

Asset security and logistics

Protecting your valuable assets starts by using the latest in GPS-locatable beacons. The Guardian 1200 is the smallest beacon with internal antennas and back-up battery available today.



Kit Contents

- GPS Beacon device
- DC Power regulator
- AC Power adapter
- Adhesive mounting velcro
- Spare battery

Tools/Supplies Required

- Wire cutters / wire strippers
- Voltmeter (multimeter)
- Soldering Iron / Solder
- Electrical tape
- Plastic cable ties
- Adhesive sealant
- Screw drivers
- Wrenches/sockets
- 2 Amp in-line fuse (recommended)

Installation Overview

Installation of the Guardian 1200 can be as simple as:

1. Select the installation location
2. Connect power
3. Affix the beacon in place
4. Test the installation

There are typically two installation alternatives:

- Internal – where the asset itself provides protection from the elements for the beacon
- External – where a weatherproof enclosure is required to protect the beacon from the elements

Choosing the best alternative depends primarily on the type of asset to be tracked. If it's not clear which is the best choice for your asset, reading through this installation guide can help you make the decision.

1

Select the Installation Location ***CRITICAL***

It is very important to determine an appropriate location for the beacon. This selection will be based on the following factors:

- Visible or concealed installation
- GPS signal blockage
- Adequate space
- Availability of a power connection point
- Beacon orientation
- Secure mounting points
- No excessive vibration
- No excessive heat
- Adequate moisture protection
- Visibility of the indicator LEDs (if desired)

Internal Installations

Preferable locations for internal installation in many assets such as machinery, construction vehicles, trailers and equipment are:

Concealed

- Behind or under non-metallic trim panels
- Inside a non-metallic console
- Under, or inside, a dashboard or control panel
- Under a seat

Visible

- Attached to the inside of a window
- On the dashboard or control panel
- Under a non-metallic section of roof
- Attached to a sun visor

External Installations

External installations generally require mounting the beacon inside a weatherproof enclosure, then mounting the enclosure to the exterior of the asset. The ideal enclosure would be:

- Non-metallic so it doesn't block signals
- Weatherproof (sealed with an O-ring)
- Durable so it is not easily broken during normal operation of the asset
- UV resistant so it does not deteriorate in sunlight
- Have mounting holes or flanges to easily attach the enclosure to the asset*
- Have an access hole for power wires (the hole must be sealed when wiring is complete)*

* holes may be drilled on site during installation

A weatherproof enclosure for the Guardian 1200 is available from Guardian.

About GPS Signals

GPS signal blockage is a primary factor in the installation so the following information is critical to determining an appropriate location.

The proper beacon orientation is for the top surface of the beacon to be facing up, or to have the greatest "visibility" from the sky.

- Signals will penetrate:
 - > Plastic
 - > Glass
 - > Upholstery (vinyl, cloth, leather)
 - > Fiberglass
 - > Styrofoam
 - > Carpet
 - > Wood
- Signals will not penetrate any material that can conduct electricity such as:
 - > Steel, including sheet metal
 - > Aluminum
 - > Copper
 - > Wire mesh or screen
 - > Metallic coated plastic or glass
- Metal bars, pipes, and brackets above the beacon may degrade signals, depending on the size of holes, openings, or spacing between the metal components
- Radio antennas or defrost wires embedded in glass may degrade signals
- Tinted windows may use a metallic coating that can degrade signals



2 Connect Power

The Guardian 1200 can be powered from either 110 Volts AC or 8 to 40 Volts DC, depending on the type of asset the beacon is being installed in.

