



EMBEDDED RF  
MODULES FOR OEMS



# XBEE® S1 802.15.4 RF MODULES

Easy-to-deploy modules provide critical end-point connectivity to devices and sensors

XBee RF modules provide OEMs with a common footprint shared by multiple platforms, including multipoint and ZigBee/Mesh topologies, and both 2.4 GHz and 900 MHz solutions. OEMs deploying the XBee can substitute one XBee for another, depending upon dynamic application needs, with minimal development, reduced risk and shorter time-to-market.

XBee 802.15.4 RF modules are ideal for applications requiring low latency and predictable communication timing. Providing quick, robust communication in point-to-point, peer-to-peer, and multipoint/star configurations, XBee 802.15.4 products

enable robust end-point connectivity with ease. Whether deployed as a pure cable replacement for simple serial communication, or as part of a more complex hub-and-spoke network of sensors, XBee 802.15.4 RF modules maximize performance and ease of development.

XBee 802.15.4 modules seamlessly interface with compatible gateways, device adapters and range extenders, providing developers with true beyond-the-horizon connectivity.

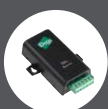
## BENEFITS

- Simple, out-of-the-box RF communications, no configuration needed
- Point-to-multipoint network topology
- 2.4 GHz for worldwide deployment
- Common XBee footprint for a variety of RF modules
- Low-power sleep modes
- Multiple antenna options

## RELATED PRODUCTS



ConnectPort®  
X4/X4H Gateways



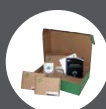
XBee®  
Adapters



XCTU

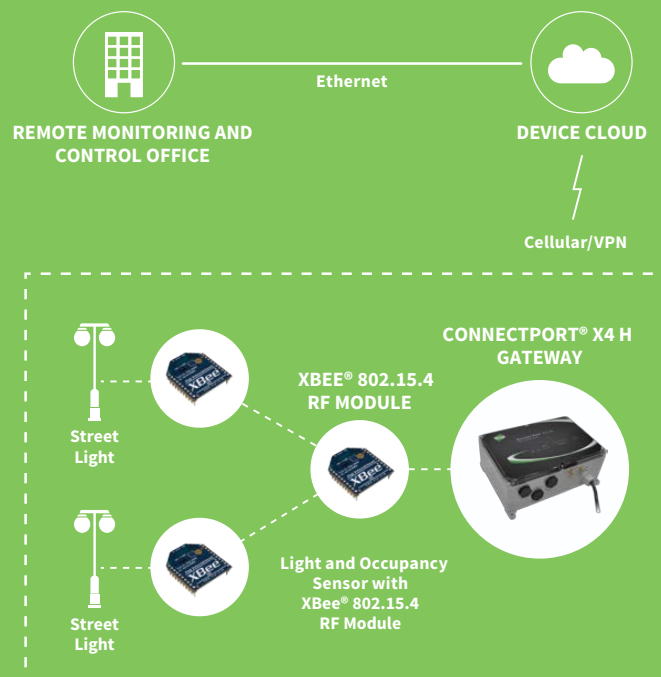


Digi Device  
Cloud<sup>SM</sup>



Development  
Kits

## APPLICATION EXAMPLE



## SPECIFICATIONS

Legacy XBee® S1 802.15.4

| Legacy XBee-PRO® S1 802.15.4

### PERFORMANCE

|                                |                   |                  |
|--------------------------------|-------------------|------------------|
| RF DATA RATE                   | 250 kbps          | 250 kbps         |
| INDOR/URBAN RANGE              | 100 ft (30 m)     | 300 ft (100 m)   |
| OUTDOOR/RF LINE-OF-SIGHT RANGE | 300 ft (100 m)    | 1 mi (1.6 km)    |
| TRANSMIT POWER                 | 1 mW (+0 dBm)     | 60 mW (+18 dBm)* |
| RECEIVER SENSITIVITY (1% PER)  | -92 dBm           | -100 dBm         |
| DIGI HARDWARE                  | S1                |                  |
| TRANSCEIVER CHIPSET            | Freescale MC13212 |                  |

### FEATURES

|                       |                                           |
|-----------------------|-------------------------------------------|
| SERIAL DATA INTERFACE | 3.3V CMOS UART                            |
| CONFIGURATION METHOD  | API or AT Commands, local or over-the-air |
| FREQUENCY BAND        | 2.4 GHz                                   |
| INTERFERENCE IMMUNITY | DSSS (Direct Sequence Spread Spectrum)    |
| SERIAL DATA RATE      | 1200 bps - 250 kbps                       |
| ADC INPUTS            | (6) 10-bit ADC inputs                     |
| DIGITAL I/O           | 8                                         |
| ANTENNA OPTIONS       | Chip, Wire Whip, U.FL, & RPSMA            |

