Remote Monitoring for Business

ALTA Accelerometer
Tilt Detection Sensor
USER GUIDE

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I. ABOUT THE WIRELESS TILT DETECTION SENSOR

The ALTA Wireless Accelerometer - Tilt Detection Sensor is a digital, low-power, low-profile, MEMS sensor that is able to measure acceleration on one axis to provide a measure of pitch. The sensor constantly monitors a single axis of rotation over a range of -179.9 to +180.0 degrees. The data is displayed in degrees with 0.1° of resolution. If the sensor does not experience a detectable orientation change, the sensor will produce a current report at a time interval (defined by the user). If an orientation change is detected, the sensor will report immediately. User configurable angles are used to define regions for “Up”, “Down, and “Stuck”. Data is reported when the sensor move between these regions.

ALTA WIRELESS TILT DETECTION SENSOR 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 hundreds of readings per sensor:
  - 10-minute heartbeats = 22 days
  - 2-hour heartbeats = 266 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

- Inclination monitoring
- Bay doors
- Loading gates
- Overhead doors
- Additional applications

II. SENSOR SECURITY

The ALTA Wireless Accelerometer - Tilt Detection Sensor has been designed and built to securely manage data from sensors monitoring your environment and equipment. Hacking from botnets are in the headlines, Monnit Corporation has taken extreme measures to ensure your data security is handled with the utmost care and attention to detail. The same methods utilized by financial institutions to transmit data are also used in Monnit security infrastructure. Security features of the gateway include tamper proof network interfaces, data encryption, and bank-grade security.

Monnit's proprietary sensor protocol uses low transmit power and specialized radio equipment to transmit application data. Wireless devices listening on open communication protocols cannot eavesdrop on sensors. Packet level encryption and verification is key to ensuring traffic isn't altered between sensors and gateways. Paired with best-in-class range and power consumption protocol, all data is transmitted securely from your devices. Thereby ensuring a smooth, worry-free, experience.

SENSOR COMMUNICATION SECURITY

Monnit sensor to gateway secure wireless tunnel is generated using ECDH-256 (Elliptic Curve Diffie-Hellman) public key exchange to generate a unique symmetric key between each pair of devices. Sensors and gateways use this link specific key to process packet level data with hardware accelerated 128-bit AES encryption which minimizes power consumption to provide industry best battery life. Thanks to this combination, Monnit proudly offers robust bank-grade security at every level.

DATA SECURITY ON THE GATEWAY

The ALTA gateways are designed to prevent prying eyes from accessing the data that is stored on the sensors. Gateways do not run on an off the shelf multi-function OS (operating system). Instead they run a purpose specific real-time embedded state machine that cannot be hacked to run malicious processes. There are also no active interface listeners that can be used to gain access to the device over the network. The fortified gateway secures your data from attackers and secures the gateway from becoming a relay for malicious programs.

iMONNIT SECURITY

iMonnit is the online software and central hub for configuring your device settings. All data is secured on dedicated servers operating Microsoft SQL Server. 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 blanket of protection to encrypt all data exchanged between iMonnit and you. The same encryption is available to you whether you are a Basic user of Premiere user of iMonnit. You can rest assured that your data is safe with iMonnit.

III. 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.

IV. 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.

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.

Desktop

Mobile

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.

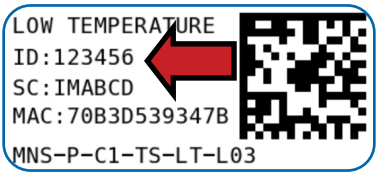


Figure 1

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.

To get you up and running fast, your sensor comes with preset use cases. Choose from the list or create your own custom settings. You will see the heartbeat interval, and aware state settings (see page 9 for definitions) .

Select the **Skip** button when completed.

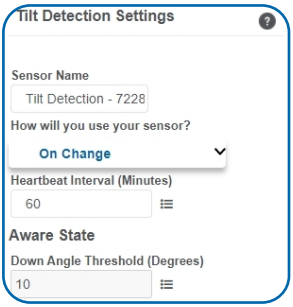


Figure 3

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.

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.

