User Guide

Wireless Pulse Counter

Applies to: ZPC-10, ZPC-12, ZPC-20, ZPC-22

EPI-058-00

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Safety Information

Please read these instructions carefully before trying to install, operate, service or maintain the ZPC. The following special notes may appear throughout the user guide (or on the equipment labels) to warn of potential hazards or to call attention information that clarifies or simplifies a procedure for users.

Symbol	Description
	The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.
	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Electrical Installation

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by EpiSensor for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Installation, wiring, testing and service must be performed in accordance with all local and national electrical codes.

 **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH** 

- ➔ NEVER work alone.
- ➔ Use appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- ➔ Only qualified electrical workers should install this equipment. Such work should be performed only after reading the entire set of installation instructions.
- ➔ If the equipment is not used in a manner specified by EpiSensor, the protection provided by the equipment may be impaired.

- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Turn off all power supplying the ZPC and the area in which it is installed before working on it.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Before closing all covers and doors, inspect the work area for tools and objects that may have been left inside the equipment or panel.
- When removing or installing metering or other equipment, do not allow it to extend into an energised bus.
- The successful operation of this equipment depends upon proper handling,
- Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.
- Before performing Dielectric (Hi-Pot) or Megger testing on any equipment in which the energy meter is installed, disconnect all input and output wires to the ZPC.
- High voltage testing may damage electronic components contained in the ZPC.
- Failure to follow these instructions will result in death or serious injury.

Installation & Safety Notes

- EpiSensor equipment should be installed, operated, serviced and maintained only by qualified personnel. EpiSensor does not assume any responsibility for any consequences arising out of the use of this equipment.
- Fuse for neutral terminal is required if the source neutral connection is not grounded.
- Clearly label the device's disconnect circuit mechanism and install it within easy reach of the operator.
- The fuses / circuit breakers must be rated for the installation voltage and sized for the available fault current.

Intended Use

Do not use this device for critical control or protection applications where human or equipment safety relies on the operation of the control circuit. Failure to follow these instructions can result in death, serious injury, or equipment damage.

Related Documents

Related installation and configuration documents are listed in the following table:

Document	Reference No.
EpiSensor ZPC Datasheet	EPI-072-00
Install Sheet for ZPC-1X	EPI-073-00
Install Sheet for ZPC-2X	EPI-074-00
Gateway API User Guide	ESE-009-08

Introduction

EpiSensor's ZPC Pulse Counter is intended to interface with sensor products which produce either a dry contact (relay), open collector, or an active voltage pulse output. The ZPC reports the data through the wireless sensor network to the Gateway.

The ZPC Pulse Counter interfaces with existing meters that provide a pulsed output (gas or water flow, power consumption, etc.). The ZPC reports data in terms of the 'number of pulses counted' and users of 3rd party software systems can interpret these values and convert to the appropriate Units of Measure for the sensor. The ZPC-10/12 product variants are battery powered, and the ZPC-20/22 are mains powered versions. The available product variants are as follows:

SKU	Description
ZPC-10	Single Channel, Battery Powered Pulse Counter
ZPC-12	Dual Channel, Battery Powered Pulse Counter
ZPC-20	Single Channel Mains Powered Pulse Counter
ZPC-22	Dual Channel Mains Powered Pulse Counter

Pulse Output Installation

The pulse wires should be fed through the enclosure's M10 waterproof glands and connected to the terminal block, taking note of the positive and negative terminals. There will be 2 terminals used per channel, so the dual-channel pulse counter would use 4 terminals. The pulse input wires are connected to IN1 for single channel models, and IN1 and IN2 for dual-channel models.

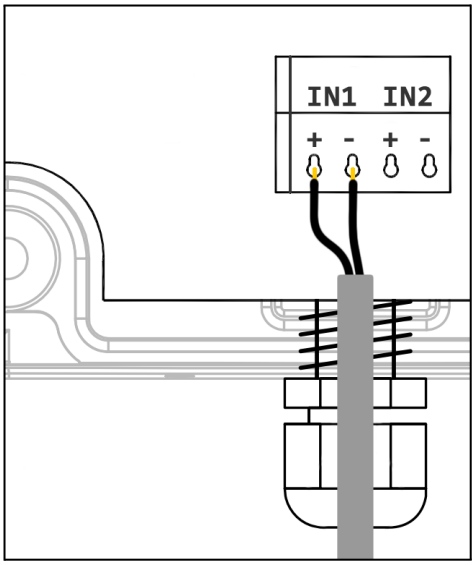


Diagram of a pulse output connected to Input 1 of the single-channel ZPC-10

Note: the single-channel pulse counter may use the same hardware as the dual channel version and so would also have a 4-pin terminal block. However, only the first channel (IN1) will be enabled on the ZPC-10/12 variants.

