

# SIGMA CELL & SATELLITE GATEWAY 70420-10

IECEX ATEX Certification: SNA 24.0005X / SGSNA24ATEX071901X

IECEX	Ex db IIB T4 Gb
ATEX	Ex II 2G Ex db IIB T4 Gb

## Lasso Technologies, LLC Capabilities



The advent of wireless communication and GPS technologies has enabled businesses worldwide to capitalize on wireless sensing and location services. Lasso Technologies provides both Cellular and Satellite based wireless communications technologies used for asset management, monitoring, control, and machine status. Lasso builds the controls and web pages needed to convey sensor and GPS data back to the user so that they can gain a better understanding of their business processes. Sensors and interfaces are provided to the customer based upon what the customer intends on monitoring. Lasso provides a complete drop-in solution so that the customer can focus on their business.

- **Do not Use Lasso where transmission errors or product failure may cause environmental issues or injury.**

- **Do not use the GPS feature for loss or theft prevention or recovery.**

- **Please visit our licensing terms at**

<http://www.lasso.com/terms>

- **For support contact [support@lasso.com](mailto:support@lasso.com) or call 866-392-0923**

- **Headquarters: Dallas, Texas**
  - Office, Lab & Manufacturing
- **Industry experience:**
  - Internet of Things development
  - Entrepreneurial, sales and marketing
  - Hardware, software, mechanical design
  - Verizon Partner Program
  - Globalstar Value Added Reseller
  - Amazon AWS Lambda
  - Thousands of installations.
- **Products:**
  - Globalstar GPS products and Satellite chipsets
  - iRadar
  - Alpha, Omega, Sigma gateways
  - Geotab vehicle monitoring
  - Nimbelink GPS
- **U.S. based Eng., Mfg., Certification and Support**
- **Technologies: Cellular and Satellite**
- **Patent No. 10,290,203 and 11,555,732 and Patents Pending**



## IECEX and ATEX

The "Sigma" is available With or Without IECEX and ATEX. The label on the Sigma will indicate if your Sigma is rated IECEX and ATEX. IECEX and ATEX require that the Sigma be strictly installed and used as described in this user manual. If the Sigma label does not show the IECEX and ATEX certifications then it does not have IECEX or ATEX certification. Only battery powered Sigmas with special wiring and strain reliefs can be IECEX or ATEX.

## Features

- The "Sigma" Lasso product can communicate using Globalstar Satellites, AT&T or International cellular network.
- The satellite solution is one way communication from the Sigma to the web site.
- Cellular 2-way communication can also be used as stand alone or in support of Satellite. 2-way is for real-time communication and control with remote assets.
- Sigma is used to communicate with many types of: pressure, temperature, level, chemical, generator, fuel gauges, ultrasonic, and engine controls.
- Sensor data and GPS coordinates are returned to Lasso.com web pages.
- The web can send data via text, email or phone alerts.
- Raw Data can be pulled from the servers by the customer using an API for use on their portal. Date, time, and serial number filters can be sent.
- Keypad and display allow sensors to be configured, and reporting times.
- Solar recharged or Lithium batteries.
- IP68 enclosure.
- All Lasso data has SSL encryption on our web site and while sending data via API.

## Satellite Modem

- The satellite communication is provided through the Globalstar network.
- The Globalstar constellation consists of 48 LEO satellites.
- The Sigma gathers sensor and GPS data at specified intervals and initiates satellite transmission through the Globalstar modem located on the Lasso circuit board.

## Cellular Modem


- Cellular AT&T or an International SIM through multiple provider communication.
- The Sigma gathers sensor and GPS data at specified intervals and initiates cellular transmission through the cellular LTE modem located in the Sigma..

## Installation


- Installation should be done with the power off.
- Mount Sigma so that the lid FACES THE SKY! Transmission is more reliable if the lid faces the sky. Try not to mount Sigma on its side or vertical to the ground.
- Turn off the power switch. Run cable from the quick disconnect wiring from sensors to the Sigma control. Make sure you follow the strict Atex installation requirements in this user manual in regards to cables, strain reliefs, and sealing.
- After wiring, turn on the power using slide switch in the Sigma. Adjust setup parameters

## Flexible Sigma Configuration

Sigma is meant to be configured using Bluetooth  for virtually any application.

- Modbus, 4-20, or discrete inputs and outputs.
- 30 Different “channels” are used to send data. Each channel can be configured.
- Adjustable Modbus baud rate, addressing, registers, floating point or integer.
- Quick setup for pre-configured sensors such as Endress or Siemens for each channel.
- Conveniently displayed units are defined by you for each of the channels on local display.
- Math can be performed on each channel to scale or offset a sensor reading.
- Time of day Wake times or intervals for data reporting.
- Modbus Register values can be altered using the web or Bluetooth .
- Templates available for common applications like temperature or tank levels.

## Bluetooth

- Bluetooth  or a cellular connection can program or query any setup parameter.
- Downloading the Bluetooth app, operation and a list of Bluetooth commands are listed in the Appendix.

## Cellular

- Commands can also be sent over a cellular connection and the Sigma will respond to requests. Most parameters can be set remotely using this powerful 2-way communication process. Use with caution since you don't want to change something that will be difficult to restore without you being near the Sigma.

## WEB OPERATION Authentication

- Navigate to <https://cloud.lasso.com> to login.
- Initial user provisioning is done by your Lasso account representative.
- Click your initial in the top right to select a sub-company of yours if needed.

**LASSO**  
Technologies, LLC

### Log in

I agree to Lasso's [Terms of Service](#)

Log in

Having trouble logging in? [Reset password](#)

If you need help, contact us at 1-866-392-0932

**MURPHY**  
OIL CORPORATION


### Sign in

Email, phone, or Skype

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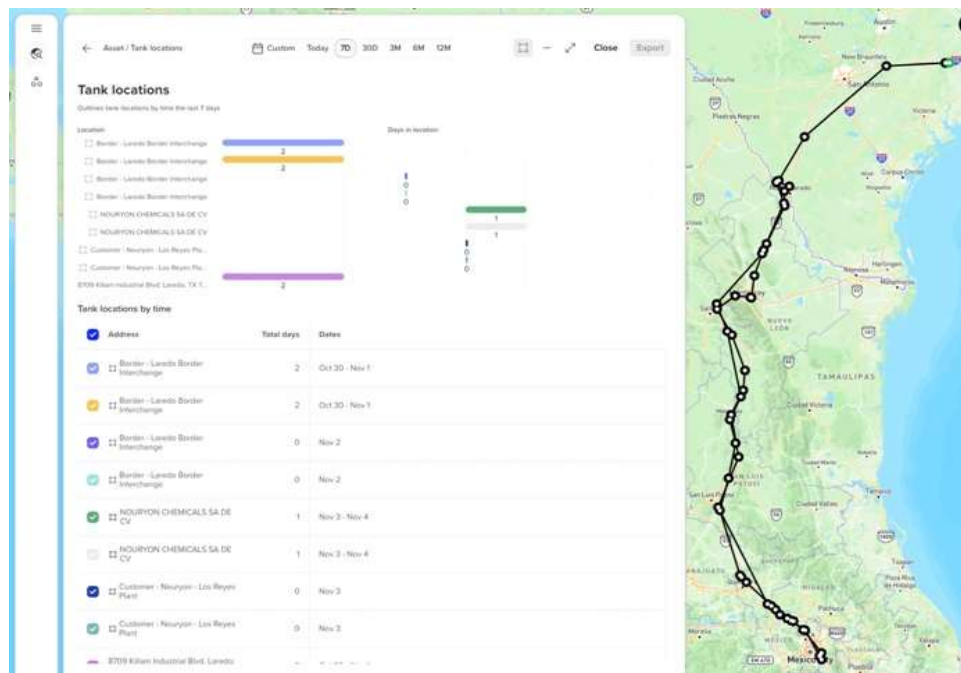
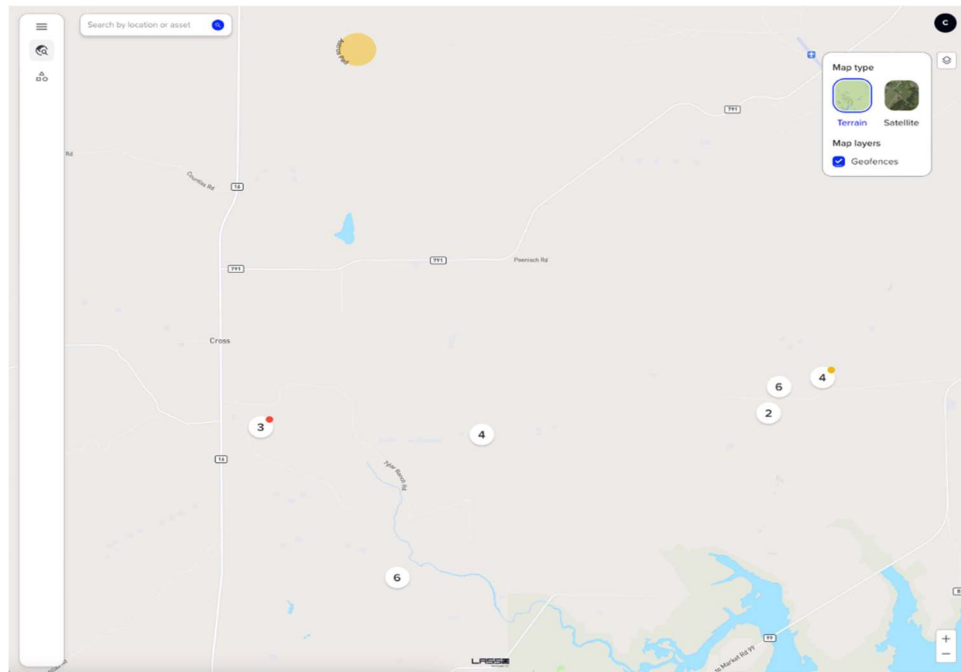
[Can't access your account?](#)

Back Next

 Sign-in options

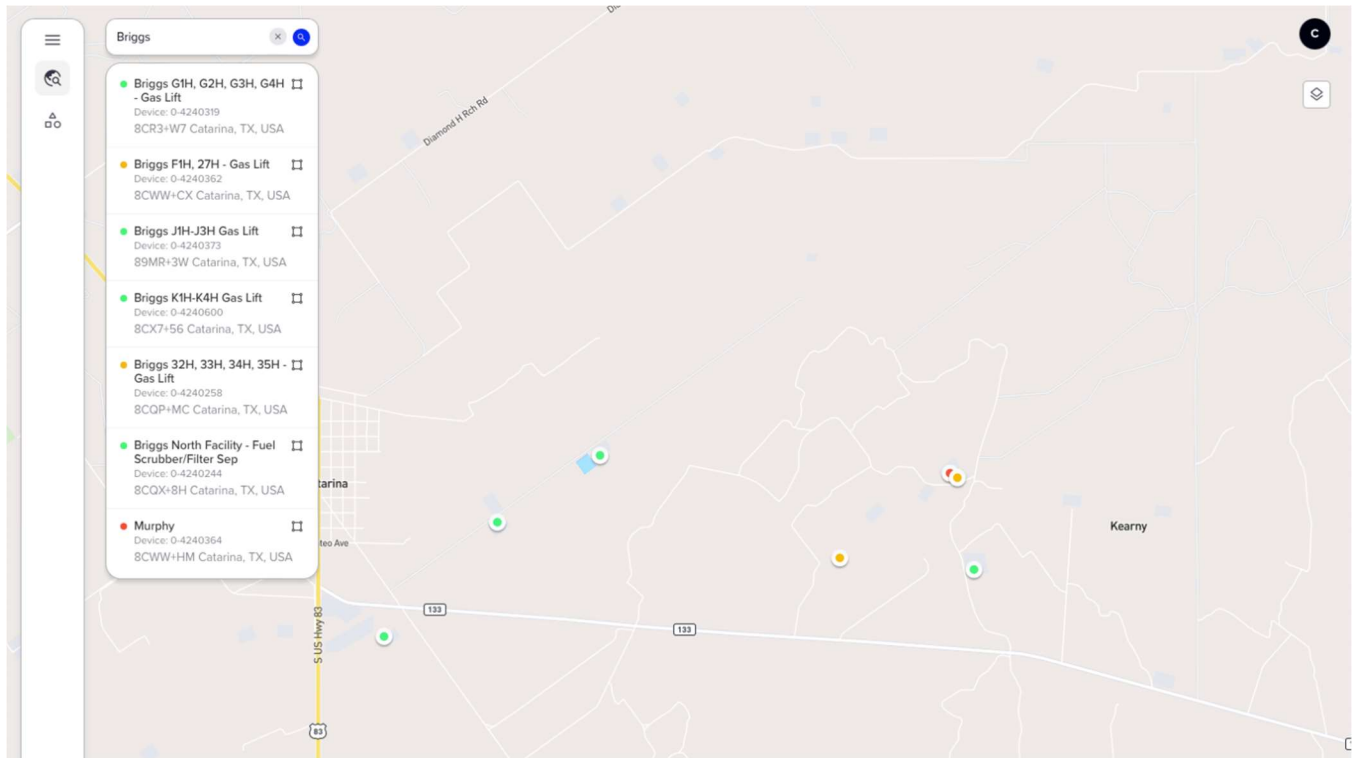
## Overview Map

- After logging in, users will see a map view showing the position of all of their assets.
- Click and drag the map to move the view. Double-click or use the zoom controls to zoom in on a specific area.
- Using the layer control, select Terrain or Satellite overlays. Click on the Geofences layer to toggle visibility of custom Geofences.
- Click on any map symbol to see current status and a summary of device telemetry.



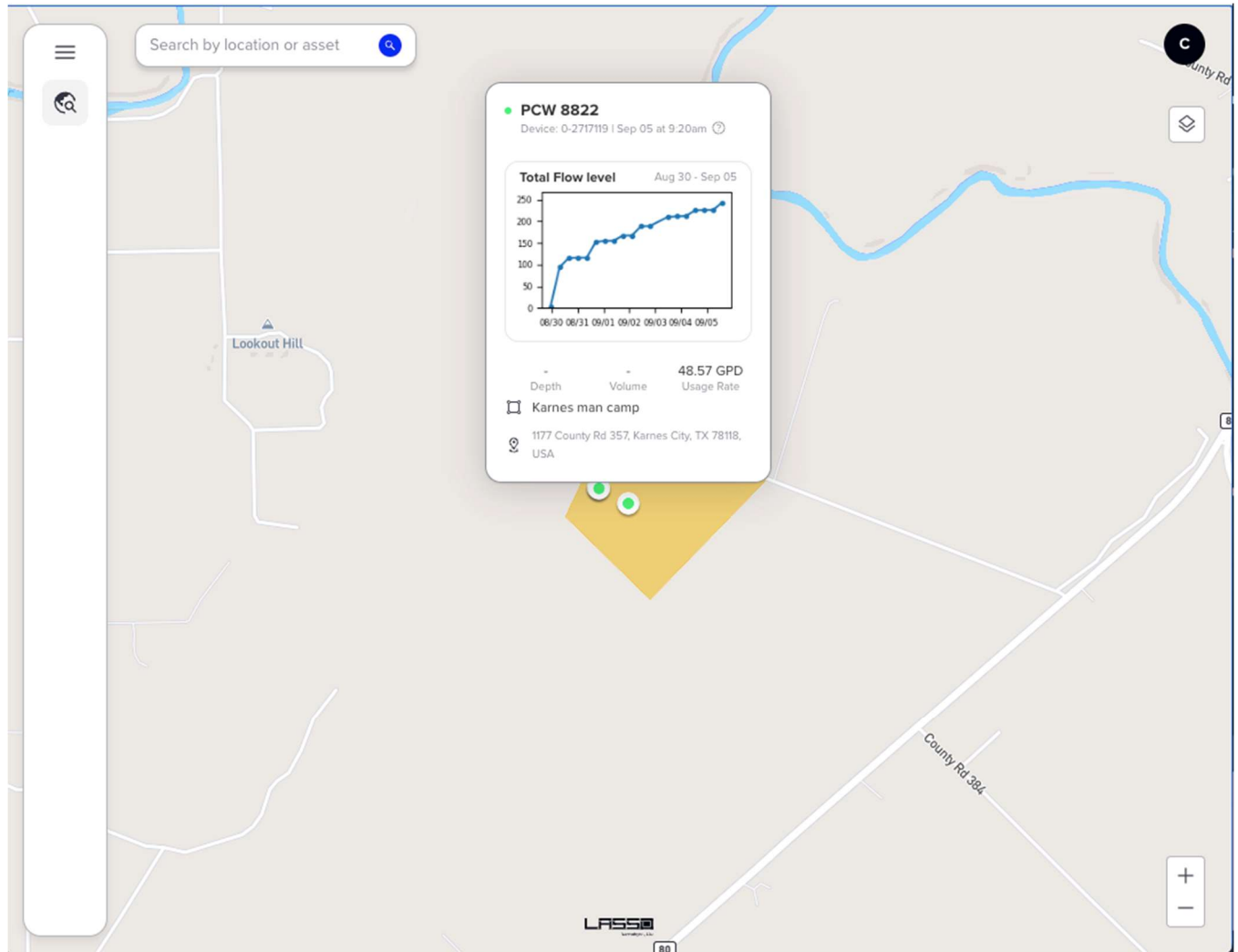
## Asset Search

- Use the search box to find assets on the map.
- Search terms can include any asset properties such as name, ESN, or other identifiers.
- Users may type in \* as a search term to see all assets.
- Clicking on the main graph area will let you adjust the timeframe of the data being shown.



## Map Popup

- Clicking on a map symbol will show a popup “quick view” for that item.
- Popup data includes asset name, associated device serial number, position summary and a trailing 7-day history.
- Click anywhere on the popup to see the asset history.

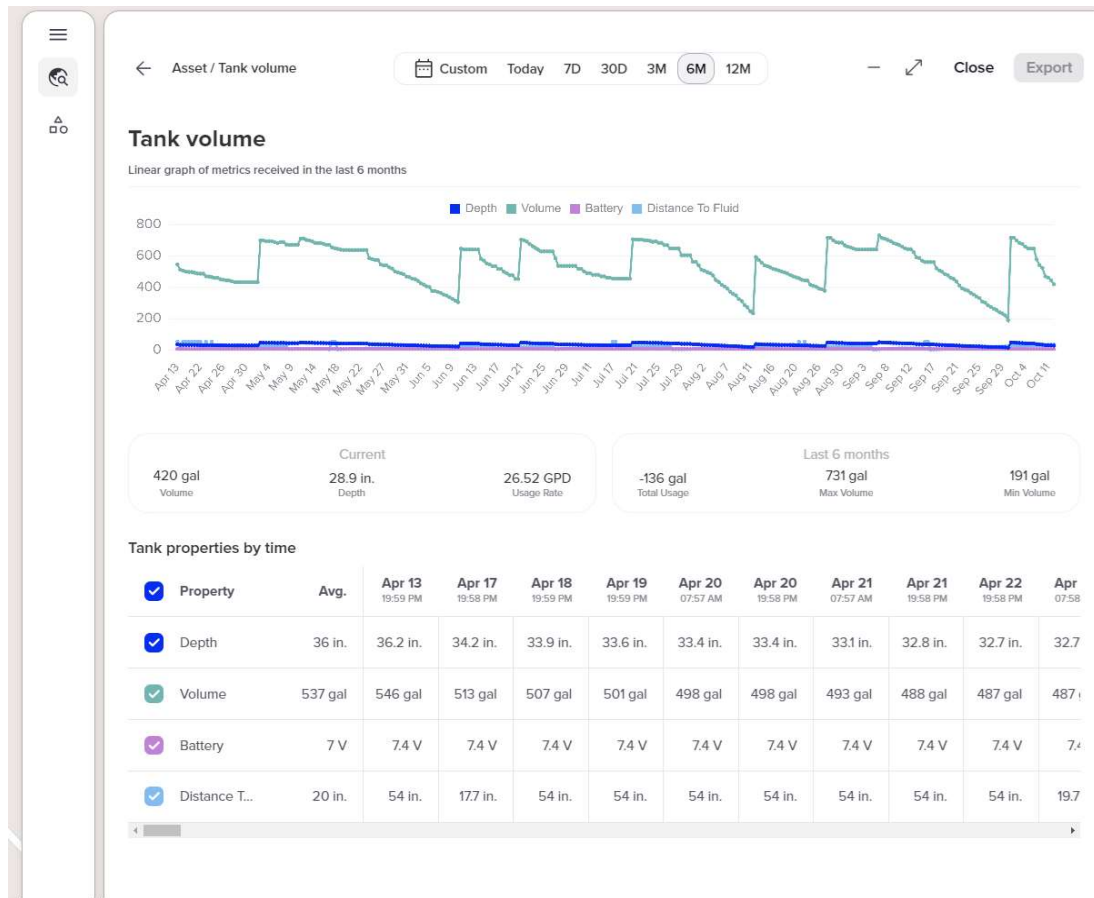
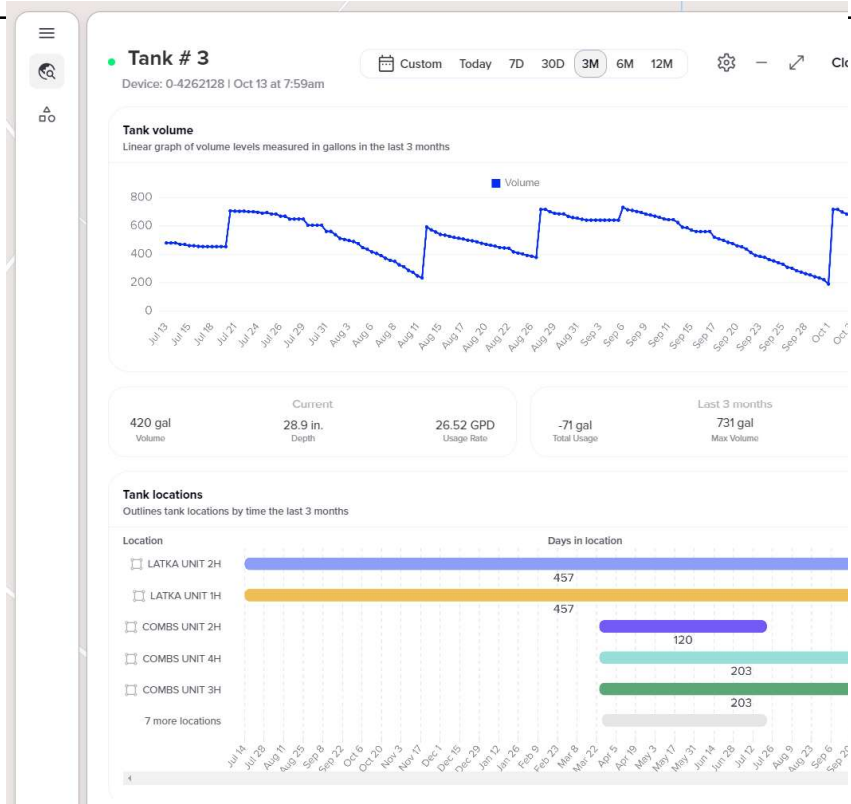




## Asset History

- The asset history view shows telemetry and position view for an asset.
- Telemetry history defaults to the trailing 7 days for the critical measurement.
- Timeframe can be adjusted using the time controls at the top of the view.
- Location history overview is shown in the lower part of the view.





