



MDS™ Orbit MCR

Managed Connected Router for 3G/4G LTE Networks

The MDS Orbit MCR is an advanced wireless router for industrial networking and machine-to-machine applications. The MDS Orbit leverages GE's extensive experience delivering private wireless network solutions to empower the convergence of multiple applications utilizing the public cellular infrastructure. MDS Orbit's advanced feature set and processing capabilities present new levels of flexibility and versatility, and provide options to seamlessly bridge cellular communications onto WiFi and unlicensed 900 MHz networks.

Key Benefits

- Integrated routing and switching combined with an extensive feature suite allow for easy integration into a variety of network designs
- Communicate with legacy serial devices utilizing MDS Orbit's embedded terminal server and Modbus TCP protocol conversion
- Secure your network utilizing MDS Orbit's exceptional cyber security suite addressing user, device and network security
- Rugged design and extended temperature range permit installation in harsh industrial environments

Applications



Oil & Gas

- Well Head and Production Pad Automation
- WiFi Connectivity for Field Technician Operations



Water & Wastewater

- Level, Pressure and Flow Monitoring
- Pipeline Monitoring and Control



Utility

- Distribution Automation for Legacy Line Devices
- Substation Device Monitoring and Video Surveillance



Heavy Industrial

- Train Control and Machinery Monitoring
- Excavation Machine Control
- Facility Wide Network Extension to Offsite Areas

Comprehensive Security

- Security capabilities include firewall, IP sec, VPN and certificate management
- Secure boot cryptographic signature of firmware to prevent compromising the device
- SX.509 digital certificate management to simplify provisioning and lifecycle management
- Integrate with enterprise security systems (RADIUS, AAA, SCEP, and Syslog)

Advanced System Performance

- Hardware accelerated switching and high performance processors minimize latency
- Designed for harsh rugged environments
- Secure device management with NETCONF, HTTP, SNMPv3, and SSH
- Electrostatic discharge (ESD) protection
- Extended temperature range (-40°C to + 70°C)
- IEEE® 1613 and Class 1/Div 2 conformance

Ease of Use & Integration

- Industrial options for application flexibility including 10/100 Ethernet and RS232/485 serial ports
- Compact enclosure easily fits into existing cabinets
- Integrated DIN rail mount facilitates rapid deployment



MDS Orbit Series

GE MDS has been providing products to meet the specific and unique requirements for a broad range of industrial applications for over twenty-five years. The MDS Orbit Series extends the portfolio to support public infrastructure requirements. Built on a common platform, GE's MDS Orbit Series provides integrated communications, enhanced security, consistent user interface configuration, common packaging, and the rugged construction inherent in all MDS products.

Flexible Communications

The MDS Orbit Series was designed to support Ethernet and legacy serial applications. Serial protocol support, both active and transparent, provides easy connectivity to common control and data acquisition equipment and protocols, such as Modbus and DNP3. The MDS Orbit MCR devices are equipped with two Ethernet ports, reducing the need for cabling when used in multiple Ethernet applications. Serial needs are covered by an RS232/RS485 port. A USB port provides access for a PC or laptop to connect and configure, troubleshoot, or maintain the device.

Provides a Secure Environment

Critical infrastructure communication must ensure availability, integrity, and confidentiality for data flows. The MDS Orbit platform provides a wealth of best-in-class cyber security capabilities. Cellular communication is protected with IPsec VPN, network address translation, and a stateful firewall. WiFi communication is protected with WPA/WPA2 security. Access to device management is protected through role-based access control with RADIUS integration and secure protocols including NETCONF, HTTPS, SNMPv3, and SSH. The MDS Orbit MCR is protected with boot security and digitally signed firmware.

Ease of Use

The combination of cellular and WiFi provides a method for extending communications across a well pad or substation. The MDS Orbit MCR with WiFi delivers 54 Mbps throughput making it ideal for video monitoring of remote sites with public access for backhaul. The compact enclosure easily fits into existing cabinets and its integrated DIN rail mount makes it a quick and easy product for deployment in all applications.

