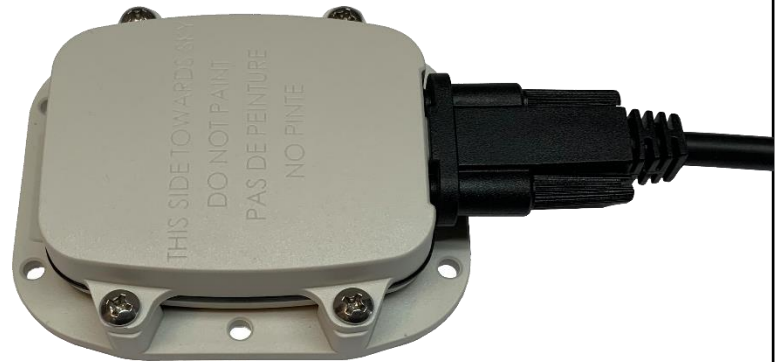
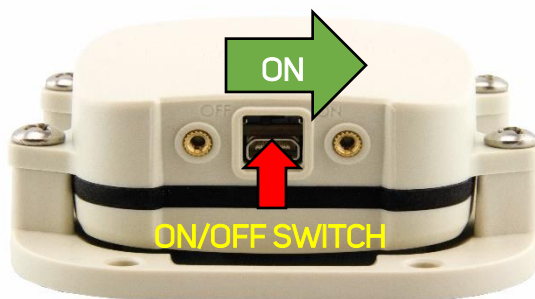


Step 1: Selecting a Mounting Location

To ensure ideal performance and to maximize service life:

- Select a horizontal mounting position (lying flat, facing skyward) that provides the best view of the sky.
- Select a mounting location that is clean and isolates the AT5, ERT cable, and baseplate from damage.
- The AT5 can also be mounted on a flat vertical surface, but this may reduce the communication reliability, GPS location accuracy, and decrease the maximum sustainable messaging rate. If the device must be mounted vertically, point the device with the connector cap pointed upward towards the sky.
- Thoroughly clean the mounting area, especially for VHB tape installs.
- Recommended mounting area size is 5.0" L x 3.0" W (127mm L x 76mm W).
- DO NOT PAINT OR COVER THE AT5**, otherwise product performance and service life will be impacted.
- DO NOT PRESSURE WASH THE AT5 device or connection.**

Step 2: Assemble the ERT Kit



The AT5 ERT kit consists of the following parts:

- Qty 1 AT5 Tracking Device
 - Qty 1 AT5 ERT Input Cable
 - Qty 1 VHB Tape pad
- Remove the AT5 Endcap with a P0 or P1 size Phillips Screwdriver. The endcap can be kept for future maintenance or simply discarded.
 - IMPORTANT:** Set the AT5 ON/OFF switch to ON. The AT5 will NOT operate in the OFF position. Use a tool with a small nonconductive tip to toggle the switch. Avoid hitting any circuit components or electrical contacts.
 - Insert the AT5 ERT Input Cable into the connection on the end of the AT5. The cable end can only be inserted properly in one orientation.
 - By hand, thread in the two screw posts on the cable body into the AT5 connection end and secure with a 3/16" flat blade screwdriver. Hand tight is acceptable to seat the connection. Do not overtighten or damage to the connection may occur.
 - The AT5 should be shipped installed on its plastic mounting bracket. If not, secure the AT5 to the mounting bracket with the supplied screws. Do not over-tighten the mounting screws or damage to the mounting ear or AT5 body may occur. Do not exceed 10 in.lb (1.2 N.m) of torque.

Tools Required:

- Phillips Screwdriver (Size P0 or P1)
- 3/16" Flat-blade Screwdriver

Step 3: Select a Mounting Method

VHB Adhesive Tape

The AT5 may be mounted using the supplied VHB double sided adhesive tape (with or without the mounting bracket). Consult the Geoforce VHB Installation and Removal Guide for proper cleaning and use of VHB tape when mounting the device.

Self-Tapping Screws

For installations requiring metal fasteners, select the appropriate self-tapping or machine screws to secure the AT5 plate to the AT5 device. If using self-tapping screws, installer must use low torque setting to avoid cracking the plastic base. Avoid potential screw damage where screw penetration could result in a hazardous environment or interfere with AT5 operation (i.e. wires, moving parts, liquid pipes etc.).

Step 4: Connect the Engine Runtime (ERT) Cable to the Asset

There are two recommended options for connecting the AT5 to an asset for ERT measurements:

1. Pressure Switch (Engine Oil or Pump Hydraulic) - **Preferred**
2. Electrical Ignition Source (Engine Ignition or Electrical DC "Engine Running" Signal) – **12V Equipment ONLY**

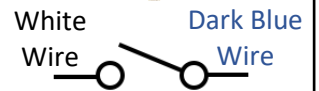
DO NOT apply voltage directly to the White or Dark Blue Wires of the AT5 Harness.

