LigoDLB 5-20n
Outdoor wireless device
DLB 5-20n
LigoWave’s DLB 5-20n delivers the highest performance and stability available in the 5 GHz CPE class. This product combines a highly advanced radio core containing MIMO 2x2 technology with an integrated, high-gain, dual polarization directional antenna. The feature-rich operating system is optimized for ultra-high performance wireless communications while optionally allowing compatibility with older 802.11 a standard devices.

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 5-20n was designed and tested to meet an IP-66 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.

New form factor
The shape of the enclosure is now smaller, lighter but retains the IP-66 weather protection rating. Smaller packaging reduces freight costs and makes them less obvious. The new design has no metal parts, which makes them lighter and corrosion resistant.

New mounting
The adjustable mounting bracket is very easy to assemble and install. It consists of two easy to connect parts that allow tilting the device up and down when installing on a pole. A metal strap is included to securely tighten the device. This design includes additional reinforcements and thicker materials to ensure survival in extreme climate conditions.

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
- WNMS compatible
Specifications

<table>
<thead>
<tr>
<th>Product/distance recommendation</th>
<th>PTMP mode</th>
<th>PTP mode</th>
<th>PTP mode (full capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLB 5-20n</td>
<td>DLB 5-20n</td>
<td>DLB 5-20n</td>
<td>DLB 5-20n</td>
</tr>
<tr>
<td></td>
<td>10 km / 6.21 mi</td>
<td>15 km / 9.32 mi</td>
<td>8 km / 4.97 mi</td>
</tr>
</tbody>
</table>

**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 -75 and -97 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)

<table>
<thead>
<tr>
<th>802.11N/iPoll (20/40 MHz)</th>
<th>15 Mbps</th>
<th>30 Mbps</th>
<th>45 Mbps</th>
<th>60 Mbps</th>
<th>90 Mbps</th>
<th>120 Mbps</th>
<th>135 Mbps</th>
<th>150 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>802.11a</td>
<td>-97</td>
<td>-95</td>
<td>-93</td>
<td>-88</td>
<td>-85</td>
<td>-81</td>
<td>-79</td>
<td>-77</td>
</tr>
<tr>
<td></td>
<td>-94</td>
<td>-92</td>
<td>-89</td>
<td>-85</td>
<td>-82</td>
<td>-78</td>
<td>-77</td>
<td>-75</td>
</tr>
<tr>
<td>802.11n</td>
<td>-97</td>
<td>-97</td>
<td>-95</td>
<td>-93</td>
<td>-90</td>
<td>-86</td>
<td>-82</td>
<td>-81</td>
</tr>
</tbody>
</table>

### Output power (dBm - combined)

<table>
<thead>
<tr>
<th>802.11N/iPoll (20/40 MHz)</th>
<th>15 Mbps</th>
<th>30 Mbps</th>
<th>45 Mbps</th>
<th>60 Mbps</th>
<th>90 Mbps</th>
<th>120 Mbps</th>
<th>135 Mbps</th>
<th>150 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>802.11a</td>
<td>29</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>27</td>
<td>27</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>24</td>
<td>23</td>
</tr>
<tr>
<td>802.11n</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>27</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>

**Antenna**

- **Type**: Integrated dual-polarized directional panel antenna
- **Gain**: 20 dBi

**Wired**

- **Interface**: 10/100 Base-T, RJ45
**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, WNMS, Telnet

**Tools**
Site survey, link test, antenna alignment

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**Physical**

**Dimensions**
216 mm (8.5”), 184 mm (7.2”), 80 mm (3.1”)

**Weight**
413 g (0.91 lb)

**Mounting**
Pole mounting bracket included

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**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

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**Environmental**

**Operating temperature**
-40°C (-40 F) ~ +65°C (+149 F)

**Humidity**
0 ~ 90 % (non-condensing)

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**Management**

**System monitoring**
SNMP v1 server, Syslogs, system alerts via e-mail and SNMP trap

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**Regulatory**

**Certification**
FCC/IC/CE
**Antenna specifications**

<table>
<thead>
<tr>
<th>V Pol</th>
<th>H Pol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azimuth</td>
<td>0</td>
</tr>
<tr>
<td>Elevation</td>
<td>0</td>
</tr>
<tr>
<td>Azimuth</td>
<td>0</td>
</tr>
<tr>
<td>Elevation</td>
<td>0</td>
</tr>
</tbody>
</table>

**Internal antenna**

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>5.1 - 5.9 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain</td>
<td>20 dBi</td>
</tr>
<tr>
<td>Polarization</td>
<td>Dual linear</td>
</tr>
<tr>
<td>Cross-pol Isolation</td>
<td>27 dBi</td>
</tr>
<tr>
<td>VSWR</td>
<td>&lt;1.8</td>
</tr>
<tr>
<td>Azimuth beamwidth (H pol)</td>
<td>16 deg</td>
</tr>
<tr>
<td>Azimuth beamwidth (V pol)</td>
<td>16 deg</td>
</tr>
<tr>
<td>Elevation beamwidth</td>
<td>16 deg</td>
</tr>
</tbody>
</table>

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**LinkCalc™**

Link calculator is a link planning tool available online. The link calculator allows 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 the LigoWave and Deliberant extensive product portfolios. In addition, custom calculations using other vendors’ equipment specs can be used, making link calculator the ultimate link planning tool.

Available at: [http://www.ligowave.com/linkcalc](http://www.ligowave.com/linkcalc)