Dry pulses are not polarity sensitive, but Open Collector and Active pulses are polarity sensitive. Take note of the positive and negative terminals for both inputs.

Configuring the Jumpers

To the right of the terminal block there is a selector grid that is used to configure the ZPC for different types of pulse inputs. There are two rows of jumpers in the grid, the top row for IN1 and the bottom for IN2. The columns of the grid are used to configure the pulse type. For Battery Powered Pulse Counters the selector options are:

- T for Temperature Sensors (Not used on the ZPC product range)
- AP for Active Pulse Inputs
- DP for Dry Pulse Inputs, or Open Collector Inputs

The image below shows a single-channel battery powered pulse counter (ZPC-10) configured for a Dry Pulse Input. Note that because this is a single channel device, the location of the jumper for Input 2 is not important.

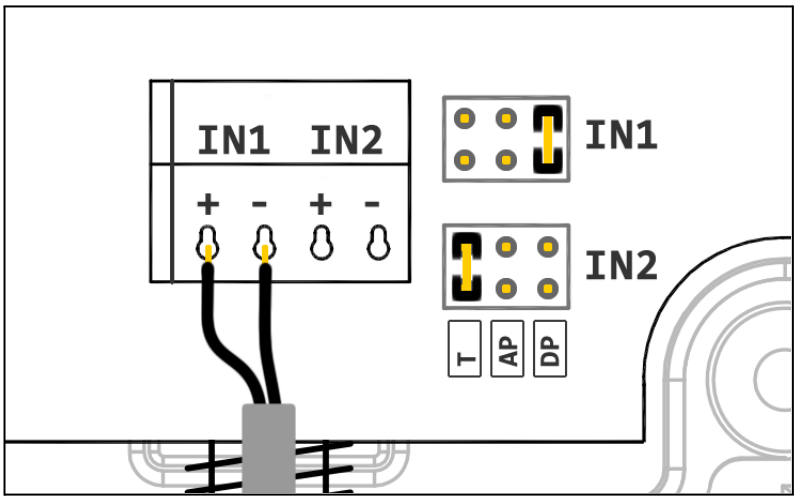


Diagram showing a ZPC-10 with Input 1 configured for a dry pulse (DP)

For Mains Powered Pulse Counters the selector options are:

- AP for Active Pulse Inputs
- DP for Dry Pulse Inputs, or Open Collector Inputs
- 0-10 for 0-10 Volt Sensors (not used on the ZPC product range)
- 4-20 for 4-20 Milliamp Sensors (not used on the ZPC product range)

The image below shows a dual channel mains powered pulse counter where IN1 is configured for a Dry Pulse and IN2 is configured for an Active Pulse:

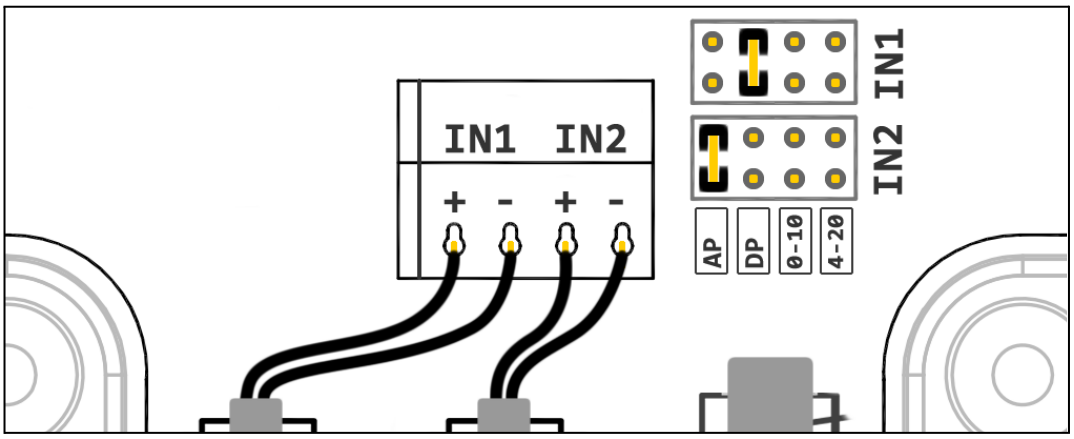


Diagram showing ZPC-22 with IN1 configured for an Active Pulse, and IN2 configured for a Dry Pulse

Pulse Types

This section describes the operation of the 3 different pulse types.

