

## Product Overview



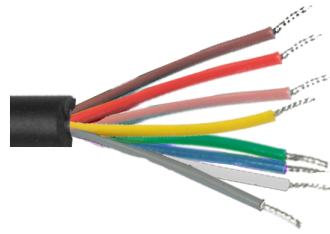
### 1 Connect Your Sensor

Remove the (4) black screws that hold the top of the node in place. Connect your sensor.

It is best practice that wiring is done prior to installing batteries or powering up the device.

#### Conduit Models: Analog and Digital

Thread the included wire harness through the conduit and into the node. Plug it into the circuit board inside the node.

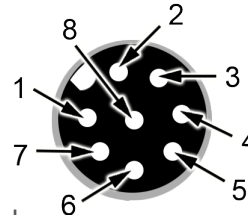


- 1 Brown
- 2 Red
- 3 Pink
- 4 Yellow
- 5 Green
- 6 Blue
- 7 White
- 8 Gray

Connect your sensor to the wires running from the node's conduit. Consult the chart on the other side of this page for wiring instructions.

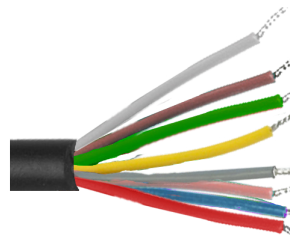
#### M12 Models: Analog and Digital with Accessory Cable

You can use your own M12 cable or order B&B Electronics accessory WSCAM12-6



Consult the chart on the other side of this page for wiring instructions.

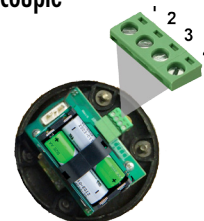
#### B&B M12 Accessory Cable



- 1 White
- 2 Brown
- 3 Green
- 4 Yellow
- 5 Gray
- 6 Pink
- 7 Blue
- 8 Red

#### Terminal Block Connections: Thermocouple

Thread the thermocouple wires through the conduit and attach them to the terminal block.



- 1 = Thermocouple input #1 positive (+)
- 2 = Thermocouple input #1 negative (-)
- 3 = Thermocouple input #2 positive (+)
- 4 = Thermocouple input #2 negative (-)

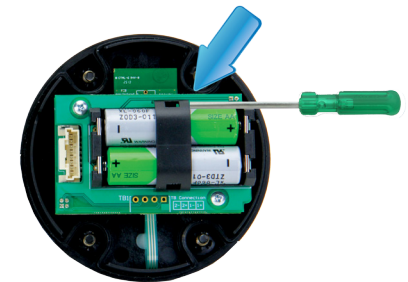
### 2 Install Your Batteries

Use (2) 3.6V 2400 mAH Lithium Thionyl Chloride AA batteries.

In most installations you will only need to place the batteries in the battery holder.

But in high vibration environments you should also use the optional battery retaining clip. Do not use excessive force while placing or removing the clip, as you can break it.

The best way to remove the clip is to insert a small flathead screwdriver between the batteries and the clip, parallel to the batteries, and give the screwdriver a gentle twist. This will remove the clip without damage.



Replace the cover and tighten the (4) screws. Screws must be tightened to 5 in-lb torque in order to maintain IP66 rating. (This can be accomplished via hand tightening.)

### 3

## Check LEDs

After you have installed the batteries the LED will begin to blink. This indicates that the Node is attempting to establish a network connection. The LED will cease blinking when a connection is made.

Status LED		
Data	Solid On	Module startup initialization, approx. 10 sec.
	Slow Blink (1 per sec.)	Attempting to establish connection with SmartMesh IP network
	Fast Blink (10 per sec.)	Firmware Update in progress
	OFF	Unit is connected to wireless network

### 4

## Install the Wzzard App on Your Handheld Device

Install the Wzzard app on your Android handheld device. Your handheld device must be compatible with Bluetooth LE 4.0. The Wzzard app can be downloaded from the Google Playstore.

