

# GPS Resilient Kit

## Installation Manual

FOCUS TELECOM – TIMING & SYNC SOLUTIONS

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## Introduction

Thank you for buying GPS Resilient Kit

GPS Resilient Kit is an antenna kit for any GPS-based system that protects it from GPS jamming or spoofing attacks.

GPS Resilient Kit ensures continuity of autonomous navigation and timing signals and enables normal operation during jamming and spoofing conditions. No other solution that offers such protection is as small, light, affordable, easy to install or completely unregulated by export control.

Two active GPS antennas, with nominal gain of 26dB, are connected to the SMA RF connectors; the primary and auxiliary antenna inputs. The RF Output provides connection to the input of the GPS Receiver.

Optional: communication module that continuously monitor the GNSS environment and update customer inficloud using cellular communication.

### GPS Receiver System with GPS Resilient Kit

The GPS Resilient Kit unit is integrated into the static or vehicle GPS receiver as shown in Figure 3. Two antennas are connected to the module (supplied antennas or locally purchased for permanent installation); the GPS antenna connects to primary input 'P' and an additional antenna connects to the auxiliary input 'A.'

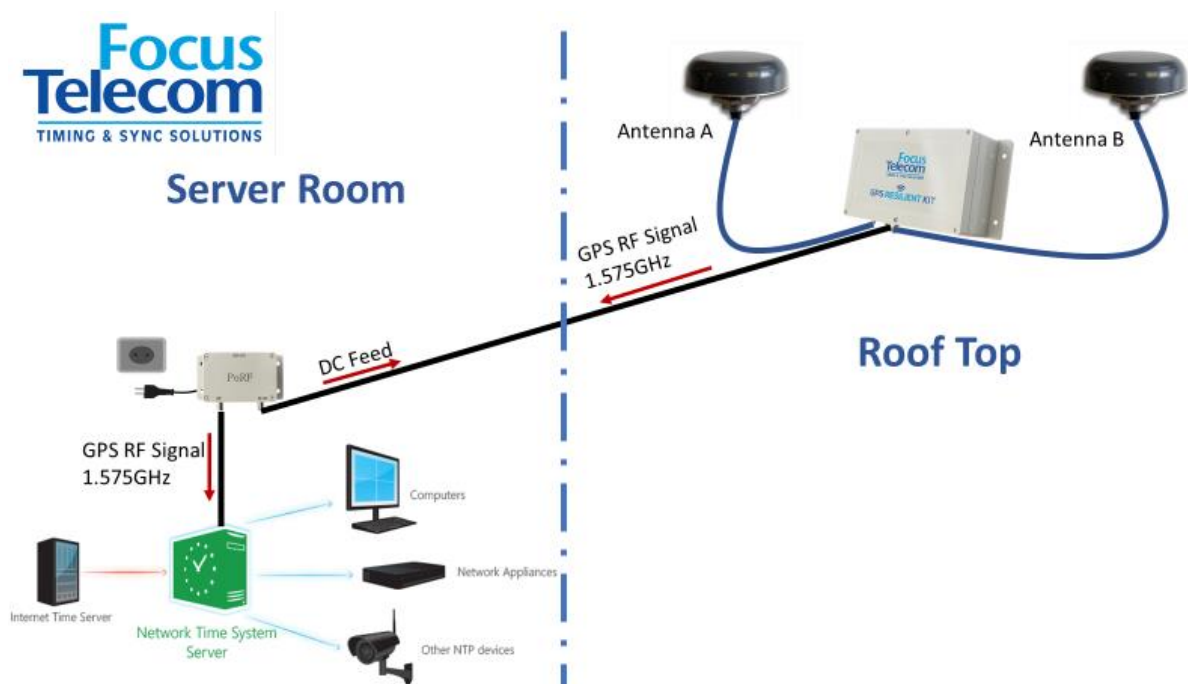


Figure 1 - GPS Receiver with GPS Receiver Kit

## Interfaces

Output to the GPS receiver TNC-F. (Also used to receive DC from PoRF)

Primary Antenna Input (P) - 50Ω SMA 2.75VDC designed for 26dB ±2dB gain.

Auxiliary Antenna Input (A) - 50Ω SMA 2.75VDC designed for 26dB ±2dB gain.

