User Guide

Thread X3

CONNECTIVITY

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Document Information

Version	Creation Date	Author	Description
1.0.0	20/10/2023	Customer Success	Final version - User Guide Thread X3

Overview

The Thread is a plug-and-play data aggregation instrument that is used to power and connect any integrated hardware device. For a list of integrated devices, please see the Support Devices List article. The Thread will automatically create a Mesh node network to transfer the device's sensor data back to the gateway and onto the iTwin IoT software platform.

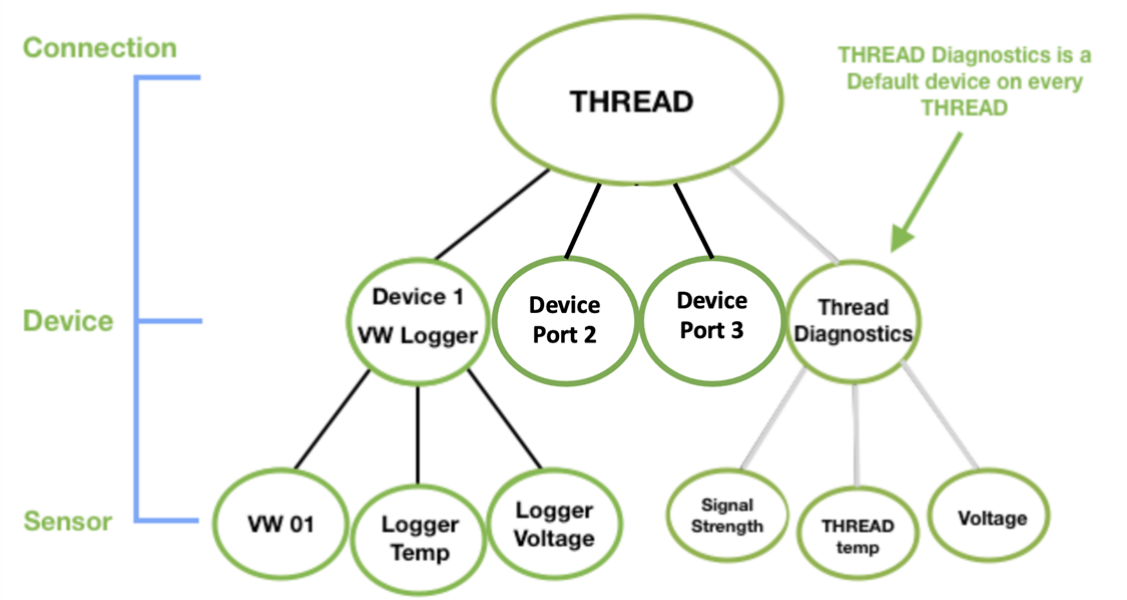
Each Thread Supports Three Devices

A Thread has three Device ports that can be configured to collect data from any supported device. These device ports are identified as ports 1 (right), 2 (middle), and 3 (left)

Sensors are Dependent on the Device

A Device can have one or many sensors associated with it, all dependent on what data is being sent from the device to the Thread. Sensors are where the data will be collected and stored with the iTwin IoT application.

Below is an example of how a Thread might be configured with associated Devices and Sensors.



This Thread has one device configured on Port 1, a Vibrating Wire datalogger that has a single Piezometer sensor attached to it. Once configured, the piezometer will be included in the sensor section as an individual sensor below the VW logger Device. The datalogger also has diagnostic sensors for battery voltage and temperature, which will be added as additional sensors below the device. Choose these sensors from the sensor selection tool in the Data modules to graph any metric read by each sensor.

No Devices are configured on Ports 2 and 3.

Thread Power

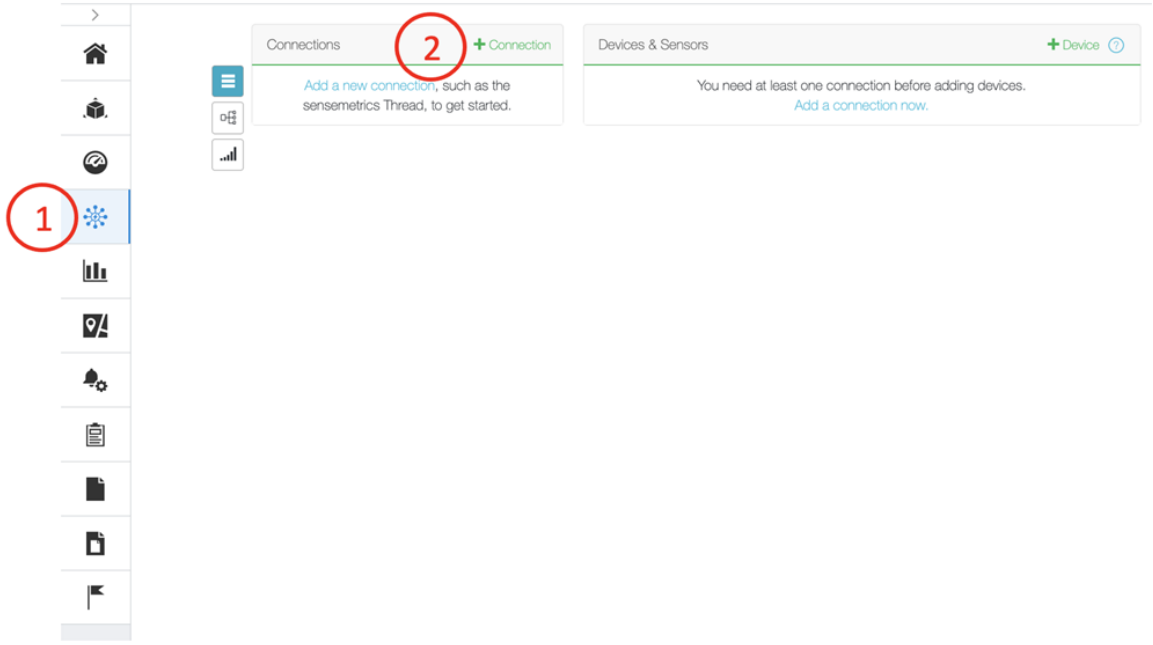
The Thread has a power button with LED diagnostics. The power input port is next to the power button, allowing the Thread to be powered on AC power or by solar panels.

Thread Diagnostic Sensors

Once added to the application, each Thread will have twelve-fourteen default diagnostic sensors populated under the Device on the Connectivity page, including several voltage and current sensors, sensor communication sensors, and Temperature. These can be selected and plotted as well to aid in evaluating Thread performance.

Adding a Thread as a Connection

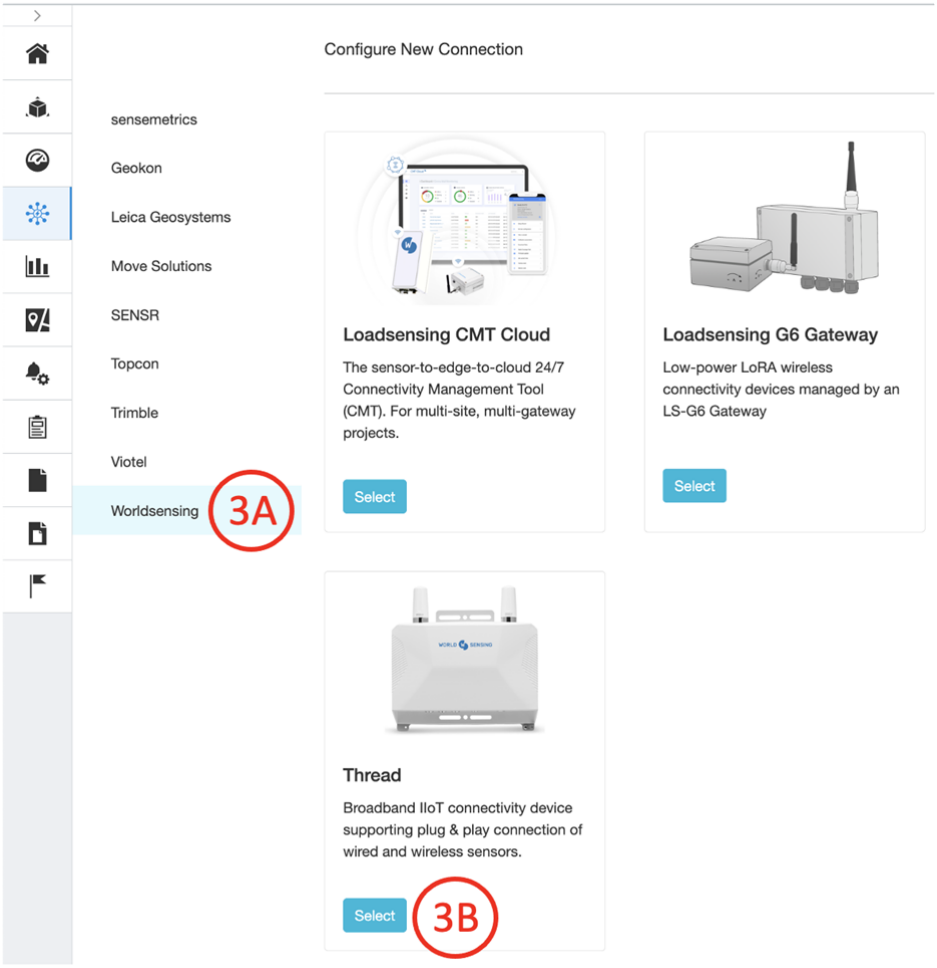
The Thread will be added as a Connection within the iTwin IoT hierarchy of Connections, Devices, and Sensors.



1. **Connectivity Page-** Navigate to the Connectivity Module.

2. **Add Connection-** Press the "+Connection" button in the Connections Column.
3. **Connection Selection**

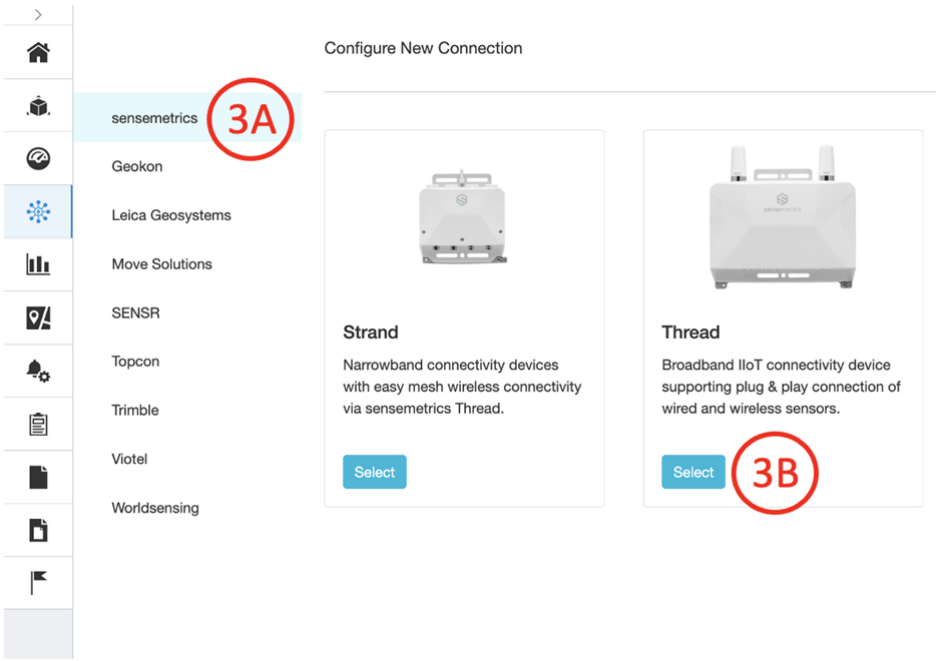
If adding a Worldsensing Thread:



3A- Select Worldsensing on the left side options bar.

3B- Click the "Select" icon below the Thread symbol.

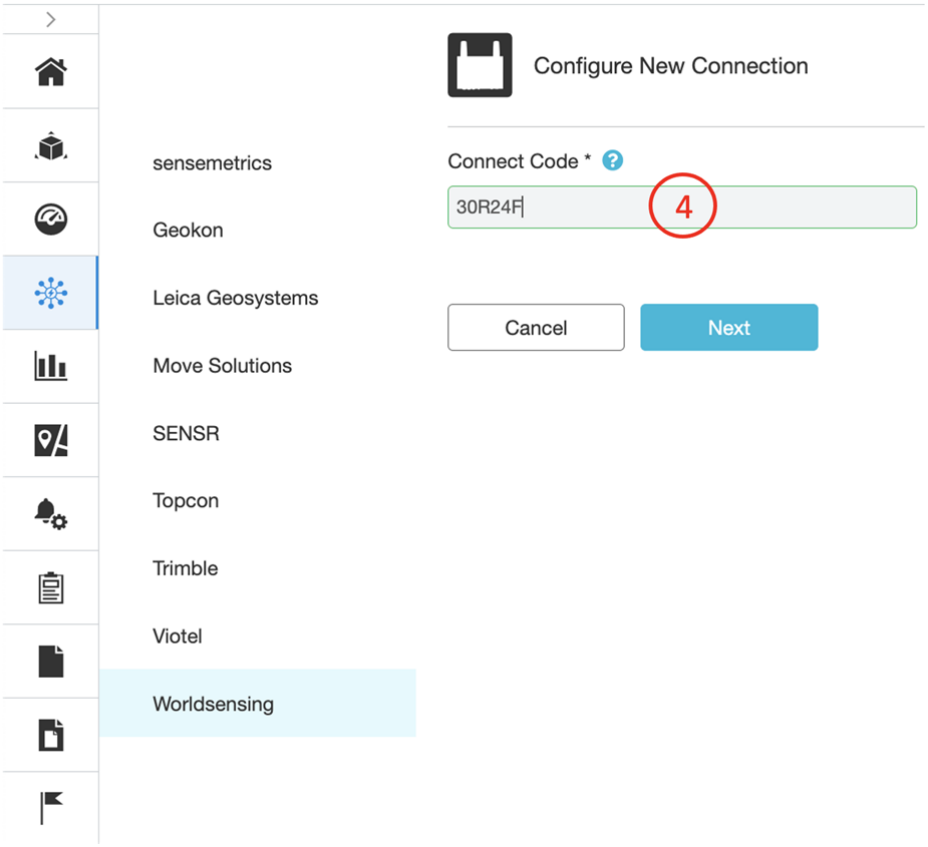
If adding a Sensemetrics Thread:



3A- Select Sensemetrics on the left side options bar.

3B- Click the "Select" icon below the Thread symbol.

4. Entering Thread Connect Code



Find and enter the 6-digit Connect Code of the Thread. This code is located on the silver label on the back of the Thread. The location is highlighted in the image below. Click "Next" after entering the Connect Code.

Connections Overview

Connections can be added to the platform through API, FTP, or direct cell or radio network communication, and can be seen in the Network Page.

Connection Types

iTwin IoT Connections can generally be grouped into two categories, file transfer-based and telemetry-based.

File Transfer Connections: are typically set up and configured in other software programs. The Connection is then established, and data is transferred from the external software into the iTwin IoT platform, automatically populating sensors. Examples of such connections include Worldsensing

CMT Cloud, Geomos Leica and Spider, Move Solutions sensors, Viotel sensors, and Kinemetrics Etna2 Accelerographs.

Telemetry-based Connections: are added directly to the application. These Connections can be further divided into Gateways, which are responsible for aggregation and transmission of data to the iTwin IoT cloud, and Endpoints, which aggregate and then transmit data to Gateways. Examples of Gateway Connections include Worldsensing Threads and Worldsensing CMT Edge Gateways. Examples of Endpoint Connections include Sensemetrics Strands and Geokon Geonets.

Connection Status

The status indicators are located next to the connections in the Connectivity Module.

Icon	Description
	The green icon indicates the connection is currently connected to the network
	The red icon represents a Connection that is powered down or not able to establish a connection
	The blue icon represents a Connection in Low Power mode
	The grey icon indicates the Connection is archived
	The Signal Bar icon located underneath the Connection acts similarly to the signal bars on your cell phone. The more bars there are, the stronger the signal connection.

Note: In some cases, API or FTP connection color status may be misleading. Best practice is to verify connection status of these connections by looking at the sensors "Last:" timestamp on the right side of the Connectivity page.

Connection Functions

Connection functions are located either next to the connection or at the top of the connection module.

Indicator	Description
	Configure a Thread to use a supported Device on one of its Device Ports.
	Check the box next to any connection to filter its Devices and Sensors. Mass editing may be performed using the checkmarks
	Use the Gear icon at the top of the column to quickly edit a connection including notes and power schedule. Bulk editing is available if multiple connections are selected via the check box
	Sort the connection list by type, status, last activity and more

Thread Network Roles

Getting your network up and running on the sensemetrics platform is easy. We recommend configuring your network before beginning installation on a project. Begin by unpacking your Threads, we recommend plugging your Thread in using the Ethernet adaptor provided with your Thread. However, this is not necessary if you have a cellular Thread that can connect straight to the cloud using wireless cellular communication. Simply power on the Thread using the power button, and then log on to your sensemetrics account and add the connection to your project. Please see adding a Thread as a connection for more information on this.

Thread operation mode

Mode Gateway Threads

The Thread will operate in the role of a gateway when it is connected to a broadband Internet connection via Ethernet or cellular services. All cellular models will prioritize use of a cabled Internet connection, but will fall back to cellular service if the primary connection is interrupted. Reversing this priority is configurable in the Thread settings.

Thread devices configured with the optional active wireless mesh transceiver and operating in the role of a gateway, will serve as a wireless access point for any other Thread devices in proximity that also have the wireless mesh transceiver.

Gateways can host up to 25 wireless endpoint devices depending on many factors, including:

1. Distance between gateway and endpoint

2. Signal strength
3. RF noise in proximity
4. Sampling frequency
5. Configured sensor data rate

Installing additional Thread devices as gateways will automatically provide load balancing and redundancy for proximal Thread devices operating as endpoints. Gateway Threads will fall back and operate as an endpoint if internet uplink is disrupted and additional gateways are operating in proximity.

Mode Endpoint Threads

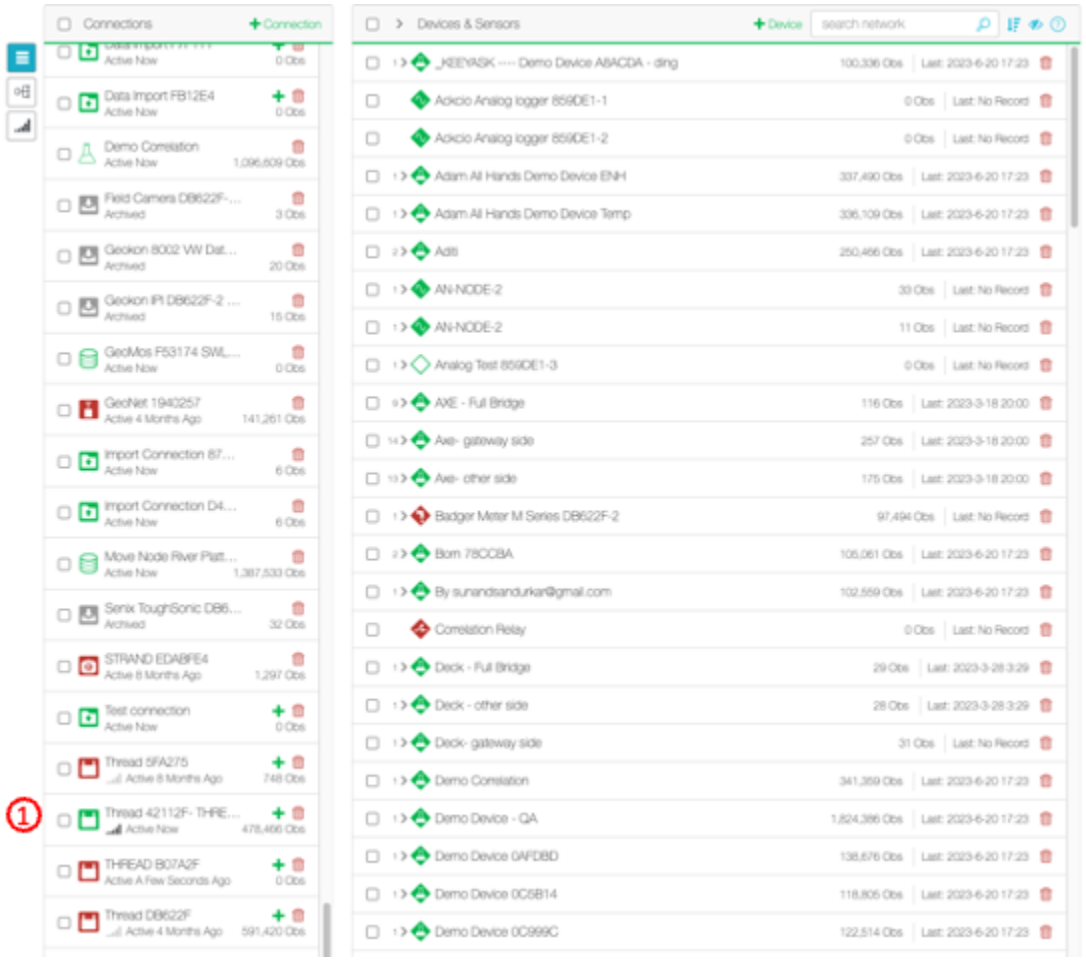
After setting up at least one Gateway Thread that connects directly to the network, you can connect additional Endpoint Threads. Endpoint Threads are not required to connect via a cabled network connection or internal cellular transceiver. Instead, Endpoints will connect to the cloud through neighboring gateway Thread devices using active wireless mesh. Endpoints will automatically negotiate a secure wireless connection - either directly through the closest gateway or by hopping through other endpoints. Up to three hops can be made to access a gateway.

