



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

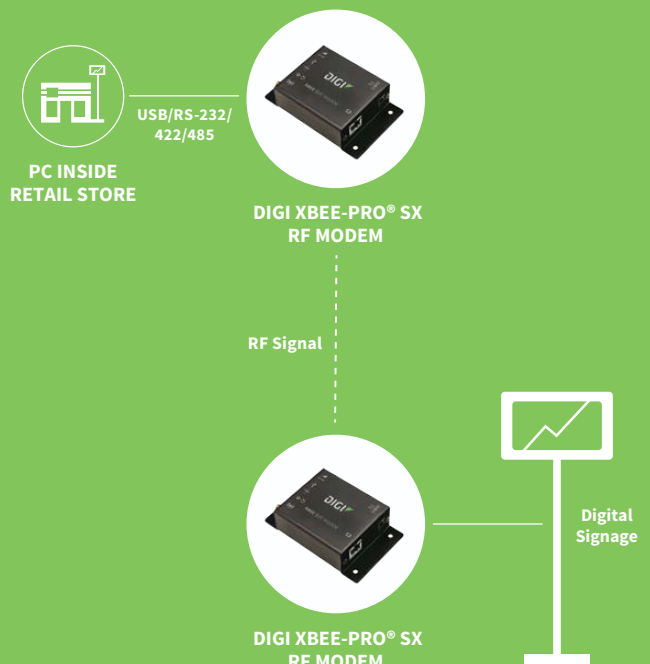


ConnectPort®  
X2



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 Middle data rate: 30 dB @ 250 kHz; 40 dB @ 500 kHz 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 Current loop mode: 4 - 20 mA Differential voltage mode: $\pm 4$ VCD
<b>INPUT IMPEDANCE</b>	Single-ended voltage mode: 13300 $\Omega$ Current loop mode: 120 $\Omega$ 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 IMPEDANCE</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

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