

GE
Digital Energy

Industrial Communication Solutions for the Mining Industry



imagination at work

GE Industrial Communications

For over twenty-five years, GE Industrial Communications has provided rugged communication networks for leading industrial and energy companies around the world.

As the industry leader in deploying communication networks with exceptional reliability, GE's reputation for delivering the highest quality products is unsurpassed. With extensive domain expertise in networking applications for harsh, industrial environments, GE provides mining companies best-in-class solutions from the industry experts.

From hardened wireless devices to industrial-grade fiber multiplexers and Ethernet switches, GE provides a broad range of industrial products delivering comprehensive end-to-end communication networks that scale to meet our customers' unique requirements.

GE's capabilities extend to purpose-built network management providing IT departments with the tools specifically designed to proactively monitor and manage their communication assets.

With an installed base exceeding one and a half million devices worldwide, industries rely on GE's communication networks everyday to attain operational targets and meet efficiency goals.



Industry Challenges

Mining operations vary greatly around the world depending on the region, the minerals being extracted, the mining technologies required, as well as the size and scale of the enterprise.

Common to all applications is the need for a reliable and robust communications infrastructure designed for operations in harsh environments, providing the highest availability for process control, asset monitoring, safety and security.

Industry Goals

Continuous operation is a major objective for mining companies in order to achieve commercial goals. This requires solutions that reduce the risk of failure and minimize downtime.

Improving efficiency and meeting production targets drive the need for a secure and reliable communication infrastructure that:

- Supports comprehensive real-time data acquisition, even for hard to reach assets
- Delivers high-speed and long-range performance for monitoring and control requirements
- Facilitates faster response for both process and equipment problems
- Lowers installed costs and reduces maintenance overhead
- Maximizes flexibility and ease of expansion to meet changing requirements
- Simultaneously supports multiple applications, media and infrastructure types

From extraction to processing to transportation, GE Industrial Communications provides mining operations with the communication networks to meet their demanding and diverse requirements.

GE's Solutions

GE Industrial Communications delivers comprehensive communication networks for the mining industry to drive performance improvements and operational efficiencies.

Our flexible, scalable networks are designed for harsh mining environments and rely on GE's core capabilities in the following areas:

Industrially Hardened Communication Solutions

GE's products have been rated and tested to harsh industrial specifications. This includes operation over extreme temperature ranges (-40°C to +70°C), environments with high continuous vibration, hazardous location approvals, such as Class 1/Div 2, and design and packaging options to withstand a variety of extreme outdoor environments.

Scalable and Flexible Networks

GE's broad product portfolio ensures flexible network communication options that not only align with current requirements, but also scale to your evolving demands. From hardened wireless devices to industrial-grade fiber multiplexers to Ethernet switches, our products span both public and private infrastructures operating in unlicensed and licensed spectrum to create communication networks for IP/Ethernet, serial and I/O data.

Comprehensive Network Management

GE's purpose-built Network Management Solution (NMS) provides an intuitive and user-friendly interface to monitor and manage communication networks. GE's NMS is a critical tool for consistently monitoring assets, proactively preventing downtime and rapidly responding to equipment problems in order to reduce maintenance costs.

Outstanding Performance and Reliability

With a reputation for quality, GE's products are manufactured to comply with stringent Six Sigma Quality processes. Our dedication to quality helps ensure the highest level of product performance and reliability to avoid disruption in service and network downtime.

GE Industrial Communications



Extraction Applications

- Monitor loading vehicles across the extraction site
- Collect crusher and load data from site
- Communication for facility access gates and traffic control for seismic and blast safety
- Collection of remote seismic data to central controller networks
- Collect operation, maintenance and status data from remote operating machinery and devices
- Monitor remote de-watering pump status, containment systems and liquid level data in effluent tanks and holding ponds

Transportation Applications

- Communication infrastructure providing continuous communication for locomotives and transport vehicles transferring ore from excavation to processing
- High-speed, high-throughput data communication for unmanned vehicles
- Data acquisition for equipment and device status for preventive maintenance and reduced operating expenses
- Control and monitoring of mineral slurry pipeline and locomotive transport