Power Scheduler

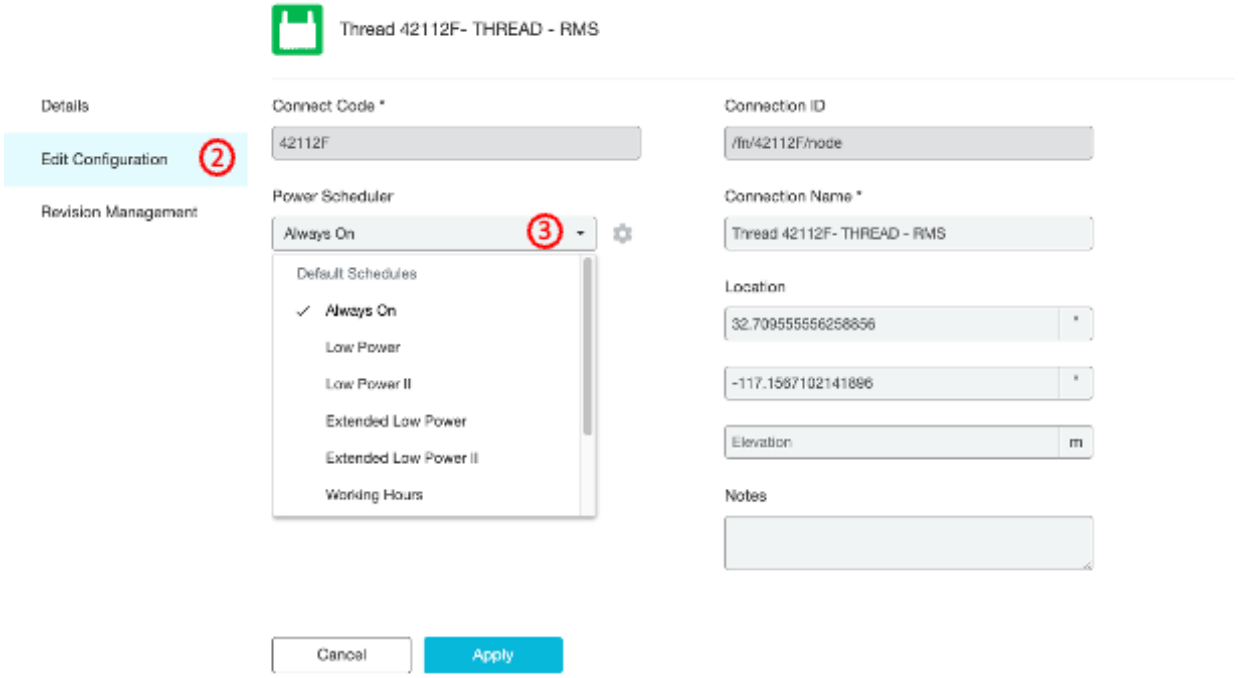
The Power Scheduler allows users to implement default power schedules or build custom schedules to implement power-saving measures for Thread hardware, optimizing the use of power when operating in environments requiring solar panels or with other limited power sources. The Power Scheduler feature sets time parameters to determine when a Thread is awake (powered on and available to process commands or upload data) and when it is in sleep mode. Default schedule options cover most normal use-case power scenarios, while customizable schedules allow the user to implement a schedule specific to their needs. The Power Scheduler is set to 'Always On' by default, so the Thread is always available to process commands and record data.

Note: To change the Power Schedule, the Thread must be awake and online. If the Thread is asleep offline, the change will go into effect the next time the Thread is available to process commands.

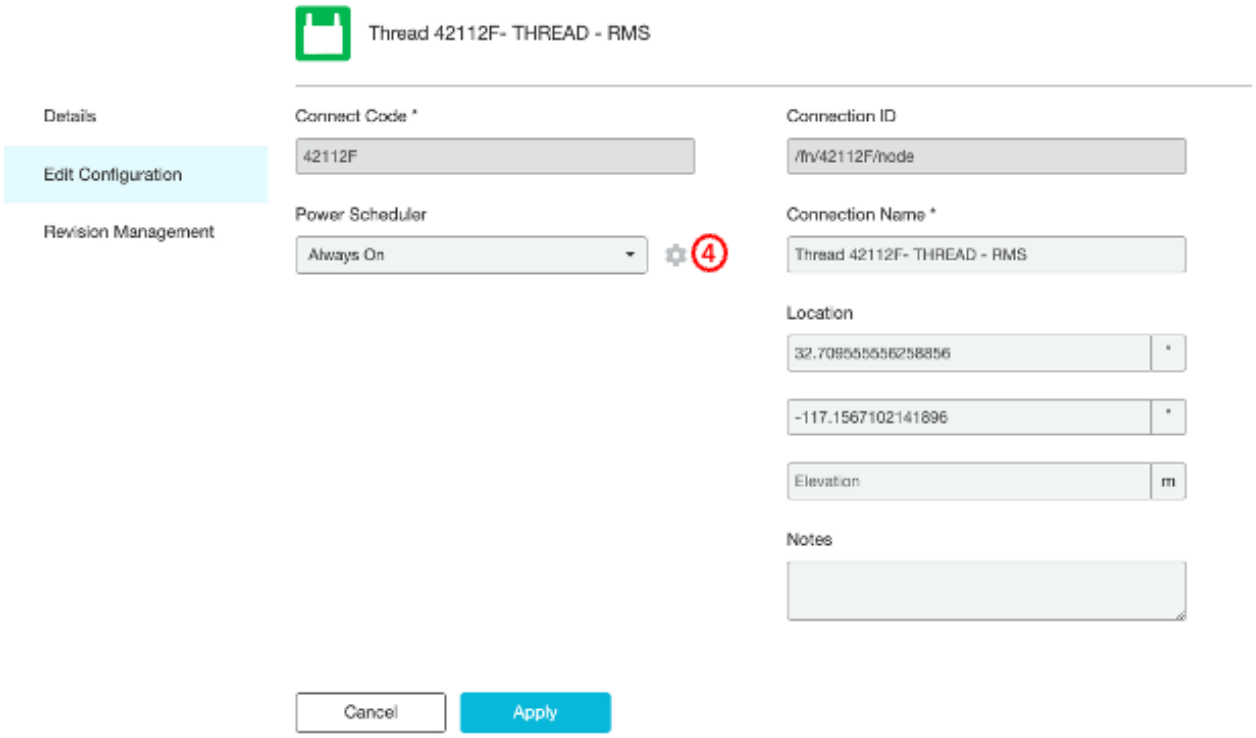
Navigating to Thread Power Schedule



1. **Connection**- Click on the desired Thread on the Connections side of the Network page, then navigate to the 'Edit Configuration' tab on the left.



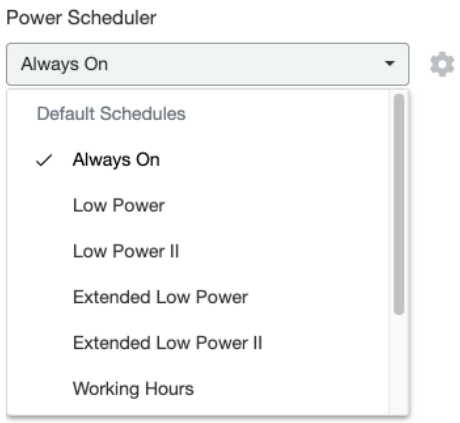
2. **Edit Configuration**- Click on the "Edit Configuration" button on the left side of the Thread screen.
3. **Dropdown Selection**- Clicking the dropdown option allows the user to view and select Default power schedules and user-customized schedules that have already been configured. Default options are illustrated below.



4. **Scheduler Settings**- Clicking the cogwheel opens a pop-out window allowing the user to view schedule cycles, and create, modify, or delete custom schedules.

Default Schedules

Using a premade default schedule is a quick way to apply the most commonly used schedules. The default schedules don't require any setup and can be found in the Schedule dropdown bar.



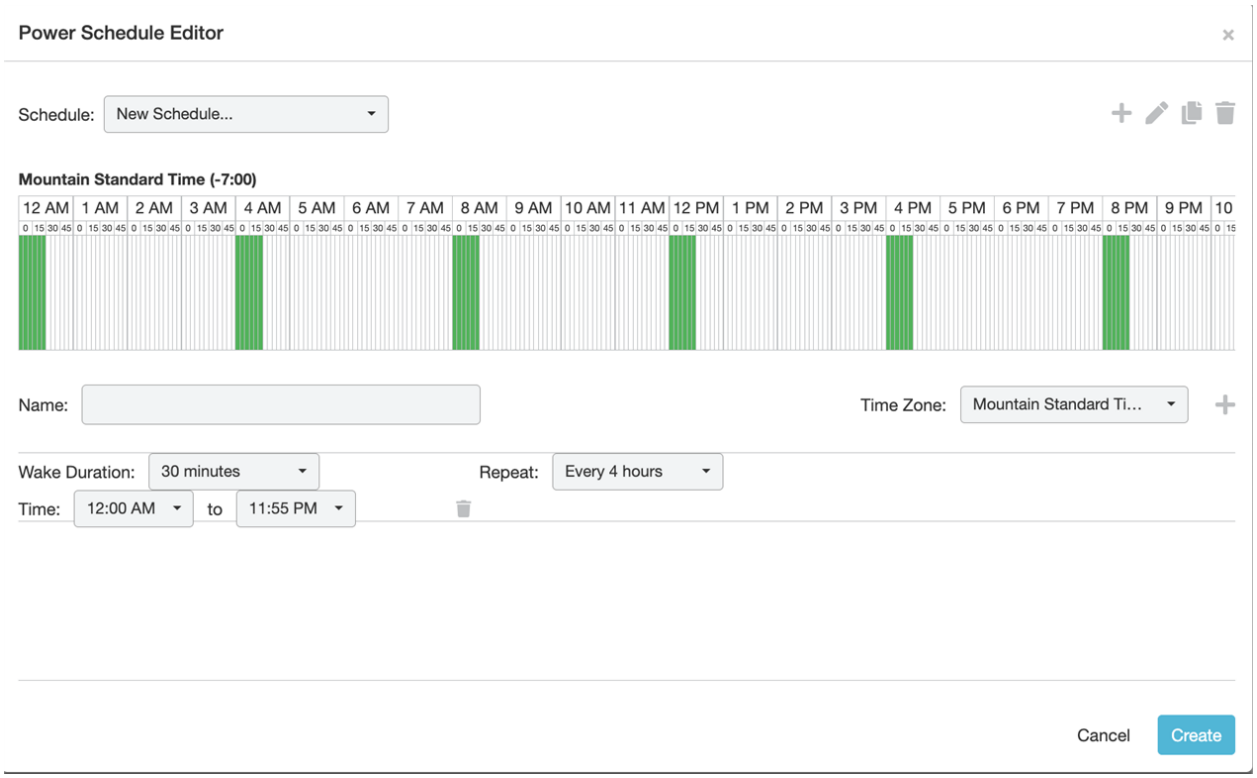
Each default schedule will come with different pre-configured schedule rows (Wake Duration, Repeat, and Time settings). The default schedules cannot be edited, but you can quickly clone the schedule and edit it to your desired preferences.

Select a default schedule to view its different settings. Green bars indicate the Thread will be powered on, while white bars indicate that the Thread will be asleep.

Creating New Schedules

Custom power schedules can be created to best suit asset monitoring needs. Follow the steps outlined in Step 4 above to navigate to the Power Schedule settings window.

Once in the Power Schedule Editor, click the + icon at the top right corner. You can name the schedule, select your time zone, wake duration, if it repeats, and the time frame for the wake duration.



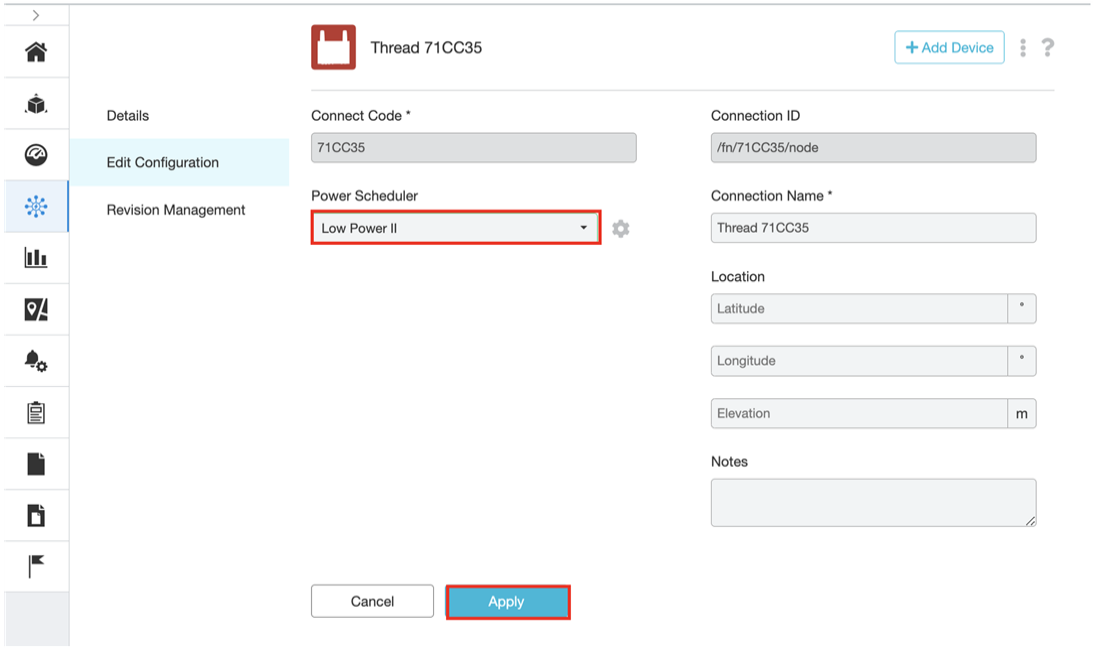
Name: Create a unique name for your custom schedule. Everyone within your organization will then be able to use this schedule on any Thread.

Wake Duration: Defines how long the Thread and connected devices/sensors are awake. During this time, the Thread will process commands and read data from the connected devices/sensors.

Repeat: Sets the frequency that the Wake Duration repeats.

Time: Sets the start and end time for the selected schedule row.

Additional Schedule Row: To create another row, click the + icon located to the right of the Time Zone. Configure your Wake Duration, Repeat, and Time settings for the new row.

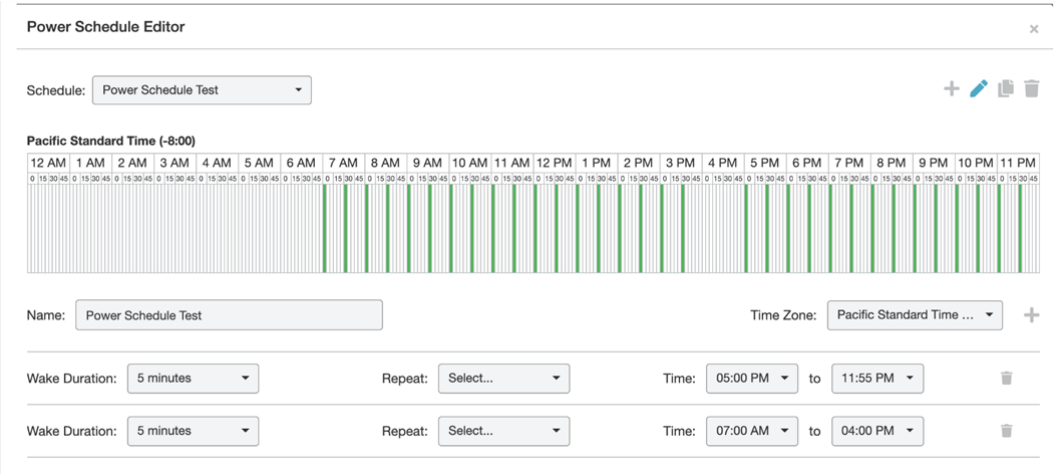


Once you have configured all the parameters, click 'Create' in the bottom right corner. This creates a new Power Schedule that is now available to all users within your organization. To use the schedule on a Thread, you must select it in the 'Edit Configuration' Page and hit 'Apply'.

Editing Schedules

An existing custom power schedule can be edited or cloned in order to modify it to better suit your specifications. Follow the steps above outlined in Step 4 of Navigating to Thread Power Scheduler to navigate to the Power Schedule settings window. Click the  icon in the top right corner while viewing the desired custom schedule.

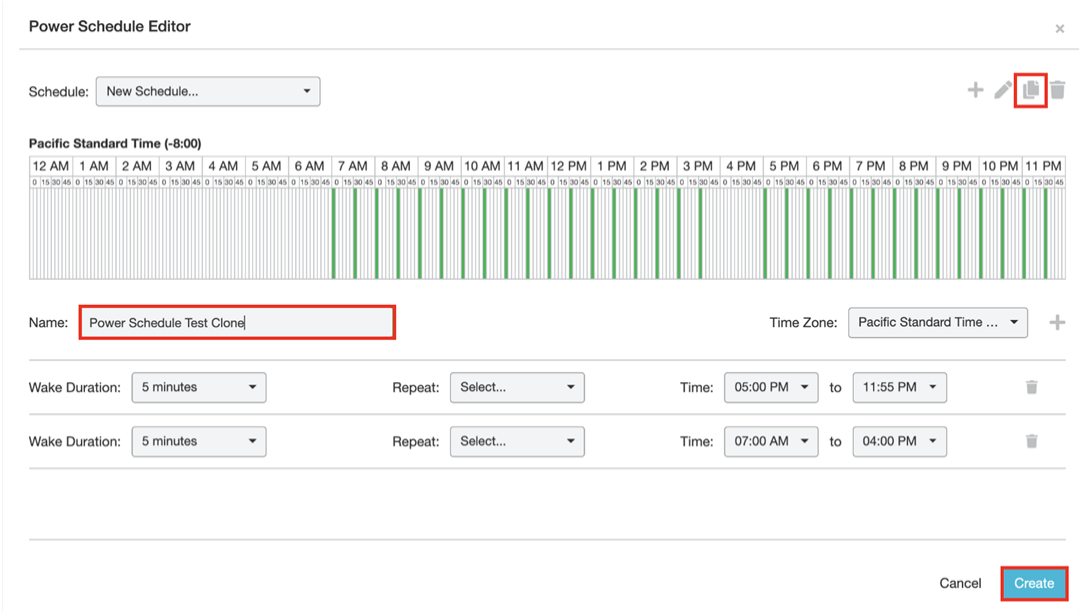
Note: Default Schedules cannot be modified. Please copy the default schedule and edit to your specifications.