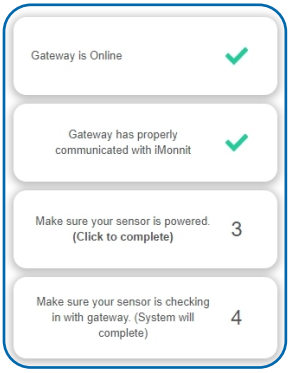


Figure 4

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.

Select the **Done** button when completed.

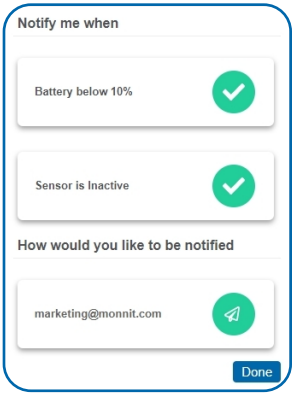


Figure 5

V. SETTING UP YOUR TILT DETECTION SENSOR

When you are finished adding the sensor to your account, the next step is to insert the battery. The type of battery you use will depend on the category of your sensor. ALTA Wireless Accelerometer - Tilt Detection Sensors will either be powered by commercial coin cell, AA, or an industrial battery.

INSTALLING BATTERIES

ALTA commercial sensors are powered by AA or CR2032 coin cell batteries. Industrial sensors need a 3.6V Lithium battery supplied from Monnit or another industrial battery supplier. Monnit encourages customers to recycle all old batteries.

Coin Cell

The lifespan of a standard CR2032 coin cell battery in an ALTA Tilt Detection Sensor is 2 years.

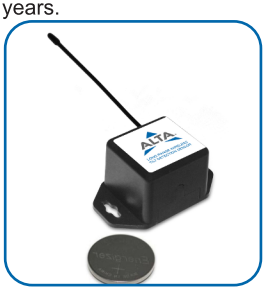


Figure 6

Install a coin cell battery by first taking the sensor and pinching the sides of the enclosure. Gently pull up the enclosure, separating the sensor from its base. Then slide a new CR2032 coin cell battery with the positive side facing toward the base. Press the enclosure back to together; you'll hear a small click.

Lastly, open iMonnit select **Sensors** from the navigation menu. Verify that iMonnit is showing the sensor has a full battery level.

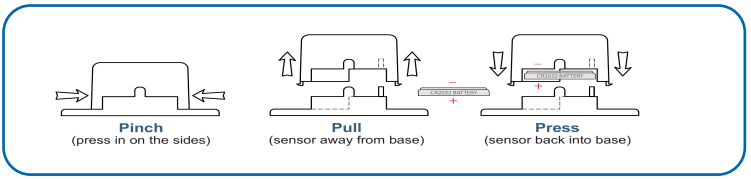


Figure 7

AA Batteries

Figure 8

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase). The typical battery life is 10 years.

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.

Place batteries in the device by first taking the sensor and sliding the battery door open. Insert fresh AA batteries in the carriage, then shut the battery door.

Complete the process by opening up iMonnit and selecting **Sensors** from the main navigation menu. Verify that iMonnit is showing the sensor has a full battery level.

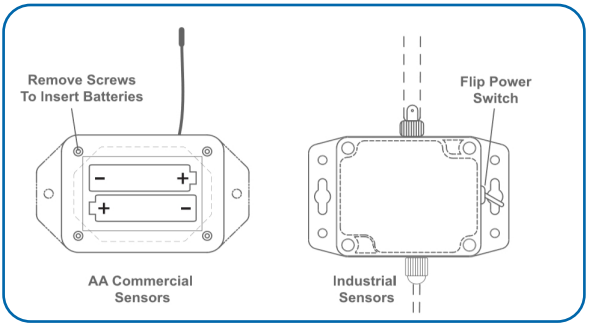


Figure 9

Industrial Batteries

Figure 10

3.6V Lithium batteries for the Industrial Wireless Tilt Detection Sensor is supplied by Monnit. The ALTA battery life for the Industrial battery is 5 years.

Industrial sensors come shipped with a 3.6V Lithium battery already installed. They do not need to be taken apart for battery installation and are not rechargeable.

