GE
Digital Energy

MDS™ Intrepid HC MX

6-38 GHz Licensed High Capacity Wireless Data Backhaul

TDM to IP Migration

Secure and fast long-distance transmission is a basic requirement of private data communication network operators. Today, the challenge includes overcoming the potential backhaul bottleneck of an ever-increasing number of IP devices and applications that can require a channel size whose ability to efficiently carry data can exceed the network's capacity. The MDS Intrepid HC MX provides the solution with high-speed and high-capacity point-to-point microwave backhaul capability based on the latest radio technology. The MDS Intrepid HC MX supports effective migration from TDM to IP with combinations of native TDM and native IP.

The MDS Intrepid HC MX operates in the licensed 6 to 38 GHz frequency bands and offers throughput capacity between 8 and 350 Mbps. It provides a flexible combination of IP and TDM interfaces and supports STM-1 interfaces. The MDS Intrepid HC MX can be deployed as non-protected (1+0), protected standby (1+1), space diversity, and frequency diversity. The rich feature set and interface support of native TDM and native Ethernet provide maximum throughput with minimal latency.

Key Benefits

- Operates in the secure FCC/ETSI licensed bands between 6 and 38 GHz
- Provides scalable throughput options from 8 to 350 Mbps
- Native Ethernet and TDM implementation provide separation of service and low latency
- Multiple configurations maximize equipment and RF redundancy and minimize cost
- Low latency facilitates T1/E1 and Ethernet ring-base deployments for efficient data pass-through

Wireless Applications
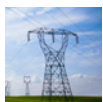
Energy
- Substation SCADA, LAN/WAN and cellular/carrier
- Fiber extensions, voice/PBX, video surveillance

Oil & Gas
- Pump on/pump off SCADA control, WAN networks for remote offices
- Disaster recovery, video surveillance, voice/PBX

Heavy Industrial and Transportation
- Two-way radio repeater control, mobile command vehicles
- T1/E1 leased line replacement, disaster recovery, video surveillance

Water & Wastewater
- Water monitoring SCADA and LAN/WAN
- Fiber extensions, video surveillance, building connectivity

imagination at work

Application Flexibility

- Native TDM and native Ethernet traffic allows smooth TDM to IP migration
- Payload reallocation options among interface types to accommodate changing traffic patterns
- Single, cost-effective solution for voice and data (E1/T1 and Ethernet) reduces equipment expenditures
- Gigabit Ethernet, multiple E1/T1 circuits, SONET/STM-1 provide the most common interfaces
- Software selectable options eliminate future hardware upgrades
- Multiple configuration options to support all applications: split-mount or all-indoor, (1+0), (1+1), space diversity (SD) and frequency diversity (FD)
- MPLS and LTE compatible for future needs

Reliable and Secure Design

- Optional diversity protection with errorless switching ensures continuous communication
- Complete hot-standby protection and 100% redundancy of all active components results in zero system downtime
- AES 128/256 encryption for high security
- Definable authorization lists to prevent unauthorized access

Ease of Use and Upgrade

- Removable license card retains terminal configuration during changeovers
- Specific license-key upgrades allow for additional capacity, adaptive code modulation (ACM), and managed switch authorization, as required
- Advanced network management capability via PulseNET™ and SNMP*
- Built-in chart recorder for real-time diagnostics and link performance monitoring

PulseNET support pending

MDS Intrepid HC MX

The convergence of voice, data, and video networks has changed the wireless telecommunications landscape. Products need to deliver substantial cost savings and scalable architecture. GE is ready to extend your core infrastructure investments, reduce your costs and simplify your operations with our point-to-point microwave products.

The MDS Intrepid HC MX is capable of carrying native legacy TDM and Ethernet services in a single hybrid backhaul radio platform. Designed for data capacities of up to 350 Mbps, the MDS Intrepid HC MX offers Ethernet and TDM in a single, extremely flexible radio, allowing for easy migration, from legacy networks to Gigabit Ethernet.

Securely Supports Increased Throughput

The combination of integrated add/drop mux, DS1/E1 loop protection, and comprehensive data grooming, along with the use of ACM, increases throughput while protecting critical traffic. Whether you are keeping pace with growing traffic demands or regularly reconfiguring radio-link payloads for new services, the MDS Intrepid HC MX is specifically designed to adapt to your needs at the lowest cost of ownership.

