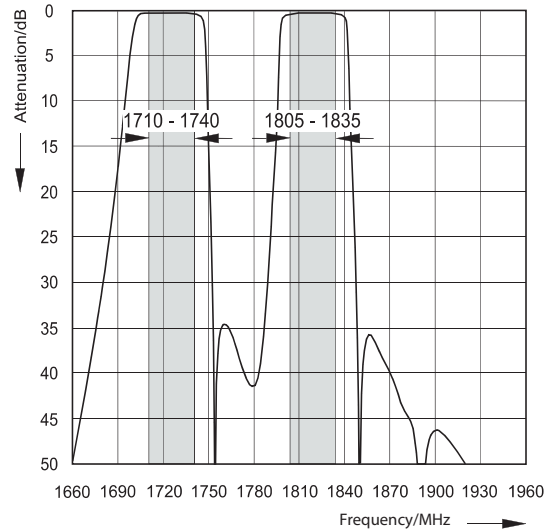


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (LTE/GSM 1800)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

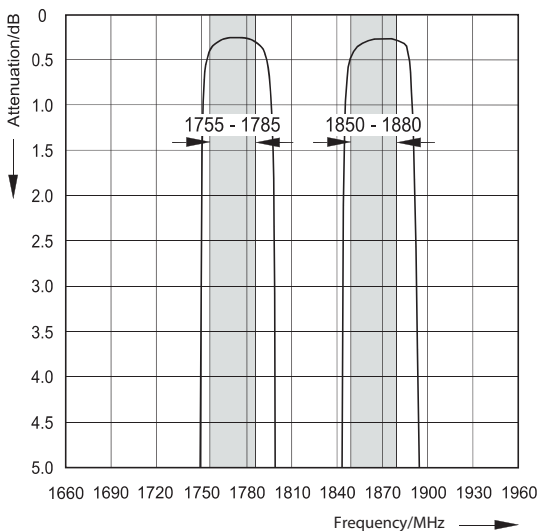
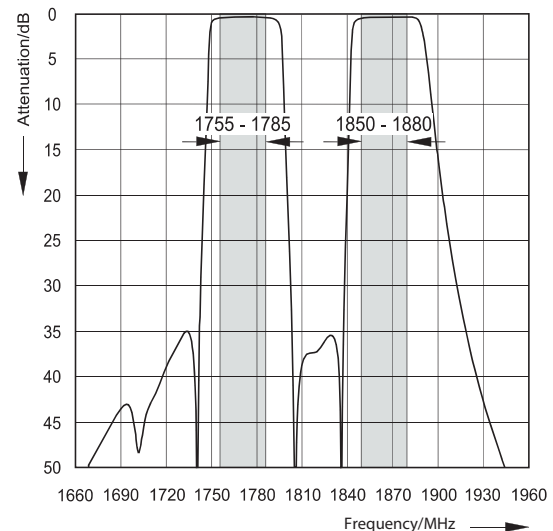
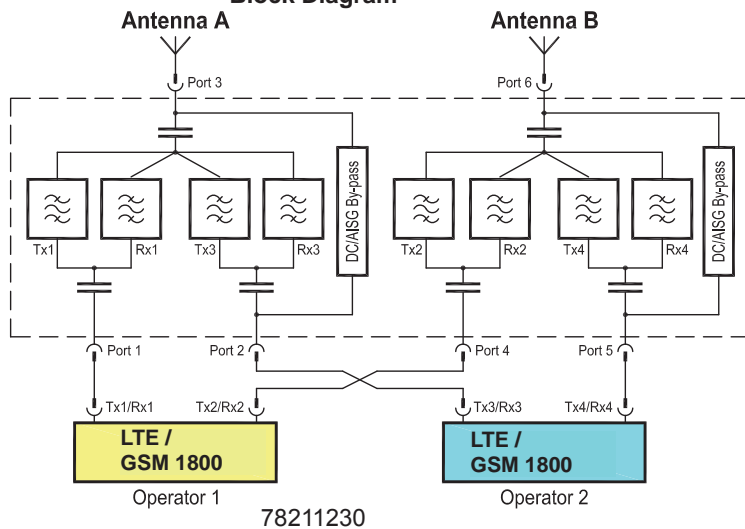


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



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".

Same-Band Combiner

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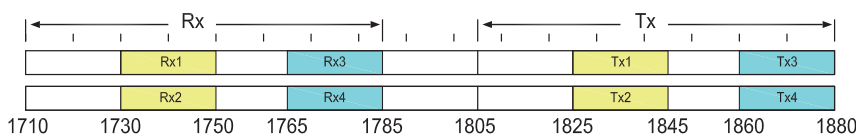
1730 – 1750 / 1825 – 1845 MHz
LTE/GSM1800 (20 MHz Bandwidth)

1765 – 1785 / 1860 – 1880 MHz
LTE/GSM1800 (20 MHz Bandwidth)

- 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)

Same-Band Combiner

1730 – 1750 / 1825 – 1845 MHz
LTE/GSM1800 (20 MHz Bandwidth)

1765 – 1785 / 1860 – 1880 MHz
LTE/GSM1800 (20 MHz Bandwidth)

Typical Attenuation Curves

BTS 1 (LTE/GSM 1800)

Diagram 1

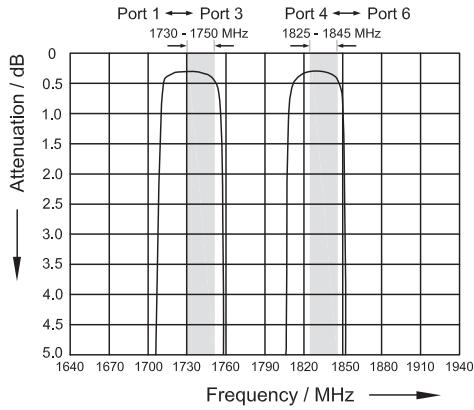
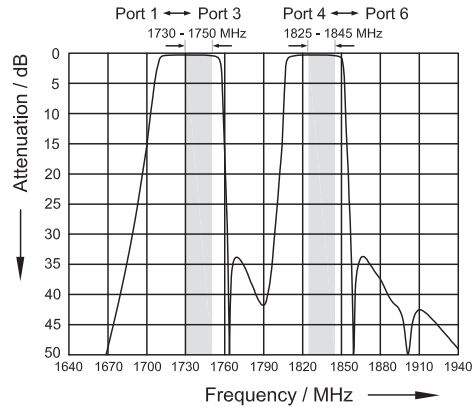


Diagram 2



BTS 2 (LTE/GSM 1800)

Diagram 3

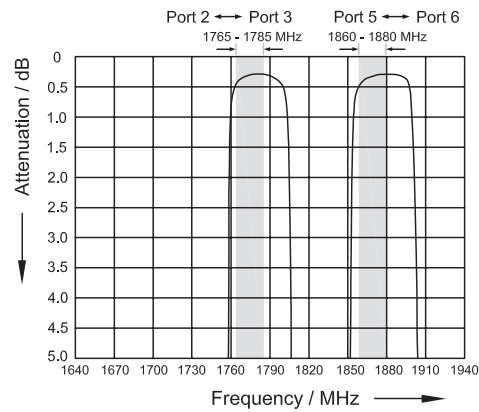
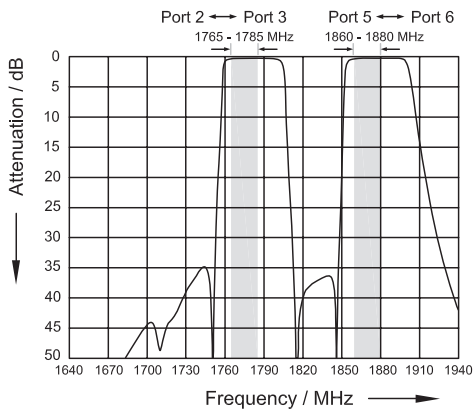
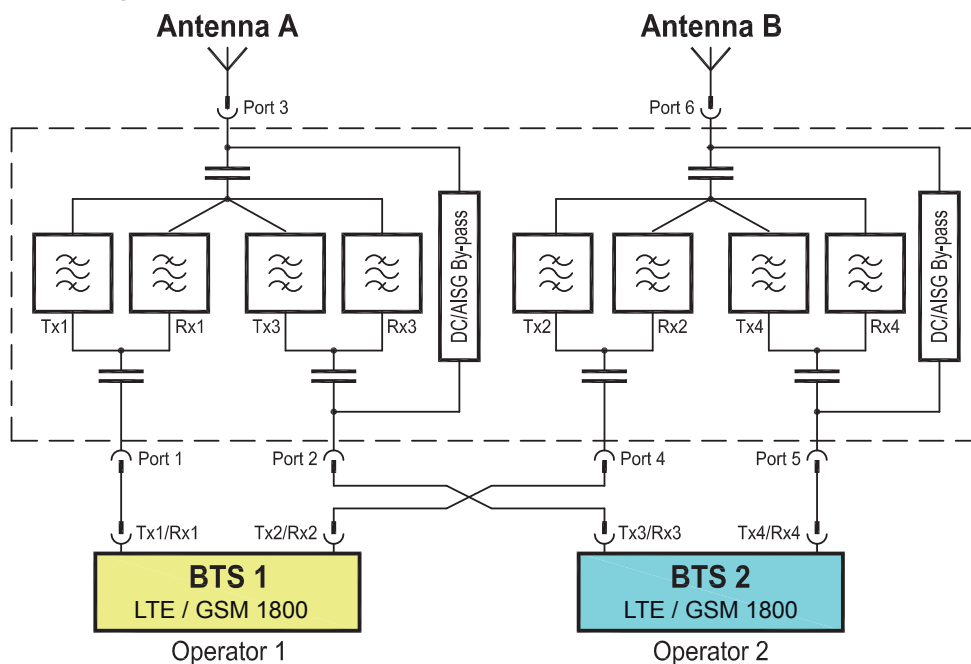


Diagram 4



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 Combiner

KATHREIN

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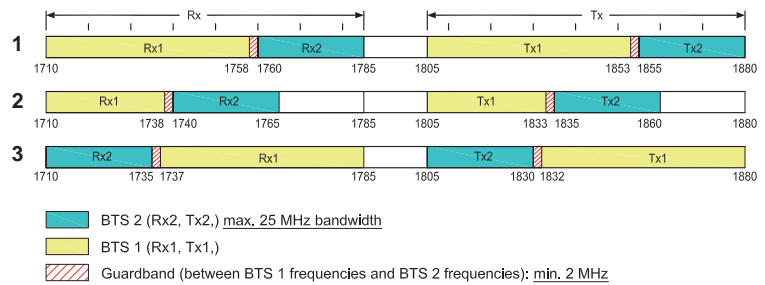
1710 - 1785 / 1805 - 1880 MHz
GSM / LTE 1800

1710 - 1785 / 1805 - 1880 MHz
GSM / LTE 1800 (25 MHz Bandwidth)

- 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



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)

Same-Band Combiner

KATHREIN

Antennen · Electronic

1710 - 1785 / 1805 - 1880 MHz
GSM / LTE 1800

1710 - 1785 / 1805 - 1880 MHz
GSM / LTE 1800 (25 MHz Bandwidth)

Typical Attenuation Curves 78211370V01

Diagram 1 Port 2 ↔ Port 3

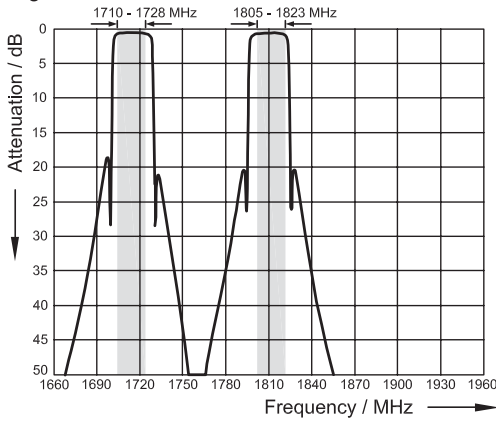


Diagram 3 Port 1 ↔ Port 3

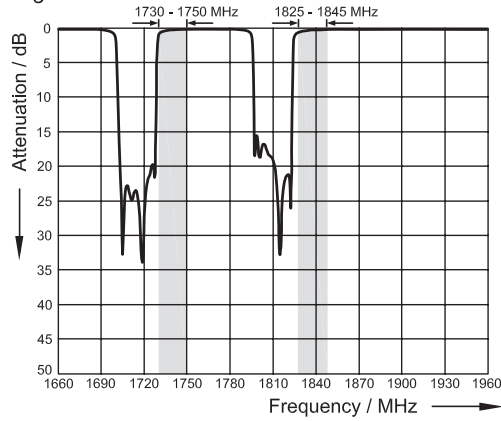


Diagram 2 Port 2 ↔ Port 3

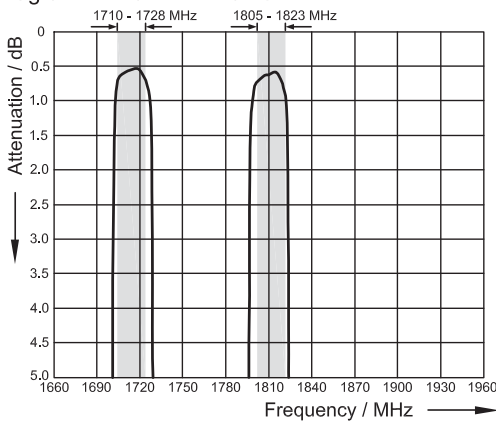
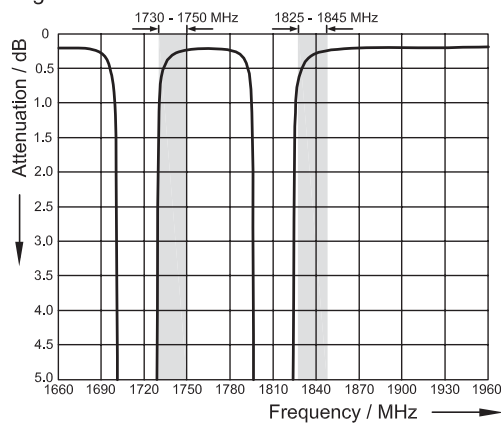
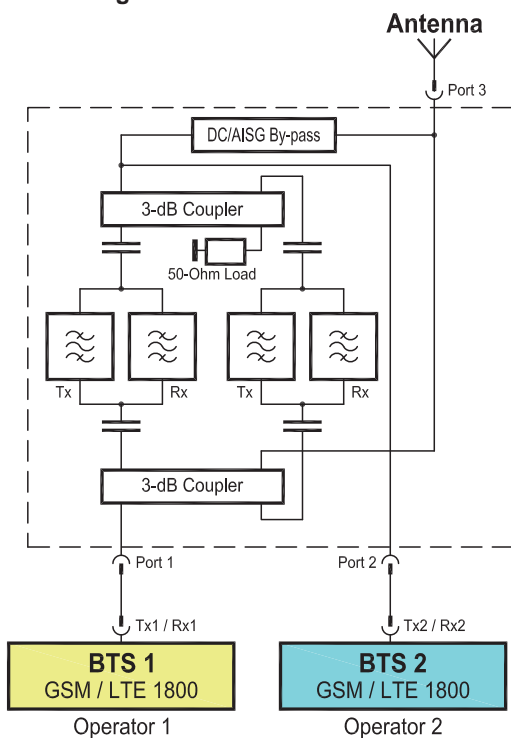


Diagram 4 Port 1 ↔ Port 3



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".

Same-Band Combiner

KATHREIN

Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (10 MHz Bandwidth)

- 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



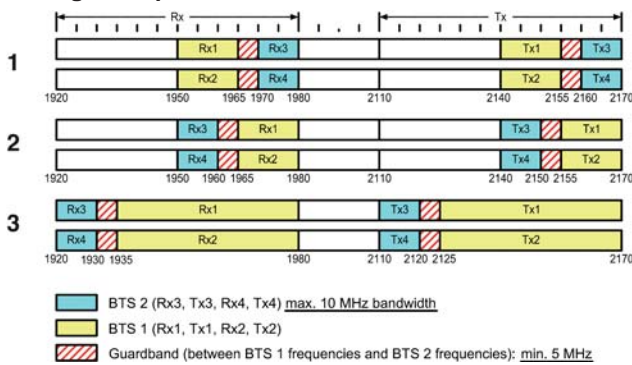
Frequency ordering information:

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

Tuning Examples



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)

Same-Band Combiner

KATHREIN

Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (10 MHz Bandwidth)

Typical Attenuation Curves

BTS 1 (UMTS 2100)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

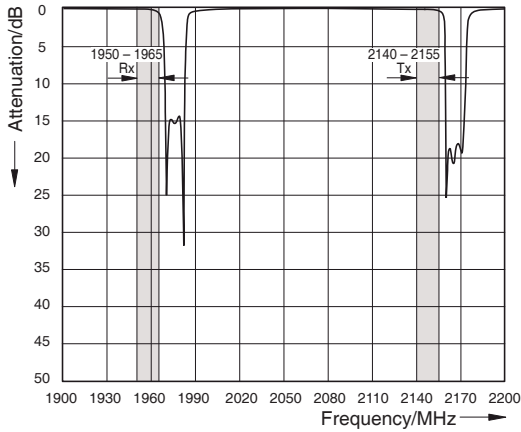
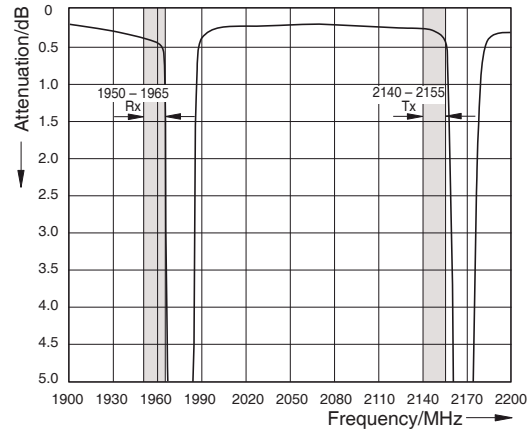


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (UMTS 2100)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

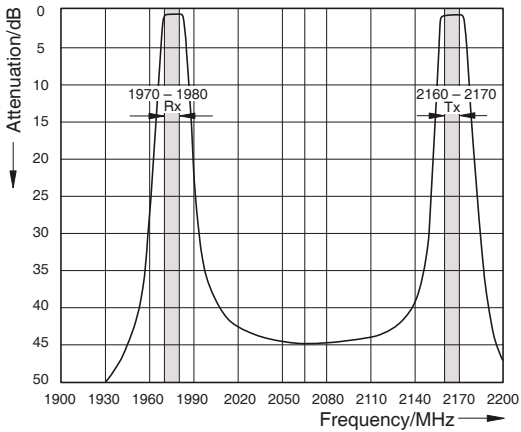
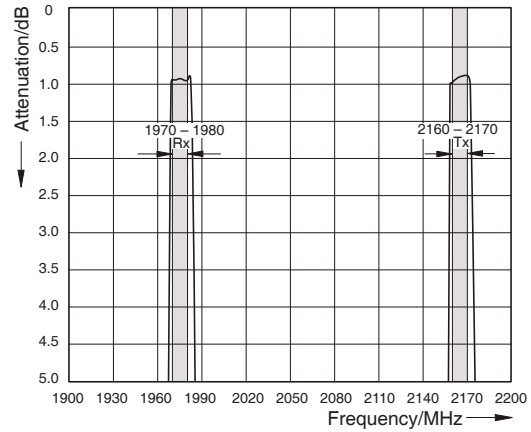
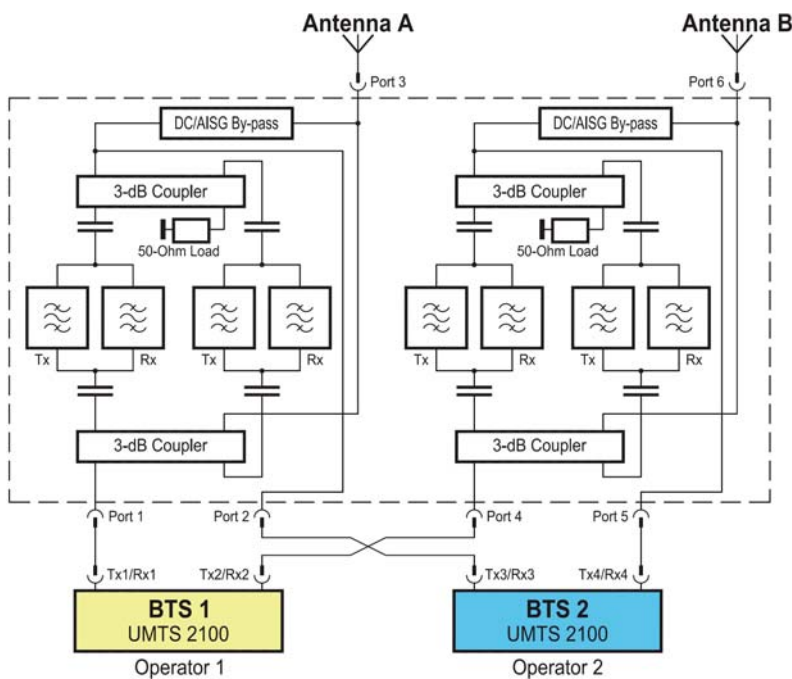


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



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".

