

Wzzard™ Intelligent Edge Node

With SmartMesh IP and Bluetooth LE

B+B SMARTWORX

Powered by

ADVANTECH



PRODUCT FEATURES

Wireless Connectivity Where You Need It

The Wzzard™ intelligent wireless sensor platform creates a complete, quick and easy connectivity stack between your sensors and your application, on your network or on the Internet. The platform uses Intelligent Edge Nodes, a wireless 802.15.4e SmartMesh IP network to transmit sensor data to the Spectre Network Gateway. The Spectre Network Gateway can connect to the Internet via wired connections or the cellular data networks and communicate with application platforms using the MQTT IoT protocol and JSON data formats.

The Wzzard Intelligent Edge Nodes accommodate virtually any industry-standard external sensors. Connections can be made via conduit fitting, cable gland or an M12 connector. The Nodes provide a wide variety of sensor interface options, including general purpose analog inputs, digital input/output and thermocouple. They can also contain internal sensors like an accelerometer, depending upon the model number. All 802.15.4e Wzzard Intelligent Edge Nodes contain an internal temperature sensor.

Secure, Reliable and Highly Scalable Wireless Networking

The Wzzard platform uses mesh networking and time-synchronized channel hopping to provide up to 99.999% connectivity, even in the most demanding RF environments. New nodes may be added at any time, and the SmartMesh IP network will dynamically self-configure as new nodes are added or removed. This is a function of the mesh network itself, and does not need to be controlled by the network gateway.

Easy Configuration and Installation

Configuration of the Wzzard sensor platform is easy via Android smart phones or tablets. Using the Wzzard app, your handheld devices can configure the Wzzard Intelligent Edge Nodes over their Bluetooth LE connections. The Wzzard Intelligent Edge Nodes can be configured with calibration and scaling information, eng. units, friendly names, geolocation and other descriptive information.

The platform simplifies physical installation as well. The Wzzard Intelligent Edge Nodes can be attached to any surface using screws or their embedded magnetic bases. The IP66-rated, fiber reinforced polyester PBT housing makes the units deployable in virtually any industrial or commercial environment.

Intelligence at the Network Edge

The Wzzard wireless platform places intelligence at the network edge. The Wzzard Intelligent Edge Nodes can be configured to communicate data only when specified threshold or alert levels are exceeded. When reporting, they can associate useful information like geolocation, device name and uptime. This eliminates unnecessary network traffic, eases the processing burden on upstream resources, and cuts the cost of cellular data plans when the Gateway is using the cellular data network. Thanks to low-power wireless technology and programmable time synchronization, the Intelligent Edge Nodes can operate for multiple years on battery power

- Ultra low power 802.15.4e SmartMesh IP technology
- Communicates with Spectre Network Gateway via highly scalable and reliable wireless mesh networks
- Connect to industry standard analog or digital sensors
- Wzzard app lets you read or configure the nodes using Android tablets and smart phones
- Rugged, IP66-rated, fiber reinforced polyester PBT enclosure
- MQTT and JSON IoT protocol to application platform
- Class 1 DIV 2 approved for hazardous locations

SPECIFICATIONS

| POWER | |
|---------------------------------|---|
| Internal | (2) 3.6V 2400 mAh Lithium Thionyl Chloride AA batteries |
| Battery Life | Multiyear based on 1 min sensor sampling and reporting |
| Optional External Input Voltage | 3.3 VDC +/- 5% |
| MECHANICAL | |
| Physical Connection | M12 Connector 1/2" (12.7 mm) Conduit, sensor interface cable included; 8 wire, 26 gage, 6 ft. (1.8 m) |
| Sensor Inputs | Analog Input (0 - 5 VDC, 0 - 20 mA, 4 - 20 mA) Digital Input (0-48 VDC) Digital Input Frequency 1-1K Hz (Accuracy + or - 1 Hz) Digital Input Counter Integrated Accelerometer 3 Axis Integrated Temperature Thermocouple J, K Type Digital Output (0-30 VDC) |
| Optional External Antenna | RP-SMA, Omnidirectional, 3.8 dBi, 2.4 GHz Dimensions 7.64 inches (194 mm) |
| Mounting | Magnetic mounting via internal magnet Pull force 4.7 lbs (2.13 kg) (4) Mounting ears, M5 (#10) |
| Enclosure | IP66-rated, fiber reinforced polyester PBT |
| Weight | 0.75 lbs (0.34 kg) |
| TECHNOLOGY | |
| Wireless | 802.15.4e, SmartMesh IP |
| Protocols | MQTT-SN, MQTT, JSON |
| Bluetooth | Bluetooth 4.0 Low Energy (LE) |
| LED | Network Connectivity |
| ENVIRONMENTAL | |
| Installation | Indoor or outdoor |
| Operating Temperature | -40 to 80°C (-40 to 176°F) |
| Storage Temperature | -40 to 85°C |
| Operating Humidity | 0 to 95% Non-condensing |
| WIRELESS SECURITY | |
| Device Authentication | 128 bit AES-based encryption with multiple keys |
| Message integrity check (MIC) | |
| Synchronized key changeovers | |
| Customized key rotation | |

