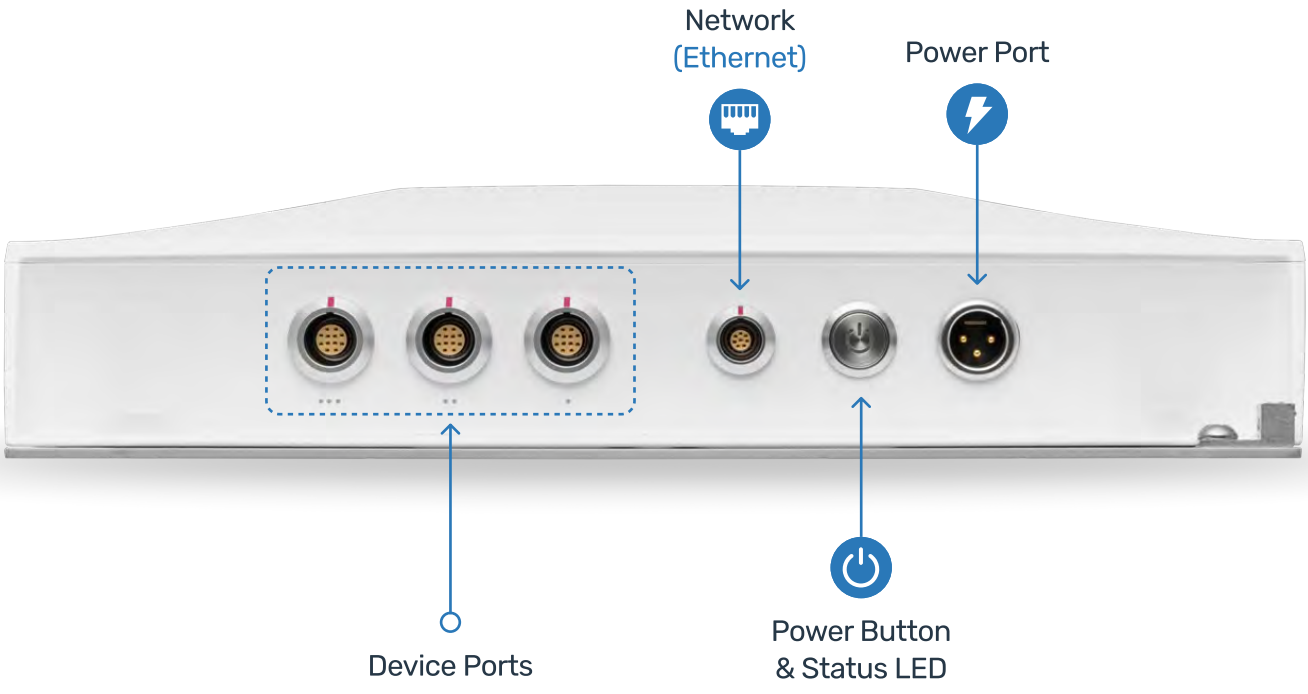
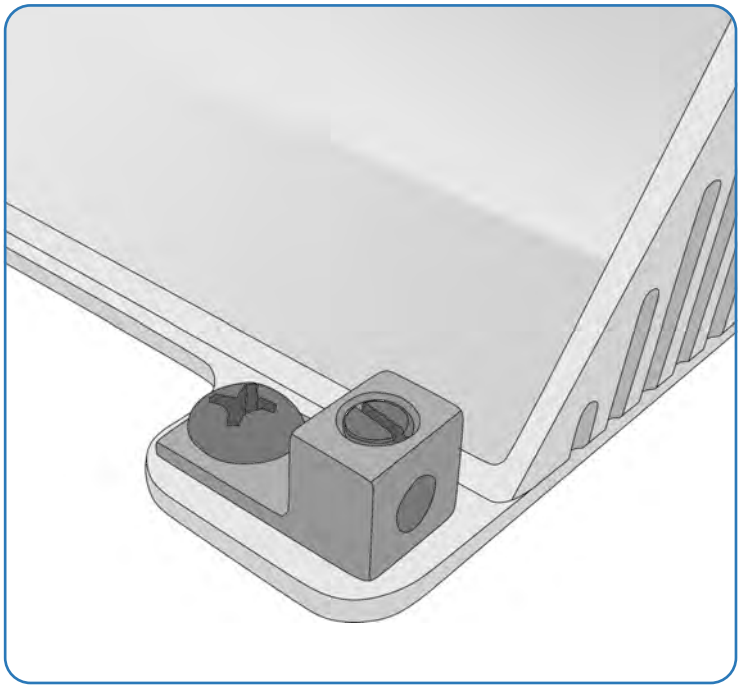