Same-Band Combiner

KATHREIN

Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (15 MHz Bandwidth)

- 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



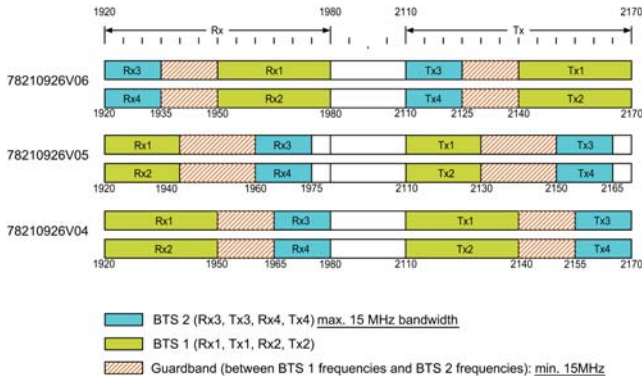
Frequency ordering information:

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

Tuning Examples



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 ± 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 ↔ Port 3 / Port 4 ↔ Port 6 Port 2 ↔ Port 3 / Port 5 ↔ Port 6	< 1.2 dB < 1.2 dB
Isolation Port 1 ↔ Port 2 / Port 4 ↔ 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 °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
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)

Same-Band Combiner

KATHREIN

Antennen · Electronic

1920 – 1980 / 2110 – 2170 MHz
UMTS 2100

1920 ... 1980 / 2110 ... 2170 MHz
UMTS 2100 (15 MHz Bandwidth)

Typical Attenuation Curves (Tuning Example 1)

BTS 1 (UMTS 2100)

Diagram I (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)

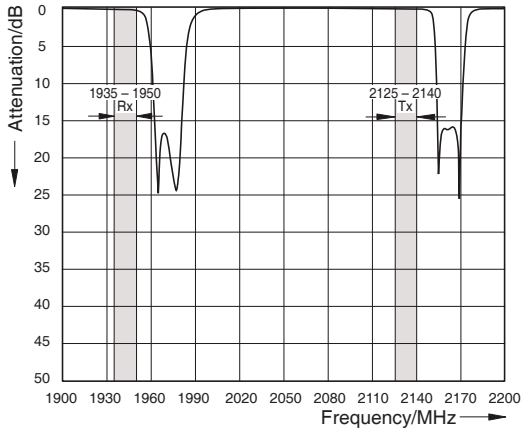
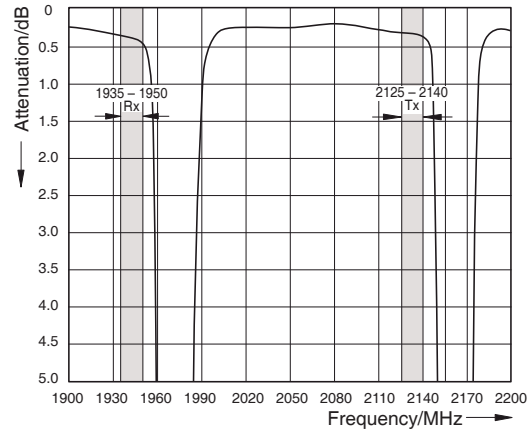


Diagram II (Port 1 ↔ Port 3 / Port 4 ↔ Port 6)



BTS 2 (UMTS 2100)

Diagram III (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)

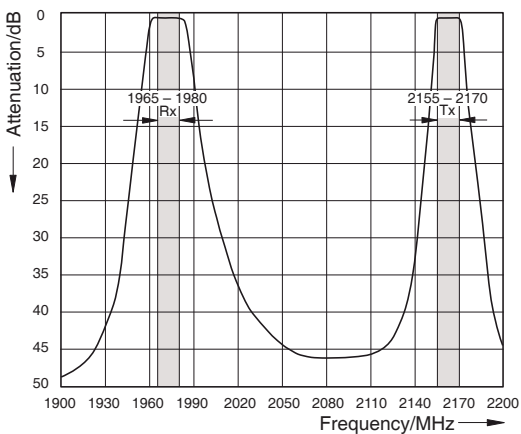
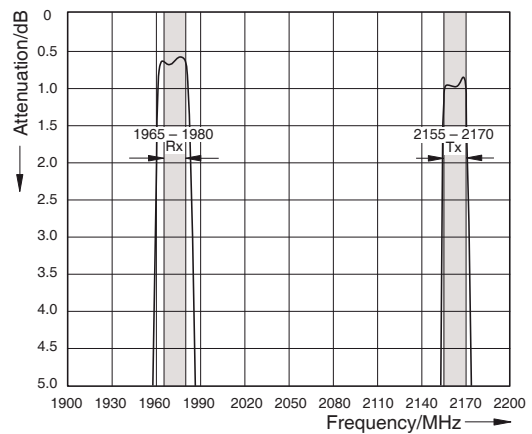
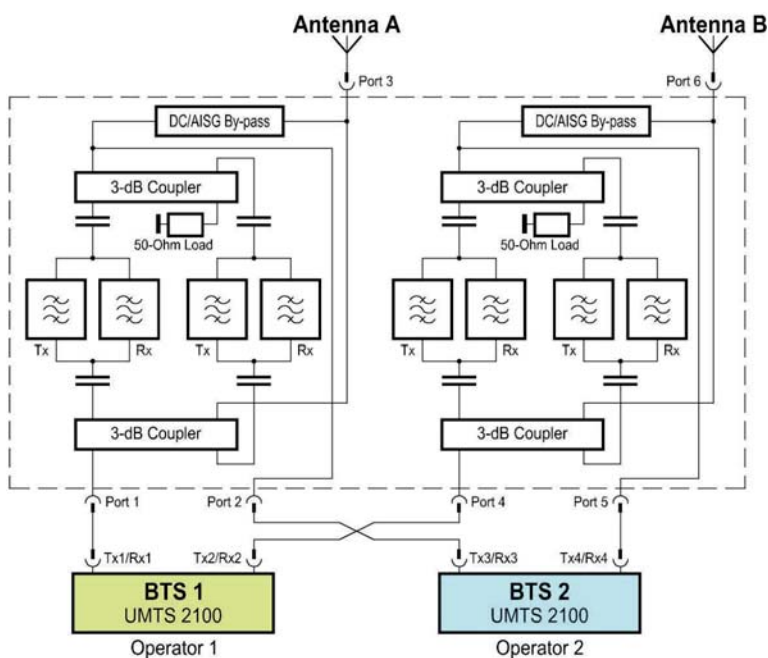


Diagram IV (Port 2 ↔ Port 3 / Port 5 ↔ Port 6)



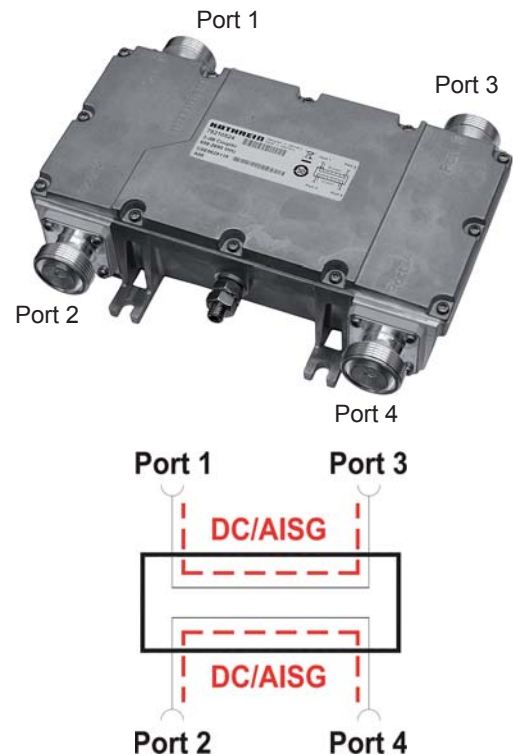
Block Diagram



- Clamp set (type no. 734360 - 734365) and
 - 50-Ohm load (type no. 78410367)
- (order separately) can be found in the section "System Components".

3-dB Coupler Hybrid Combiner 2 : 2 698 - 2690 MHz

- 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 or outdoor applications
- Single unit
- Suitable for indoor or outdoor applications
- DC/AISG by-pass
- External DC stop available as an accessory



Technical Data

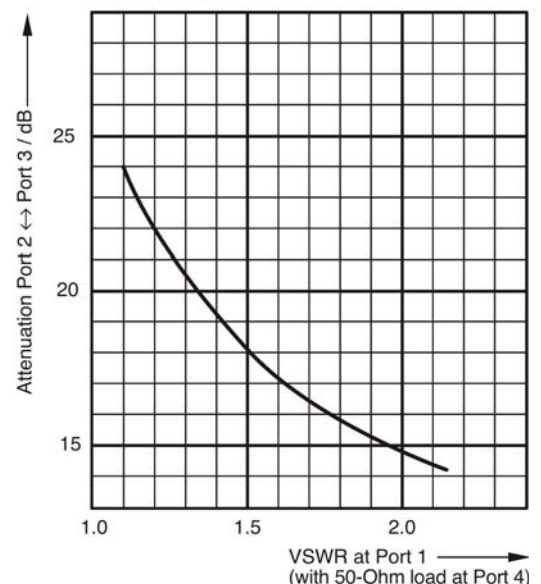
Type No.	782 10524
Frequency range	698 - 2690 MHz
Attenuation	
Port 1 ↔ Port 2	3.1 ±0.5 dB
Port 1 ↔ Port 3	3.1 ±0.5 dB
Port 2 ↔ Port 3	See diagram
Directivity	> 20 dB
VSWR	< 1.25
Impedance	50 Ω
Input power	< 150 W at each input port
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature 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

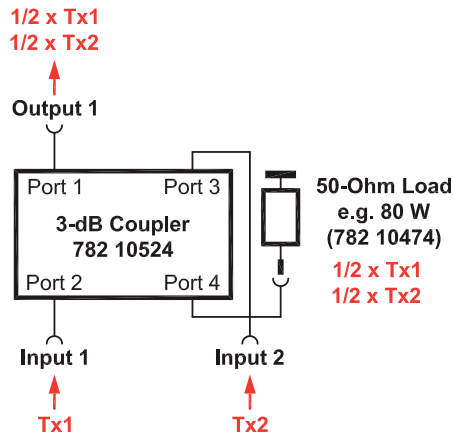
Typical attenuation Port 2 ↔ Port 3 vs.
VSWR at Port 1



3-dB Coupler Hybrid Combiner 2 : 2 698 - 2690 MHz

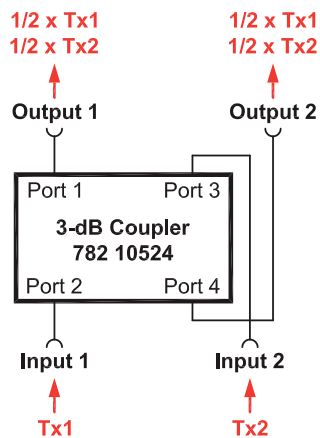
Application Example 1: Hybrid Combiner 2:1

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)



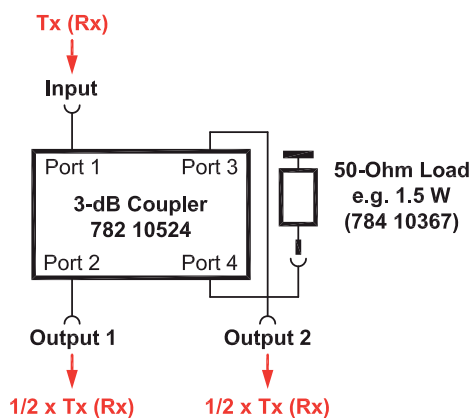
Application Example 2: Hybrid Combiner 2:2

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)



3-dB Coupler Hybrid Combiner 2:2 806 - 960 MHz

The 3-dB coupler can be used:

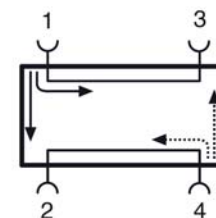
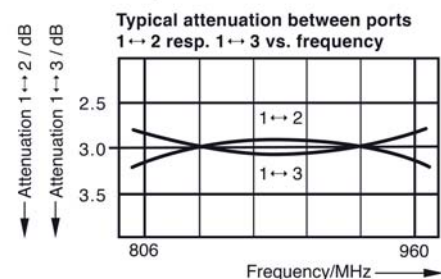
- as a decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
- for the decoupled combining of two receivers with frequency spacing as narrow as desired,
- for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
- as a frequency-independent 90° phase shifter,
- as a component to form combiners.



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.

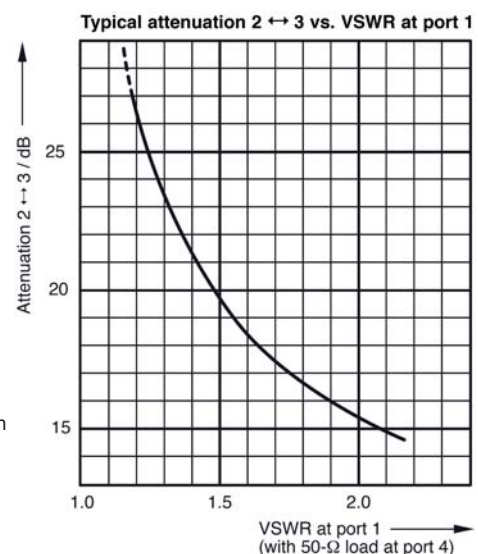
Diagram I



Technical Data

Type No.	793506
Frequency range	806 - 960 MHz
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ±0.4 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 30 dB
VSWR	< 1.1
Impedance	50 Ω
Input power	< 500 W total power at two inputs, with max. 350 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. 6 mm diameter)
Weight	1.8 kg
Packing size	160 x 95 x 65 mm
Dimensions (w x h x d)	136 x 46.5 x 94 mm (including connectors)

Diagram II



Note:

VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads

3-dB Coupler

Hybrid Combiner 2:2

1700 - 2200 MHz

The 3-dB coupler can be used:

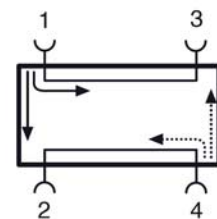
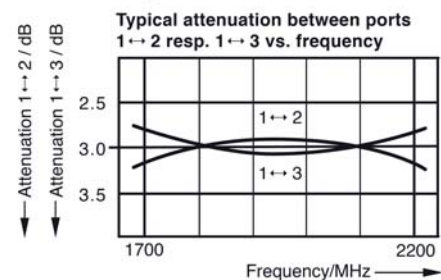
- as a decoupled power splitter with a ratio of 1:1,
- for the decoupled combining of two transmitters with frequency spacing as narrow as desired (at 3 dB loss),
- for the decoupled combining of two receivers with frequency spacing as narrow as desired,
- for the decoupled combining of two transmitter/receiver units, whose integrated duplexers are within the same frequency range,
- as a frequency-independent 90° phase shifter,
- as a component to form combiners.

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.



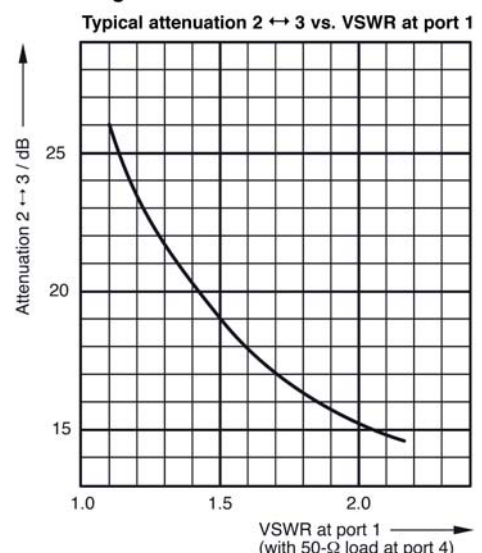
Diagram I



Technical Data

Type No.	793006
Frequency range	1700 - 2200 MHz
Attenuation 1 ↔ 2 / 1 ↔ 3	3 ± 0.4 dB (see diagram I)
Attenuation 2 ↔ 3	See diagram II
Directivity	> 25 dB
VSWR	< 1.15
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)	94 x 59.5 x 89 mm (including connectors)

Diagram II



Note:

VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads

3-dB Coupler

Hybrid Combiner 2:2

800 - 2200 MHz

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.

