

# SD Series

Secure, Long Range IP/Ethernet  
MDS SD4™



## Data Acquisition | Ethernet and Serial

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

This software-controlled digital 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.

### Key Benefits

- Reliable connectivity to Ethernet devices
- Long-range communication of serial and IP/Ethernet data over licensed band radio
- Secure communications with AES-128 encryption
- Compatible with multiple industry-standard SCADA protocols including Modbus/TCP and DNP3
- Low-power consumption with sleep mode allowing for solar powered operation
- Lower integration, configuration, and support costs than multi-box solutions
- RoHS/WEEE compliant (Lead-free construction)

### Application Specific Wireless Solution



#### Oil & Gas

- Remote monitoring of pipeline flow and status signals
- 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/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
- IEEE-1613 for electric substation environments

## Application Flexibility

- Low-power consumption for solar powered applications
- Long range wireless communication - up to 50 miles for 400 MHz
- IP/Ethernet and serial functions operate simultaneously on the same network
- Fully compatible with previous generations of MDS radios

## Reliable & Scalable

- Exclusive-use, non-shared licensed band operation in 400 MHz
- Point-to-Multipoint, 2-way communication
- High receive sensitivity for noisy environments and long distances communications
- Compatible with multiple industry protocols including Modbus, Modbus/TCP, and DNP3

## Secure

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



## 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 400 MHz (SD4) frequency, 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.

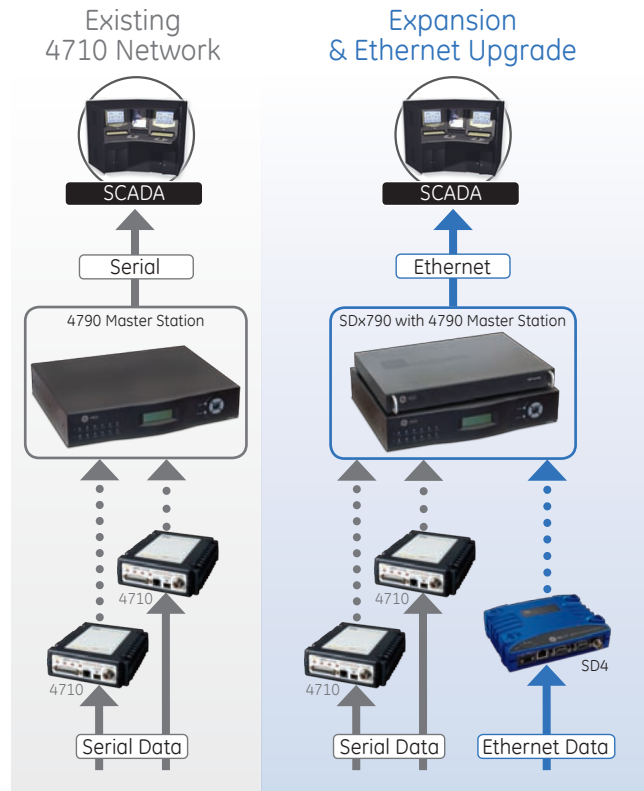
## Low Power Consumption

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. SD4 is one of the lowest power consumption Ethernet radios available for long-range SCADA applications allowing for solar powered operation.

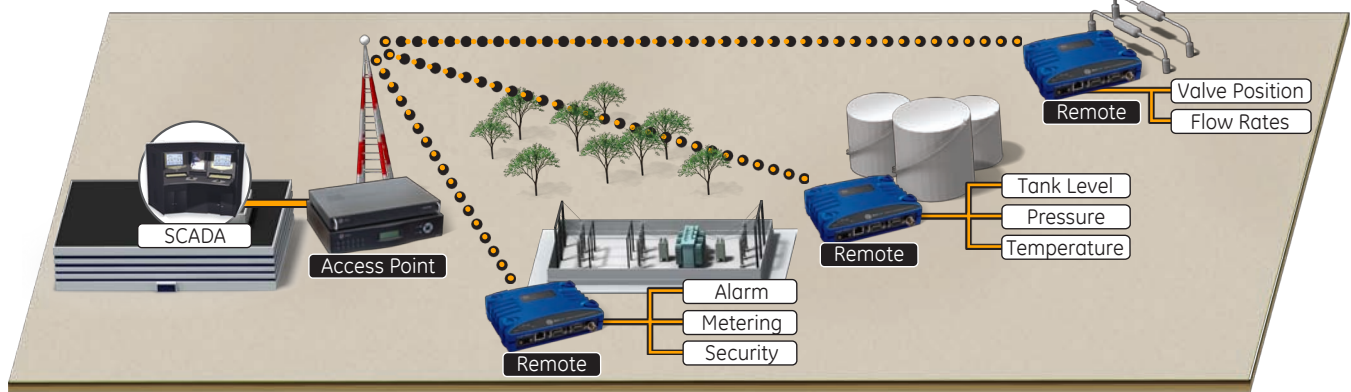
Additionally, sleep mode allows the SD4 to temporarily disable unused circuitry saving energy and reducing the size of the batteries needed to operate a remote location, for longer periods of time, when the sun is not shining.

## Backward Compatibility

SD4 radios can be directly added to existing MDS 4710 and 4790 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 400 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
- 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 SD4 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 6.25kHz, 12.5kHz, or 25kHz, all on a single hardware platform. The ability to operate in 6.25kHz 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 referred to as rebanding.

