ZigBee/802.15.4 technology enables low-cost, low-power networking of sensors, controllers and other devices used for remote monitoring and control. All XBee adapters can be used with Digi’s ConnectPort™ IP gateways to build wireless Drop-in Networks.

Each Digi XBee adapter contains a ZigBee/802.15.4 wireless module for network connectivity and a physical interface for device connectivity. Available interfaces include RS-232 (powered power harvesting), RS-485, USB, 1-Wire, Digital I/O and Analog I/O. Each is offered in a small form factor with various powering options that include external power supply, N-cell battery, both external and battery power for redundancy, or parasitic power drawn from the connected device. Two performance levels of XBee adapters are available: XBee and XBee-PRO. The PRO version provides greater transmit power and approximately three-times the range of the regular version.

Compatibility Note:
Two sets of XBee and XBee-PRO adapters are offered: Series 1 and Series 2. Though overall performance and product specifications are largely similar, the two series are built on distinct and non-compatible technology platforms. Thus, users must standardize on one series or the other for operability. The same is true for compatibility with the ConnectPort X gateways. Series 1 XBee adapters are compatible only with Series 1 gateways, while Series 2 XBee adapters are compatible only with Series 2 gateways. Series 1 XBee specifications appear on page 2 of this datasheet. Series 2 XBee specifications are on page 3.

Features/Benefits

- ZigBee/802.15.4 wireless mesh connectivity for all types of end-point devices
- Compatible with Digi’s ConnectPort X family of IP gateways for LAN/WAN connectivity
- Multiple interface options provide broad device support: Serial, USB, 1-Wire, Digital I/O, Analog I/O
- Small form factor for easy handling and installation
- Flexible powering options include external power, N-Cell battery or both for power redundancy
- Two versions available: XBee and XBee-PRO™ (longer range)
## Features/Specifications - Series 1 XBee Adapters

### General
- **Frequency:** 2.4 GHz (ISM)
- **Antenna options:** Integrated whip antenna

### Performance: XBee
- Indoor/Urban range: Up to 100 ft (30 m)
- Outdoor RF line of sight range: Up to 300 ft (100 m)
- Transmit power output: 1 mW (0 dBm)
- RF data rate: 250,000 bps
- Receiver sensitivity: -92 dBm (1% PER)

### Performance: XBee-PRO
- Indoor/Urban range: Up to 300 ft (100 m)
- Outdoor RF line of sight range: Up to 1 mile (1.6 km)
- Transmit power output: 60 mW (18 dBm)*, 100 mW EIRP*
- RF data rate: 250,000 bps
- Receiver sensitivity: -100 dBm (1% PER)

### Networking and Security
- **Network topologies:** Point-to-Point, Point-to-Multipoint, Peer-to-Peer, Mesh
- Number of channels:
  - XBee: 16 - 5 MHz channels (Direct Sequence Spread Spectrum)
  - XBee-PRO: 12 Direct Sequence Channels (software selectable)
- **Filtration options:** PAN ID, Channel, Source/Destination Addresses

### LEDs
- **Power:** Glows green when external power is supplied (not active when battery powered to limit power drain)
- **Associate:** Glows when unit is connected and associated on an RF network

### Controls
- **Device reset (internal push button)**
- **Identification (internal push button):** Relays identification to ConnectPort X gateway

### REGULATORY APPROVALS
- FCC Part 15.247 - Pending
- Industry Canada (IC) - Pending
- Europe (CE) - Pending
- EN55022, Class A - Pending
- UL60950 - Pending
- CAN/CSA C22.2 No. 60950 - Pending
- EN60950 - Pending
- RoHS compliant

### DIMENSIONS

#### XBee 232, 485, 1-Wire, Analog I/O and Digital I/O
- **Operating temperature:** Externally powered: -40°C to 85°C
- **Battery powered:** -18°C to 55°C

#### XBee USB
- **Operating temperature:** -40°C to 85°C

#### XBee 232PH
- **Operating temperature:** 0°C to 65°C

### Power Requirements
- **XBee 232, 485, 1-Wire, Analog I/O and Digital I/O**
  - Externally powered: 9-30 VDC, locking connector
  - Battery powered: 3 internal N cell batteries
- **XBee USB**
  - Bus powered: +5V from USB bus
  - Power consumption during normal operation:
    - XBee: 70mA
    - XBee-PRO: 70 mA (Rx) and 250 mA (Tx)
  - Power consumption during suspend mode:
    - XBee and XBee-PRO: 200 uA
- **XBee 232PH**
  - Internal battery provides power when unit is operating and recharges from the serial port when in sleep mode
  - Requires a sleep/wake duty cycle as part of its normal operation.
  - Requires a fully functional serial port conforming to the RS232c standard for optimal operation.
  - Sleep/wake duty cycle requirements will vary based on the current output of serial port
  - Serial ports with more than 14VDC output (rare) are not supported and may cause malfunction

