

EUM3006

900 MHz Non-Line-of-Sight Integrated Outdoor Modem

www.waverider.com

WaveRider EUM3006 Outdoor Modem with Integrated Antenna and Power over Ethernet



EUM3006 Outdoor Modem

WaveRider's LMS4000 is the world's most advanced NLOS (non-line-of-sight) broadband wireless system designed specifically for the 900 MHz spectrum.

The EUM3006 Integrated Outdoor Modem is the latest modem for the LMS4000 system and significantly enhances key system capabilities: outdoor unit with extended temperature range; integrated, high-gain, active diversity antenna; 802.3af compatible, 48 VDC Power over Ethernet; higher output power; improved Rx Sensitivity; DHCP Enabled; Auto CCU Discovery, Automatic Remote Configuration; easy-to-use Setup menu and MDB1000 alignment tools; VoIP support.

Features

The EUM3006 is a major step in the evolution of the LMS4000 900MHz Wireless Internet Modems offered by WaveRider. It has many new features that provide improved RF performance, ease of installation, and improved remote management. These features include:

Outdoor Installation

The EUM3006 is tested to meet ETSI 300-019 environmental standards for outdoor installations, with an extended temperature range of -40° C to 50° C plus solar loading. The EUM3006 can also work in uninhabited indoor locations, such as attics, if there is an adequate RF signal. The advantages of an integrated outdoor unit include:

- More flexible installations.
- Improved range since there are no RF losses from long cable runs.
- Lower installation costs.

Integrated high-gain, diversity antenna

There are many advantages to the EUM3006's integrated antenna:

- Integrated, so that there are no RF losses due to long cable runs.
- High-gain (10 dBi), so that the EUM3006 can generate the maximum RF signal allowed by FCC and increase the overall operating range.
- Active diversity, which is done on a packet by packet basis, so that the EUM3006 performs better in a multi-path fading environment.
- Polarization diversity, so that the installer need not worry about what polarization the CCU is. Sector polarization can be readily changed at the base stations, with the EUMs automatically adjusting.

LMS4000 Advantages

- ✓ Over-the-air data rates of 2.75 Mbps and access speeds of 2.0 Mbps
- ✓ Average range of 5 miles NLOS, outdoor
- ✓ LOS range up to 25 miles
- ✓ Up to 300 users per base station radio
- ✓ Dynamic Polling MAC
- ✓ VoIP support
- ✓ Built-in spectrum analyzer
- ✓ Mobile-survey utility
- ✓ Supports RADIUS AAA
- ✓ SNMP management
- ✓ PPPoE support
- ✓ Supports a profitable business model

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LMS4000 Technical Specifications

Power over Ethernet (PoE)

The EUM3006 is powered by standard 48 VDC Power over Ethernet (802.3af Mode B compatible). Since the antenna is integrated, there is no need for an RF cable. With PoE, there is no need for a separate power and Ethernet cable. So the EUM3006 has only one standard flexible cable, making installation simpler.

Using 48 VDC power allows the EUM3006 to have up to 100 m of Ethernet cable to the end-user's PC, which is the maximum by the Ethernet standard. The PoE injector can be located anywhere along this 100 m of cable. This provides great flexibility in placing the EUM3006 to get the best RF signal.

Higher RF Power

Taking advantages of changes to the FCC rules, the EUM3006 makes best use of its high-gain antenna to generate a full 36 dBm AVERAGE EIRP out of the antenna. This represents an increase of about 4 dB from the previous generations of EUMs with approved high gain antenna systems.

Improved RX Sensitivity

Each EUM3006 is tested to ensure that its RX Sensitivity is -89 dBm or better (average received signal). Combined with the antenna gain of 10 dBi, the EUM3006 can receive signals at -99 dBm.

DHCP Client

The EUM3006 can obtain its IP address, subnet mask and IP gateway information from a DHCP server, reducing the amount of configuration needed for installation. This also allows the Network Operator to re-assign IP addresses to EUMs without having to access the EUM itself.

Auto CCU Discovery

The EUM3006 searches the full RF frequency range to locate CCUs. It then selects the CCU with the best RF signal that allows it to register. With this and DHCP Client enabled (factory defaults), the installer does not need to enter ANY configuration parameters into the EUM3006 in order to install it.

