

**THE GNSS REPEATER TECHNOLOGY EXPERT**



**ROGER GNSS-RAS-8**  
**GNSS Amplifying Splitter**  
**19-inch 1U Rack Mount**  
**User Manual**

**Time2Act™**

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*Thank you for choosing Roger-GPS Ltd for your requirements. We appreciate your support and are certain that our product will serve you reliably. This product is designed to provide many years of reliable service, provided it is used as intended and taken care of. This user manual will assist you in assembling and generally operating this product.*

## Roger-GPS Ltd. – the Company

The increasing dependence on GNSS – Global Navigation Satellite System (GPS, GLONASS, Galileo, Compass, Beidou) and their applications has placed an additional demand on them to operate indoors and outdoors without interruption to the data.

ROGER-GPS Ltd. is a company that specializes in GNSS (GPS) repeating technology. The ROGER-GPS proven system concept enables the use of GNSS repeater devices to provide services in places where it was previously unavailable. We have a wide range of customers who always require reliable GNSS signal reception or time synchronization; they include telecommunications providers, Public Safety Services, Utilities, Defence, Transport, Airlines, Finance, Logistics and the companies who manufacture, sell and maintain GNSS systems, receivers, terminals and services.

The Roger-GPS Ltd. business concept permits the use of GNSS repeater devices and services in places where it was not previously possible.

In September 2008 Sparklike Ltd. launched the first CE-certified GPS repeater product family approved by the communications authorities in Finland and Sweden for use as a radio-licensed device. ROGER-GPS was established as a spin-off in February 2009 to continue the development, manufacturing and marketing of GPS products started by Sparklike Ltd.

The private company owners of Roger-GPS Ltd. are Maktub Consulting Ltd., and Naxim Ltd.

### **IMPORTANT!**

Read carefully the contents of this manual before assembly or operation of this product.

**Only a qualified company/person can install this product.**

# GNSS-RAS-8

## General Description

The GNSS-RAS-8 is a 1-to-8 splitter for signal-splitting purposes. It is specially designed for GNSS time synchronization and GNSS signal distribution in server halls, laboratories, and other facilities where precise GNSS reception is required. The device can distribute signals from 1.15 GHz to 1.63 GHz. The device features a fully redundant dual power supply to ensure signal reception for end-user devices. The GNSS-RAS-8 has indicator LEDs for the antenna and both PSUs. The splitter outputs are DC-blocked with 200-ohm resistors to prevent false antenna faults in end-user devices.

### WHAT IS GNSS-RAS-8 PRODUCT

- 1x ROGER Splitter unit (**GNSS-RAS-8**)
- 2x Rack brackets for 19" rack installation
- 4x rubber feet for tabletop installation (available in the product package)
- 1x User Manual in English (this document).

### NOTE:

**The power supplies are not included in the product package; thus, they must be ordered separately based on the installation requirements.**

## Installation

All RF ports are SMA female connectors. Install a GNSS antenna with a suitable RF cable to the RF IN port. Install the user equipment cables to the RF OUT ports. Any RF OUT port can be used. All unused RF OUT ports shall be terminated with SMA-male 50-ohm terminators (supplied by separate order). After securing all RF connections, plug in the power supply or supplies. If only one power supply is used, either of the two DC IN ports can be used.

