ioXpander 2x2 Two-Way Wireless Transceiver Installation Guide

About ioXpander 2x2

The ioXpander 2x2 is a two-way wireless transceiver which comprises two general purpose inputs, two general purpose outputs (PGM). The outputs can be converted into two additional inputs.

Each of the two general purpose inputs can be remotely configured as 'Normally-Closed', 'Normally-Open', 'End-of-Line' or 'Double-End-of-Line' input.

The general purpose outputs are designed for controlling apparatuses having dry-contact control inputs. These general purpose outputs can withstand up to 15VDC (OFF state, open loop) and are capable of sinking up to 1A (ON state, close loop).

The device is tamper protected, both front cover tamper and back mounting tamper.

Operating power is obtained from an on-board 3V Lithium battery. The battery voltage is monitored and reported when low battery conditions are detected.

The device has the following features:

- Dealer lock down
- Two-factor authentication
- Two-way PowerG communication with the control panel
- Front cover and back cover tamper detection
- Periodic supervision message is transmitted automatically to the control panel at regular interval
- Signal strength LED indication during installation
- Discreet transmission of supervision message
- PowerG two-way frequency hopping spread spectrum time-division multiple access (FHSS-TDMA) technology
- Battery reporting
- Low battery indication
- User-selectable operation of auxiliary input as Normally open, Normally closed, End of Line (EOL), or Double EOL

Installation guidelines

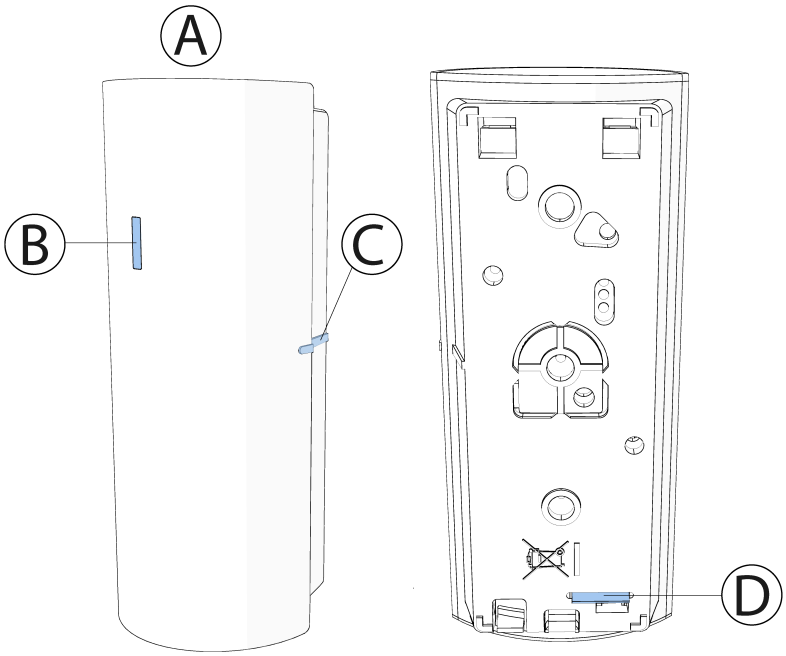
The reference to ioXpander 2x2 throughout this manual includes the models ioXpander 2x2 P8M0 and ioXpander 2x2 P8M1

⚠ **CAUTION:** Risk of explosion if battery is replaced by an incorrect type. Dispose used battery according to manufacturer's instructions

Important: Check the device and the entire alarm system weekly to ensure optimal performance. Have a qualified technician check the entire system at least every three years. Not for use external to the supervised premises.

D-309507

Figure 1: ioXpander 2x2



Callout	Description	Callout	Description
A	Device	C	Transmission LED
B	Back of device	D	Pull-tab

For more information refer to section About ioXpander 2x2.

Enrolling the device

The following steps are relevant for IQ panels. For other panels, refer to the control panel installation manual for the complete set of enrollment instructions and testing procedures.
Verify that the IQ panel software version supports the device. The minimum IQ Panel 4 software version required is 4.6.0.

1. From the **panel** menu, enter the **Settings** menu.
2. Select **Advanced Settings >Enter Code>Installation >Devices>Security Sensors > Auto Learn Sensor** .
3. Remove the battery pull-tab to power on the device and begin the auto-enrollment process. If the battery pull-tab is not available or if the device does not automatically enroll, open and close the device cover to trigger the enrollment. Alternatively, press the enroll button until the orange LED turns on.
4. **Optional:** Select **Add Sensor** to manually enroll device.
   a. Scan the QR Code on the device box, using the IQ4 camera if available, or see step b.
   b. Manually enter the device ID, printed on the product label. Use the ID 530-XXXX for two input and two output wires. Use ID 106-XXXX for four input wires. In fallback mode (PG2 products), use ID 105-XXXX for two input and two output wires.

