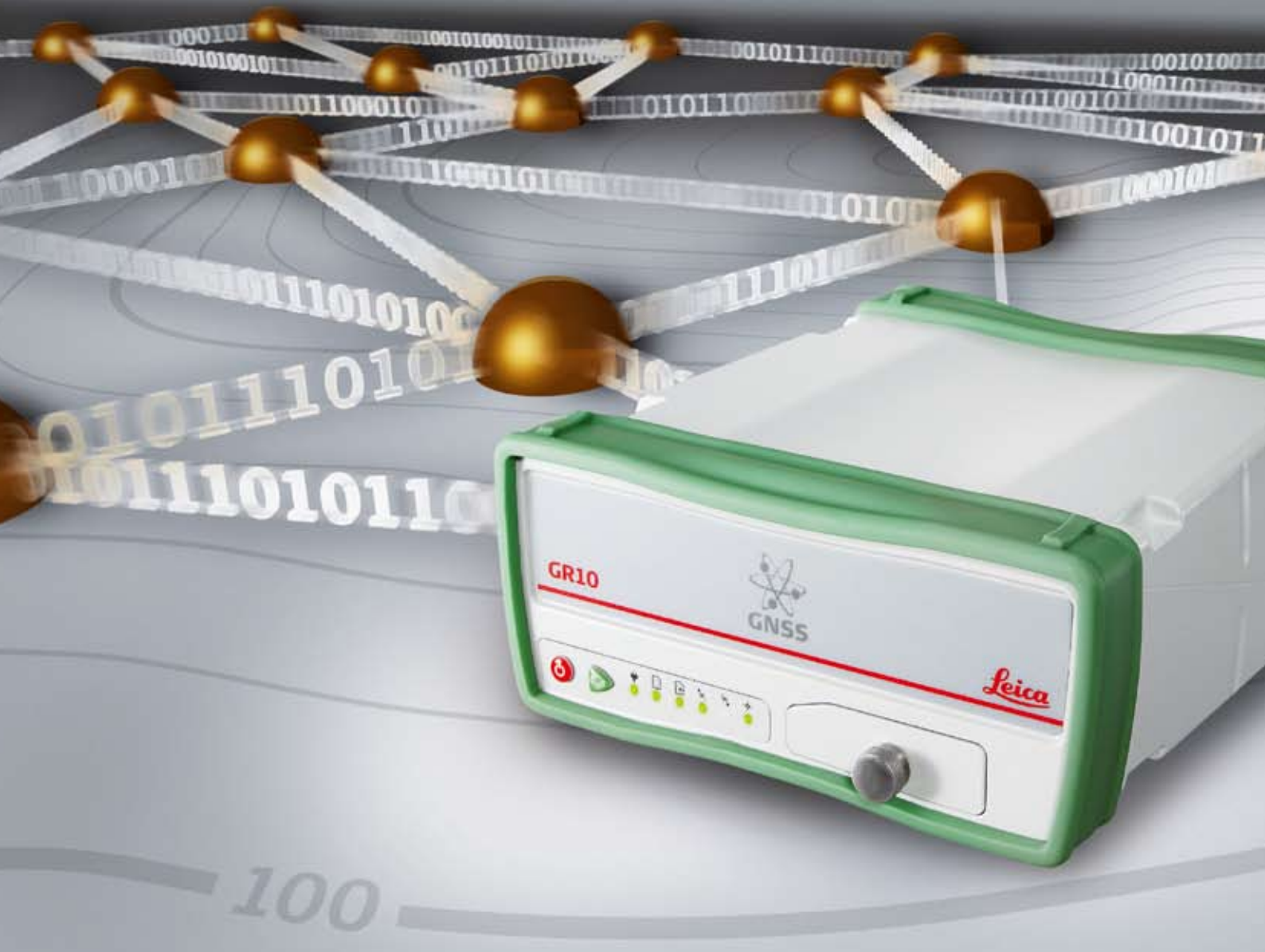
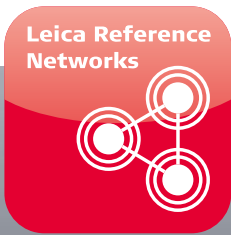


Leica GR10

Operational Manual

(Online Help)



- when it has to be **right**

Leica
Geosystems

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1: Introduction

How to use the Online Help: Overview

The GR10 Online Help (Operational Manual) is comprehensive guide to the GR10 and its operation.

The table below provides a brief description of each chapter:

Chapter	Description
1: Introduction	Detailed instructions on how to use the Online Help and find and print topics. A summary of all available documentation for the GR10 is listed.
2: Description of the system	Includes a summary of the GR10, reference station components, instrument components, operation, software and power supply.
3: Installation	Detailed diagrams showing installation options.
4: User interface	Detailed diagrams describing the GR10 keyboard, led indicators, USB/SD card cover and the Web interface.
5: Getting started	Detailed instructions on how to setup your GR10 and access the web interface.
6: Context sensitive help	Includes detailed context sensitive help for every page in the web interface.
7: GR10 Software	A detailed summary of the GR10 software and step-by-step guides to upgrade firmware.
8: GNSS Spider / Remote Access	An overview of the GNSS Spider, remote access process and the requirements that are required.
9: How to	A list of step-by-step guides to help you configure and use the receiver.
10: Support resources	A summary of the support resources available for a GR10 user.
11: External devices	This section explains which external devices can be used with the GR10. Includes step-by-step guides for each device.
12: Default settings	Detailed information on the reformatting of the receiver settings.
13: Technical Data	Technical data for the GR10 and GNSS Antennas .
Appendix A: Ports & Pin Assignments	A summary of GR10 port and pin assignments.
Appendix B: NMEA Messages	A list of all NMEA messages supported by the GR10.
Appendix C: RTCM Messages	A list of all RTCM messages supported by the GR10.
Appendix D: Web interface: Directory Structure of the Menu Bar	A summary of the directory structure of the web interface.
Appendix E: Directory Structure of the Memory Device	A summary of the directory structure of the memory device.
Appendix F: GR10 default settings	The GR10 default settings.
Appendix G: Glossary	A description of common GNSS terms.

Further information

[How to display and use the Online Help](#)




[How to find a Online Help topic](#)

[How to print a Online Help topic](#)

How to display and use the Online Help

Accessing the Online Help using the Web interface




There are three ways to access the Online Help whilst using the Web interface

Access Online Help	Description
	Press the help menu to open the complete Online Help.
	Press to open content-sensitive help.
	Press to activate hints on the active Web interface page.

Online Help User Interface

The HTML Help viewer is a tri-pane window presenting you with a navigation pane to the left and a pane for displaying help contents and selecting browse sequences on the right.

The Contents tab is synchronized with the topic pane, so that users never lose their place.

Field	Description
Contents	The Contents tab displays a table of contents. Books  and pages  represent the categories of information in the online help system. When you double-click a closed book, it opens  to display its content (sub-books and pages). When you double-click an open book, it closes. When you click pages, you select topics to view in the right-hand pane of the HTML Help viewer.
Index	The Index tab displays a list of keywords and phrases. The keywords are associated with their corresponding topics.
Search	The Search tab enables you to search for words in the help system and locate topics containing those words. Full-text searching looks through every word in the Online Help to find matches. When the search is completed, a list of topics is displayed so you can select a specific topic to view.

Further information

[How to find a Online Help topic](#)


[How to print a Online Help topic](#)

How to find a online help topic

- Click the **Contents** tab to browse through topics by category.
- or click the **Index** tab to see an alphabetically ordered list of index entries: either type the word you're looking for or scroll through the list.
- or click the **Search** tab to search for words and/ or phrases that may be contained in a Help topic. Combine several phrases by logical operators for a more advanced search.

How to use Search step-by-step

To use the online help search follow these steps:

Steps	Description
1	To find information with advanced full-text search click the Search tab and type the word or phrase you want to find.
2	Click GO and select a topic listed below.
	<ul style="list-style-type: none">• Searches are not case-sensitive, so you can type your search in uppercase or lowercase characters.• You may search for any combination of letters (a-z) and numbers (0-9).• Punctuation marks such as the period, colon, semicolon, comma, and hyphen are ignored during a search.

Further information

[How to display and use the Online Help](#)

[How to print a Online Help topic](#)

How to print a online help topic


Background information

The entire GR10 Operation Manual (Online Help) can be printed from the PDF version.

To print an individual Online Help topic follow the steps listed below.

How to Print step-by-step

Internet Explorer

Steps	Description
1	Open the Online Help topic
2	Open the Show Navigation Component if not already visible.
3	Click in the topic frame on the right or highlight a section of text you wish to print.
4	Go to File / Print Preview .
5	From the Select Content drop down list select, Only the selected frame .
	Select As selected on screen to only print a highlighted section of text.
6	If you are happy with what is displayed on the screen, press Print.

Mozilla Firefox

Steps	Description
1	Open the Online Help topic.
2	Right click in the topic frame on the right.
3	Go to This Frame / Print Frame .
4	The Print window opens.
5	Select the Printer Name and press OK.

Google Chrome

Steps	Description
1	Open the Online Help topic.
2	Right click in the topic frame on the right.
3	Go to Open frame in new tab/window .
4	Right click in the topics frame.
5	Go to Print .

Further information

[How to display and use the Online Help](#)

[How to find a Online Help topic](#)

Available documentation

Name	Description	Printed	PDF
GR10 User Manual	All instructions required in order to operate the product to a basic level are contained in the User Manual. Provides an overview of the product together with technical data and safety directions.	✓	✓
GR10 Operational Manual (Online Help)	Comprehensive guide to the product and the operation. Includes a description of the hardware installation and common accessories. Software setup is described in detail, along with the technical specifications.	-	✓
GNSS Reference Station and Networks - An Introductory Guide	Offers practical advice on how to set up and run individual GNSS reference stations and networks of stations and to provide the services that are required.	✓	✓
GNSS Networks and Reference Stations Equipment List	Detailed list of equipment available for GNSS reference stations including hardware and software.	-	✓

Refer to the following resources for all GR10 documentation/software:

- the Leica GR10 DVD
- <https://myworld.leica-geosystems.com>

2: Description of the system

Description of the system: Overview

Menu option	Description
GR10 General Information	A detailed list of GR10 design features, special features and satellites tracked.
GNSS Reference Station Components	Details a typical reference station setup and the most common accessories that can be used with a GR10.
Unpacking the GR10 instrument	A list of the minimum items delivered with a GR10.
Instrument Components	A labelled diagram of the GR10.
GR10 Operation	An overview of how to operate the GR10.
Power Supply	An overview of the power supply options for the GR10.

A detailed description of every Web Interface page is included in the [Web Interface](#) section.

GR10 General Information

Design

The GR10

- is designed for a variety of permanent and semi-permanent reference station applications including network RTK, single base station, scientific, campaign, monitoring and seismic studies
- collects, stores and disseminates GNSS data
- is highly suited to system integration
- supports a variety of external devices including communication, meteo and tilt

Satellite tracking

The GR10 can track

- GPS L1/L2 (including L2C)/L5
- GLONASS L1/L2
- Galileo E1/E5a/E5b/AltBOC
- SBAS



Once the first operational Galileo satellites are available, a software update will be required.



The GR10 instrument is designed to support Compass. The Compass signal definition is not fully finalised, although, test signals have been tracked in a test environment. As changes may still occur, Leica Geosystems cannot guarantee full Compass compatibility.

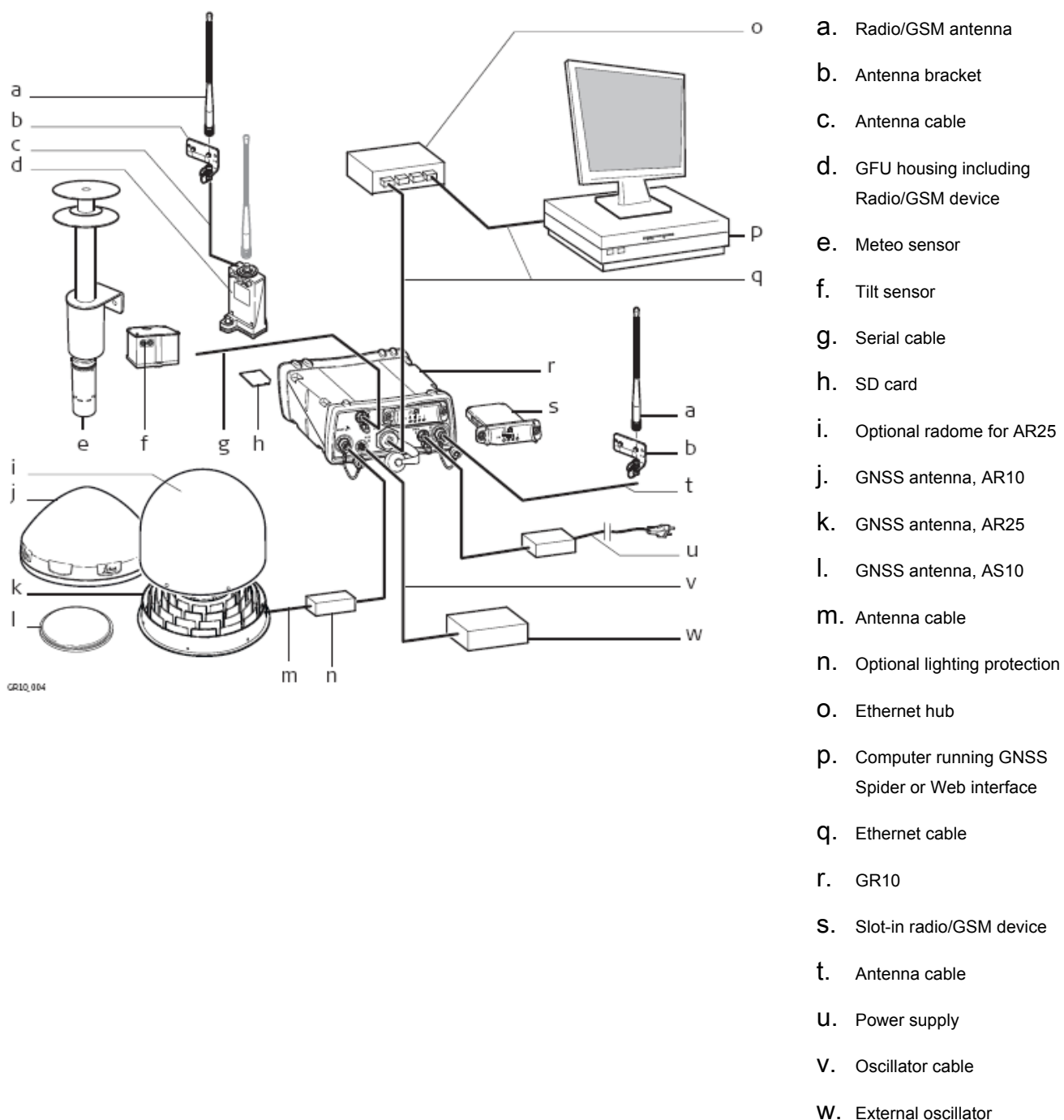
Special features

- 50 Hz data logging and streaming.
- SmartTrack+ measurement engine for higher accuracy and availability.
- Up to 10 multiple logging sessions and 20 data streams.
- Multiple data storage formats including MDB, RINEX and Hatanaka.
- Supports high capacity storage up to 32 GB and intelligent Smart clean-up.
- Multiple data output formats including Leica, Leica 4G, RTCM 2.x,3.x, LB2, BINEX, CMR, CMR+.
- Modern, user friendly Web interface GUI, available in different languages.
- Seamless integration with Leica GNSS Spider.
- Robust lightweight metal housing.
- Fully ruggedised to IP67, including a ruggedised Ethernet port.
- Simple mounting for IT rack, cabinet and wall mount. Unit is also stackable.
- Built in communications Slot-in port.
- Integrated device management for external devices.
- Supports DHCP, DNS, DynDNS and mobile internet.
- Improved security including IP filtering, access management and HTTPS with SSL.
- Out of the box plug and play hostname setup.
- Wide supply voltage 10.5-28 V.
- Low-power consumption, with 3.0-3.5 W typical.

GNSS Reference Station Components

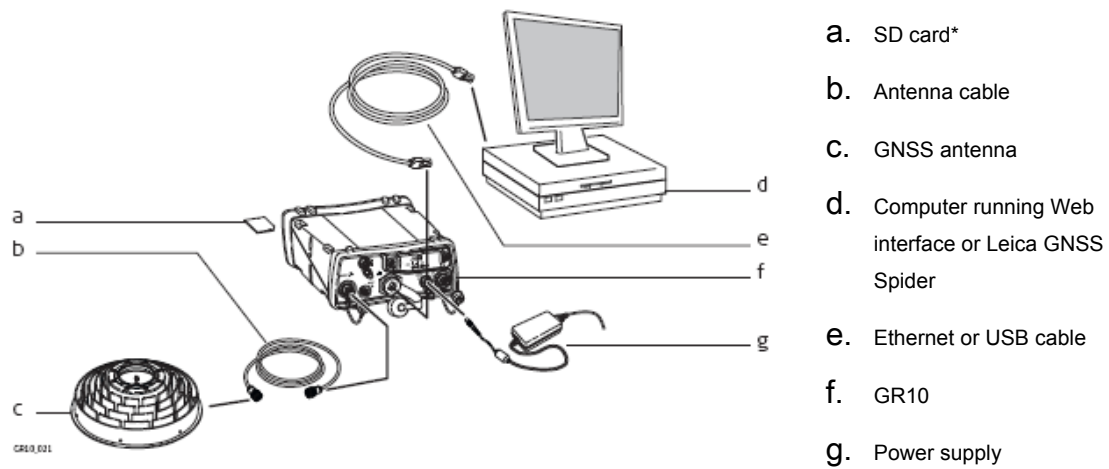
Component overview

The following diagram shows a typical reference station setup and the most common accessories that can be used with a GR10.



Minimum setup components

The following diagram shows the minimum components required to operate a GR10.



* The GR10 can be operated without the SD card but only data streaming will be possible.

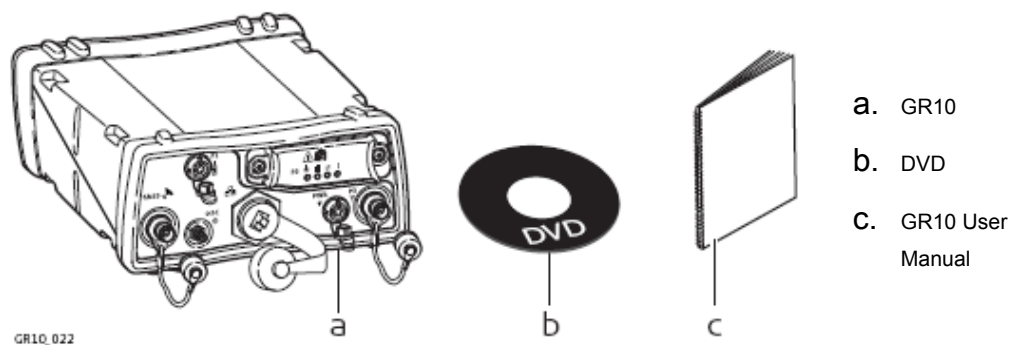
Main components

Component	Description
GR10	To provide the storage and streaming of raw satellite data.
Antenna	To receive the satellite signals from the GNSS (Global Navigation Satellite System) satellites.
Web interface	Web-based tool to configure the GR10.
Leica GNSS Spider	The reference station software including comprehensive receiver control and configuration, file download and firmware upload functions which support working with Leica GR10 instruments. Supports connection to single or multiple reference instruments simultaneously.

Unpacking the GR10 instrument

Delivery box for GR10

The minimum items delivered with the GR10 include:



Accessories

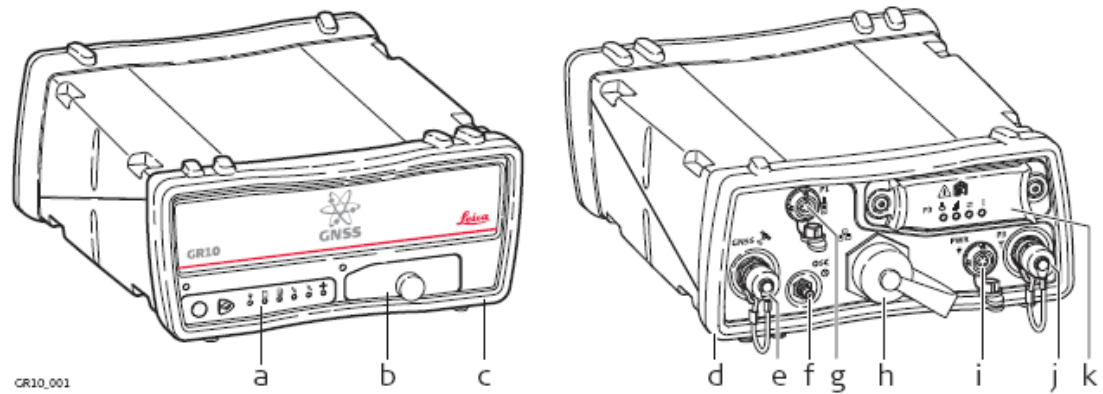
Additional equipment such as cables, antennas and power supply required for a complete reference station installation are delivered with the GR10 when ordered.

The [Component overview](#) shows a typical reference station installation and the accessories that can be ordered.

For further information on accessories please refer to the **GNSS Reference Station Equipment List**.

Instrument Components

GR10 components



- a. User interface
- b. USB and SD card cover
- c. Front rubber bumper
- d. Back rubber bumper
- e. GNSS Antenna port
- f. External Oscillator port
- g. Serial port (P1)
- h. Ruggedised Ethernet port
- i. Power port
- j. Communication Slot-in port Antenna (P3)
- k. Communication Slot-in port (P3)

GR10 Operation

GR10 Operation

The GR10 instrument can be operated by:

- pressing its buttons (ON/OFF button, Function button)
- the GR10 Web interface
- Leica GNSS Spider software
- or with the Leica Binary 2 (LB2) interface. Contact your Leica Geosystems representative for information on LB2 documentation.

The GR10 instrument is delivered with default settings which cover the needs of the typical user. Use the Web interface or Leica GNSS Spider to adjust the GR10 settings.

Operation by GR10 Web interface

The Web interface is the main component used to configure and operate the GR10. A detailed description of every Web Interface page is included in the [Web Interface](#) section.

Supported operating systems for the GR10 Web Interface

- Windows XP Professional SP2 and SP3 (32 bit)
- Windows Vista Enterprise SP2 (32 bit)
- Windows Server 2008 SP1 (64 bit)
- Windows 7 Ultimate (32 bit & 64 bit)

Support internet browsers for the GR10 Web Interface

Browser	Supported version
Internet Explorer	7 and higher
Mozilla Firefox	3.5 and higher
Opera	10 and higher
Safari	4 and higher
Google Chrome	4 and higher



The Web interface is the primary interface between the user and the fix_GR10. To use the Web interface correctly make sure the web browser allows JavaScript to be run. Check the web browsers settings if you have problems using the Web interface.

Web interface security

When accessing the Web interface for the first time use the default **User name** (Admin) and **Password** (12345678).



For security reasons, it is recommended to create a new administrator account when logged in for the first time. After creating the new administrator, log out and relogin with the new user credentials. The default user account can then be deleted.

Refer to the [Access the web interface for the first time and change the default user](#) for a step-by-step guide.

Operation by Leica GNSS Spider

The reference station software Leica GNSS Spider provides some of the same instrument operation functionality as the Web interface.



Some configuration settings are available both in the Web Interface and in Leica GNSS Spider. If such settings are configured in the Web interface, and then an **Upload Settings** or **Start** is done from GNSS Spider, these will be overwritten. In this case use the Web interface exclusively for settings that are not available in GNSS Spider.

To operate Leica GNSS Spider, refer to the

- [GNSS Spider / Remote Access](#) for basic information.
- **Leica GNSS Spider Online Help** for advanced information.

Requirement

- GR10: Leica GNSS Spider v4.0 or later must be installed.

GNSS Spider Features

- Simultaneous configuration and communication with one or many instruments.
- Monitoring and messaging on instrument key parameters such as power voltage level, data storage availability, instruments internal temperature or events logged on the receiver.
- Visualisation of satellite tracking status.
- Transfer raw data automatically from the instrument to a central data storage.
- Perform RINEX conversion manually or automatically at different decimation rates and file lengths.
- FTP push archived data to multiple locations.
- Perform automatic quality control of archived RINEX data.
- Manage a whole network of reference stations.
- Supply single base or network RTK corrections to many users using a variety of communication methods incl. e.g. Ntrip.

- Protect and manage access to RTK correction services using the Spider Business Center advanced user access management.

Related topics

[Keyboard](#)

[Web Interface: Overview](#)

[GNSS Spider / Remote Access](#)

Software: Overview

Software for GR10

Software type	Description
GR10 firmware (GR10_x.xx.fw)	<p>The GR10 firmware is called RefWorx.</p> <p>This important system software covers the basic functions of the instrument.</p> <p>The onboard web server is integrated into the firmware and cannot be deleted.</p> <p>The English language is integrated into the firmware and cannot be deleted.</p>
Language software (REF_LANG.sxx)	<p>Numerous languages are available for the instrument web server. Language software is also referred to as system language.</p> <p>The system software enables a maximum of three languages which can be stored at any one time - the English language and two other languages. The English language is the default language and cannot be deleted. One language is chosen as the active language.</p>
Windows CE Operating System (GR10_WinCE_x.x.xx.fw)	<p>Windows CE is the underlying operating system on the GR10.</p>
Measurement Engine firmware (ME4.xx.fw)	<p>This file contains the Measurement Engine firmware for the GR10. This firmware is always included in the GR firmware file however it is also possible to load this file separately should an update become available.</p>

Software upload

Software for	Description
GR10	<p>All software is stored in the System RAM of the instrument.</p> <p>A new firmware file must be uploaded to the SD card before installation. The file can be uploaded via:</p> <ul style="list-style-type: none"> • the GR10 Web interface. • direct copy to the SD card using a computer. • direct FTP access to the SD card. <p>After uploading, the firmware must be transferred from the SD card to the System RAM via the GR10 Web interface. For detailed step-by-step instructions, refer to Firmware upgrade step-by-step.</p> <p>Leica GNSS Spider can also be used to install the firmware. Loading the firmware to the SD card and installing it on the instrument is done in one step when using GNSS Spider. Refer to the Leica GNSS Spider Online Help for more information.</p>

Receiver Information

Important information regarding the instrument details, installed options and firmware can be found on the [Status / Receiver Information](#) page on the GR10 Web interface.

Related topics

[Is my firmware up to date?](#)

[Firmware upgrade step-by-step](#)

[Firmware upgrade using Leica GNSS Spider](#)

[Loading a Language file](#)

[Status: Receiver Information](#)

[Receiver setup: Firmware management](#)

[Receiver setup: Language management](#)

Power Supply

General

Use the Leica Geosystems power supplies, batteries, chargers and accessories or accessories recommended by Leica Geosystems to ensure the correct functionality of the instrument.

Power options

Power for the instrument can be supplied either by power supply or batteries.

Up to two external power supplies can be connected using a Y-cable.

External power supply:

- GEV242 (774437), 110 V/240 V AC to 24 V DC power supply unit, supplied by Leica Geosystems.

OR

- 110 V/240 V AC to 12 V DC power supply unit (722409), supplied by Leica Geosystems.

OR

- GEB171 (439038) battery connected via a cable.

OR

- Car battery connected via a converter cable supplied by Leica Geosystems.

Y-cable:

- GEV243 (774438), Y-cable can be used with GEV238 power supply and GEB171 battery or the existing 12 V power supply (722409). The black Lemo connector on this cable only supports the use of the GEV238 power supply.

OR

- GEV172 (733298), Y-cable can be used with any combination of 110 V/240 V AC to 12 V DC power supply (722409) or a GEB171 battery.

Uninterruptible Power Supply

For permanent operations use **Uninterruptible Power Supply** units as a back-up in a main power failure.

3: Installation

Installation: Overview

Menu option	Description
Before Installation	A detailed list of things to consider before installing the GR10, including <ul style="list-style-type: none">• Installation location• Installation orientation• Cable installation
Installation options	Detailed diagram of possible installations <ul style="list-style-type: none">• Rack mount• Wall / Cabinet Mount• Free Standing / Stacking• Tripod

A detailed description of every Web Interface page is included in the [Web Interface](#) section.

Before Installation

Installation location

It is recommended that the instrument is installed so that it is

- protected from mechanical influences and lightning.
- within 70 m of the antenna, without the need to use inline amplifiers.

Installation orientation

- For inside assembly, the instrument can be installed in any direction
- When installing the instrument outside, orientate the instrument vertically so that the connector points are pointing downwards

Cable installation

Ensure that the cables between the instrument and antenna are positioned to prevent them from becoming bent, stretched or squeezed. For the installation of the cables, the general rules for the installation of electrical wiring apply.

Please consider that a well-planned and thoroughly carried out electric installation not only protects the cables against damage, but also looks professional.

For detailed installation information, refer to the **GNSS Reference Station and Networks - An Introductory Guide**.

Related topics

[Installation Options](#)

[Description of the system: Overview](#)

Installation Options

Description

GR10 instruments are designed for various installation cases. Below is a short description of four installation cases for the GR10. Please note that the

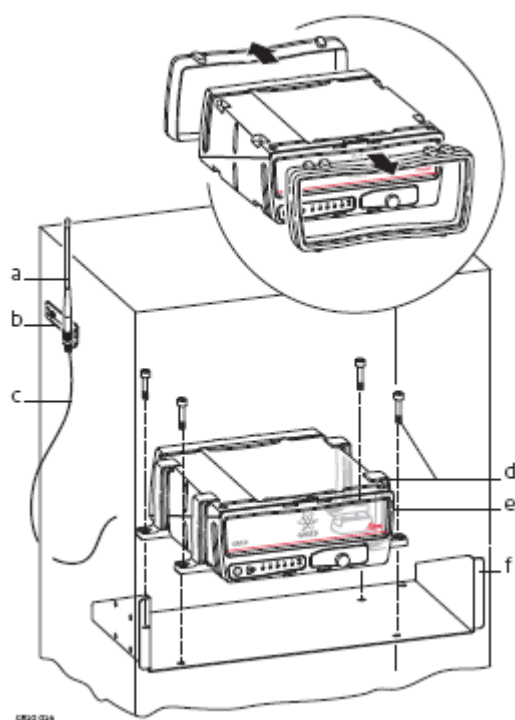
diagrams do not show all the equipment required for a complete reference station installation. For full installation details, please refer to the

- GNSS Reference Station and Networks - An Introductory Guide.
- GNSS Networks and Reference Stations Equipment List

Rack Mount

Together with the rack mount accessory kit the GR10 can be easily mounted into a standard 19 inch IT rack.

- If space in the rack is limited, then the rubber bumpers on the GR10 can be removed. The total height of the rack kit and instrument is then 2U. If the bumpers are removed, please remove the small feet from the mounting brackets.
- The radio/GSM antenna must be installed on the outside of the rack if a slot-in radio or GSM device is used. Attach the Radio/GSM antenna cable to port P3.

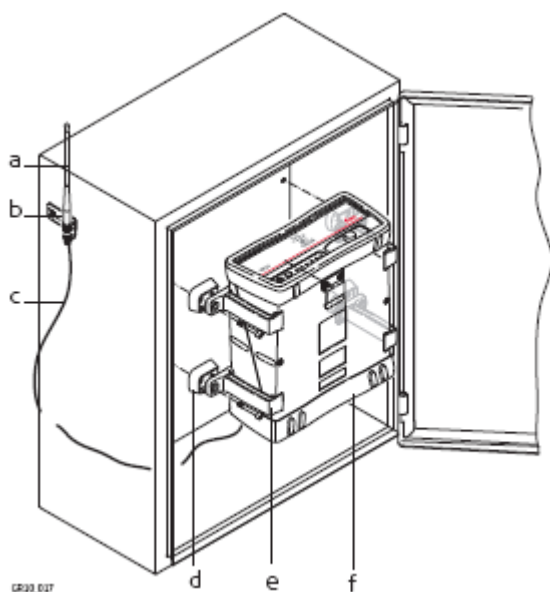


- a. Radio/GSM antenna
- b. Antenna bracket
- c. Radio/GSM antenna cable
- d. Wall mount accessory - screws
- e. GR10
- f. Rack accessory
- g. Wall mount accessory - bracket

Wall / Cabinet Mount

Together with the wall mount accessory kit the GR10 can be easily mounted onto an existing wall or structure, or inside an environmental case.

- If space in the cabinet is limited, then the rubber bumpers on the GR10 can be removed. If the bumpers are removed, please remove the small feet from the mounting brackets.
- The radio/GSM antenna must be installed on the outside of the rack if a slot-in radio or GSM device is used. Attach the Radio/GSM antenna cable to port P3.

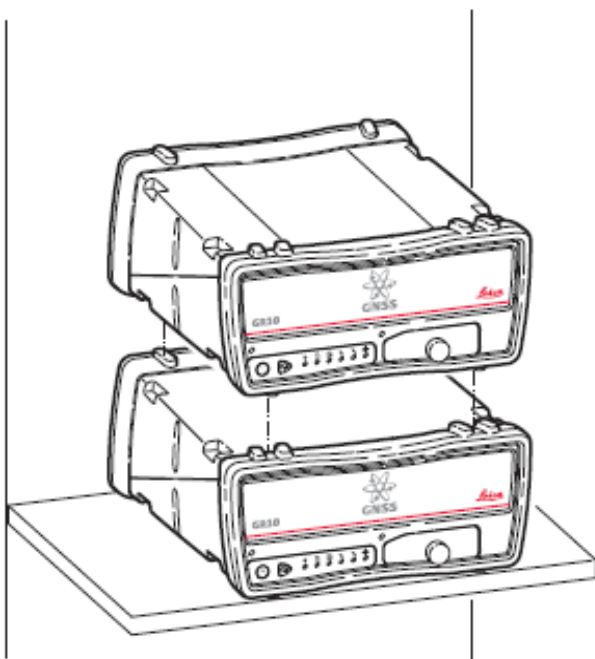


- a. Radio/GSM antenna
- b. Antenna bracket
- c. Radio/GSM antenna cable
- d. Wall mount accessory - bracket
- e. Wall mount accessory - screws
- f. Rubber bumper

Free Standing / Stacking

The GR10 is designed to allow stable free standing installation and stacking for easy configuration of multiple receivers.

