



think|wireless

# **Product: GenX Mobile 5p Device**

## **Installation Guide**

Version 1.1

Date: April 29, 2013

Distribution: GPS Customers

**NOTE: PLEASE READ INSTALLATION INSTRUCTIONS CAREFULLY AS CHANGES HAVE BEEN MADE IN AN EFFORT TO IMPROVE QUALITY & SERVICES**

\*\*\* This free guide is provided as a reference and suggested method of installation only. GenX Mobile or Think Wireless Solutions will not be liable for any damages arising from installation units. Testing, operation and approval of installation/device will be sole responsibility of customer.

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## 1. Introduction

This installation manual covers the installation of the GenX Mobile 5p Device. This manual is for the professional installer and should be used to ensure a safe and functional install of the 5p Device.

## 2. Safety statement

\*\*\*Always disconnect the vehicle battery while installing this or any other automotive electronic product.

This product is connected directly to the vehicle's 12-volt system. There is no on-off switch on the unit. The installed unit operates 24 hours a day and should be energized to log vehicle events or send data as required by anyone using the service.

The 5P Device is shipped with in-line 3-amp fuse(s) attached to the power cable. This fuse must be installed as close as possible to the primary 12-volt source connection. The fuse protects the power cable should there be a short in the cable between the fuse and the module. This fuse must be installed properly. If the fuse is replaced, it should be of the same type as originally supplied from the factory. The original fuse supplied is a 3 amp 125-volt type 3AG.

Failure to use the proper fuse or to install the fuse in the recommended location could cause a vehicle fire hazard. The fuse provides overload protection for the power cable and GenX 5p Device. The wiring installed between the fuse and primary vehicle power is not protected from overheating if a short should occur. Use care when routing the power cable and fuse. Route the cables where they will be protected and uses commonly accepted install practices for aftermarket automotive electronic devices.

There are two acceptable methods of making a wire connection: Soldering your connections or using crimp connectors (with the use of the proper crimping tool). Regardless of the method you choose, ensure that connection is mechanically sound and properly insulated.

## 3. Selecting the GenX 5p Device Location

The 5p Device should be mounted so it will not be exposed to damage from people or objects. The cables that connect to the 5p should also be routed to protect them from possible damage. The 5p device has a mounting base or flange with mounting holes. Normal installation is with these four holes and #6 or #8 sheet metal screws. In some cases adhesive tape and /or zip ties may be used. It is important that that unit be fixed firmly. The control module must be mounted where it will not be exposed to direct sunlight or excessive heat generated by the vehicle operation.

## 4. Antenna Description

### 4.1 External Antenna

The 5p device typically uses one antenna. The antenna is for receiving GPS signals from the Navistar GPS satellites and for communication with the cellular networks. The antenna does not require a ground plane to function properly.

There are two antenna cables in addition to the main cable harness that must be connected to the module, so be sure there is room to access the connectors for installation and service. Satellites are in a 12-hour orbit at 12,000 miles above the earth. There are 29 Navistar GPS satellites in the system and generally there are at least 5 satellites orbiting overhead at any one time. This antenna must be positioned to receive signals from these satellites. The antenna location must be selected carefully so that the antenna can receive the satellite signals.

***Note: The ideal location is in a place that allows line of sight reception from the GPS satellites in orbit above. The satellite signals will pass through glass or plastic if not coated with a film or metallic obstruction.***

The covert combination radio transceiver antenna and GPS antenna is to be mounted inside the vehicle not exposed to the weather. (See last page for examples)

## 5. Locating Vehicle Power

The 5p device has an internal power management program that monitors the vehicle power at all times. The management program is continuously looking at the condition of the vehicle battery in order to detect the state of the vehicle operation. The module determines the state of the vehicle power by detecting changes in the battery voltage over time. It is critical in this installation that the vehicle power be taken from a source as close to the battery as possible. Possible sources besides the direct connection to the battery are the main fuse block panel or the point where the vehicle charging circuits are connected to the 12-volt system.

