Digital Energy
MDS

SD Series

Long Range IP/Ethernet & Serial
MDS SD2,™ MDS SD4,™ & MDS SD9™



Data Acquisition | Ethernet and Serial

The MDS SD Series are industrial wireless solutions that provide long distance communications over licensed radio bands, allowing users to interface to both Ethernet and serial controllers such as PLCs, RTUs and SCADA systems.

The SD radio is the latest generation of MDS licensed narrowband wireless devices and is compatible with previous generations, allowing for a smooth and controlled upgrade to existing systems. The SD models operate in licensed spectrum between 200 and 900 MHz.

Key Benefits

- Improved speed at 19.2 Kbps in 12.5 KHz channel
- Multiple serial and IP/Ethernet device connectivity on a single radio
- Full Ethernet Bridging to support TCP and UDP
- Easy migration path from serial to IP/Ethernet
- Backward integration with existing MDS x710 networks
- RoHS/WEEE compliant (lead-free construction)

Application Specific Wireless Solution



Oil & Gas

- Remote data collection from gas flow meters
- Monitor and transmit wellhead pressure and tank levels collected by RTUs



Energy

- Remote control of IED and PLC at distribution substations
- Condition monitoring for pole-top circuit breakers and capacitor banks



Water & Wastewater

- Monitor lift stations across multiple sites from control room



Heavy Industrial

- Activation of perimeter gates based on detection of vehicle
- Monitor and control remote pumps and compressors

Industrially Hardened

- Operational temperature range from –40°C to 70°C
- CSA Class I, Div. 2 groups A,B,C,D for Hazardous Locations
- IEEE1613 for electric substation environments

Application Flexibility

- Supports two serial ports and an IP/Ethernet port simultaneously
- Broad coverage flexibility over distances up to 50 miles
- Supports both Ethernet Bridging and dedicated serial to serial communications
- Low power consumption with sleep mode for solar and battery powered applications
- Fast-serial features with embedded serial to IP/Ethernet conversion

Reliable & Scalable

- Exclusive-use, non-shared licensed band operation
- Point-to-Multipoint, 2-way communication
- High receive sensitivity for long distance communications
- Compatible with multiple industry protocols including Modbus, Modbus TCP, and DNP3

Secure

- AES 128-bit data encryption
- Password protected access and lockdown

imagination at work

Long Range Communications

The MDS SD Series of industrial-strength data communications products offer secure, reliable, long distance transmission of data for your mission critical applications. The higher transmit power used by the SD to operate in the licensed 200 MHz (SD2), 400 MHz (SD4) and 900 MHz (SD9) frequencies, results in a wide area of coverage. The SD's exceptional receiver sensitivity allows for deployment in applications where obstructions, such as trees and buildings, would limit the effectiveness of other wireless devices. The combination of these features results in the ideal data acquisition product for error free, long distance communication.

IP/Ethernet and Serial Communications

SD Series are cost-effective solutions to wirelessly transport polled IP/Ethernet, and/or serial data from attached PLCs and RTUs, over long distances, to SCADA systems.

The SD optimizes the use of narrow radio channels and increases the throughput available for data traffic. This results in a higher usable data speed that benefits Ethernet SCADA applications.

