MDS Master Station

Long Range IP/Ethernet and Serial

The MDS™ Master Stations, built upon our modular communication platform, are used with MDS SD Series and MDS x710 Series remote radios. The MDS Master Stations support full duplex communication in a protected 1+1 warm standby transceiver configuration to provide reliability for continuous use, high duty cycle applications associated with licensed narrowband Base Station and Repeater applications. The MDS Master Station is offered in a 19 in/43.8 cm, 2 rack-unit high chassis containing an internal duplexer with options for connecting an external duplexer if required.

Key Benefits

- Redundancy with warm standby transceiver
- Full duplex, half duplex and simplex operating modes
- Operation as Master Station, Repeater or Remote
- Backward compatibility with MDS x710 radios
- 5 and 10 watt output power
- Connectivity for multiple IP/Ethernet and serial host systems
- MDS PulseNET management of online and standby transceivers

Applications

Oil & Gas

- SCADA communication for flow/metering devices, controllers and RTUs
- Data acquisition for well head production data and pipeline status

Energy

- SCADA communication for IEDs, controllers and RTUs at distribution substations
- Data acquisition for pole-top transformers and capacitor banks

Water/Wastewater

- SCADA communication for lift station controllers and monitoring devices
- Data acquisition for tank and reservoir levels, flow rates and pipeline valve status

Reliability

- Full duplex operation
- 1+1 transceiver redundancy with warm standby
- 5 and 10 watt output power
- Redundant power supply & antenna options
- Optional redundancy – Ethernet & serial ports
- Contact outputs for failover, error & alarm annunciation
- Optional battery backup

Flexibility

- 12-36, +/- 36-72, 75-140 VDC & 90-260 VAC power options
- Backward compatible with MDS x710 /x790
- Support for internal & external duplexers
- Connectivity for additional notched filter
- 2 Ethernet, 2 serial & 1 USB connections
- Simultaneous operation of multiple host systems
- Configuration & maintenance via optional WiFi
- 820-960 MHz, 300-512 MHz *

Industrially Hardened

- Operation from -30 to +60 °C
- Rated for continuous operation
- No moving parts and no fans for higher reliability

Secure

- AES 128-bit encryption
- Password protected access
- VLAN data & management segregation

imagination at work

Exceptional Reliability

GE's MDS SD Series and MDS x710 licensed narrowband communication networks are deployed to monitor, control and maintain critical processes and distributed assets. Users require high reliability and availability, driving demand for high duty cycle products that are capable of continuous operation and that minimize central points of network failure. The MDS Master Station is built to meet these demanding requirements.

In licensed systems, the MDS Master Station is assigned the primary transmit frequency that is used to communicate to all remote radios in the network. As such, a failure of the Master Station radio can result in a network wide communication interruption. In a redundant configuration, the MDS Master has two complete full duplex SD Series transceivers and power supplies. In the event of a failure the controlling logic switches to the standby unit. Switchover can occur based upon transceiver error codes, loss of communication over a user configurable time period or loss of power. Switchover typically occurs in less than one second.