   ⓘ **Note:** If the device has been powered up for more than 48 hours it will be identified by the system only after the device has been reset. The ioXpander 2x2 is enrolled with device ID 530-XXXX or 106-XXXX. In fall back mode it enrolls as WL-IOG PG2 with device ID 105-XXXX.

5. Select the desired zone.
6. Configure any device parameters that are required.
7. Mount and test the device. See Local diagnostics test for information on testing the device.

Configuring the device parameters

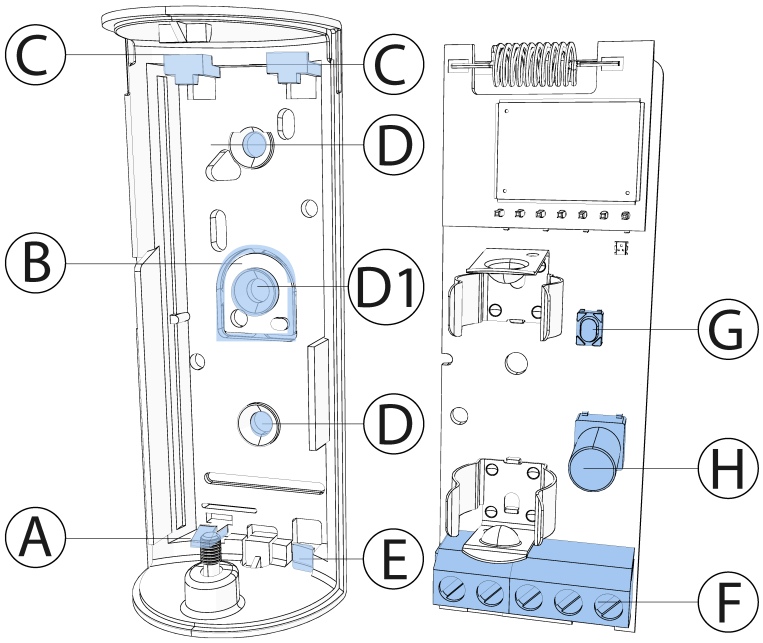
1. On the IQ panel, enter the **Installation** > **Devices** > **Security Sensors** > **Edit Sensor**. Select the required configuration as described in the following table:

Table 1: Configuration options

Option	Action
Sensor input	Define the auxiliary hard-wired input. Optional settings: **Disabled**, **End Of Line (EOL)**, **Double end of line (DEOL)**, **Auxiliary Normally Open (NO)**, **Auxiliary Normally Closed (NC)**, or **Global**.
Activation LED	Define whether the alarm LED indication will be activated. Optional settings: LED **Enabled** (default) and LED **Disabled**.

Mounting the device using screws

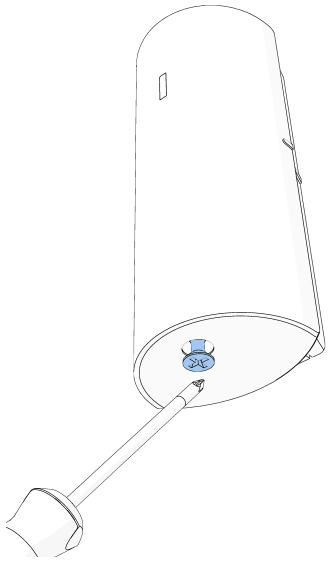
Figure 2: Internal view



Callout	Description
A	Flexible electronic board retainer
B	Break-away segment
C	Electronic board edge supports
D	Mounting holes
D1	Tamper protection
E	Wiring inlet
F	Terminal block
G	Enroll button
H	Tamper switch

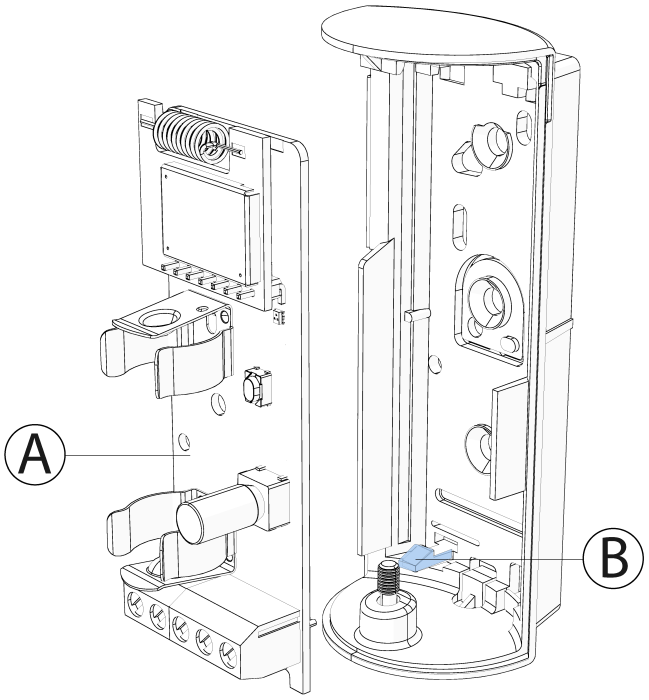
1. To open the device cover, use a screwdriver to loosen the cover screw and separate the base from the cover.