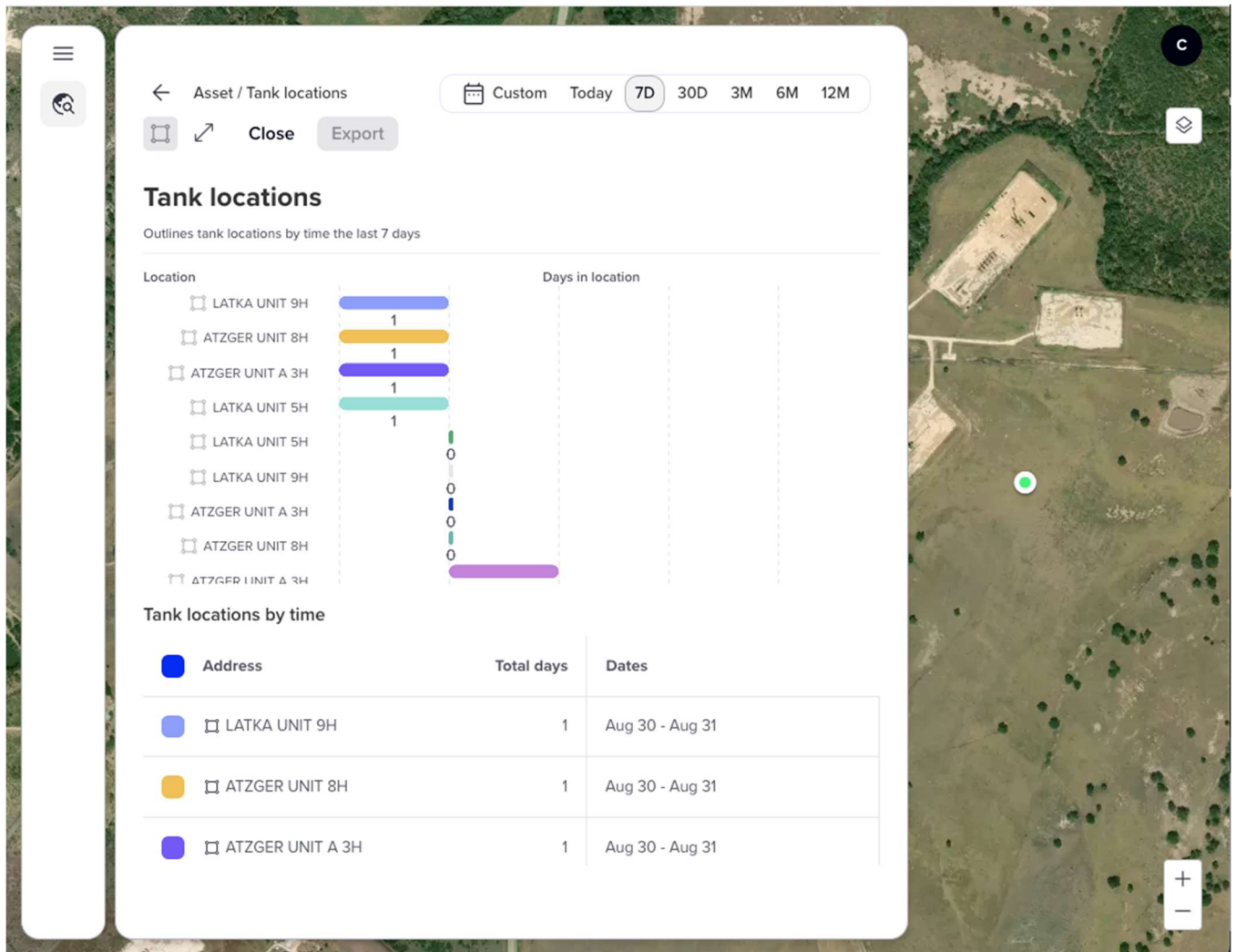
## Asset Measurement Detail

- Clicking on the telemetry history panel in the asset history view will show detailed telemetry data for all data collected by the device.
- Individual data series can be toggled on or off using the data series controls on the lower portion of the view.
- Individual timestamps and observed values are indicated in the lower portion of the view. Scroll right to see values over time.



## Asset Location Detail

- Clicking on the location history panel in the asset history view will show detailed location data for the asset.
- Location place names include custom geofences, Google, and Texas RRC well names.
- Individual timestamps and observed locations are indicated in the lower portion of the view. Scroll right to see values over time.



## Add Asset

- From the Groups module, click on the plus icon to the right of the Assets header at the top of the module.
- The user will be guided through the steps to add a new asset to their account.
- Device (ESN) assignment will be available if there are any devices in the account that are currently not associated with an asset.
- Only a Name and Identifier are required. All other fields are optional.

Step 1

### Asset details

Create an asset and assign a device to start monitoring.

Select device ESN

MurphyFuelTank / Murphy Fuel Tank

Bulk Tank  T5762

Tank 5762 assigned to the field team

**Other properties**

Create properties and values to track additional information

Paint Color  Tea

E.g. property can be "Driver" E.g. value can be driver's name

[+ Add new property](#)

**Save and Continue** →

Step 2

### Tank properties

Additional information to monitor tank levels with accuracy.

Fuel Tank

Stainless Steel

Fluid name

Allows you to find assets by fluid type

200 gal Distance to bottom in.

Higher accuracy on level reporting Accurately calculate fluid levels

Installation accessories

Alert threshold % Warning threshold %

← Back **Save and Continue** →

Step 3

### Analytics

Unlock advanced analytics such as ROI tracking, target vs actual consumption, and missed replenishments.

4.17 USD

Track dollars spent and savings

Expected volume change rate in gallons gal

Improves volume rate monitoring

Week

Volume

Expected change measure

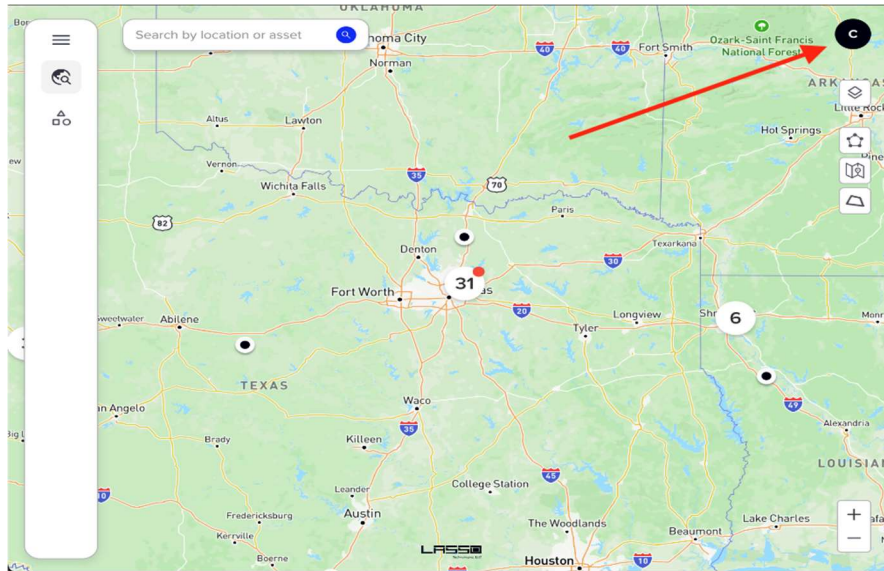
4 days

Expected drains or fills

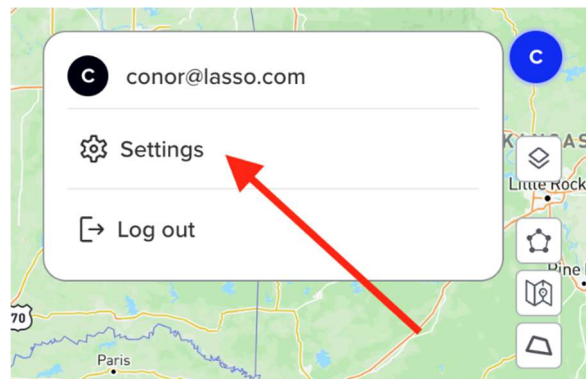
← Back Create and add another **Save**

## Change sub-company

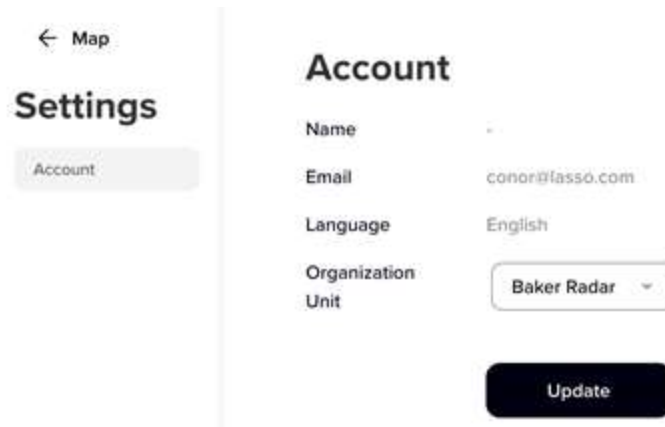
- Once you are logged in, you can change the account by clicking on the “letter” icon in the top-right corner.



Then click on the “Settings” option in the popup menu that appears.

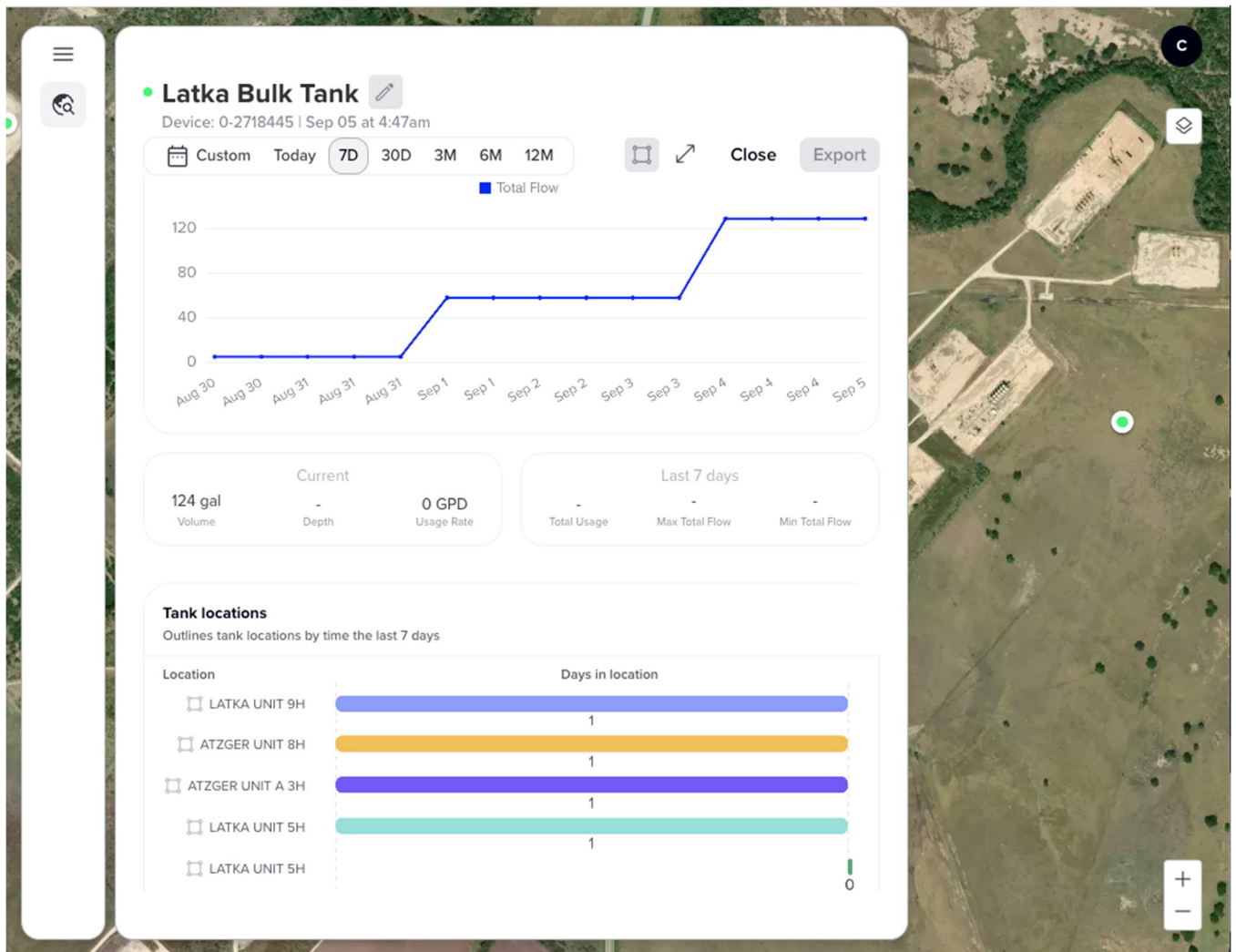


The user profile screen will appear. On this screen you can select whichever customer you'd like to make active by changing the "Organization Unit" setting. Click the "Update" update button when done to save your selection.



## Asset History

- The asset history view shows telemetry and position view for an asset.
- Telemetry history defaults to the trailing 7 days for the critical measurement.
- Timeframe can be adjusted using the time controls at the top of the view.
- Location history overview is shown in the lower part of the view.





## Groups

- Accessible by clicking on the Groups icon on the left-hand menu bar.
- Organizational Units are denoted by a triangle icon, groups are denoted by a folder icon, and assets are denoted by a filled square icon.
- Groups can be added or removed by clicking on the appropriate icon next to the group name.
- Assets can be assigned to a group by dragging the asset onto the group the user wants to assign it to.
- When an asset is selected, details for that asset are shown in the detail panel on the right.
- Clicking on the edit pencil icon will allow a user to edit user-managed asset properties.
- Once in edit mode, the user can click on the disk icon to save change to the selected asset.

The screenshot displays the LASSO interface. On the left, a sidebar shows a menu with a 'Groups' icon. The main area is titled 'Assets' and contains a table with columns for different groups: Baker Radar, Eastern, South TX, and Murphy. Each group contains a list of assets with icons for expansion and assignment. On the right, a detailed view for the 'Briggs K1H-K4H Gas Lift' asset is shown. This view includes a 'Volume level' line graph for the period Nov 24 - Nov 30, showing a fluctuating volume around 400-500 units. Below the graph, key asset properties are listed: Name (Briggs K1H-K4H Gas Lift), Asset Type (Baker Hughes Tank), ESN (0-4240600), Identifier (Iso-v59-yem-159), and Groups (Murphy). Other properties include Depth (52.3 in.), Volume (465 gal), Battery (7.2 v), and Distance To Fluid (12.5 gal). The status is shown as 'OK' for both Asset and Device. The last position report is from Nov 30 at 12:06am, and the last telemetry report is from Nov 30 at 6:59am.

Briggs K1H-K4H Gas Lift Cancel [icon] X

General Properties Other

Type BakerHughes Tank

Capacity

Tank UOM Imperial X

Material Select an option v

Fluid

Name

Price per UOM

Orientation Select an option v

Expected Operation Mode Drains X

## Create A New Asset

- From the Groups module, click on the plus icon to the right of the Assets header at the top of the module.
- The user will be guided through the steps to add a new asset to their account.
- Device (ESN) assignment will be available if there are any devices in the account that are currently not associated with an asset.
- Only a Name and Identifier are required. All other fields are optional.

Step 1

### Asset details

Create an asset and assign a device to start monitoring.

Select device ESN ▼

MurphyFuelTank / Murphy Fuel Tank ×

Bulk Tank T5762

Tank 5762 assigned to the field team

**Other properties**

Create properties and values to track additional information

Paint Color ? Teal 🗑️

E.g. property can be "Driver" E.g. value can be driver's name

[+ Add new property](#)

**Save and Continue** →

Step 3

### Analytics

Unlock advanced analytics such as ROI tracking, target vs actual consumption, and missed replenishments.

4.17 USD

Track dollars spent and savings

Expected volume change rate in gallons gal

Improves volume rate monitoring

Week ×

Volume

Expected change measure

4 days

Expected drains or fills

← Back Create and add another **Save**

Step 2

### Tank properties

Additional information to monitor tank levels with accuracy.

Fuel Tank

Stainless Steel ×

Fluid name

Allows you to find assets by fluid type

200 gal Distance to bottom in.

Higher accuracy on level reporting Accurately calculate fluid levels

Installation accessories ▼

Alert threshold % Warning threshold %

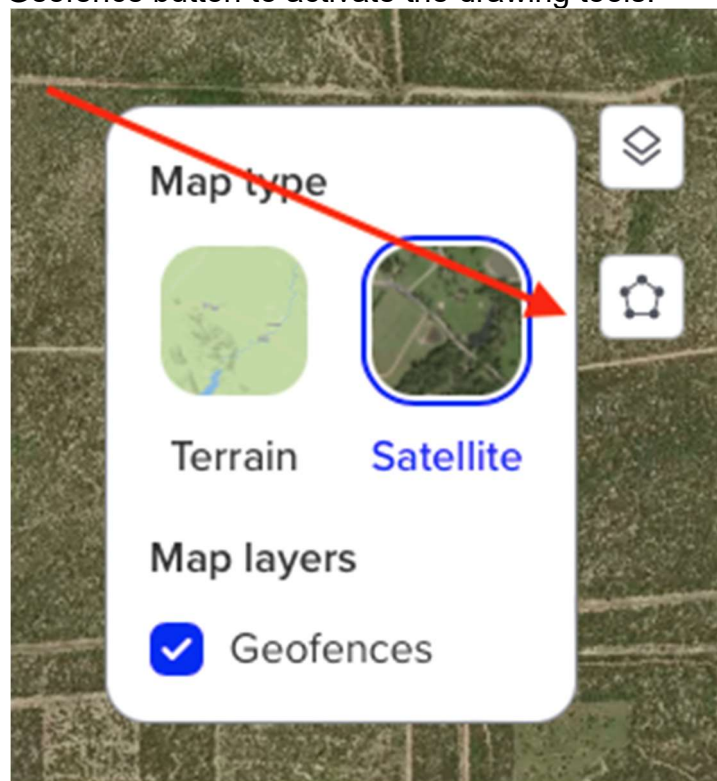
← Back **Save and Continue** →

## GEOFENCES

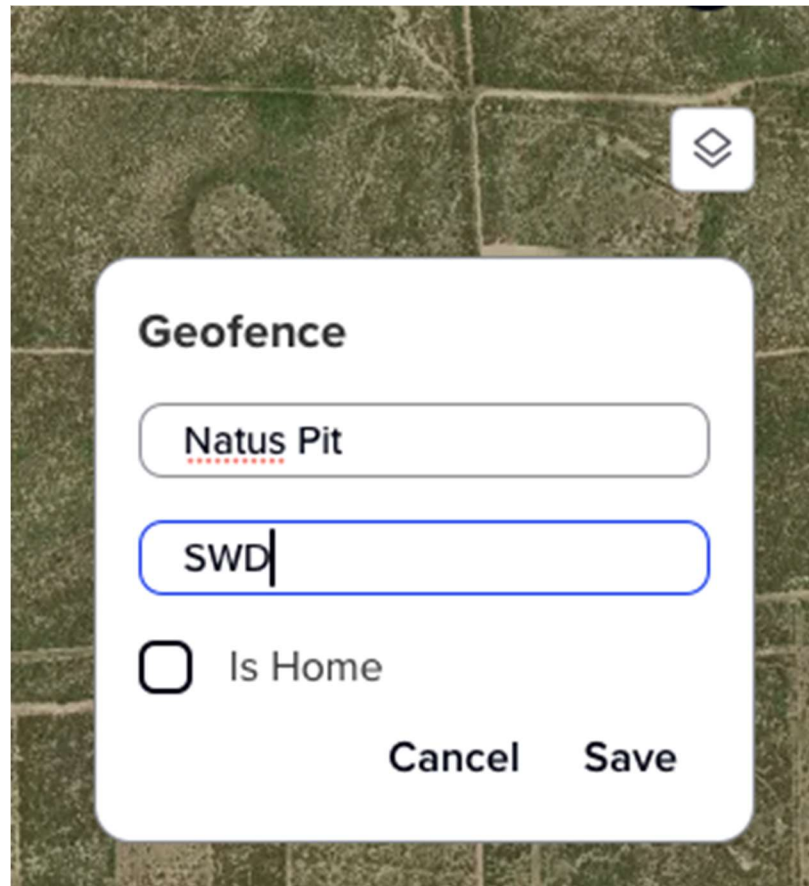
Geofences are useful for providing enhanced detail to your asset location data. In the Lasso Cloud Portal, you are able to create and modify geofences directly on the map by clicking on the Draw Geofence tool button located in the upper-left corner of the map screen.

### Creating a Geofence

- Using the layer control, select Terrain or Satellite overlays. Click on the Geofences layer to toggle visibility of custom Geofences.
- Click on the Draw Geofence button to activate the drawing tools.



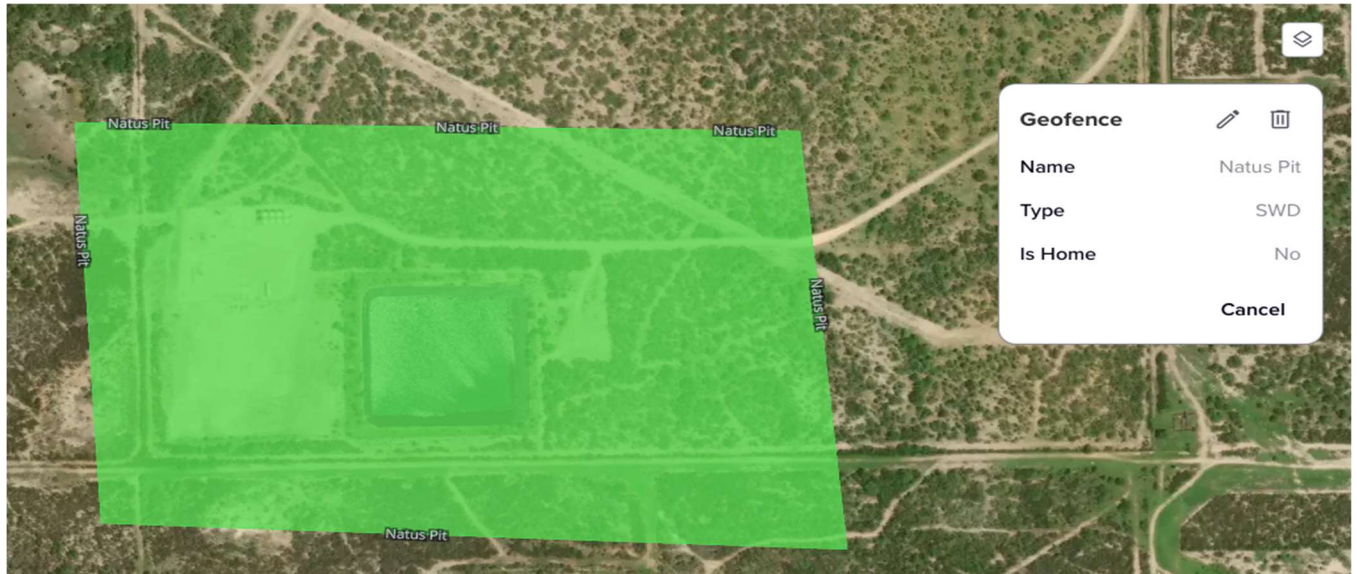
- Click on the map to specify a vertex for the geofence shape. A geofence can have as many vertices as possible in whatever shape is required. Double-click when specifying the final vertex to complete the geofence.
- In the Geofence dialog, specify the required Name and optional Type and “Home yard” parameter values. Home yards are most often specified around company-owned locations to indicate that items in that location should be considered “home” or off-rent/non-billable.
-



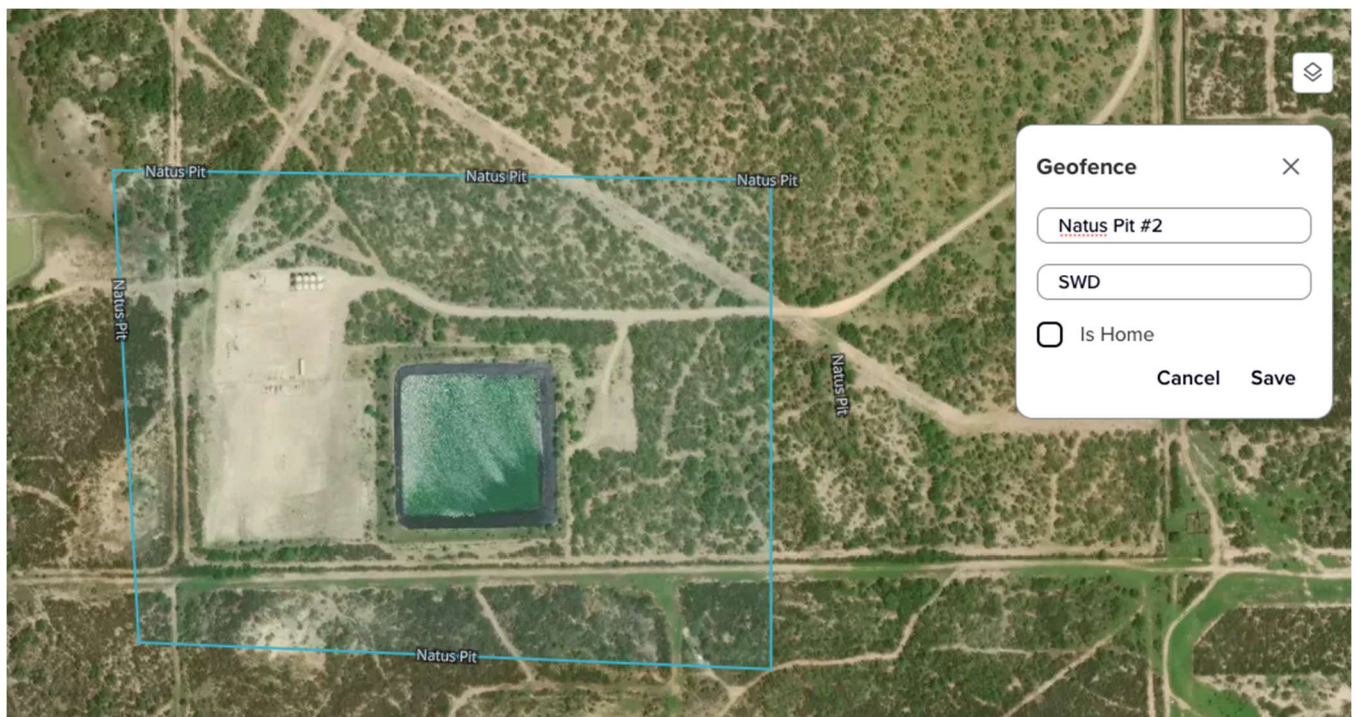
- Press the Save button when finished.
- The geofence will be shown on the map and saved for future use.

