
MultiGuard
User Manual

Connected Finland Oy

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Device Information

Connected Inventions MultiGuard is an industry grade metering device for various industrial retrofitting sensor needs. The device measures and sends measurements once in every 30 minutes. MultiGuard uses worldwide Sigfox IoT-network for data transmission, enabling very low lifetime cost and long battery life of five years. External dry contact or switch sensor can be freely installed, for example on pulse output of water and electricity meters.

Product Features

1. Casing: P 67 ASA-plastic, for indoor and outdoor usage
2. Size: 94x94x44 mm
3. Weight: 350 g
4. Attachment: Screw / cable tie / adhesive tape
5. One input, sensor options: Pulse / Switch / Voltage (0-10V) / Current (4-20 mA)
6. Battery: C 3,6V 9 000 mAh (replaceable)
7. Battery lifetime: 5 years
8. Measurement interval: Every 30 mins (Configurable)
9. Operating zone: RCZ1, RCZ2 and RCZ4.
10. Certifications: CE, Sigfox
11. Product code: CS-ITZ-1

CAUTION!

MultiGuard R1 is an electrostatic sensitive (⚡) device. Observe necessary precautions when you open the enclosure of the device.

Transportation

Observe necessary precautions when transporting devices and contact your service for the transportation of dangerous goods. The device includes a lithium metal battery which contains 2.7 grams of lithium. Do not remove packing material or repack devices unless necessary.

Installation

Please follow the following steps for the installation of the device:

1. Read and mark down the Sigfox identifier and the PAC key of the device. The information is on the label on the back cover of the device. The information is also in the QR code of the label.
2. Open the enclosure of the device using the screwdriver. Place the screwdriver gently between the device and the lid and rotate the screwdriver carefully until the lid comes off.
3. Connect the sensor to the device using the screw terminals. For further details, please see the connections section.

4. Connect the battery of the device.
5. Close the enclosure of the device. Do not touch the wire antenna of the device.
6. Install the device on the wall using the double sided adhesive tape or screw.

 **CAUTION!**

Do not install or use the device if the battery pack is broken. Disconnect the battery pack immediately and contact the vendor of the device.

Connections

The device can be used with several types of sensors:

- Analog sensors with a voltage output
- Analog sensors with a current loop
- Meters with a passive pulse output
- Passive switches

 **CAUTION!**

The device has been programmed for a specific sensor. Please check that the sensor is compatible with the device before connecting the sensor.

VOLTAGE OUTPUT	<p>The device supports analog sensors with a voltage output. The maximum output voltage of the sensor is 24 V.</p> <p>The input voltage of the device must not exceed the nominal voltage of the device (3.6 V). The input voltage can be set with the voltage divider which must be set before the sensor is connected to the device.</p> <p>The voltage divider can be set to 1:1, 1:2, 1:4, or 1:8. By default, the voltage divider has been set to 1:8.</p> <p>Check the maximum voltage of the sensor before you set the voltage divider. For example, if the maximum voltage of the sensor is 12 V, the voltage divider must be set to 1:4.</p> <p>Connect the ground of the sensor to GND screw terminal and the signal of the sensor to VOL screw terminal.</p>
PULSE OUTPUT	<p>The device supports meters with passive pulse outputs. The device must not be connected to meters with active pulse outputs.</p> <p>Connect the ground of the meter to GND screw terminal and the passive pulse output of the sensor to P/S screw terminal. Check the polarization of the passive pulse output from the documentation of the meter if necessary.</p>
CURRENT LOOP	<p>The device supports analog sensors with a current loop (4 – 20 mA). The maximum output current of the sensor is 24 mA.</p> <p>Connect the ground of the sensor to GND screw terminal and the signal of the sensor to CUR screw terminal.</p>
SWITCH	<p>The device supports passive switches. The device must not be connected to active switches.</p> <p>Connect the ground of the switch to GND screw terminal and the switch output of the sensor to P/S screw terminal. Check the polarization of the switch from the documentation of the meter if necessary.</p>

Payload

The interpretation of the payload depends on the type of the sensor. The first byte in the payload tells you what sensor is being measured.

Byte	Explanation	Byte	Explanation
0x00	Error	0x03	Pulse
0x01	Voltage	0x04	Switch
0x02	Current	0x05...0xFF	Error

VOLTAGE OUTPUT	The output voltage of the sensor in millivolts (mV). The payload consists of two bytes. For example, if the voltage divider has been set to 1:2 and the payload is 0x0101F4, the output voltage of the sensor is: $0x01F4 * 2 = 500 * 2 = 1000 \text{ mV} = 1.0 \text{ V}$
PULSE OUTPUT	The amount of pulses. The payload consists of four bytes. For example, if the payload is 0x0300000007, the amount of pulses is: $0x00000007 = 7 \text{ pulses}$
CURRENT LOOP	The output current of the sensor in microamperes (uA). The payload consists of two bytes. For example, if the payload is 0x021ECA, the output current of the sensor is: $0x1ECA = 7882 * 2 = 15,764 \text{ uA} = 15.764 \text{ mA}$
SWITCH	The state of the switch. The payload consists of a single byte. The payload can be interpreted as follows: 0x0400 – The switch is closed 0x04FF – The switch is open

Connection to Sigfox Backend

Register the device to the Sigfox network using the Sigfox backend at backend.sigfox.com. You need the Sigfox identifier and the PAC key to register the device. For further details, please see the documentation of the Sigfox backend.

Connection to FOXERIOT Cloud Services

If the device is connected to FoxerIoT, provided by Connected Finland, you do not need to do anything else. You can immediately login to FoxerIoT and follow the measurements.



Disposal

Check the regulations regarding the disposal of electronic devices and lithium metal batteries before you disposed devices.



Support

Please contact the vendor of the device for support. If the vendor is not available, you can also contact the manufacturer of the device at support@connectedfinland.fi or +358 10 311 5800.



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