The custom schedule will load the time zone selector and a Schedule Row (Wake Duration, Repeat, and Time) for you to edit. Click Update in the bottom right to save the changes you made.

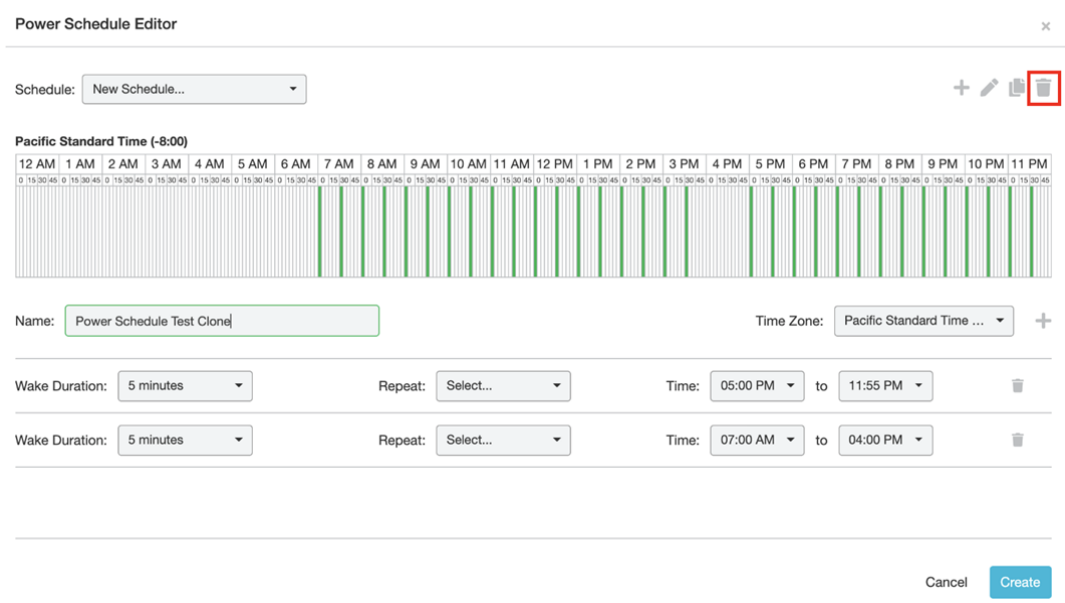
Cloning Schedules

To clone an existing power schedule choose the schedule you want to clone in the Schedule selection bar. Default schedules and custom schedules can both be cloned. Click the  icon in the top right corner to start cloning. Once you have cloned the schedule, create a unique name. The Schedule Row will populate for you to modify. After renaming and modifying the schedule, click "Create" in the lower right corner of the window to save the new power schedule.



Deleting Schedules

Choose the schedule you want to delete in the Schedule selection bar. Click the icon in the top right corner. Once you confirm your action, the schedule will be permanently deleted.



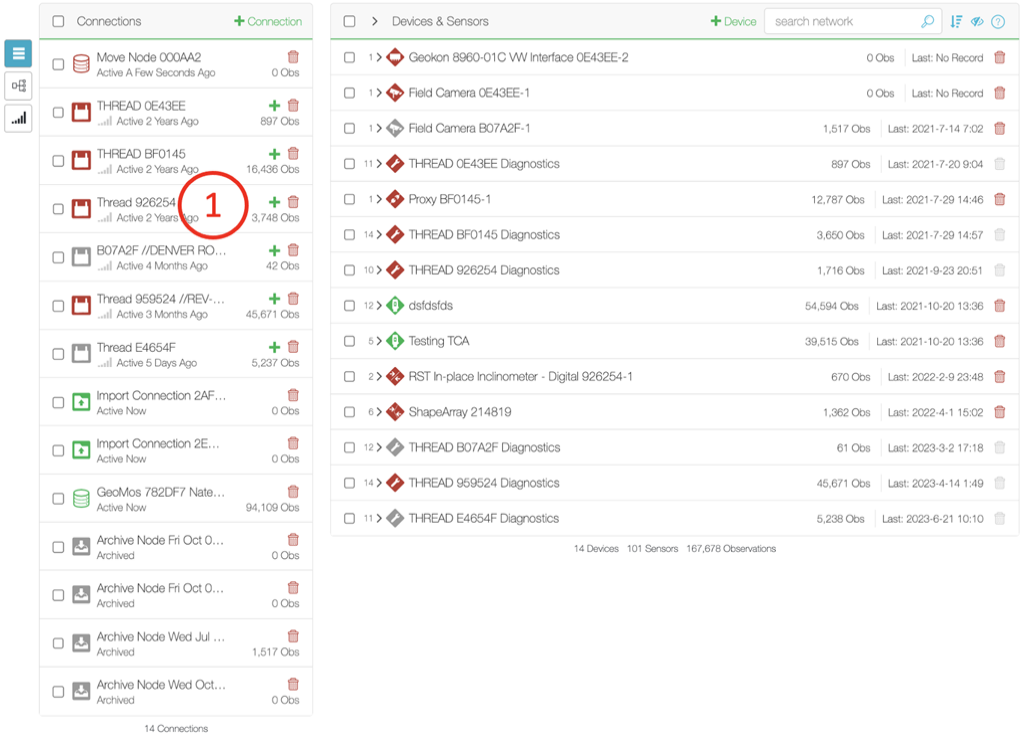
Diagnostics Controls Menu

Threads can be remotely monitored with the Thread Diagnostics page of the Thread Connection, allowing the user to remotely update the Threads via the FOTA (Firmware Over-The-Air) firmware update system, as well as providing users with some additional remote controls and for troubleshooting or diagnosing the Thread. This article will explain available tools and guide the user in their use.

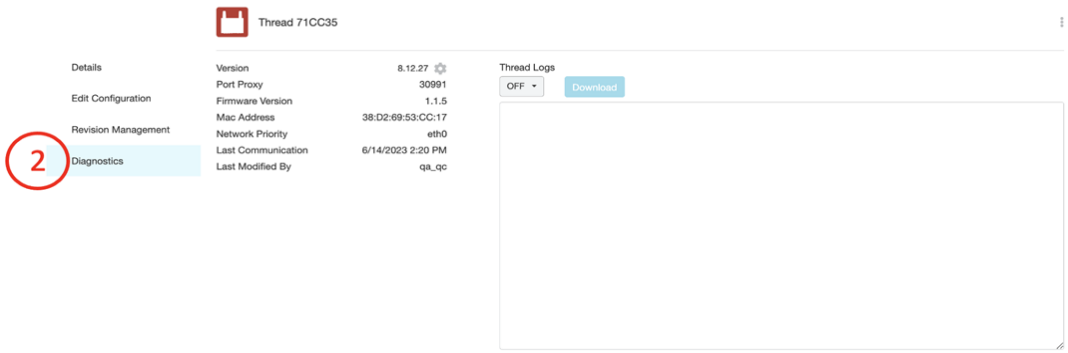
Note: The Thread Diagnostics page will only be accessible for users with an Admin role in the Organization.

Navigating to the Diagnostics Page

1. From the Connectivity Module, click on the Thread name within the Connections column on the left side of the screen.

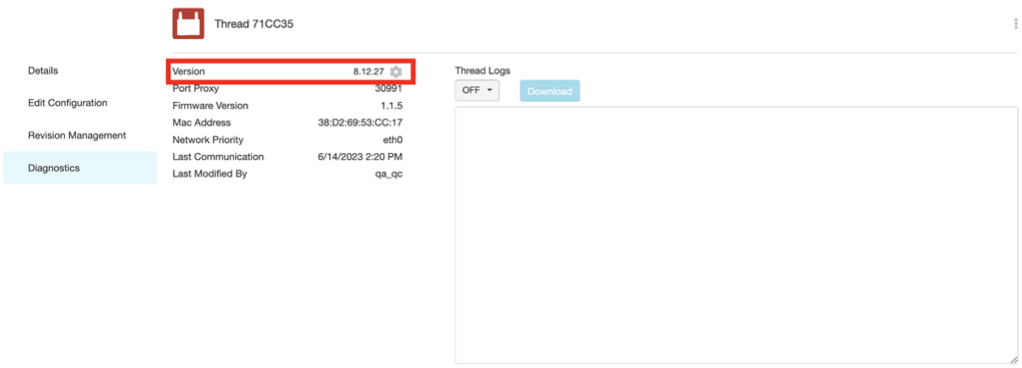


2. Click on the "Diagnostics" tab on the left side of the screen. The user will then be presented with the Diagnostics panel illustrated below.



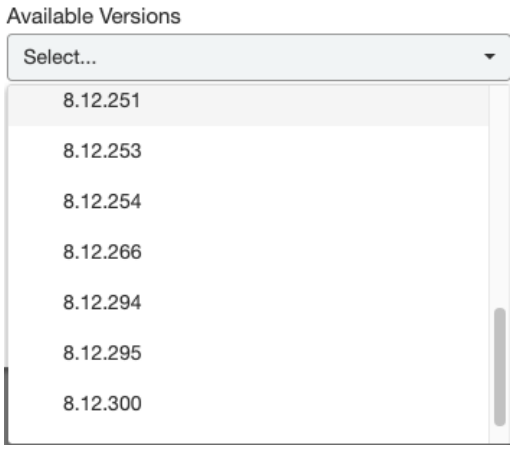
Updating Firmware

Thread information, including the FW version, is listed on the left side of the Diagnostics panel below the Thread name. Clicking the cogwheel icon next to the Firmware version will open a window allowing the user to view the available Firmware versions for transmission to the Thread via FOTA.



After clicking on the cogwheel a pop up window will appear with a dropdown of available Firmware versions. The higher the number of the version the newer the Firmware is, the newest version of firmware will be found at the bottom of the dropdown list. It is recommended to always update your Thread device to the newest available Firmware version.

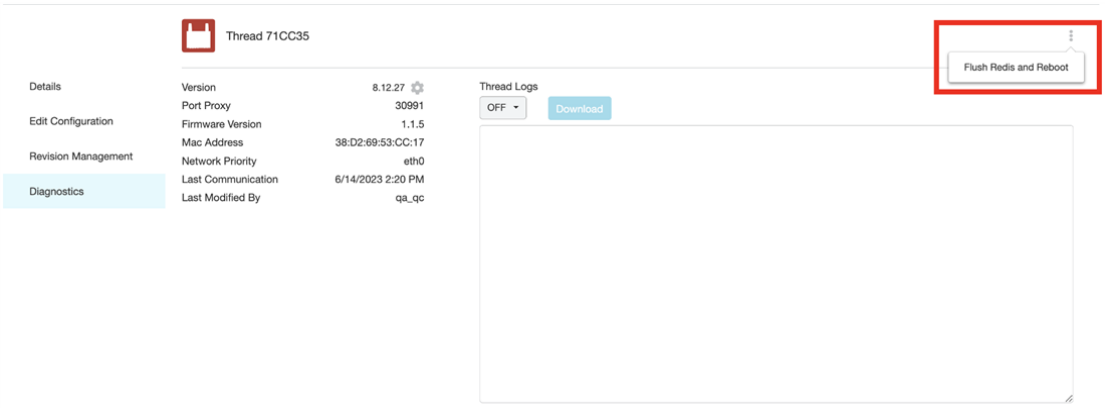
Clicking update will close the window and begin the update. A status bar will be visible in place of the Firmware version on the Diagnostics page. When the Thread is finished updating, it will turn off and reboot before reconnecting to the application.



Firmware Update Best Practice Notes: The Thread must be on in order to take the Firmware update command and receive the update data packet. The Customer Success team recommends turning the Thread to Always On in order to take the firmware update. If updating an Endpoint Thread, ensure that the Gateway Thread the Endpoint Thread is connecting to is updated first and that both Threads are in Always On before pushing the FOTA update to the endpoint Thread.

Remote Commands

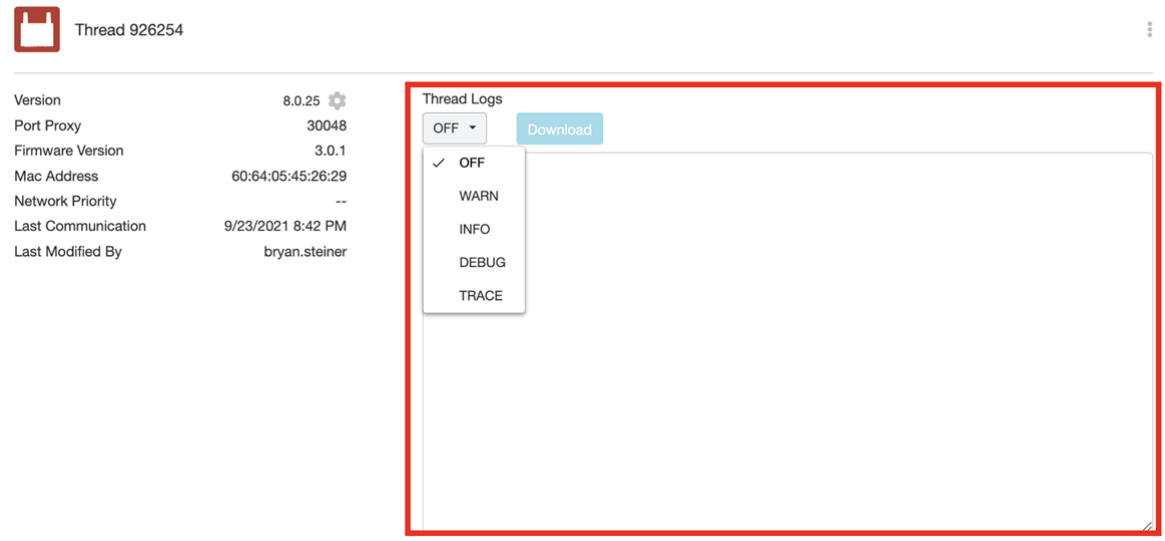
Commands can be pushed to a Thread remotely if the Thread is On and connected to the application. The command can be used to remotely manipulate the Thread in the event that a Thread is not behaving in an expected manner. The Command can be accessed by clicking the Kebab icon in the upper right portion of the Diagnostics window.



Flush Redis and Reboot- This command turns the Thread hardware off and back on before booting the Thread back up.

Logs

Thread Logs can be a useful analytical and troubleshooting tool to help Worldsensing Customer Success remotely determine a Thread's behavior. This tool is only available for Threads acting as Gateways. To access Thread logs, click on the dropdown above the window in the middle of the Diagnostics page. The user can select from "Warn", Info", "Debug", and "Trace". Each of the first three selections will provide Thread information with only that coding note, while Trace will provide all Thread information. Once selected, the Thread Logs will begin streaming in the window. Selecting the "Download" button will download a copy of the Thread Logs, which will then be accessible in the Asset Documents portion of the Documents Module.



LED Status Indication

The X3 Series THREAD has a multicolor LED behind the power button that provides a diagnostic indication of its current state. The reference guide below will assist the user in determining the current state of the Thread.

Color Diagnostic References

Color Spectrum LED: Boot up

Indicates boot process from cold start or sleep mode. This process lasts approximately 120 seconds.

CROSS-COLOR SPECTRUM MODULATION

Green LED: Connected

THREAD is active and operating in high-power mode and IS connected to the cloud.

GREEN FLASH, 3 SECOND FREQUENCY

Red LED: Disconnected

THREAD is active and operating in high-power mode and IS NOT connected to the cloud.

RED FLASH, 3 SECOND FREQUENCY

Blue LED: Low power mode

THREAD is in low-power mode to conserve battery and will wake at the next scheduled time.

BLUE FLASH, 10 SECOND FREQUENCY

Yellow LED: Battery below lower limit

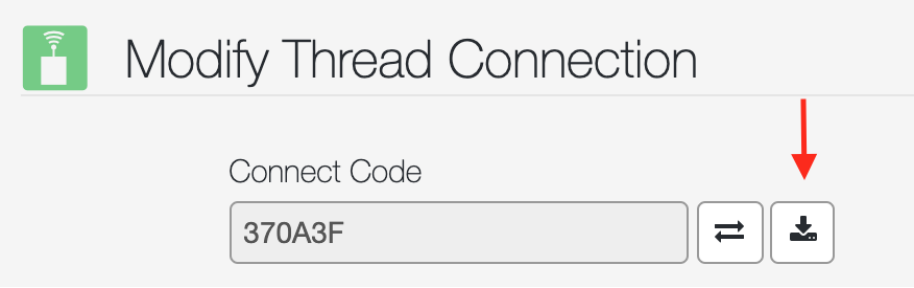
Thread is in low-power mode to conserve battery and will wake once input power is restored and the battery exceeds the low voltage cutoff threshold.

YELLOW FLASH, 10 SECOND FREQUENCY

Save all the data and device/sensor configuration

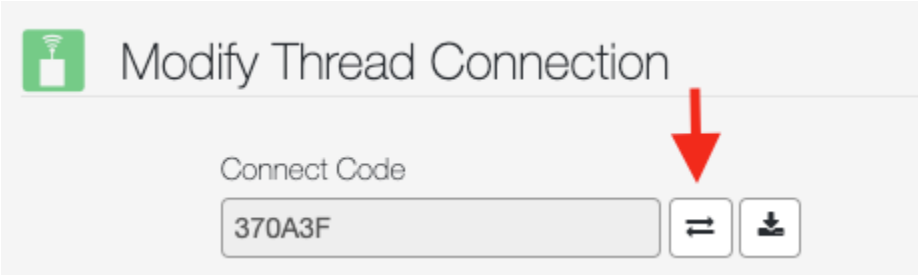
How to Archive All Sensors

Archiving a THREAD allows you to save all the data and device/sensor configuration settings to a virtual THREAD for the purpose of swapping out sensors or devices while still having access to past data. To Archive a THREAD, click the archive button right of the Connect Code on the THREAD Configuration page.

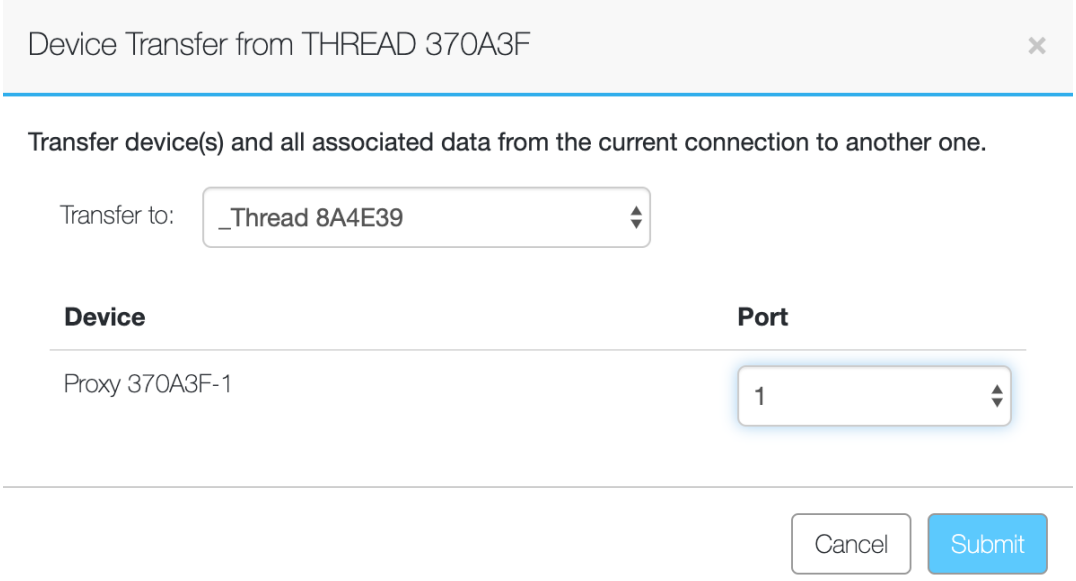


How to Swap Sensors to Another Thread

You can swap all devices and sensors from one THREAD to another in a single function. On the THREAD configuration page, click the double arrow button next to the THREAD connect code.



From there, choose your target THREAD and the device ports for the previous THREAD's associated devices, then click Submit.



