Trailer Tracking and Security

The Vecima 2840 is a high-performance beacon designed for commercial trailers which are typically tethered to 12V and 24V vehicle systems. Trailers may now be tracked independently in the Vecima portal, regardless of whether they are tethered to a vehicle. The device transmits location data using the latest 4G LTE network technology.

This fully weather-proofed device has an internal battery that will power the device for more than one month while the trailer is untethered, providing periodic location data.

Kit Contents

- GPS Beacon device with SIM
- Wiring harness

Tools and Supplies Required

- Wire cutters, wire strippers
- Voltmeter (multimeter)
- Soldering iron, solder
- Electrical tape
- Plastic cable ties
- Screw drivers, mounting screws
- Wrenches, sockets

Beacon Installation

The 2840 comes with highly sensitive internal GPS and cell network antenna modules. Because of this, the beacon must be positioned on the trailer so that it has a clear signal path to the sky as much as possible, without metal obstruction. The internal antenna will allow signals to be received regardless of the orientation of the device once it is installed.

- Determine beacon installation position but do not fasten it in place until all wiring is complete.
- Determine the best location for the beacon – a strong flat surface that can be drilled to accommodate the mounting holes is ideal.
- Visibility of the indicator LEDs will be useful for testing and troubleshooting.

Connect Power and Ignition Sense

The 2840 power harness is connected to the beacon with a weather-proof connector. It contains twelve 22AWG leads, 3 of which are important for the proper connection of the device:

- Constant Power (Red)
- Ground (Black)
- Ignition Sense (White)

Vecima 2840 Power and I/O Connections

Wire	Color	Description
1	White	Input 0 – Ignition Sense
2	Green	Output 0 – Starter Disable Relay Driver
3	Blue	Input 1 – Digital Input
4	Brown	Output 1 – Digital Output
5	Orange	Input 2 – Digital Input
6	Yellow	Output 2 – Digital Output
7	Pink	ADC Input
8	White/Blue	1-Wire Data Line
9	Green/Black	Serial Output
10	Blue/Black	Serial Input
11	Red	Primary Power
12	Black	Ground

Connection Instructions

- Connect the Black (Ground) wire to battery negative or the trailer chassis. **This wire must be connected first, before the power wire.** Be sure the grounding screw is not painted or coated with an insulating material.
- Connect the Red (Power) wire to a constant 9-32V power connection point. **It is recommended to connect directly to the trailer's power source (i.e. directly to the trailer connector cable).**
- Connect the White (Ignition Sense) wire directly to the same power connection point as the red wire. **Failure to install the ignition sense correctly will result in erroneous data being reported from the beacon.**

Notes

- If the wiring harness needs to be extended, use the same gauge wire. Solder the extension wire on, then insulate with heat shrink tubing or electrical tape.
- Ensure that no wires are routed near heat sources.
- Ensure that any wires in the wiring harness that are not to be connected do not come in contact with power, ground, or any other voltage. Insulate them with electrical tape.

Important Notice

The 2840 is designated to operate from 9 to 32 Volts DC. The user is responsible for ensuring the voltage supplied to the 2840 remains in this voltage range to include transient voltage spikes and load dump voltages. Failure to comply may damage the 2840. The current draw under normal operating conditions is approximately 68mA at 12V.

Connect and Mount Beacon

- Affix the beacon securely to the vehicle using the mounting holes found in the tabs on either side of the beacon. If the beacon is not securely mounted, it may report false data.
- If a suitable panel for affixing the beacon is not available, fastening the beacon to a bracket or wire bundle with plastic cable ties is also adequate.
- Secure any loose or extra lengths of wire.

LED Indicators

The 2840 is equipped with two status LEDs, one for GPS (green) and one for wireless network communications (orange). The LEDs use the patterns described in the following table to indicate the current state of the device.

Vecima 2840 LED Indicators

Orange (Comm) LED Behavior	Device Status
off	modem is off
slow blinking	modem is on, searching for network
fast blinking	network is available
alternate fast blink/solid every 1s	network registered, no inbound acknowledgement
solid	network registered, received inbound acknowledgement

Green (GPS) LED Behavior	Device Status
off	GPS is off
slow blinking 2	GPS is on
fast blinking	GPS time sync
solid	GPS fix acquired