Open iMonnit and select **Sensors** from the main navigation menu. Verify that iMonnit is showing the sensor has a full battery level. Replace the battery door by screwing in the four corners.

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 of the device. Make sure to snug the antenna connection, but do not over tighten. When placing the sensor, make sure to mount the sensor with the antenna oriented straight up (vertical) to ensure the best wireless radio signal.

Since the electronics are sealed within the sensor housing, we have added an "On/Off" switch to the unit for your convenience. If you are not using the sensor, simply leave the button in the off position to preserve battery life. If the sensor needs to be reset for any reason, you can simply cycle the power by turning the switch to the "Off" position and waiting 30 seconds before powering back on.

MOUNTING THE SENSOR

Monnit wireless sensors feature mounting flanges and can be attached to most surfaces using the included mounting screws or double-sided tape. The sensor should be mounted directly on the door, gate, etc. being monitored.

For an additional layer of security, and to protect against tampering, you can mount the sensor inside a plastic box or cage.

ANTENNA ORIENTATION

In order to get the best performance out of your ALTA Wireless Sensors, it is important to note proper antenna orientation and sensor 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.

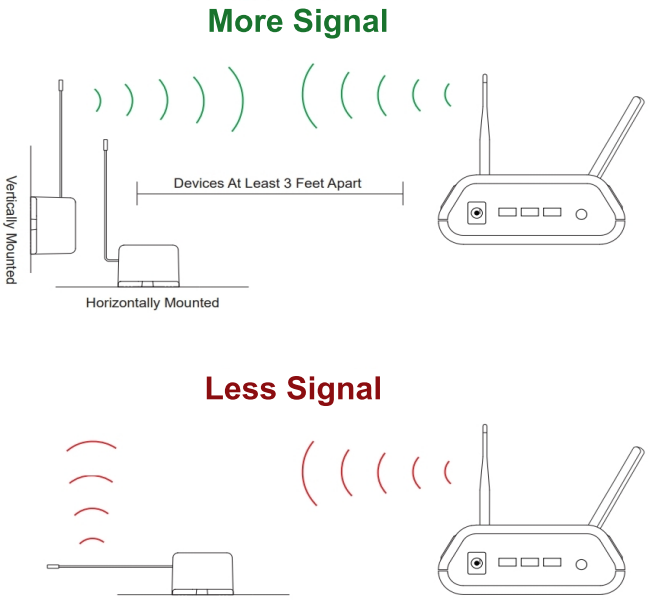


Figure 11

VI. SENSOR OVERVIEW

Select **Sensors** from the main navigation menu on iMonnit to access the sensor overview page and begin making adjustments to your Tilt Detection Sensors.

MENU SYSTEM

Details - Displays a graph of recent sensor data.

Readings- List of all past heartbeats and readings.

Actions - List of all actions attached to this sensor.

Settings - Editable levels for your sensor.

Calibrate - Reset readings for your sensor.

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

- **Green** indicates the sensor is checking in and 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, due to perhaps 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.

A. The sensor overview section will be above every page. This will consistently 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. This graph charts how the sensor fluctuates 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.

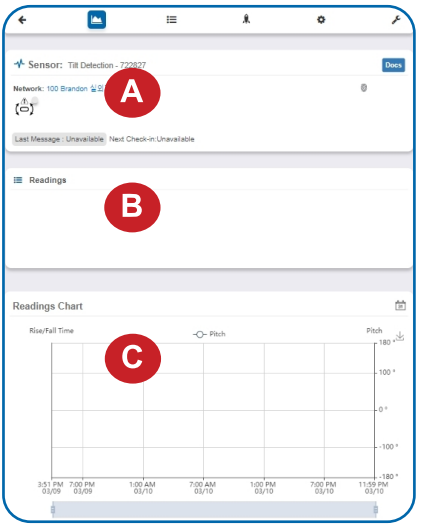


Figure 12

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 most recent week by default. Only the first 2,500 entries in the selected date range will be exported.

The data file will have the following fields:

MessageID: Unique identifier of the message in our database.

Sensor ID: If multiple sensors are exported you can distinguish which reading was from which using this number even if the names for some reason 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.

Battery: Estimated life remaining of the battery.

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).

Gateway ID: The Identifier of the gateway that relayed the data from the sensor.

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

Signal Strength: Strength of communication signal between the sensor and the gateway, shown as percentage value.

Voltage: Actual voltage measured at the sensor battery used to calculate battery percentage, similar to Received Signal you can use one or the other or both if they help you.

State

The integer 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.

Using a temperature sensor as an example.

If the sensor is using factory calibrations the Calibrate Active field is set True (1) so the bit values are 00010000 and it is represented as 16.

If the sensor is outside the Min or Max threshold, the Aware State is set True (1) so the bit values are 00000010 and it is represented as 2.

If the customer has calibrated the sensor this field the Calibrate Active field is set False (0) AND the sensor is operating inside the Min and Max Thresholds, the bits look like 00000000 this is represented as 0.

If the sensor is using factory calibrations and it is outside the threshold the bit values are 00010010 and it is represented as 18 (16 + 2 because both the bit in the 16 value is set and the bit in the 2 value is set).

Note: These two are the only bits that typically observed outside of our testing procedures.

The sensor will either be up at an angle, down at an angle, or stuck in mid-transition. Any angle above the up angle or below the down angle will be counted as an acceptable reading.

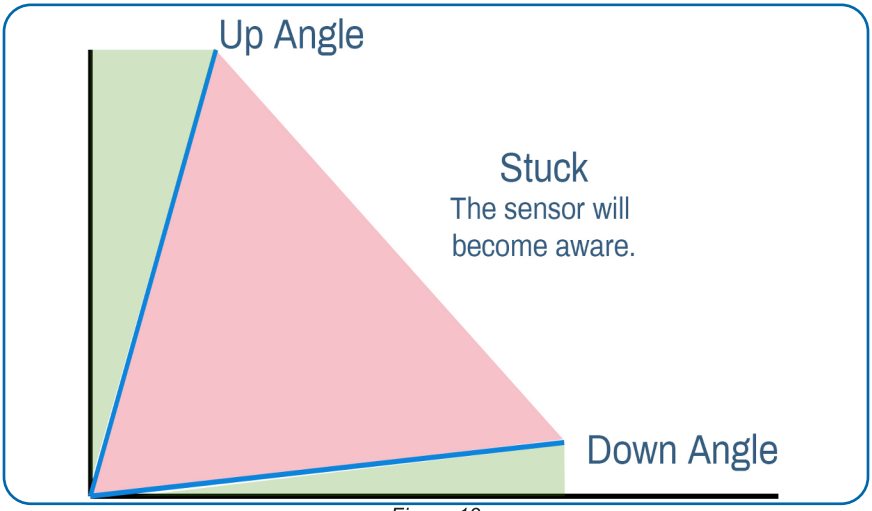


Figure 13

Here's a helpful diagram of options for the rotational axis.

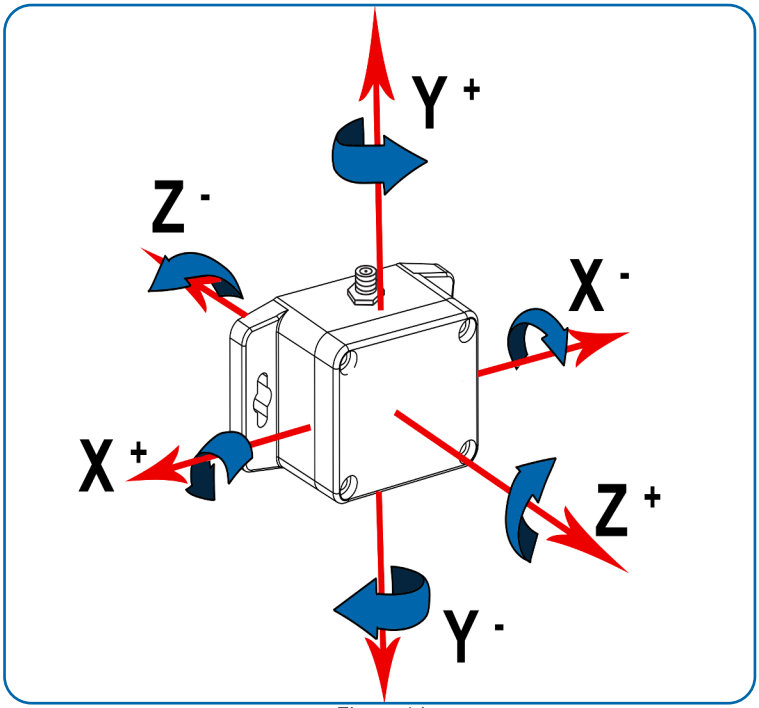


Figure 14

Settings View

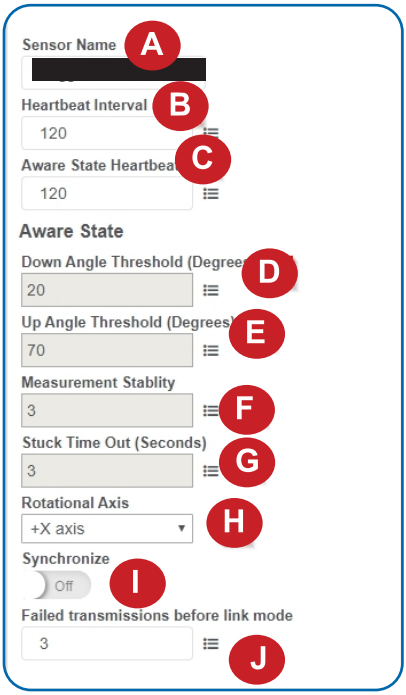


Figure 15

To edit the operational settings for a sensor, choose the "**Sensor**" option in the main navigation menu then select the "**Settings**" tab to access the configuration page.

A. Sensor Name is a unique name you give the sensor to easily identify it in a list and in any notifications.

B. The **Heartbeat Interval** is how often the sensor communicates with the gateway if no activity is recorded.

C. Aware State Heartbeat is how often the sensor communicates with the gateway while in an Aware State. In this case the sensor becomes aware when it is stuck between an up angle and a down angle.

D. Up Angle Threshold is the angle the sensor should be at when the sensor is up. Your Up Angle Threshold should always be higher than your down angle threshold.

E. Down Angle Threshold is the angle the sensor should be at when the sensor is down.

F. Measurement Stability is the number of readings in a row before the last reading is reported. The default is three and we suggest this not be changed. If the movement -- like on a gate for example -- is slow, you may need to raise it.

G. Stuck Time Out is the time in seconds for the sensor to move from the down angle to an up angle and vice versa.

H. Rotational Axis is a drop down menu to select the axis you wish to measure. While the Tilt Detection sensor can measure tilt on all three axis, it can only report readings from one positive or negative polarity.

I. 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.

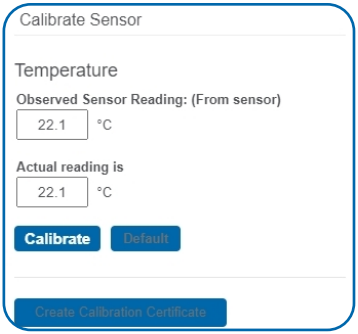
J. Failed transmissions before link mode is the number of transmissions the sensor sends without response from a gateway before it goes to battery saving link mode. In link mode, the sensor will scan for a new gateway and if not found will enter battery saving sleep mode for up to 60 minutes before trying to scan again. A lower number will allow sensors to find new gateways with fewer missed readings. Higher numbers will enable the sensor to remain with its current gateway in a noisy RF environment better. (Zero will cause the sensor to never join another gateway, to find a new gateway the battery will have to be cycled out of the sensor.)

The default heartbeat interval is 120 minutes or two hours. It is recommended that you do not lower your heartbeat level too much because it will drain the battery.

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.

Figure 16



Calibrate View

If a sensor type has readings that need to be reset, the “Calibrate” tab will be available for selection in the sensor tab bar.

To calibrate a sensor, ensure that the environment of the sensor and other calibration devices are stable.

Enter the actual (accurate) reading from the calibration device into the text field. If you need to change the unit of measurement you can do that here.

Press **Calibrate.**

To ensure that the calibration command is received prior to the sensors next check-in, press the control button on the back of the gateway, once, to force communication (Cellular and Ethernet gateways).

After pressing the "Calibrate" button and choosing the gateway button, the server will send the command to calibrate the specified sensor to the gateway. When the sensor checks-in, it will send the pre-calibration reading to the gateway, then receive the calibration command and update it’s configuration. When the process is completed, it will send a “Calibration Successful” message. The server will display the sensor’s last pre-calibrated reading for this check-in, then all future readings from the sensor will be based on the new calibration setting.

It is important to note that after calibrating the sensor, the sensor reading returned to the server is based on pre-calibration settings. The new calibration settings will take effect on the next sensor heartbeat.

Note: If you would like to send the changes to the sensor right away, please remove the battery(s) for a full 60 seconds, then re-insert the battery(s). This forces the communication from the sensor to the gateway and this the message to make a change from the gateway back to the sensor. (If the sensors are industrial sensors, turn the sensor off for a full minute, rather than removing the battery).

Creating a Calibration Certificate

Creating a sensor calibration certificate will mask the calibration tab from those who should not have permissions to adjust these settings. Permissions for self-certifying a calibration must be enabled in user permissions.

Directly below the calibrate button is the selection to "Create Calibration Certificate.

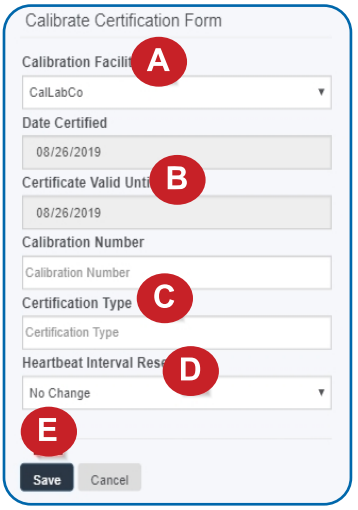


Figure 17

A. The **Calibration Facility Field** will be filled. Select the drop-down menu to change your facility.

B. The **"Certificate Valid Until"** field must be set one day in the future after the date contained in the "Date Certified" field.

C. "**Calibration Number**" and **"Calibration Type"** are unique values to your certificate.

D. If necessary, you can reset the heartbeat interval here to 10 minutes, 60 minutes, or 120 minutes. By default, this will be set to no change.

E. Choose the "**Save**" button before moving on.

When the new certificate is accepted, the Calibration tab will change to a Certificate tab.

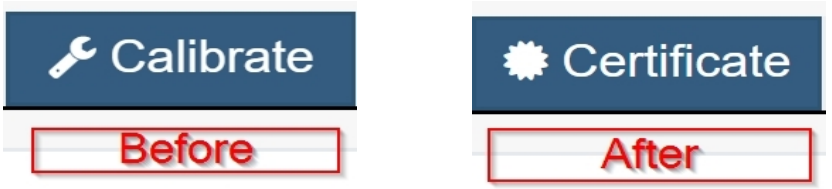


Figure 18

You will still be able to edit the certificate by choosing the Certificate Tab and navigating down to "Edit Calibration Certificate."

The tab will revert back to "Calibrate" after the period for the certificate ends.

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 Monnit 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 labor 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 Customer's 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 user's 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 23 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)

English

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.

French

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la Puissance Isotrope Rayonnée Èquivalente (P.I.R.È) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteurs radio (IC: 9794A-RFSC1, IC: 9794A-G2SC1, IC: 4160a-CNN0301, IC: 5131A-CE910DUAL, IC: 5131A-HE910NA, IC: 5131A-GE910 et IC: 8595A2AGQN4NNN) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne figurant sur la page précédente et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, méme si le brouillage est susceptible d'en compromettre le fonctionnement.

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, aircrafts, 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 same precautions should be taken if manually inserting a SIM card, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

Every device has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (23 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The European Community provides some Directives for the electronic equipments 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 equipments 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 Wireless Sensors or the iMonnit Online System, please visit us on the web at .