The standby transceiver is constantly operating and its operational readiness can be monitored by the user and external network management systems. For less demanding use cases, the MDS Master Station is also available in a non-redundant configuration.
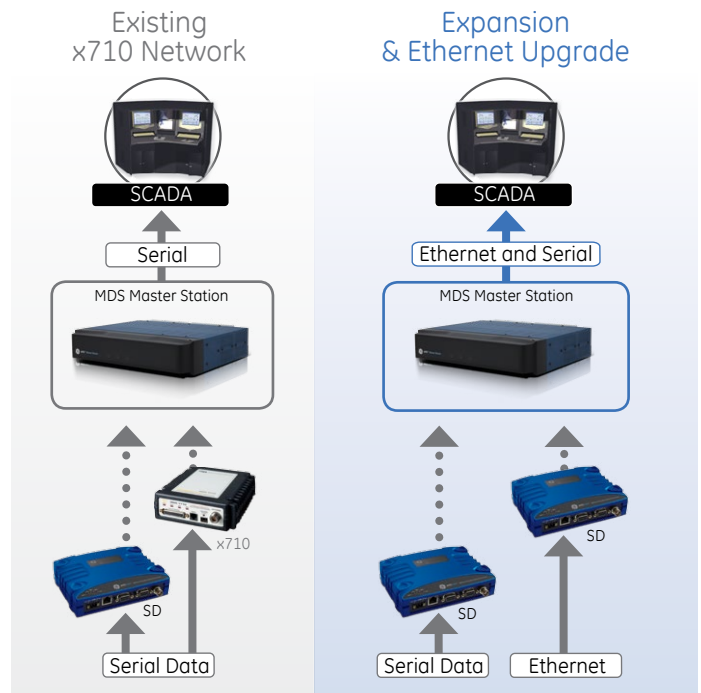
Operate as Master, Repeater or Polling Remote

The MDS Master Station is used in various operational settings depending upon the user's specific use case including Master, streaming Repeater or polling Remote. In addition to full duplex, both half duplex and simplex modes are configurable by the user.

Typically, the MDS Master Station is located where the primary connection to the user's host system or network is made. In many instances however, clear RF line of sight to remote radio locations cannot be achieved at control centers or host system connection points. In these cases the Master Station can be configured as a streaming Repeater and installed at optimal tower sites where line of site can be achieved. An additional Master Station is then configured as a polling Remote. Host system communication is then achieved at the polling Remote through the Repeater to all remote radio locations.

Backward Compatibility

The MDS Master Station features backward compatibility with MDS x790-x710 networks including 2000 and 4000 series. Backward compatibility preserves your investment and provides maximum flexibility for users to migrate from complete x710 radio to hybrid x710 and SD radios, ultimately achieving a full SD radio deployment for evolving to enhanced serial and IP/Ethernet functionality. When a full SD network is achieved, users can broadcast switchover to higher modulation and IP/Ethernet services to all remote radios.

The MDS Master Station is fully compatible with "B" modem analog x710 radios and supports switched carrier, continuously keyed or key on data operation as well as configurable PTT and CTS delays.