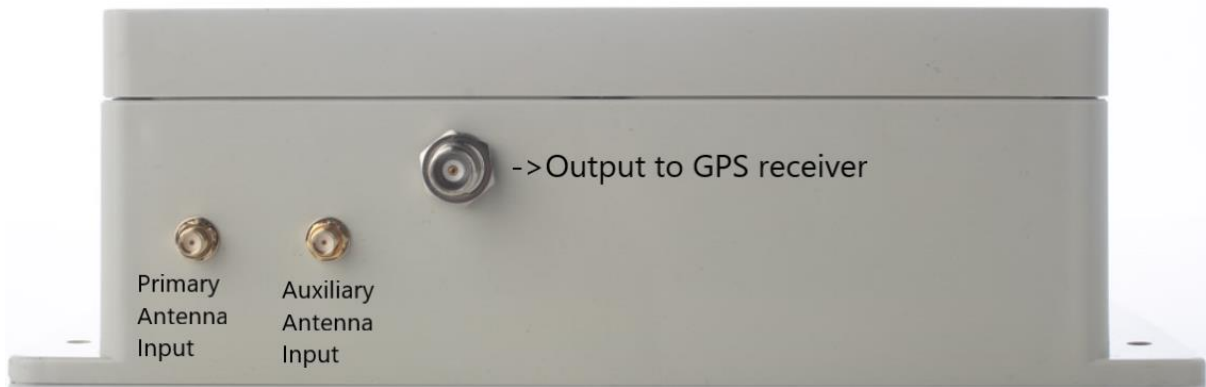


Figure 2 – GPS Resilient Kit - General Overview

## PoRF

The PoRF module receives a DC input from an external AC adapter and provides DC power to the GPS Resilient Kit over the RF cable. As most installations of PPS units are on a roof of a building where no power source is available, the PoRF enables the GPS Resilient Kit to be sufficiently powered over the RF cable.

The PoRF unit is mounted next to the GPS receiver or timing server. It is connected to the antenna port on the receiver, connected to a power supply via DC input, and connected to the antenna cable going to the roof where it will be connected to the GPS Resilient Kit unit.



Figure 3 –PoRF - General Overview

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## Installation

### Before installation

Please verify that the following equipment is available:

- GPS Resilient Kit
- 2 units of 26dB  $\pm$ 2dB gain antennas, 2.75VDC (from the same type) with 50 $\Omega$  cable and SMA connector (length of the cables should be identical).
- 2 antenna mounting brackets
- TNC coax cable from GPS Resilient Kit connector to the receiver
- PoRF unit
- BNC-M to BNC-M (Short cable to connect between PoRF and receiver)

### Unpacking and inspecting equipment

When unpacking equipment, make a visual inspection for evidence of damage incurred during shipment. The following parts should be included:

- Connectors – please verify that the connectors are not damaged, and the thread is complete.
- Make sure that the unit does not have any dents.

### Where to install

**GPS Resilient Kit** – locate and secure the GPS Resilient Kit with the antenna cables trimmed in equal lengths to provide adequate separation and connection to GPS Resilient Kit unit. (See Step 2 in Installation Procedure below).

**Antennas** – locate and secure the antennas in full sky visibility, on the same horizontal plane, for maximum GNSS signal reception.

### Recommendations:

It is recommended that you consider the following location and environment influences before installing the GNSS antenna:

- If possible, provide the antenna with an unobstructed 360-degree view of the sky from the horizon.
- In general, do not allow obstructions that obscure the horizon (as viewed from the antenna) by more than 10 degrees.
- Locate the antenna well away from, and preferably in a plane above electrical equipment such as elevators, air conditioners, or other machinery.
- Locate the antenna high enough to avoid drifted snow.

**PoRF** – locate the PoRF unit next to the GPS receiver/Server. Make sure to connect the RF+DC connector towards the GPS Resilient KIT and the RF connector towards the GPS receiver/Server.

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## Installation procedure

### Step 1. Mount GPS Resilient Kit

- a) Mark out and drill four holes suitable for M3 screws.
- b) Allowing for ease of cable connection, align the GPS Resilient Kit to the holes.
- c) Secure the GPS Resilient Kit using appropriate fixings (not included), such as four self-tapping M3 screws.

### *Cautions*

- 1. The GPS Resilient Kit should be mounted on a flat surface where possible and secured using the mounting holes provided.**
- 2. To prevent damage to any cable assemblies used in this installation, ensure the cables are not bent, deformed or snagged to cause damage to the internal wiring or the connector ends.**
- 3. During installation ensure there is NO power applied to the module. Make sure the GPS receiver is powered off.**

### Step 2. Installation of the Antennas

With reference to physical installation, the location of the two antennas to be fitted is as follows:

- Locate the antennas on a suitable area on a horizontal surface that always faces the sky, e.g. on the roof area.
- Avoid placing the antennas near obstacles including: roof racks, other antennas such as AM/FM and cell phone or air-conditioning devices that could block a clear view of the sky, preventing the satellite signals from reaching the antenna.
- Ensure that there is a distance of at least 1 meter between the two antennas.

Route the antenna cables away from moving parts, under carpet and behind plastic trim, to the GPS Resilient Kit unit location.

### Step 3. Installation of the PoRF

PoRF unit should be installed inside the server room next to the GPS receiver/server.

- customer should source an AC adapter, 3-24VDC (MATING PLUG 5.5mm \* 2.1-2.5mm)
- Connect the RF+DC connector towards the GPS Resilient KIT
- Connect the RF connector towards the GPS receiver/Server

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- Connect the PoRF into the power outlet.



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## Maintenance

GPS Resilient Kit does not contain any user-serviceable parts and contains no moving parts. With reference to the CAUTIONS on page 3, no maintenance is required apart from examining all the cable assemblies for secure connection, damage and corrosion.