Active Wireless
Mesh Antenna
(optional)
Cellular Antenna
(optional)
WORLD SENSING

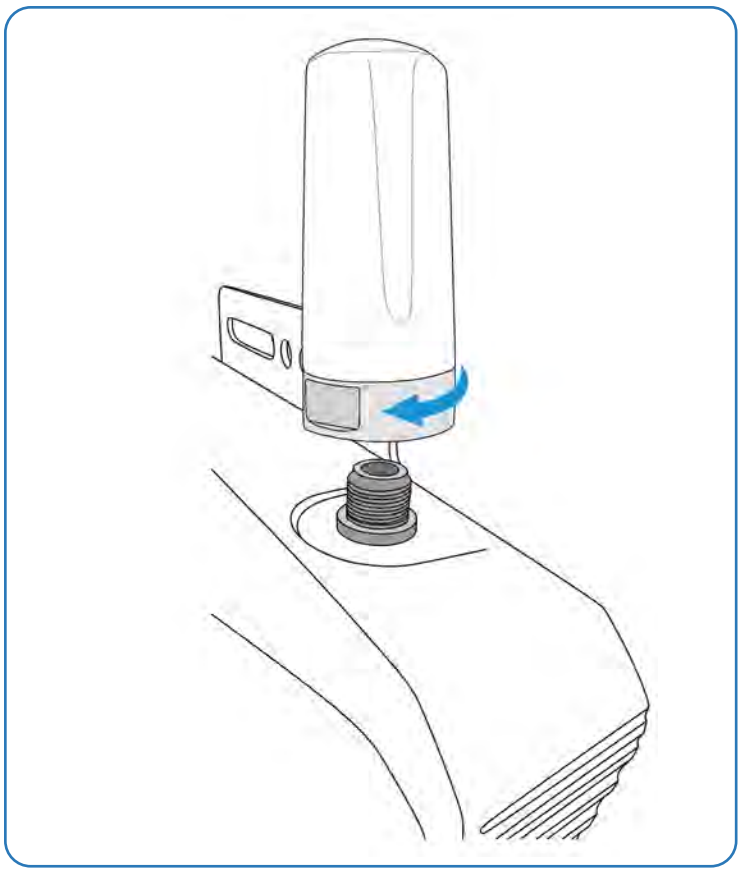

Network
(Ethernet)
Power Port
Device Ports
Power Button
& Status LED

# Assembly

1

Attach the grounding lug to the mounting bracket using the provided 1/4”-20 screw.





2

Screw provided antennas onto the N-type connectors located on the top of the Thread. Alternatively, use coaxial cables with N-type connectors for attachment to externally mounted antennas.

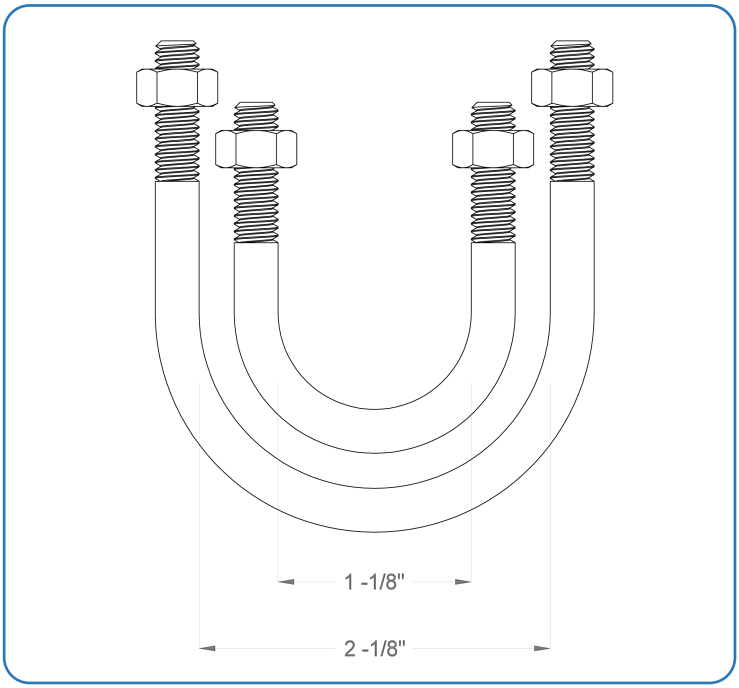
# Installation

1

The Thread mounting brackets will accommodate the following fasteners.

