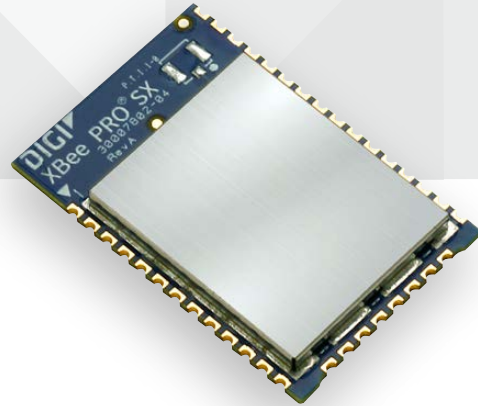# DIGI XBEE®
# SX MODULES

## 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®
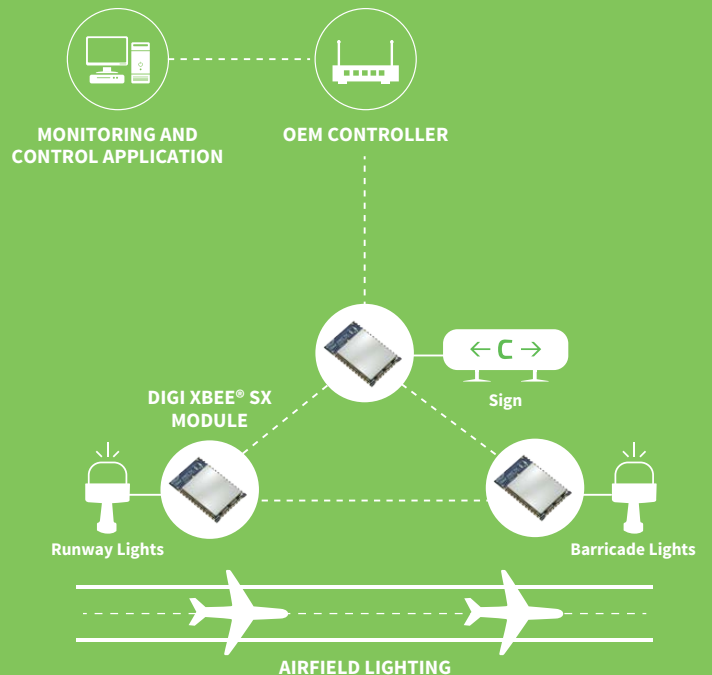
| SPECIFICATIONS | Digi XBee® SX Module | Digi XBee-PRO® SX Module |
|---|---|---|
| **PERFORMANCE** | | |
| **FREQUENCY RANGE** | ISM 902 to 928 MHz | ISM 902 to 928 MHz |
| **TRANSMIT POWER (SOFTWARE SELECTABLE)** | Up to 13 dBm | Up to 30 dBm* |
| **CHANNELS** | 10 hopping sequences share 50 frequencies | 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<br>Middle data rate, +/- 250 kHz: 30 dB; Middle data rate, +/- 500 kHz: 40 dB<br>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** | | |

| | | Digi XBee® SX Module | Digi XBee-PRO® SX Module |
|---|---|---|---|
| **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 | Digi XBee® SX Module | Digi XBee-PRO® SX Module |
|---|---|---|
| **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 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.

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| 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 |

# FOR MORE INFORMATION
# PLEASE VISIT WWW.DIGI.COM

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