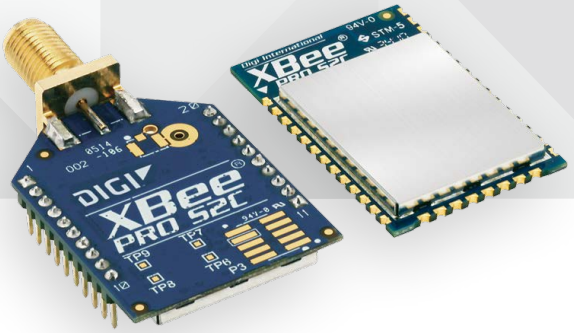
MESH NETWORKING
EMBEDDED RF
MODULES FOR OEMS



DIGI XBEE®
S2C DIGIMESH® 2.4

Embedded RF modules deliver wireless connectivity using the innovative and easy-to-deploy DigiMesh protocol

Digi XBee DigiMesh S2C 2.4 embedded RF modules provide wireless connectivity to electronic devices using a globally deployable 2.4 GHz transceiver. These modules use the DigiMesh networking protocol. This innovative, peer-to-peer mesh network offers users added network stability through self-healing, dense network operation, extending the operational life of battery dependent networks.

Digi XBee modules are ideal for low-power applications. Digi XBee-PRO modules are power-amplified versions of Digi XBee modules for extended-range applications. Products in the Digi XBee family are easy to use, share a common hardware footprint, and are fully interoperable with other Digi XBee products utilizing the same technology. They are available in a variety of different protocols to suit different applications, enabling users to substitute one Digi XBee module for another with minimal development time and risk.

The updated Digi XBee S2C DigiMesh module is built with the SiliconLabs EM357 SoC and offers improved power consumption, support for over-the-air firmware updates, and provides an upgrade path to IEEE 802.15.4 or ZigBee® mesh protocols if desired.

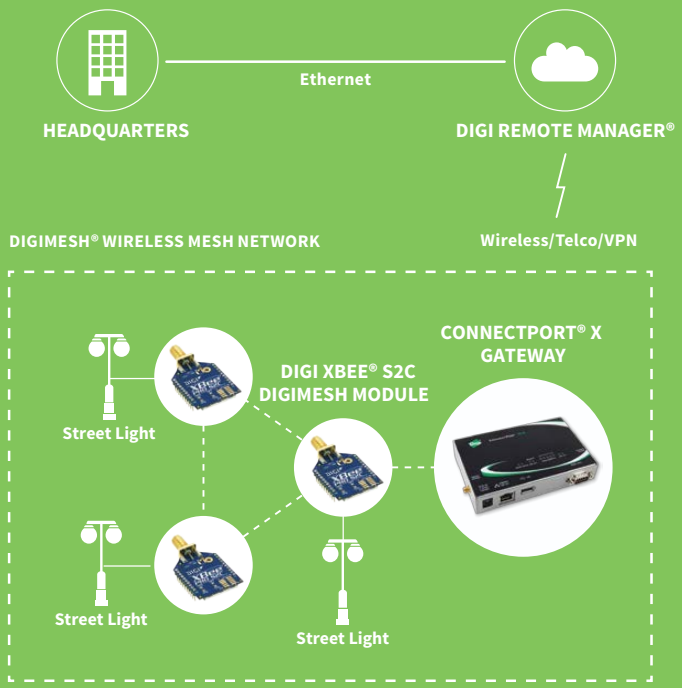
BENEFITS

- No configuration needed for out-of-the-box RF communications
- Common Digi XBee footprint for a variety of RF modules
- Simple topology to deploy and grow
- 2.4 GHz for worldwide deployment
- Low-power Digi XBee or extended-range XBee-PRO (pin/over-the-air compatible)
- Multiple antenna options
- Outdoor RF line-of-sight range up to 2 miles (3.2 km)* with high-gain antennas
- DigiMesh peer-to-peer mesh networking protocol
  - Supports self-healing and discovery for network stability