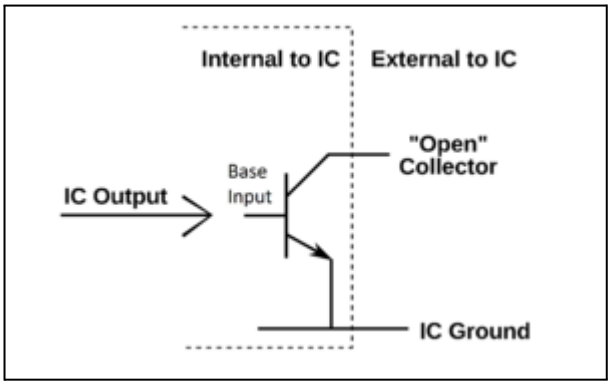
Dry Pulse

A dry pulse can be thought of as a simple switch. Window alarm contacts or reed switches would be examples of such a connection. In this configuration, a small voltage is applied to the + terminal of the IN connector. A pulse is detected when this signal is connected to the negative (–) terminal of the IN connector.

The selector grid for Dry Pulse should be on the “DP” setting.

Open Collector Pulse

An Open Collector pulse is generally used by electronic meters. The diagram below is an example of such a Pulse.



Schematic diagram of an open collector pulse output

When the Integrated Circuit (IC) Output is pulsed, the signal on the “Open Collector” gets connected to the IC’s Ground. This system is polarity sensitive. The Open Collector connection must be connected to the positive (+) terminal of the IN connector and IC Ground must be connected to the negative (–) terminal of the IN connector.

As the Open Collector is simply an electronic switch, the selector grid for the Open Collector Pulse should be on the “DP” setting.

Active Pulse

An active pulse occurs when the system generating the pulse applies a positive DC voltage for a short period of time. This system is polarity sensitive. The Pulse Generator and ZPC units share a common Ground on the negative (–) terminal of the IN connector. The positive DC voltage representing the pulse must be connected to the positive (+) terminal of the IN connector.

Note: The Active Pulse Voltage on the ZPC-20/22 should not exceed 40 Volts!

The jumper should be in the “AP” position on the selector grid for monitoring Active Pulse outputs.

Pulse Rate

Depending on the version of ZPC you have, the maximum pulse rate that the ZPC can handle will vary. For mains powered versions (ZPC-20, ZPC-22) the maximum pulse rate is 40 pulses per second, or 40Hz. For battery powered versions, the limit is 4Hz.

Pulse Width

The pulse width is the length of time the pulse needs to remain in a changed state to ensure the pulse is registered on the ZPC.

The minimum pulse width is 10 milliseconds, but this should be configured to a higher value where possible in the meter or other device that's generating the pulse. There is no maximum pulse width.

For battery powered pulse counters, the "active state" (closed for dry contacts, or logic high for an active pulse) should be kept as short as possible. The ZPC will consume battery power while the pulse is in the active state.

Sensors & Settings

Node level settings, sensor level settings and a list of sensors (data feeds) available on the ZPC are listed below. Data reporting can be enabled or disabled as required for each of the sensors listed.

Node Level Settings

The following table lists the settings available at the node level on the ZPC.

Property ID	Setting	Description	Unit	Resolution	Reporting	Default	Read/Write
7012	**Radio Power**	The power the unit will set for RF communications. These must be valid values from the Radio Manufacturers settings or the radio will use the next lower valid setting. If a Power Amp is used, this power level is amplified further. Care must be taken not to exceed the regional variances for max radio power. Both the Radio Power, and Amplifier Power must be taken into consideration when setting this power level.	dBm	1		8	Read Only for non "engineer" logins. Read/Wrive for "engineer"

Sensors

These data feeds show the number of pulses counted by the ZPC, wireless performance and battery health:

Sensor ID	Data Feed	Description	Unit	Resolution	Reporting	Default	Read/Write
450	**Pulse Count**	The total Pulse Count on Channel 1 of the Pulse Input	pulses	1	Off	-	Read/Write
462	**Interval Pulse Count**	The total number of Pulses on channel 1 during the previous reporting interval	pulses	1	On	15	Read Only
463	**Pulse Count 2**	The total Pulse Count on Channel 2 of the Pulse Input	pulses	1	Off	-	Read/Write
464	**Interval Pulse Count 2**	The total number of Pulses on channel 2 during the previous reporting interval	pulses	1	On	15	Read Only
4097	**Link Quality**	A gauge on radio performance based on incoming and outgoing packets.	%	1	Off	-	Read Only
4099	**RSSI**	A measure of received signal at the radio on the current channel	dBm	1	Off	-	Read Only

Note: The maximum value for Pulse Count sensors (450 and 463) is 4294967295. If this value is reached, the count will reset back to zero.

Mains Powered ZPC versions (ZPC-20, ZPC-22 and ZPC-23) have the following additional sensors:

Sensor ID	Data Feed	Description	Unit	Resolution	Reporting	Default	Read/Write
444	**Pulse Rate 1**	The instantaneous Pulse Rate on Channel 1	Hz	0.001	Off	-	Read Only
445	**Min Pulse Rate 1**	The minimum Pulse Rate during the last time interval	Hz	0.001	Off	-	Read Only
446	**Max Pulse Rate 1**	The Maximum Pulse Rate during the last time interval	Hz	0.001	Off	-	Read Only
447	**Pulse Rate 2**	The instantaneous Pulse Rate on Channel 2	Hz	0.001	Off	-	Read Only
448	**Min Pulse Rate 2**	The minimum Pulse Rate during the last time interval	Hz	0.001	Off	-	Read Only
449	**Max Pulse Rate 2**	The Maximum Pulse Rate during the last time interval	Hz	0.001	Off	-	Read Only
4101	**Neighbour Count**	The number of radio devices within radio range that would route radio messages back to the Gateway		1	Interval and Delta	3600 changed to 360 in 3.71	Read Only
4102	**Child Count**	The number of battery powered devices that are using this node as a routing parent		1	Interval and Delta	3600 changed to 360 in 3.71	Read Only

Battery powered ZPC versions have the following additional sensors:

Sensor ID	Data Feed	Description	Unit	Resolution	Reporting	Default	Read/Write
4096	**Battery Level**	The voltage measured on the battery	mV	1	Snap to Clock	1440	Read Only

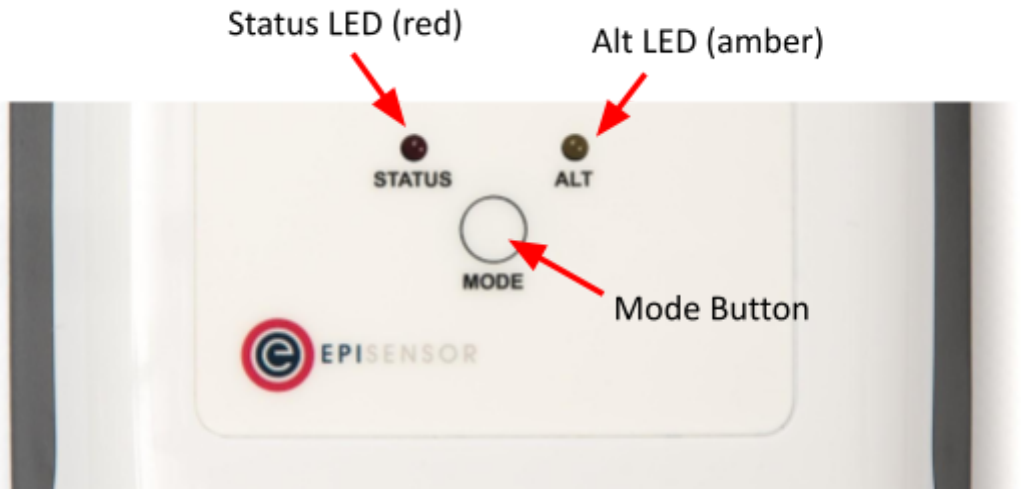
Sensor Level Settings

The following table lists the settings available at the sensor-level on the ZPC:

