

LigoPTP MiMo^{PRO}

5 GHz point-to-point integrated/connectorized backhaul device



Product Overview

LigoWave unleashes its highest capacity, license-free PTP device with the release of the LIGOPTP 5 MIMO PRO series product line. Making use of ground breaking 2x2 MIMO technology, the LigoPTP 5-23/5-N MIMO PRO delivers aggregate TCP throughput **capability of up to 210 Mbps (105 Mbps full-duplex)** combined with high packets-per-second performance.

This product enables carrier-class point-to-point capability, ideal for dedicated access or backhaul applications (including VOIP or other small packet applications). The LigoWave PTP MiMo PRO product family couples flexible channel width capability (20 or 40 MHz) and industry-leading proprietary software mechanisms to set the utmost standard in spectral efficiency. The LigoPTP 5-23/5-N MIMO PRO product features an integrated dual-polarized antenna (or 2 N-type connectors for the 5-N product) and is housed in a rugged, cast aluminum enclosure.

Combining digital signal processing, dual polarization antennas and proprietary W-Jet 2 MiMo protocol these bridges have a high spectral efficiency of 7.5bit/Hz.

The LigoPTP 5-23/5-N MIMO PRO showcases an array of advanced software mechanisms that provide optimal point-to-point connectivity for high-throughput, long distance links. LigoWave's proprietary PTP mechanisms utilize techniques such as Dynamic Time Division Duplexing (TDD) to dynamically allocate bandwidth in the direction needed, thus increasing link efficiency

and greatly decreasing the impact that distance has on throughput of the link.

The LigoWave point-to-point products also feature selective repeat ARQ technology, an enhanced error-correction software mechanism that optimizes data traffic to provide very high throughput over high-bandwidth, long-range links even in the presence of interference.

The new MiMo PRO series products have an extremely powerful **integrated radio 32 dB (1500 mW)** which allows building solid long-distance links even with an integrated antenna. The output power on lowest modulation (MCS 7) is 27 dBi which is not available on the market today.

Gigabit Ethernet port and 802.3 af standard support makes MiMo Pro series product line even more professional. **Improvements on the ESD protection** side make this product ideal for mission critical and harsh-weather condition installations.

Another innovation on the LigoPTP MiMo PRO series equipment is an **integrated accelerometer** which allows to detect movement of your equipment.

The LigoPTP 5-23/5-N MIMO PRO is also compatible with LigoWave online link calculator and WNMS, a centralized configuration, firmware, and statistics server offered by LigoWave for carrier class diagnostic and configuration.

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Key Features

- 5 GHz PTP bridge, ideal for:
 - Dedicated Access
 - Backhaul
 - Private networks
- Flexible center channel and channel width capability (20/40 MHz) for throughput optimization
- Radio rate of up to 300Mbps
- True TCP throughput up to 210 Mbps
- Advanced proprietary W-jet MiMo 2 wireless protocol
- High packet-per-second (PPS) rate - ideal for VOIP backhaul applications
- Low packet latency (2ms)
- Great spectral efficiency (7.5 bit/ Hz)
- ARQ (Selective Repeat) for very high throughput
- Dynamic TDD for allocating bandwidth in real-time to the direction needed
- Integrated dual-polarized antenna (2 N-type connectors for the LigoPTP 5-N MiMo PRO product)
- PoE built-in for single cable installation (802.3 af compatible)
- 1000 BaseT Ethernet port
- 32 dB (1500 mW) integrated radio (27 dB on MCS 7)
- Advanced security technologies
- Integrated accelerometer for movement detection
- Comprehensive management features
 - Web GUI
 - Command line management via SSH
 - RCMS server support for configuration
 - SNMP V1/2/3 with traps supporting MIBs:802.11, 802.1x, MIBII
 - Syslog support
 - Compatible with LigoWave link calculator
 - Real-time alerts
- Rugged articulating bracket solution for multi-facet mounting
- Oled screen and beeper for alignment
- IP-67 compliant



W-jet is LigoWave's proprietary wireless protocol that combines special techniques to achieve great performance and reliability even over long distances. The W-jet protocol is the result of years of development and gives LigoWave PTP products the ability to outperform other products on the market while simultaneously optimizing ROI for the customer.