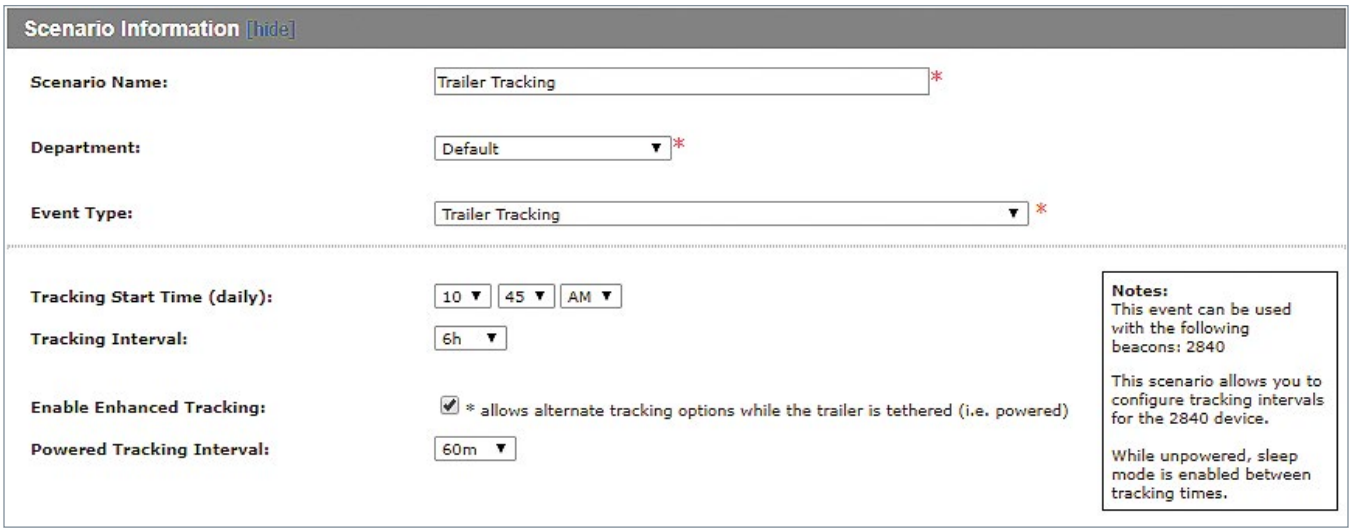
Scenario Configuration

The primary feature of the 2840 is the ability to locate and track the trailer, even while it is untethered from the vehicle. When disconnected from the power source, the beacon can be configured to enter sleep mode to conserve internal battery power, while periodically sending location points to the portal.

Note that the Trailer Tracking scenario must be created in the Vecima portal to enable sleep mode.

Without the scenario, the 2840 will remain awake and be locatable when untethered, but the internal battery may be drained within 2-3 days.

Trailer Tracking Scenario Setup



Note that live locates are unavailable in sleep mode, but the Trailer Tracking scenario will continue to operate, sending locates on the configured schedule. Tracking may be enabled at a frequency of up to 4 locates per day, every 6 hours from a start time set by the user. The interval may be set to every 12 hours, or once every 24 hours to maximize battery life.

While tethered to the vehicle (i.e. connected to a power source), the 2840 will remain awake and may be located or tracked directly from the portal at any time.

Other scenarios may be configured to provide email and/or SMS notifications related to power:

1. when the power is cut from the device (i.e. when the trailer is untethered), and
2. when the internal battery is low and requires recharging. Note that the internal battery will fully recharge in 2-3 hours while connected to a power source.

Scenario configuration changes will not be processed while the device is in sleep mode. The commands will be queued for the device, and processed the next time the device wakes up

Testing and Troubleshooting

After installation, it is strongly recommended that a road test be performed to verify the beacon wiring and to ensure that the configured scenarios are performing correctly.

If you are still experiencing difficulties after following the steps in this guide, please contact:

Vecima Support at telematics.support@vecima.com.

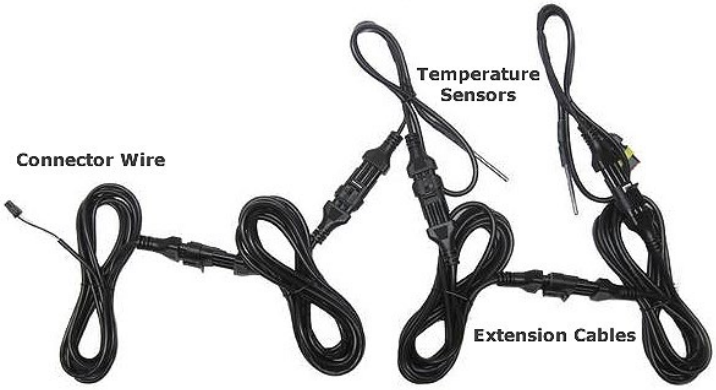
Addendum A – Temperature Sensor Configuration

The Vecima 2840 Trailer Tracking Unit (TTU) supports the DS28EA00 Chain-able 1-Wire Temperature Sensor from HeiTech Custom Solutions. This guide describes how to connect the sensor to the 2840 and configure the TTU Temperature Sensor scenario in the portal.

Two different components are supplied with the TTU Temperature Sensor:

1. The connector wire, which connects to the wiring harness of the 2840.
2. Temperature sensors, which connect in a chain to the connector wire.

The temperature sensors are attached in a chain, with an optional extension cable between each sensor to allow them to be spaced appropriately in the trailer, as shown in the diagram below. The extension cables may be ordered separately.



One end of the connector wire is a sealed port for attaching the chain of temperature sensors. The other end has two wires (White and Black) with a small connector, as shown in the image below. Remove the connector to expose the two wires. The White wire is the 1-Wire Data connection, and the Black wire is Ground.

