



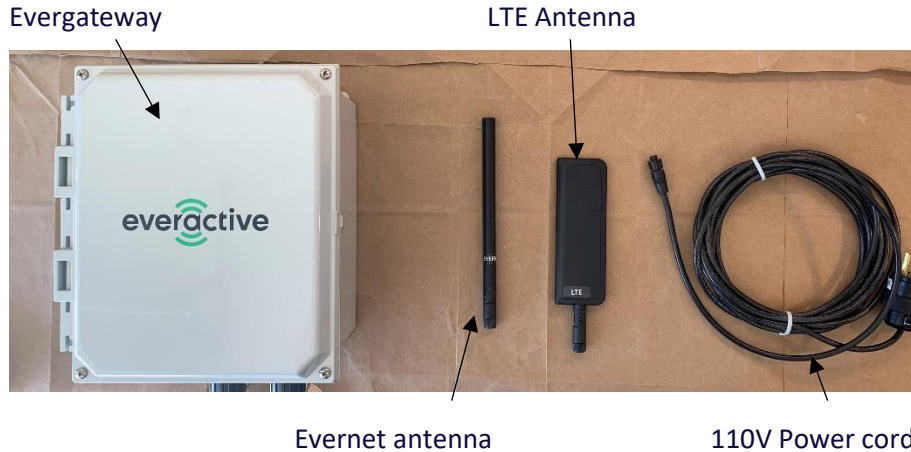
Machine Health Monitoring (MHM) 2.0 Installation Guide

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Evergateway

Components



Installation

1. Evergateway
2. Determine a central location between all sensors and has adequate structure for installation.



3. Evernet Antenna gets screwed into the top right corner.
4. LTE Antenna gets screwed into the bottom left corner.
5. Power cord is plugged in at the bottom right corner then plugged into power.

