

# BB-WCD1H2102H BB-WCD1H3001HP100

## Wzzard™ Mesh Wireless Sensor Monitoring Nodes – Commercial Applications



### Features

- Ultra-low power 802.15.4e SmartMesh IP technology
- Communicates with SmartSwarm 342 gateway via a highly scalable and reliable wireless mesh network
- Internal temperature & humidity sensing support
- Connect to industry standard analog or digital sensors
- MQTT and JSON IoT protocol to application platform
- Wide operating temperature range
- Monitor refrigeration, food processing/storage or light stacks

### Introduction

#### Wireless Connectivity Where You Need It

The Wzzard mesh 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 Wzzard mesh wireless sensor nodes and a wireless 802.15.4e SmartMesh IP network to transmit sensor data to the gateway. The SmartSwarm 342 gateway connects to the Internet via wired connections or cellular data networks.

#### Reliable, Highly Scalable Wireless Network

The Wzzard Mesh platform uses mesh networking and time-synchronized channel hopping to provide up to 99.999% connectivity, even in demanding RF environments. New nodes may be added at any time – the SmartMesh IP network will dynamically self-configure as 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. One gateway can support up to 100 nodes.

#### Easy Installation and Configuration

Non-intrusive - even portable - network “overlay” is easy to install and remove with no disruptions to your existing network and no downtime. Configuration of the Wzzard mesh sensor platform is easy via the Advantech hub cloud management portal.

### Ordering Information

| Model No.                | Description                                                                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BB-WCD1H2102H</b>     | <b>Wzzard Mesh Wireless 802.15.4e Sensor Node</b><br>– HVAC/Cooler Node for Temperature & Humidity Sensing<br>– 2 AI, 1 DI, 1 Thermistor, Internal Temperature & Humidity, Internal Antenna |
| <b>BB-WCD1H3001HP100</b> | <b>Wzzard Mesh Wireless 802.15.4e Sensor Node</b><br>– Commercial Stacklight Node for Light Sensing<br>– 3 AI, vBat Out, Internal Antenna<br>– Internal Temperature & Humidity supported    |

### Accessories – Sold Separately

– Or included with select Wzzard starter kits (see kit/s below for details)

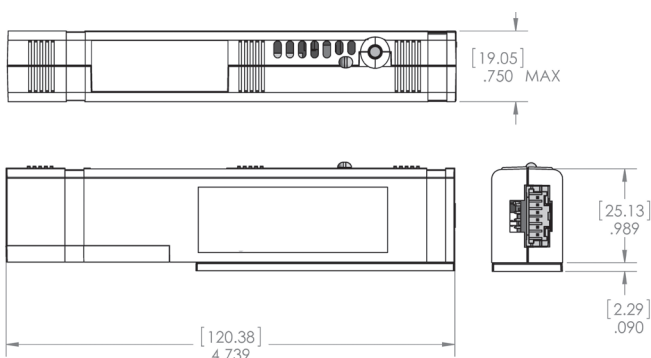
BB-WCHMS – Door sensor cable (open/close)

BB-WCHCBL – Thermistor/Breakout sensor cable

BB-LSSCBL – Light sensor cable (stack light)

BB-JC10F50V – 50A clamp-on current sensor (compressor, fan)

### Dimensions



### Starter Kits Available

Everything you need to get started – easy to expand later.



#### Refrigeration/Cooler Monitoring

Model# BB-WSK-REF-2

- 1 - Wzzard wireless node - temperature & humidity (# BB-WCD1H2102H)
- 2 - Clamp-on current sensors (# BB-JC10F50V)
- 1 - 10K thermistor for temperature (# BB-WCHCBL)
- 1 - Door open/close sensor (# BB-WCHMS)
- 1 - SmartSwarm 342 Gateway



#### Stack Light Monitoring

Model# BB-WSK-SLM-2

- 1 - Wzzard wireless node - light (# BB-WCD1H3001HP100)
- 1 - Stack Light Sensor Cable (# BB-LSSCBL)
- 1 - SmartSwarm 342 Gateway