## Modifying a Geofence

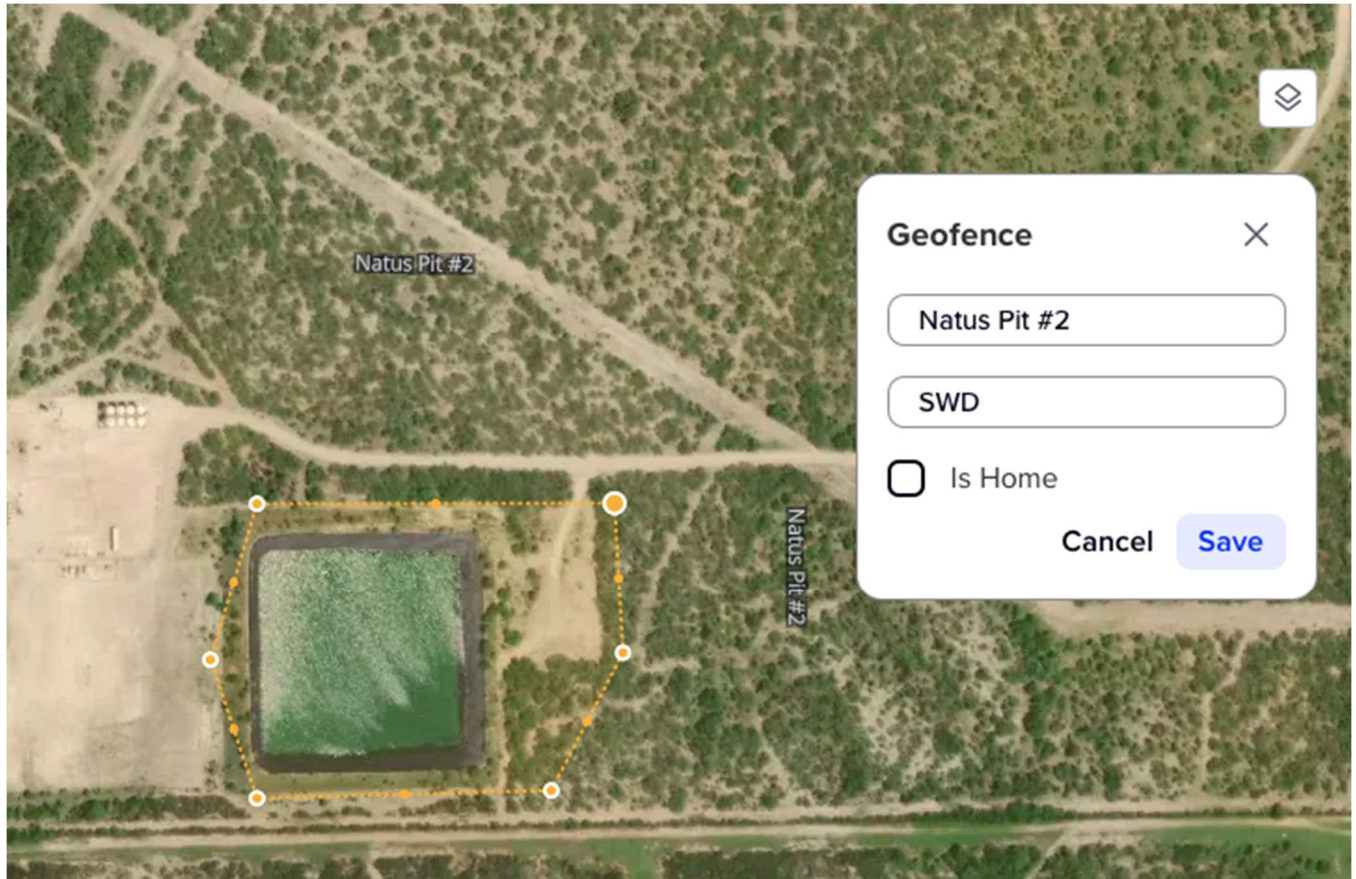
- Using the layer control, select Terrain or Satellite overlays. Click on the Geofences layer to toggle visibility of custom Geofences.
- Click on the geofence you would like to modify. The geofence will turn green when selected and the Geofence dialog will appear.



- To edit the geofence name, type, or home attributes, click on the edit pencil icon to make changes in the Geofence dialog. Press the Save button when finished.



- To edit the geofence geometry, click the edit pencil icon and then double-click on the existing geofence geometry. When circular handles appear on the geofence you may alter the shape or add additional vertices as needed. Press the Save button when done.

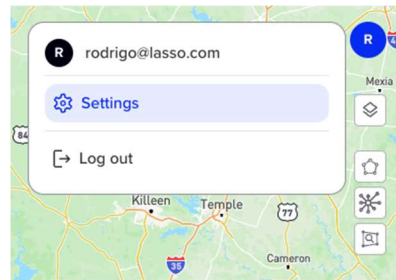


- To delete a geofence, click on the trash-can icon.

## Settings Page

### Overview

The Settings page provides users with the ability to manage their account information, configure organization-specific settings, and customize alerts notification preferences. This section ensures that users can update their details, change their assigned organization unit, and control the alerts they wish to enable or disable.



### Account

- **Overview:** The Account section allows users to view their personal account details such as:
  1. **Name**
  2. **Email**
  3. **Language**
  4. **Organization Unit**
- **Steps to Change Organization Unit:**
  1. Click on the "Organization Unit" field.
  2. A modal will appear with a search bar and a list of available organization units.
  3. Select the desired organization unit from the list.
  4. Click the **Confirm** button.
  5. Verify that the selected organization unit is updated in the Account section.
  6. Click **Update** to save the changes.

← Map

**Settings**

Account

Notification Alerts

**Account**

Name	Rodrigo Viera
Email	rodrigo@lasso.com
Language	English
Organization Unit	<input type="text" value="Baker Radar"/>

**Update**

### Notes:



- This action will change the user's visibility and access scope to align with the selected organization unit.

## Notification Alerts

- **Overview:** The Notification Alerts section displays all active alerts associated with the user's account. Users can enable or disable alerts for specific assets.
- **Features:**
  1. Each alert is listed with the following details:
    - **Alert Description:** Provides the condition or event triggering the alert (e.g., "Volume < 4.0 gal").
    - **Associated Asset:** Specifies the asset the alert is linked to.
    - **Status Toggle:** A switch to enable or disable the email alert notification.
- **Steps to Enable/Disable Alerts:**
  1. Navigate to the **Notification Alerts** section in Settings.
  2. Locate the alert you wish to modify.
  3. Toggle the switch under the **Status** column to enable or disable the alert.
  4. Changes are saved automatically.

← Map

**Settings**

Account

Notification Alerts

ALERTS	ASSET	STATUS
When Volume < 10.0 gal.	<a href="#">DL Facility - Ultra Fab</a>	<input checked="" type="checkbox"/>
Depth < 5.0 in.	<a href="#">DL Facility - Ultra Fab</a>	<input checked="" type="checkbox"/>
Any home geofence enter	Dos Hermanos	<input type="checkbox"/>
When any measurement data is received	DL Facility - Ultra Fab	<input type="checkbox"/>
Any geofence enter	Tom CF - Tank #6 UF Methanol	<input type="checkbox"/>
Depth > 2.0 in.	Senegal	<input type="checkbox"/>
Battery < 1.0 V	DL Facility - Ultra Fab	<input type="checkbox"/>

### Notes:

- Disabled alerts will no longer notify the user for the associated conditions or assets.

## Alerts Page

### Overview

The Alerts page enables users to manage alerts associated with assets or groups. Alerts notify users when certain conditions or events occur, such as measurement thresholds, low battery levels or geofence entries. This functionality ensures that users stay informed about critical updates related to their assets in real time.

### Alert List View:

- Displays all configured alerts in a table format, filtered by the organization unit associated with the logged-in user.
- Data displayed for each alert:
  - **Rule:** A description of the alert condition.
  - **Type:** The type of alert (e.g., measurement, geofence).
  - **Asset/Group:** The associated asset or group.
  - **Email:** The email address(es) receiving notifications.
  - **Schedule:** The alert notification schedule (e.g., Always, Disabled).
  - **Status:** Indicates whether the alert notification is enabled or disabled.
  - **Actions:** Edit or Delete the alert.

RULE	TYPE	ASSET / GROUP	EMAIL	SCHEDULE	STATUS	ACTION
When Volume < 10.0 gal.	Measurement	DL Facility - Ultra Fab	ro.viera@gmail.com		Enabled	
Depth < 5.0 in.	Measurement	DL Facility - Ultra Fab	ro.viera@gmail.com		Enabled	
Any home geofence enter	Geofence	Dos Hermanos	ro.viera@gmail.com		Disabled	
When any measurement data is received	Any measurement	DL Facility - Ultra Fab	ro.viera@gmail.com		Disabled	
Any geofence enter	Geofence	Tom CF - Tank #6 UF Methanol	ro.viera@gmail.com		Disabled	
Depth > 2.0 in.	Measurement	Senegal	ro.viera@gmail.com		Disabled	
Battery < 1.0 V	Measurement	DL Facility - Ultra Fab	ro.viera@gmail.com		Disabled	

## Create an Alert:

- Click the **+ Create Alert** button in the top-right corner.
- Fill in the required fields:
  - **Alert Type:** Select the type of alert (e.g., Measurement, Geofence, Any Position) and configure the parameters.
  - **Asset/Group:** Choose the asset or group the alert applies to.
  - **Alert Schedule:** Set the schedule (e.g., Always, Weekly, Specific Date).
  - **Email Addresses:** Enter one or more email addresses to receive notifications.
- Click **Create** to save the alert.

The screenshot shows a 'New Asset Alert' configuration window. At the top, it says 'New Asset Alert' and 'It will send an email alert using the following criteria.' The form is divided into several sections:

- Alert type:** A dropdown menu showing 'Measurement' with a close button (x).
- Measurement:** A dropdown menu showing 'Volume' with a close button (x).
- Operator:** A dropdown menu showing '<' with a close button (x).
- Value:** A text input field containing '10'.
- Asset / Group:** A dropdown menu showing 'Baker Radar'.
- Alert Schedule:** A dropdown menu showing 'Weekly' with a close button (x).
- Weekly Schedule:** Radio buttons for days of the week: Sun, Mon (checked), Tue, Wed, Thu, Fri (checked), Sat.
- Schedule Timing:** A checked radio button for 'All day', and two empty time input fields for 'Start Time' and 'End Time'.
- Email Addresses:** A list of email addresses, currently showing 'rodrigo@lasso.com' with a close button (x), and an input field for 'Enter email' with a plus sign (+) to add more.

At the bottom, a yellow box displays the 'Alert Rule: When volume < 10'. Below this, there are 'Cancel' and 'Create' buttons.

### Edit an Alert:

- Click the **Edit (pencil)** icon in the Actions column.
- Modify the desired fields (e.g., Alert Type, Schedule, Email Addresses, Status, Assigned Asset or Group).
- Click **Update** to save changes.

### Delete an Alert:

- Click the **Delete (trash can)** icon in the Actions column.
- Confirm the action in the modal that appears.

### Notes:

- Alerts will trigger based on the defined rule and notify the associated email addresses.
- Ensure accurate email addresses are configured to avoid missed notifications.
- Alerts with a **Disabled** status will not trigger.
- Example scenarios for Alerts:
  - A geofence alert triggers when an asset enters or exits a specified boundary.
  - A measurement alert triggers when a parameter exceeds a threshold.

## Users Page

### Overview

The Users page allows administrators to manage user accounts within their organization unit. Users can be created, edited, or deleted based on their roles and assigned permissions.

### Users List View:

- Displays a table of users associated with the logged-in user's organization unit.
- Data displayed for each user:
  - **Name:** Full name of the user.
  - **Email:** User's email address.
  - **Organization:** Organization unit or Group the user belongs to.
  - **Role:** User role (e.g., Admin, Viewer, Manager, Super Admin).
  - **Phone:** Contact phone number (if provided).
  - **Language:** User's preferred language.
  - **Status:** Active, Invited or Deactivated.
  - **Last Login:** Last login timestamp (if available).
  - **Actions:** Edit or Delete user.

NAME	EMAIL	ORGANIZATION	ROLE	PHONE	LANGUAGE	STATUS	LAST LOGIN	ACTION
Conor Brady	conor@lasso.com	Baker Radar	Admin	-	English	Active	-	
Omkar More	ommore524@gmail.com	Baker Radar	Admin	+918623081523	English	Active	-	
Rodrigo Viera	ro.viera@gmail.com	New Mexico	-	099520527	English	Deactivated	-	
Rodrigo Viera	ro.viera@gmail.com	Baker Radar	Super Admin	123-456-7890	Spanish	Active	-	

## Create a User:

- Click the **+ Create User** button in the top-right corner.
- Fill in the following details in the **New User** modal:
  - **User Details:** First name, last name, email, phone number, preferred language.
  - **Role:** Assign a role (Viewer, Manager, Admin or Super Admin).
    - Roles define the permissions and functionalities available to the user.
  - **Organization Unit/Sub-group:** Assign the user to a specific organization or subgroup.
- Click **Create** to finalize.
- An invitation email is sent to the new user, enabling them to log in.

The screenshot shows a 'New User' modal window. At the top, it says 'New User' and 'An invitation will be sent to the user's email after creation.' Below this are three sections: 'User details', 'Role', and 'Organization Unit / Sub-group'. The 'User details' section has input fields for first name (John), last name (Smith), email (john@lasso.com), phone number (+17603551934), and preferred language (English). The 'Role' section has a dropdown menu set to 'Admin' and a list of permissions. The 'Organization Unit / Sub-group' section has a dropdown menu set to 'Permian'. At the bottom right, there are 'Cancel' and 'Create' buttons.

**New User**  
An invitation will be sent to the user's email after creation.

**User details**

John Smith  
john@lasso.com +17603551934  
English

**Role**

Admin

- List and manage triggers and geofences.
- View and edit assets and devices.
- List notifications.
- Setup and receive notifications and reports.
- Manage user accounts.
- Manage groups.

**Organization Unit / Sub-group**

Permian

Cancel Create

## Editing a User:

- Click the **Edit (pencil)** icon in the Actions column of the user to modify.
- Adjust the desired fields in the **Edit User** modal:
  - Update user details, role, or organization unit/sub-group.
- Click **Edit** to save the changes.

**Edit User**  
Currently editing user Rodrigo Viera

**User details**

John Smith

john@lasso.com +17603551934

English

**Role**

Manager

- List triggers and geofences.
- View and edit assets and devices.
- List notifications.
- Setup and receive notifications and reports.

**Organization Unit / Sub-group**

Baker Radar

Cancel Edit

## Deleting a User:

- Click the **Delete (trash can)** icon in the Actions column of the user to remove.
- Confirm the action in the **Delete User** modal.
- Note: This action cannot be undone.
- Verify that the user no longer appears in the list.

**Delete user**

Are you sure you want to delete this user?

Warning: This action cannot be undone

Cancel Confirm

## User Roles and Permissions

- **Viewer:**
  - List triggers and geofences.
  - View assets and devices.
  - List notifications.
  - Receive notifications and reports.
  
- **Manager:**
  - List triggers and geofences.
  - View and edit assets and devices.
  - List notifications.
  - Setup and receive notifications and reports.
  
- **Admin:**
  - List and manage triggers and geofences.
  - View and edit assets and devices.
  - List notifications.
  - Setup and receive notifications and reports.
  - Manage user accounts.
  - Manage groups.
  
- **Super Admin (For Lasso Personnel Only):**
  - List and manage triggers and geofences.
  - View and edit assets and devices.
  - List notifications.
  - Setup and receive notifications and reports.
  - Manage and create user accounts.
  - Manage groups.
  - Manage devices.

### Notes:

- Users are restricted to visibility within their assigned organization unit or subgroup.
- Ensure user roles are assigned appropriately to avoid unauthorized access.
- Only active users can log in and perform tasks. Deactivated users remain visible in the list but cannot log in.



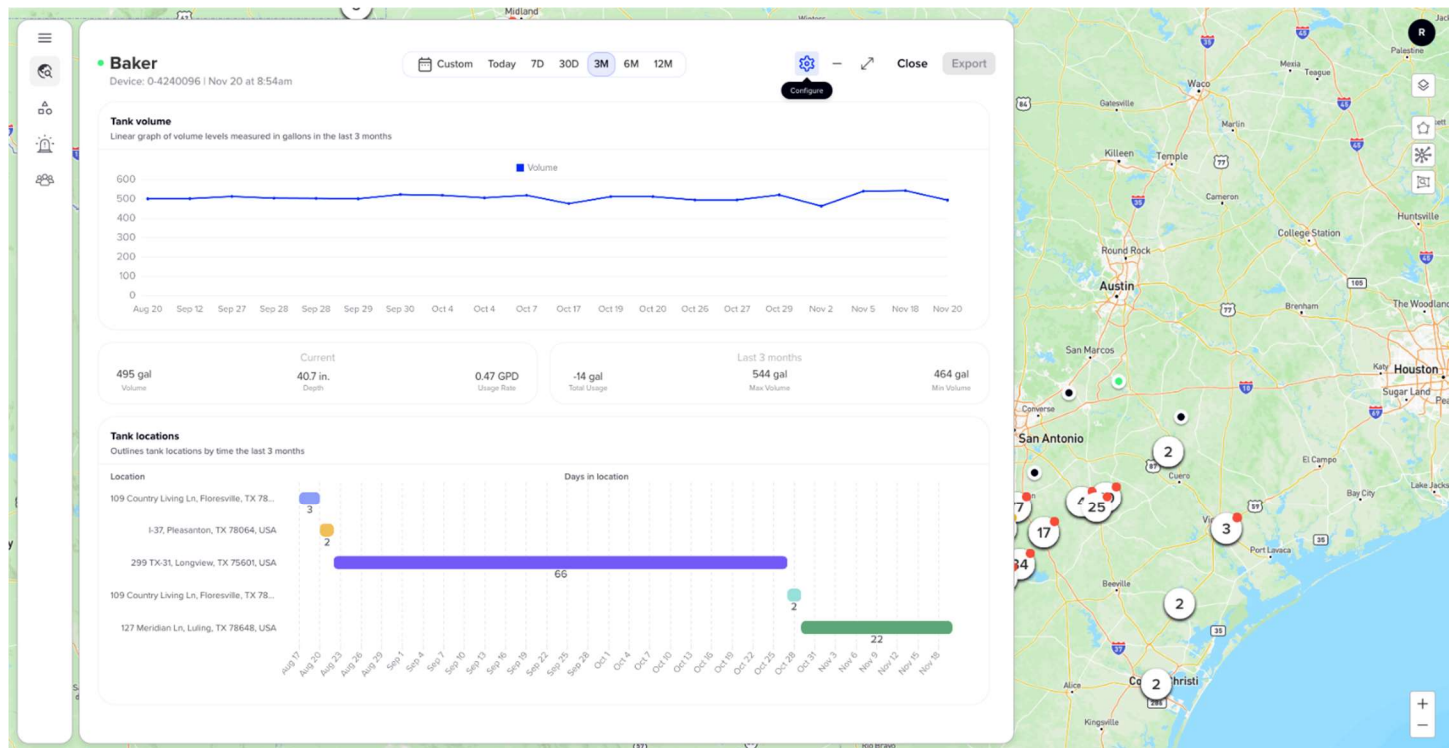
## Asset Device Configure Page

### Overview

The Asset Device Configure page allows administrators to set up and manage device channels for assets. Channels define how measurements and telemetry data are handled, enabling customization for specific use cases. This page can be accessed from the **Asset Details** page using the **gear icon** located on the top-right bar.

### Access to Configure page:

- Select an asset on the map and access the **Asset Details** page by clicking on the asset information popup.
- If you are an administrator, click the **gear icon** in the top-right bar to open the **Configure** page.



## Device Asset Details:

### Main Properties:

The **Main Properties** section displays key asset details, including:


- **Name:** The asset's name.
- **Asset Type:** Type of the asset (e.g., Tank, Vehicle).
- **ESN:** Unique identifier for the device.
- **Identifier:** Custom identifier for the asset.
- **Details:** Additional information about the asset.
- **Groups:** The group or organizational unit associated with the asset (read-only).
- **Other Properties:** Custom properties associated with the asset. Users can add, edit, or remove properties as needed.

The screenshot displays the 'Asset / Configure' interface. It features a 'Main properties' section with input fields for Name (Baker), Asset Type (Generic Tank), ESN (0-4240096), and Identifier (Iso-551-k59-x38). A 'Details' section is present but empty. The 'Groups' section is labeled 'Not editable'. To the right, the 'Other properties' section contains a list with one item: 'previous\_asset\_ids' with the value '45192b79-8db7-4940-b104-4d8e7142f8e2,d3ec70e9-2103-4eb5-9abc-a0cedfe58b5d'. A '+ Add new property' link is located below the list. At the bottom right, there are 'Cancel' and 'Save' buttons.

## Device Channels:

The **Channels** section lists all existing channels configured for the asset device. Each channel includes:

- **Index:** Channel number.
- **Measurement:** The type of data being measured (e.g., Battery, Volume, Depth, Distance To Fluid).
- **Unit:** The unit of measurement (e.g., Volts, Gallons, Inches).
- **Start/End Byte:** Byte range for the data.
- **Offset:** Adjustment applied to the raw data.
- **Factor:** Multiplicative factor applied to the data.
- **Allow Zeros:** Toggle to allow zero values in the data.

Channels								
INDEX	MEASUREMENT	UNIT	START BYTE	END BYTE	OFFSET	FACTOR	ALLOW ZEROS	ACTION
0	Battery	volts	1	1	11	1	<input checked="" type="checkbox"/>	 

[+ Add new channel](#)

## Manage Device Channels:

### Add a New Channel:

- Click the **+ Add New Channel** button at the bottom of the Channels section.
- Fill in the following details for the new channel:
  - Index, Measurement, Unit, Start Byte, End Byte, Offset, Factor, and Allow Zeros.
- Click **Save** to add the channel.

INDEX	MEASUREMENT	UNIT	START BYTE	END BYTE	OFFSET	FACTOR	ALLOW ZEROS	ACTION
0	Battery	volts	1	1	11	1	<input checked="" type="checkbox"/>	
1	Depth	inches			0	1	<input type="checkbox"/>	

+ Add new channel

Cancel Save

### Edit an Existing Channel:

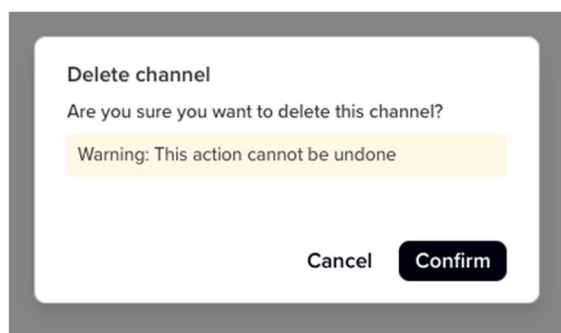
- Click the **Edit (pencil)** icon next to the channel you wish to modify.
- Update the necessary fields.
- Click **Save** to save the changes.

INDEX	MEASUREMENT	UNIT	START BYTE	END BYTE	OFFSET	FACTOR	ALLOW ZEROS	ACTION
0	Battery	volts	1	1	11	1	<input checked="" type="checkbox"/>	

Cancel Save

### Delete a Channel:

- Click the **Delete (trash can)** icon next to the channel you want to remove.
- Confirm the action in the modal that appears.



