Grid Solutions

MDS SD SERIES

Long Range IP/Ethernet & Serial SD1, SD2, SD4 & SD9

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 devices such PLCs, RTUs and meters with host monitoring and control systems.

The SD Series is the latest generation of MDS licensed narrowband wireless devices providing exceptional communication performance and reliability to meet demands for IP/Ethernet services as well as support for multiple devices and host systems. The SD is compatible with previous generations allowing for a smooth and controlled migration for existing systems. The SD Series radios are compatible with the MDS Master Station.

Key Benefits

- High speed, up to 65 Kbps in 50 KHz channel in SD2 and SD9
- Operate IP/Ethernet and serial communication on a single network
- Connect multiple host systems to a single Access Point radio
- Connect multiple devices to a single remote radio
- Implement push communication and report by exception from remote devices
- Simple, intuitive web based configuration and maintenance
- Easy migration path from serial to IP/Ethernet
- Backward compatible with existing MDS x710 networks
- Compatible with MDS Master Station

Application Specific Wireless Solution

Oil & Gas

- Remote data collection from meters and flow devices
- Monitor and transmit wellhead performance and status data collected by RTUs

Energy

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

Water & Wastewater

- Monitor lift stations across multiple sites from control room
- Communicate with remote PLCs controlling tank levels and water flow

Heavy Industrial

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

GE VERNOVA

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*, IEC 61850-3 and EN61000 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
- Extend Communication paths using single radio Store and Forward
- Supports Ethernet Bridging, IP to serial and serial to serial communications
- Low power consumption with sleep mode for solar and battery powered applications
- Fast-serial features with embedded terminal server functions for serial to IP/Ethernet encapsulation

Reliable & Scalable

- Exclusive, non-shared licensed band operation
- High performance Media Access Control for asynchronous polling and exception reporting
- Collision detection and avoidance insures data arrives at destination without lost messages
- 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
- VLAN data segregation

** Requires an external DC to DC converter having floating DC inputs (neither side grounded)*

Long Range Communications

The MDS SD Series of industrial-strength radios offer secure, reliable, long distance transmission of data for your mission critical applications. The SD Series combines 5 Watt transmit power and exceptional receive sensitivity to support wide coverage areas and maximum performance when difficult terrain or obstructions such as trees and buildings limit the effectiveness of other wireless devices. The SD Series operates in the 100 MHz (SD1), 200 MHz (SD2), 400 MHz (SD4) and 900 MHz (SD9) frequencies and allows users to select the channel size and modulation option best suited to their unique requirements. The combination of these features results in the ideal data acquisition product for error free, long distance communication.

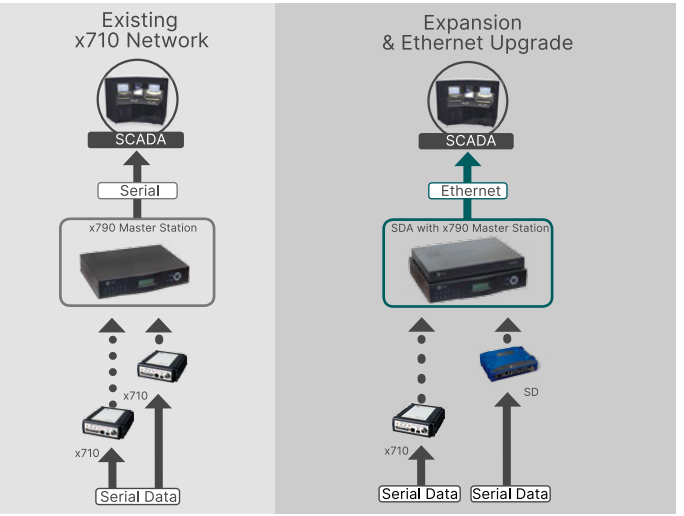
Exceptional Network Performance

The performance of a wireless network is more than a measurement of speed. It also includes the efficiency of the radio system in mediating over-the-air channel access. This is particularly important for operating IP/Ethernet in narrow licensed channel sizes. The SD Series implements several features designed to provide maximum performance. The SD's Media Access Control (MAC) is optimized to reduce Ethernet overhead and preserve bandwidth for higher usable data speed. The IP Payload feature removes unneeded Ethernet frames to shrink messages and improve throughput.

