

# MDS Mercury 900™

Smart Wireless IP/Ethernet Connectivity



Industrial performance at multi-megabit speed

- QoS
- OFDM
- Receive Diversity
- Long Range

## Features

- Multi-megabit Speed
- QoS
- OFDM Encoding Technology
- Adaptive split for optimal duty cycle calculation
- Long Range Coverage—up to 25 miles<sup>1</sup>
- Receive Diversity
- Multiple Layers of Cyber Security, including AES-128 Encryption and RADIUS Authentication
- Extended Temperature Range
- Class 1 Div 2 for Hazardous Locations<sup>2</sup>

## Applications

- Multi-functional mobile data access, to include text, high-res images, access to agency Intranet, streaming video, VoIP, and more
- High speed, low latency for SCADA and polling applications
- High speed, backhaul alternative
- Long range wireless Ethernet
- Gateway for serial/legacy networks and/or devices to IP networks

## GE MDS...Global wireless solutions. Industrial Wireless Performance.

For more than two decades, GE MDS has been providing highly secure, industrial strength mission critical wireless communications solutions for a broad spectrum of public and private sector clients worldwide. With an installed base approaching 1,000,000 radios in 110 countries, GE MDS offers both licensed and license-free solutions with applications in SCADA, telemetry, public safety, telecommunications, and online transaction markets.

### Introducing MDS Mercury 900™

The Mercury 900 is a multi-megabit, long-range, industrial wireless IP/Ethernet solution, with advanced cyber-security. Featuring QoS, the Mercury 900 is able to be optimized for your specific application, whether mobile data, video surveillance, VoIP, or SCADA polling. In addition Mercury 900 is based on OFDM which enables it to use multipath to its advantage to enhance radio coverage.

The multiple interfaces of Mercury 900 facilitate the communication of Ethernet and/or serial devices through an IP network. The radio operates in the license-free 902-928 MHz ISM band at distances of up to 25 miles<sup>1</sup> and with user throughput under optimal point-to-point conditions of over 8 Mbps.

The Mercury 900 provides the best combination of range and speed in the industrial market today.

### Why use an MDS Mercury 900™ Wireless Networking Solution?

**Multi-megabit longest range** product in the industrial class.

**Reliable communications** for your specific application by virtue of QoS and OFDM

**Secure wireless operation** – with multiple layers of protection, including AES-128 encryption, 802.1x and RADIUS authentication - current industry standards. This standard level of protection is supplemented by 900 MHz physical layer privacy.

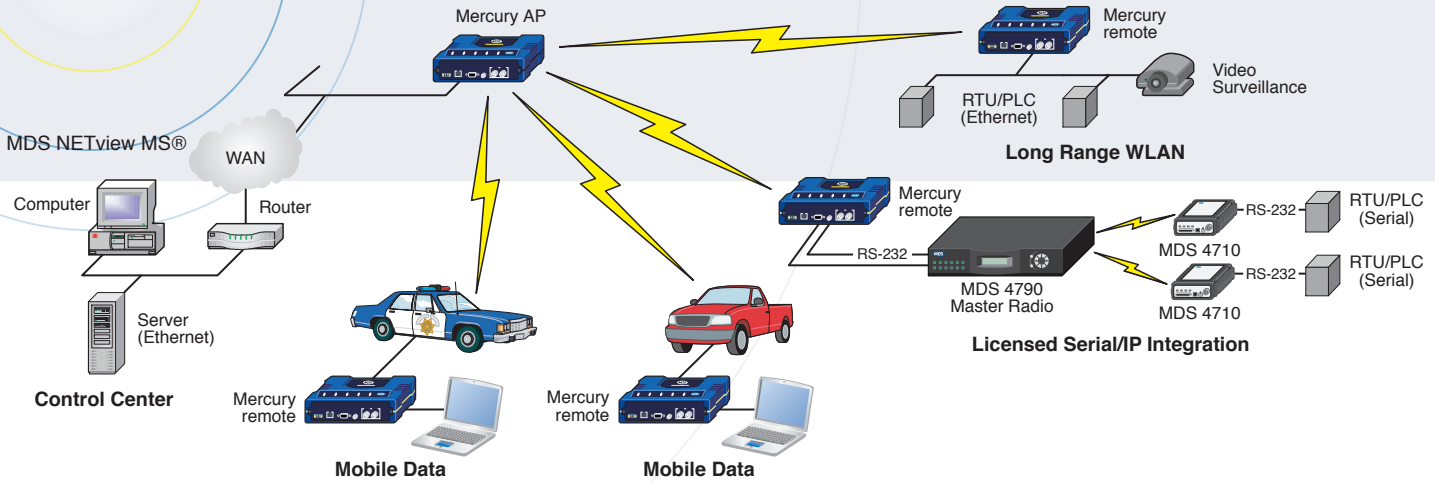
**Industrial reliability** – Designed and built for low failure rates and reduced maintenance costs thereby providing low total cost of ownership.

**Future proof** – Mercury 900 adheres to open standards and interfaces with a wide range of external devices, allowing both new and old technologies to communicate.

**Comprehensive Network Management** – Compatible with MDS NETview MS™ and any standard off-the-shelf SNMP management system.