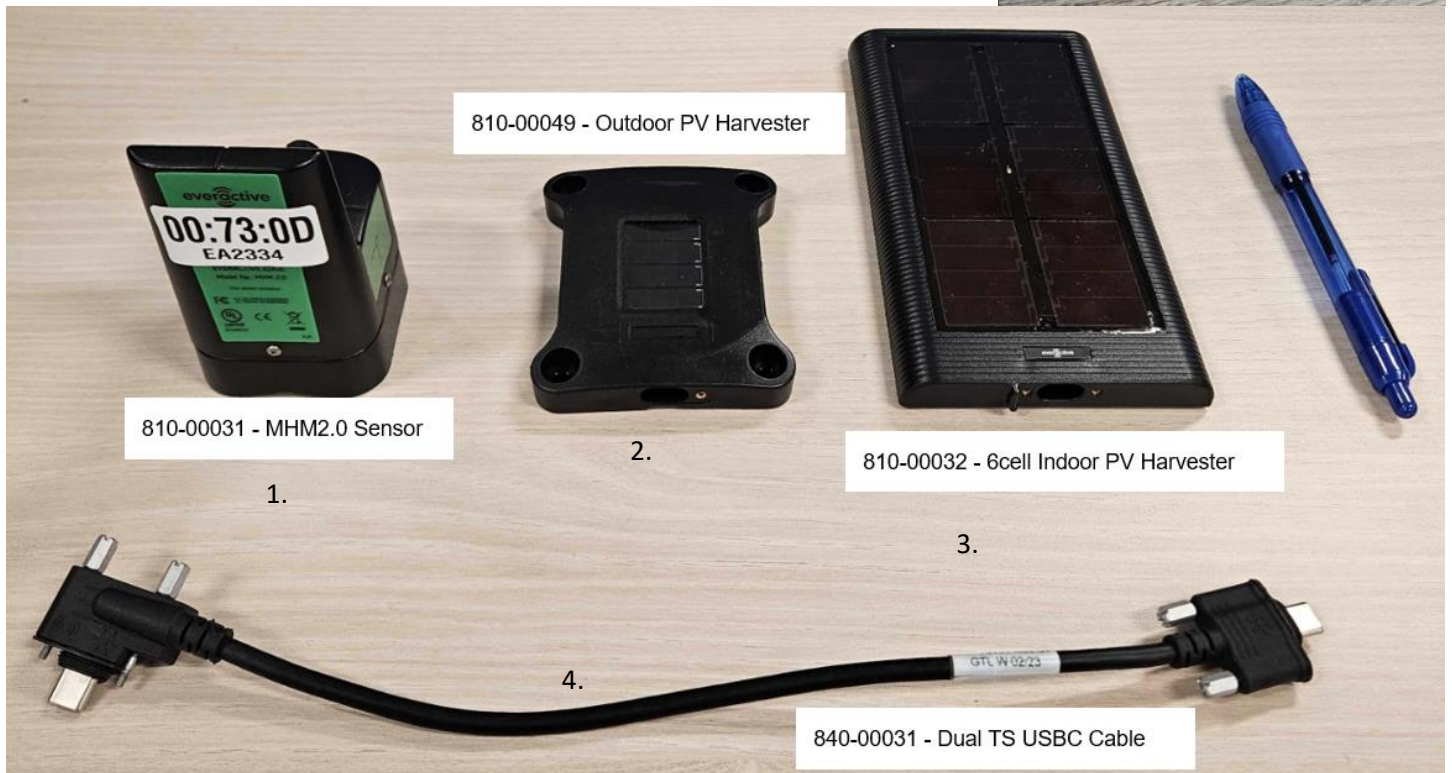
Configuration

If pairing Eversensors to an Evergateway that has already been configured, skip this section. Troubleshooting can be found here: <https://support.everactive.com/hc/en-us/articles/1500004086202-Gateway-Troubleshooting->

Eversensors

Components

1. Eversensor
2. [Optional] photovoltaic (PV) harvester (outdoor)
3. [Optional] Photovoltaic (PV) Harvester (indoor)
4. USB-C style custom cable to connect TEG harvester to Eversensor
5. Thermoelectric generator (TEG) harvester
6. [Optional] USB-C style custom cable to connect PV harvester



Important notice: *Only Everactive cables should be used with Everactive devices. The cables should never be plugged into a USB-C style charger or laptop; Eversensors cannot charge from a USB-C charger.*

Eversensor Attachment

There are two ways of mounting the MHM 2.0 Eversensor: Epoxy and magnets.

Mounting using the magnets built into the base of the sensor is the fastest, easiest way to mount an MHM sensor to an asset, as outlined below.

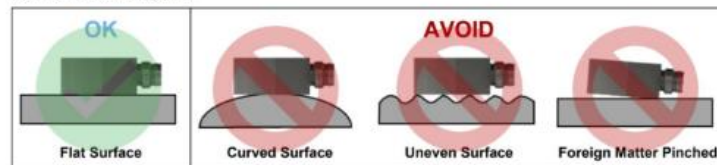
Magnetic Mounting Process:

An MHM sensor may be mounted to the surface of a machine using the magnetic base when:

- The machine surface is a ferromagnetic material.
- There is approximately a 2" x 2" area to place the MHM sensor.
- The MHM sensor does not "rock" when placed on the machine's surface.

1. Select a location on the asset to be monitored at either the inboard or outboard end of the unit, oriented vertically or horizontally.
2. Place the MHM sensors on the machine with the antenna oriented perpendicular to the machine's axis of rotation. Test to ensure a positive connection between the sensor and the machine by gently "wiggling" the antenna of the sensor. If the MHM sensor "rocks" it will not produce useful data.
 - If the sensor "rocks", reposition the sensor until the sensor shows no rocking motion.

The frequency performance of the sensor is highly dependent on the method of installation. The sensor must be secured tightly on a flat, hard surface. It should be positioned closest to the measurement point.



Epoxy Mounting Process:

Everactive recommends using **Loctite AA 330 No-Mix Adhesive** for epoxy mounting MHM hardware (sensor, TEG, or PV Harvester). Please refer to the Loctite Specifications and MSDS sheets if more information is needed on Loctite AA 330.



An MHM sensor may be mounted to the surface of a machine using epoxy when:

- The machine surface is uneven (E.g. Cast Steel) and causes the MHM sensor to "rock" when attempting to mount via magnet.

- The machine casing or surface is made of a non-ferromagnetic material.
- The machined casing is finned for cooling.