Connect the RED lead or fuse end of the power cable to +12 volt constant vehicle power. Connect the WHITE lead to +12 volt switched vehicle IGNITION. (Not accessory) Connect the BLACK lead to the vehicle chassis (GROUND).

\*\*\* Think Wireless Solutions \*\*\* Install only the 3 bundled wires on the long black cord with the 3AMP in-line fuse (Red, Black, and White) need to be connected.



## 6. Powering the GenX 5p Device for the First Time

Connect the two coax or FAKRA cables from the combo antenna securely, then connect the vehicle's 12-volt power to the red wire on harness, next connect the black wire on the harness to constant ground, then connect white ignition wire on harness to ignition, finally turn vehicle ignition on and observe the Diagnostic Test LED's.

***Note: Power, Ground and Ignition are always required for operation of the GenX 5p Device***

## 7. System Testing

The Diagnostic LEDs will indicate if the GenX mobile device is having issues with communication, GPS fixing and more. It is also recommended that the data server be checked to confirm that report data is arriving.

### Green & Red LED reference

The green and red LEDs are intended to troubleshoot installations. Below is a summary of their behavior.

#### Green LED

When the ignition is first turned on the GNX will powerup. The Green LED will show solid for approximately 30 seconds (there may be some brief flickers initially while the processor initializes). At no other time should the green LED remain on solid for such a long period. After 30 seconds the green LED will start to flash at the following rates:

- 25 times on-off every 10 seconds when the ignition is on (this is quite rapid)
- 8 times on-off every 10 seconds when the ignition is off (this is quite slow)
- Very short blip once every 3 seconds when in sleep mode

The green LED will also show if there is a PTO (a.k.a. input) active by flashing a number of times corresponding to the PTO (1,2,3,4). For example if PTO 4 is active then there will be 4 short flashes every 3 seconds.

#### Red LED

The RED LED flashes 2-digit codes. Roughly speaking the first digit tells you what general area is having a problem (hardware, modem, GPS, end-end service). The second digit gives specific error information. Since there can be more than one error condition the GNX rotates through the error codes (for example if GPS is tracking no satellites and the modem is not registered).

### **1 – X error codes : GNX specific errors**

**1-1** The GNX has an expired license key due to failure to resync with the GenXMobile configuration server. Contact Think Wireless Solutions with serial number of the device.

**1-2** Low supply voltage. This could be caused by a true low voltage condition (<8v) or a high impedance supply that dips in voltage when the current draw spikes due to modem transmit. This feature was introduced in 1.x.53 firmware.

**1-3** Allocated data usage exhausted. Resync the unit to restore (see MAXDATAUSAGE)

## **2 – X error codes: Modem related error codes**

**2-1** Modem module fault.

**2-2** No SIM inserted. Make sure SIM drawer contains SIM and is correctly seated in the socket.

If it is then RMA unit for failure analysis and repair.

**2-3** No signal. Check that the cellular antenna is correctly attached. Try to substitute a known-good cellular antenna to see if the antenna may be broken. If this cures the problem then reinstall new antenna. If not then RMA unit to for failure analysis and repair.

**2-4** Network not found. For GSM remove the SIM card and try in a known-good GNX. If that GNX displays the same problem then the SIM card or account may be the source of the problem. For CDMA check that the account is still active. If it is then RMA the unit and transfer the account to the new ESN.

**2-5** Last data session failed. This means that an attempt to establish a data session (GPRS, CDMA1x) failed. This could be because of an account problem, an incorrect APN, username or password, or simply due to network loading, temporary network outage, or poor radio coverage. This failure will occasionally happen in a working unit, but if the problem is persistent then further investigation is required.

**2-6** GPRS is not attached, or CDMA 1xRTT data is not available.

## **3 – X error codes: GPS related error codes**

**3-1** GPS module fault: RMA the GNX for failure analysis.

**3-2** GPS antenna fault: Try replacing the GPS antenna with a known good antenna. If the condition is not corrected (wait 2 minutes for the LED to update) then RMA for failure analysis.