Network Management Ready

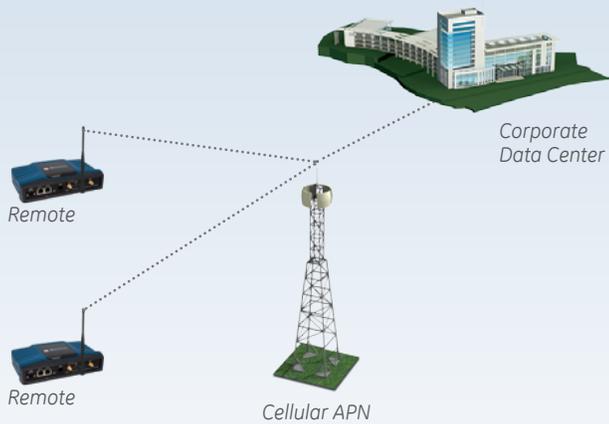
Once a network is operational, users are able to utilize the MDS PulseNET™ comprehensive network management system for end-to-end management. MDS PulseNET provides pre-built workflows, along with intuitive graphical representations of the communications network. It provides real-time availability, performance,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



GE's MDS Orbit Cellular Deployment Options

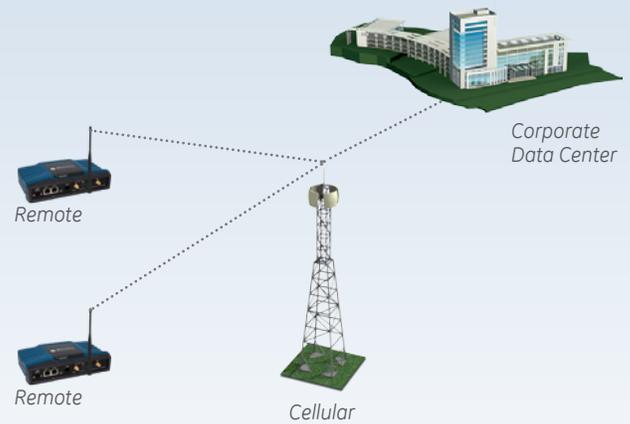
Point to Point or Multipoint via Cellular APN

- Support for modern cellular APN attachment
- Available security functionality includes firewalling and VPN



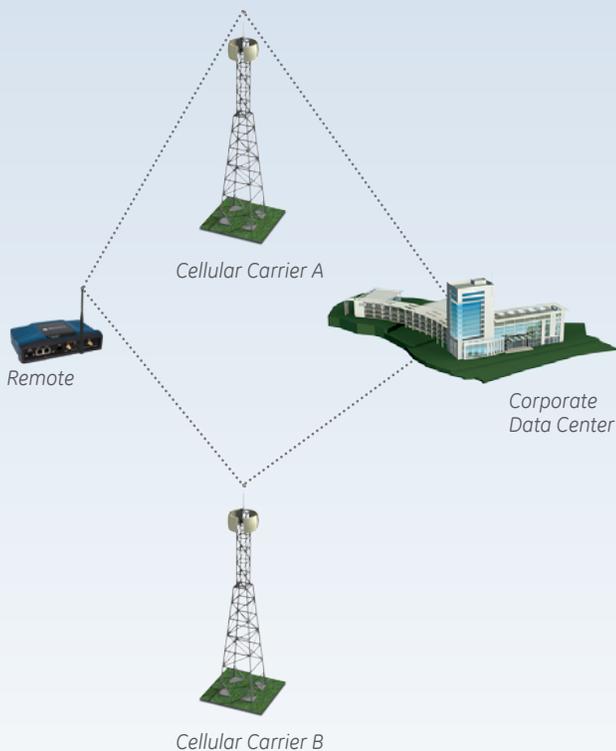
Secure Communication via IPSec VPN Tunnels