- When stacking multiple GR10 instruments on top of each other, the rubber bumpers must be on.

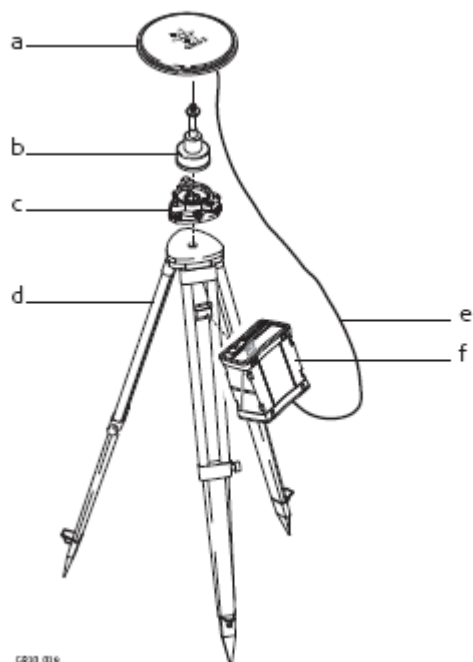


GR10_018

Tripod

The GR10 has a built-in Tripod mount to allow attachment to all Leica Geosystems Tripods.

- When using the GR10 on a tripod, the rubber bumpers must be on.



- a. AS10
- b. GNSS antenna carrier with 5/8 inch screw
- c. Tribach
- d. Tripod
- e. Antenna cable
- f. GR10

Related topics

[Before Installation](#)

[Description of the system: Overview](#)

4: User Interface

User Interface - GR10: Overview

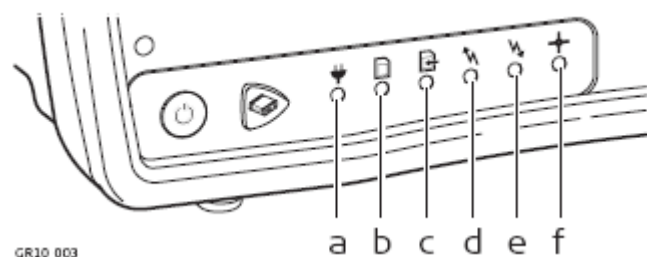
Menu option	Description
GR10	<p data-bbox="523 405 616 432">Keyboard</p> <p data-bbox="523 479 975 506">A detailed overview of the buttons on the GR10</p> <ul data-bbox="571 557 815 674" style="list-style-type: none"><li data-bbox="571 557 767 584">• ON/OFF button<li data-bbox="571 602 767 629">• Function button<li data-bbox="571 647 815 674">• Button combinations <p data-bbox="523 719 759 745">LED Indicators on GR10</p> <p data-bbox="523 792 1198 819">A detailed overview of the LED indicators on the GR10 and their status.</p> <p data-bbox="523 866 762 893">USB and SD Card Cover</p> <p data-bbox="523 940 991 967">A detailed overview of the USB and SD card slot.</p>
Web Interface	<p data-bbox="523 969 724 996">Web Interface: Login</p> <p data-bbox="523 1043 804 1070">Web interface: User Interface</p> <p data-bbox="523 1117 1275 1164">A detailed overview of the layout of the web interface and a brief description of the major components.</p>

GR10

LED Indicators on GR10





GR10









The GR10 has Light Emitting Diode indicators. They indicate the basic instrument status.



- a. Power LED
- b. SD card LED
- c. Raw data logging LED
- d. RT out data stream LED
- e. RT in data stream LED
- f. Position LED

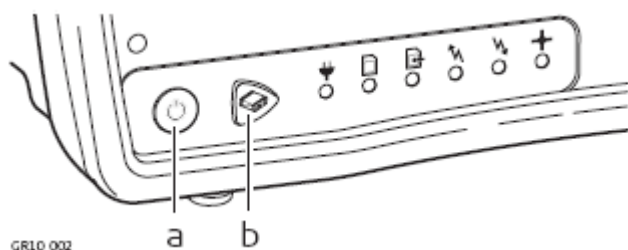
Description of the LED's

IF the	is	THEN
Power LED 	off	External power is not connected or power is off.
	green	The power level of the connected power source is between 40-100%.
	yellow	The power level of the connected power source is between 10-40%. The LED indicates the overall power status. If a second external power source is connected using a Y-cable, both power sources are used simultaneously. When the LED is yellow, the power level on both external power sources is low, 10-40%.
	red	The power level of the connected power source is between 1-10%.  Recommended user action: Switch to a new power source.
SD card LED 	off	No SD card inserted or power is off.
	green	SD card is inserted. The free space on the SD card is greater than 20%.
	yellow	The free space on the SD card is below 20%.  Recommended user action: Activate the Smart clean-up or the automatic file delete for each logging session.
	red	SD card is full. Data logging has stopped.

		 Recommended user action: Immediately activate the Smart clean-up or the automatic file delete for each logging session.
Raw data logging LED 	off	No active logging sessions or power is off.
	green	Active logging sessions are configured on the instrument and data is being logged.
	yellow	Active logging sessions are configured but Smart clean-up is deleting data from all or some of the configured logging sessions. OR Active logging sessions are configured but no position is available.  Recommended user action: Check the remaining space on the SD card and delete old data if necessary. Check the tracking and position status.
	red	Active logging sessions are configured but the SD card is full or no navigated position is available.  Recommended user action: Check the SD card and the tracking status.
RT out data stream LED 	off	No active real-time out data stream or power is off.
	green	One or more real-time data streams are configured and active. Data is being streamed.
	red	Data streams are active but no data is streamed.  Recommended user action: Check that data is tracked and a navigated position is available. Check that the correct reference position is entered.
RT in data stream LED 	-	Currently not supported.
Position LED 	off	The instrument is switched off.
	flashing green	The instrument is tracking satellites but no position is available.
	green	A navigated position is available.
	red	No satellites are tracked and no navigated position is available.

Keyboard


Keyboard GR10



- a. ON/OFF button
- b. Function button

The instrument can be turned on and off by holding down the ON/OFF button for 2 s. A green steady light at the power LED indicates that the instrument is turned on and ready.

ON/OFF button


Button	Function
ON/ OFF 	If GR10 already off: Turns on GR10 when held for 2 s. If GR10 already on: Turns off GR10 when held for 2 s.





Hold the ON/OFF button for 10 s, to force the instrument to turn off. Instrument settings and some data can be lost when using this method.

Function button

All the following functions described assume the GR10 is already on.

Button	Function
	<p>The Function and ON/OFF button work in combination and allow a number different functions as described in Button combinations.</p> <p>The Function button switches between these different functions.</p>

Button combinations

Function
<p>Activate dual button functionality</p> <p>Press and hold both buttons until all LEDs are flashing. After 1 s the  Raw data logging LED starts flashing slowly.</p> <p>The following instrument commands are now activated.</p>
<p>Start/Stop all logging sessions</p> <p>Activate dual button functionality as described above.</p> <p>If all logging sessions had been off, the Raw data logging LED is flashing green.</p> <ul style="list-style-type: none"> Press the Function button until the LED flashes quickly to START all configured logging sessions if the Raw data logging LED is flashing green. <p>OR</p> <p>If any logging session had been active, the Raw data logging LED is flashing red.</p> <ul style="list-style-type: none"> Press the Function button until the LED flashes quickly to STOP all active logging sessions if the Raw data logging LED is flashing red. <p>After logging has been started or stopped, the LED and instrument functionality goes back to general behaviour.</p>
<p>Start/Stop all data streams</p> <p>Activate dual button functionality as described above.</p> <p>Press the Function button until the  RT out data streams LED starts flashing slowly:</p> <p>If all data streams had been off, the RT out data stream LED is flashing green.</p> <ul style="list-style-type: none"> Press the Function button until the LED flashes quickly to START all configured data streams if the RT out data stream LED is flashing green. <p>OR</p>

If any data stream had been active, the RT out data stream LED is flashing red.

- Press the Function button until the LED flashes quickly to STOP all active data streams if the RT out data stream LED is flashing red.

After data streams have been started or stopped, the LED and instrument functionality goes back to general behaviour.

Initialise the measurement engine

Activate dual button functionality as described above.

Press the Function button until the  Position LED starts flashing slowly:

- Press the Function button for until the LED flashes quickly to reset the measurement engine. This will delete all almanac and ephemeris information and the instrument will take a few minutes to restart tracking satellites.

After the measurement engine has been initialised, the LED and instrument functionality goes back to general behaviour.

Format the receiver settings

Activate dual button functionality as described above.

Press the Function button until the  Power LED starts flashing slowly:

- Press the Function button until the LED flashes quickly to set all configured instrument settings back to factory default values.

After the system format is completed, the LED and instrument functionality goes back to general behaviour.

Format the SD card

Activate dual button functionality as described above.

Press the Function button until the  SD card LED starts flashing slowly:

- Press the Function button for until the LED flashes quickly to format the SD card.

After the SD card format is completed, the LED and instrument functionality goes back to general behaviour.

Exit combined button functionality

- Use the buttons functionality as described above.

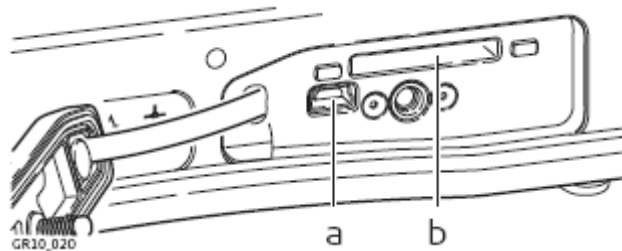
OR

- Press the Function button until all LEDs stop flashing.

USB and SD Card Cover

USB port and SD card slot

The GR10 has a USB port and an SD card slot.



- a. USB port
- b. SD card slot

USB port

The USB port can be used:

- to connect the GR10 to a computer and access the GR10 Web interface and FTP server.
- connect the GR10 to a CS10 or CS15 Field controller and access the GR10 Web interface.

SD card slot

Data is stored on a removable SD card. For more information on how to work with the SD card, refer to [Working with the Memory Device](#).



If no SD card is inserted, data storage is not possible.



While other SD cards can be used, Leica recommends to only use Leica SD cards and is not responsible for data loss or any other error that can occur while using a non-Leica card.



Unplugging connection cables or removing the SD card during data logging or streaming can cause loss of data. It is recommended to switch off the instrument before removing the SD card.



The **Leica USB Card Reader (767895) MCR7 USB for SD and CF Cards** is recommended for reading the SD card.



If formatting the SD card is necessary, we highly recommend to format the SD card on the instrument. Refer to the How to reset the receiver settings - [Step-by-step format the SD card](#) for detailed instructions.

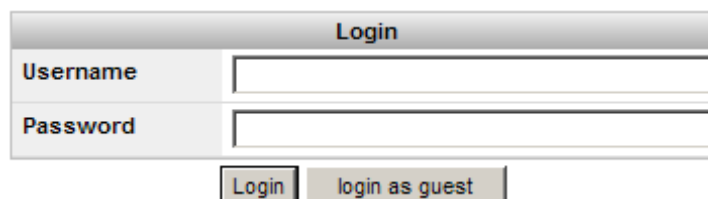
SD card capacity

- Maximum supported capacity: 32 GB.

Web interface

Web Interface: Login

Entering the receivers IP address or host name in a browser window always displays the GR10 web interface login page.



Login	
Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Login"/> <input type="button" value="login as guest"/>	

- The login page is also shown after user login.
- For a partially restricted web interface access, the login as guest button can be used. This login allows access to all Status information.
- The login page is not shown if the web interface access level is set to unrestricted. The web interface home page is opened directly. For security reasons it is not recommended to set the web interface access to unrestricted.
- To change the access setting, go to **Receiver Setup / Access Management / [Access settings](#)**.

Web interface: User Interface



Per default Java Script is activated in all browsers. If it is deactivated in your browser, you may not be able to display and use all web interface functionality. We recommend to have Java Script active when using the GR10 web interface.

The basic Layout of the web interface is the same on all pages. On the top is the web interface header that contains receiver site code, installed firmware version and the current system time. Below the menu bar that is used to navigate in the web interface.

Below on the right is the Status block that summarizes the most important receiver functionality information. This status block is visible on every page.

Left of the status block is the content area. This contains the actual information for this page, e.g. status information, a configuration page or links to receive support and information directly from Leica Geosystems AG.

Update rates for each element in the status block is as follows: Event log: 5s, Tracking block: 10s, General block: 15s.

The default appearance of the GR web interface consists on the following main components:

The screenshot displays the GR10 web interface with the following components:

- Header:** GR10 - 1.0 (257) | Spid | 2009-12-10 09:07:16
- Menu Bar:** Home | Status | GNSS management | Receiver setup | Help | Support | Logout Admin
- Status: General:**
 - Status:** View the status of important receiver information such as the configured logging and streaming sessions, the satellite tracking, the used ports and system resources.
 - Receiver setup:** Configure all receiver related settings such as network connections, user management or FTP server. Or use the tools to upgrade the receiver firmware or install new licences.
- Status: Tracking:**
 - General:** 100 %, 3.51 GB (91.34%) free, No active data stream(s), 3 active log session(s), 00h 20min, Smart clean-up active.
 - Tracking:** Navigated, GPS 9 / 9, GLO Not active, GAL Not active, SBAS Not active, OSC Internal.
- Status: Event log:**
 - 09:07:02 Reference coordinates differ from navigated
 - 09:04:46 FTP location SLUG: file product FTP1 - Spid344i.m00 successfully archived
 - 08:59:46 FTP location SLUG: file product FTP1 - Spid344h.m55 successfully archived
 - 08:57:02 Reference coordinates differ from navigated
 - 08:54:45 FTP location SLUG: file product FTP1 - Spid344h.m50 successfully archived
 - 08:49:46 FTP location SLUG: file product FTP1 - Spid344h.m48 successfully archived
 - 08:48:11 Navigated position available.
 - 08:47:48 FTP location SLUG: file product FTP1 - Spid343m.m55 successfully archived

Web interface components

Header

The header contains general information about the receiver, including

- Receiver type
- Loaded firmware version.
- The site code
- The current system date and time.

Menu Bar

The menu bar is a special tool bar at the top of the screen that contains links for the home page, all status information, GNSS management pages, receiver setup, a help link and the support pages. The menus are extended when the mouse is moved over a menu item. When clicking on one of the menu items, a site map is displayed listing all links contained in that menu.

If a link is not available to logged in user, it is grayed out and not accessible. Which menu items are available are depend on

- whether the [Access to Web interface is](#) set to Unrestricted, Partially restricted or Fully restricted, and
- the selected [Web interface user level](#) of the logged in user.



































Menu item	Description
Home	Press to return to the overview page.
Status	View the status of important receiver information, such as the configured logging sessions and data streams, the satellite tracking, an overview of the ports in use and the power and memory available.
GNSS Management	Configure all GNSS data related settings, such as logging sessions, data streams and the tracking settings. Or enter site specific information such as the site name, position and antenna details.
Receiver setup	Configure all receiver related settings such as network connections, Leica GNSS Spider remote access ports and the user management. Or use the tools to upgrade the receiver firmware, add new option keys or switch to your preferred language.
Help	Access the complete web interface online help.
Support	Send receiver information and questions to your Leica support contact, stay informed about new firmware releases or browse the Leica FAQs to quickly find a solution for common questions.
Logout	Select to logout of the web interface and return to the main login page.














Click here to view the complete [Directory structure of the Menu Bar](#).

Status: General

The General box in the Status block provides an overview of the current status of the receiver.

- The General box is updated every 15 seconds.
- The icons correspond to the [LED indicators](#) on the GR10.

Icon	Description						
	<p>Power status</p> <p>The power status is shown with an icon and the current voltage level.</p> <table border="1" data-bbox="331 371 1471 824"> <tr> <td data-bbox="338 371 427 427">  </td> <td data-bbox="427 371 1465 427">The power level of the connected power source is between 40%-100%.</td> </tr> <tr> <td data-bbox="338 427 427 719">  </td> <td data-bbox="427 427 1465 719"> <p>The power level of the connected power source is between 10%-40%.</p> <p>The icon indicates the overall power status. If a second power source is connected via a Y-cable, both power sources are used.</p> <p>The power level on both external power source is low, 10%-40%</p> <p>Recommended user action: Consider providing a new power source to replace the current one.</p> </td> </tr> <tr> <td data-bbox="338 719 427 824">  </td> <td data-bbox="427 719 1465 824"> <p>The power level of the connected power source is between 1%-10%.</p> <p>Recommended user action: The user should urgently switch to a new power source.</p> </td> </tr> </table>		The power level of the connected power source is between 40%-100%.		<p>The power level of the connected power source is between 10%-40%.</p> <p>The icon indicates the overall power status. If a second power source is connected via a Y-cable, both power sources are used.</p> <p>The power level on both external power source is low, 10%-40%</p> <p>Recommended user action: Consider providing a new power source to replace the current one.</p>		<p>The power level of the connected power source is between 1%-10%.</p> <p>Recommended user action: The user should urgently switch to a new power source.</p>
	The power level of the connected power source is between 40%-100%.						
	<p>The power level of the connected power source is between 10%-40%.</p> <p>The icon indicates the overall power status. If a second power source is connected via a Y-cable, both power sources are used.</p> <p>The power level on both external power source is low, 10%-40%</p> <p>Recommended user action: Consider providing a new power source to replace the current one.</p>						
	<p>The power level of the connected power source is between 1%-10%.</p> <p>Recommended user action: The user should urgently switch to a new power source.</p>						
	<p>SD card status</p> <p>The SD card status (icon) and the available space on the SD card (Mb/%) are shown.</p> <table border="1" data-bbox="331 976 1471 1294"> <tr> <td data-bbox="338 976 427 1032">  </td> <td data-bbox="427 976 1465 1032">SD card is inserted. The free space on the SD card is greater than 20%.</td> </tr> <tr> <td data-bbox="338 1032 427 1167">  </td> <td data-bbox="427 1032 1465 1167"> <p>The free space on the SD card is below 20%.</p> <p>Recommended user action: Activate the Smart clean-up or the automatic file delete for each logging session.</p> </td> </tr> <tr> <td data-bbox="338 1167 427 1294">  </td> <td data-bbox="427 1167 1465 1294"> <p>The SD card is full. Data logging is stopped.</p> <p>Recommended user action: Immediately activate the Smart clean-up or the automatic file delete for each logging session.</p> </td> </tr> </table>		SD card is inserted. The free space on the SD card is greater than 20%.		<p>The free space on the SD card is below 20%.</p> <p>Recommended user action: Activate the Smart clean-up or the automatic file delete for each logging session.</p>		<p>The SD card is full. Data logging is stopped.</p> <p>Recommended user action: Immediately activate the Smart clean-up or the automatic file delete for each logging session.</p>
	SD card is inserted. The free space on the SD card is greater than 20%.						
	<p>The free space on the SD card is below 20%.</p> <p>Recommended user action: Activate the Smart clean-up or the automatic file delete for each logging session.</p>						
	<p>The SD card is full. Data logging is stopped.</p> <p>Recommended user action: Immediately activate the Smart clean-up or the automatic file delete for each logging session.</p>						
	<p>Data stream status</p> <p>The data stream status is shown with an icon and the number of currently active data streams. This number includes both outgoing and incoming streams.</p> <table border="1" data-bbox="331 1491 1471 1675"> <tr> <td data-bbox="338 1491 427 1547">  </td> <td data-bbox="427 1491 1465 1547">One or more data streams are configured and active. Data is being streamed.</td> </tr> <tr> <td data-bbox="338 1547 427 1675">  </td> <td data-bbox="427 1547 1465 1675"> <p>Indicates that the data streams are active but no data is streamed.</p> <p>Recommended user action: Check that data is tracked and a navigated position is available. Check that the correct reference position is entered.</p> </td> </tr> </table>		One or more data streams are configured and active. Data is being streamed.		<p>Indicates that the data streams are active but no data is streamed.</p> <p>Recommended user action: Check that data is tracked and a navigated position is available. Check that the correct reference position is entered.</p>		
	One or more data streams are configured and active. Data is being streamed.						
	<p>Indicates that the data streams are active but no data is streamed.</p> <p>Recommended user action: Check that data is tracked and a navigated position is available. Check that the correct reference position is entered.</p>						
	<p>Raw data logging status</p> <p>The raw data logging status is shown with an icon and the number of currently active logging sessions.</p> <table border="1" data-bbox="331 1827 1471 2022"> <tr> <td data-bbox="338 1827 427 1883">  </td> <td data-bbox="427 1827 1465 1883">Active logging sessions are configured on the receiver and data is being logged.</td> </tr> <tr> <td data-bbox="338 1883 427 2022">  </td> <td data-bbox="427 1883 1465 2022"> <p>Active logging sessions are configured on the receiver but Smart clean-up is deleting data from all or some of the configured logging sessions.</p> <p>Recommended user action: Check the remaining space on the SD card and delete old data if</p> </td> </tr> </table>		Active logging sessions are configured on the receiver and data is being logged.		<p>Active logging sessions are configured on the receiver but Smart clean-up is deleting data from all or some of the configured logging sessions.</p> <p>Recommended user action: Check the remaining space on the SD card and delete old data if</p>		
	Active logging sessions are configured on the receiver and data is being logged.						
	<p>Active logging sessions are configured on the receiver but Smart clean-up is deleting data from all or some of the configured logging sessions.</p> <p>Recommended user action: Check the remaining space on the SD card and delete old data if</p>						

	necessary.						
	<p>Active logging sessions are configured but</p> <ul style="list-style-type: none"> The SD card is full <p>or</p> <ul style="list-style-type: none"> No navigated position is available. <p>Recommended user action: Check the SD card and the tracking status.</p>						
	The time since the receiver was turned on.						
	This icon is only shown if the receiver is turned on because of an active wake-up session .						
	<p>Smart clean-up status</p> <table border="1"> <tr> <td></td> <td>Smart clean-up is active.</td> </tr> <tr> <td></td> <td>Smart clean-up is inactive.</td> </tr> <tr> <td></td> <td> <p>Indicates active logging sessions are available and Smart clean-up is deleting data from all or some of these sessions.</p> <p>Recommended user action: Please check the remaining space on the SD card and delete old data if necessary.</p> </td> </tr> </table>		Smart clean-up is active.		Smart clean-up is inactive.		<p>Indicates active logging sessions are available and Smart clean-up is deleting data from all or some of these sessions.</p> <p>Recommended user action: Please check the remaining space on the SD card and delete old data if necessary.</p>
	Smart clean-up is active.						
	Smart clean-up is inactive.						
	<p>Indicates active logging sessions are available and Smart clean-up is deleting data from all or some of these sessions.</p> <p>Recommended user action: Please check the remaining space on the SD card and delete old data if necessary.</p>						

Status: Tracking

The Tracking box provides an overview of the current tracking status of the receiver.

- All satellite systems are listed, independent of the installed option keys. For further information on option keys go to [Tools / Options](#).
- For active satellite systems with a registered option key, the number of tracked satellites on L1 and the number of satellites available above the cut off angle is shown in the right column.
- Click on the number of tracked satellites for each satellite system to view a pop-up box with a detailed list of the tracked signals. Or click on the satellite icon to be redirected to the Status: Tracking page for this satellite system.
- The tracking box is updated every 10 seconds.

- **GPS - GPS satellite system pop-up information**

Sat. available	Number of GPS satellites available above the cut-off angle.
Tracked L1	Tracked GPS satellites on L1.
Tracked L2P	Tracked GPS satellites on L2P.
Tracked L2C	Tracked GPS satellites on L2C.
Tracked L5	Tracked GPS satellites on L5. GPS L5 tracking can only be activated when the GPS L5 option is installed on the receiver.

- **GLO - GLONASS satellite system pop-up information**

Sat. available	Number of GLONASS satellites available above the cut-off angle. GLONASS tracking can only be activated when the GLONASS option is installed on the receiver.
Tracked L1	Tracked GLONASS satellites on L1.
Tracked L2	Tracked GLONASS satellites on L2.







- **GAL - Galileo satellite system pop-up information**

Sat. available	Number of visible Galileo satellites available above the cut-off angle. Only available when the GLONASS option is installed on the receiver
Tracked E1	Tracked Galileo satellites on E1.
Tracked E5a	Tracked Galileo satellites on E5a.
Tracked E5b	Tracked Galileo satellites on E5b.
Tracked ABOC	Tracked Galileo satellites on ABOC (Alt-Boc).

- **SBAS - Satellite Based Augmentation System**




Tracked L1	Tracked SBAS satellites on B1.
Tracked L2	Tracked SBAS satellites on B2.

The table below describes the icons used in the Tracking box.

Icon	Description
	<p>No position, indicates that no navigated position is available. This is displayed after a reboot when the receiver has not started tracking yet. Check that an antenna cable is connected.</p> <p>Navigated, indicates that a navigated position is available but the configured reference position is more than 100m away from the navigated position. An error message is displayed in the event log.</p> <p>User action: Check the configured reference position.</p>
	Navigated position available.
	Indicates that the satellite system is activated and the receiver is tracking satellites. The number of currently tracked satellites is shown.
	Indicates that the satellite system is activated but the receiver is not tracking.
	Indicates that the satellite system is not activated.
	<p>Internal - this receiver is configured to use the internal receive clock (default setting).</p> <p>TCXO, OCXO, Rubidium, Cesium - The receiver is configured to use the listed external oscillator. If an external oscillator is configured connected, the receiver will not be able to track any satellites.</p>

Status: Event log


The Event log box shows the latest eight messages from the [Status / Event log](#) page. The Event log box is updated every 5 seconds.

Icon	Description
	<p>Information message.</p> <p>User action: No action is required from the user.</p>
	<p>Receiver message.</p> <p>User action: A change in the receiver operation has occurred. Check that this was an intended change.</p>
	<p>Warning message.</p> <p>User action: Receiver warning message, an action is required from the user.</p>

Hints

On each web interface page that allows configuration changes, the shown input fields are described in hints. Hints provide a quick context based help system. For more information consult the online help available via the **Show help**

button .



For better clarity, the hints are hidden per default. Press the **Hints** button  to display the information. After pressing the button, a blue box appears underneath each field to explain the setting.

FTP server port	<input type="text" value="21"/>
	The TCP/IP server port of the FTP server (commonly used is 21).

Press the **Hints** button  again to hide the hints.

Pop-up boxes

Pop-up boxes provide quick access to additional status information that per default is hidden for better clarity. A pop-up box opens when the user clicks on underlined text in the web interface.

	Name	Type
	<u>MDB</u>	MDB - continuous
	<u>RINEX</u>	RINEX - continuous

X

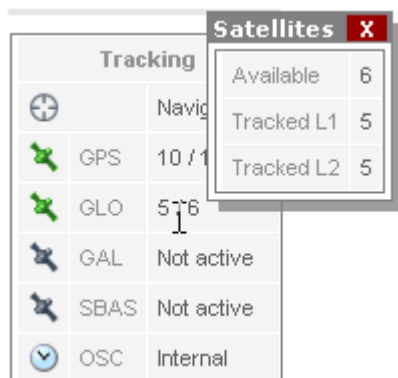
Logging session properties

Session name	RINEX
Data type	RINEX
Session priority	medium
Session type	continuous
Logging rate	1 sec
Length of file	1 h
Log doppler observations	no
Log SNR values	no
Archive data to	<u>SD Card</u>
Auto delete	Never
Archive to FTP location	no
Latest file	0020027m.10o



Please note that the underlined SD Card token in the Logging session properties pop-up box opens an FTP access to the receivers SD card.

A pop-up box is also opened when clicking on the number of tracked satellites in the Tracking status block.



Press the **X** button in the upper right corner to close the pop-up box.

Tool tips

In the web interface, tool tips are used to explain the functionality of icons and buttons. Move the mouse over an icon to show the tool tip.



Move the mouse away from the icon and the tool tip disappears.

Related topics

[LED Indicators on GR10](#)

5: Getting started

Operation: Overview

Menu option	Description
Network technology and protocol overview	An explanation of some of the networking technologies and protocols which are used by the GR10.
Equipment Setup	A step-by-step overview of the required equipment and cables to set up the receiver. <ul style="list-style-type: none">• Basic setup• Setup via Web interface over Ethernet and DHCP• Setup in a non - DHCP network• Install USB drivers• Setup via Web interface over USB
Working with the Memory Device	Important safety directions for using the SD card and a step-by-step guide on how to insert and remove an SD card.

Step-by-step guides

- [Use DynDNS and DHCP to automatically assign a host name and all network parameters to a GR10](#)
- [Use DynDNS to assign a host name to a GR10 with static IP](#)
- [Access the web interface for the first time and change the default user](#)
- [Activate Leica support access step-by-step](#)
- [Configure coordinates and site name step-by-step](#)
- [Configure tracking settings step-by-step](#)
- [Configure a RINEX logging session step-by-step](#)
- [Configure a data stream step-by-step](#)

A detailed description of every Web Interface page is included in the [Web Interface](#) section.

Network technology and protocol overview

This section explains some of the networking technologies and protocols which are used by the GR10.

DNS

DNS stands for “Domain Name System”. This protocol allows the usage of a host name rather than only using the IP address to register and access a network device within a computer network. However, the IP address can still be used to access the network device.



A DNS server is needed within a network in order to use the preconfigured host name of a GR10.

DHCP

DHCP stands short for **Dynamic Host Configuration Protocol**. This protocol allows a dynamic assignment of network configuration parameters of a new network device which is added to a computer network. If a DHCP enabled network device is connected to a LAN it can query the DHCP server to assign valid values for IP address, default gateway, subnet mask and other parameters which are needed to be properly registered within the network. DHCP reduces system administration workload, allowing devices to be added to the network with little or no manual intervention.

As a result, directly after connecting it the network device can be accessed straightaway by a preconfigured host name. In case of a GR10 this host name is GRxxxxxxx, where “xxxxxxx” has to be replaced by the serial number of the GR10.

Dynamic vs. static IP address

Network devices may have a permanent, so called “static”, IP address or they may have a changing so called “dynamic” IP address. Usually static IP addresses are more expensive than dynamic addresses. If only a dynamic address is available then DHCP should be used in order to always have the same host name of the respective network device. When using a dynamic IP without assigning a host name the IP of a GR10 will frequently change. This means that the connection settings to connect to the GR10 would have to be updated each time the IP address has changed (e.g. once per day).

When DHCP and DNS servers are available within a LAN the same host name can be used for a network device like a GR10 even when the IP address changes.