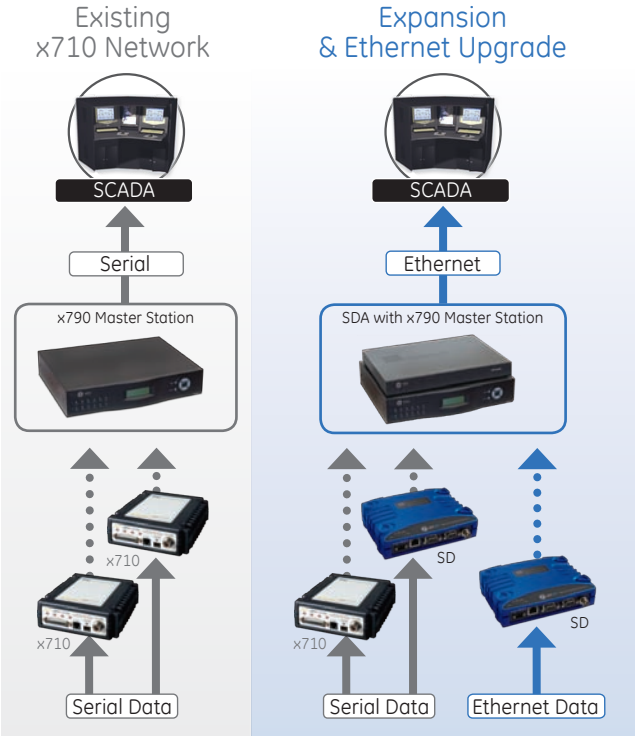
Low Power Consumption

The ability to power a remote wireless device using solar power not only makes the communication system more resistant to failure, but it also adds installation and application flexibility. SD is one of the lowest power consumption Ethernet radios available for long range SCADA applications allowing for solar powered operation.

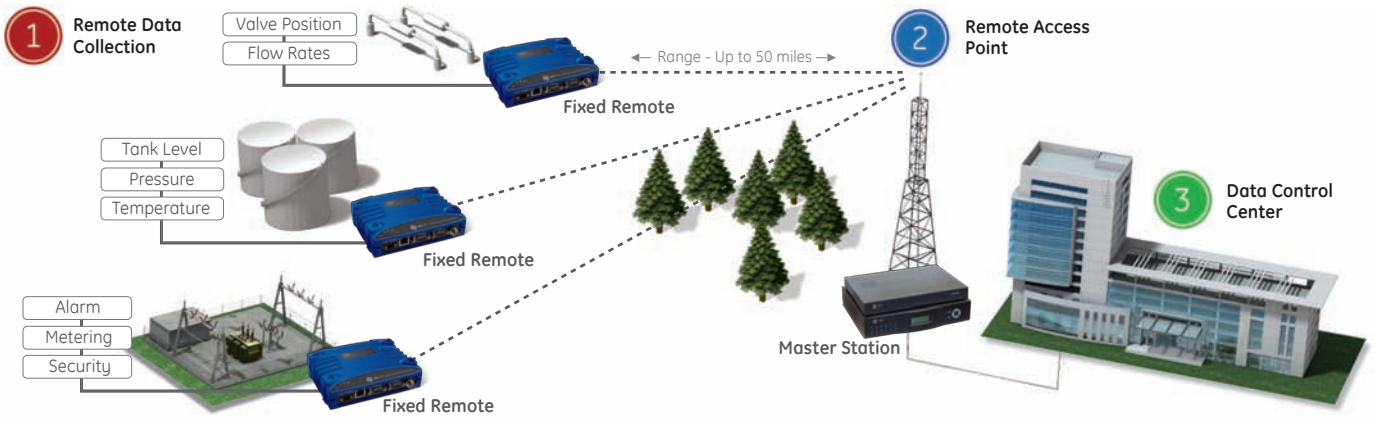
Additionally, sleep mode allows the SD to temporarily disable unused circuitry saving energy and reducing the size of the batteries needed to operate in a remote location, for longer periods of time, when direct sunlight is not available.

Backward Compatibility

MDS SD Series radios can be directly added to existing MDS x710 and x790 systems, providing both "drop-in" compatibility for expansions and replacements, and adding Ethernet support. Backward compatibility preserves your investment and allows a smooth transition from a serial based SCADA infrastructure to IP/Ethernet without disrupting day-to-day operations.



SD Series Application Advantages



Secure Communications

- Licensed 200 MHz, 400MHz, and 900 MHz is free from the potential interference in unlicensed bands
- AES 128-bit encryption to secure data and achieve regulatory compliance

Long Range Coverage

- Operation in licensed band uses a higher transmit power for greater coverage
- Exceptional receiver sensitivity maximizes operation in difficult links where foliage limits other wireless devices

Protocol Communications

- Supports multiple protocols including Modbus, Modbus TCP, DNP3
- Provides IP/Ethernet and serial communication to SCADA hosts, UDP, TCP Client and TCP Server
- Accommodates multiple protocols for diverse devices on the same radio system

Increased Reliability

The SD Series software-defined architecture maximizes durability. A single-board design and extended temperature range maximizes reliability and performance in the field. A wireless system built with SD digital radios will provide greater longevity and less maintenance issues over the lifetime of the system.

