

# cnReach™ N500 900 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. 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 900 MHz Radio

- Licensed and unlicensed 900 MHz (cnReach is also available in 700 MHz licensed)
- Secure communications with AES 128/256-bit encryption with password authentication
- Highly reliable communications with access point synchronization and adaptive modulation
- Single and dual radio configurations for advanced back-to-back relay and store-and-forward 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		
		U.S./Canada (FCC/IC)	Australia	Global
	N500 900 MHz Single	NB-N500910A-US	NB-N500910A-AU	NB-N500910A-GL
	N500 900 MHz Single with IO	NB-N500911A-US	NB-N500911A-AU	NB-N500911A-GL
	N500 900 MHz Dual	NB-N500920A-US	NB-N500920A-AU	NB-N500920A-GL
	N500 900 MHz Dual with IO	NB-N500921A-US	NB-N500921A-AU	NB-N500921A-GL
	N500 IO Expander	NB-N500001A-US	NB-N500001A-AU	NB-N500001A-GL

## DEPLOYMENT TOPOLOGIES

- Point to Point (PTP)
- Point to Multipoint (PMP)
- Repeater (REP) - Single or Dual Radio

Stand-alone IO Expander

\* 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.

RADIO PERFORMANCE	ISM MODE	MAS MODE
Frequency Range	902 - 928 MHz; (915-928 MHz in Australia)	928 - 960 MHz
Output Power	10 mW to 1 W (10 dBm to 30 dBm)	10 mW to 3 W (10 dBm to 34.8 dBm)
Step Size	50 mW	50 mW
Modulations	MSK / 2FSK / BPSK / QPSK / 8PSK / 16PSK / 16QAM / 32QAM	MSK / 4FSK / QPSK / 8PSK / 16QAM / 32QAM / 64QAM
Capacity*	57 kbps up to 4.4 Mbps	10 kbps up to 210 kbps
Channel Bandwidths	FHSS: 76 / 154 / 207 / 310 kHz DTS: 600 / 1200 kHz	12.5 / 25 / 50 kHz
Range	Up to 70 miles	Up to 70 miles

RECEIVE SENSITIVITY (MAS MODE)	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	-114	10	-115	19	-112	39
QPSK	-108	23	-110	36	-108	71
8PSK	-101	34	-105	52	-101	101
16QAM	-97	45	-100	70	-98	137
32QAM	-91	57	-96	87	-93	175
64QAM			-91	105	-84	210

RECEIVE SENSITIVITY (ISM MODE)	76 KHZ CHANNEL		154 KHZ CHANNEL		207 KHZ CHANNEL		310 KHZ CHANNEL	
	Receive Sensitivity (dBm)	Capacity* (kbps)	Receive Sensitivity (dBm)	Capacity* (kbps)	Receive Sensitivity (dBm)	Capacity* (kbps)	Receive Sensitivity (dBm)	Capacity* (kbps)
MSK	-111	57	-109	114	-108	153	-106	229

	600 KHZ CHANNEL		1200 KHZ CHANNEL	
	Rx Sensitivity (dBm)	Capacity (kbps)	Rx Sensitivity (dBm)	Capacity (kbps)
BPSK	-101	530	-99	884
QPSK	-98	1061	-97	1768
8PSK	-93	1591	-91	2651
16QAM	-90	2121	-88	3535
32QAM	-84	2651	-82	4419

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

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## MANAGEMENT

Web-based Interface via HTTP/HTTPS
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

## 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)	ISM (1W)			MAS (3W)		
	Transmit	Receive	Idle	Transmit	Receive	Idle
Single Radio Configuration (mA)	335	290	270	495	380	210
Dual Radio Configuration (mA)	385	300	292	580	421	293
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 +60C
Humidity	95% operating humidity @ 40C non-condensing
HAZLOC	UL-Approved to Class 1 / Div 2

## REGULATORY

UL	Approved
FCC ID	Z8H89FT0025
IC ID	109W-0025

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