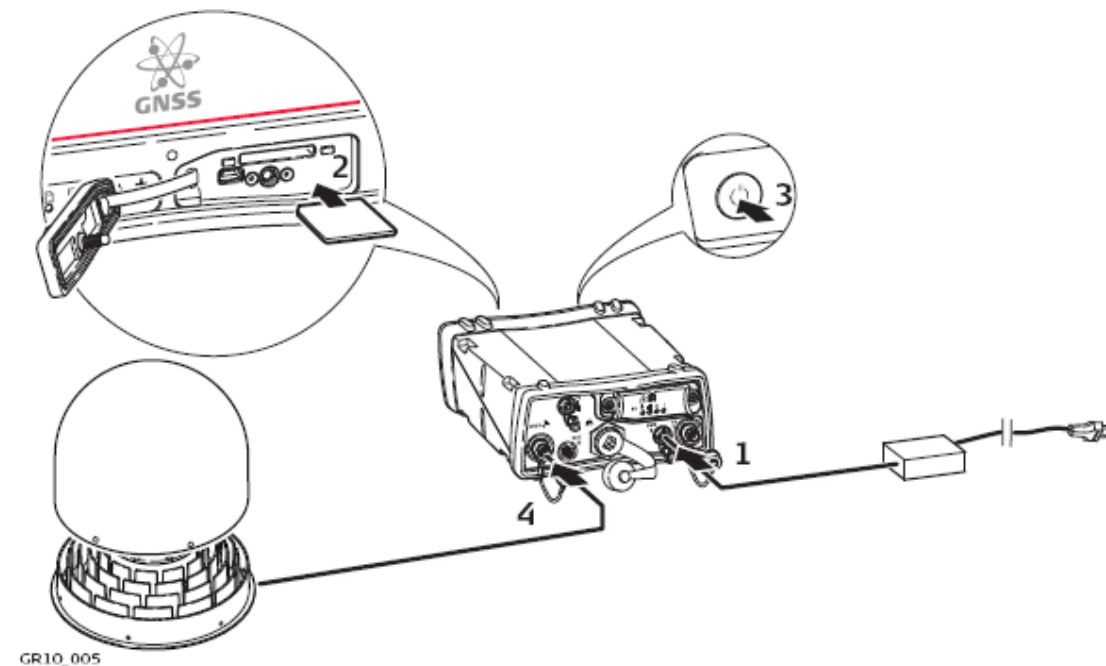
Related topics


[Use DNS and DHCP to automatically assign a host name and all network parameters to a GR10](#)

[Use DNS to assign a host name to a GR10 with static IP](#)

Equipment Setup

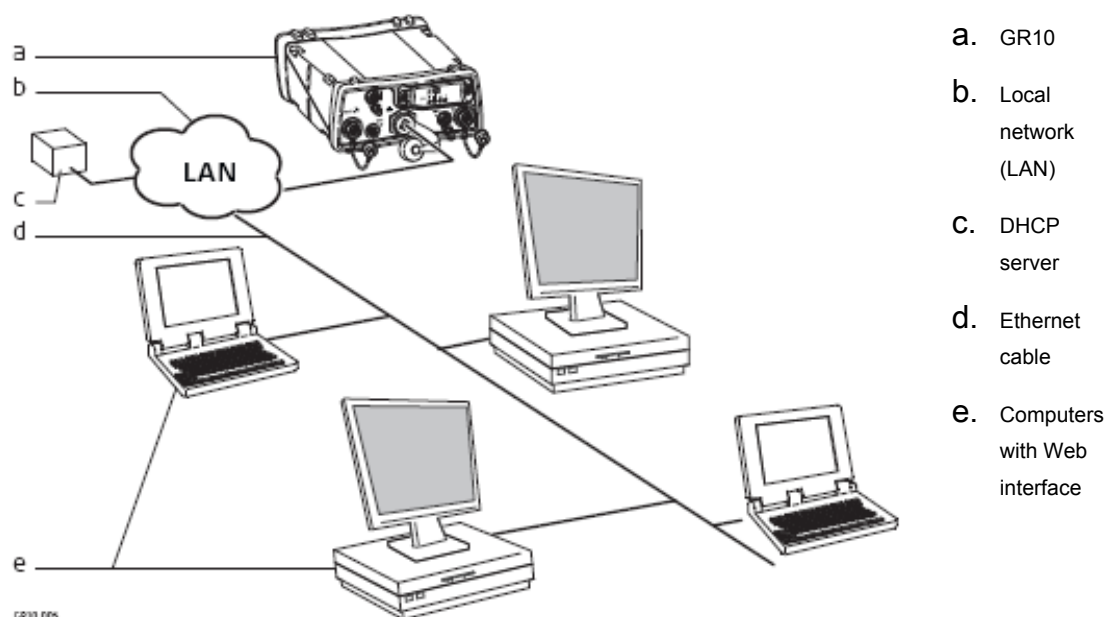
Basic setup step-by-step



Step	Description
1	Find the power port (PWR) at the back of the GR10. Plug the power cable/GEV238 power supply into the GR10.
2	Insert the SD card into the SD card slot. For more information on how to work with the SD card, refer to Working with the Memory Device .
3	Turn on the GR10.
4	Attach the antenna cable, for example the GEV194, 1.8 m antenna cable, to the instrument's antenna port and to the connector on the antenna.
	<p>To access the instrument via Ethernet or USB refer to:</p> <ul style="list-style-type: none"> • Setup via Web Interface over Ethernet and DHCP • Install USB drivers • Setup via Web Interface over USB

Access the instrument via Ethernet

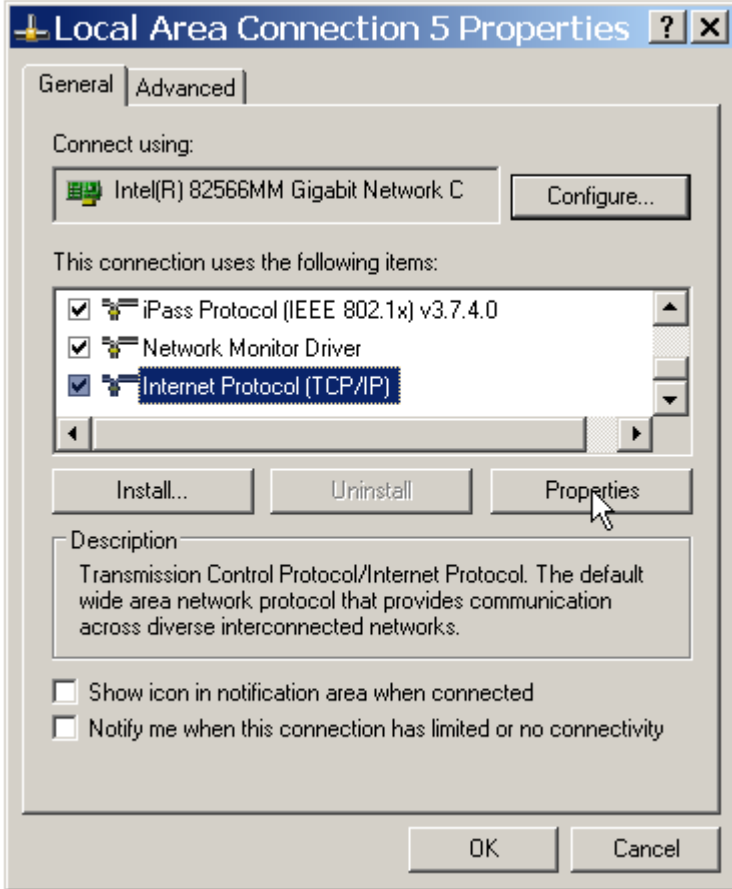
Setup via Web Interface over Ethernet and DHCP

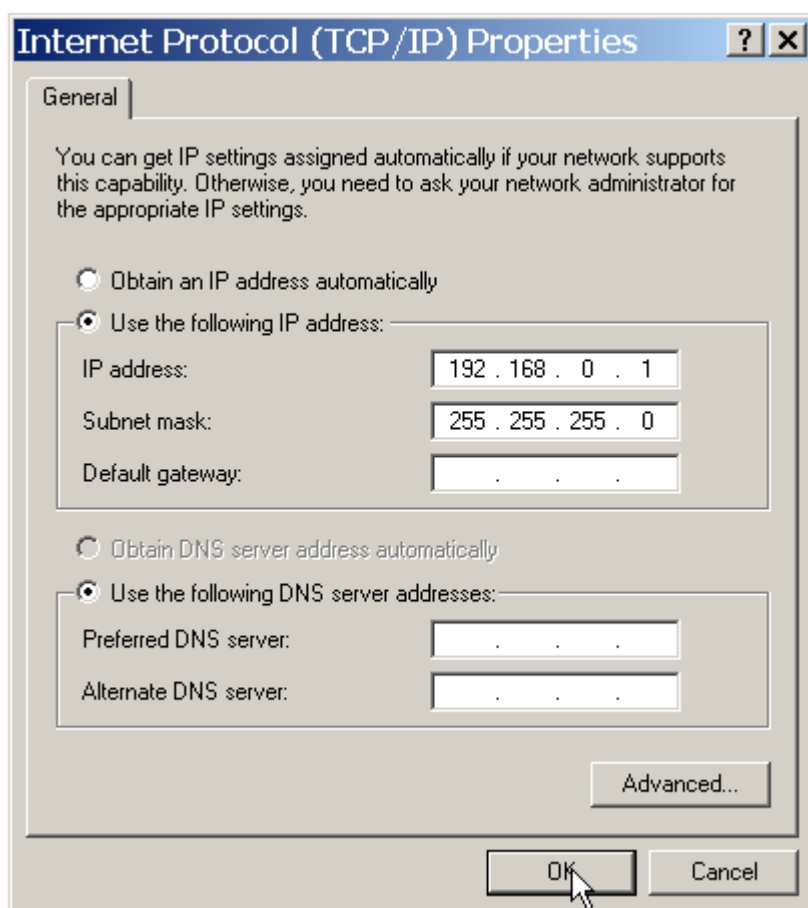


Step	Description
1	Start the computer.
2	To connect the GR10 to the local LAN supporting DHCP, plug an Ethernet cable with a RJ45 connector into the RJ45 Ethernet port on the back of the GR10.
3	Connect the other end of the cable with a network device of your LAN, e.g. hub, switch or router.
4	Turn on the GR10.
5	Open a browser window on your computer.
6	Type "GR*****" into the browser's address field, where ***** is the serial number of the instrument. For example, GR1700001.
7	The GR10 Web interface will now be available. Configure the GR10 for all required settings.

Setup in a non - DHCP network

If the GR10 receiver is set up in a non-DHCP network, the web interface can still be accessed using a crossed Ethernet cable.

Step	Description
1	Connect the crossed Ethernet cable to the GR10 receiver and your PC.
2	On the PC, open the Network Connections properties.
3	Select the Network connection used with the crossed Ethernet cable, right click and select properties.
4	In the General tab, highlight Internet Protocol and press Properties :
	 <p>The screenshot shows the 'Local Area Connection 5 Properties' dialog box with the 'General' tab selected. Under 'Connect using:', 'Intel(R) 82566MM Gigabit Network C' is chosen. The 'This connection uses the following items:' list contains three items: 'iPass Protocol (IEEE 802.1x) v3.7.4.0', 'Network Monitor Driver', and 'Internet Protocol (TCP/IP)'. The 'Internet Protocol (TCP/IP)' item is selected and highlighted. Below the list are buttons for 'Install...', 'Uninstall', and 'Properties'. The 'Properties' button is being clicked by a mouse cursor. A 'Description' box below shows the text: 'Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.' At the bottom are 'OK' and 'Cancel' buttons.</p>
5	<p>Select Use the following IP address and enter,</p> <ul style="list-style-type: none"> • IP address: 192.168.0.1 • Subnet mask: 255.255.255.0



6	Press OK.
7	Open a browser window and enter 192.168.0.3 to open the GR10 web interface.

Access the instrument via USB

Install USB drivers

Before connecting the GR10 to a computer using a USB cable, you must first install USB drivers. To install the USB drivers refer to:

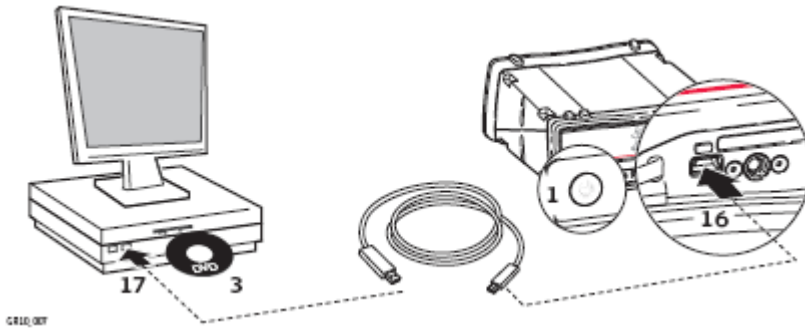
- [Install USB drivers for Windows XP operating systems](#)
- [Install USB drivers for Windows Vista operating systems](#)
- [Install USB drivers for Windows 7 operating systems](#)










Only one GR10 can be connected to the computer via USB at a time.

Install USB drivers for Windows XP operating systems

Follow these steps to install drivers for Windows XP operating systems for the first time:



Step	Description
1	Turn on the GR10.
2	Start the computer.
3	Insert the Leica GR10 DVD.
4	Run the installer executable depending on your CPU and operating system to install the drivers necessary for your GR10. <ul style="list-style-type: none"> • 32 bit CPU: SetupViva&GR_USB_32bit.exe • 64 bit CPU: SetupViva&GR_USB_64bit.exe • Itanium 64 bit CPU: SetupViva&GR_USB_64bit_itanium.exe
5	The Welcome to the InstallShield Wizard for Leica Viva & GR USB drivers window appears.
	Make sure that all GR10 or Viva devices are disconnected from the PC.
6	Click Next> .
7	The Ready to Install the Program window appears.
8	Click Install . The drivers will be installed on your computer.
9	Click Continue Anyway every time a window pops up saying that the software has not passed the Windows Logo testing.
10	The InstallShield Wizard Completed window appears.
11	Read the instructions and check the box, I have read the instructions . These instructions are listed in detail in the following steps.
12	Click Finish to exit the wizard.
13	Click Yes to restart the system so all changes take effect.
	For Windows XP users with Service Pack 3: Windows does not require a restart.
14	Loosen the screw on the SD card/USB port cover.
15	Open the SD card/USB port cover.
16	Plug the USB cable into the USB port on the GR10.
17	Plug the USB cable into the USB port of the computer.
18	Wait until the new hardware wizard starts up automatically. Select, No, not this time and click Next> .
	It can take some time for the wizard to start.
19	Click Next> to install the software automatically.
20	Click Continue Anyway when a window pops up saying that the software has not passed the Windows Logo testing
21	Click Finish to exit the wizard.
22	Another Found new hardware wizard starts up automatically. Select, No, not this time and click Next> .
23	Click Next> to install the software automatically.
24	Click Finish to exit the wizard.
	Windows will show searching for IP address. Ignore this and go to the next step.
25	Run shortcut Configure GR connection which has been created on the Windows desktop.

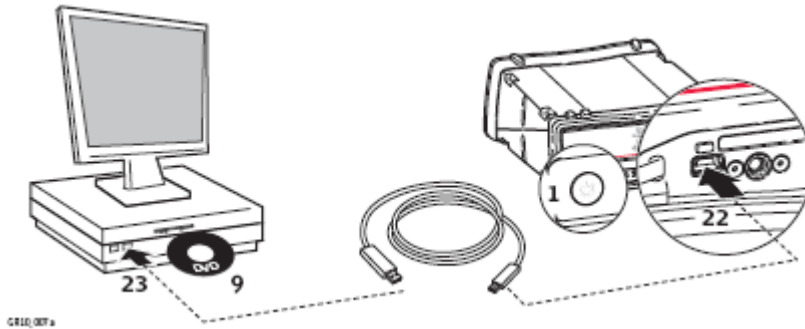
	There are two more shortcuts created for the GS and CS. These shortcuts can be ignored, unless these devices will be used on this computer. Refer to the GS or CS User Manual for further information.
26	A DOS window is opened and a batch file is started to configure the IP settings for the RNDIS network adapter.
27	Press any key to close the DOS window.
28	Disconnect and reconnect the USB cable.
29	Open a browser and type in the IP address: 192.168.254.2 to access the GR10 web interface.
30	Configure the GR10 for all required settings.
31	Use the default User name (Admin) and Password (12345678).
	After logging in the first time you must create a new user account, including a new user name and password. The default user account can then be deleted. Go to Access the web interface for the first time and change the default user for a step-by-step guide.
	Please make sure that JavaScript is allowed to be executed. Check the browser settings if you should have problems using the web interface.



Troubleshooting



[Troubleshooting: Installing USB drivers](#)

Install USB drivers for Windows Vista operating systems

Follow these steps to install drivers for Windows Vista operating systems for the first time:



Step	Description
1	Turn on the GR10.
2	Start the computer.
3	Disable the User Account Control before installing the drivers.
4	Go to Start / Control Panel / User Accounts and Family Safety (or User Accounts , if you are connected to a network domain) / User Accounts .
5	Select Turn User Account Control on or off . Enter the computer administrators password if prompted.
6	Disable the check box, Use User Account Control (UAC) to help protect your computer .
7	Click OK .
8	Restart the computer for all changes to take effect. (Not needed if UAC is already disabled).
9	Insert the Leica GR10 DVD.
10	Run the installer executable depending on your CPU and operating system to install the drivers necessary for your GR10. <ul style="list-style-type: none"> • 32 bit CPU: SetupViva&GR_USB_32bit.exe • 64 bit CPU: SetupViva&GR_USB_64bit.exe • Itanium 64 bit CPU: SetupViva&GR_USB_64bit_itanium.exe
11	Wait until the Mobile Device Center Driver Update is finished.
12	The Welcome to InstallShield Wizard for Remote NDIS based LGS device connection window appears.
13	Click Next> .
14	The Ready to Install the Program window appears.
15	Click Install . The drivers will be installed on your computer.
16	Click Install this driver software anyway every time a window pops up saying that the software has not passed the Windows Logo testing.
17	The InstallShield Wizard Completed window appears.
18	Read the instructions and check the box, I have read the instructions . These instructions are listed in detail in the following steps.
19	Click Finish to exit the wizard.
20	Loosen the screw on the SD card/USB port cover.
21	Open the SD card/USB port cover.
22	Plug the USB cable into the USB port on the GR10.
23	Plug the USB into the USB port of the computer.
	Windows will show searching for IP address. Ignore this and go to the next step.
24	Run shortcut Configure GR connection which has been created on the Windows desktop.
	There are two more shortcuts created for the GS and CS. These shortcuts can be ignored, unless these devices will be used on this computer. Refer to the GS/CS User Manual for further information.
25	A DOS window is opened and a batch file is started to configure the IP settings for the RNDIS network adapter.
26	Press and key to close the DOS window.

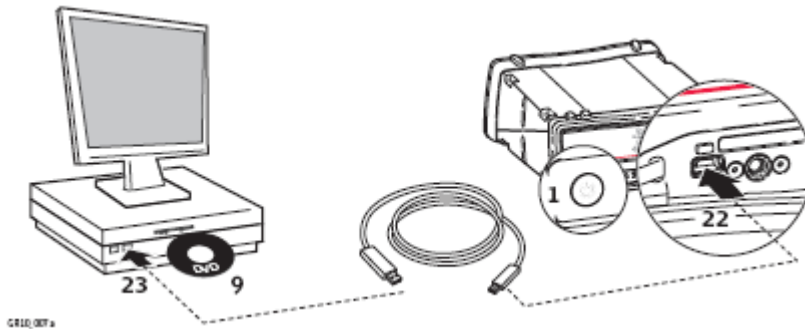
27	Disconnect and reconnect the USB cable.
28	Open a browser and type in the IP address: 192.168.254.2 to access the GR10 web interface.
29	Configure the GR10 for all required settings.
30	Use the default User name (Admin) and Password (12345678).
	After logging in the first time you must create a new user account, including a new user name and password. The default user account can then be deleted. Go to Access the web interface for the first time and change the default user for a step-by-step guide.
	Please make sure that JavaScript is allowed to be executed. Check the browser settings if you should have problems using the web interface.



Troubleshooting



[Troubleshooting: Installing USB drivers](#)

Install USB drivers for Windows 7 operating systems

Follow these steps to install drivers for Windows 7 operating systems for the first time:



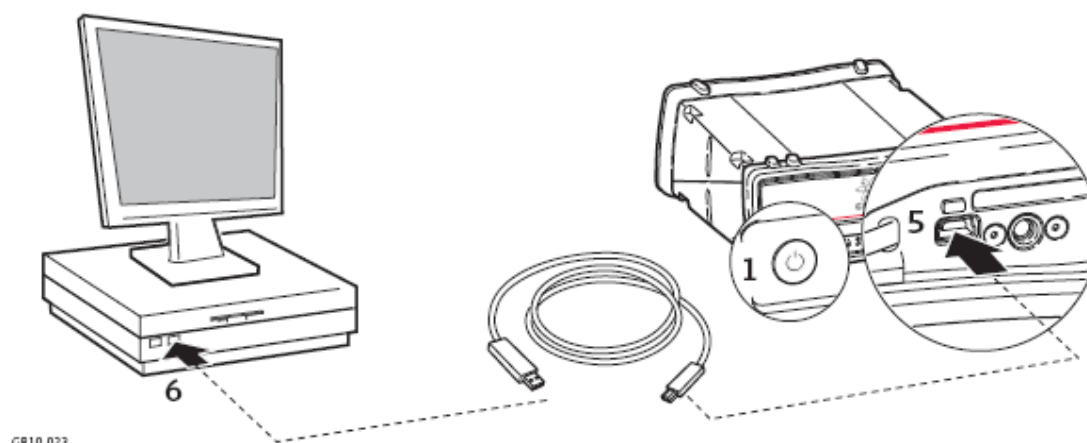
Step	Description
1	Turn on the GR10.
2	Start the computer.
3	Disable the User Account Control before installing the drivers.
4	Go to Start / Control Panel / User Accounts and Family Safety (or User Accounts , if you are connected to a network domain) / User Accounts .
5	Go to Change User Account Control settings.
6	Select level Never notify and click OK .
7	Confirm the change by clicking on Yes when asked to allow the change.
8	Restart the computer for all changes to take effect. (Not needed if UAC is already disabled.)
9	Insert the Leica GR10 DVD.
10	Run the installer executable depending on your CPU and operating system to install the drivers necessary for your GR10. <ul style="list-style-type: none"> • 32 bit CPU: SetupViva&GR_USB_32bit.exe • 64 bit CPU: SetupViva&GR_USB_64bit.exe • Itanium 64 bit CPU: SetupViva&GR_USB_64bit_itanium.exe
11	Wait until the Mobile Device Center Driver Update is finished.
12	The Welcome to the InstallShield Wizard for Leica Viva & GR USB drivers window appears.
13	Click Next> .
14	The Ready to Install the Program window appears.
15	Click Install . The drivers will be installed on your computer.
16	Click Continue Anyway every time a window pops up saying that the software has not passed the Windows Logo testing.
17	The InstallShield Wizard Completed window appears.
18	Read the instructions and check the box, I have read the instructions . These instructions are listed in detail in the following steps.
19	Click Finish to exit the wizard.
20	Loosen the screw on the SD card/USB port cover.
21	Open the SD card/USB port cover.
22	Plug the USB cable into the USB port on the GR10.
23	Plug the USB cable into the USB port of the computer.
	Windows will show searching for IP address. Ignore this and go to the next step.
24	Run shortcut Configure GR connection which has been created on the Windows desktop.
	There are two more shortcuts created for the GS and CS. These shortcuts can be ignored, unless these devices will be used on this computer. Refer to the GS/CS User Manual for further information.
25	A DOS window is opened and a batch file is started to configure the IP settings for the RNDIS network adapter.
26	Press any key to close the DOS window.


27	Disconnect and reconnect the USB cable.
28	Open a browser and type in the IP address: 192.168.254.2 to access the GR10 web interface.
29	Configure the GR10 for all required settings.
30	Use the default User name (Admin) and Password (12345678).
	After logging in the first time you must create a new user account, including a new user name and password. The default user account can then be deleted. Go to Access the web interface for the first time and change the default user for a step-by-step guide.
	Please make sure that JavaScript is allowed to be executed. Check the browser settings if you should have problems using the web interface.

Troubleshooting

[Troubleshooting: Installing USB drivers](#)

Setup via Web Interface over USB



Step	Description
1	Turn on the GR10.
2	Start the computer.
3	Loosen the screw on the SD card/USB port cover.
4	Open the SD card/USB port cover.
5	Plug the USB cable into the USB port on the GR10.
6	Plug the USB cable into the USB port of the computer.
7	Open a browser and type in the IP address: 192.168.254.2 to access the GR10 Web interface.
8	Use the default User name (Admin) and Password (12345678).
	After logging in the first time you must create a new user account, including a new user name and password. The default user account can then be deleted. Go to Access the web interface for the first time and change the default user for a step-by-step guide.
9	Configure the GR10 for all required settings.

Related topics

[Setup via Web Interface over USB, for the first time](#)

[Setup via Web Interface over Ethernet and DHCP](#)

Troubleshooting: Installing USB drivers

The Web interface is not available

1. Have you Followed the steps outlined in Setup via Web Interface over USB, for the first time ?
2. If the web interface is not available it might be necessary to manually assign an IP address to the virtual network adapter. To do so please follow the steps below:

Windows XP

Step	Description
1	Go to Start / Control Panel / Network Connections .
2	Right click the connection and enter the connection's properties page. To identify the correct network connection check the name of the network adapter which is used. The device name must be Remote NDIS based LGS GR Device .
3	Select Internet Protocol (TCP/IP) and click on Properties .
4	Pick option Use the following IP address and choose an address in the range of 192.168.254.1 ... 192.168.254.255 - except 192.168.254.2 which is the IP of the GR10. Use subnet mask 255.255.255.0.
5	Disconnect and reconnect the USB cable.

Windows Vista

Step	Description
1	Go to Start / Control Panel / Network and Internet / View Network Status and Tasks .
2	Find the network connection using the Remote NDIS based LGS GR Device .
3	Click on View status .
4	Click on Properties .
5	Select the item, Internet Protocol Version 4 (TCP/IPv4) and click on Properties .
6	Pick option Use the following IP address and choose an address in the range of 192.168.254.1 ... 192.168.254.255 - except 192.168.254.2 which is the IP of the GR10. Use subnet mask 255.255.255.0.
7	Disconnect and reconnect the USB cable.

Working with the Memory Device

Working with the Memory Device



- Keep the card dry.
- Use it only within the specified temperature range.
- Do not bend the card.
- Protect the card from direct impacts.



- The SD card must not be removed while the instrument is writing data to the card. To remove the SD card safely, turn off the instrument beforehand.
- Ensure that the instrument is off before inserting the SD card. Switching on the instrument will ensure the necessary folder structure is available on the SD card.



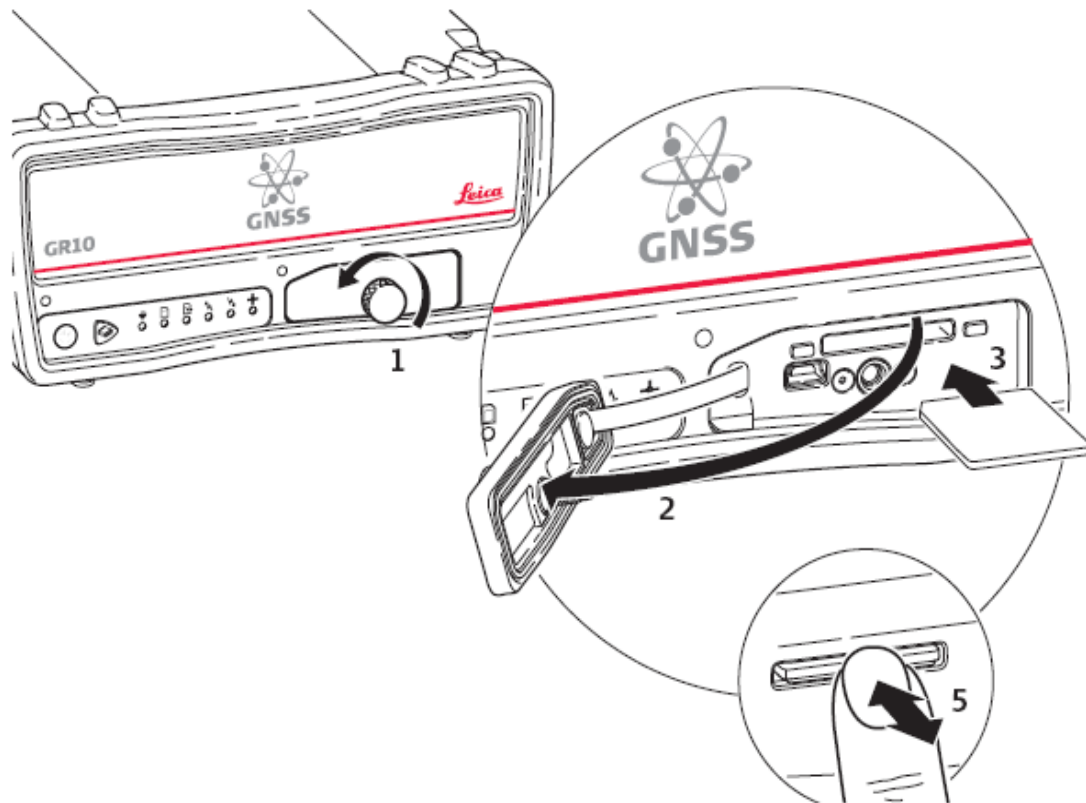
Failure to follow these instructions could result in data loss and/or permanent damage to the card.


Related topics

[Insert and remove an SD card into GR10 step-by-step](#)

[Directory structure of the memory device](#)

Insert and remove an SD card into the GR10 step-by-step



Step	Description
	The SD card is inserted into a slot inside the SD card/USB port cover on the front of the instrument.
1	Loosen the screw on the SD card/USB port cover.
2	Open the SD card/USB port cover.
3	Place the SD card into the slot. The card should be held with the contacts downwards and facing the slot. Do not touch the contacts.
4	Slide the card firmly into the slot until it clicks into position.
5	To remove the SD card, gently press inwards on the card to release it from the slot.
6	Place the SD card/USB port cover back over the slot and tighten the cover screw.

Related topics

[Directory structure of the memory device](#)

Use DynDNS and DHCP to automatically assign a host name and all network parameters to a GR10

This procedure requires DHCP and DynDNS servers within the LAN. As a result all network parameters will be assigned automatically. No IP address, subnet mask, gateway or DynDNS servers have to be assigned manually. Besides, the assigned host name can be used to access the receiver within the network. Per default the preconfigured host name GRxxxxxxx can be used, where “xxxxxxx” has to be replaced by the serial number of the GR10.

Step	Description
1	Enter the web interface using an Administrator user account.
2	Go to Receiver Setup / Network Connections .
3	On the Ethernet tab enter a receiver host name.
4	Tick the check box Obtain an IP address automatically .
5	Click on Save changes to save all settings.

Use DynDNS to assign a host name to a GR10 with static IP

This procedure requires a DynDNS server. As a result the assigned host name can be used to access the receiver within the network. If no DHCP server is available all network parameters have to be entered manually. Please contact your network administrator to get valid parameters.

If no DHCP is available a static IP address should be available which can be related to a host name using DynDNS.

Step	Description
1	Enter the web interface using an Administrator user account.
2	Go to Receiver Setup / Network Connections .
3	On the Ethernet tab enter a receiver host name.
4	Do not tick the check box Obtain an IP address automatically .
5	Enter valid values for IP address, subnet mask and default gateway.
6	Enter valid values for preferred and alternate DynDNS servers.
7	Click on Save changes to save all settings.

Access the web interface for the first time and change the default user

This section explains using which user account the web interface can be accessed for the first time, how a new user account is created and how the default user account is deleted.

Step	Description
1	When accessing the web interface for the first time the default administrator user account must be used.
2	On the Log in page use user name Admin and password 12345678 .
3	Then go to page Receiver Setup / Access Management .
4	Use the Create new user button.
5	Type in a user name and password, confirm the password.
6	In the list box Web interface user level select Administrator .
7	In list box FTP server access choose Read / Write .
8	Use the Save changes button to save all settings.
9	If the password meets the password requirements the new user account will be saved and thus be shown in the list of configured users.
10	To avoid unauthorized access it is recommended to delete the default user.
11	For this, log out from the web interface and log in now using the new user account.
12	Go to Receiver Setup / Access Management and use the Delete button to delete the default Admin user account.
13	Confirm the deletion by clicking on the OK button. After this, the default user Admin will have been deleted.

Activate Leica support access step-by-step

This section explains how Leica Support can be allowed to access the web interface.

Step	Description
1	Enter the web interface using a user account having Administrator rights.
2	Go to Support / Properties .
3	Activate check box Enable Leica support .
4	Save the settings using the Save changes button. Type topic text here.

Configure coordinates and site name step-by-step

This section explains how to configure site coordinates and site name

Step	Description
1	Access the web interface.
2	Go to page GNSS management / Site name and coordinates .
3	Enter values in the text field Site code . This four character ID will be used as identifier for the instrument and will be used for the name of logged files (first four characters of the file name).
4	Entering values in fields Site name , Marker name and Marker number is optional as this information is only used as header information when creating RINEX files.
5	In the second section of the page you can enter the reference coordinates of your site. Either geodetic or Cartesian coordinates can be entered.
6	The time zone can be set to have all receiver activities aligned to a specific time zone. As a result all event messages will refer to the chosen time zone. Also the logged files will have creation time stamps referring to the chosen time zone.
7	Press the Save changes button to save all settings.







Configure tracking settings step-by-step

This section explains how to configure the tracking settings.

Step	Description
1	Access the web interface.
2	Go to page GNSS management / Tracking .
3	On the General tab the basic tracking options can be configured.
4	Select the satellite systems you want to track using the check boxes.
5	In the row Satellite signals specific signals of a satellite system can be chosen, e.g. the L2P tracking settings for GPS.
6	Select an elevation cut off angle depending on your site.
7	Select smoothed or unsmoothed code observations using the list box.
8	Enable check box Message on loss of lock if you want to get an event message in case a loss of lock happens.
9	In row Oscillator leave the default option "Internal" when no external oscillator is connected. If an external oscillator should be used select its type and choose the frequency of the time signal.
10	Press the Save changes button to save all settings.
11	For each active satellite system there is an additional tab which allows to manually set individual satellites to healthy or unhealthy. Please refer to the Content sensitive help topic, GNSS management: Tracking General for more information on this topic.







Configure a RINEX logging session step-by-step

This section explains how to configure a continuous RINEX logging session.

Step	Description
1	Access the web interface.
2	Go to page GNSS management / Logging sessions .
3	Use the button Create a new logging session  .
4	The logging session wizard will start.
5	On the first page of the wizard enter a session name and choose RINEX in list box Data type . Select a session priority and choose continuous in list box Session type . Then use the Continue  button.
6	On the next page choose a logging rate, the length of the logged file, the dynamics of the session and activate the check box if Doppler observations should be logged. Then use the Continue  button.
7	On the following page you can choose if the logged files should be zipped, you can select a directory naming convention, choose an FTP location where the files should be sent to and set an interval after which the files should be deleted from the memory device.
	Note that you have to set up an FTP location on page GNSS management / FTP location before you can choose it in the respective list box. Then use the Continue  button.
8	On the last page of the wizard you can activate the logging session. In this case the logging will immediately start. If you do not activate the check box Activate session the session will be saved with all its settings but it will not be started. Press the Save changes  button to save all settings.

Configure a data stream step-by-step

This section explains how to configure a new outgoing real time data stream using a radio.

Step	Description
1	Access the web interface.
2	Go to page GNSS management / Data streams .
3	Use the button Create a new data stream  .
4	The outgoing data stream wizard will start.
5	Select Real time in list box Data stream type . Press Continue  .
6	On the next page select a message format, version and message types (if available). Here you can also configure a reference station ID, the end of message settings, enable time slicing and choose the message rates. When finished press the Continue  button.
7	On the following page you can choose the type of data transmission, e.g. TCP/IP, modem or radio. Select Radio and press Continue  .
8	The next page allows selecting a specific radio from the list of configured radio devices. Besides this, the radio channel can be defined. When finished press the Continue  button.
9	On the last page of the wizard you can activate the stream or just save the settings without starting the new stream. Press the Save changes  button to save all settings.