Figure 3: Device cover removal



2. Remove the battery.
3. Flex the retainer and remove the electronic board. See B in the following figure.

Figure 4: Removing the electronic board



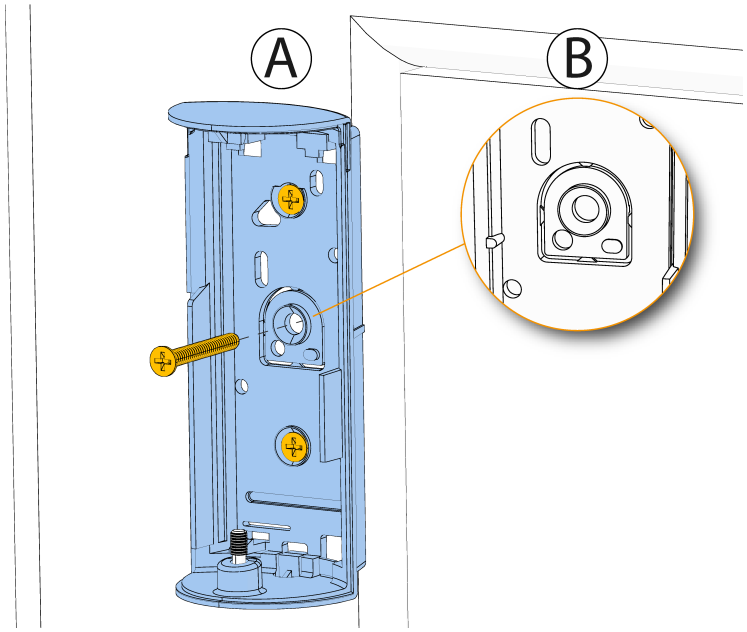
Callout	Description
A	Electronic board
B	Retainer

4. Screw the device base on to the chosen surface. See the following figure.

   Note:

   Make sure to fasten the break-away segment to the frame. If the device is forcibly removed from the wall, this segment will break away from the base, causing the tamper switch to open. See Figure 5 A.

Figure 5: Device screw installation



Callout	Description
A	Screwing device base
B	Break-away Segment

5. Complete the wiring tasks and the local diagnostics test.

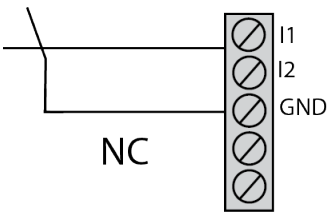
Wiring the input

Note: Depending on panel either two or four inputs are added.

The auxiliary input is programmable as either Auxiliary Disabled, End Of Line (EOL), Double end of line (DEOL), Auxiliary Normally Open (NO), Auxiliary Normally Closed (NC), or Global.

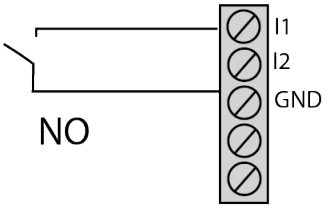
If an input is configured as NC type, series connected NC sensor contacts must be used exclusively. An alarm message is transmitted once the loop is opened.

Figure 6: Normally closed



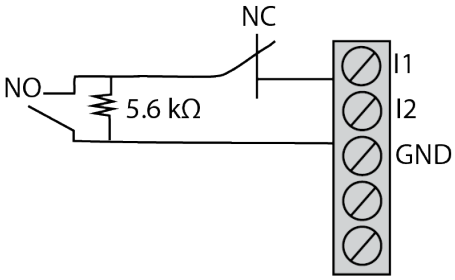
If an input is configured as NO type, parallel connected NO sensor contacts must be used exclusively. An alarm message is transmitted once the loop is closed.

