

# GP-Probe TGE2

Three-channel GNSS probe with an embedded RF signal analyzer for spoofing/jamming/interference detection

# Quick Start Guide

Document version 1.0



## Online user manual:

<https://support.gpspatron.com/support/solutions/folders/101000427656>



## Datasheet:

<https://gpspatron.com/gp-probe-tge2-datasheet/>



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# General Safety Summary

Carefully read the following safety precautions to avoid any personal injury or damage to the instrument and any equipment connected to it. To avoid potential hazards, please use the instrument as specified.

## **Use Proper Power Cord**

Only the power cord designed for the instrument and authorized by local country could be used.

## **Ground the Instrument**

The instrument is equipped with two power units:

- 100 - 240VAC
- 18 - 75VDC

The instrument is grounded through the protective earth conductor of the power cord connected to 100 - 240VAC power unit or central pin of the 18 - 75VDC power connector. To avoid electric shock, please make sure the instrument is grounded correctly before connecting its input or output terminals.

## **Look Over All Terminals' Ratings**

To avoid fire or electric shock, please look over all ratings and sign instruction of the instrument. Before connecting the instrument, please read the manual carefully to gain more information about the ratings.

## **Lightning protection**

GPSPATRON recommends installing lightning and surge protection equipment to protect GNSS antenna ports on all permanent sites.

## **Keep Well Ventilation**

Inadequate ventilation may cause increasing of temperature, which may eventually damage the instrument.

## **Do Not Operate Without Covers**

Do not operate the instrument with covers or panels removed.

## **General Care**

Do not store or leave the instrument in direct sunshine for long periods of time.

To avoid damages to the instrument, please do not leave it in fog, liquid, or solvent.

## **Cleaning**

Please perform the following steps to clean the instrument regularly according to its operating conditions.

1. Disconnect the instrument from all power sources, and then clean it with a soft wet cloth.
2. Clean the loose dust on the outside of the instrument with a soft cloth. When cleaning the LCD, take care to avoid scratching it.

To avoid damages to the surface of the instrument, please do not use any corrosive liquid or chemical cleanser.

Make sure that the instrument is completely dry before restarting it to avoid short circuits or personal injuries.

# Contents

- 1 Quick Start ..... 7
  - 1.1 First Power-On..... 8
  - 1.2 GNSS Antennas Installation ..... 9
  - 1.3 Connect GP-Probe to GP-Cloud ..... 10
- 2 The Front Panel..... 13
- 3 The Rear Panel..... 15
- 4 Reset to Default Settings ..... 18
- 5 Troubleshooting..... 19

# 1 Quick Start

Using GP-Probe TGE2 is very easy (we truly believe that!). Simply follow a few straightforward steps:

- 1.1 First power-on
- 1.2 GNSS Antennas Installation
- 1.3 Connect GP-Probe to GP-Cloud  
OR
- 1.4 Activate Onboard Signal Processing

We recommend starting with this video:

<https://youtu.be/zovZwfmofc>



# 1.1

## First Power-On

GP-Probe TGE2 has no power button, so once you plug in the power cable the probe will start up immediately.

By default, all three GNSS channels are activated, resulting in Hardware Error 478 and a red LED near each GNSS port:



Once the GNSS antennas are connected, this error will be resolved. The probe will show the status "Connecting" and then "Offline":



Now you should install GNSS antennas and set up a connection to GP-Cloud or activate the Onboard Signal Processing option.

## 1.2 GNSS Antennas Installation

GPSPATRON's algorithms for GNSS interference detection and classification are calibrated to operate under a wide range of challenging conditions. You can use inexpensive magnetic GNSS antennas and install them on the windowsill in your office. But the better the antennas are installed, the more efficient the system will be.