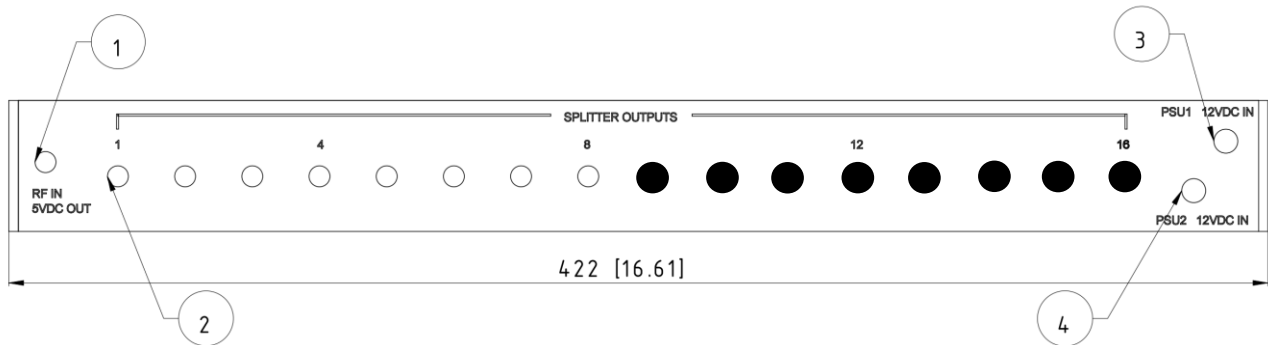
The product can be installed on a standard 19-inch rack or used as tabletop equipment. For rack installations, rack brackets are supplied. See the dimensions on the next page.

Note the length of the power adapter cable when planning the installation location. The power supply used shall not exceed 100W. **Ensure the antenna connector is correctly fastened to the device and unused ports are terminated.**

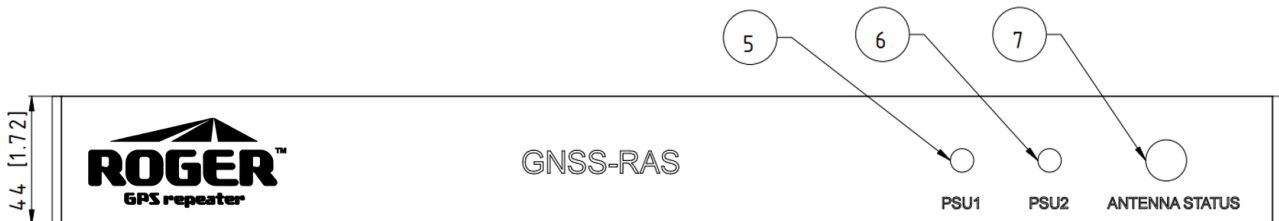
# Description and Dimensions

Millimetres [Inches]

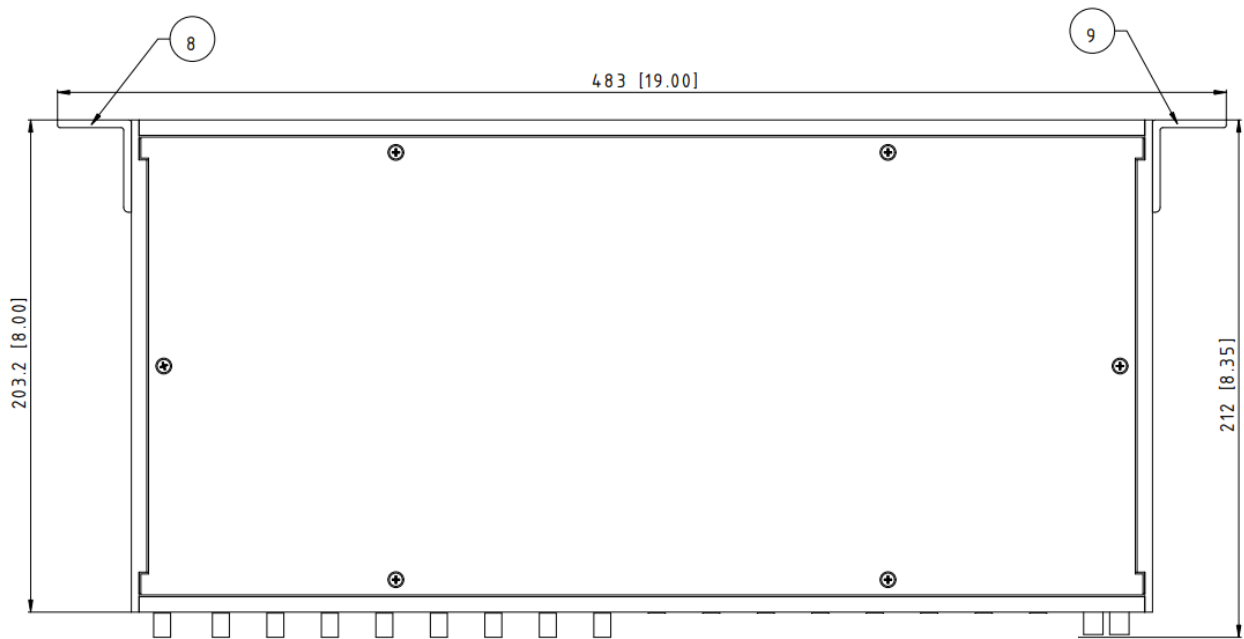
1. SMA female RF Input with +5VDC feed for an outdoor antenna. Maximum input power -20dBm.
2. 8 SMA female output ports with 200-ohm DC load termination. Maximum DC block voltage 12.0 VDC. 9-16 ports are not in use.
3. & 4. M8 4-pin male connector for power supply. Power supplies are redundant. If only one PSU is used, it can be connected to either port. Maximum DC input 13.2VDC.