Swapping Sensors to another device port on the same Thread

To swap a device from one device port to another on the same THREAD, you must first archive the sensors on that THREAD. Once the data has been transferred to an archive node, you can open the archive node configuration page and follow the Swapping Sensors to a New Thread method, selecting the new device port as the new target port.

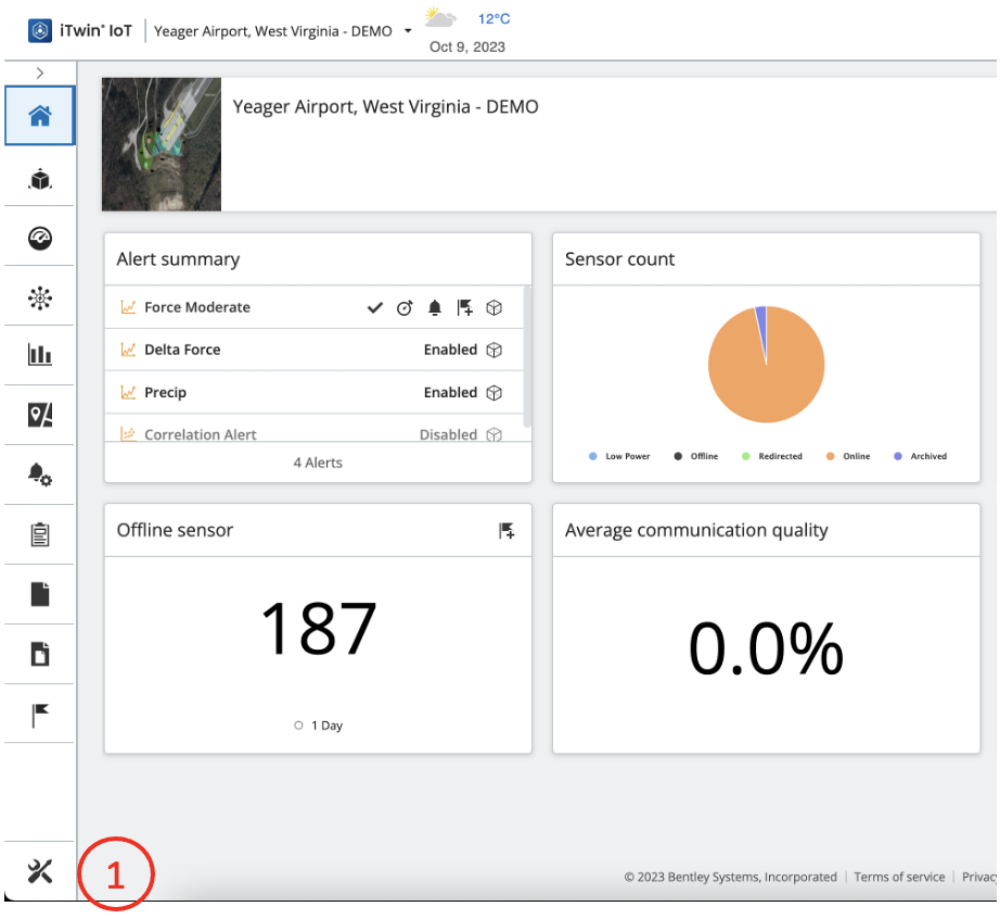
CMT Edge API Connection

The Worldsensing CMT Edge API connection supports the connection and transfer of data from CMT Edge into the iTwin IoT platform.

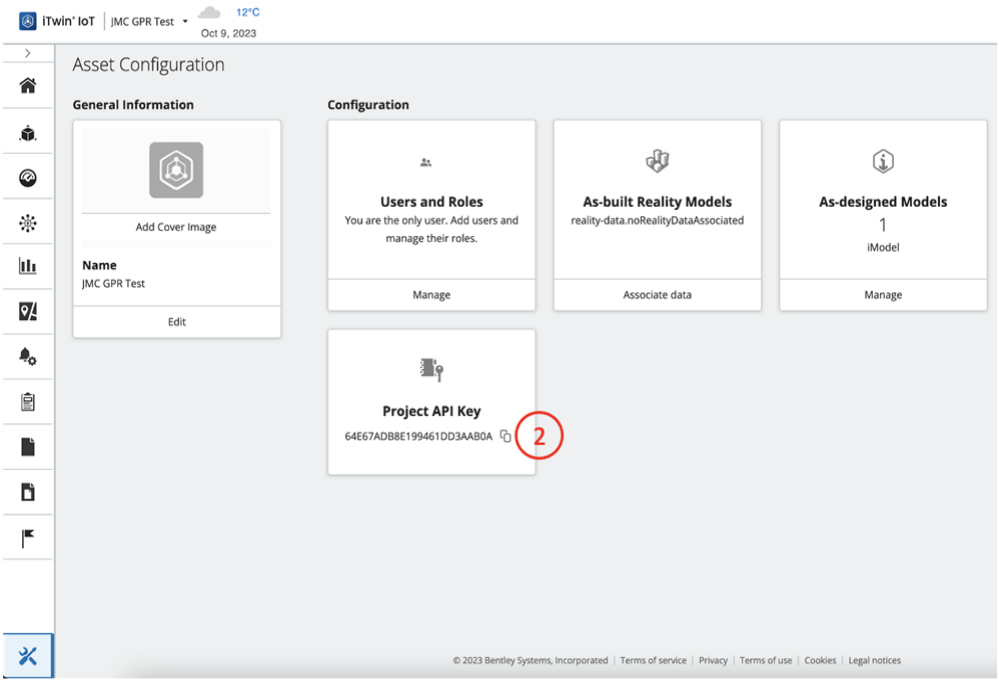
Retrieving iTwin IoT Asset API Key

An API key from the iTwin IoT asset will be required in order to establish the data transfer connection between Worldsensing and iTwin IoT. This section will guide the user in retrieving an API key from iTwin IoT.

1. Navigate to the Asset that data will be pushed to in iTwin IoT. From any page, click on the "Configure" icon in the lower left side of the page.

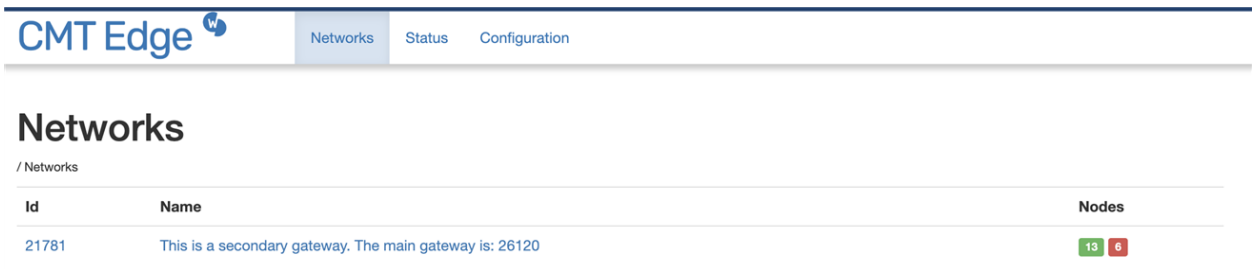


2. The user will be directed to the "Asset Configuration" page. The API key will be available within a tile on this page. The API key can either be highlighted and copied, or the "Copy to Clipboard" button will save it for pasting in future steps.



CMT Edge Setup

Worldsensing and Loadsensing device configuration is performed through the CMT Edge network management software.

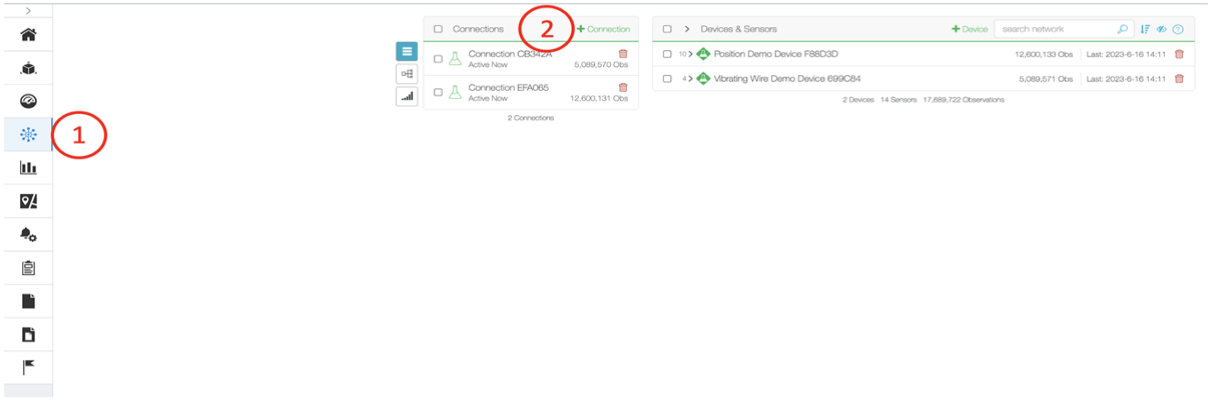


Set up all projects and devices within the CMT Edge application. Please contact Worldsensing support with any questions regarding CMT Edge app login or Gateway and Device configuration.

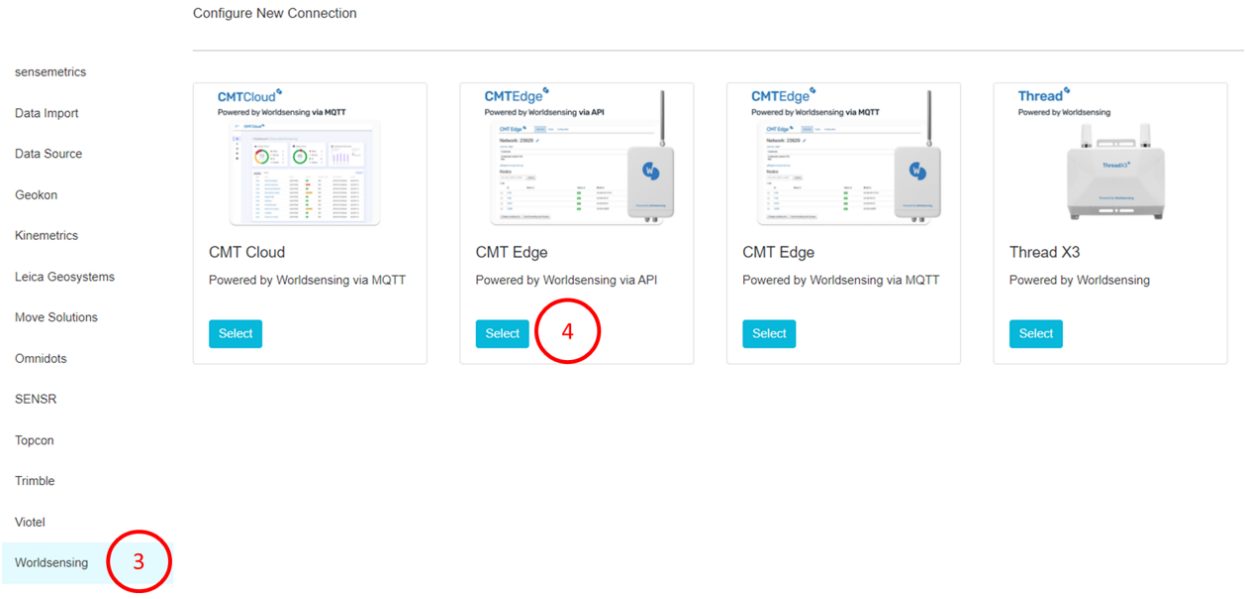
Once configured, the API connection is ready to be set up in iTwin IoT.

iTwin IoT API Connection

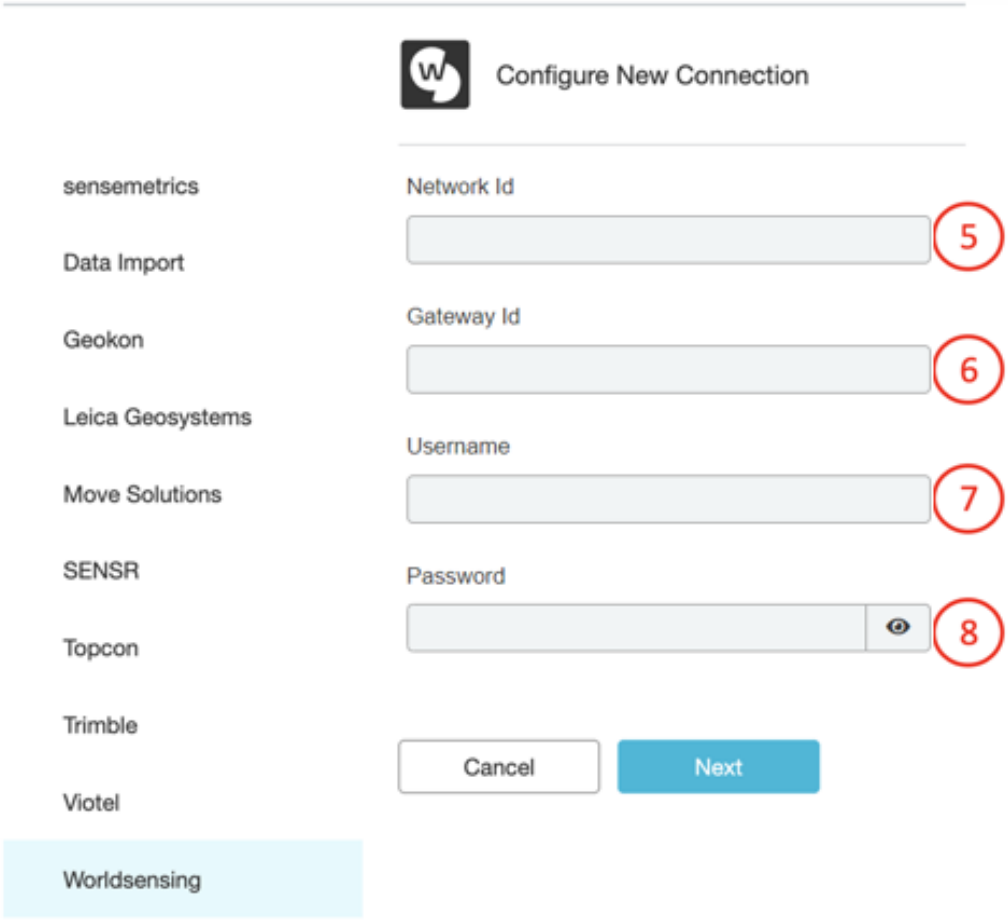
1. Within the iTwin IoT application, begin by navigating to the Connectivity Module.



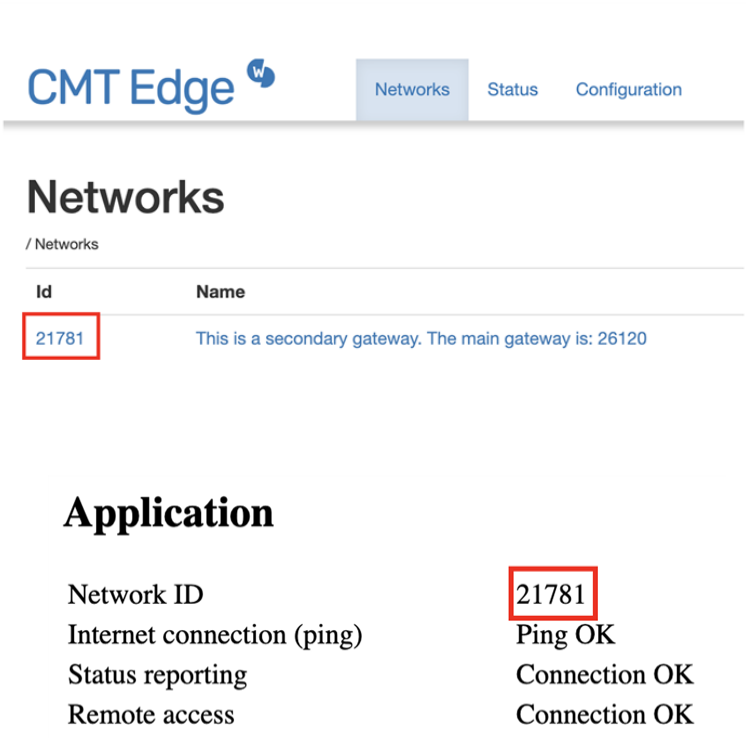
2. Click on the "+Connection" icon.
3. Select Worldsensing from the available Connections list on the left sidebar.



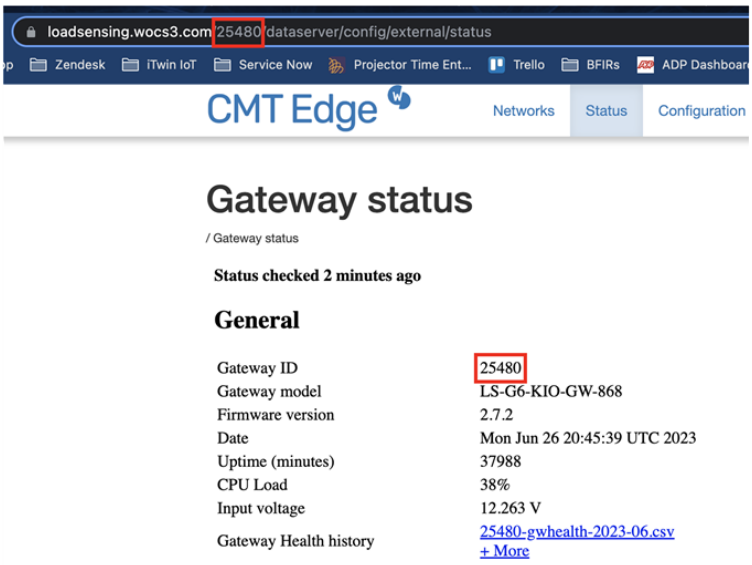
4. Click the "Select" icon on the Loadsensing G6 Gateway cloud tile.



5. Network ID- Input the network ID found on the Networks page (image 1) or on Status page (image 2) of the CMT Edge application.



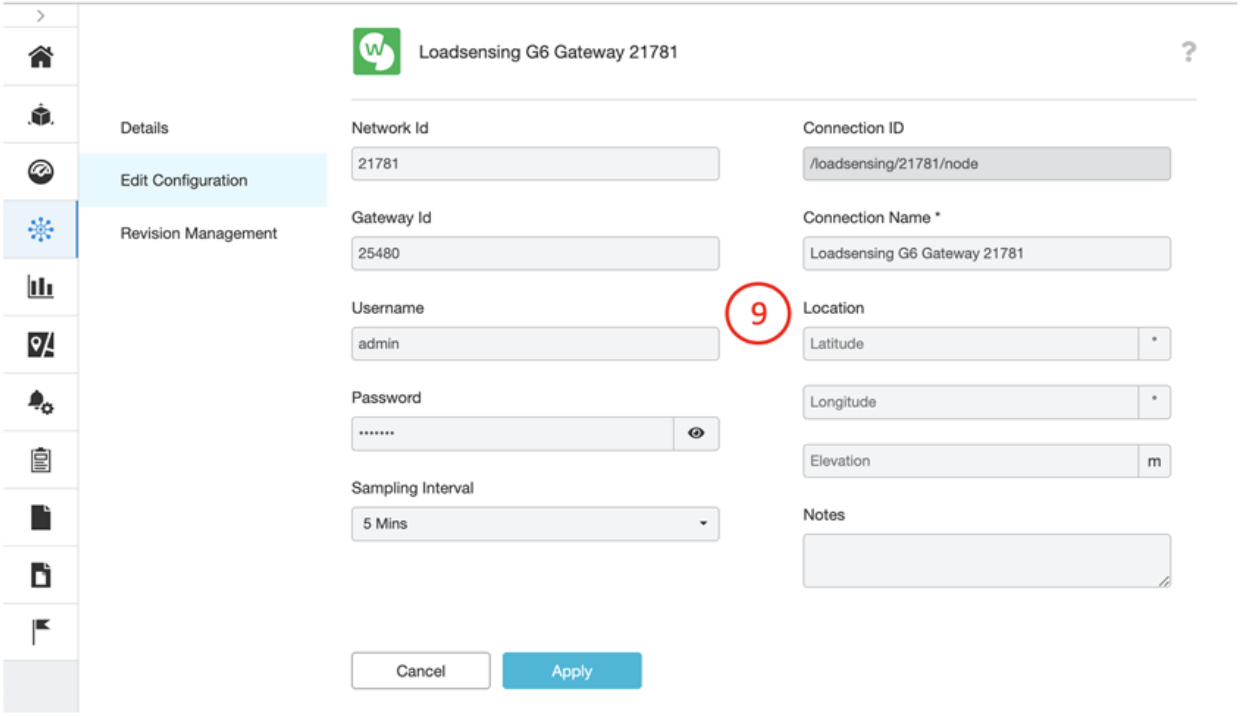
6. Gateway ID- Input the Gateway ID, which can be found in the URL or on the Status page of the CMT Edge application.