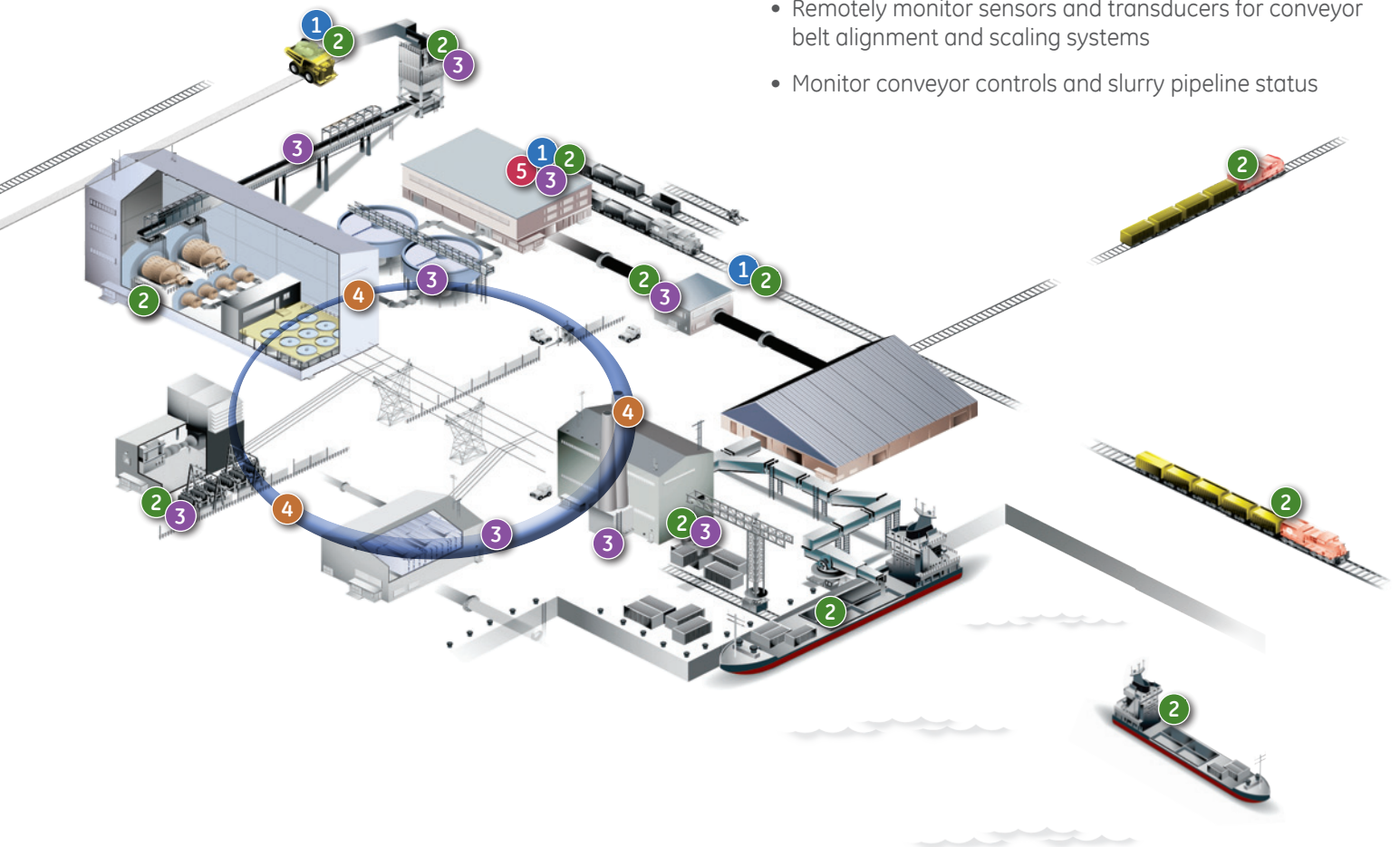
Devices legend

- 1 MDS WiFi/Cell
- 2 MDS Mercury/MDS iNET
- 3 MDS WiYZ
- 4 Lentrionics JungleMUX/MDS Intrepid Series
- 5 MDS PulseNET



Processing Applications

- Infrastructure for operational video surveillance of critical processing points in the system
- Communication for operation and maintenance of facility power grids
- Security surveillance of the processing plant
- Aggregate data from end-points to fiber ring backbone for backhaul to a central location
- Extend data acquisition and control networks to remote controllers, meters and instrumentation
- Monitor conveyor status, bearing temperature status, dust suppression and filtering equipment
- Remotely monitor sensors and transducers for conveyor belt alignment and scaling systems
- Monitor conveyor controls and slurry pipeline status



GE Industrial Communications Portfolio Overview

Critical processes demand secure and reliable networks

Rugged Wireless | MDS

- World's leading industrial end-to-end wireless solutions provider
- IP/Ethernet and serial traffic, plus analog and digital process I/O signals

