cnReach™ N500 450 MHz ETSI RED Radio

For outdoor critical infrastructure operations, cnReach transports process monitoring and control data from remote sensors or RTU/PLC’s back to the operations center supporting real-time automated decision making and on-going analytics. Covering large geographic areas, hard to reach terrain and challenging spectrum environments, cnReach delivers reliable, secure connectivity to the petrochemical, electric utility, water/wastewater/stormwater and transportation industries. cnReach eases the migration to modern networks by combining legacy serial and analog/digital I/O with TCP/IP and Ethernet connectivity. Fully integrated into a 'single pane-of-glass' management platform (cnMaestro™), cnReach helps bridge the IT/OT sides of complex organizations. Combining cnReach’s licensed and unlicensed narrow-band radios with Cambium Networks’ broadband technologies, industrial organizations are delivering end-to-end Industrial Internet of Things solutions today.

- Licensed 450 MHz (406-470 MHz); ETSI RED Compliant w/ CE Mark (also available in an FCC model)
- Up to 8W transmit (39 dBm)
- Point-to-point, Point-to-multipoint and Back-to-back Relay configurations (dual radios)
- Secure communications with AES 128/256-bit encryption and password authentication
- Highly reliable communications with access point synchronization and adaptive modulation
- Single and dual radio configurations for advanced back-to-back relay topologies.
- Extensive I/O capabilities easing the transition from serial to all-IP networks with two serial ports, two Ethernet ports and optional analog/digital I/O built-in.
- Sophisticated network planning with LINKPlanner, a no-charge planning tool enabling network designers to predict both capacity and availability of networks crossing all of Cambium’s technologies.
- Supported by cnMaestro software for monitoring the status of entire networks

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>PRODUCT DESCRIPTION</th>
<th>ETSI MODEL NUMBERS</th>
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<tbody>
<tr>
<td>N500 450 MHz Single - ETSI RED</td>
<td>NB-N500430A-EU</td>
<td></td>
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<tr>
<td>N500 450 MHz Single with IO - ETSI RED</td>
<td>NB-N500431A-EU</td>
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<tr>
<td>N500 450 MHz Dual - ETSI RED</td>
<td>NB-N500440A-EU</td>
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<tr>
<td>N500 450 MHz Dual with IO - ETSI RED</td>
<td>NB-N500441A-EU</td>
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**DEPLOYMENT TOPOLOGIES**

- Point to Point (PTP)
- Point to Multipoint (PMP)
- Back-to-back Repeater (BTB) - Requires Dual Radio
**Specifications**

**RADIO PERFORMANCE**

- **Frequency Range**: 406-470 MHz
- **Output Power**: 100 mW to 8W (13 dBm to 39 dBm)
- **Step Size**: 10 mW
- **Modulations**: BPSK / MSK / QPSK / 8PSK / 16QAM / 32QAM
- **Capacity**: 9.6 kbps to 44 kbps RF data rate; up to 26 kbps UDP throughput in 12.5 kHz channels
- **Channel Bandwidths**: 12.5 / 25 kHz (50 / 100 kHz available regulations permitting and by request)

**RECEIVE SENSITIVITY**

BER = 10E-4; (for 10E-6 reduce sensitivities by 2 dB)

<table>
<thead>
<tr>
<th>Modulation</th>
<th>12.5 kHz CHANNEL - ETSI</th>
<th>25 kHz CHANNEL - ETSI</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Rx Sensitivity (dBm)</td>
<td>Capacity* (kbps)</td>
</tr>
<tr>
<td>BPSK</td>
<td>-110</td>
<td>9</td>
</tr>
<tr>
<td>MSK</td>
<td>-105</td>
<td>10</td>
</tr>
<tr>
<td>QPSK</td>
<td>-106</td>
<td>17</td>
</tr>
<tr>
<td>8PSK</td>
<td>-101</td>
<td>26</td>
</tr>
<tr>
<td>16QAM</td>
<td>-98</td>
<td>35</td>
</tr>
<tr>
<td>32QAM</td>
<td>-95</td>
<td>44</td>
</tr>
</tbody>
</table>

**DATA CAPABILITIES**

- **Packet handling**: Layer 2 bridge
- **Layer 3 static routes**
- **VLAN support**
- **Error Correction**: Up to 32-bit CRC, Retransmit on error
- **Data Encryption**: 128/256-bit AES
- **I/O and Serial Data Access**: Optional I/O allows seamless integration of Modbus RTU and Modbus TCP protocols

**MANAGEMENT**

- **Web-based Interface via HTTP/HTTPS**
- **LINKPlanner integration (capacity and availability planning)**
- **Remote Management via SNMP**
- **cnMaestro integration (roadmap)**
- **Support for configuration files, remote software upgrades**
- **Built-in diagnostic tools via web interface such as RF Ping and RF Throughput**

* Capacities are over-the-air signalling rates. Usable throughput varies based on payload size, uplink/downlink ratio and protocol. UDP traffic is typically 55-60% of the over-the-air signalling rate.
Specifications

INTERFACES

Ethernet Interfaces 2 x RJ-45
10/100BaseT, Full Duplex, rate auto-negotiated (802.3 compliant)

Serial Interfaces 2 x RJ-45
RS-232/422/485, up to 230.4 kbps

Analog/Digital I/O (optional) 8 pins for analog input/output and digital input/output

RF / Antenna TNC RF connectors (1 or 2 depending on single or dual-radio configuration)

POWER

Input 10-32VDC with reverse polarity protection

<table>
<thead>
<tr>
<th>Power Consumption (12VDC average)</th>
<th>1W Output</th>
<th>8W Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transmit</td>
<td>Receive</td>
</tr>
<tr>
<td>Single Radio Configuration (mA)</td>
<td>611</td>
<td>266</td>
</tr>
<tr>
<td>Dual Radio Configuration (mA)</td>
<td>1200</td>
<td>380</td>
</tr>
</tbody>
</table>

PHYSICAL

Dimensions 6.625" x 3.45" x 1.835" (168 mm x 876 mm x 466 mm)

Weight Single Radio Configuration 1.54 lbs. (0.70 kg)
Dual Radio Configuration 1.61 lbs. (0.73 kg)

DIN Rail Mount optional

ENVIRONMENTAL

Operating Temperature -40C to +75C

Humidity 95% operating humidity @ 40C non-condensing

HAZLOC UL-Approved to Class I / Div 2

REGULATORY

UL Approved

EMC/Safety CE Mark
EMC: EN 301 489-1 v2.1.1, EN 301 489-5 v2.1.1
Health EME: EN 50385:2002
Radio: EN 300 113 v2.2.1
RoHS: EN 50581:2012