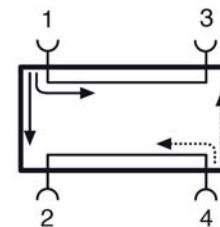
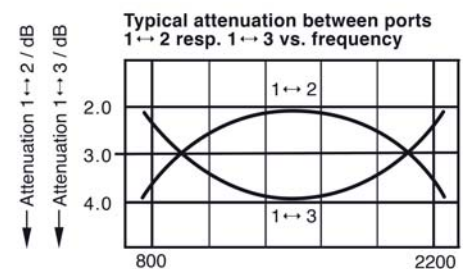


Function:

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



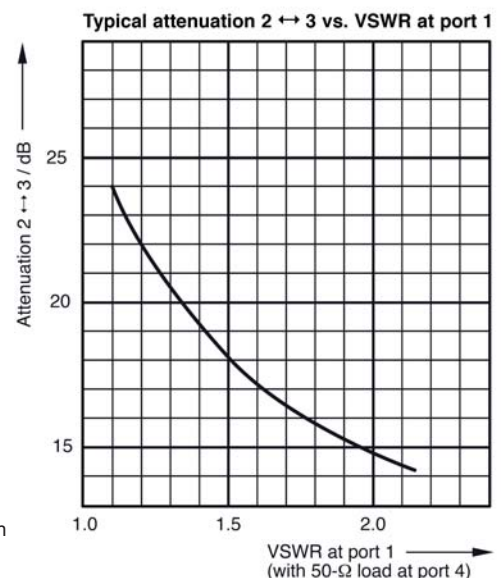
Technical Data

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)

Note:

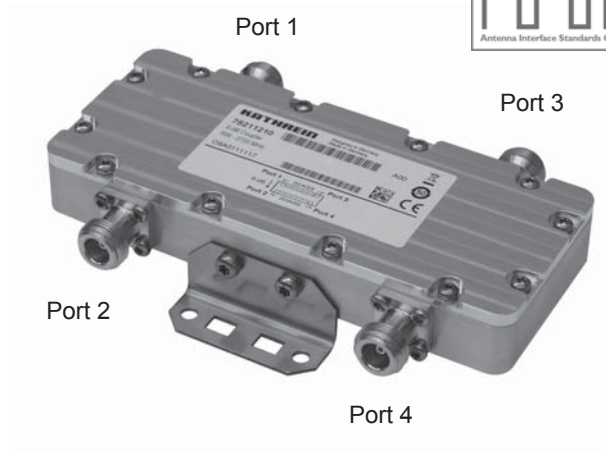
VSWR and attenuation values are measured when the remaining ports are terminated with 50-Ω loads

Diagram II



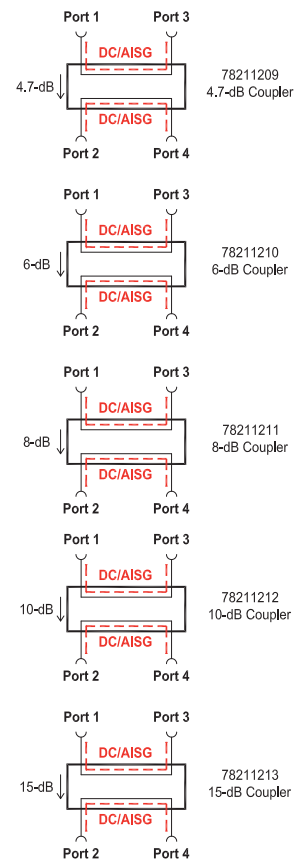
4.7-, 6-, 8-, 10-, 15-dB Coupler Hybrid Combiner 2:2 698 – 2690 MHz

- Suitable for indoor or outdoor applications
- DC/AISG bypass



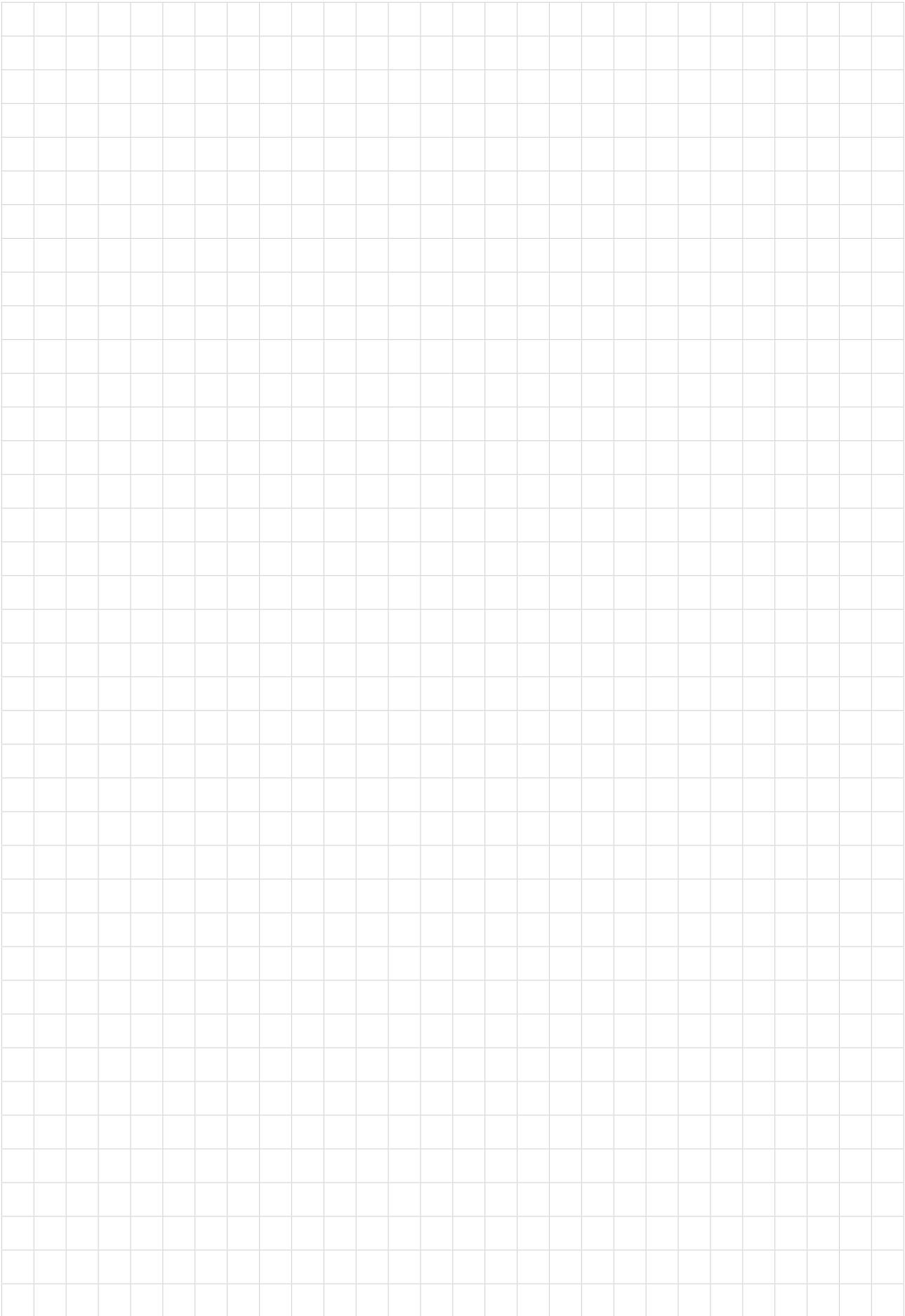
Technical Data

Type No.	78211209	78211210	78211211	78211212	78211213
Frequency range	698 – 2690 MHz				
Attenuation					
Port 1 ↔ Port 2	4.7 ± 1.0 dB	6.0 ± 1.0 dB	8.0 ± 1.0 dB	10.0 ± 1.0 dB	15.0 ± 1.0 dB
Port 1 ↔ Port 3	2.25 ± 0.5 dB	1.75 ± 0.5 dB	0.7 ± 0.3 dB	0.5 ± 0.5 dB	0.2 ± 0.2 dB
Port 2 ↔ Port 3	> 18 dB	> 18 dB	> 20 dB	> 20 dB	> 20 dB
VSWR	< 1.3 (698-2600), < 1.35 (2600-2690)	< 1.25			
Impedance	50 Ω				
Input power	< 150 W at each input port				
Intermodulation products	< -150 dBc (3 rd order; with 2 x 20 W)				
Temperature range	-40 ... +70 °C				
Connectors	N female				
Application	Indoor or outdoor (IP66)				
DC/AISG transparency	Bypass between Port 1 ↔ Port 3 / Port 2 ↔ Port 4 (max. 2500 mA)				
Mounting	With 4 screws (max. 4 mm diameter)				
Weight	0.8 kg				
Dimensions (w x h x d)	156 x 64.5 x 22.7 (without connectors and mounting feet)				



Note:

VSWR and attenuation values only valid if all ports are terminated with 50-Ohm loads.



System Components

Bias Tees
Measuring Directional Couplers
DC-Stops
Attenuators
50- Ω Loads
DC-DC Converter



System Components:

Description	Type No.	Frequency range	Max. input power	Page
DC Stop	793301	800 - 2170 MHz	750 W	330
DC Stop	78210850V01	250 - 2700 MHz	750 W	331
Bias Tee, outdoor	78210577	690 - 2700 MHz	250 W	332
Bias Tee, outdoor (AISG)	78210578	690 - 2700 MHz	250 W	333
Smart Bias Tee	78211053	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211054	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211055	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211056	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211063	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211064	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211065	690 - 2700 MHz	750 W	334 - 336
Smart Bias Tee	78211066	690 - 2700 MHz	750 W	334 - 336
DC-DC Converter	78210480	790 - 2300 MHz	250 W	337
DC-DC Converter	78210481	790 - 2300 MHz	250 W	337
50-Ω Load (N male)	K6226611	0 - 2700 MHz	0.5 W	338
50-Ω Load (7-16 male)	78410367	0 - 4000 MHz	1.5 W	338
50-Ω Load (7-16 female)	78410470	0 - 4000 MHz	1.5 W	338
50-Ω Load (N male)	K6226111	0 - 2700 MHz	2 W	338
50-Ω Load (N female)	K6226401	0 - 2700 MHz	10 W	338
50-Ω Load (N male)	K6226411	0 - 2700 MHz	10 W	338
50-Ω Load (N female)	K6226201	0 - 2700 MHz	25 W	339
50-Ω Load (N male)	K6226211	0 - 2700 MHz	25 W	339
50-Ω Load (7-16 female)	K6226207	0 - 2700 MHz	25 W	339
50-Ω Load (7-16 male)	K6226217	0 - 2700 MHz	25 W	339
50-Ω Load (N female)	K6226301	0 - 2700 MHz	50 W	339
50-Ω Load (N male)	K6226311	0 - 2700 MHz	50 W	339
50-Ω Load (7-16 female)	K6226307	0 - 2700 MHz	50 W	339
50-Ω Load (7-16 male)	K6226317	0 - 2700 MHz	50 W	339
50-Ω Load (N female)	K6226501	0 - 1000 MHz	100 W	339
50-Ω Load (N male)	K6226511	0 - 1000 MHz	100 W	339
50-Ω Load (7-16 female)	K6226507	0 - 1000 MHz	100 W	339
50-Ω Load (7-16 female) Low IM	78210474	698 - 2700 MHz	80 W	340
Attenuator 3 dB	78410235	0 - 4000 MHz	2 W	341
Attenuator 6 dB	78410236	0 - 4000 MHz	2 W	341
Attenuator 10 dB	78410237	0 - 4000 MHz	2 W	341
Attenuator 20 dB	78410238	0 - 4000 MHz	2 W	341
Attenuator 3 dB	791918	0 - 4000 MHz	15 W	341
Attenuator 6 dB	791919	0 - 4000 MHz	12 W	341
Attenuator 10 dB	791920	0 - 4000 MHz	10 W	341
Attenuator 20 dB	791921	0 - 4000 MHz	10 W	341
Clamp set	734360			342
Clamp set	734361			342
Clamp set	734362			342
Clamp set	734363			342
Clamp set	734364			342
Clamp set	734365			342

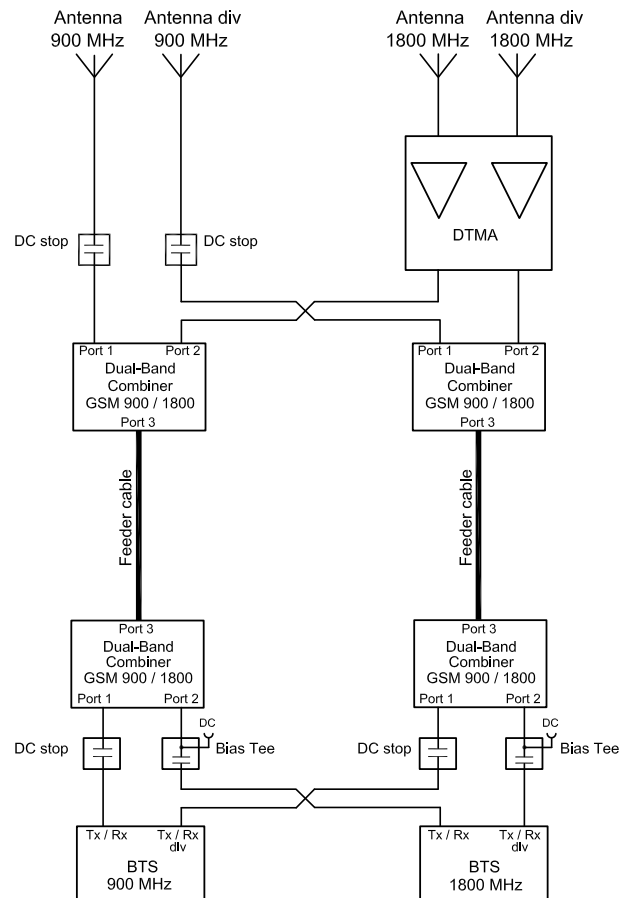
**New
Products**

DC Stop

800 - 2170 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
- Suitable for indoor or outdoor applications



Application Example

Technical Data

Type No.	793301
Frequency range	800 - 2170 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (800 - 2170 MHz)
Isolation Port 1 ↔ Port 2	> 70 dB (DC)
VSWR	< 1.1 (800 - 2000 MHz) < 1.2 (2000 - 2170 MHz)
Impedance	50 Ω
Input power	< 750 W (800 - 2170 MHz)
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Temperature range	-40 ... +70 °C
Connectors Port 1 Port 2	7-16 male 7-16 female
Application	Indoor or outdoor (IP 66)
Weight	0.32 kg
Dimensions (w x h x d)	70.4 x 39.5 x 32 mm (including connectors and earthing screw of 6 mm diameter)

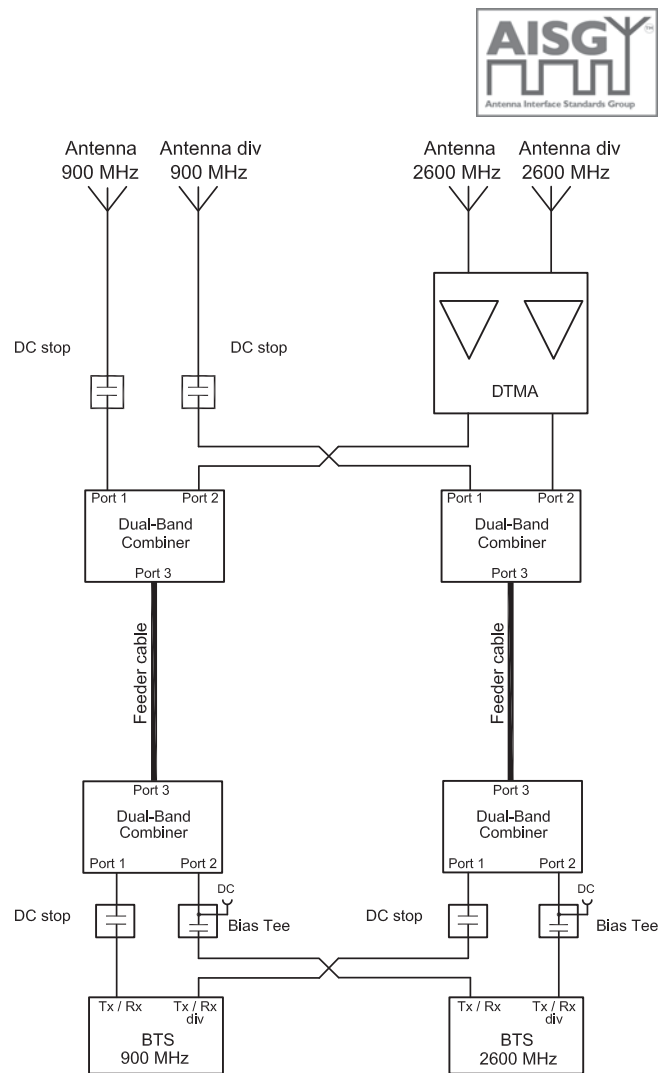


DC Stop

250 - 2700 MHz

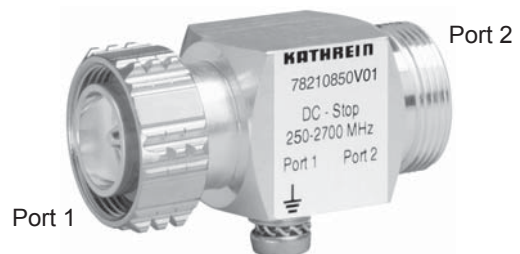
DC Stop is used in dual- or multi-band antenna systems where one or more antenna systems require a DC supply for an installed mast head amplifier. The DC Stop prevents DC voltage from being shorted within the non-biased antenna system(s) and isolates the corresponding base station output(s) from DC voltage.

- 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 Port 2	7-16 male 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)

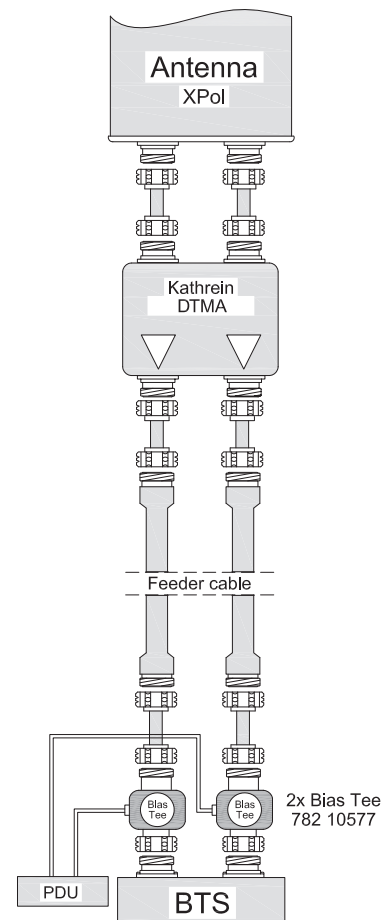


Bias Tee

690 - 2700 MHz

The Bias Tee is suitable to feed DC voltage into the feeder cable of a receiving and/or transmitting antenna system in order to provide the operating voltage for a mast head amplifier.

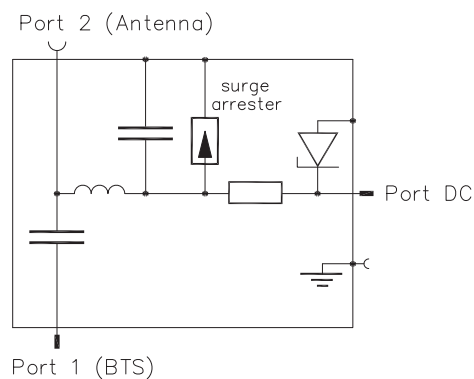
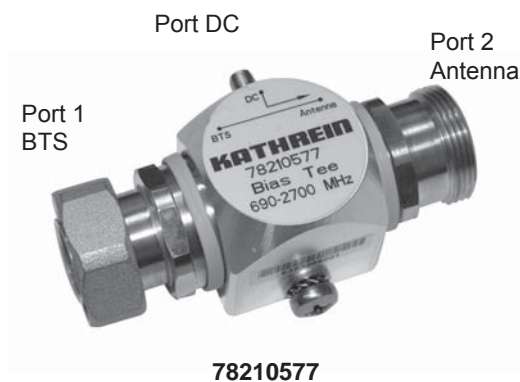
- The Bias Tee provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The DC voltage is fed from the DC port to the antenna port while providing a high level of DC isolation from the DC to the BTS port and from the antenna to the BTS port.
- The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.



