GE
Digital Energy

MDS™ Intrepid HC OIP

6 to 38 GHz Licensed High Capacity Wireless Data Backhaul

Ethernet Bridge Radio For IP Services

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 OIP fully supports next generation IP-only backhaul networks.

The MDS Intrepid HC OIP operates in the licensed 6 to 38 GHz frequency bands and offers throughput capacity of up to 350 Mbps. As an all-outdoor radio terminal, the MDS Intrepid HC OIP eliminates the need for rack space within shelters, cabinets, and enclosures. The radio mates directly to the back of its associated antenna, minimizing visual impact. Power to the radio is provided by an outdoor PoE unit and uses the same Cat5e Ethernet cable that provides data to the radio.

Key Benefits

- Software-configurable capacity licenses allow system capacity upgrade without the need for hardware upgrade
- Supports SyncE and IEEE 1588 v2 synchronization to allow for critical time synchronization of equipment across the system
- Jumbo packets of up to 9600 bytes offer the highest performance in GigE environments
- Q-in-Q, VLAN, QoS with 8 queues support the latest in VLAN requirements
- 50 ms switching for ring protection (ITU-T G.8032) minimizes data interruption and delay

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
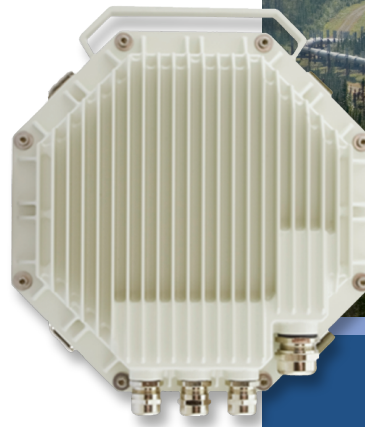- Disaster recovery, video surveillance, voice/PBX

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

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

Application Flexibility

- All-outdoor solution for Ethernet voice and data reduces equipment and installation expenditures
- Software selectable options eliminate future hardware upgrades
- Gigabit Ethernet capability via fiber optic and RJ45 connection for field flexibility
- Designed to optimize throughput while minimizing latencies for faster data transmission
- Multiple configuration options to support all applications: non-protected (1+0), ring protected, and (1+1) hot-standby protected
- PoE power injection offers simple and low-cost installation

Reliable and Secure Design

- Optional diversity protection with errorless switching ensures continuous communication
- Rugged construction for extreme environments
- Definable authorization lists to prevent unauthorized access
- Password protected access and lockdown

Ease of Use and Upgrade

- Advanced network management capability via PulseNET™ and SNMP*
- Out-of-the-box setup and connectivity for ease of installation and quickest deployment possible

imagination at work

PulseNET support pending

MDS Intrepid HC OIP

The convergence of voice, data, and video networks has changed the wireless telecommunications landscape. Network operators must protect existing infrastructure investments while quickly moving to provide more capacity and new IP-based services. 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 OIP is capable of Ethernet/IP-only services in an all-outdoor backhaul radio platform. Designed for capacities of up to 350 Mbps, the MDS Intrepid HC OIP offers Ethernet communication configured in a PoE supported radio. The MDS Intrepid HC OIP provides easy and rapid deployment of 10/100/1000 Base-T and optical Gigabit Ethernet.

Securely Supports Increased Throughput

The use of adaptive code modulation (ACM), and IP traffic class priorities (QoS) provides for maximum throughput during path fading events 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 OIP is specifically designed to adapt to your needs at the lowest cost of ownership.

Full Redundancy for Critical Applications

The MDS Intrepid HC OIP is designed for applications requiring extreme reliability and offers ring, or (1+1) hot-standby protection options. This comprehensive feature-set makes the MDS Intrepid HC OIP 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 OIP allows you to grow your network economically as your throughput requirements expand. With software-upgradeable license keys, the firmware on the MDS Intrepid HC OIP can be updated remotely.