Property ID	SensorID	SensorID	Setting	Description	Unit	Resolution
6202	**ALL**	**ALL**	**Reporting Mode**	Defines the style of reporting for the sensor	-	-
6203	**ALL**	**ALL**	**Reporting Interval**	Sets the interval for timed sensors reports	seconds	1
6204	**ALL**	**ALL**	**Logging**	When logging is on, the sensor will store values on the node when communication with the gateway is not available	boolean	-
6205	**ALL**	**ALL**	**Reporting Delta**	For Delta style reporting, this is the value for the “difference” from the last reported value	Sensor units	Sensor Resolution
6280	**462, 464**	**Interval Pulse Count 1 & 2**	**Delta No Input Timeout**	When the Reporting Mode is any of the Delta settings, this defines the number of seconds after the last pulse when the value is reported. For example, if the Delta value is 1, then every pulse could potentially generate a radio message. So when a number of pulses arrive together, it may be better to report that number once the pulse line goes quiet rather than a stream of 1’s.	seconds	1
6280	**444, 447**	**Pulse Rate 1 & 2**	**Delta No Input Timeout**	When the Reporting Mode is any of the Delta settings, this defines the number of seconds after the last pulse when the pulse rate is deemed to have returned to zero	seconds	1

User Interface

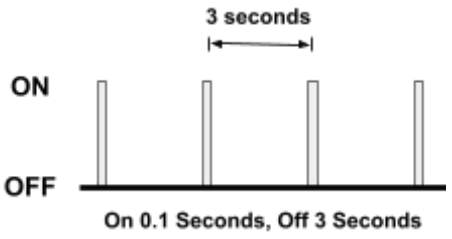
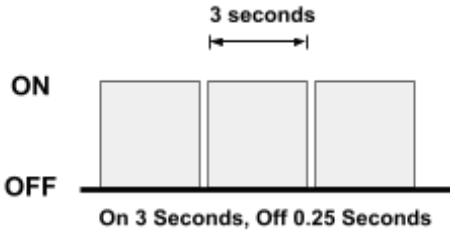
There are two LED’s and one button on the front panel of the ZPC product range that are used to show the status of the product and to issue commands. This section describes how to interact with user interface and what each state means.

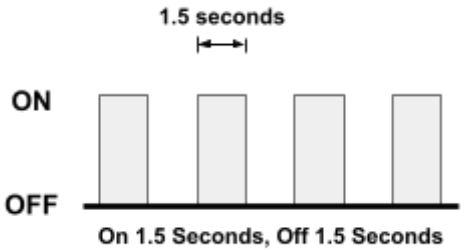


A node must be in “command mode” before users can interact with the product. To put the node in Command Mode, press and hold the “MODE” button for 2 seconds, then release. At this point, a battery powered node will switch the LED On Solid, while a mains powered node will flicker the LED and then switch the LED On Solid.

Status LED

The red status LED will flash in different sequences depending on the current state of the ZPC. This table below lists all possible LED flash sequences and their meaning.

Flash Sequence	Description	Diagram
Heartbeat	The node is operating correctly and has successfully joined a wireless network.	
Inverse Heartbeat	The node has received valid security keys, but is not connected to a Gateway.	

Square Wave	The node is operating correctly but has lost contact with the Gateway.	
On Solid, or Off	If the LED is On Solid, the node is searching for a Gateway to join. If it is Off, the node may not be powered, or there is a problem with the node. Check the power supply, and if the problem persists, contact EpiSensor support.	

Alt LED

The Alt LED will flash when data is transmitted or received on the ZigBee wireless network. For mains powered nodes, it will always be active - but for battery powered nodes, it will only be active when in Command Mode.

Mode Button

The following options are available with Command Mode. The button should be pressed and then released to register a valid button press. If no further button presses are made, the device will terminate “command mode” 4 seconds after the last button press.

Press	Description
0	Send a PING message disable any active Install Mode or Range Test Mode. If the node is not joined, try and join a network.
1	Send a DATA message to the Gateway for any enabled sensors that are not reporting in ‘snap-to-clock’ mode.
2	Leave the current network. Mains powered Nodes will automatically try and join a new network once they have left and will periodically retry the join. Battery powered nodes will go to sleep.
4	Start “Install Mode”. Node sends a PING message every 15 seconds, with the LED pulse speed indicating the wireless signal strength of the reply. Automatically expires after 5 minutes.
6	Reboot the node. Security keys for the wireless network the node is joined to will not be erased, and all other settings will remain the same.
8	Factory-reset the node and perform a reboot. All settings and security keys will be lost. The node will be returned to its factory default state.
12	Start “Range Test” mode. Node will send a PING message every 5 seconds. The LED pulse speed indicates the wireless signal strength of the reply. Automatically expires after 5 minutes.