Full Redundancy for Critical Applications

The MDS Intrepid HC MX is designed for applications requiring extreme reliability and features 100% redundancy of all traffic and overhead channels with automatic switchover. This comprehensive feature-set makes the MDS Intrepid HC MX suitable for public safety and utility networks where critical traffic must be maintained, as well as for railroad, and enterprise LAN and WAN applications.

Software-Configurable Options

The MDS Intrepid HC MX allows you to grow your network economically as your throughput requirements expand. Indoor modules are upgradable from 8 to 350 Mbps using a single carrier. Software-selected bandwidth, modulation, capacity, channel frequency, and output power increase capacity through software license upgrades, without hardware changes. Payloads can be reallocated among interface types as needed, to accommodate changing traffic patterns. ACM can be configured to maintain critical traffic during adverse path conditions, while operating at a high throughput under normal conditions.

For advanced network support, the MDS Intrepid HC MX supports VLAN using IEEE 802.1p and 802.1Q for traffic class priorities (QoS), port-based and tag-based labels.

Future Migration to 4G/LTE

With the MDS Intrepid HC MX, migrating from existing TDM to new IP-based networks and services, including 4G/LTE, is simple, convenient, and economical thanks to the combination of native TDM and native IP on a single radio platform.

Network Management Ready*

Once a network is operational, users are able to take advantage of the MDS PulseNET comprehensive network management system for end-to-end network control. MDS PulseNET provides pre-built workflows and intuitive graphical representations of the communications network. Real-time availability, performance, and configuration management of all MDS radio products and select third-party devices are available through PulseNET, allowing operations personnel to create customizable, pro-active support processes.

*PulseNET support pending

MDS Intrepid HC MX Application Advantages
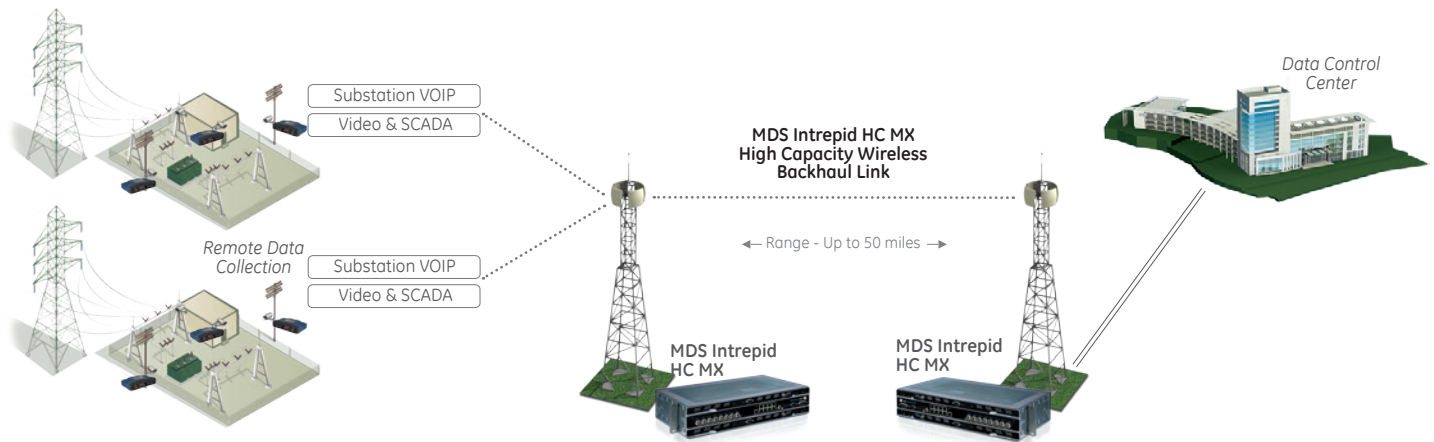
Reliable Communications

- Hitless and errorless ACM with modulations from QPSK to 256 QAM
- Adaptive power and exceptionally high system gain
- Full hardware/interface redundancy and network level resiliency

Flexible Deployment

- Various channel size options facilitate the best combination of range and speed
- Integrated carrier Ethernet switching and TDM cross-connect
- Future capacity growth and additional functionality are enabled with license keys while using the same hardware

Prioritized & Secure

- Quality of Service (QoS) ensures critical communications receive highest priority
- AES 128/256 encryption for high security

Application Example:

Oil and Gas

In this oil and gas application, the MDS Intrepid HC MX is used as a secure private network to backhaul data collected from a WiFi-enabled remote site data collection system.
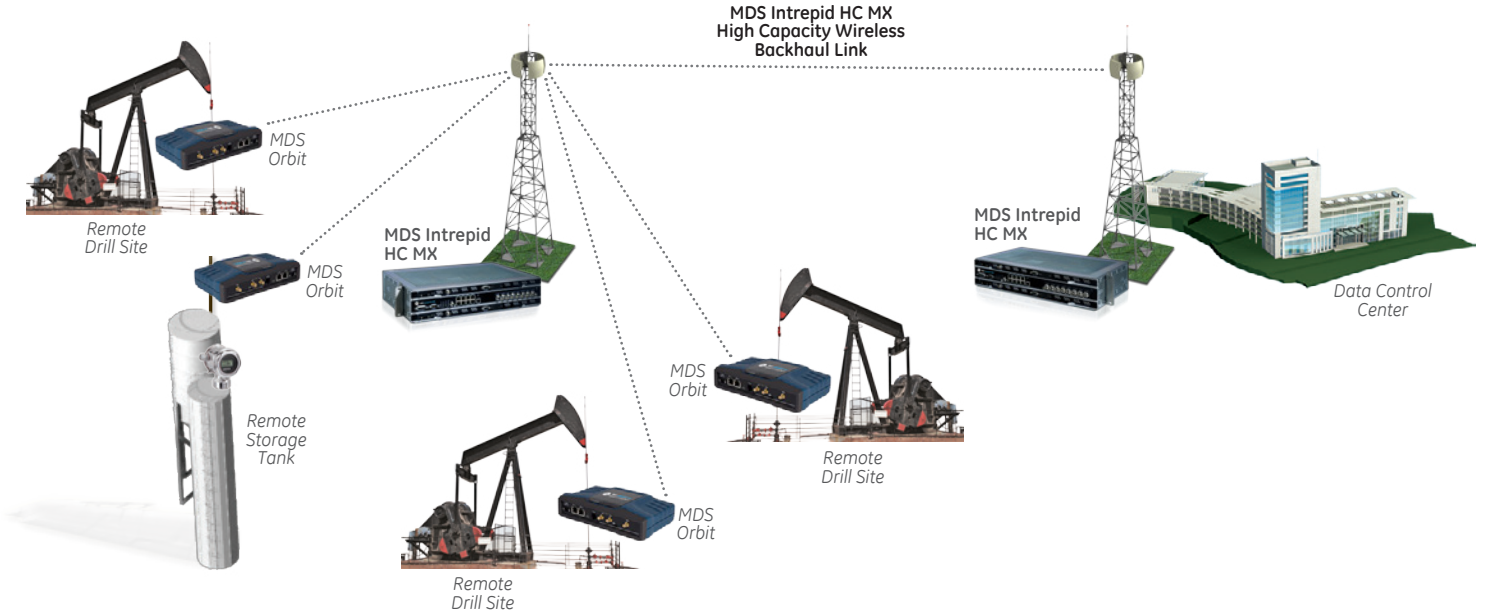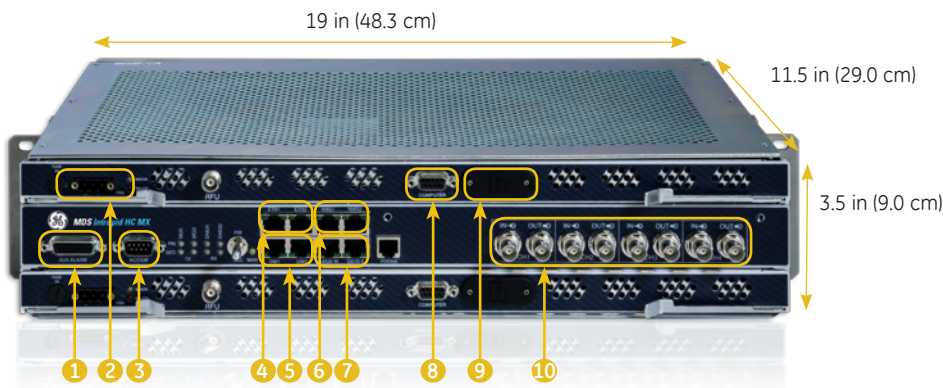