Search store for **“Wzzard Sensor Application.”**

1. Open the Wzzard App.
2. Press the “Configuration’ button on the Node to wake up Bluetooth.

3. Select the device you would like to view from the list. Note that the list may take a few moments to populate. (This screen lets the user view Bluetooth advertisements from the Nodes.)
4. Press the “Configure Device” button.
5. Pair with the device. Defaults are *admin/admin*.
6. Press the “Radio Setup’ button to set the Network ID and Network Join Key. (These must be the same values that you enter in the corresponding network gateway.)
7. Press the ‘Save’ button to save the new settings.

### Wiring for Units with Conduit Connectors and Attached Wiring Harness

Model	1 Brown	2 Red	3 Pink	4 Yellow	5 Green	6 Blue	7 White	8 Gray
WSD2CTJ	3.3V					DO2	GND	GND
WSD1CTJ	3.3V					DO2	GND	GND
WSD2CTK	3.3V					DO2	GND	GND
WSD1CTK	3.3V					DO2	GND	GND
WSD2CA2	3.3V	AIN1	GND	AIN2	GND	DO2	3.3REF	GND
WSD1CA2	3.3V	AIN1	GND	AIN2	GND	DO2	3.3REF	GND
WSD2CD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD1CD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD2CA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND
WSD1CA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND

### Wiring for Units with M12 Connectors and B&B M12 Accessory Cable

Model	1 White	2 Brown	3 Green	4 Yellow	5 Gray	6 Pink	7 Blue	8 Red
WSD2MA2	3.3V	AIN1	GND	AIN2	GND	DO2	3.3REF	GND
WSD1MA2	3.3V	AIN1	GND	AIN2	GND	DO2	3.3REF	GND
WSD2MD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD1MD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD2MA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND
WSD1MA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND

## Wiring Chart Abbreviations

3.3V = 3.3V power input  
 3.3REF= 3.3V output reference  
 AIN1= Analog Input #1  
 AIN2= Analog Input #2  
 AIN3= Analog Input #3  
 DIN1= Digital Input #1  
 DIN2= Digital Input #2  
 DO1= Digital Output #1  
 DO2= Digital Output #2  
 GND= Ground Input

### 5

## Configure the Node

Refer to the Intelligent Edge Nodes User Manual for further details and the Wzzard Bluetooth Application Configuration Manual for detailed configuration instructions.

### 6

## Mount the Node

### Flange Mounting

Wzzard nodes may be mounted via their mounting ears. (M5, #10)

### Magnetic Mounting

Wzzard nodes contain a powerful, internal mounting magnet. (Pull force 4.7 lbs, 2.13 kg) The magnet is in the base of the Wzzard node.

Apply the anti-skid disk to the bottom of the unit for extra grip.

# 7

## Resetting the Node

When you press and hold the “Configuration” button on the Node for more than 5 seconds it will:

- Restore the BLE login and password
- Restart the device.

It will not reset the device back to factory settings.

## Recommended Accessories

### ZXTMT

#### Cable Gland/Conduit Kit

<http://www.bb-elec.com/Products/Wireless-Cellular/Wireless-Accessories/Zlinx-Xtreme-Accessories.aspx>



### 371-9000-001G

#### 001G Rubber Duck Magnetic Mount Antenna with 5' Cable with RPSMA Plug

<http://www.bb-elec.com/Products/Wireless-Cellular/Wireless-Accessories/Wireless-Accessories.aspx>



## Fast, Easy Answers

You can use your smart phone to access complete documentation on our website. Simply scan the code to the right.



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B+B SMARTWORX. QUICK START GUIDE



Wzzard™ Intelligent Edge Node with SmartMesh IP and Bluetooth LE

## ✓ First Things First...

Before you begin, be sure you have the following:

- Wzzard Intelligent Edge Node
- Wire harness
- Two Lithium Thionyl Chloride AA batteries
- External Antenna (Some models)
- Anti-skid disk



Fast and easy on the web: [bb-smartsensing.com](http://bb-smartsensing.com)

# Information – UL Class 1 Division 2

## Wizzard Intelligent Edge Nodes

- SUITABLE FOR USE IN CLASS 1, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.
- WARNING - EXPLOSION HAZARD** SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.
- WARNING - EXPLOSION HAZARD** DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
- The unit is to be connected to a Class 2 power source via the terminal block.
- Field wiring conductor minimum insulation rating - 80°C.
- Use Copper Conductors Only or equivalent.
- See Instruction Manual for additional information.