Wzzard™ Intelligent Edge Node

With SmartMesh IP and Bluetooth LE

SENSOR INTERFACE SPECIFICATIONS

| DIGITAL INPUTS | |
|-----------------------|---|
| Voltage range | 0 – 48 VDC |
| V_L | 0.97 V Maximum |
| V_H | 1.8 V Minimum |
| Pull up current | 32 μ A |
| Type | Sourcing (PNP)/Sinking (NPN) Software selectable input |
| Isolation | None |
| RATE/FREQUENCY INPUTS | |
| Frequency | Does a 1 second measurement at each measurement/publish interval Digital Input Frequency 1-1K Hz (Accuracy + or – 1 Hz) Uses the falling edge or rising edge based on the Invert Enabled setting |
| COUNTER INPUT | |
| Channels | Actively counts either the falling edge (Invert enabled) or rising edge (Invert disabled) Can use a multiplier to convert to a unit type or count 2 selectable/shared with Digital inputs Rolls over at 999999.9 |
| ANALOG INPUTS | |
| Input ranges | 0 - 5 VDC, 0 – 20 mA, 4 – 20 mA |
| Resolution | 12 bit |
| Input load resistance | 100 Mega ohm (0-5VDC), 250 ohm (0 - 20 ma) |
| Accuracy | Voltage: 0.10% of full scale reading, 0.20% max. Current: 0.11% of full scale reading, 0.24% max. |
| THERMOCOUPLE INPUT | |
| Types Supported | J and K |
| Ranges Supported | Type J -210 to +1,200 °C Type K -270 to +1,372 °C |
| Resolution | 0.25 °C |
| Accuracy | Typical +/- 2 °C +/- 6 °C over the temperature range of -40 to 80 °C |
| DIGITAL OUTPUTS | |
| Voltage range | 0 - 30 VDC |
| Output Type | Open Drain |
| Output Current | Not to be less than 100ma |
| Protection | Current Limit Protection |
| Isolation | None |

INTEGRATED SENSORS

| TEMPERATURE | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------|--|-----|-----------|-----|--------|
| Offset | Temperature Offset Error @ 25 °C | | +/- 0.25 | | °C |
| Slope Error | | | +/- 0.033 | | °C/ °C |
| 3 AXIS ACCELEROMETER | | | | | |
| Configurable measurement ranges | +/-2 g, resolution of 1 mg/LSB +/-4 g +/-8 g | | | | |
| Configurable output data rates | 12.5Hz, 5Hz, 50Hz, 100Hz, 200Hz, 400Hz | | | | |

SMARTMESH IP 802.15.4E RADIO SPECIFICATIONS

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|-------------------------|---|-------|-----------------|--------|-------|
| Frequency Band | | 2,400 | | 2,4835 | GHz |
| Number of Channels | | | 15 | | |
| Channel Separation | | | 5 | | MHz |
| Channel Clear Frequency | Where k = 11 to 25, as defined by IEEE 802.4.15 | | 2405 + 5*(k-11) | | MHz |
| Modulation | IEEE 802.15.4 Direct Sequence Spread Spectrum (DSSS) | | | | |
| Raw data rate | | | 250 | | kbps |
| Range | 25 °C, 50% RH, +2dBi Omni-Directional Antenna, Antenna 2 m above ground | | | | |
| | Indoor | | 100 | | m |
| | Outdoor | | 300 | | m |
| Receiver Sensitivity | Packet Data Error Rate (PER) = 1% | | | -93 | dBm |
| Receiver Sensitivity | PER = 50% | | | -95 | dBm |
| Output Power | Delivered to a 50 Ω load | | | 8 | dBm |

Wzzard™ Intelligent Edge Node

With SmartMesh IP and Bluetooth LE

BLUETOOTH LE RADIO SPECIFICATIONS

| NO. | CHARACTERISTICS | CONDITIONS | MIN | TYP | MAX | BT SPEC. | UNIT |
|-----|-----------------------------|--|------|----------------|------|------------|----------------|
| 1 | Operation Frequency Range | | 2402 | | 2480 | | MHz |
| 2 | Channel Spacing | | | 2 | | | Mhz |
| 3 | Output Power | Maximum setting, measured at single ended 50ohm. Minimum setting, measured at single ended 50ohm. | | 4 -24 | | | dBm dBm |
| 4 | Sensitivity, High Gain Mode | High Gain Mode Standard Mode | | -93.0 -92.5 | | -70 -70 | dBm dBm |

THIONYL CHLORIDE LITHIUM BATTERIES (2 SUPPLIED WITH PRODUCT)

| CHARACTERISTICS | CONDITIONS |
|--|-------------|
| Temperature Range | -40 to 85°C |
| Nominal Capacity | 2.4 Ah |
| Nominal Voltage | 3.6 V |
| Diameter | 14.5 mm |
| Height | 50.5 mm |
| *Potential hazard: Do not recharge, crush, disassemble or heat above 212°F (100°C) | |