6: Context sensitive help

Context sensitive help: Overview

View detailed context sensitive help for every page in the web interface.

Chapter	Description
Status	View the status of important receiver information, such as the configured logging sessions, the satellite tracking, an overview of the ports in use and the power and memory available.
GNSS Management	Configure all GNSS data related settings, such as logging sessions, data streams and the tracking settings. Or enter site specific information such as the site name, position and antenna details.
Receiver setup	Configure all receiver related settings such as network connections, FTP push locations and the user management. Or use the tools to upgrade the receiver firmware, add new option keys or switch to your preferred language.
Support	The Support menu options allow you to send the settings of your receiver and debug information to Leica NRS support in order to help solve receiver problems.

Status

Status: Overview

View the status of important receiver information, such as the configured logging sessions, the satellite tracking, an overview of the ports in use and the power and memory available.

Menu option	Description
Receiver information	View detailed information about the receiver, including the installed firmware version, maintenance data and options.
Position	Shows the currently navigated position, the user entered reference position and the DOP values.
Tracking	<p>The general page provides an overview of the received almanac for each satellite system and the health information for all satellites.</p> <p>Each satellite system tab shows the satellites tracked on each frequency and their current status information such as elevation, azimuth, SNR values and health.</p> <p>Available tabs:</p> <ul style="list-style-type: none"> • General • GPS • GLONASS • GALILEO • SBAS
Data streams	Displays a list of all configured outgoing data streams and all incoming data streams from attached devices (meteo and tilt devices).
Logging sessions	View detailed information about the configured logging sessions.
Port summary	Shows all configured open ports, their connections status and the data stream used for this port.
Event log	View and filter the history of messages regarding the receiver status.
Network connections	Lists all active TCP/IP network connections on the receiver and their status.
System resources	Shows the status of the connected power supply and the used/free space on the inserted SD card.

Status: Receiver information

Status: Receiver information - Receiver

Background information

Provides an overview of receiver specific information such as serial number, installed firmware version and installed options.

Field description

The table below describes the fields in the Status: Receiver information / Receiver tab.

Press the **Refresh icon**  to update the displayed data.

Instrument details	Description
Instrument type	The receiver type.
Serial number	Serial number of the receiver.
Site code	Four digit identifier for the receiver. This is also used as the first four characters of the raw data (MDB) and RINEX file name created on the receiver.
System language	The language loaded on the receiver.
ME serial number	The serial number of the measurement engine.
ME Hardware	The hardware revision of the measurement engine.

The default functionality section, list the options that are installed per default on each GR10 receiver.

Default functionality	Description
Ethernet	Ethernet connection is available on every GR10 receiver.
L2C tracking	GR10 receivers can be activated to track GPS L2C.
GNSS Spider OWI	The Leica GNSS Spider software can connect and control any GR10 receiver per default. No additional option is needed.

Loaded firmware	Description
Maintenance end	The expiry date of the software maintenance contract. For information on Custom Care Packages visit the Leica Geosystems web page or contact your local Leica Geosystems representative .
Firmware	The firmware version (build number) loaded on the receiver.
ME Firmware	The firmware version of the measurement engine.
ME Boot	The firmware version of the boot software for the Measurement Engine.
Navigation software	The navigation firmware version with the algorithms for signal processing.
LB2 / OWI	The version number of the LB2/OWI commands.
Operating system	The firmware version of the Windows CE operating system.
EFI loader	The firmware version of the Electronic Front Interface loader.
EFI	The firmware version of the Electronic Front Interface.
XLDR	The firmware version of the XLDR loader component of the operating system.
EBoot	The version of the Eboot loader component of the operating system.
CHAIN	The version of the CHAIN loader component of the operating system.

Related topics

[Status: Overview](#)

[Status: Receiver information - Options](#)

[GNSS management](#)

[Receiver setup](#)

Status: Receiver information - Options

Background information

The receiver options tab lists all the options available for this receiver and which of these options are already installed.

- To install new options go to Receiver setup / Tools / Options.
- To view a detailed description of all options and their article numbers go to [GR10 Options](#).

Field description

The table below describes the fields in the Status: Receiver information, Options tab.

Press the **Refresh icon**  to update the displayed data.

Instrument details	Description
Installed options	Lists all options installed on the receiver.
Options currently not installed	Lists all options that are currently not installed on the receiver but are available for purchase and installation.

Related topics

[Status: Overview](#)

[Status: Receiver information](#)

[Receiver setup: Option management](#)

Status: Position

Background Information

Shows the current navigated position and the user entered reference position of the receiver. The receivers position is configured via GNSS Management / Site name and coordinates.

- If the entered reference position and the navigated position differ by more than 100m, an error message is displayed.

Field Descriptions

The table below describes the fields in the Status: Position page.

Press the **Refresh icon**  to update the displayed data.

Field	Navigated Position	Reference Position
Latitude, Longitude, Ellipsoidal height	Shows the navigated position of the receiver in geodetic coordinates.	Shows the entered reference position of the receiver in geodetic coordinates.
X, Y, Z	Shows the navigated position of the receiver in Cartesian coordinates.	Shows the entered reference position of the receiver in Cartesian coordinates.

Local time	The current time in the local time system.
Position latency	The latency of the computed position. Latency is typically attributed to the time required for data transfer and computation of position.
HDOP	The Horizontal Dilution of Precision (HDOP) of the current position solution.
VDOP	The Vertical Dilution of Precision (VDOP) of the current position solution.
GDOP	The Geometric Dilution of Precision (GDOP) of the current position solution.
PDOP	The Position Dilution of Precision (PDOP) of the current position solution.
Position quality	2D coordinate quality of the computed position.
Height quality	Height quality of the computed position.

Related topics

[Status: Overview](#)

[GNSS management: Site name and coordinates](#)

Status: Tracking

Status tracking: General

Field Description

The table below describes the fields in the Status: General tab.



The information shown is dependent on the settings configured on the [GNSS management: Tracking](#) page and which satellite options are available on the receiver.



If the satellite health setting has been changed to a user defined setting in the [GNSS management: Tracking](#) page, then the satellite PRN will be displayed in brackets to indicate that this is not the almanac transmitted health status for that satellite.

Press the **Refresh icon**  to update the displayed data.

Field	Description
Date of GPS almanac	The date and time of the GPS almanac.
Date of GLONASS almanac	The date and time of the GLONASS almanac. Only available for receivers with the GLONASS option.
Date of GALILEO almanac	The date and time of the GALILEO almanac. Only available for receivers with the GALILEO option.
Time signal	Shows the oscillator configured on the receiver. If no external oscillator is used, Internal clock is shown.

Satellite Health	GPS, GLONASS, Galileo and SBAS
Healthy	Lists the PRN numbers of the healthy satellites.
Bad	Lists the PRN numbers of the unhealthy satellites. The satellites are available in the almanac but are flagged unhealthy.
Not available	Lists the PRN numbers of the unavailable satellites. The satellites are not available in the almanac.

Related topics

[Tracking: GPS](#)

[Tracking: GLONASS](#)

[Tracking: GALILEO](#)

[Tracking: SBAS](#)

[GNSS management: Tracking](#)

Status tracking: GPS

Field Description

The table below describes the fields in the Status: GPS tab.

The information shown is dependent on the settings configured on the [GNSS management: Tracking](#) page and which satellite options are available on the receiver.

Press the **Refresh icon**  to update the displayed data.

Field	Description
Sat	The Pseudo Random Noise (PRN) number of the satellite.
Elevation	The elevation of the satellite in degrees. An arrow is shown to indicate if the satellite is rising or setting.
Azimuth	The azimuth of the satellite in degrees.
S/N L1	The signal to noise ratio on L1. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N L2P	The signal to noise ratio on L2P. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N L2C	The signal to noise ratio on L2C. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N L5	The signal to noise ratio on L5. The number is shown in brackets if the signal is not currently being used in the position calculations.
URA	The User Range Accuracy (URA) as transmitted in the broadcast navigation message. Only available for GPS satellites.
IODE	The Issue Of Data Ephemeris (IODE) of the currently used broadcast navigation message. Only available for GPS satellites.

Health	Description
Healthy	Lists the PRN numbers of the healthy satellites.
Bad	Lists the PRN numbers of the unhealthy satellites. The satellites are available in the almanac but are flagged unhealthy.
Not available	Lists the PRN numbers of the unavailable satellites. The satellites are not available in the almanac.

Related topics

[Tracking: General](#)

[Tracking: GLONASS](#)

[Tracking: GALILEO](#)

[Tracking: SBAS](#)

[GNSS management: Tracking](#)

Status tracking: GLONASS

Field Description

The table below describes the fields in the Status: GLONASS tab.

The information shown is dependent on the settings configured on the [GNSS management: Tracking](#) page and which satellite options are available on the receiver.

Press the **Refresh icon**  to update the displayed data.

Field	Description
Sat	The Pseudo Random Noise (PRN) number of the satellite.
Elevation	The elevation of the satellite in degrees. An arrow is shown to indicate if the satellite is rising or setting.
Azimuth	The azimuth of the satellite in degrees.
S/N L1	The signal to noise ratio on L1. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N L2	The signal to noise ratio on L2. The number is shown in brackets if the signal is not currently being used in the position calculations.

Health	Description
Healthy	Lists the PRN numbers of the healthy satellites.
Bad	Lists the PRN numbers of the unhealthy satellites. The satellites are available in the almanac but are flagged unhealthy.
Not available	Lists the PRN numbers of the unavailable satellites. The satellites are not available in the almanac.

Related topics

[Tracking: General](#)

[Tracking: GALILEO](#)

[Tracking: SBAS](#)

[GNSS management: Tracking](#)

Status tracking: GALILEO

Field Description

The table below describes the fields in the Status: GALILEO tab.

The information shown is dependent on the settings configured on the [GNSS management: Tracking](#) page and which satellite options are available on the receiver.

Press the **Refresh icon**  to update the displayed data.

Field	Description
Sat	The Pseudo Random Noise (PRN) number of the satellite.
Elevation	The elevation of the satellite in degrees. An arrow is shown to indicate if the satellite is rising or setting.
Azimuth	The azimuth of the satellite in degrees.
S/N L1	The signal to noise ratio on L1. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N E5a	The signal to noise ratio on E5a. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N E5b	The signal to noise ratio on E5b. The number is shown in brackets if the signal is not currently being used in the position calculations.
S/N ABOC	The signal to noise ratio on Alt-Boc. The number is shown in brackets if the signal is not currently being used in the position calculations.

Satellite Health	
Healthy	Lists the PRN numbers of the healthy satellites.
Bad	Lists the PRN numbers of the unhealthy satellites. The satellites are available in the almanac but are flagged unhealthy.
Not available	Lists the PRN numbers of the unavailable satellites. The satellites are not available in the almanac.

Related topics

[Tracking: General](#)

[Tracking: GPS](#)

[Tracking: SBAS](#)

[GNSS management: Tracking](#)

Status tracking: SBAS

Field Description

The table below describes the fields in the Status: SBAS tab.

The information shown is dependent on the settings configured on the [GNSS management: Tracking](#) page and which satellite options are available on the receiver.

Press the **Refresh icon**  to update the displayed data.

Field	Description
Sat	The Pseudo Random Noise (PRN) number of the satellite.
System	The SBAS satellite system.
S/N L1	The signal to noise ratio on L1. The number is shown in brackets if the signal is not currently being used in the position calculations.

Related topics

[Tracking: General](#)

[Tracking: GLONASS](#)

[Tracking: GALILEO](#)

[GNSS management: Tracking](#)

Status: Data streams

Status: Data streams - Outgoing

Background information

Displays a list of all configured Outgoing data streams from the receiver.



Field Description



The table below describes the fields in the Data streams / Outgoing tab.



The information shown is dependent on the settings configured via the Data stream wizard on the [GNSS management: Data streams / Outgoing tab](#) page



The data streams can be sorted by each field by clicking on the header.

Press the **Refresh icon**  to update the displayed data.

Real time	Description
Icon	 Data stream is active.  Data stream is inactive.
Type/Message	The configured message type and version. Click on the underlined message type to open a list box showing how many satellites are used.
Data rate	The configured rate at which data is sent out.
Last sent	The latency of the last outgoing data stream sent in seconds.
Connection: port	The connection type and port over which the data stream is sent out.

LB2	Description
Icon	 Data stream is active.  Data stream is inactive.
Data	Shows which data output is active; Meas.Data (measurement data) and Sat.Data (satellite data).
Message	The configured message type (D or E) that is sent.
Data rate	The configured rate at which data is sent out.
Connection: port	The connection type and port used.

NMEA	Description								
Icon	<p>Data stream is active.</p>  <p>Data stream is inactive.</p> 								
Message	<p>The configured NMEA messages activated for the outgoing data stream.</p> <p>Click the listed NMEA messages to view additional properties.</p> <p>NMEA message properties</p> <p>The table below describes the additional NMEA message properties that are shown when the underlined NMEAMessages are selected.</p> <table border="1"> <thead> <tr> <th>NMEA message properties</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Message</td> <td>The configured NMEA messages activated for the outgoing data stream.</td> </tr> <tr> <td>Output</td> <td>The select output type for each message, either at epoch or immediately.</td> </tr> <tr> <td>Rate</td> <td>The configured data rate for the NMEA message.</td> </tr> </tbody> </table>	NMEA message properties	Description	Message	The configured NMEA messages activated for the outgoing data stream.	Output	The select output type for each message, either at epoch or immediately .	Rate	The configured data rate for the NMEA message.
NMEA message properties	Description								
Message	The configured NMEA messages activated for the outgoing data stream.								
Output	The select output type for each message, either at epoch or immediately .								
Rate	The configured data rate for the NMEA message.								
Connection: port	The connection type and port over which the data stream is sent out.								

BINEX	Description						
Icon	<p>Data stream is active.</p>  <p>Data stream is inactive.</p> 						
Message	<p>The configured BINEX messages activated for the outgoing data stream.</p> <p>Click the listed BINEX messages to view additional properties.</p> <p>BINEX message properties</p> <p>The table below describes the additional BINEX message properties that are shown when the underlined BINEXMessages are selected.</p> <table border="1"> <thead> <tr> <th>NMEA message properties</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Message</td> <td>The configured BINEX messages activated for the outgoing data stream.</td> </tr> <tr> <td>Rate</td> <td>The configured data rate for the BINEX message.</td> </tr> </tbody> </table>	NMEA message properties	Description	Message	The configured BINEX messages activated for the outgoing data stream.	Rate	The configured data rate for the BINEX message.
NMEA message properties	Description						
Message	The configured BINEX messages activated for the outgoing data stream.						
Rate	The configured data rate for the BINEX message.						
Connection: port	The connection type and port over which the data stream is sent out.						

Related topics

[GNSS management: Data streams overview](#)

[GNSS management: Outgoing data stream](#)

[Streaming session wizard: Configure realtime out data stream](#)

[Streaming session wizard: Configure LB2 data stream](#)

[Streaming session wizard: Configure NMEA data stream](#)

[Streaming session wizard: Configure BINEX data stream](#)

Status: Data streams - Incoming

Background information

Displays a list of all configured Incoming data streams from meteo and tilt devices that send data to the receiver.

Field Description

The table below describes the fields in the Data streams / Incoming tab.

The information shown is dependent on the settings configured via the Data stream wizard on the [GNSS management: Data streams / Incoming tab](#) page.

Press the **Refresh icon**  to update the displayed data.

Meteo	Description
Name	The name of the configured meteo device.
Serial number	The serial number of the configured meteo device.
Data time	The time and date of the displayed temperature, pressure and humidity reading.
Temperature	The temperature recorded by the device at the data time.
Pressure	The pressure recorded by the device at the data time.
Relative humidity	The relative humidity recorded by the device at the data time.

Tilt	Description
Name	The name of the configured tilt device.
Serial number	The serial number of the configured tilt device.
Data time	The time and date of the displayed temperature and inclination.
Temperature	The temperature recorded by the device at the data time.
Inclination X	The inclination X recorded by the device at the data time.
Inclination Y	The inclination Y recorded by the device at the data time.

Related topics

[GNSS management: Data streams overview](#)

[GNSS management: Incoming data streams](#)

[Streaming session wizard: Configure Meteo](#)

[Streaming session wizard: Configuration Tilt](#)

Status: Logging sessions

Background Information






View status information about all configured logging sessions.

Configure or edit a logging session via [GNSS management / Logging sessions](#). A logging session wizard will guide you through the procedure.

Field Description




The table below describes the fields in the Status: Logging session page.

The logging sessions can be sorted by each of these criteria by clicking on the header.

Field	Description
Icon	<p>  Logging session is active. </p> <p>  Logging session is inactive. </p> <p>  Smart clean-up is activated. </p> <p>  Smart clean-up is activated and deleting files. </p> <p>  Logging session is blocked by Smart clean-up. </p> <p> To activate or deactivate a session go to GNSS management / Logging session / Sessions tab. </p> <p> To activate or deactivate Smart clean-up go to GNSS management / Logging session / Smart clean-up tab. </p>
Name	The name of the logging session.
Type	The configured logging session type (MDB, RINEX or Hatanaka) and if the session is continuous or timed .
Runtime	The time that the session has run or is running since it was last activated. For timed logging sessions this is the overall time of the session logging data to files.
#Files	<p>The number of files logged in the session runtime and available on the SD card or USB device for this logging session.</p> <p>Please note: If logging sessions are configured and the SD card is formatted, the number of files for the logging sessions will not be updated immediately. This may take several minutes.</p>

Logging session properties

The table below describes the additional logging session status information that is shown when the logging session **Name** is selected.

Field	Description
Session name	The configured logging session name.
Data type	The configured data type.
Session Priority	The configured session priority which determines the Smart clean-up tasks. Go to GNSS management / Logging sessions / Smart clean-up tab for further information and to enable the Smart clean-up functionality.
Session type	The configured session type, either continuous or timed . Timed allows specific logging intervals to be defined.
Logging rate	The configured rate at which the observations are logged.
Length of file	The configured file length. The file length defines how long data is written to one file before a new file is created.
Log doppler observations	Indicates if logging doppler observations is activated (yes) or deactivate (no) in the logging session.
Log SNR values	Indicates if logging SNR values in the RINEX file is activated (yes) or deactivate (no) in the logging session.
Archive data to	Shows where the logging session data is archived. Clicking on the SD Card link opens an FTP connection to the SD Card. This is only possible when the FTP server access is enabled. To enable FTP server access go to Receiver Setup / FTP server .  The FTP access to the SD card may not work in all browsers. Set the FTP server access restrictions to allow anonymous access to ensure SD card access via the browser link.. Go to Receiver Setup / FTP server .
Auto delete	Shows when the logging session files are automatically deleted.  The SD card can run full when Auto delete is set to Never.
Archive to FTP location	Indicates where the logging session data is archived. Click on the link SD card to access the SD card via FTP.  Some browsers have limitations concerning their FTP capabilities. Please use a dedicated FTP client in case you experience problems while accessing files via FTP.
Remaining repeats	This field is only shown for timed logging sessions. Shows the number of repeats remaining.
Latest file	The file name of the last file that this logging session was written to.



For RINEX and Hatanaka logging sessions it will always list the observation file name (*.10o).

Related Topics

[Logging sessions: Overview](#)

[GNSS management: Logging sessions](#)

[GNSS management: Smart clean-up](#)


Status: Port Summary





Background Information





Shows all ports used in the receiver configuration for data streams, remote access (OWI), FTP and web interface access. For each port the connection status and use case is displayed.




Field Description

The table below describes the fields on the Status: Port summary page.

Press the **Refresh icon**  to update the displayed information.

Data Ports	Description
Icon	<p>An icon is shown, indicating the data stream connection status.</p> <p> Disconnected</p> <p> Connecting</p> <p> Awaiting connection(s)</p> <p> Connected</p>
Data connections: Port	The connection type, port number and mountpoint (for NTRIP connections) configured for the data stream.
# Connections	<p>The number of connected users on each port. With the default setting, a maximum of one user is possible.</p> <p>If the Multi-Client option is installed on the receiver and the configuration is set accordingly, more than one connection per TCP/IP port is possible. In this case, the number of connected users and the number of possible connections is shown.</p>
Host / Duration	<p>The IP address of the client/server connected to the TCP/IP port.</p> <p>If there are multiple connections to the port, the longest connection is shown.</p> <p>Click on the IP address to open a pop up window. The pop up window shows the data volume sent and received on this port and lists all connected host IPs and the connection duration.</p>
Data type	The data type transmitted by the port.

Remote ports	Description
Icon	<p>An icon is shown to indicated the remote connection status.</p> <p> Disconnected</p> <p> Connecting</p> <p> Awaiting connection(s)</p> <p> Connected</p>
Data connections: Port	The connection type and port number configured for the remote port.
# Connections	The number of connected users on each port. For each remote port a maximum of one connection per port is possible.
Connection IP	<p>The IP address connected to the port.</p> <p>Click on the IP address to open a pop up window. The pop up window shows the data volume sent and received on this port and lists the connected host IP address and the connection duration.</p>

HTTP/FTP ports	Description
Icon	<p>An icon is shown, indicating the port status.</p> <p> Disconnected</p> <p> Awaiting connection(s)</p> <p> Connected</p>
Port type	Shows if HTTP or HTTPS is active and differentiates between FTP data ports and FTP control points.
Port number	The configured port number.

Related topics

[GNSS management: Data streams](#)

[Receiver setup: Spider and remote access](#)

[Receiver setup: FTP server](#)

[Receiver setup: Web server](#)

Status: Event log

Background Information

The Event log contains a list of status and information messages produced by the receiver. The Event log is updated every 5 seconds.




The messages from the Event log can be sent to an administrator via an event email. Sending event emails can be configured and activated via **Receiver setup / Event log**.




Event log messages can be filtered to easily find specific information.


Field Description

The table below describes the fields in the Status: Event log page.

Press the **Refresh icon**  to update the displayed data.


Field	Description
Icon	<p> Warning message</p> <p>This level of receiver message indicates that vital functionality on the receiver was interrupted. Action should be taken by an administrator to ensure correct receiver operation.</p> <p> General message</p> <p>A general message indicates a problem with a receiver task that does not influence the most important functionality. Investigate by checking the receiver configuration.</p> <p> Information message</p> <p>Information messages reflect events from the normal receiver activity. No action is required by the administrator.</p>
Date / Time	The local date and time of the message.
Message	The text message created by the receiver.

 Download	Press to download the event log content. The content of the event log will be displayed in a new browser window and can be stored on the PC.
 Filter	Filter the event log content to find specific information. The filter settings allow sorting of the messages by time, content or message type.
 Clear filter	Press to clear the filtering of the event messages and return to the main Event log page.

 Filter	Indicates that an event log filter is currently applied. Press to change the filter details.
---	--

Filter Event log content

Select the Filter icon . Select the filtering limits and then press the Apply icon .

Field	Description
From/ To	Select the interval to view messages From (the selected data and time) and To (the selected data and time).
Show verbose messages	Activate or deactivate verbose messages. Verbose messages provide additional information about the receiver status that are not shown per default, in order to keep the event log clearer.  Verbose mode will be deactivated after closing the browser, logging out of the receiver, or rebooting the receiver.
Content	Filter the messages by the selecting the messages content category, such as Logging or Tracking .
Message Type	Filter the messages by selecting the level of importance.

Related topics

[Receiver setup: Event log](#)

Status: Network connections

Background information

Displays all active network connections used to connect the receiver to a network, including DynDNS setup if configured.

Possible connections

- [Ethernet](#)
- [TCP/IP over USB](#)
- [Mobile internet](#)
- [DynDNS](#)

Field Descriptions

The table below describes the fields in the Status: Network connections page.

Default gateway shown in the status header indicates if the specific connection is set as the main gateway.

Press the **Refresh icon**  to update the displayed data.

Ethernet	Description
Status	The status of the configured ethernet connection, Connected or Disconnected .
IP address type	Indicates if the IP address was assigned by DHCP or manually configured.
IP address	The IP address used for accessing the receiver via ethernet connection.
Subnet mask	The subnet mask for the connection.
Gateway	The gateway for the connection.
DNS servers	The IP addresses of the DNS servers that are used.
Data sent	The amount of data sent out from this connection.
Data received	The amount of data received by this connection.
MAC address	The MAC address of the receivers ethernet device.

Mobile internet	Description
Status	The status of the configured network connection, Connected or Disconnected .
Duration	The duration or uptime of this connection without interruption.
IP address type	Indicates if the IP address was assigned by DHCP or manually configured.
IP address	The current IP address of the connection.
Subnet Mask	The subnet mask for the connection.
Data sent	The amount of data sent out from this connection.
Data received	The amount of data received by this connection.
Device name	The name of the mobile internet device used for this connection.
Port	The port used for connecting the mobile internet device.



By default, the Ethernet connection is set as the default gateway. The default gateway can be changed to the mobile internet connection. The configured connection used as the default gateway is displayed on top and shows (default gateway) in the header.

TCP/IP over USB	Description
Status	The status of the configured network connection, Connected or Disconnected .
IP address	The default IP address for accessing the web interface via a USB device.
Subnet Mask	The default subnet mask for the connection.
Data sent	The amount of data sent out from this connection, in bytes.
Data received	The amount of data received by this connection, in bytes.
Device name	States that this USB connection is established via the USB host port.

DynDNS	Description
Status	Indicates if updating the IP address of the receiver at the DynDNS service was successful.
Service provider	The DynDNS service provider configured.
Last IP update	The date and time when the IP address was last updated at the DynDNS service.
Hostname	The hostname of the receiver that is registered with the DynDNS service.
Registered IP address	The IP address sent to the DynDNS service. This IP address is used to access the receiver when entering the URL in a browser window.

Related topics

[Network connections: Overview](#)

[Network connections: Ethernet](#)

[Network connections: Mobile Internet](#)

[How to set up a mobile internet connection](#)

Status: System resources

Background information

Shows the status of the connected power supply and the used/free space on the inserted SD card.



When HTTPS mode is used in Internet Explorer, the graphs shown on the System resources page may not display correctly. Internet Explorer does not support SVG natively. Please use another browser such as Mozilla Firefox or Google Chrome.

Field Descriptions

The table below describes the fields in the Status: System resources page.

Power	Description
Available capacity	The available capacity on the external power source.

SD Card	Description
Total size	The total storage space available on the SD card.
Memory left	The available storage space remaining on the SD card.

CPU load	Description
Current CPU usage	Displays the current CPU load

CPU load history	Description
Diagram	The CPU load history diagram shows the CPU load for the last 10 minutes. The graph is visible after a few minutes and is only shown when this Status page is accessed. If you leave the status page, all information in the graph is deleted.

GNSS management

GNSS management: Overview

Configure all GNSS data related settings, such as logging sessions, data streams and the tracking settings. Or enter site specific information such as the site name, position and antenna details.

Menu option	Description
Site name and coordinates	Enter the site name and coordinates of the receiver.
Data streams	Create, configure and edit incoming and outgoing data streams.
Logging sessions	<p>Create, configure and edit logging sessions for writing MDB, RINEX or Hatananka files.</p> <p>Enable or disable the Smart clean-up of logging session data on the receiver to ensure optimal use of the SD card size and data availability.</p>
FTP locations	Configure, edit and delete FTP locations that are used to push data created by a logging session on the receiver to an external FTP server.
Antenna management	Select the used reference station antennas and configure, edit or delete all available antennas.
Tracking	<p>Configure the satellite tracking settings.</p> <ul style="list-style-type: none"> • General • GPS • GLONASS • GALILEO
Wake-up sessions	Configure, edit and delete specific intervals for the receiver to be turned on or off.

GNSS management: Site name and coordinates

Background Information

Site name and coordinates is used to enter the reference station information that will be used for real time correction messages and raw data logging.



Changing the site name and/or coordinates interrupts logging and streaming. If any of these settings are changed when a logging session is active then the current files will be finalized and new file(s) will start to be logged.

Setting Descriptions





The table below describes the settings that can be configured on the Site name and coordinates page.

Naming	Description
Site name	<p>Enter the name of the site. This is a unique identifier for the location of the receiver.</p> <p>The site name field can be left blank.</p> <ul style="list-style-type: none"> • The maximum number of characters is 16. • Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ . (hyphen, underscore, period and space are also allowed)</p>
Site code	<p>Enter a four character site code as an identifier for the instrument. The code is used for the first four characters of the raw data (MDB and RINEX) file names.</p> <ul style="list-style-type: none"> • The maximum number of characters is 4. • Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ (hyphen and underscore are also allowed)</p>

<p>Marker name</p>	<p>Enter a marker name.</p> <ul style="list-style-type: none"> • The marker name is used to occupy the equivalent entry in the RINEX header when creating RINEX files for this site. • If no Marker Name is entered then it will default to the Site Name. If no site name is entered, the marker name field in the RINEX header will stay empty. • The maximum number of characters is 60. • Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ . (hyphen, underscore, period and space are also allowed)</p>
<p>Marker number</p>	<p>Enter a marker number.</p> <ul style="list-style-type: none"> • The marker number is used to occupy the equivalent entry in the RINEX header when creating RINEX files for this site. • If no Marker Number is entered then it will default to the Site Code. • The maximum number of characters is 20. • Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ . (hyphen, underscore, period and space are also allowed)</p>

Coordinates	Description
Coordinate Type	Choose the coordinate type, either Geodetic or Cartesian.
Latitude	The latitude of the site.
Longitude	The longitude of the site.
Ellipsoidal height	The ellipsoidal height of the site.

Time settings	Description
Time zone	Select the time zone.

<p>Get current position</p> 	<p>Click this link to apply the currently computed navigated position as the reference position for this site. This is not an accurate coordinate with a known accuracy but merely an estimate. Without knowing the reliability of the coordinate of the reference station, the reference station should not be used for relative positioning. A position adjustment is necessary to calculate the exact coordinate for the reference position. The current position helps to set up reference station receivers to collect data for this position adjustment.</p> <p>The Save button  must be pressed to store the current position.</p>
<p>Restore default values</p> 	<p>Press to restore the default values.</p> <p> The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.</p>

Related Topics

[Status: Position](#)

GNSS management: Tracking

GNSS management: Tracking General

Background information

Tracking configuration options may be used to control which satellite systems are tracked by the receiver and to set the tracking modes.



If an external oscillator is selected but not connected, the receiver will not track any satellite signals.






Changing the Satellite system, Satellite signals and/or Cut-off angle interrupts logging and streaming. If any of these settings are changed when a logging session is active then the current files will be finalized and new file(s) will start to be logged.

Setting Descriptions

The table below describes the settings that can be configured on the Tracking General tab.

Field	Description
Satellite system	<p>Activate the satellite system(s) to be tracked.</p> <p>The availability of the different satellite systems depends on the installed receiver options.</p> <p>When activating a satellites system check box, all frequencies listed below are activated. When deactivating a satellites system, all frequencies below are deactivated if possible. GPS L1 and L2 are always active.</p> <p>The Tools / Options page provides an overview of all purchased options that are currently activated on the receiver and a detailed description of all available options.</p>
Satellite signals	<p>Lists all available satellite signals for each satellite system.</p> <p>Activate / deactivate the check boxes to track the different signals.</p>
Cut off angle	<p>Enter the elevation cut off angle.</p>
Code smoothing	<p>Select Smoothed or Not smoothed.</p> <ul style="list-style-type: none"> • Smoothed: <p>Carrier phase observations are used to smooth the code pseudo-range in order to reduce multipath and ionospheric bias.</p> • Not smoothed: <p>Raw code pseudo-ranges are recorded.</p>
Message on loss of lock	<p>Select the desired behaviour when loss of lock occurs.</p> <p>When checked, a message appears in the event log stating that a loss of lock has occurred.</p>

<p>Oscillator</p>	<p>An external oscillator can be used to provide a better quality time signal to the receiver than the receiver's own internal clock. The same external oscillator can also be used with a number of receivers so that each receiver is guaranteed to be tracking satellites using the same time signal. An external oscillator is attached to the receiver via the port OSC.</p> <p>Select Internal to use the receivers internal clock, or</p> <p>if an external oscillator is connected to the oscillator port, select the type of external oscillator and the frequency.</p> <ul style="list-style-type: none"> • TCXO: A temperature compensated crystal oscillator (TCXO) is used. • OCXO: An oven controlled crystal oscillator (OCXO) is used. • Rubidium: A rubidium based external oscillator is used. • Cesium: A cesium based external oscillator is used. <p> If an external oscillator <u>is selected but not connected</u>, the receiver will not track any satellite signals.</p>
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<p>Restore default values</p> 	<p>Press to restore the default values.</p> <p> The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.</p>
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SBAS note

Activate SBAS for logging and streaming the SBAS data.

- Activate the SBAS check box.
- If needed, specify a certain SBAS satellite system in the **Track sat. syst.** list box or leave at **Automatic** to have the receiver automatically select the SBAS system or set to **All** visible to use all SBAS satellite systems that are tracked by the receiver.

The receiver will now include the SBAS data in all data streams and in all MDB and RINEX files written. Deactivate the SBAS check box to stream/log without SBAS data included.

When SBAS satellites are tracked, the logged MDB and RINEX files will contain SBAS observations.

Related topics

[GNSS management: Tracking GPS](#)

[GNSS management: Tracking GLONASS](#)

[GNSS management: Tracking GALILEO](#)

GNSS management: Tracking GPS

Background information

Tracking GPS options, may be used to control which health settings are used for each GPS satellite tracked by the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Tracking GPS tab.