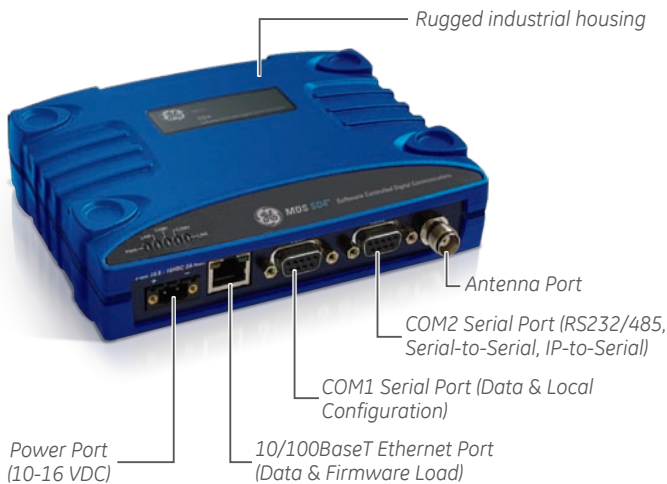
### SD Series Remote

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

The SD Series handles concurrent serial and Ethernet 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.

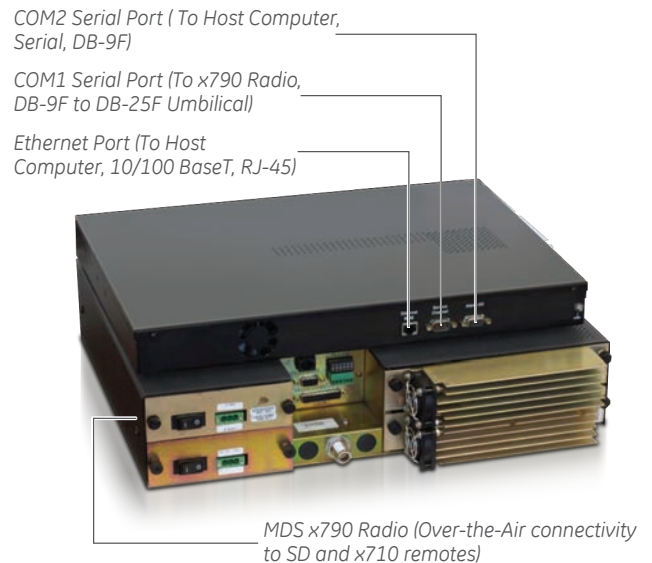
An SD Series remote radio can be used as an Access Point.



### 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. The SD4790 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. Installation of an SD adaptor to an existing 4790 Master Station adds direct Ethernet connectivity to an IP network, and adds advanced data encryption.

When used as a repeater station, the full-duplex capability of the 4790 maximizes the speed of data traffic retransmissions, resulting in better system performance.



## Specifications

### GENERAL

|                   |                      |
|-------------------|----------------------|
| Freq.             |                      |
| Programmability   | Configurable         |
| Operational modes | Simplex, half-duplex |
| Modulation        | Digital / CPFSK      |

### SD4

|                          |  |
|--------------------------|--|
| RF data rate & bandwidth | 4800 bps @ 6.25 kHz<br>9600 bps @ 12.5 kHz<br>19200 bps @ 25 kHz |
| Frequency bands          | 350 - 400 MHz<br>400 - 450 MHz<br>450 - 512 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 <sup>-6</sup> @ -112 dBm typical |
| Frequency Stability        | +/- 0.5 ppm                           |
| 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

|               |                                   |
|---------------|-----------------------------------|
| Primary power | (10.5 to 16 Vdc) 13.8 Vdc nominal |
| Tx Current    | 2A Typical at 5 Watts             |
| Rx Current    | <125 mA                           |
| Sleep mode    | 9 mA nominal                      |

### MECHANICAL

|            |   |
|------------|---|
| Case       | Rugged die cast aluminum  |
| Dimensions | 5.08 H x 14.29 W x 18.4 D cm.<br>(2.0 H x 5.625 W x 7.25 D in.) |
| Weight     | 1 kg (2.2 lb.)  |

### AGENCY APPROVALS

|  |
|--|
| CSA Class 1 Div 2 for Hz Loc                                 |
| IEEE 1613 substation environment                             |
| FCC Part 90  |
| Industry Canada & ENTELA                                     |
| SD4: ETSI, EMC, CE MARK (ETSI: ETS 300 113, EMC: EN 300 279) |

## Ordering

### SD4 Remote

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

#### Order Code Example

SD04MD-CSS-NNSNN

- Remote Radio
- Serial Only Communication
- Standard mounting brackets
- No special assembly

### SD Adapter for x790 Series Master Stations

|             |   |
|-------------|---|
| <b>SDA-</b> | <b>*</b>                                  |
| Modem       | A Pre-configured for x790A Master Station |
|             | C Pre-configured for x790C Master Station |
|             | E Pre-configured for x790E Master Station |
|             | M Pre-configured for x790M Master Station |

#### Order Code Example

SDA-A

- Adaptor for Master Station
- 9600 bps
- 12.5 kHz
- Ethernet Communications

### Accessories for the SD Series

|                                  |            |
|----------------------------------|------------|
| <b>Antenna Kit</b> (incl. cable) | KFR-N09-D1 |
| <b>Power Supply</b> (AC Input)   | 01-3682A02 |

View Accessories catalog at [www.gemds.com](http://www.gemds.com)

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