



1-WATT 900 MHZ  
RF MODEMS



# DIGI XBEE® SX RF MODEMS

1-Watt 900 MHz RF modem features best-in-class range and power consumption for mission-critical wireless cable replacement

Digi XBee SX 1-Watt 900 MHz RF modems provide a combination reliability and redundancy for integrators building low-power, mission-critical wireless systems. With interface options including RS232/485 or Digital/Analog I/O, these modems utilize the DigiMesh® wireless networking protocol, with redundant mesh network operation and support for low-power sleeping nodes.

Customers that don't require mesh network architecture can configure the modem to operate in simple point to multipoint mode. With ideal RF line-of-sight range estimated up to 65 miles and strong interference blocking, these modems are ideal for

applications requiring a reliable, redundant wireless cable replacement over longer ranges.

The Digi XBee SX modems can be configured easily via the USB port, using Digi's free XCTU software. They are pre-certified for use in multiple countries and provide secure, reliable delivery of critical data between devices with 256-bit AES encryption.

## BENEFITS

- Adjustable output power up to 1-Watt achieves up to 65 mile range with high gain antenna
- Interfaces options include RS-232, RS-485, USB, Analog I/O and Digital I/O
- DigiMesh networking topology for redundancy and reliability
- 256-bit AES encryption for secure data communications
- Rugged metal enclosure and -40° C to +85° C operating temperature for industrial applications
- Fully certified for use in free, unlicensed 900 MHz band

## RELATED PRODUCTS



Digi XBee®  
SX Modules



XTend® PKG



Digi XBee®  
Gateways

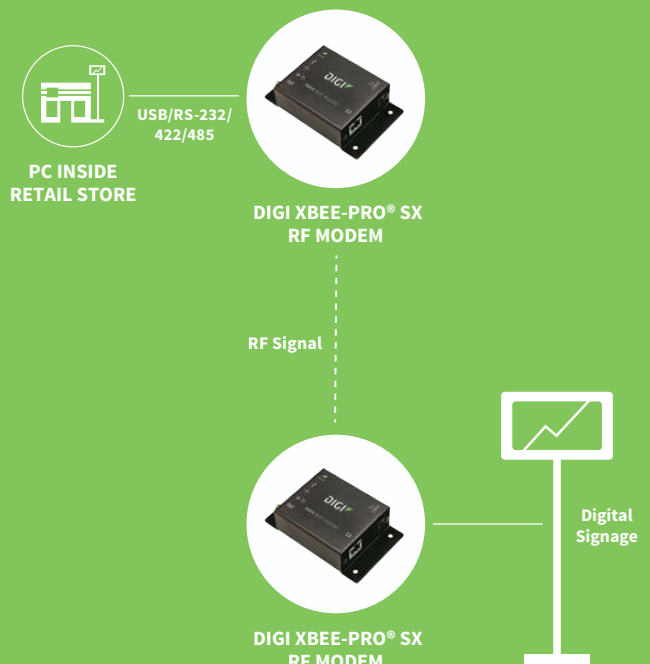


ConnectPort®  
X2



Digi XLR PRO®

## APPLICATION EXAMPLE



## SPECIFICATIONS

## Digi XBee® SX Modem

## PERFORMANCE

|                                    |                                                                                                                                                            |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INDOOR/URBAN RANGE                 | Up to 18 km (11 mi)* at low data rate                                                                                                                      |
| OUTDOOR/RF LINE-OF-SIGHT RANGE     | Up to 105 km (65 mi)** at low data rate                                                                                                                    |
| TRANSMIT POWER                     | Up to 30 dBm software selectable                                                                                                                           |
| RF DATA RATE (SOFTWARE SELECTABLE) | Low data rate: 10 kbps; Middle data rate: 110 kbps; High data rate: 250 kbps                                                                               |
| RECEIVER SENSITIVITY               | Low data rate: -113 dBm; Middle data rate: -106 dBm; High data rate: -103 dBm                                                                              |
| RECEIVER IF SELECTIVITY            | Low data rate: 40 dB @ 250 kHz; 50 dB @ 500 kHz<br>Middle data rate: 30 dB @ 250 kHz; 40 dB @ 500 kHz<br>High data rate: 30 dB @ 500 kHz; 45 dB @ 1000 kHz |
| RECEIVER RF SELECTIVITY            | Below 900 MHz and above 930 MHz: >50 dB                                                                                                                    |