- IPSec VPN tunnels encrypt communication between MDS Orbits
- Stateful firewall protects against network intrusion
- Support for multiple VPN tunnels per device



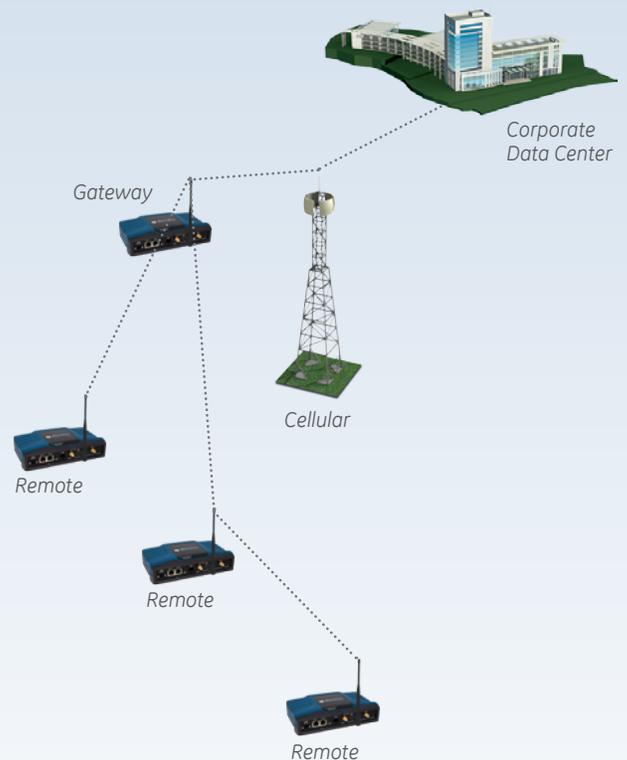
Redundant Cellular Uplinks

- Flexible support for multiple cellular technologies within one device
- Dual SIM support enables multiple carrier option for redundancy at critical sites
- Failover to second carrier based on connection availability



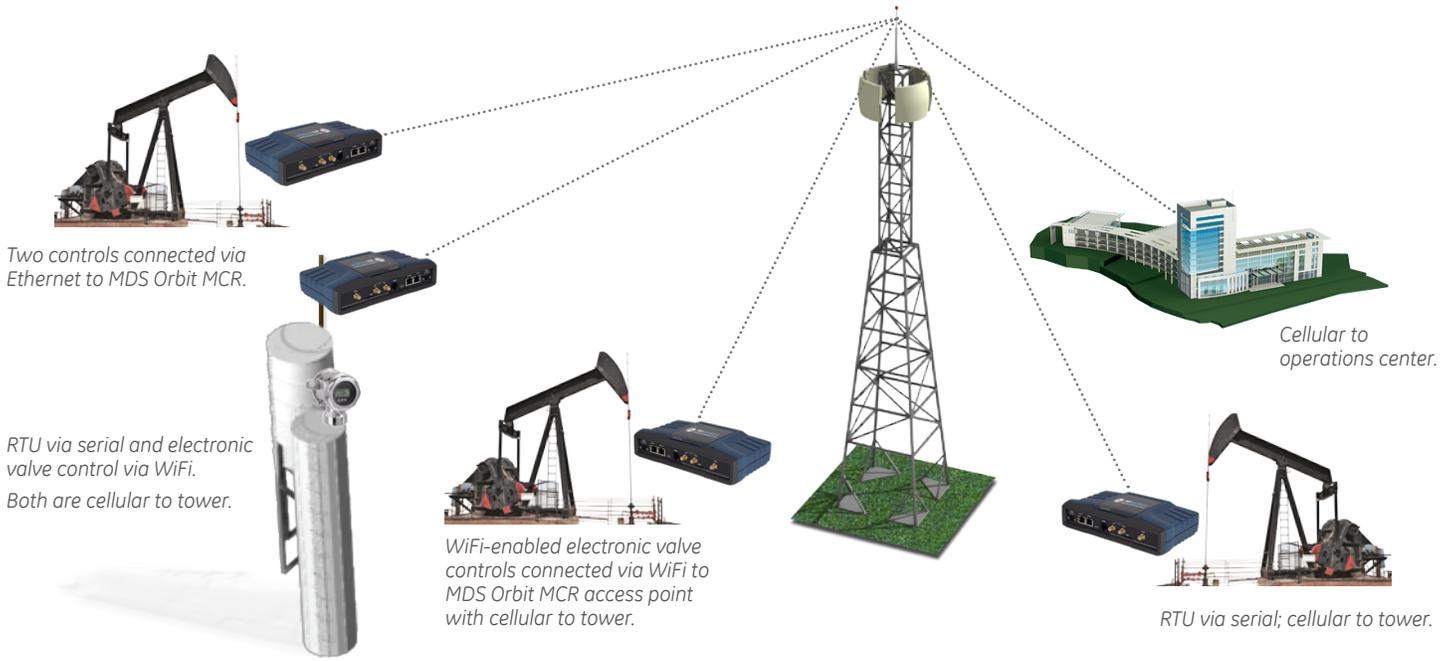
Extend Cellular Communication Using WiFi and 900 MHz