Application Example:

Mining and Transportation

The MDS Intrepid HC MX serves as a long-distance, high-capacity wireless system to backhaul data, as shown in this mining and transportation application.
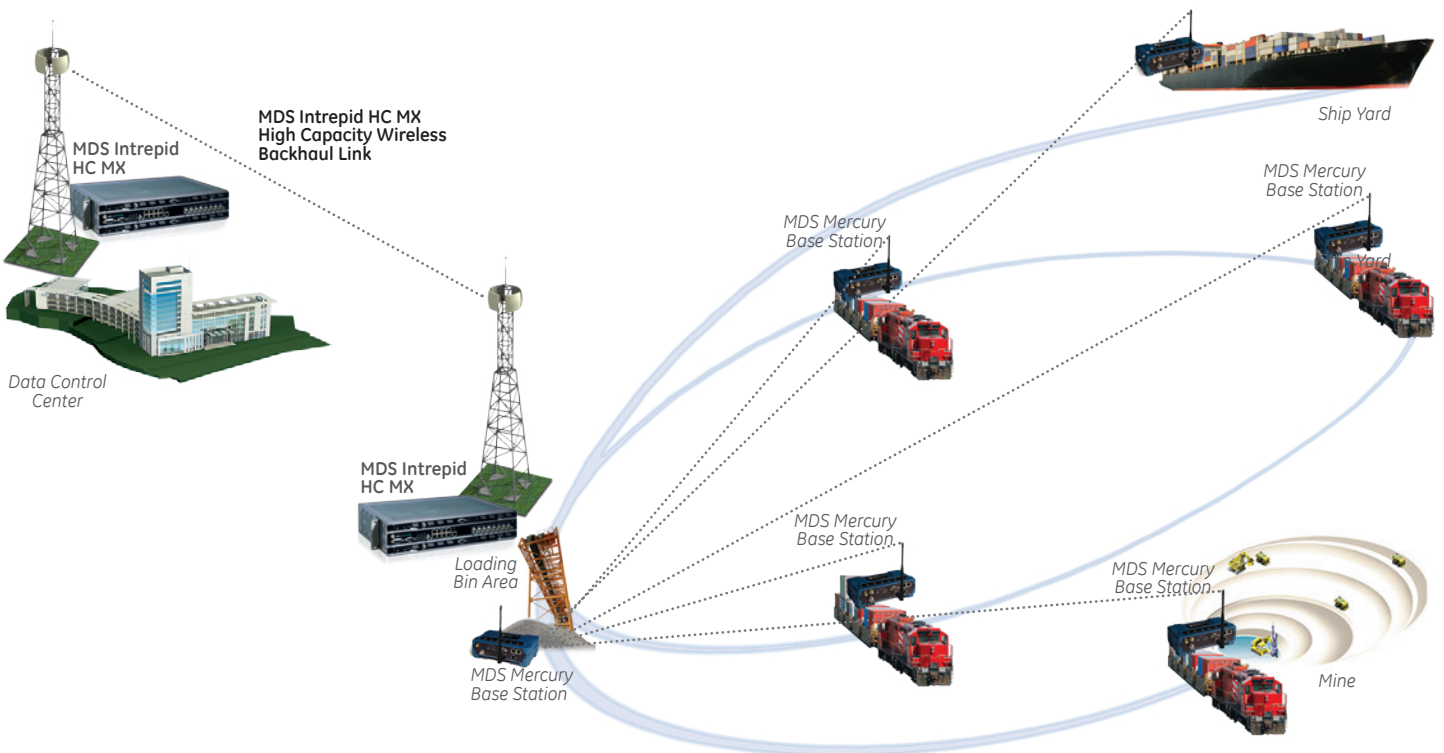
Product Details
Indoor Unit - IDU

19 in (48.3 cm)

11.5 in (29.0 cm)

3.5 in (9.0 cm)

Connector Name/Type

1. Auxillary alarm: high density DB-26 (female) mate supplied with radio..
2. DC power 3-pin socket. Plug provided with radio terminal.
3. Modem, DB-9 (male)
4. ETH1/ETH2, RJ-45
5. EOW1/EOW2, RJ-45
6. NMS1/NMS2, RJ-45
7. µBUS W/µBUS E, RJ-45
8. Computer, DB-9 (female)
9. SIM (System Identification Memory), SD flash
10. DS3 data interface (BNC)
11. DS1 data interface (two 64-pin CHAMP connectors) on rear of IDU (not pictured).