Secure & Dependable Multiplexers | Lentrionics

- Hardened, multi-service telecommunications platforms
- Secure application performance from the network edge to the core

Ethernet Switches & Protocol Converters | MultiLink

- Family of industrial hardened Ethernet switches
- Secure, reliable communications for critical infrastructure devices

Network Management

- Comprehensive network management software for asset monitoring
- Purpose-built for managing communication networks

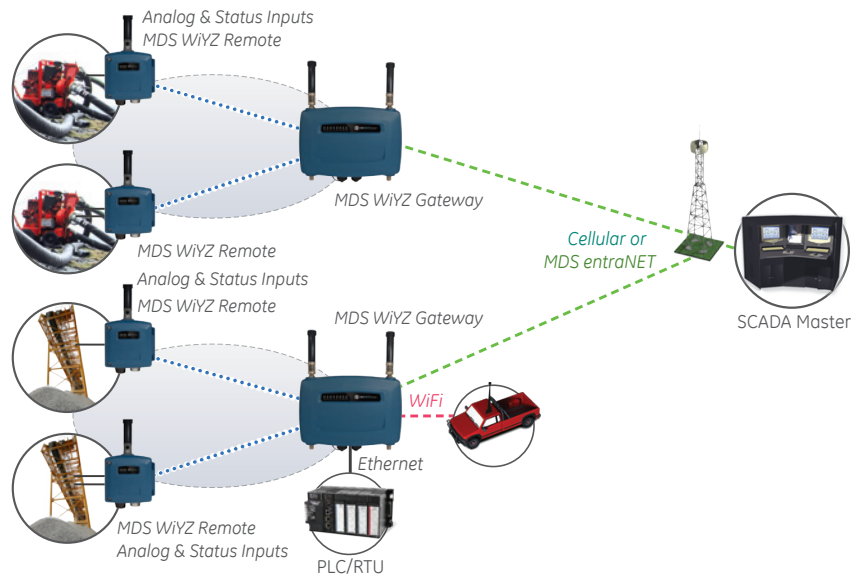
Professional Services

- Network planning, systems design, implementation and commissioning services
- Project and program management services

Application Examples

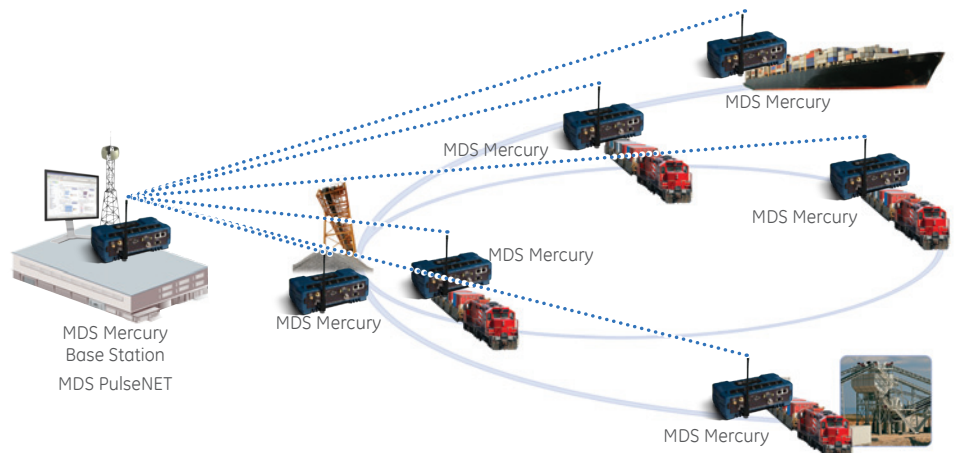
Extraction Application

- Use MDS WiYZ™ for analog and digital data acquisition of transducer values and device status
- Automate remote monitoring of de-watering pumps and conveyor status even in areas without power
- Provide connectivity for controllers to remote assets
- Provide local WiFi connectivity to mobile field force and backhaul data to host SCADA systems