- Seamlessly bridge cellular, WiFi and unlicensed 900 MHz networks
- Extend range up to 30 miles using unlicensed 900 MHz
- Store and forward extends range up to 8 hops



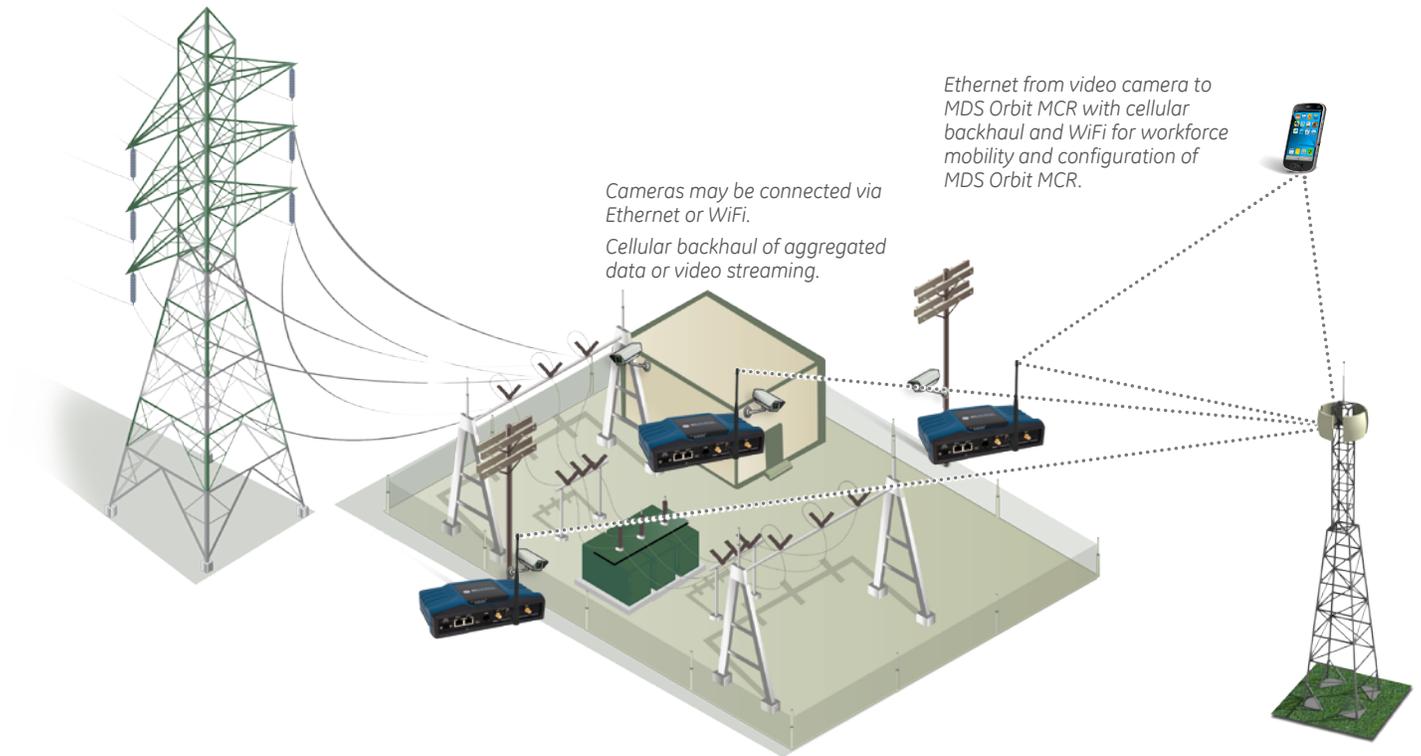
Application Example: Device Monitoring

Monitoring devices from a distance is achieved with the MDS Orbit MCR, which provides the bridge to tie your remote private networks to public access.



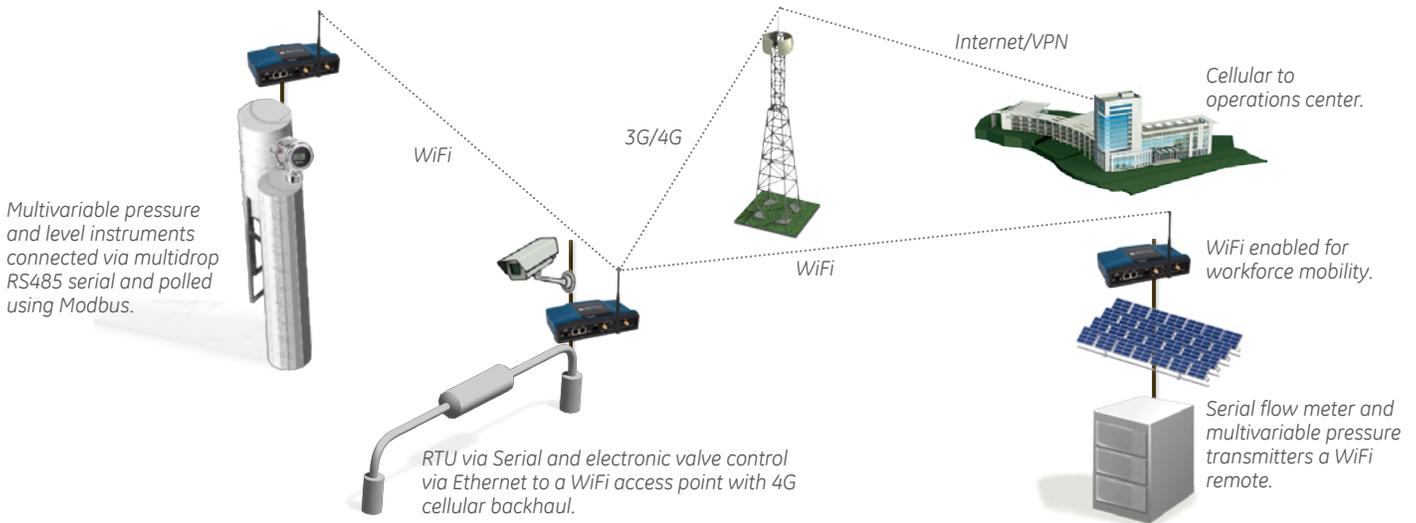
Application Example: Substation Communications

Utilities have distribution substations in remote areas of their franchise territory. Cellular coverage is often available at remote substations that may be outside of the utility's established private network. These substations benefit from video surveillance to monitor for theft and equipment failure. Within the substation, the MDS Orbit MCR-WiFi stations communicate with the surveillance cameras and the MDS Orbit MCR-WiFi access point. The MDS Orbit MCR with WiFi provides the aggregated data back to the control center over the cellular network.

