

IP70-2.6 ULTRA HIGH CAPACITY E-BAND IP RADIO



- **2.6Gbps Full Duplex Gigabit Ethernet Radio operating in millimeter-wave bands (70 & 80 GHz)**
- **Outdoor Radio Unit**
- **1 GE or 10GE Ethernet transport via SFP+ user ports or 1 GE Ethernet transport via RJ-45 user port**
- **Configurable Modulation QPSK through 256QAM**
- **Configurable Forward Error Correction Modes**
- **Hitless Adaptive Coding and Modulation**
- **Web GUI management**
- **In-band management channel allows web GUI management of far-side terminal**
- **External BNC connector provides antenna alignment analog signal strength indicator**

PRODUCT DESCRIPTION:

The IP70-2.6 is an outdoor point-to-point radio system operating in the millimeter-wave 70 and 80 GHz frequency bands with up to 2.6 Gbps full duplex capacity.

The state-of-the-art radios incorporate direct modulation at 70 GHz (Zero IF frequency) to eliminate the harmonic mixing spurs and the additional Phase Noise that would exist with multiple up and down conversion.

The radios feature configurable Forward Error Correction Modes (heavy and light) to allow a trade-off between capacity and sensitivity, as well as Adaptive Coding and Modulation for maximum throughput given available propagation conditions.

Configurable BERT (Bit Error Rate Test) mode operation can be implemented on part of the data stream without disabling the complete link.

In-band management channel allows web GUI management of far-side terminal.

The radios include built-in surge protection for its Ethernet and power interfaces. Surge protection mechanism complies with surge immunity standard IEC 61000-4-5, level 4.

The radios are available with a choice of three high gain antennas of 0.2 m, 0.3 m and 0.6 m diameter depending on link distance.

IP70-2.6 Specifications



Parameter	Value
Frequency of Operation	71 to 76 and 81 to 86 GHz (FDD)
Transmission Power	+20 dBm
Max Radio Link Throughput	2.6 Gbps over the air
Modulation Types	QPSK/16-QAM/32-QAM/64-QAM/128-QAM/256-QAM Hitless ACM (Adaptive Coding and Modulation)
FEC	Reed Solomon – multiple rates available
RF Bandwidth	250 and 500MHz (symbol rates software defined)
SyncE	Ethernet line data clock frequency passthrough
Signal Strength Output	BNC Output, 0 to 3V
Status LEDs	
ATPC (Automatic Transmit power Control)	Adaptively controls RF transmit power to support maximum capacity under all link conditions
Management	In Band

Network Interfaces	
RJ-45 Copper Ethernet	1000Base-T compliant
1 GE SFP	1000Base-X2
10 GE SFP	10GBASE-SR/LR3
Protocol	802.3z (Gigabit Ethernet)
OSI Layer	Physical Layer 2
Management Interface	
Management Access	
Alarm Reporting	

Mechanical	Specification
Dimensions (without antenna)	57L x 33W x 36H (cm)
Weight (without Antenna)	10 Kg
Operating Temperature	-35 to +60 Deg C
Humidity	95 % (non condensing)
Power Consumption	40 W max

IP70-2.6 Specifications



CAPACITY VERSUS BANDWIDTH

Modulation	CAPACITY (Mbps)	
	BANDWIDTH 250 MHz	BANDWIDTH 500 MHz
QPSK	340	690
16QAM	690	1390
32QAM	870	1740
64QAM	1040	2090
128QAM	1210	2430
256QAM	1390	2780

SENSITIVITY TABLE (Sensitivity versus modulation type)

Mod Type	Receiver Threshold (250 MHz bandwidth)	Receiver Threshold (500 MHz bandwidth)
QPSK	-73.9 dBm	-70.9 dBm
16 QAM	-63.8 dBm	-64.8 dBm
32 QAM	-65.2 dBm	-62.2 dBm
64 QAM	-61.9 dBm	-58.9 dBm
128 QAM	-57.8 dBm	-54.8 dBm
256 QAM	-56.1 dBm	-53.1 dBm

LATENCY TABLE, 500 MHz Bandwidth

Mod Type	Latency in microseconds versus frame size (500 MHz bandwidth)							
	64	128	256	512	1024	1280	1518	9600
QPSK	38.14	38.83	42.08	46.98	57.57	63.50	69.09	343.34
16-QAM	35.89	36.62	38.50	42.34	48.88	52.35	63.94	172.55
32-QAM	34.69	35.56	36.81	40.30	46.96	50.16	60.06	160.04
64-QAM	33.52	34.22	35.60	39.12	44.89	47.15	51.07	183.30
128-QAM	32.38	33.06	34.49	37.22	43.06	50.09	49.10	170.35
256-QAM	31.30	31.91	33.29	36.34	41.79	47.85	47.42	160.85

LATENCY Table, 250 MHz Bandwidth

Mod Type	Latency in microseconds versus Frame Size (250 MHz bandwidth)							
	64	128	256	512	1024	1280	1518	9600
QPSK	60.61	61.30	66.05	73.20	90.65	128.14	106.10	369.54
16-QAM	58.30	59.54	62.16	65.46	75.43	79.80	82.87	248.14
32-QAM	57.26	58.00	59.86	64.78	73.72	77.16	96.78	226.44
64-QAM	55.98	56.68	58.06	60.98	70.30	72.33	78.07	280.58
128-QAM	54.85	55.54	57.70	61.78	65.34	80.26	70.81	255.18
256-QAM	53.69	54.78	55.92	60.06	65.83	70.47	73.92	189.40