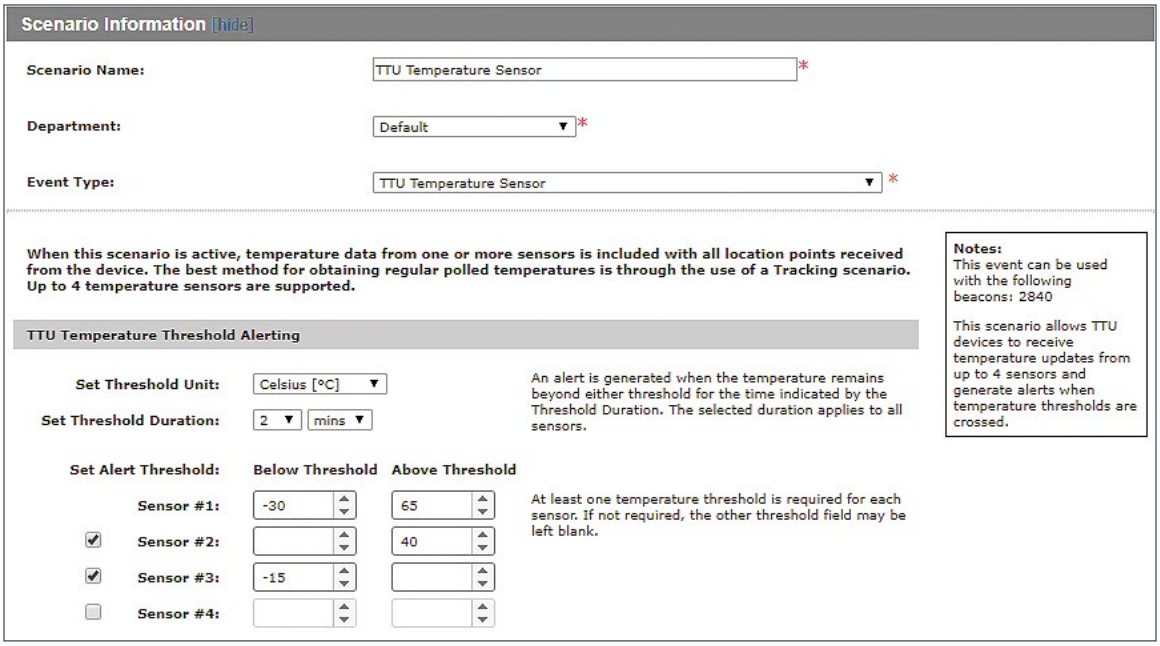
The 1-Wire Data connection on the 2840 wiring harness is wire 9 (White/Blue).

- Connect the White wire on the connector to the White/Blue wire on the harness.
- Connect the Black wire on the connector to Ground (the Black wire on the harness or any other Ground source).

The temperature sensor(s) may then be chained to the sealed port on the connector wire, and installed in the trailer compartments that require temperature monitoring.

In order to receive temperature readings and send notifications, a **TTU Temperature Sensor** scenario must be configured in the portal.

TTU Temperature Sensor Scenario Setup



The TTU Temperature Sensor scenario allows each sensor in the chain to be individually configured with thresholds that determine when Temperature Alerts are generated in the portal. The Threshold Duration is the length of time a temperature reading must remain beyond the Temperature Threshold before an alert is raised.

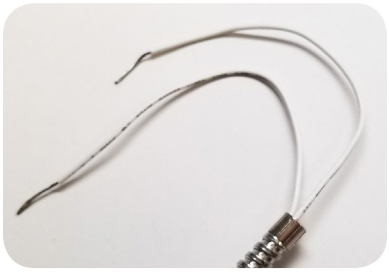
For example, using the configuration above, if Sensor #1 measured a temperature below -30 ˚C for more than two minutes, a Below Threshold alert event would be generated. Similarly, if Sensor #2 measured a temperature above 40 ˚C for more than two minutes, an Above Threshold alert would be raised.

Addendum B – Door Sensor Configuration

The Vecima 2840 Trailer Tracking Unit (TTU) supports input from door sensors. When installed and configured, the door sensors will generate events in the Vecima Portal when trailer doors are opened or closed.

Two different models of door sensors are supported: heavy-duty and light-duty, as illustrated in the image above. Both types of sensors function in the same manner.

The weatherproof connection on the sensor contains two White wires. One of these wires connects to wire 3 (Blue, which is Input 1) on the 2840 wiring harness. The other wire connects to Common Ground (the Black wire on the harness or any other Ground source). Either wire on the sensor may be used for these two connections.



The sensor can be installed anywhere around the door to be monitored, so that the two halves are in close proximity (within 1 cm) when the door is closed. Once connected to the beacon, the events are generated when the two halves of the sensor are separated (for a Door Opened event) or when they come in close proximity (Door Closed).

For the events to be generated, a **Door Sensor Alert** scenario must be configured in the Nero portal. This scenario may optionally be configured to send notifications (either SMS or email) when door open/close events are generated. Note that if the 2840 is in sleep mode, it will wake up when door events are generated so that messages can be transmitted to the portal.