## BB-WCD1H2102H BB-WCD1H3001HP100

### Specifications

| Technology                                                                           |                                                                                            |
|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Wireless                                                                             | 802.15.4e, SmartMesh IP                                                                    |
| LED                                                                                  | Network Connectivity, Node Status                                                          |
| Power                                                                                |                                                                                            |
| Internal                                                                             | 3.6V 1650 mAh Lithium Thionyl Chloride 2/3 AA battery                                      |
| Battery Life                                                                         | 5-year battery life, based on 1 minute sensor sampling interval                            |
| Mechanical                                                                           |                                                                                            |
| Physical Connection                                                                  | Molex® 6-pin MicroClasp™                                                                   |
| Antenna                                                                              | Internal                                                                                   |
| Mounting Options                                                                     | Mounting bracket (included), VHB adhesive strip (included), or zip tie (ties not included) |
| Dimensions                                                                           | 120.38l x 27.42h x 19.05d mm (4.74l x 1.08h x 0.75d in)                                    |
| Weight                                                                               | 0.09 kg (0.2 lb)                                                                           |
| Wireless Security                                                                    |                                                                                            |
| Device Authentication                                                                |                                                                                            |
| 128-bit AES-based encryption with multiple keys                                      |                                                                                            |
| Message Integrity Check (MIC)                                                        |                                                                                            |
| Synchronized Key Changeovers                                                         |                                                                                            |
| Customized Key Rotation                                                              |                                                                                            |
| Thionyl Chloride Lithium Battery* (1 supplied with product)                          |                                                                                            |
| Temperature Range                                                                    | -60 to +85 °C                                                                              |
| Nominal Capacity                                                                     | 1.65 Ah                                                                                    |
| Nominal Voltage                                                                      | 3.6 V                                                                                      |
| Diameter                                                                             | 14.5 mm                                                                                    |
| Height                                                                               | 33.5 mm                                                                                    |
| *Potential Hazard: Do not recharge, crush, disassemble or heat above +100°C (+212°F) |                                                                                            |
| Environmental                                                                        |                                                                                            |
| Installation                                                                         | Indoor                                                                                     |
| Operating Temperature                                                                | -20 to +70 °C (-4 to +158 °F)                                                              |
| Storage Temperature                                                                  | -40 to +85 °C (-40 to +187 °F)                                                             |
| Operating Humidity                                                                   | 0 to 95%, non-condensing                                                                   |

| Regulatory – Approvals / Standards / Directives          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC Part 15, 15.247, Class B<br>Industry Canada - RSS210 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| CE - Directives                                          | 2014/35/EU Low Voltage Directive<br>2014/53/EU Radio Equipment Directive<br>2011/65/EU amended by (EU) 2015/863 - Reduction of Hazardous Substances Directive (RoHS)<br>2012/19/EU Waste Electrical and Electronic Equipment (WEEE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| CE - Standards                                           | <b>EMC:</b><br>ETSI EN 300 328 v2.1.1 - EMC & Radio Spectrum Matters (ERM) Wideband Transmission Systems, 2.4 GHz ISM Band<br>ETSI EN 301 489-1 V2.1.1 - Applied in accordance with the specific requirements of:<br>ETSI EN 301 489-17 V3.2.0 - EMC and Radio Spectrum Matters: Broadband Data Systems<br>EN 55032 +AC, Class A Information technology equipment – RF Emissions<br>EN 55024 Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement<br><b>Safety:</b><br>EN/IEC 61010-1 3rd Ed. Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements<br>EN/IEC 61010-2-201 1st Ed. Particular requirements for control equipment<br><b>RF Exposure:</b><br>EN 62479 - Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz) |
| Standards - other                                        | EN 61000-6-2 - Generic Immunity Standard for (Heavy) Industrial Environments<br>EN 61000-6-4 + A1 - Emission Standard for (Heavy) Industrial Environments<br>EN 60255-21-1 - Vibration, 2g, 10-500 Hz, 1.5mm displacement<br>EN 60255-21-2 - Shock, 50g, 11ms half sine wave, 18 shocks<br>IEC 60068-2-31 - Drop                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### SmartMesh IP 802.15.4e Radio Specifications