### Interfaces

#### Serial
- RS-232 (DB-9M)
- RS-232PH (DB-9M); power harvesting version
- RS-485 (6-position wire terminal block)
  - Switch selectable between RS-422 half duplex, RS-422 full duplex and RS-485
- 1-Wire (RI-45)

#### USB
- USB 2.0 Full Speed (with ESD protection); connects to host via captive 2-meter cable

### Environmental

#### XBee 232, 485, 1-Wire, Analog I/O and Digital I/O
- **Operating temperature:** Externally powered: -40°C to 85°C
- **Battery powered:** -18°C to 55°C

#### XBee USB
- **Operating temperature:** -40°C to 85°C

#### XBee 232PH
- **Operating temperature:** 0°C to 65°C

### Model/Interface

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<td>XA-A14-CS3R</td>
<td>XA-A14-CS3P</td>
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<tr>
<td>XBee/XBee-PRO RS-232</td>
<td>XA-A14-CS2R</td>
<td>XA-A14-CS2P</td>
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<tr>
<td>XBee/XBee-PRO 1-Wire</td>
<td>XA-A14-CS1R</td>
<td>XA-A14-CS1P</td>
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<tr>
<td>XBee/XBee-PRO Analog I/O</td>
<td>XA-A14-CS5R</td>
<td>XA-A14-CS5P</td>
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<tr>
<td>XBee/XBee-PRO Digital I/O</td>
<td>XA-A14-CS4R</td>
<td>XA-A14-CS4P</td>
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<td>XBee/XBee-PRO USB</td>
<td>XA-A14-CE1R</td>
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<td>XBee/XBee-PRO RS-232PH (power harvesting)</td>
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Series 1 XBee Adapters are compatible only with Series 1 ConnectPort X gateways.

*When operating in Europe: XBee-PRO adapters must be configured to operate at a maximum TX power output level (power output level is set using the PL command). Additionally, European regulations stipulate an EIRP power maximum of 12.86 dBm (1 mW).*
### Features/Specifications - Series 2 XBee Adapters

#### General
- Frequency: 2.4 GHz (ISM)
- Antenna options: Integrated whip antenna

#### Performance
- Indoor/Urban range: Up to 100 ft (30 m)
- Outdoor RF line of sight range: Up to 300 ft (100 m)
- Transmit power output: 1 mW (0 dBm)
- RF data rate: 250,000 bps
- Receiver sensitivity: -95 dBm (1% PER)

#### Networking and Security
- Network topologies: Point-to-Point, Point-to-Multipoint, Peer-to-Peer, Mesh
- Number of channels: 16 - 5 MHz channels (Direct Sequence Spread Spectrum)
- Filtration options: PAN ID, Channel, 264 (64-bit) addresses

#### LEDs
- Power: Glows green when external power is supplied (not active when battery powered to limit power drain)
- Associate: Glows when unit is connected and associated on an RF network

#### Controls
- Device reset (internal push button)
- Identification (internal push button): Relays identification to ConnectPort X gateway

#### Dimensions
- XBee 232, 485, 1-Wire, Analog I/O and Digital I/O
  - Width: 1.68 in (4.26 cm)
  - Height: 0.99 in (2.53 cm)
  - Length: 3.87 in (9.84 cm)
  - Weight: 2.29 oz (6.50 g)
- XBee USB and 232PH
  - Width: 1.80 in (4.57 cm)
  - Height: 0.83 in (2.10 cm)
  - Length: 2.87 in (7.29 cm)
  - Weight: 1.60 oz (45.36 g)

#### Power Requirements
- XBee 232, 485, 1-Wire, Analog I/O and Digital I/O
  - Externally powered: 9-30 VDC, locking connector
  - Battery powered: 3 internal Ni-Cd batteries
- XBee USB
  - Bus powered: +5V from USB bus
  - Power consumption: 70 mA
- Power consumption during suspend mode:
  - XBee and XBee-PRO: 200 uA

#### Environmental
- XBee 232, 485, 1-Wire, Analog I/O and Digital I/O
  - Operating temperature: Externally powered: 0°C to 55°C
- XBee USB
  - Operating temperature: -40°C to 55°C
- XBee 232PH
  - Operating temperature: 0°C to 40°C

#### Regulatory Approvals
- FCC Part 15.247 - Pending
- Industry Canada (IC) - Pending
- Europe (CE) - Pending
- EN55022, Class A - Pending
- UL60950 - Pending
- CAN/CSA C22.2 No. 60950 - Pending
- EN60950 - Pending
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<td>XA-B14-C51R</td>
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<td>XA-B14-CE2R</td>
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**Series 2 XBee Adapters are compatible only with Series 2 ConnectPort X gateways.**
Line Art/Application Diagram

Drop-in Network for Tank Level Monitoring

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