Common recommendations:

- Average SNR > 30 dB
- Antennas see the whole sky
- All three antennas are installed in the same conditions
- Avoid RF signal reflections

Discover additional tips on how to properly install GNSS antennas here:

<https://support.gpspatron.com/en/support/solutions/articles/101000466605-gnss-antenna-installation-tips>



## 1.3 Connect GP-Probe to GP-Cloud

To connect GP-Probe to GP-Cloud you need to follow the following three steps:

- Register GP-Probe in GP-Cloud.
- Configure GP Probe.
- Calibrate GP-Cloud algorithms.

In order to register, you need to know the unique GP-Probe ID. It can be found on the device screen and in the Web Configuration Panel:



The registration can solely be performed by the system admin on GP-Cloud's user interface:

- Navigate to the "Probes" menu and click on "Add New Probe".
- In the popup, choose the probe's model, make up a password (remember it for the next step), and type in the probe's ID.

Learn more here about how to register a GP-Probe in the cloud:

<https://support.gpspatron.com/en/support/solutions/articles/101000492697-gp-probe-registration-in-gp-cloud>

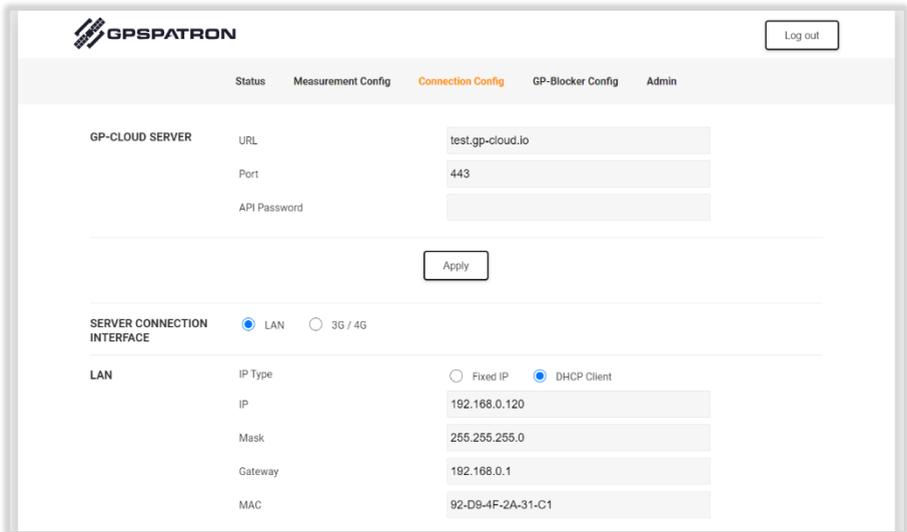


For GP-Probe configuration you should login to the Web Configuration Panel with the following default credentials:

Default URL: <http://192.168.0.120>  
Default user: admin  
Default password: admin

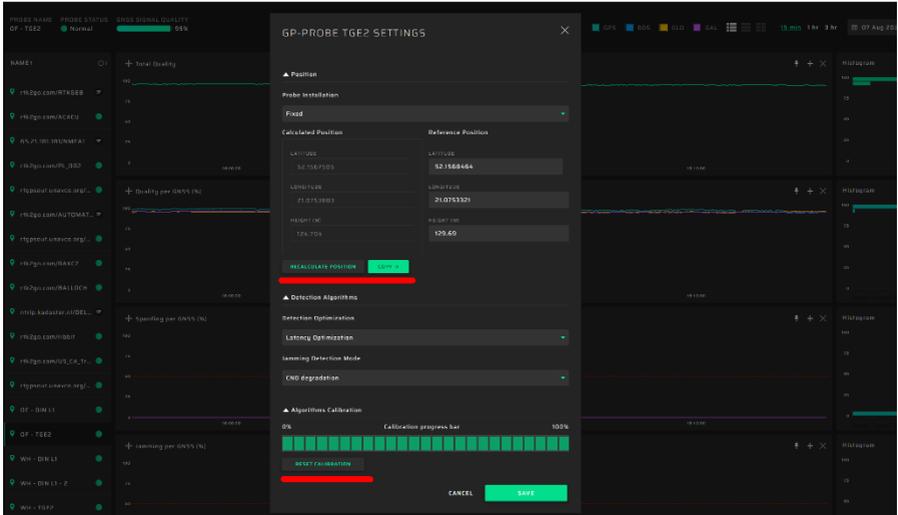
Then proceed as follows:

- Navigate to the "Connection Config" menu.
- Enter the URL/IP of your GP-Cloud server instance. If you're using our cloud service, then leave gp-cloud.io
- Enter the API password you created when registering the probe in the GP-Cloud.
- Select your preferred data streaming method: either through the Ethernet port or the built-in 3/4G modem.
- Set up the network IP connection as required:



That's it! Your GP-Probe should now be connected and ready to stream data.

Now you can access the data coming from the probe through your GP-Cloud account, but the probe's status may not be displayed as "Normal". It is more likely to show "Anomaly" or "Low Position Accuracy". To rectify this, simply open the Probe Config Popup, recalculate a new reference position, and reset the calibration:



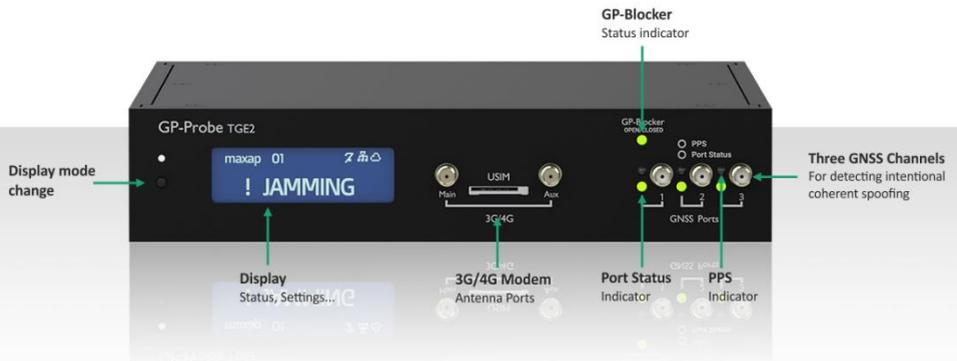
Here, you can find more information on how to calibrate your GP-Probe: <https://support.gpspatron.com/en/support/solutions/articles/101000492698-gp-probe-calibration>



## 2 The Front Panel

On the front panel of GP-Probe TGE2, there are:

- display and control button
- two SMA connectors for 4G antennas connection (if there is a built-in 4G modem)
- a slot for a USIM card (if there is a built-in 4G modem)
- three SMA connectors for GNSS antennas connection
- indicators for the status of GNSS ports
- indicator for the status of GP-Blocker



Use the left button to change pages and view the device status. You can read here what information is available on the screen of the device:

<https://support.gpspatron.com/a/solutions/articles/101000492691>



To the left of each GNSS antenna port, there are two LEDs showing the port status.

The top LED:

- blinks if there is a 3D Fix

The bottom LED:

- off – the port is disabled
- green – the port is enabled and working without errors
- red – port error

The GP-Blocker status indicator shows:

- off – GP-Blocker is disabled
- green – blocker is open
- red – blocker is closed

Be careful when inserting a SIM card. Read here how to do it safely:

<https://support.gpspatron.com/a/solutions/articles/101000466603>



## 3 The Rear Panel

On the rear panel of GP-Probe TGE2, there are:

- 100-240VAC power connector.
- 18-75VDC power connector.
- PPS input, PPS output SMA connectors.
- NO/NC relay switch terminals.
- GP-Blocker connector.
- RS-232, RS-485/422 interfaces.
- LAN.