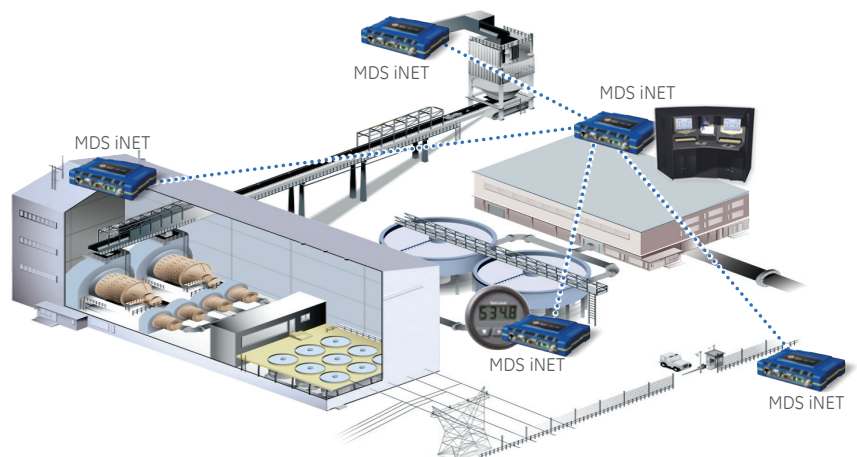
Transportation Application

- Use MDS Mercury™ WiMAX for wide area mobile network communication across multiple Base Stations
- Implement video and collect GPS data for monitoring unmanned ore train movement
- High network capacity supports visualization of locomotives at loading sites
- Leverage common network for ore train load data, SCADA communication and track geometry



Processing Application

- Use MDS iNET™, MDS Mercury WiMAX and WiFi devices to extend high speed control and monitoring networks across your processing enterprise
- Provide Ethernet connectivity for crusher controllers and conveyor status and alarm monitors
- Integrate WiFi connectivity to perimeter security video and access control
- Support remote HMI displays and local control over a common network





GE Industrial Communications



High-Throughput, Standards Based Wireless Networking

Local Area Network (LAN) wireless communication solutions that extend your network into the field, the MDS Mercury and iNET Series provide a highly secure, industrial-grade and high-throughput communications platform for mission critical, industrial applications.

MDS's LAN solutions provide options for both licensed and unlicensed requirements in a variety of global frequencies. The solutions are designed to facilitate high-throughput wireless networking data requirements ranging from 500Kbps to +20Mbps on a highly secure platform.



Short-Range, High-Speed, Wireless Solutions

The MDS Industrial WiFi Cellular platform provides FIPs 140-2 compliant security, extended temperature range, multiple interface options and industrial grade packaging for localized WiFi communications and extension to public carriers.

MDS Industrial WiFi Cellular products provide cost-effective endpoint connectivity to a wide range of devices within an excavation or recovery site. The products use GE's network management system, MDS PulseNET™, for management and maintenance, providing additional flexibility and ease of use to companies growing their sites quickly and relying on critical infrastructure communications.



Wireless Monitoring & Control

GE's MDS WiYZ is an intelligent data acquisition and networking platform combining wireless connectivity for sensors, I/O, instruments and meters with comprehensive network infrastructure solutions for IP/Ethernet, serial, machine-to-machine and backhaul communications to host systems and devices.

Whether your application requires the collection of data from remote, unpowered sensors, deployment in areas with obstructed communication paths or a bridge for data using the cellular infrastructure to your enterprise network, MDS WiYZ products provide versatile, reliable and cost-effective solutions.



GE Industrial Communications



High Capacity Fiber Optic & Wireless Backhaul

The Lentronics™ JungleMUX SONET and STM Multiplexers deliver optical networking solutions with data speeds of OC-48 and STM-16 respectively. These multiplexers provide integrated transport and access capabilities for voice, data, Ethernet/IP WAN and video traffic combined in a single unit.

GE's MDS Intrepid™ family of industrial wireless Point-to-Point and Point-to-Multipoint backhaul products offer a variety of protected and non-protected configurations, supporting licensed and unlicensed frequency options with speeds up to 800 Mbps.



Ethernet Switches

GE's family of MultiLink switches and MultiNet™ serial port servers provide secure, reliable communications for critical infrastructure devices. These industrial and substation hardened devices provide secure, reliable communications for all of your critical infrastructure devices.

With more than 12 different models to choose from, it's easy to find the right solution for any application, environment, and project size to ensure your communications network is always available, fast and secure.



Comprehensive Network Management

Manage your communications network utilizing the MDS PulseNET network management system. PulseNET includes sophisticated and meaningful pre-built workflows along with intuitive graphical representations of the network at your fingertips.

GE also offers a fully hosted 24 x 7 Network Operations Center (NOC) as well as transitional NOC services for customers that need assistance getting their network up and running and then hosted for a short period of time.

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



Digital Energy
175 Science Parkway
Rochester, NY 14620
Tel: +1-585-242-9600

GEDigitalEnergy.com

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