Technical Data

Type No.	78210577
Frequency range	690 - 2700 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (690 - 2700 MHz)
Isolation Port 1 ↔ Port 2 Port 1 ↔ DC Port 1/2 ↔ DC	DC-Stop DC-Stop > 65 dB (690 - 2700 MHz)
VSWR	< 1.1 (690 - 2700 MHz)
Impedance	50 Ω
Input power Port 1 DC	< 250 W (690 - 2700 MHz) < 1 A / 0 ... +30 VDC
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Lightning protection	3 kA, 10/350 μs pulse
Temperature range	-40 ... +70 °C
Connectors Port 1 (BTS) Port 2 (Antenna) Port DC	7-16 male 7-16 female SMA female
Application	Indoor or outdoor (IP 66)
Weight	0.32 kg
Packing size	144 x 88 x 83 mm
Dimensions (w x h x d)	98.5 x 39.15 x 52.92 mm (including connectors and earthing screw of 6 mm diameter)

Application Example

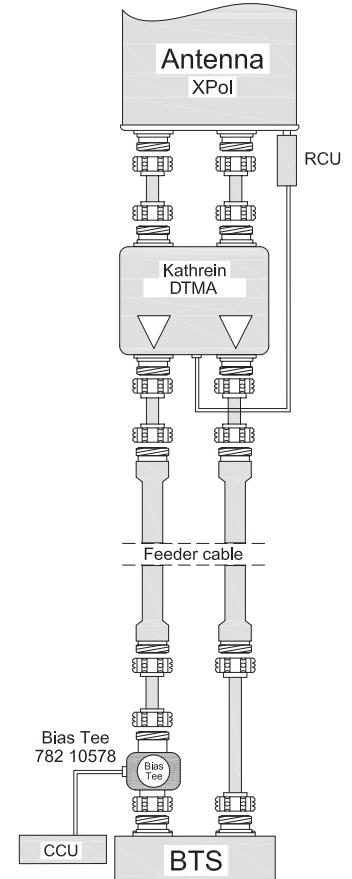


Bias Tee

690 - 2700 MHz

The Bias Tee is suitable to feed DC voltage and AISG control signals into the feeder cable in order to provide operating voltage and control signals via the RF feeder cable to the TMA or RCU.

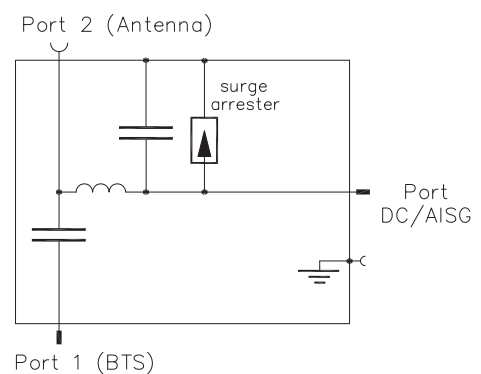
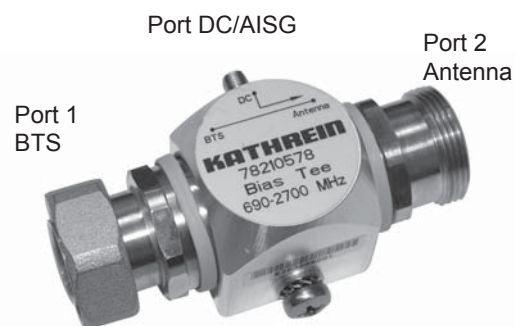
- The Bias Tee provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The DC voltage and AISG control signal (2.176 MHz) is fed from the DC port to the antenna port while providing a high level of DC isolation from the DC to the BTS port and from the antenna to the BTS port.
- The measures taken in conjunction with the CCU-LOC to protect against static discharge and lightning ensure a high level of reliability and operational safety



Application Example

Technical Data

Type No.	78210578
Frequency range	690 - 2700 MHz
Insertion loss Port 1 ↔ Port 2	< 0.1 dB (690 - 2700 MHz)
Isolation Port 1 ↔ Port 2 Port 1 ↔ Port DC/AISG	> 70 dB (DC) > 70 dB (DC)
VSWR	< 1.1 (690 - 2700 MHz)
Impedance	50 Ω
Input power Port 1 Port DC/AISG	< 250 W (690 - 2700 MHz) < 1 A / 0 ... +30 VDC
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)
Lightning protection	3 kA, 10/350 μs pulse
Temperature range	-40 ... +70 °C
Connectors Port 1 (BTS) Port 2 (Antenna) Port DC	7-16 male 7-16 female SMA female
Application	Indoor or outdoor (IP 66)
Weight	0.32 kg
Packing size	144 x 88 x 83 mm
Dimensions (w x h x d)	98.5 x 39.15 x 52.92 mm (including connectors and earthing screw of 6 mm diameter)



Smart Bias Tee

690 – 2700 MHz



The **Smart Bias Tee** combines the performance of a standard Bias Tee (e.g. type 78210577) 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.

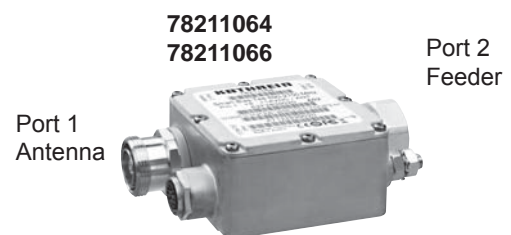
- **78211053, 78211063:**
+8 ... 14 VDC (DC on pin1) version for use near the BTS, in order to feed-in DC voltage and RCU control signals into a feeder cable (**only required for TMAs and RCUs with power supply below 15 VDC**)
- **78211054, 78211064:**
+8 ... 14 VDC (DC on pin1) version for use near 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 11063	782 11064	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

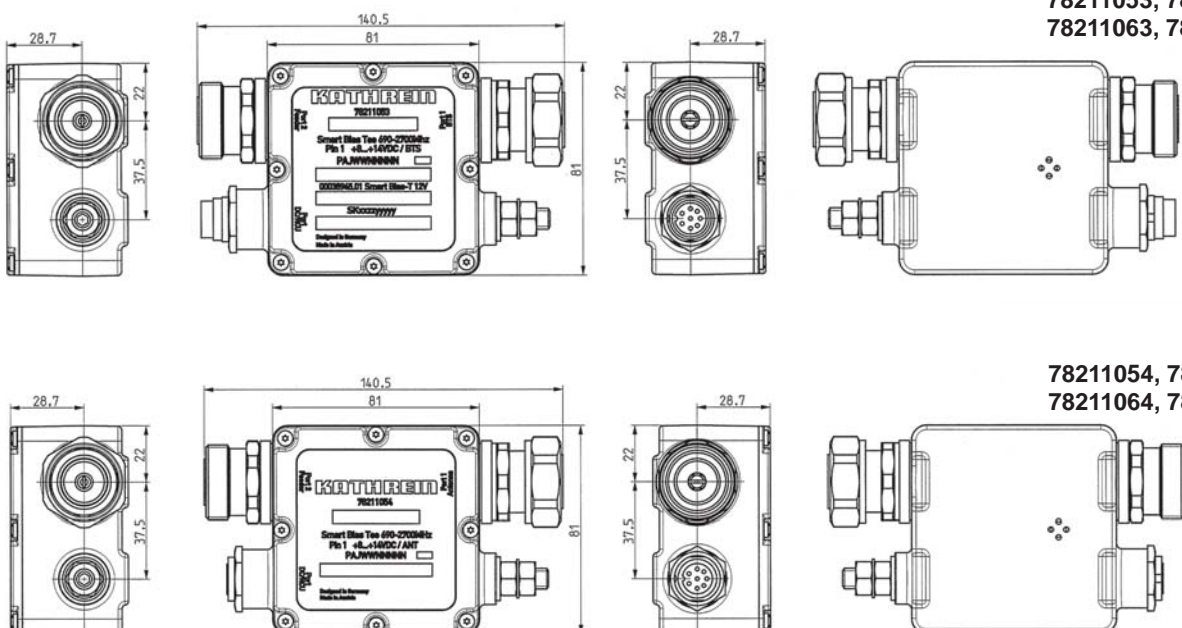


Smart Bias Tee 690 – 2700 MHz

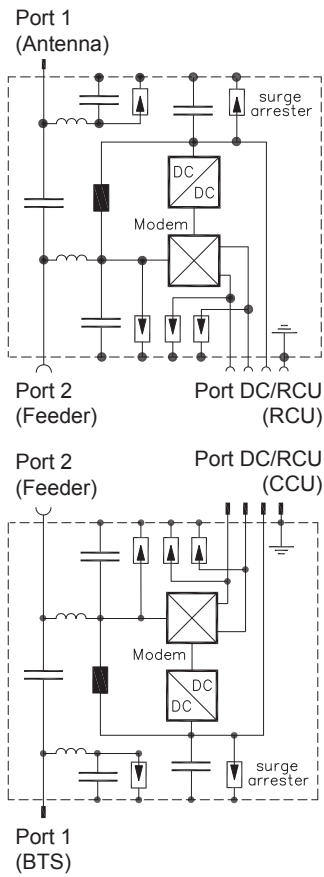
Technical Data

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.	78211063 +8 ... +14 VDC / BTS	78211064 +8 ... +14 VDC / Antenna	78211065 +8 ... +32 VDC / BTS	78211066 +8 ... +32 VDC / Antenna
Port 1: 7-16 female	BTS	Antenna	BTS	Antenna
Port 2: 7-16 male	Feeder	Feeder	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)			

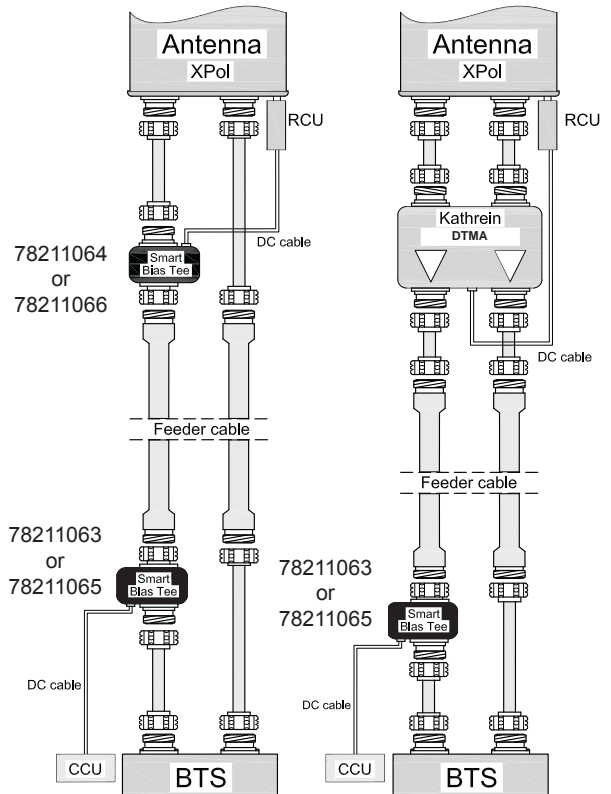
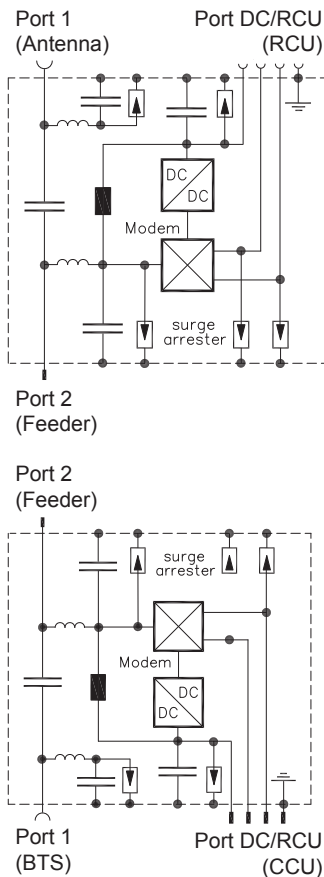
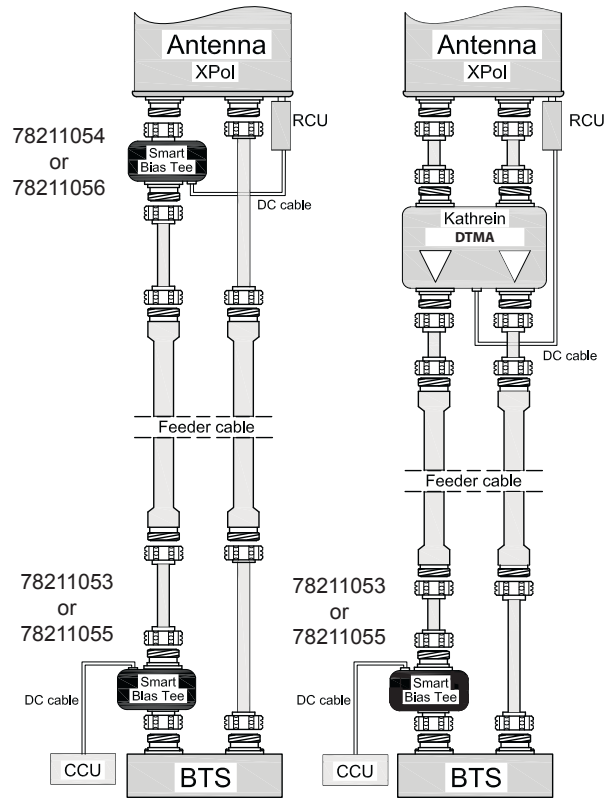
Dimensional drawings:



Block diagrams:



Application Examples:

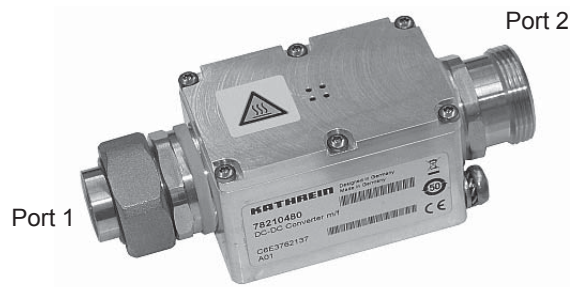


DC-DC Converter

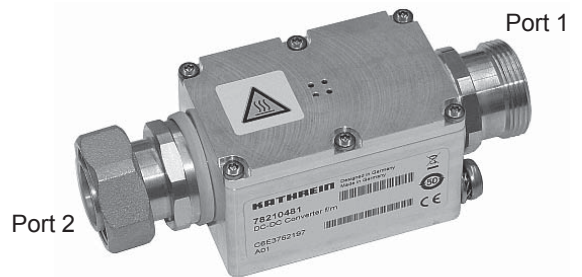
790 – 2300 MHz
 LTE800 / GSM900 / GSM1800 / UMTS2100

The DC-DC Converter is suitable to convert a high DC voltage on BTS port to a lower constant DC voltage on antenna port to provide the operating voltage for a mast head amplifier.

- The DC-DC Converter provides low RF signal insertion loss from the BTS to the antenna port and vice versa.
- The measures taken to protect against static discharge and lightning ensure a high level of reliability and operational safety.
- Over temperature protection
- The DC-DC Converter is fully DC current transparent over the whole operational voltage range. The output current is nearly the same of the input current (< 5 mA power consumption).



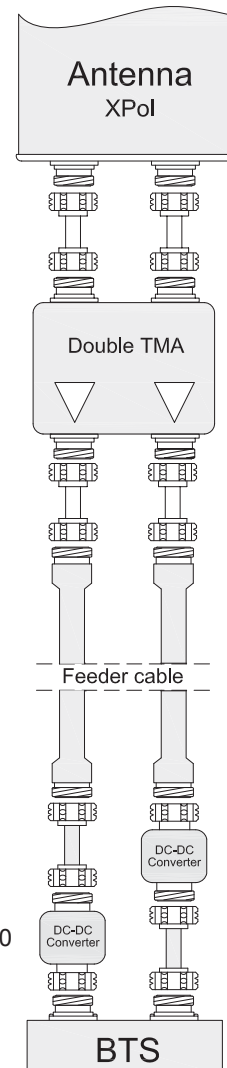
78210480



78210481

Technical Data

Type No.	78210480	78210481
Frequency range	790 - 2300 MHz	
Insertion loss Port 1 ↔ Port 2	< 0.05 dB (790 - 2300 MHz)	
Input voltage	15 - 32 V	
Output voltage	12 V (max. 13.8 V)	
Inrush current limit	Max. 500 mA	
Power consumption	≤ 5 mA	
VSWR	< 1.1 (790 - 2300 MHz)	
Impedance	50 Ω	
Input power	< 250 W (790 - 2300 MHz)	
Intermodulation products	< -160 dBc (3 rd order; with 2 x 20 W)	
Temperature range	-40 ... +65 °C	
Connectors	Port 1 7-16 male	7-16 female
	Port 2 7-16 female	7-16 male
Application	IP 68	
DC/AISG transparency	AISG stop	
Weight	0.8 kg	
Packing size	50 x 158 x 50 mm	
Dimensions (w x h x d)	43 x 70 x 46 mm (without connectors and earthing screw of 6 mm diameter)	



78210480

78210481

50-Ohm Load

0 ... 4000 MHz

0.5 ... 100 W

- Standard 50-Ohm terminations for small and medium power
- Suitable for terminating open ports on RF equipment for indoor and/or outdoor applications

0.5 Watt *

Type No.	K6226611
Connector	N male
Frequency range	0 - 2700 MHz
VSWR	0 - 1000 MHz < 1.08
	1000 - 2000 MHz < 1.15
	2000 - 2700 MHz < 1.20
Application	Indoor
Weight	40 g
Packing size	90 x 60 x 25
Dimensions	33 / 21 mm diameter



K 62 26 61 1

1.5 Watt *

Type No.	78410367	78410470
Connector	7-16 male	7-16 female
Frequency range	0 - 4000 MHz	
VSWR	0 - 2000 MHz < 1.10	
	2000 - 4000 MHz < 1.30	
Application	Indoor or outdoor (IP65)	
Weight	120 g	
Packing size	Approx. 50 x 90 x 100 mm	
Dimensions	40 / 32 mm diameter	42 / 29 mm diameter



784 10367

2.0 Watt *

Type No.	K6226111
Connector	N male
Frequency range	0 - 2700 MHz
VSWR	0 - 1000 MHz < 1.08
	1000 - 2000 MHz < 1.15
	2000 - 2700 MHz < 1.20
Application	Indoor
Weight	40 g
Packing size	90 x 60 x 25
Dimensions	33 / 21 mm diameter



K 62 26 11 1

10 Watt *

Type No.	K6226401	K6226411
Connector	N female	N male
Frequency range	0 - 2700 MHz	
VSWR	0 - 1000 MHz < 1.08	
	1000 - 2000 MHz < 1.15	
	2000 - 2700 MHz < 1.20	
Application	Indoor	
Weight	Approx. 250 g	
Packing size	50 x 90 x 100 mm	
Dimensions	40 x 82 x 77 mm (including connector)	40 x 82 x 85 mm (including connector)



