MDS Mercury™ Series
Industrial WiMAX Networking
Mercury 900

LAN Extension | Mobile and Fixed Long Range
MDS Mercury is a highly secure, industrial-grade WiMAX platform for mission critical, industrial and public safety applications, including AMI, SCADA, Distributed Automation devices, video, Voice over Internet Protocol, mobile data, and Intranet applications. With aggregate Ethernet throughput up to 800 kbps for parked mobile applications, MDS Mercury has the capacity, service prioritization, and deployment flexibility to facilitate your immediate and long-term requirements.

Key Benefits
- WiMAX technology for high speed, long range point-to-multipoint communications
- Prevents unauthorized network access and secures data as it’s transmitted over the air
- Rugged solution for operation in extreme temperature ranges and hazardous locations
- Reduces required infrastructure and simplifies deployment and maintenance
- Supports existing PLCs and RTUs with comprehensive serial protocol support
- Optional second Ethernet port, built-in WiFi and USB ports for greater application flexibility

Application Specific Wireless Solution

Energy
- High capacity wireless network for AMI collectors, aggregation locations, RTUs, voltage regulators, reclosures, cap banks, and switches

Oil & Gas
- High capacity wireless network for SCADA and aggregation locations
- Monitor well-heads, video surveillance, and transmit Voice over IP (VoIP)

Water & Wastewater
- Monitor vital water flow
- Transmit real-time, fast scan rate video surveillance

Public Safety
- Mobile data access to dispatch system, agency Intranet for Amber Alerts, shift logs, and policies

WiMAX Technology
- Up to 800 kbps for parked mobile applications
- Time-Division Duplexing (TDD) synchronization for deterministic deployments
- Seamless, automatic adaptive modulation for optimized throughput

Industrially Hardened
- Operation in extreme temperatures from -30°C to +70°C
- Class I, Div 2 hazardous location approved
- IEEE-1613 compliant for operation in electric substation environments (standard remotes only)
- Rugged aluminum chassis tested to military shock and vibration standards

Application Flexibility
- Multi-megabit speed accommodates multiple services on one infrastructure
- Long range wireless communications, up to 4 miles (mobile)
- IP/Ethernet and serial communications operate simultaneously on the same network
- Handles multiple industry protocols including DNP3, Modbus, Modbus TCP, and Multicast/Unicast Ethernet
- Optional second Ethernet port, built-in WiFi and USB ports

Secure
- Built-in AES 128-bit encryption
- VLAN traffic data segregation
- Radius authentication and MAC address filtering for robust authentication
Multi-Use, Industrial Infrastructure

With high WiMAX throughput, an organization may deploy an MDS Mercury solution to provide communications to mission critical polling and monitoring devices with enough capacity remaining to provide additional services such as video surveillance, Voice over IP (VoIP), and mobile data. VLAN tagging facilitates segregating sensitive operational data from administrative and overhead communications.

Advanced roaming algorithms make Mercury 900 the choice for mobile applications. The Mercury remote switches access points based on several criteria, such as signal strength, distance, or a combination of signal strength, distance, and bearing.

All MDS Mercury radios provide extreme operational temperature ranges, -30°C to +70°C, are housed in a rugged, aluminum chassis, and are tested for shock and vibration according to military standards. These radios are built for mission critical industrial deployments.

More Deterministic Deployments

The MDS Mercury platform provides channel selection options to permit using the clearest channels in a given area, which facilitates optimized and more consistent throughput and latencies. Single channels may be selected, or for multiple channels may be selected in the frequency hopping pattern.

Additionally, Time-Division Duplexing synchronizes access points (APs) to facilitate co-location of APs and overlap of coverage without introducing self-inflicted interference.

Networking Flexibility

Serial protocol support, both active and transparent, provides communications to legacy and proprietary solutions as easily as Ethernet communications. Whether using active Modbus TCP or transparently passing through the TCP server, TCP client, Modbus TCP, Modbus RTU, or others the MDS Mercury platform seamlessly provides a wide array of protocol support.

Secure Communications

Sensitive communications must be protected from over-the-air capture and deciphering, and networks must be protected from unauthorized access. The MDS Mercury platform provides AES 128-bit encryption to protect data as it travels the air waves. Secure network authentication is provided by Radius authentication and MAC address filtering. Finally, sensitive data may be segregated using VLAN tagging.

Mercury Application Advantages

1. Metering from over 200 homes
2. Access Point
3. Data Control Center

Multi-Use, Secure Infrastructure

- High throughput to support multiple applications, including high speed mobile data, video surveillance, collection point data aggregation, and VoIP
- Transmission security, network authentication security, and segregation of sensitive data

Flexible and More Deterministic

- Full Ethernet and serial protocol support—in the same chassis
- Ability to block “noisy” channels

* Communication between the Access Point and the Data Control Center is achieved via a Backhaul device, such as the MDS Intrepid series.
Mercury 900

High speed, secure mobility
Mercury 900 is a premier mobile data solution for public safety and field force automation deployments where security, channel availability, and high throughput are required. While Mercury 900 may be deployed as fixed infrastructure, its feature set is optimized for mobility and includes advanced roaming capabilities and seamless adaptation to specific access point configuration settings.

Network Management Ready
Once the MDS Mercury radio network is operational, the user is able to utilize the MDS PulseNET comprehensive network management system for end-to-end management. MDS PulseNET provides pre-built workflows along with intuitive graphical representations of the communications network. It provides real-time availability, performance, and configuration management of the MDS Mercury radios, allowing operations personnel to create customizable, proactive support processes.