**3-3** GPS not tracking any satellites. Check that the GPS antenna has a clear, unobstructed view of the sky, and has been operating for at least 5 minutes. Check that the GPS antenna is facing the correct way up. If the condition persists RMA for failure analysis.

**3-4** GPS no fix (<3 satellites). If antenna has only partial view of sky due to the position of the vehicle (under a cover, close proximity to a building) then try to move the vehicle to ensure that it will be able to make fixes when standing in the open. If the vehicle has a full view of the sky and the error condition persists then try to reposition the GPS antenna to get less obstructed view of the sky.

**3-5** GPS has no time. The GPS receiver sets its internal clock from the satellite signals. If the GPS receiver has no time then it has never seen a single satellite since the GNX5/10 was last power cycled.

## **4 - X error codes : end-end application error codes**

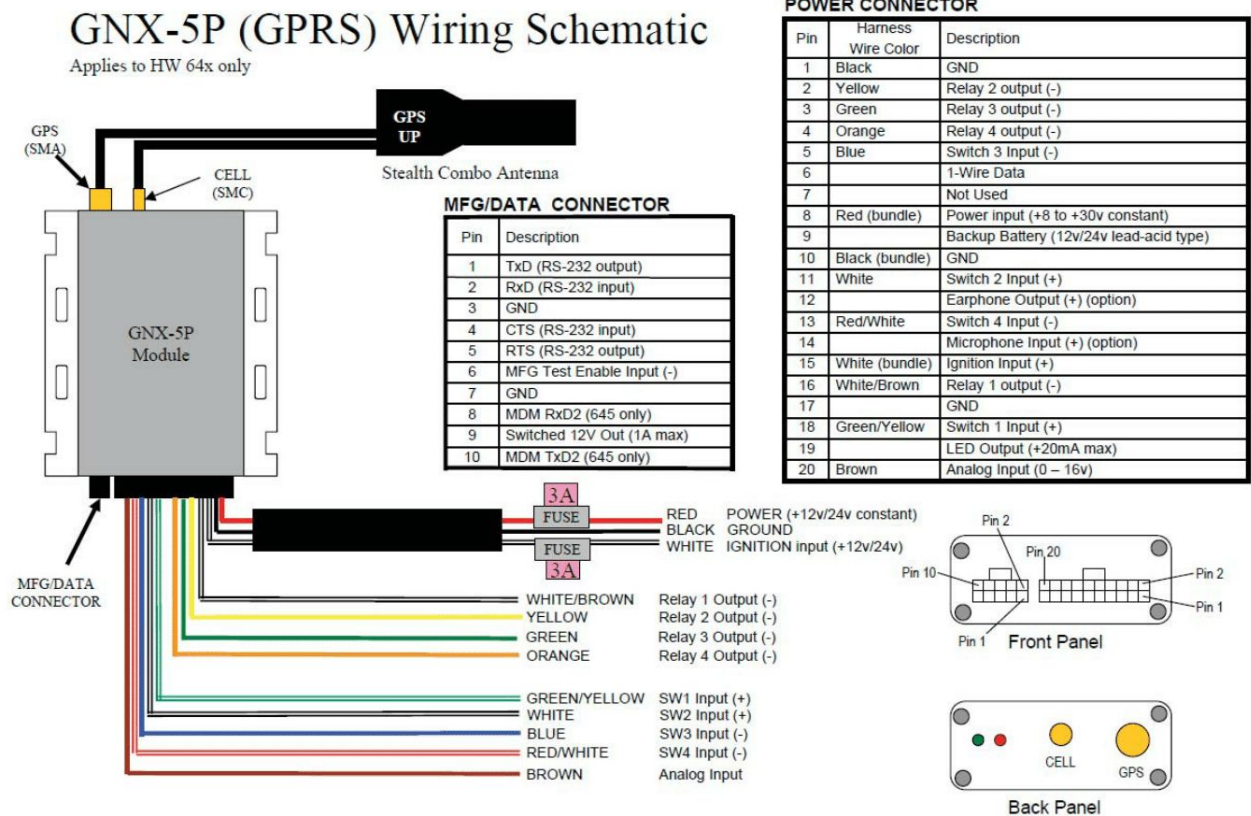
**4-2** Data transfer failed. This could be a TFTP, FTP, SMTP file transfer or a data transfer via TCP or UDP socket. It could indicate a failure to resync with the GenX Mobile server, or a failure to upload position data to the customer server.