K 62 26 40 1

50-Ohm Load

0 ... 4000 MHz

0.5 ... 100 W

25 Watt *

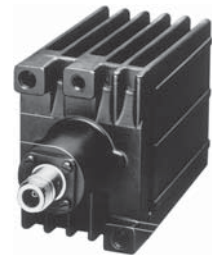
Type No.	K6226201	K6226211	K6226207	K6226217
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 - 2700 MHz			
VSWR	0 - 1000 MHz < 1.08			
	1000 - 2000 MHz < 1.15			
	2000 - 2700 MHz < 1.20			
Application	Indoor			
Weight	Approx. 0.5 kg			
Packing size	50 x 100 x 135 mm			
Dimensions (w x h x d)	35 x 94 x 113 mm (incl. connector)	35 x 94 x 121 mm (incl. connector)	35 x 94 x 125 mm (incl. connector)	35 x 94 x 124 mm (incl. connector)



K 62 26 20 1

50 Watt *

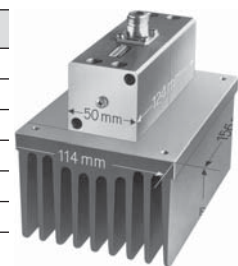
Type No.	K6226301	K6226311	K6226307	K6226317
Connector	N female	N male	7-16 female	7-16 male
Frequency range	0 - 2700 MHz			
VSWR	0 - 1000 MHz < 1.08			
	1000 - 2000 MHz < 1.15			
	2000 - 2700 MHz < 1.20			
Application	Indoor			
Weight	Approx. 0.8 kg			
Packing size	80 x 95 x 145 mm			
Dimensions (w 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)



K 62 26 30 1

100 Watt *

Type No.	K6226501	K6226511	K6226507
Connector	N female	N male	7-16 female
Frequency range	0 - 1000 MHz		
VSWR	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 153 x 156 mm (including connector)	114 x 161 x 156 mm (including connector)	114 x 170 x 156 mm (including connector)



K 62 26 50 1

* 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 782 010474, 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)

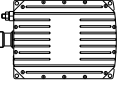
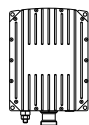
Note:

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

2 - 15 W

0 - 4000 MHz

Air-cooled attenuator for low 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.	78410235	78410236	78410237	78410238
Attenuation	3 ±0.3 dB	6 ±0.3 dB	10 ±0.3 dB	20 ±0.5 dB
Frequency range	0 - 4000 MHz			
VSWR	< 1.12			
Impedance	50 Ω			
Max. power	2 W			
Connectors	N			
IP rating	IP65			
Application	Outdoor			
Weight	60 g			
Dimensions (L x diameter)	49 x 21 mm			

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

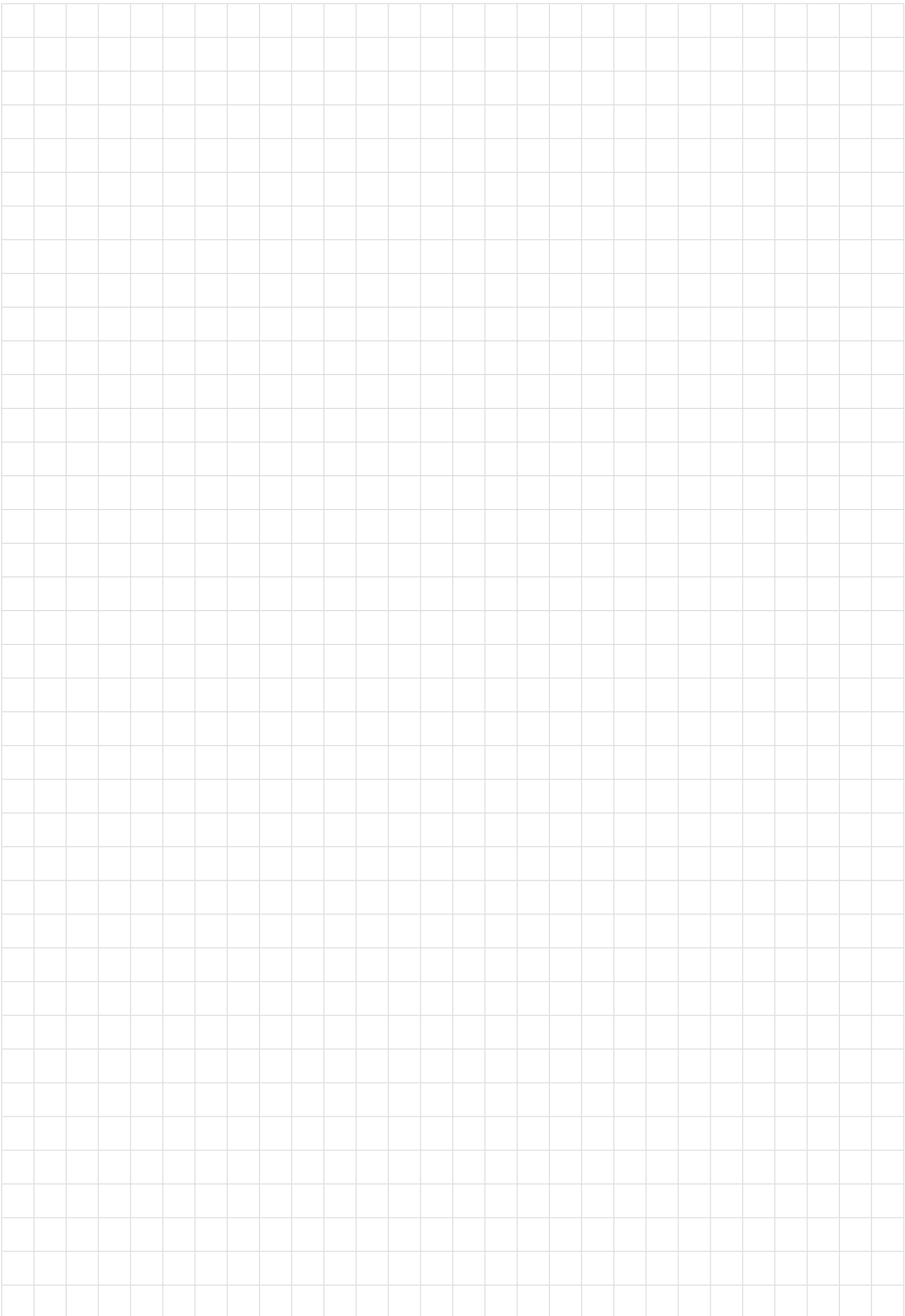


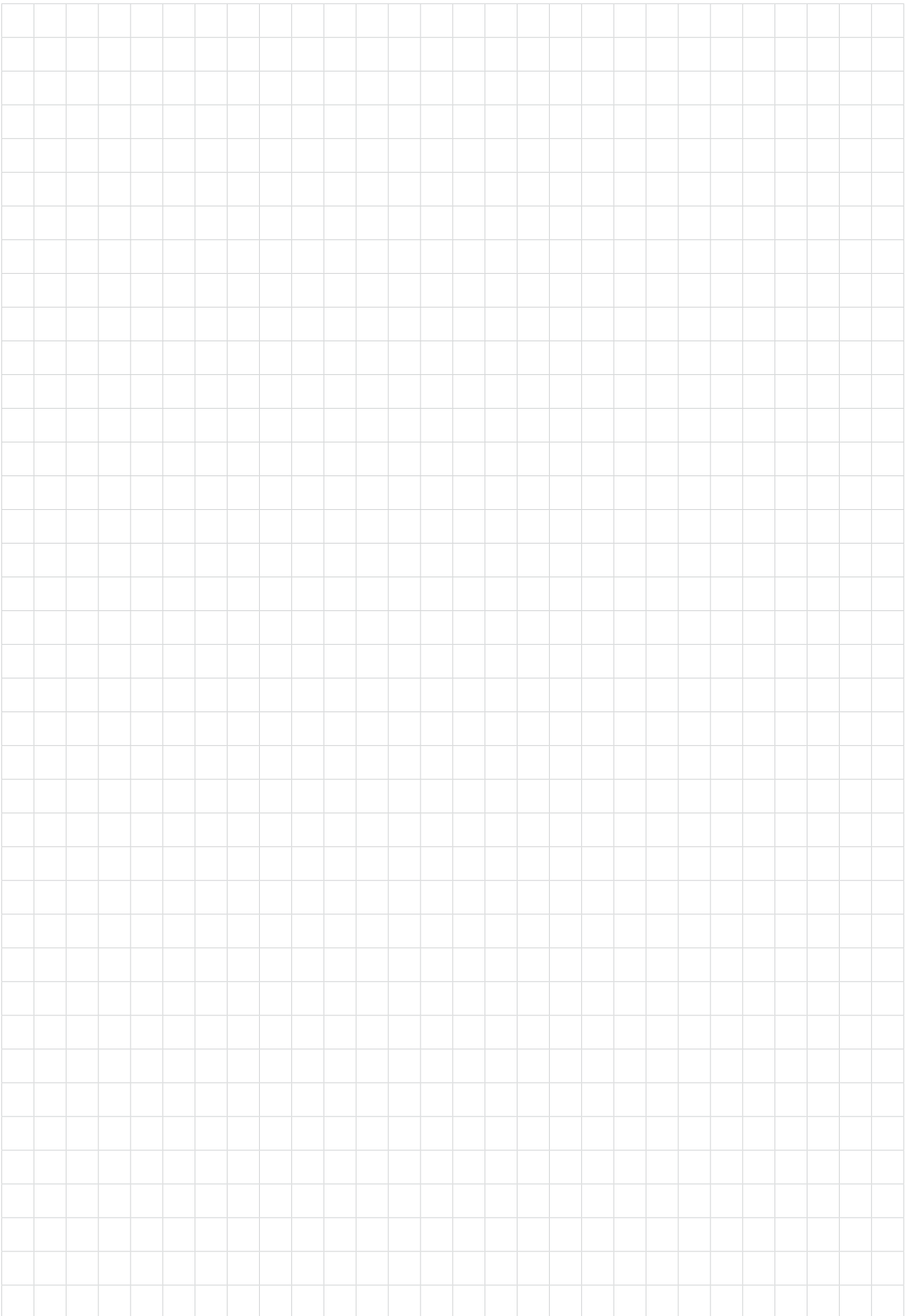
Technical Data

Type No.	791918	791919	791920	791921
Attenuation	3 ±0.3 dB	6 ±0.3 dB	10 ±0.3 dB	20 ±0.5 dB
Max. power	15 W	12 W	10 W	10 W
Frequency range	0 - 4000 MHz			
VSWR	< 1.15			
Impedance	50 Ω			
Connectors	N			
IP rating	IP65			
Application	Outdoor			
Weight	70 g			
Dimensions (L x diameter)	50 x 26 mm			

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

DTMAs:

Description	Type No.	Frequency range	Gain	Page
DTMA-800-12-AISG	78210430	UL: 832 - 862 / DL: 791 - 821 MHz	12 dB	348
DTMA-850-12-AISG-CWA	78210874	UL: 824 - 849 / DL: 869 - 894 MHz	12 dB	349
DTMA-800-900-12-AISG-CWA	78210510	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	12 dB	350, 351
DTMA-800-900-12-AISG-CWA	78210511	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	12 dB	350, 351
DTMA-800-900-12-AISG	78210512	UL: 832 - 862 / DL: 791 - 821 MHz UL: 880 - 915 / DL: 925 - 960 MHz	12 dB	352, 353
DTMA-900-12-32-AISG-CWA	78210440	UL: 880 - 915 / DL: 925 - 960 MHz	12/32 dB	354
DTMA-900-12-32-AISG-CWA	78210442	UL: 880 - 915 / DL: 925 - 960 MHz	12/32 dB	354
DTMA-900-32-AISG-CWA	78210490	UL: 880 - 915 / DL: 925 - 960 MHz	32 dB	355
DTMA-900-12-AISG-CWA	78210495	UL: 880 - 915 / DL: 925 - 960 MHz	12 dB	356
DTMA-1800-12-CWA	78210580	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	12 dB	357
DTMA-1800-12-AISG	78210581	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	12 dB	358
DTMA-1800-12-AISG-CWA	78210583	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	12 dB	359
DTMA-1800-12-AISG-CWA	78210584	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	12 dB	359
DTMA-1800-UMTS-12-AISG-CWA	78211103	UL: 1710 - 1785 / DL: 1805 - 1880 MHz	12 dB	360, 361
DTMA-1800-UMTS-12-AISG-CWA	78211105	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	360, 361
DTMA-1800-UMTS-12-AISG	78211106	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	362, 363
DTMA-1800-UMTS-12-AISG-D	78210990	UL: 1710 - 1785 / DL: 1805 - 1880 MHz UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	364, 365
DTMA-AWS-12-AISG-CWA	78210877	UL: 1710 - 1770 / DL: 2110 - 2170 MHz	12 dB	366
DTMA-1900-12-AISG-CWA	78210876	UL: 1850 - 1910 / DL: 1930 - 1990 MHz	12 dB	367
DTMA-UMTS-12-AISG-CWA	78210612	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	368
DTMA-UMTS-12-AISG-CWA	78211120	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	368
DTMA-UMTS-24-AISG-CWA	78210613	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	24 dB	369
DTMA-UMTS-12-AISG	78211145	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	370
DTMA-UMTS-12-AISG-CWA	78211245	UL: 1920 - 1980 / DL: 2110 - 2170 MHz	12 dB	371
DTMA-UMTS-BYP1800-12-AISG-CWA	78211102	UL: 1920 - 1980 / DL: 2110 - 2170 MHz Bypass: 1710 - 1880	12 dB	372, 373
DTMA-UMTS-BYP1800-12-AISG-CWA	78211104	UL: 1920 - 1980 / DL: 2110 - 2170 MHz Bypass: 1710 - 1880	12 dB	372, 373
DTMA-2600-12-AISG	78210860	UL: 2500 - 2570 / DL: 2620 - 2690 MHz	12 dB	374
DTMA-2600-12-AISG	78211330	UL: 2500 - 2570 / DL: 2620 - 2690 MHz	12 dB	375

**New
Products**

UL = Up Link / DL = Down Link

Frequency/MHz	antenna outputs		Gain
	4 outputs	2 outputs	
800 MHz	High CWA	•	12dB
800 MHz	Low CWA	•	
800 MHz	AISG*	•	
850 MHz	High CWA		12dB
850 MHz	Low CWA	•	
850 MHz	AISG*	•	
900 MHz	High CWA	•	12dB
900 MHz	Low CWA	•	
900 MHz	AISG*	•	
1800 MHz	High CWA	•	12dB
1800 MHz	Low CWA	•	
1800 MHz	AISG*	•	
1800 MHz	RF-Bypass	•	
1900 MHz	High CWA		12dB
1900 MHz	Low CWA	•	
1900 MHz	AISG*	•	
AWS	High CWA		12dB
AWS	Low CWA	•	
AWS	AISG*	•	
2100 MHz	High CWA	•	12dB
2100 MHz	Low CWA	•	
2100 MHz	AISG*	•	
2600 MHz	High CWA		12dB
2600 MHz	Low CWA		
2600 MHz	AISG*	•	
800 MHz	High CWA	•	24dB
800 MHz	Low CWA	•	
800 MHz	AISG*	•	
850 MHz	High CWA		24dB
850 MHz	Low CWA	•	
850 MHz	AISG*	•	
900 MHz	High CWA	•	24dB
900 MHz	Low CWA	•	
900 MHz	AISG*	•	
1800 MHz	High CWA	•	24dB
1800 MHz	Low CWA	•	
1800 MHz	AISG*	•	
1800 MHz	RF-Bypass	•	
1900 MHz	High CWA		24dB
1900 MHz	Low CWA	•	
1900 MHz	AISG*	•	
AWS	High CWA		24dB
AWS	Low CWA	•	
AWS	AISG*	•	
2100 MHz	High CWA	•	24dB
2100 MHz	Low CWA	•	
2100 MHz	AISG*	•	
2600 MHz	High CWA		24dB
2600 MHz	Low CWA		
2600 MHz	AISG*	•	
800 MHz	High CWA	•	32dB
800 MHz	Low CWA	•	
800 MHz	AISG*	•	
850 MHz	High CWA		32dB
850 MHz	Low CWA	•	
850 MHz	AISG*	•	
900 MHz	High CWA	•	32dB
900 MHz	Low CWA	•	
900 MHz	AISG*	•	
1800 MHz	High CWA	•	32dB
1800 MHz	Low CWA	•	
1800 MHz	AISG*	•	
1800 MHz	RF-Bypass	•	
1900 MHz	High CWA		32dB
1900 MHz	Low CWA	•	
1900 MHz	AISG*	•	
AWS	High CWA		32dB
AWS	Low CWA	•	
AWS	AISG*	•	
2100 MHz	High CWA	•	32dB
2100 MHz	Low CWA	•	
2100 MHz	AISG*	•	
2600 MHz	High CWA		32dB
2600 MHz	Low CWA		
2600 MHz	AISG*	•	

• = default; * = AISG2.0 (default) & AISG1.1 (optional); Low CWA (Current Window Alarm) = 170 - 200mA; High CWA (Current Window Alarm) = 230 - 295mA; ¹ = Current Window Alarm 380 - 420mA; ² = Current Window Alarm 800 - 900mA

DTMA-800-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **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

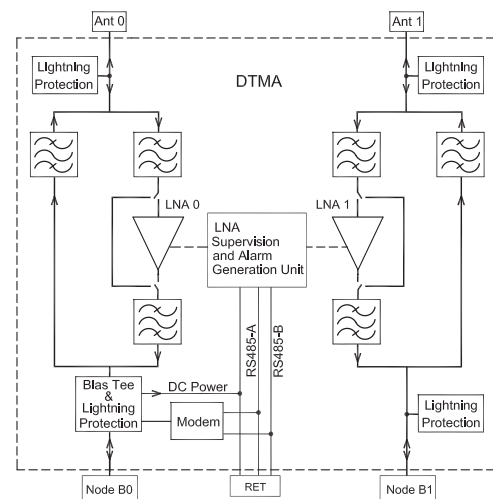
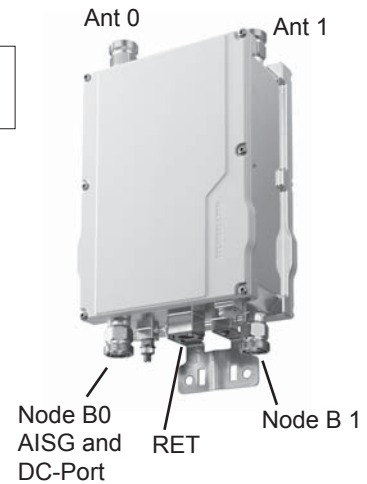


AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

Technical Data

Type No.	78210430 DTMA-800-12-AISG (12 dB gain)
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-850-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting swichable
- CWA and AISG configuration
- 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

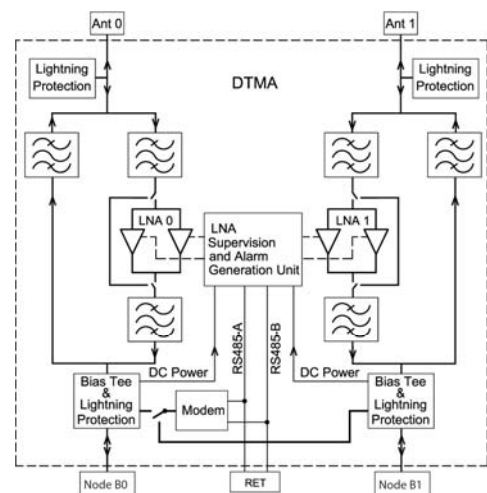
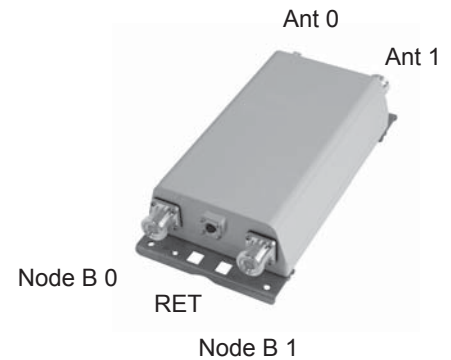
AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
CWA = Current Window Alarm