## NETWORK AND SECURITY

|                              |                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------|
| FREQUENCY RANGE              | ISM 902 MHz to 928 MHz                                                                     |
| SPREAD SPECTRUM              | Frequency hopping                                                                          |
| SUPPORTED NETWORK TOPOLOGIES | Mesh, Point-to-point, Point-to-multipoint, Peer-to-peer                                    |
| MODULATION                   | Gaussian Frequency Shift Keying (GFSK)                                                     |
| ENCRYPTION                   | Optional 254-bit Advanced Encryption Standard (AES) cipher block chaining (CBC) Encryption |

## ANTENNA

|                             |                        |
|-----------------------------|------------------------|
| CONNECTOR                   | RPSMA                  |
| ANTENNA IMPEDANCE           | 50 $\Omega$ unbalanced |
| INPUT LEVEL AT ANTENNA PORT | Maximum 6 dBm          |

## POWER REQUIREMENTS

|                        |               |
|------------------------|---------------|
| SUPPLY VOLTAGE RANGE   | 7-30 VDC      |
| TYPICAL SUPPLY VOLTAGE | 12 V          |
| RECEIVE CURRENT        | 20 mA (@12V)  |
| TRANSMIT CURRENT       | 300 mA (@12V) |
| SLEEP CURRENT          | 5 mA (@12V)   |

## PHYSICAL PROPERTIES

|                       |                                                                                                                            |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------|
| SIZE                  | 4.5 in x 2.75 in x 1.125 in (11.4 cm x 7 cm x 2.9 cm)                                                                      |
| WEIGHT                | 5 oz (142 g)                                                                                                               |
| DATA CONNECTION       | Female RJ-45 (RS232/485), 10-pin screw terminal (4 digital, 4 analog, GND, 12 VDC output), USB mini-B (configuration port) |
| OPERATING TEMPERATURE | -40° C to +85° C (Industrial)                                                                                              |

## REGULATORY APPROVALS

|                    |             |
|--------------------|-------------|
| FCC (U.S.A)        | MCQ-XBPSX   |
| IC (CANADA)        | 1846A-XBPSX |
| C-TICK (AUSTRALIA) | RCM         |
| ROHS               | Compliant   |

\* We estimate rural ranges based on a 14.5 km (9 mi) range test with dipole antennas.

\*\*Range estimated assuming that the urban noise floor is approximately 15 dB higher than rural. The actual range depends on the setup and level of interference in your location.

## SPECIFICATIONS

## Digi XBee® SX Modem

## ANALOG INPUTS

|                                |                                                                                                                                |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>ABSOLUTE VOLTAGE RATING</b> | Maximum: 11 V; Minimum: -.05 V (each pin)                                                                                      |
| <b>OPERATING INPUT RANGE</b>   | Single-ended voltage mode: 0 - 10 VDC<br>Current loop mode: 4 - 20 mA<br>Differential voltage mode: $\pm 4$ VCD                |
| <b>INPUT IMEDANCE</b>          | Single-ended voltage mode: 13300 $\Omega$<br>Current loop mode: 120 $\Omega$<br>Differential voltage mode: $\sim 1$ M $\Omega$ |
| <b>RESOLUTION</b>              | 10 bits                                                                                                                        |
| <b>ACCURACY</b>                | .5% at 25° C                                                                                                                   |

## DIGITAL INPUTS

|                                           |                                           |
|-------------------------------------------|-------------------------------------------|
| <b>INPUT TYPE</b>                         | Non-inverting Schmitt trigger gate        |
| <b>POSITIVE-GOING SWITCHING THRESHOLD</b> | 2.5 V                                     |
| <b>NEGATIVE-GOING SWITCHING THRESHOLD</b> | 1 V                                       |
| <b>ABSOLUTE VOLTAGE RATING</b>            | Maximum: 31 V; Minimum: -.05 V (each pin) |
| <b>INPUT IMEDANCE</b>                     | $\sim 1$ M $\Omega$                       |

## DIGITAL OUTPUTS

|                               |                                      |
|-------------------------------|--------------------------------------|
| <b>OUTPUT TYPE</b>            | Open collector sinking driver        |
| <b>MAXIMUM SINK CURRENT</b>   | 200 mA                               |
| <b>MAXIMUM SUPPLY VOLTAGE</b> | 31 V (for external pull-up resistor) |
| <b>RESISTOR PULL-UPS</b>      | 10 k $\Omega$ pulled up to 3.3 VDC   |

## PART NUMBERS

## DESCRIPTION

|            |                                         |
|------------|-----------------------------------------|
| XM-X9-3P-U | XBee SX Modem, RS232/485, North America |
| XM-X9-5P-U | XBee SX Modem, AIO/DIO, North America   |

FOR MORE INFORMATION  
PLEASE VISIT [WWW.DIGI.COM](http://WWW.DIGI.COM)

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#### Как с нами связаться

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