



Industrial Wireless Three Phase Current Meters

General Description

The ioX Industrial Wireless Three Phase Current Meter measures the RMS current of an alternating current (AC) system using 3 current transformers (CTs) that wrap around the wires of a three phase power system. The sensor reports Minimum RMS current, maximum RMS current, average RMS current, and duty cycle for each phase and the combined amp hours of all three phases to the ioX-Connect platform. ioX-Connect is capable of generating watt hour or kilowatt hour readings as well based on a user specified RMS voltage.

- Measures amp hours, max RMS current, min RMS current, average RMS current, and duty cycle for each phase and combined amp hours from all three phases
- 3 x 0-150 amp current transducers
- Capable of generating watt hour or kilowatt hour readings using ioX-Connect Platform.
- Data logging for accumulated amp hour readings
- Can notify based on current levels
- Simple and safe installation of current/power measurement hardware, no rewiring required

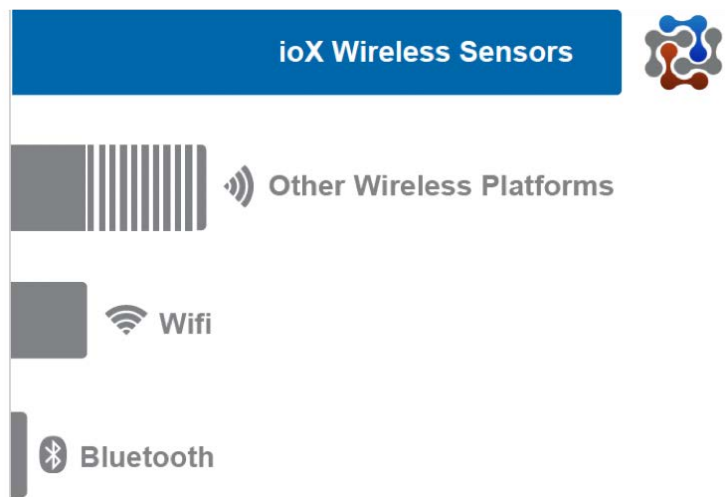
Principle of Operation

To measure current, clip the CT around only a single wire of a powered system (clipping around a hot and neutral wire at the same time will result in 0 current readings). After the sensor powers on and connects to the gateway it will begin taking measurements based on the averaging interval (5 seconds default). It will report data to ioX-Connect with every heartbeat or if the current goes outside of the aware thresholds set in ioX-Connect IoT Module. The sensor reports average current, max RMS current, min RMS current, and duty cycle for each phase and amp hours for all three phases combined. ioX-Connect can also generate watt hour or kilowatt hour readings if a default RMS voltage is set against the sensor in the IoT Module.




Features of ioX Sensors

- Wireless range of 1,200+ feet through 12+ walls *
 - Frequency-Hopping Spread Spectrum (FHSS)
 - Improved interference immunity
 - Improved power management for longer battery life ** (12+ years on AA batteries)
 - Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
 - Onboard data memory stores up to 512 readings per sensor:
 - 10-minute heartbeats = 3.5 days
 - 2-hour heartbeats = 42 days
 - Over-the-air updates (future proof)
 - Set up text and email notifications on the ioX-Connect platform to be alerted immediately when something goes outside of set thresholds.
- * 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



ioX Industrial Wireless Three Phase Current Meter | Technical Specifications

Supply voltage	2.0–3.8 VDC (3.0–3.8 VDC using power supply) *	
Current consumption	0.2 μ A (sleep mode), 0.7 μ A (RTC 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 battery)	-40°C to +85°C (-40°F to +185°F) **	
Included battery	Max temperature range	-40°C to +85°C (-40°F to +185°F)
	Capacity	1500 mAh
Optional solar feature	Solar panel	5VDC/30mA (53mm x 30mm)
	Charging temperature range	0°C to 45°C (32°F to 113°F)
	Max temperature range	-20°C to 60°C (-4°F to 140°F)
	Included rechargeable battery	600 mAh/>2000 charge cycles (80% of initial capacity)
	Solar efficiency	Optimized for high and low-light operation ***
Integrated memory	Up to 512 sensor messages	
Wireless range	1,200+ ft non-line-of-sight	
Security	256-bit key exchange and AES-128 CTR	
Weight	28.7 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	   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

