

# cnReach™ N500 700 MHz Radio

For outdoor critical infrastructure operations, cnReach transports process monitoring and control data from the remote sensor 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.



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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 700 MHz (cnReach is also available in 900 MHz licensed and unlicensed in a single radio)
- Up to 10W transmit (37 dBm) allows deployments up to FCC EIRP limits of 40 dBm in all bandwidths and modulations.
- 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 applications.
- Extensive I/O capabilities easing the transition from serial to all-IP networks with multiple serial ports, Ethernet ports and 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 carrying traffic across sensors

| PRODUCT | PRODUCT DESCRIPTION         | MODEL NUMBERS  |
|---------|-----------------------------|----------------|
|         | N500 700 MHz Single         | NB-N500710A-US |
|         | N500 700 MHz Single with IO | NB-N500711A-US |
|         | N500 700 MHz Dual           | NB-N500720A-US |
|         | N500 700 MHz Dual with IO   | NB-N500721A-US |
|         | N500 IO Expander            | NB-N500001A-US |

## DEPLOYMENT TOPOLOGIES

- Point to Point (PTP)
- Point to Multipoint (PMP)
- Back-to-Back Repeater (REP) - Dual Radio
- Stand-alone IO Expander

\*\* At 10W output transmit duty cycles are reduced depending on operating conditions.

## RADIO PERFORMANCE

|                    |   |
|--------------------|---|
| Frequency Range    | 757-758 MHz and 787-788 MHz   |
| Output Power       | 50 mW to 10W (10 dBm to 40 dBm); FCC limits maximum EIRP to 44 dBm in 700 MHz |
| Step Size          | 10 mW   |
| Modulations        | MSK / QPSK / 8PSK / 16QAM / 32QAM / 64QAM                                     |
| Capacity*          | 10 kbps to 1 Mbps; up to 550 kbps UDP throughput                              |
| Channel Bandwidths | 12.5 / 25 / 50 / 100 / 200 / 250 kHz  |
| Range              | Up to 70 miles  |

|       | 12.5 KHZ CHANNEL     |                  | 25 KHZ CHANNEL       |                  | 50 KHZ CHANNEL       |                  |
|-------|----------------------|------------------|----------------------|------------------|----------------------|------------------|
|       | Rx Sensitivity (dBm) | Capacity* (kbps) | Rx Sensitivity (dBm) | Capacity* (kbps) | Rx Sensitivity (dBm) | Capacity* (kbps) |
| MSK   | -113                 | 10               | -113                 | 19               | -110                 | 39               |
| QPSK  | -109                 | 23               | -107                 | 36               | -108                 | 71               |
| 8PSK  | -104                 | 34               | -102                 | 52               | -99                  | 101              |
| 16QAM | -100                 | 45               | -98                  | 70               | -93                  | 137              |
| 32QAM | -94                  | 57               | -93                  | 87               | -93                  | 175              |
| 64QAM |                      |                  | -93                  | 105              |                      |                  |
|       | 100 KHZ CHANNEL      |                  | 200 KHZ CHANNEL      |                  | 250 KHZ              |                  |
|       | Rx Sensitivity (dBm) | Capacity* (kbps) | Rx Sensitivity (dBm) | Capacity* (kbps) | Rx Sensitivity (dBm) | Capacity* (kbps) |
| MSK   | -108                 | 76               | -108                 | 153              | -104                 | 194              |
| QPSK  | -103                 | 160              | -102                 | 320              | -101                 | 403              |
| 8PSK  | -97                  | 240              | -94                  | 480              | -95                  | 605              |
| 16QAM | -91                  | 320              | -91                  | 640              | -91                  | 806              |
| 32QAM | -87                  | 400              | -87                  | 800              | -87                  | 1008             |

## DATA CAPABILITIES

|                            |   |
|----------------------------|---|
| Packet handling            | Layer 2 bridge<br>Layer 3 static routes<br>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.  
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## 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 |         |      |             |         |      |      |
| Power Consumption (12VDC average)      | 3W Output                                 |         |      | 5W** Output |         |      |      |
|  | Transmit                                  | Receive | Idle | Transmit    | Receive | Idle | Idle |
| <i>Single Radio Configuration (mA)</i> | 593                                       | 430     | 292  | 750         | 544     |      | 369  |
| <i>Dual Radio Configuration (mA)</i>   | 620                                       | 467     | 311  | 784         | 591     |      | 393  |
| IO Expander (mA)                       | 293 mA                                    |         |      |             |         |      |      |

## 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 +70C                                |  |  |  |  |  |  |
| Humidity              | 95% operating humidity @ 40C non-condensing |  |  |  |  |  |  |
| HAZLOC                | UL-Approved to Class 1 / Div 2              |  |  |  |  |  |  |

## REGULATORY

|        |             |  |  |  |  |  |  |
|--------|-------------|--|--|--|--|--|--|
| UL     | Approved    |  |  |  |  |  |  |
| FCC ID | Z8H89ft0026 |  |  |  |  |  |  |

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