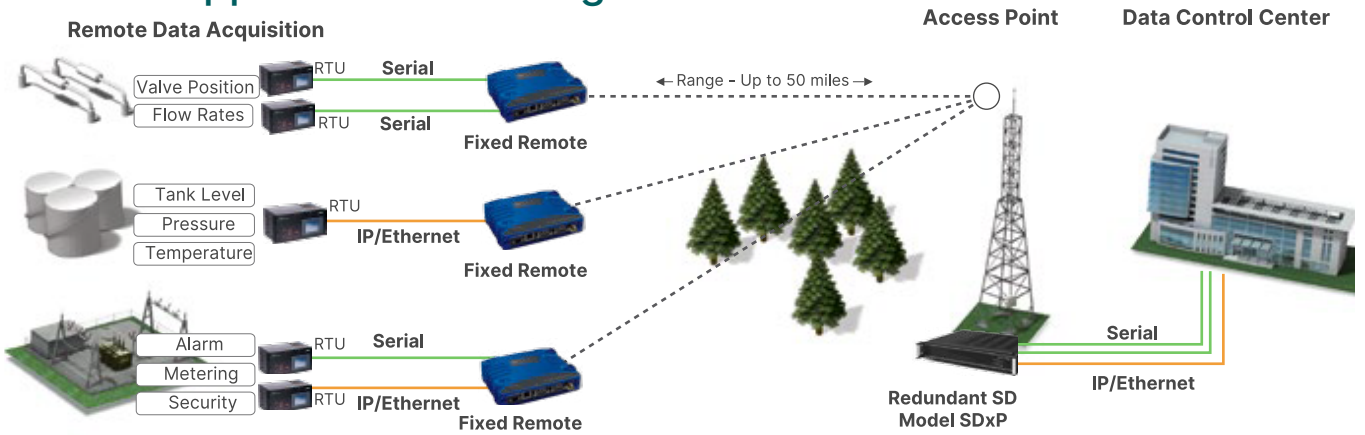
The SD Series automatically controls over-the-air communication between host systems and remote devices to insure that data collisions are detected and avoided. The result is exceptional performance for networks requiring connections to multiple host systems, multiple device types connected to a single remote radio, or a mix of Ethernet and serial devices. The SD also insures maximum reliability for systems implementing unsolicited communication and exception reporting from remote devices and RTUs, which is particularly important for non-polled protocols such as DNP3.

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



Unmatched Connectivity

- Connect multiple RTUs and controllers to a single remote radio
- Operate serial and Ethernet devices concurrently on the same network
- Implement exception reporting and pushed communication initiated by remote devices.

Highest Network Performance

- SD Media Access Control reduces network overhead, prevents data collisions and insures successful data delivery.
- High transmit power and exceptional receiver sensitivity maximizes performance over significant distances and challenging terrains

Flexible System Communications

- Provides IP/Ethernet and serial communication for multiple hosts and asynchronous polling
- Embedded terminal server functions support serial & Ethernet connections without adaptors.
- Secure AES 128 encryption for IP/Ethernet UDP, TCP Client and TCP Server and serial.

Low Power Consumption

The SD Series low power consumption and sleep mode make it ideal for applications requiring solar power operation. The SD Series requires less energy resulting in lower costs for solar panels and batteries.

Simple Intuitive Configuration

Use the web based SD Device Manager for easy configuration of all SD Series parameters including transmit and receive frequencies, channel size and modem speed. SD Device Manager is also used to access important performance and maintenance information.

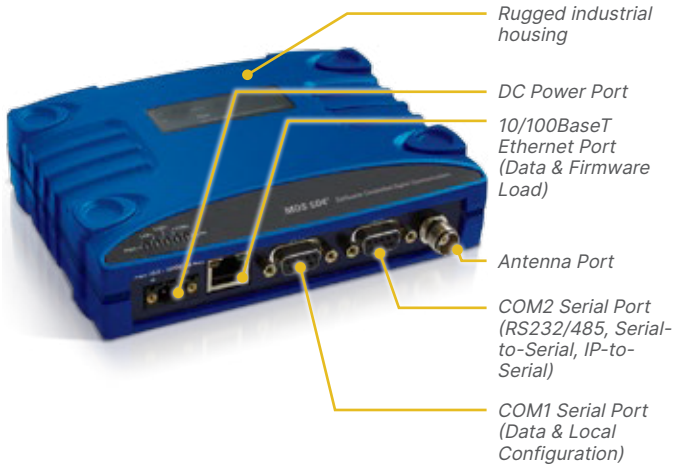
The SD Series supports 3 Virtual Radio Channels (VRC) that allow users to assign communication to specific serial ports or IP addresses and ports when multiple devices or systems are connected.

SD Series configuration and maintenance can also be performed using Telnet and HyperTerminal sessions.

SD Series Remote

The SD1 radio operates in the 100 MHz frequency band, SD2 operates in the 200 MHz frequency band, SD4 operates in the 300 MHz, 400 MHz and 500 MHz frequency bands and SD9 operates in the 800 MHz and 900 MHz frequency bands. Choose between models that support both Ethernet and serial, or only serial interface.

The SD Series handles concurrent Ethernet and serial traffic using built-in terminal server plus industry-standard TCP or UDP protocols.



SDxP Redundant/Protected Models

The SDxP is used when applications demand no single point of failure for the communications system. The MDS SDxP incorporates two MDS SD transceivers and power supplies with automatic or manual switchover capability. On detection of a failure, the MDS SDxP switches immediately to the standby transceiver. The switchover occurs for selectable transceiver alarm conditions. Switchover also occurs when no valid packets are received in a programmable time frame of 1 to 30 minutes, or upon loss of power to the operating radio. An internal back-up battery is provided in AC-powered models for continued operation during a loss of primary power.