For advanced network support, the MDS Intrepid HC OIP supports VLAN using IEEE 802.1p and 802.1Q for traffic class priorities (QoS), port-based and tag-based labels, with 8 available queues.

Future Migration to 4G/LTE

The MDS Intrepid HC OIP supports new IP-based networks and services including 4G/LTE. The MDS Intrepid HC OIP's traffic management features, combined with software-based configuration and upgrades, give network providers the required control over their IP networks to maximize their return on investment.
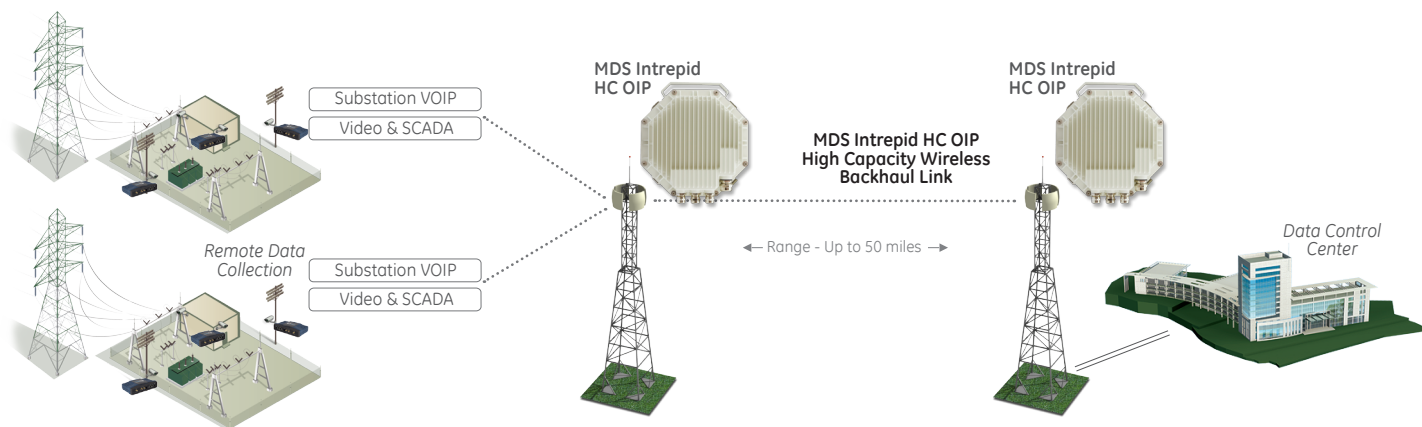
Network Management Ready*

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 OIP Application Advantages:

MDS Intrepid HC OIP
MDS Intrepid HC OIP

Substation VOIP
Video & SCADA

MDS Intrepid HC OIP
High Capacity Wireless
Backhaul Link

Remote Data Collection
Substation VOIP
Video & SCADA

← Range - Up to 50 miles →

Data Control Center

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
- Future capacity growth and additional functionality are enabled with license keys while using the same hardware
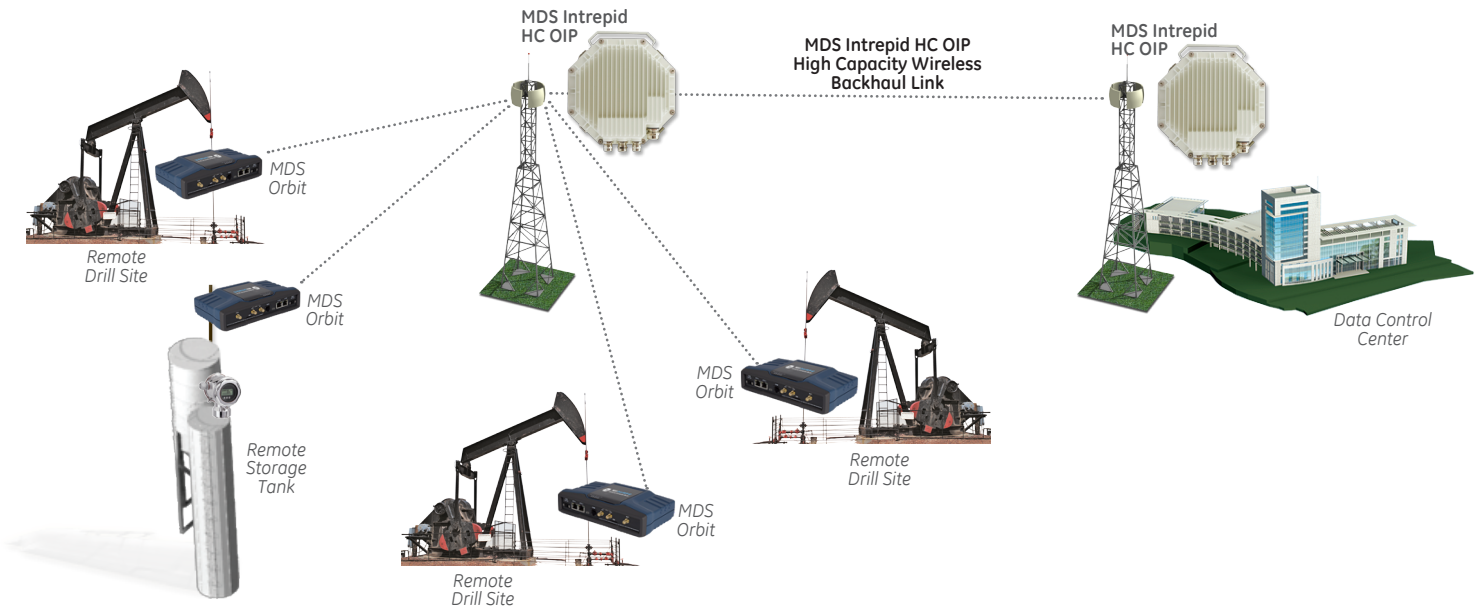
Prioritized & Secure

- Quality of Service (QoS) ensures critical communications receive highest priority

Application Example:

Oil and Gas

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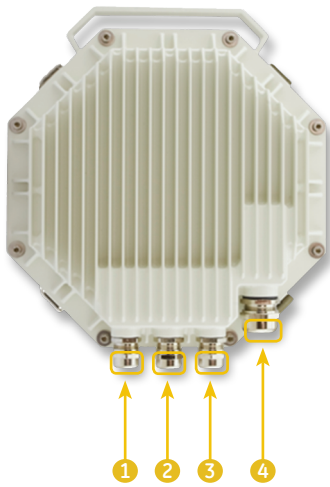

Application Example:

Mining and Transportation

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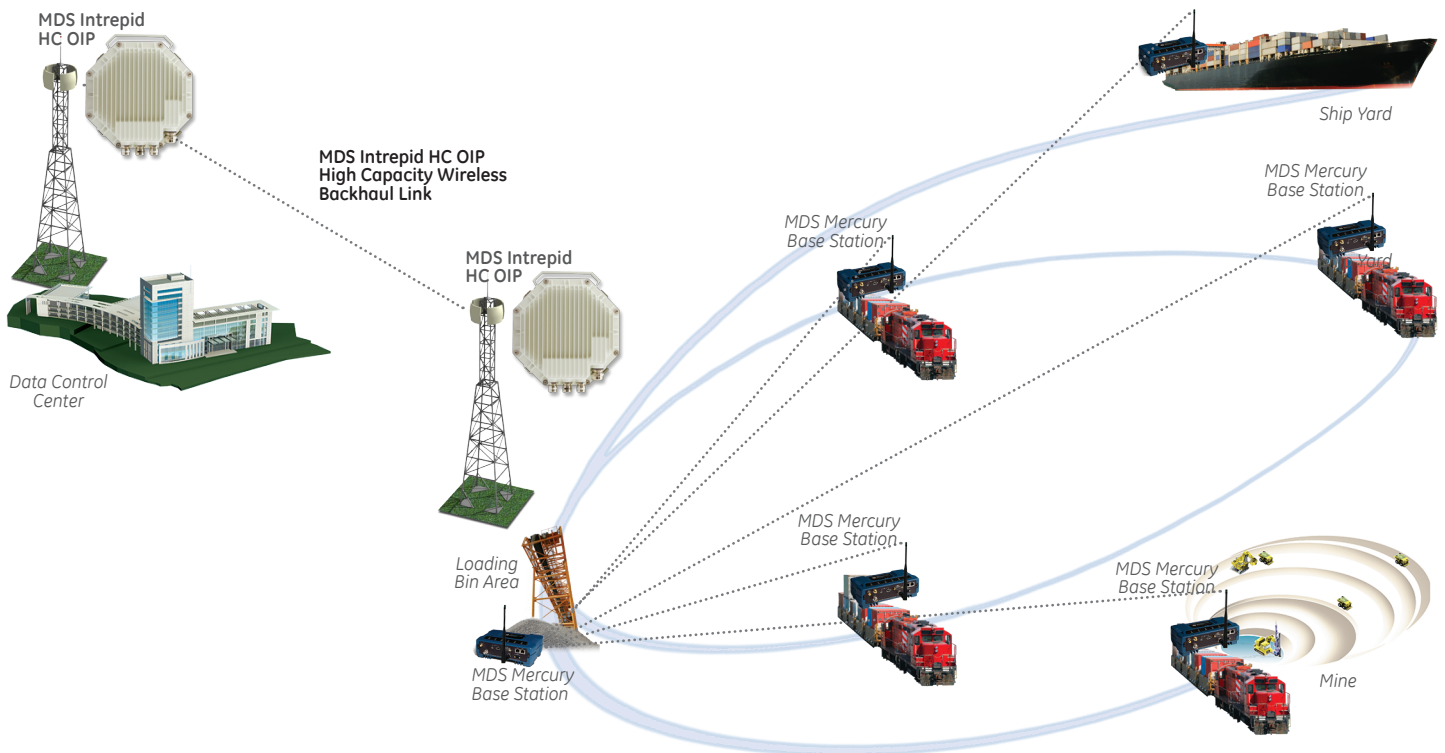
Outdoor Unit
Product Details

Connector Name/Type

1 **RJ-45** *(GbE electrical 1000 Mbps) port for interconnection of two MDS Intrepid HC OIPs for 1+1 or 2+0 configurations.*
2 **RJ-45** *(FE 10/100 Mbps) port for out-of-band management and power.*
3 **RJ-45** *(FE 10/100 Mbps) port for out-of-band management and power.*
4 **SFP** *(GbE optical 1000 Mbps) port for traffic and in-band management.*

Height 5.4 in (13.8 cm)
Width 12.8 in (32.6 cm)
Depth 11.2 in (28.5 cm)
Weight 15.5 lb (7 kg)

Power Over Ethernet (PoE) Unit
Product Detail: Cover Removed
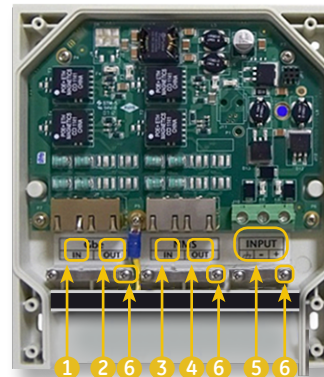
Connector Name/Type

1 **GbE IN:** *RJ-45 10/100/1000 BaseT interface for connection to the customer network.*
2 **GbE OUT:** *RJ-45 output carries data and DC voltage to the MDS Intrepid HC OIP.*
3 **NMS IN:** *RJ-45 10/100BaseT interface for out-of-band network management traffic.*
4 **NMS OUT:** *RJ-45 output carries NMS traffic and DC voltage to the MDS Intrepid OIP.*
5 *-48 VDC terminal block.*
6 *Cable clamps.*

Width 6.7 in (17.0 cm)
Height 5.9 in (15.0 cm)
Depth 1.5 in (39.0 cm)
Weight 1.1 lb (0.5 kg)

Specifications

GENERAL OPERATION	
Frequency Bands	6, 7, 8, 11, 13, 15, 18, 23, 26, and 38 GHz
Signal Interface	10/100/1000 Base-T electrical, 1000 BaseX Optical
Modulation	4, 16, 32,64,128, 256 QAM - Adaptive
Channel Bandwidth	7, 14, 28, 56 MHz (20, 40 MHz for 11 GHz)
DC Input Voltage	-40 V to -60 V
Residual BER	Better than 10-13
Average Ethernet Latency	< 150 µsec for 350 Mbps with 1518 byte packets

DATA INTERFACE	
User Data Input	
Electrical	1 × RJ-45 - 100/1000 BaseT w PoE
Optical	1 × SFP Jack for Optical Gigabit
Network Management	1 × RJ-45 - 10/100/1000 Base-T with w PoE
AGC Voltage Monitor	1 × BNC

STANDARDS COMPLIANCE	
Ethernet Standards	IEEE 802.3z (1000 Mbps Optical)
	IEEE 802.3ab (1000 Mbps Electrical)
	IEEE 802.3u (100 Mbps Electrical)
	IEEE 802.1Q (Virtual LAN)
	IEEE 802.1p (QoS)
	IEEE 802.1ad (Provider Bridging, Q-in-Q)
	IEEE 802.3ag (Service OAM (CFM))
	ITU-T 7.1731 (Performance Monitoring)
	MEF 9 & MEF 14 Compliant for EPL, EVPL and ELAN
	ITU-T G.8032 - Ethernet Rings
	IEEE 802.1w Rapid Spanning Tree Protocol
Synchronous Ethernet	ITU-T G.8261/G8262/G8264 ESMC
	IEEEv2 1588 Transparent Operation
Radio	ETSI EN 302217-2-2
EMI/EMC	ETSI EN 301489-1, EN 301489-4
Electrical Safety	EN 60950-1, EN 60950-22
Radiation Safety	Radiation Safety ETSI EN 50385
RoHS	RoHS 2002/ 95/ EC
Environmental - Operation	ETSI EN 300 019-2-4 V2.1.2, Class 4.1
Environmental - Storage	ETSI EN 300 019-2-1 V2.1.2, Class 1.2
Environmental -Transportation	ETSI EN 300 019-2-2 V2.1.2, Class 2.3
Environmental - Protection Dust/ Water	IEC 60529, Class IP66

GENERAL TRANSMITTER SPECIFICATIONS	
Frequency Stability	±7 ppm
Frequency Resolution	250 kHz
Output Power Accuracy	±2 dB
Muted Output Power	-50 dBm (Frequency < 21 GHz)
	-30 dBm (Frequency > 21 GHz)
Output Power Attenuation	30 dB or to -4 dBm minimum power output
Output Power Step Size	1 dB

GENERAL RECEIVER SPECIFICATIONS	
Frequency Stability	±7 ppm
Frequency Resolution	250 kHz
Maximum RSL	
No Damage	10 dBm
No Bit Errors	-20 dBm
RSL Accuracy	± 2dB

POWER CONSUMPTION (1+0 TYPICAL, X2 FOR 1+1 OR 2+0)	
6**, 8, 11 GHz	49 W
13, 15, 18 GHz	41 W
23, 26, 38 GHz	47 W

MECHANICAL	
Dimensions (H x W x D)	
OIP Radio Unit	138 × 326 × 285 mm
	5.4 × 12.8 × 11.2 in
PoE Injector	170 × 150 × 39 mm
	6.7 × 5.9 in 1.5 in
Weight	
OIP Radio Unit	< 7 kg (15.5 lb)
PoE Injector	0.5 kg (1.1 lb)
Operating Temperature	
Full Specification	-33° to +55° C
Operational, Cold Start	-50° C

*** Supported in 1:0 configuration only*

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To order the MDS Intrepid HC OIP, please contact your MDS Account Manager. Refer to the MDS Intrepid HC OIP Operations Manual for a full listing of product specifications.