



ALTA® Wireless AC Current Meters (Single & Three-Phase)

General Description

[ALTA® Wireless AC Current Meters](#) and [ALTA® Industrial Wireless Three-Phase Current Meters](#) continuously measure the alternating current root mean square (AC RMS) using current transformers that clip around the wires in single-phase and three-phase power systems.

Key Features

- ▶ Three current transformer sizes available for single-phase and three-phase systems:
 - ▶ 0-20 Amp, 0-150 Amp, 0-500 Amp
- ▶ Measures:
 - ▶ Minimum, Maximum, and Average in Amp-RMS
 - ▶ Current Accumulation in Amp-hours
- ▶ Resolution: 0.1 - 0.3 Amp-RMS
- ▶ Accuracy:
 - ▶ Uncalibrated: $\pm 2\%$ (typical)
 - ▶ Calibrated: $\pm 1\%$ (typical)
- ▶ Configurable thresholds for critical condition monitoring
- ▶ Industrial 150 Amp and 500 Amp options come standard with a detachable lead

Principles of Operation

ALTA Wireless Current Meters measure one or three AC RMS signals produced by current transformers (CTs). The analog currents are converted to digital currents periodically based on a user-configurable measurement interval. The sensor will report the minimum, maximum, and average current per CT, and the accumulated current over time at a user-configurable reporting interval or Heartbeat. On every Heartbeat, the meter reports its recorded measurements to the gateway, making the data available in iMonnit or other approved data services.

ALTA Three-Phase Current Meters are only available in the Industrial version. All current meters can be calibrated for improved accuracy. Also, iMonnit can scale the accumulated current into kilowatt-hours for power monitoring.

Example Applications

- ▶ Current monitoring
- ▶ Current usage
- ▶ Amperage monitoring
- ▶ Amp-hour metering

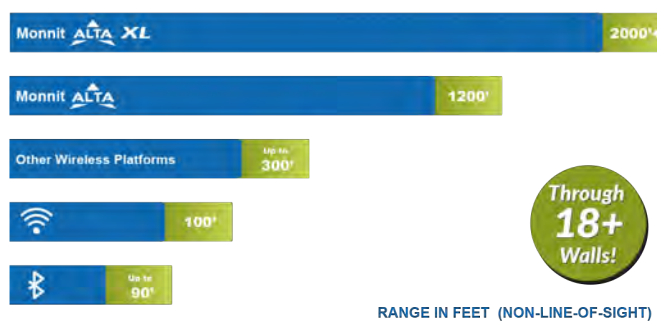
Features of Monnit ALTA Sensors

- Wireless range of 2,000+ feet through 18+ 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 + Advanced Encryption Standard (AES)-128 Cipher Block Chaining (CBC) for sensor data messages)
- Sensor logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through power cycling):
 - 10-minute Heartbeats = ~ 22 days
 - 2-hour Heartbeats = ~ 266 days
- Automatic over-the-air updates to sensor firmware (future-proof)
- Free iMonnit Basic Online Wireless Sensor Monitoring and Notification System to configure sensors, view data, and send alerts via SMS text, email, and voice call