Figure 7: Normally open



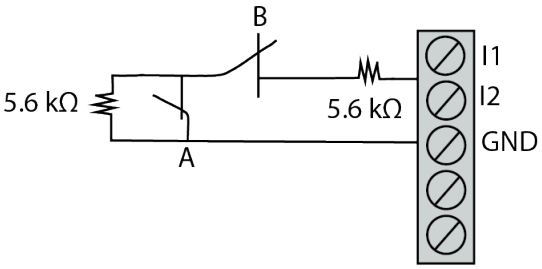
If an input is configured as EOL type, NC or NO, sensor contacts can be used, as shown in the figure below. 5.6kΩ* resistor must be wired at the far end of the zone loop. An alarm message is transmitted once the loop is opened or short circuited.

Figure 8: End of line



If an input is configured as DEOL type, two NC sensor contacts can be used as shown in the figure below. Two 5.6kΩ* resistors must be wired at the far end of the zone loop. An alarm message is transmitted once the Alarm switch is opened. A Tamper message is transmitted once the loop is opened or short circuit.

Figure 9: Double end of line



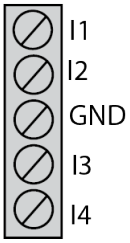
ⓘ **Note:** The inputs can be calibrated to work with end-of-line resistors different from 5.6kΩ. Acceptable resistor values range from 2.5kΩ to 12kΩ.

1. Make sure the device is enrolled and configured with the enabled inputs.
2. Check that all inputs are properly wired and set to their requested normal secured state.
3. Press the enroll button until the green LED turns on, then release the button.
4. If the inputs are calibrated successfully, the green LED flashes three times. If the red LED flashes at this point, return to step one.

   ⓘ **Note:** During calibration, all enabled inputs must be set or wired to a normal secure state; otherwise, the calibration will fail. When the inputs are reconfigured, the calibration value goes back to its factory settings.

The ioXpander 2x2 has by default two inputs and two outputs. The two outputs can be converted to two additional inputs. After the conversion, the ioXpander 2x2 functions as described in the figure below. To convert a ioXpander 2x2 device from 2 inputs and 2 outputs to a 4-input device, complete the following steps.

Figure 10: Wiring four inputs

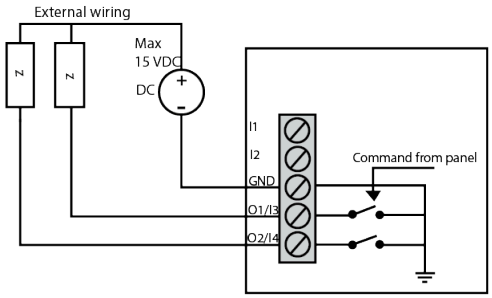


5. Press the enroll button until red LED turns on, then release the button. If the device has been converted successfully to a 4-input device, the red LED flashes three times. The device is now ready to be enrolled as 4-input device. The converted device is shown in the panel as Contact+4in . Use the ID 530-XXXX for two input and two output wires. Use ID 106-XXXX for four input wires. In fallback mode (PG2 products), use ID 105-XXXX for two input and two output wires.
6. To convert the device back to 2 inputs and 2 outputs device, press the enroll button until red LED turns on. When red LED is on, release the button. If the device has been converted back successfully to 2 inputs and 2 outputs device, the green LED flashes three times.

Wiring the output

The general purpose outputs are designed for controlling apparatuses having dry-contact control inputs. These general purpose outputs can withstand up to 15 VDC (off state, open loop) and are capable of sinking up to 1 A (on state, closed loop).

Figure 11: Outputs wiring

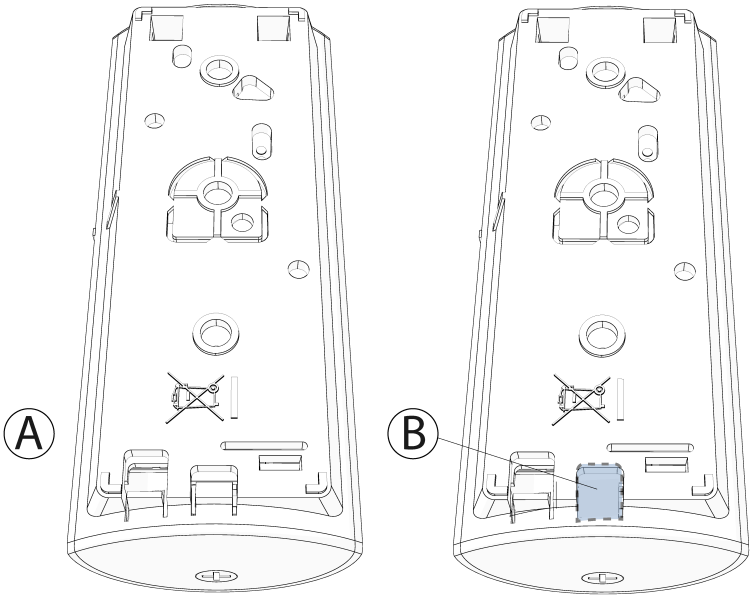


1. Check apparatuses specifications for maximum port voltage and maximum load current.
2. Disconnect the battery.
3. Connect the apparatus to the device.
4. Tighten the connector screws.
5. Insert the battery.