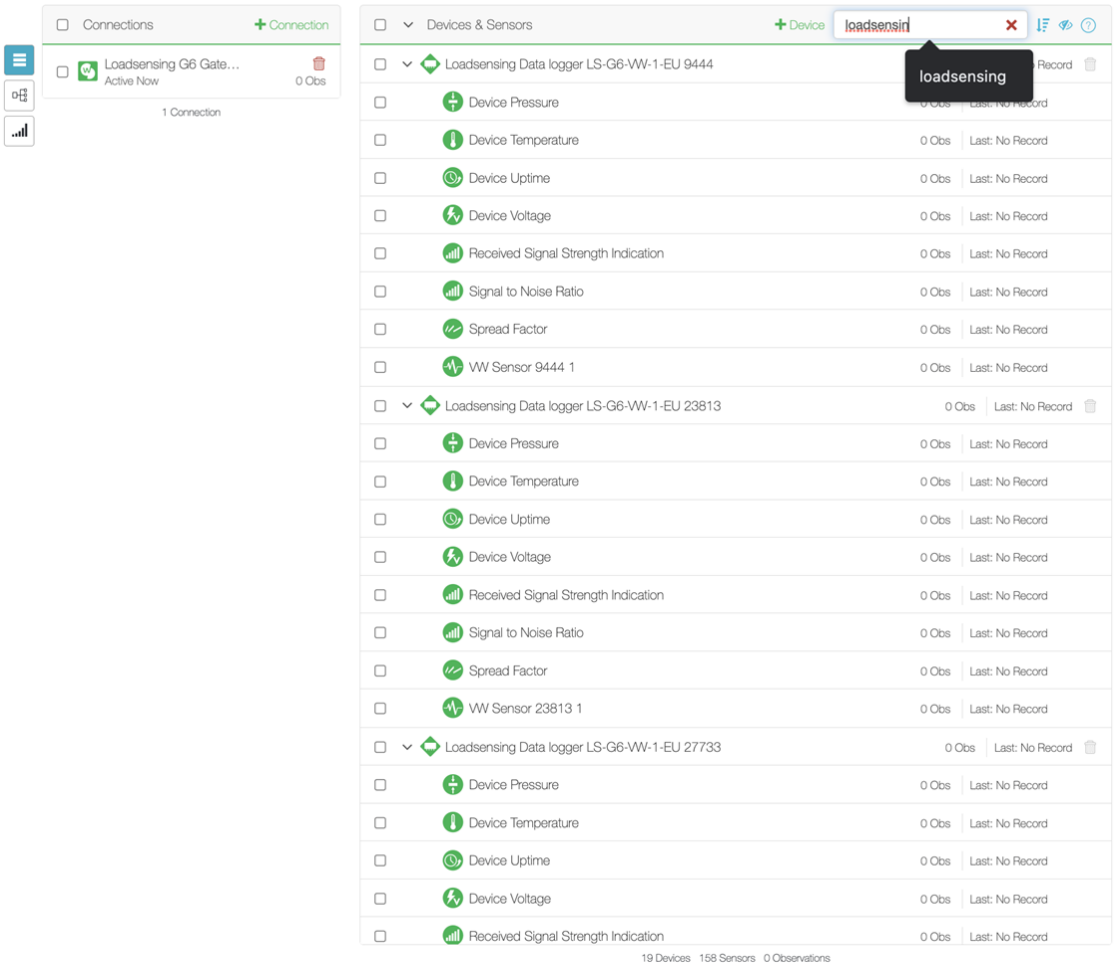
7. Username- Input your CMT Edge username used for logging into the application.
8. Password- Input your CMT Edge password used for logging into the application.

Click "Next" once all information has been input.

9. The next page will be the Edit Configuration page for the connection. Standard configurations are available. After configuration changes have been made, click "Next".



Once complete, Devices and Sensors will begin populating within the Connectivity module and observations will begin streaming from CMT Edge.

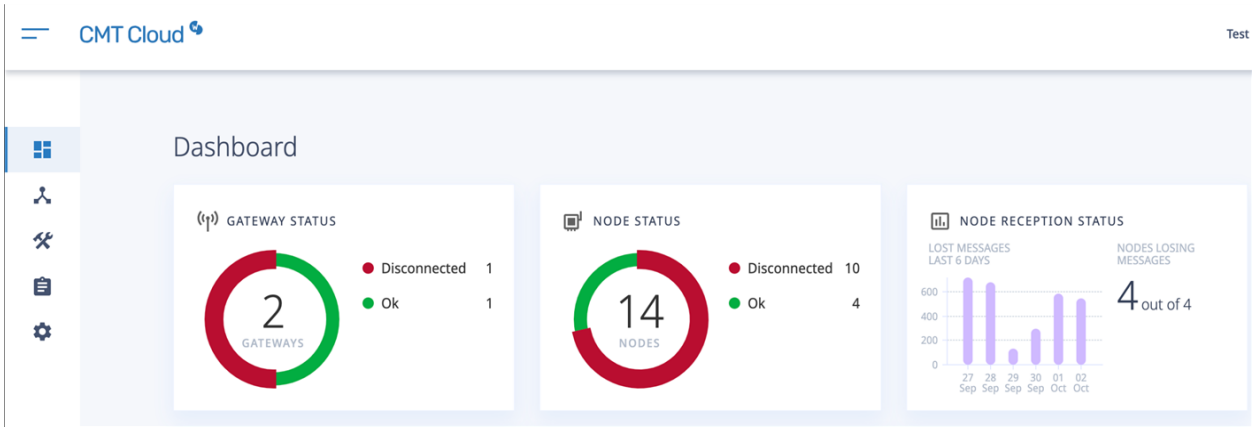

Connections
+ Connection
Loadsensing G6 Gate...
Active Now
0 Obs
1 Connection
Devices & Sensors
+ Device
loadsensin
loadsensing
Loadsensing Data logger LS-G6-VW-1-EU 9444
Device Pressure
Device Temperature
Device Uptime
Device Voltage
Received Signal Strength Indication
Signal to Noise Ratio
Spread Factor
VW Sensor 9444 1
Loadsensing Data logger LS-G6-VW-1-EU 23813
Device Pressure
Device Temperature
Device Uptime
Device Voltage
Received Signal Strength Indication
Signal to Noise Ratio
Spread Factor
VW Sensor 23813 1
Loadsensing Data logger LS-G6-VW-1-EU 27733
Device Pressure
Device Temperature
Device Uptime
Device Voltage
Received Signal Strength Indication
0 Obs
Last: No Record
19 Devices 158 Sensors 0 Observations

CMT Cloud MQTT Connection

The Worldsensing CMT Cloud MQTT connection supports the connection and transfer of data from CMT Cloud into the ITwin IoT platform.

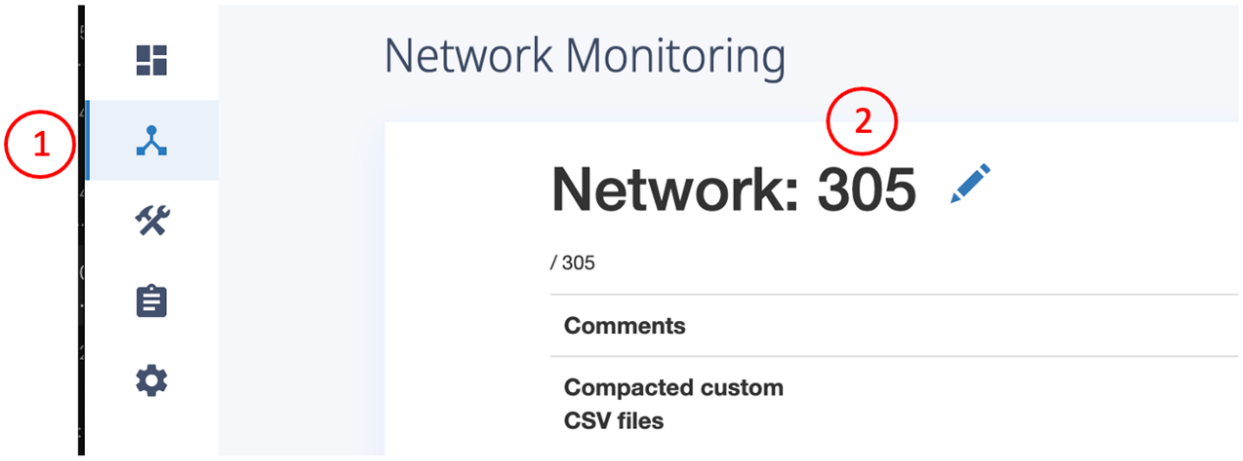
CMT Cloud Setup

Worldsensing and Loadsensing device configuration is performed through the CMT Cloud website.

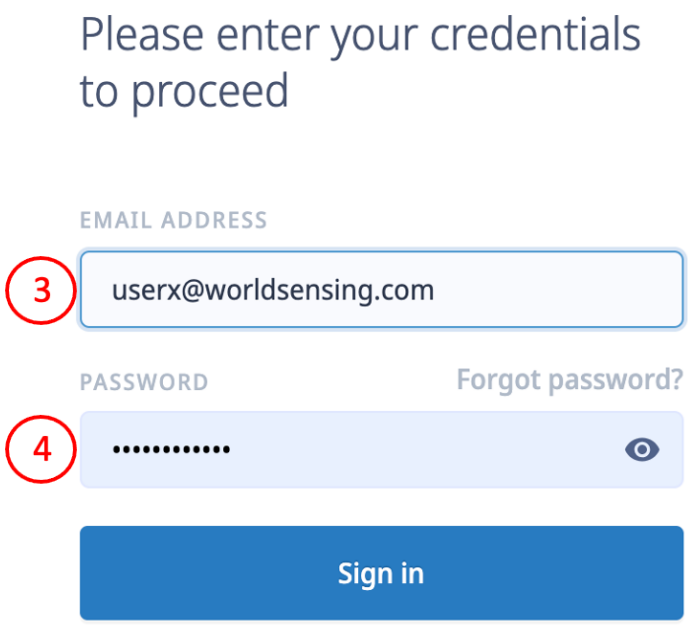


Set up all projects and devices within the CMT Cloud application. Please contact Worldsensing support with any questions regarding CMT Cloud login or Gateway and Device configuration.

Once configured, the connection is ready to be set up in iTwin IoT. There are a few pieces of information to gather from the CMT cloud site for input into the iTwin IoT setup.



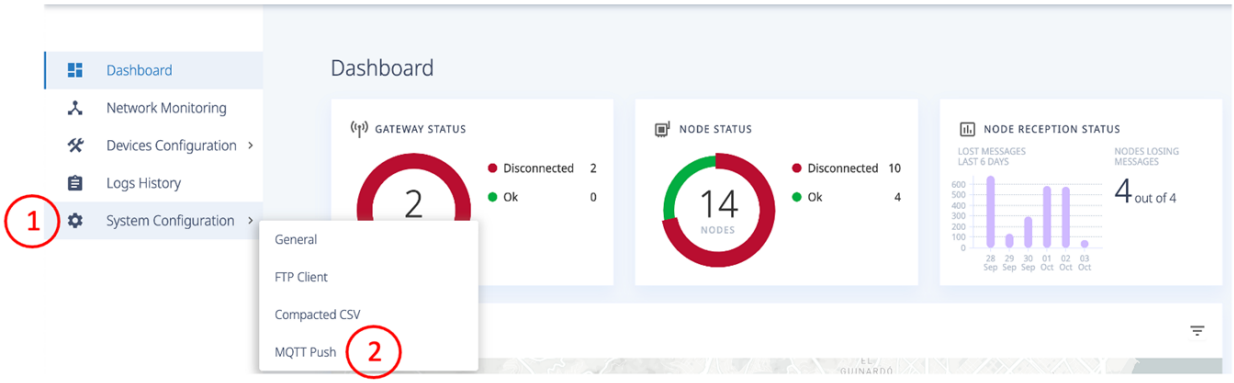
1. **Network**- Navigate to the Network page by clicking on the second icon on the left of the page.
2. **Network ID**- Record the Network ID listed in the page. This number may also be visible within the Cloud app's URL. The number will also serve as the Connectivity ID in the following setup page.



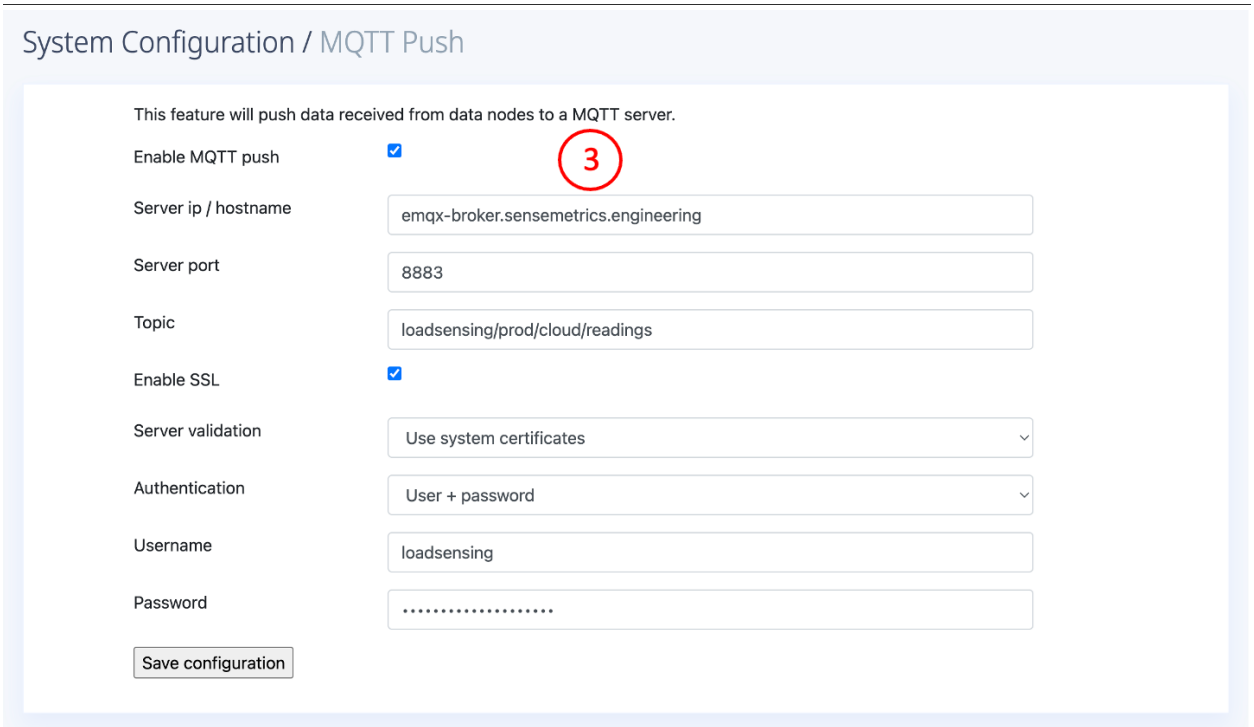
3. **Username**- Record your username used to login to CMT cloud.
4. **Password**- Record your password used to login to CMT cloud.

CMT Cloud MQTT Push Settings

MQTT Push needs to be enabled within CMT Cloud in order for data to be pushed between CMT Cloud and ITwin IoT. To confirm that the Push is enabled, follow the steps below.

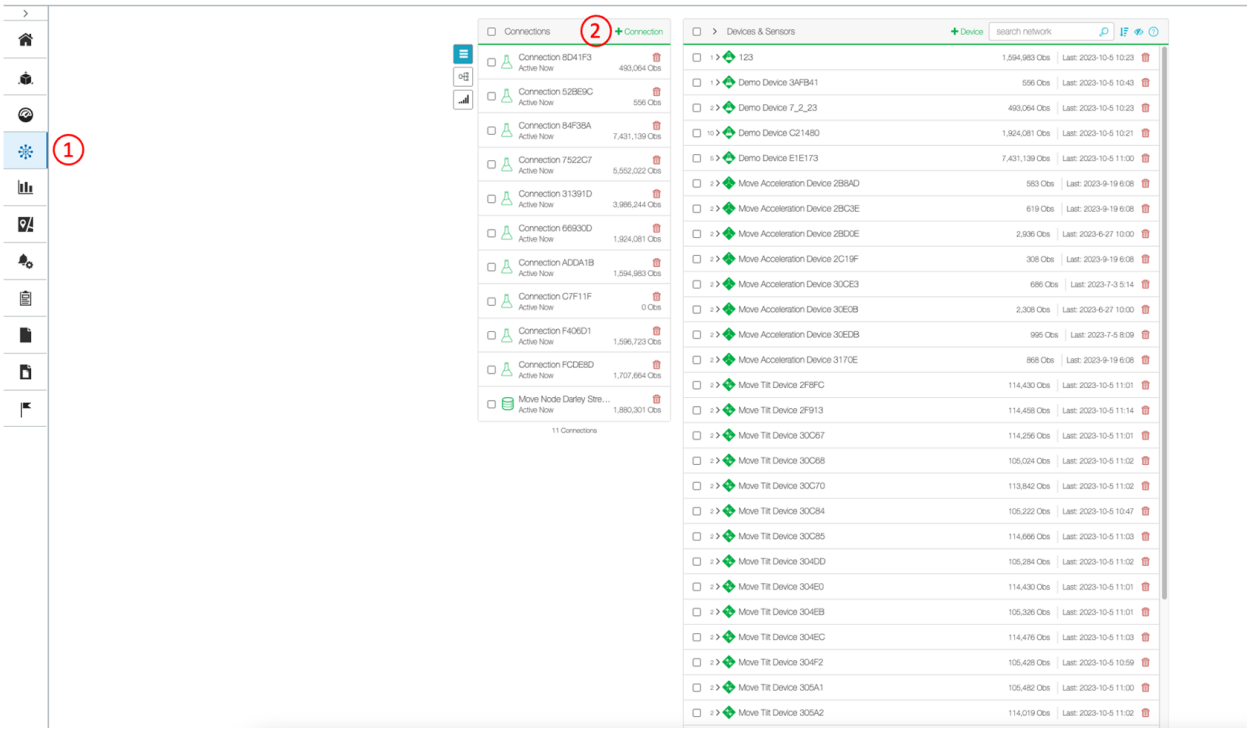


1. Click on "System Configuration" on the left side of the screen. A pop-up window will appear to the right.
2. Click on "MQTT Push" in the pop-up window.

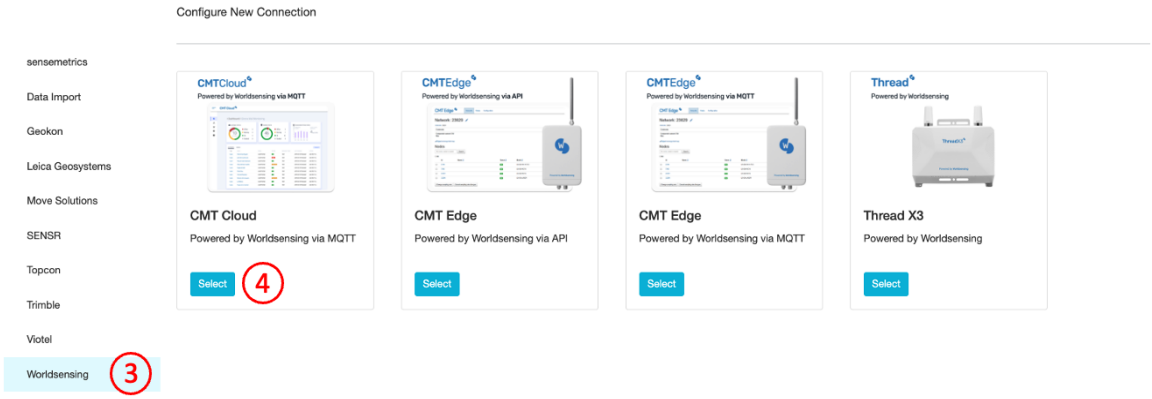


3. Confirm that the following page, illustrated below, is configured in the same manner as below, including enabling the MQTT Push and SSL checkboxes. Reach out to iTwin IoT Bentley Customer Success for the Password.

