

cnReach™ N500 450 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.



cnReach N500 450 MHz Radio

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 (406-430 and 450-470 MHz) (cnReach is also in an ETSI RED Version)
- Up to 8W transmit (39 dBm) in FCC
- Point-to-point, Point-to-multipoint and Relay configurations in same hardware
- 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 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	FCC MODEL NUMBERS
	N500 450 MHz Single	NB-N500410A-US
	N500 450 MHz Single with IO	NB-N500411A-US
	N500 450 MHz Dual	NB-N500420A-US
	N500 450 MHz Dual with IO	NB-N500421A-US
	N500 IO Expander	NB-N500001A-US

DEPLOYMENT TOPOLOGIES

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

** At 8W output transmit duty cycles are reduced depending on operating conditions.

RADIO PERFORMANCE

Frequency Range	406-430 MHz and 450-470 MHz
Output Power	50 mW to 8W (10 dBm to 39 dBm) for FCC
Step Size	10 mW
Modulations	MSK / QPSK / 8PSK / 16QAM / 32QAM
Capacity*	9.6 kbps to 56.7 kbps RF data rate; up to 30 kbps UDP throughput in 12.5 kHz channels
Channel Bandwidths	12.5 kHz (25 / 50 / 100 kHz available regulations permitting)
Range	Up to 70 miles

RECEIVE SENSITIVITY* 12.5 KHZ CHANNEL - FCC

	Rx Sensitivity (dBm)	Capacity* (kbps)
MSK	-116	9.6
QPSK	-106	23
8PSK	-101	34
16QAM	-98	45
32QAM	-94	57

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.

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

** At 8W output transmit duty cycles are reduced depending on operating conditions.

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" (168mm x 88mm x 46.6mm)						
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	406-430 MHz: Z8H89ft0033			450-470 MHz: Z8H89ft0034			

** At 8W output transmit duty cycles are reduced depending on operating conditions.