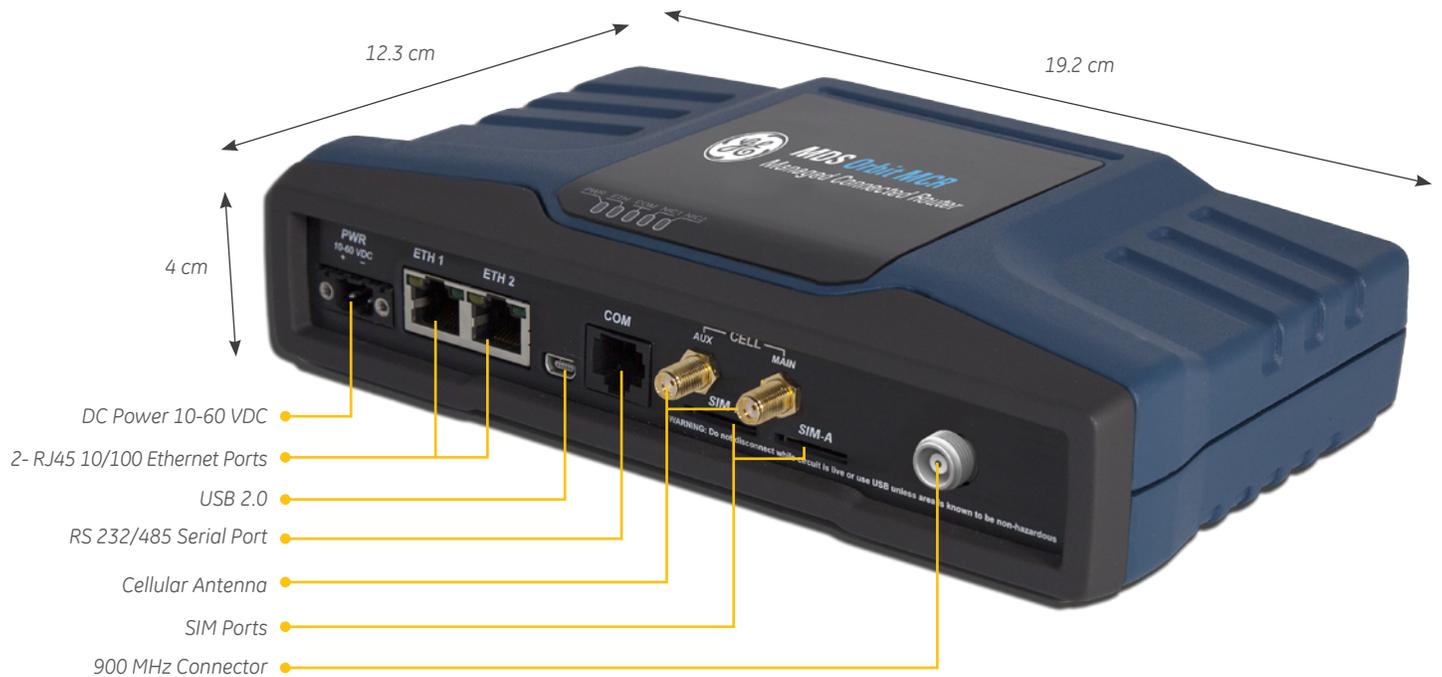


Application Example: Natural Gas Production

Use the Orbit WiFi for an unlicensed WiFi network across a gas production pad and provide wireless access to instrumentation, controllers, and flow meters for production and custody transfer. Backhaul site data to operations center by seamlessly bridging private local WiFi networks onto public 3G/4G infrastructure.