Officers or field workers benefit from up to 800 kbps aggregate Ethernet throughput while parked. This throughput is required for today’s feature-rich dispatch applications and accessing agency Intranet and e-mail systems.

Accessories & Custom Enclosures
GE MDS provides a complete line of reliable industrial-strength and cost-effective accessories that are tested to perform at optimal levels. GE MDS offers both standard and custom packages for wireless applications in harsh industrial environments. We simplify your wireless systems design by providing a convenient single-source ordering process. From antennas to field-rated power supplies for your mission-critical application, GE MDS can help ensure your system is robust and future-proof.
Specifications

General
- Technology: 802.16d-2004, WiMAX
- Modulation: OFDM with FEC and configurable ARQ
- Frame Duration: 5 ms, 8 ms, 10 ms, 20 ms
- Duplex Method: TDD with GPS synchronization, fixed or dynamic duty cycle
- Output Impedance: 50 Ohms
- Available Configurations: Access Point, Remote

MERCURY 900
- Frequency: 902-928 MHz
- Channel Size: 1.75, 3.5 MHz
- Carrier Power: 100 mW – 1 W
- Range: Up to 4 miles (mobile)

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

Optional Feature Set (Remotes Only)
- Built-in 2.4 GHz 802.11 b/g WiFi
- Second 10/100BaseT, RJ-45 Ethernet port with integrated switch
- USB 2.0 management port.

Radio Sensitivity in dBM

<table>
<thead>
<tr>
<th>Channel BW</th>
<th>1.75 MHz</th>
<th>3.5 MHz</th>
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<tbody>
<tr>
<td>BPSK FEC 1/2</td>
<td>-98</td>
<td>-95</td>
</tr>
<tr>
<td>QPSK FEC 1/2</td>
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<td>-92</td>
</tr>
<tr>
<td>QPSK FEC 3/4</td>
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<tr>
<td>16-QAM FEC 1/2</td>
<td>-89</td>
<td>-86</td>
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<tr>
<td>16-QAM FEC 3/4</td>
<td>-86</td>
<td>-83</td>
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<tr>
<td>64-QAM FEC 2/3</td>
<td>-83</td>
<td>-80</td>
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</table>

Signal Rate (SR) & Aggregate Ethernet Throughput (AET) in Mbps

<table>
<thead>
<tr>
<th>Channel BW</th>
<th>SR</th>
<th>AET</th>
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<tbody>
<tr>
<td>1.75 MHz</td>
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<tr>
<td>BPSK FEC 1/2</td>
<td>0.71</td>
<td>0.30</td>
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<td>QPSK FEC 1/2</td>
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<td>0.96</td>
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<td>QPSK FEC 3/4</td>
<td>2.12</td>
<td>1.51</td>
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<td>16-QAM FEC 1/2</td>
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<td>2.01</td>
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<td>16-QAM FEC 3/4</td>
<td>4.24</td>
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<td>64-QAM FEC 2/3</td>
<td>5.60</td>
<td>3.84</td>
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<tr>
<td>64-QAM FEC 2/3</td>
<td>11.18</td>
</tr>
</tbody>
</table>

Management
- HTTP, HTTPS, TELNET, SSH, SSL, local console
- SNMPv1/v2/v3, MIB-II, Enterprise MIB
- MDS Netview MS™ compatible

Environmental
- Temperature: -30°C to 70°C (-22°F to 158°F)
- Humidity: 95% at 60°C (104°F) non-condensing

Protocols
- Ethernet: IEEE 802.3, Spanning Tree (Bridging), VLAN, IGMP
- TCP/IP: DHCP, ICMP, UDP, TCP, ARP, Multicast, SNTP, TFTP
- Serial: Active Modbus TCP and transparent TCP server, TCP client, Modbus TCP, Modbus RTU, UDP Unicast, UDP Multicast, BSAP and DNP3

Security Suite, Level 1
- Encryption: AES-128 w. auto key rotation
- Authentication: 802.1x, RADIUS, EAP/TLS, PKI, PAP, CHAP
- Management: SSL, SSH, HTTPS

Electrical
- Operating Voltage: 10-30 Vdc
- Current Consumption (nominal): 13.8 Vdc

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

Agency Approvals
- FCC Part 15.247
- CSA Class 2 Div. 2 (UL 508, UL 1604) IC

Ordering
- Mercury 900
  - Frequency range: A090, R090
  - Channel size: 0, 1, 2
  - Interface package: 00, 01
  - Security suite: 1
  - Serial support: 1
  - RF Essentials Kit

Order Code Example
- HG-R090-0F-0011-1-2-3
  - 902-928 MHz ISM FCC remote radio
  - Software configurable channel size
  - Two Ethernet, WiFi, one serial, USB
  - AES 128-bit encryption
  - VLAN
  - Radius authentication
  - Full serial support
  - RM kit with panel and WiFi antenna

Accessories for the Mercury
- Fixed Remote Kit with Panel: KFR-M09-F1
- Fixed Remote Kit with extended interfaces, includes with Panel and WiFi Antenna: KFR-M09-F2

Visit www.GEDigitalEnergy.com/Mercury to:
- Buy Mercury through the online store
- Download guideform specifications
- Download user documentation
- Read application notes and white papers

View Accessories catalog at www.gemds.com