GE
Digital Energy
MDS

MDS Mercury™

Industrial WiMAX*

SECURE, INDUSTRIAL-GRADE WIMAX COMMUNICATIONS

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, VoIP, mobile data, and Intranet applications. With aggregate Ethernet throughput up to 9 Mbps (or 800 kbps for nomadic mobile deployments), quality of service (QoS), service flows, and a choice of frequencies, MDS Mercury has the capacity, service prioritization, and deployment flexibility to facilitate your immediate and long-term requirements.

No other solution provides the combination of ruggedness and high level security in a one-box solution. Radius authentication and MAC address filtering with AES 128-bit encryption facilitates outstanding transmission and network access security. VLAN tagging supports segregating sensitive, operational data from administrative data. The MDS Mercury is certified to operate in extreme temperature ranges, from -40C to +70C. The rugged, durable aluminum chassis is tested to military standards for shock and vibration. Class 1/Div 2 certification and IEEE 1613-compliance facilitate deployments in hazardous and electric power substation environments. The one-box solution simplifies deployments, limits infrastructure, and reduces maintenance.

MDS Mercury 3650

Operating at 3.65 GHz, the Mercury 3650 offers a wireless solution for industrial U.S. private infrastructure used in mission-critical SCADA, data aggregation, video, AMR/AMI and VoIP applications. An MDS Mercury 3650 deployment may be optimized for throughput (up to 9 Mbps aggregate) or for range (up to 14 miles).

- FCC Approval, 3.65 – 3.70 GHz (Part 90)
- 50 MHz of spectrum offers both higher capacity and better channel planning options

MDS Mercury 900

The advanced roaming capabilities of the Mercury 900 provide an optimized platform for mobile data applications at 900 MHz. Offering typical ranges of 1-3 miles for mobile applications, and up to 15 miles for fixed deployments, the Mercury 900 implements sophisticated interference mitigation using advanced frequency hopping and channel selection technologies.

- FCC Approval, 902-928 MHz ISM (Part 15)
- User aggregate throughput up to 800 kbps while parked with a 1.75 MHz channel. Higher throughput—up to 5 Mbps—is available for fixed deployments.

MDS

* WiMax Certification Pending

LAN EXTENSION

FEATURES / BENEFITS

- High capacity - aggregate Ethernet throughput up to 9 Mbps (800 kbps for mobile deployments while parked)
- Optimized range and throughput—WiMAX technology, including OFDM for NLOS; adaptive split for optimal duty cycle calculation
- Quality of Service (QoS) and service flows for dedicated and prioritized data transmission
- Rugged - Class 1 Div II for installation in hazardous locations; extremely wide temperature specs: -40C to +70C; certified for noise immunity/operation in electric substation environments.
- Multiple layers of cyber security, including AES 128-bit encryption, RADIUS authentication, and VLAN tagging
- Support of PLCs/RTUs with integrated serial support
- One-box solution reduces investment, operation, and sparing costs
- Optional built-in 802.11 b/g WiFi

Applications

- High capacity, multi-use infrastructure support for fixed SCADA polling, data aggregation, AMI, distributed automation devices, mobile data, and video
- Multi-functional mobile data access, including text, high-res images, access to agency Intranet, streaming video, VoIP, and more
- High-speed backhaul alternative
- Long range wireless Ethernet
- Gateway for serial legacy devices and IP networks

MDS Mercury™ SPECIFICATIONS

General

	Mercury 900	Mercury 3650
Technology	802.16d-2004, WiMAX	
Modulation	OFDM with FEC and configurable ARQ	
Frequency	902-928 MHz	3.65 – 3.70 GHz*
Channel Size	1.75, 3.5 MHz	1.75, 3.5, 5, 7 MHz
Frame Duration	5 ms, 8 ms, 10 ms, 20 ms	
Duplex Method	TDD with GPS synchronization, fixed or dynamic duty cycle	
Carrier Power	100 mW – 1 W	100 mW – 200 mW
Output Impedance	50 Ohms	
Available Configurations	Single box Access Point, single box Remote	
Range	Up to 5 miles mobile, 1 – 3 typical	Up to 14 miles, 8 – 10 typical

* Full 50 MHz access pending "listen-before-talk" protocol implementation Q1 '09.

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
- LEDs: PWR, LAN, COM1, GPS, LINK
- Optional feature set:
  - Built-in 2.4GHz 802.11 b/g WiFi
  - Second 10/100BaseT, RJ-45 Ethernet port with integrated switch
  - USB 2.0 management port.

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

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, SSL, local console
- SNMPv1/v2/v3, MIB-II, Enterprise MIB
- MDS NETview MS™ compatible

Environmental

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

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 (Mercury 900)
- FCC Part 90 (Mercury 3650)
- CSA Class 1 Div. 2 (UL 508, UL 1604)
- IC pending

Electrical

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

	Mode	Power	13.8 Vdc	24 Vdc
AP	Operational (50% TX)	12W	.87A	.5A
RM	Operational & Associated	8W	.58A	.33A

Radio Sensitivity in dBm

Mercury 3650				
Channel BW	1.75 MHz	3.5 MHz	5 MHz	7 MHz
BPSK	-102.0	-99.0	-97.4	
QPSK FEC 1/2	-98.7	-95.7	-94.1	
QPSK FEC 3/4	-95.7	-92.7	-91.1	
16QAM FEC 1/2	-92.9	-89.9	-88.3	
16QAM FEC 3/4	-89.9	-86.9	-85.3	
64QAM FEC 2/3	-86.1	-83.1	-81.5	
64QAM FEC 3/4	-84.5	-81.5	-79.9	
Mercury 900				
BPSK FEC 1/2	-98.0	-95.0	N/A	N/A
QPSK FEC 1/2			N/A	N/A
QPSK FEC 3/4	-95.0	-92.0	N/A	N/A
16QAM FEC 1/2			N/A	N/A
16-QAM FEC 3/4	-89.5	-86.0	N/A	N/A
64-QAM FEC 2/3			N/A	N/A

* For mobile data deployments, user throughput up to 600 – 800 kbps while parked

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

Mercury 3650								
Channel BW	1.75 MHz		3.5 MHz		5 MHz		7 MHz	
	SR	AET	SR	AET	SR	AET	SR	AET
BPSK	0.46	0.30	0.99	0.97	1.43	1.30	2.83	1.78
QPSK FEC 1/2	0.96	0.95	2.00	2.09	2.90	2.76	5.85	3.58
QPSK FEC 3/4	1.46	1.51	3.03	3.19	4.37	4.10	8.47	6.01
16QAM FEC 1/2	1.95	2.01	4.05	3.61	5.84	5.72	11.29	7.52
16QAM FEC 3/4	2.94	2.99	6.10	5.52	8.78	7.46	16.94	8.11
64QAM FEC 2/3	3.90	3.84	8.06	6.36	11.60	8.67	22.36	8.86
Mercury 900*								
BPSK FEC 1/2	0.71	0.30	1.41	0.96	N/A	N/A	N/A	N/A
QPSK FEC 1/2	1.41	0.96	2.82	2.09	N/A	N/A	N/A	N/A
QPSK FEC 3/4	2.12	1.51	4.24	3.20	N/A	N/A	N/A	N/A
16QAM FEC 1/2	2.82	2.01	5.85	3.60	N/A	N/A	N/A	N/A
16-QAM FEC 3/4	4.24	2.99	8.47	5.52	N/A	N/A	N/A	N/A
64-QAM FEC 2/3	5.60	3.84	11.18	6.36	N/A	N/A	N/A	N/A

MDS

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