



ioX Wireless Motion+ Sensor: Motion, Temperature, and Humidity

General Description

The [ioX Wireless Motion+ Sensor](#) detects movements made by people and animals within a 15-ft (4.5 m) range and measures ambient temperature and relative humidity (RH).

Features

- Software-adjustable range (15-ft / 12-ft / 9-ft)
- Accurately detects occupancy and movement
- High-accuracy humidity and temperature measurements

Principle of Operation

The ioX Wireless Motion+ Sensor detects movement using a passive infrared (PIR) motion sensing element. The PIR element detects relative changes in temperature caused by warm bodies moving through the sensor viewing area. The Motion+ Sensor is also equipped with a high-accuracy RH/temperature sensing element. The RH element measures the air that cycles through the sensor enclosure via breath holes. Once the sensor detects movement, it reports motion detection and RH/temperature data to the ioX-Connect Platform via an ioX Gateway. You can set up notifications in ioX-Connect software to alert you when the sensor detects motion. The sensor also reports data when your configured RH/temperature thresholds are crossed or when the sensor's configurable heartbeat lapses. The ioX-Connect system stores all data so it can be reviewed, exported or reported on through ioX-Analytics on paid subscriptions.

Example Applications

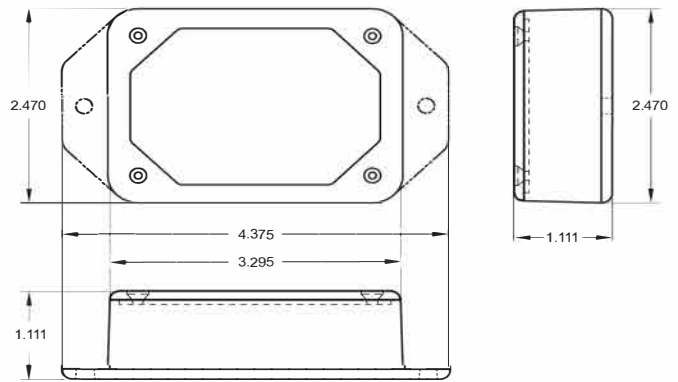
- Full-featured room/area monitoring
- Hospital rooms
- Senior care monitoring
- Pet care monitoring
- Animal welfare monitoring
- Data centers
- Manufacturing
- Art galleries
- Greenhouses and grow houses
- Life science labs




Features of ioX-Connect Sensors

- Wireless range of 1,200+ feet through 12+ walls¹
- Frequency-Hopping Spread Spectrum (FHSS)
- Best-in-class interference immunity
- Best-in-class power management for longer battery life²
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Data logs 2000 to 4000 readings if the 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 ioX-Connect Basic Online Wireless Sensor Monitoring and Notification System to configure sensors, view data, and set alerts to be sent via SMS text, email or call.
 - 1 Actual range may vary depending on the environment.
 - 2 Battery life is determined by the sensor reporting frequency and other variables. Other power options are also available.

At a Glance

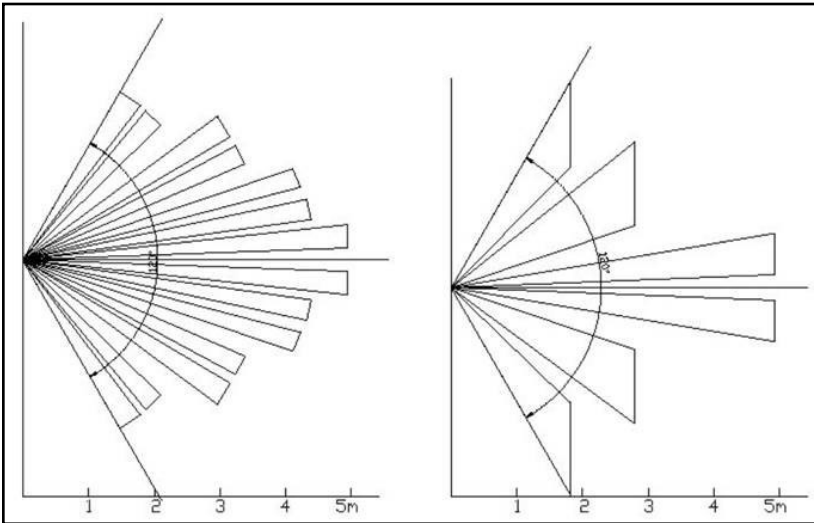
Motion		
Detection Range	Viewing Angle	
Up to 15 ft.	80°	
Relative Humidity %		
Accuracy	Range	Resolution
+/- 0.3 °C	0 - 100 %	0.01 %
Temperature		
Accuracy	Range	Resolution
+/- 0.3 °C	-40 to 125 °C	0.01 °C