Master, Repeater or Polling Remote

The MDS Master Station can be configured as a Master, Streaming Repeater, and Polling Remote when frequency plans, tower locations and RF line-of-site considerations drive flexibility in enterprise network connections.
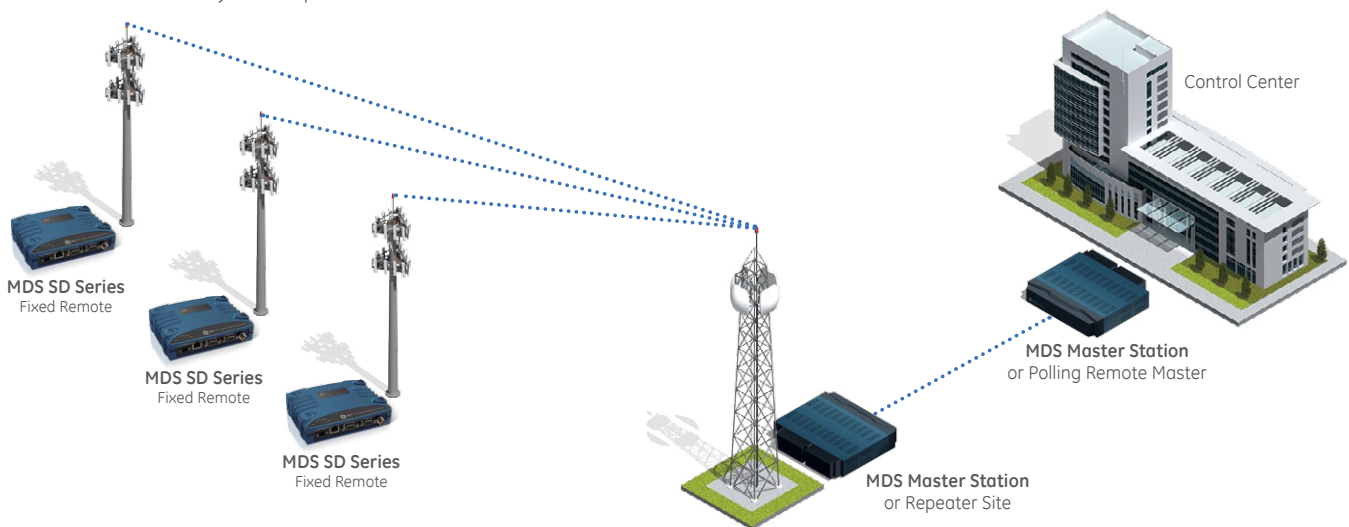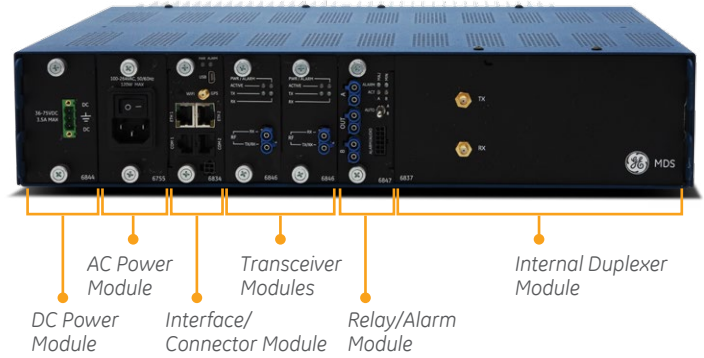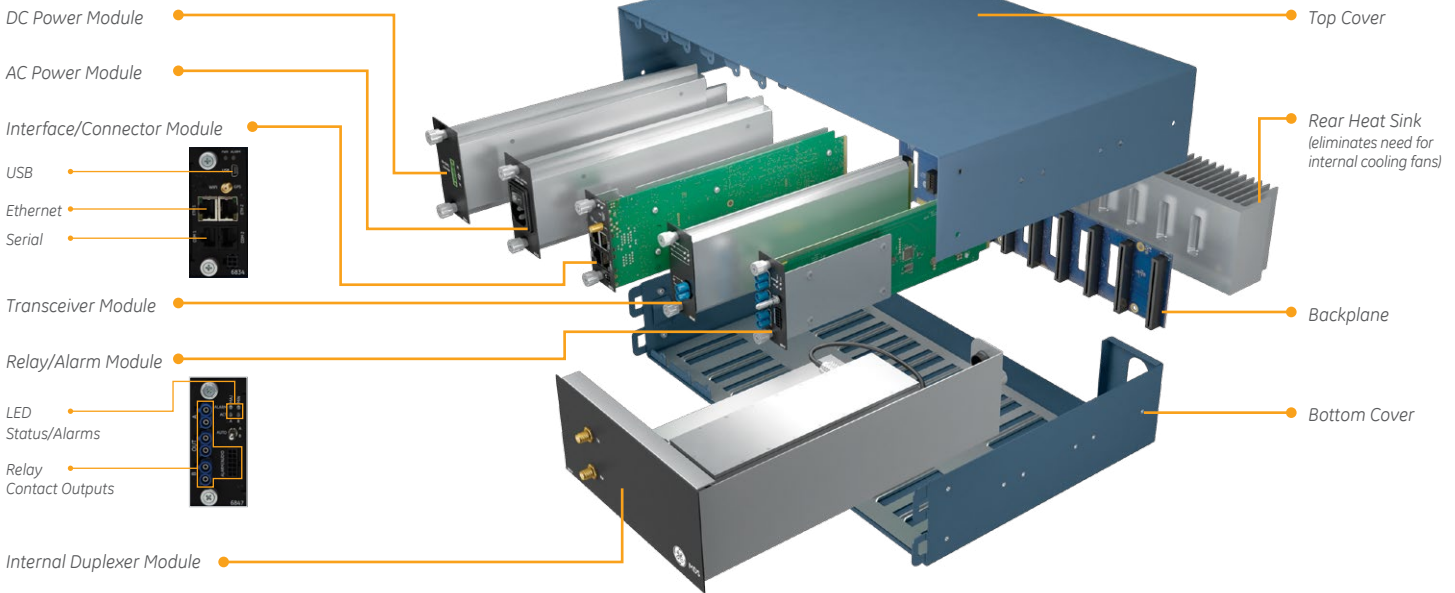
Modular Communication Platform