Before using the device, please carefully review the technical specifications in the datasheet: <https://gpspatron.com/gp-probe-tge2-datasheet/>



## Power Ports

The GP-Probe TGE2 has two independent power units to implement a backup supply scheme. Switching between power units is instantaneous, without loss of performance or parameter degradation. Ports are equipped with grounding terminals.

## PPS Input/Output

The GP-Probe TGE2 has a PPS output coming from the built-in GNSS receiver on the first channel. The pulse is generated only if the status of the GP-Probe TGE2 is "Normal".

The GP-Probe TGE2 has a built-in PPF phase difference measurement module. When an external pulse source, such as a time server, is connected to the "PPS In" port, the GP-Probe TGE2 determines the phase difference every second and sends the data to GP-Cloud. If a specified threshold is exceeded, GP-Cloud sets the GP-Probe TGE2 status to "PPS Offset".

The "PPS In" port supports low-voltage PPS signal sources.

## Relay Terminal

Integrating GP-Probe into existing infrastructure is made simple with the use of a relay. The relay's behavior can be configured through the web configuration panel. If interference is detected, the relay will switch, making it easy to control external equipment.

The relay has three pins:

- C – common wire.
- NC – normally closed.
- NO – normally open.

## **GP-Blocker Connection Port**

The GP-Probe TGE2 can control four connected GP-Blockers. When an incident is detected, the GP-Probe TGE2 sends a command to the GP-Blocker to close the port. The connected time server loses track of the satellites and switches to holdover mode.

## **RS-232, RS-422/485 Ports**

The ports are intended to control external equipment with an embedded LUA scripting engine. The sent commands, as well as the port operation modes, are determined by a script developed using the LUA language.

Learn more here about LUA scripting engine:

<https://support.gpspatron.com/support/solutions/folders/101000427666>



## **LAN**

The LAN port has a standard 10/100BASE-T RJ45 interface pinout. POE power supply is not supported.

## 4 Reset to Default Settings

If you have forgotten the password to access the Web Configuration Panel or if you need to switch the device to use a static IP address, you can reset the probe to the factory default settings.

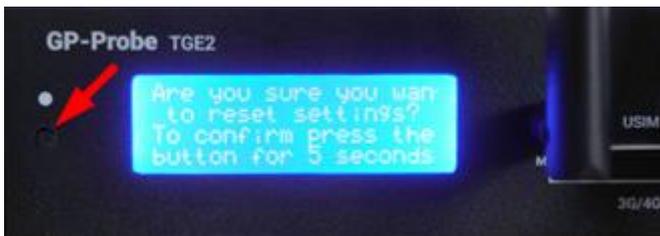
When resetting, the following settings will be restored:

- IP type: static
- IP: 192.168.0.120
- username/password: user/user, admin/admin

Access settings for GP-Cloud and LUA script will not be affected.

To reset, you should:

- Disconnect the device from the power source
- Press and hold the button on the front panel
- Connect the power supply
- Wait five seconds until the message "Are you sure you want to reset settings?" appears on the screen:



- Release the button
- Press and hold the button again for five seconds.

## 5 Troubleshooting

The GP-Probe TGE2 has a built-in self-diagnostic system. When an error is detected, the device displays an error code on the screen and sends the error to GP-Cloud. All errors are saved in the GP-Cloud logs.

<b>Error code</b>	<b>Description</b>
<b>471</b>	Malfunction of RS-485 connection interface for remote control of GP-Blocker.
<b>472 - 475</b>	GP-Blocker 1-4 operation error.
<b>476</b>	GP-Probe TGE2 built-in memory error
<b>477</b>	GNSS Port Driver Failure
<b>478</b>	GNSS Antenna Not Connected
<b>479</b>	GNSS Antenna Short Circuit
<b>480</b>	The embedded spectrum analyzer (RFSA option) is not functioning properly
<b>481</b>	External PPS is not coming to the "PPS In" port
<b>482 - 484</b>	Low GNSS signal quality on channel 1-3