ioX AA Wireless Motion+ Technical Specifications	
Power Source	Two AA alkaline batteries (included) Two AA lithium batteries (optional)
Supply voltage	2.0–3.8 VDC
Current consumption	1.0 μ A (Sleep) 570 μ A (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 batteries)	-18°C to 55°C (0°F to 130°F) using alkaline -40°C to 60°C (-40°F to 140°F) using lithium
Optimal battery temperature range (AA)	+10°C to +50°C (+50°F to +122°F)
Data logging	Data logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through the power cycle): - 10-minute heartbeats = ~ 22 days - 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	2.9 ounces (82.2 g) ¹
Certifications	<div style="display: flex; align-items: center; gap: 10px;">    Industry Canada </div> 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

1. Weight does not include batteries.

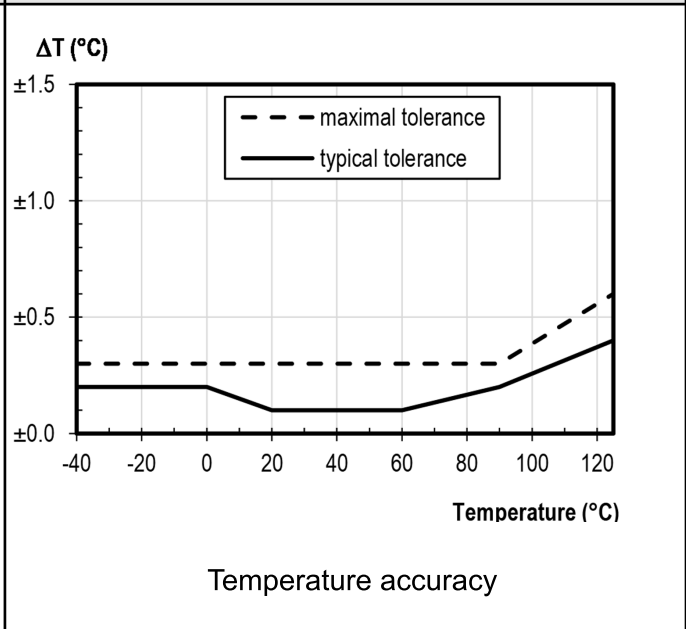
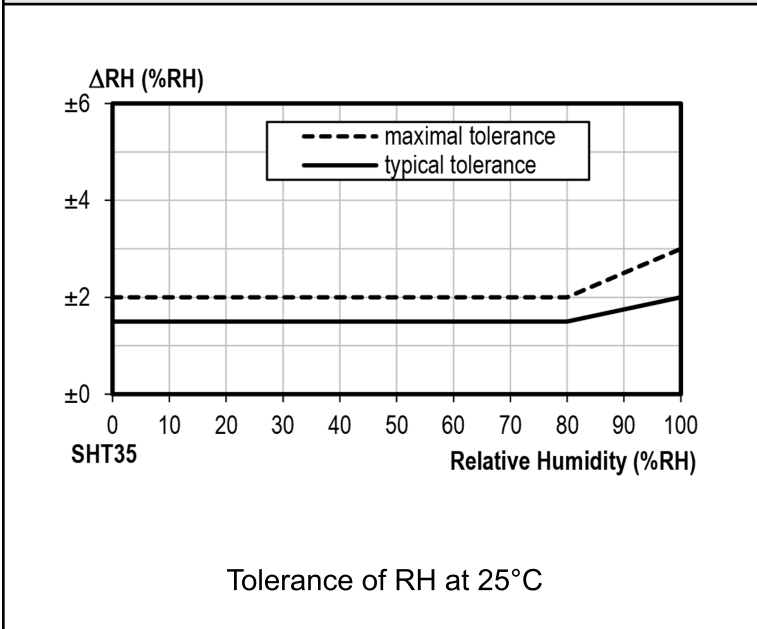
PIR Element Specifications		
Motion Sensing Technology	Quad Array Passive Infrared (PIR) Sensing Element	
Motion Range	Up To 15 ft. (4.5m) ⁴	
Quad Array Passive Infrared (PIR) Sensing Element		
Current Consumption	3 μ A	
Typical Response Time	1 to 3 Seconds ¹	
Operating / Storage Temperature	-40°C to 85°C (-40°F to 185°F)	
Lens		
Standard Lens	Viewing Angle	80° ³
	Configurable Range	15 ft / 12 ft / 9 ft (Software Configurable) ²