BUILDING-TO-BUILDING CONNECTIVITY



DEDICATED ACCESS

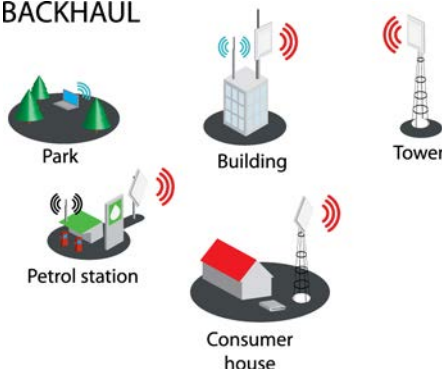


TI REPLACEMENT



Main applications

BACKHAUL



VIDEO SURVEILLANCE



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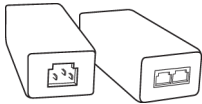


Summary

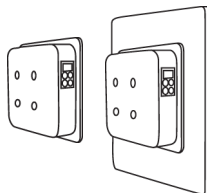
- Easy and quick planning;
- Free online application and can be used with all wireless equipment;
- Has integration with Google maps;
- Allows storing, downloading and publishing data about the links online.
- PDF results can even be used by installation teams!

LigoWave's link calculator is a link planning tool available online at <http://www.ligowave.com/linkcalc/>. The link calculator allows LigoPTP users to calculate link performance expectations taking into account geographical information, distance between the units, antenna height and gain, transmit power, and other factors in order to choose the most suitable product available from LigoWave's extensive product portfolio. In addition, custom calculations using other vendors' equipment specs can be used, making the LigoWave link calculator the ultimate link planning tool. At the same time, this tool is offered free of charge, and users only need to register to get quick and easy access to this very helpful tool. On top of that, each user is able to save and create a database of links, download a PDF document that contains all the necessary information about the link, and publish a hyperlink online so that it could be shown to other people during the evaluation process.

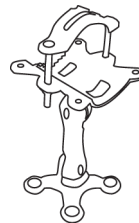
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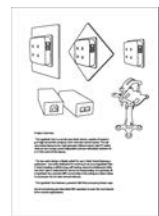
48 V 802.3 af PoE with grounding and lightning protection



LigoPTP 5-23/5-N MiMo PRO outdoor unit



Professional mounting kit



Quick install guide

Antenna patterns (only for LigoPTP 5-23 MiMo PRO product):

RF patterns (vertical)

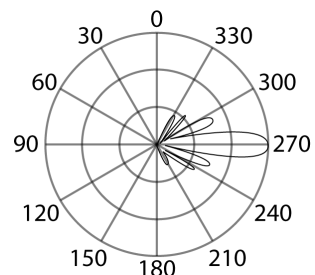
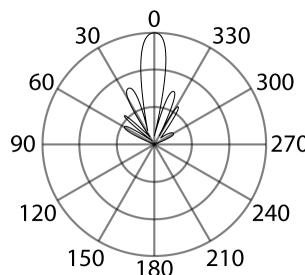
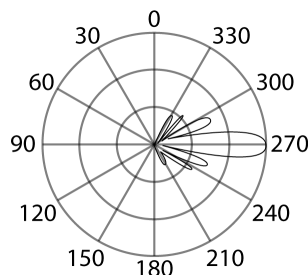
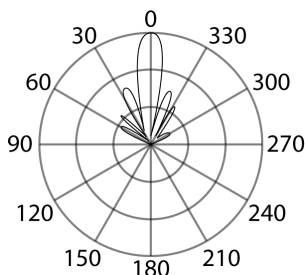
RF pattern (horizontal)

Vertical cut

Horizontal cut

Vertical cut

Horizontal cut



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Sales offices:

EMEA:

Veiveriu 150-IIIa. Kaunas,
LT-46931, Lithuania

Sauletekio al. 15-610, Vilnius, LT-
20000, Lithuania

Americas:

138 Mountain Brook Dr.
Canton, GA 30115, USA

984 Shetland Ave. Winter Springs, FL
32708 USA

Asia Pacific:

China-Beijing

Room 602, Everlast Plaza, No. 39,
Anding Road,
Chaoyang District, Beijing, China
100029

China-Shanghai

4H, No. 92, Guiping Road, Zuhui Dis-
trict, Shanghai, China 200233

China-Huizhou

No. 6, Huifeng East 2 Road, Zhongkai
Hi-Tech Industrial Development Zone
Huizhou, Guangdong, China

China-Shenzhen

No. 9, Dragon Jade Industrial District,
Bantian Village Buji Town Longgang
District, Shenzhen, China

Hong-Kong

B7, 6F, Chung Mei Centre, 15B Hing
Yip Street, Kwun Tong, Kowloon, Hong Kong

Singapore

60 Kaki Bukit Place, #08-04/05 Eunos
Tech Park, Singapore 415979

Indonesia

Gedung Starpage Jl. Salemba Tengah
No. 5 Lt. 3, Jakarta Pusat, Indonesia

Taiwan

12F, No. 33 Sec. 2, Roosevelt Road,
Taipei, Taiwan

Malaysia

No. 17 Jalan P2/12, Bandar Teknologi
Kajang, 43500 Semenyih, Selangor,
Malaysia

Philippines

3rd Floor. ETPI Bldg. #2161 Soler St,
Conner Calero St. Sta Cruz, Manila
City, Philippines

Thailand

169 Soi Sirindhorn 7, Charansanitwong
Road, Bangbamu, Bangkok, Bangkok
10700, Thailand

India

New No. 6, Old No. 16, Rajagopalan
Street, Valmiki Nagar, Thiruvanimiyur,
Chennai 600041, India

Radio specifications

Wireless technology	Proprietary W-Jet protocol, 2x2 MIMO
Operating mode	Point-to-point
Radio frequency band	4.920 - 5.915 GHz
Channel size	Configurable 20, 40 MHz
Max transmit power	2 chains x 32 dBm
Modulation schemes	BPSK, QPSK, 16QAM, 64QAM
Receive sensitivity	Varying between -94 and -72 dBm depending on modulation and channel size
Error correction	FEC, Selective ARQ
Duplexing scheme	Dynamic time division duplex

Antenna

Type	Integrated directional panel (LigoPTP 5-23 MIMO PRO) or 2 N-Type connectors (LigoPTP 5-N MIMO PRO)
Polarization	Dual (LigoPTP 5-23 MIMO PRO)
Gain V/H	23/23 dBi (LigoPTP 5-23 MIMO PRO)
3dB Beam-width V/H	8/8 degrees (LigoPTP 5-23 MIMO PRO)

Data Interface

Physical interface	10/100/1000 BaseT
Protocol	Ethernet IEEE 802.3
Connector type	RJ45
Surge protection	Built-in

Link performance

Real data (TCP) throughput	210 Mbps aggregate (105 Mbps full-duplex)
Max packets per second	65,000
Packet latency	2 ms (64 bytes packet)
Recommended link distance*	More than 100 km (62,17 mi)

Security

Data encryption	Hardware based AES
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Physical

Dimensions (PTP 5-N MIMO)	Width 218 mm (8.5 "), height 218 mm (8.5 "), depth 70 mm (2.7 ")
Dimensions (PTP 5-23 MIMO)	Width 335 mm (13 "), height 335 mm (13 "), depth 90 mm (3.5 ")
Weight (PTP 5-N MIMO)	2 kg (4.4 lb) (mount included)
Weight (PTP 5-23 MIMO)	3.3 kg (7.3 lb) (mount included)
Power supply	9 - 48 VDC, active PoE (802.3af)
Power source	100 - 240 VAC via included adapter
Power consumption	15 W

Environmental

Operating temperature	-20°C (-4 F) ~ +60°C (+140 F)
Humidity	0 - 90 % (non-condensing)

Management

Installation assistant	OLED screen and beeper
System configuration interfaces	User-friendly web GUI, SSH CLI, SNMP v1/2c/3 with traps, centralized Remote
Management system	WNMS, WNMS Cloud

Regulatory

Certification	FCC/IC/CE
Ingress protection	IP-67
Safety	RoHS compliant

*Link distance recommendation with an external antenna