

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

## APPLICATION EXAMPLE



PC INSIDE  
RETAIL STORE

USB/RS-232/  
422/485



DIGI XBEE-PRO® SX  
RF MODEM

RF Signal



DIGI XBEE-PRO® SX  
RF MODEM



Digital  
Signage

## RELATED PRODUCTS



Digi XBee®  
SX Modules



XTend® PKG



Digi XBee®  
Gateways



ConnectPort®  
X2



Digi XLR PRO®

## 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 256-bit Advanced Encryption Standard (AES) cipher block chaining (CBC) Encryption

## ANTENNA

CONNECTOR	RPSMA
ANTENNA IMPEDANCE	50 Ω 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

UNITED STATES	FCC ID: MCQ-XBPSX
CANADA	IC: 1846A-XBPSX
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.

\*\*\* Range figure estimates are based on free-air terrain with limited sources of interference. Actual range will vary based on transmitting power, orientation of transmitter and receiver, height of transmitting antenna, height of receiving antenna, weather conditions, interference sources in the area, and terrain between receiver and transmitter, including indoor and outdoor structures such as walls, trees, buildings, hills, and mountains.

## 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: ± 4 VCD
<b>INPUT IMPEDANCE</b>	Single-ended voltage mode: 13300 Ω Current loop mode: 120 Ω Differential voltage mode: ~1 MΩ
<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>	~1 MΩ

## 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 kΩ pulled up to 3.3 VDC

## PART NUMBERS

## DESCRIPTION

<b>XM-X9-3P-U</b>	Digi XBee SX Modem, RS232/485, North America, No Accessories or Power Supply Included
<b>XM-X9-5P-U</b>	Digi XBee SX Modem, AIO/DIO, North America, No Accessories or Power Supply Included
<b>7600098</b>	Digi XBee SX Modem Accessories - 12V Power Supply, USB Cbl, RJ45 Cable, 900MHz Articulating Antenna