Ease of maintenance and serviceability are two additional benefits derived from our modular communication platform. All components in the MDS Master Station are easily accessed from the front panel eliminating the need to remove the chassis should module replacement be required. In addition, redundant transceivers and power supply modules are hot swappable to ensure that the MDS Master Station remains fully operational during service periods after a failover.

All power, serial and Ethernet connections are made to the front panel. Antenna and external filter connections are made in the rear of the unit.

Exterior View – Front Panel

AC Power Module

Transceiver Modules

Internal Duplexer Module

DC Power Module

Interface/ Connector Module

Relay/Alarm Module

Interior View

DC Power Module

AC Power Module

Interface/Connector Module

USB

Ethernet

Serial

Transceiver Module

Relay/Alarm Module

LED Status/Alarms

Relay Contact Outputs

Internal Duplexer Module

Top Cover

Rear Heat Sink
(eliminates need for internal cooling fans)

Backplane

Bottom Cover

Connectivity Options

The MDS Master Station's Interface Connector module provides two serial and two Ethernet connections as well as one USB connection. The simultaneous operation of multiple host system either serial or IP/Ethernet is fully supported in the SD Series.

The Relay and Alarm module provides connectivity for four contact output to externally signal failover and alarm events. LEDs show current status of active and standby transceivers.

Embedded Device Manager

Use the web based MDS Device Manager for easy configuration of all MDS Master Station parameters. MDS Device Manager is also used to access important performance and maintenance information.

Optional WiFi access to the MDS Device Manager is also supported. WiFi access to wireless and wired networks is prohibited.
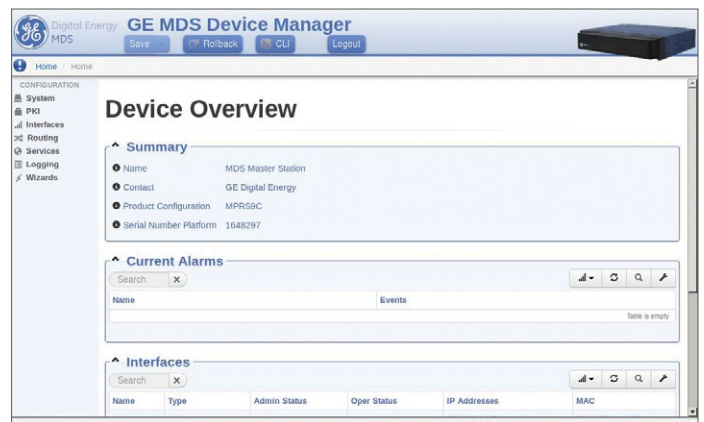
Opening Screen for Master Station MDS Device Manager

Technical Specifications

GENERAL

Frequency	Configurable
Operational Modes	Full duplex, half duplex, simplex
Modulation	Digital, CPFSK/SOQPSK
Range	Up to 50 Miles

820-960 MHz FREQUENCY BANDS

RF Data Rate & Channel Size	9,600 & 19,200 bps @ 12.5 kHz
	19,200 & 38,400 bps @ 25 kHz
	65,000 bps @ 50 kHz

Frequency Sub-Bands
(See footnote for sub-band availability):

