# ioX-Connect®

Intelligent Wireless Monitoring Solutions

## Wireless AC Voltage Detection Sensors (500 VAC)

### General Description

The Wireless AC Voltage Detection Sensor can interface with other devices to detect voltage at 500 VAC. The sensor reports presence or absence of voltage when the 4 volt threshold is breached. It is intended for use on power sources or power supplies up to 500 VAC. Not intended for voltages higher than 600 VAC. Perfect for monitoring electrical appliances.

- Wireless interface for detecting voltage
- Detects voltage from 4 to 500 VAC.

### Principle of Operation

The Wireless AC Voltage Detection sensor can be connected to the hot(black) and neutral(white) terminals of an electrical device or power supply line, triggering on the state change from voltage presence to absence and vice versa. The information is sent to the sensor portal where the data is displayed as either "No Voltage" or "Voltage Detected". The data is stored in the online system and can be reviewed and exported as a spread sheet or graph. Notifications can also be set up through the online system to alert the user when certain criteria have been met.

### Example Applications

- Sprinkler Systems
- HVAC Systems
- Appliances
- Electrical Sources
- Power Couplings
- Line Power
- Power Supplies
- Sump Pumps
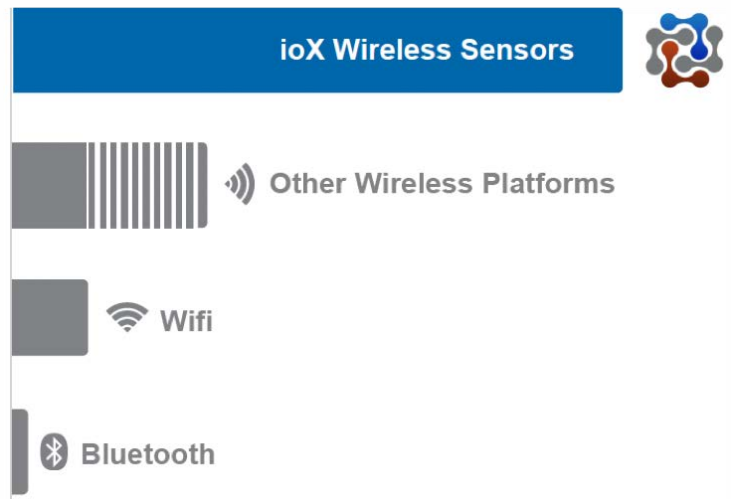- Additional applications
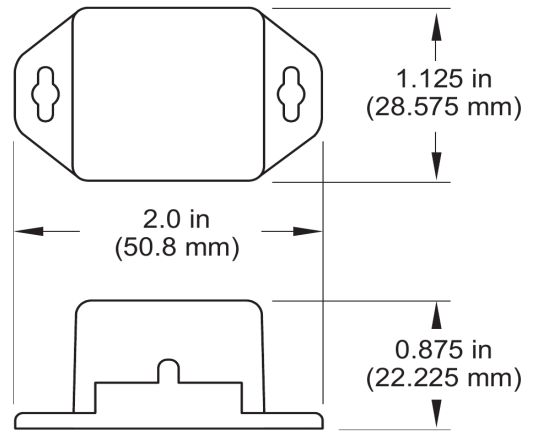
### Features of Wireless Sensors

- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Best in class interference immunity
- Best in class power management for longer battery life **
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Datalogs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through the power cycle):
    - 10-minute heartbeats = ~ 22 days
    - 2-hour heartbeats = ~ 266 days
- Over-the-air updates (future proof)
- Free basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email

*Actual range may vary depending on environment.

**Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

### Wireless Range Comparison

1.125 in
(28.575 mm)

2.0 in
(50.8 mm)

0.875 in
(22.225 mm)

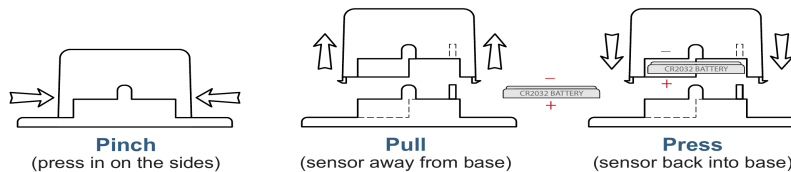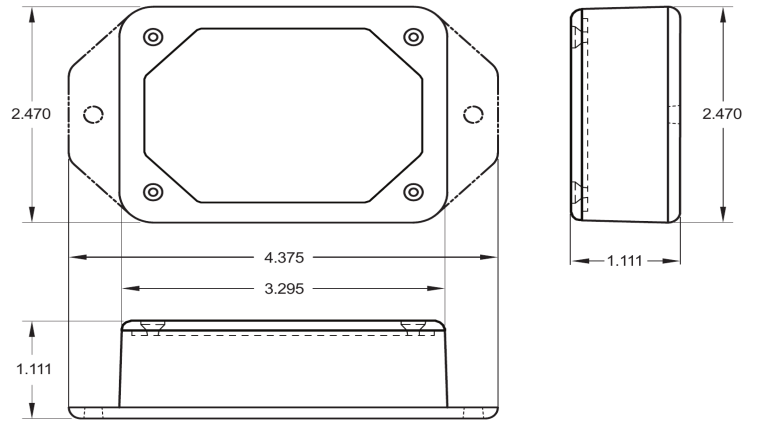| Commercial Coin Cell Wireless AC Voltage Detection Sensor \| Technical Specifications ||
| --- | --- |
| Supply voltage | 2.0–3.8 VDC * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -7°C to +60°C (20°F to +140°F) |
| Optimal battery temperature range (coin cell) | +10°C to +50°C  (+50°F  to +122°F) |
| Absolute Maximum Input Voltage | 600 VAC rms ** |
| Response Time | ~1 Second |
| Minimum Detection Voltage | >4 VAC rms |
| Indeterminant Detection Region | 3 - 4 VAC rms *** |
| Input Impedance | 2 MOhm |
| Leaded Wire Specification | 2 Wires, 1 ft (12 in), Black (Line), White (Common), 18 AWG |
| Datalogging | Datalogs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through the power cycle):<br>  - 10-minute heartbeats = ~ 22 days<br>  -  2-hour heartbeats = ~ 266 days |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 0.7 ounces |
| Certifications | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

*Circuit cannot withstand negative voltage. Please take care when installing batteries.

**Connecting to power sources over 600 VAC rms can damage the hardware.

*** The sensor may indicate present or absent in this voltage range.

## PinchPower™ Enclosures



**Pinch**
(press in on the sides)

**Pull**
(sensor away from base)

**Press**
(sensor back into base)

| Commercial Coin Cell Wireless AC Voltage Detection Sensor \| Technical Specifications | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0 - 3.8 VDC using power supply)* |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and coin cell) | -18°C to 55°C (0°F to +130°F) using alkaline<br>-40°C to 85°C (-40°F to +185°F) using lithium |
| Optimal battery temperature range (AA) | +10°C to +50°C  (+50°F  to +122°F) |
| Absolute Maximum Input Voltage | 600 VAC rms ** |
| Response Time | ~1 Second |
| Minimum Detection Voltage | > 4 VACrms |
| Indeterminant Detection Region | 3 - 4 VAC rms *** |
| Input Impedance | 2 MOhm |
| Leaded Wire Specification | 2 Wires, 1 ft (12 in), Black (Line), White (Common), 18 AWG |
| Datalogging | Datalogs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through the power cycle):<br>  - 10-minute heartbeats = ~ 22 days<br>  -  2-hour heartbeats = ~ 266 days |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 3.7 ounces |
| Certifications        FC    Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

*Circuit cannot withstand negative voltage. Please take care when installing batteries.

