

# BlueWave Broadband™ 311+ Mbps Ethernet Radio

## 23 Ghz Licensed Band with up to 32 T1/E1 Circuits



**Front Panel of 311+ Mbps In-Door Unit with optional 2<sup>nd</sup> modem/IF and GigE Interface**

BlueWave Broadband™ has introduced the SDR Series™ of interference-free Licensed Ethernet Radios for the US backhaul market. This line provides exactly the right mix of Ethernet and T1/E1 for Internet Service Providers, cellular carriers, utility companies, government, schools, universities, and hospitals. This radio is optimized for Ethernet with ultra-low latency, with either 100BaseT or GigE Ethernet interfaces. Using a split-system design, the critical digital modem is indoors where it is accessible year round, safe from temperature extremes and tampering, while the hardened outdoor radio unit is mounted to the back of the antenna so as to eliminate the costs associated with waveguides. Designed as a Carrier-Class product for +99.999% availability, this radio will provide many years of reliable performance. The IDU can be economically upgraded to support a second link for hot standby or loop protection, with the addition of the second modem/IF & power modules.



**Rear View of Out-Door Unit with 2 ft HP Dish**

- Base model is 100 Mbps 100BaseT, with 16 T1s
- Base model includes Free 2nd 100 Mbps channel
- No software keys, w/full hardware throughput
- Ultra Low End-to-End Latency, under 500  $\mu$ s
- 1 Year Limited Warranty w/ Extension Options
- Expansion 16 x T1/E1 Circuit Module Available
- Programmable Bandwidths and Modulation
- Optional STM-1, OC-3, DS-3 interfaces
- Web Interface or Serial CLI for Management
- Low Power -48 Volt DC Operation
- SNMP Remote Management and Reporting
- Optional Hot-Standby (1+1) or Loop Protection
- 99.999% availability using mesh or ring support

# BlueWave Broadband™ 311+ Mbps Ethernet Radio

## General Specifications – SDR Series™

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Frequency Band:	<b>23 Ghz Band</b> (21.1-23.6 Ghz) Covered in 4 sub-band splits
Overall System Gain, 100 Mbps: 200 Mbps, and 300 Mbps:	<b>99 dB</b> (16QAM) default, 95 dB (32QAM), 88 dB (64QAM), 85 dB (128QAM)
Programmable:	
Modulation Modes:	<b>QPSK, 16QAM, 32QAM, 64QAM, 128QAM</b> (16QAM default)
FCC Channel Bandwidths:	<b>10, 20, 30, 40, 50, OR 80 MHz</b> (40 MHz default)
T/R Spacing:	<b>1,560 MHz</b>
IF Cable Specs and Freq:	<b>50-Ohm Cable at 350 MHz.</b> (Use up to 1000. of LMR400)
Emission Designator:	<b>40M0D7W</b> (16QAM) 100 Mbps (default) or 200 Mbps (128QAM) <b>50M0D7W</b> (128QAM) 250 Mbps, <b>56M0D7W</b> (128QAM) 311 Mbps
Frequency Stability:	<b>0.001%</b>
Line Interfaces:	<b>T1/E1, RJ-45C, plus dual 100BaseT or GigE</b>
Latency:	<b>From 133 to 560 microseconds, depending upon bit-rate</b>
Antenna Interface:	<b>Circular Waveguide</b> (industry standard)
Craft Interface:	<b>Web Interface</b> and/or <b>RS-232 Serial (Command Line)</b>
Network Management:	<b>Embedded SNMP agent</b>

## Transmitter

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Power Output	<b>+22 dBm</b> (QPSK . 32QAM), +19 dBm (64 - 128QAM)
Spurious & Out-of-Band Emissions:	<b>FCC Compliant, Part 101 &amp; 15</b> (Verified)
Interference Immunity:	<b>FCC Compliant, Part 101</b>

## Receiver

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Sensitivity, (BER 10 <sup>-6</sup> ):	<b>-77 dBm</b> (16QAM), -73 (32QAM), -70 (64QAM), -67 (128QAM)
Maximum Receive Level:	<b>-24 dBm</b>

## Power

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Input Power & Consumption:	<b>-45 to -60 Volts DC @ 52 watts</b> (Optional AC adapter available)
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## Mechanical

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Modem . Rack Mountable IDU:	<b>1.7 in H x 14 in D x 17 in W, 9.5 lbs</b>
Radio ODU (without antenna):	<b>10.5 in diameter x 3.5 in thickness, 10.1 lbs</b>

## Temperature

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Modem . In-Door Unit:	<b>- 5°C to +50°C (+23°F to +122°F)</b>
Radio . Out-Door Unit:	<b>-33°C to +50°C ( -27°F to +122°F)</b>

## Performance

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Sample Link with both antennas as:	<b>2' HP</b>	<b>4' HP</b>	<b>6' HP</b>
Calculated Fade Margin (100 Mbps):			
5 Mile Link	41 dB	53 dB	61 dB
10 Mile Link	35 dB	47 dB	54 dB
15 Mile Link (not advisable in some regions)		44 dB	51 dB
20 Mile Link (not advisable in some regions)		41 dB	48 dB

Notes: The 23 Ghz band exhibits no attenuation from ground reflections, but significant rain attenuation. The SDR Series™ is also available in 11 Ghz and 18 Ghz bands. Other bands are special order.