5. & 6. LED indicators for PSUs. A green light indicates power on.
7. Antenna current draw. Green LED indicates normal current consumption (10-100 mA). Red LED indicates abnormal current (below 10 mA or above 100 mA).

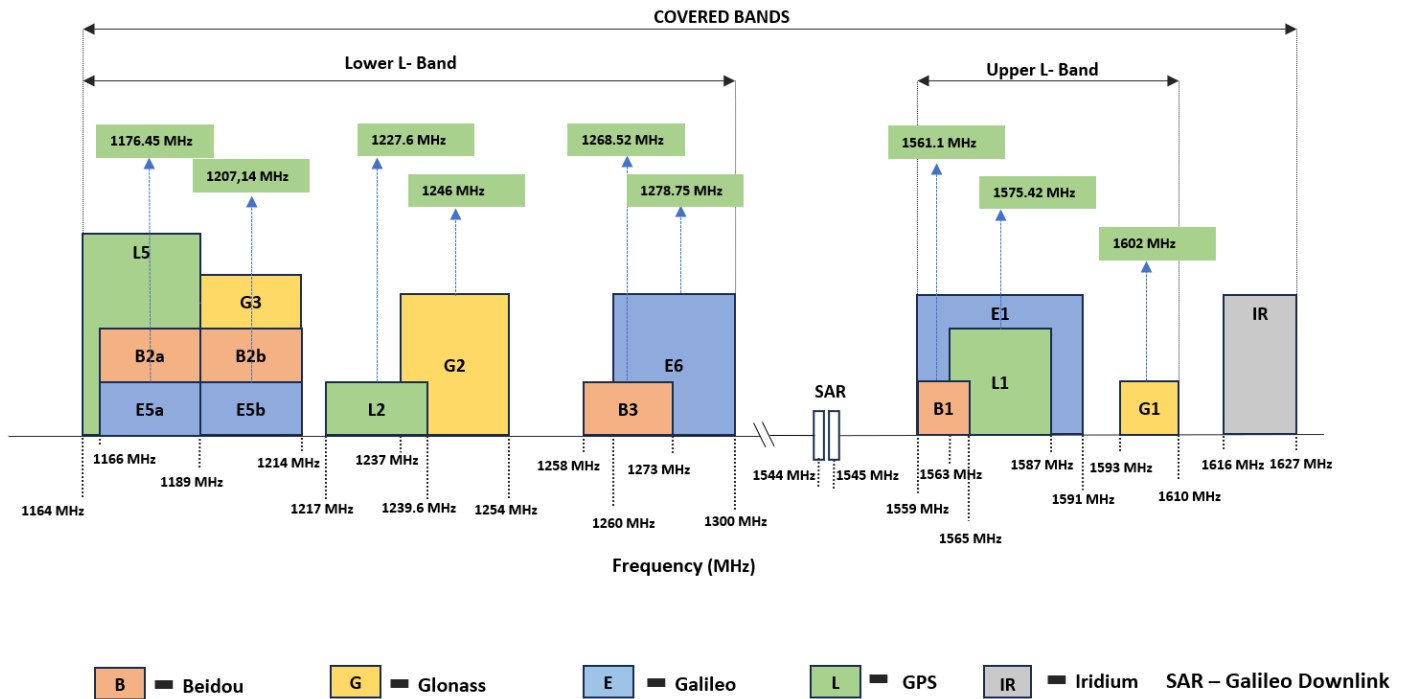


8. & 9. Rack mounting brackets are included in the package and assembled to side panels by default. The brackets can be mounted either to the front or rear.