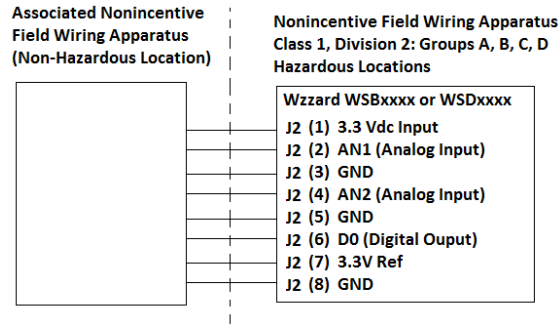
## Batteries

- Warning:** Risk of Fire and Burns. Do Not Recharge, Open, Crush, Heat Above 100°C, or Incinerate the batteries.
- Batteries are not user replaceable, only a qualified technician should replace the batteries.

# Nonincendive Field Wiring Apparatus Control Drawing (Document # 260-10194-00)

The following are UL limitations for the application of customer I/O wiring to the indicated B+B products. These limitations involve the maximum inductance, capacitance and resistance that may be connected to I/O lines, current and power maximums that can be drawn from the I/O lines, and the maximum output voltage from the I/O lines.

Customer I/O wiring is on the left; the B+B product is on the right in the drawing below:



**Table 1: Nonincendive Field Wiring Apparatus vs. Associated Field Wiring Apparatus per UL Limitations**

	Nonincendive Field Wiring Apparatus	Relationship	Associated Field Wiring Apparatus
1	Vmax (or Ui)	>=	Voc (or Vt (or Uo)
2	Imax (or Ii)	>=	Isc or It (or Lo)
3	Pmax	>=	Po
4	Ci + Ccable	<=	Ca (or Co)
5	Li + Lcable	<=	La (or Lo)

The following notes are pertinent to Class 1, Division 2 applications:

- Associated apparatus output current must be limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.
- [Optional] The Nonincendive Field Wiring device does not provide 500 V isolation with respect to earth. Associated apparatus used must be galvanically isolated or dual channel shunt zener diode barriers with linear outputs used channel to channel.
- Associated apparatus may be in a Division 2 or Zone 2 location if so approved.
- Selected associated apparatus must be third party listed as providing Nonincendive Field Wiring circuits for the application, and have Voc or Vt not exceeding Vmax (or Uo not exceeding Ui), Isc or It not exceeding Imax (or Io not exceeding Ii), and the Po of the associated apparatus must be less than or equal to the Pmax or Pi of the Nonincendive Field Wiring equipment, as shown in Table 1.
- Capacitance and inductance of the field wiring from the Nonincendive Field Wiring equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus Nonincendive Field Wiring equipment capacitance, Ci, must be less than the marked capacitance, Ca (or Co), shown on any associated apparatus used. The same applies for inductance (Lcable, Li and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft.
- Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada.
- When required by the manufacturer's control drawing, the associated apparatus must be connected to a suitable ground electrode per the National Electrical Code (ANSI/NFPA 70), the Canadian Electrical Code, or other local installation codes, as applicable. The resistance of the ground path must be less than 1 ohm.

h. Associated apparatus must not be used in combination unless permitted by the associated apparatus certification.

i. Control equipment must not use or generate more than 250 V rms or dc with respect to earth.

j. The WSB-XXXX and WSD-XXXX are provided with a permanently connected cable having the following characteristics:

(Following are some characteristics that should be considered for inclusion. In general, as much information as possible should be included.)

- Type
- Rated Voltage
- Rated Current
- Maximum Rated Temperature
- Conductor size
- Insulation type
- Insulation thickness
- Certifications)

k. Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ).