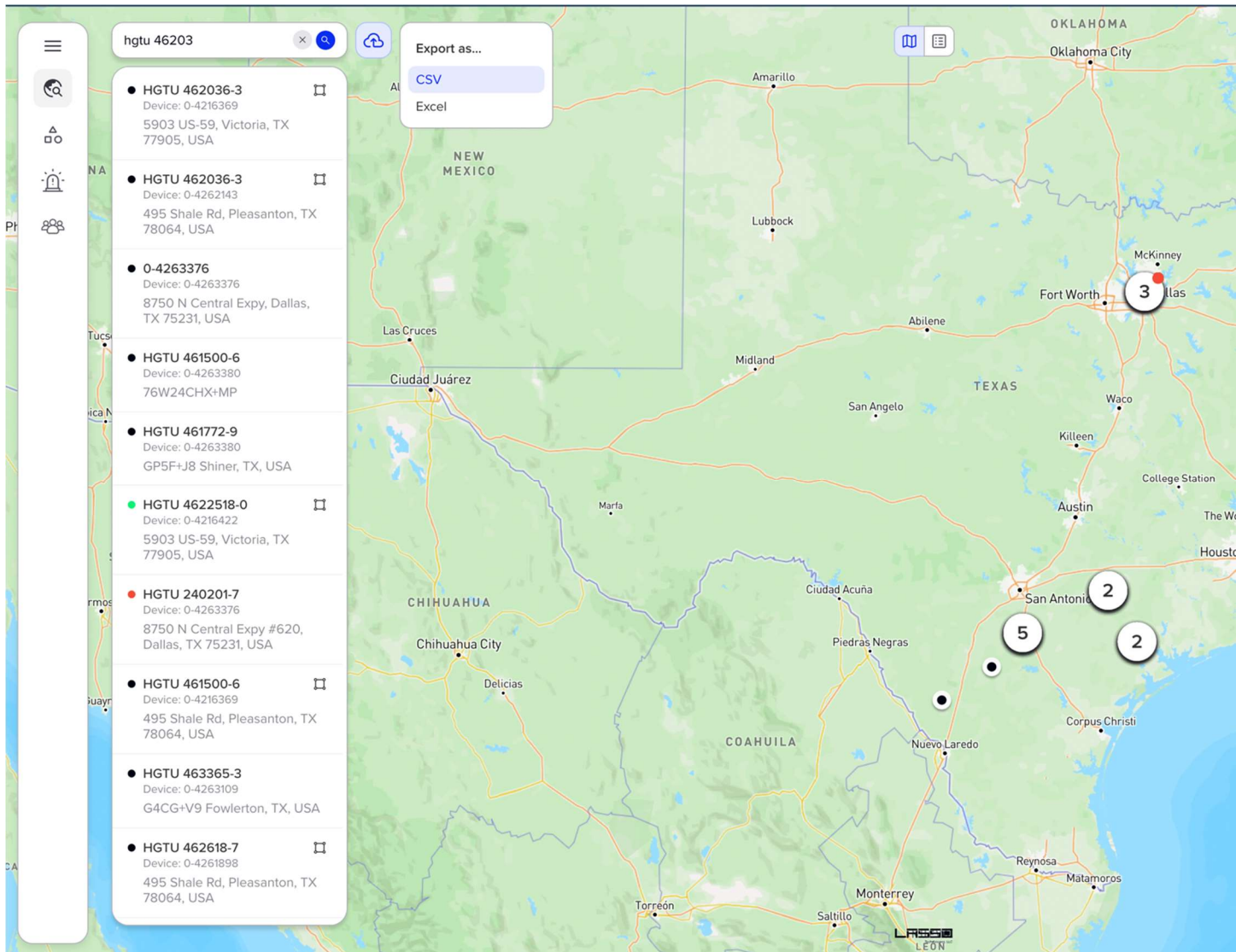
## Notes

- Only administrators and super administrators have access to the Configure page.
- Ensure all channel parameters are configured accurately to prevent data discrepancies.
- Changes to channels will directly affect how telemetry data is processed for the associated asset.

## Search Assets on Map View

### Overview

The **Search Assets on Map** functionality enables users to locate specific assets quickly by searching for their name, device ESN, or other identifiers. This feature updates the map view to display the locations of matching assets and provides a list of results under the search bar. Users can also export the search results as a CSV or Excel file for further analysis.

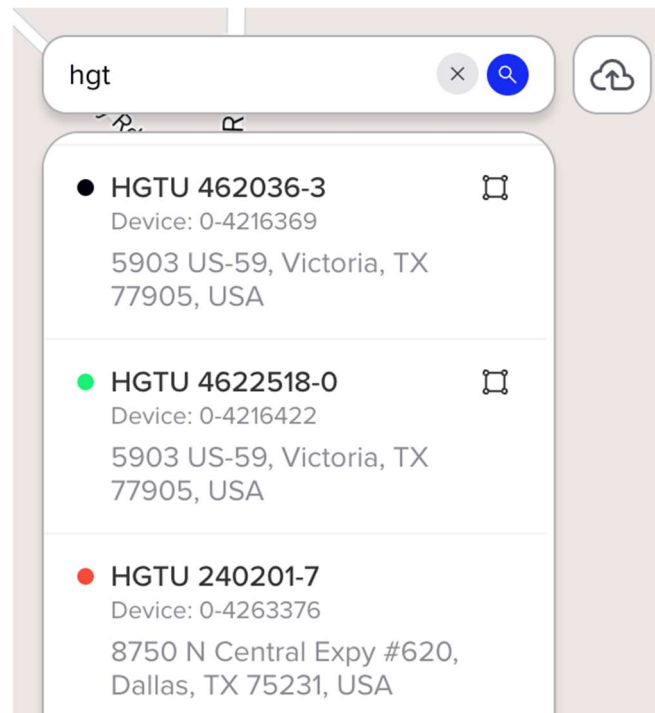


### Search Bar:

- Located at the top-left of the **Map View**.
- Users can enter search terms, such as asset names, device ESN, or partial identifiers.
- Supports filtering assets based on the entered criteria.

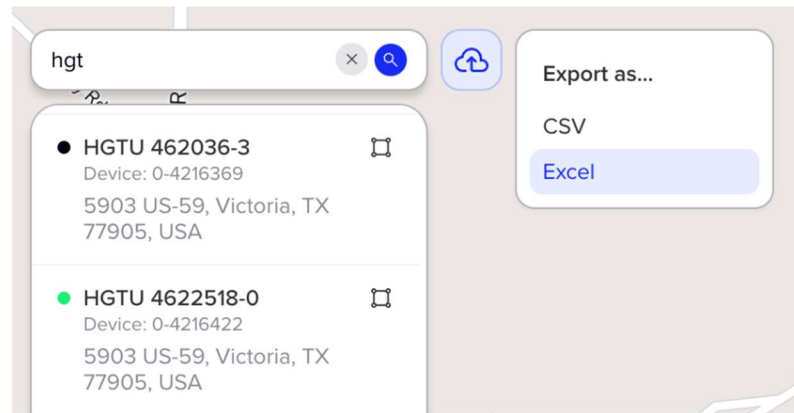
## Search Results:

- The map dynamically updates to display the asset locations of the search results.
- The results list below the search bar presents the matching assets in an easy-to-navigate, scrollable format.
- Each entry of the search result list includes:
  - **Name:** Asset name.
  - **Device ESN:** Unique identifier for the asset.
  - **Location:** Geocoded address of the asset.
  - **Geofence:** A top-right icon Indicates whether the asset is within a geofence or not.
  - **Status:** Current status of the asset (e.g., None (black), OK (green), Issue (red)).
- Clicking on an item of the result list enters to Asset Details page and highlights the asset on the map.



**Export Search Results:**

- Users can export the search results list by clicking the **Export** button next to the search bar.
- Supported file formats include **CSV** and **Excel**.
- The exported file contains the following data:
  - **Name:** Asset name.
  - **Device ESN:** Unique identifier for the asset.
  - **Group Paths:** The group or organizational path of the asset.
  - **Coordinates:** Latitude and longitude of the asset.
  - **Geocoded Address:** Full address of the asset.
  - **Status:** Current status of the asset (e.g., None, OK, Issue).



Name	Device ESN	Group Paths	Coordinates	Geocoded Address	Status
HGTU 462036-3	0-4216369	G-440	28.80, -96.95	5903 US-59, Victoria, TX 77905, USA	None
HGTU 462036-3	0-4262143	G-440	28.93, -98.48	495 Shale Rd, Pleasanton, TX 78064, USA	None
0-4263376	0-4263376	G-412	32.87, -96.77	8750 N Central Expy, Dallas, TX 75231, USA	None
HGTU 461500-6	0-4263380	G-440	28.13, -99.55	76W24CHX+MP	None
HGTU 461772-9	0-4263380	G-440	29.51, -97.28	GP5F+J8 Shiner, TX, USA	None
HGTU 4622518-0	0-4216422	G-440	28.80, -96.95	5903 US-59, Victoria, TX 77905, USA	OK
HGTU 240201-7	0-4263376	G-441	32.87, -96.77	8750 N Central Expy #620, Dallas, TX 75231, USA	Issue
HGTU 461500-6	0-4216369	G-440	28.93, -98.48	495 Shale Rd, Pleasanton, TX 78064, USA	None
HGTU 463365-3	0-4263109	G-440	28.52, -98.87	G4CG+V9 Fowlerton, TX, USA	None
HGTU 462618-7	0-4261898	G-440	28.93, -98.48	495 Shale Rd, Pleasanton, TX 78064, USA	None
HGTU 462518-0	0-4216376	G-440	28.93, -98.48	495 Shale Rd, Pleasanton, TX 78064, USA	None
	0-4262792	G-412	32.94, -96.60	3010 Tree Line Rd, Garland, TX 75040, USA	None
HGTU 463227-7	0-4262795	G-440	28.93, -98.48	495 Shale Rd, Pleasanton, TX 78064, USA	None
HGTU 463227-7	0-4262792	G-440	29.29, -97.37	7JRM+82 Cheapside, TX, USA	None

**Notes:**

- Ensure search terms are relevant to asset identifiers for accurate results.
- The exported file is useful for offline analysis and reporting of asset locations and statuses.

## FCC Certifications

Contains Transmitter Module FCC ID: L2V-STGR IC: 3989A-STGR.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, 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 instructions, 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 or 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 Globalstar may render the device non-compliant with FCC and other regulatory body standards for operation and may void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus complies with Canadian ICES-003.

This device will operate in accordance to the standards set forth by the CE Mark Directives and standards R&TTE: (TBR41 v1.1.1 May 2000, EN 301 441), RFI: (EN61000-4-3:1996 + A1:1998 + A2:2000), ESD: (EN61000-4-2: 1995 + A1:1998)

**NOTICE:** This equipment complies with the FCC RF Exposure Limits. A minimum of 20 centimeters (8 inches) separation between the device and the user and all other persons should be maintained.



## IMPORTANT NOTES FOR CABLE GLAND INSTALLERS

### Use caution when installing cable glands. Example from INSTALLATION INSTRUCTIONS FOR A2F100, RA2F100 CABLE GLAND [www.cmp-products.com](http://www.cmp-products.com)

1. Read all instructions before beginning installation. Installation shall only be performed by competent, suitably trained personnel (in accordance with EN/IEC 60079-14 using the correct tools; spanners should be used for tightening).
2. Inspection and maintenance shall only be performed by competent, suitably trained personnel (in accordance with EN/IEC 60079-14 (Initial Inspection) and EN/IEC 60079-17).
3. The interface between a cable entry device and its associated enclosure / cable entry will require additional sealing to achieve ingress protection (IP) ratings higher than IP54. The minimum protection level is IP54 for explosive gas atmospheres and IP6X for explosive dust atmospheres. Parallel threads (and tapered threads when using a non-threaded entry) require a CMP sealing washer or integral O-ring face seal (where available) to maintain IP66, 67 and 68 (when applicable). It is the installer's responsibility to ensure the IP rating is maintained at the interface. Note: When fitted to a threaded entry, all tapered threads will automatically provide an ingress protection rating of IP66.
4. The standard product temperature range is -60°C to +130°C. The equipment should not be used outside of this range.
5. Cable glands do not have any serviceable parts and are therefore not intended to be repaired.
6. Cable glands are manufactured from Brass, Nickel Plated Brass, Stainless Steel, Mild Steel or Aluminum, with Silicone seals. The end user shall consider the performance of these materials with regard to attack by aggressive substances that may be present in the hazardous area. Consideration should be given to potential degradation due to galvanic corrosion at the interface of dis-similar metallic materials.
7. It is the end user's responsibility to ensure the equipment and materials are suitable for their final installation location. If in doubt consult CMP Products Limited.
8. Ex db marked cable glands can only be supplied with metric or NPT entry threads.
9. Once installed do not dismantle except for inspection. An inspection should be conducted as per IEC/EN 60079-17 by a qualified person. After inspection the gland should be re-assembled as instructed, ensuring the outer seal nut is correctly tightened to ensure the cable is secured.
10. 3/8" NPT, Ingress Discs (all materials) and Aluminum Cable Glands not to be used for Group I applications.
11. Metric entry threads comply with ISO 965-1 and ISO 965-3 with a 6g tolerance as required by IEC 60079-1:2014. The CMP standard metric thread pitch is 1.5mm for threads up to M75, and 2.0mm from M90 and above. Special thread pitches between 0.7 – 2.0mm are available on all products on request. See certificate for details of other thread types. NPT threads are in accordance with ASME B1.20.1-2013 gauging to C1 3.2 for external threads. For details of other thread types refer to IECEx certificate.
12. The enclosure surface finish must be smooth and flat to facilitate sealing with an O-ring or Entry Thread Sealing Washer for the required IP rating.
13. Enclosure will need to be sufficiently strong to support the cable and cable gland assembly. Enclosure entries must be perpendicular. Any draft angles from the casting/molding process should have a perpendicular flat spot machined to facilitate sealing with an O-ring or Entry Thread Sealing Washer.
14. CMP Products recommends when using the cable gland with a through-hole, the hole must be circular, free of burrs and the diameter shall be no larger than 0.7mm above the thread nominal diameter. A suitable CMP Products locknut shall be used to secure the product. See CMP Products catalogue for locknut options.
15. A CMP earth tag should be used when it is necessary to provide an earth bond connection. CMP earth tags have been independently tested to comply with Category B rating specified in IEC 62444 (no ratings stated in IEC 60079-0). Ratings are shown in the associated table. CMP earth tags slip over the cable gland or accessory entry thread from inside/outside the enclosure and must be secured with a locknut (if fitted internally).

**General product information:** Product SIGMA is a Remote Equipment Telemetry system intended for Zone 1 Applications. This sensing device is placed inside of an already approved Ex d enclosure XD-120Lwin by Limatherm, rated for Gb, Zone 1 / 21 areas (Ex db II C Gb). The product is intended for an ambient of -20°C to 75°C. The product also incorporates the following critical components.

TRF No. ExTR

1) CIR-2 Crush and Impact Resistant without external Armoring Cables: Nexans, 37-102 611CIRAG2 / 610CIRAG2, 16 AWG, 1.3mm<sup>2</sup>, 0.7in / 0.437in diameter, 600V, 90°C.

2) Cable Gland: 20A2F100, M20 and M25, CMP Products with overall cable diameters as 7mm to 13.5mm and 11.5mm to 19.5mm respectively. This is an Ex Component, with IECEx Cert: IECEx CML 18.0172, IECEx SIM 17.0010 & ATEX: CML18ATEX1307, CML18ATEX4311. Rating: Ex db IIC Gb, IP 66.

3) Stopper Plug: 767DM2, 767DM3, CMP Products with thread sizes M20x1.5, M25x1.5, (respectively) by CMP Products, IECEx Cert: IECEx CML 18.0177X, IECEx SIM 15.0002X, ATEX: CML18ATEX1320X.

The intended rating of the end product SIGMA is Ex db IIB T4 Gb. All parts intended for connection are understood to be approved. The external connection to this unit is to be interfaced with 4-20mA or Modbus sensor options, rated for intended for area classification of the end product. These sensors may or may not be used with a Barrier as applicable. It is to be noted that, it the responsibility of the end installation user to validate the connection of these sensors at the time

**National differences considered as part of this evaluation:**

ATEX Directive 2014/34/EU

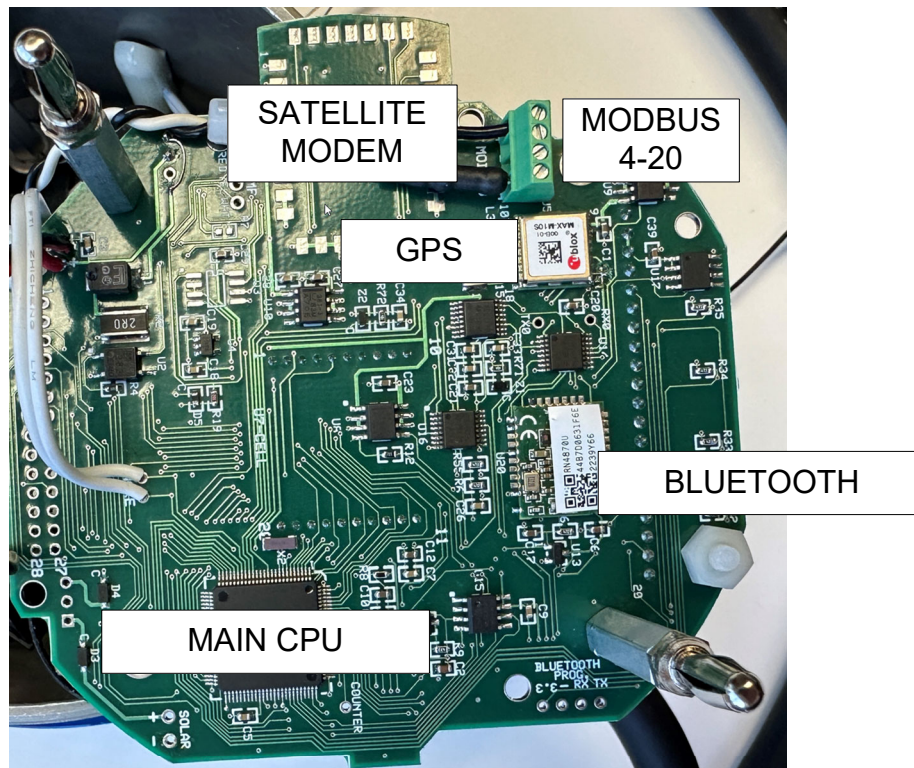
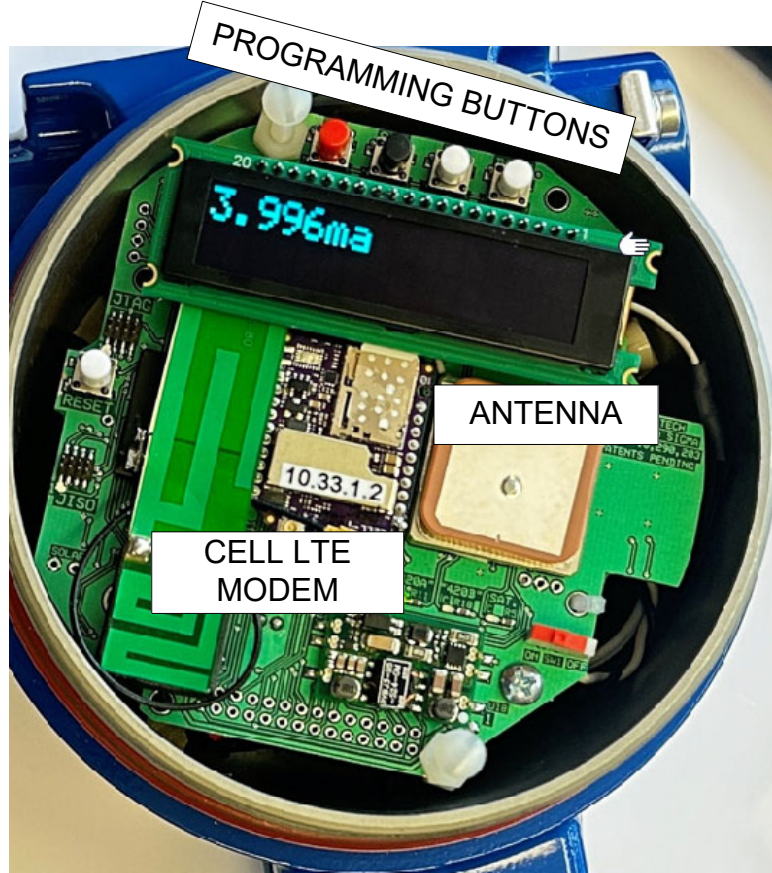
**Specific Conditions of Use:**

- External sensors intended for connection with this device in the field must be approved per IECEx and ATEX requirements (as applicable), for the permissible ratings of the product.
- Installation of this product must be performed in accordance with the User Manual provided by the manufacturer, IEC / EN 60079-14 and requirements of importing country.

**For ATEX Regions, kindly note that translated user manuals in the regional language will be provided by Lasso Technologies upon request.**

**Please ensure that all Ex Components are used in accordance with Instructions Provided by the component manufacturer.**

# MAIN CIRCUIT BOARD



# Normal Operation Display Messages

**4.1ma**

Current value of current going to the 4-20 mA sensor.

**5:123.4 psi**

Channel 5 reads 123.4 psi. This value is comprised of a scaled raw sensor value and a label assigned by the user.

**WAIT TO GET GPS**

Sigma is acquiring the GPS lock

**lat=96.2345  
lon=24.7465**

Latitude and Longitude GPS found

**GET MODEM STATUS**

Get the Modem status

**Sent Data Airplane Mode**

Cellular modem goes into airplane mode before going to sleep.

**Config is OK**

Satellite modem configuration success.

**Send Data OK**

Satellite modem send data confirmed.

**Abort TX OK**

Abort any pending messages to prepare for GPS send.

**SEND GPS**

GPS coordinates just sent.

**iPhone Connected**

iPhone is connected to the Sigma.

**Programming  
Bluetooth**

Bluetooth is being programmed.  
Bad Bluetooth modem if it says 'Bluetooth not talking'

**Write Modbus  
Register=123 Value=456**

User gave the command to write to the Modbus register.

# Error Messages

## Sensor not connected

4-20 mA sensor not connected.

## Re-read sensor

4-20 mA circuit not functioning.

## Bad Modbus CRC

Modbus CRC value is incorrect. Check baud rate, message length.

## Bad Modbus Response

Modbus response was not valid. Check baud rate, message length.

## Bluetooth Not Talking

Bluetooth circuit is not communicating. Re-program Bluetooth by pressing UP DOWN button.

# Program Messages.

Remove the lid. Tighten lid when done.

Turn on Alpha control.

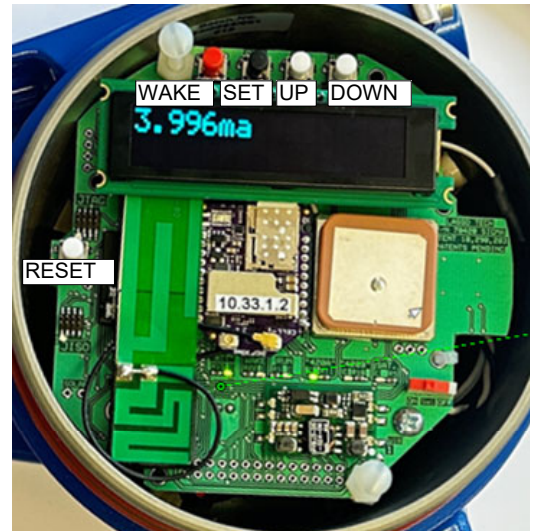
Press WAKE

Press SET button to enter teach mode.  
Press again to select next parameter.

Press UP or DOWN

RESET only if needed. Data will not be lost.

HIDDEN KEYPAD COMMANDS  
UP+DOWN=FACTORY RESET (cannot undo)



Remove the lid. Tighten lid when done.

**GPS Interval 8hr=.25day**

Set interval that GPS will be transmitted.

**GMT Offset 5 hrs**

Hours from GMT for local time.

**Send Satellite when Wake Button**

Select to send satellite message if Wake button is pressed or choose to not send message.

**Max Sensor Channel**

Set Maximum number of channels to be scanned

**4-20 sensors**

Select if sensors are 4-20 or Modbus

**Satellite Channel = 2**

Satellite channel used. US=0 International=2.

**CELL SATELLITE COMM**

Select if cellular, satellite, or both will be used. Necessary hardware and software options are needed.