Install Mode

Issuing a press sequence on the Mode button of a powered node can enable either “Install Mode” or “Site Survey Mode” on that node. In this mode, the LED will flash at a rate that indicates the wireless signal strength (Link Quality Indicator) of that node, based on the following table:

Flash Rate	Flashes per Second	Wireless Signal Strength	LQI
Very Fast	10 flashes / second (Light on 50ms, off 50ms)	Very good Signal	> 200
Fast	2 flashes / second (LED on 250ms, off 250ms)	Good Signal	> 150
Slow	1 flash / 2 seconds (LED on 1 sec, off 1 sec)	OK Signal	> 100
Very Slow	1 flash / 6 seconds (LED on 3 sec, off 3 sec)	Poor Signal	< 100

Note: This mode expires after 15 minutes for Install Mode and 5 minutes for Site Survey Mode.

Electrical Installation

The ZPC-20/22 is a mains powered device – the mains cable on the ZPC-20/22 is colour coded to conform to European CENELEC standards. The CENELEC standard insulation colours are as follows:

Live – **Brown**

N – **Blue**

Important Note: The ZPC-20/22 should be connected via a switched junction box and breaker to protect the cable. Also, please ensure that the live connection is made on the same circuit as the neutral connection where residual-current devices (RCD’s) are used.

Installation should only be carried out only by personnel qualified in the installation of electrical equipment. All parts of the circuit within the enclosure must be considered to be at dangerously high mains voltage when the unit is connected to a mains voltage source.

Mechanical

This section describes how to wall-mount the ZPC enclosure, the enclosure materials and important safety considerations when connecting the ZPC to external systems.

Enclosure & Label Material

The ZPC is housed in an IP67 water and dust proof enclosure to provide maximum safety, flexibility and reliability. The enclosure material is polycarbonate plastic, which is resistant to a variety of chemicals, oils and detergents.

The front label is made from polycarbonate. There will be two or more labels on the back of the enclosure, depending on the model selected. The compliance label is made from PVC and the serial number label is made from polyethylene film.

Mounting Instructions

The ZPC-10/12 product range will have one or two cable glands at the bottom for the pulse inputs depending on the model. The ZPC-20/22 is housed in the same enclosure, but includes an additional gland and mains voltage input cable.

The ZPC product requires 2 screws for mounting. These screws can be preinstalled on a vertical surface spaced 122mm vertically apart. The head of the screw should be less than 8.5mm in diameter and the screw thickness should be less than 4.5mm. The screws should be left unscrewed by more than 5 mm before installing the enclosure.

Important Safety Note

The enclosure of the ZPC must not be drilled, cut or modified in any way for mounting or connecting to external systems.

All parts of the circuit within the enclosure must be considered to be at dangerously high mains voltage when the unit is connected to a mains voltage source. Modifying the enclosure could expose parts of the system to users, or cause an internal fault or short circuit.

There are no user-serviceable parts inside the ZPC enclosure, and it should always be isolated from mains voltages before opening the enclosure lid.

Opening the Enclosure

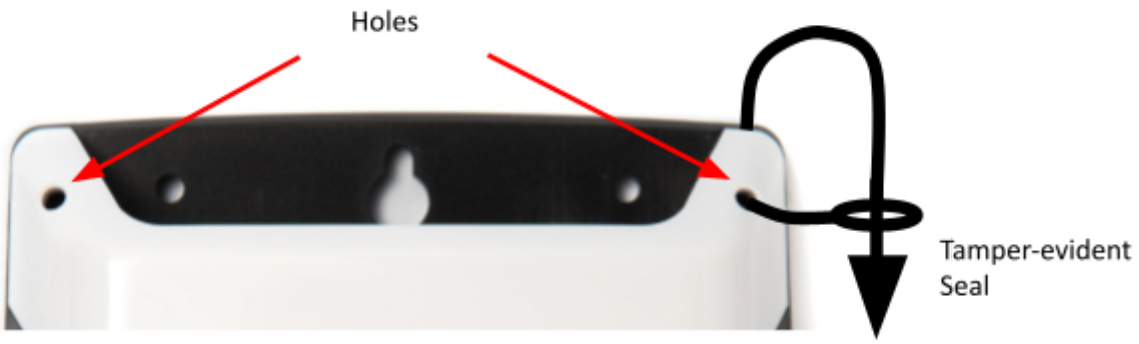
To make connections to the ZPC, it is necessary to open the lid of the enclosure. This is fastened with four screws that are accessible from the back of the enclosure. This should only be done by qualified personnel, and for the mains powered version, only when the ZPC-2X has been isolated from any high voltage supplies. Please consult the safety notes at the start of this user guide for more information.