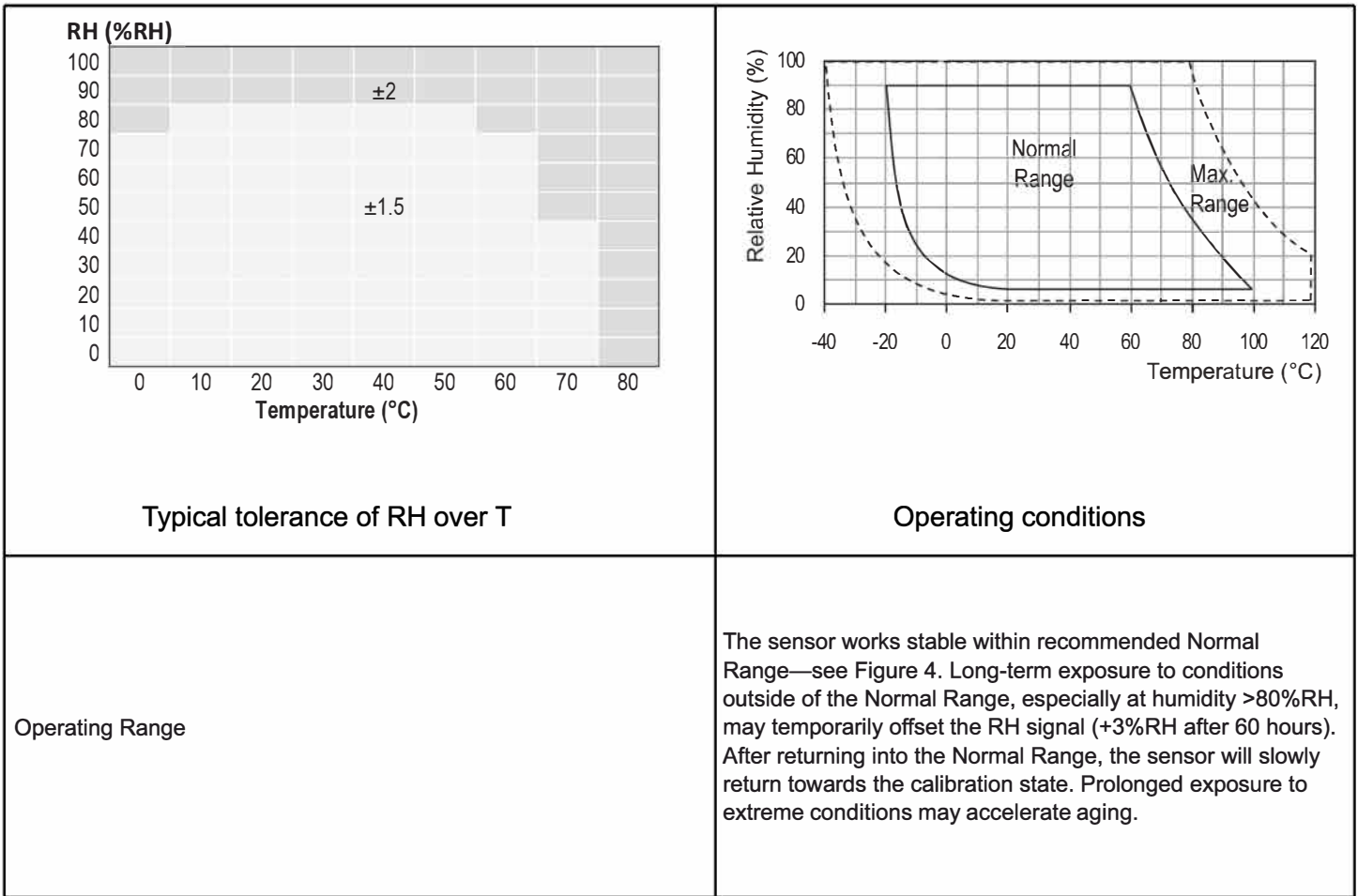


1. The response time may be elongated by up to three seconds after a radio transmission. The sensor is most responsive when used with less frequent heartbeats. Heartbeats of 10 seconds or greater is recommended.
2. The range assumes a 5' 8", 170-lb person moving across the sensor face from left to right wearing pants and a t-shirt. If the target is fully covered with insulating material or moving toward (not across) the sensor face the actual detection range may be reduced.
3. The maximum range is greatest when the target is centered on the sensor, as the target moves farther from the center of the sensor in any direction the range reduces gradually (Ex: On standard lens, 5 M range when centered on sensor, 4 M on edge of widest detection angle). Standard lens has a potential viewing angle of 120° but range is reduced to ~2 M beyond 80°.
4. Refer to element specific tables and figures in this data sheet for more information on sensor specifications.

Relative Humidity / Temperature Element Specifications

RH Accuracy	+/- 2 %
RH Range	0.00 to 100.00 %
RH Resolution	0.01 %
RH Response Time	8 seconds (tau(63%)) ^{2,3}
RH Repeatability	+/- 0.21 %
RH Long-term drift	0.5 %RH/yr ¹
Temperature Accuracy	+/- 0.3 °C
Temperature Range	-40 to 125 °C
Temperature Resolution	0.01 °C
Temperature Response Time	2 seconds (tau(63%)) ^{2,3}
Temperature Repeatability	+/- 0.15 °C
Temperature Long-term drift	<0.03 °C/yr





1. Maximum value is < 0.5 %RH/yr. Higher drift values might occur due to contaminant environments with vaporized solvents, out-gassing tapes, adhesives, packaging materials, etc. For more details please refer to Handling Instructions. Do not clean with or expose sensor to alcohol-based cleaners or solutions.