Note that since mobile data communication is inherently unreliable this code can appear from time to time even on a perfectly healthy GNX, and is not necessarily indicative of a hardware, firmware, or installation problem.

Only the 3 bundled wires on the long black cord with the 3AMP in-line fuse (Red, Black, and White) need to be connected.

The 6 inch colored wires are not used at this time.

## Wiring Schematic Diagram



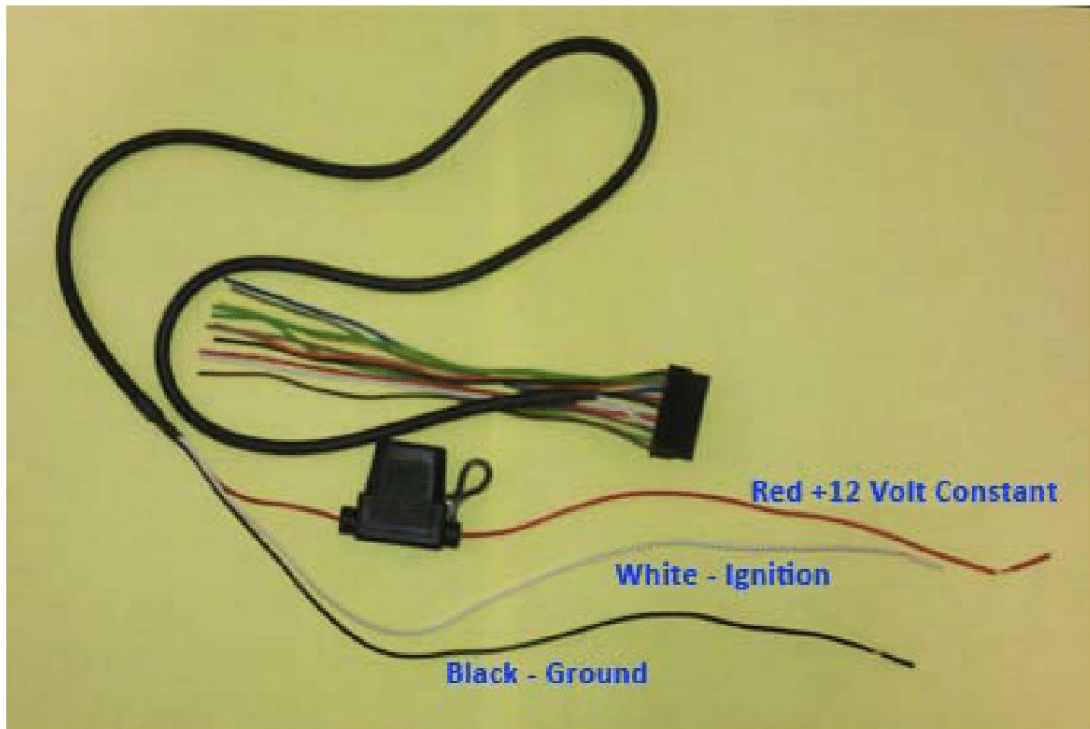
10/15/2009

GNX-5P GPRS Wiring Schematic ver 2.3



## Install Diagram

\*\*\* Only the 3 bundled wires on the long black cord with the 3AMP in-line fuse (Red, Black, and White) need to be connected. The 6 inch colored wires are not used at this time. \*\*\*



## Antenna Placement Examples

The antenna should be placed with the word "Bottom" faced down.

