



LigoWave



## DLB 2-90

Outdoor Wireless Device

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LigoWave's DLB 2-90 delivers the highest performance and stability available in the 2.4 GHz Base Station class. This product combines a robust, highly advanced 802.11n radio core containing MIMO 2x2 technology with an integrated, high gain, dual polarized, 100° sector antenna. The device is powered by a reliable, advanced, and feature-rich operating system, allowing the creation of high throughput, stable wireless networks quickly and effectively. Although the DLB 2-90 was designed mainly as a Base Station it also supports client-operating mode, which greatly extends the possible application scenarios.

The smart dynamic polling based protocol (ipoll 3) ensures reliable communication even in congested areas with 64 client devices connected to a base-station.

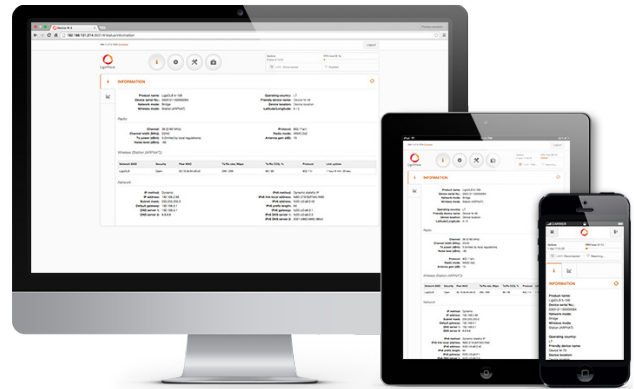
Equipped with LigoWave's dual firmware image feature, remote software upgrades are assured even if a power failure interrupts the process. The device will restart using the prior firmware in the event of an upgrade failure.

The enclosure is made of polycarbonate plastic with UV inhibitors to provide years of outdoor exposure in direct sunlight without cracking. The DLB 2-90 was designed and tested to meet an IP-65 rating as well as vibration, temperature, drop, salt, fog, and electrical surge standards to ensure a high level of reliability unsurpassed in the industry. It is equipped with a grounding lug and a grounded 24-volt PoE to allow a professional installation, resistant to electrical surges. The mounting bracket permits installation on a wall or a pole and provides up to 30 degrees of down-tilt adjustment.

## OS

The DLB OS is a highly functional and easy to use operating system. This powerful and flexible operating system ensures flawless operation of all DLB hardware devices and effortless setup for those deploying the networks.

- Smart polling data transmission protocol (ipoll 3)
- Dual-firmware image support
- Responsive HTML 5 based GUI
- 170 Mbps capacity
- 80,000 PPS rate
- IPv6 support
- Infinity controller compatible



## INFINITY CONTROLLER

The Infinity Controller is LigoWave's proprietary element management system that facilitates network installation, configuration, control, maintenance, monitoring, and expansion.

The Infinity Controller is designed to work with Infinity (NFT), LigoDLB, and LigoPTP NEs. It offers full functionality with the Infinity series and LigoDLB series, but only supports the monitoring feature on LigoPTP NEs. The PTP configuration feature is currently undergoing development.

# Specifications

Product/ distance recommendation	PTMP mode	PTP mode	PTP mode (full capacity)
DLB 2-90	10 km/ 6.21 mi	N/A	N/A

## Wireless

WLAN standard	IEEE 802.11 b/g/n, iPoll 3 (proprietary)
Radio mode	MIMO 2x2
Radio frequency band	2.402 - 2.492 GHz (FCC 2.412 - 2.462 GHz)
Transmit power	Up to 31 dBm (country dependent)
Receive sensitivity	Varying between -96 and -74 dBm depending on modulation
Channel size	5, 10, 20, 40 MHz
Modulation schemes	802.11 g/n: OFDM (64-QAM, 16-QAM, QPSK, BPSK) 802.11 b: DSS (CCK, DQPSK, DBPSK)
Data rates	802.11 n: 300, 270, 240, 180, 120, 90, 60, 30 Mbps 802.11 g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11 b: 11, 5.5, 2, 1 Mbps
Error correction	FEC, Selective ARQ
Duplexing scheme	Time division duplex