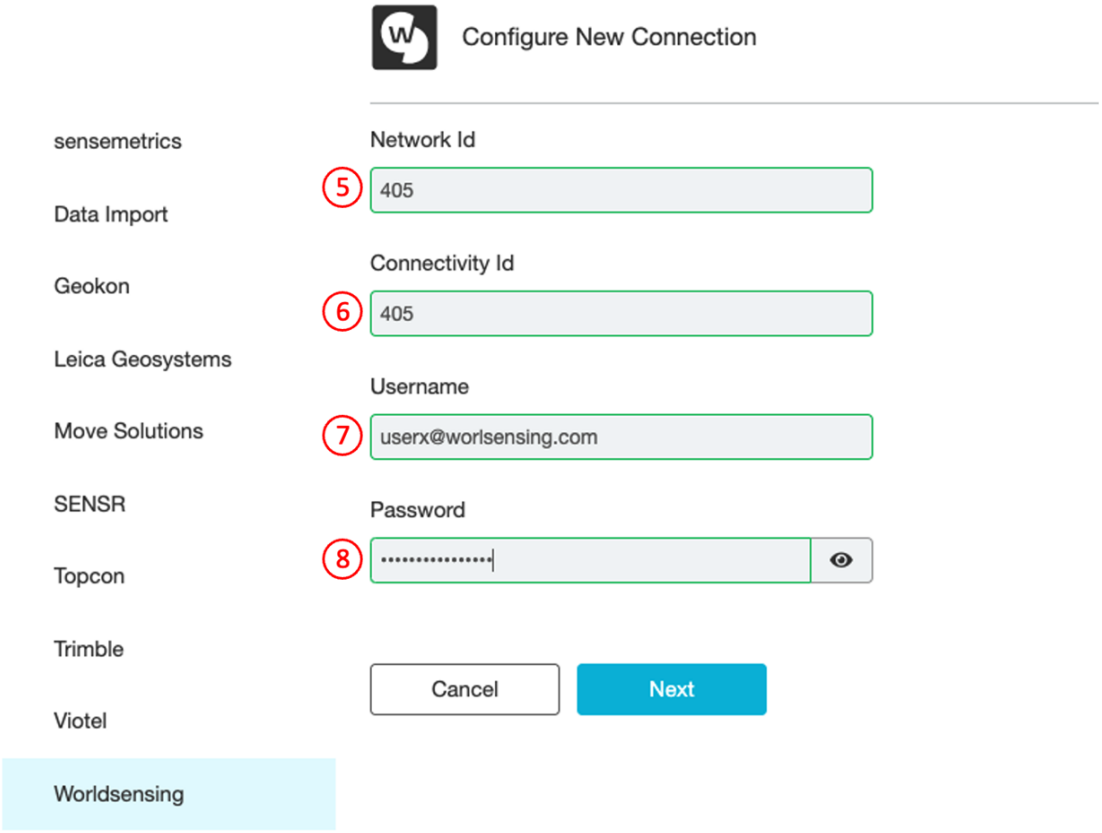
ITwin IoT CMT Cloud Connection



1. Within the application, begin by navigating to the Connectivity Module.
2. Click on the "+Connection" icon.

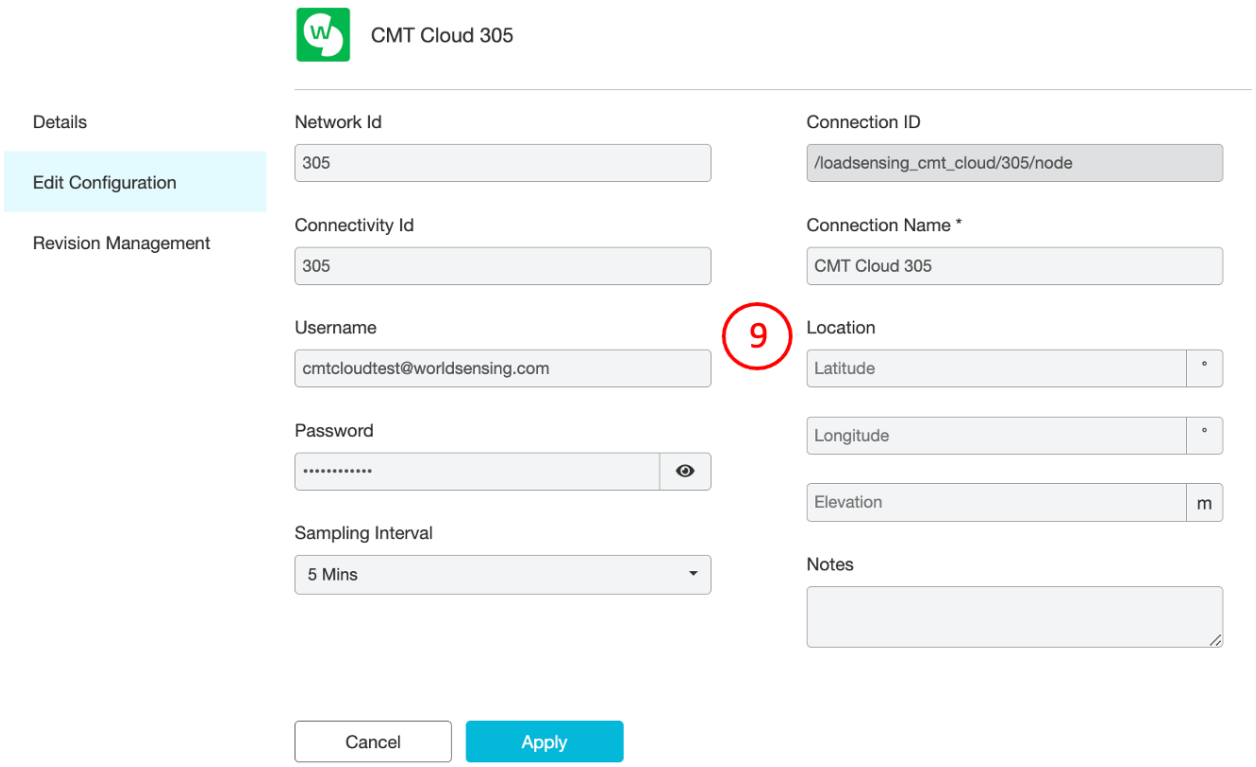


3. Select Worldsensing from the available Connections list on the left sidebar.
4. Click the "Select" icon on the CMT Cloud tile.

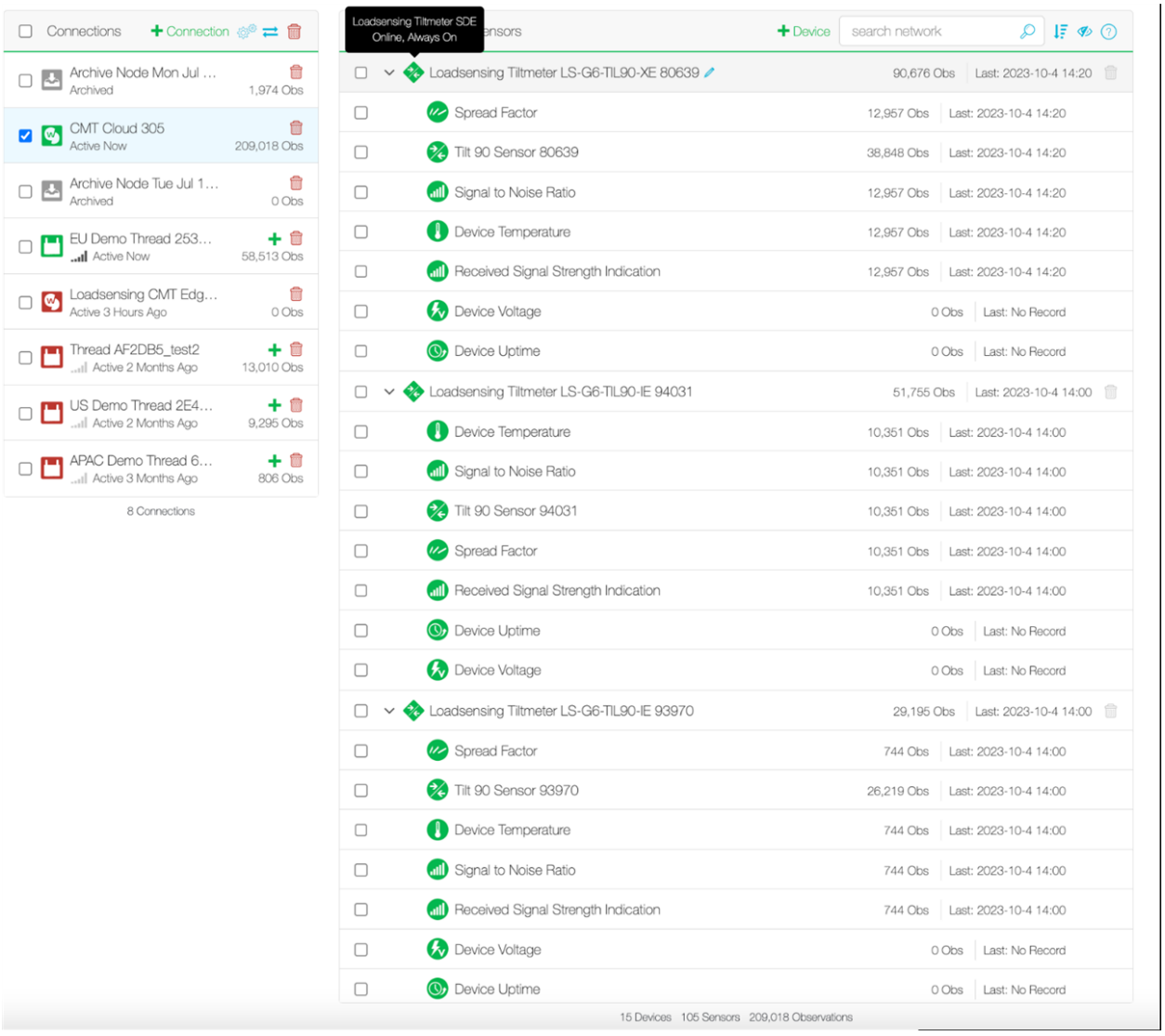


5. **Network ID**- Input the Network ID from step 2 of the previous section.
6. **Connectivity ID**- Input the same number as Network ID for the Connectivity ID.
7. **Username**- Input your CMT Cloud username used for logging into the application.
8. **Password**- Input your CMT Cloud password used for logging into the application.

Click "Next" once all information has been input.



9. The next page will be the Edit Configuration page for the connection. Standard configuration options like Connection Name change and location inputs are available. After configuration changes have been made, click "Apply".



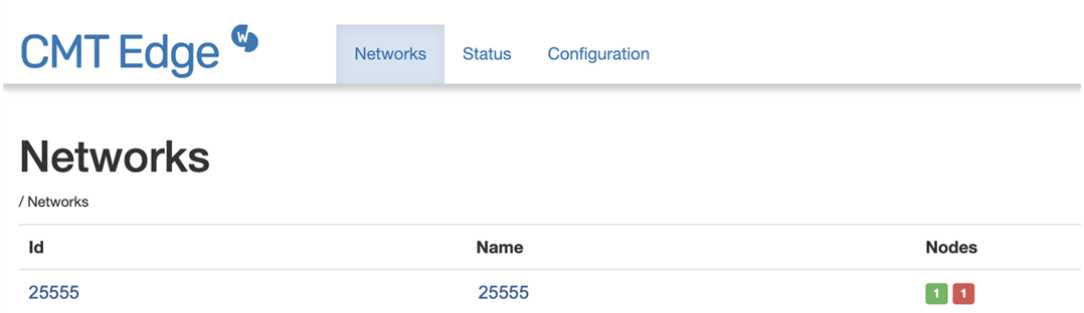
Once complete, Devices and Sensors will begin populating within the Connectivity module and observations will begin streaming from CMT Cloud.

CMT Edge MQTT Connection

The Worldsensing CMT Edge MQTT connection supports the connection and transfer of data from CMT Edge into the ITwin IoT platform.

CMT Edge Setup

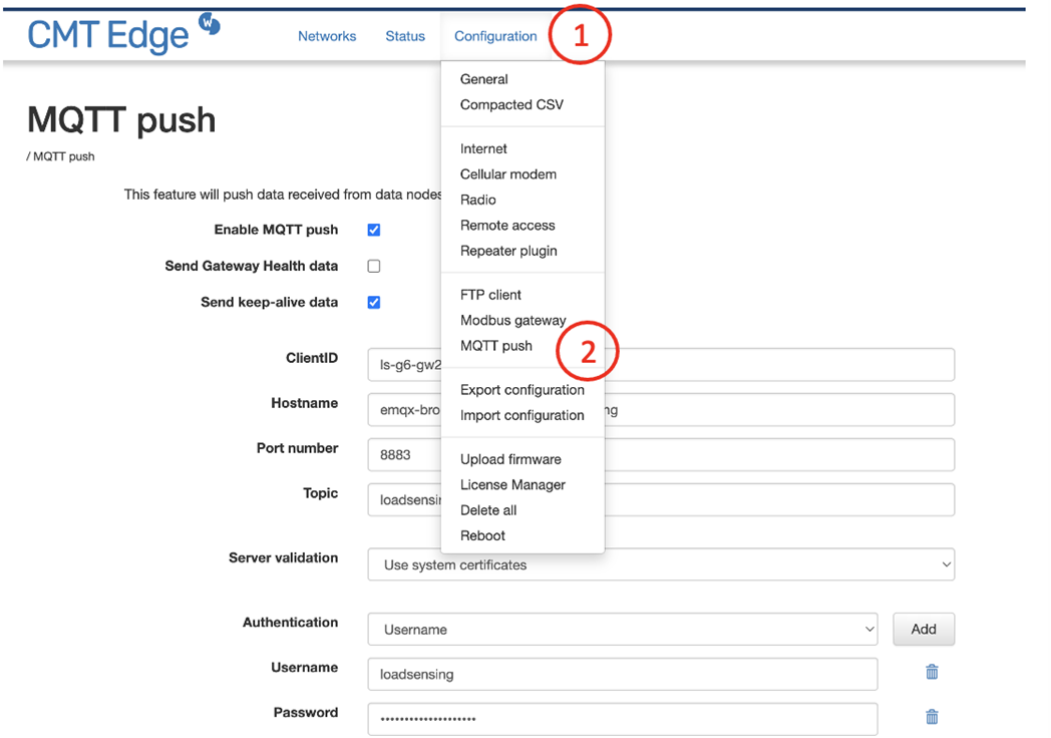
Loadsensing gateway and device configuration is performed through the CMT Edge application. Set up all projects and devices within the CMT Edge application. Please contact Worldsensing support with any questions regarding CMT Edge login or Gateway and Device configuration.



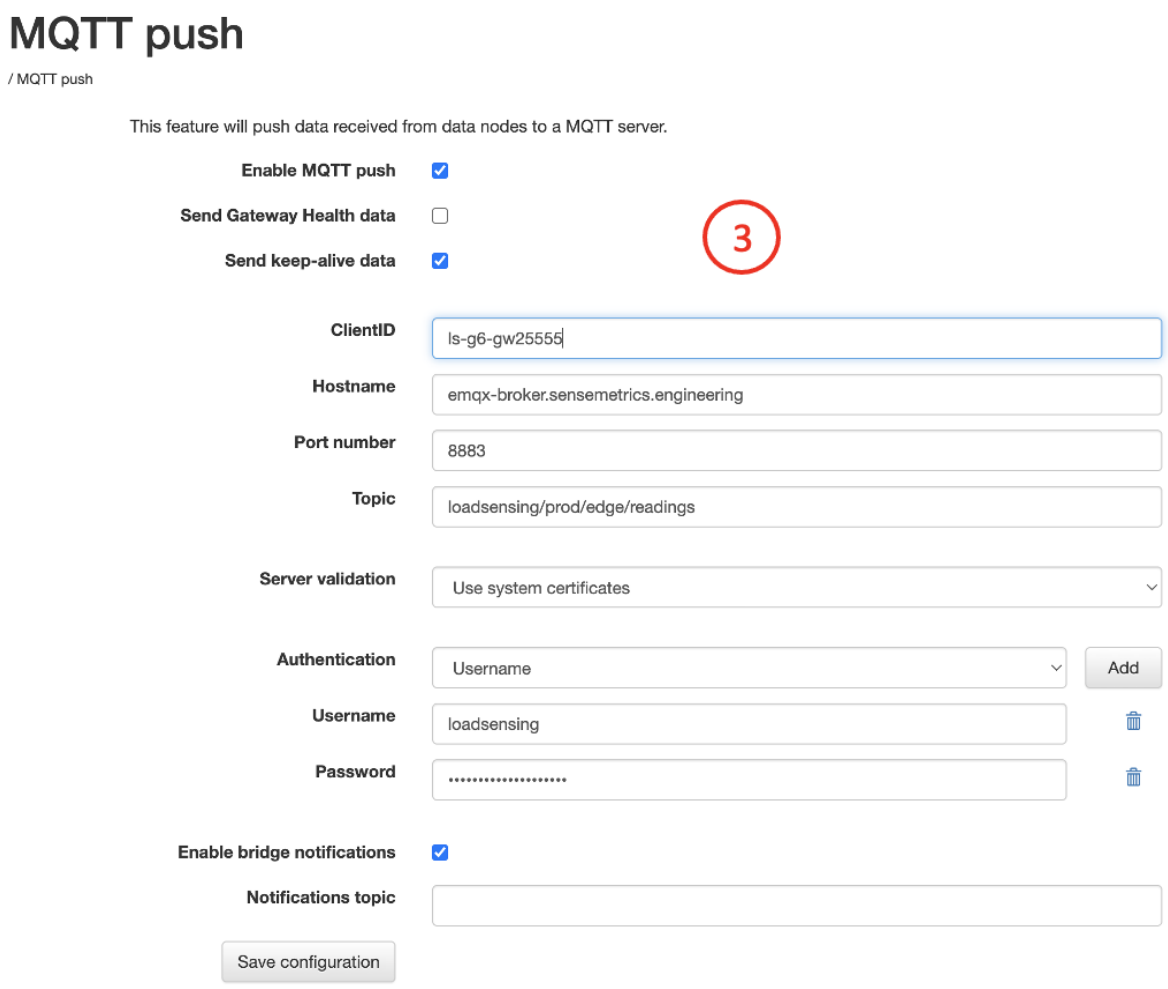
Setting Up CMT Edge MQTT Push

MQTT Push will need to be enabled within CMT Edge.

1. Click "Configuration" on the upper menu portion of the CMT Edge platform.
2. Click "MQTT push" on the dropdown options.



3. Configure The MQTT push page with the same inputs as the image below. ClientID will be automatically filled in by the application. Ensure that the "Enable MQTT Push" and "Send keep-alive data" checkboxes are enabled. For the password input, reach out to Bentley Customer Success.