Current Transformer Specifications

Number of current transducers	3 per sensor (3 ft wires)
Absolute max CT current	200 Amps RMS (Arms)
Maximum accurate CT current	150 Arms
Frequency range	50–100 Hz
Accuracy	+/- 2% @ 2 to 150 Arms, +/- 0.4 Arms @ < 15 Arms ****
Calibrated accuracy with appropriate offset	+/- 1% @ 2 to 150 Arms, +/- 0.2 Arms @ < 2 Arms ****
Offset limits	-1.27 to + 1.27 Arms (default set to +0.3 Arms) *****
Measurement resolution	Average: 0.01 Arms Max: 1 Arms Min: 1 Arms Duty: 1% Amp Hours: 0.1 Amp Hours
Current transducer dimensions	67 mm x 49 mm x 42 mm (24 mm inner diameter)

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

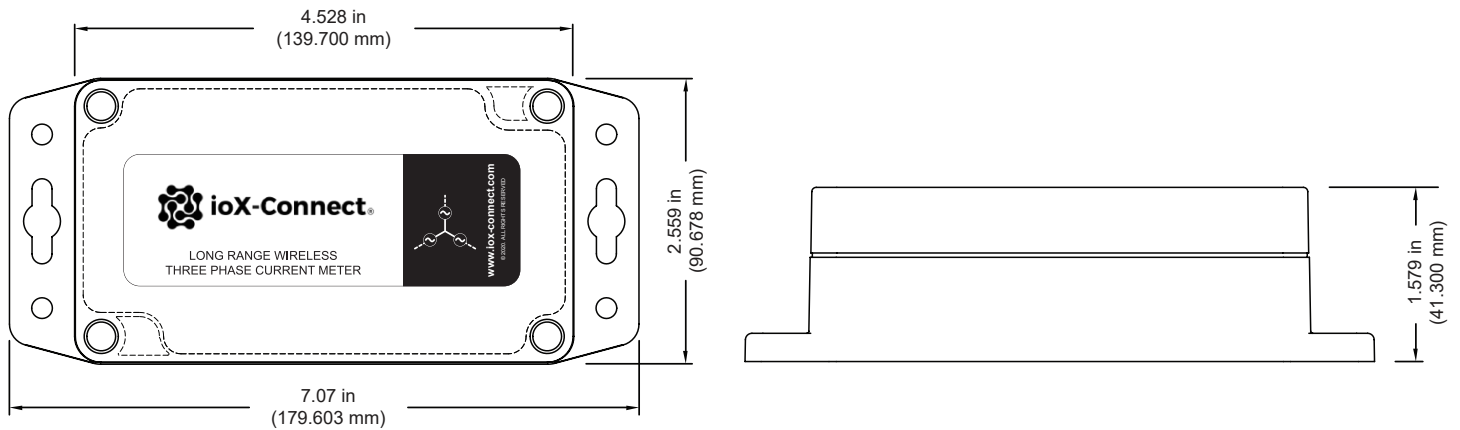
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

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

**** CTs are inherently less accurate at or below 10% of max range. For best calibration results, calibrate at a current between 30% and 90% of max accurate range.

***** Offset is used to overcome a diode voltage drop inherent to the hardware. To accurately account for this drop a default offset is used. To best identify the optimal value of this offset make a series of measurements at 0.2 to 2 Arms and find the current (Arms) difference between your measurement standard and the ioX sensor.

Three Phase Current Meter Enclosure Dimensions



Example Interfacing

- Current monitoring
- Current usage
- Amperage monitoring
- Amp hour meter

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

ioX's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. The 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

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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