Field	Description
Satellite health	For each tracked satellite it is possible to set the health as Auto , Healthy or Bad . Use the drop down list to change the satellite health for all satellites to the same value.
Satellite	The PRN satellite number.
Health from almanac	Shows the health setting for this satellite as received from the broadcast navigation message. NA , is shown for satellites where no health information is available in the ephemeris.
User defined health	Shows the configured health setting for each satellite. Either Auto , Healthy or Bad . This field can be edited via the list box. If the setting is set to Auto , the satellite is used with the health received from the ephemeris. If the setting is different from Auto , the user defined health setting is used.

Related topics

[GNSS management: Tracking General](#)

[GNSS management: Tracking GLONASS](#)

[GNSS management: Tracking GALILEO](#)

GNSS management: Tracking GLONASS

Background information

Tracking GLONASS options may be used to control which health settings are used for each GLONASS satellite tracked by the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Tracking GLONASS tab.

Field	Description
Satellite health	For each tracked satellite it is possible to set the health as Auto , Healthy or Bad . Use the drop down list to change the satellite health for all satellites to the same value.
Satellite	The PRN satellite number.
Health from almanac	Shows the health setting for this satellite as received from the broadcast navigation message. NA , is shown for satellites where no health information is available in the ephemeris.
User defined health	Shows the configured health setting for each satellite. Either Auto , Healthy or Bad . This field can be edited via the list box. If the setting is set to Auto , the satellite is used with the health received from the ephemeris. If the setting is different from Auto , the user defined health setting is used.

Related topics

[GNSS management: Tracking General](#)

[GNSS management: Tracking GPS](#)

[GNSS management: Tracking GALILEO](#)

GNSS management: Tracking GALILEO

Background information

Tracking Galileo options may be used to control which health settings are used for each Galileo satellite tracked by the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Tracking GALILEO tab.

Field	Description
Satellite health	For each tracked satellite it is possible to set the health as Auto , Healthy or Bad . Use the drop down list to change the satellite health for all satellites to the same value.
Satellite	The PRN satellite number.
Health from almanac	Shows the health setting for this satellite as received from the broadcast navigation message. NA , is shown for satellites where no health information is available in the ephemeris.
User defined health	Shows the configured health setting for each satellite. Either Auto , Healthy or Bad . This field can be edited via the list box. If the setting is set to Auto , the satellite is used with the health received from the ephemeris. If the setting is different from Auto , the user defined health setting is used.

Related topics

[GNSS management: Tracking General](#)

[GNSS management: Tracking GPS](#)

[GNSS management: Tracking GLONASS](#)

GNSS management: Data streams

GNSS management: Data streams overview


Tab	Description
GNSS management: Outgoing data stream	Configure outgoing realtime, LB2 (Leica Binary), NMEA or BINEX messages from the receiver.
GNSS management: Incoming data streams	Configure incoming meteo and tilt data streams to the receiver.

GNSS management: Outgoing data stream

GNSS management: Outgoing data streams

Background Information

This page provides an overview of the configured outgoing data streams.

Configure outgoing realtime, LB2 (Leica Binary), NMEA or BINEX messages from the receiver by pressing **Create new data stream** .









The maximum number of configured outgoing data streams is 22, 20 TCP/IP connections and 2 serial connection available.





Mozilla Firefox does not support the use of certain ports. Use a different internet browser if these ports need to be used. [Ports blocked by default in Mozilla Firefox browser.](#)

Setting Descriptions

The table below describes the fields in the Outgoing data streams tab.

Setting	Description
Icon	<p> Data stream is active.</p> <p> Data stream is inactive.</p> <p>To activate or deactivate a data stream press the Activate icon.</p>
Stream Type	The configured outgoing data type.
Type/Message	The configured outgoing message types.
Connection	The configured connection type.
Device	The configured device used for transmitting the outgoing data stream.
Port	The configured port on the receiver used for transmitting the outgoing data stream.
 Delete	Press delete to permanently delete the data stream.
 Edit data stream	Press to edit the data stream settings. The outgoing data stream wizard will open.
 Create new data stream (copy)	Press to create a new data stream product based on the settings of an existing data stream.
Activate	 The data stream is inactive. Click to start streaming data.

	 The data stream is active. Click to stop streaming data.
Create new data stream 	<p>Upon pressing Create a new data stream, the Data stream wizard opens.</p> <p>The wizard is a tool that guides you through the following stages of an outgoing data stream configuration:</p> <ul style="list-style-type: none"> • Streamed data types - realtime, LB2 (Leica Binary), NMEA or BINEX • Message selection • Connection type and configuration • Activating the data stream

Related topics

[GNSS management: Data streams overview](#)

[GNSS management: Incoming data streams](#)

[Outgoing data stream wizard: Select data stream](#)

[Outgoing data stream wizard: Configure realtime out data stream](#)

[Outgoing data stream wizard: Configure LB2 data stream](#)

[Outgoing data stream wizard: Configure NMEA data stream](#)

[Outgoing data stream wizard: Configure BINEX data stream](#)

[Outgoing data stream wizard: Connection](#)

[Outgoing data stream wizard: Configure TCP/IP server](#)

[Outgoing data stream wizard: Configure TCP/IP client](#)

[Outgoing data stream wizard: Configure NTRIP server \(source\)](#)

[Outgoing data stream wizard: Configure Serial port](#)

[Outgoing data stream wizard: Configure Radio](#)

[Outgoing data stream wizard: Configure GSM / Modem / CDMA - dial up](#)


[Outgoing data stream wizard: Summary](#)

Outgoing data stream wizard: Select data stream

Setting Descriptions

The table below describes the settings that can be configured on the Select data stream page.

Setting	Description
Data stream type	Select the data stream type. <ul style="list-style-type: none">• Realtime• LB2• NMEA• BINEX

Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure realtime out data stream

Background Information

Realtime output is used to configure output of real time correction messages for RTK and DGPS.

Setting Descriptions

The table below describes the settings that can be configured on the Configure realtime out data stream page.



Setting	Description																		
Version and message type	Select the message type and version.																		
	<table border="1"> <thead> <tr> <th>Message type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Leica</td> <td>The proprietary Leica real-time data format supporting GPS and GLONASS. This is the best format to use when working exclusively with Leica Viva rovers or other Leica rover units.</td> </tr> <tr> <td>Leica 4G</td> <td>Leica proprietary RT format supporting GPS (including L5), GLONASS and Galileo. This is the best format to use when working exclusively with Leica rover units which support all available GNSS signals.</td> </tr> <tr> <td>CMR</td> <td>Compacted formats used to broadcast data for third party receivers.</td> </tr> <tr> <td>CMR+</td> <td>Compacted formats used to broadcast data for third party receivers.</td> </tr> <tr> <td>RTCM 2.x (Type 1,2)</td> <td>Differential and Delta Differential (Code) GPS corrections. Use for DGPS applications. An accuracy of 0.5-5m rms can be expected at the Rover. Additional messages sent: 3</td> </tr> <tr> <td>RTCM 2.x (Type 2,9)</td> <td>GPS Partial Correction Set and Delta Differential GPS Corrections. Use for DGPS applications. An accuracy of 0.5-5m rms can be expected at the Rover. Use this when a slow data link is being used in the presence of interference. Additional messages sent:3</td> </tr> <tr> <td>RTCM 2.x (Type 18,19)</td> <td>Uncorrected pseudorange and carrier phase measurement. Use for RTK operations where the ambiguities will be resolved at the Rover (RTK). An accuracy of around 1-5cm (rms) can be expected after successful ambiguity resolution. Additional messages sent: 3, 22, 23, 24</td> </tr> <tr> <td>RTCM 2.x (Type 20,21)</td> <td>RTK Carrier phase corrections and high-accuracy pseudo-range corrections. Use for RTK operations. There is negligible difference in the accuracy obtained using these messages as compared to messages 18</td> </tr> </tbody> </table>	Message type	Description	Leica	The proprietary Leica real-time data format supporting GPS and GLONASS. This is the best format to use when working exclusively with Leica Viva rovers or other Leica rover units.	Leica 4G	Leica proprietary RT format supporting GPS (including L5), GLONASS and Galileo. This is the best format to use when working exclusively with Leica rover units which support all available GNSS signals.	CMR	Compacted formats used to broadcast data for third party receivers.	CMR+	Compacted formats used to broadcast data for third party receivers.	RTCM 2.x (Type 1,2)	Differential and Delta Differential (Code) GPS corrections. Use for DGPS applications. An accuracy of 0.5-5m rms can be expected at the Rover. Additional messages sent: 3	RTCM 2.x (Type 2,9)	GPS Partial Correction Set and Delta Differential GPS Corrections. Use for DGPS applications. An accuracy of 0.5-5m rms can be expected at the Rover. Use this when a slow data link is being used in the presence of interference. Additional messages sent:3	RTCM 2.x (Type 18,19)	Uncorrected pseudorange and carrier phase measurement. Use for RTK operations where the ambiguities will be resolved at the Rover (RTK). An accuracy of around 1-5cm (rms) can be expected after successful ambiguity resolution. Additional messages sent: 3, 22, 23, 24	RTCM 2.x (Type 20,21)	RTK Carrier phase corrections and high-accuracy pseudo-range corrections. Use for RTK operations. There is negligible difference in the accuracy obtained using these messages as compared to messages 18
	Message type	Description																	
	Leica	The proprietary Leica real-time data format supporting GPS and GLONASS. This is the best format to use when working exclusively with Leica Viva rovers or other Leica rover units.																	
	Leica 4G	Leica proprietary RT format supporting GPS (including L5), GLONASS and Galileo. This is the best format to use when working exclusively with Leica rover units which support all available GNSS signals.																	
	CMR	Compacted formats used to broadcast data for third party receivers.																	
	CMR+	Compacted formats used to broadcast data for third party receivers.																	
	RTCM 2.x (Type 1,2)	Differential and Delta Differential (Code) GPS corrections. Use for DGPS applications. An accuracy of 0.5-5m rms can be expected at the Rover. Additional messages sent: 3																	
	RTCM 2.x (Type 2,9)	GPS Partial Correction Set and Delta Differential GPS Corrections. Use for DGPS applications. An accuracy of 0.5-5m rms can be expected at the Rover. Use this when a slow data link is being used in the presence of interference. Additional messages sent:3																	
RTCM 2.x (Type 18,19)	Uncorrected pseudorange and carrier phase measurement. Use for RTK operations where the ambiguities will be resolved at the Rover (RTK). An accuracy of around 1-5cm (rms) can be expected after successful ambiguity resolution. Additional messages sent: 3, 22, 23, 24																		
RTCM 2.x (Type 20,21)	RTK Carrier phase corrections and high-accuracy pseudo-range corrections. Use for RTK operations. There is negligible difference in the accuracy obtained using these messages as compared to messages 18																		

	and 19. Additional messages sent: 3, 22, 23, 24
RTCM 2.x (Type 1,2,18,19)	Output of both Code corrections and uncorrected carrier phase data. Additional messages sent: 3, 22, 23, 24
RTCM 2.x (Type 1,2,20,21)	Output of both Code and carrier phase corrections. Additional messages sent: 3, 22, 23, 24
RTCM 3 (Compact)	RTCM standard for correction transmission including message types 1003 & 1011. Higher efficiency than RTCM versions 2.x. Supports real-time services with significantly reduced bandwidth. Additional messages sent:1006, 1033
RTCM 3 (Compact & ephemeris)	RTCM standard for correction transmission including message types 1003 & 1011, satellite ephemeris GPS data (1019) and GLONASS ephemeris data (1020).
RTCM 3 (Extended)	RTCM standard for correction transmission including message types 1004 & 1012. Higher efficiency than RTCM versions 2.x. Supports real-time services with significantly reduced bandwidth. Additional messages sent:1006, 1008, 1033
RTCM 3 (Extended & ephemeris)	RTCM standard for correction transmission including message types 1004 & 1012, satellite ephemeris GPS data (1019) and GLONASS ephemeris data (1020).
	Further information go to <ul style="list-style-type: none"> • RTCM Messages Types • Realtime message formats
Reference station ID	Enter a reference station ID. The reference station ID is converted into a compact format and sent out with real-time data in all real-time data formats. It is different from the point ID of the reference station. The reference station ID is also required when working with several reference stations in time slicing mode on the same frequency. In this case, the ID of the reference station from which data is to be accepted from must be typed in at the rover.
End of message	Select Nothing or CR to add a carriage return at the end of the realtime message.
Time slicing	Activate or deactivate time slicing. Select activate to delay the sending of the realtime message. This is required when a

	realtime message from different reference stations are sent on the same radio channel.
Nr of reference stations	Only visible when Time slicing is checked. Select the number of reference stations in use from where realtime messages are sent on the same radio channel.
Time slot	Select the time slot. This field is only visible when Time slicing is checked. The time slot represents the actual time delay. The number of possible time slots is the number of reference stations in use. The time delay equals 1 s divided by the total number of reference stations. If two reference stations are used, the time delay is 0.50 s. Therefore, the time slots are at 0.00 s and at 0.50 s. With three reference stations, the time delay is 0.33 s. The time slots are at 0.00, 0.33 and 0.66 s.

The following settings are dependant on the selected version and message type.

Data rate	Select the rate at which data will be sent.
Coordinate rate	Select the rate at which coordinates will be sent.
Info rate	Select the rate at which the Reference Station information, such as point ID will be sent.
Message xx rate	Enter the rate at which the selected messages will be sent out.
Message xx repeat	Enter the number of times the selected messages will be repeated.
Message 9nr. Satellites	The number of satellites to be included in message 9.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure LB2 data stream



Background Information

LB2 is the Leica proprietary binary protocol to interface with the receiver. An outgoing LB2 stream can contain measurement data and/or satellite data.

Setting Descriptions

The table below describes the settings that can be configured on the Configure LB2 data stream page.

Setting	Description
Measurement data	<ol style="list-style-type: none"> 1. Activate to stream LB2 data raw code and phase data for all tracked satellites. 2. Select the message type to be sent out <ul style="list-style-type: none"> • Message D: LB2 (D Message) supports GPS L1 and L2 and GLONASS L1 and L2 data. • Message E: LB2 (Message) additionally supports GPS L5 and Galileo signals and is more compact. 3. Select the rate to send the measurement data.
Satellite data	Activate to stream satellite data and send out ephemeris data (GPS: 0x88, GLONASS: 0xD1) immediately when new data is available.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.



Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure NMEA data stream

Setting Descriptions

The table below describes the settings that can be configured on the Configure NMEA data stream page.

Setting	Description
Message	<p>Activate or deactivate the NMEA message check boxes that are to be output.</p> <p>A detailed description of each NMEA message is contained in Appendix B: NMEA Messages.</p>
Output	Select to output the NMEA message, either at epoch or immediately .
Rate	Select the data rate for the NMEA messages.
Output delay	Define an output delay for the NMEA message.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure BINEX data stream



Background Information

BINEX (Binary Exchange Format) is an exchange format for GNSS data defined by UNAVCO. You can find more information about BINEX at <http://binex.unavco.org>. The configuration wizard includes a check box table which enables and disables individual BINEX messages.

Setting Descriptions

The table below describes the settings that can be configured on the Configure BINEX data stream page.

Setting	Description
Message	<p>The data rates may be specified for each of the following messages:</p> <ul style="list-style-type: none"> • BINEX 0x00 Site Metadata output control • BINEX 0x01 GNSS Navigation Information output control • BINEX 0x7d Receiver Internal State output control • BINEX 0x7e Ancillary Site Data Prototyping output control • BINEX 0x7f GNSS Observable Prototyping output control
Rate list box	<p>Select the data rate for the BINEX messages.</p> <ul style="list-style-type: none"> • When new data available: The receiver will send the message whenever new data is available. e.g. whenever the receiver receives new ephemeris data for a certain satellite. This option is only available for BINEX 0x01 GNSS Navigation Information output control.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Connection

Background Information

Data can be streamed from the GR10 using a variety of communication types.

Setting Descriptions

The table below describes the settings that can be configured on the Connection page.

Setting	Description	
Connection type	Select the connection type.	
	TCP/IP server	The receiver works as a TCP server allowing TCP clients to connect to the receiver's ports to receive the data streams.
	TCP/IP client	This setting allows the receiver to act as a TCP client and send data out to a configured IP address and port. This way no port has to be opened in the firewall to allow clients to connect to the receiver. Furthermore since the data stream is now sent to a PC port, the number of connections to the data stream is not limited by the receiver.
	NTRIP server (source)	This mode allows the receiver to act as Ntrip Server, and to provide data to an Ntrip Caster. In terms of TCP/IP, the Ntrip server mode is in fact a TCP client mode. As an Ntrip Server, the receiver connects to a caster and starts to stream data.
	Serial port	The receiver streams data out of the physical serial port (P1).
	Radio	The receiver streams data using an attached radio.
	GSM / Modem / CDMA - dial up	The receiver streams data using an attached GSM, Modem or CDMA dial up service.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure TCP/IP server



Background Information

The receiver works as a TCP server allowing TCP clients to connect to the receiver's ports to receive the data streams.

Setting Descriptions

The table below describes the settings that can be configured on the Configure TCP/IP server page.

Setting	Description
TCP/IP port	Enter the TCP/IP port of the receiver.
Allow connections from	Specify the number of users that are allowed to connect to the data stream via TCP/IP. <ul style="list-style-type: none"> • Minimum of 1 user, maximum of 10 users. • This setting is only available for receivers with the GRL115, Multi-Client option key loaded. For all other receivers the number of users is fixed to 1. The option can be purchased from Leica Geosystems.
Limit access range	Select the range of IP addresses, which are authorized to access the receiver. The IP range is from 1.0.0.0 to 254.254.254.254.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure TCP/IP client

Background Information

The TCP/IP client connection setting allows the receiver to act as a TCP client and send data out to a configured IP address and port. This way no port has to be opened in the firewall to allow clients to connect to the receiver.

Furthermore since the data stream is now sent to a PC port, the number of connections to the data stream is not limited by the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Configure TCP/IP client page.

Setting	Description
Server IP address	Enter the numeric IP address of the Server to connect to. The IP range is from 1.0.0.0 to 223.255.255.254.
TCP/IP port	Enter the TCP/IP port of the receiver.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure NTRIP server (source)

Background Information


This mode allows the receiver to act as Ntrip Server, and to provide data to an Ntrip Caster.

In terms of TCP/IP, the Ntrip server mode is in fact a TCP client mode. As an Ntrip Server, the receiver connects to a caster and starts to stream data.

Setting Descriptions

The table below describes the settings that can be configured on the Configure NTRIP server (source) page.

Setting	Description
Server IP address	The IP address of the Ntrip server to connect to. Enter the numeric IP address. The IP range is from 1.0.0.0 to 223.255.255.254 including.
TCP/IP port	Enter the TCP/IP port to connect to on the NTRIP server.
Mount point	Enter the mount point. The mountpoint is the identifier of a data stream on an Ntrip Caster. It is needed to provide data to an Ntrip Caster.
Password	Enter a password. A password for authentication is required in order to send data to the Ntrip Caster.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure Serial port

Background Information

This mode allows data to be streamed out of the physical serial port (P1).

This page allows you to change the settings of the instrument's serial port.




Do not select the connection type Serial Port if you have a radio/modem/phone connected to the serial port (P1). In this case you must select the connection type Radio or GSM/Modem/CDMA - dialup. The serial port settings for these devices are configured in [Receiver settings: Device Management](#).

Setting Descriptions

The table below describes the settings that can be configured on the Configure serial port page.

Setting	Description
Baud rate, Parity, Data bits, Stop bits	Select the port settings for the communication between the receiver and the serial port.
Flow control	Defines which kind of handshake is used. <ul style="list-style-type: none">• None: No handshake.• RTS/CTS: Handshake in both directions.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure Radio

Background Information

This mode allows data to be transmitted with an attached Radio device. The GR10 supports eight different types of radios including seven which attach to the Serial Port (P1) via a serial cable and one which attached to the Slot in port (P3).





Only the radios listed in the [Receiver settings: Device Management](#) page are supported.

The port settings for these radios are predefined and cannot be modified.

Setting Descriptions

The table below describes the settings that can be configured on the Configure radio page.

Setting	Description
Device	Select the radio device.
Channel	Enter the channel that will be used on the device.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Configure GSM / Modem / CDMA - dial up

Background Information

This mode allows data to be transmitted with an attached GSM, Modem or CDMA - dial up service device. There are a number of default devices defined in the [Receiver settings: Device Management](#) page.



The device settings can be edited in the [Receiver settings: Device Management](#) page.

New devices can be created in the Receiver settings: Device Management page by creating a copy of an existing device.

Setting Descriptions

The table below describes the settings that can be configured on the Configure GSM / Modem / CDMA - dial up page.

Setting	Description
Device	Select the device name. Only devices defined in the Receiver settings: Device Management page are available for selection.
Pin code	Enter the pin code for the devices SIM card.
Puk code	The puk code is a security code for the SIM card for some devices. The puk codes needs to be entered when the pin code has been entered incorrectly more than three times. The puk will unblock the SIM card.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.


Press  to cancel and return to [GNSS management: Outgoing data stream](#).

Outgoing data stream wizard: Set streaming status

Setting Descriptions

The table below describes the settings that can be configured on the Set streaming status page.

Setting	Description
Activate data stream	Deactivate the data stream if you do not want it to run immediately.

Press  to go back to the previous wizard step.


Press  to cancel and return to [GNSS management: Outgoing data stream](#).

GNSS management: Incoming data streams

GNSS management: Incoming data streams

Background Information








This page provides an overview of the configured incoming data streams.


Configure an incoming meteo or tilt data stream to the receiver by pressing **Create new data stream** .

- One incoming data stream can be configured at a time. The device used to stream meteo or tilt data to the receiver must be connected to the serial port.

Setting Descriptions

The table below describes the fields in the Incoming data streams tab.

Setting	Description
Icon	 Data stream is active.  Data stream is inactive. To activate or deactivate a data stream press the Activate icon.
Stream Type	The configured outgoing session type (meteo or tilt).
Device	The configured meteo or tilt device connected to the serial port.
Port	The configured port on the receiver receiving the meteo and tilt data.
Data rate	The configured data rate.
 Delete	Press delete to permanently delete the data stream.
 Edit data stream	Press to edit the incoming data stream. The data stream wizard will open.
 Create new data stream (copy)	Press to create a new data stream product based on the settings of an existing data stream.
Activate	 The data stream is inactive. Press to activate the stream.  The data stream is active. Press to deactivate the stream.

<p>Create new data stream</p> 	<p>Click to open the Create new data stream wizard.</p> <p>The data stream wizard guides the user through the</p> <ul style="list-style-type: none">• creation of a new incoming data stream, or• editing of an existing data stream.
--	--

Data stream wizard

Upon pressing Create new data stream in the **GNSS management / Incoming data stream** page, the Incoming data stream wizard opens.

The wizard is a tool that guides you through the following stages of incoming data stream configuration:

- Data stream types - Meteo and tilt
- Device selection and configuration
- Data stream activation

Related topics

[Data streams: Overview](#)

[GNSS management: Incoming data streams](#)

[Incoming data stream wizard: Select data stream](#)

[Incoming data stream wizard: Configuration Meteo](#)

[Incoming data stream wizard: Configuration Tilt](#)


[Incoming data stream wizard: Summary](#)


Incoming data stream wizard: Select data stream

Setting Descriptions

The table below describes the settings that can be configured on the Select data stream page.

Setting	Description
Data stream type	Select the incoming data stream type. <ul style="list-style-type: none">• Meteo• Tilt

Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Outgoing data stream](#) or [GNSS management: Incoming data streams](#).

Incoming data stream wizard: Configure Meteo

Background Information

Meteorological sensors are used for measuring air pressure, temperature and relative humidity. The data from the meteo sensor is logged together with the GPS raw observations into the MDB and RINEX files. If RINEX logging is active, an additional meteo RINEX file is created that contains the data from the meteo sensor.

Data is logged into the same file as the GPS raw observations (MDB) or into a file with the same file name but with the extension m (RINEX). No data is logged, unless raw observation logging is configured and a logging session is started.

Setting Descriptions

The table below describes the settings that can be configured on the Configure Meteo device page.

Setting	Description
Device	Select from the list box all available meteo sensors available on the receiver.
Data rate	Select the rate at which data is requested from the meteo sensor.




The following default settings are used for communication between the Meteo device and receiver.

Met3, Met3A, Met4A default communication settings

Communication setting	Default setting
Port name	Serial Port (P1).
Baud rate	9600
Parity	Even
Data bits	8
Stop bit	1
Flow control	No handshake. The handshake used between the receiver and the tilt device.

Vaisala PTU300 default communication settings

Communication setting	Default setting
Port name	Serial Port (P1).
Baud rate	4800
Parity	Even
Data bits	7
Stop bit	1
Flow control	No handshake. The handshake used between the receiver and the tilt device.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Incoming data streams](#).

Incoming data stream wizard: Configure Tilt

Background Information

Tilt devices (such as the Leica NIVEL210) are used for measuring inclinations. The data from the tilt device is logged together with the GPS raw observations into MDB files. When logging RINEX files, the tilt data is written into a special auxiliary file.



No tilt data is logged unless a logging session is configured in GNSS management: Logging sessions and the incoming data stream is active.

Setting Descriptions

The settings on this screen define the input port and parameters for incoming tilt device measurements.



Setting	Description
Device	Select the device. The Leica NIVEL210 is the only tilt device supported by the GR receiver.
Data rate	Select the rate at which data is requested from the tilt device.



The following default settings are used for communication between the Tilt device and receiver.

NIVEL210 default communication settings

Communication setting	Default setting
Port name	Serial Port (P1).
Baud rate	9600
Parity	None
Data bits	8
Stop bit	1
Flow control	No handshake. The handshake used between the receiver and the tilt device.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.


Press  to cancel and return to [GNSS management: Incoming data streams](#).


Incoming data stream wizard: Set streaming status

Setting Descriptions

The table below describes the settings that can be configured on the Set streaming status page.

Setting	Description
Activate data stream	Deactivate the data stream if you do not want it to run immediately.

Press  to store the data stream configuration.

Press  to go back to the previous wizard step.

Press  to cancel and return to [GNSS management: Incoming data stream](#).

Related topics

[Data streams: Overview](#)

[GNSS management: Incoming data streams](#)

GNSS management: Logging sessions

GNSS management: Logging sessions overview

Tab	Description
GNSS management: Logging sessions	Configure, create or edit a logging session.
GNSS management: Smart clean-up	Enable and disable the smart clean-up of logging session files on the receiver.

GNSS management: Logging sessions



Background Information








Logging sessions are used to log observations in the data file type MDB, RINEX or Compact RINEX (Hatanaka) for later use in post processing.

- A logging session must be [active](#) in order to begin logging.
- All files can be directly imported into Leica Geo Office (LGO). All MDB files can also be downloaded via GNSS Spider.
- If you wish to push the logging session data to an FTP server, an [FTP location](#) needs to be configured before starting the logging session wizard. An FTP location is configured via the menu option GNSS management / FTP locations. An FTP location contains the information needed to access an external FTP server, such as server name, user name and password.
- An SD card must be inserted in the receiver to log data. The SD card can run full if the logging session data files are not removed (e.g. by autodelete or FTP push). Activate the [Smart clean-up](#) functionality to ensure that the SD card will not run full.

Field Descriptions


The table below describes the fields in the Sessions tab.

Field	Description
Icon	<p>  Session is active.  Session is inactive. </p> <p>To activate or deactivate a session press the Activate icon.</p>
Name	<p>The configured logging session name.</p> <p>Click the logging session name to view additional properties. Use this functionality to quickly check the configuration of the logging session.</p>
Data type	<p>The configured data type: MDB, RINEX or HATANAKA.</p>
Session priority	<p>The configured session priority which determines the Smart clean-up tasks.</p> <p>When Smart clean-up is active and the SD card is running full, data from low priority sessions is deleted first, high priority sessions are preserved as long as possible. When Smart clean-up is off, this setting has no influence.</p> <p>Go to GNSS management / Logging sessions / Smart clean-up tab for further information and to enable the Smart clean-up functionality.</p>

 Delete	<p>Press delete to permanently delete the logging session.</p> <p> Note: This will delete all corresponding files from the SD card. It cannot be undone!</p>
 Edit logging session	<p>Press to edit the logging session settings. The Logging session wizard will open. The Session name and Data Type cannot be edited.</p>
 Create new logging session (copy)	<p>Press to create a new logging session based on the settings of an existing logging session.</p>
<p>Activate</p>	<p> The logging session is deactivated. Press to activate.</p> <p> The logging session is activated. Press to deactivate.</p>
<p>Create new Logging session </p>	<p>Press to open the Create new Logging session wizard.</p> <p>The logging session wizard is explained in detail below.</p>

Logging session properties

The table below describes the additional logging session properties that are shown when the logging session **Name** is selected.

Field	Description
<p>Session name</p>	<p>The configured logging session name.</p>
<p>Data type</p>	<p>The configured data type.</p>
<p>Session type</p>	<p>The configured session type, either continuous or timed.</p> <p>Timed allows specific logging intervals to be defined.</p>
<p>Logging rate</p>	<p>The configured rate at which the observations are logged.</p>
<p>Length of file</p>	<p>The configured file length. The file length defines how long data is written to one file before a new file is created.</p>
<p>Log doppler observations</p>	<p>Indicates if logging doppler observations file is activated (yes) or deactivated (no) in the logging session</p>
<p>Archive data to</p>	<p>Indicates where the logging session data is archived. Click on the link SD card to access the SD card via FTP.</p> <p> Some browsers have limitations concerning their FTP capabilities. Please use a dedicated FTP client in case you experience problems while accessing files via FTP.</p>
<p>Archive to FTP location</p>	<p>Indicates if the logging session data is archived to an FTP location.</p>
<p>Remaining repeats</p>	<p>This field is only shown for timed logging sessions. Shows the number of repeats remaining.</p>

Logging session wizard

Upon pressing Create a new Logging session, the Logging session wizard opens.

The wizard is a tool that guides the user through the following stages of a logging session configuration:

- Logging session name, data types, priority and session type
- Session timing
- Logging rates, file lengths, included observations
- Data handling configuration
- Logging session activation

Related topics

[GNSS management: Smart clean-up](#)

[Logging session wizard: Create a new logging session](#)

[Logging session wizard: Session timing](#)

[Logging session wizard: MDB](#)

[Logging session wizard: RINEX](#)

[Logging session wizard: Compact RINEX](#)

[Logging session wizard: Data handling](#)

[Logging session wizard: Summary](#)

GNSS management: Smart clean-up

Background Information

The SD card in the receiver can run full if the logging session data files are not removed (e.g. by FTP push or download). **Smart clean-up** ensures that the SD card will not run full, while preserving the data that has the highest priority to the user.

Smart clean-up functionality differs from **auto delete files**. **Auto delete files** is time dependant, whilst **Smart clean-up** is dependant on the free storage space on the SD card. **Smart clean-up** allows the available SD card space to be used up completely without the risk of losing important data.



Smart clean-up will delete files from both active and inactive logging sessions.


Setting Descriptions

The table below describes the fields in the Smart clean up tab.

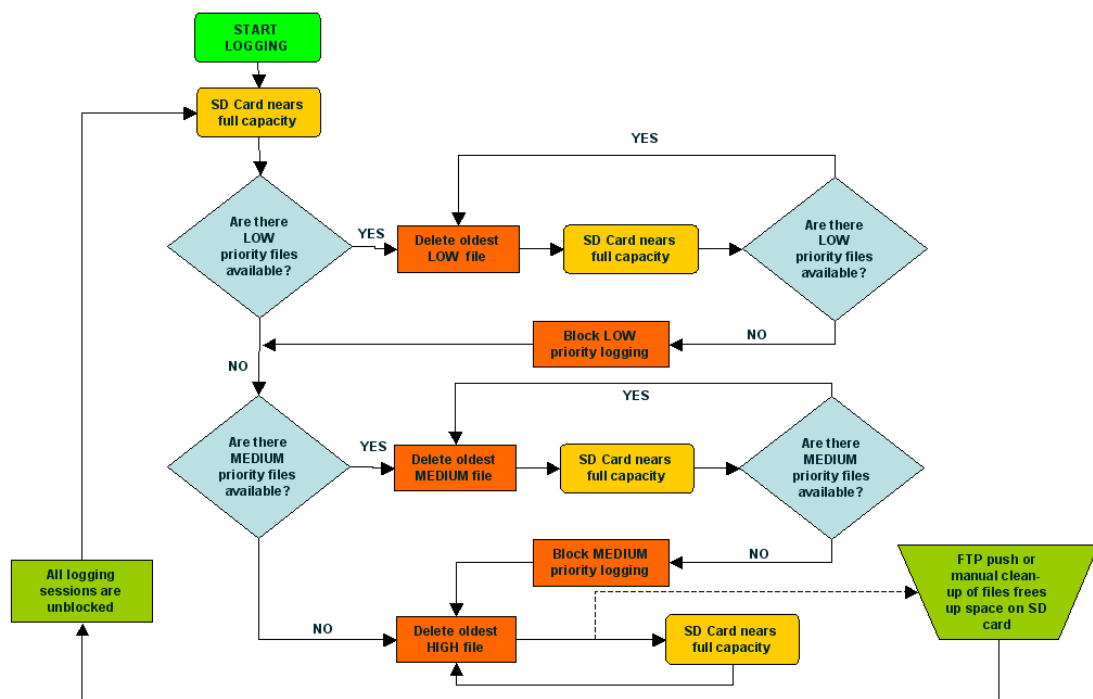
Setting	Description
Enable Smart clean-up	<ul style="list-style-type: none"> Active <p>When the SD card is almost completely filled by logging session data, the Smart clean-up will first delete the oldest files with the lowest priority to create space for new files. (Note: The logging session priority is configured via the first logging session wizard page, Create a new logging session).</p> <p>Once all data from low priority session is deleted, the receiver will stop logging data for low priority logging sessions if the SD card continues to fill up. Next, medium priority session will be deleted and the receiver will stop logging medium priority sessions.</p> <p>Once only high priority sessions remain active, logging will run in a loop. Only high priority data will be logged and the oldest files are deleted as soon as necessary. This ensures that there is always space available for the latest high priority data.</p> <p>Activate Smart clean-up to always log the most recent and highest priority logging session data.</p> Inactive

All running logging sessions will continue logging as configured, until the SD card is full. All logging sessions will then stop logging data.