Epoxy Mounting process:

1. Select a location on the asset to be monitored at either the inboard or outboard end of the unit, oriented vertically or horizontally.
2. Surfaces should be dry and clean of any heavy grease or oil.
3. Sensor mount rubber bottom should be removed.



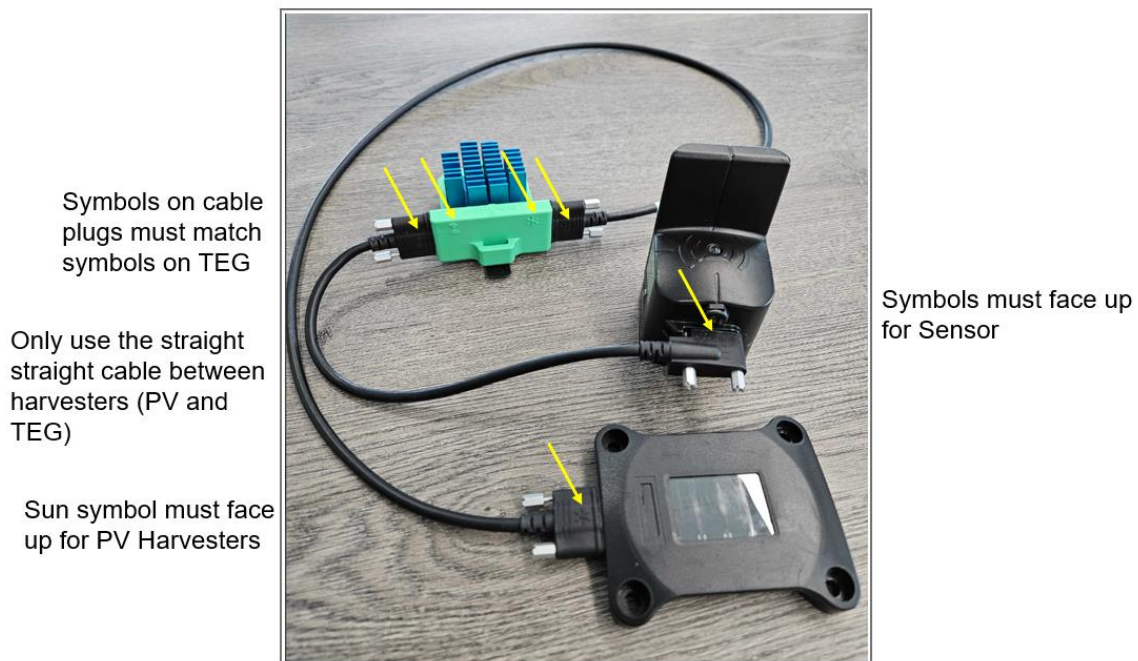
4. Hold Activator can 1-2 inches from the MHM sensor mount location and coat the surface with Loctite AA 330 Activator.
5. Apply Loctite AA 330 adhesive to the base of the MHM sensor, forming two parallel beads. Place the sensor on the machine ensuring the antenna is perpendicular to the axis of rotation within the machine.
6. Press the MHM sensor to the machine firmly for 60 seconds. Handling strength in 1-2 minutes. Full cure in 4-24 hours depending on environmental conditions. Larger gaps between mount surfaces will increase cure times.

PV Harvester Attachment

If the thermal harvesting source is insufficient, Everactive offers a PV harvester as a supplemental harvesting source. Both the indoor and outdoor PV harvesters connect using the same custom USB-C cables.

1. Connect the PV harvester directly to the TEG harvester, which must itself be connected to the Eversensor.
2. The same epoxy may be used to secure the PV Harvester to the surface of the machine.
3. Angle the PV harvester to maximize direct light to the PV cells once secured.