Technical Data

Type No.	78210874	
	DTMA-850-12-AISG-CWA (12 dB gain)	
Tx Characteristics		
Frequency range	869 - 894 MHz	
Insertion loss	Typically 0.35 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	824 - 849 MHz	
Loss in bypass mode	Typically 1.5 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 15 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.6 dB	
Output 1-dB compression point	> 10 dBm	
3 rd order intercept point (OIP3)	Typically 25 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 200 000 hours (per TMA)	
EMC	FCC Part 15	
DC and Alarm Characteristics		
	CWA Mode	AISG Mode
DC supply	9 - 19 V	9 - 30 V
Operating current per TMA	80 - 130 mA	Nom. 50 mA at 12 V
Alarm management	170 - 180 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 6: 9 - 30 V DC, pin 3: RS485B, pin 5: RS485A, 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	4.9 kg	
Packing size	400 x 250 x 150 mm	
Dimensions (w x h x d)	168 x 275 x 73 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)

- 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
- AISG setting switchable
- CWA and AISG configurations



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm

Technical Data

Type No.	CWA alarm 170 - 200 mA	78210510 DTMA-800-900-12-AISG-CWA
	CWA alarm 230 - 295 mA	78210511 DTMA-800-900-12-AISG-CWA

800 MHz Tx Characteristics

Frequency range	791 - 821 MHz
Insertion loss	Typically 0.5 dB
Input power (per input and frequency band)	< 100 W (+53 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)	< 100 W (+53 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

Environmental Characteristics

Operating temperature range	-40 ... +65 °C
IP rating	IP67 *)
MTBF	> 1 000 000 hours (per TMA)

* see note on data sheet



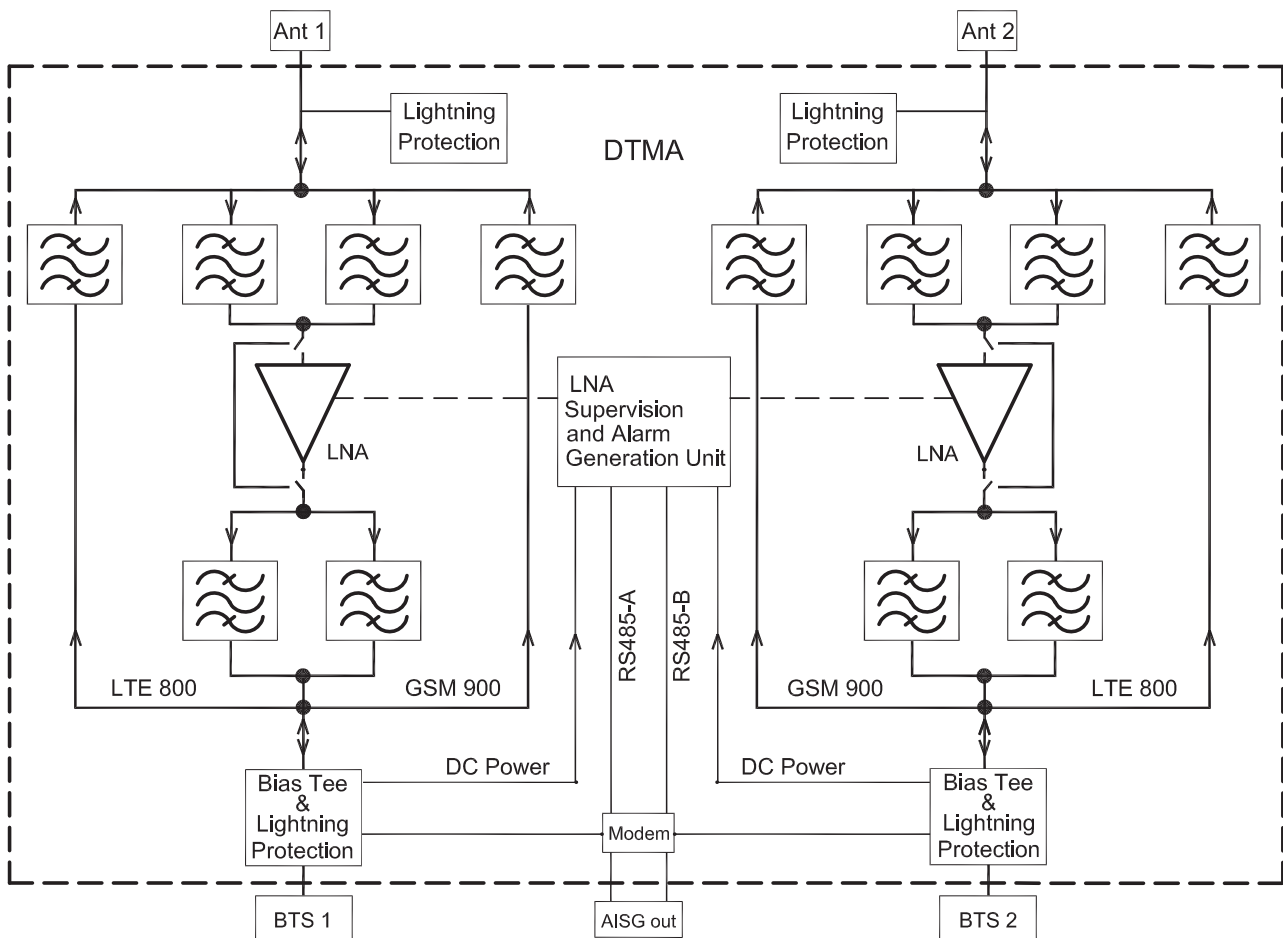
DTMA-800-900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



EMC	According to ETS 300 342-3	
Lightning protection	3 kA, 10/350 µs pulse	
DC and Alarm Characteristics	CWA Mode	AISG Mode
DC supply	9 - 19 V DC	9 - 31 V DC
Operating current (without RET)	80 - 120 mA	Nom. 300 mA at 10 V Nom. 100 mA at 30 V
Alarm management	78210510: 170 - 200 mA 78210511: 230 - 295 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	11 kg	
Dimensions (w x h x d)	230 x 245 x 155 mm (without connectors, without mounting brackets)	

- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".



DTMA-800-900-12-AISG

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 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)	< 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
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)	< 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
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
Environmental Characteristics	
Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1 000 000 hours (per TMA)



- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

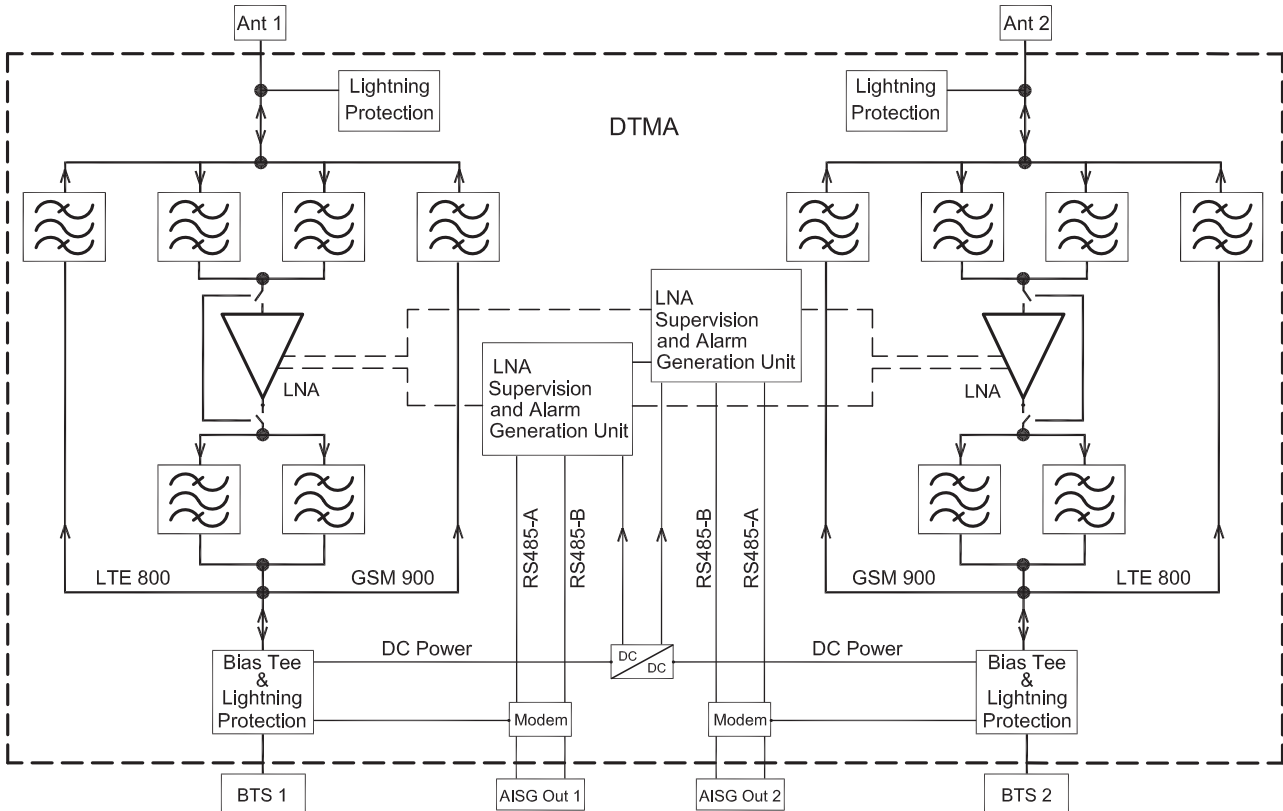
DTMA-800-900-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



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



DTMA-900-12-32-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- Double units for easy use with XPol antennas
- Gain setting switchable from 12 dB (default) to 32 dB
- Both versions support CWA, AISG 1.1 and AISG 2.0 (default)
782 10440: CWA alarm 170 – 200 mA / 800 – 900 mA
782 10442: CWA alarm 230 – 295 mA / 800 – 900 mA
- AISG and gain setting switchable as described on page 2
- CWA and AISG configurations as described on page 2
- 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 = Remote Electrical Tilt
AISG = Antenna Interface Standards Group
CWA = Current Window Alarm



Technical Data

Type No.	CWA alarm 170 – 200 mA / 800 – 900 mA	78210440 DTMA-900-12-32-AISG-CWA (12/32 dB gain)
	CWA alarm 230 – 295 mA / 800 – 900 mA	78210442 DTMA-900-12-32-AISG-CWA (12/32 dB gain)

Tx Characteristics	
Frequency range	925 – 960 MHz
Insertion loss*	Typically 0.5 dB
Input power (per input)	< 180 W (+52.5 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

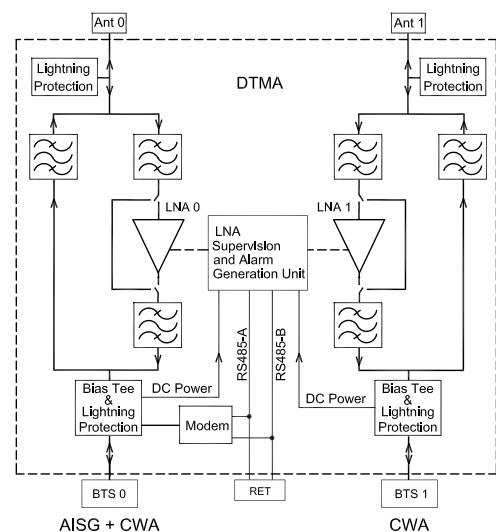
Rx Characteristics	
Frequency range	880 – 915 MHz
Loss in by-pass mode	Typically 4 dB (DC OFF)
Return loss	> 16 dB (DC ON)
Gain	12/32 dB nominal
Noise figure	Typically 1.3 dB
Input 3 rd order intercept point (IIP3)	Typically 5 dBm

Environmental Characteristics	
Operating temperature range	-40 ... +55 °C
IP rating	IP 67
MTBF	> 1 000 000 hours (per TMA)
EMC	According to ETS 300 342-3

DC and Alarm Characteristics	CWA Mode	AISG Mode
DC supply	8.5 – 19 V (12 dB gain) 8.5 – 15 V (32 dB gain)	10 – 30 V
Operating current per TMA (without RET)	80 – 130 mA (12 dB gain) 360 – 400 mA (32 dB gain)	< 110 mA (12 dB gain) < 350 mA (32 dB gain)
Alarm management	12 dB gain: 782 10440: 170 – 200 mA 32 dB gain: 782 10442: 230 – 295 mA 800 – 900 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)
Weight	8.7 kg
Packing size	342 x 579 x 212 mm
Mounting	Wall mounting: With 4 screws (max. 8 mm diameter) Mast mounting: With additional clamp set
Dimensions (w x h x d)	250 x 353 x 94 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-900-32-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **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 swichable
- CWA and AISG configuration
- Clamp set 45-125 mm included



AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt
CWA = Current Window Alarm

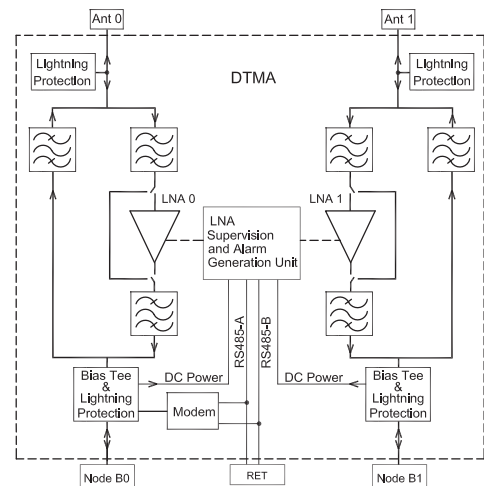
Technical Data

Type No.	78210490 DTMA-900-32-AISG-CWA	
Tx Characteristics		
Frequency range	925 - 960 MHz	
Insertion loss	< 0.8 dB	
Input power (per input)	< 100 W (+50 dBm) / < 1.6 kW (+62 dBm) peak	
Intermodulation products in RX band	< -115 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	880 - 915 MHz	
Loss in bypass mode	< 4.0 dB	
Return loss	> 16 dB (DC ON) / > 12 dB (DC OFF)	
Gain	32 dB ±1 dB	
Noise figure	≤ 2.2 dB	
Input 1-dB compression point	> -7 dBm	
3 rd order intercept point (OIP3)	< 37 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	7 - 15 V DC	10 - 32 V DC
Operating current per DTMA (without RET)	300 - 410 mA	Nom. 400 mA at 10 V Nom. 150 mA at 30 V
Alarm management	800 - 900 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 included clamp set (734365)	
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)	

* see note on data sheet



Block Diagram



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

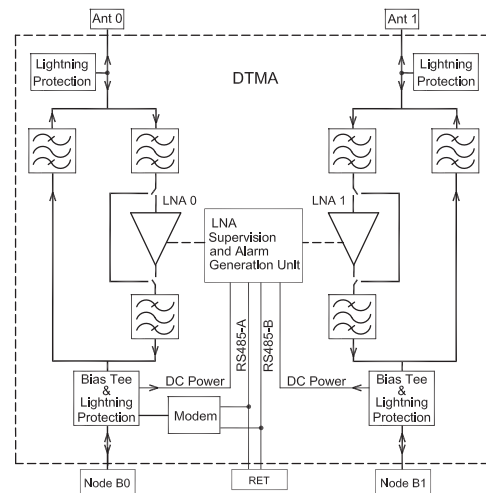
- **Compact line**
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- AISG setting switchable
- 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 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	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-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **Compact line**
- Double units for easy use with XPol antennas
- Alarm management: CWA
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection

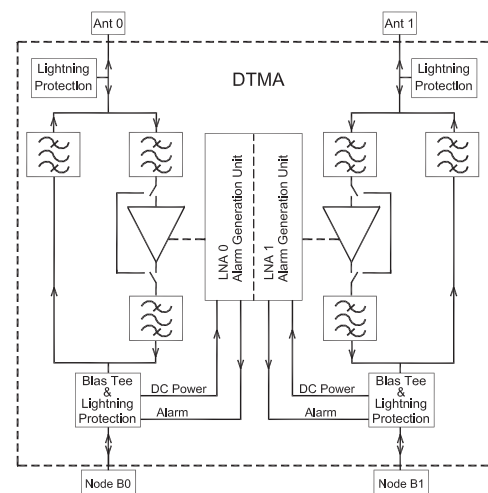
CWA = **C**urrent **W**indow **A**larm



Technical Data

Type No.	78210580 DTMA-1800-12-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 Mode	
DC supply	7 - 15 V
Operating current per DTMA (without RET)	Typically 80 mA
Alarm management	230 - 290 mA
Mechanical Characteristics	
Material	Aluminium housing
Connectors	7-16 female (long neck)
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

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **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

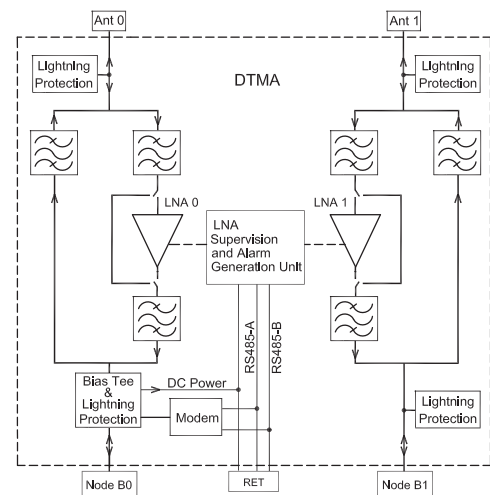
RET = Remote Electrical Tilt
AISG = Antenna Interface Standards Group



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 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	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)

- **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 = Remote Electrical Tilt
AISG = Antenna Interface Standards Group
CWA = Current Window Alarm

Technical Data

Type No.	CWA alarm 170-200 mA	78210583 DTMA-1800-12-AISG-CWA
	CWA alarm 230-295 mA	78210584 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

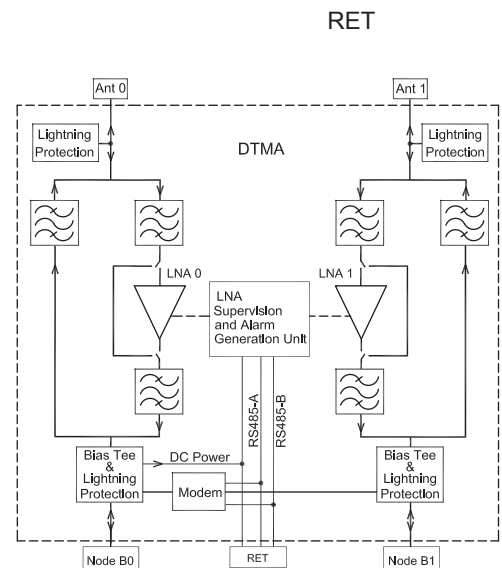
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 000 000 hours (per TMA)	
EMC	According to ETS 300 342-3	

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	78210583: 170-200 mA 78210584: 230-295 mA	AISG*

Mechanical Characteristics

Material	Aluminium housing	
Connectors	RF	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 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)	

* see note on data sheet



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-1800-UMTS-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
- AISG setting switchable
- CWA and AISG configurations



AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm

Technical Data

Type No.	78211103	78211105
	DTMA-1800-UMTS-12-AISG-CWA	
CWA alarm	170 - 200 mA	230 - 295 mA
1800 MHz Tx Characteristics		
Frequency range	1805 - 1880 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	
1800 MHz Rx Characteristics		
Frequency range	1710 - 1785 MHz	
Loss in bypass mode	Typically 2.0 dB	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.5 dB	
Output 1-dB compression point	> 10 dBm	
3 rd order intercept point (OIP3)	Typically 25 dBm	
UMTS Tx Characteristics		
Frequency range	2110 - 2170 MHz	
Insertion loss	Typically 0.4 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 Rx Characteristics		
Frequency range	1920 - 1980 MHz	
Loss in bypass mode	Typically 2.0 dB	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.4 dB	
Output 1-dB compression point	> 10 dBm	
3 rd order intercept point (OIP3)	Typically 25 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	



- **Clamp set** (type no. **734360 - 734365**) (order separately) can be found in the section "System Components".