ORDERING INFORMATION

| MODEL NUMBER | THERMOCOUPLE INPUT |
|--------------|---|
| WSD2CTJ | Wireless Mesh 802.15.4e, 2 Thermocouple J-type Inputs, 1 Digital Output; External Antenna, Conduit Connector |
| WSD1CTJ | Wireless Mesh 802.15.4e, 2 Thermocouple J-type Inputs, 1 Digital Output; Internal Antenna, Conduit Connector |
| WSD2CTK | Wireless Mesh 802.15.4e, 2 Thermocouple K-type Inputs, 1 Digital Output; External Antenna, Conduit Connector |
| WSD1CTK | Wireless Mesh 802.15.4e, 2 Thermocouple K-type Inputs, 1 Digital Output; Internal Antenna, Conduit Connector |
| MODEL NUMBER | ACCELEROMETER |
| WSD2XV0 | Wireless Mesh 802.15.4e Integrated Accelerometer; External Antenna |
| WSD1XV0 | Wireless Mesh 802.15.4e Integrated Accelerometer; Internal Antenna |
| MODEL NUMBER | ANALOG INPUT |
| WSD2MA2 | Wireless Mesh 802.15.4e; 2 Analog Inputs, 1 Digital Output; External Antenna, M12 Connector |
| WSD1MA2 | Wireless Mesh 802.15.4e; 2 Analog Inputs, 1 Digital Output; Internal Antenna, M12 Connector |
| WSD2CA2 | Wireless Mesh 802.15.4e; 2 Analog Inputs, 1 Digital Output; External Antenna, Conduit Connector |
| WSD1CA2 | Wireless Mesh 802.15.4e; 2 Analog Inputs, 1 Digital Output; Internal Antenna, Conduit Connector |
| WSD2CJA | Wireless Mesh 802.15.4e; 2 Analog Inputs, 1 Digital Output, 2 Thermocouple J-type Inputs; External Antenna, Conduit Connector |
| WSD2MA3 | Wireless Mesh 802.15.4e; 3 Analog Inputs; External Antenna, M12 Connector |
| WSD1MA3 | Wireless Mesh 802.15.4e; 3 Analog Inputs; Internal Antenna, M12 Connector |
| WSD2CA3 | Wireless Mesh 802.15.4e; 3 Analog Inputs; External Antenna, Conduit Connector |
| WSD1CA3 | Wireless Mesh 802.15.4e; 3 Analog Inputs; Internal Antenna, Conduit Connector |
| MODEL NUMBER | DIGITAL INPUT |
| WSD2MD2 | Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; External Antenna, M12 Connector |
| WSD1MD2 | Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; Internal Antenna, M12 Connector |
| WSD2CD2 | Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; External Antenna, Conduit Connector |
| WSD1CD2 | Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; Internal Antenna, Conduit Connector |

ACCESSORIES

| PART NUMBER | DESCRIPTION |
|-----------------|---|
| ACH2-DBAT-DP003 | External Antenna, 2.4 GHz, 2 dBi, Dipole, RP-SMA, hinged, 3.8 dBi |
| ACH2-AT-DP011 | Magnetic Mount Antenna, 2.4 GHz, 3.8 dBi |
| WSCAC0-6 | Pigtail Cable 6 ft (1.8m) |
| WSCAM12-6 | M12 Wiring harness cable, 8 pin, 6 ft (1.8 m) |
| ZXTMT | Cable Gland/Conduit Kit |

Wzzard™ Intelligent Edge Node

With SmartMesh IP and Bluetooth LE

APPROVALS AND CERTIFICATIONS

| | |
|---|---|
| CE | |
| EN55022 | CISPR (EN55022) Class A |
| EN 61000-6-2:2005 | Generic immunity standard for (heavy) industrial environments |
| EN 61000-6-4:2006+A1:2011 | Emission standard for (heavy) industrial environments |
| EN61000-4-2 | ESD +/- 8kV air, +/- 4kV contact |
| EN61000-4-3 | RFI |
| EN61000-4-4 | EFT |
| EN61000-4-5 | Surge |
| EN61000-4-6 | CI |
| EN60255-21-1 | Vibration, 2g, 10-500Hz 0.3mm displacement |
| EN60255-21-2 | Shock, 50g, 11ms half sine wave, 18 shocks |
| ENVIRONMENTAL | |
| IEC 60068-2-6:2007 | Vibration, 2g, 10-500 Hz, 1.5mm displacement |
| IEC 60068-2-27:2008 | Shock, 50g, 11ms half sine wave, 18 shocks |
| FCC/IC | |
| FCC Part 15 Class A | |
| FCC - Part 15.247 | |
| Industry Canada - RSS210 | |
| SAFETY | |
| UL/CSA Class 1, Division 2 Group A, B, C, D | |
| REGULATORY APPROVALS | |
| ROHS and WEEE Compliant | |

MECHANICAL DIAGRAM