## Covered Bands

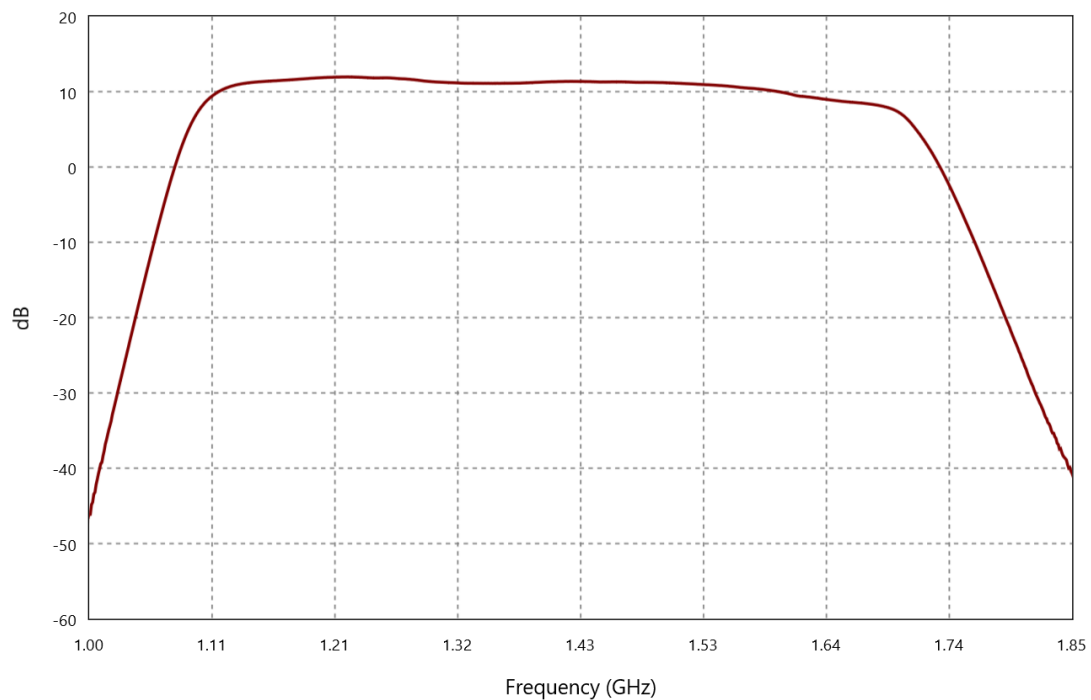
The GNSS-RAS-8 covers all received GNSS and Iridium bands from 1.15 to 1.63 GHz.



### Typical Wideband S21

(From RF IN to any output port, unused ports terminated to 50 ohms)

### GNSS-RAS-8 Typical S21



# Troubleshooting

Any changes to the cabling must be made when the device is turned off.

