HARRIS

7, 8 GHz CEPT digital hierarchy

MicroStar® M/H

point-to-point

digital radio

M = QPSK Modulation
4/8/16 E1 or
E3 + 2 E1

H = 16 QAM Modulation
8/16 E1 or
E3 + 2 E1

MicroStar® M/H is a family of point-to-point digital PDH (Plesiochronous Digital Hierarchy) microwave radios designed for rapid, easy deployment of short, medium, and long links. A wide range of frequency bands and protection configurations are available for voice and data applications.

Based on a common platform architecture incorporating the most reliable design in the industry, MicroStar® M/H has features ideally suited for cellular networks, personal communications networks, and global private or public communications systems.

For long link applications, the MicroStar® M/H is available at frequencies ranging from 7 GHz to 8 GHz. The innovative design of the Outdoor Unit (ODU) allows two transceivers to be mounted in the same enclosure to provide a protection configuration with only a single antenna.

The Outdoor Units are capacity independent while the Indoor Units are frequency independent which reduce equipment sparing needs. In addition, the embedded software within the radio is also common simplifying operation, configuration, maintenance, and training requirements.

next level solutions

System Characteristics

Frequency Range:
7,110 - 7,755 MHz 7,725 - 8,275 MHz 8,275 - 8,750 MHz

Xmtr/Rcvr Frequency Spacing: 119 MHz min. (single antenna)

Modulation:	M = QPSK	H = 16 QAM
Capacity:	4/8/16 E1, E3 + 2 E1	8/16 E1, E3 + 2 E1

Channel Bandwidth:

	4 E1	8 E1	16 E1	E3 + 2 E1
QPSK	7.0 MHz	14 MHz	28 MHz	28 MHz
16 QAM	--------	7 MHz	14 MHz	14 MHz

Frequency Source: Programmable Synthesizer - full tuning range

Diplexer: Bandwidth 60 MHz Loss 3 dB (Tx/Rx)

Configurations: Non-protected, Monitored Hot-Standby, Frequency Diversity, Space Diversity, Hybrid Diversity

IDU/ODU Interconnection: Separation 300 m max.
Single coaxial cable, Belden 9913 (RG-8U) or equivalent

Digital Interface: E1; 120 ohms,balanced or 75 ohms, unbalanced
E3; 75 ohms, unbalanced

Line Code: HDB3 or AMI

Digital Service Channel: 4 channels including 1 VF channel with DTMF signaling and 1 data channel

VF Channel: Analog (Type III) Digital (Type II)

Data Interface: Type III; RS232 (V24) or RS423 (V10) Type II; RS232

NMS Interface:
IDU Types II & III; SNMP, FarScan™, dry relay contacts, and supported on NetBoss™ systems Type II; Ethernet

Radio Control/Monitoring Tools:
Type III; CIT, VT-100, handheld terminal, NMS
Type II; WebCIT, VT-100, handheld terminal, NMS

Fault Detection: Auto-Diagnostics, replace-me LEDs
Alarms: Indoor Unit, Outdoor Unit, Cable, Sum

Operating Environment	Indoor	Outdoor
Guaranteed Performance;	0°C to +50°C	-33°C to +55°C
Operational;	-10°C to +55°C	-40°C to +55°C

Humidity; Indoor, 95% max 100 % *(non-condensing)*

Power Sources: 21 to 60 Vdc, positive or negative ground

Power Consumption	Capacity	Non-protected	Protected
IDU Type III	4, 8 E1	75 Watts	140 Watts
	16 E1 or E3	80 Watts	150 Watts
IDU Type II	4/8/16 E1	70 Watts	130 Watts

Transmitter Characteristics

Power Output:
QPSK; + 26.5 dBm nominal ± 2 dB (at antenna port NP transceiver)
16 QAM; + 22.5 dBm nominal ± 2 dB (at antenna port NP transceiver)

