LigoWave

DLB ECHO 5

Outdoor Wireless Device

DLB ECHO 5

The DLB ECHO 5 was designed for cost-effective and long distance connectivity (up to 50 km). It has a unique mounting system designed to utilize standard satellite offset dish antennas to provide increased system gain and distance. These antennas are readily obtainable in most countries, thereby reducing freight and inventory costs. The aluminum housing improves RF performance, allowing solid communications in interference laden environments as well as providing strength against the elements.

DLB ECHO 5 is a universal device that can be used in a two different ways: with a 60 cm offset dish antenna provided by LigoWave or with a 3rd party offset dish antenna.

The product is equipped with a high output power MIMO radio (up to 29 dBm) and when coupled to LigoWave's 27 dBi dual-polarized, 60 cm, offset satellite dish antenna it is ideal for ultra long range wireless communication.

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 aluminum and polycarbonate plastic with UV inhibitors to provide years of outdoor exposure in direct sunlight without cracking and survive in harsh weather conditions. Environmentally tested to meet an IP-67 rating as well as vibration, temperature, drop, salt, fog, and electrical surge standards to ensure a high level of reliability and backed by a two-year warranty.   It is equipped with a grounding lug and a grounded 24-volt PoE to allow a professional installation, resistant to electrical surges.

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 2)
- Dual-firmware image support
- Responsive HTML 5 based GUI
- 170 Mbps capacity
- 80,000 PPS rate
- IPv6 support
- WNMS compatible
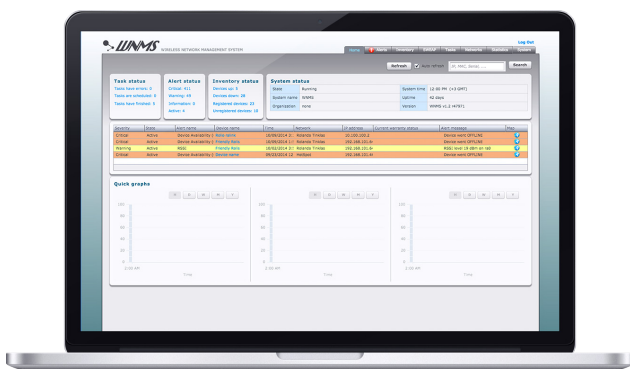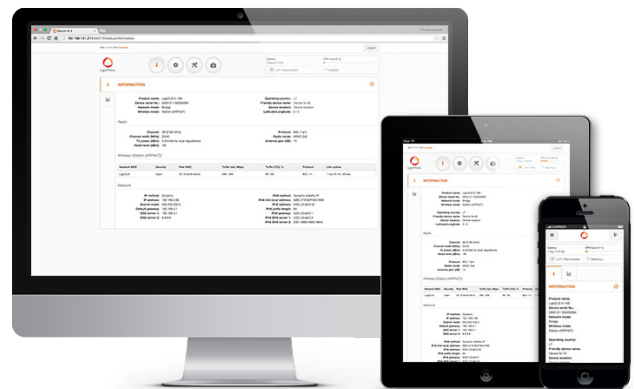
WNMS

WNMS is a FREE enterprise grade Wireless Network Management System. A single software solution simplifies a large number of management and monitoring tasks for network administrators. LigoWave's comprehensive network management system supports several thousands of nodes. Multiple networks may be maintained and monitored using one server. A rich feature set helps to diagnose network problems effectively, visualize networks on a map, perform scheduled firmware upgrades automatically, track states of devices, get failure alerts, and collect statistics. The Web-based system environment supports multi-user accounts. Several administrators may manage different networks on the same server, without having access to each other's equipment. WNMS is available as a stand-alone version for Linux and Windows servers, as a cloud-based system and as a mobile application for Android devices.