Narrowbanding

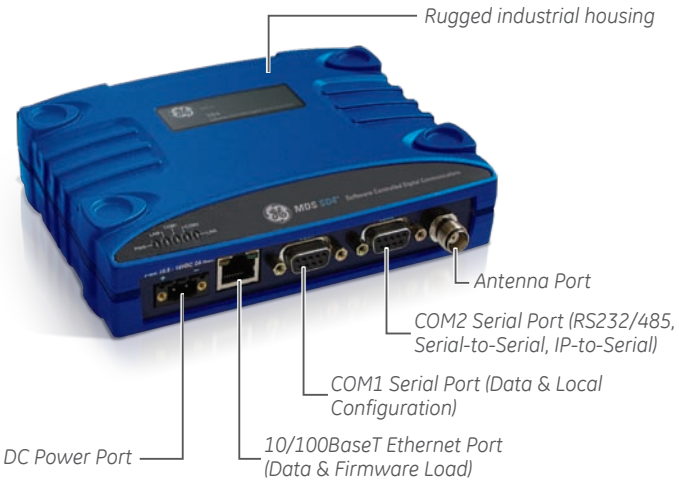
The SD Series achieves optimal throughput with configuration options for 6.25 kHz, 12.5 kHz, or 25 kHz, all on a single hardware platform. The ability to operate in 6.25 kHz channels is important preparation for the FCC mandate to use radio frequency between 150 and 512 MHz more efficiently starting in 2013. This process is also referred to as reframing.

SD Series Remote

The SD2 radio operates in the 200 MHz frequency band, SD4 operates in the 400 MHz frequency band, and the SD9 operates in the 900 MHz frequency band. Choose between remote models that support both Ethernet and serial, or only serial interface.

The SD Series handles concurrent Ethernet and serial traffic from multiple sources. Directly communicate to multiple PLCs using the built-in serial device server and modem-sharing device using industry-standard TCP or UDP protocols.

Every SD Series wireless device includes remote management capability and can be managed by MDS NETview or MDS InSite management systems.

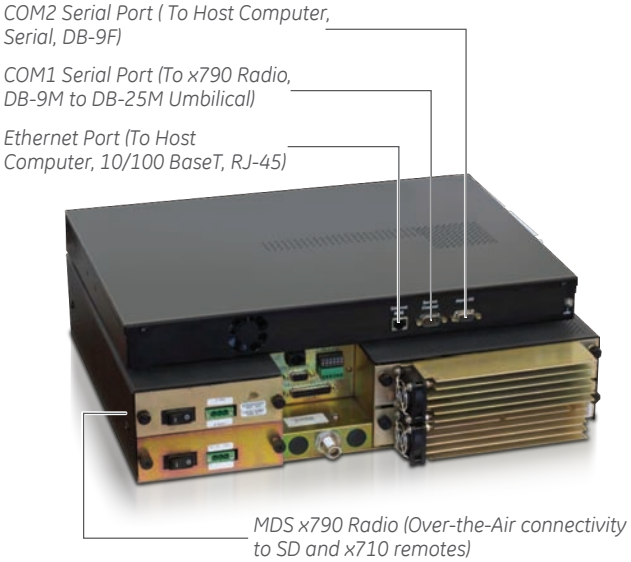


Master Station (Access Point) and Repeater Station

Mission-critical applications demand that no single point of failure can stop the communications system. In wireless applications the Master Station serves as the central hub to all remote radios. Installation of an SD adapter to an existing x790 Master Station adds direct Ethernet connectivity to an IP network, and adds advanced data encryption. The SDA Master Station with redundancy option increases the availability of a system with a warm-standby configuration. The standby radio activates automatically whenever a fault condition is detected by the active radio.

When used as a repeater station, the full-duplex capability of the x790 maximizes the speed of data traffic retransmissions, resulting in better system performance.