USBC Cable Plug Orientation with Sensor + TEG + Outdoor PV (Straight to Straight Cable)

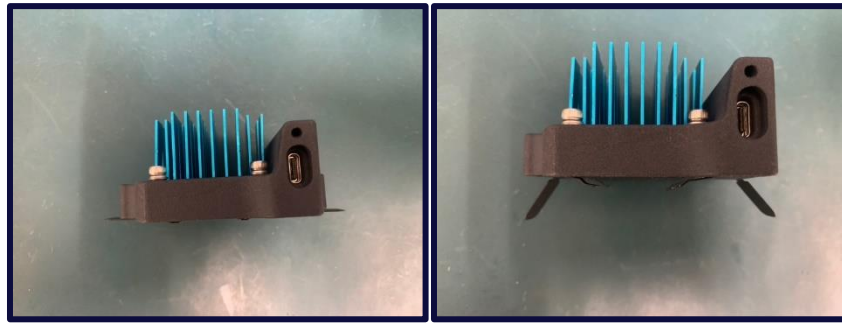


PV harvester attached to system via TEG harvester

TEG Harvester Attachment

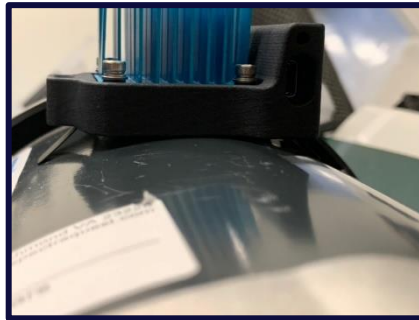
Once the MHM sensor has been attached, it's time to connect and dress the TEG, PV, and cables for the MHM power train.

1. Identify the hottest location on the machine or the motor driving the machine to be monitored. This is where the TEG harvester will be attached.
2. Bend the metal tabs down on the underside of the TEG harvester to provide stability along the curved surface of the machine.
3. Secure the magnetic TEG harvester to the machine such that the contact point is centered to maximize heat transfer to the harvesting source.



TEG harvester
from factory

TEG harvester with
tabs bent down



TEG harvester with
tabs stabilizing base



Aerial view of TEG harvester
attachment

Cabling Attachments

The Everactive USB-C cables are custom-keyed to ensure proper connection.

1. Eversensor
 - Right-angle connection only
2. TEG harvester
 - Straight connection from Eversensor USB-C cable into TEG port with “heat waves” icon



PV harvester

- Straight connection from PV harvester USB-C cable into TEG port with “sun” icon, which should be facing up.



Adding Sensors

Click on the circle icon on the very right of the upper blue bar
Select "Manage Products"

The screenshot shows the Evercloud by Everactive interface. At the top, there is a navigation bar with 'Machine Health', 'Dashboard', and 'Summary' tabs. Below this is a search filter and a table of equipment. On the right side, there is a user profile menu for 'tom.ross' with options like 'Manage Products', 'Profile', 'Security', 'Support', 'Toggle SA View', 'Feature Flags', and 'Logout'. The table contains the following data:

Facility	Location	Equipment Name	Time of Last Sample (PST)	Alarm Status	Customer	ID	
503	Central Hydraulic System Annex	R 00836 - Compressor cooling skid Pump 01 2V Motor IB	2:46:56 PM 02/19/2021	Alarm	Hill AFB	3a6dd2e1-0718-46e5-83acc4b95df80f6	
AES EAGLE VALLEY	MARTINSVILLE INDIANA	NH3 DILUTION AIR BLOWER MIR	2:50:55 PM 02/19/2021	Clear	Nelson Baxter	e6069f71-ccce-486f-bd63-5bc51211bfb3	
Sunnyvale	Outside Utility Yard	PCWP-1 1V Motor Outboard	1:41:11 PM 02/16/2021	Clear	Applied Materials	d0745e48-402d-47c7-a752-8fb4be385d1d	
AES EAGLE VALLEY	MARTINSVILLE INDIANA	1B BOILER FEED PUMP HC	2:51:54 PM 02/19/2021	Clear	Nelson Baxter	c9039d33-7d79-414e-a7e05dd6dd6f97b	
Sunnyvale	Outside Utility Yard	PCWP-1 2V Motor Inboard	1:41:08 PM 02/16/2021	Clear	Applied Materials	1ae34ff6-29b2-46fd-b795-eb10206baee8	
AES EAGLE VALLEY	MARTINSVILLE INDIANA	1A BOILER FEED PUMP POB	3:37:55 PM 02/16/2021	Clear	Nelson Baxter	d1ed5082-fd3b-4006-839d-68a19ae629f4	bc5ea1.ffe:00:11:38
Sunnyvale	Outside Utility Yard	PCWP-2 1V Motor Outboard	1:44:06 PM 02/16/2021	Clear	Applied Materials	5ca072ce-33d2-4fc0-b116-e14788d8bcc7	bc5ea1.ffe:00:22:69
AES EAGLE VALLEY	MARTINSVILLE INDIANA	1B CIRC WATER PUMP FLANGE	2:52:54 PM 02/19/2021	Clear	Nelson Baxter	53356d09-ed71-4ce2-b7b9-5a43f3689a3a	bc5ea1.ffe:00:11:5d
Sunnyvale	Outside Utility Yard	PCWP-2 2V Motor Inboard	1:44:07 PM 02/16/2021	Clear	Applied Materials	3cebb808-2996-4827-a1e8-2977c3a7f5e1	bc5ea1.ffe:00:22:6e
Sunnyvale	Outside Utility Yard	PCWP-2 3V Pump Inboard	1:44:05 PM 02/16/2021	Clear	Applied Materials	a1a0fa98-e78d-466d-a743-7123e2a448d3	bc5ea1.ffe:00:22:70