Automatic Remote Configuration

The EUM3006 will accept parameters from a RADIUS server to set other configurable parameters in the modem. These parameters include: password, all SNMP parameters, RF Frequency (including enabling auto-discovery), and number of customers.

Installation Tools

The EUM3006 has two new tools to make installation and alignment easy and error-free.

- **MDB1000** - This hand-held, battery-powered device displays detailed key signal quality information to allow the EUM3006 to be located and aligned to the best RF signal possible by a single installer. The MDB1000 can be in any position near the EUM3006 to provide easy viewing.
- **SETUP Menu** - The EUM3006 supports the local link IP address, 169.254.10.250, on its Ethernet port at all times. Using the local-link address, any user can use the password "setup" to call up the setup menu that allows any user to check the RF link quality to help align the EUM3006 and troubleshoot the link. This avoids needing to know the IP address and password of the modem.

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LMS4000 Technical Specifications

EUM3006 Integrated Outdoor Specifications

Radio Specifications

Operating Frequency	902 to 928 MHz
Radio Type	DSSS
Radio Modulation	Complementary Code Keying (CCK)
Average Output Power	+36 to 25 dBm EIRP (software selectable)
RF Rx Threshold	-89 dBm (BER<10 ⁻⁶) internal antenna port, not including antenna gain
Minimum/Maximum Center Channel Frequency	905/925 MHz
Channel Bandwidth	5.5 MHz
Center Frequency Spacing Increment	0.2 MHz
Orthogonal Channels	4
Orthogonal Channel Separation	6.6 MHz

Radio Performance

Maximum Over-the-Air Raw Data Rate	2.75 Mbps
User Data Rate	Up to 2.0 Mbps
Maximum Link Path Distance	> 25 miles (40 km)

Antenna Specification

Antenna Package	Integrated with modem in single outdoor package
Antenna Gain	10 dBi
Antenna Beamwidth	45 degrees for both Horizontal and Vertical Polarization
Front-Back Min. Ratio	15 dB
Diversity	Automatic Diversity Selection of Horizontal and Vertical Polarization per packet

Power Specifications

Supply Type	48 VDC 802.3af Mode B compatible Power over Ethernet (PoE)
PoE Power Injector Input	Auto-sensing 100-240 VAC, 47-63 Hz
PoE Power Injector Output	48 VDC, 350 mA max
PoE Power Consumption (typical)	10W

Interface Specifications

Physical Interface	10BaseT RJ-45 HDX Ethernet Jack (TIA - T568A)
Power Over Ethernet	+48 VDC on pins 4 & 5 (pair 1) / 0 VDC on pins 7 & 8 (pair 4)
Ethernet Cable Length Supplied	25 feet CAT-5e Outdoor rated
Max. Ethernet Cable Length	330 feet (100 m)

Dimensions

L x W x H	16.25" x 8.25" x 3.5" (41.5 cm x 21 cm x 9 cm)
Weight/Shipping Weight	6.4 lb (2.9 kg)
Materials	Aluminum base , plastic radome

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WaveRider Communications Inc.

255 Consumers Road, Suite 500, Toronto, Ontario, Canada M2J 1R4

The logo for WaveRider, featuring the word "WaveRider" in a bold, sans-serif font. The "Wave" part is in black, and the "Rider" part is in red. A red wave graphic is positioned above the "Rider" part, extending from the "W" and curving over the "R".

LMS4000 Technical Specifications

Environmental Specifications

Operating Temperature	-40° C to 50° C plus solar loading
Storage Temperature	-40° C to 70° C
Operating Humidity	0% to 95% RH (non-condensing @ 50C)
Standards	Designed for outdoor unsheltered conditions, Compliant with ETSI-300-019-1-4, Class 4.1 with extended temp. range (similar to NEMA-4)
Wind Loading	Up to 112 mph (180 kph) maintains alignment to better than 56 mph (90 kph)
Ice Loading	Better than 1.25" (32 mm)
Mounting Interface	Mounts to any secure pole from 1" to 3.5" (2.5 cm to 9 cm) via 2 gear clamps
Orientation	Mounts horizontally or vertically.

Approvals

Radio Transmitter	FCC Class A, CFR 47 Part 15. FCC ID: OOX-EUM3006
Safety	UL, CSA

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Note: WaveRider's Continuous Improvement Policy means that specifications are subject to change without notice.

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