SDA Adaptor for 4790/9790 Radios

The SDA adaptor is used with 4790 and 9790 Master Stations to add IP/Ethernet connectivity. The SDA can be ordered with new Master Stations or easily added to equipment already installed. Once connected to a 4790/9790, one (1) serial port and one (1) Ethernet port are available for connection to external systems or devices.

Comprehensive Network Management

Manage your SD network using MDS PulseNET NMS. PulseNET is purpose-built for industrial communications and includes sophisticated and meaningful pre-built workflows along with intuitive graphical representations of the network at your fingertips.

Specifications

SD1	
RF Data Rate & Channel Size	3,200 bps @ 6.25 kHz 9,600 & 19,200 bps @ 12.5 kHz 19,200 & 38,400 bps @ 25 kHz
Frequency bands	150-174 MHz

SD2	
RF Data Rate & Channel Size	3,200 bps @ 5 kHz 4,800 bps @ 6.25 kHz 9,600 & 19,200 bps @ 12.5 kHz 19,200 & 38,400 bps @ 25 kHz 65,000 bps @ 50 kHz (Band D)
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 19,200 & 38,400 bps @ 25 kHz
Frequency bands	300 - 360 MHz 350 - 400 MHz 400 - 450 MHz 450 - 512 MHz

SD9	
RF data rate & bandwidth	9,600 & 19,200 bps @ 12.5 kHz 19,200 & 38,400 bps @ 25 kHz 65,000 bps @ 50 Khz
Frequency bands	820-870 MHz 880-915 MHz 850-860/926-936 MHz 928-960 MHz

GENERAL	
Frequency	Configurable
Operational modes	Simplex, half-duplex
Modulation	Digital, CPFSK
Range	Up to 50 miles

TRANSMITTER	
Frequency Stability	+/- 0.5 ppm
Carrier power	0.1 to 5 Watts Programmable
Carrier power Accuracy	Normal +/- 1.5 dB
Duty Cycle Output	Continuous
Impedance	50 Ohms

RECEIVER	
Type	Double Conversion Superheterodyne
Sensitivity	-112 dBm typical @ 1×10^{-6} BER, -104 dBm (SD2 Band D) -100 dBm (SD9 Band D
Selectivity Adjacent Channel	>70dB
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 PulseNET NMS, MDS InSite software, MDS Radio Configuration Software

ENVIRONMENTAL	
Temperature	-40°C to +70°C (-40°F to +158°F)
Humidity	95% @ 40C (104°F) non-condensing

ELECTRICAL	
Tx Current	2.2A Typical at 5 Watts
Rx Current	<125 mA
Sleep mode	9 mA nominal
Primary power	10 Vdc to 30 Vdc

MECHANICAL	
Case	Rugged die-cast aluminum
Dimensions	1.5 H x 6.5 W x 4.625 D in (3.81 H x 16.51 W x 11.75 D cm)
Weight	0.55 kg (1.22 lbs)

AGENCY APPROVALS
CSA Class 1 Div 2 for hazardous locations IEEE 1613*, IEC 61850-3, EN61000 for electric substation environment Industry Canada & ENTELA FCC Part 90: SD1, SD2, SD4, SD9 FCC Part 80: SD2 FCC Part 95: SD2 FCC Part 101: SD9 CE, ETSI: SD1, SD4

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Ordering

SD1 Remote

SD01MD	*	**	-NNSNN	
Subband	B			150-174 MHz
Model		SS		Serial
		ES		Ethernet and Serial
		MS		9710 Emulation

SD2 Remote

SD02MD	*	**	-NNSNN	
Subband	A			216-220 MHz
	B			220-222 MHz
	C			220-235 MHz
	D			216-220 MHz/50 KHz Channel
Model		SS		Serial
		ES		Ethernet and Serial

SD4 Remote

SD04MD	*	**	-NNSNN	
Subband	A			350-400 MHz
	B			400-450 MHz
	C			450-512 MHz
	D			300-360 MHz
Model		SS		Serial
		ES		Ethernet and Serial
		MS		4710 Emulation

SD9 Remote

SD09MD	*	**	-NNSNN	
Subband	A			820-870 MHz
	C			928-960 MHz
	D			928-960 Mhz/50 Khz Channel
	E			880-915 MHz
	F			880-915 MHz / 50 kHz Channel
	G			850-860 / 926-936 MHz, Transmit Low
	H			850-860 / 926-936 MHz, Transmit High
Model		SS		Serial
		ES		Ethernet and Serial
		MS		9710 Emulation

Order Code Example
SD01MD-**BES**-NNSNN

- Remote radio
- 150 - 174 MHz
- Ethernet & serial communications
- Standard mounting brackets
- No special assembly

Order Code Example
SD02MD-**AES**-NNSNN

- Remote radio
- 216 - 220 MHz
- Ethernet & serial communications
- 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

For more information, visit
gevernova.com/grid-solutions

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