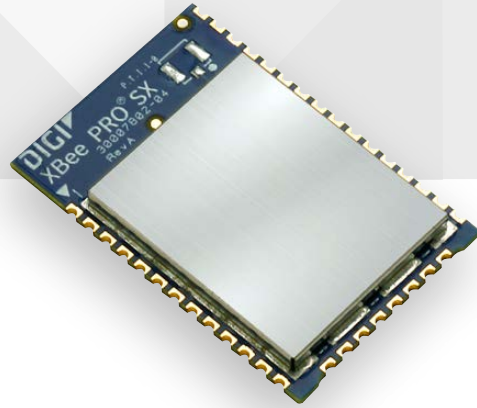# DIGI XBEE®
SX MODULES

900 MHz OEM RF modules pack maximum power, security and flexibility into the Digi XBee SMT footprint for mission-critical wireless designs

Digi XBee SX 900 MHz RF modules are the "muscle modules" of the Digi XBee ecosystem, providing a combination of reliability and redundancy for OEMs building low-power, mission-critical wireless devices. They utilize the DigiMesh® networking protocol, featuring redundant mesh network operation and support for low-power sleeping nodes. Customers that don't require mesh network architecture can configure the Digi XBee SX to operate in simple point to multipoint mode.

With RF line-of-sight ranges up to 65 miles and strong interference blocking, these modules are ideal for applications requiring the combination of range, data redundancy and data reliability.

The Digi XBee SX modules can be configured easily using Digi's free XCTU software or via Digi's simplified AT or API command sets. They are pre-certified for use in multiple countries and include integrated antennas, removing the burden of RF development/support costs and enabling fast time to market for OEM designs. The modules provide secure, reliable delivery of critical data between devices with 256-bit AES encryption, and the small Digi XBee surface-mount form factor saves valuable board space.

BENEFITS

– Family includes powerful 1-Watt 900 MHz Digi XBee-PRO SX and battery-optimized 20 mW Digi XBee SX modules for mission-critical OEM designs
– DigiMesh networking topology for redundancy and reliability
– 256-bit AES encryption for secure data communications
– Digi XBee SMT form factor saves valuable PCB space
– Fully certified for use in unlicensed 900 MHz band