Leave this setting unchecked if you don't want to loose old data and are unaffected by the possibility of all logging sessions stopping due to a full SD card.

Press  to save any setting changes.

[Click here to view the Smart clean up flow chart](#)



Related topics

[GNSS management: Logging sessions](#)

Create new Logging session - Logging session wizard

Logging session wizard: Create a new logging session / Edit a logging session

Setting Descriptions

The table below describes the settings that can be configured on the Create/Edit a logging session page.


Setting	Description
Session name	<p>Enter a unique logging session name.</p> <ul style="list-style-type: none"> Maximum number of characters allowed is 20. Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <ul style="list-style-type: none"> No spaces/blanks are allowed, however underscore (_) can be used. The session name is used in the folder structure when storing log files.
Data type	<p>Select the data type that shall be written.</p> <ul style="list-style-type: none"> MDB RINEX Compact RINEX (Hatanaka)
Session priority	<p>Select the priority level to be used for Smart clean-up of the SD card, either high, medium or low.</p> <p>If Smart clean-up is activated then the session priority will determine which logging session are stopped / saved if the SD card is nearing capacity.</p> <p>Read the topic GNSS management: Smart clean-up, for further information on the Smart clean-up functionality .</p>
Session type	<p>Select the session type, either continuous or timed.</p> <ul style="list-style-type: none"> Timed: Allows specific times to be configured for the session to log data, including duration, repetition interval and the number of intervals. Selecting timed will open an additional wizard step, Session timing.



Do not change a logging session created by Leica GNSS Spider into a timed logging session. Spider can not configure timed logging sessions.

- **Continuous:** Select to define the data type file length only.

If a continuous session type is activated, it will start logging immediately. To stop logging, manually deactivate the session via the **GNSS management: Logging sessions** menu option.

Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Logging session](#).

Related topics

[Logging sessions: Overview](#)

[GNSS management: Logging sessions](#)

[GNSS management: Smart clean-up](#)

Logging session wizard: Session timing

Background information

Timed logging sessions consider the configured file length and the configured interval length.

Example: If a timed logging session is configured to

- Start logging at a certain date at 15:00h
- End logging after 30min
- No of repeats: repeat 10 times
- Start next session: 10 min after last session ended
- And the file length is set to 1h, the behaviour will be as follows:
 1. The receiver starts logging at 15:00h because the first interval starts.
 2. The receiver stops logging and closes the file at 15:30h because the first interval ends.
 3. The receiver starts logging into a new file at 15:40h because the second interval starts.
 4. The receiver closes this file at 15:59:59h and immediately starts a new file because of the 1h file rollover.
 5. The receiver stops logging and closes this file at 16:10h because the second interval ends.



Setting Descriptions

The table below describes the settings that can be configured on the Session timing page.

Please note that the time settings will refer to the receivers defined **Time zone**. To set the receivers **Time zone**, go to [GNSS management / Site name and coordinates](#).

Setting	Description
Start logging at	Configure the start time and data of the logging session. Use the date and time pickers to select the logging start time.
End logging	Configure the end time and data or the duration of the logging session. End logging <ul style="list-style-type: none"> • at: Select a time and date for the first logging interval to end. • after: Select a time interval after which the first logging interval ends. • no end: The logging session starts at the defined date and time, and runs continuously. The minimum time interval for a logging session to run is 5 minute.
No. of intervals	Configure the number of repeats for the current logging session. This setting is only available if End logging is set to at or after .

	<p>Select</p> <ul style="list-style-type: none"> • Select run to enter a number of repetitions for this logging session. • Select repeat infinitely to configure a logging session with no defined end. • Select run once to configure only one interval for a logging session.
Start next session	<p>This setting is only active if repeat infinitely or repeat is selected in the No. of repeats.</p> <p>Configure the time for the next session to start as the number of days, hours and minutes after the last session ended.</p> <p>Note: The gap between logging sessions only has an impact if it is repeated at least once. The length of the gap must not be more than 14 days 23 : 59 h.</p>
Create a wake up session	<p>Activate to create a wake-up session with the same timing settings as this logging session.</p> <p>When the check box is activated and the logging session is stored, a wake-up session with the same name is created. This wake-up session has the same time and repeat settings as the logging session.</p> <p>After the logging session is stored and the wake-up session is created, both can be edited and deleted independently. The logging session will continue to run without the wake-up session if the receiver is turned on. The wake-up session will run without the logging session if the receiver was turned on.</p>

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [GNSS management: Logging session](#).

Related topics



[GNSS management / Site name and coordinates](#)

Logging session wizard: MDB

Setting Descriptions

The table below describes the settings that can be configured on the MDB page.

Setting	Description
Logging rate	Select the rate at which the observations are to be logged. Note: a faster logging rate results in higher resource consumption on the receiver.
Length of file	Choose a value from 5 minutes to 24 hours. The file length defines how long data is written to one file before a new file is created.
Dynamics	Raw data for the MDB logging session can be logged in static or moving (kinematic) mode.
Log doppler observations	Activate or deactivate logging doppler observations to the MDB file.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.



Press  to cancel and return to [GNSS management: Logging session](#).


Logging session wizard: RINEX

Setting Descriptions

The table below describes the settings that can be configured on the RINEX page.

Setting	Description
Logging rate	Select the rate at which the observations are to be logged. Note: A faster logging rate results in higher resource consumption on the receiver.
Length of file	Choose a value from 5 minutes to 24 hours. The file length defines how long data is written to one file before a new file is created.
Dynamics	Raw data for the RINEX logging session can be logged in static or moving (kinematic) mode.
Operator	Enter the name of the operator that is to appear in the RINEX file header. <ul style="list-style-type: none"> Maximum number of characters allowed is 20. Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ and a "space" are allowed.</p> <ul style="list-style-type: none"> If left empty, the field in the RINEX header will be left blank.
Agency	Enter the name of the agency that is to appear in the RINEX file header. <ul style="list-style-type: none"> Maximum number of characters allowed is 40. Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ and a "space" are allowed.</p> <ul style="list-style-type: none"> If left empty, the field in the RINEX header will be left blank.
Include SNR values	Activate to include the (unmapped) SNR observations in the RINEX file.
Log doppler observations	Activate to include the doppler observations in the RINEX file.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.



Press  to cancel and return to [GNSS management: Logging session](#).


Logging session wizard: Compact RINEX (Hatanaka)

Setting Descriptions

The table below describes the settings that can be configured on the Compact RINEX (Hatanaka) page.

Setting	Description
Logging rate	Select the rate at which the observations are to be logged. Note: A faster logging rate results in higher resource consumption on the receiver.
Length of file	Choose a value from 5 minutes to 24 hours. The file length defines how long data is written to one file before a new file is created.
Dynamics	Raw data for the Compact RINEX logging session can be logged in static or moving (kinematic) mode.
Operator	Enter the name of the operator that is to appear in the RINEX file header. <ul style="list-style-type: none"> Maximum number of characters allowed is 20. Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ and a "space" are allowed.</p> <ul style="list-style-type: none"> If left empty, the field in the RINEX header will be left blank.
Agency	Enter the name of the agency that is to appear in the RINEX file header. <ul style="list-style-type: none"> Maximum number of characters allowed is 40. Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- _ and a "space" are allowed.</p> <ul style="list-style-type: none"> If left empty, the field in the RINEX header will be left blank.
Include SNR values	Activate to include the (unmapped) SNR observations in the Compact RINEX file.
Log doppler observations	Activate to include the doppler observations in the Compact RINEX file.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.



Press  to cancel and return to [GNSS management: Logging session](#).

Logging session wizard: Data handling

Setting Descriptions

The table below describes the settings that can be configured on the Data handling page.

Setting	Description
Zip files	Activate to ZIP the logging session files.
Directory naming convention	Select the directory naming convention. This is the folder structure that will be used on the SD card and on the FTP server (when FTP push is used) to store the logging files.
Choose FTP location	Select an FTP location to push the logging session data to. This list contains all FTP locations configured in Receiver setup / FTP locations . If an FTP location has not been configured prior to creating the logging session, finish creating the current logging session and then create the FTP push location. Via the logging session Edit functionality, assign the FTP push location. An FTP location contains all information such as server name, user name and password. needed to access an FTP server.
Delete files	Select from the list box when or if the logging session files should be automatically deleted. Note: The SD card can run full when Delete files is set to Never.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.


Press  to cancel and return to [GNSS management: Logging session](#).


Logging session wizard: Set logging status

Setting Descriptions

The table below describes the settings that can be configured on the Set logging status page.

Setting	Description
Activate session	Deactivate the logging session if you do not want it to run immediately.

Press  to go back to the previous wizard step.

Press  to save the logging session.

Press  to cancel and return to [GNSS management: Logging session](#).

GNSS management: FTP locations

GNSS management: FTP locations

Background Information

FTP locations configuration allows the user to

- Add new FTP locations
- Edit and delete FTP locations
- View information about existing FTP locations



FTP locations are used to push data created by a logging session on the receiver to an external FTP server. Each FTP location can be used in several logging sessions. An unlimited number of FTP push locations can be created.






An FTP location needs to be configured in order to push a logging session (data) to an FTP server. An FTP location contains the data needed to access an FTP server, such as server name, user name and password. When an FTP location is assigned to a logging session, the logged data from this session is automatically pushed onto an FTP server.


This functionality is only available for GR receivers with the [FTP push](#) option installed.

Setting Descriptions

The table below describes the fields in the FTP locations overview page.

Settings	Description
Icon	<p>The  icon is shown when the FTP push location is used in a logging session.</p> <p>FTP push locations showing this icon cannot be deleted.</p>
Name	<p>The configured name of the FTP location.</p> <p>Click the FTP location name to view additional properties. Use this functionality to quickly check the configuration of the FTP location.</p>
FTP server	<p>The configured hostname of the FTP server (IP or URL).</p>
Queue	<p>The total number of files queued to be pushed to the configured FTP server. This number is zero unless a problem occurs when trying to connect to the FTP server.</p> <p>Files in the queue are pushed as soon as the FTP server is accessible again. If the queue number keeps increasing, check the FTP location settings. Use the edit icon to access the Edit FTP locations page and use the Test FTP locations link to test the settings.</p> <p> Files deleted from the queue will not be automatically pushed to the FTP server.</p>

 Clear	<p>Press to clear the queue of pending files to be pushed to an FTP location. This deletes a backlog of files caused by for example, FTP sever unavailability.</p> <div style="display: flex; align-items: center;">  <ul style="list-style-type: none"> The Clear icon is only shown when the Queue number is greater than zero. Files deleted from the queue will not be automatically pushed to the FTP server. </div>
 Delete	<p>Press to permanently delete the selected FTP location.</p> <p>Note: FTP locations that are currently in use can not be deleted.</p>
 Edit FTP location	<p>Press to edit the selected FTP location.</p>
 Create new FTP location (copy)	<p>Press to create a new FTP location based on the settings of an already existing location.</p>

Create new FTP location 	Press to create a new FTP location .
--	--

FTP location properties

The table below describes the content of the FTP location pop-up box that is displayed when clicking on the underlined FTP location name.

Properties	Description
Name	The configured name of the FTP location.
FTP server host	The configured FTP server host name (IP or URL).
FTP server port	The configured TCP/IP server port of the FTP server
FTP root directory	The configured FTP root directory.
Username	The configured username which is used to connect to the FTP sever.
In use	Indicates if the FTP location is used in a logging session.
Use passive mode	Indicates if Use passive mode is activated for the selected FTP location.

Related topics

[Receiver setup: New FTP location](#)


GNSS management: New / Edit FTP location

Background Information

Enter the necessary access information for pushing logged data from the GR receivers SD card to an external FTP server.

Setting Descriptions

The table below describes the fields in the New / Edit FTP location page.

Setting	Description
Name	Enter a unique FTP location name. The maximum number of characters is 60.
FTP server host	Enter the server name or IP-address of the FTP server. The maximum number of characters if 250.
FTP server port	Enter the TCP/IP server port of the FTP server. The default value is 21.
FTP root directory	Enter an optional FTP root directory. This field can be left blank. If entered, this directory has to exist on the FTP server. It will not be created automatically during the FTP push.
Username	Enter a valid username to access the FTP sever account.
Password	Enter the password of the FTP sever account.
Send commands	Add a custom FTP protocol command which is executed directly after login. This field can be left blank.
Use passive mode	Activate or deactivate using the passive mode. Using the passive mode is recommended as it improves communication robustness.
Test FTP location 	Press to test read and write access to the FTP location. Depending on the FTP server setup, this test may take several minutes. Check the event log for results.

FTP retry:

If the receiver is not able to FTP push a data file to the remote FTP server at the scheduled time, this file will be listed in the FTP push queue for this FTP location and a message will be displayed in the event log.

The receiver will then try at periodic intervals to push all files that have not yet been pushed successfully (new and queued).

If the FTP push was successful, a message is displayed in the event log and the FTP push queue number is updated.

GNSS management: Antenna management

GNSS management: Antenna Management overview

Tab	Description
Select antenna	Select an antenna and enter the height reading and measurement type.
Antenna management	Upload new antenna files, create new antennas and restore antenna default values.

GNSS management: Select antenna

Background information

Select the antenna currently connected to the receiver and enter the height reading and measurement type.



Correctly specifying the antenna and related information is critical for high accuracy positioning.



Changing the antenna type and/or antenna height interrupts logging and streaming. If any of these settings are changed when a logging session is active, then the current files will be finalized and new file(s) will start to be logged.

Field Descriptions

The table below describes the fields in the Select antenna tab.

[Calculate the antenna height reading](#) contains detailed information for the Height reading and Measurement type.

Field	Description
Antenna	From the list box select the antenna to be used with the receiver. The list contains all default and user defined antennas. Go to Antenna management to upload a new antenna file or manually define a new antenna.
Height reading	Enter the antenna height reading.
Measurement type	Select the measurement type, Vertical or Slope. The measurement type determines how the antenna height reading is calculated.

Related topics

[GNSS management: Antenna management](#)

[Create/Edit and Antenna](#)

[GNSS Management: Calculate the antenna height reading](#)




GNSS management: Antenna management




Background information



Upload new antenna files, create new antennas and restore antenna default values.

Field Descriptions

The table below describes the fields in the Antenna management tab.

Field	Description
Loadable antenna files	The name of the antenna file. All antenna files loaded onto the SD card are shown.
Location	The location of the antenna file.
 Delete	Select to delete the antenna file.
 Install	Select to install the antenna file.
Upload new antenna file 	Select to upload a new LIST.ANT antenna file exported previously from LGO from the computer to the receiver. The File upload page will open.

Installed antennas	All antennas currently configured on the receiver are listed.
Type	Shows the antenna type. Default antennas are available in the factory default settings. User defined antennas have been added manually.
 Delete	Press Delete to permanently delete the antenna. The ADVULLANTENNA can not be deleted.
 Edit antenna	Press to edit the antenna settings. The Edit antenna page will open. The antenna name cannot be edited. The ADVULLANTENNA can not be deleted.
 Create new antenna (copy)	Create a new antenna based on the settings of an existing antenna.

Create new antenna 	Press to create a new antenna. The Create antenna page will open.
Restore default values 	Restore the default antenna settings. This will restore all default antennas with the factory default settings. User

defined antennas will not be deleted.



The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.

Related topics

[File upload](#)

[Create/Edit and Antenna](#)

[GNSS management: Select antenna](#)

GNSS management: Create/Edit an Antenna

Field Descriptions

The table below describes the fields in the Create/Edit an Antenna tab.

Field	Description
Name	The antenna name. When editing an existing antenna, the antenna name can not be changed.
Horizontal offset	Horizontal distance from the physical reference point (ARP) to the point on the antenna where the slope height reading is measured. If you are using vertical height readings (Height Hook) this value may be 0. See also GNSS Management: Calculate the antenna height reading .
Vertical offset	Vertical distance from the ARP to the point where the height reading is measured to. If you are using slope height readings to a point above the physical reference plane this value must be negative. See also GNSS Management: Calculate the antenna height reading .
L1 phase offset	The L1 and L2 phase offset values.
L2 phase offset	
IGS name	The IGS name for the antenna.
Serial number	The antenna serial number.

Related topics

[GNSS management: Antenna management](#)

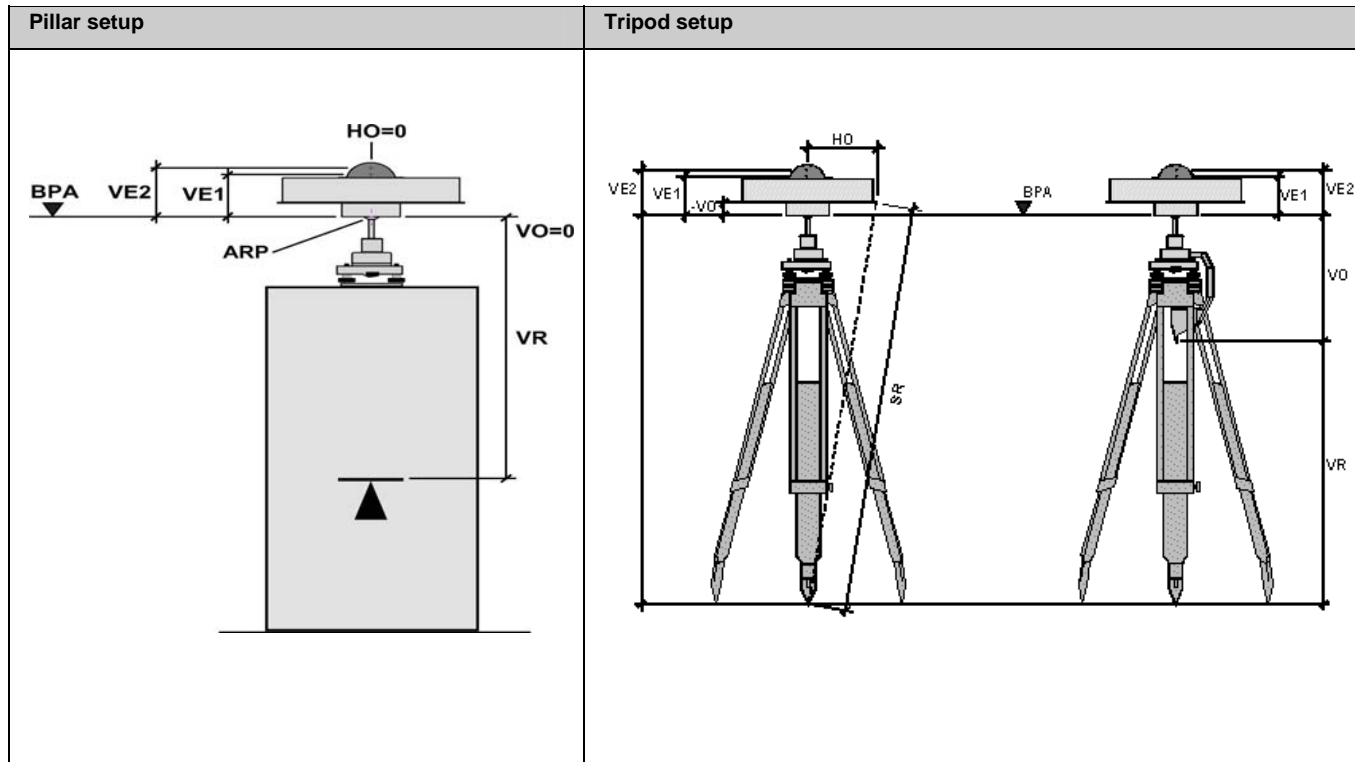
[GNSS management: Select antenna](#)

[GNSS Management: Calculate the antenna height reading](#)

GNSS management: Calculate the antenna height reading

The pictures below show examples for a standard setup of a Leica AT504/AT504 GG antenna on a pillar and a tripod. They also illustrate the antenna height reading values and give an example of what a permanent antenna setup could look like.

The Tripod setup illustrates the two different ways the height of the antenna can be measured. On the left the height is determined by measuring the slope distance to an offset point on the antenna. On the right the height is measured by using a height hook.



- HO = Horizontal Offset
- VO = Vertical Offset
- VR = Vertical Height Reading
- VE1 = Vertical Phase Center Offset for L1
- VE2 = Vertical Phase Center Offset for L2
- BPA = Physical Reference Plane (bottom of pre-amplifier)
- ARP = Antenna Reference Point. Intersection of the BPA horizontal plane and the vertical symmetry axis.
- SR = Slope Height Reading

Slope measurement type

$$\text{Antenna Height} = \sqrt{SR^2 - HO^2} \pm VO$$

Note: If the Offset Point on the antenna is above the Physical Reference Plane BPA, the Vertical Offset VO is negative!

Vertical measurement type

$$\text{Antenna Height} = VR + VO$$

GNSS management: Wake-up sessions

GNSS management: Wake-up sessions

Background Information

GNSS management setup: Wake-up sessions allows the user to

- Configure new wake-up sessions.
- Edit and delete existing wake-up sessions.
- View information about existing wake-up sessions.

Wake-up sessions define a number of intervals for which the receiver is configured to run. The receiver turns itself on at the configured start time and starts e.g. logging and streaming as configured in [GNSS management:: Logging session](#) and [GNSS management: Data streams](#). After the configured duration, the receiver stops all activities and automatically shuts down. This is especially useful in field campaigns where only a limited power supply is available.

- Up to twenty wake-up sessions can be configured.
- The maximum time between 2 consecutive start times is 21 days.
- More than one wake-up session may be active at a time. If at least one session is active any programmed power down requested by another session will be omitted.
- If the time between wake-up session is set to zero, the receiver will not power down.

Wake-up sessions can be configured in two ways, using

- Receiver setup: Wake-up sessions, or via the
- Logging session wizard. See [GNSS management: Logging session](#) for further information.



The time settings will refer to the receivers defined **Time zone**. To set the receivers **Time zone**, go to [GNSS management / Site name and coordinates](#).



When the receiver is powered down, remote communication with the receiver will be lost. If you have no wake-up session configured, you will not be able to remotely restart the receiver.

Note the following behaviour for a wake-up session









- If an active wake-up session is configured, the receiver will power down at the end of the first interval, independent of whether the receiver had been on or off before the start of the interval.
- Once the receiver is powered down, no remote communication is possible until the next interval.
- If a power loss occurs during a wake-up session interval (when the receiver is on) and the power comes back between intervals (when the receiver is supposed to be off), the receiver will boot and stay on until the end of the next interval.
- If a power loss occurs between intervals (when the receiver is off) and power comes back after the configured boot time, the receiver will stay on and power down at the end


of the interval.

- During a wake-up session all data streams and logging sessions that had been configured and activated before the start of the wake-up session will automatically resume streaming and logging. Additional data streams and logging sessions can be configured during the intervals.
- The receiver starts booting 2 minutes before the configured time to ensure that the software is fully started by the configured start time.
- The receiver powers down 1-30 seconds after the configured time. Logging files may not be finalised before the receiver is powered down. These files will be finalized when the receiver boots the next time.
- After the last interval of a wake-up session has ended, the receiver is powered down and stays off. Remote access is not possible after the power down.

Setting Descriptions

The table below describes the fields in the Wake-up sessions page.

Settings	Description
Icon	 Wake-up session is active and running.  Wake-up session is inactive or the last wake-up session has ended.  Wake-up session is active but is currently not running.
Name	The configured name of the wake-up session. If a wake-up session was configured when creating a logging session, the name shown will be the logging session name.
Next start time	The time the receiver is configured to wake up next.
Next end time	The time the receiver is configured to power down next.
Remaining interv.	Number of remaining repetitions of the wake-up session.
 Delete	Press delete to permanently delete the corresponding wake-up session.
 Edit wake-up session	Press to edit the wake-up session.
 Create new wake-up session (copy)	Press to create a new wake-up session based on the existing wake-up session.
Activate	 The wake-up session is deactivated. Press to activate.  The wake-up session is activated. Press to deactivate.

Create new wake-up session 	Press to create a new wake-up session.
---	--

Wake-up session properties

The table below describes the content of the Wake-up session properties pop up box. Press on the underlined Wake-up session name to open the pop-up box.

Properties	Description
Name	The configured name of the wake-up session.
Session start	The start time and date of the first wake-up interval of this session.
Session end	The calculated power down time and date of the last interval of this wake-up session. <ul style="list-style-type: none"> • Select at to enter a specific power down time. • Select after to enter the interval length. • Select No end to configure an infinite wake-up session.
No. of intervals	The total number of repeats for the session.
Time between intervals	The time between power down of one interval and the power up of the next interval.
Interval length	The length of one wake-up interval.

Related topics

[GNSS management: New/Edit wake-up session](#)

[GNSS management / Site name and coordinates](#)

[How to configure a Wake-up session](#)


GNSS management: New/Edit wake-up session

Setting Descriptions

The table below describes the fields in the New/Edit wake-up session page. This page opens when creating a new Wake-up session with the Create new wake-up session button.

Setting	Description
Name	<p>Enter a unique name for the wake-up session.</p> <p>If the Wake-up session is created from a logging session, the default name is derived from the logging session name.</p> <ul style="list-style-type: none"> • Maximum number of characters allowed is 20. • Only certain ASCII characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <ul style="list-style-type: none"> • Spaces / blanks, as well as underscore (_) are allowed. • The wake-up name can not be edited, once a session has been created.
Wake-up at	<p>The date and time for the receiver to boot for the first time with this Wake-up session.</p>
Power down	<p>The date and time for the receiver to power down after the first wake up interval.</p> <ul style="list-style-type: none"> • After: Define the length of the wake up interval. • At: Define the end time and date for the first wake up interval. • No end: The receiver will not power down automatically after the wake-up session has started.
No. intervals	<p>The total number of repeats for the wake-up session.</p> <ul style="list-style-type: none"> • Select run to enter a number of repetitions for this wake-up session. • Select repeat infinitely to configure a wake-up session with no defined end. • Select run once to configure only one interval for a wake-up session.
Start next session	<p>Only shown when No. of intervals is set to run or repeat infinitely.</p> <p>Define the time between power down of one interval and the power up of the next</p>

	interval. The maximum time between 2 consecutive start times is 21 days.
Activate Wake-up session	Activate this check box to activate the wake-up session.

Save the settings by pressing . This will redirect to the Wake-up session overview page where all configured wake-up sessions are listed.

Related topics

[GNSS management: Wake-up sessions](#)

[GNSS management / Site name and coordinates](#)

Receiver setup

Receiver Setup: Overview

Configure all receiver related settings such as network connections, FTP push locations and the user management. Or use the tools to upgrade the receiver firmware, add new option keys or switch to your preferred language.

Menu option	Description
Network Connections	Configure the receiver IP and DNS settings to allow access via the internet. Selected devices such as mobile phones, modems and radios that can be used for mobile internet access to the receiver.
Access Management	Create new users and set the access level for the receivers web interface.
Spider and remote access	Configure and open remote access connections for OWI based software, such as GNSS Spider to the receiver.
Web server	Set the HTTP port number or configure secure access to the web interface via an SSL (Secure Socket Layer) connection.
DynDNS	Allow access to the receivers web interface when using a dynamic IP address by configuring and enabling the DynDNS functionality.
FTP server	Configure access to the receivers FTP server (SD card).
Device management	Create, configure or delete modem, radio and GSM devices to be used with the receiver.
Event log	Activate the sending of event emails that contain the event log information. Set the auto delete interval for all event log entries.
Power management	Configure the power up and low power behaviour of the receiver according to the intended use case.
Tools	Load new firmware or purchased options to the receiver, change the language or use the tools to format or reboot the receiver.

Network connections

Network connections: Overview

The Network connections page allows defining the access to the receiver via an internet connection.

Tab option	Description
Ethernet	Configure the Ethernet settings which will enable the receiver to be accessed via the internet.
Mobile internet	Configure access to the receiver via the internet with a mobile phone device (e.g.GSM).

Network connections: Ethernet


Background Information




Ethernet configuration enables the receiver to be accessed via the internet when an Ethernet cable is connected.

Setting Descriptions

The table below describes the settings that can be configured on the Ethernet tab.

Hostname	Description
Receivers hostname	<p>Enter a hostname (device name) for the receiver.</p> <ul style="list-style-type: none"> Only certain characters are allowed. <p>0123456789</p> <p>ABCDEFGHIJKLMNOPQRSTUVWXYZ</p> <p>abcdefghijklmnopqrstuvwxyz</p> <p>- (hyphen is allowed)</p> <p>When running the receiver in a LAN, the hostname allows access to the web interface without knowing the IP address assigned to the receiver by the DHCP server.</p> <p>The default hostname for each receiver is GRxxxxxxx, where xxxxxx is the serial number. DHCP is enabled per default. When first connecting the receiver to a LAN that runs a DHCP server, entering the default hostname in a browser window opens the receivers web interface. The user does not need to know the IP address assigned to the receiver.</p>

IP settings	Description
Obtain an IP address automatically	<p>Activate to obtain the IP address automatically using DHCP.</p> <p> For more information on how to access the web interface in a non-DHCP network, please refer to Setup in a non - DHCP network.</p>
IP address	<p>Enter the internet protocol address of the receiver.</p> <p>This field can only be edited if the Obtain an IP address automatically</p>

	<p>field is disabled.</p> <p>The IP address is a 32 bit number which must be obtained from the network administrator or the internet service provider. The format of the IP address is aaa.bbb.ccc.ddd where aaa is a value ranging from 001 to 223 and bbb, ccc and ddd are values ranging from 000 to 255.</p>
Subnet mask	<p>Enter the subnet mask assigned to the subnet the receiver is connected to.</p> <p>A subnet mask allows IP networks to be subdivided for security and performance purposes.</p> <p>This field can only be edited if the Obtain an IP address automatically field is disabled.</p>
Default gateway	<p>Enter the Gateway. This is the IP address of a local default IP router on the same network. It is used to forward traffic to destinations beyond the local network.</p> <p>This field can only be edited if the Obtain an IP address automatically field is disabled.</p> <p>A gateway is the connection or interchange point that connects separate IP networks. For example, a Local Area Network may need a gateway to connect it to the Internet. The format of the gateway is aaa.bbb.ccc.ddd, where aaa is a value ranging from 001 to 223 and bbb, ccc and ddd are values ranging from 000 to 255.</p>
DNS settings	Description
Preferred DNS server	The DNS (Domain Name System) server IP address which was obtained via DHCP if the option Obtain DNS address automatically field is checked. Otherwise the DNS server can be entered manually.
Alternate DNS server	The alternate DNS server IP address which was obtained via DHCP if the option Obtain DNS address automatically field is checked. Otherwise the DNS server can be entered manually.
Restore default values 	<p>Press to fill the form with factory default settings.</p> <p> The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.</p>
Renew DHCP lease 	Press to trigger a renewed IP address from the DHCP server.

Related topics

[Receiver setup: DynDNS](#)

Network connections: Mobile internet

Background Information

Use mobile internet configuration to configure mobile internet access (e.g. via GPRS device) to the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Mobile internet page.

Configure device for internet usage	Description
Device	<p>Select the device to be used to connect the receiver to the internet. All phone/modem devices configured in the device management with mobile internet capability are listed.</p> <p>When Not used is selected, all fields below are hidden.</p> <p>Note: To select a device, the device must be configured in advance via Device Management.</p>
Pin code	Enter the pin code for the used SIM card.
Puk code	<p>Enter the Puk code for the used SIM card. Usually this field can be left blank.</p> <p>The Puk code is a security code for the SIM card for some devices. The Puk code needs to be entered when the pin code has been entered incorrectly more than three times. The Puk code will unblock the SIM card.</p>
APN	Enter the access point name (APN) of a server from the network provider, which allows access to data services. Contact your provider to obtain the correct APN.
User name	Necessary to access certain APN's. Contact your provider for the APN user name.
Password	Necessary to access certain APN's. Contact your provider for the APN password.
IP address	Select a dynamic or static IP address to be used. For a static address enter the IP address manually.
Use as default gateway	The receiver can connect to the internet via the mobile internet device or the ethernet interface. Only one IP address can be sent to the DynDNS service and assigned to the receiver's host name. Per default, the Ethernet IP will be transmitted. Activate this check box to send the IP of the mobile internet device.

Related topics

[Receiver setup: Device Management: Overview](#)

[How to set up a mobile internet connection](#)

Access Management

Access Management: Overview

Access Management is used to control access to the receiver via the web interface and FTP.

Tab option	Description
User management	<ul style="list-style-type: none">• View configured users• Create new users• Delete users• Edit users details and password
Access settings	<ul style="list-style-type: none">• Configure the access restriction level for the web interface• Access a link to the FTP server access restrictions page
Create a new user	<ul style="list-style-type: none">• Set password• Configure the web interface user level• Configure the FTP server access level

Access Management: User management

Background Information





User management configuration allows the Administrator to




- View configured users
- Create new users
- Delete users
- Edit users details and password

Setting Descriptions

The table below describes the settings that can be configured on the User management tab.

Field	Description
User	The configured user name.
Web interface access	The users web interface access rights.
FTP server access	The users FTP server access rights.