| Parameter                       | Conditions                                           | Minimum | Typical         | Maximum | 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                           | Indoor                                               |         | 100             |         | m     |
|                                 | Outdoor                                              |         | 200             |         | m     |
| Receiver Sensitivity            | Packet Data Error Rate (PER) = 1%                    |         |                 | -93     | dBm   |
| Receiver Sensitivity            | PER = 50%                                            |         |                 | -95     | dBm   |
| Conducted Output Power (PA on)  | Delivered to a 50 Ω load                             |         | 8               |         | dBm   |
| Conducted Output Power (PA off) | Delivered to a 50 Ω load                             |         | 0               |         | dBm   |
| Radiated Output Power (PA on)   | Taoglas PA.11.BB antenna                             |         | 7               |         | dBm   |
| Radiated Output Power (PA off)  | Taoglas PA.11.BB antenna                             |         | -1              |         | dBm   |



## BB-WCD1H2102H BB-WCD1H3001HP100

### BB-WCD1H2102H – Sensor Interface Specifications

| Analog Inputs                       |                                            |         |         |         |         |
|-------------------------------------|--------------------------------------------|---------|---------|---------|---------|
| Input Range                         | 0 - 10V DC / 0-20 mA (software selectable) |         |         |         |         |
| Resolution                          | 0.3 mV / 1.3 uA                            |         |         |         |         |
| Input Load Resistance               | 59 K Ohms / 250 Ohms                       |         |         |         |         |
| Accuracy                            | +/-25 mV +/-0.05 mA                        |         |         |         |         |
| Number of Analog Inputs             | 2                                          |         |         |         |         |
| Thermistor Input                    |                                            |         |         |         |         |
| Types Supported                     | 10K @ +25 °C                               |         |         |         |         |
| Ranges Supported                    | -40 to +85 °C                              |         |         |         |         |
| Resolution                          | 0.05 °C                                    |         |         |         |         |
| Accuracy                            | Typical ± 0.3 °C @ +25 °C                  |         |         |         |         |
| Number of Thermistor Inputs         | 1                                          |         |         |         |         |
| Digital Inputs                      |                                            |         |         |         |         |
| Voltage Range                       | 0 - 48V DC                                 |         |         |         |         |
| V <sub>L</sub>                      | 0.4 V, maximum                             |         |         |         |         |
| V <sub>H</sub>                      | 2.5 V, minimum                             |         |         |         |         |
| Pull-up Current                     | 65 µA                                      |         |         |         |         |
| Type                                | Sinking (NPN) Input                        |         |         |         |         |
| Isolation                           | None                                       |         |         |         |         |
| Number of Digital Inputs            | 1                                          |         |         |         |         |
| Integrated Sensors - inside of node |                                            |         |         |         |         |
| Humidity Sensor                     |                                            |         |         |         |         |
| Accuracy                            | 4%, relative humidity                      |         |         |         |         |
| Response Time                       | 80% response within 10 minutes             |         |         |         |         |
| Number of Humidity Sensors          | 1                                          |         |         |         |         |
| Temperature Sensor                  | Conditions                                 | Minimum | Typical | Maximum | Units   |
| Offset                              | Temperature Offset Error @ +25 °C          |         | ± 0.25  |         | °C      |
| Slope Error                         |                                            |         | ± 0.033 |         | °C / °C |

### BB-WCD1H3001HP100 – Sensor Interface Specifications

| Analog Inputs                       |                                |
|-------------------------------------|--------------------------------|
| Input Range                         | 0 - 10 VDC                     |
| Resolution                          | 0.3 mV                         |
| Input Load Resistance               | 59 K Ohms                      |
| Accuracy                            | +/-25 mV                       |
| Number of Inputs                    | 3                              |
| Sensor Power                        |                                |
| Power to Sensor                     | Switched vBat Out              |
| Integrated Sensors - inside of node |                                |
| Humidity Sensor                     |                                |
| Accuracy                            | 4% RH                          |
| Response Time                       | 80% response within 10 minutes |