On the Manage Products page Select "Add Machine"

The screenshot shows a web browser window with the URL <https://insights.everactive.com/management>. The page features a dark blue header with the Everactive logo and navigation links for 'Machine Health', 'Dashboard', and 'Summary'. Below the header, the interface is organized into three main sections: 'Evercloud Access', 'Everactive Hardware', and 'Monitored Assets'. The 'Monitored Assets' section contains four cards: 'Add Steam Trap', 'Steam Trap Bulk Upload', 'Add Machine', and 'Machine Bulk Upload'. The 'Add Machine' card is highlighted with a green border, indicating it is the selected option.

Evercloud Access

- User Management: Add, edit and remove users and change access permissions
- Customer Management: Add and edit customers

Everactive Hardware

- Discovered Eversensors: Authorize discovered Eversensors
- Evergateway Management: View, pair and edit Evergateways
- Eversensor Management: Add, view and edit Eversensors

Monitored Assets

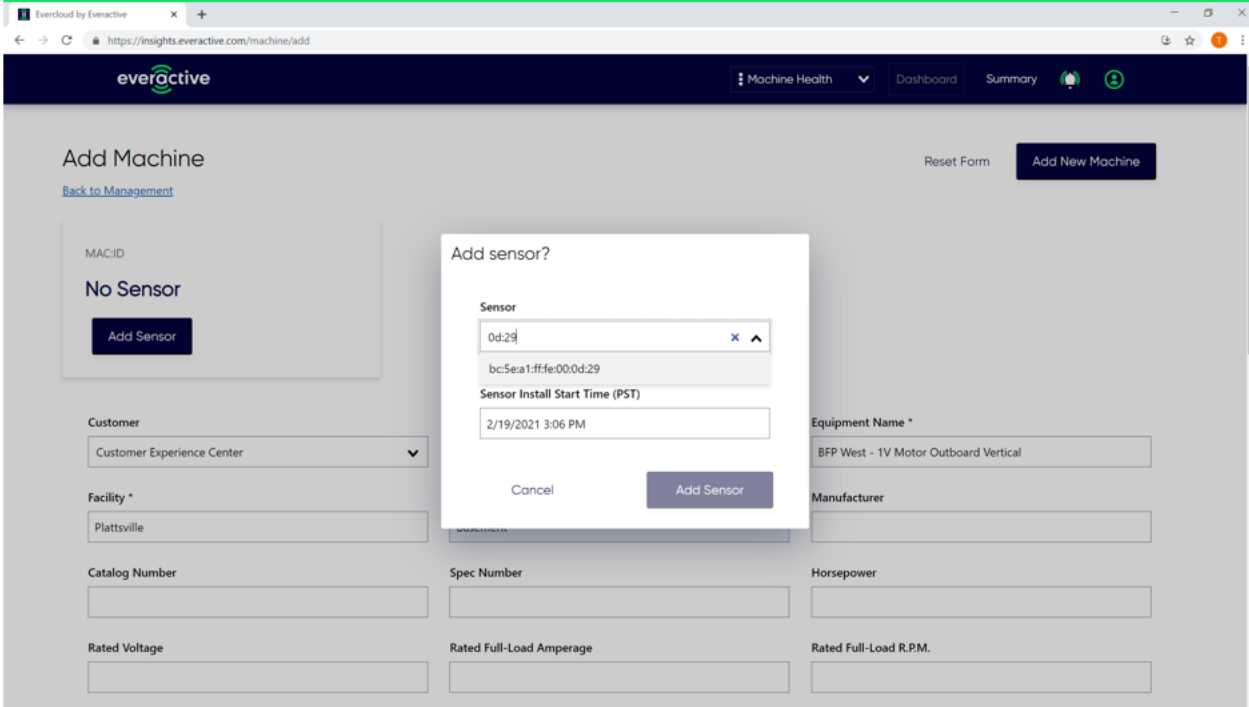
- Add Steam Trap
- Steam Trap Bulk Upload
- Add Machine**
- Machine Bulk Upload