 Delete	<p>Press delete to permanently delete the user.</p>  <p>This will delete all corresponding user information from the SD card. It cannot be undone!</p>
 Edit user	<p>Press to edit the selected users details and password.</p>
 Create new user (copy)	<p>Press to create a new user based on the existing user settings.</p>

Create new user 	<p>Press to create a new user.</p>
Restore default values 	<p>Restore the default user settings. This will delete all users and load the admin user with the default values.</p> <p>If the web interface access level is set to Restricted, then pressing this icon will redirect you to the login page. Login is then only possible with the default administrator settings.</p>  <p>The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary.</p>

Pressing the save button is not necessary.
When accepting the confirmation message, all settings on this page are overwritten with the default settings.

Related topics

[Access Management: Access settings](#)

[Access Management: New user / Edit User](#)

Access Management: Access settings

Background Information

The access settings allow the Administrator to

- configure the user access to the web interface
- Access a link to the FTP server access restrictions page

Setting Descriptions

The table below describes the settings that can be configured on the Access settings tab.

Field	Description
Access to Web interface is	<p>Set the security level for web interface access. If the access settings are changed you will be automatically logged out.</p> <ul style="list-style-type: none"> • Unrestricted <p>All settings and information in the web interface can be viewed and changed without login. This setting is very insecure and therefore only recommended</p> <p>for example on internal networks where access without official authorization is possible.</p> • Partially restricted <p>The user can see the Status information when opening the web interface in a browser window. Display of the Configuration settings requires a user name and password to log in. The settings available after login depend on the user status of the logged in user.</p> • Fully restricted <p>Requires a user name and password to show any information on the web interface. When the receiver URL is entered in a browser window, the login details have to be entered. The settings available after login depend on the user status of the logged in user.</p> <p>The Web interface access description below provides a summary of which pages will be available for each user depending on the access level.</p>
Set FTP access restrictions	<p>Press the configure the FTP server access restrictions link. The Receiver setup: FTP server page will open.</p>



If the access settings are changed, all users will be required to login again.

Web interface access description

The **Web interface access description** provides a summary of which menus will be available for each user depending on

- whether the selected **Access to Web interface is**: Unrestricted, Partially restricted or Fully restricted, and
- the selected **Web interface user level**: Administrator, GNSS manager, Status Viewer or None. The Web interface user level is configured via Receiver setup / Access Management: User management / Create [New User](#) or [Edit User](#).

Access to Web Interface is ...	Menu	Web interface user level			
		Administrator	GNSS manager	Status Viewer	None
Unrestricted	Status	no login required	no login required	no login required	no login required
	GNSS management	no login required	no login required	no login required	no login required
	Receiver setup	no login required	no login required	no login required	no login required
	Support	no login required	no login required	no login required	no login required
Partially restricted	Status	with login or guest login	with login or guest login	with login or guest login	with login or guest login
	GNSS management	with login	with login	no access	no access
	Receiver setup	with login	Limited access	Change password only	no access
	Support	with login	no access	no access	no access
Fully restricted	Status	with login	with login	with login	no access
	GNSS management	with login	with login	no access	no access
	Status	with login	Limited access	Change password only	no access
	Support	with login	no access	no access	no access

Related topics

[Receiver setup: FTP server](#)

New User / Edit User

Setting Descriptions

The table below describes the settings that can be configured on the New User / Edit User page.

Field	Description
User name	<p>Enter a unique user name.</p> <ul style="list-style-type: none"> • Maximum number of characters allowed is 30. • Only certain ASCII characters are allowed.
Password	<p>Input user password.</p> <ul style="list-style-type: none"> • Only certain ASCII characters are allowed. • The password length must be between 8 and 20 characters • The password should contain a mix of letters, numbers and symbols. • Note: If the logged in Administrator edits their user account, the web interface access level cannot be changed.
Confirm password	<p>Re-enter password to confirm.</p>
Web interface user level	<p>Select the web interface user level.</p> <ul style="list-style-type: none"> • None <p>This user has no access rights to the web interface in restricted mode. In partially restricted mode the user can see the sensor status. This functionality can be used for defining users with only FTP access.</p> <ul style="list-style-type: none"> • Status Viewer <p>The Status viewer can login and view the receiver status when the web interface access level is set to fully restricted.</p> <ul style="list-style-type: none"> • GNSS manager <p>This user is allowed to view the receiver status and can access and edit all settings in the GNSS management. The user can not access the receiver setup pages or the support menu.</p> <ul style="list-style-type: none"> • Administrator <p>The user can access all pages available in the receiver web interface and change all available settings</p> <p>Which web interface pages are visible to each user level is dependant on whether the selected Access to Web interface is: Unrestricted, Partially restricted</p>

	<p>or Fully restricted. Go to Receiver Setup / Access management / Access settings tab, to change this setting.</p> <p>The Web interface access description below provides a summary of which pages will be available for each user depending on the access level.</p>
FTP server access	<p>Select the FTP server access level.</p> <ul style="list-style-type: none"> • None <p>The user is not able to access the receivers SD card via a FTP connection.</p> • Read only <p>The user is able to view all folders and files on the receivers SD card via a FTP connection. The user cannot edit, delete or copy files on the SD card.</p> • Read / Write <p>The user has full access to the receivers SD card via a FTP connection. The user can view all files and folders, delete files, upload and download files.</p>

Web interface access description

The **Web interface access description** provides a summary of which menus will be available for each user depending on

- whether the selected **Access to Web interface is:** Unrestricted, Partially restricted or Fully restricted, and
- the selected **Web interface user level:** Administrator, GNSS manager, Status Viewer or None. The Web interface user level is configured via Receiver setup / Access Management: User management / Create [New User](#) or [Edit User](#).

Access to Web Interface is ...	Menu	Web interface user level			
		Administrator	GNSS manager	Status Viewer	None
Unrestricted	Status	no login required	no login required	no login required	no login required
	GNSS management	no login required	no login required	no login required	no login required
	Receiver setup	no login required	no login required	no login required	no login required
	Support	no login required	no login required	no login required	no login required

Partially restricted	Status	with login or guest login	with login or guest login	with login or guest login	with login or guest login
	GNSS management	with login	with login	no access	no access
	Receiver setup	with login	Limited access	Change password only	no access
	Support	with login	no access	no access	no access
Fully restricted	Status	with login	with login	with login	no access
	GNSS management	with login	with login	no access	no access
	Status	with login	Limited access	Change password only	no access
	Support	with login	no access	no access	no access

Related topics

[Access Management: User management](#)

[Access Management: Access settings](#)

Spider and remote access

Spider and remote access: Overview

Background Information

The Spider and remote access configuration page lists all ports on the GR10 receiver that are open for any OWI based tool to connect to the receiver and change the settings via OWI commands.

Leica GNSS Spider or other OWI based tools can be connected to the receiver via

- TCP/IP server
- TCP/IP client
- Serial port
- Radio
- GSM / Modem / CDMA

It is also possible to connect a receiver to the GNSS Spider site server via a USB connection. The receiver must be connected directly to the Spider site server using the USB cable. Use the default USB connection settings (IP address 192.168.254.2) to configure the site in Leica GNSS Spider.




It is recommended to configure two remote access ports as a minimum to utilise the GNSS Spider feature - backup communication. Detailed information on this topic can be found in the GNSS Spider online help.








Mozilla Firefox does not support the use of certain ports. Use a different internet browser if these ports need to be used. [Ports blocked by default in Mozilla Firefox browser.](#)

Setting Descriptions

The table below describes the fields in the Spider and remote access page.

Setting	Description
Icon	 Connection is active. Port is open.  Connection is inactive. Port is closed. To activate or deactivate a session press the Activate icon.
Allow connection via	The configured connection type that is used on GNSS Spider and the receiver.
Device	The configure device used for the remote access.
Port	The configure port on the receiver used for the remote access.
 Delete	Press delete to permanently delete the remote access port configuration.

 Edit Spider and remote port	Press to edit the remote access configuration. The remote access wizard will open.
 Create new Spider and remote port (copy)	Press to create a new remote access configuration based on the existing configuration.
Activate	<div style="display: flex; flex-direction: column; gap: 10px;"> <div data-bbox="724 383 761 416">  </div> <div data-bbox="807 360 1209 427"> The remote access is deactivated. Click to activate the stream. </div> <div data-bbox="724 472 761 506">  </div> <div data-bbox="807 450 1182 517"> The remote access is activated. Click to deactivate the stream. </div> </div>

Create new Spider and remote port 	<p>Click to open the Spider/remote access wizard.</p> <p>The wizard is a tool that guides you through the following stages of a remote access configuration:</p> <ol style="list-style-type: none"> 1. Connection type - Select if you want to connect the GR10 to the Spider site server via TCP/IP server, TCP/IP client, Serial port, Radio or GSM / Modem / CDMA - dial up 2. Device selection and configuration 3. Activation of remote access
--	--

Related topics

[Remote access wizard: Connection](#)

[Remote access wizard: Configure TCP/IP server](#)

[Remote access wizard: Configure TCP/IP client](#)

[Remote access wizard: Configure Serial port](#)

[Remote access wizard: Configure Radio](#)

[Remote access wizard: Configure GSM / Modem / CDMA-dial up](#)

[Remote access wizard: Summary](#)

Remote access wizard: Connection

Setting Descriptions

The table below describes the settings that can be configured on the Connection page.

Setting	Description
Connection type	Select the connection type that is needed for Leica GNSS Spider or other OWI based software to connect to the receiver.
TCP/IP server	This setting allows the receiver to work as a TCP server, allowing TCP clients to connect to the receiver's NET ports.
TCP/IP client	This setting allows the receiver to act as a TCP client and connect to a configured IP address and port. This way no port has to be opened in the firewall on the receiver side to allow clients to connect to it.
Serial port	This setting allows connecting the receiver directly to a PC's communication port via a GR10 data cable with a RS232 connector.
Radio	Use two, 2-way radios to allow Leica GNSS Spider or other OWI based software to configure the receiver.
GSM / Modem / CDMA - dial up	This setting allows Leica GNSS Spider or other OWI based software to use a modem to dial into a modem connected to the GR10 and configure the receiver.

Press  to change settings. Press  to continue to the next wizard step.

Press  to cancel and return to [Spider and remote access: Overview](#).

Remote access wizard: Configure TCP/IP server

Background Information

The receiver works as a TCP server, allowing TCP clients to connect to the receiver's ports, configure the receiver settings and receive LB2 data.

Setting Descriptions

The table below describes the settings that can be configured on the Configure TCP/IP server page.

Setting	Description
TCP/IP port	Enter the TCP/IP port of the receiver for Leica GNSS Spider or other OWI based software to connect to.
Limit access range	Select the range of IP addresses which are authorized to access the receiver. The available IP range is from 1.0.0.0 to 254.254.254.254.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [Spider and remote access: Overview](#) .

Remote access wizard: Configure TCP/IP client



Background Information

The TCP/IP client connection setting allows the receiver to act as a TCP client and connect to a configured IP address and port. This way no port has to be opened in the firewall on the receiver side to allow clients to connect to the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Configure TCP/IP client page.

Setting	Description
Server IP address	Enter the IP address or URL of the Server to connect to. The IP range is from 1.0.0.0 to 223.255.255.254.
TCP/IP port	Enter the TCP/IP port on the Server for the receiver to connect to.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [Spider and remote access: Overview](#) .

Remote access wizard: Configure Serial port

Background Information

The Configure Serial port settings, allow configuring a connection to a computer, for when the GR10 receiver is connected directly via a serial cable.

The settings for the Com port on the computer must match the settings for the serial connection on the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Configure serial port page.

Setting	Description
Port name	Serial port is always selected here. The field can not be edited.
Baud rate, Parity, Data bits, Stop bits	Select the port settings for the communication between the receiver and the PC's Com port.
Flow control	Defines which kind of handshake is used. <ul style="list-style-type: none">• None: No handshake.• RTS/CTS: Handshake in both directions.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [Spider and remote access: Overview](#) .

Remote access wizard: Configure Radio

Background Information

Radios can be used to connect the receiver to Leica GNSS Spider or other OWI based software, if the radios are configured for two-way communication.



The radio on the Leica GNSS Spider side must be pre-configured in a way that it can be addressed as serial device.

Go to [Receiver Setup / Device Management](#) page to change the communication settings of a device if needed.

Setting Descriptions

The table below describes the settings that can be configured on the Configure Radio page.

Setting	Description
Device	Select the radio device.
Channel	The radio channel can only be changed if the radio is attached. If the configured radio device is not attached, the device will be stored with the default channel 1 (or the last stored channel when the device was attached) and a message is displayed in the event log.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.

Press  to cancel and return to [Spider and remote access: Overview](#) .

Remote access wizard: Configure GSM / Modem / CDMA

Background Information

The settings on this page allow Leica GNSS Spider or other OWI based software to use a modem to dial into a modem connected to the GR10 and configure the receiver.


GSM (Global System for Mobile communications) is a telecommunication standard for transmitting data packages to mobile phones.

CDMA is a telecommunication standard for transmitting data packages using the Internet protocol.

Setting Descriptions

The table below describes the settings that can be configured on the Configure GSM / Modem / CDMA page.

Setting	Description
Device	Select the device to be used. The list shows all GSM / Modem / CDMA devices configured in the device management.
PIN code	Enter the PIN (personal identification number) code for the device's SIM card.
PUK code	The PUK (PIN unblock key)code is a security code for the SIM card used on some devices. The PUK code needs to be entered when the PIN code has been entered incorrectly more than three times and the SIM card is blocked. The PUK will unblock the SIM card. This field can normally remain empty.

Press  to go back to the previous wizard step. Press  to continue to the next wizard step.


Press  to cancel and return to [Spider and remote access: Overview](#) .


Remote access wizard: Set port status


Setting Descriptions

The table below describes the settings that can be configured on the Set port status page.

Setting	Description
Activate remote access	Deactivate the port configuration if you do not want to open the port immediately.

Press  to go back to the previous wizard step.

Press  to store the new remote access configuration and return to [Configuration: Spider and remote access: Overview](#).

Press  to cancel and return to [Configuration: Spider and remote access: Overview](#).

Receiver setup: Web server


Background Information

In order to allow secure connections to your receiver web interface, the GR web server is SSL (Secure Socket Layer) capable. Enable HTTPS in order to activate an SSL connection.

After you have accepted the certificate, the SSL connection is established. A padlock icon is shown in many browsers indicating that an SSL connection is being used.

What is SSL used for?

A common misconception is that SSL certificate's main purpose is to protect the data that is being sent over the internet. But really this is just one of the features of SSL. Another main purpose of SSL is to certify your web site identity by a trusted third party, meaning it proves that your website is actually what it claims to be – your web site. The "trusted third party" who signed the SSL certificate, is the guarantee that a user is actually on your receivers web interface and not some other site.

To see more information on the SSL certificate of a secure website, click on the  icon in one of the browsers corners. This will open a pop up box showing information about the web site and the trusted third party that issued the certificate.

For the standard SSL certificate on your receivers web interface, Leica Geosystems AG will be shown as the third party that issued the SSL certificate.

Where do I get an SSL certificate?

Certificates authorized by third parties can be free or cost up to \$1,500 per year.

A large number of providers are selling SSL certificates but there 6 major SSL certificate providers as listed below. If you buy an SSL certificate it will most likely be from one of these providers or re-sellers of one of them. All 6 have 128 bit key encryption.


The primary SSL certificate providers are:

- Verisign
- Thawte
- InstantSSL
- Entrust
- Baltimore
- Geotrust

Besides the purchased SSL certificates, there are also self-signed certificates which do not cost anything. Self signed certificates work just as well as purchased ones but they are missing the authorization of the third party. Self signed SSL certificates mainly guarantee the protection of your data when sending it over the internet. You will know that a self signed certificate is used when you see an authentication warning in the browser window when accessing the page which has to be accepted before the web site opens. Such a self signed certificate is the default that comes with the GR10 web site. The URL of the web site is not verified (as this is different for every receiver) and the certificate is self signed by Leica Geosystems AG.

How do I install my SSL certificate and key?

When you have created an SSL key and an SSL certificate you will have two files that can be opened with a text editor such as note pad.

1. Open the SSL certificate (CRT file) and copy the text into the SSL certificate window on the Receiver setup / Web server page on your receivers web interface.
2. Open the key file in the same way and copy / paste the text into the SSL key window on the same page.
3. Store the settings.
4. Your certificate should now be installed. Activate the HTTPS settings and re-open the web interface. It should open as an HTTPS secure site. Click on the  icon in the browser and check the certificate information.



Mozilla Firefox does not support the use of certain ports. Use a different internet browser if these ports need to be used. [Ports blocked by default in Mozilla Firefox browser.](#)

Setting Descriptions


The table below describes the fields in the Web server page.



The keyboard short cuts **CTRL +C** and **CTRL +V** can be used to copy and paste the **SLL certificate** and **SSI key** into the web interface.

Setting	Description
Protocol	<p>Select the protocol</p> <p>HTTP: Use standard hypertext transfer protocol communication</p> <p>HTTPS: Use secure HTTP communication</p> <p>If HTTPS is activated, the browser will automatically redirect to the standard HTTPS port if not configured otherwise.</p>
Custom port	<p>Enter a custom port number if you wish to override the default settings. The default ports are used automatically if the field is left blank.</p> <p>Default HTTP port: 80</p> <p>Default HTTPS port: 443</p> <p>If the default ports are not used, then the port number needs to be entered in the browser window when trying to access the web interface.</p>
SSL certificate	<p>Paste a signed certificate in X.509 PEM format here.</p> <p>Open SSL License</p> <pre>/* ===== * Copyright (c) 1998-2004 The OpenSSL Project. All rights reserved. * * Redistribution and use in source and binary forms, with or without * modification, are permitted provided that the following conditions * are met: * * 1. Redistributions of source code must retain the above copyright * notice, this list of conditions and the following disclaimer.</pre>

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<p>SSL key</p>	<p>Paste an RSA private key in PEM format here.</p> <p><u>Original SSLeay License</u></p> <p>-----</p> <p>* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)</p> <p>* All rights reserved.</p> <p>*</p> <p>* This package is an SSL implementation written</p> <p>* by Eric Young (eay@cryptsoft.com).</p> <p>* The implementation was written so as to conform with Netscapes SSL.</p> <p>*</p> <p>* This library is free for commercial and non-commercial use as long as</p> <p>* the following conditions are aheared to. The following conditions</p>

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Restore default values	<p>Press to fill the form with factory default settings.</p>   The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.
-------------------------------	---

Receiver setup: DynDNS

Background Information

The DynDNS page allows the configuration of a dynamic DNS service to ensure access to the web interface of a receiver with a dynamic IP address. This is especially useful when the receiver is accessed via mobile internet connection that in most case provides only dynamic IP addresses.

- **[When to use DynDNS](#)**

The DynDNS functionality allows clients to use an internet domain name to address a GR10 receiver with a dynamic IP address. The typical use case for this functionality is a receiver with an internet connection via a GPRS / mobile internet device. In this setup the GR10 receiver will have a different IP address every time the internet connection is established.

Another use case is a GR10 receiver behind a router in a local network, where the router is connected to the internet and regularly gets an updated IP address. The GR10 receiver will check every 12min for a new IP address on the router and updates the DynDNS settings when necessary.

- **[System Requirements](#)**

The table below describes the system requirements necessary for DynDNS.

Requirement	Description
DNS Server	To use the DynDNS service, it is necessary to have a DNS server installed in same network as the receiver. A DNS server can find the IP address assigned to a hostname. This is necessary because although the DNS server knows the hostname of the DynDNS service, the IP address of the service can change. The DNS server makes it possible to find the DynDNS server IP address, thus allowing access to the DynDNS service.
Register for a DynDNS account	You need to register for a DynDNS account to use this functionality. The GR10 allows the use of the three most common DynDNS services on the internet. At registration enter the hostname you want your receiver to be accessed with. Enable wildcard use. Mail exchanger functionality is not necessary.
Available ports	To use the full web interface functionality you need to apply for an APN profile that includes the APN (access point name) and a list of open ports from your provider. Make sure that for Email and FTP push, the required ports from your SMTP and FTP server are available. Also make sure to change the HTTP port (Receiver setup / Web server), the FTP control port and FTP data port range (Receiver setup / FTP server) to those open ports available from your provider.


DynDNS step-by-step

Follow this procedure to enable using DynDNS on the GR receiver:

Step	Action
1	Register at DynDNS service: Go to one of the supported DynDNS services and register for an account. At registration enter the hostname you want your receiver to be accessed with. Enable wildcard use. Mail exchanger functionality is not necessary. Click here for further information on Hostname rules .
2	Get APN profile from your Internet Service provider: In order to connect to the internet from your sensor, you need to get the APN from your provider and also a list of all ports that are open and available for use. This profile needs to be activated for each SIM card you want to use for internet access on your receiver. When using Email and FTP push, make sure that the relevant SMTP and FTP ports are open. For DynDNS service also either port 80, 8245 or 443 have to be available. The profile also needs to contain the IP of at least one DNS server that is run by your provider.
3	Apply correct port numbers: After you received a list of the available ports, go to Receiver setup / Web server and change the HTTP port accordingly. Also the FTP control port and data port range might need to be changed.
4	Connect a GRPS phone to the receiver: To connect to the internet via GPRS please refer to Receiver setup / Network connections and apply the correct configuration on the mobile internet tab. Make sure to activate the mobile internet gateway as the default gateway.
5	Configure DynDNS functionality: Enter all necessary settings as described below. After pressing "Store", the receiver should connect to the DynDNS service and show the current IP of the receiver in the message log.

Setting Descriptions

The table below describes the settings that can be configured on the DynDNS page.

Field	Description
Service provider	<p>Lists all available DynDNS service providers. Select the provider that the hostname of your receiver has been registered with.</p> <p>The GR10 supports</p> <ul style="list-style-type: none"> • DynDNS.com • No-ip.com • Two-dns.de/en
Hostname	<p>Enter the hostname that the receiver's web interface is accessed with from the internet. This is the hostname that has been registered at the selected DynDNS service.</p> <p>Click here for further information on Hostname rules.</p>
Username	<p>Enter the user name for login at the DynDNS service.</p> <p> The characters allowed in a username are a subset of the ASCII character set, and include the characters a through z, A through Z, digits 0 through 9, and the hyphen. This rule is known as the LDH rule (letters, digits, hyphen). The use name is interpreted in a case-independent manner. Labels may not start or end with a hyphen, nor may two hyphens occur in sequence.</p>
Password	Enter the password for login at the DynDNS service.

Related topics

[Receiver setup / Network connections: Ethernet](#)

[How to use DynDNS service on receiver](#)

Receiver setup: FTP server

Background Information



The FTP server configuration page is used to enter the necessary information for accessing the receivers FTP server (SD card). The FTP server can also be accessed via a TCP/IP connection over USB cable. The settings for this connection are hard wired. For more information on setting up a USB connection, see [Setup via Web Interface over USB](#).



Mozilla Firefox does not support the use of certain ports. Use a different internet browser if these ports need to be used. [Ports blocked by default in Mozilla Firefox browser](#).

Setting Descriptions

The table below describes the fields in the FTP server page.

Setting	Description
Enable access to FTP server	Turn the FTP server on or off on the receiver. If disabled, FTP access to the receivers SD card is not possible.
Allow anonymous access	Activate to allow read only access to anonymous users.
FTP control port	Enter the TCP/IP port where the FTP server listens for incoming connections. Default: 21
FTP data port range	Enter the TCP/IP port range used for data transfers. Default: 50000 - 51000
Session timeout	Select the time in seconds after which the FTP sever drops inactive connections. Default: 180 A maximum of 6 simultaneous connections is possible on the GR10 FTP server.
Restore default values 	Press to fill the form with factory default settings and store.  The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.

Press the save icon  to store the settings.

Related topics

[Setup via Web Interface over USB](#)

Device Management

Device Management: Overview

Device Management is used to create, configure or delete modem, radio and GSM devices to be used with the receiver.

Tab option	Description
Modem / Phone	<ul style="list-style-type: none">• View all default and user defined modem and phone devices• Create new modem and phone devices• Delete modem and phone devices• Edit modem and phone device details• Check which modem or phone devices are currently in use
Radio	<ul style="list-style-type: none">• View all default and user defined radio devices• Delete radio devices• Check which radio devices are currently in use






Device Management: Modem / Phone

Background Information

Create, configure or delete modem and phone (GSM) devices to be used with the receiver.

Setting Descriptions

The table below describes the settings that can be configured on the Modem / Phone tab.

Settings	Description
Icon	 Device is in use. If a device is in use it cannot be deleted.
Name	The device name. Click the device name to view the currently configured device communication settings.
Type	The device type, default or user defined.
Group	The device grouping, GSM/GPRS, CDMA, TDMA, UMTS or modem.
Port	The port the device can be connected to.
 Delete	Press delete to permanently delete the device.
 Edit device	Press to edit the device settings. The edit device wizard will open.
 Create new device (copy)	Press to create a new device based on the settings of an existing device.
Restore all default phones and radios 	Press to restore the default values. <ul style="list-style-type: none"> • All device settings for default devices are restored. • All deleted default devices are restored. • All user defined device will be kept.

Related topics

[Device Management: Radio](#)




Device Management: Radio

Background Information

View and delete radio devices to be used with the receiver.

Setting Descriptions

The table below describes the settings that can be viewed on the Radio tab.

Settings	Description
Icon 	Device is in use. If a device is in use it cannot be deleted.
Name	The device name. Click the device name to view the device communication settings.
Port	The port the device can be connected to.
 Delete	Press delete to permanently delete the device.
Restore all default phones and radios 	Press to restore the default values. <ul style="list-style-type: none"> All deleted default devices are restored.

Related topics


[Device Management: Modem / Phone](#)

Device Management: New / Edit modem/phone device

Setting Descriptions

The table below describes the settings that can be configured on the New / Edit modem/phone page.

Settings	Description
Device type	Lists the device type.
Device name	Enter or edit the device name.
Mobile internet capable	Configure if the device can be used to access the internet.
Baud rate, Parity, Data bits, Stop bit, Flow control	Set the device communication settings.

Press  to continue to the next wizard step.

Press  to cancel and return to [Device Management: Modem / Phone](#)


Device Management: GPRS / Internet initialization

Setting Descriptions

The table below describes the settings that can be configured on the GPRS / Internet initialization page.

This page is only shown when [Mobile internet capable](#) is set to **Yes** on the New / Edit modem/phone page.

Settings	Description
Init string 1	Enter a valid AT command to initialize the device.
Init string 2	Enter a valid AT command to initialize the device.
Connect string	Enter a valid AT command to connect to the internet.

Press  to continue to the next wizard step.


Press  to cancel and return to [Device Management: Modem / Phone](#)


Device Management: GSM / CSD initialization

Setting Descriptions

The table below describes the settings that can be configured on the GSM / CSD initialization page.

Settings	Description
Init string 1	Enter a valid AT command to initialize the device.
Init string 2	Enter a valid AT command to initialize the device.
Dial string	Enter a valid AT command to connect to the device.
Hangup string	Enter a valid AT command to end the network connection.
Escape string	Enter a valid AT command to switch into command mode before using the hangup string.

Press  to change settings.

Press  to save the logging session.

Press  to cancel and return to [Device Management: Modem / Phone](#)

Receiver setup: Event log

Background Information

The Configuration: Event log page is used for configuring and editing the settings for sending automatic event emails containing all messages from the event log.

The page also allows settings the automatic delete interval for all event log messages.






Setting Descriptions

The table below describes the settings that can be configured on the Event log page.

Cleanup	Description
Autodelete event log entries	Select the time interval after which event log messages are deleted from the receivers data base.

Event log emailing	Description
Enable event email	Activate to send the content of the event log via email. When activated the Event log emailing settings are visible and can be edited.

Send event email to	Enter a single email address or a list of email addresses (separated by semicolon ";") to send the event log to.
Email address of sender	Enter the email address to be displayed as the sender when emailing the event log.
Mail server name (SMTP)	Enter the IP address or the domain name of the SMTP server to be used.
Mail server port	Enter the TCP port number of the SMTP server (commonly used defaults: 25 or 587).
Mail server username	Enter the username as configured for the SMTP server account.
Mail server password	Enter the password as configured for the SMTP server account.
Send event email every	Select the interval to send event email. The email interval will be aligned with midnight UTC time. This means for example, if you select a time interval of 6hrs and your local UTC time is +2hrs, event emails will be sent at 8am, 2pm, etc...

Save changes 	Press to store all event log and email settings.
Send test email 	Press to send a test email using the entered settings. Check the event log for results.
Restore default values 	Press to fill the form with factory default settings.  The restore default button fills all fields with the default values and stores these values. Pressing the save button is not necessary. When accepting the confirmation message, all settings on this page are overwritten with the default settings.
Clear complete event log 	Press to permanently remove all entries from the event log. This can not be undone!



Please note that verbose messages are not included in Event emails. Go to [Status / Event log](#), adjust the filter settings to include verbose messages and use the download button in order to have all messages, including the verbose messages. This procedure should be applied before contacting support.



Verbose mode will be deactivated after closing the browser, logging out of the receiver, or rebooting the receiver.

Related topics

[Status: Event log](#)

Receiver setup: Power management

Background Information

Configure the power up and low power behaviour of the receiver according to the intended use case.

Setting Descriptions

The table below describes the settings that can be configured on the Power management page.

Boot receiver on pulse to port	Description
Serial (P1)	Determines if the receiver powers up when a pulse is received at the serial port (P1).

Power failure recovery	
Reboot after power failure	<p>Select the power failure recovery setting.</p> <ul style="list-style-type: none"> • Always <p>After a power failure, the system will immediately start up even if there is very low power available. This should only be selected when the system is powered by an external main AC/DC power source. This option is not recommended for systems powered by batteries as it could affect a deep discharge and even destruction of the battery.</p> <ul style="list-style-type: none"> • Sudden loss only <p>After a power failure, the system only starts up again if an abrupt power failure occurred. For example, after a short circuit or unplugging batteries by mistake. The system will not power up automatically following a slow loss of power such as an external battery running flat.</p>

Receiver setup: Tools

Receiver Setup: Tools - Overview






The Receiver Setup: Tools page allows:

Tab option	Description
Tools	Power down and reboot the receiver, format the SD card, initialise the ephemeris and almanac and reset and store the receiver settings.
Firmware management	Load and delete firmware files.
Option management	Load or delete options on the receiver. This page lists all purchased options that are currently installed on the receiver.
Language management	Upload language files from the computer to the receiver and select which language should be used.
Receiver settings backup	Backup and upload receiver settings.

Receiver setup: Tools

Setting Descriptions

The table below describes the fields in the Tools tab.

Action	Icon	Description
Power down		Press to power down the receiver. After power down, the web interface will redirect to the Leica Geosystems GR10 web site.
Reboot		Press to reboot the receiver. After reboot, you will be redirected to the Web interface login page.
Format SD card		Press to format the SD card. This deletes the complete SD card content including all data stored for each logging session.
Format receiver settings		<p>Select from the list box:</p> <ul style="list-style-type: none"> Reset all: Press to reset all receiver settings to their default values. This includes all communication settings. Remote access to the receiver might no be possible after the reset. When the receiver settings are reset, all logging sessions and data streams are deleted. View the GR10 default settings. Keep communication settings: Press to reset all receiver settings except the communication settings. Always use this setting when formatting the receiver settings for a remotely controlled receiver. The following receiver settings will not be overwritten <ul style="list-style-type: none"> Spider and remote ports Network connections - Ethernet Network connections - Mobile internet DynDNS settings Web server settings The device used for mobile internet setup (changed default devices and user defined devices)
Initialize measurement engine		Press to delete all current ephemeris and almanac data and restart the position computation.



Press the associated icon to execute the selected action.



The actions, **Reboot**, **Format SD card**, **Format receiver settings** and **Initialize measurement engine**, if executed, will result in the receiver rebooting.

Related topics

[Appendix F: GR10 default settings](#)


[Format receiver settings via Web interface step-by-step](#)

[Format receiver settings via instrument buttons step-by-step](#)

Receiver setup: Firmware management

Background information

In order to install a new firmware version, it must be first loaded onto the SD card. Press **Upload new firmware file**

, to select the firmware file and upload it.

For further information please read the following topics



- [GR10 Software: Overview](#)
- [Is my firmware up to date?](#)
- [Firmware upgrade step-by-step](#)
- [Firmware upgrade using Leica GNSS Spider](#)
- [Loading a Language file](#)



Please ensure that there are no power interruptions during the firmware upgrade !

Setting Descriptions

The table below describes the fields in the Firmware tab.

Firmware	Description
Loadable firmware files	The name of the firmware file. All firmware files loaded onto the SD card are shown.
Version	The firmware version number.
Location	The location of the firmware file.
Delete 	Press to delete the firmware file.
Install 	Press to install the firmware file.

Upload new firmware file 	Press to upload a new firmware file from the computer to the receiver. Opens the File upload page.
---	---

Available firmware updates	Description
Available firmware updates	The name of the firmware file available for download from the Leica web site. This field shows if there is a later firmware version available on the Leica web site than the one installed on the receiver.
Version	The firmware version number.
Required maintenance date	Installing new firmware is only possible if a valid maintenance key is available.
Download from Leica website	The link starts a download of the latest firmware from the Leica website.

Related topics

[Receiver setup: File upload](#)




Receiver setup: Option management


Background Information

The Option management page allows the installation and deletion of options, and provides an overview of all purchased options that are currently installed on the receiver.

Setting Descriptions

The table below describes the information that is contained in the Options tab.

Field	Description
Install option keys	<p>To install a new option either:</p> <ul style="list-style-type: none"> • Key: Enter the option key. The key is contained in the option file. You can copy and paste the key into the Key field. <p>or</p> <ul style="list-style-type: none"> • Upload new option file  : Press to upload a new option from the computer to the receiver. Opens the File upload page.
Delete 	Press to delete the option file.
Install 	Press to install the option file.