Important Safety Note	
	EpiSensor equipment should be installed, operated, serviced and maintained only by qualified personnel. There are no user-serviceable parts inside the ZPC-2X enclosure, and it should always be isolated from mains voltages before opening the enclosure lid.

When closing the lid, take care to ensure that no wires or cable ties are obstructing the gasket of the enclosure, as this could interfere with the waterproof seal. When tightening the screws on the lid, apply pressure to the enclosure so the gasket is compressed, and tighten each screw gradually and in sequence.

Tamper Evident Seals

Some applications (particularly applications where data is used for billing purposes) will require a tamper evident seals to be attached to the ZPC enclosure. These seals can be attached to two or more of the corners of the ZPC enclosure, as shown on the diagram below.



Compliance

There is a compliance label on the back of the ZPC enclosure that has important regulatory and node identification information.

The label material is gloss white PVC foil with permanent adhesive and gloss overlaminate. The following table lists the certification and safety symbols that appear on the certification labels of EpiSensor products. Please refer to it for a definition of each symbol.

Symbol	Name	Description
CE	**CE Mark**	This marking certifies that a product has met EU consumer safety, health or environmental requirements.

	**WEEE Symbol**	The directive imposes the responsibility for the disposal of waste electrical and electronic equipment on the manufacturers of such equipment.
	**Class II IEC Protection**	This certifies that this product has been designed in such a way that it does not require a safety connection to electrical earth/ground.
	**IP / NEMA Rating**	Water and dust ingress protection standard. IP67 / NEMA 4 means complete protection against contact with dust, and protected from ingress of water when immersed in up to 1 metre depth for up to 30 minutes. For more information, see IEC 60529.
	**RoHS Directive**	Restriction of Hazardous Substances Directive restricts (with exceptions) the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment.
	**Safety Alert**	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
	**Danger / Warning**	The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

EpiSensor products are not suitable or specifically designed, manufactured or licensed for use in military, aviation, powerplant, medical or in other inherently dangerous or safety critical applications.

Battery Life

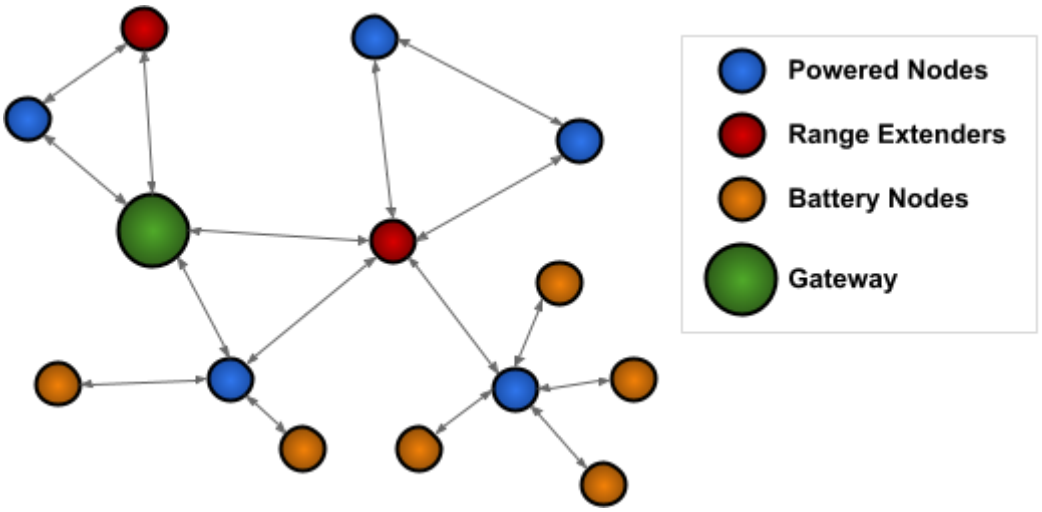
The following table estimates battery life for the ZPC-10/12 range. There are other environmental factors that this table does not take into account, and the calculations are made assuming the wireless node is not logging data for long periods of time, that the pulse frequency is low, and that the pulse duration is quite short.