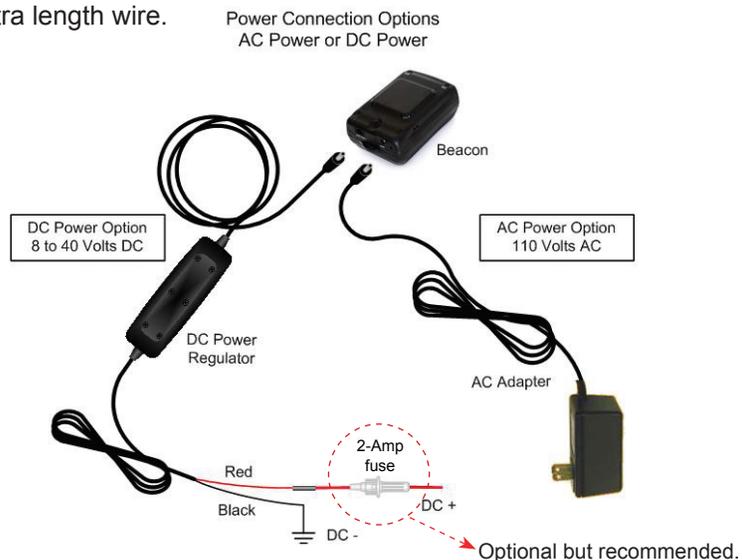
If AC power is to be used, simply plug the AC adapter into a standard wall outlet and plug the connector into the jack labeled POWER on the beacon.

If DC power is to be used, the following procedure will help ensure proper operation. DC is typically used if the beacon is being installed in some type of vehicle.

- 1) With the vehicle's ignition turned off, and all other electrical systems in the vehicle turned off, use a voltmeter to assist in finding a suitable, uninterruptible power connection point - the vehicle's battery may be best. *Connect the red power wire (DC +) to this point through an in-line 2-Amp fuse. (fuse optional but recommended)*
- 2) Connect the black wire to battery negative or to the vehicle's chassis.
- 3) After the power adapter is connected to the vehicle, plug the connector into the jack labeled POWER on the beacon.
- 4) Coil and secure any loose or extra length wire.

GUIDELINES:

- Do not connect the power harness to the beacon until the harness installation is complete.
- Ensure that the DC power regulator is not placed in a hot or moist environment.
- Ensure that no wires are routed near heat sources.
- Many vehicles have extra auxiliary connections available in the fuse box, these are also an ideal source of 12 Volts, as long as they are never switched off by any other vehicle function. Many vehicles have more than one fuse box or fuse block - check vehicle owners manual.
- If power wires need to be extended, use the same gauge wire and solder extension wires on to the power regulator input wires. Insulate the connections with heat shrink tubing or electrical tape.



Wire Connection Technique

The recommended method for splicing the beacon power wires in to a vehicle's wiring is a soldered connection. This is best performed by cautiously stripping a ½ inch section of insulation from the vehicle's wire using a razor knife. Next, wrap the bare end of the beacon's power wire several times around the exposed vehicle wire. Use a soldering iron and rosin-core solder to make the electrical connection. Be sure to get both sections of wire hot enough to melt the solder until it flows freely between the strands of wire. The connection should be held still until the solder cools and solidifies to a shiny metallic bead. After the soldering is complete, wrap at least 5 layers of electrical tape around the connection point, ensuring that the tape adheres to the wires' coating creating a sealed layer of insulation.

3 Affix the Beacon in Place

It is usually preferable to use plastic cable ties to attach the beacon to the asset. Cable ties offer a flexible mounting system that dampens vibration yet securely affixes the beacon in any orientation. Cable ties can strap the beacon to a bracket, wire bundle, or sturdy fitting of any kind. Be sure to cinch the cable ties relatively tight so the beacon won't slip out. There is a square protrusion on the top side of the beacon, placing the cable ties on either side of it should prevent the beacon from sliding. You may also wish to use the provided Velcro strips to add stability.



Remember: The proper beacon orientation is for the top surface of the beacon to be facing up, or to have the greatest “visibility” from the sky.

4 Test

- For the initial test, the asset should be outdoors in an open area where GPS signals can be readily received
- Watch the indicator LEDs on the beacon's top panel for the first few minutes after power is connected. They indicate the following status:

| Name | Color | Function | Behaviour | |
|------|-------|------------------|----------------------|----------------------|
| | | | Searching for Signal | Connected/Signal Fix |
| Cell | Red | Wireless Network | Blinking* | Steady** |
| GPS | Blue | GPS Status | Off | Steady** |

* *Blinking means approximately equal off time and on time.*

** *Very brief flashes during a mostly steady state is normal.*

- Once the two LED indicators are on steady (note that it may take up to an hour, usually much less, for the wireless network and the GPS receiver to synchronize the first time the beacon is powered up) perform an end-to-end system test by locating the beacon via the user portal.