**Press UP to change Wake Times**

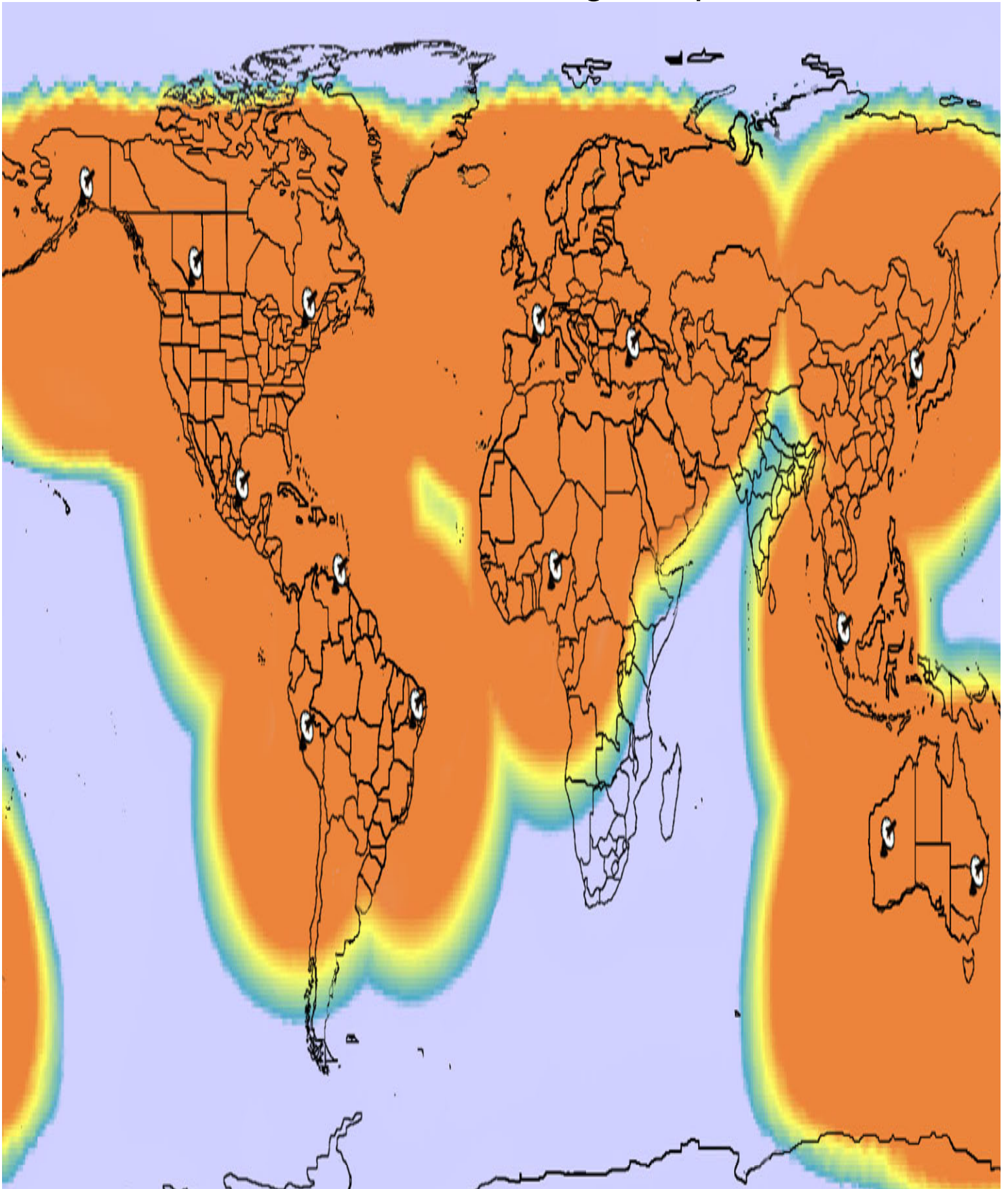
Press UP if you want to scroll through 24 hours and flag if you want it to report at that hour.

**REPORT 7:00 ON**

Set option to send data at any of 24 hour times. ON transmits at that hour. OFF ignores that hour.

**REPORT 13:00 OFF**

# Globalstar Coverage Map



Patents 10,290,203 11,555,732 12,072,223 and Patents Pending  
LASSO.COM 8750 N. Central Expy, Suite 300 Dallas, TX 75231 TEL: 866-392-0923

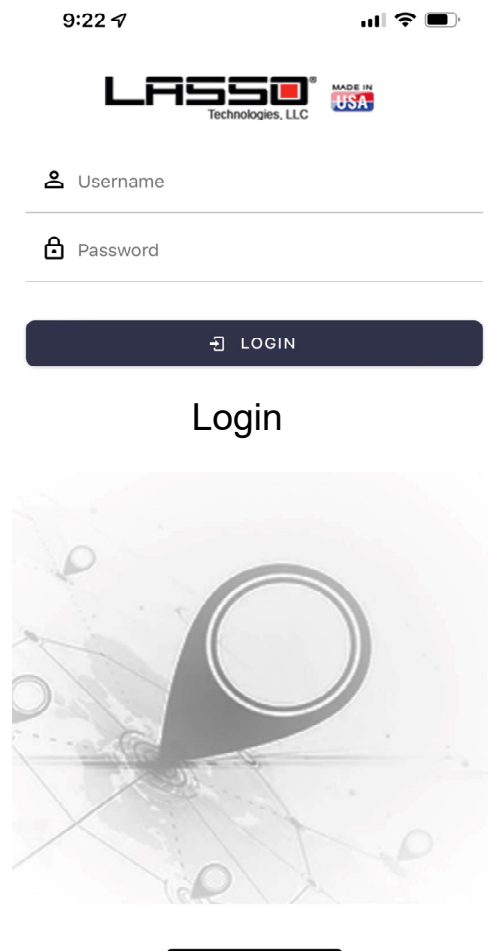
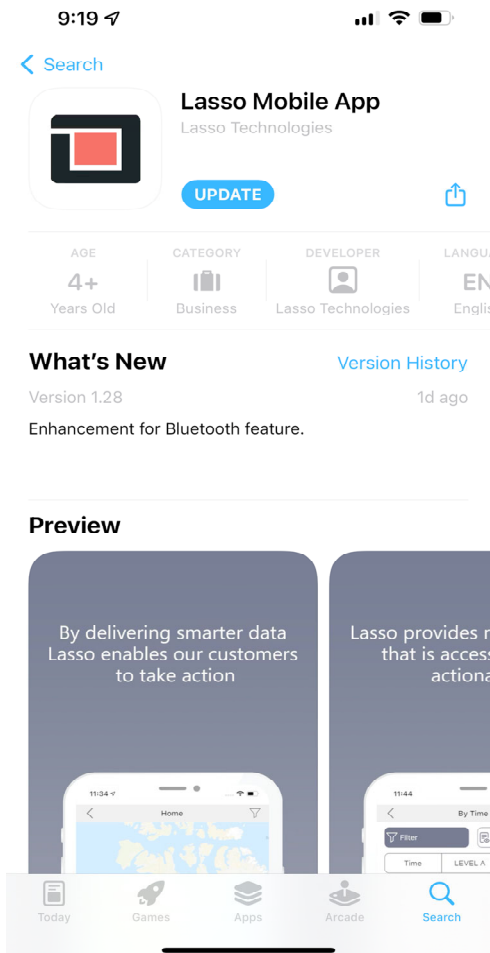
# iPhone or Android APP

<https://itunes.apple.com/us/app/lasso-mobile-app/id1180627689?mt=8>

<https://play.google.com/store/apps/details?id=com.lasso>

OR Search for **Lasso Technologies** in the APP store

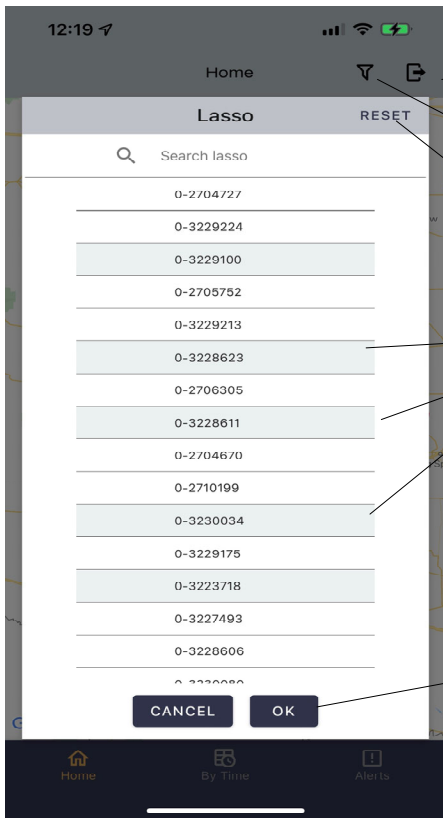
Contact Lasso to activate the APP using your Lasso Login.



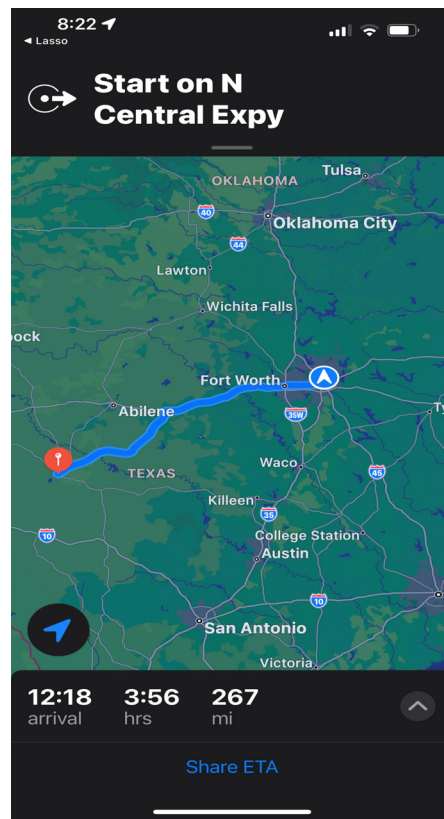
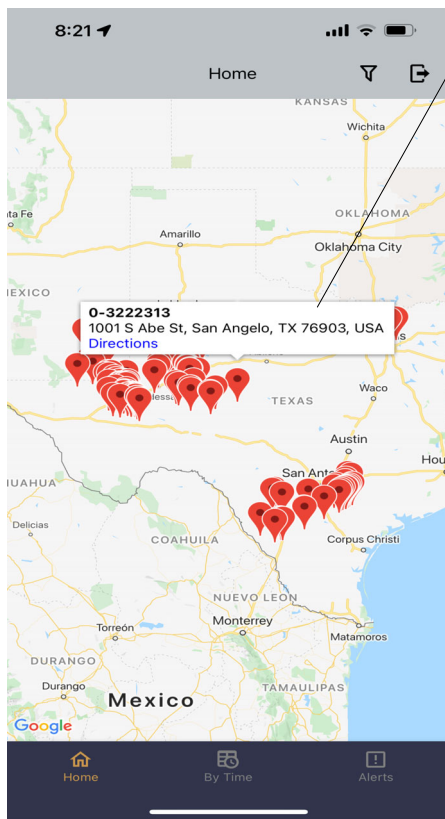
Patents 10,290,203 11,555,732 12,072,223 and Patents Pending  
LASSO.COM 8750 N. Central Expy, Suite 300 Dallas, TX 75231 TEL: 866-392-0923



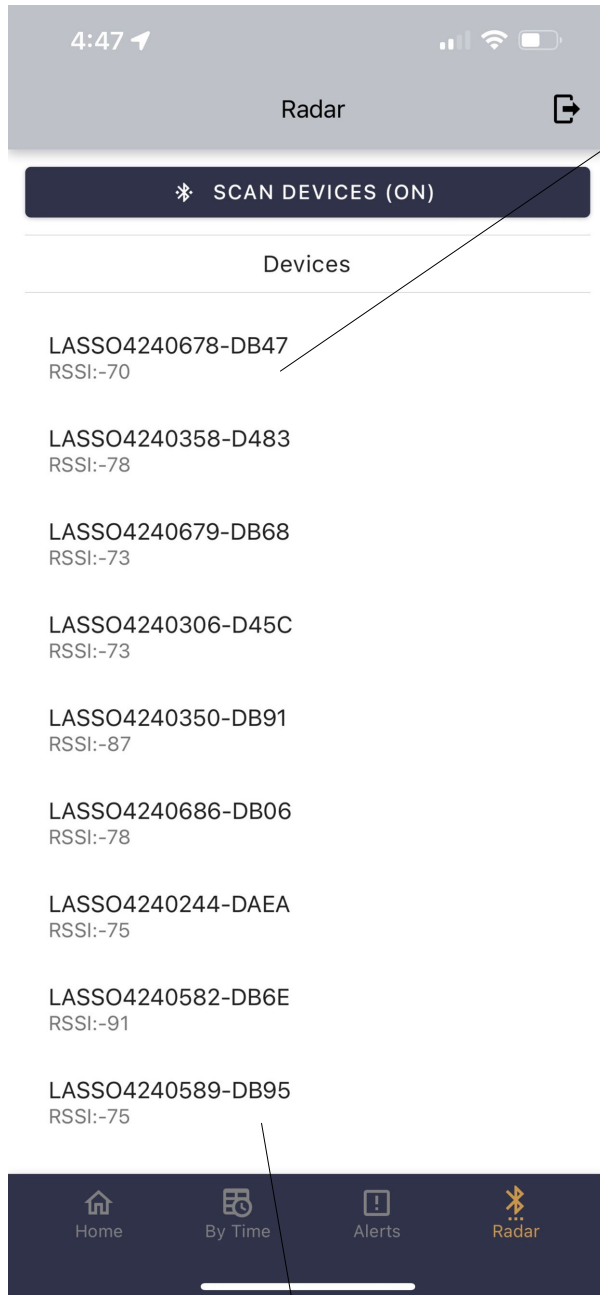
# ONCE LOGGED IN, YOU WILL SEE A LIST OF ALL ASSETS



EXIT THIS LOGIN  
FILTER TO LOOK FOR AN ASSET  
RESET TO SEE ALL THEN CLICK OK  
CLICK ON SEVERAL TO SEE MORE  
OK ONCE SELECTED  
CLICK ON BOX TO GET DIRECTIONS



# APP BY TIME



SELECT YOUR ASSET

9:58

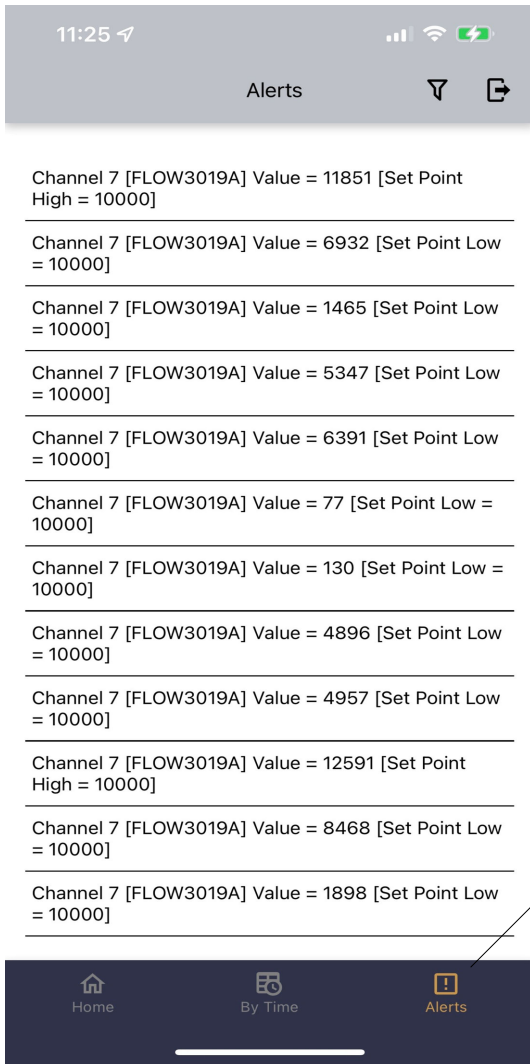
By Time

TIME	FLOW3018A	FLOW3019A	FLOW3020A
12/03/2021 21:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 20:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 19:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 18:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 17:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 16:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 15:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 14:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 13:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 12:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 11:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 10:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 09:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 07:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 06:00:00	33,675.00	14,119.00	25,285.00
12/03/2021 05:00:00	33,675.00	14,119.00	25,285.00

Home By Time Alerts

SELECT ByTime TO SEE DATA

# APP ALERT



SELECT ALERT TO SEE ALL ALERTS

ALERTS CAN BE GEOFENCE OR MIN MAX ALERTS AS SET ON THE CONFIGURE PAGE. SEE USER MANUAL FOR DETAILS ON PROGRAMMING ALERTS.

Send Alert Email ?

Send Information Email ?

Submit

**Assign Geofence**

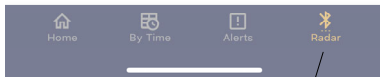
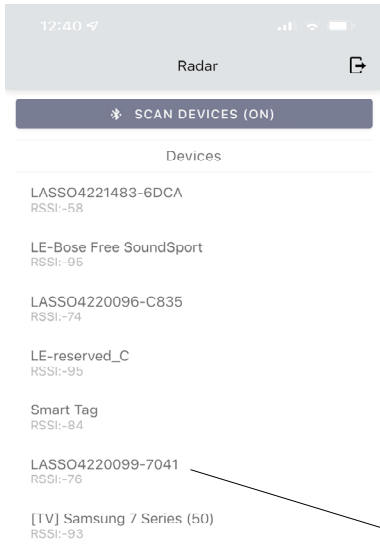
1asso

big springs

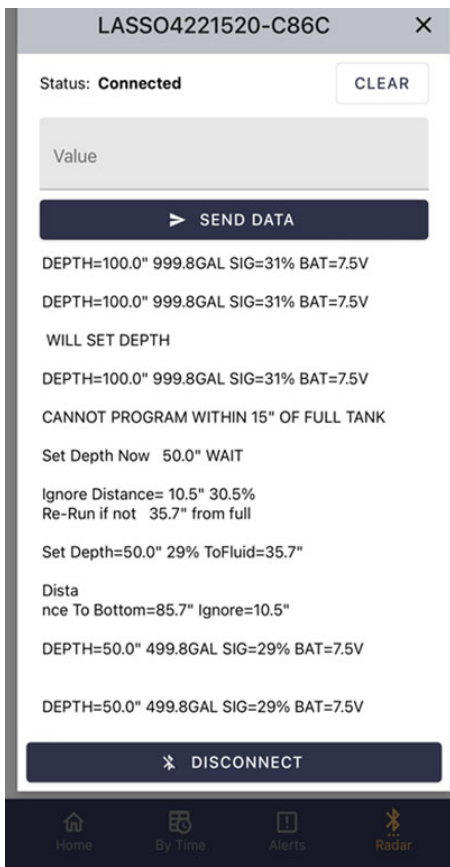
**Message Responses Sensor Description**

Channel	Show column	Description	Offset	Scale	Capacity	Min alert	Max alert
Channel 1	<input checked="" type="checkbox"/>	LEVELA FT	-10000	0.01	20		
Channel 2	<input checked="" type="checkbox"/>	TEMPA F	-10000	0.01	120		
Channel 3	<input checked="" type="checkbox"/>	LEVELB FT	-10000	0.01	20		
Channel 4	<input checked="" type="checkbox"/>	TEMPB F	-10000	0.01	120		
Channel 5	<input checked="" type="checkbox"/>	FLOW3017A	0	1	65535		
Channel 6	<input checked="" type="checkbox"/>	FLOW3018A	0	1	65535		
Channel 7	<input checked="" type="checkbox"/>	FLOW3019A	0	1	65535	1000	20000

# APP



SELECT Sigma



LIST OF ALL Sigma  
LASSOxxxxxxx-yyyy  
xxxxxxx=SERIAL NUMBER  
yyyy=ID OF BLUETOOTH MODULE

CLICK ON ANY Sigma TO COMMUNICATE  
WITH THAT Sigma

THE APP CAN WAKE THE Sigma UP FROM A  
DEEP SLEEP.

Sigma CALLS OUT EVERY 10 SECONDS SO  
THERE MAY BE A DELAY.

REMEMBER TO CLOSE THE APP WHEN DONE  
OR YOU WILL RUN DOWN THE BATTERY.

UPDATE OF Sigma STATUS AND ANY  
COMMANDS YOU SEND.

**iPhone CONNECTED**

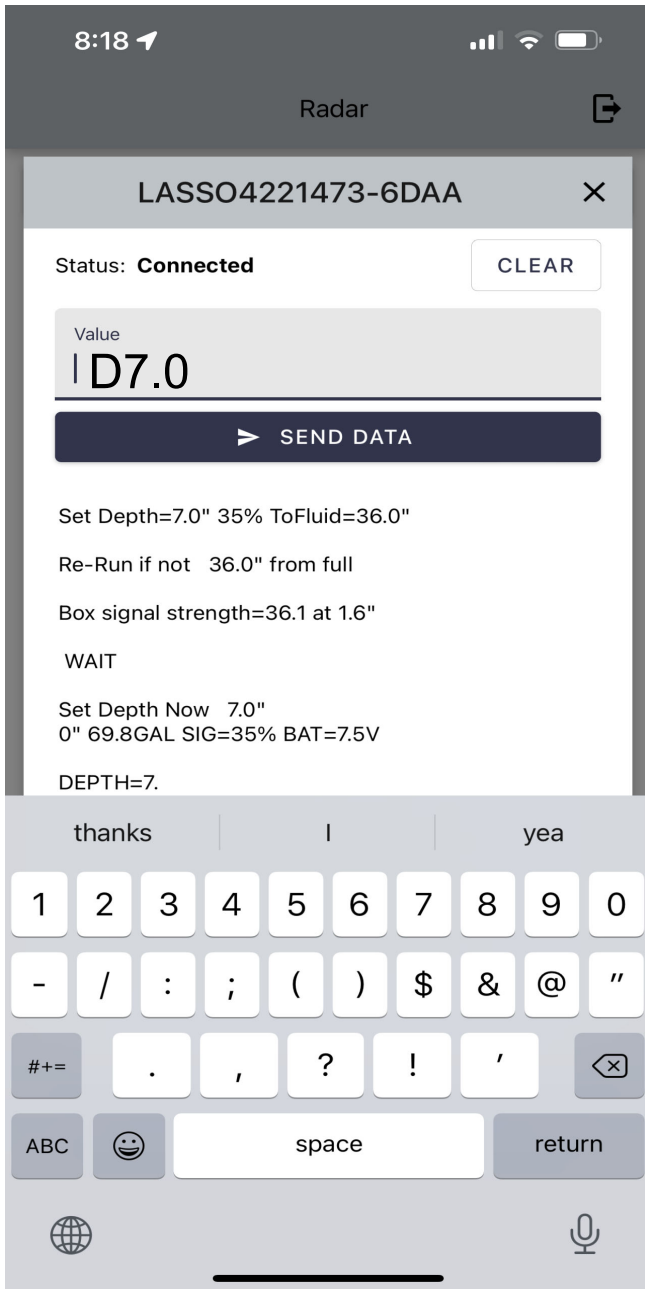
Touching the Lasso 0-xxxxx on the iPhone or pressing the Wake button on the remote display will wake the Sigma and start communication. There may be many Sigma to choose from on your phone.