Wiring the terminal block

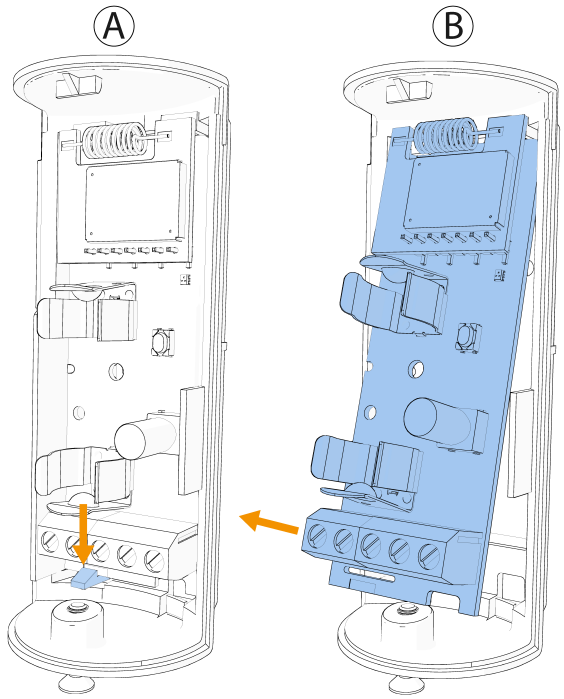
1. To open the device cover, use a screwdriver to loosen the cover screw and separate the base from the cover. See Figure 3.
2. Use long nose pliers to remove the wiring inlet. See Figure 12.

Figure 12: Removing the knock-out



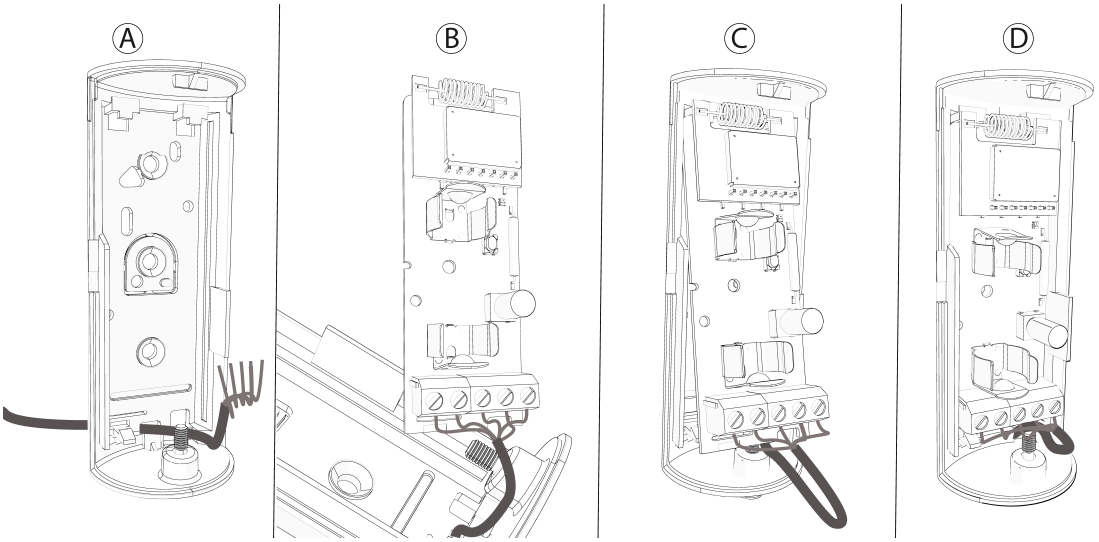
3. Remove the electronic board from the plastic case. See the following figure.

Figure 13: Removing the electronic board



4. Insert the cable into the space where the knock-out was removed from. See the following figure part A.
5. Connect the wires to the terminal block. See the following figure part B.
6. Connect the cable with a screw. See the following figure part C.
7. Verify that the cable is placed in the correct position and adjust if necessary.
8. To reattach the electronic board to the base, flex the retainer and place the electronic board under the electronic board edge supports. See the following figure part D.