Specifications

GENERAL	
Frequency Programmability	Configurable
Operational modes	Simplex, half-duplex
Modulation	Digital / CPFSK
Range	Up to 50 miles
SD2	
RF data rate & bandwidth	3,200 bps @ 5 kHz 4,800 bps @ 6.25 kHz 9,600 & 19,200 bps @ 12.5 kHz 19,200 bps @ 25 kHz
Frequency bands	216 - 220 MHz 220 - 235 MHz
SD4	
RF data rate & bandwidth	4,800 bps @ 6.25 kHz 9,600 & 19,200 bps @ 12.5 kHz
Frequency bands	350 - 400 MHz 400 - 450 MHz 450 - 512 MHz
SD9	
RF data rate & bandwidth	9,600 & 19,200 bps @ 12.5 kHz 19,200 bps @ 25 kHz
Frequency bands	928-960 MHz

TRANSMITTER	
Frequency Stability	+/- 0.5 ppm
Carrier power	0.1 to 5 Watts Programmable
Carrier power Accuracy	Normal +/- 1.5 dB
Duty Cycle	Continuous
Output Impedance	50 Ohms
RECEIVER	
Type	Double Conversion Superheterodyne
Bit Error Rate	1x10-6 @ -112 dBm typical
Selectivity	>70dB
Adjacent Channel Rejection	40 dB nominal
INTERFACES	
Serial COM1	RS-232, DB-9
Serial COM2	RS-232, RS-485 DB-9
Ethernet	10/100 BaseT, RJ 45
Antenna	TNC Female
MANAGEMENT	
MDS InSite software	
MDS NetView software	
MDS Radio Configuration software	

ENVIRONMENTAL	
Temperature	-40°C to +70°C (-40°F to +158°F)
Humidity	95% at 40C (104°F) non-condensing
ELECTRICAL	
Tx Current	2.2A Typical at 5 Watts
Rx Current	<125 mA
Sleep mode	9 mA nominal
SD4	
Primary power	10.5 Vdc to 16 Vdc , 10-30 Vdc pending
SD2, SD9	
Primary power	10 Vdc to 30 Vdc
MECHANICAL	
Case	Rugged die-cast aluminum
Dimensions	1.5 H x 4.625 W x 6.5 D cm (0.6 H x 1.8 W x 2.6 D in)
Weight	0.55 kg (1.22 lbs)
AGENCY APPROVALS	
CSA Class 1 Div 2 for hazardous locations	
IEEE 1613 substation environment	
Industry Canada & ENTELA	
FCC Part 80: SD2, FCC Part 90: SD2, SD4, SD9	
FCC Part 101: SD9, CE, ETSI: SD4	
FCC Part 95: SD2	

Ordering

SD2 Remote

SD02MD	*	**	**-NNSNN**
Sub -band	A		216-220 MHz
	B		220-235 MHz
Model		SS	Serial
		ES	Ethernet and Serial
		MS	2710 Emulation

SD4 Remote

SD04MD-	*	**	**-NNSNN**
Sub -band	A		350-400 MHz
	B		400-450 MHz
	C		450-512 MHz
Model		SS	Serial
		ES	Ethernet and Serial
		MS	4710 Emulation

SD9 Remote

SD09MD-	*	**	**-NNSNN**
Sub -band	C		928-960 MHz
Model		SS	Serial
		ES	Ethernet and Serial
		MS	9710 Emulation

SD Adapter for x790 Series Master Stations

SDA-	*	**	
Modem	A		Pre-configured for 4790A or 9790A Master Station
	C		Pre-configured for 4790C Master Station
	E		Pre-configured for 4790E or 9790E Master Station
	M		Pre-configured for 4790M Master Station
Network		S	SD-only radio system
		X	x710 compatible system

Order Code Example
SD02MD-**ASS**-NNSNN
- Remote radio
- 216 - 220 MHz
- Serial only communication
- Standard mounting brackets
- No special assembly

Order Code Example
SD04MD-**CSS**-NNSNN
- Remote radio
- 450 - 512 MHz
- Serial only communication
- Standard mounting brackets
- No special assembly

Order Code Example
SD09MD-**CES**-NNSNN
- Remote radio
- Ethernet and Serial
- Standard mounting brackets
- No special assembly

Order Code Example
SDA-**AS**
- Adaptor for master station
- Pre-configured for 9600 bps
- Pre-configured for 12.5 kHz
- Ethernet communications

Accessories for the SD Series

Fixed Remote Kits with Yagi

KFR-S04-C1 (406-430 MHz)
KFR-S04-C2 (430-450 MHz)
KFR-S04-C3 (450-470 MHz)
KFR-S09-D1 (900 MHz)
KFR-S02-A (216-235 MHz)

View Accessories catalog at www.gemds.com

Visit www.GEMDS.com/SDSeries to:



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