REAL TIME DISPLAY

**Display off. Sleep Soon.**

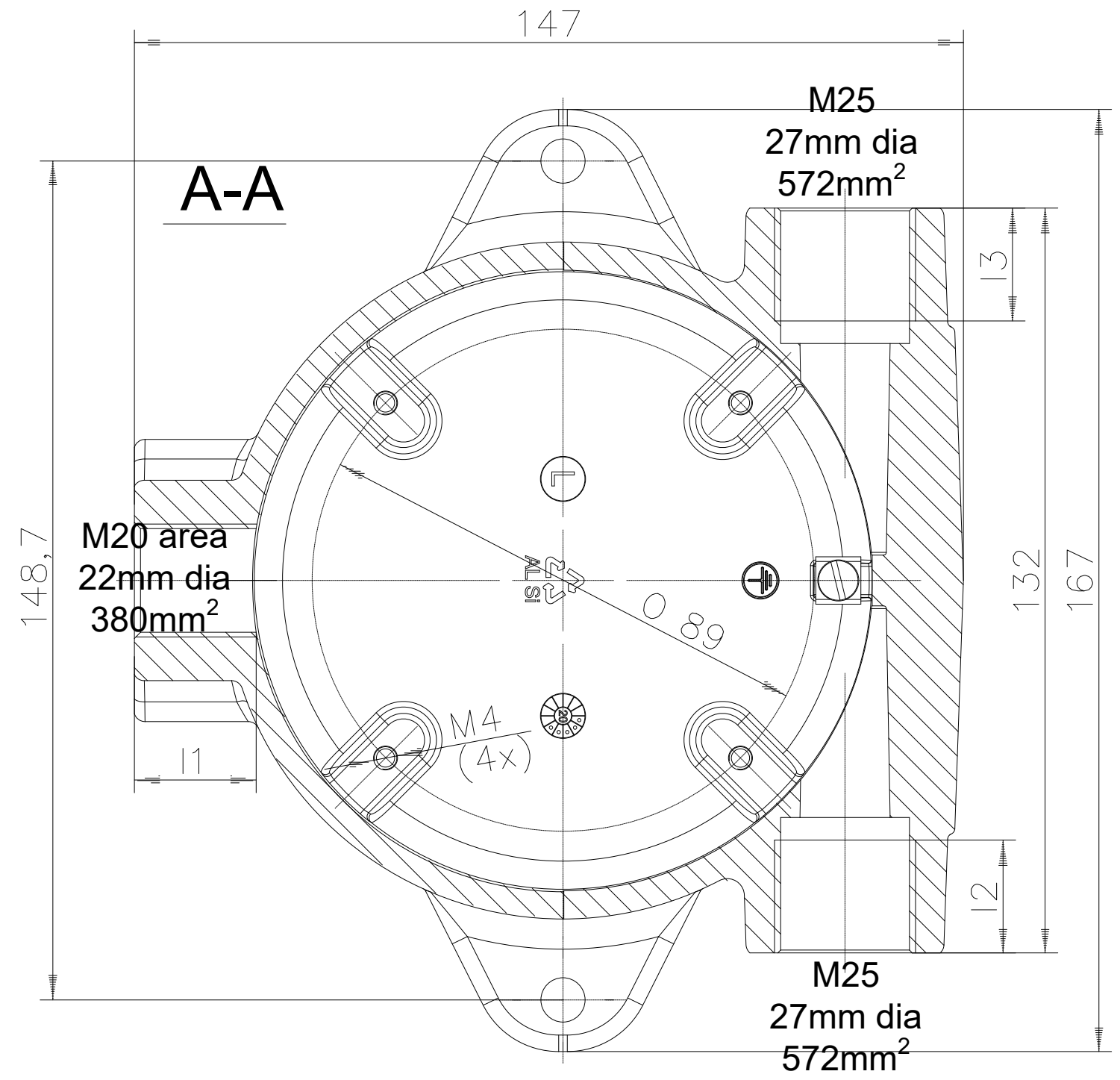
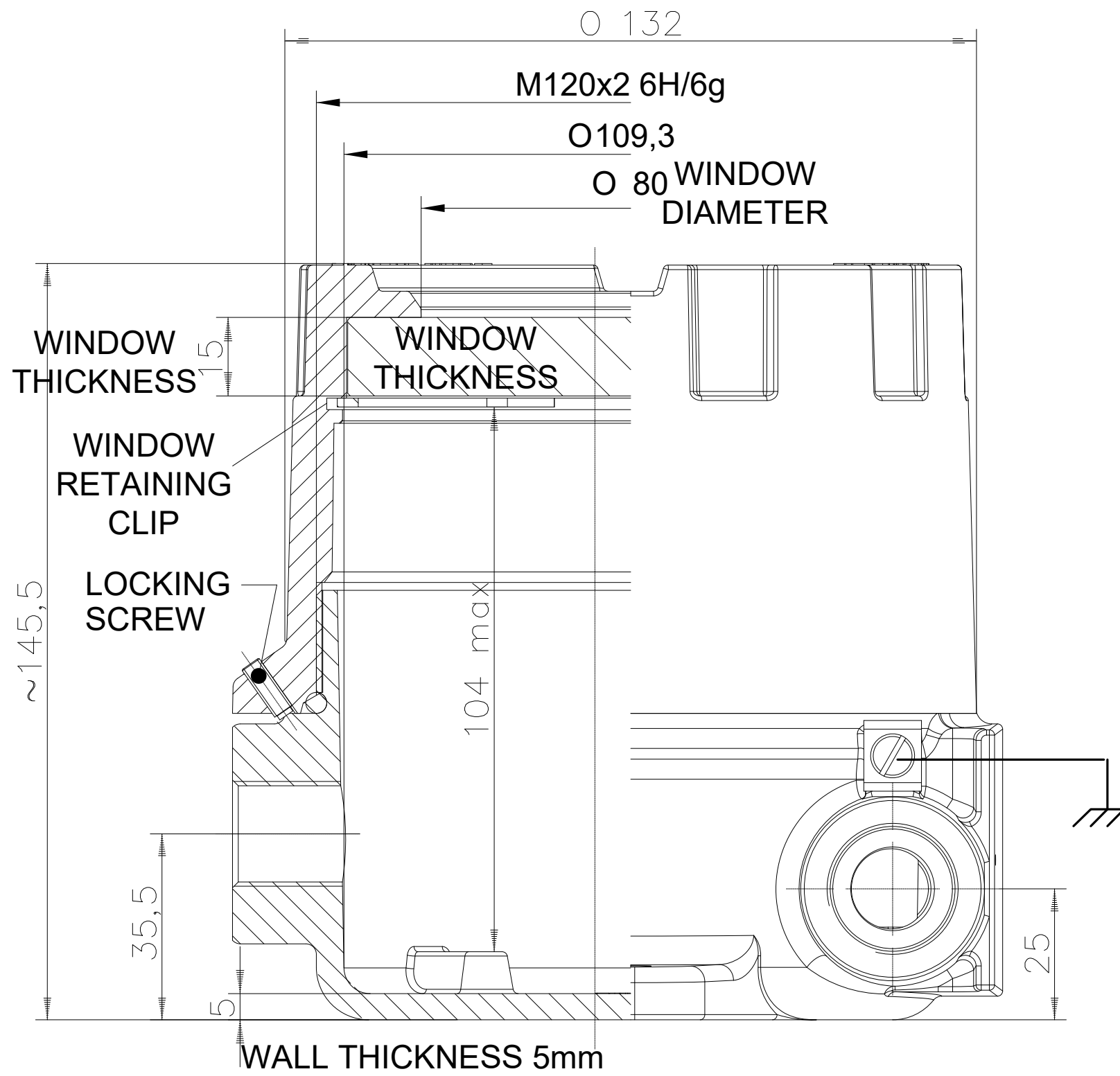
iPhone disconnected so sleep.

# Sigma APP SEND COMMANDS



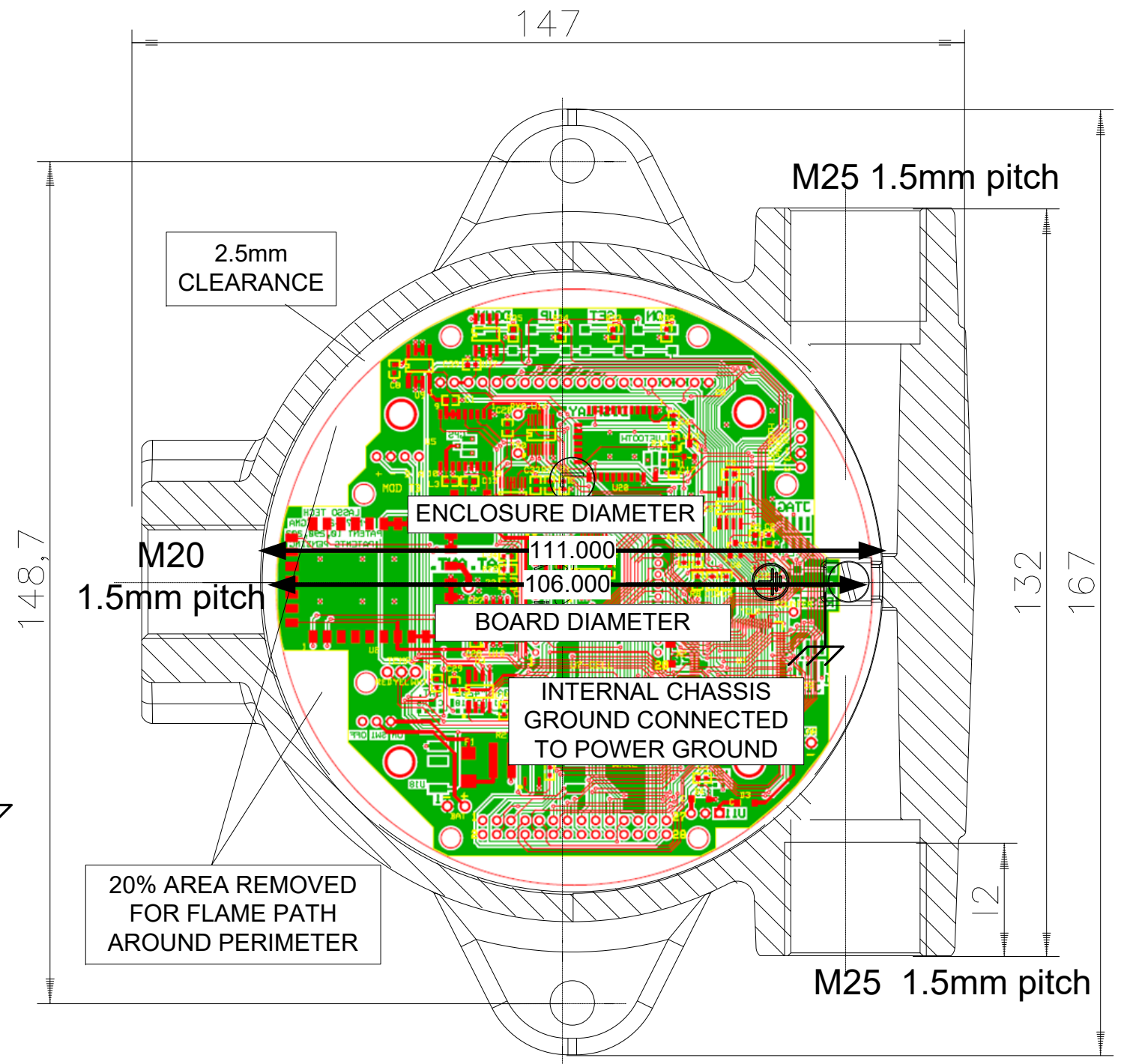
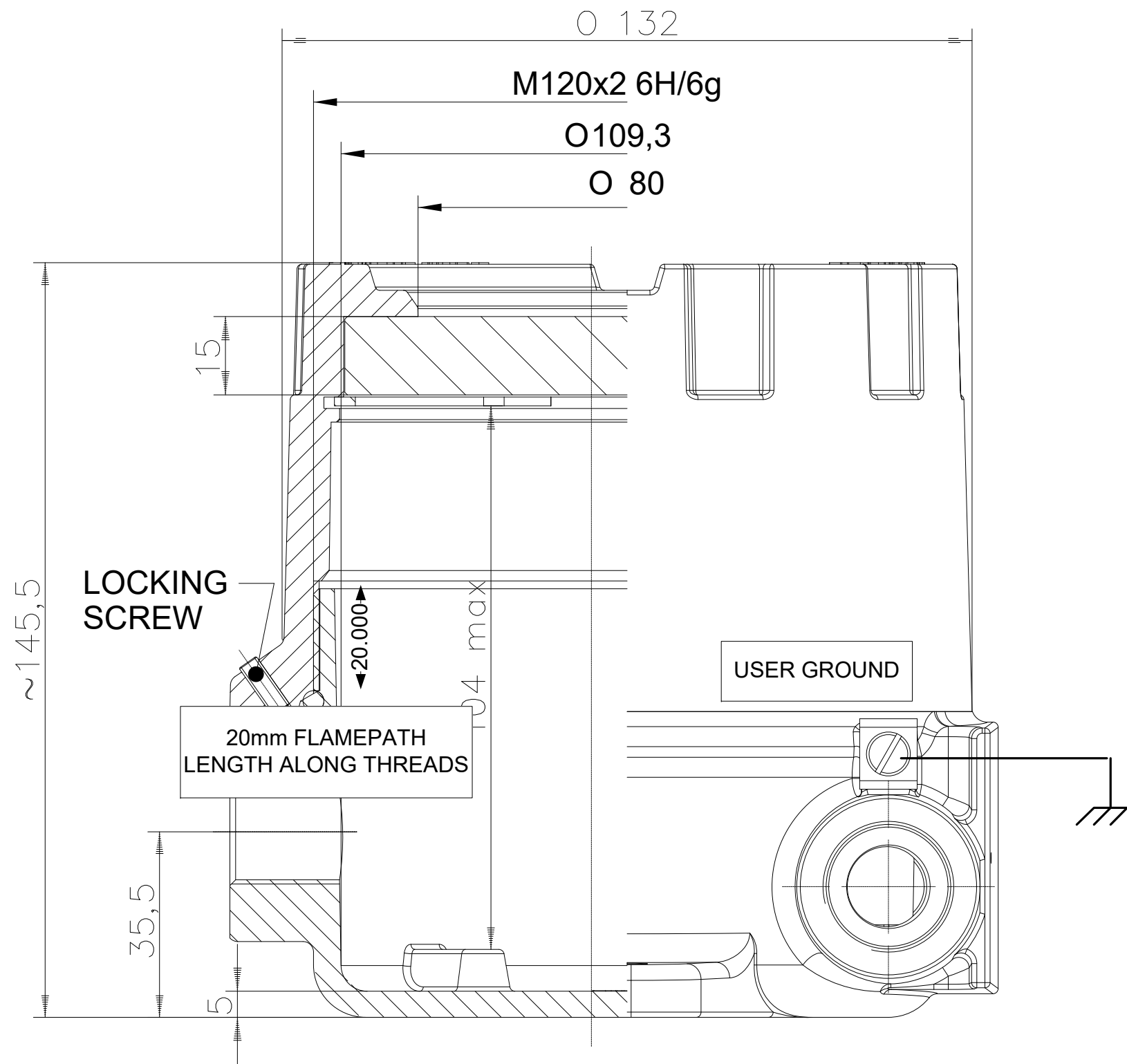
SEND INSTALLATION COMMANDS TO THE Sigma. COMMANDS ARE LISTED ON THE NEXT PAGE.

USE **SEND DATA** BUTTON  
**CLEAR** SCREEN IF NEEDED.



All dimensions in mm

**LASSO**  
 Technologies, LLC  
 Lasso Technologies, LLC.  
 WWW.LASSO.COM  
 SIGMA DIMENSIONS  
 July 17, 2024  
 Drawing 70420-2



**ENCLOSURE VOLUME, FLAMEPATH**

Total Volume of empty enclosure 850mL

Enclosure Volume with components inside 615mL

Difference is

**Volume of Components** 225mL Housing ID=111.6mm Board Diameter=106.6mm.

**Clearance** between edge of board and enclosure=2.5mm

Length of **Flamepath** along threads of housing 20mm

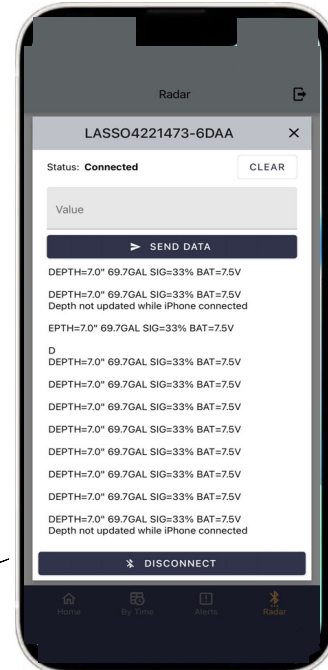
All dimensions in mm

**LASSO**  
Technologies, LLC

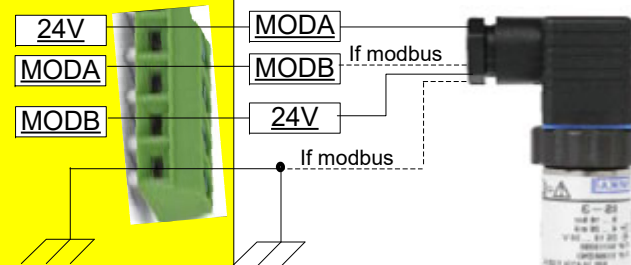
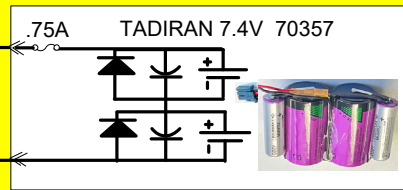
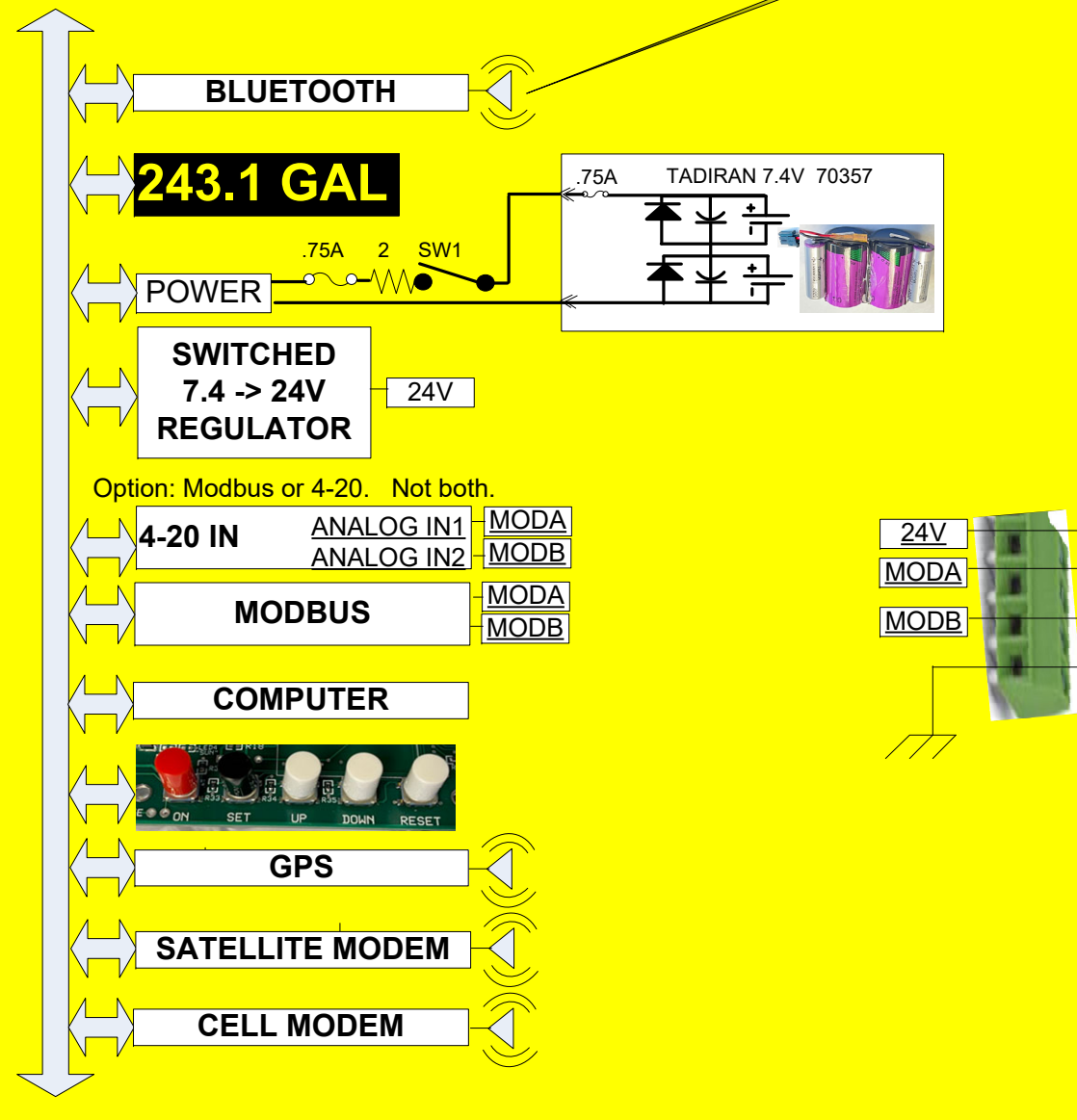
Lasso Technologies, LLC.  
WWW.LASSO.COM  
SIGMA FLAMEPATH. VOLUME.