RF Power Attenuation: 20 dB in 1 dB steps

Power Mute Control: > 50 dB attenuation **Filter & Branching Loss:** 1.5 dB

Frequency Stability: ± 7 ppm including aging

System Gain (dB) nominal

QPSK	IDU Type II			IDU Type III			
	4 E1	8 E1	16 E1	4 E1	8 E1	16 E1	E3 + 2 E1
BER $1x10^{-3}$	115.5	112.5	110.0	114.5	112.0	109.0	108.5
BER $1x10^{-6}$	114.0	111.0	108.5	112.5	110.0	107.0	106.5
16 QAM							
BER $1x10^{-3}$	107.5	104.5	101.5	106.5	104.0	101.0	100.5
BER $1x10^{-6}$	106.0	103.0	100.0	104.5	102.0	99.0	98.5

At the antenna port for a non-protected assembly including filter and branching losses equal to 3 dB for non-protected.

Nominal System Gain = Guaranteed Receiver Sensitivity + Nominal Transmitter Power Output

Receiver Characteristics

Noise Figure: 5 dB maximum (outdoor/indoor installation, excluding ACU)

Sensitivity: (dBm) guaranteed

QPSK	IDU Type II			IDU Type III			
	4 E1	8 E1	16 E1	4 E1	8 E1	16 E1	E3 + 2 E1
BER $1x10^{-3}$	-89.0	-86.0	-83.5	-88.0	-85.5	-82.5	-82.0
BER $1x10^{-6}$	-87.5	-84.5	-82.0	-86.0	-83.5	-80.5	-80.0
16 QAM							
BER $1x10^{-3}$	-85.0	-82.0	-79.0	-84.0	-81.5	-78.5	-78.0
BER $1x10^{-6}$	-83.5	-80.5	-77.5	-82.0	-79.5	-76.5	-76.0

At the antenna port for a non-protected assembly including filter and branching losses equal to 1.5 dB for non-protected.

Residual BER: < 10^{-12} BER

Frequency Stability: ± 7 ppm including aging **FEC:** Built-in

Regulatory Information

Frequency Plans: ITU-R Rec. 385-5/386-4 & Report 1055-1.
Other frequency plans available.

Electromagnetic Interference Standards: ETS 300 385 (EN55022)

Mechanical Characteristics

Antenna Connection: WR-112 Waveguide, CPR-112G Flange

Cable Connector: Indoor to Outdoor; Type N-Type Female

Rack Size: Indoor Unit; 483 mm (19") EIA or ETSI relay rack
Outdoor Unit; Pole or Wall mount

Dimensions	Height	Width	Depth
Outdoor Unit	381 mm (15")	216 mm (8.5")	310 mm (12.2")
Indoor Units			
Type II (NP)	45 mm (1.75")	483 mm (19")	267 mm (10.5")
Type II (Protected)	90 mm (2.5")	483 mm (19")	267 mm (10.5")
Type III	133 mm (5.3")	483 mm (19")	296 mm (11.7")

Weight: IDU Type III; 8.5 kg (18.7 lbs.) IDU Type I; < 3 kg, (6.6 lbs.)
Outdoor Unit; 12.5 kg (27.5 lbs)

Altitude: 5000 m AMSL

Antenna Characteristics

Type: Parabolic, Andrews VHLP available in 1, 2, 4, ft., sizes.

Mounting: Pole or Wall mount

Alignment: Optional Alignment Kit

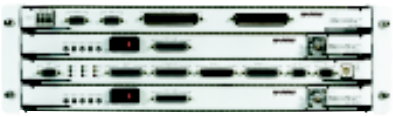
Polarization: Horizontal or Vertical

Windload: Operational; 150 Km/h Survival; 205 Km/h

Indoor Units (IDU)

***Type II** - Non-protected*

***Type II** - Protected*



***Type III** - Protected*

Unless otherwise indicated, typical performance specifications are listed and apply to transmitters/receivers connected back-to-back and must be confirmed before they become applicable to any specific system, contract or order.

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