APPLICATION EXAMPLE

MONITORING AND CONTROL APPLICATION

OEM CONTROLLER

DIGI XBEE® SX MODULE

Sign

Runway Lights

Barricade Lights

AIRFIELD LIGHTING

RELATED PRODUCTS

Modules

Development Kits

Modems

XCTU

Digi Remote Manager®
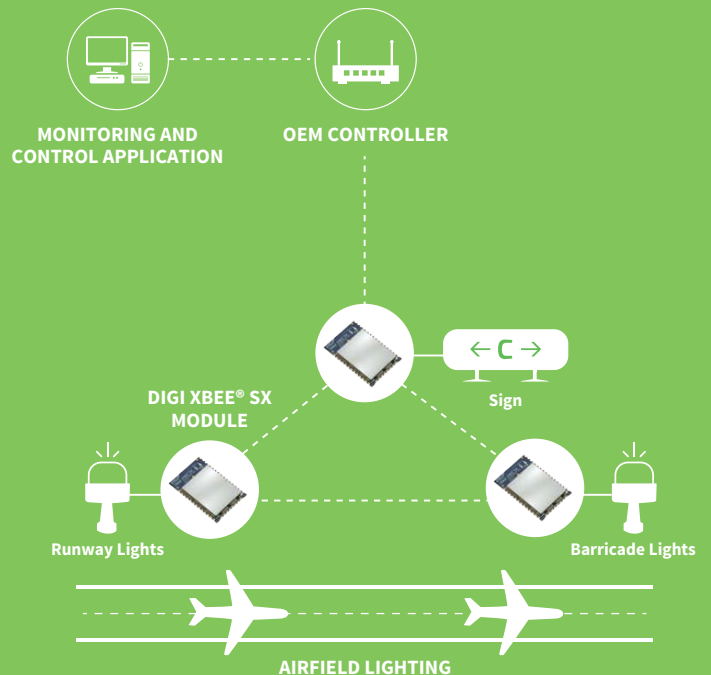
SPECIFICATIONS	Digi XBee® SX Module	Digi XBee-PRO® SX Module
PERFORMANCE		
FREQUENCY RANGE	ISM 902 to 928 MHz	ISM 902 to 928 MHz
TRANSMIT POWER (SOFTWARE SELECTABLE)	Up to 13 dBm	Up to 30 dBm*
CHANNELS	10 hopping sequences share 50 frequencies	10 hopping sequences share 50 frequencies
RF DATA RATE	Low data rate: 10 kb/s; Middle data rate: 110 kb/s; High data rate: 250 kb/s	
MAXIMUM DATA THROUGHPUT	High data rate: 120 kb/s	High data rate: 120 kb/s
AVAILABLE CHANNEL FREQUENCIES	Low and middle data rate: 101**; High data rate: 50	Low and middle data rate: 101**; High data rate: 50
RECEIVER SENSITIVITY	Low data rate: -113 dBm; Middle data rate: -106 dBm; High data rate: -103 dBm	
RECEIVER IF SELECTIVITY	Low data rate, +/- 250 kHz: 40 dB; Low data rate, +/- 500 kHz: 50 dB Middle data rate, +/- 250 kHz: 30 dB; Middle data rate, +/- 500 kHz: 40 dB High data rate, +/- 500 kHz: 30 dB; High data rate, +/- 1000 kHz: 45 dB	
RECEIVER RF SELECTIVITY	Below 900 MHz and above 930 MHz; > 50 dB	Below 900 MHz and above 930 MHz; > 50 dB
RURAL RANGE LINE OF SIGHT***	Low data rate: Up to 14.5 km (9 mi)	Low data rate: Up to 105 km (65 mi)
URBAN RANGE LINE OF SIGHT****	Low data rate: Up to 2.5 km (1.5 mi)	Low data rate: Up to 18 km (11 mi)
INDOOR RANGE	Low data rate: Up to 100 m (330 feet)	Low data rate: Up to 300 m (1,000 feet)
NETWORKING AND SECURITY		
MODULATION	Gaussian Frequency Shift Keying	Gaussian Frequency Shift Keying
SPREADING TECHNOLOGY	Frequency Hopping Spread Spectrum (FHSS)	Frequency Hopping Spread Spectrum (FHSS)
SUPPORTED NETWORK TOPOLOGIES (SOFTWARE SELECTABLE)	Peer-to-peer (master/slave relationship not required), point-to-point/point-to-multipoint, mesh	
ENCRYPTION	Optional 256-bit AES CBC encryption. Encryption is enabled with the ATKY command.	
GENERAL		
DIMENSIONS	3.38 x 2.21 x 1.29 cm (1.33 x 0.87 x 0.12 in)	3.38 x 2.21 x 1.29 cm (1.33 x 0.87 x 0.12 in)
WEIGHT	3 g	3 g
ROHS	Compliant	Compliant
MANUFACTURING	ISO 9001:2000 registered standards	ISO 9001:2000 registered standards
HOST INTERFACE CONNECTOR	37 castellated SMT pads	37 castellated SMT pads
ANTENNA CONNECTOR OPTIONS	U.FL or RF pad	U.FL or RF pad
ANTENNA IMPEDANCE	50 ohms unbalanced	50 ohms unbalanced
MAXIMUM INPUT RF LEVEL AT ANTENNA PORT	6 dBm	6 dBm
OPERATING TEMPERATURE	-40° C to 85° C	-40° C to 85° C
POWER REQUIREMENTS		
SUPPLY VOLTAGE		2.4 to 3.6 VDC, 3.3 V typical	2.6 to 3.6 VDC, 3.3 V typical
RECEIVE CURRENT	VCC = 3.3 V	40 mA	40 mA
TRANSMIT CURRENT	VCC = 3.3 V	55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm	900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBm
SLEEP CURRENT	VCC = 3.3 V	2.5 uA	2.5 uA
REGULATORY APPROVALS		
UNITED STATES	FCC ID: MCQ-XBSX	FCC ID: MCQ-XBPSX
CANADA	IC: 1846A-XBSX	IC: 1846A-XBPSX
AUSTRALIA	RCM	RCM
NEW ZEALAND	RSM	–
BRAZIL	Anatel	–

* 30 dBm typical at 3.3 V and above. Maximum power will decrease at lower voltages.

** The device hops on 50 channels selected, using the CM command, from 101 available frequencies.

*** 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 Digi level of interference in your location.

PART NUMBERS	DESCRIPTION
KITS	
XK9X-DMS-0	Digi XBee SX RF Module Dev Kit, US/CA
XK9X-DMS-1	Digi XBee SX RF Module Dev Kit, Brazil
XK9X-DMS-2	Digi XBee SX RF Module Dev Kit, Australia
Digi XBee-PRO SX Modules (1-Watt)	
XBP9X-DMRS-001	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, RF Pad, North America
XBP9X-DMUS-001	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, U.FL, North America
XBP9X-DMRS-021	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, RF Pad, Australia
XBP9X-DMUS-021	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, U.FL, Australia
XBP9X-DMRS-011	Digi XBee-PRO SX, 1W, DigiMesh, SMT, RF Pad, Brazil
XBP9X-DMUS-011	Digi XBee-PRO SX, 1W, DigiMesh, SMT, U.FL, Brazil
Digi XBee SX Modules (20 mW)	
XB9X-DMRS-001	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, RF Pad, North America
XB9X-DMUS-001	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, U.FL, North America
XB9X-DMRS-021	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, RF Pad, Australia
XB9X-DMUS-021	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, U.FL, Australia
XB9X-DMRS-031	Digi XBee SX, 20mW, DigiMesh, Point to Multipoint, SMT, RFPAD, New Zealand
XB9X-DMUS-031	Digi XBee SX, 20mW, DigiMesh, Point to Multipoint, SMT, U.FL, New Zealand
XB9X-DMRS-011	Digi XBee SX, 20 mW, DigiMesh, SMT, RF Pad, Brazil
XB9X-DMUS-011	Digi XBee SX, 20 mW, DigiMesh, SMT, U.FL, Brazil