## **The user equipment cannot obtain a GNSS signal**

Check the antenna indicator LED.

1. If the LED is red:
  - a. Check the cables and their connections coming to the RF IN port. Replace broken cables.
  - b. If cables or connectors are in good condition the antenna can be broken. Check the antenna.
2. If the LED is green:
  - a. Check the cable connections from the splitter to the user equipment.
  - b. Check the antenna placement. The antenna must have a line of sight to the satellites.
  - c. Check the antenna environment for possible interference sources. HVAC machines and other antennas nearby can cause interference.

## **The user equipment GNSS signal is weak**

1. Ensure that the link budget for the user equipment is sufficient.
2. Check all RF cables and connections.
3. Check the antenna placement. The antenna must have a line of sight to the satellites.
4. Check the antenna environment for possible interference sources. HVAC machines and other antennas nearby can cause interference

## **The splitter does not work, All LEDs in the front panel are off**

1. Check the power supply connections. One power supply is enough to power the device.
2. Remove the RF IN cable. If the LEDs turn on, there is a short circuit in the RF IN cable. Replace the cable.

## **Antenna status LED is off, PSU1 or/and PSU2 LED is green, splitter does not work**

1. Remove the RF IN cable. If the LED turns on, there is a short circuit in the RF IN cable. Replace the cable.

## Technical Information

| General                     |                                         |         |       |         |
|-----------------------------|-----------------------------------------|---------|-------|---------|
| Size                        | 483x212x44 mm<br>19.00x8.35x1.72 inches |         |       |         |
| Weight                      | 1.7 kg, 3.75 pounds                     |         |       |         |
| Operating Temperature       | -25 - +55°C                             |         |       |         |
| Power Connector             | M8 4-pin male                           |         |       |         |
| RF IN Connector             | 1xSMA female                            |         |       |         |
| RF OUT Connectors           | 8xSMA female                            |         |       |         |
| CE                          | Yes                                     |         |       |         |
| EMC                         | EN 301 489-1                            |         |       |         |
| Power On Indicator          | 1 piece for each PSU                    |         |       |         |
| Antenna Current Indicator   | Green: Antenna Ok, Red: Antenna Fault   |         |       |         |
| Electrical                  |                                         |         |       |         |
|                             | Min                                     | Typical | Max   | Unit    |
| Frequency Range             | 1.15                                    |         | 1.627 | GHz     |
| Gain                        | 7.5                                     | 10.0    | 12.5  | dB      |
| Amplitude Balance           |                                         | 0.5     |       | dB      |
| Group Delay @ L5 (1176 MHz) |                                         | 9.3     |       | ns      |
| Group Delay @ L2 (1227 MHz) |                                         | 8.4     |       | ns      |
| Group Delay @ L1 (1575 MHz) |                                         | 7.9     |       | ns      |
| Phase Balance               |                                         | <5      |       | degrees |
| Input VSWR                  |                                         | <2      |       |         |
| Output VSWR                 |                                         | <1.2    |       |         |
| Output Port Isolation       |                                         | >21     |       | dB      |
| RF Input                    |                                         |         | -20   | dBm     |
| Input Voltage               | 10.8                                    | 12      | 13.2  | VDC     |
| Power Consumption           |                                         | 3       |       | W       |
| Antenna Output Voltage      |                                         | 5       |       | VDC     |
| Antenna Current             |                                         |         | 100   | mA      |
| DC Block load termination   |                                         | 200     |       | ohm     |
| DC Block Voltage            |                                         |         | 12.0  | VDC     |

# WARRANTY

Roger™-GPS Ltd agrees that any Roger™-GPS Ltd manufactured hardware supplied under these Conditions shall be free from defects in materials and workmanship and design for a period of 24 months from the date of the delivery “(the Warranty Period)” covering material and workmanship and design. The 24 months period is calculated from the date, the products are shipped from the Buyer’s warehouse in the case that the Buyer has an accounting system that keeps track on the shipment dates. Nevertheless, the warranty period cannot exceed in any circumstances 26 months from the date of delivery from Roger™-GPS Ltd warehouse. The 3<sup>rd</sup> party products what Roger™-GPS Ltd sell as part of the product solution, they warranty is based on the OEM terms in question, typically 12 months from the date of delivery. The warranty terms of 3<sup>rd</sup> party products from Roger™-GPS Ltd shall be delivered to the Buyer prior to the delivery of the products.