2. Nonincendive Field Parameters for DIGITAL OUTPUTS (DO). Customer's attached equipment (apparatus) cannot exceed each of these values.

**Table 2: Product DO Lines (TB1)**

	Parameter	Value	Definitions – all refer to B+B product DO lines (TB1)
1	Voc	30 Vdc	Maximum output voltage that can be applied by the DO lines to customer's equipment with suitable load that limits current (note b).
2	Isc	100 mA	Maximum output current that DO lines can supply to the customer's equipment
3	Ca	0.1 µF	Maximum external capacitance that the B+B DO lines shall present to customer's equipment
4	La	5 mH	Maximum external inductance that the B+B DO lines shall present to customer's equipment
5	Po	3.0 w	Maximum output power that DO lines shall supply to customer's equipment – note b

a. Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ)

b. Since the Digital Output is an open FET drain, customer will attach a voltage source (30 Vdc max) through a load that will limit current to 100 mA maximum. A typical load would thus be  $R = E/I = 30V/0.1A = 300$  ohms. This load is in series with the FET (source-to-drain). Since the Ron of the FET is 1 ohm max, over 99% of the voltage drop will be across the customer load, <1% will be across the FET. The power dissipated in the FET will in this case be  $P = I^2 * R = (0.1A)^2 * 2 * 1 \text{ ohm} = 10 \text{ mW}$ .

3. Nonincendive Field Parameters for 3.3V REF port. Customer's attached equipment (apparatus) cannot exceed each of these values.

**Table 3: 3.3V REF (TB1)**

	Parameter	Value	Definitions – all refer to B+B product 3.3V REF (TB1)
1	Vmax	5 VDC	Maximum input voltage that can be applied to the 3.3V REF line
2	Imax	7 mA	Maximum input current that customer's equipment can draw from the 3.3V REF line.
3	Ci	10.11 µF	Maximum capacitance that customer's equipment shall present to the B+B 3.3V REF line.
4	Li	0 mH	Maximum inductance that customer's equipment shall present to the B+B 3.3V REF line.
5	Pmax	35 mW	Maximum power that customer's equipment shall draw from 3.3V REF line. (3.3v x 0.007a)

NOTE 1:

a. Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ)

4. Nonincendive Field Parameters for ANALOG INPUT ports in Voltage-Input mode (AIV). Customer's attached equipment (apparatus) cannot exceed each of these values.

**Table 4: AI Ports in Voltage Mode**

	Parameter	Value	Definitions – all refer to B+B product AI Ports in Voltage mode
1	Vmax	5 VDC	Maximum voltage that can be applied to the AI Ports in Voltage mode
2	Imax	1 µA	Maximum input current that customer's equipment can draw from the B+B AI Ports in Voltage mode
3	Ci	0.01 µF	Maximum capacitance that customer's equipment shall present to the B+B AI Ports in Voltage mode
4	Li	0 mH	Maximum inductance that customer's equipment shall present to the B+B AI Ports in Voltage mode
5	Pmax	5 µW	Maximum power that customer's equipment shall draw from B+B AI Ports in Voltage mode (5v x 1µA)

a. Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ)

5. Nonincendive Field Parameters for ANALOG INPUT ports in Current-Loop mode (AV-I). Customer's attached equipment (apparatus) cannot exceed each of these values.

**Table 5: AI Ports in Current-Loop Mode**

	Parameter	Value	Definitions – all refer to B+B product AI Ports in Current-Loop mode
1	Vmax	5 VDC	Maximum voltage that can be applied to the AI Ports in Current-Loop mode
2	Imax	20 mA	Maximum input current that customer's equipment can supply to the B+B AI Ports in Current-Loop mode
3	Ci	0 µF	Maximum capacitance that customer's equipment shall present to the B+B AI Ports in Current-Loop mode
4	Li	0 mH	Maximum inductance that customer's equipment shall present to the B+B AI Ports in Current-Loop mode
5	Pmax	100 mW	Maximum power that customer's equipment shall draw from B+B AI Ports in Current-Loop mode (5v x 20 mA)

a. Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ)