



Remote Monitoring for Business



ALTA® Hydrogen Sulfide Gas Sensor **USER GUIDE**

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CAUTION SYMBOL EXPLANATION



The following caution symbol appears on the product. This symbol indicates caution and a potential risk of danger. Carefully read the warning attached with each symbol.

I. ABOUT THE WIRELESS HYDROGEN SULFIDE SENSOR

The [ALTA Wireless Hydrogen Sulfide \(H₂S\) Sensor](#) measures the levels of toxic H₂S gas in the environment. The sensor produces instantaneous and 8-hour time weighted average (TWA) H₂S readings along with temperature. Every five seconds the sensor takes a new temperature-compensated H₂S measurement and checks this measurement against a configurable threshold. If the threshold is crossed, the sensor transmits data immediately. This means the sensor can report a critical gas level as soon as it's detected. If the threshold isn't crossed, the sensor transmits H₂S data at a configurable Heartbeat. Using configurable Actions within iMonnit Software, you can set up notifications to be sent via text, email, and phone call as different triggering events occur—gas level, battery level, inactivity, etc. The instantaneous reading is calculated using 40 seconds of data averaged together for improved stability and accuracy. The TWA reading is calculated using eight hours of data.

HYDROGEN SULFIDE SENSOR FEATURES

- Measures H₂S levels in surrounding air.
- Provides instantaneous and TWA H₂S readings.
- Works within excellent range (0 to 50 ppm).
- Offers configurable thresholds.
- Responds in less than one minute.

ALTA WIRELESS FEATURES

- Wireless range of 1,200+ feet through 12+ walls¹
- Frequency-Hopping Spread Spectrum (FHSS)
- Best-in-class interference immunity
- Best-in-class power management for longer battery life²
- Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Onboard data memory stores up to 3,200 readings:
 - 10-minute heartbeats = 22 days
 - 2-hour heartbeats = 266 days
- Over-the-air updates (future proof)
- The iMonnit Premiere Cloud-Based Wireless Sensor Management & Monitoring Software is free for 45 days to configure sensors, view data, and set up alerts to be sent via SMS text, email, or call. The system will automatically default to the free iMonnit Basic version if you don't purchase an annual subscription to iMonnit Premiere.

¹ Actual range may vary depending on environment.

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

EXAMPLE APPLICATIONS

- Crude oil production
- Natural gas production
- Wastewater treatment
- Utility facilities
- Sewers
- [Additional applications](#)



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 setup correctly.

1. **Create an 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 and power on the gateway and wait until it checks into iMonnit.**
4. **Power on the sensor and verify it checks into iMonnit.**
We recommend powering the sensor on near the gateway then moving it to the installation location, checking signal strength along the way.
5. **Configure the sensor for use. (This can be done at any point after step 2.)**
6. **Install the sensor in the final location.**

Note: For information on setting up iMonnit and the gateway refer to the iMonnit user guide and the gateway's user guide.

Note: Specific ALTA Hydrogen Sulfide Sensor setup is covered in more detail in the following sections.

III. SENSOR SETUP

If this is your first time using iMonnit, you must create a new account. If you have already created an account, start by logging in. For instructions on how to register and set up your iMonnit account, please consult the [iMonnit user guide](#).

STEP 1: ADD DEVICE

1. **Add the sensor to iMonnit.**

Add the sensor to your account by choosing [Sensors](#) in the main menu. Navigate to the [Add Sensor](#) button.



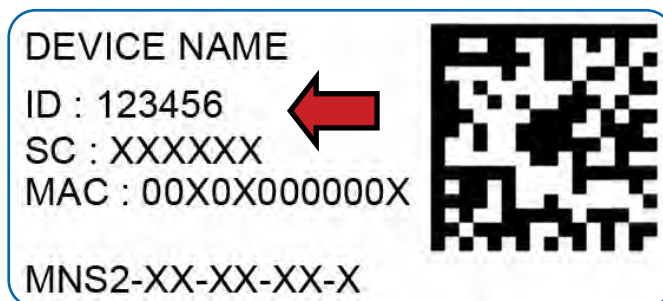
Desktop



Mobile

2. **Find the device ID.**

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



3. Adding your device.

First, select the network from the drop-down **Assigning to** menu to add your device. If you have not yet created a network, please see the [iMonnit user guide](#) for instructions about how to create a network. You need a working gateway assigned to the selected network to use your sensor.

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 the sensor. If you don't have a phone camera, or the system is not accepting the QR code, enter the Device ID and Security Code manually.

- The Device ID is a unique number located on the barcode label of each sensor.
- Next, enter the Security Code from the sensor. 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 the sensor.

When completed, select the **Add Device** button.

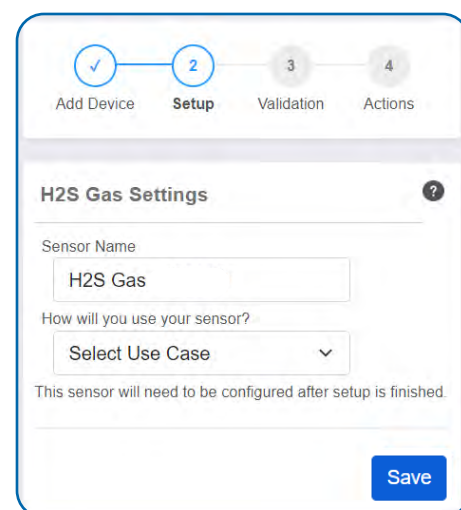
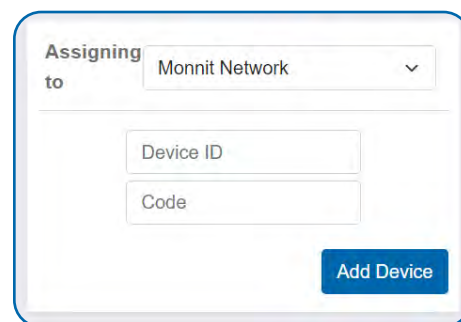
STEP 2: SETUP

Select your use case.

To get up and running fast, your sensors often come with preset use cases. They're not, however, preset use cases for the H₂S Sensor. The only option is to select **Custom** from the **How will you use your sensor?** drop-down menu, meaning that the sensor will need to be configured after the setup process is finished.

Once the setup process is complete you can configure your sensor. Select **Sensors** from the left-hand main navigation menu in iMonnit and select the **Network** of the sensor to access the **Sensor Overview** page. From the **Sensor Overview** page, select the **Settings View** icon (⚙️) from the menu and configure the H₂S Sensor as you reference the configuration explanations on the **Settings View** page below.

Select the **Save** button when completed.



STEP 3: VALIDATION

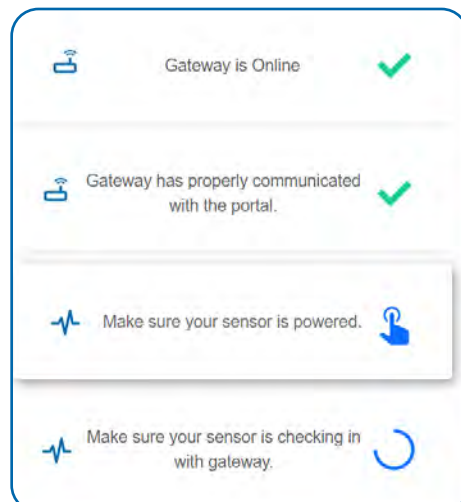
Check your signal.

The validation checklist helps you ensure your sensor is communicating with the gateway properly and that you have a strong signal. The first two checkpoints verify the existence of the working gateway assigned to the same network as the sensor you are setting up.

You should only click on **Checkpoint 3** when you power on the sensor by inserting the batteries.

Checkpoint 4 will only complete when your sensor achieves a solid connection to the gateway. Once the sensor has been powered on, the sensor communicates with the gateway every 30 seconds for the first few minutes to establish the connection.

Select the **Continue** button when completed.



STEP 4: ACTIONS


Choose your actions.

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 10 for how to set Actions for your sensor.


Select the **Done** button when completed.

Notify me when

Battery below 10%




Sensor is Inactive

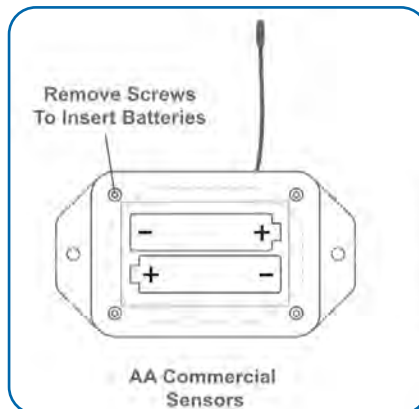


How would you like to be notified

marketing@monnit.com



Done



IV. BATTERIES AND INSTALLATION

INSTALLING/REPLACING BATTERIES

Commercial AA Sensors

Two replaceable alkaline 1.5V AA-sized batteries (included with purchase) power the standard or commercial version of this sensor. The typical battery life is up to 10 years.

This sensor is also available with a line-power option. The line-powered version has a barrel power connector, allowing it to be powered by a standard 3.0–3.6V power supply. The line-powered version also uses two standard 1.5V AA batteries as backup for uninterrupted operation in the event of a line-power outage.

Power options must be selected at the time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.

Installing batteries in a new sensor: Place batteries in the sensor by first rotating the top lid open (only one lid screw will be partially inserted on new sensors allowing lid rotation). Insert fresh AA batteries in the battery holder, then rotate the top lid closed.

Replacing batteries: Remove top lid screws, open top lid, remove old batteries, wait a full 30 seconds, then insert fresh AA batteries in the battery holder.

After installing batteries, verify the sensor checks into iMonnit with a full battery level, then insert all of the top lid screws until fully seated. Only tighten until screw is fully seated, do not overtighten.



WARNING: When installing the batteries be extremely careful to not touch the sensor element face as this may damage the element or effect the accuracy.



WARNING: When replacing the batteries in AA commercial sensors and meters, **ONLY** install new batteries from the same manufacturer.



SENSOR PLACEMENT

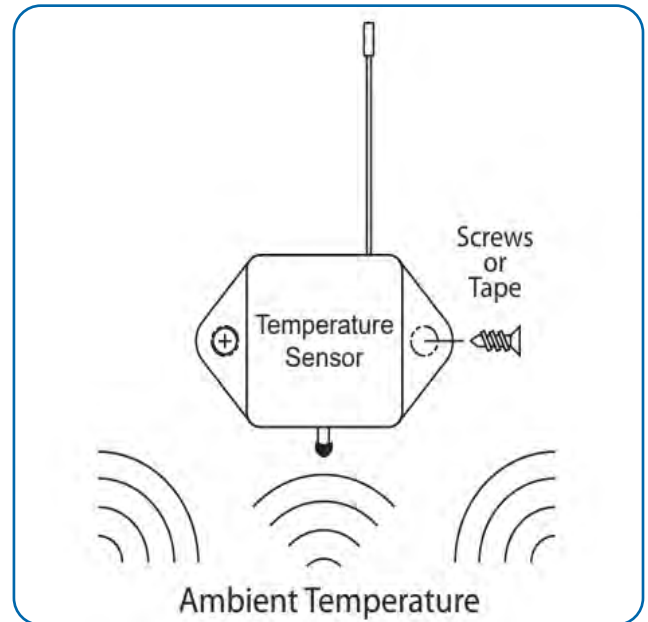
Place each ALTA® Sensor within 1,200 feet of the gateway. The sensor should be placed to avoid transmissions through metal, or concrete, and should be further re-positioned to avoid such obstacles if radio communication is spotty. We recommend placing Monnit devices at least 3 feet (1 meter) away from other Monnit devices for best performance.

Except for ALTA-ISX® Sensors under the specific conditions for which they are approved, ALTA Sensors should NOT be placed where they can be exposed to volatile or flammable gas. An ALTA Sensor should be deployed where it will be protected from environmental conditions outside those disclosed in the sensor's data sheet.

MOUNTING THE SENSOR

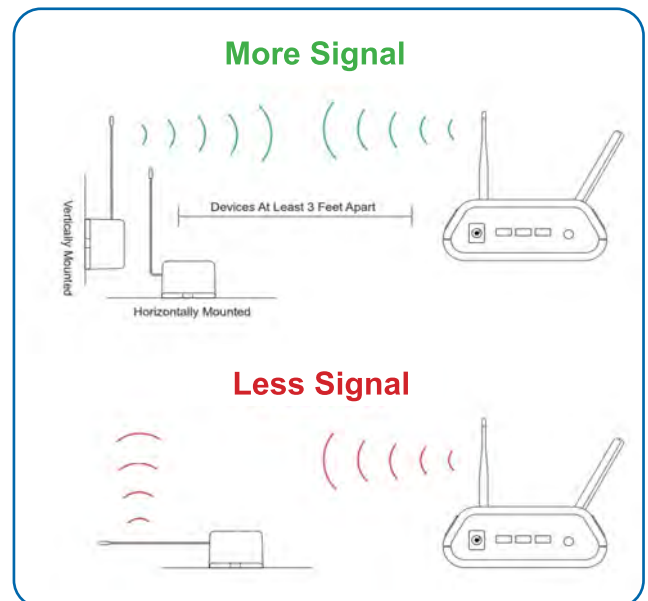
We recommend mounting the sensor vertically on a wall or bulkhead with the antenna pointing up and the bottom vent holes facing down. Mounting it this way will reduce the likelihood that the internal sensing element will become contaminated by dust or foreign objects and improve measurement stability over the life of the sensor.

The sensor's feature mounting flanges can be attached to most surfaces using the included mounting screws or double-sided tape. For a wooden surface, a metallic surface, or dry-wall, the included double-sided tape (one piece of tape for coin-cell, two pieces otherwise) or the two included screws may be used. For masonry, use the included double-sided tape. If the included screws aren't available, use two #7, 7/16" (0.4375") screws. If the included double-sided tape is not available, use one or more pre-cut, double-sided foam squares of dimensions 1/32" x 3/4" x 3/4" available from ULINE as model number S-11695, or the like.



ANTENNA ORIENTATION

Get the best performance out of ALTA Wireless Sensors by properly positioning antennas. Point sensor and gateway antennas in the same direction, vertically from the device. If the sensor is mounted flat on a horizontal surface, bend the antenna as close to the sensor housing as possible, with most of the antenna pointing vertically. Make the antenna wire as straight as possible, avoiding any kinks and curving of the wire.



CLEANING

When needed, clean the sensor with a damp, but not dripping-wet, cloth where the sensor is installed. Do not use any cleaners or chemicals on or in very close proximity to this sensor.

INITIAL SETUP



ADVISORY: We recommend zeroing the sensor when it is first deployed and approximately every three months for best performance.

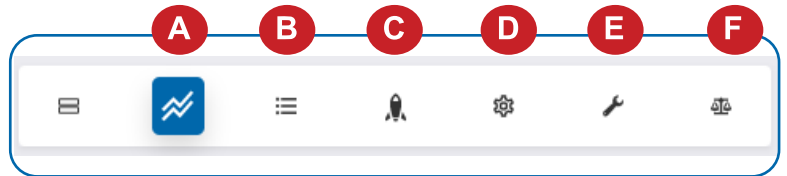


V. SENSOR OVERVIEW IN iMONNIT

Select **Sensors** from the main navigation menu in iMonnit to access the **Sensor Overview** page and begin to configure the settings of the ALTA Hydrogen Sulfide Sensor.

MENU SYSTEM

- A. Details** - Displays a graph of recent sensor data
- B. Readings** - List of all past Heartbeats and readings
- C. Actions** - List of all Actions attached to the sensor
- D. Settings** - Configurable levels for a sensor
- E. Calibrate** - Sets the sensor to read more accurately
- F. Scale** - Changes the units for the sensor readings



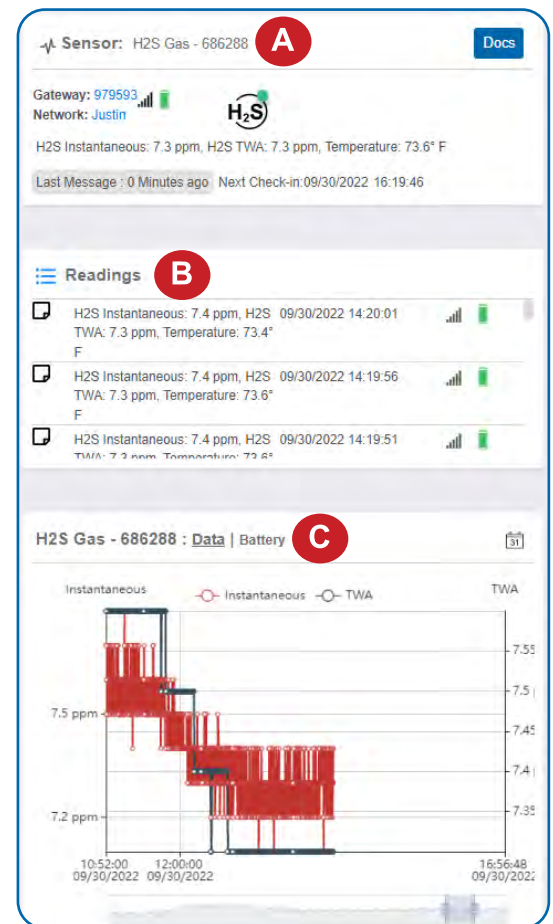
Directly under the top horizontal tabbed menu bar is an overview of the sensor. You can see the signal strength and the battery level of the selected sensor. A colored dot in the left corner of the sensor icon denotes its status.

- **Green** indicates the sensor is checking in and 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 outdated, 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 or review.

- 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 the most recent data received from the sensor.
- C.** The Readings Chart shows how the sensor's 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 date and To date.

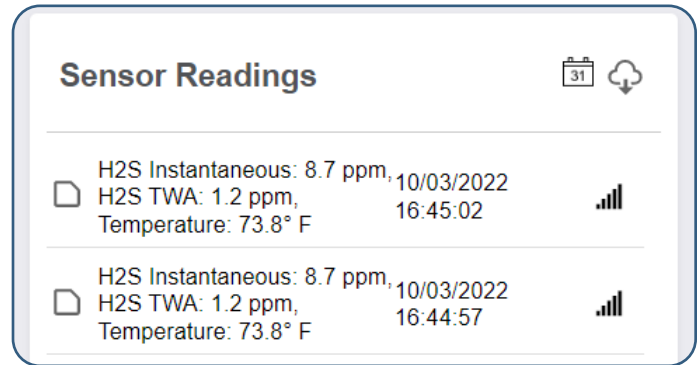


Readings View

Select the **Readings Tab** within the tab bar to view the devices data history as time stamped data.

- On the far right of the Sensor History Data is a cloud icon(). Selecting this icon will export a .csv file containing sensor data.

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 can be exported.



Exported Data

The exported .csv file will have the following columns of data:

MessageID: Unique identifier of the message in our database.

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

Sensor Name: The name you gave the sensor.

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

Value: Primary data value presented with transformations applied, but without labels.

Formatted Value: Data transformed and presented as shown in iMonnit.

Battery: Estimated life remaining of the battery, reported as a percentage.

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

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

Gateway ID: ID of the gateway that connects the sensor to the Internet

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

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.

Sensor State

The value presented here is generated from a single byte of stored data. A byte consists of eight 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.

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, causing the gateway to forward the data to the server immediately or nearly immediately.

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

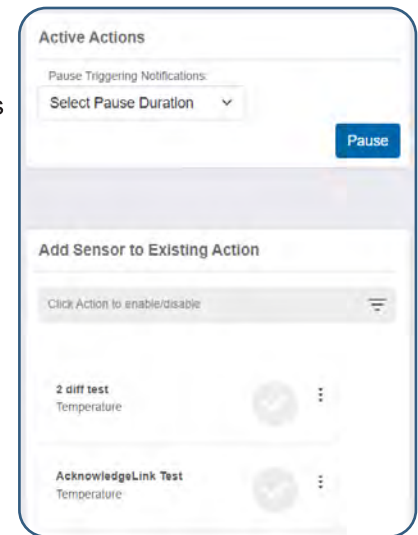
STS Specific Codes:

0 = No problems sensor is functioning normally, 5 = Calibration failed due to unstable readings, 6 = Duplicate calibration command was sent multiple times by the system and was rejected, 7 = Calibration failed, 8 = Calibration passed, 12 = Reading exceeded 50 ppm limit, 13 = Temperature range exceeded, 14 = Hardware error, 15 = Sensor initializing because it was just powered on or reset.



Actions View

In this view, you can pause triggering notifications and add/remove the sensor as a trigger for existing Actions. For information on creating/editing Actions go to the Actions Overview section of this user guide.



Settings View

To edit the operational settings for the 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, in minutes, the sensor communicates with the gateway if the sensor is not in an Aware State.

C. Aware State Heartbeat is how often, in minutes, the sensor communicates with the gateway while in an Aware State.

D. Above is the maximum reading the sensor should record before entering an Aware State.

E. The Aware State Buffer prevents the sensor from bouncing between Standard Operation and Aware State when the assessments are very close to the Above threshold. For example, when the Aware State Buffer is 5 ppm and the Above threshold is 50 ppm, once the sensor takes an assessment of 50 ppm it will remain in an Aware State until taking an assessment below 45 ppm.

F. Synchronize causes the sensors in a network to synchronize their communications. The default setting "off" allows the sensors to randomize their communications, thereby maximizing communication robustness.

G. Failed Transmissions Before Link Mode is the number of transmissions the sensor sends without a 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 make the sensor enter link mode more quickly upon transmission failure. Higher numbers will better enable the sensor to remain with its current gateway in a noisy RF environment. 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.

H. Once all configuration changes have been accepted by the sensor, to restore the settings to their default values, press the **Default** button in the lower right-hand side of the screen

H2S Gas Settings

Sensor Name: H2S Gas (A)

Heartbeat Interval (Minutes): 120 (B)

Aware State Heartbeat (Minutes): 120 (C)

Above (ppm): 50 (D)

Aware State Buffer (ppm): 5 (E)

Synchronize: Off (F) / On

Failed transmissions before link mode: 3 (G)

Default (H) Save



Calibration View

In this view, you can Calibrate Temperature, Zero H₂S, and set default values for the sensor. Follow the instructions on the page to calibrate.

Clicking the **Calibrate** button after entering selecting the appropriate calibration type and entering appropriate information into the page will send a calibration command from the sensor through the gateway.

Clicking the **Default** button will reset specific calibration configurations to default values.

Create Calibration Certificate is described further below.



ADVISORY: Setting Default in the Calibrate view will un-calibrate the sensor, after which the sensor may not read within specified accuracy. Only set Default per guidance provided by Monnit Support.



ADVISORY: We recommend zeroing the sensor once every three months for best performance.

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.

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.

Calibrate Sensor

Important: Perform these steps in the order indicated.

1. Zero Calibration: Press the zero button. Keep the sensor in the 0 PPM environment and wait for a full two data points to come in after this command is accepted (red x on status icon clears) for this process to complete, don't send any other calibration or configuration changes before this process completes. After this step is complete the sensor should read near 0 ppm

Temperature Calibration: Submit actual Temperature

☐ Zero Calibration ☐ Temperature Calibration

Default

Calibrate

Create Calibration Certificate

Calibrate Certification Form

Calibration Facility

Custom Facility

A

Date Certified

09/26/2022

Certificate Valid Until

09/27/2023

B

Calibration Number

345

C

Certification Type

Certification Type

Heartbeat Interval Reset

No Change

D

E

Cancel

Save

Scale View

In this view, you can set the units for temperature to Fahrenheit or Celsius.

Sensor Scale Settings

Show Temperature Values in

Fahrenheit


Save



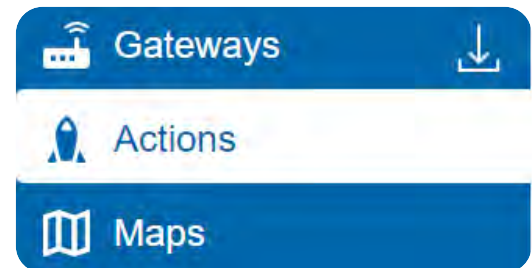
VI. ACTIONS OVERVIEW

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

ACTIONS MENU


Device notifications can be created, deleted, and edited starting in the Actions menu (not to be confused with the Actions view on the sensor) found in the left Overview pane or by clicking the menu button  in the upper left corner of the screen.

Within the Actions menu, you will see a filterable list of existing Actions and an Add Action button.



Note: If this is your first time adding an Action, the list of Actions will be blank.

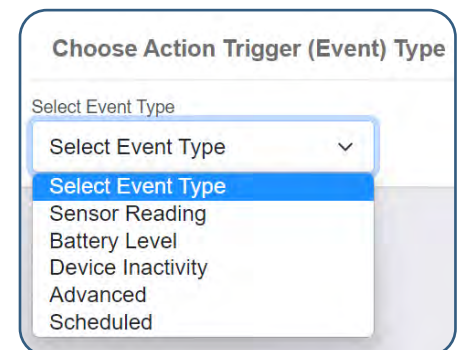
CREATING A NEW ACTION

From the **Actions** page, tap **Add Action** in the upper right-hand corner. On smaller screens or windows it may also appear as a blue dot  in the lower right corner of the screen.

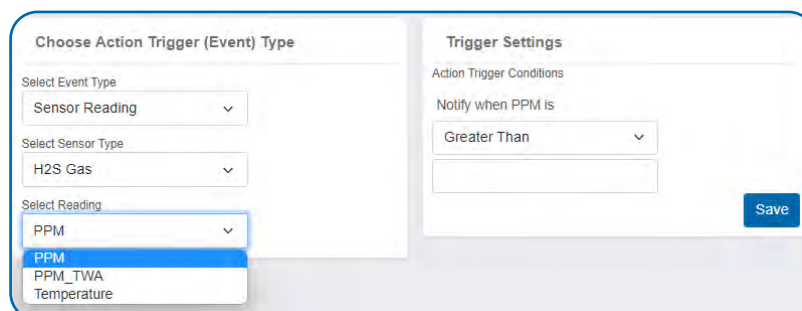
Step 1: What triggers your Action?

The drop-down menu will have the following options for Action Types:

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



- 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 **H2S Gas** in the drop-down menu.
- Choose whether you wish to trigger a notification on the basis of an instantaneous ppm reading, a TWA ppm reading, or a temperature reading and whether that trigger occurs when the reading is greater than, equal to, or less than the threshold amount to be put in the final field. You also need to define the threshold ppm or temperature.

A screenshot of the 'Choose Action Trigger (Event) Type' dialog box. It has two main sections. The left section, titled 'Choose Action Trigger (Event) Type', contains three dropdown menus: 'Select Event Type' (set to 'Sensor Reading'), 'Select Sensor Type' (set to 'H2S Gas'), and 'Select Reading' (set to 'PPM'). The 'Select Reading' dropdown is currently open, showing options: 'PPM', 'PPM_TWA', and 'Temperature'. The right section, titled 'Trigger Settings', contains a dropdown menu labeled 'Action Trigger Conditions' (set to 'Notify when PPM is') and a dropdown menu labeled 'Greater Than'. There is a 'Save' button at the bottom right.

Press the **Save** button.



Step 2: Actions

Select **Send Notification** from the **Select Actions** list.

- A.** Input the subject for the notification.
- B.** Customize the message body of email notification.
- C.** Customize message body of an SMS text notification.
- D.** Customize the message body of a voice notification.
- E.** Snooze timer for Action.
- F.** Jointly snoozes alerts from all sensors that can trigger the Action after a single sensor causes an alert to fire. Independently, will only snooze alerts for the specific sensor that triggered the Action allowing the other sensor to continue to alert independently.
- G.** Auto automatically stops alerts from being sent after the triggering condition returns to normal. Manual will continue to send alerts after the snooze time until the alert is manually acknowledged in iMonnit.
- H.** Recipient list identifies who will receive the notification.
 - 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 will receive the notifications and what type of notifications will be received.
 - If a delay has been selected, the delay time will display beside the icon.

Press the **Save** button.

Notification Settings

Subject: PPM Greater Than 40.0 **A**

Message: **B**

PPM Greater Than 40.0
Device: {Name} {{ID}}
Reading: {Reading}

Advanced Settings

SMS Message (160 max): If left blank, default message used **C**

Voice Text: If left blank, default message used **D**

Snooze: Don't Alert again for (Minutes): 60 **E**

Snooze each trigger: Jointly ☒ Independently **F**

Acknowledgement Mode: Manually ☒ Auto **G**

Save

Recipient Email SMS Voice

Click on icon to enable or disable Name

Test Group 1	H
Test Group 2	
Admin Admin	
App Tester	



Select **System Action** from the **Select Actions** list.

- Scroll down to the **System Action** section.
- The **Action to be done** select list has the following options:

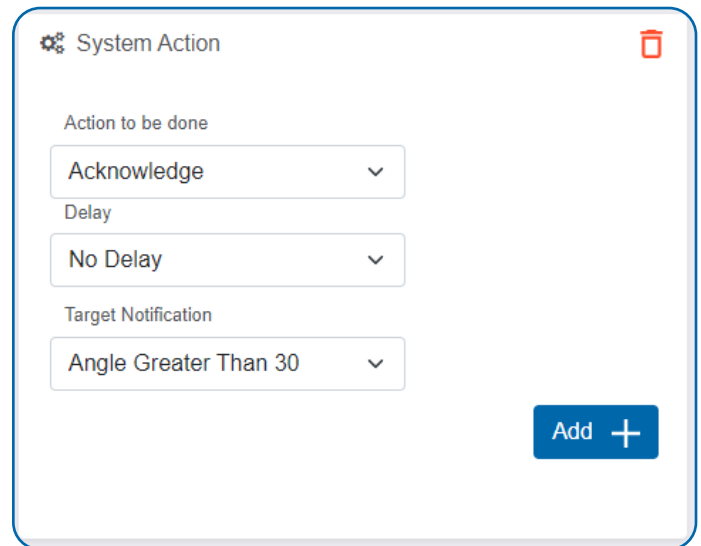
Acknowledge: Automatically signals that you have been notified of an Action. When an Action has been triggered, alerts will continue processing until the Action returns to a value that no longer triggers an Action.

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

Activate: Enable an Action trigger.

Deactivate: Disable an Action trigger.

Press the **Add** button.



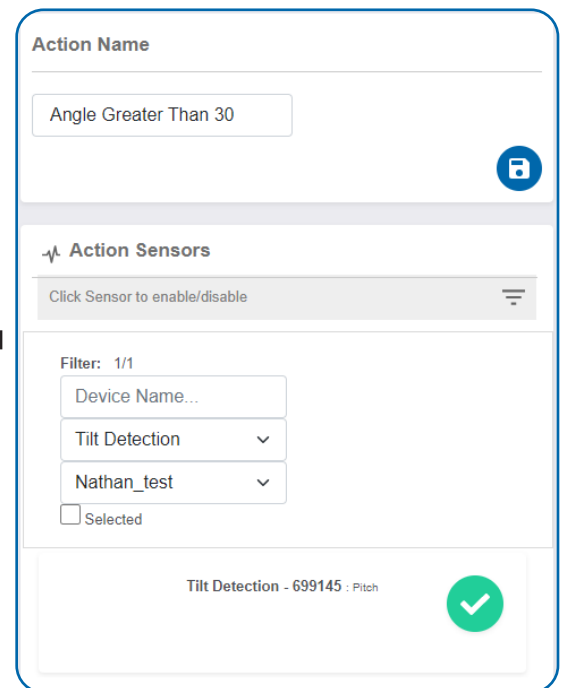
Press the **Continue** button in the upper right portion of the screen.

Continue →

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 unassign the sensor from the Action.
- 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 **Save** button to complete the process.



VII.TROUBLESHOOTING

Symptoms	Detailed Problem Description	Solution
Not Checking into iMonnit	The sensor lost the radio link to the gateway or never connected to the gateway.	<ol style="list-style-type: none"> 1.Ensure the network is set up correctly in iMonnit (sensor and gateway are on the same network). Press the utility button on the gateway to pick up the latest network configurations. 2.If the network is set up correctly, reform the gateway. 3.Move the sensor ~10 feet from the gateway and power cycle the sensor by removing the batteries for 60 seconds then replacing them to restore power. 4.Move the sensor progressively further from the gateway ensuring at least two signal bars are showing. Keep in mind the signal bars represent the signal from the previous message, not the current message. We recommend taking two readings to verify signal strength. 5.Check the antenna position on the gateway.
Low Signal	The 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 the Setup and Installation section).
Any Calibration Failure Message	<p>In the Readings View any "CALIBRATION FAILED" message appears.</p> <p>STS value is 5 or 7</p>	<ol style="list-style-type: none"> 1.Attempt the calibration again. 2.If problem persists, contact support.
"GAS OVERANGE ERROR" Appears in Readings	<p>In the Readings View "GAS OVERANGE ERROR" message appears.</p> <p>STS value is 12</p>	<ol style="list-style-type: none"> 1.The sensor is or has been exposed to gas above 50 ppm. Assume the environment is filled with H₂S and proceed with extreme caution. 2.If this message persists after the environment has been cleared contact Monnit Support for additional information on resolution.
"TEMPERATURE RANGE EXCEEDED" Appears in Readings	<p>In the Readings View "TEMPERATURE RANGE EXCEEDED" message appears.</p> <p>STS value is 13</p>	<ol style="list-style-type: none"> 1.This can only occur if the sensor measures a temperature lower than -40 C or above 125 C. If the temperature conditions are not actually outside this range, contact Monnit Support. This will most likely require an RMA to physically repair the sensor.
"HARDWARE ERROR" Appears in Readings	<p>In the Readings View "HARDWARE ERROR" message appears.</p> <p>STS value is 14</p>	<ol style="list-style-type: none"> 1.This message may appear momentarily when the sensor is first powered on but should go away in a few minutes. 2.If the message does not go away, contact Monnit Support. To address this problem, it will most likely require an RMA repair.



Symptoms	Detailed Problem Description	Solution
"SENSOR INITIALIZING" Appears in Readings	In the Readings View "SENSOR INITIALIZING" message appears. STS value is 15	This message appears when the sensor first powers on or resets. It should go away within 2 minutes. This is a normal message.
Unexpected H₂S TWA Readings	The H ₂ S TWA readings are other than expected.	After powering on, resetting or zeroing the TWA value resets to 0 and assumes the previous 8 hours of readings was 0 ppm. As this 8 hours of data is filled in, the TWA will progress towards the steady Instantaneous H ₂ S reading. These are all normal behaviors for this sensor. For other readings that can effect TWA, see Unexpected Instantaneous Readings below.
Unexpected Instantaneous H₂S Readings	The Instantaneous H ₂ S readings are other than expected.	<p>The H₂S reading can be affected by several different environmental factors, here are a few to consider:</p> <ol style="list-style-type: none"> 1. Fast changes in pressure, temperature, or humidity. Once the environment stabilizes the readings should also stabilize. 2. Other gases the element may be sensitive to are present in the environment. See the Cross Sensitivity table in the data sheet for some examples. 3. Directly breathing on the sensing element or into the sensor can cause readings to increase due to sudden increases in humidity but also because the sensor can detect bad breath (halitosis). 4. Moisture or dust forming or settling on the sensing element. <p>Contaminants can affect the readings in unpredictable ways, be sure to follow the mounting and placement guides for best performance. If operating in extremely dusty/dirty environments consider a non H₂S reactive dust cover that will still allow gases to flow freely through it.</p>



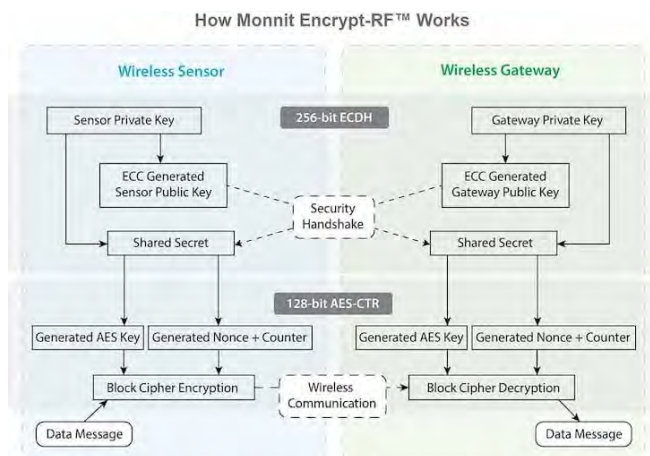
VIII. MONNIT DATA SECURITY

The ALTA Site Survey Tool is designed and built to securely manage data. Monnit works to ensure your data security is handled with the utmost care. The same methods used by financial institutions to transmit data are also used in Monnit's security infrastructure. Security features from sensors to gateways include tamper-proof network interfaces, data encryption, and bank-grade security.

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

SENSOR COMMUNICATION SECURITY

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



DATA SECURITY ON THE GATEWAY

ALTA Gateways are designed to prevent prying eyes from accessing the data that is stored on the sensors and the gateway. Gateways do not run on an off-the-shelf, multi-function operating system. Instead, they run on a purpose-specific, real-time, and 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. Our fortified gateways secure your data from attackers and secures the gateway from becoming a relay for malicious programs.

[Click here](#) for more information on gateway security.

iMONNIT SECURITY

The iMonnit system 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 that requires Two-Factor Authentication (2FA), 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 an iMonnit Basic or Premiere user. You can rest assured that your data is safe with iMonnit.

OPTIONAL DATA AUTHENTICATION

SensorPrints™ is the industry's only end-to-end Internet of Things (IoT) data authentication platform for low-power wireless sensors. SensorPrints authenticates data by issuing a unique fingerprint for each device within the IoT. Data is secured from the point of generation to the point of consumption. Easy to install and use, SensorPrints is the definitive IoT security solution for any enterprise.

SensorPrints authenticates data at both the point of generation and consumption, creating trust between the sensor and server levels. Implementing 256-bit SHA 3 authentication, SensorPrints creates a "fingerprint" for an ALTA Wireless Sensor that contains an authenticated sensor message. When data is transmitted from the sensor, it is accompanied by a generated authentication token. Upon receipt by the application, the token is evaluated via cryptographic hash function against a unique per sensor secret key. This step provides an unprecedented level of full-coverage security for any Monnit user wishing to secure their IoT devices and data.

[Click here](#) for more information on SensorPrints.



IX. 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 licence-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 Équivalente (P.I.R.E) 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, même si le brouillage est susceptible d'en compromettre le fonctionnement.

UK / CE

There is no restriction for the commercialization of Monnit ALTA 868MHz and 433MHz wireless products in all the countries of the European Union. The European Community provides specific directives for the electronic equipment introduced on the market. All the relevant information is available on the European Community websites.

ALTA wireless products comply with the specific harmonized standards, regulations, instruments, and directives listed in the table below. For more information on product compliance, please contact Monnit Sales or Support and request a copy of the manufactures Declaration of Confirmatory (DoC) for the relevant product(s).

Directive / Instrument / Regulation	Part	Harmonized Standard(s) / Standard(s)
Low Voltage Directive (LVD) (2014/35/EC) Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101)	All parts	EN 61010-1:2010 IEC 61010-1:2010/ AMD1:2016
ElectroMagnetic Compatibility Directive (EMCD) (2014/30/EU) Electromagnetic Compatibility Regulations 2016	Emissions Requirement	EN 55032:2015/ A11:2020
	Immunity Requirement	EN 55035:2017/ A11:2020
Radio Equipment Directive (RED) (2014/53/EU) Radio Equipment Regulations 2017 (S.I. 2017/1206)	Electrical Safety Article 3.1(a)	EN 61010-1:2010 IEC 61010-1:2010/ AMD1:2016
	EMC Article 3.1(b)	ETSI EN 301 489-3 V2.2.0
	RF Spectrum Efficiency Article	ETSI EN 300 220 V3.2.1 (2018-06)
	Internet of Things Cybersecurity Article 3.3(d)-(f)	EU 2022/30 ETSI EN 303 645 V2.1.1 (2020-06)
Restriction of Hazardous Substances (2011/65/EU) Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic	RoHS II and RoHS III	IEC 63000:2016/ AMD1:2022
Registration, Evaluation, and Authorization of CHemicals (REACH) Regulation 1907/2006	Article 33	SVHC 224 (June 10, 2022)



X. SUPPORT

For technical support and troubleshooting tips please visit our support library 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.

XI. 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. This correction will be completed after Monnit receives from the 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. This will take place after Monnit receives from the 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. The Customer must obtain from Monnit a Return Merchandise Authorization (RMA) number prior to returning any Products to Monnit. Products returned under this Warranty must be unmodified.

The 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 RMA number 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 1-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, the 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. Please visit [Monnit.com/policy/returns/](https://monnit.com/policy/returns/) for Monnit's return policy and instructions.

(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 the Customer. Monnit's Warranty obligations shall run solely to the Customer, and Monnit shall have no obligation to customers of the 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.



XII. USER SAFETY REQUIREMENTS

READ CAREFULLY



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



WARNING: This product is not certified for use in hazardous locations (HAZLOC) where there is a risk of explosions.



WARNING: IF THE SENSOR IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED. *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.*



WARNING: The device has a mechanical stress rating of **IK06**, meaning its housing and/or its readings could be compromised by an impact with greater energy than one Joule.

Justification of a mechanical impact rating less than five Joules exists by: (1) a documented Risk Analysis performed and maintained by Monnit; (2) installation of the sensor in locations that cannot easily be touched by unauthorized persons or the general public; (3) the equipment being only accessible in normal use for occasional operations such as adjustment, programming, or maintenance.



WARNING: DO NOT rely solely on the sensor system to prevent: (1) one or more fatalities; (2) disabling injury or illness; (3) chemical release with acute or public health impact; (4) chemical release with temporary environmental or public health impact; (5) system or facility loss; and/or, (6) major subsystem loss.

Note: 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.

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

Industrial products are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the gateway 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
- Remains undamaged by ice formation on the enclosure



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