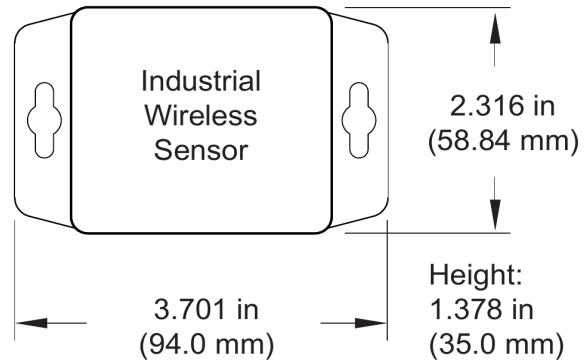**Connecting to power sources over 600 VAC rms can damage the hardware.

*** The sensor may indicate present or absent in this voltage range.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase).

This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage.

Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

Industrial
Wireless
Sensor

2.316 in
(58.84 mm)

3.701 in
(94.0 mm)

Height:
1.378 in
(35.0 mm)

## Industrial Wireless AC Voltage Detection Sensor | Technical Specifications

| | |
|---|---|
| Supply voltage | 2.0–3.8 VDC (3.0–3.8 VDC using power supply) * |
| Current consumption | 0.2 µA (sleep mode), 0.7 µA (RTC sleep), 570 µA (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode) |
| Operating temperature range (board circuitry and battery) | -40°C to +85°C   (-40°F  to +185°F) |

| Included battery | Max temperature range | -40° to +85°C   (-40° to +185°F) |
|---|---|---|
| | Capacity | 1500 mAh |

| Optional solar feature | Solar panel | 5VDC/30mA   (53mm x 30mm)– |
|---|---|---|
| | Charging temperature range | 0° to 45°C (32° to 113°F) |
| | Max temperature range | -20° to 60°C (-4° to 140°F) |
| | Included rechargeable battery | 600 mAh/>2000 charge cycles (80% of initial capacity) |
| | Solar efficiency | Optimized for high and low-light operation ** |
| | Charging efficiency | 40% **** |
| | Luminous sustainability | Minimum of 250 LUX **** |

| | |
|---|---|
| Absolute Maximum Input Voltage | 600 VAC rms ** |
| Response Time | ~1 Second |
| Minimum Detection Voltage | > 4 VAC rms |
| Indeterminate Detection Region | 3 – 4 VAC rms |
| Input Impedance | 2 MOhm |
| Leaded wire specification | 2 Wires, 1 ft (12 in), Black (Line), White (Common), 18 AWG |
| Datalogging | Datalogs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through the power cycle):<br>  - 10-minute heartbeats = ~ 22 days<br>  -  2-hour heartbeats = ~ 266 days |
| Wireless range | 1,200+ ft non-line-of-sight |
| Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| Weight | 4.7 ounces |
| Enclosure rating | NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof |
| UL rating | UL Listed to UL508-4x specifications (File E194432) |
| Certifications   FC  Industry Canada | 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950 |

*Circuit cannot withstand negative voltage. Please take care when installing batteries.

**Light present 25% of day yields 125% of operating power to support 10-minute heartbeats

***Connecting to power sources over 600 VACrms can damage the hardware.

****  Solar feature's energy harvesting circuitry works indoors with low light.

***** The sensor may indicate present or absent in this voltage range.

## Proper Installation

If the sensor is not connected to the power source properly, it will appear that the sensor is broken. Please follow this wiring diagram to ensure proper performance and detection.
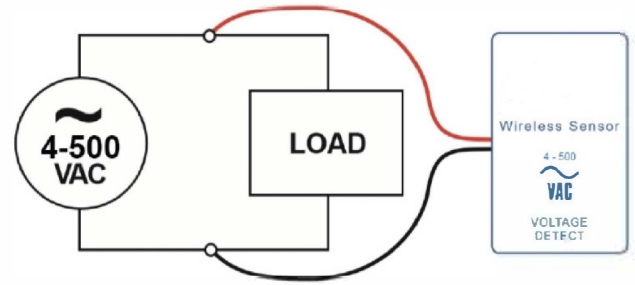


## Commercial Grade Sensors

Commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

## Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure

**ioX-Connect**®

For more information about our products or to place an order, please contact our sales department at sales@iox-connect.com

Visit us on the web at www.iox-connect.com

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