

MANN -DMRIP-1 Complete Outdoor Radio

High Capacity Microwave Radio Links

(6, 7/8, 11, 13, 15, 18, 23, 26, 38GHz)

DMR IP Microwave System provides high capacity transmission, flexibility, reliability, rich features and convenience for wireless communications networks.

DMR IP digital point-to-point radio series represents a new microwave radio product line that is designed to address universal applications for high capacity Ethernet. This advanced technology platform is designed to provide high flexibility to customers currently and in the future.

DMR IP digital radio series enables network operators (mobile and private), government and access service providers to offer a portfolio of secure and scalable wireless applications for data, video, and voice services in Ethernet.

DMR IP digital radio includes integrated OAM&P (Operations, Administration, Maintenance, and Provisioning) functionality and design features that enable simple commissioning when the radio network is initially set up in the field.

DMR-IP Digital Microwave System is a large-capacity, all-outdoor microwave transmission equipment. The unique integrated structure makes its easy for all-weather work. It weighs only 3kg, which enables it rooftop/tower/wall mounting. Under particular circumstances, DMR-IP can also be installed behind windows for concealment purpose.

Applications

- Wideband wireless access, wireless local loop (WLL) and access market
- Mobile cellular network, which require higher capacity due to an increase in subscriber, cell sites and data application
- Back up network for fiber optic trunk links
- Private and Enterprises network such as educational institutions, financial institution and utility companies providing voice ATM & IP private networks

Product features

- Frequency: 6~40GHz
- Single ODU, transmission capacity 180Mbps@28MHz, 364Mbps@56MHz.
- All outdoor design, low cost, low latency, low power consumption, wide DC power input range and high reliability
- Adaptive Modulation Control (AMC*) and bandwidth capacity controlled by software
- 2×GE interface; Ethmux16 Optional expansion unit provides 5×GE electrical ports and 1×GE optical port, all 6×GE ports can be used as uplink ports or local data interfaces, and users can get NMS data through any electric port;
- Built-in FEC, ATPC, RF, analog and digital loopback functions
- Ethernet GE Interfaces
- Large package, UDP/IP package encapsulation format, cache absorption function, RSTP, Layer-2 switching, and VLAN, 802.3x, 802.1p protocols
- SNMP, Web Server NMS and software/hardware online update
- Transparency transmission of IP, STM-1 and TDM over IP; native IP & SDH/PDH; support new generation IP-based Mesh network and NGN

Modulation Type	Channel Bandwidth (MHz)			
	7	14	28-30	56
QPSK	10 Mbps	21 Mbps	42 Mbps	
16 QAM	20 Mbps	42 Mbps	85 Mbps	172 Mbps
32 QAM	25 Mbps	52 Mbps	106 Mbps	215 Mbps
64 QAM	32 Mbps	65 Mbps	133 Mbps	268 Mbps
128 QAM	37 Mbps	77 Mbps	156 Mbps	316 Mbps
256 QAM			180 Mbps	364 Mbps

Modes of Operation and Radio Data throughput (Inclusive of Fixed Radio Overhead)



Optional IPMUX-16 is available to provide 16E1 interfaces and 6 GE ports. Supports: Ethernet built-in layer 2 switch, support VLAN, comply with IEEE 802.3Q and 802.3ad, support 802.1P. Point to point and point to multipoint application, Stable E1 clock recovery, low jitter and wander, Low processing delay for E1 channels, high bandwidth usage efficiency, Resistant to packet loss, with PCM frame synchronization protection



TECHNICAL SPECIFICATIONS

GENERAL			
Power Over Ethernet (POE Supply Voltage)	-30 to -60VDC	Supply In-Rush Current	ETS 300 132-2
Command/Control Functions	Tx Pwr, Tx Carrier Freq, Tx Mute, Rx Carrier Freq Mod, Channel BW	V _{BNC} Accuracy (derived RSL from -30 to -70dBm)	± 3dB Max
Monitored/Reported Functions	Tx Pwr, Tx Mute, Synth (Loss of Lock) Alarms, rx Signal Strneght Indication (RSSI), Internal Temp)	Voltage @BNC vs RSL	RSL (dbm) = 15.77VBNC - 91.58 (typical monotonic response(e.g. 4.5vDc @RSL = -20dBm, 0.1VDc @ -90dBm)
Antenna Alignment Connector	BNC	FPGA	Radio Model Option
MTBF	30 years	Latency	TBD
Payload Port Interface Connection	GbE with POE (RJ45)	Payload Port Data Throughput	See Modes of Ops & Radio Data Table
Payload QOS Performance	VLAN Tag 802.1q, Priority queing per 802.1q (port based VLAN or DiffServe priority bytes)	Payload Jumbo Frame Size (software configurable)	Upto 9720 bytes
Payload Standard Frame Size	64 to 1518 bytes		
Network Management Port Interface Connection	GbeE with POE (RJ45)	NMS Protocols	SNMPv2, v3, SSH, Telnet, TFTP
Installation and Maintenance Port Interface Connection	RS232 (RJ45)	Data Rate	38.4Kbps max