Band A*	820-870 MHz
Band C	928-960 MHz
Band D*	928-960 MHz/50 KHz Channel
Band E*	880-915 MHz
Band F*	880-915 MHz/50 KHz Channel
Band G*	850-960/926-936 MHz Tx Low
Band H*	850-960/926-936 MHz Tx High
Band J*	Tx 880-915/Rx 928-960 MHz

300-512 MHz FREQUENCY BANDS

RF Data Rate & Channel Size	4,800 bps @ 6.25 kHz
	9,600 & 19,200 bps @ 12.5 kHz
	19,200 & 38,400 bps @ 25 kHz

Frequency Sub-Bands
(See footnote for sub-band availability):

Band A*	350 – 400 MHz
Band B	400 – 450 MHz
Band C	450 – 512 MHz
Band D*	300 – 360 MHz

TRANSMITTER

Frequency Stability	+/- 0.5 ppm
Carrier Power	1 to 10 Watts Programmable
Carrier Power Accuracy	Normal +/- 1.5 dB
Duty Cycle	Continuous
Output Impedance	50 Ohms

RECEIVER

Type	Double Conversion Superheterodyne
Sensitivity	-112 dBm typical @ 1x10-6 BER Typical
Selectivity	> 70 dB
Adjacent Channel Rejection	40 dB Nominal

INTERFACES

Serial COM1	RS232, RJ45
Serial COM2	RS232/485, RJ45
USB	
Ethernet 1 and 2	10/100 BaseT, RJ45
Antenna	N Female

MANAGEMENT

MDS PulseNET NMS

MDS Radio Configuration Software

ENVIRONMENTAL

Temperature	-30°C to 60°C (-22°F to 140°F)
Humidity	95% at 40°C (104°F) non-condensing

ELECTRICAL

Power Required	< 60 Watts
DC Power	12-36, +/- 36-72, 75-140
AC Power	90-260, 50/60 Hz

MECHANICAL

Dimensions	8.9 H(2U) x 43.8 W x 40.6 D cm
	3.5 H x 17.2 W x 16 D in
Weight	10.9 kg, 24 lbs
Cooling	Heat sinks (no fans)

AGENCY APPROVALS

Industry Canada and ENTELA

FCC Part 101: MPRS9

FCC Part 90: MPRS4, MPRS9 *(See footnote *** for approval status)*

CE, ETSI: MPRS4 *(See footnote for approval status)*

Ordering

MPRS	*	*	*	D	*	*	*	S	2	N	*	*	*	N	*	N	N	Descrprition
Band	9																	SD9| 820-960 MHz
	4																	SD4| 300-512 MHz
Sub-band		*																Please select the appropriate frequency band from the MPRS9 and MPRS4 tables above.
Redundancy			R															Redundant
			N															Non-Redundant
Duplexer Options					N	A												None
					N	O												None - wire for external duplexer
					N	S												None - wire for internal duplexer
					X	X												Internal duplexer - specify frequencies on order
Antenna and External Filter Wiring							1											Single Antenna Connection
							2											Separate Tx and Rx antenna connections
							3											Wire for External Filter, Rx Out, Rx In, Combined Out
Primary Power											1							12-36 VDC
											2							+/-36-72 VDC
											4							75-140 VDC
											3							90-260 VAC
Secondary Power												1						12-36 VDC
												2						+/-36-72 VDC
												4						75-140 VDC
												3						90-260 VAC
Regulatory													*					Please refer to the OLS for the latest available regulatory options.
SD Operating Mode															S			MS/SS Operation
															E			ES Operation

Footnotes

*   *Check with factory for availability of specific sub-bands.*

***   *Part 90 approval is pending.*

GE Digital Energy

175 Science Parkway
Rochester, NY 14620
+1 877-605-6777 (toll free in North America)
+1 678-844-6777 (direct number)

GEDigitalEnergy.com

imagination at work