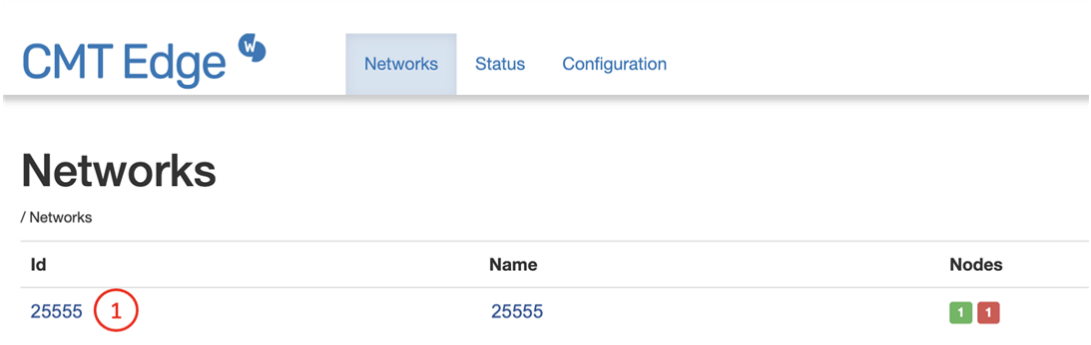


Once configuration is complete, click "Save configuration" at the end of the page.

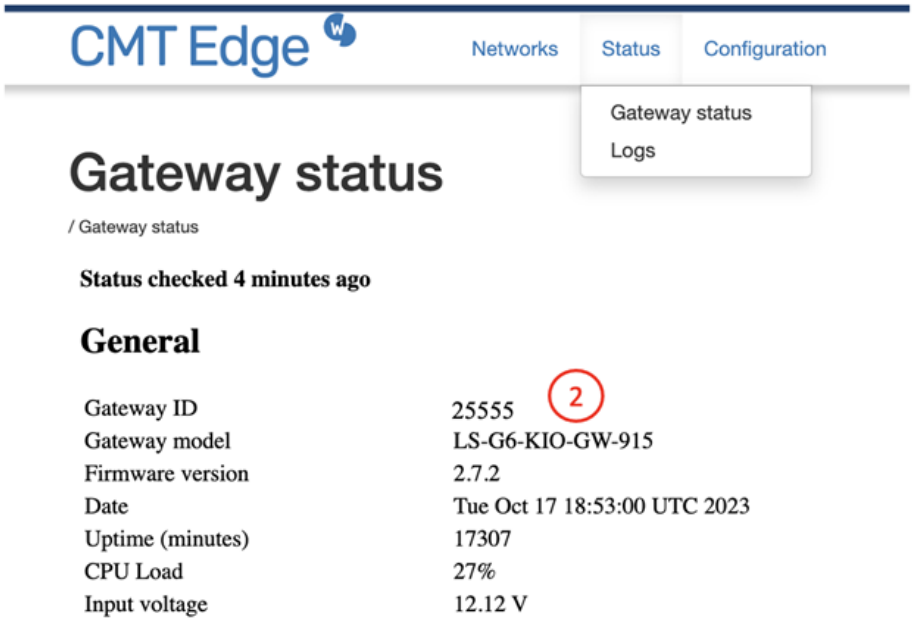
Retrieving CMT Edge Data

Once configured, the connection is ready to be set up in iTwin IoT. There are a few pieces of information to gather from the CMT Edge site for input into the iTwin IoT setup.

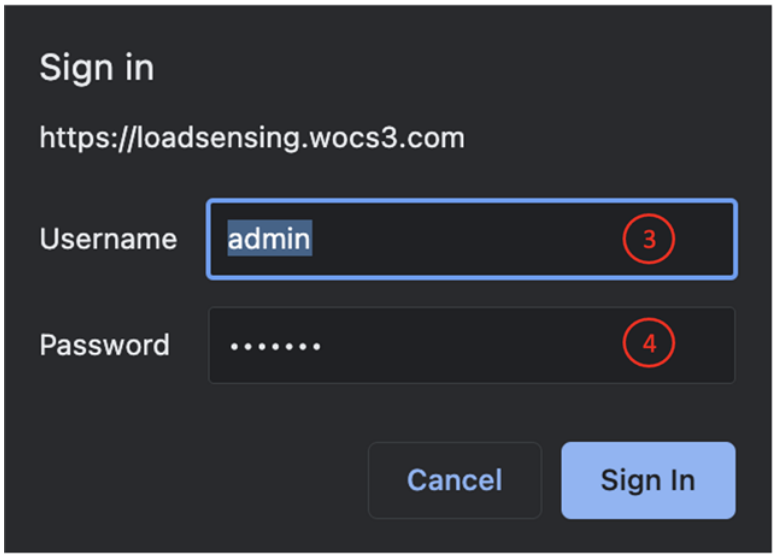
1. **Network ID**- The Network ID can be located within the Networks page of the CMT Edge application.



2. **Gateway ID**- The Gateway ID can be found by navigating to the Status Bar and clicking on the Gateway Status. The Gateway ID will be listed in the following page.

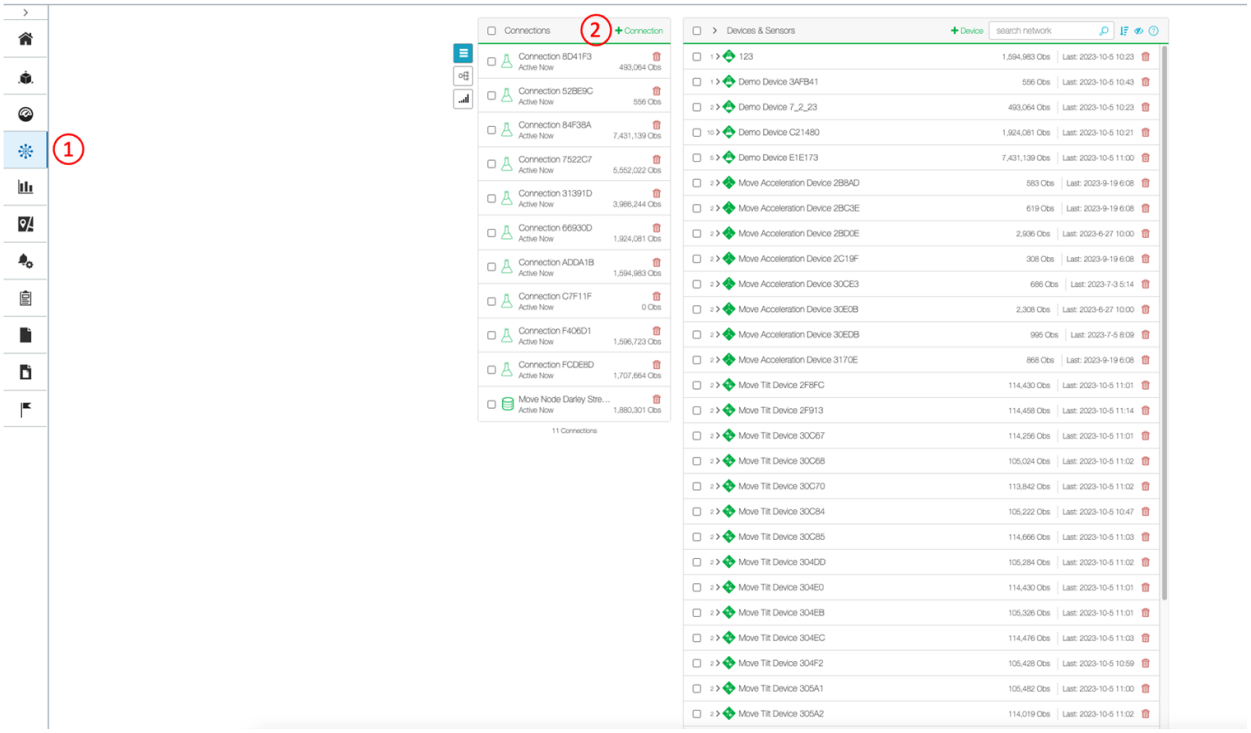


3. **Username**- Collect the username used for logging into the CMT Edge application.
4. **Password**- Collect the password used for logging into the CMT Edge application.

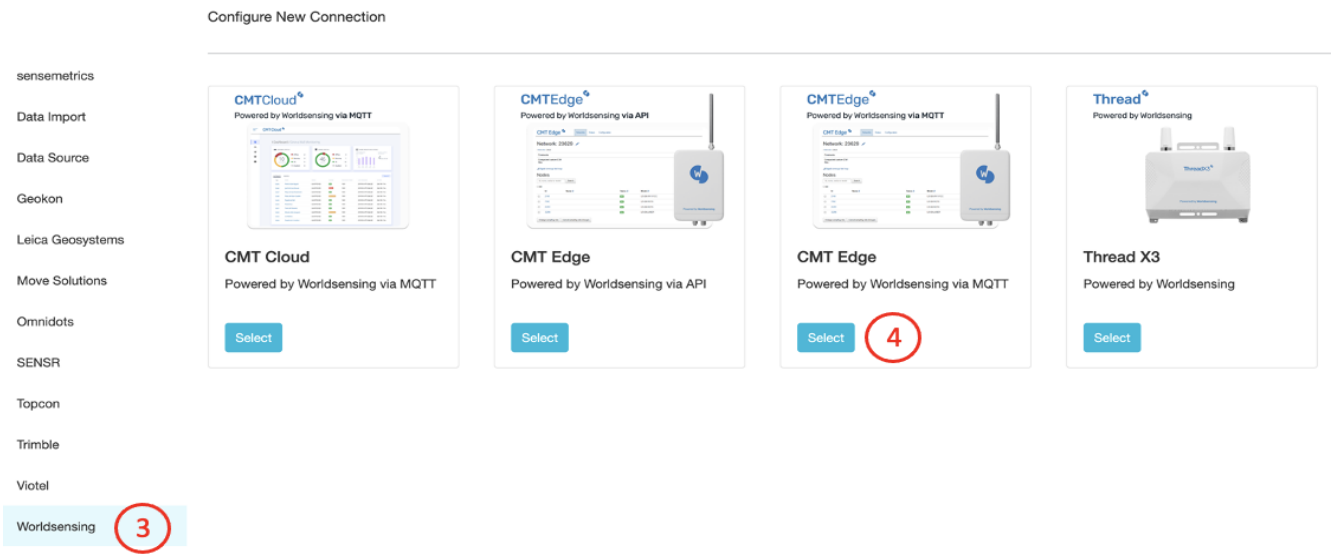


ITwin IoT CMT Edge Connection

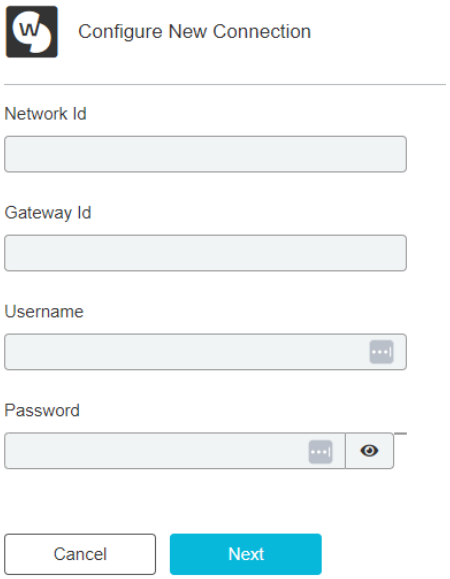
With the information gathered from the Edge application, the Edge connection in iTwin IoT can be set up.



1. Within the application, begin by navigating to the Connectivity Module.
2. Click on the "+Connection" icon.



3. Select Worldsensing from the available Connections list on the left sidebar.
4. Click the "Select" icon on the CMT Edge (via MQTT) tile.



5. **Network ID**- Input the Network ID from step 1 of the previous section.
6. **Gateway ID**- Input the Gateway ID retrieved in step 2 of the previous section.
7. **Username**- Input your CMT Edge username used for logging into the application, outlined previously in step 3.
8. **Password**- Input your CMT Edge password used for logging into the application, outlined previously in step 4.

Click "Next" once all information has been input. Click "Apply" in the following "Edit Configuration" page of the connection. This will direct the user back to the Connectivity page. Once complete, Devices and Sensors will begin populating within the Connectivity module and observations will begin streaming from CMT Edge.

Manual Data Import Options

There are a couple of options available to users to house manually imported data collected by manual readings or sensors not connected to the iTwin IoT cloud. This section of articles will review those options.

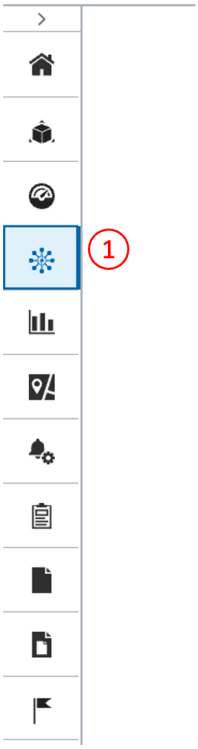
Import Device

The Import Device allows users to emulate a number of sensor types available within iTwin IoT. These sensors include Load Cell, Position, Position (ENH), Temperature, Tilt Biaxial, and Vibrating Wire. Follow this link for instructions about setting up an Import Device.

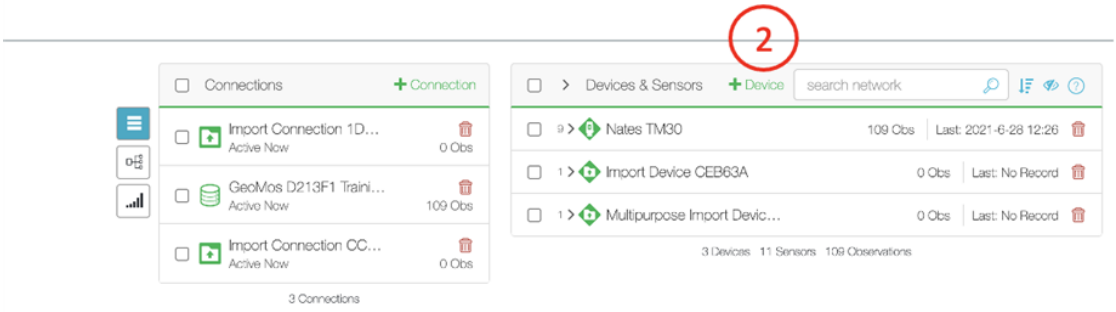
Adding the Import Device

This section of the article will guide the user in adding the Import Device to an Asset.

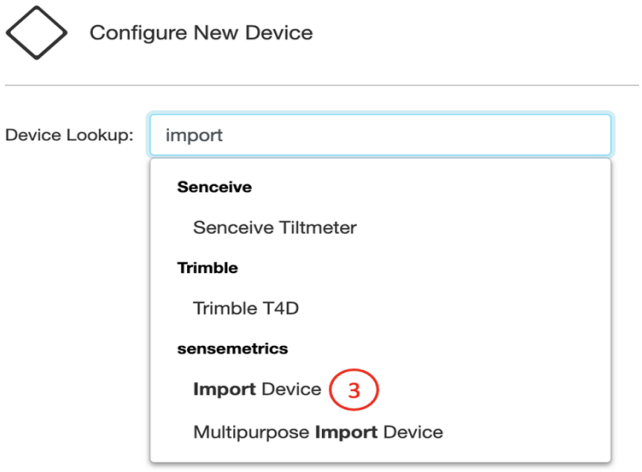
1. Navigate to the Connectivity Module.



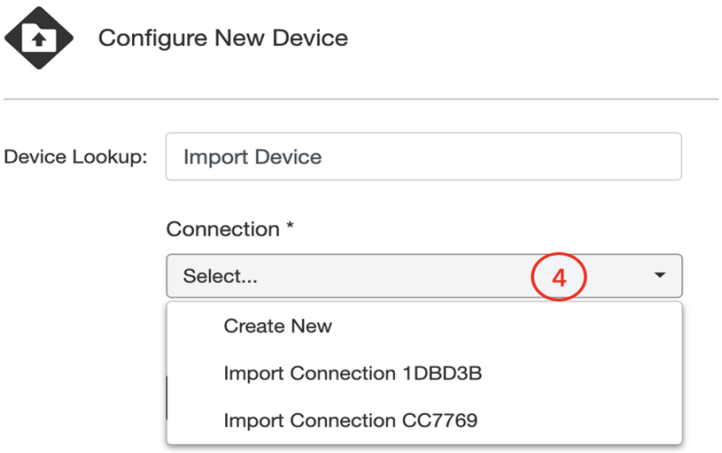
2. Click the "+Device" icon.



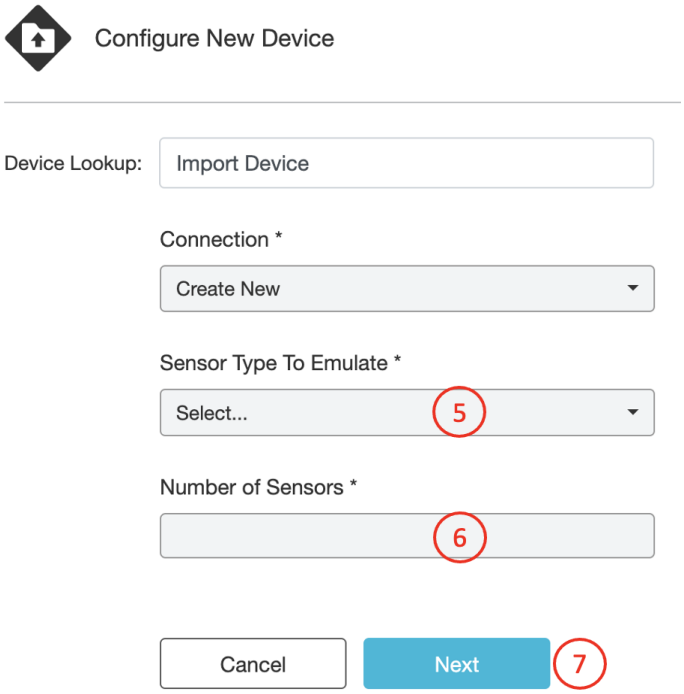
3. Within the Device Lookup window, begin typing "Import Device". When the dropdown options begin to populate, select "Import Device".



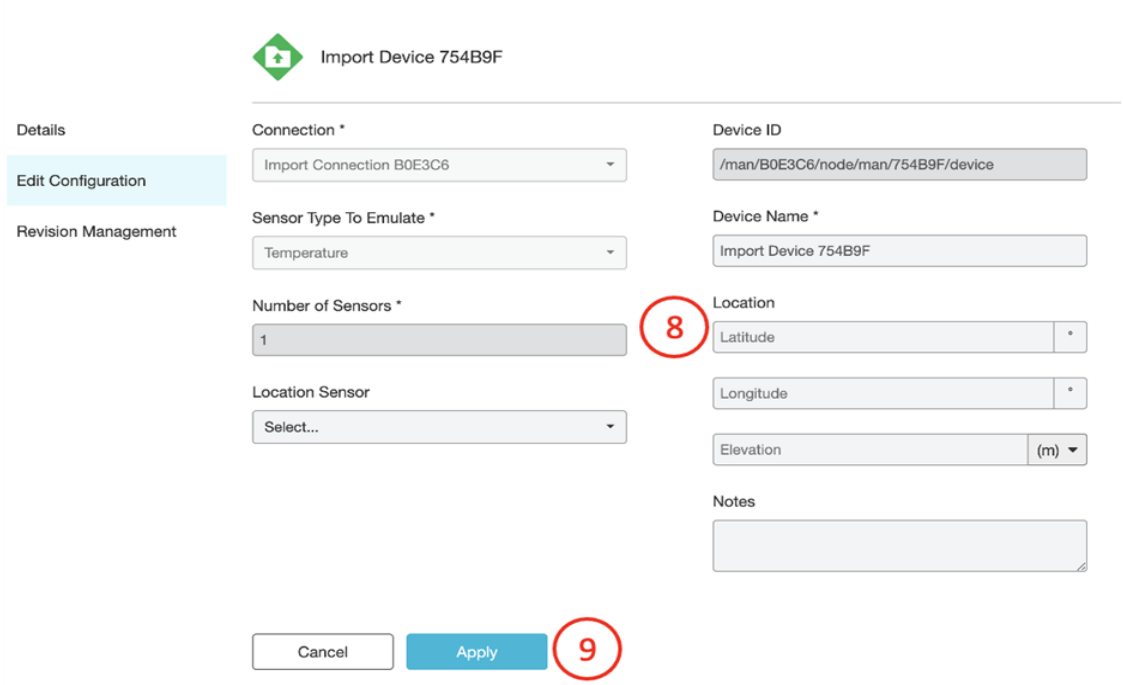
4. A Connection selection dropdown will appear on the next page. If no previous Import Connections have been made, the user will be required to "Create New", and a new Import Connection will be made. Previously created Import Connections can also be selected, which can aid in Import Device management if multiple Import Devices are being utilized in the asset.