Specifications

Product/ distance recomendation	PTMP mode	PTP mode	PTP mode (full capacity)
APC ECHO 5 (with 60 cm offset dish)	17 km/ 10.56 mi	50 km/ 31.07 mi	35 km/ 21.75 mi

Wireless

WLAN standard	IEEE 802.11 a/n, iPoll (proprietary)
Radio mode	MIMO 2x2
Radio frequency band	5.150 - 5.850 GHz (FCC 5.150 - 5.250 and 5.725 - 5.850 GHz)
Transmit power	Up to 29 dBm (country dependent)
Receive sensitivity	Varying between -97 and -75 dBm depending on modulation
Channel size	5,10, 20, 40 MHz
Modulation schemes	802.11 a/n: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Data rates	802.11 n: 300, 270, 240, 180, 120, 90, 60, 30 Mbps
	802.11 a: 54, 48, 36, 24, 18, 12, 9, 6 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
		-97	-95	-93	-88	-85	-81	-79	-77
		30 Mbps	60 Mbps	90 Mbps	120 Mbps	180 Mbps	240 Mbps	270 Mbps	300 Mbps
		-94	-92	-89	-85	-82	-78	-77	-75
	802.11a	6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
		-97	-97	-95	-93	-90	-86	-82	-81

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
		29	28	28	28	27	27	25	24
		30 Mbps	60 Mbps	90 Mbps	120 Mbps	180 Mbps	240 Mbps	270 Mbps	300 Mbps
		28	28	28	28	26	26	24	23
	802.11a	6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
		29	29	29	29	29	27	26	25

Antenna

Type	Directional offset dish antenna or an integrated panel antenna
Gain	Dish (27 dBi), panel (15 dBi)

Wired

Interface	10/100 Base-T, RJ45

Software

Wireless operating modes	Access point (auto WDS), access point (iPoll 2), station (WDS, iPoll 2), 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 2
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, WNMS, Telnet
Tools	Site survey, link test, antenna alignment

Physical

Dimensions (head)	Length 90 mm (3.54 ''), width 70 mm (2.6 ''), height 90 mm (3.54 '')
Weight	185 g (6.53 oz), offset dish: 3000 g (105.82 oz)

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	SNMP v1/2c/3 server, Syslogs, system alerts via e-mail and SNMP trap

Regulatory

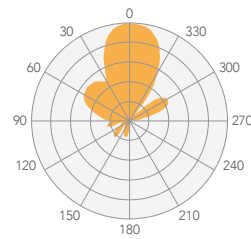|	
Certification	FCC/IC/CE

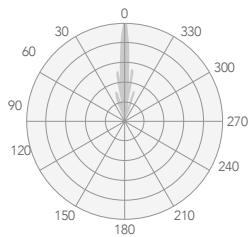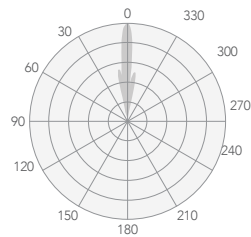# Antenna specifications

V Pol
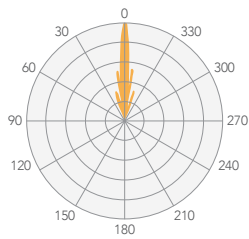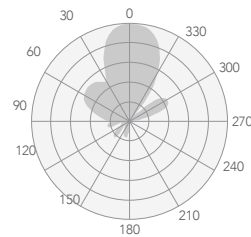

Azimuth
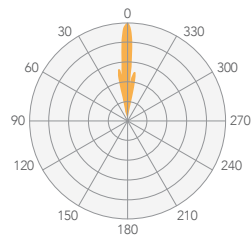
Elevation

V Pol

Azimuth
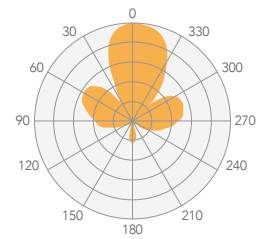
Elevation

H Pol

Azimuth

Elevation
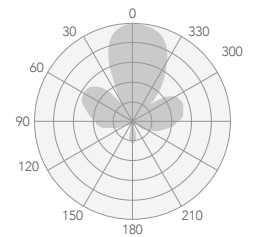
H Pol

Azimuth

Elevation

Offset dish antenna provided by LigoWave

Frequency range	5.1 - 5.9 GHz
Gain	27 dBi
Polarization	Dual linear
Cross-pol Isolation	30 dBi
VSWR	<1.4
Azimuth beamwidth (H pol)	6 deg
Azimuth beamwidth (V pol)	6 deg
Elevation beamwidth	6 deg

Internal antenna

Frequency range	5.1 - 5.9 GHz
Gain	15 dBi
Polarization	Dual linear
Cross-pol Isolation	27 dBi
VSWR	<1.4
Azimuth beamwidth (H pol)	35 deg
Azimuth beamwidth (V pol)	35 deg
Elevation beamwidth	35 deg

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