Pressure Switch (Engine Oil or Pump Hydraulic)

A pressure-based ON/OFF switch is the most direct and accurate method of determining engine or pump runtime. An appropriate switch must be sourced for the particular asset and application being monitored.

The selected pressure switch shall:

- a. Be plumbed into the required pressure line or oil galley with appropriately rated pressure fittings, lines, and adapters.
- b. Be installed independently of any other electrical system on the asset so as to avoid interference or damage to the asset engine electrical systems or the AT5.
- c. Be appropriately rated for the asset's particular line pressures and environmental exposures.
- d. Allow for easy and reliable electrical connections to the AT5 cable wiring.
- e. Be in a CLOSED (conducting) state when the line pressure is high (engine/pump running).



The following AT5 ERT Input Cable wire colors are to be used:

White Wire: ERT Input

Dark Blue Wire: ERT Ground

There is no polarity for ON/OFF switches in these cases, so the wires can be installed in either orientation to the switch.

Electrical Ignition Source (Engine Ignition or Electrical DC "Engine Running" Signal)

When access to a pressure source is not available to determine engine or pump runtime, an alternative is to use an engine ignition or other voltage source that indicates that the engine or pump is running. In these cases, it is possible to determine engine or pump runtime by connecting the AT5 to this voltage source through a relay that acts similarly to an ON/OFF pressure switch.

A relay will isolate the AT5 tracking device from otherwise harmful voltages, surges, and load dump voltages that may occur on assets that could have large inductive electrical systems.

Geoforce provides an AT5 relay kit for 12V systems ONLY:

"ERT-RELAY-12V" – ERT Relay Kit, 12VDC systems

The AT5 is not approved for use on voltages above 16VDC.

DO NOT apply voltage directly to the White or Dark Blue Wires.

The pre-wired relay ERT accessory kit consists of the following parts:

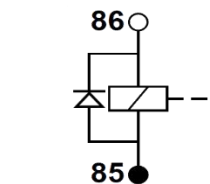
- a. Qty 1 - 12VDC Sealed Weathertight Relay
- b. Qty 1 - Pre-wired Relay Socket Harness
- c. Qty 6 - Butt-splice Crimp Terminals
- d. Qty 1 - ¼"x0.75" Self-Tapping Relay Mounting Screw

Reference Geoforce document HW-IS-0-0074 that comes with the 12V relay kit for more detailed relay kit installation instructions.



Socket White Wire connects to IGNITION

Socket Blue Wire connects to Device Cable Dark Blue Wire



Socket Black Wire connects to GROUND

Socket Red Wire connects to Device Cable White Wire



Step 5: Line Power Connections

There are occasions when line power is available to power the AT5 directly from the asset instead of off of its internal batteries. Line power is recommended for the AT5 at all times to eliminate the need for replacing its internal batteries.

Use the following AT5 ERT Input Cable wire colors:

Violet Wire: Line Power + (Positive)

Green Wire: Line Power – (Negative)

Butt-Splice crimp terminals are provided in the ERT Relay Kit for use in line power wire connections.

A line power source on the asset should be properly selected to support ongoing device operation. Geoforce highly recommends paying attention to the following considerations:

- The voltage source shall be capable of sourcing and handling at minimum 100mA.
- The acceptable Line Power voltage range is 10VDC to 22VDC, but should NOT exceed 22VDC.



Line power is ONLY acceptable for 12VDC rated equipment. Connecting the Line Power input to 24VDC systems will cause damage to the device and/or cable.

- Line Power can be sourced from a direct connection to the asset battery or to a switched ignition source.
- If the AT5 is connected directly to an asset's battery**, it will operate using the asset's battery rather than its own internal batteries, thus eliminating the need to periodically replace the AT5 internal batteries. It may, however, slowly pull the asset's battery voltage down over long periods if the asset battery is not charged or otherwise maintained at least monthly.
- If the AT5 is connected to an asset ignition source**, then the AT5 will only draw power from the asset when that ignition source is energized. Otherwise, the AT5 will operate normally on its internal batteries. The internal batteries of an AT5 may only provide normal operation by themselves for up to 1 year depending on message reporting rate.
- Choose a line power source that allows for easy and reliable electrical connections to the AT5 cable.
- Damage to the AT5 and its accessories caused by voltage spikes, surges, load dumps, or excessive currents are not covered under the product warranty.**

Step 6: Record the Asset and AT5 Serial Numbers

- Record the AT5 serial number.
- Record the asset name and serial number.
- Enter the asset information into the Geoforce Track and Trace software application and assign the AT5 serial number. Contact your Geoforce account service representative if you require assistance.