<https://insights.everactive.com/machine/add>

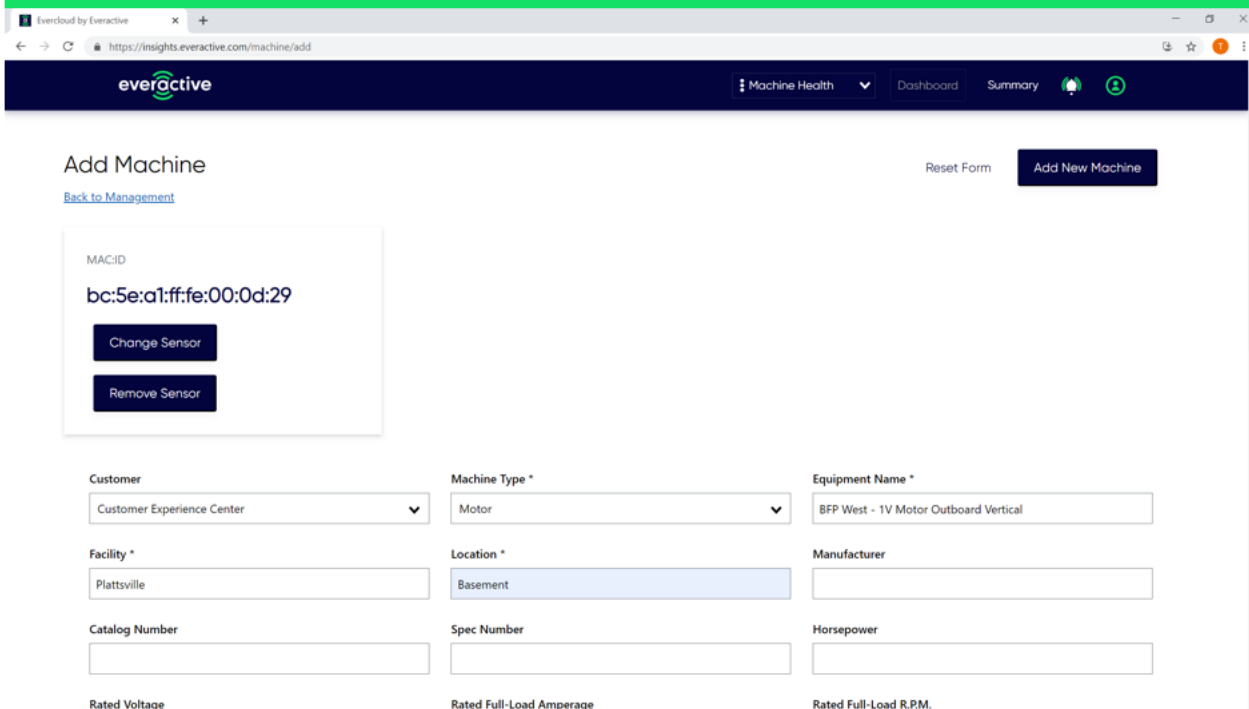
On the Add Machine page
 Input information in required fields (those with an asterisk)

On the Add Machine page
 Input information in required fields (those with an asterisk) then click on the "Add Sensor" blue button on the middle left of the screen

In the dialogue box type in the final 5 digits of the sensor MAC:ID, select the sensor then click "Add Sensor"



Click "Add New Machine" button in the upper right



Navigate to new machine and confirm data is flowing

