

# 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.



cnReach N500 450 MHz ETSI RED Radio

- 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

PRODUCT	PRODUCT DESCRIPTION	ETSI MODEL NUMBERS
	N500 450 MHz Single - ETSI RED	NB-N500430A-EU
	N500 450 MHz Single with IO - ETSI RED	NB-N500431A-EU
	N500 450 MHz Dual - ETSI RED	NB-N500440A-EU
	N500 450 MHz Dual with IO - ETSI RED	NB-N500441A-EU

## DEPLOYMENT TOPOLOGIES

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

## 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)
Range	Up to 110 km / 70 miles

## RECEIVE SENSITIVITY

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

### 12.5 kHz CHANNEL - ETSI

### 25 kHz CHANNEL - ETSI

	Rx Sensitivity (dBm)	Capacity* (kbps)	Rx Sensitivity (dBm)	Capacity* (kbps)
BPSK	-110	9	-107	18
MSK	-105	10	-102	20
QPSK	-106	17	-102	34
8PSK	-101	26	-98	52
16QAM	-98	35	-95	70
32QAM	-95	44	-92	88

## 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.

## 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)	1W Output			8W Output		
	Transmit	Receive	Idle	Transmit	Receive	Idle
<i>Single Radio Configuration (mA)</i>	611	266	194	1145	430	345
<i>Dual Radio Configuration (mA)</i>	1200	380	215	2600	1108	387

## 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 1 / Div 2

## REGULATORY

UL	Approved
EMC/Safety	CE Mark Safety: EN60950-1: 2006 + A11:2009:2010+A12:2011+A2:2013 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