Specifications

OPERATING FREQUENCIES	T/R SPACING (MHZ)
5.925 - 7.125 GHz	All ETSI, FCC, and ITU spacings
7.125 - 7.900 GHz	154, 160, 161, 196
7.900 - 8.500 GHz	119, 126, 208, 266, 311.32
10.70 - 11.70 GHz	490, 530
12.75 - 13.25 GHz	266
14.40 - 15.35 GHz	315, 420, 475, 490, 640, 644, 728
17.70 - 19.70 GHz	1008, 1010, 1560
21.20 - 23.60 GHz	1008, 1200, 1232
24.20 - 26.50 GHz	800, 1008
37.00 - 40.00 GHz	700, 1260
Frequency Stability	+/- 10 ppm (.001 %)
RX Overload	-20 dBm for < 10^{-6} BER
Residual BER	Better than 10^{-12}
Output Power Control	Manual or Automatic, -4 dBm to Maximum
Power Consumption (Maximum)	Split-Mount: 80 W Non-Protected, 166 W Protected
	All-Indoor: 180 W Non-Protected, 360 W Protected
Signal Interface	155 Mbps optical and electrical
	E3/DS3
	E1/DS1
	10/100/1000 BaseT Ethernet optical and electrical
Modulation	QPSK, 8PSK, and 16, 32, 64, 128, 256 QAM
Transmission Rate	191 Mbps max. in 30 MHz channel
	250 Mbps max. In 40 MHz channel
	340 Mbps max. in 56 MHz channel
Channel Bandwidth	2.5, 3.5, 3.75, 5, 7, 10, 14, 20, 28, 30, 40, 50, 56 MHz

MANAGEMENT	
Protocol	SNMPv3 (Supports SNMP v1 and v2)
Element Manager (EM)	Java-Based Management Software; Access Radio Through Any Local/Remote Management
NMS Interface	2 × RJ-45; 10/100 BaseT; for Access and Bridging
Command Line Interface	RS-232 Serial DB-9; for Local VT-100 Type Interface or TELNET Access
Modem (PPP)	RS-232 Serial DB9; for Dial-Up Access
Management IP Routing	RIP2 and OSPF Dynamic Routing or Static Route Maps
NMS Compatibility	PulseNET, OpenView™, NetView™, SNMPc™

OPERATING FREQUENCIES	SPLIT-MOUNT RF	ALL-INDOOR RF
Frequencies	6, 7, 8, 11, 13, 15, 18, 23, 26 and 38 GHz	6, 7, 8, and 11 GHz
Configuration	Split-Mount; IDU Inside / ODU Outside	All Indoor Rack Mounted
Dimensions	26 cm Diameter; 15 cm Deep	17.78 cm x 48.26 cm x 29.21 cm (4RU)
Weight	4.9 kg	21.36 kg
Temperature		
Full Performance	-33° C to +55° C	-5° C to +50° C
Operational	-55° C to +55° C	
Humidity	Up to 100%	95% (no condensation)
Altitude	4,500 m	4,500 m
IDU to ODU Interface	TNC Female (IDU); N-Type Female (ODU)	
Recommended Cable	Times LMR-400 or RG-8A/U Equivalent; 50 ohms	
Maximum IDU to ODU Distance	275 m using LMR-400	
Intermediate Frequencies	IDU to ODU - 350 MHz; ODU to IDU - 140 MHz	
Antenna Diameters (cm)	30, 45, 60, 90, 120, 180	Remote Mount with Elliptical Waveguide
Antenna Connection Options	Integrated Push-Fit or Remote Mounting	CMR-137F (6GHz); UG-51/U (7/8GHz); UG-39/U (11GHz)

STANDARDS COMPLIANCE	
Safety	EN 60950
EMI/EMC	EN 301 489; EN 300 385
RF	EN 302 217-2
Power Supply	EN 300 132-2
Storage	ETS 300 019-1-1 (Class 1.1E)
Transport	ETS 300 019-1-2 (Class 2.1E)
Environmental - SPU	ETS 300 019-1-3 (Class 3.1E)

To order the MDS Intrepid HC MX, please contact your MDS Account Manager.

Refer to the MDS Intrepid HC MX Operations Manual (05-6703A01) for a full listing of product specifications.

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