

# Wzzard™ Mesh Wireless Sensor Monitoring Nodes – Commercial Applications

Models BB-WCD1H2102H, BB-WCD1H3001HP100

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## PRODUCT FEATURES

- Ultra-low power 802.15.4e SmartMesh IP technology
- Communicates with SmartSwarm 342 gateway via 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

## 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, 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.

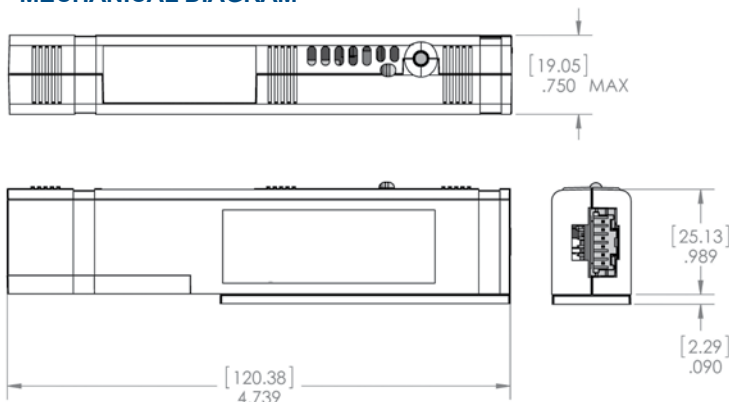
## Reliable, Highly Scalable Wireless Network

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 dynamically self-configures 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 supports 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.

## MECHANICAL DIAGRAM



## ORDERING INFORMATION

MODEL NUMBER	
BB-WCD1H2102H	Wzzard Mesh Wireless 802.15.4e Sensor Node – HVAC/Cooler Node for Temperature & Humidity Sensing – 2 AI, 1 DI, 1 DO, 2 Thermocouples, 2 Thermistors, Internal Temperature & Humidity, Internal Antenna
BB-WCD1H3001HP100	Wzzard Mesh Wireless 802.15.4e Sensor Node – Commercial Stacklight Node for Light Sensing – 3 AI, vBat Out, Internal Antenna – Internal Temperature & Humidity supported

## ACCESSORIES

– sold separately

– 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)

## 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

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All product specifications are subject to change without notice.  
BB-WCD1Hxx\_WzzardCommercialNodes\_2320ds

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## GENERAL 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)
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	
FCC Part 15, 15.247, Class B Industry Canada - RSS210	
UL Class 2/Division 2	
UL C1/D2 - Product Exceptions Summary	UL C1/D2 rating is voided when: -using non UL-specified batteries. Do not mix old and new batteries.
CE - Directives	2014/35/EU Low Voltage Directive 2014/53/EU Radio Equipment Directive 2011/65/EU amended by (EU) 2015/863 Reduction of Hazardous Substances Directive (RoHS) 2012/19/EU Waste Electrical and Electronic Equipment (WEEE)
CE - Standards	<b>EMC:</b> ETSI EN 300 328 v2.1.1 - EMC & Radio Spectrum Matters (ERM) Wideband Transmission Systems, 2.4 GHz ISM Band ETSI EN 301 489-1 V2.1.1 - Applied in accordance with the specific requirements of: ETSI EN 301 489-17 V3.2.0 - EMC and Radio Spectrum Matters: Broadband Data Systems EN 55032 +AC, Class A Information technology equipment – RF Emissions EN 55024 Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement <b>Safety:</b> EN/IEC 61010-1 3rd Ed. Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements EN/IEC 61010-2-201 1st Ed. Particular requirements for control equipment <b>RF Exposure:</b> 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 55022 - CISPR Class B EN 61000-6-2 - Generic Immunity Standard for (Heavy) Industrial Environments EN 61000-6-4 + A1 - Emission Standard for (Heavy) Industrial Environments EN 60255-21-1 - Vibration, 2g, 10-500 Hz, 1.5mm displacement EN 60255-21-2 - Shock, 50g, 11ms half sine wave, 18 shocks IEC 60068-2-31 - Drop

## 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	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

# Model BB-WCD1H2102H

## Wzzard™ Mesh Wireless Monitoring Node

### – Temperature & Humidity Sensing



#### BB-WCD1HH202H – SENSOR INTERFACE SPECIFICATIONS

ANALOG INPUTS					
Input Range	0 - 10 VDC / 0-20mA (software selectable)				
Resolution	0.3 mV / 1.3 uA				
Input Load Resistance	59 K Ohms				
Accuracy	+/-25mV +/-0.05mA				
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 - 48 VDC				
V <sub>IL</sub>	0.4 V, maximum				
V <sub>IH</sub>	2.5 V, minimum				
Pull-up Current	65 uA				
Type	Sinking (NPN) Input				
Isolation	None				
Number of Digital Inputs	1				
INTEGRATED SENSORS - within node					
HUMIDITY SENSOR					
Accuracy	4%, relative humidity				
Response Time	80% response within 10 minutes				
Number of Humidity Sensors	1				
TEMPERATURE SENSOR	CONDITIONS	MIN	TYP	MAX	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 / 0-20mA (Software Selectable)				
Resolution	0.3 mV/1.3 uA				
Input Load Resistance	59 K Ohms				
Accuracy	+/-25mV +/-0.05mA				
Number of Inputs	3				
POWER					
Power Backup Method	vBat Out operating mode				
INTEGRATED SENSORS - within node					
HUMIDITY SENSOR					
Accuracy	4% RH				
Response Time	80% response within 10 minutes				
TEMPERATURE SENSOR	CONDITIONS	MIN	TYP	MAX	UNITS
Offset	Temperature Offset Error @ 25 °C		± 0.25		°C
Slope Error			± 0.033		°C / °C