MDS Orbit Platform – An Exterior View



Technical Specifications

CELLULAR 3G

Protocol/Frequency	GSM, GPRS, EDGE,HSPA+ 850/900/1800/1900 MHz UMTS, HSPA, HSPA+ 800/850/900/ 1700/1900/2100 MHz
Region/Carrier	Global PTCRB, GCF certification Regional carrier certifications
Max Throughput	21 Mbps downlink 5 Mbps uplink
Typical Throughput	5.5 Mbps downlink 0.3 Mbps uplink

CELLULAR 4G

Protocol/Frequency	LTE Release 8 700MHz CDMA Band class 0 (850 MHz) Band class 1 (1900 MHz)
Region/Carrier	U.S. Verizon
Max Throughput	50 Mbps downlink 25 Mbps uplink
Typical Throughput	21 Mbps downlink 10 Mbps uplink

WiFi

Standard IEEE	802.11 b/g/n
Operating Modes	Access Point, Station
AP Networking	Dual SSID with VLAN mapping
Security	WPA/WPA2 PSK, Enterprise SSID hiding
Carrier Power	20dBm

PROTOCOL

Networking	Layer 2 bridging Layer 3 routing, QoS
Ethernet	IEEE 802.3, Spanning Tree (Bridging), VLAN, IGMP TCP/IP DHCP, ICMP, UDP, TCP ARP, NTP, FTP, SFTP, TFTP, DNS
Serial	TCP server, TCP client UDP Unicast and Multicast Terminal Server for any asynchronous serial protocol Modbus TCP to RTU conversion

PHYSICAL INTERFACES

Ethernet	10/100BaseT, RJ-45 Integrated Switch
Serial	RS-232/RS-485, RJ-45
USB	2.0 Management Port
Antenna Ports	900 ISM: TNC WiFi: RP-SMA Cellular: SMA
LEDs	PWR, ETH, COM, NIC1, NIC2

ELECTRICAL

Input Voltage	10 – 60 Volt DC
Power Consumption	at 13.8 VDC

MCR 3G (NOMINAL, 25C)

MODE	POWER/CURRENT
Connected (Idle)	2.5W/182mA
Connected (Typical Download)	3.2W/235mA

MCR 4G (NOMINAL, 25C)

MODE	POWER/CURRENT
Connected (Idle)	4.0W/292mA
Connected (Typical Download)	4.3W/310mA

MECHANICAL

Case	Die Cast Aluminum
Dimensions	4.4 H x 20.3W x 12.2 D cm. (1.75 H x 8.0 W x 4.8 D in.)
Weight	2 lbs
Mounting Options	Integrated DIN Rail mount Standard Mounting bracket

ENVIRONMENTAL

Temperature	-40° to 70° C (-40° to 158° F)
Humidity	95% at 60° C (140° F) non-condensing

MANAGEMENT

- HTTP, HTTPS, SSH, NETCONF, local console
- SNMPv1/v2/v3, MIB-II, Enterprise MIB
- Syslog and Syslog-over-TLS
- MDS PulseNET compatible

AGENCY APPROVALS

- FCC Part 15
- IC
- ETSI / CE (3G and WiFi models)
- CSA Class 1, Div. 2, UL 508, UL 1604
- IEEE 1613

ORBIT CYBER SECURITY SUITE

Tunneling	IPSec VPN
900 ISM Encryption	AES-CCM 128/256 bit with auto key rotation
Authentication	RADIUS, PSK, EAP/TLS, PKI
Firewall	Stateful Packet Inspection Access Control Lists, NAT
Certificates	X.509, SCEP, PEM, DER
Boot Security	Digitally signed firmware

ACCESSORIES FOR THE MDS ORBIT MCR SERIES

- Antenna kit for WiFi cellular and cabling
- Antenna kit for WiFi only
- Stand-alone antennas
- Ground wire surge suppressors

For more information about
GE Industrial Communications products visit
GEDigitalEnergy.com/Communications



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imagination at work

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