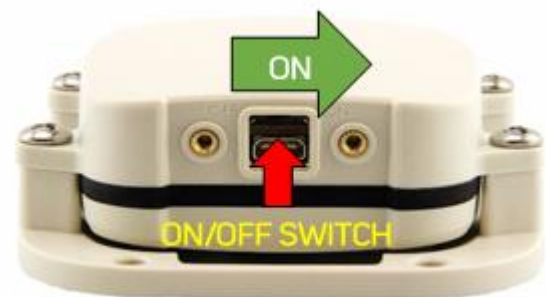
Step 7: Initializing the AT5



To begin service, flip the on/off switch to ON while outdoors with a good sky view.



WARNING: IF YOU DO NOT TURN THE DEVICE TO "ON" THE AT5 WILL NOT WORK.



The AT5 should now be fully installed and functional.

AT5 Maintenance – Battery Replacement

The AT5 Satellite Asset Tracker ships with and uses four “Energizer Ultimate” L92 AAA Primary Lithium batteries. When replacing the internal batteries, it is required to replace with the same “Energizer Ultimate” L92 AAA batteries.

Tools/Supplies Required:

- Phillips P1 sized screwdriver. An electric drill is not recommended.
- Four new “Energizer Ultimate” L92 AAA lithium batteries.

Note: Alkaline and rechargeable AAA sized batteries are not allowed.

Battery Replacement Notes

- Always replace the batteries in a clean and dry environment (to avoid water or debris from entering the enclosure).
- Ensure the device is clean of any caked-on dirt or other debris and dry prior to opening the device for battery replacement.

Step 1: Remove Housing Screws

- Using a Phillips P1 size screwdriver, remove the four screws that secure the device to its plastic mounting bracket and set them safely aside (magnetic dish recommended).
- Remove the four housing screws that secure the two halves of the device together and set them safely aside (magnetic dish recommended).

Step 2: Remove Top Cover

With the screws removed, grasp the top cover/electronics assembly and remove.

NOTE: Use caution to prevent dirt, water, or other foreign contamination from entering the device during battery replacement.

NOTE: Avoid directly touching any antennas or circuit components.

Step 3: Remove and Replace the Old Batteries

- Carefully remove the four old batteries, one at a time.
- Set old batteries aside for responsible disposal and do not let old batteries mix with new replacement batteries.
NOTE: Replace all batteries and do not mix with other battery types.
- Carefully install four new batteries.
NOTE: Correct battery polarity is critical to device function.

Step 4: Reinstall Cover

- Reinstall the top cover/electronics assembly with the gasket and electrical spring contacts clean and properly aligned.
- Reinstall **all four** screws in an “X” pattern to ensure an even and proper seal on each corner. **Maximum screw torque: 5 in-lbs.**

Step 5: Confirm Functionality

The AT5 Satellite Asset Tracker will automatically power up and begin service after battery replacement by sending a power up location message. If the unit is outdoors and in good sky-view this reading will register with the Geoforce Track and Trace application.

NOTE: If leaving the switch in the ON position, changing batteries while indoors or with obstructed sky view may result in NOT receiving a “power on” message. To receive a “power on” message, restart the AT5 device by switching it off and then back on with good sky view.

NOTE: The Geoforce Track and Trace Application may not show the update immediately; it may take up to 30 minutes for the new check-in reading to register depending on sky view at the time of device power up.



Product Notices and Warnings

Installation Notices

1. **WARNING:** This product assembly is **NOT** certified for use in Hazardous Locations including all Zone and Class/Division classified areas. **Operating this product assembly within known classified hazardous areas is at the user's risk.**
2. Geoforce highly recommends using mounting fasteners made of a material such as stainless steel that resists galvanic corrosion and environmental weathering. This is especially important for marine applications.
3. Do not apply any voltages directly to the AT5 ERT cable (with the exception of the violet colored line power wire). Doing so will void any expressed or implied warranty.
4. Connect the wires to the pressure switch or relay terminals using best practices for the electrical connections being used to ensure a reliable connection and ERT measurement.
5. Geoforce is not liable for any asset, engine, or pump damage resulting from an improperly chosen or installed pressure switch or relay.

Operational Notices

1. **Line power is ONLY acceptable for 12VDC rated equipment. Connecting the Line Power input to 24VDC rated systems will cause damage to the device and/or cable.**
2. **DO NOT apply voltage directly to the White or Dark Blue Wires.**
3. **Damage to the AT5 and its accessories caused by voltage spikes, surges, load dumps, or excessive currents are not covered under the product warranty.**
4. Usage of the AT5 above 60°C may cause RF signal degradation and decreased battery longevity.
5. If the asset is going to be stored indoors for extended periods, shut down the AT5 by flipping the power switch to off to prevent draining the internal batteries.

Battery Notices

1. When replacing the internal batteries, use only "Energizer Ultimate" L92 AAA batteries.