RF SPECIFICATIONS (VARIABLE WITH FREQUENCY)													
Frequency Band	6L	6U	7	8	11	13	15	18	23	26	28	32	38
Frequency Range (GHz)	5.9 to 6.4	6.4 to 7.1	7.1 to 7.9	7.9 to 8.5	10.7 to 11.7	12.7 to 13.3	14.4 to 15.4	17.7 to 19.7	21.2 to 23.6	24.2 to 26.5	28 to 30	31.8 to 33.4	37 to 40
T/R Spacings (MHz)	240 to 252.04	340	154	119	490	266	315	1008	1008	1008	N/A	812	1260
			161	126	500		420	1010	1232				
			168	151.61	530		475						
			196	208			490						
			245	266			640						
				311.32			644						
Antenna Port Interface WR or Circular (inches)	*	*	1.025	1.025	75 or 0.74	75 or 0.62	62 or 0.56	42 or 0.455	42 or 0.375	42 or 0.37	N/A	28 or 0.25	0.219
Antenna Port Return Loss (dB)	≥ 10										≥ 6		
TX Output Power	See System Performance Tables.						See System Performance Tables.						
RX Threshold	See System Performance Tables.						See System Performance Tables.						
System Gain	See System Performance Tables.						See System Performance Tables.						
POWER DISSIPATION													
Frequency Band	6L	6U	7	8	11	13	15	18	23	26	28	32	38
RER4-xxxxxx-xxxx-xxxx-x0	76 W max.					67 W max.							
	[(2) CAT5e req'd for length > 20 m]					[(2) CAT5e req'd for length > 65 m]							
RER4-xxxxxx-xxxx-xxxx-x1	80 W max.					71 W max.							
	[(2) CAT5e req'd]					[(2) CAT5e req'd for length > 45 m]							
RECH-xxxxxx-xxxx-xxxx-x0	N/A	58 W max.				50 W max.				56 W max.			
RECH-xxxxxx-xxxx-xxxx-x1	N/A	62 W max.				54 W max.				60 W max			
	[(2) CAT5e req'd for length > 90 m]												

* Dielectrically loaded rectangular waveguide interface (non-standard). Requires external waveguide transition to WR 137.

ENVIRONMENTAL		MECHANICAL	
Operating Temperature	ETS 300 019-2-4 Class 4M5 (-33 to +55 deg C)	Weight	5.6 kg [12.3 lbs]
Cold Start Conditions	Power Supplies Operational @ -45 deg C, Radio will transmit, no QoS guarantee.	Size	26.7 cm [10.5 in] Diameter, 14.0 cm [5.5 in] Height
Storage	ETS 300-019-2-1	Finish	Corro-Coat PE 71-190Z (Powder Coat), Gloss White
Transport	ETS 300-019-2-2	Ground Lug	M5 x .8 x 9.5 long
Lightning (Protection)	IEC 61000-4-5		

RF SPECIFICATIONS	
TX Power Accuracy [over Command Range]	± 2.0 dB max.
TX Spectrum Mask	Meets ETSI requirements.
TX ATPC Range	15 dB min.
TX RTPC Range	10 dB min. (RER4), 6 dB min. (RECH)
TX Muted Power	-50 dBm max.
TX Frequency Accuracy [total including temperature and aging]	± 7 ppm max. ±10 ppm max. (8 GHz T/R=311.32 or 151.614 and 6 GHz T/R=252.04)
TX Frequency Step Size	250 KHz (except for 8GHz T/R = 311.32 or 151.614 & 6 GHz T/R=252.04)
RSL Dynamic Range [Receive Signal Level]	-20 to -90 dBm
RSSI Accuracy (-30 to -70 dBm)	± 2 dB max.
[Receive Signal (-20 to -90 dBm) Strength Indication]	± 3 dB max.
High RSL (4-32QAM) (64-256QAM)	-20 dBm -23 dBm
RX Threshold	Meets ETSI Requirements (refer to 8.6.7).
RX Interference Immunity [CW, Co-Channel, Adjacent Channel]	Meets ETSI Requirements.
Radiated Emissions [Antenna Port] (0.03 to 21.20 GHz) (21.2 to 26.5 GHz or TX 2nd harmonic, whichever is greater)	-50 dBm max. -30 dBm max.

APPLICATIONS