July 17, 2024

Drawing 70420-3



MUST USE LIMATHERM ENCLOSURE XD-120Lwin  
(3) M25 metric threads



EXAMPLE SENSOR



CHASSIS MUST BE TIED TO EARTH GROUND USING SCREW LUG ON HOUSING

### BATTERY CARE

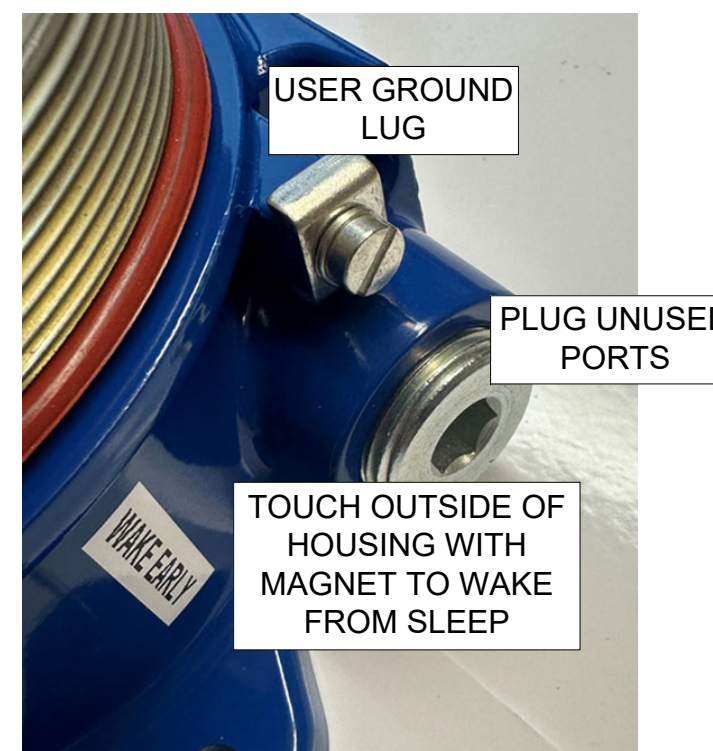
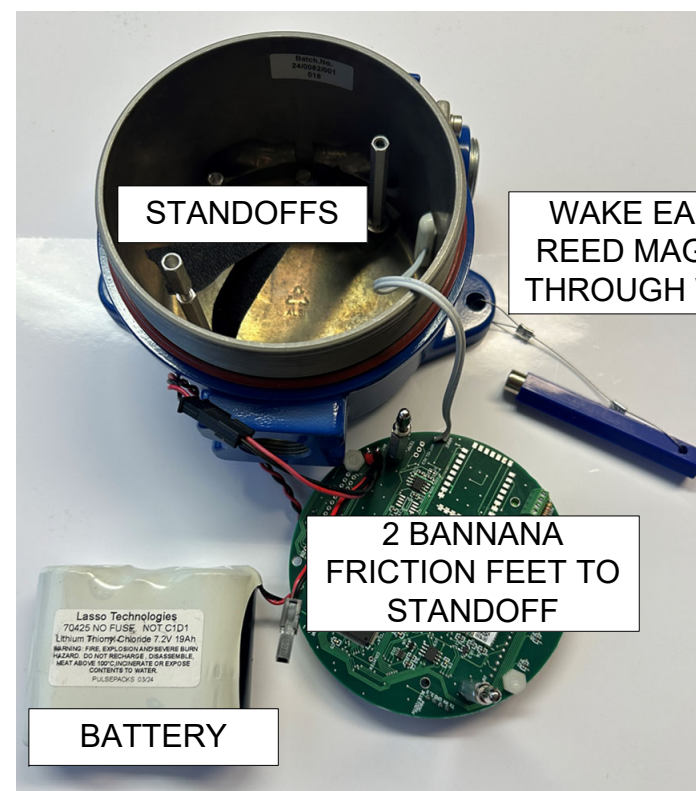
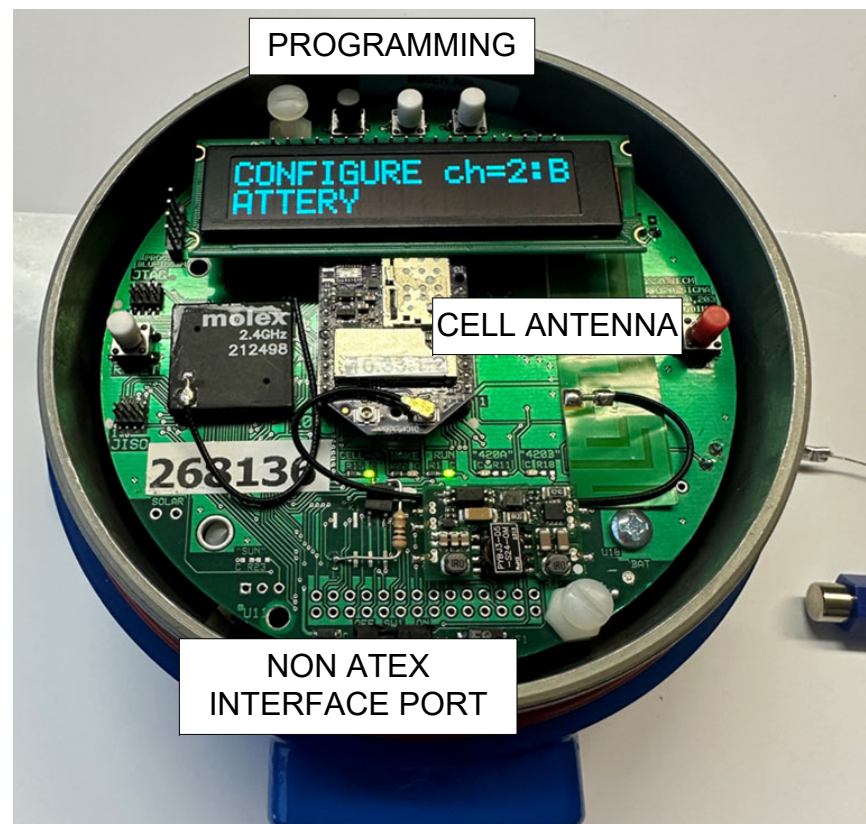
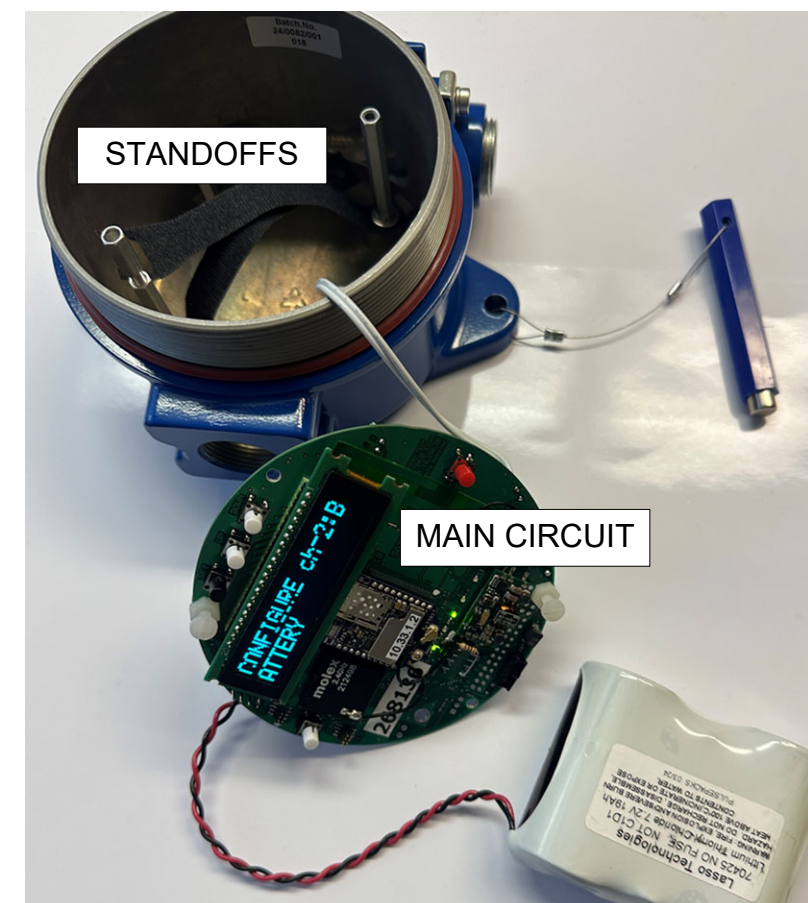
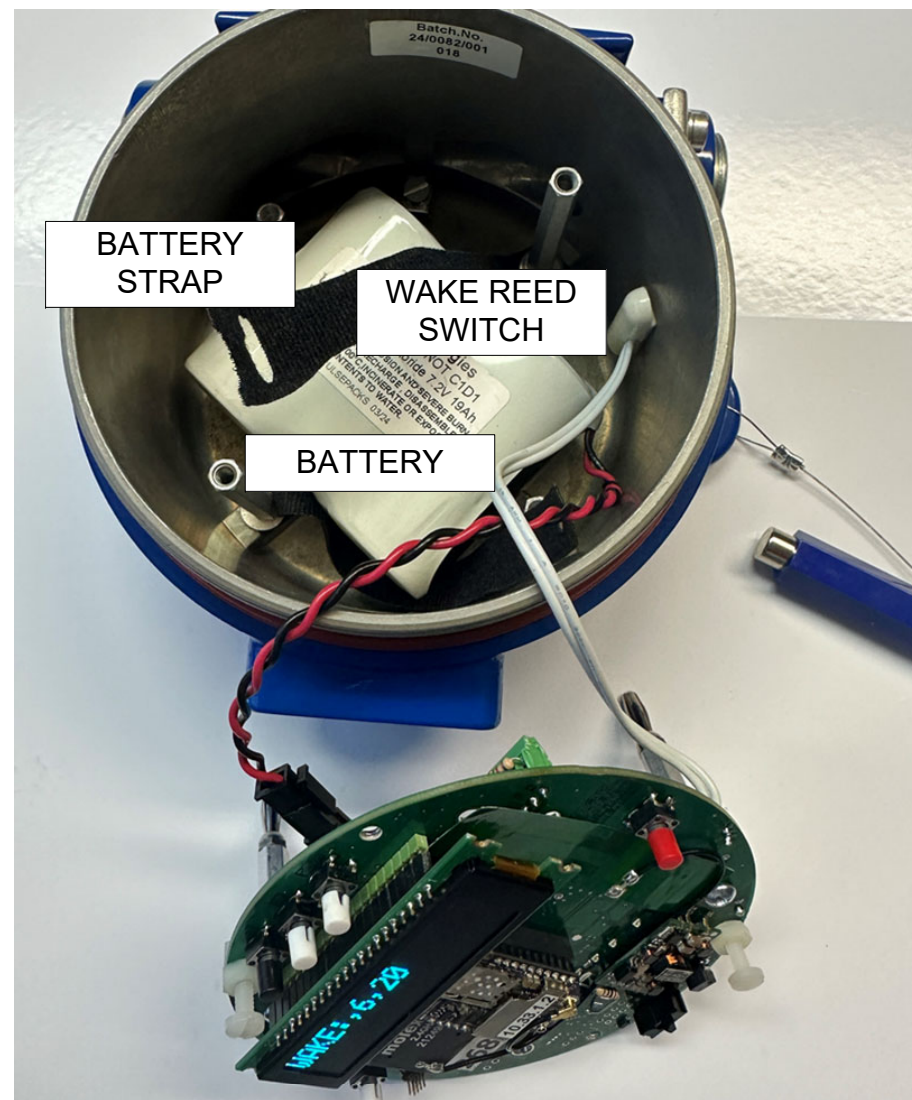
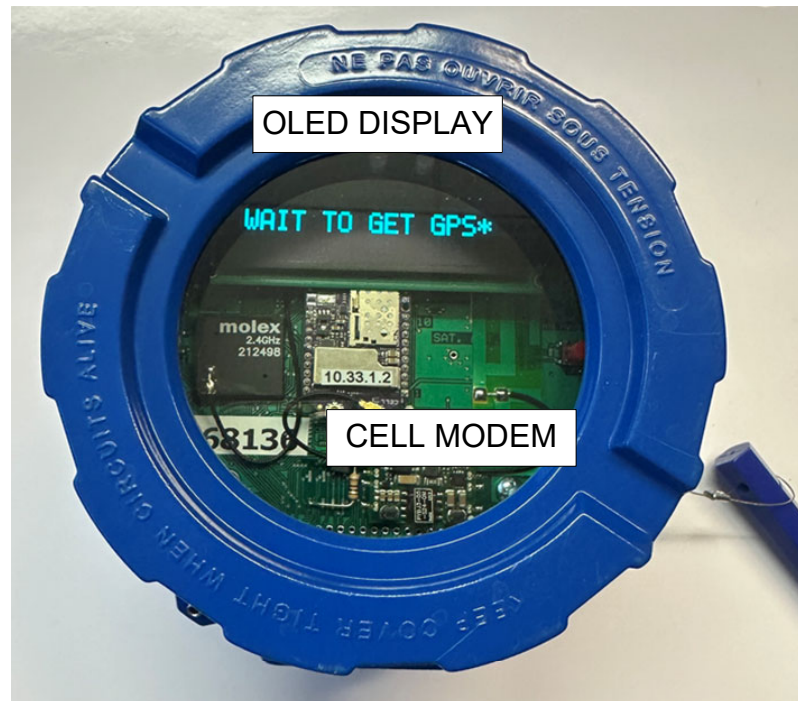
[1] 70357 Tadiran BATTERY  
19Ahr 3.6V X 2 -55C to 85C  
NOT RECHARGEABLE  
1 or 2 batteries may be used

**PROTECTION**  
2 diodes  
In-line resistor current limit  
**FUSES**  
lithium-thionyl chloride.

Do not use Substitutes.  
Available from Lasso.com  
Do not charge lithium batteries.  
Do not change batteries in hazardous areas.

**LASSO**  
Technologies, LLC  
Lasso Technologies, LLC.  
WWW.LASSO.COM  
USER SCHEMATIC  
July 17, 2024  
70420-4 SIGMA





MUST USE ATEX CABLE GLANDS  
 SUGGESTED: EUTEX A2F100 METRIC  
 Size 20A2F100 – 11mm O.D. cable O.D.:  
 7mm- 13.5mm  
 Size 25A2F100 – 17mm O.D. cable O.D.:  
 11.5mm -19.5mm



UNUSED PORT PLUGS  
 SUGGESTED: EUTEX  
 767DM2 M20  
 767DM3 M25

M20, M25 GLANDS USED IN 3  
 DIFFERENT PORTS FOR CABLES.



TYPICALLY PROVIDED BY LASSO OR  
**eutexinternational.com**  
 Sonia Dauge (346)-415-6057  
 sdauge@eutexinternational.com  
 1225 N Loop W #1110, Houston, TX. 77008

**CONDUCTOR**

Soft annealed flexible  
 stranded tinned copper  
 per IEEE 1580 Table 11.

**PAIRS / TRIADS**

Each pair/triad is twisted  
 with a bare tinned drain  
 wire. Each pair/triad  
 is shielded with  
 polyester-backed  
 aluminum foil tape to  
 afford 100% coverage.  
 Pair to pair, or triad  
 to triad, isolation –  
 plus overall shielding –  
 is provided.

**INSULATION**

GEXOL® cross-linked  
 flame retardant polyolefin,  
 meeting the requirements  
 for Type P of IEEE 1580  
 and Type X110 of  
 UL 1309/CSA 245.  
 600V/IEC 1000V.

**JACKET**

A black, flame  
 retardant, oil,  
 abrasion, chemical  
 and sunlight resistant  
 thermoset compound  
 meeting UL 1309/  
 CSA 245 and  
 IEEE 1580.



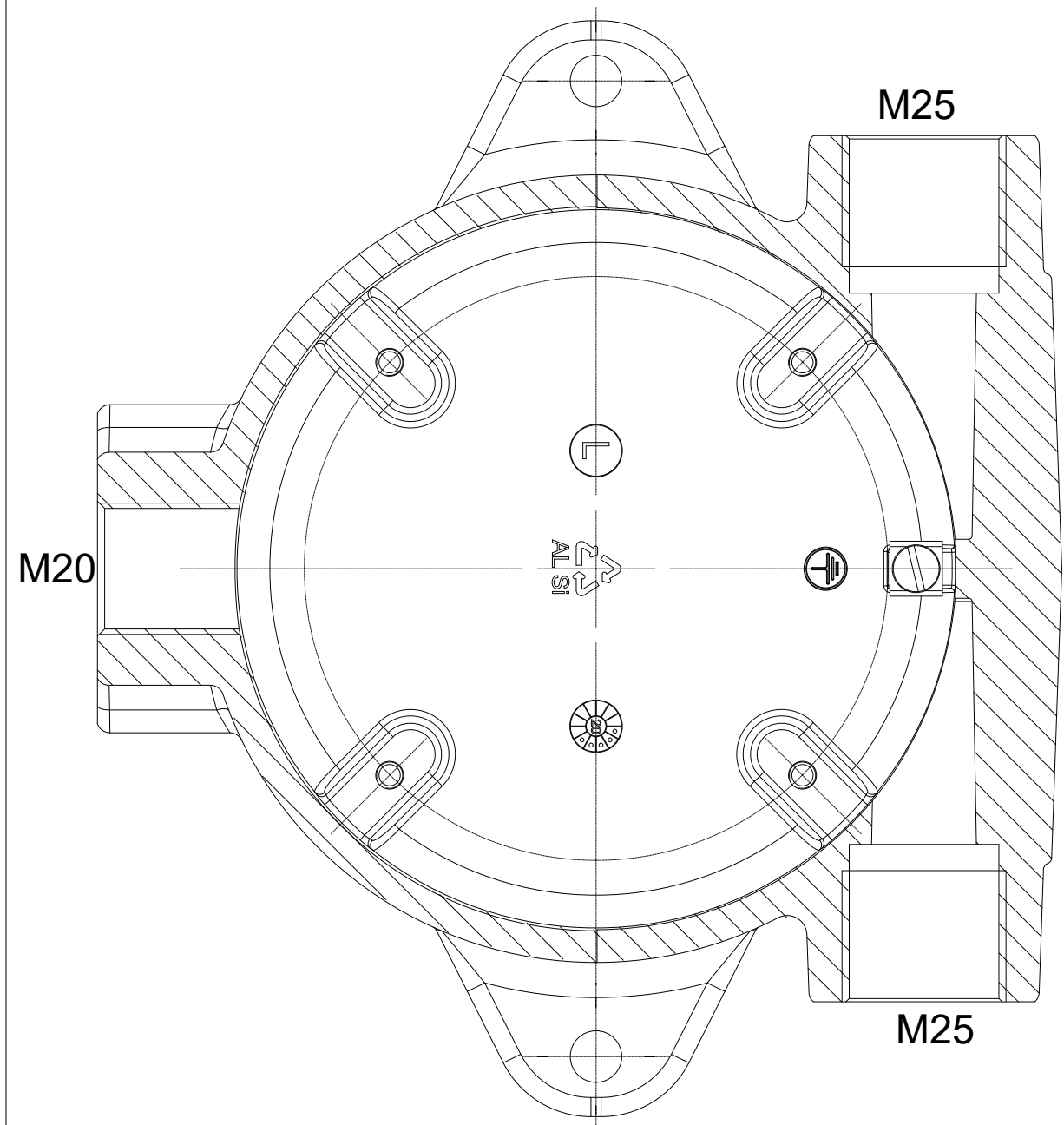
SUGGESTED WIRE IS NEXAN  
 UL Listed as TC-ER-HL, (E123629):  
 Class 1, Div 1 and Zone 1 environments  
 -40C to 90C

610CIRAG2 4-20mA 1 pair .437" 11mm  
 611CIRAG2 modbus 2 pair .7" dia 17mm  
 16AWG cond dia .059" 1.5mm

**Nexan Americable** 346-773-2800  
 Doug.miller@nexans.com  
 2747 West Grand Parkway N • Suite A • Katy, TX 77449  
 713-896-5800

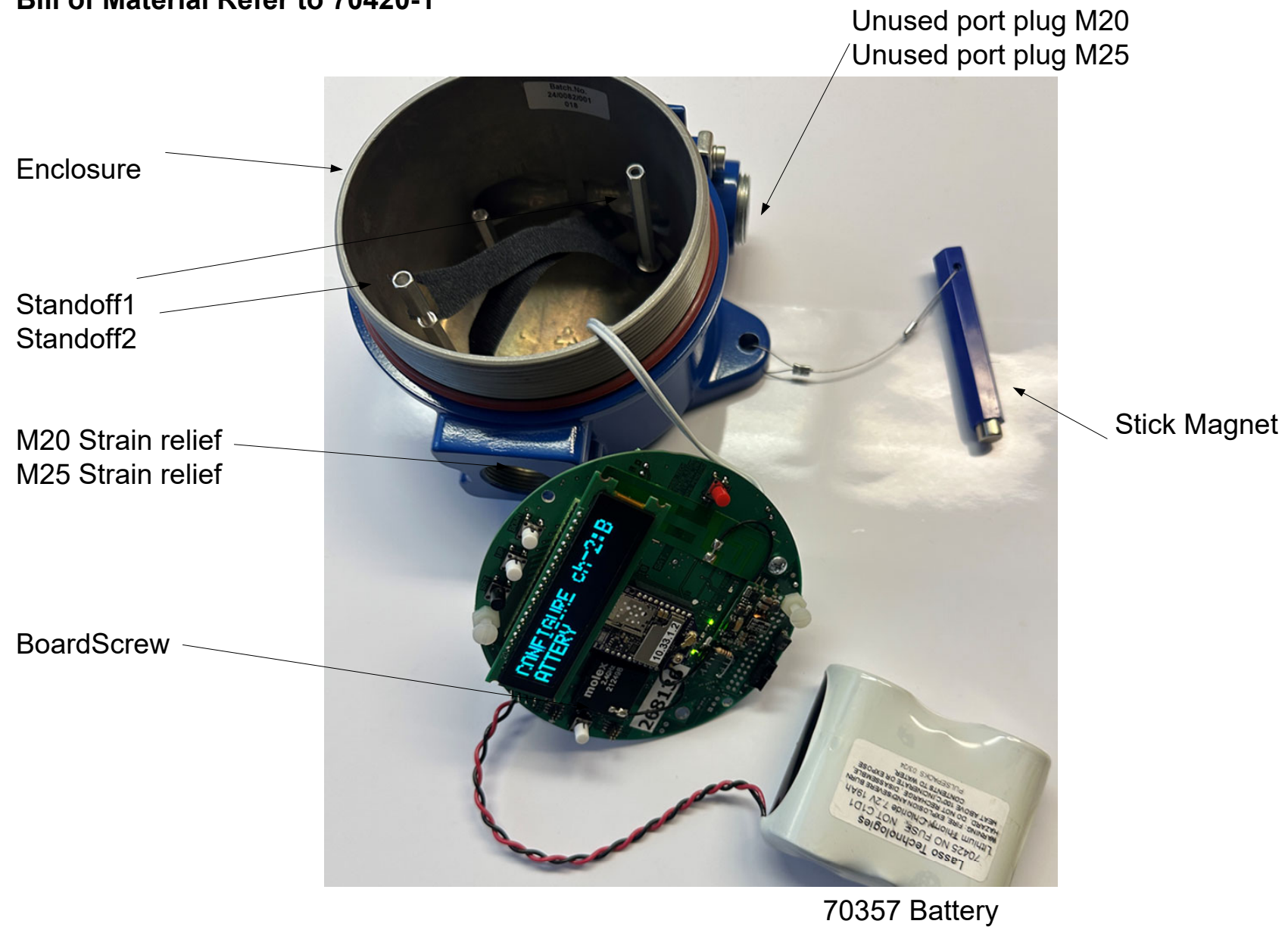
4.5ohm/1000ft  
 32nF/1000ft  
 .2mH/1000ft

Housing tapped for different strain reliefs.

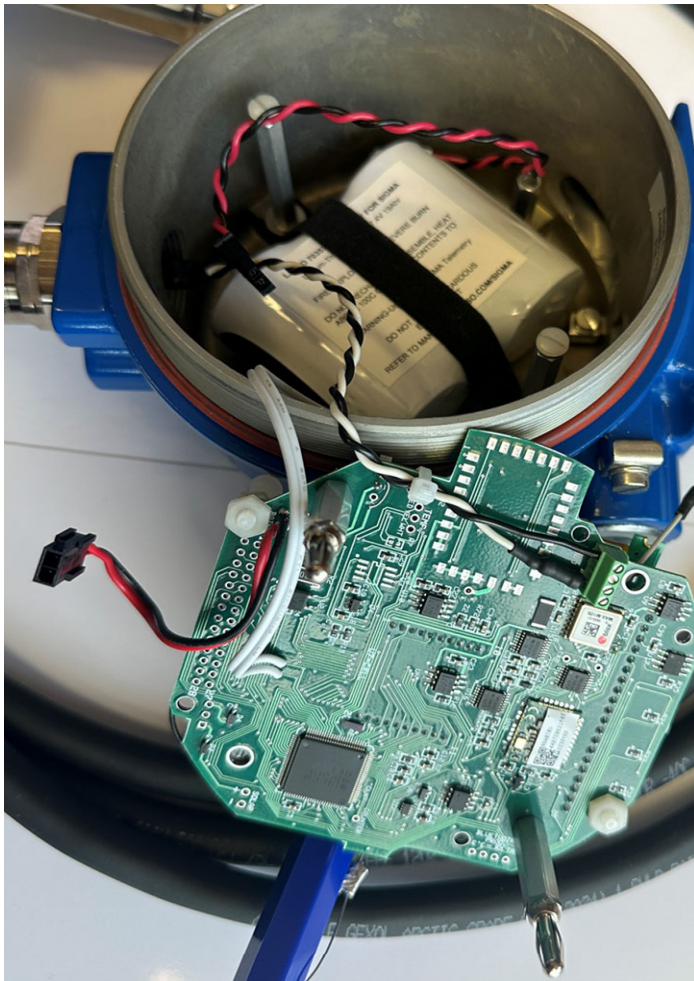


<b>LASSO</b> Technologies, LLC	
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SIGMA	
CABLE GLANDS. WIRE	
July 17, 2024	
Drawing 70420-7	

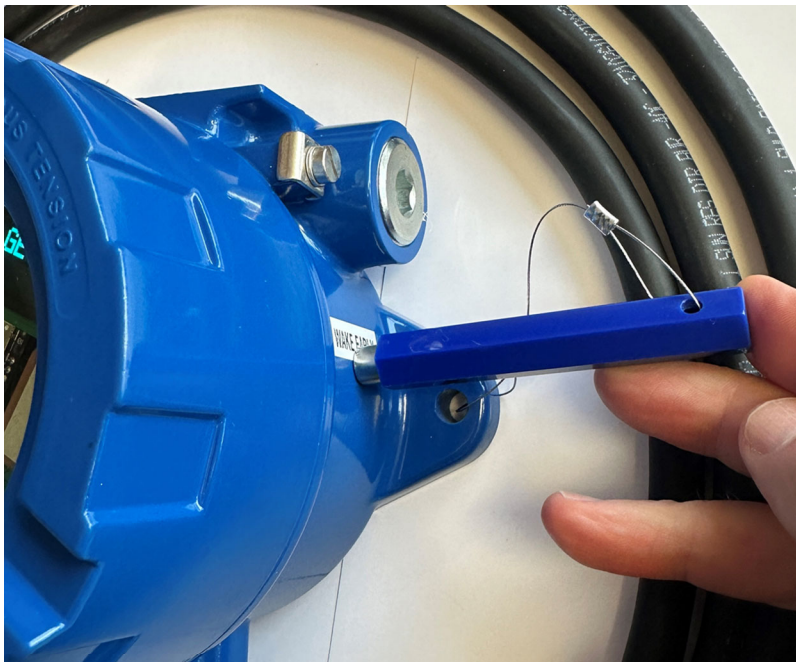
**Bill of Material Refer to 70420-1**




Lasso Technologies, LLC. WWW.LASSO.COM
SIGMA
Assembly Parts
July 18,2024
Drawing 70420-9



- Contact Lasso for a spare battery.
- Only Lasso battery 70357-B can be used in the Sigma.
- Move the Sigma to a non-hazardous location.
- Remove the lid and pull directly up on the two white plastic screws.'
- Disconnect the black battery disconnect.
- Swap the battery.
- Return the lid and Tighten so it does not leak water.
- Restore service.

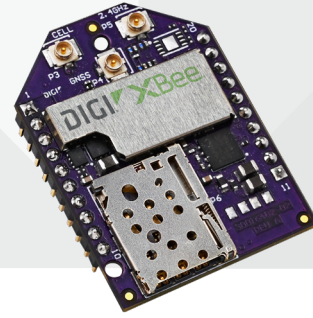


Place the Wake Early magnet near the label to wake the Sigma from sleep. This trips a reed switch on the inside wall. A button is restricted under ATEX IECeX rules.