# MDS Mercury 900™



## General

- Raw Bit Rate: from 600 kbps to 12.7 Mbps (see chart below)
- Frequency Band: 902-928 MHz ISM band
- Orthogonal Frequency Division Multiplexing (OFDM)
  - 200 Carriers per Channel
- Range (BPSK/1.75 MHz channel)<sup>1</sup>:
  - Typical Fixed Range: 12-15 miles
  - Maximum Fixed Range: 25-30 miles
  - Mobile Range (parked): 3-5 miles, strong RF signal environment
  - Mobile Range (moving): 2-4 miles, strong RF signal environment
- Available Configurations:
  - Access Point - Ethernet, Serial, GPS
  - Remote - Ethernet, Serial, GPS

## Radio

- System Gain: 140 dB for 1.75 MHz channel, 137 dB for 3.5 MHz channel
- Carrier Power: 0.1 to 1 watt
- Output Impedance: 50 Ohms
- Sensitivity and Data Rate<sup>2</sup>:

Modulation (CP=1/16)	3.5 MHz Channel			1.75 MHz Channel		
	Sensitivity	Signaling Rate	Max User Throughput Aggregate	Sensitivity	Signaling Rate	Max User Throughput Aggregate
64-QAM 3/4	-77 dBm	12.7 Mbps	7.2 Mbps	-80 dBm	6.35 Mbps	3.6 Mbps
16-QAM 3/4	-86 dBm	8.4 Mbps	4.8 Mbps	-89.5 dBm	4.2 Mbps	2.4 Mbps
QPSK 3/4 FEC	-92 dBm	4.2 Mbps	2.4 Mbps	-95 dBm	2.1 Mbps	1.2 Mbps
BPSK 1/2 FEC	-95 dBm	1.4 Mbps	500 Kbps	-98 dBm	706 Kbps	250 Kbps

(i) Mercury is a half-duplex radio, so max user throughput is based on configured or dynamic duty cycle, which is typically 50/50 indicating that half of the max throughput would be available one way.

(ii) The max throughput is also based on high protocol overhead from TCP/IP applications. For UDP applications, these throughput numbers will increase.

## Physical Interfaces

- Ethernet: 10/100BaseT, RJ-45
- Serial: 1,200 – 115,200 bps  
COM1: RS-232, DB-9F
- Antennas: TX/RX and RX (diversity mode) - TNC connectors  
GPS - Female SMA connector
- LEDs: PWR, LAN, COM1, GPS, LINK

## Protocols

- Ethernet: IEEE 802.3, Spanning Tree (Bridging), VLAN, IGMP
- TCP/IP: DHCP, ICMP, UDP, TCP, ARP, Multicast, SNMP, TFTP
- Serial: Encapsulation over IP (tunneling) for serial async multidrop protocols including Modbus, DNP.3, DF1, BSAP

## MDS Cyber Security Suite, Level 1

- Encryption: AES-128 with automatic key rotation.
- Authentication: 802.1x, RADIUS, EAP/TLS, PKI, PAP, CHAP
- Management: SSL, SSH, HTTPS

## Management

- HTTP, HTTPS, TELNET, SSH, local console
- SNMPv1/v2/v3, MIB-II, Enterprise MIB
- MDS NETview MST™ compatible

## Environmental

- Temperature: -40°C to +70°C (-40°F to +158°F)
- Humidity: 95% at 40°C (104°F) non-condensing

## Electrical

- Input Voltage range: 10-30 Vdc
- Current Consumption (nominal):

Mode	Power	13.8 Vdc	24 Vdc
AP Operational (50% TX)	16W	1.16A	667 mA
TX (Maximum)	30W	2.2A	1.25A
RM Operational & Associated TX (Maximum)	12W	870mA	500mA
	25W	1.8A	1.04A

## Mechanical

- Case: Die Cast Aluminum
- Dimensions: 5.715 H x 20 W x 12.382 D cm. (2.25 H x 7.875 W x 4.875 D in.)
- Weight: 1kg (2.2 lb.)
- Mounting options: Flat surface mount brackets, DIN rail, 19" rack tray

## Agency Approvals

- FCC Part 15.247
- CSA Class 1 Div. 21 (UL 508, UL 1604)
- IC pending

<sup>1</sup> Typical fixed range calculation assumes a 6 dBd gain Omni on a 100 ft tower at the AP, a 10 dBd gain Yagi on a 25 ft mast at the remote with output power decreased to yield maximum allowable EIRP (36 dBm), a 10 dB fade margin, and a mix of agricultural and commercial terrain with line of sight.

Typical mobile range calculation assumes a 6 dBd gain Omni on a 100 ft tower at the AP, a 5 dBd gain Omni with 1 watt output power at 6 ft height, a 10 dB fade margin, and 90% reliability with near line-of-sight in a mix of agricultural and commercial terrain. Maximum range achieved with a clear line-of-sight path, and fresnel zone clearance. Actual performance is dependent on many factors including antenna height, blocked paths and terrain.

<sup>2</sup> Please note that for best range and performance, mobile data is limited to using a 1.75 MHz channel and BPSK and QPSK modulation schemes.



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