



MONNIT 20 Amp Three Phase Current Meter User Guide

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MONNIT 20 Amp Three Phase Current Meter User Guide



Remote Monitoring for Business



20 Amp, 150 Amp, and 500 Amp
Three Phase Current Meter
USER GUIDE

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I. ABOUT THE WIRELESS THREE PHASE CURRENT METER

The ALTA Industrial Wireless Three Phase Current Meter measures the RMS current of an alternating current (AC) system using 3 current transducers (CTs) that wrap around the wires of a three phase power system.

- 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
- 3x current transducers
- Capable of generating watt hour or kilowatt hour readings using immunity
- Data logging for accumulated amp hour readings
- Can notify based on amperage/power levels
- Simple and safe installation of amperage/power measurement hardware, no rewiring required

To measure current, clip the CT around a single wire of a powered system (clipping around a hot and neutral wire at the same time will result in 0 amp 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 iMonnit every heartbeat or sooner if the sensors aware state changes based on the current threshold setting in iMonnit. 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. These readings are based on all measurements taken between heartbeats. iMonnit can also generate watt hour or kilowatt hour readings if a default RMS voltage is set in iMonnit. The Three Phase Current Meter comes in three types:

- [High = 500 Amp](#)

- [Medium = 150 Amp](#)
- [Low = 20 Amp](#)

ALTA WIRELESS THREE PHASE CURRENT METER FEATURES

- Wireless range of 1,200+ feet through 12+ walls *
- Frequency-Hopping Spread Spectrum (FHSS)
- Interference immunity
- Power management for longer battery life **
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 3200 readings:
 - 10-minute heartbeats = 22 days
 - 2-hour heartbeats = 250 days
- Over-the-air updates (future proof)
- Free iMonnit 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.

EXAMPLE APPLICATIONS

- Heavy Machinery
- Breaker Panels
- Conveyor System Motors
- Factory / Manufacturing Management

II. ORDER OF OPERATIONS

It is important to understand the order of operations for activating your sensor. If performed out of sequence, your sensor may have trouble communicating with iMonnit. Please perform the steps below in the order indicated to make sure you are performing your set-up correctly.

1. Create iMonnit Account (If new user).
2. Register all sensors and gateways to a network in iMonnit.
Sensors can only communicate with gateways on the same iMonnit network.
3. Connect/power on gateway and wait till it checks into iMonnit.
4. Power on sensor and verify it checks into iMonnit. We recommend powering the sensor on near the gateway then moving to the installation location, checking signal strength along the way.
5. Configure sensor for use (This can be done at any point after step 2)
6. Install sensor in final location.

Note: For information on setting up iMonnit and the gateway refer to the iMonnit User Guide and the gateways user guide.

Note: Device specific setup is covered in more detail in the following sections.

III. SETUP AND INSTALLATION

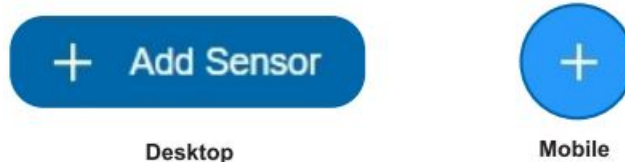
If this is your first time using the iMonnit online portal, you will need to create a new account. If you have already created an account, start by logging in. For instructions on how to register and setup your iMonnit account, please consult the [iMonnit User Guide](#).

REGISTER THE SENSOR

STEP 1: ADD DEVICE

1. Add the sensor on iMonnit.

Add the sensor to your account by choosing Sensors in the main menu. Navigate to the Add Sensor button.



2. Find the device ID. See Figure 1.

The Device ID (ID) and Security Code (SC) are necessary to add a sensor. These can both be located on the label on the side of your device.

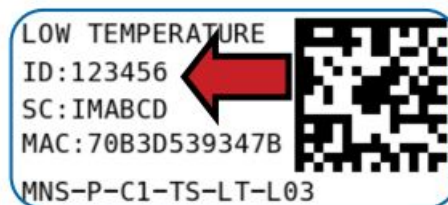


Figure 1

3. Adding your device. See Figure 2.

You will need to enter the Device ID and the Security Code from your Sensor in the corresponding text boxes. Use the camera on your smartphone to scan the QR code on your device. If you do not have a camera on your phone, or the system is not accepting the QR code, you may enter the Device ID and Security Code manually.



Figure 2

- The Device ID is a unique number located on each device label.
- Next, you'll be asked to enter the Security Code from your device. A security code consists of letters and must be entered in upper case (no numbers). It can also be found on the barcode label of your device.

When completed, select the Add Device button.

STEP 2: SETUP

Select your use case. See Figure 3.

Unlike most sensors, choosing a use case in Step 2 of adding this sensor does not give you the option to customize your settings. These will need to be adjusted in the settings tab for your device. See page 9 for instructions.

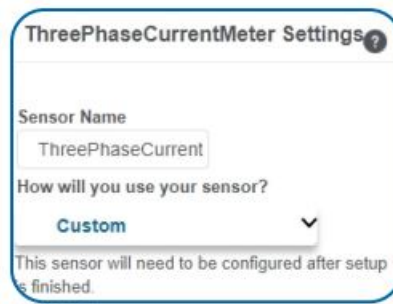
The image shows a mobile app screen titled "ThreePhaseCurrentMeter Settings" with a help icon. It contains a "Sensor Name" field with the text "ThreePhaseCurrent". Below it is a dropdown menu labeled "How will you use your sensor?" with "Custom" selected. At the bottom, a message states: "This sensor will need to be configured after setup is finished."

Figure 3

Select the Skip button when completed.

STEP 3: VALIDATION

Check your signal. See Figure 4.

The validation checklist will help you ensure your sensor is communicating with the gateway properly and you have a strong signal.

The image shows a validation checklist screen with four items. The first two are completed with green checkmarks: "Gateway is Online" and "Gateway has properly communicated with iMonnit". The third item is "Make sure your sensor is powered. (Click to complete)" with a counter of 3. The fourth item is "Make sure your sensor is checking in with gateway. (System will complete)" with a counter of 4.

Figure 4

Checkpoint 4 will only complete when your sensor achieves a solid connection to the gateway. Once you insert the batteries (or flip the switch on an industrial sensor) the sensor will communicate with the gateway every 30 seconds for the first few minutes.

Select the Save button when completed.

STEP 4: ACTIONS

Choose your actions. See Figure 5.

Actions are the alerts that will be sent to your phone or email in the event of an emergency. Low battery life and device inactivity are two of the most common actions to have enabled on your device. See page 12 for how to set actions for your sensor.

Select the Done button when completed.

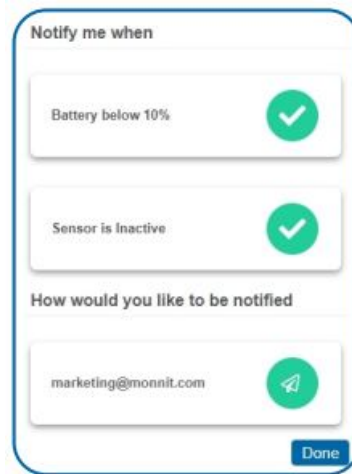


Figure 5

INSTALL THE ANTENNA

In order for the sensor to function properly, you will need to attach the included antenna. Simply screw the antenna onto the barrel connector on the top side of the device. Make sure the antenna connection is snug, but do not over tighten.

BATTERY REPLACEMENT (As Needed)

The Three Phase Current Meter is powered by a single pre-installed 3.6 V AA-sized industrial lithium battery that lasts 10 years on average so no battery installation is required on new sensors. On the off chance you do have to replace the battery flip the power switch to the Off position, remove the four screws on each corner of the case, remove the case top, then remove and replace the battery located in the center of the sensor. Flip the power switch to the On position. Recommend verifying functionality before replacing the case top. Replace the case top the same way it was removed (recommend partially tightening screws in a cross pattern then tightening screws completely following the same pattern).

POWER SENSOR ON

Flip the power switch to the On position. To power cycle an already powered sensor flip the power switch to the Off position for 30 seconds then flip it back to the On position.

CHECK iMONNIT

Open iMonnit and verify the sensor is checking and reporting data. Verify the sensor has a full battery level. If you don't see the sensor checking in, press the button on the gateway and power cycle the sensor.

INSTALLATION

CT Installation

The CTs are designed to clip around a single current carrying wire. Ensure that the CT is NOT wrapped around a cable with a common and live wire otherwise the sensor will read approximately 0.00 amps. See the diagram below for appropriate CT installation.

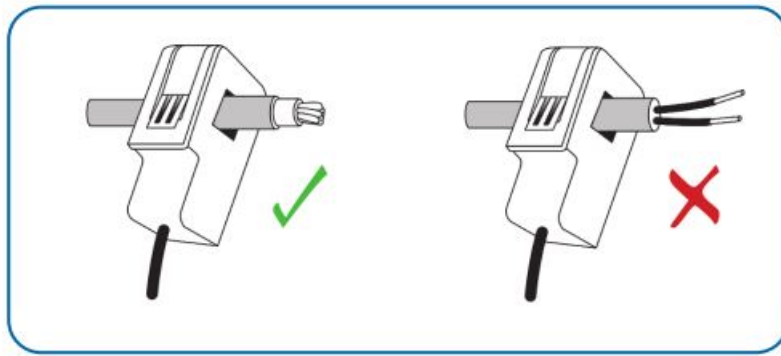


Figure 6

Mounting Sensor

Location and orientation of sensor and antenna can effect the sensor's ability to consistently communicate data and stay connected to the gateway. Refer to Antenna Orientation guide below for best practices and things to consider. The sensor can be mounted using appropriate mounting screws or other mounting material (Note Included).

Antenna Orientation

In order to get the best performance out of your ALTA device, it is important to note proper antenna orientation and device positioning. Antennas should all be oriented in the same direction, pointing vertically from the sensor. If the sensor is mounted flat on its back on a horizontal surface, you should bend the antenna as close to the sensor housing as possible giving you the most amount of antenna pointing vertical. You should make the antenna wire as straight as possible, avoiding any kinks and curving of the wire. Sensors must be at least 3 ft. away from other sensors and the wireless gateway to function.

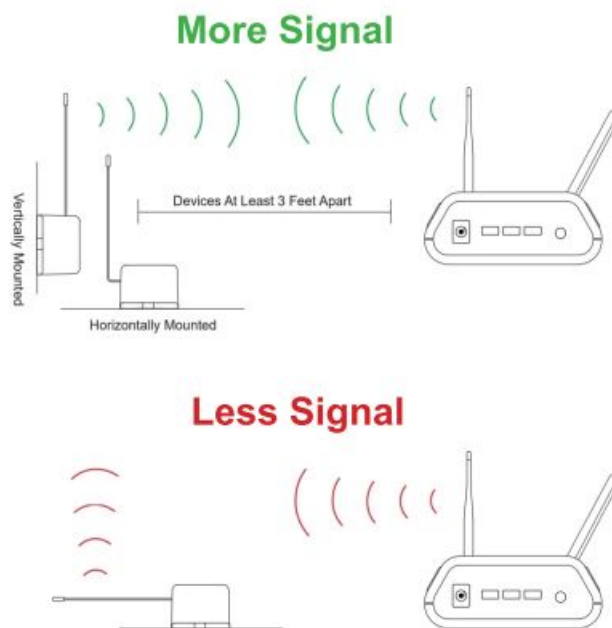


Figure 7

IV. SENSOR OVERVIEW

Select Sensors from the main navigation menu on iMonnit to access the sensor overview page and begin adjusting your meter.

MENU SYSTEM

Details – Displays a graph of recent sensor data
History – List of past readings
Actions – List of actions attached to this sensor
Settings – Editable levels for your sensor
Calibrate – Reset readings for your sensor
Scale – Change the scale of readings for your sensor

Directly under the tab bar is an overview of your sensor. This allows you to see the signal strength of the selected sensor. A coloured dot in the left corner of the sensor icon denotes its status:

- **Green** indicates the sensor is checking in and is within user-defined safe parameters.
- **Red** indicates the sensor has met or exceeded a user-defined threshold or triggered event.
- **Gray** indicates that no sensor readings are being recorded, rendering the sensor inactive.
- **Yellow** indicates that the sensor reading is out of date, possibly due to a missed heartbeat check-in.

Details View

The Details View will be the first page you see upon selecting which sensor you would like to modify. See Figure 7.


- A. The Sensor Overview section is at the top of every page. This will display the present reading, signal strength, battery level, and status.
- B. The Recent Readings section below the chart shows your most recent data received by the sensor.
- C. The Readings Chart displays how the sensor readings fluctuate throughout a set date range. To change the date range displayed in the graph, navigate up to the top of the Readings Chart section on the right-hand corner to change the “From:” and/or “To:” date.



Figure 8

Readings View

Selecting the Readings Tab within the tab bar allows you to view the sensor's data history as time stamped data.

- On the far right of the Sensor History Data is a cloud icon. () Selecting this icon will export an Excel file for your sensor into your download folder.

Note: Make sure you have the date range for the data you need input in the ?From? and ?To? text boxes. This will be the previous day by default. Only the first 2,500 entries in the selected date range will be exported.

The data file will have the following fields:

Message ID: Unique identifier of the message in our database.

Sensor ID: If multiple sensors are exported, you can distinguish between the sensors using this number ? even if the names are the same.

Sensor Name: The name you have given the sensor.

Date: The date the message was transmitted from the sensor.

Value: Data presented with transformations applied, but without additional labels.

Formatted Value: Data transformed and presented as it is shown in the monitoring portal.

Raw Data: Raw data as it is stored from the sensor.

Sensor State: Binary field represented as an integer containing information about the state or the sensor when the message was transmitted. (See “Sensor State” explained below.)

Alert Sent: Boolean indicating if this reading triggered a notification to be sent from the system.

Sensor State

The value presented here is generated from a single byte of stored data. A byte consists of 8 bits of data that we read as Boolean (True (1) / False (0)) fields.

When broken into individual bits, the State byte contains the following information: aaaabcde

STS: This value is specific to the sensor profile and is often used to indicate error states and other sensor conditions. Not used for this sensor, will always be 0.

UNUSED: This sensor does not use these bits.

AWARE: Sensors become aware when critical sensor specific conditions are met. Going aware can cause the sensor to trigger and report before the heartbeat and cause the gateway to forward the data to the server immediately resulting in near immediate transmission of the data.

TEST: This bit is active when the sensor is first powered on or reset and remains active for the first 9 messages when using default configurations.

Settings View

To edit the operational settings for a sensor, choose the Sensor option in the main navigation menu and then select the Settings Tab to access the configuration page. See Figure 9.

Figure 9

The image shows a configuration form for a sensor. The form includes the following fields and controls, each labeled with a red circle and a letter:

- A**: Sensor Name (Text input: "Three Phase Current I")
- B**: Heartbeat Interval (Minutes) (Text input: "60")
- C**: Aware State Heartbeat (Minutes) (Text input: "60")
- D**: Minimum Threshold (Amps) (Text input: "0")
- E**: Maximum Threshold (Amps) (Text input: "500")
- F**: Aware State Buffer (Amps) (Text input: "0")
- G**: Averaging Interval (Seconds) (Text input: "5")
- H**: Accumulate (Toggle switch: "Off")
- I**: Show Full Data Value (Toggle switch: "Off")
- J**: Synchronize (Toggle switch: "Off")
- K**: Failed transmissions before link mode (Text input: "3")

At the bottom of the form are three buttons: "Save" (blue), "Reset Counter" (grey), and "Default" (blue).

- A. Sensor Name is the unique name you give the sensor to easily identify it in a list along with any notifications.
- B. The Heartbeat Interval is how often the sensor communicates with the server when not Aware. C. Aware State Heartbeat is how often the sensor communicates with the server while in an Aware State.
- D. Minimum Threshold: Current readings below this value will cause the sensor to enter the Aware State.
- E. Maximum Threshold: Current readings above this value will cause the sensor to enter the Aware State.
- F. The Aware State Buffer is a buffer to prevent the sensor from bouncing between Standard Operation and Aware State when the assessments are very close to a threshold.
- G. Averaging Interval is how often the sensor measures current.
- H. Accumulate will accumulate current consumption (Ah) from heartbeat to heartbeat.
- I. Show Full Data Value: When On, shows Usage(Ah), Min, Max, and Av current readings for each phase. When Off, shows only Usage.
- J. In small sensor networks the sensors can be set to synchronize their communications. The default setting off allows the sensors to randomize their communications therefore maximizing communication robustness. Setting this will synchronize the communication of the sensors.
- K. Failed transmissions before link mode is the number of transmissions the sensor sends without response from a gateway before it goes to battery saving link mode. In link mode, The sensor will scan and Join a gateway at the following intervals: @ 0 Seconds, 3 sec, 6 sec, 9 sec, 15 sec, 30 sec, 1 min, 2 min, 5 min, 15 min, 30 min, and 60 min, then 60 minutes thereafter. While attempting to link, the sensor will continue to measure. A lower number will allow sensors to find new gateways with fewer missed readings. High numbers will enable the sensor to remain with its current gateway in a noisy RF environment better.

Finish by selecting the Save button.

Note: Be sure to select the Save button anytime you make a change to any of the sensor parameters. All changes made to the sensor settings will be downloaded to the sensor on the next sensor heartbeat (check-in). Once a change has been made and saved, you will not be able to edit that sensor's configuration again until it has downloaded the new setting.

V. ACTIONS OVERVIEW

Device notifications can be created, deleted, and edited by selecting the Actions Tab in the tab bar.

You can toggle the Action Trigger on or off by selecting the switch under Current Action Triggers. See Figure 10.

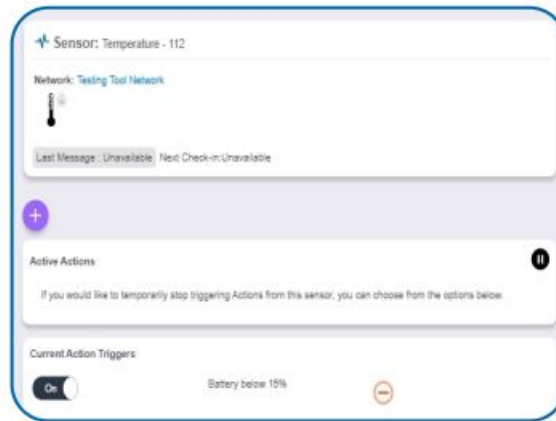


Figure 10

CREATING AN ACTION

- Actions are triggers or alarms set to notify you when a sensor reading identifies that immediate attention is needed. Types of actions include sensor readings, device inactivity, and scheduled data. Any one of these can be set to send a notification or trigger an action in the system.

Choose Actions in the main navigation menu.



Figure 11

- A list of previously created actions will display on the screen. From here, you have the ability to filter, refresh, and add new actions to the list.

Note: If this is your first time adding an action, the screen will be blank.

From the Actions page, tap Add Action in the left hand corner.



Figure 12

Step 1: What triggers your action?

The drop-down menu will have the following options for Action Types (See Figure 13):

- Sensor Reading: Set actions based on activity or reading.
- Device Inactivity: Actions when the device doesn't communicate for an extended period of time.
- Advanced: Actions based on advanced rules, such as comparing past data points with current ones.
- Scheduled: These actions are performed at a time set basis.



Figure 13

- Select Sensor Reading from the drop-down menu.
- A second drop-down menu will appear. From here, you will be able to see a list of the different type of sensors registered to your account. Choose Current Meter in the drop-down menu. Then select whether you wish to be alerted to insufficient Amp Hours, Avg Current, Max Current, or Minimum Current.
- Next, you will be asked to input the trigger settings. You have the option of setting this trigger to detect greater than or less than a desired reading.



Figure 14

Press the Save button.

Step 2: Actions

- Press the Add Action button under the information header, available action types will then be presented in a select list.
- Notification Action: Specify account users to receive notification when this event triggers.

- System Action: Assign actions for the system to process when this event triggers.
- Choose Notification Action from the notification list.
- A. Input the subject for the notification. See Figure 15.
- B. Customize the message body for the notification. See Figure 15.

Figure 15

- C. Recipient list identifies who will receive the notification. See Figure 16.

Figure 16

- Select the icon next to a user to specify how they will be notified.
- Choose if you want notifications sent immediately, when triggered, or if you want a delay before sending and press Set.
- A green icon indicates that the users that will receive the notifications.
- If a delay has been selected, the delay time will display beside the icon.

Select System Action from the Add Action list. See Figure 17.

Figure 17

- Scroll down to the System Action section.

- The Action to be done select list has the following options:

Acknowledge: Signals the system to stop processing actions for this Action Instance. (No further actions will take place until the Action has been “Reset”)

Full Reset: Reset your trigger so it is armed for the next reading.

Activate: Enable an action trigger.

Deactivate: Disable an action trigger.

Step 3: Action Name and Devices

- By default, the sensor(s) will not be assigned to the action conditions you’ve just set. To assign a sensor, find the device(s) you want to designate for this action and select. Selected sensor boxes will turn green when activated. Choose the sensor box again to unassigned the sensor from the action. See Figure 18.
- Continue toggling the sensor(s) corresponding to this new action until you are satisfied with your selection. These can be adjusted later by returning to this page.

Press the Check-mark button to complete the process.



Figure 18

VI. SENSOR SECURITY

Data security and integrity is paramount at Monnet. Each layer of the system is secured using encryption and protocols designed to protect customer data and information. The system consists of sensor(s), gateway(s), and iMonnit software. One or more sensors communicate with iMonnit software through a gateway.

SENSOR TO GATEWAY

Sensor and gateway radio modules are purpose built devices with proprietary unreadable firmware, which means the sensor cannot be physically hacked or re-purposed for malicious purposes. This adds a strong level of inherent security even before considering encryption. Data transmission between the sensor and gateway are secured using Encrypt-RF Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages). Beyond the encryption, data transmissions are also structurally verified and CRC checked before they are passed up to iMonnit or down to the sensor, this ensures the integrity of the data itself.

GATEWAY TO IMONNIT

Data transmission between the gateway and iMonnit server is also secured using Encrypt-RF Security (Diffie-

Hellman Key Exchange + AES-128 CBC for data messages). Beyond the encryption, data transmissions are also structurally verified and CRC checked before they are accepted by the server, this ensures the integrity of the data.

iMONNIT

Access is granted through the iMonnit user interface, or an Application Programming Interface (API) safeguarded by 256-bit Transport Layer Security (TLS 1.2) encryption. TLS is a blanket of protection to encrypt all data exchanged between iMonnit and you. The same encryption is available to you whether you are a Basic or Premiere user of iMonnit. You can rest assured that your data is safe with iMonnit.

SENSOR PRINTS

Sensor Prints utilize a shared key between the software and the sensor to ensure that once the data comes to iMonnit it is guaranteed to be from the device identified by the sensor print. If this feature is purchased for the device (via iMonnit software) the devices data becomes impossible to spoof by any malicious device.

VII.TROUBLESHOOTING

Symptoms	Detailed Problem Description	Solution
Not Checking into iMonnit	Sensor lost radio link to gateway or never connected to gateway.	<p>Power cycle sensor by flipping the power switch to the Off position for 30 seconds then flipping it back to On.</p> <ol style="list-style-type: none">1.Ensure the network is setup correctly in iMonnit (sensor and gateway are on same network). Press button on gateway.2.If network is setup correctly reform the gateway.3.Move sensor ~10 feet from gateway.4.Move progressively further from gateway ensuring at least 2 signal bars are showing. Keep in mind the signal bars represent signal from the previous message, not the current message. Recommend taking two readings to verify signal strength.5.Check antenna on the gateway.
Low Signal	Radio signal strength in iMonnit is lower than expected.	<ol style="list-style-type: none">1.Ensure the gateway antenna is properly connected.2.Ensure the gateway antenna is optimally oriented with respect to the position of the sensor. (See Antenna Orientation guide in Setup and Installation section).
Reads 0.00 Amps Unexpectedly	Reads 0.00 Amps When Current is Flowing Through Wire	<ol style="list-style-type: none">1. Ensure CT is fully closed and clip locks into place.2. Ensure there are no obstructions between metal contacts of the CT (Pinched wires, debris, etc.)3. Ensure CT is wrapped around a single current carrying wire. See <i>CT Installation</i> in Setup and Installation section for more information.

SUPPORT

For technical support and troubleshooting tips please visit our support library online at monnit.com/support/. If you are unable to solve your issue using our online support, email Monnet support at support@monnit.com with your contact information and a description of the problem, and a support representative will call you within one business day.

For error reporting, please email a full description of the error to support@monnit.com.

WARRANTY INFORMATION

(a) Monnit warrants that Monnit-branded products (Products) will be free from defects in materials and workmanship for a period of one (1) year from the date of delivery with respect to hardware and will materially conform to their published specifications for a period of one (1) year with respect to software. Monnit may resell sensors manufactured by other entities and are subject to their individual warranties; Monnit will not enhance or extend those warranties. Monnit does not warrant that the software or any portion thereof is error free. Monnit will have no warranty obligation with respect to Products subjected to abuse, misuse, negligence or accident. If any software or firmware incorporated in any Product fails to conform to the warranty set forth in this Section, Monnit shall provide a bug fix or software patch correcting such non-conformance within a reasonable period after Monnit receives from Customer (i) notice of such non-conformance, and (ii) sufficient information regarding such non-conformance so as to permit Monnit to create such bug fix or software patch. If any hardware component of any Product fails to conform to the warranty in this Section, Monnit shall, at its option, refund the purchase price less any discounts, or repair or replace nonconforming Products with conforming Products or Products having substantially identical form, fit, and function and deliver the repaired or replacement Product to a carrier for land shipment to customer within a reasonable period after Monnit receives from Customer (i) notice of such non-conformance, and (ii) the non-conforming Product provided; however, if, in its opinion, Monnit cannot repair or replace on commercially reasonable terms it may choose to refund the purchase price. Repair parts and replacement Products may be reconditioned or new. All replacement Products and parts become the property of Monnit. Repaired or replacement Products shall be subject to the warranty, if any remains, originally applicable to the product repaired or replaced. Customer must obtain from Monnit a Return Material Authorization Number (RMA) prior to returning any Products to Monnit. Products returned under this Warranty must be unmodified.

Customer may return all Products for repair or replacement due to defects in original materials and workmanship if Monnit is notified within one year of customer's receipt of the product. Monnit reserves the right to repair or replace Products at its own and complete discretion. Customer must obtain from Monnit a Return Material Authorization Number (RMA) prior to returning any Products to Monnit. Products returned under this Warranty must be unmodified and in original packaging. Monnit reserves the right to refuse warranty repairs or replacements for any Products that are damaged or not in original form. For Products outside the one year warranty period repair services are available at Monnit at standard labour rates for a period of one year from the Customer's original date of receipt.

(b) As a condition to Monnit's obligations under the immediately preceding paragraphs, Customer shall return Products to be examined and replaced to Monnit's facilities, in shipping cartons which clearly display a valid RMA number provided by Monnit. Customer acknowledges that replacement Products may be repaired, refurbished or tested and found to be complying. Customer shall bear the risk of loss for such return shipment and shall bear all shipping costs. Monnit shall deliver replacements for Products determined by Monnit to be properly returned, shall bear the risk of loss and such costs of shipment of repaired Products or replacements, and shall credit Customers reasonable costs of shipping such returned Products against future purchases.

(c) Monnit's sole obligation under the warranty described or set forth here shall be to repair or replace non-conforming products as set forth in the immediately preceding paragraph, or to refund the documented purchase price for non-conforming Products to Customer. Monnit's warranty obligations shall run solely to Customer, and Monnit shall have no obligation to customers of Customer or other users of the Products. Limitation of Warranty and Remedies.

THE WARRANTY SET FORTH HEREIN IS THE ONLY WARRANTY APPLICABLE TO PRODUCTS PURCHASED BY CUSTOMER. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. MONNIT'S LIABILITY WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE OR OTHERWISE SHALL NOT EXCEED THE PURCHASE PRICE PAID BY CUSTOMER FOR THE PRODUCT. UNDER NO CIRCUMSTANCES SHALL MONNIT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES. THE PRICE STATED FOR THE PRODUCTS IS A CONSIDERATION IN LIMITING MONNIT'S LIABILITY. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THIS AGREEMENT MAY BE BROUGHT BY CUSTOMER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED.

IN ADDITION TO THE WARRANTIES DISCLAIMED ABOVE, MONNIT SPECIFICALLY DISCLAIMS ANY AND ALL LIABILITY AND WARRANTIES, IMPLIED OR EXPRESSED, FOR USES REQUIRING FAIL-SAFE PERFORMANCE IN WHICH FAILURE OF A PRODUCT COULD LEAD TO DEATH, SERIOUS PERSONAL INJURY, OR SEVERE PHYSICAL OR ENVIRONMENTAL DAMAGE SUCH AS, BUT NOT LIMITED TO, LIFE SUPPORT OR MEDICAL DEVICES OR NUCLEAR APPLICATIONS. PRODUCTS ARE NOT DESIGNED FOR AND SHOULD NOT BE USED IN ANY OF THESE APPLICATIONS.

CERTIFICATIONS

United States FCC

This equipment has been tested and found to comply with the limits for a Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications not expressly approved by Monnit could void the users authority to operate the equipment.

RF Exposure



WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, the antenna used for this transmitter must not be co-located in conjunction with any antenna or transmitter.

Monnit and ALTA Wireless Sensors:

This equipment complies with the radiation exposure limits prescribed for an uncontrolled environment for fixed and mobile use conditions. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and the body of the user or nearby persons.

All ALTA Wireless Sensors Contain FCC ID: ZTL-G2SC1. Approved Antennas

ALTA devices have been designed to operate with an approved antenna listed below, and having a maximum gain of 14 dBi. Antennas having a gain greater than 14 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

- Xianzi XQZ-900E (5 dBi Dipole Omnidirectional)
- HyperLink HG908U-PRO (8 dBi Fiberglass Omnidirectional)
- HyperLink HG8909P (9 dBd Flat Panel Antenna)
- HyperLink HG914YE-NF (14 dBd Yagi)
- Specialized Manufacturing MC-ANT-20/4.0C (1 dBi 4' whip)

Canada (IC)

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the Equivalent Isotropically Radiated Power (E.I.R.P.) is not more than that necessary for successful communication.

The radio transmitters (IC: 9794A-RFSC1, IC: 9794A-G2SC1, IC: 4160a-CNN0301, IC: 5131A-CE910DUAL, IC: 5131A-HE910NA, IC: 5131A-GE910 and IC: 8595A2AGQN4NNN) have been approved by Industry Canada to operate with the antenna types listed on previous page with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

SAFETY RECOMMENDATIONS – READ CAREFULLY

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircraft, etc.
- Where there is risk of explosion such as gasoline stations, oil refineries, etc.

It is responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of this user guide for correct setup and use of the product.

Please handle the product with care, avoiding any dropping and contact with the internal circuit board as electrostatic discharges may damage the product itself.

The European Community provides some Directives for the electronic equipment introduced on the market. All the relevant information's is available on the European Community website:

<http://ec.europa.eu/enterprise/sectors/rtte/documents/>

The text of the Directive 99/05 regarding telecommunication equipment is available, while the applicable Directives (Low Voltage and EMC) are available at: <http://ec.europa.eu/enterprise/sectors/electrical>

Additional Information and Support


For additional information or more detailed instructions on how to use your Monnit Sensors or the iMonnit Online System, please visit us on the web at <https://www.monnit.com/support/documentation>.



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www.monnit.com

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Documents / Resources

 The image shows the cover of a user guide for the Monnit 20 Amp Three Phase Current Meter. It features the Monnit logo at the top, a photograph of the device with its antenna and cables, and the text "20 Amp, 150 Amp, and 500 Amp Three Phase Current Meter USER GUIDE" at the bottom.	<p>MONNIT 20 Amp Three Phase Current Meter [pdf] User Guide 20 Amp, Three Phase Current Meter, Current Meter</p>
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[Manuals+](#).