DTMA-1800-UMTS-12-AISG-CWA

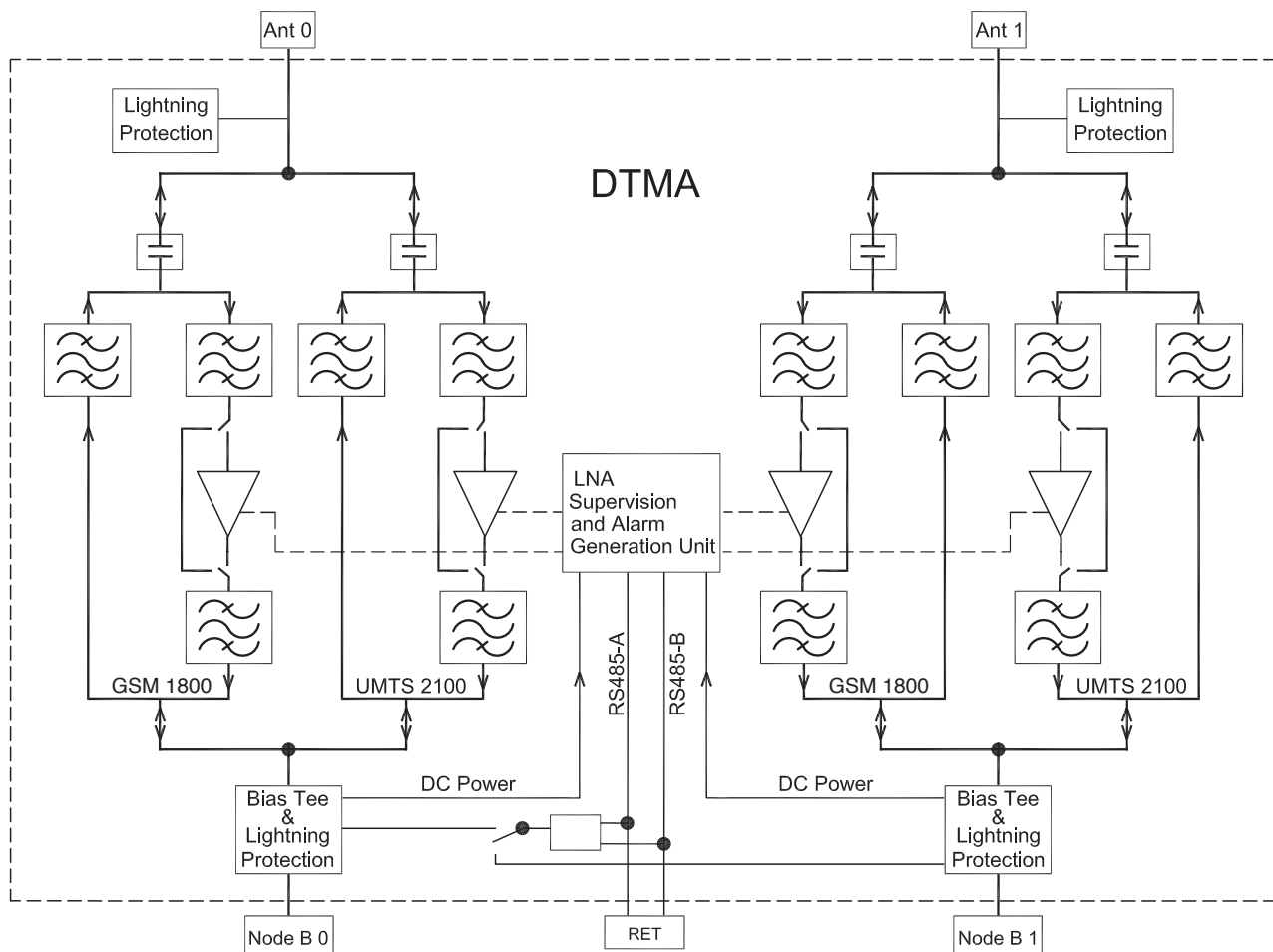
Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



IP rating	IP67*	
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	CWA Mode	AISG Mode
DC supply	9 - 19 V DC	9 - 31 V DC
Operating current per DTMA (without RET)	80 - 120 mA	Nom. 300 mA at 10 V Nom. 100 mA at 30 V
Alarm management	78211103: 170 - 200 mA 78211105: 230 - 295 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: 9 - 31 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	8.0 kg	
Dimensions (w x h x d)	168 x 274 x 124 mm (without connectors, without mounting brackets)	

* see note on data sheet



DTMA-1800-UMTS-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **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

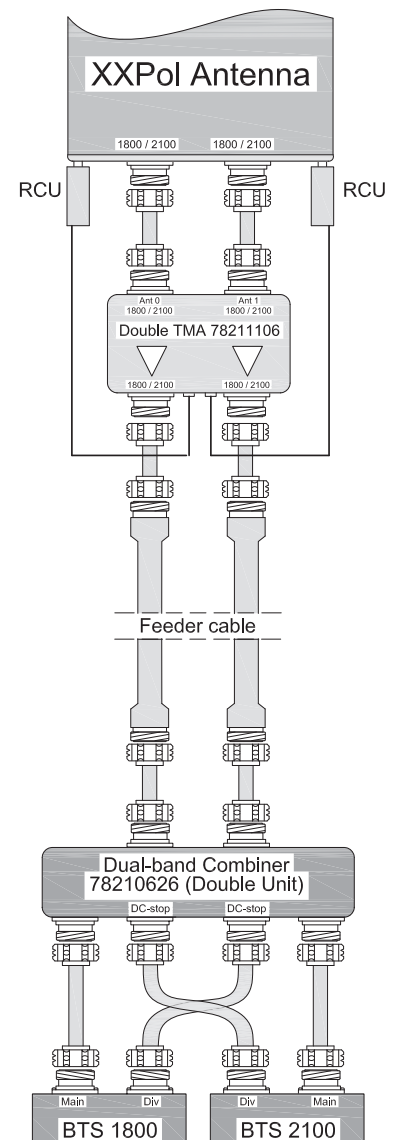
Technical Data

Type No.	78211106 DTMA-1800-UMTS-12-AISG (12 dB gain)	
Tx Characteristics		
Frequency range	1805 - 1880 MHz	2110 - 2170 MHz
Insertion loss	Typically 0.5 dB	Typically 0.4 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	1710 - 1785 MHz	1920 - 1980 MHz
Return loss	> 18 dB (DC ON) / > 14 dB (DC OFF)	
Loss in bypass mode	Typically 2.0 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.5 dB	Typically 1.4 dB
Output 1-dB compression point	> 10 dBm	
3 rd order intercept point (OIP3)	Typically 25 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. 300 mA at 10 V Nom. 100 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	8.0 kg	
Dimensions (w x h x d)	168 x 274 x 120 mm (without connectors, without mounting brackets)	

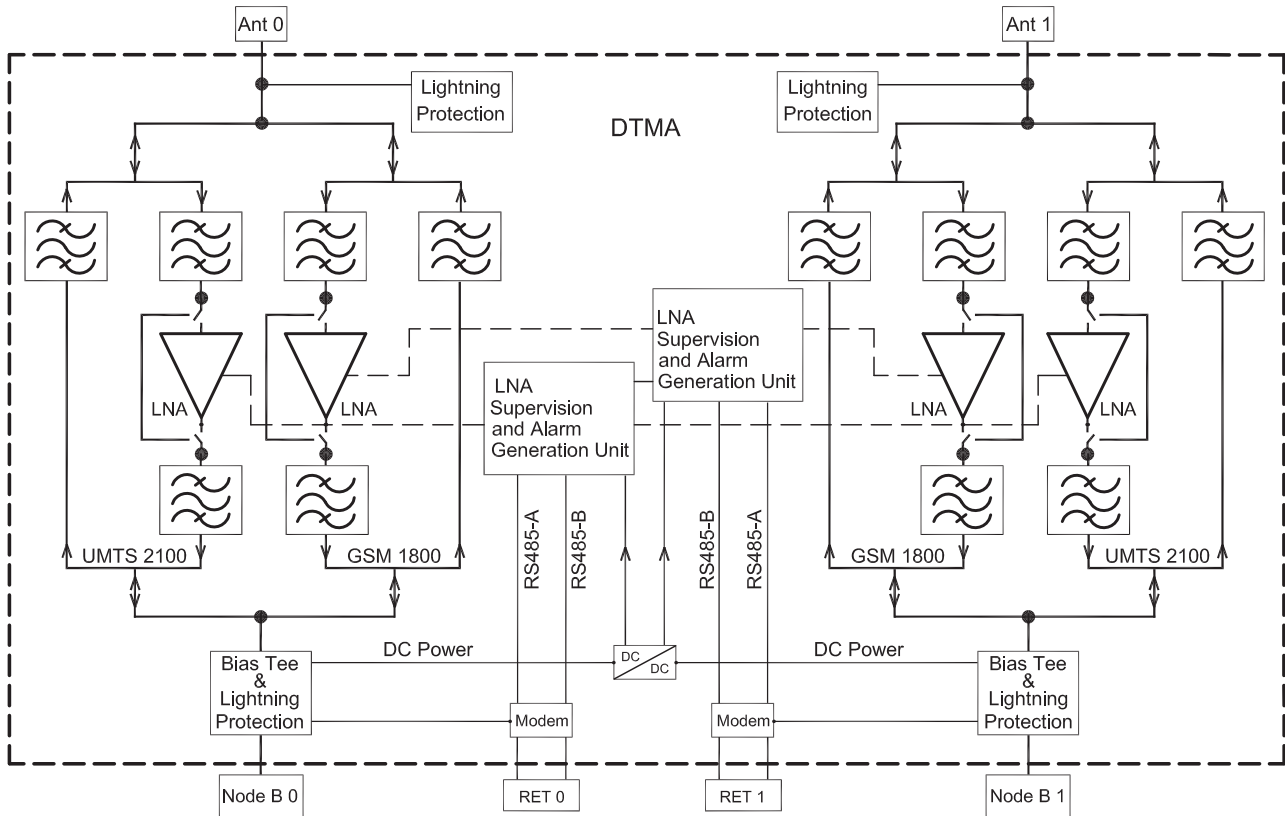
* see note on data sheet



Connector configuration



DTMA-1800-UMTS-12-AISG
Fullband Double Dual Duplex Tower Mounted Amplifier
(Masthead Amplifier)



- **Clamp set** (type no. **734360 - 734365**)
 (order separately) can be found in the section "System Components".

DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- **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

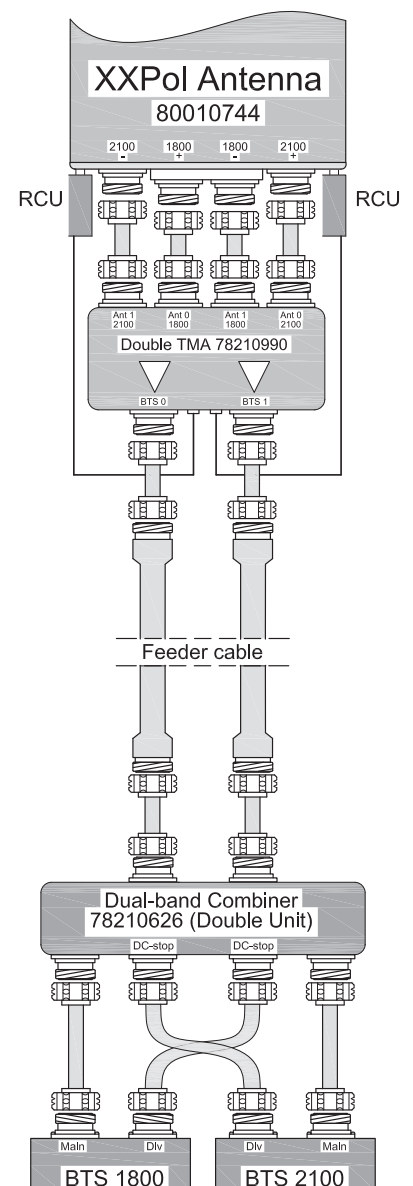
Technical Data

Type No.	78210990 DTMA-1800-UMTS-12-AISG-D (12 dB gain)	
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

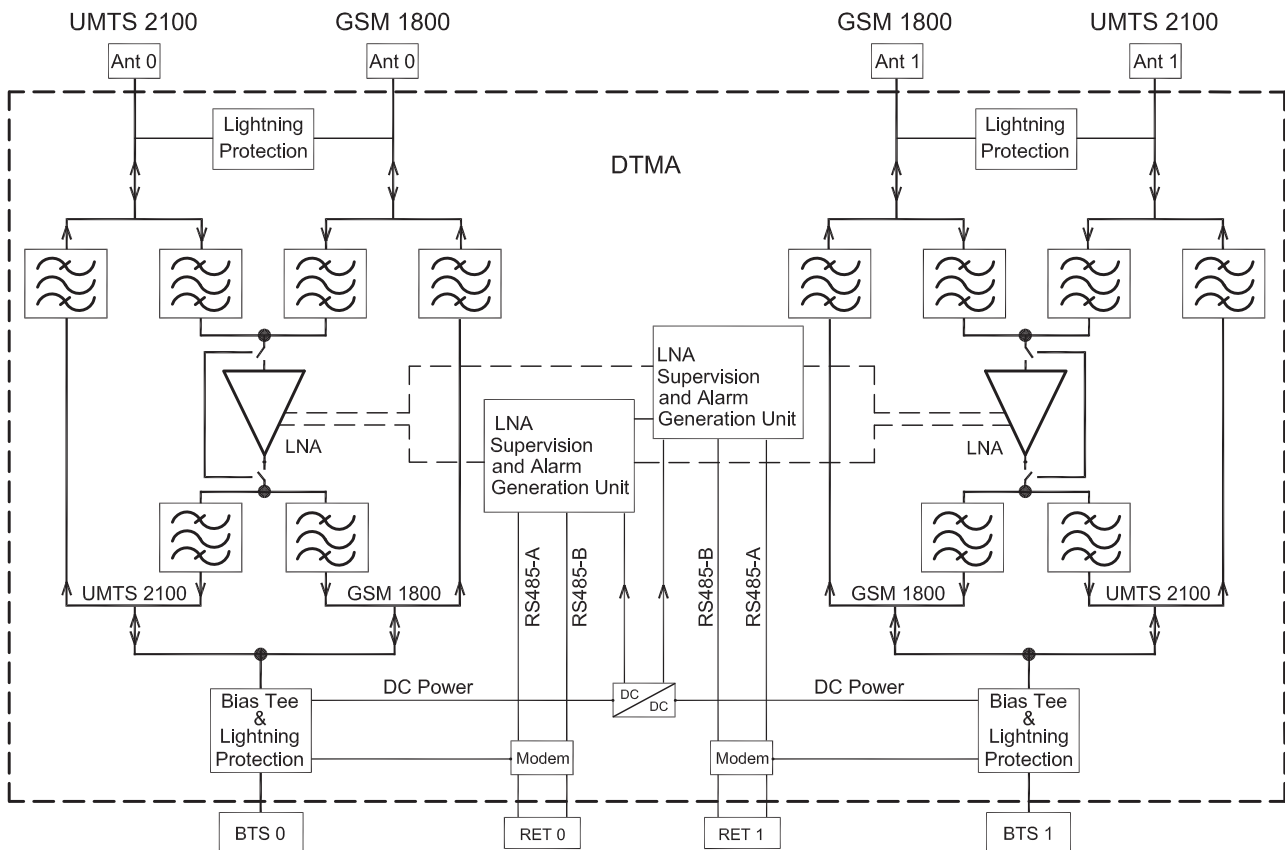


Connector configuration



DTMA-1800-UMTS-12-AISG-D

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)



- **Clamp set** (type no. **734360 - 734365**)
(order separately) can be found in the section "System Components".