**Pole-mount**
U-bolts of 5/6" diameter, ranging from 1"dia SCH40 pipe to 2"dia SCH40 pipe. Clamping u-bolts are recommended.

**Wall-mount**
3/8"dia self-tapping machine screws, or
3/8"dia lag bolts




2 Install the Thread enclosure in a vertical orientation with the device ports facing down to minimize water intrusion.

3 Connect the power supply (Solar panel or AC transformer) with 3-pin power connector to the Power Port. The connector will provide a light tactical feedback when a solid connection is made. Please attempt to pull the connector lightly to ensure that the lock is engaged.

**IMPORTANT:** If you desire to use a third-party power supply to the Thread, please contact Worldsensing support prior to connecting to verify compatibility. Damage to the Worldsensing device caused by third-party power supplies is not covered under warranty.

4 Connect the grounding lug to a verified ground source using a 14AWG cable, no longer than 30ft in length.

# Connect

## 1 SETUP GATEWAY THREADS

The Thread will operate in the role of a **gateway** when it is connected to a broadband Internet connection via Ethernet. Additionally, all cellular models will prioritize use of a cabled Internet connection, but 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 additionally have the wireless mesh transceiver.

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

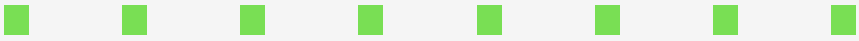
1) Distance between **gateway** and endpoint
2) Signal strength
3) RF noise in proximity
4) Sampling frequency
5) Configured sensor data rate

Installing additional Thread devices as gateways will automatically provide load balancing and redundancy for proximal Thread devices operating as endpoints. Additionally, any gateway will fall back and operate as an endpoint if Internet uplink is disrupted, and additional gateways are operating in proximity.

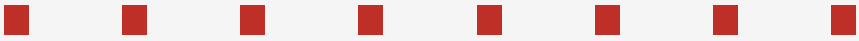
Color spectrum LED: **Boot Up**
Indicates boot process, from cold start or sleep mode. Process lasts approximately 60 seconds.

CROSS COLOR SPECTRUM MODULATION 

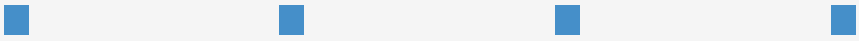
Green LED: **Connected**
Thread is active and operating in high-power mode, and IS connected to the cloud.

GREEN PULSE, 3 SECOND FREQUENCY 

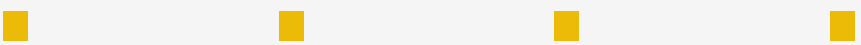
Red LED: **Disconnected**
Thread is active and operating in high-power mode, and is NOT connected to the cloud.

RED PULSE, 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 

# Connect

## 2 SETUP ENDPOINT THREADS

Thread devices not connected to the Internet using a cabled network connection, or internal cellular tranceiver, will connect to the cloud through neighboring Thread devices using active wireless mesh. Endpoints will automagically 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.**

## 3 CONFIGURE THE THREAD

**— 1. Login to your sensemetrics account:**

**sensemetrics Workspace:**
https://workspace.sensemetrics.com
(Compatible with any browser, but we recommend using Chrome version 87 or newer for optimimal experience.)

**sensemetrics Mobile App:**
Download the sensemetrics app for IOS or Android

GET IT ON Google Play

Download on the App Store

If you do not have a sensemetrics account yet, please email register@sensemetrics.com to initiate your registration.