Figure 14: Connecting the cable



Use cases – alarm triggers

- Self-powered wired sirens
- Long range radio transmitters
- Light / flash activation in case of alarm
- Activation of buzzers
- Fog and smoke generators
- In the event of fire – trip doors (strikes, mags, dog-doors, gates (driveway), overhead doors(mechanical)
- Trip fire suppression systems
- Remote triggers off the universal communicators, for example, 4010 (inputs on the modules)
- Integration with triggers for video system
- Integration with lock-down type of devices
- Integration with access control
- Integration with all call audio systems (evacuation as an example)
- Local siren/strobe notification triggers (24 hour emergency zones)

Use cases – automation

- Manual control of lights
- Opening of automatic driveway and pedestrian gates
- Opening and closing garage door
- (POWERMASTER) Automatic light control based on brightness sensing for gardens, driveways or night lights for perimeter surveillance)
- Lights activation with zone tracking activation
- (POWERMASTER) Thermoregulation with boilers (manual and automatic) with temperature sensor

- Thermoregulation of pellet stoves (manual and automatic)
- Thermoregulation of air conditioners
- Motor control for roller shutters, awnings, darkeners (timed relay required)
- Control Solenoid valves (fire – gas closing, flooding – water closure)
- Remote operation of anti-icing systems of the pipes of mountain houses

ⓘ **Note:** For Incert certified applications the input of the device is not to be used in conjunction with other hardwired intrusion devices.

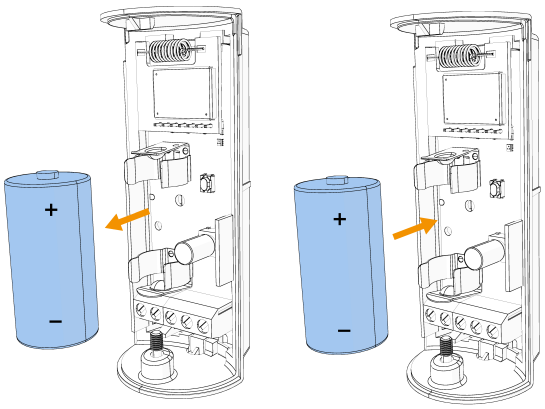
Replacing the battery

⚠ **CAUTION:** Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the manufacturer's instructions and according to local rules and regulations.

Replace the battery yearly to ensure optimal performance.

1. Remove the device cover. See Figure 3.
2. Remove the battery. See the following figure.
3. Insert the new battery while observing battery polarity. See the following figure.

Figure 15: Battery removal and insertion



4. Press down on the battery until it fits into place.
5. Close the device cover and fasten the cover screw.

ⓘ **Note:** After restoring a low battery, the system may take up to 5 minutes to clear the trouble. Device support minimum 30 days after low battery message.

Associating an output with a PGM number

The following steps are relevant for IQ panels. For other panels, refer to the control panel installation manual.

1. In the panel menu, select **Settings**.
2. Select **Advanced Settings > Installation > Devices>Security Sensor**.
3. Select **PGM Output Rules**.
4. Find and select the desired device: 530-XXXX or 106-XXXX. Fallback: 105-XXXX or 106-XXXX.
5. Edit rule PGM1 or PGM2.
6. Select **ADD** and modify all parameters as required.

7. Define location.

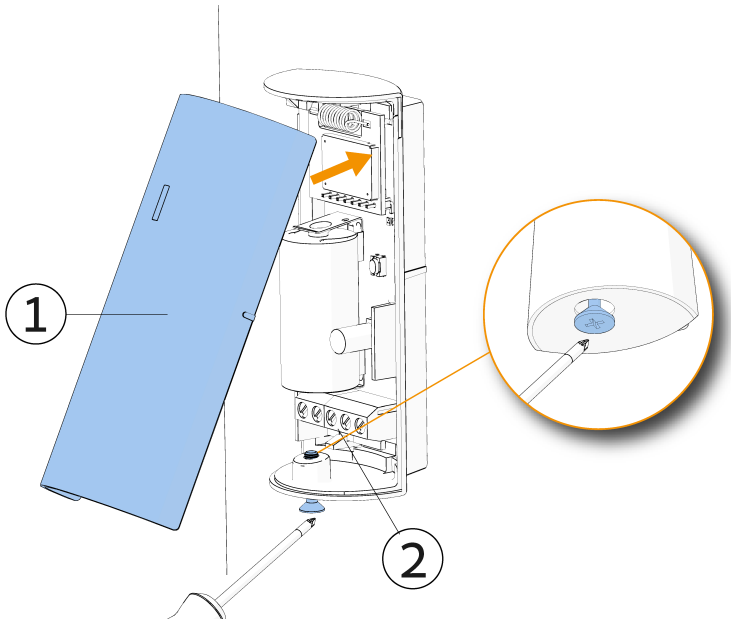
Local diagnostics test

After power-up or closing the cover, the device automatically enters Test Mode for 15 minutes. To manually enter the devices into Test Mode refer to the Control Panel Installer Guide.