Roger™-GPS Ltd undertakes to remedy all defects in the Products notified to it by the Buyer during the Warranty Period by either repairing or replacing or refunding at Roger™-GPS Ltd.’s option the defective Product or defective part at Roger™-GPS Ltd.’s cost.

Goods returned under this guarantee shall be delivered to Roger™-GPS Ltd at the Buyer’s expense. Before shipping the products to Roger™-GPS Ltd, the buyer must follow the RMA (Return Material Authorization) instructions given by Roger™-GPS Ltd and the inward processing directives set by the Finnish Customs. The Buyer shall bear all risks of loss or damage to the Product during its transportation.

Warranty will be void in respect of goods which in Roger™-GPS Ltd.’s reasonable opinion, have been subjected to unauthorized modification or repair, improper installation, neglect, misuse or operation in environmental conditions outside of specified safe operating extremes. The warranty applicable to non-Roger™-GPS Ltd product supplied by Roger™-GPS Ltd shall be limited to the warranty offered by the manufacturer of the product.

Roger™-GPS Ltd shall not be liable to the Buyer for any consequential loss.

No warranties, expressed or implied, including but not limited to, any implied warranty of merchantability of fitness for any purpose, are made or deemed to have been made by the Roger™-GPS.

Roger™-GPS Ltd shall not be responsible to the Buyer for any incorrect orders.

Roger™-GPS Ltd does not warrant the software delivered under these conditions per se but agrees to maintain the software for a period of 90 days from the date of delivery of the relevant software.

The Buyer shall indemnify Roger™-GPS Ltd against all proceedings, claims or demands in any way connected with the Conditions brought or threatened against Roger™-GPS Ltd by a third party except to the extent that Roger™-GPS Ltd is liable for the functioning and quality of the Product during the term of the warranty period under this Warranty.

When an exporter knows or has reasonable reason to believe that its product will end up in a sanctioned country via a third country, such export must be viewed in the same way as direct exports to a sanctioned country. All obligations provided by EU regulations apply, including restrictions the export of certain products as well as the prohibition of directly or indirectly making funds or economic resources available to designated persons and entities.

Supplier reserves all rights for product changes and upgrades.  
Pictures and texts are indicative.

## Safety and Disposal Instructions

**Follow these safety and disposal instructions when using or installing the product. Before taking the product into use carefully read the user manual and installation instructions. Further safety information may be requested from Roger-GPS Ltd.**

### Safety instructions

1. Only a qualified company/person can install this product. The product is not intended for personal use.
2. Do not exceed the maximum input power stated in the manual. Higher power may cause danger and permanent damage to the device.
3. If the product is used as a part of a GNSS repeater network check, apply, and fulfil the radio licensing regulations and directives of the use of GNSS repeaters in your country from your regulator.
4. The product is designed to be used only for distribution of GNSS signal. Any other use is strictly forbidden. Improper use may cause interference for other radio equipment.
5. Do not install or use the equipment in zones where there are fire hazards or explosive materials.
6. The equipment shall be installed and used according to the installation instructions and the user manual. Improper use may cause interference for other radio equipment.
7. The nominal operation voltage of the device is 12VDC. Other voltages may cause permanent damage to the device. Used power supply power shall not exceed 100W.

### Disposal and recycling

The product and its parts shall be disposed of as electronic waste. Cabling shall be disposed of as metal waste.



## Contact information



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