# Connect

## — 2. Add a connection using Workspace or the Mobile App:

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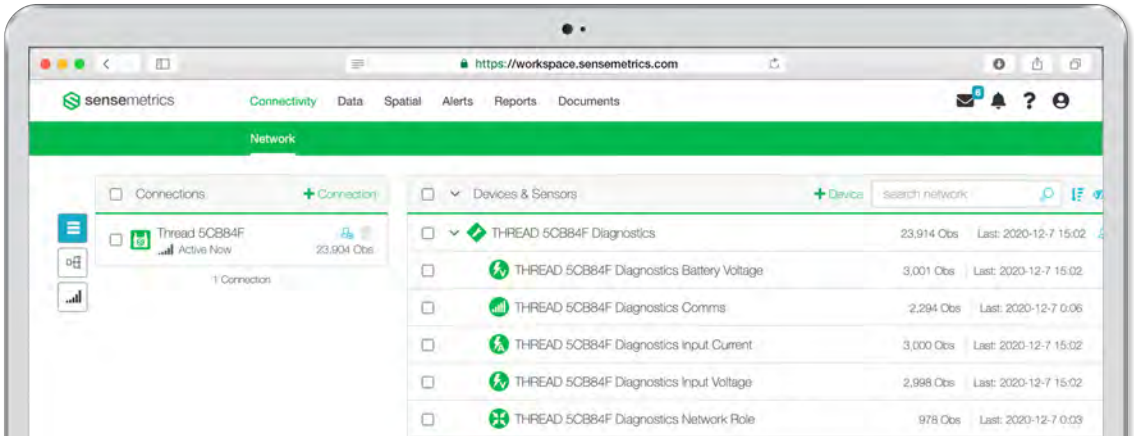
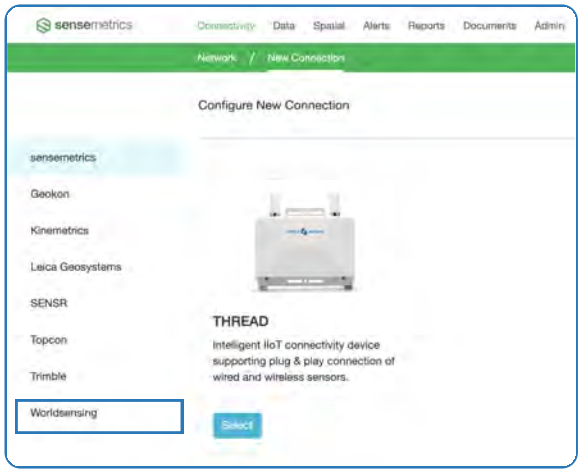
### Workspace

Navigate to the Connectivity page and click on + Connection.




### Under "Worldsensing," select the option to add a Thread.

Navigate to the Connectivity page and click on + Connection.




**Enter the unique 6-digit Connect Code found on the back of the Thread device.**

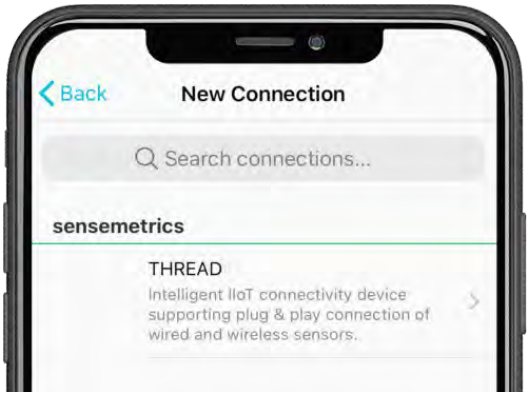
O8XDDD

# Connect

## Mobile App

From the Connections tab on the Network page, click the blue Add Connection button.


**Under "Worldsensing" select the option to add a Thread.**

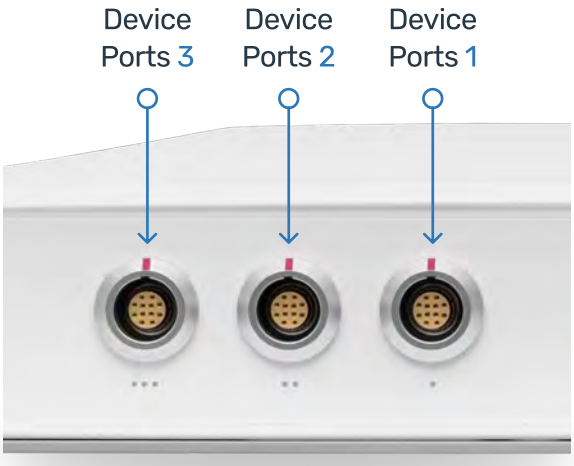



**Using your mobile camera, scan the QR code on the back of the Thread or type in the unique 6-digit Connect Code and click, "Connect."**

# Connect

## 4 ADD A SENSOR

Plug your sensor or device into one of the Thread device ports using the appropriate Thread connect cable. Take care to align the red marker on both the cable, and device port before applying pressure.




For more information on configuring specific sensors for automated data capture and analytics, visit our Help Center at:
https://support.sensemetrics.com

Scan to view the Device Configuration Overview article on our Help Center:

# Factory Reset

If you experience any connection or performance issues, we recommend that you restore the Thread's factory settings. This can be initiated by powering down the device, then holding down the power button for 10 seconds. You will observe the LED behavior change to a magenta pulse. This behavior will continue for approximately 6 minutes, after which the Thread will begin a normal boot cycle. Once completed, we recommend that you perform a Thread firmware update to ensure that the latest features, and performance updates are installed.

Magenta LED: **Factory Reset**
Thread is performing a Factory Reset.

MAGENTA PULSE, 1 SECOND FREQUENCY

# IMPORTANT INFORMATION ABOUT YOUR THREAD

The Thread is specifically designed to work with the Tenergy 31383-1 LiFePO4 Battery. Use of any other battery is strictly prohibited and will void any warranties. This battery is not user-serviceable. Worldsensing is not responsible for any damages due to replacement or use of an unsupported battery.

- Maximum operating altitude: 4000m
- External battery will require a 10A fuse and waterproof fuse holder.
- WARNING: Risk of fire, explosion or burn
  - Do not replace battery with unsupported type
  - Do not heat above 70˚C or throw battery into fire
  - Do not disassemble, crush, or modify the battery
- The Thread is specifically designed to charge with the following approved power supplies:

| Solar Panels | AC Power Supplies | Regional Plug |
|---|---|---|
| 10011186 | 10011205 | 10012208 (AU) |
| 10011233 | | 10012209 (CH) |
| 10011402 | | 10011479 (EU) |
| | | 10012211 (UK) |
| | | 10011290 (US) |

- Additionally, the Thread can be paired with 3rd party solar panels with MC4 connectors using the approved Worldsensing part: 10011250. To ensure performance, please pair with a solar panel that meets the stated performance specifications below:
  - Maximum Open Circuit Voltage (Voc): 22.9V
  - Optimum Operating Voltage (Vmp): 20.2V
  - Maximum Operating Current (Imp): 7.92A

**Intended use:**

- Computing with software.
- Data communication with external appliances.
- The product must not be disposed with household waste.

# COMPLIANCE AND CERTIFICATIONS

The conformity for countries with other national regulations not covered by the FCC part 15, 22 and 24 or European directive 2014/53/EU has to be approved prior to use and operation.

This product must be operated at a distance of 20 cm from persons to ensure compliance with regulatory requirements.

**US and Canadá:** This device complies with Part 15 of the FCC Rules and Innovation, Science and Economic Development Canada's licence-exempt RSS(s). 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.

Cet appareil a été testé et déclaré en conformité avec la section 15 des directives FCC et aux exigences de l'organisme canadien Innovation, Sciences et Développement économique (ISDE) . Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférences nuisibles et (2) cet appareil doit accepter toute interférence reçue, y compris des interférences susceptibles d'occasionner un fonctionnement non souhaité.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

Innovation, Science and Economic Development Canada

**Europe / UK:** This equipment complies with the essential requirements and other provisions of Directive 2014/53/EU. This X3.1000SE Thread is in compliance with the essential requirements and other relevant provisions of Radio Equipment Regulations 2017. For more information please refer to the Declaration of Conformity.

This device operates in:
ISM: 863 to 870 MHz: 25 mW (13 dBm)
4G LTE B1/B3/B7/B8/B20; 0.2W (23 dBm) , 3G: B1/B8: 0.25 W (24 dBm), 2G GSM 900: 2W (33dBm); DCS 1800 (30 dBm): 1W

# COMPLIANCE AND CERTIFICATIONS

The conformity for countries with other national regulations not covered by the FCC part 15, 22 and 24 or European directive 2014/53/EU has to be approved prior to use and operation.

**Brazil:** Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. www.gov.br/anatel/pt-br

ANATEL

# About Worldsensing

Worldsensing is a global IoT pioneer. Founded in 2008, the infrastructure monitoring expert serves customers in more than 70 countries, with a network of global partners to jointly drive safety in mining, construction, rail and structural health.
Worldsensing is headquartered in Barcelona and has a local presence in the UK, North and South America, Singapore, Australia and Poland. Investors include Cisco Systems, Mitsui & Co, McRock Capital, ETF, Kibo Ventures and JME Ventures.

## Schedule a discovery session with Worldsensing to explore your monitoring needs

www.worldsensing.com/contact us



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