Note: When closing the cover, the device enters local diagnostics mode for about 15 minutes During this state event detection (reed switch) generates LQT LED indication.

1. Before you start the test, remove the device cover from the base. See Figure 3.
2. Clip the cover onto the device base, return the tamper switch to its normal position, and tighten the cover screw. See the following figure.

Figure 16: Closing the device cover



3. After 2 seconds the LED blinks in one of the colors described in the following table.
   The following table indicates received signal strength indication.

Table 2: Signal strength indication

LED response	Reception
Green LED blinks	Strong
Yellow LED blinks	Good
Red LED blinks	Poor
No blinks	No communication

Important: Reliable reception must be assured. Therefore, poor signal strength is not acceptable. If you receive a poor signal from the device, relocate it and re-test until strong signal strength is received.

Note: It is recommended to have a strong signal strength and you must verify the signal strength using the control panel's diagnostic test. For detailed Diagnostics Test instructions, refer to the control panel installer guide.

Specifications

Table 3: Specifications

Frequency Band	868 to 869 MHz
Maximum Tx power	+14 dBm @ 868 MHz
Modulation	GFSK
Communication protocol	PowerG
Battery type	3 V Lithium CR123A manufactured by GP or Duracell only
Battery life	3 years (typical use) for two inputs and two outputs configuration. 5 years (typical use) for four inputs configuration
Low battery threshold	2.4 V at room temperature 25°C
Nominal operating voltage	3 V
Minimum current	2 uA
Maximum current	70 mA
Operating temperature	-10°C to 55°C
Storage temperature	-20°C to 70°C
Relative humidity	Up to 93% non-condensing
Inputs	Wire Resistance: Up to 100 Ω. Wire Capacitance: Up to 1nF (maximum distance of 10 meters from the unit for 20 to 22 AWG cable). EOL supervision resistors (optional): 5.6 KΩ, can be field calibrated within the range of 2.5 KΩ to 12 KΩ.
Outputs	Up to 15VDC (OFF state, open loop, ~20uA leakage current). Up to 1A (ON state, close loop, ~0.25V terminals dropout).
Dimensions (LxWxD)	89 mm x 37 mm x 30 mm
Weight (including battery)	53 g
Color	White
Auxiliary Input EOL Resistor	5.6 KΩ

Compliance with standards

ioXpander 2x2 PG+ complies with the following standards:

ioXpander 2x2 P8M0 **ioXpander 2x2 P8M1**	**Europe (868 Mhz):** EN 300220, EN 301489, EN 50130-4, EN 50130-5, EN 61000-6-3, EN 62368-1, EN 50131-1, EN 50131-3, EN 50131-5-3 Grade 2, Class II and EN 50131-6 Type C
	UK (868 MHz): is suitable for use in systems installed to conform to PD6662 at Grade 2 and environmental class II, DD243 and BS8243

ioXpander 2x2 P8M0 is certified by KIWA in accordance with EN 50131-3, EN 50131-5-3, EN 50131-6, EN 50130-4, EN 50130-5. Security Grade 2 and Environmental Class II.

ⓘ **Note:** Do not co-locate the antennas used for this product, or operate them in conjunction with any other antenna or transmitter.

Simplified EU declaration of conformity

Hereby, Visonic Ltd. declares that the radio equipment type ioXpander 2x2 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: http://www.visonic.com/download-center.

CE UKCA

Safety Instructions

Read the safety information before you install the equipment.

The detector shall be installed and used within an environment that provides the pollution degree max 2 and over voltages category II in non-hazardous locations, indoor only. The equipment is designed to be installed by SERVICE PERSONS only; (SERVICE PERSON is defined as a person having the appropriate technical training and experience necessary to be aware of hazards to which that person may be exposed in performing a task and of measures to minimize the risks to that person or other persons).

The detector is to be installed in an indoor dry location. Exposure to weather or corrosive conditions may damage the unit.

⚠ **CAUTION:** Risk of explosion if the battery is replaced with an incorrect type. Dispose of used battery according to the manufacturer's instructions.

WEEE Product recycling declaration

	For information regarding the recycling of this product you must contact the company from which you originally purchased it. If you are discarding this product and not returning it for repair then you must ensure that it is returned as identified by your supplier. This product is not to be thrown away with everyday waste. Directive 2012/19/EU Waste Electrical and Electronic Equipment.