Receive sensitivity (dBm)	802.11N/ iPoll (20/ 40 MHz)	15 Mbps	30 Mbps	45 Mbps	60 Mbps	90 Mbps	120 Mbps	135 Mbps	150 Mbps
		-95	-93	-91	-88	-83	-80	-78	-77
802.11g	30 Mbps	60 Mbps	90 Mbps	120 Mbps	180 Mbps	240 Mbps	270 Mbps	300 Mbps	
	-92	-90	-87	-84	-81	-77	-76	-74	
802.11g	6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps	
	-96	-95	-94	-92	-89	-85	-81	-79	

Output power (dBm - combined)	802.11N/ iPoll (20/ 40 MHz)	15 Mbps	30 Mbps	45 Mbps	60 Mbps	90 Mbps	120 Mbps	135 Mbps	150 Mbps
		31	30	29	28	27	27	26	25
802.11g	30 Mbps	60 Mbps	90 Mbps	120 Mbps	180 Mbps	240 Mbps	270 Mbps	300 Mbps	
	30	29	28	27	27	26	25	24	
802.11g	6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps	
	31	30	29	28	27	27	26	26	

## Antenna

Type	Integrated directional dual - polarized panel
Gain	16 dBi

## Wired

Interface	10/100 Base-T, RJ45
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## Software

Wireless operating modes	Access point (auto WDS), access point (ipoll 3), station (WDS, ipoll 3), station (ARP NAT)
Wireless techniques	Smart station polling, smart auto-channel, adaptive auto modulation, automatic transmit power control (ATPC)
Wireless security	WPA/WPA2 personal, WPA/WPA2 enterprise, WACL, user isolation
Wireless QoS	4 queues prioritization on ipoll 3
Network operating modes	Bridge, router IPv4, router IPv6
Network techniques	Routing with and without NAT, VLAN
WAN protocols	Static IP, DHCP client, PPPoE client
Services	DHCP server, SNMP server, NTP client, router advertisement daemon, ping watchdog
Management	HTTP(S) GUI, SSH, SNMP read, Infinity controller, Telnet
Tools	Site survey, link test, antenna alignment

## Physical

Dimensions	Length 430 mm (16.9 "), width 150 mm (5.9 "), height 40 mm (1.6 ")
Weight	1000 g (2.2 lb)
Mounting	Combination wall / pole mount included

## Power

Power supply	12 - 24 VDC passive PoE (24 V passive PoE adapter is included in the package)
Power source	100 – 240 VAC
Power consumption (max)	4.5 W

## Environmental

Operating temperature	-40°C (-40 F) ~ +65°C (+149 F)
Humidity	0 ~ 90 % (non-condensing)

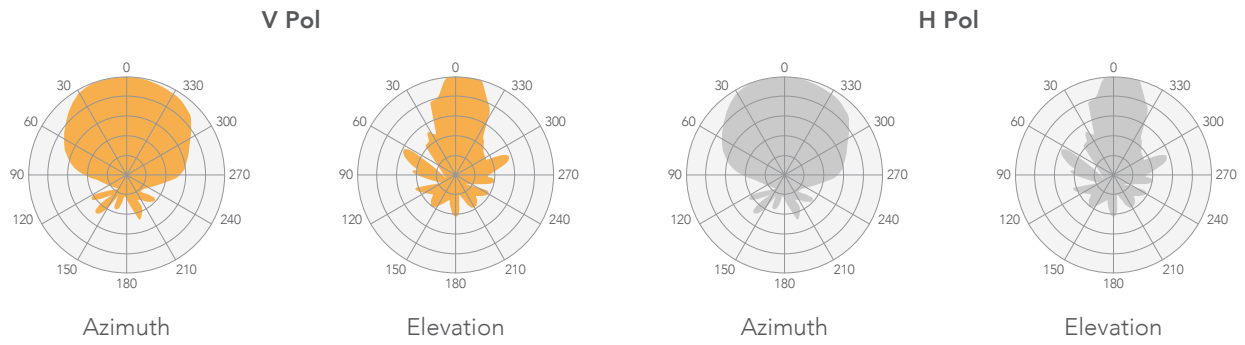
## Management

System monitoring	System monitoring: SNMP v3, Syslog, Web UI and Infinity Controller
Configuration	WebUI, Infinity Controller

## Regulatory

Certification	FCC/IC/CE
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## Antenna specifications



## Internal antenna

Frequency range	2.4 - 2.5 GHz
Gain	16 dBi
Polarization	Dual linear
Cross-pol Isolation	25 dBi
VSWR	1.7:1
Azimuth beamwidth (H pol)	100 deg
Azimuth beamwidth (V pol)	100 deg
Elevation beamwidth	30 deg