5. Once a Connection is selected, two additional dropdowns will appear. The first dropdown allows the user to select which type of sensor the Import Device will emulate.
6. Next the user can select the number sensors of the selected emulation type that they would like to create.



7. Once configuration is complete, click "Next" to save those selections.
8. The user will then be directed to the Device "Edit Configuration" page, where items like Device Name, Location, etc. can be configured.
9. Click "Apply" to finish the configuration.



The configured sensor or sensors will then be displayed under the device, as highlighted below.

Importing Data to the Import Sensor

Now that the Import Sensor has been created, data in .csv format can be imported into the sensor.

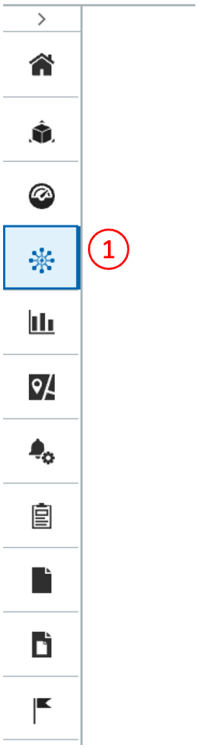
Multi-Purpose Import Device

The Multi-Purpose Import Device allows users to create a sensor or sensors and then select a data metric and metric unit that each sensor will store data for in iTwin IoT. Available metrics include Deposition, Depth, Depth to H2O, Distance 1D, Electrical Conductivity, Elevation, Elevation H2O, Force, Height, Δ Distance 1D, Oxidation-Reduction Potential, Precipitation, Pressure, pH, Humidity, Temperature, Tilt X, Tilt Y, Turbidity, Voltage, Volume, and Volumetric Flow Rate. Follow this link for instructions about setting up a Multi-Purpose Import Device.

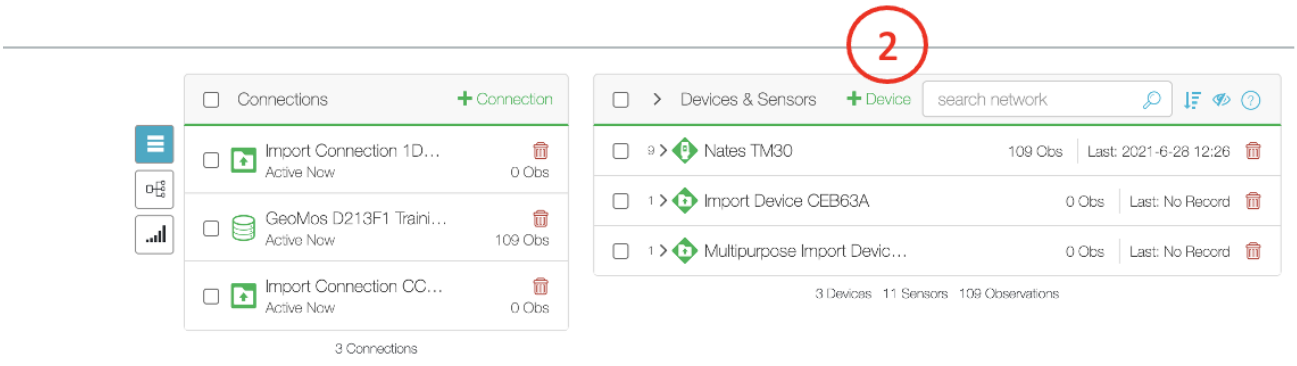
Adding the Multi-Purpose Import Device

This section of the article will guide the user in adding the Import Device to an Asset.

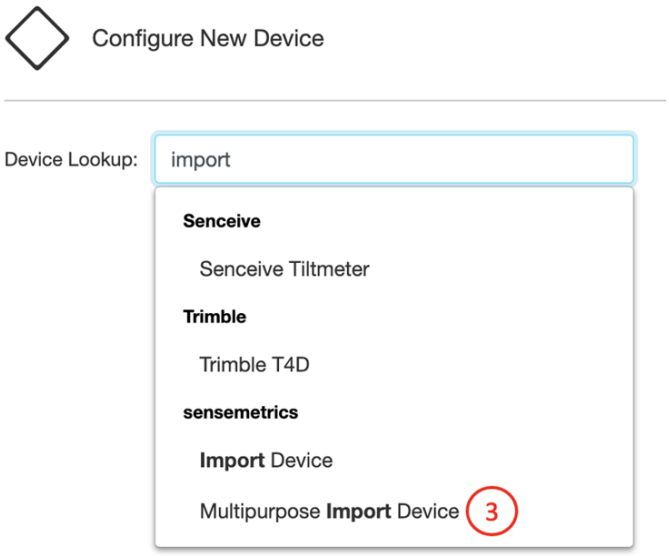
1. Navigate to the Connectivity Module.



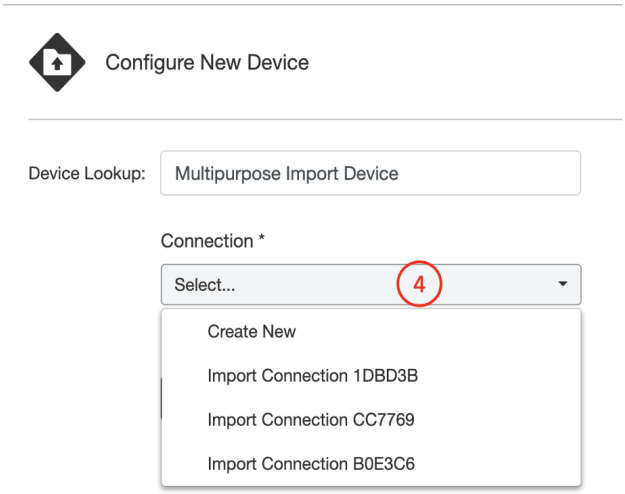
2. Click the "+Device" icon.



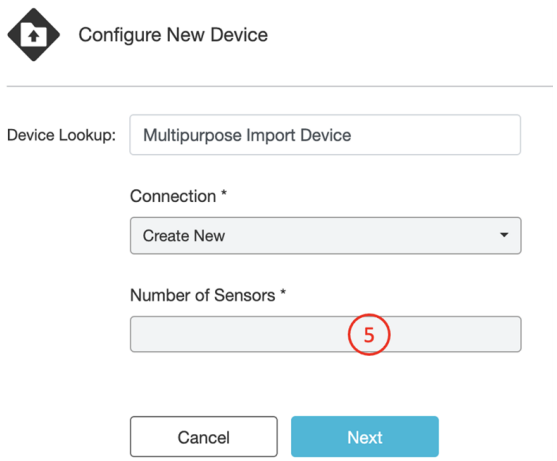
3. Within the Device Lookup window, begin typing "Import Device". When the dropdown options begin to populate, select "Multi-Purpose Import Device".



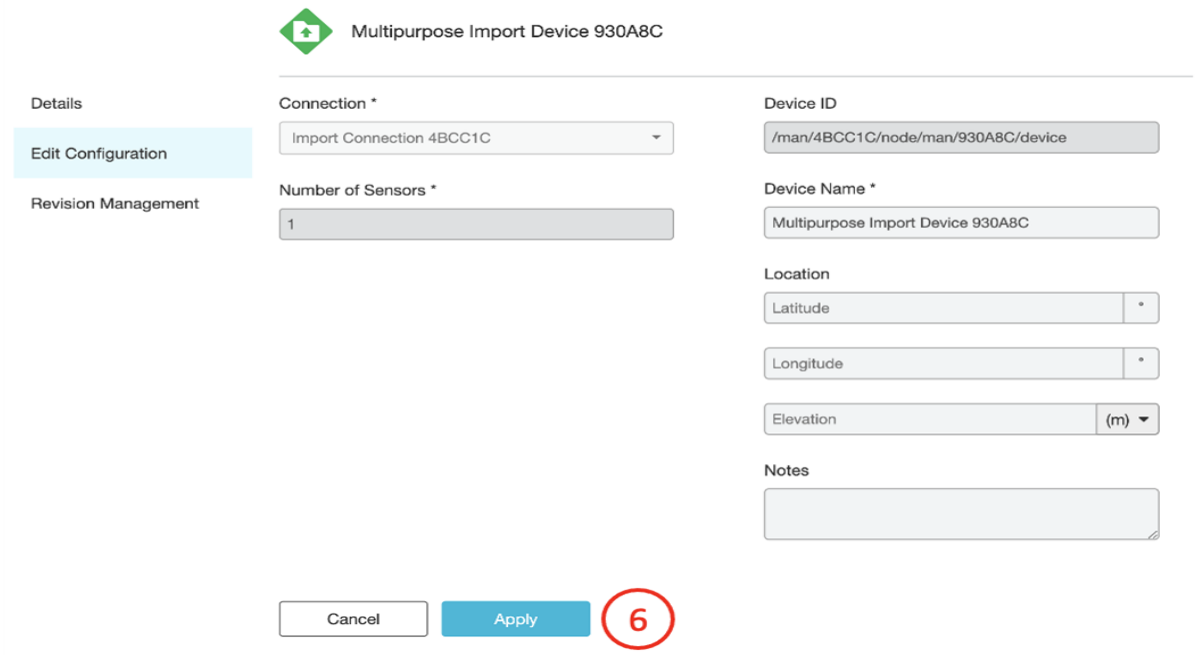
4. A Connection selection dropdown will appear on the next page. If no previous Import Connections have been made, the user will be required to "Create New", and a new Import Connection will be made. Previously created Import Connections can also be selected, which can aid in Import Device management if multiple Import Devices are being utilized in the asset.



5. Once a Connection is selected, the user can select the number of sensors that they would like to create to be housed under the Device. Sensor metric configuration is completed at the sensor level, so sensors with different metric configurations can be added under the same device. Click "Next" when the sensor number selection is complete.



6. The user will be directed to the Device "Edit Configuration" page, where the user can configure the Device items like Device Name, Location, etc. Click "Apply" when finished configuring the Device.

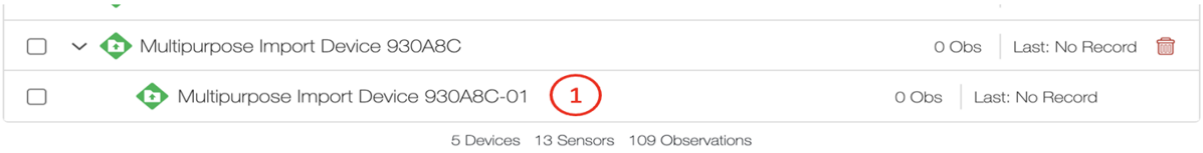


The user will be navigated back to the main Connectivity Module page. The newly configured Multi-Purpose Import Device and its associated sensor/sensors will be visible under the Devices & Sensors portion of the Connectivity page.

Configuring the Multi-Purpose Import Device Sensors

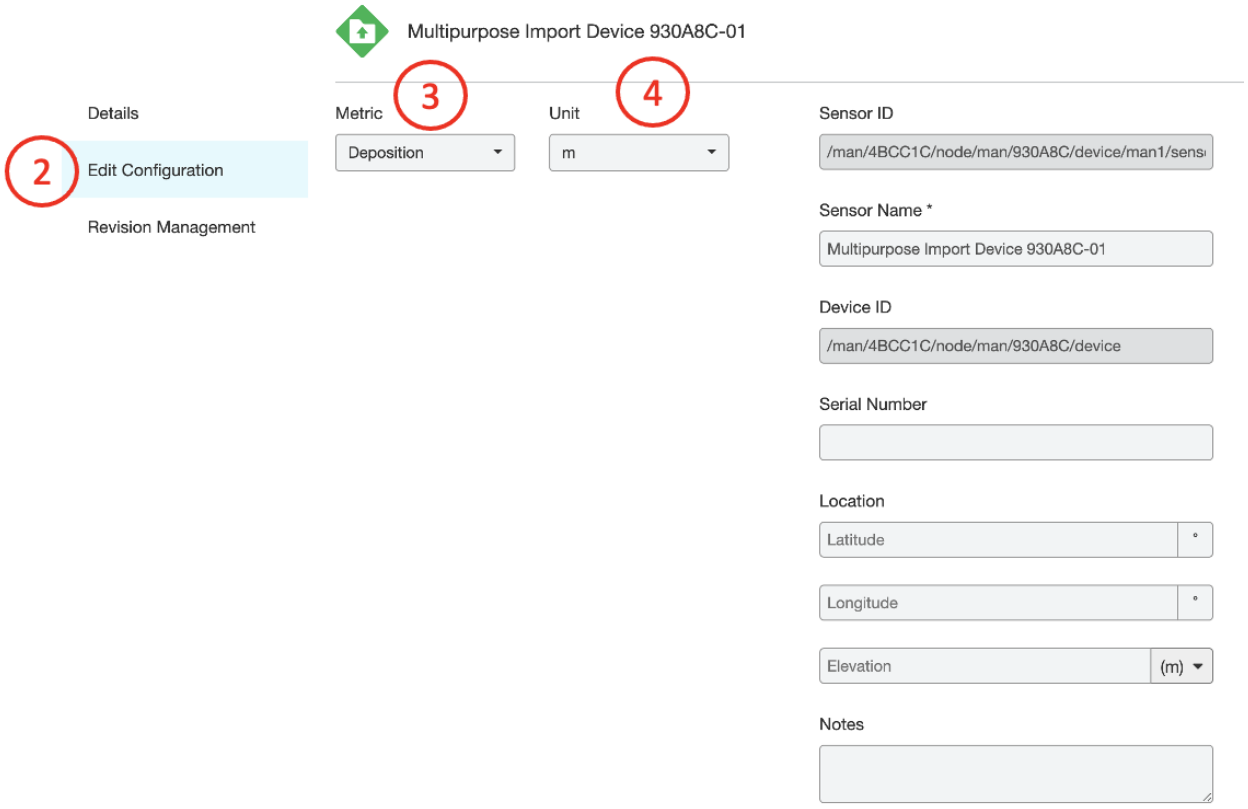
Once the Multi-Purpose Import sensor is visible on the Connectivity page, it can be configured for the desired metric and unit.

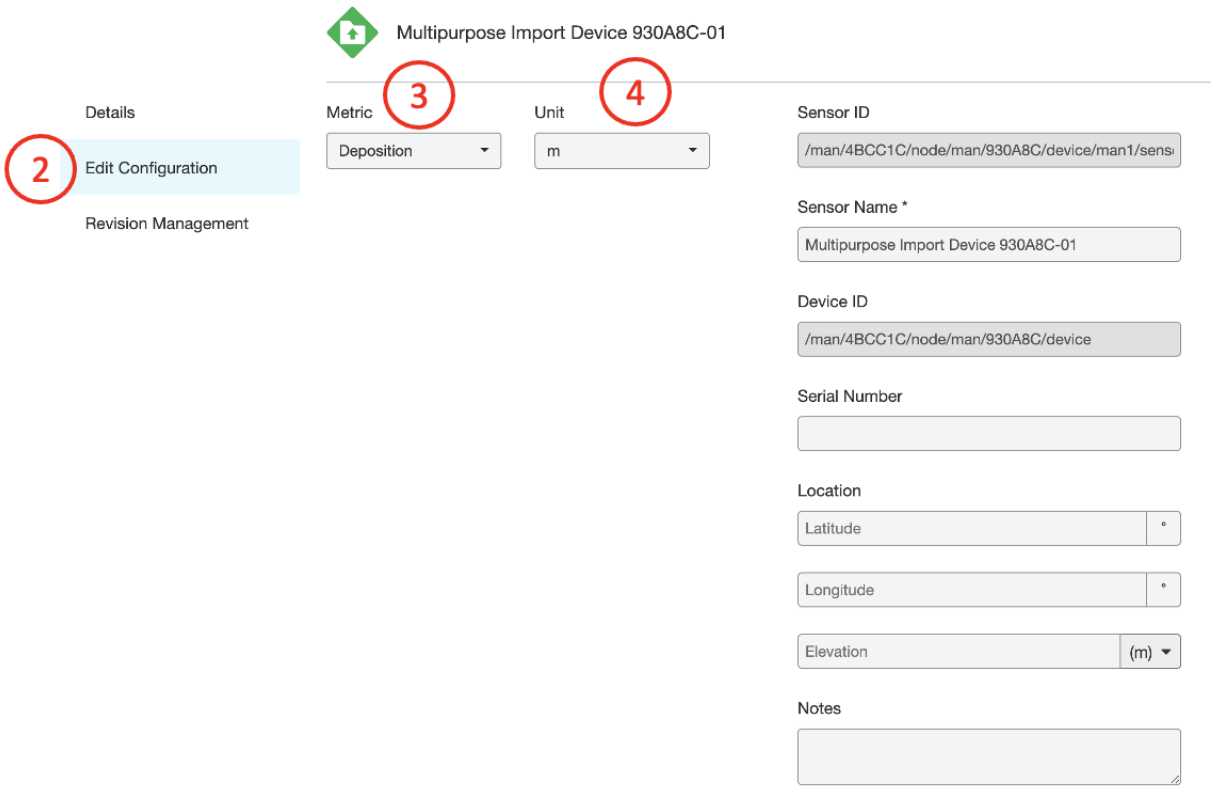
1. Click on the sensor to be configured



2. Navigate from the "Details" page to the "Edit Configuration" page of the sensor.
3. The "Metric" dropdown allows the user to select the type of data that will be imported.
4. The "Unit" dropdown will provide the user with measurement metrics that are being imported.

The sensor name, location, etc. can also be configured on this page. Click "Apply" at the bottom of the page to save all configurations.


Multipurpose Import Device 930A8C-01
Details
2
Edit Configuration
Revision Management
Metric
3
Deposition
Unit
4
m
Sensor ID
/man/4BCC1C/node/man/930A8C/device/man1/sens
Sensor Name *
Multipurpose Import Device 930A8C-01
Device ID
/man/4BCC1C/node/man/930A8C/device
Serial Number
Location
Latitude
°
Longitude
°
Elevation
(m)
Notes



Importing Data to the Import Sensor

Now that the Multi-Purpose Import Sensor has been created, data in .csv format can be imported into the sensor. Please ensure that the metric and unit selected in the configuration above match the metrics and units of the data being imported.

Environmental best practices

Installation and operation

Please install Worldsensing products in an energy-efficient manner by minimizing power usage for computers, mobile phones or other devices needed for setup and configuration. Minimize the use of small components needed for installation, like mounting brackets and other connection materials. Avoid using toxic materials and/or hazardous substances.

- Set the sampling rate only in the nodes you need.

- When configuring the nodes, use "Set last configuration" whenever possible.

- Remove the batteries if you are not using the node.

- For nodes with switch, use the usb mode when not in operation.

Return Material Authorization (RMA)

In the event of requesting a Return Material Authorization (RMA) please make sure to use the most environmentally friendly mode of transportation possible.

Product End of Life and disposal

Please take the necessary measures to extend the life of the product and reuse it when possible.

Once the product reaches its end of life (EoL) recycling is crucial to divert material from waste streams into new applications.

Electrical and electronic devices, and batteries must be recycled according to the European Union WEEE Directive 2012/19/EU.

Please separate batteries from equipment.

This product and the batteries it may contain should not be discarded as unsorted waste. Please send them to separate collection facilities for recovery and recycling.

Product packaging

Worldsensing's product packaging is recyclable. Separate the different materials for a correct waste management.

Safety and emergency procedures

Please read the safety sheet that comes with our products before installing them. For safety information on batteries and other materials, as well as instructions in case of emergency please read the safety information available at: https://info.worldsensing.com/safety-information/

In the case of an emergency and after it has been managed, please evaluate the waste generated in order to dispose of it in accordance with current legislation and local regulation.

It is your responsibility to dispose of your waste equipment, batteries and packaging properly to help prevent potential negative consequences for the environment and human health.

The cost of environmental waste management is included in the battery's selling price.

By following these best practices you can help protect the environment. Thank you for your cooperation.

CONTACT WORLDSENSING

Need more support? Get in touch with our Customer Success team:
Email: support@worldsensing.com
Phone: +34 93 418 05 85 (08.30h - 16.30h UTC)

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