Warranty

Visonic Ltd. (“**Seller**”) warrants the Products to the original purchaser only (the “**Buyer**”) against defective workmanship and materials under normal use of the Products for a period of twelve (12) months from the date of shipment by the Seller.

This Warranty is absolutely conditional upon the Products having been properly installed, maintained and operated under conditions of normal use in accordance with the Seller's recommended installation and operation instructions. Products which have become defective for any other reason, according to the Seller's discretion, such as improper installation, failure to follow recommended installation and operational instructions, neglect, willful damage, misuse or vandalism, accidental damage, alteration or tampering, or repair by anyone other than the Seller, are not covered by this Warranty.

There is absolutely no warranty on software, and all software products are sold as a user license under the terms of the software license agreement included with such Product.

The Seller does not represent that Products may not be compromised and/or circumvented or that the Products will prevent any death and/or personal injury and/or damage to property resulting from burglary, robbery, fire or otherwise, or that the Products will in all cases provide adequate warning or protection. The Products, properly installed and maintained, only reduce the risk of such events without warning and it is not a guarantee or insurance that such events will not occur.

Conditions to Void Warranty: This warranty applies only to defects in parts and workmanship relating to normal use of the Products. It does not cover:

- damage incurred in shipping or handling;
- damage caused by disaster such as fire, flood, wind, earthquake or lightning;
- damage due to causes beyond the control of the Seller such as excessive voltage, mechanical shock or water damage;
- damage caused by unauthorized attachment, alterations, modifications or foreign objects being used with or in conjunction with the Products;
- damage caused by peripherals (unless such peripherals were supplied by the Seller;
- defects caused by failure to provide a suitable installation environment for the products;
- damage caused by use of the Products for purposes other than those for which they were designed;
- damage from improper maintenance;
- damage arising out of any other abuse, mishandling or improper application of the Products.

Items Not Covered by Warranty: In addition to the items which void the Warranty, the following items shall not be covered by Warranty: (i) freight cost to the repair centre; (ii) customs fees, taxes, or VAT that may be due; (iii) Products which are not identified with the Seller's product label and lot number or serial number; (iv) Products disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection or testing to verify any warranty claim. Access cards or tags returned for replacement under warranty will be credited or replaced at the Seller's option.

This warranty is exclusive and expressly in lieu of all other warranties, obligations or liabilities, whether written, oral, express or implied, including any warranty of merchantability or fitness for a particular purpose, or otherwise. In no case shall the SELLER be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties whatsoever, as aforesaid.

The Seller shall in no event be liable for any special, indirect, incidental, consequential or punitive damages or for loss, damage, or expense, including loss of use, profits, revenue, or goodwill, directly or indirectly arising from Purchaser’s use or inability to use the Product, or for loss or destruction of other property or from any other cause, even if Seller has been advised of the possibility of such damage.

The SELLER shall have no liability for any death, personal and/or bodily injury and/or damage to property or other loss whether direct, indirect, incidental, consequential or otherwise, based on a claim that the

Product failed to function. However, if the Seller is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty,**the SELLER'S maximum liability (if any) shall not in any case exceed the purchase price of the Product INVOLVED,** which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Seller.

When accepting the delivery of the Products, the buyer agrees to the said conditions of sale and warranty and he recognizes having been informed of.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so these limitations may not apply under certain circumstances.

The Seller shall be under no liability whatsoever arising out of the corruption and/or malfunctioning of any telecommunication or electronic equipment or any programs.

The Seller's obligations under this Warranty are limited solely to repair and/or replace at the Seller's discretion any Product or part thereof that may prove defective. Any repair and/or replacement shall not extend the original Warranty period. The Seller shall not be responsible for dismantling and/or reinstallation costs. To exercise this Warranty the Products must be returned to the Seller freight pre-paid and insured. All freight and insurance costs are the responsibility of the Buyer and are not included in this Warranty.

This warranty shall not be modified, varied or extended, and the Seller does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Products only. All products, accessories or attachments of others used in conjunction with the Products, including batteries, shall be covered solely by their own warranty, if any. The Seller shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Products due to products, accessories, or attachments of others, including batteries, used in conjunction with the Products. This Warranty is exclusive to the original Buyer and is not assignable.

This Warranty is in addition to and does not affect your legal rights. Any provision in this warranty which is contrary to the Law in the state or country were the Product is supplied shall not apply.

Governing Law: This disclaimer of warranties and limited warranty are governed by the domestic laws of Israel.

Warning

The user must follow the Seller's installation and operational instructions including testing the Product and its whole system at least once a week and to take all necessary precautions for his/her safety and the protection of his/her property.

Email: info@visonic.com

Website: www.visonic.com