RELATED PRODUCTS

Gateways | Modules | Adapters | Network Extenders | Development Kits

APPLICATION EXAMPLE



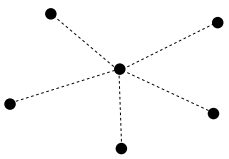
SPECIFICATIONS	Digi XBee® S2C DigiMesh® 2.4	DigiXBee-PRO® S2C DigiMesh® 2.4
PERFORMANCE		
TRANSCEIVER CHIPSET	Silicon Labs EM357 SoC	Silicon Labs EM357 SoC
DATA RATE	RF 250 Kbps, Serial up to 1 Mbps	RF 250 Kbps, Serial up to 1 Mbps
INDOOR/URBAN RANGE*	Up to 200 ft (60 m)	Up to 300 ft (90 m)
OUTDOOR/RF LINE-OF-SIGHT RANGE*	Up to 4000 ft (1200 m)	Up to 2 miles (3200 m)
TRANSMIT POWER	3.1 mW (+5 dBm) / 6.3 mW (+8 dBm) boost mode	63 mW (+18 dBm)
RECEIVER SENSITIVITY (1% PER)	-100 dBm / -102 dBm boost mode	-101 dBm
FEATURES		
SERIAL DATA INTERFACE	UART, SPI	UART, SPI
CONFIGURATION METHOD	API or AT commands, local or over-the-air (OTA)	API or AT commands, local or over-the-air (OTA)
FREQUENCY BAND	ISM 2.4 GHz	ISM 2.4 GHz
FORM FACTOR	Through-Hole, Surface Mount	Through-Hole, Surface Mount
HARDWARE	S2C	S2C
ADC INPUTS	(4) 10-bit ADC inputs	(4) 10-bit ADC inputs
DIGITAL I/O	15	15
ANTENNA OPTIONS	Through-Hole: PCB Antenna, U.FL Connector, RPSMA Connector, or Integrated Wire; SMT: RF Pad, PCB Antenna, or U.FL Connector	
OPERATING TEMPERATURE	-40° C to +85° C	-40° C to +85° C
DIMENSIONS (L X W X H) AND WEIGHT	Through-Hole: 0.960 x 1.087 in (2.438 x 2.761 cm) SMT: 0.866 x 1.33 x 0.120 in (2.199 x 3.4 x 0.305 cm)	Through-Hole: 0.960 x 1.297 in (2.438 x 3.294 cm) SMT: 0.866 x 1.33 x 0.120 in (2.199 x 3.4 x 0.305 cm)
NETWORKING AND SECURITY		
PROTOCOL	Digi XBee DigiMesh 2.4 (Proprietary 802.15.4 based mesh protocol)	Digi XBee DigiMesh 2.4 (Proprietary 802.15.4 based mesh protocol)
UPDATABLE TO DIGI 802.15.4 PROTOCOL	Yes	Yes
UPDATABLE TO ZIGBEE PROTOCOL	Yes	Yes
INTERFERENCE IMMUNITY	DSSS (Direct Sequence Spread Spectrum)	DSSS (Direct Sequence Spread Spectrum)
ENCRYPTION	128-bit AES	128-bit AES
RELIABLE PACKET DELIVERY	Retries/Acknowledgements	Retries/Acknowledgements
IDS	PAN ID and addresses, cluster IDs and endpoints (optional)	PAN ID and addresses, cluster IDs and endpoints (optional)
CHANNELS	16 channels	15 channels
POWER REQUIREMENTS		
SUPPLY VOLTAGE	2.1 to 3.6V	2.7 to 3.6V
TRANSMIT CURRENT	33 mA @ 3.3 VDC / 45 mA boost mode	120 mA @ 3.3 VDC
RECEIVE CURRENT	28 mA @ 3.3 VDC / 31 mA boost mode	31 mA @ 3.3 VDC
POWER-DOWN CURRENT	<1 µA @ 25° C	<1 µA @ 25° C
REGULATORY APPROVALS		
FCC, IC (NORTH AMERICA)	Yes	Yes
ETSI (EUROPE)	Yes	No
RCM (AUSTRALIA AND NEW ZEALAND)	Yes	Yes
TELEC (JAPAN)	Yes	No (Coming soon)

*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.

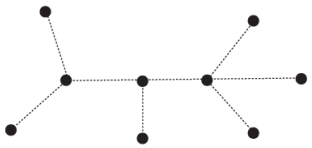
PART NUMBERS	DESCRIPTION
SMT MODELS	
XB24CDMPIS-001	Digi XBee, S2C DigiMesh 2.4, SMT, PCB antenna
XBP24CDMPIS-001	Digi XBee-PRO, S2C DigiMesh 2.4, SMT PCB antenna
XB24CDMUIS-001	Digi XBee, S2C DigiMesh 2.4, SMT, U.FL
XBP24CDMUIS-001	Digi XBee-PRO, S2C DigiMesh 2.4, SMT, U.FL
XB24CDMRIS-001	Digi XBee, S2C DigiMesh 2.4, SMT, RF Pad
XBP24CDMRIS-001	Digi XBee-PRO, S2C DigiMesh 2.4, SMT, RF Pad
THROUGH-HOLE MODELS	
XB24CDMPIT-001	Digi XBee, S2C DigiMesh 2.4, TH, PCB antenna
XBP24CDMPIT-001	Digi XBee-PRO, S2C DigiMesh 2.4, TH, PCB antenna
XB24CDMUIT-001	Digi XBee, S2C DigiMesh 2.4, TH, U.FL
XBP24CDMUIT-001	Digi XBee-PRO, S2C DigiMesh 2.4, TH, U.FL
XB24CDMSIT-001	Digi XBee, S2C DigiMesh 2.4, TH, RPSMA
XBP24CDMSIT-001	Digi XBee-PRO, S2C DigiMesh 2.4, TH, RPSMA
XB24CDMWIT-001	Digi XBee, S2C DigiMesh 2.4, TH, WIRE antenna
XBP24CDMWIT-001	Digi XBee-PRO, S2C DigiMesh 2.4, TH, WIRE antenna
KIT	
XK-WDM	Digi XBee S2C DigiMesh Development Kit with two XB24CDMPIT-001 modules and one XB24DMPIS-001 module

Note: International users select the standard module. The PRO module is for use in North America only.

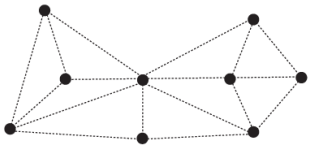
802.15.4 – Star



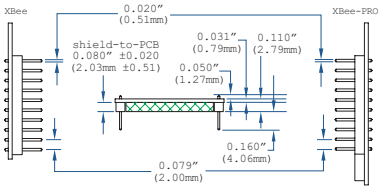
ZigBee - Open Standard Mesh



DigiMesh - Proprietary Mesh

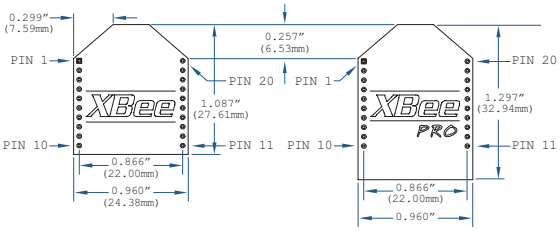


(Side Views)



(Top View)

(Top View)



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