1 Actual range may vary depending on the environment and gateway.

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

Wireless Range Comparison



Technical Specification | ALTA® Wireless Current Meters

| | | |
|-------------------------------|---|---|
| 0-20 Amp Current Transformer | Absolute max CT current | 50 A RMS |
| | Maximum accurate CT current | 20 A RMS |
| | Frequency range | 50 – 100 Hz |
| | Accuracy | +/- 2% FS @ 2 to 20 A RMS, +/- .07 A RMS @ < 2 A RMS ¹ |
| | Calibrated accuracy with appropriate offset | +/- (1% + .035 A RMS) ¹ |
| | Offset limits | -1.27 to + 1.27 A RMS (default set to +0.1 A RMS) ² |
| | Measurement resolution | ~.01 A RMS |
| | Typical Deadband | ~0.1 A RMS ² |
| | Weight | 2.10 oz (CT only), 2.9 oz (CT + Industrial Connector) |
| | Lead Length | 0.9 m (3 ft) |
| 0-150 Amp Current Transformer | Absolute max CT current | 200 Amps RMS (A RMS) |
| | Maximum accurate CT current | 150 A RMS |
| | Frequency range | 50–100 Hz |
| | Accuracy | +/- (2% + .4 A RMS) ¹ |
| | Calibrated accuracy with appropriate offset | +/- (1% + .2 A RMS) ¹ |
| | Offset limits | -1.27 to + 1.27 A RMS (default set to + 0.3 A RMS) ² |
| | Measurement resolution | ~0.1 A RMS |
| | Typical Deadband | ~0.3 A RMS ² |
| | Weight | 7.27 oz (CT only), 8.07 oz (CT + Industrial Connector) |
| | Lead Length | 0.9 m (3 ft) |
| 0-500 Amp Current Transformer | Absolute max CT current | 600 Amps RMS (A RMS) |
| | Maximum accurate CT current | 500 A RMS |
| | Frequency range | 50–100 Hz |
| | Accuracy | +/- (2% + 1.4 A RMS) ¹ |
| | Calibrated accuracy with appropriate offset | +/- (1% + .7 A RMS) ¹ |
| | Offset Compensation Limits | -327.68 to + 327.68 A RMS (default set to + 1.45 A RMS) ² |
| | Measurement resolution | ~0.3A RMS |
| | Typical Deadband | ~1.45 A RMS ² |
| | Weight | 14.55 oz (CT only), 15.35 oz (CT + Industrial Connector) |
| | Lead Length | 0.9 m (3 ft) |
| ALTA Wireless | Data logging | Sensor logs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through power cycling): 10-minute Heartbeats = ~22 days - 2-hour Heartbeats = ~266 days |
| | Wireless protocol | ALTA Proprietary Frequency-Hopping Spread Spectrum (FHSS) |
| | Wireless transmission power (EIRP) | 50 mW (900 MHz), 25 mW (868 MHz), 10 mW (433 MHz) |
| | Wireless range | 2,000+ ft. through 18+ walls with the ALTA XL® Gateway |
| | Security | Encrypt-RF® (256-bit key exchange and AES-128 CTR) |
| General | Battery voltage range | 2.0 to 3.8 VDC |
| | Operating altitude (non-pressurized environments) | -15.2 to 1,982 m (-50 to 6,500 ft) ³ |
| | Storage altitude (non-pressurized environments) | -15.2 to 3,048 m (-50 to 10,000 ft) ³ |
| | Operating humidity | 5 to 85% RH (non-condensing) |
| | Certifications | 900 MHz sensors: FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz sensors tested and comply with: EN 55032: 2015/A11:2020; EN 55035:2017/A11:2020; ETSI EN 300 220 V3.2.1 (2018-06); ETSI EN 301 489-3 V2.2.0. (2021-11); and ETSI EN 303 645. All sensors tested and comply with: EN 61010-1 and EN 60950 and meet RoHS 2015/863 and REACH 224 (June 2022), according to IEC 63000:2016/AMD1:2022. |

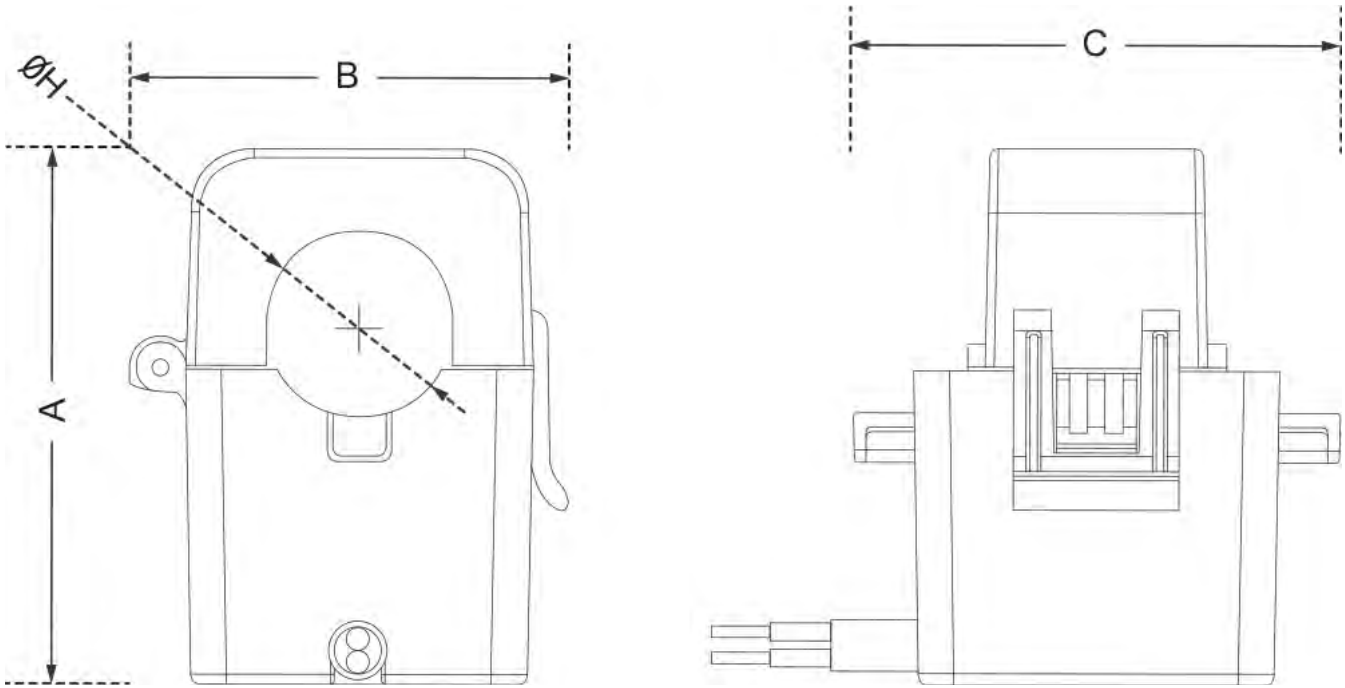


1. CTs are inherently less accurate at or below 10% of max range. For best calibration results calibrate at a current between 30% and 90% of max accurate range.
2. Because of a diode inherent to the hardware, the sensor is incapable of reading between 0 and the deadband value. This diode also creates an offset. To account for this, the firmware uses offset compensation.
3. Operating and storage altitude without DC power supply is -30.48 to 9144 m (-100 to 30000 ft).

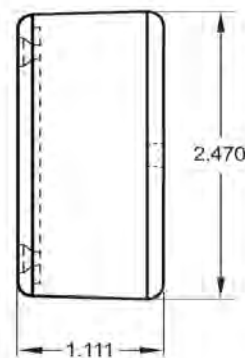
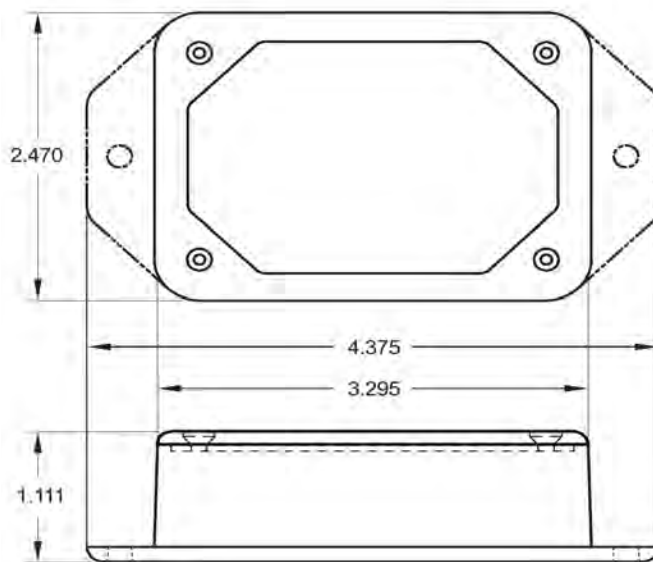
This sensor reports the following four values:

- Average RMS current measured over the Heartbeat
- Maximum RMS current measured over the Heartbeat
- Minimum RMS current measured over the Heartbeat
- Current Accumulation of Amp Hours

CURRENT TRANSFORMER DIMENSIONS

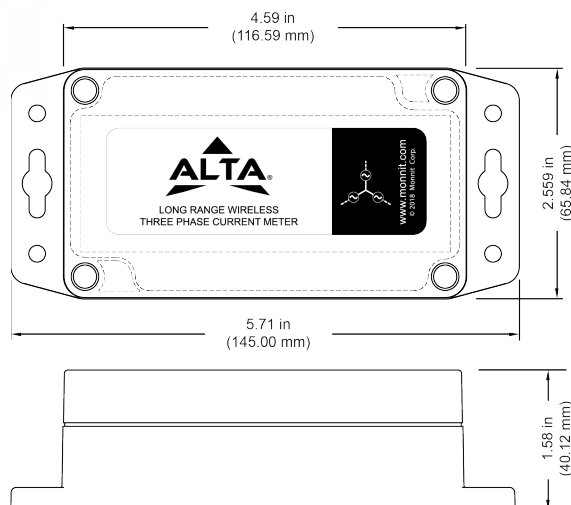
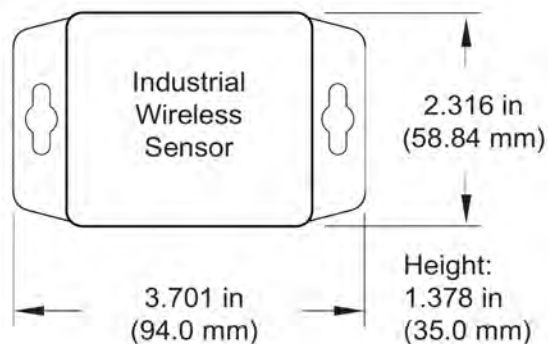
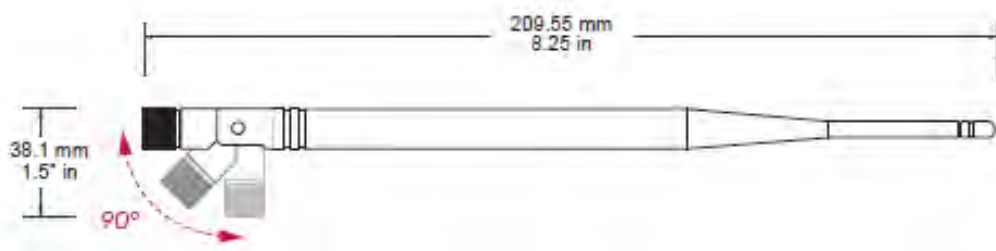


| Dimensions | A | B | C | D |
|------------|------------------|------------------|------------------|----------------|
| 20 Amp CT | 1.594" (40.5 mm) | 1.059" (26.9 mm) | 1.413" (35.9 mm) | 0.393" (10 mm) |
| 150 Amp CT | 2.952" (75 mm) | 2.169" (55.1 mm) | 1.779" (45.2 mm) | 0.944" (24 mm) |
| 500 Amp CT | 3.606" (91.6 mm) | 2.685" (68.2 mm) | 2.043" (51.9 mm) | 1.417" (36 mm) |



| Technical Specifications ALTA® Enterprise | |
|---|---|
| Battery ¹ | 2x 1.5 V AA Alkaline, 1500 mAh, (standard) 2x 1.5 V AA Lithium, 3000 mAh, (optional) |
| Battery Life | 10+ years expected |
| External line-power option ² | Input voltage: 5.0-12.0 V Power jack: 2.1 x 5.5 mm barrel, center positive |
| Operating temperature range (non-leaded measurement range) ³ | -18°C to 55°C (0°F to 130°F) - AA Alkaline Batteries -25°C to 60°C (-13°F to 140°F) - AA Lithium L91 Batteries 0°C to 40°C (32°F to 104°F) - US 5 V Power Supply 10°C to 40°C (50°F to 104°F) - International 5 V Power Supply |
| Wireless antenna type | 1/4-wave, 20 gauge wire whip, 3.5" (900/868MHz), 7" (433MHz) |
| Weight | 20 Amp Sensor: 5.8 oz. (164.4 g) 150 Amp Sensor: 10.97 oz. (311.0 g) 500 Amp Sensor: 18.25 oz. (517.4 g) |

1. Hardware cannot withstand negative voltage. Please take care when inserting and removing batteries.
2. Batteries will provide backup power in the case the external power is removed.
3. Operating below 0°C (-32°F) degrees will reduce battery life.



Technical Specifications | ALTA® Industrial (Single- & Three-Phase Meters)

| | |
|---|--|
| Battery | 1x 3.6 V AA Lithium Thionyl Chloride, 1500 mAh, pre-installed |
| Battery Life | 10+ years expected |
| Operating temperature range (non-leaded measurement range) ¹ | -40°C to 85°C (-40°F to 185°F) |
| Wireless antenna type | 1/2-wave waterproof dipole with RP-SMA connector and swivel neck; dBi of 3.0 (900/868 MHz) or 2.5 (433 MHz); length of 8.27" (210 mm) (900/868 MHz) or 7.68" (195 mm) (433 MHz); diameter at thickest point of 0.55" (14 mm) |
| Weight | 20 Amp Single Phase Meter: 6.7 oz. (190.0 g) 150 Amp Single Phase Meter: 13.8 oz. (391.2 g) 500 Amp Single Phase Meter: 19.6 oz. (555.7 g) 20 Amp Three Phase Meter: 20.1 oz. (569.8 g) 150 Amp Three Phase Meter: 30.0 oz. (850.5 g) 500 Amp Three Phase Meter: 52.9 oz. (1,500 g) |
| Enclosure rating | IP-65 (dust-proof and waterproof but not submersible) NEMA 1, 2, 4, 4x, 12, and 13 rated, sealed, and weatherproof UL Listed to UL508-4x specifications (File E194432) |
| Detachable Connector (150 Amp and 500 Amp only) | M12, 5-pin, circular, waterproof |

1. Operating below 0°C (-32°F) degrees will reduce battery life.

Commercial-Grade Sensors

Monnit 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.

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

Monnit's 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 and the damaging effects of 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



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