Reporting Interval	Estimated Battery Life
1 minute	3 months
15 minutes	6 years
30 minutes	8 years
60 minutes	10 years

Wireless Communications

All EpiSensor products use IEEE 802.15.4 ZigBee Pro for wireless communications operating at 2.4GHz. This is a secure, scalable mesh networking communications protocol designed for transmitting small amounts of data reliably, and at low power levels.

There are two types of nodes in the EpiSensor wireless mesh network: powered nodes and battery nodes. Powered nodes on the wireless sensor network are capable of routing data from any other type of wireless nodes.



Range extenders are powered nodes where the main function is to route data. Any node with a mains power supply will act as a routing node in the network. Battery nodes do not route data – they spend most of the time in a low power mode.

Each powered node can have up to 32 ‘neighbours’ which are nodes with a mains power supply and can Route data back to the Gateway. They can also have up to 32 ‘children’ which are nodes that are battery powered and cannot participate in any routing in the network.

The range that can be achieved with ZigBee will depend mainly on two factors: the power level of the ZigBee radio module and the environment that the device is installed in. There are two types of ZigBee radio module used across the EpiSensor product range, a power amplified version, and non-power amplified version.

The power output of nodes with a power-amplified module can be configured with an output power level of +20 dBm depending on the region they are deployed in. Non-power amplified nodes have a maximum output power of +8 dBm.

Module Type	Tx Power	Rx Sensitivity	LoS Range	Region(s)
Normal	+8 dBm	-101dBm	up to 300m (985ft)	Worldwide
Power-amplified	+20 dBm	-106dBm	up to 1600m (5250ft)	North America (FCC / IC)

All communications over the ZigBee wireless network is AES 128-bit encrypted. For more detailed information on ZigBee security features, contact EpiSensor support.

Ordering Information

EpiSensor products are available to order directly or via EpiSensor's distribution partners. The following table lists the available ZPC options.

SKU	Description
ZPC-10	Wireless Digital Signal Sensor (pulse counter) single channel, 4Hz max, battery powered
ZPC-12	Wireless Digital Signal Sensor (pulse counter) dual channel, 4Hz max, battery powered
ZPC-20	Wireless Digital Signal Sensor (pulse counter) single channel, 40Hz max, mains powered
ZPC-22	Wireless Digital Signal Sensor (pulse counter) dual channel, 40Hz max, mains powered

Troubleshooting & Support

If you are experiencing problems with your ZPC or any other part of your EpiSensor system, or you notice something unusual - please contact EpiSensor support at the following email address, phone number or via live chat on our website.

- Email: support@episensor.com
- Tel: +353 61 512 500
- Website: http://episensor.com

For customers and partners who are deploying systems in business-critical environments, there are a number of support packages available that offer a higher level of service and response time. For more information on EpiSensor Premium Support, visit: http://episensor.com/premium-support/

Warranty

All EpiSensor products and provided with a 365 day limited warranty effective from the shipping/invoice date of an order. During the warranty period, under the conditions of normal use, EpiSensor will repair or replace any product that has a manufacturing defect.

Warranty can be extended by up to 4 years within 30 days of a purchase. For more information on warranty, visit: http://episensor.com/warranty/

Glossary

Definitions for terms and abbreviations used in this document are listed in the following table:

Term	Description
Sensor	Describes a feed of data within the EpiSensor system
Node	Used to describe a physical EpiSensor product
Gateway	The central computer that managed the EpiSensor system
ZigBee	IEEE 802.15.4 Wireless communications standard that EpiSensor nodes use
WSN	Wireless Sensor Network
Reporting Mode	Defines how an EpiSensor node should report data to the Gateway
Reporting Interval	The length of time between each data point produced by a node
Snap to Clock	Reporting mode where data is 'snapped' to the nearest 1 minute / 5 minute / 15 minute interval etc.
Interval and Delta	Reporting mode where data is produced when the reporting interval has elapsed, unless a change is detected
Allow join mode	A mode that can be enabled on the Gateway that allows new wireless nodes to join