### NETWORKING & SECURITY

|                          |                                      |
|--------------------------|--------------------------------------|
| ENCRYPTION               | 128-bit AES                          |
| RELIABLE PACKET DELIVERY | Retries/Acknowledgments              |
| IDS AND CHANNELS         | PAN ID, 64-bit IEEE MAC, 16 Channels |

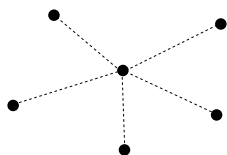
### POWER REQUIREMENTS

|                    |                |                 |
|--------------------|----------------|-----------------|
| SUPPLY VOLTAGE     | 2.8 - 3.4VDC   | 2.8 - 3.4VDC    |
| TRANSMIT CURRENT   | 45 mA @ 3.3VDC | 215 mA @ 3.3VDC |
| RECEIVE CURRENT    | 50 mA @ 3.3VDC | 55 mA @ 3.3VDC  |
| POWER-DOWN CURRENT | <10 uA @ 25° C |                 |

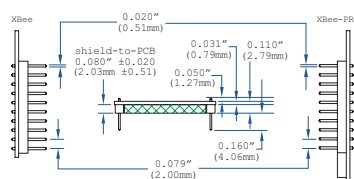
### REGULATORY APPROVALS

|                  |            |                    |
|------------------|------------|--------------------|
| FCC (USA)        | OUR-XBEE   | OUR-XBEEPRO        |
| IC (CANADA)      | 4214A-XBEE | 4214A-XBEEPRO      |
| ETSI (EUROPE)    | Yes        | Yes - Max TX 10 mW |
| C-TICK AUSTRALIA | Yes        |                    |
| TELEC (JAPAN)    | Yes        |                    |

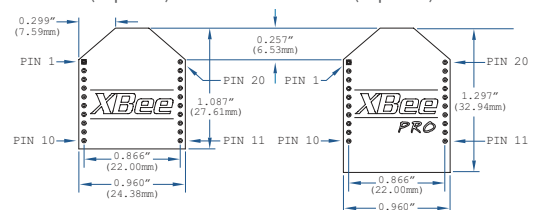
802.15.4 - Star



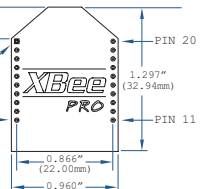
(Side Views)



(Top View)



(Top View)



| PART NUMBERS   | DESCRIPTION                                                                   |
|----------------|-------------------------------------------------------------------------------|
| KITS           |                                                                               |
| XKB2-AT-WWC    | Wireless Connectivity Kit w/ Legacy XBee 802.15.4                             |
| XKB2-AT-WWG    | XBee / Arduino Compatible Coding Platform w/ Legacy XBee 802.15.4             |
| MODULES        |                                                                               |
| XB24-AWI-001   | XBee S1 802.15.4 low-power module w/ wire antenna                             |
| XB24-API-001   | XBee S1 802.15.4 low-power module w/ PCB antenna                              |
| XB24-AUI-001   | XBee S1 802.15.4 low-power module w/ U.fl connector                           |
| XB24-ASI-001   | XBee S1 802.15.4 low-power module w/ RPSMA connector                          |
| XBP24-AWI-001  | XBee-PRO S1 802.15.4 extended-range module w/ wire antenna                    |
| XBP24-AWI-001J | XBee-PRO S1 802.15.4 extended-range module w/ wire antenna (International)    |
| XBP24-AUI-001  | XBee-PRO S1 802.15.4 extended-range module w/ U.fl connector                  |
| XBP24-AUI-001J | XBee-PRO S1 802.15.4 extended-range module w/ U.fl connector (International)  |
| XBP24-ASI-001  | XBee-PRO S1 802.15.4 extended-range module w/ RPSMA connector                 |
| XBP24-ASI-001J | XBee-PRO S1 802.15.4 extended-range module w/ RPSMA connector (International) |
| XBP24-API-001  | XBee-PRO S1 802.15.4 extended-range module w/ PCB antenna                     |
| XBP24-API-001J | XBee-PRO S1 802.15.4 extended-range module w/ PCB antenna (International)     |

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