2. Response time is best case in ideal conditions and is very dependent upon temperature and humidity exchange between the sensor and environment. In a stagnant air environment, it may take longer for the air in the sensor to exchange with the environment and the temperature response will generally be slower than ideal since the sensors board and batteries act as a temperature well slowing down how quickly the sensing element responds to environmental changes.
3. Refer to element specific tables and figures in this data sheet for more information on sensor specifications.

Interpreting Sensor Data	
User Interface: xx.xx% @ xx.xx C/F, Motion Detected ¹	Raw Data: (data type, conversion, units)² Motion: Motion Detected = 1, No Motion Detected = 0 Relative Humidity: unsigned int, raw / 100, % Temperature: signed int, raw / 100, Celsius
Raw Data (Exported .csv Representation)	Motion Humidity Temperature STS Value Example: False 24.67 25.27 0 ³

1. Motion will not be displayed in the UI when no motion is detected for that data point.
2. Raw data refers to data as it comes directly from the ioX sensor itself, not how it is represented in raw data exports from ioX-Connect. Raw data in ioX-Connect is already converted as indicated by "conversion."
3. False = No Motion Detected, True = Motion Detected. STS is used to indicate sensor specific errors or special conditions (see User Guide for more details on specific STS values)

Commercial-Grade Sensors

ioX-Connect 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 oxide 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 temperatures may cause deterioration of the characteristics or the material quality.



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



ioX-Connect is an EAMS
Technologies Inc brand.
Orlando, FL 32746
sales@iox-connect.com