<b>LASSO</b> Technologies, LLC Lasso Technologies, LLC. WWW.LASSO.COM
BATTERY REPLACEMENT
Aug 14,2024
70420 SIGMA



GLOBAL LTE-M/NB-IOT  
SMART MODEM



Manage this device with  
**Digi Remote Manager**  
(1-year license included free)

# DIGI XBEE 3 GLOBAL AND LOW-POWER LTE-M/NB-IOT

## Compact, flexible cellular connectivity for IoT devices and gateways

Digi XBee® 3 Global LTE modules accelerate time-to-market for designers, OEMs and solution providers by quickly enabling wireless connectivity and easy-to-add functionality. Building on industry-leading technology, pre-certified Digi XBee 3 Global LTE modules offer the flexibility to switch between multiple frequencies and wireless protocols as needed.

Digi XBee 3 Global LTE modules are a key offering in the **Digi XBee Ecosystem** of wireless modules, adapters, tools and software — all engineered to accelerate product and application development, deployment and management.

Ideal for low-data (typically under 5 MB per month and where

latency is not critical), low-power, low-cost applications, Digi XBee 3 Global LTE-M/NB-IoT modules feature a power-saving mode which extends sleep time and battery life.

With **Digi Remote Manager**®, Digi XBee 3 Global LTE modules can be easily configured and controlled from a simple, central platform. Built-in **Digi TrustFence**® security, identity and data privacy features use more than 175 controls to protect against new and evolving cyber threats.

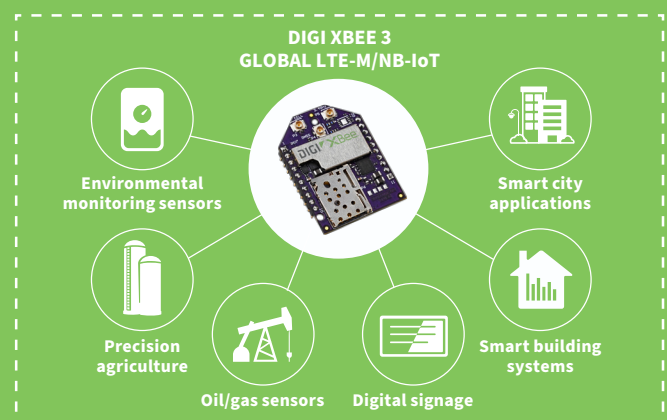
Standard Digi XBee API frames and AT commands, MicroPython and **Digi XCTU**® software tools simplify setup, configuration, testing and adding or changing functionality.

### FEATURES AND BENEFITS

- One hardware platform for use on LTE-M/NB-IoT networks with multi-band support to integrate with many carriers
- FCC certified and carrier end-device certified
- Integrated MicroPython programmability for edge compute
- MQTT support for Microsoft Azure and Amazon AWS
- Low power consumption optimized for long battery life
- Integrated with **Digi TrustFence**® security framework
- Manage and configure with **XCTU**® and **Digi Remote Manager**®
- **Digi XBee**® Transparent and API modes simplify design
- CE/RED certified and network tested
- 2G fallback/GNSS
- Bluetooth® Low Energy for beaconing, connecting to Bluetooth sensors and local configuration using the **Digi XBee Mobile app**
- Includes SIM, ready to activate at [shop.digi.com](http://shop.digi.com)

\*SIM included in select SKUs

### APPLICATION EXAMPLE



### RELATED PRODUCTS



Digi XBee® 3 Development Kit



ConnectCore® 6UL SBC Pro



Digi XCTU®



Digi Remote Manager®



Digi Wireless Design Services

## SPECIFICATIONS

## DIGI XBEE 3 GLOBAL LTE-M/NB-IOT

## | LOW-POWER LTE-M/NB-IOT

## HARDWARE

CELLULAR CHIPSET	Telit ME310-WW	Telit ME310-W1
FORM FACTOR	Digi XBee® 20-pin through-hole	
ANTENNA OPTIONS	1 U.FL (cellular), 1 U.FL (Bluetooth®), 1 U.FL (GNSS)	
DIMENSIONS	24.38 mm x 32.94 mm (0.96 in x 1.3 in)	
OPERATING TEMPERATURE	-40 °C to 85 °C (-40 °F to 185 °F)	
SIM SIZE	4FF Nano	

## INTERFACE AND I/O

DATA INTERFACE	UART, SPI, USB	
OPERATING MODES (LTE-M)	Transparent and API over serial, PPP over USB	
OPERATING MODES (NB-IOT)	Transparent, API, UDP	
SECURITY	Digi TrustFence® security with secure boot and protected JTAG	
CONFIGURATION TOOLS	Digi XCTU® (local), Digi Remote Manager® (OTA); 1-year license included free	
EMBEDDED PROGRAMMABILITY	MicroPython with 1024 kB Flash / 64 kB RAM	
I/O	4 ADC lines (10-bit), 13 digital I/O, USB, I2C	
BLUETOOTH	Bluetooth Low Energy (BLE)	

## CELLULAR CHARACTERISTICS

TRANSMIT POWER	Up to 23 dBm (LTE-M/NB-IoT), up to 33 dBm (2G)	
RECEIVE SENSITIVITY (LTE-M)	-105 dBm	
RECEIVE SENSITIVITY (NB-IOT)	-113 dBm	
SUPPORTED BANDS	LTE bands: B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B27, B28, B66, B71 and B85 2G bands: B2, B3, B5, B8	LTE bands: B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B27, B28, B66, B71 and B85
DOWNLINK/UPLINK SPEEDS (LTE-M)	Up to 588 kbps downlink, up to 1 Mbps uplink	
DOWNLINK/UPLINK SPEEDS (NB-IOT)	Up to 120 kbps downlink, up to 160 kbps uplink	
DOWNLINK/UPLINK SPEEDS (2G)	Up to 264 kbps downlink, up to 210 kbps uplink	
DUPLEX MODE	Half-duplex	

## POWER REQUIREMENTS (AT 3.3 VDC INPUT POWER)

SUPPLY VOLTAGE	3.3 to 4.3 VDC	
PEAK TRANSMIT CURRENT	550 mA with Bluetooth disabled; 610 mA with Bluetooth enabled	
AVG TRANSMIT CURRENT (LTE-M)	1.25 A peak, 410 mA average (GM2 modules); 450 mA peak, 200 mA average (GM1 modules)	
AVG TRANSMIT CURRENT (NB-IOT)	1.3 A peak, 410 mA average (GM2 modules); 400 mA peak, 270 mA average (GM1 modules)	
AVG TRANSMIT CURRENT (2G)	2.1 A peak, 320 mA average (GM2 modules)	
IDLE	200 mA peak, 100 mA average	
POWER SAVE MODE	20 µA	
DEEP SLEEP	2.65 µA	

## REGULATORY AND CARRIER APPROVALS

FCC (USA)	MCQ-XB3M2	
ISED (CANADA)	1846A-XB3M2	
CE / RED (EUROPE)	Complete	
RCM (AUSTRALIA/NEW ZEALAND)	Pending	
UKCA (UNITED KINGDOM)	Complete	
PTCRB, AT&T AND VERIZON	Complete	

## WARRANTY

PRODUCT WARRANTY	1-year	
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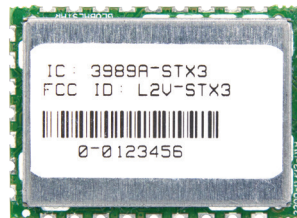
# STX3™

## SATELLITE TRANSMITTER

POWERED BY ONE OF THE WORLD'S MOST MODERN SATELLITE NETWORKS

Globalstar offers the Simplex Transmitter Unit (STX3) to help customers design and build compact and efficient communications devices. Using the Globalstar Simplex data network, the **STX3** allows information to be transmitted from areas well beyond the reach of reliable cellular coverage around the globe.

The **STX3** provides additional opportunities to integrate satellite connectivity into products used for vehicle and asset tracking, remote data reporting and data logger reporting that have limited size requirements. Affordable pricing, low power consumption and its small size make the **STX3** satellite transmitter a highly efficient device ready for integration in a wide variety of applications.



The **STX3** is a low cost, OEM simplex module which sends one-way data messages via the Globalstar Simplex Network when integrated into a tracking or monitoring device. The **STX3** is ideal for delivering remote sensing, tracking and monitoring applications.

### ADVANTAGES AND FEATURES

- Increases reliability through multiple transmissions
- Global coverage
- Low power consumption
- Surface mount design
- Versatile use: Module can be integrated for use in a wide range of applications including liquid petroleum gas (LPG) tanks, water tanks, pipelines, electricity, meters, cars, trucks, boats and sea or land containers

### OPERATIONAL MODES

- SLEEP MODE**  
Vcc is applied to the unit, no transmissions are pending, no serial activity
- ACTIVE MODE**  
The STX3 is active and responding to the serial port, but is not transmitting
- STANDBY MODE**  
The STX3 is inactive between transmission burst, but is not transmitting
- TRANSMIT MODE**  
The unit is transmitting an RF packet

### TECHNICAL SPECIFICATIONS

**SIZE** 1130 mils x 810 mils (28.70mm x 20.57mm)  
Overall thickness of the board with components/shields is 163 mils (4.13 mm)

**CERTIFICATIONS** FCC CFR Part 25 Modular Certification  
ISED  
Anatel  
CE Tested

**TECHNOLOGY** Operates over the Globalstar Simplex Data Network

When designing using the **STX3**, provisions should be made for regulatory testing including continuous RF testing for spectral measurements and power measurements.

NOTE: All products utilizing the **STX3** Simplex Module require Globalstar Network Certification. We recommend you contact the Globalstar Product Certification Team as early as possible in your development cycle.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
TX output power	25°C, Vcc=Vrf=3.3 volts, 50 ohm load	18.75	19.0	19.75	dB
Transmit mode supply current	-30° to +85° C, Vcc=Vrf=3.3 volts, 50 ohm load	325	390	475	mA
Active mode supply current	-30° to +85°C, Vcc = 3.3 volts	2	2.25	3	mA
Standby mode supply current	-30° to +85°C, Vcc = 3.3 volts	3	12	55	uA
Sleep mode supply current	-30° to +85°C, Vcc = 3.3 volts	3	7	50	uA

For more information on Globalstar's simplex communications, visit [Globalstar.com/Simplex](http://Globalstar.com/Simplex)

# Pressure transmitter Intrinsic safety Ex ia Model IS-3

WIKA data sheet PE 81.58



For further approvals,  
see page 10

## Applications

- Chemical, petrochemical industry
- Oil, natural gas
- Machine building
- Compressors, compressor systems

## Special features

- Ignition protection type intrinsically safe (Ex ia) with Equipment Protection Level (EPL) Ga, Da, Ma
- Large selection of common approvals for use in hazardous areas, e.g. ATEX, IECEx, FM, CSA, EACEx or NEPSI
- Exceptionally large variety covers almost all applications – even under extreme operating conditions
- Excellent quality and proven technology



Pressure transmitter, model IS-3

## Description

The model IS-3 intrinsically safe pressure transmitter has been designed for gas hazardous areas (EPL Ga) and can also be used with combustible dusts (EPL Da) and in mines susceptible to firedamp (EPL Ma). The model IS-3 is suitable for pressure ranges up to 6,000 bar [87,000 psi] and medium temperatures up to 200 °C [392 °F]. It features numerous approvals, such as ATEX, IECEx, FM and CSA. Thanks to the flush design variant, the IS-3 is also suitable for crystalline and viscous media, and also for applications where residue-free cleaning is needed.

### Large selection of approvals

The model IS-3 offers many globally established approvals for use in hazardous areas – even for smaller markets. For system suppliers, approval combinations reduce the number of instrument variants that they have to keep available for their markets.

### Exceptionally large variety

The model IS-3 shines with its level of customisation and diverse integration possibilities. The high-pressure version is designed for a maximum of 6,000 bar [87,000 psi]. Depending on the configuration, ingress protection of to IP68 and use with medium temperatures of to +200 °C [392 °F] are possible.

### Excellent quality, proven in the field

The model IS-3 and its predecessors have been used reliably for over 20 years. The consistently high quality and its reliable function are regularly confirmed by both internal and external audits.














<b>Material</b>		
<b>Material (wetted)</b>		
Measuring ranges $\leq 25$ bar [ $\leq 400$ psi]	G 1/2 B flush	316 Ti
	G 1 B flush	
	G 1 B hygienic	316L
	Process connections with pressure port	316L and 316Ti
	Process connections with pressure port and permissible temperature range $> 80$ °C or $\leq 20$ °C [ $> 176$ °F or $\leq 68$ °F]	316L and 316Ti
Measuring ranges $\geq 40$ bar [ $\geq 500$ psi]	Process connections with pressure port and permissible temperature range $> 80$ °C or $\leq 20$ °C [ $> 176$ °F or $\leq 68$ °F]	316L and 316Ti and S13800
Measuring ranges $\geq 40$ and $\leq 1,050$ bar [ $\geq 500$ and $\leq 15,000$ psi]	Process connections with pressure port	316Ti and S13800
Measuring ranges $> 1,050$ bar [ $> 15,000$ psi]	Process connections with pressure port	S13800
<b>Seal</b>	→ See table „Process connection”	
<b>Material (in contact with the environment)</b>		
Case	Stainless steel	
Electrical connection	→ See table „Electrical connection”	
<b>Pressure transmission medium</b>		
$< 25$ bar [400 psi]	Synthetic oil	
$\geq 25$ bar [400 psi]	Dry measuring cell	
$\leq 25$ bar abs. [400 psi abs.]	Synthetic oil	

<b>Version for special media</b>		
<b>Food</b>	Food-compatible pressure transmission medium	
<b>Oil- and grease-free</b>	Residual hydrocarbon	$< 1,000$ mg/m <sup>2</sup>
<b>Hydrogen</b>	→ On request	
	Measuring ranges	$\geq 25$ bar [400 psi]
	Material (wetted)	316L and Elgiloy® (2.4711)
	Max. permissible temperature	30 °C [86 °F]
	→ The lower limit is determined by factors such as the seal etc., see also technical information IN 00.40 on the website.	

<b>Operating conditions</b>		
<b>Permissible temperature limits for ignition protection type Ex ia</b>		
Medium temperature limit / Ambient temperature limit	Permissible temperature ranges depend on the option selected above, the EPL, the temperature class, the selected electrical connection and the selected seal.	
Storage temperature limit	-15 ... +70 °C [5 ... 158 °F]	
<b>Permissible temperature limits for ignition protection type Ex ec and Ex tc</b>		
Medium temperature limit	T6: -15 ... +55 °C [5 ... +131 °F]	
	T4/T5: -15 ... +70 °C [5 ... +158 °F]	
Ambient temperature limit	T6: -15 ... +55 °C [5 ... +131 °F]	
	T4/T5: -15 ... +70 °C [5 ... +158 °F]	
Storage temperature limit	-15 ... +70 °C [5 ... +158 °F]	
<b>Ingress protection (IP code) per IEC 60529</b>	→ See table „Electrical connection”	

## Approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> EMC directive EN 61326 emission (group 1, class B) and immunity (industrial environments) Pressure Equipment Directive RoHS directive	European Union
	ATEX directive Hazardous areas - Ex i Zone 0 gas [II 1G Ex ia IIA T4/T5/T6 Ga] [II 1G Ex ia IIC T4/T5/T6 Ga] Zone 1 mounting to zone 0 gas [II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb] Zone 2 gas [II 3G Ex ic IIC T4/T5/T6 Gc X] Zone 20 dust [II 1D Ex ia IIIB T <sub>200</sub> 135 °C Da] [II 1D Ex ia IIIC T135 °C Da] Zone 21 mounting to zone 20 dust [II 1/2D Ex ia IIIB T <sub>200</sub> 135 °C Da/Db] [II 1/2D Ex ia IIIC T135 °C Da/Db] Mining [I M1 Ex ia I Ma] - Ex e Zone 2 gas [II 3G Ex ec IIC T4/T5/T6 Gc X] - Ex t Zone 22 dust [II 3D Ex tc IIIC T90 °C Dc X]	
	<b>IECEX</b> Hazardous areas - Ex ia Zone 0 gas [Ex ia IIA T4/T5/T6 Ga] [Ex ia IIC T4/T5/T6 Ga] Zone 1 mounting to zone 0 gas [Ex ia IIC T4/T5/T6 Ga/Gb] Zone 2 gas [Ex ic IIC T4/T5/T6 Gc X] Zone 20 dust [Ex ia IIIB T <sub>200</sub> 135 °C Da] [Ex ia IIIC T135 °C Da] Zone 21 mounting to zone 20 dust [Ex ia IIIB T <sub>200</sub> 135 °C Da/Db] [Ex ia IIIC T135 °C Da/Db] Mining [Ex ia I Ma] - Ex e Zone 2 gas [Ex ec IIC T4/T5/T6 Gc X] - Ex t Zone 22 dust [Ex tc IIIC T90 °C Dc X]	International
	<b>FM</b> Hazardous areas (see approval)	USA
	<b>CSA</b> Safety (e.g. electr. safety, overpressure, ...) Hazardous areas (see approval)	USA and Canada
	<b>KazInMetr</b> Metrology, measurement technology	Kazakhstan
-	<b>MTSCHS</b> Permission for commissioning	Kazakhstan
	<b>UkrSEPRO</b> Metrology, measurement technology	Ukraine
	<b>Uzstandard</b> Metrology, measurement technology	Uzbekistan
	<b>NEPSI</b> Hazardous areas (see approval)	China
	<b>KCs (KOSHA)</b> Hazardous areas (see approval)	South Korea
	<b>DNV GL</b> Ships, shipbuilding (e.g. offshore)	International
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

## Manufacturer's information and certificates

Logo	Description
MTTF	> 100 years
-	China RoHS directive

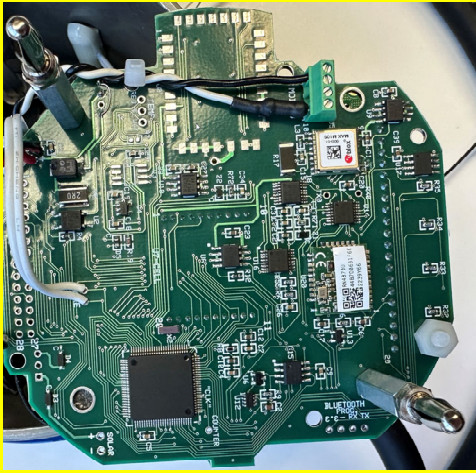
→ For approvals and certificates, see website

## Safety-related characteristic values (Ex)

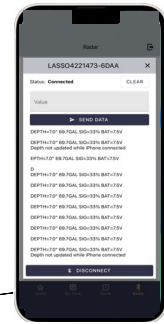
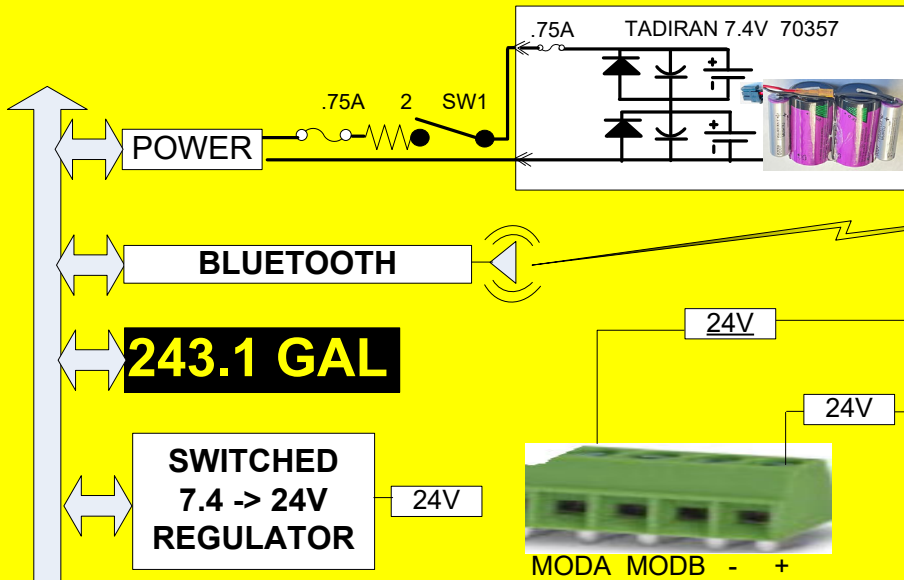
Safety-related characteristic values (Ex)			
Supply and signal circuit			
For ATEX/IECEx ignition protection type Ex ia	See product label		
	Voltage	$U_i = DC\ 30\ V$	
	Current	$I_i = 100\ mA$	
	Power	Group I (mines susceptible to firedamp):	$P_i = 800\ mW$
		Group II (explosive gas atmosphere other than mines):	$P_i = 800\ mW$
		Group IIIB (explosive gas atmosphere other than mines):	$P_i = 800/650\ mW$
		Group IIIC (explosive gas atmosphere other than mines):	$P_i = 750/650/550\ mW$
Effective internal capacitance (version with non-detachable cable connection)	<ul style="list-style-type: none"> <li>■ <math>C_i \leq 16.5\ nF</math></li> <li>■ <math>C_i \leq 16.5\ nF + 0.2\ nF/m</math></li> </ul>		
Effective internal inductance (version with non-detachable cable connection)	<ul style="list-style-type: none"> <li>■ <math>L_i = 0\ \mu H</math></li> <li>■ <math>L_i = 0\ \mu H + 2\ \mu H/m</math></li> </ul>		
Supply and signal circuit for CSA and FM	See product label		
	Entity/non-incendive parameters	$V_{max}/U_i = 30\ V$ $I_{max}/I_i = 100\ mA$ at ambient temperature $\leq 85\ ^\circ C$ [185 °F] $I_{max}/I_i = 87\ mA$ at ambient temperature $> 85\ ^\circ C$ [185 °F] $P_{max}/P_i = 0.8\ W$ $C_i = 16.5\ nF$ (flying leads: $+ 0.2\ nF/m$ ) $L_i = 0\ \mu H$ (flying leads: $+ 2\ \mu H/m$ )	

**SIGMA BLUETOOTH****8/10/2024 16:14**

LABEL,channel,labeltext LABEL,4,in-lb LABEL?,4 LABEL,4,in-lb	set local display units for specific channel set channel 4 units display to "in-lb" request value of Label 4 response to command or request
MATH,channel,scale ,offset,sensorRawOffset MATH,4,.1,100,0 MATH? MATH,channel=4,scale=.1,offset=100,rawoffset=	set internal math of sensor channel values raw sensor offset to 0 request channel math command
SENDONWAKE,sendvalud SENDONWAKE,1 SENDONWAKE? SENDONWAKE or Do not send on wake	not send. Send sat or cell message when awake Request status of send on wake flag Response to request of send on wake
WAKE,hr0,hr1,hr2,hr3,...hr10 WAKE,0,4,8,14,22 WAKE? WAKE,0,4,8,14,22	be used. end with command to wake at these hours request wake hours command
VERSION?	Request software version
FACTORY	Set factory default. Cannot be undone.
H	Show list of help command prompts
Z	Show underlying debug timers
GPS,interval GPS,360 GPS,? GPS 360 min	Set GPS interval Set GPS interval to 360 minutes Request current value of GPS Response to GPS request



WK 76212939  
 IS-3 Standard ; 0/25 psi; 4...20 mA, 2-wire  
 @ 10...30 V DC  
 Accuracy: 0.25% B.F.S.L.  
 1/2 NPT  
 Material of Wetted Parts: stainless steel  
 Adjustability: Zero/span adjustable  
 angular connector acc. to DIN EN 175301-803 1/2  
 NPT UB=1, 0V=2  
 permitted media temperature: -20...+80°C  
 Approvals: ATEX/IECEX/FM/CSA  
 II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb,  
 II 1/2D Ex ia IIC T135 °C Da/Db  
 Specifications according to data sheet: PE 81.58



**243.1 GAL**

**SWITCHED  
7.4 -> 24V  
REGULATOR**



WK 76212939  
 WHITE 2(-)  
 BLACK 1(+)  
 NEXAN 610CIRAG2



Option: Modbus or 4-20. Not both.  
 4-20 IN ANALOG IN1 MODA  
 ANALOG IN2 MODB

COMPUTER  
 GPS  
 SATELLITE MODEM  
 CELL MODEM



CHASSIS MUST BE TIED TO  
 EARTH GROUND USING  
 SCREW LUG ON HOUSING

**LASSO**  
Technologies, LLC

Lasso Technologies, LLC.  
[WWW.LASSO.COM](http://WWW.LASSO.COM)

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USER SCHEMATIC

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Aug 8,2024

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70420 SIGMA