DTMA-AWS-12-AISG-CWA

Fullband Duplex Tower Mounted Amplifier (Masthead Amplifier)

- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting swichable
- CWA and AISG configuration
- Suitable for antenna RET control according to AISG/3GPP standard
- Compact size
- Built-in lightning protection

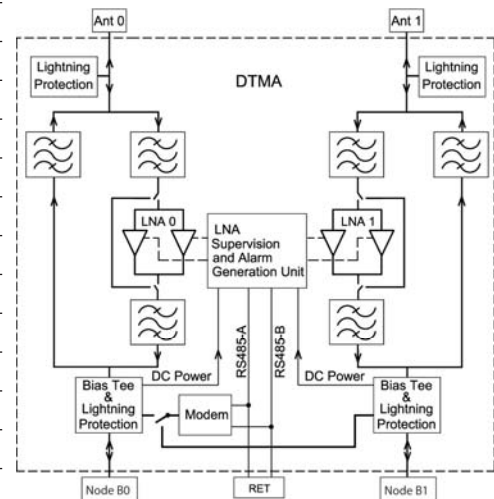
AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt
CWA	=	Current Window Alarm



Technical Data

Type No.	78210877	
	DTMA-AWS-12-AISG-CWA (12 dB gain)	
Tx Characteristics		
Frequency range	2110 - 2170 MHz	
Insertion loss	Typically 0.3 dB	
Input power	< 100 W (+50 dBm)	
Intermodulation products in RX band	< -125 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
Rx Characteristics		
Frequency range	1710 - 1770 MHz	
Loss in bypass mode	Typically 2.0 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 15 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.3 dB	
Output 1-dB compression point	> 10 dBm	
3 rd order intercept point (OIP3)	Typically 25 dBm	
Environmental Characteristics		
Operating temperature range	-40 ... +65 °C	
IP rating	IP67*	
MTBF	> 1 200 000 hours (per TMA)	
EMC	According to EN 301 489-8	
DC and Alarm Characteristics		
	CWA Mode	AISG Mode
DC supply	9 - 19 V	9 - 30 V
Operating current per TMA	80 - 130 mA	Nom. 50 mA at 12 V
Alarm management	170 - 180 mA	AISG*
Mechanical Characteristics		
Material	Aluminium housing	
Connectors	RF AISG	7-16 female (long neck) 8-pin female, IEC 60130-9 (Pin 6: 9 - 30 V DC, pin 3: RS485B, pin 5: RS485A, 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	2.5 kg	
Packing size	325 x 240 x 130 mm	
Dimensions (w x h x d)	152 x 174 x 50 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-1900-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting swichable
- CWA and AISG configuration
- 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
CWA = Current Window Alarm



Technical Data

Type No.	78210876
	DTMA-1900-12-AISG-CWA (12 dB gain)

Tx Characteristics

Frequency range	1930 - 1990 MHz
Insertion loss	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	1850 - 1910 MHz
Loss in bypass mode	Typically 2.0 dB (DC OFF)
Return loss	> 18 dB (DC ON) / > 15 dB (DC OFF)
Gain	12 dB nominal
Noise figure	Typically 1.4 dB
Output 1-dB compression point	> 10 dBm
3 rd order intercept point (OIP3)	Typically 25 dBm

Environmental Characteristics

Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1 200 000 hours (per TMA)
EMC	FCC Part 15

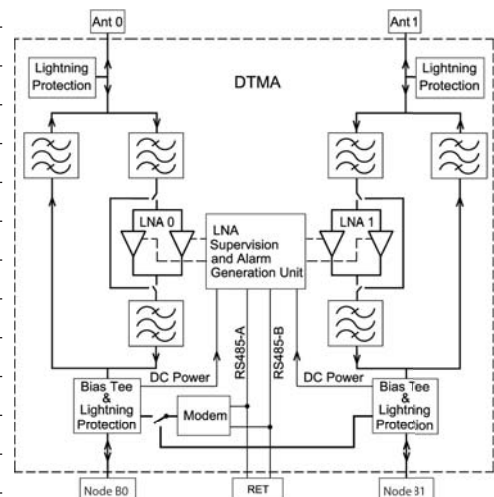
DC and Alarm Characteristics

	CWA Mode	AISG Mode
DC supply	9 - 19 V	9 - 30 V
Operating current per TMA	80 - 130 mA	Nom. 50 mA at 12 V
Alarm management	170 - 180 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: 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	4.6 kg
Packing size	395 x 290 x 180 mm
Dimensions (w x h x d)	168 x 275 x 61 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)

- **Slimline design**
- Double units for easy use with XPol antennas
- Supports: CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable as described on data sheet
- CWA and AISG configurations as described on data sheet
- 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



RET	=	Remote Electrical Tilt
AISG	=	Antenna Interface Standards Group
CWA	=	Current Window Alarm

Technical Data

Type No.	CWA alarm 170 - 200 mA	78210612 DTMA-UMTS-12-AISG-CWA (12 dB gain)
	CWA alarm 230 - 295 mA	7821120 DTMA-UMTS-12-AISG-CWA (12 dB gain)

Tx Characteristics

Frequency range	2110 - 2170 MHz
Insertion loss	Typically 0.15 dB
Ripple	< 0.1 dB
Input power (per input)	< 160 W (+52 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

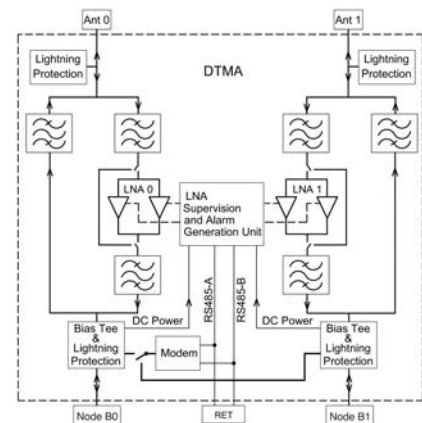
Frequency range	1920 - 1980 MHz
Loss in bypass mode	Typically 2.5 dB (DC OFF)
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)
Gain	Typically 12 dB
Noise figure	Typically 1.3 dB
Output 1-dB compression point	> 11 dBm
3 rd order intercept point (OIP3)	> 25 dBm (typically 30 dBm)

Environmental Characteristics

Operating temperature range	-40 ... +65 °C
IP rating	IP67*
MTBF	> 1000 000 hours (per TMA)
EMC	According to ETS 300 342-3

DC and Alarm Characteristics	CWA Mode	AISG Mode
DC supply	9 - 19 V	9 - 30 V
Operating current per TMA (without RET)	80 - 120 mA	Nom. 95 mA at 9 V Nom. 35 mA at 30 V
Alarm management	170 - 200 mA	AISG

* see note on data sheet



- **Clamp set** (type no. 734360 - 734365) (order separately) can be found in the section "System Components".

DTMA-UMTS-24-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

- Slimline design
- Double unit for easy use with XPol antennas
- Supports CWA, AISG 1.1 and AISG 2.0 (default)
- AISG setting switchable as described on data sheet
- CWA and AISG configurations as described on data sheet
- 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

RET = Remote Electrical Tilt
 AISG = Antenna Interface Standards Group
 CWA = Current Window Alarm



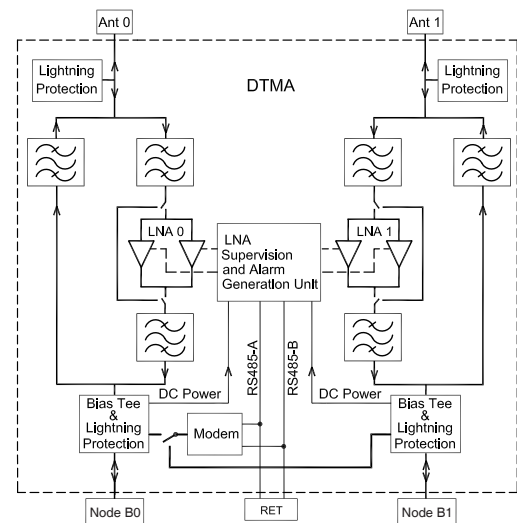
Technical Data

Type No.	78210613 DTMA-UMTS-24-AISG-CWA (24 dB gain)	
Tx Characteristics		
Frequency range	2110 – 2170 MHz	
Insertion loss	< 0.3 dB (typically 0.15 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 bypass mode	< 2.5 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Gain	24 ±1.0 dB (+22 ... +28 °C) / 24 ±1.2 dB (-40 ... +65 °C)	
Gain ripple	< ±0.3 dB	
Noise figure*	< 1.4 dB (+22 ... +28 °C)	
Output 1-dB compression point	> 18 dBm	
3 rd order intercept point (OIP3)	> 25 dBm (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 Mode	AISG Mode
DC supply	9 – 15 V	9 – 30 V
Operating current per TMA (without RET)	130 – 340 mA	Nom. 210 mA at 9 V Nom. 70 mA at 30 V
Alarm management	380 – 420 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: 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	3.8 kg	
Packing size	262 x 502 x 214 mm	
Dimensions (w x h x d)	160 x 205 x 63 mm (without connectors, without mounting brackets)	

* see note on data sheet

$$\text{Noise figure } \overline{NF} = \frac{NF_{1920 \text{ MHz}} + 2 \times NF_{1950 \text{ MHz}} + NF_{1980 \text{ MHz}}}{4}$$

(Additional variation at -40 ... +60 °C: $\Delta \overline{NF} < 0.4 \text{ dB}$)



- **Clamp set (type no. 734360 - 734365)** (order separately) can be found in the section "System Components".

DTMA-UMTS-12-AISG

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

KATHREIN

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- **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

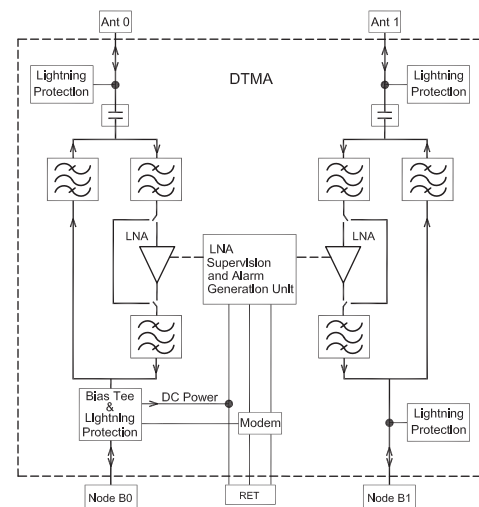
AISG	=	Antenna Interface Standards Group
RET	=	Remote Electrical Tilt



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)

- **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 page 2
- 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

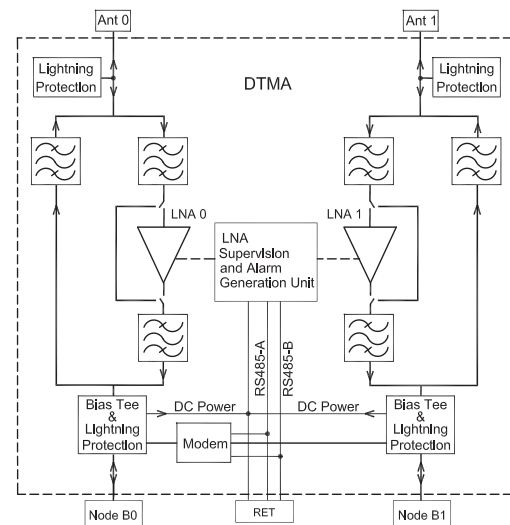
Technical Data

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



Blockdiagram



- **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)

- 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

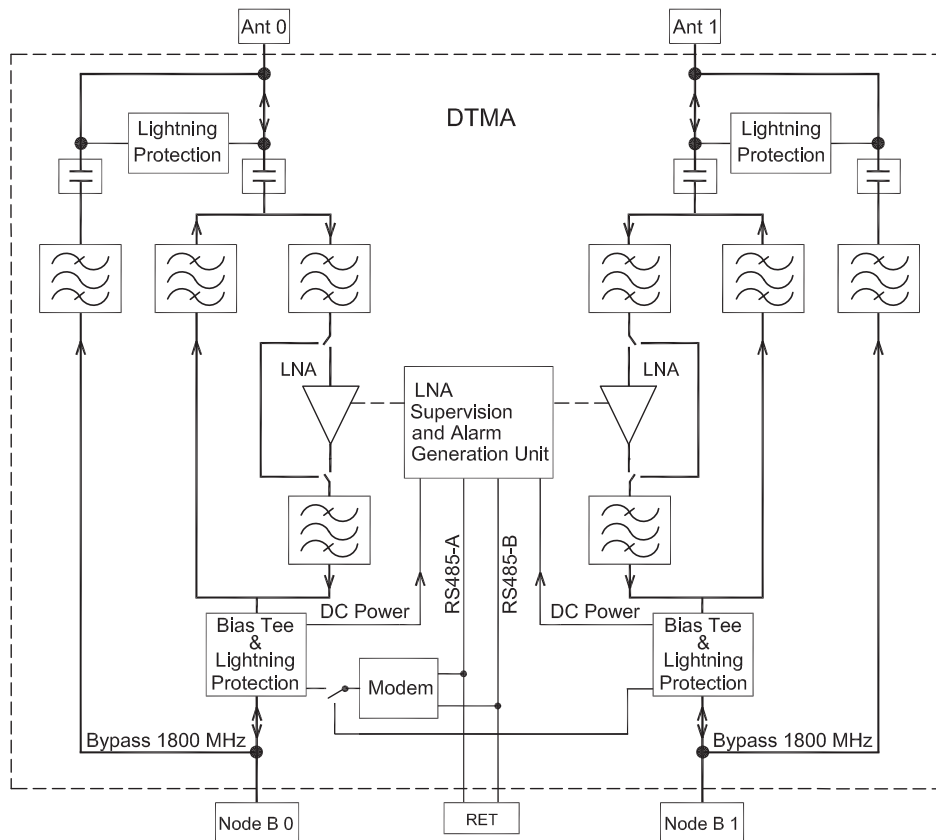
Type No.	78211102	78211104
	DTMA-UMTS-BYP1800-12-AISG-CWA (12 dB gain)	
CWA alarm	170 - 200 mA	230 - 295 mA
UMTS 2100 Tx Characteristics		
Frequency range	2110 - 2170 MHz	
Insertion loss	Typically 0.3 dB	
Input power (per input)	< 100 W (+50 dBm)	
Intermodulation products in RX band	< -117 dBm (2 Tx carriers at +43 dBm)	
Return loss	> 18 dB	
UMTS 2100 Rx Characteristics		
Frequency range	1920 - 1980 MHz	
Loss in bypass mode	Typically 2.0 dB (DC OFF)	
Return loss	> 18 dB (DC ON) / > 12 dB (DC OFF)	
Gain	12 dB nominal	
Noise figure	Typically 1.4 dB	
Output 1-dB compression point	> 10 dBm	
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 301 489-8	
Lightning protection	3 kA, 10/350 µs pulse	

DTMA-UMTS-BYP1800-12-AISG-CWA

Fullband Double Dual Duplex Tower Mounted Amplifier (Masthead Amplifier)

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		78211102: 170 - 200 mA 78211104: 230 - 295 mA	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: 9 - 31 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 datasheet



- **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)



- 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

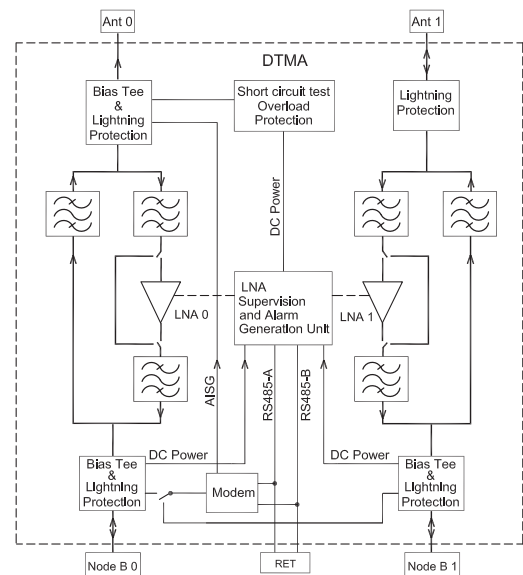
RET = Remote Electrical Tilt
AISG = Antenna Interface Standards Group



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: 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	3.5 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)

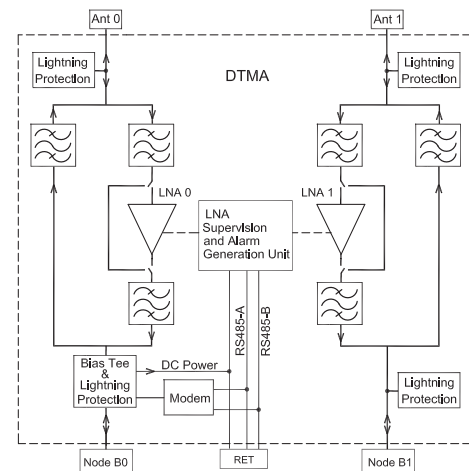
- **Compact line**
- Double unit for easy use with XPol antennas
- Supports AISG 1.1 and 2.0 (default)
- Suitable for antenna RET control according to AISG/3GPP standard
- By-pass mode to ensure cell operation in case of DC power down
- Built-in lightning protection
- Low weight

AISG = Antenna Interface Standards Group
RET = Remote Electrical Tilt

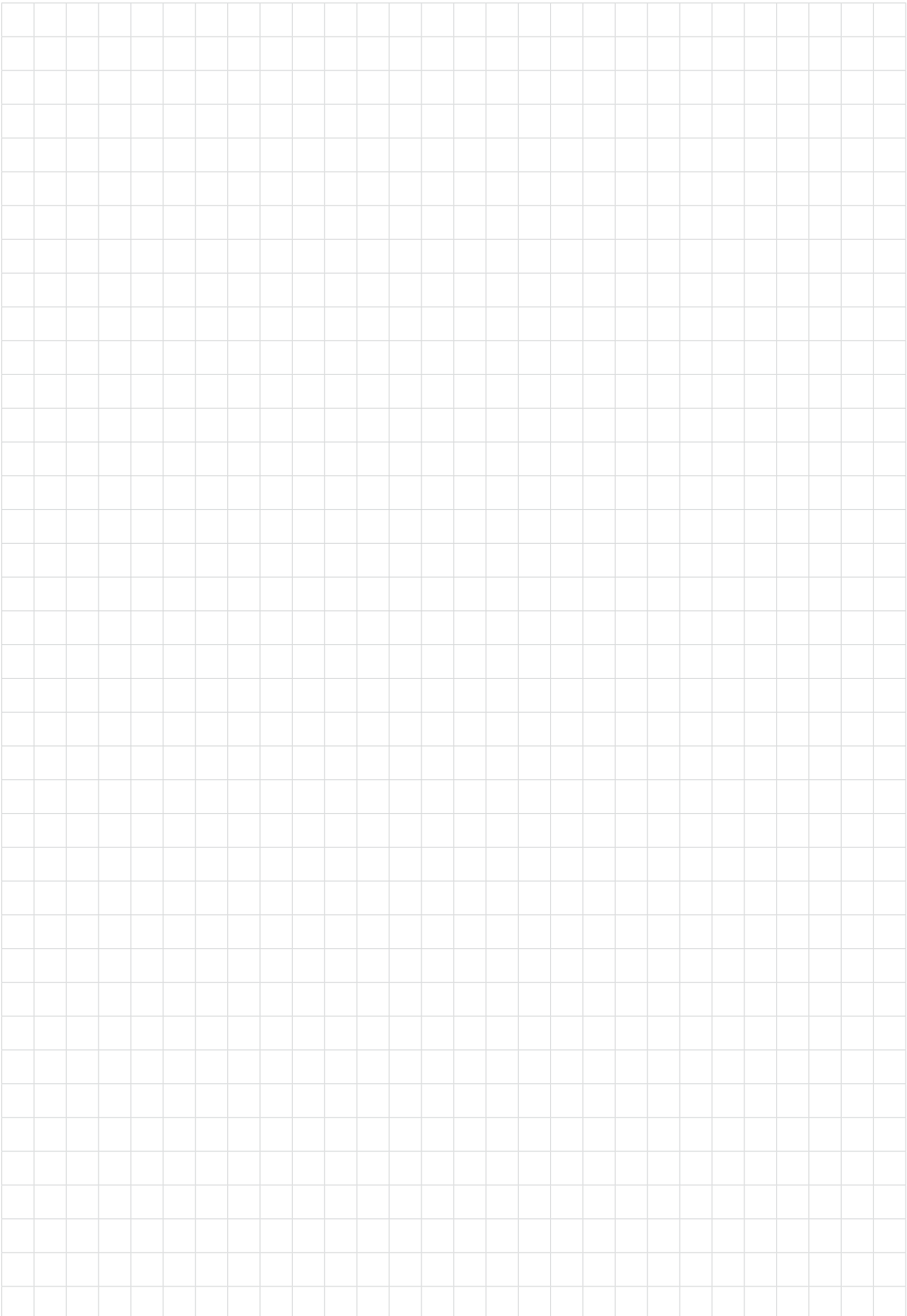
Technical Data

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 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 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".



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 and thereby respects the static mechanical load imposed on an antenna by wind at maximum velocity.

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.

In addition, please use our information brochure about mounting configurations.

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.

Subsidiaries/Affiliates

An actual list of Kathrein's International Representatives can be found on our homepage: www.kathrein.de

**For technical information,
orders, catalogues or CD-ROM,
please contact:**

mobilcom@kathrein.de

www.kathrein.de

E-Mail: mobilcom@kathrein.de

KATHREIN-Werke KG · Anton-Kathrein-Straße 1-3 · P.O. Box 10 04 44 ·
83004 ROSENHEIM · GERMANY · Phone +49 8031 184-0 · Fax +49 8031 184-820

KATHREIN
Antennen · Electronic