Delete option key	
Option	All options currently installed on the receiver are listed. Press  icon to delete an option.

GR10 options

Available options for a GR10 receiver:

Article number	Option	Description
774411	GRL100, GPS L5	Enables GPS L5 tracking.
774422	GRL101, GLONASS	Enables GLONASS L1+ L2 tracking.
774424	GRL103, Galileo	Enables Galileo, L1,E5a, E5b and AltBOC tracking.
774428	GRL107, RINEX	Enables RINEX logging.
774429	GRL108, Extended formats	Enables BINEX / CMR / CMR+ streaming.
774430	GRL109, 2-20Hz logging and streaming	Enables streaming data with up to 20Hz.
774431	GRL110, 50Hz logging and streaming	Enables streaming data with up to 50Hz. Requires 774429 GRL109.
774432	GRL111, FTP Push	Enables FTP Push.
774436	GRL115, Multi client	Enables up to 10 client connections per data stream (TCP/IP server setup).
778851	GRL116, Wake-up	Enables the wake-up functionality.
778852	GRL117, Extended OWI	Allows external OWI software to connect and send commands.

Related topics

[Status: Receiver options](#)

[Receiver setup: File upload](#)

Receiver setup: Language management



Background information


The language management page allows selecting which language will be used on the receiver. Only one language can be chosen at a time and the selection is valid for all users.

The default language is English. English will always be used if the provided language file does not contain a translated token. For more information on translating please contact your local Leica Geosystems [Dealer/Distributor](#) in the country where you bought your product.

Setting Descriptions

The table below describes the fields in the Languages tab.

Setting	Description
Language	Lists all language files loaded onto the receivers SD card.
Code	A 2 letter abbreviation for the language file.
Release date	The release date of the language file. The English language file is always released with the firmware file. No release date is listed for English.
Version	The version number.
 Delete	Select to delete the language file from the SD card. The default English language file can not be deleted.
 Install	Press to install the language file.

Upload new language file 	Press to upload a new language file from the computer to the receiver. Opens the File upload page.
---	--

Related topics

[Receiver setup: File upload](#)

Receiver setup: Receiver settings backup

Background information

The Receiver settings backup page lists all receiver setting files loaded onto or stored on the receivers SD card. A receiver settings file contains the complete system configuration of a GR10 receiver.

With the backup functionality the receiver settings can be stored for archiving or the file can be used on other GR10 receivers if the configuration is to be the same on several receivers. The system configuration is stored in a zipped file.






The receiver will always create a backup of the current receiver settings before installing a new receiver settings file. This backup file is then listed in the **Available receiver settings** list.





Please check the event log after installing a receiver settings file. The event log will show if the installation was successful.


Setting Descriptions

The table below describes the fields in the Receiver settings backup tab.

Setting	Description
Available receiver settings	Lists all receiver setting files loaded onto or stored on the receivers SD card.
Delete 	Press to delete the backup settings file.
Download 	Press to download the file from the receiver to the computer.
Install 	Press to install the settings on the receiver.

Backup current receiver settings 	Press to create a backup (.zip file) of the current receiver settings.
Upload new receiver settings 	Press to upload a new receiver settings file from the computer to the receiver. Opens the File upload page.

File upload

1. Press **Browse...** to select the new option, language, antenna, receiver configuration or firmware file from the computer.
2. Press the upload icon  to complete the upload of the new file from the computer to the receiver.

Support

Support: Overview

The Support menu options allow you to send the settings of your receiver and debug information to Leica NRS support in order to help solve receiver problems.

Menu option	Description
Properties	Activate the automatic sending of dump file to NRS support everytime the receiver stops operating.
Support tool	Enter a support case and send to NRS support with a file containing the receiver configuration and settings.
Leica Active Assist	Allow access to your receivers web interface by Leica support staff.
Links	A list of helpful links.

Support: Properties

Background information




Activate the automatic sending of dump files to Network Reference Stations support every time the receiver stops operating.



The FTP push to Leica NRS support only works if there is an active connection to the internet. If the internet connection is down, and the FTP push fails, then the dump files can be found in the **Transfer / Settings** folder on the SD card.

Setting Descriptions

The table below describes the settings that can be configured on the Properties page.

Support tool	Description
Automatic mode	<p>Select to activate Automatic mode.</p> <p>If activated and the receiver has a problem while operating, it will automatically retrieve the necessary information and send it via FTP push to NRS support.</p> <p> Please note that no email is sent to NRS support. The pushed files are checked by the NRS team on a regular basis.</p>
Operator, Company, Country, Email	<p>Enter the details in each field and press . The information will be transferred to the Support: Support tool page. If the automatic mode is not activated then these fields must be filled in.</p>
Leica support access	Description
Enable Leica support access	Activate to allow a Leica Support employee access to the receiver's web interface.
Binary data logging	Description
Enable binary data logging	<p>Activate to enable LB2 binary data logging.</p> <p> After a receiver reboot, this setting will be disabled.</p>

Related topics

[Support: Support tool](#)

[Directory Structure of the Memory Device](#)

Support: Support tool

Background information

Enter a support case and send to Network Reference Stations support with a file containing the receiver configuration and settings.




All fields except the **Existing incident ID** field must be filled in before the Support Tool can be used in manual mode.

Setting Descriptions

The table below describes the settings that can be configured on the Support tool page.

Support tool	Description
Operator, Company, Country, Email	This information is filled in via the Support / Properties page.
Subject	Enter a short description of the support incident.
Description	Enter a detailed description and work flow of the support incident. The more information that is supplied at this stage the quicker we can assist you.
Existing incident ID	Enter the incident ID if a support case already exists for the current receiver problem.



Press the Mail icon  to send your support question to Network Reference Stations support.



In the case that the Leica SMTP server cannot be reached, e.g. due to network connectivity issues on the reference site, the zip file containing the receiver settings can be downloaded from the **Transfer / Settings** directory on the SD card. After the manual download to the local PC the file can be sent via email to Leica NRS Support.

Related topics

[Support: Properties](#)

[Event log messages](#)

[Directory Structure of the Memory Device](#)

Support: Leica Active Assist

Background information

During a support incident you may be asked by Leica support staff to connect to **Active Assist**.

Active Assist allows access to your receiver's web interface by Leica NRS support staff in a protected network.

Press the Connect button in order to initiate the connection to the Active Assist server.



For using Active Assist the Leica NRS support staff needs to know the serial number of your receiver.

This means that Active Assist can only be used if a support incident has been created and the receiver's serial number has been forwarded to Leica NRS support.



Disconnect button

If the connection to the Active Assist server was accepted you will automatically be logged out from the web interface. Leica NRS support staff will inform you when the Active Assist session has been finished. Please do not log in during an Active Assist session as this may disrupt the Active Assist connection.

When being connected to Active Assist you can disconnect from the server using the Disconnect button. Please be aware that this will stop any support activities, which might be taking place. Please inform Leica support before disconnecting from the Active Assist server.

7: GR10 Software

Software: Overview

Software for GR10

Software type	Description
GR10 firmware (GR10_x.xx.fw)	<p>The GR10 firmware is called RefWorx.</p> <p>This important system software covers the basic functions of the instrument.</p> <p>The onboard web server is integrated into the firmware and cannot be deleted.</p> <p>The English language is integrated into the firmware and cannot be deleted.</p>
Language software (REF_LANG.sxx)	<p>Numerous languages are available for the instrument web server. Language software is also referred to as system language.</p> <p>The system software enables a maximum of three languages which can be stored at any one time - the English language and two other languages. The English language is the default language and cannot be deleted. One language is chosen as the active language.</p>
Windows CE Operating System (GR10_WinCE_x.x.xx.fw)	<p>Windows CE is the underlying operating system on the GR10.</p>
Measurement Engine firmware (ME4.xx.fw)	<p>This file contains the Measurement Engine firmware for the GR10. This firmware is always included in the GR firmware file however it is also possible to load this file separately should an update become available.</p>

Software upload

Software for	Description
GR10	<p>All software is stored in the System RAM of the instrument.</p> <p>A new firmware file must be uploaded to the SD card before installation. The file can be uploaded via:</p> <ul style="list-style-type: none">• the GR10 Web interface.• direct copy to the SD card using a computer.• direct FTP access to the SD card. <p>After uploading, the firmware must be transferred from the SD card to the System RAM via the GR10 Web interface. For detailed step-by-step instructions, refer to Firmware upgrade step-by-step.</p> <p>Leica GNSS Spider can also be used to install the firmware. Loading the firmware to the SD card and installing it on the instrument is done in one step when using GNSS Spider. Refer to the Leica GNSS Spider Online Help for more information.</p>

Receiver Information

Important information regarding the instrument details, installed options and firmware can be found on the [Status / Receiver Information](#) page on the GR10 Web interface.

Related topics

[Is my firmware up to date?](#)

[Firmware upgrade step-by-step](#)

[Firmware upgrade using Leica GNSS Spider](#)

[Loading a Language file](#)

[Status: Receiver Information](#)

[Receiver setup: Firmware management](#)

[Receiver setup: Language management](#)

Is my firmware up to date?

If the GR10 is connected to the internet, the web interface automatically notifies the user if a new firmware version becomes available. This message appears in the following places:

- in the **Event log**
- on the **Status / Receiver Information** page
- on the **Receiver Setup / Tools / Firmware** page

The [Firmware management](#) page allows the user to upload the latest available firmware file directly to the GR10's SD card.

Related topics

[GR10 Software: Overview](#)

[Firmware upgrade](#)


[Status: Event log](#)

[Status: Receiver Information](#)

[Receiver setup: Firmware management](#)

Firmware upgrade step-by-step

Follow these steps to complete a firmware upgrade.

Step	Description
	Please ensure that there are no power interruptions during the firmware upgrade !
1	Maintenance End Check
2	Obtaining the new firmware
3	Copy Firmware File to the SD Card
4	Install the firmware

1: Maintenance End Check

The firmware is protected and can only be loaded onto instruments with a valid firmware (software) Maintenance. To check the Maintenance End date, open the Web Interface and go to the [Status / Receiver Information](#) page.

If the Maintenance End date shown is later than in the corresponding release notes, then this firmware can be loaded.

If the Maintenance End date is no longer valid, then please contact your local Leica Representative to learn about Customer Care Packages (CCPs) that include software maintenance so that you can benefit from the latest software improvements.

2: Obtaining the new firmware



The firmware can be obtained in the following ways:

- Using the web link in the GR10 Web interface on the **Receiver Setup / Tools / Firmware management** page. This link copies the latest available firmware file to the computer.
- using the MyWorld web portal: <https://myworld.leica-geosystems.com/irj/portal>
- on DVD from a local Leica Selling Unit or Dealer

3: Copy Firmware File to the SD Card

The firmware must be uploaded to the SD card before installation. The file can be uploaded via:

The Web Interface

Step	Description
1	Go to the Receiver Setup / Tools / Firmware page.
2	Click the Upload new firmware file  button.
3	Click the Browse... button and select the new firmware file.
4	Click the Upload  button to copy the file to the SD Card.
5	You will be directed back to the Firmware management page once the file upload is complete.

Using a FTP client

Step	Description
1	Open an FTP client such as Windows Explorer or any other software capable of establishing an FTP connection.
2	Enter the IP address (hostname) of the GR10 and the username and password of a user with FTP server read/write access.
3	Copy the firmware file into the Transfer / Firmware folder on the SD Card.


SD Card reader

Step	Description
1	Insert the SD card into your PC or a SD Card reader.
2	Copy the firmware file into the Transfer / Firmware directory on the SD Card. This can be done with Windows explorer or any other PC software.
3	Insert the SD card into the GR10 and turn on the instrument.

4: Install the firmware

After uploading, the firmware must be transferred from the SD card to the System RAM via the Web interface.

Prior to starting the installation, ensure that the GR10 is connected to a reliable power supply.

Step	Description
1	Go to the Receiver Setup / Tools / Firmware page.
2	The loadable firmware file will be shown in the table.
3	Click the Install  button to install the new firmware. This may take several minutes.
4	The receiver will automatically reboot following the installation of the new firmware and you will be directed to the Log in page.
5	To verify if the installation was successful go to the Status / Receiver Information page and view the installed firmware versions.

Related topics

[GR10 Software: Overview](#)

[Is my firmware up to date?](#)

[Firmware update using Leica GNSS Spider](#)

[Loading a Language file](#)

[Status: Receiver Information](#)

[Receiver setup: Firmware management](#)

Firmware upgrade using Leica GNSS Spider

Leica GNSS Spider can also be used to install the firmware. Loading the firmware to the SD card and installing it on the instrument is done in one step when using GNSS Spider.

Step	Description
1	Open the Leica GNSS Spider Site Server and select the Site tab .
2	Right click on the GR10 site and choose Firmware upgrade .
3	Select the firmware file to be uploaded and press Upgrade .
4	Leica GNSS Spider will automatically upload and install the new firmware and then reboot the sensor. A message will appear in the GNSS Spider Watch View to confirm that the upgrade was completed successfully.

For further information, refer to the Leica GNSS Spider Online Help.

Related topics




[GR10 Software: Overview](#)

[Firmware upgrade](#)

Loading a Language file

The system software enables multiple languages to be stored on the SD card. Only one language can be activated at a time.

Follow these steps to upload a new language file:

Step	Description
1	Go to the Receiver Setup / Tools / Languages page in the GR10 Web interface.
2	Click, Upload new language file 
3	Click the Browse... button and select the new language file .
4	Click the Upload button  to copy the file to the SD Card .
5	You will be directed back to the Language management page once the file upload is complete.
6	Click the Install  button next to the desired language in the table.

Related topics

[GR10 Software: Overview](#)

[Receiver setup: Language management](#)

8: GNSS Spider / Remote Access

GNSS Spider / Remote Access: Overview

Menu option	Description
GNSS Spider / Remote Access	An overview of the GNSS Spider, remote access process and the requirements that are required.
GNSS Spider <-> GR10 configuration	An overview of how settings are stored on the receiver when using GNSS Spider.
GNSS Spider logging session	An overview of GNSS Spider logging sessions.
GNSS Spider data streams	An overview of GNSS Spider data streams.

GNSS Spider / Remote Access

Overview

On the GR10 receiver per default no port is open for remote access from any OWI software. In order to allow OWI access, a port must be defined and opened.

The OWI software can then change the receiver configuration and define and start data streams and a logging session.

In order to use any non-Leica OWI software with a GR10 receiver, a option key is required.

Spider and remote access

The **Receiver setup: Spider and remote access** page lists all ports on the GR10 receiver that are open for any OWI based tool to connect to the receiver and change the settings via OWI commands.

The page also allows creating new OWI ports and editing or deleting configured ports.

Access to the GR10 receiver can be configured via

- TCP/IP server connection
- TCP/IP client connection
- NTRIP connection
- Serial port
- Modem
- Radio

It is also possible to connect a GR10 receiver to the GNSS Spider site server via a USB connection. In this case, the connection will be handled like a network connection via an Ethernet cable.

Please see the chapter [Spider and remote access: Overview](#) for more detailed information on how to configure a remote access.

Licensing

Leica GNSS Spider users do not need a license to connect the GR10 as an active site to the Leica GNSS Spider software.

Requirement: GR10: Leica GNSS Spider v4.0 or later must be installed.

Any non-Leica OWI based software requires the **GRL117 Extended OWI** license installed on the GR10 to be allowed to change any configuration on the receiver.

If the **GRL117 Extended OWI** license is not available on the GR10 receiver, a remote port can be configured and activated but can only be used by Leica GNSS Spider.

To check the currently installed licenses on the receiver, go to **Status / Receiver Information**.

- The Receiver tab lists the GNSS Spider OWI option as default functionality.
- The Licenses tab shows if the extended OWI option is installed on this receiver.

Related topics

[GNSS Spider <-> GR10 Configuration](#)

[GNSS Spider logging session](#)

[GNSS Spider data streams](#)

GNSS Spider <-> GR10 configuration

When working with a GR10 and an active connection to Leica GNSS Spider, the settings on the receiver can be changed from either side. The last stored/uploaded settings will overwrite everything that had been configured before.

Starting and Stopping the active GR10 site in Leica GNSS Spider has only an effect on the **__spider** logging session and the Spider data streams in the GR10.

It activates or deactivates the logging session and deletes or creates the data streams. All other logging sessions and data streams are not affected by a start or stop of a GR10 GNSS Spider site.

When the user selects **Upload settings** in the Leica GNSS Spider software, all settings configured for this site are uploaded to the connected receiver. Since this includes tracking settings, changes of the site code and the receiver coordinates, logging and streaming is interrupted every time the Spider configuration is loaded onto the GR10.

For advanced information refer to the Leica GNSS Spider Online Help.

Related topics

[GNSS Spider logging session](#)

[GNSS Spider data streams](#)

GNSS Spider logging session

MDB logging on the GR10 can be configured and started from GNSS Spider via an active site.

Please see the **GNSS Spider online help** for more information on how to configure an active GR10 site.

Only one logging session can be configured and started from GNSS Spider.

When logging is configured in GNSS Spider and the settings have been uploaded to the receiver, a GNSS Spider logging session appears in the **GNSS management / Logging sessions** page and in the **Status / Logging sessions** page.

The Spider logging session is called **__spider** (with two _) and is activated by starting the site in GNSS Spider.

Per default the logged MDB data is stored in the folder **Data__spider** on the receivers SD card. This folder can be changed in the web interface configuration. GNSS Spider will still be able to download the files.

Please note that a GNSS Spider logging session is always created with the priority setting high. This means that if other logging sessions, created via the web interface, are running on the receiver and **Smart clean up** is activated, the priority setting of the GNSS Spider site guarantees that the data for this site will be protected before lower priority logging sessions on the receiver.

Logging sessions created in GNSS Spider and uploaded to the receiver can be deactivated by stopping the site in GNSS Spider or by pressing the deactivate button in the web interface of the GR10.

GNSS Spider data streams

Two real-time and one raw data stream can be configured on the receiver from an active GNSS Spider site at the same time.

A data stream configured in GNSS Spider is only visible and active on the receiver when the according site in GNSS Spider is started. When the site is stopped, the data streams are deleted from the receiver. No data streams can be deactivated from GNSS Spider on the GR10.

Data streams created in GNSS Spider and uploaded to the receiver can however be deactivated in the web interface of the GR10.

9: How to

How to: Overview

The following topics provide detailed step-by-step guides to help you configure your receiver:

- [How to set up a mobile internet connection](#)
- [How to use DynDNS service on receiver](#)
- [How to backup and restore receiver settings](#)
- [How to configure an NTRIP data stream](#)
- [How to configure FTP push of logged data](#)
- [How to reset the receivers settings](#)
- [How to configure a Wake-up session](#)

How to set up a mobile internet connection

Background information

The mobile internet setup is used to connect a GR10 receiver to the internet when no direct LAN connection is possible. A GPRS enabled device is necessary to establish this connection.



Before you begin

In order to connect to the internet from the GR10 receiver, it is necessary to apply for an APN (access point name) from your internet service provider.

Together with the APN, a profile must be assigned to you. This profile is a list of all ports that are open and available for use. It needs to be activated for each SIM card you want to use for a mobile internet connection.

When using Email and FTP push, make sure that the relevant SMTP and FTP ports are open. For DynDNS service, either port 80, 8245 or 443 also have to be available. The profile also needs to contain the IP of at least one DNS server that is run by your provider if you want to use DynDNS

Step-by-step

Step	Description
1	Connect a GPRS device to the serial or slot-in port of the receiver. Check that the LEDs on the GPRS device are on. For more information how to connect a device go to External devices / Working with Radio, Modem and GSM devices / Slot-in devices .
2	Open the receiver's web interface. Check that the event log states that the GPRS device has been connected.
3	Go to Receiver setup / Network connections . Open the mobile internet tab.
4	Select the GPRS device from the drop down list. If the used device is not available in the list, open Device management to create a new, user defined device. For more information on creating a new device see Device Management: New / Edit modem/phone device .
5	Enter the PIN code of the used SIM card. If the SIM card PIN is disabled, this field can be left blank.
6	Enter the APN , the user name and the password .
7	If a dynamic IP is used, leave the IP address field set to dynamic. If you have a static IP address, select static and enter the IP address.
8	Activate the Use as default gateway check box if all data traffic is to be done via the mobile internet connection. If activated, all FTP push, streamed data and event email sending is done via the mobile internet connection.
9	Press  Save changes. The mobile internet configuration is now stored. Check the Event log and the Status / Network connection page to make sure the mobile internet connection is successfully established.
	Please note: The APN profile used for the mobile internet setup might make it necessary to change the http port if the default http port is not available. If the http port has been changed, the web interface access then requires entering the http port with the receivers hostname in the browser window. (e.g. http://my_receiver.org:5689)

Related topics

[Slot-in devices](#)

[Device Management: New / Edit modem/phone device](#)

[Status: Network connections](#)

How to use DynDNS service on receiver

Background information

The DynDNS functionality allows clients to use an internet domain name to address a GR10 receiver with a dynamic IP address.



The typical use case for this functionality is a receiver with an internet connection via GPRS. In this setup the GR10 will have a different IP address every time the internet connection is established.

Another use case is a GR10 behind a router in a local network, where the router is connected to the internet and regularly gets an updated IP address. The GR10 will check every 12min for a new IP address on the router and updates the DynDNS settings when necessary.

Before you begin

Register at a DynDNS service: Go to <http://www.dyndns.com> or <http://www.no-ip.com> or <http://www.Two-DNS.com> and register for an account. At registration enter the hostname you want your sensor to be accessed with. Enable wildcard use. Mail exchanger functionality is not necessary.

Step-by-step

Step	Description
1	Attach and configure a mobile internet device. Please see Network connections: Mobile internet on how to configure the mobile internet device.
2	Open the receiver's web interface and go to Receiver setup / DynDNS .
3	Enter the hostname that you entered when registering for a DynDNS account.
4	Enter the user name and password that you entered when registering for a DynDNS account.
5	Press  Save changes. The DynDNS settings are now stored. Check the event log and the Status / Network connection page to make sure the current receiver IP address is successfully updated at the DynDNS service.
	Please note: The APN profile used for the mobile internet setup might make it necessary to change the HTTP port if the default HTTP port is not available. If the HTTP port has been changed, the web interface access then requires entering the HTTP port with the receivers hostname in the browser window. (e.g. http://my_receiver.org:5689)

How to backup and restore receiver settings

Background information

If several receivers are to be used with the same configuration, with differences in the coordinates and IP settings only, it would be convenient to not have to type in these settings into every receiver.

For any use case that requires the same receiver configuration to be installed more than once, the backup and restore functionality saves a lot of time and effort.




Before you begin

Installing the same receiver functionality on more than one receiver via the restore function also sets the same communication settings on all receivers. If the receivers are then all connected to the same network, the same IP and hostname may connect to any of the available receivers. Make sure that the communication settings are clearly dedicated for each receiver.






Access management is overwritten with the access settings stored in the backup file when installing a new set of receiver settings. Make sure that the access settings stored in the backup file are known, in order to prevent being locked out of the web interface.

Step-by-step backup receiver settings

Step	Description
1	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
2	Go to Receiver setup / Tools and open the Receiver settings backup tab.
3	Press Backup current receiver settings  . The receiver now collects all receiver configuration information and stores it in a zipped backup file.
4	The backup file is now listed on the Receiver settings backup page. Press Download  to download the file to your PC. It can then be used to install the same settings on another receiver or archived for later use.
	The file name contains the date and time of the file being created and the receiver's serial number. This simplifies keeping track archived of receiver backup files.

Step-by-step restore/install receiver settings

Step	Description
1	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
2	Go to Receiver setup / Tools and open the Receiver settings backup tab.
3	Press Upload new receiver settings  to upload a zip file containing all receiver settings. The file upload page is opened.
4	Use the browse button to find the backup file on your PC. This file can be from the same receiver or from a different receiver.
5	Press Upload  to load the file onto the receivers SD card. Wait until the upload is finished. The file is then listed in the Receiver settings backup page.
6	Press the Install  icon to install the new receiver settings on the GR10 or to restore a previous receiver configuration. The receiver will reboot after installing the settings.
7	After the installation, the web interface redirects to the Login page. Enter the login details; the Receiver settings backup page is opened. Delete the backup file if it is no longer needed on the receivers SD card.

How to configure an NTRIP data stream

Background information

Ntrip stands for **N**etworked **T**ransport of **R**TCM via **I**nternet **P**rotocol. Developed by the Federal Agency for Cartography and Geodesy of Germany, Ntrip enables the streaming of GNSS data over the internet.

Ntrip is implemented in three system software components: NtripClient, NtripServer and NtripCaster. The NtripCaster is the actual HTTP server program while NtripClient and NtripServer are acting as HTTP clients.







The GR10 can act as an Ntrip Server, sending GNSS data to an Ntrip caster. Leica GNSS Spider software can act as such a caster.

More information on Ntrip is contained in the Glossary topic, [Ntrip](#).

Before you begin

Ntrip is a very easy way to distribute GNSS data to a high number of users. The GR10 can act as an Ntrip server. To use the functionality, a mount point and the mount point access details on an Ntrip caster must be available.

Step-by-step




Step	Description
1	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
2	Go to the GNSS management / Data streams .
3	Press the Create new data stream  to open the data streams wizard.
4	Select the Data stream type you wish to stream via the Ntrip protocol. Then press the Continue  icon.
5	Configure the data streams details and press the Continue  icon.
6	Select the Connection type, Ntrip server (source) in the Connection page and press the Continue  icon.
7	On the Configure NTRIP server (source) page <ul style="list-style-type: none"> • For Server IP address enter the IP address of the Ntrip Caster. • In the TCP/IP port field enter the port at which the Ntrip source can access the mount point. • Enter the Mount point name and password. Then press the Continue  icon.
8	Press the Save  button to store the data stream. The receiver will attempt a connection to the NTRIP caster immediately. Check the event log for a confirmation that the connection was successful.

How to configure FTP push of logged data






Background information

Up to 10 logging sessions can be configured on a GR10 receiver. Each logging session can push the logged files to a different FTP location. These FTP locations need to be configured before assigning them to a logging session.

Step-by-step configure and FTP push location

Step	Description
1	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
2	Go to GNSS management / FTP locations and press the Create new FTP location  .
3	Enter a unique Name for the FTP location and the FTP server host name or IP address of the FTP server.
4	Enter the FTP server port number at which the FTP server can be accessed (generally this is port 21).
5	Enter the FTP root directory if this is not directly accessed when accessing the FTP server. This directory must already exist on the FTP server. It will not be created during the FTP push.
6	Enter Username and Password to access the FTP server. These fields can be left blank if anonymous access is enabled on the FTP server.
7	In the Send commands field, FTP protocol commands can be added that will be executed as soon as the FTP server is accessed. These fields can generally be left blank.
8	It is recommended to keep the Use passive mode check box enabled. If active mode is need, disable the check box.
9	Optionally, the entered FTP details can be tested by pressing Test FTP location  . This will test accessing the FTP server, writing and deleting a file on the server and closing the FTP server connection.
10	Press save changes  to store the configured FTP push location . This will redirect to the FTP push locations overview page where all configured FTP servers are listed.

Step-by-step use an FTP push location in a logging session



Step	Description
1	Go to GNSS management / Logging sessions to create a new logging session or edit an existing logging session.
2	Press the Create new Logging session  or Edit logging session  to open the logging sessions wizard.
3	Enter all necessary logging details or changes.
4	Press the Continue  icon.
5	Define if the files should be zipped by activating or deactivating the Zip files check box.
6	Choose a directory naming convention. Please note that this directory structure will also be created and used on the FTP server the files are pushed to.
7	Open the Choose FTP location list box. It lists all FTP push locations configured on the receiver. Select an FTP location.
8	Open the Delete files list box if automatic file delete is to be used. Select the After archiving option to delete the files after they have successfully been pushed to the FTP location.
9	Press the Continue  icon.
10	Activate the logging sessions and store the settings. This will redirect to the logging sessions overview page where all configured logging sessions are listed.
	On the GNSS management / FTP locations page, the Queue column lists the number of files queued to be pushed to this FTP location. Generally this is listed as 0. If there is a problem with the FTP location (e.g. the FTP server is not accessible), a message will be displayed in the event log and the Queue column will list the number of files that could not be pushed.

How to reset the receivers settings





Background information

The receiver has different reset functionalities. They allow deleting old data, restarting the receiver configuration from scratch or deleting almanac and ephemeris for special tracking applications.

Step-by-step format the SD card



Step	Description
1	Make sure the SD card is inserted in the receiver.
2	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
3	Go to the Receiver setup /Tools page.
4	Press the Format SD card  icon to start the formatting.
	Formatting the SD card will stop all active logging and streaming and reboot the receiver. Active data streams and logging sessions will resume after the reboot.

Step-by-step format the receiver settings

Step	Description
1	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
2	Go to the Receiver setup /Tools page.
3	Select Reset all in the list box if all settings are to be deleted or select Keep communication settings (default) if all communication related settings must not be deleted.
4	Press the Format receiver settings  icon to set the receiver settings back to factory default.
	If Reset all is selected, remote access to the receiver is not possible anymore unless the receiver is connected to a DHCP network.
	If the receiver is in a DHCP network it is still accessible via the default hostname (GRxxxxxx, where xx is the serial number of the receiver).
	When formatting the receiver settings, all logging sessions are deleted but the according files on the SD card are not deleted. The files on the SD card must be deleted manually.
	If "Keep communication settings" is selected, the following receiver settings will not be overwritten: <ul style="list-style-type: none"> • Spider and remote ports • Network connections – Ethernet • Network connections – mobile internet • DynDNS settings • Web server settings • Device used for mobile internet setup (changed default devices and user defined devices)

Step-by-step initialize measurement engine

Initializing the measurement is mainly useful for special tracking applications. E.g. if unhealthy satellites are forced to healthy and then set back to automatic health setting, it is recommended to initialize the measurement. Satellites with bad health may transmit incorrect almanacs and ephemeris.

Step	Description
1	Open the receiver's web interface in a browser window by typing in the receivers IP or host name.
2	Go to the Receiver setup / Tools page
3	Press the Initialize measurement engine  icon to delete the almanac and ephemeris.
	The receiver will stop tracking satellites and lose the navigated position. It takes several minutes for the receiver to start tracking again and regain a navigated position.

10. Support resources

Support resources


Background information

For assistance with the receiver we have provided a number of resources that can be used when there are questions or technical problems while setting up and using the receiver.

- Use the **Online Help** to get content based help for the receiver configuration.
- Inform the GR10 support team of any technical issues via the **Support tool**.
- Allow the support team to access the GR10 web interface via **Active Assist** for quick help
- or visit the **myWorld** portal to keep all software and documentation up to date.

Online help

The online help is accessible via the web interface.

On each web interface page the help icon  is available. Clicking this button will open the online help related to the current Web interface page. The help is open in a new browser window. This provides quick assistance for the complete Web interface.

The online help can also be opened via the help link in the web interface menu.

The online help also contains information regarding the hardware, the receiver setup, available support tools and general GNSS receiver information. It also contains a Getting Started section and a How to-guide that can provide help for a more complex setup.

For further information about the online help please read the topic: [How to display and use the Online help](#).

Support tool

The support tool provides comprehensive information about the receiver's current status to our support team in the case of a technical problem. This way any issue can be solved quickly. The effort needed from the reference station user in solving the issue can be reduced to a minimum.

The Support tool can be used manually or in automatic mode.

If the user notices an issue with the receiver, an email can be sent to the NRS support team from the receiver. The tool requires entering the identity and contact details of the receiver's operator and a description of the technical issue. When sending the email, the complete system information is stored in a file that is attached to the email. With this bundled information, the NRS support team receives an extensive overview of the current status of the receiver.

The tool can also be set to automatic mode. In this case an email is sent to the NRS support team automatically whenever the receiver detects a technical issue. In this case the user may be contacted by NRS support regarding the sent information.

Please note that the receiver must be connected to the internet for using the support tool.

For further information about the support tool please see [Support: Support tool](#).

Active Assist

During a support incident a GR user may be asked by the Leica NRS support team to connect to the Active Assist server. Via this tool, the support team can access the receiver's web interface without any security risk on the receiver side. Since the tool does not make it necessary to actually access the protected network environment of the receiver, this is a very secure way of providing support with the GR10.

In order to use the Active Assist tool, it is necessary to activate the Support user account. This allows access to the receiver's web interface. The support team is then able to access the complete receiver information and find the source of a receiver issue that the GR user may have experienced.

Please note that the use of the Active Assist tool must be requested from the NRS support team. It will not be possible to assist with any problems that have not been reported to the support team beforehand.

For further information about the support tool please see [Support: Active Assist](#).

myWorld

myWorld@Leica Geosystems (<https://myworld.leica-geosystems.com>) offers a wide range of services, information and training material.

With direct access to myWorld, you are able to access all relevant services whenever it is convenient for you, 24 hours a day, 7 days per week. This increases your efficiency and keeps you and your equipment instantly updated with the latest information from Leica Geosystems.

Service	Description
myProducts	Simply add all Leica Geosystems products that you and your company own. View detailed information on your products, buy additional options or Customer Care Packages (CCPs), update your products with the latest software and keep up-to-date with the latest documentation.
myService	View the service history of your products in Leica Geosystems Service Centers and detailed information on the services performed on your products. For your products that are currently in Leica Geosystems Service Centers view the current service status and the expected end date of service.
mySupport	Create new support requests for your products that will be answered by your local Leica Geosystems Support Team. View the complete history of your Support and view detailed information on each request in case you want to refer to previous support requests.
myTraining	Enhance your product knowledge with the Leica Geosystems Campus - Information, Knowledge, Training. Study the latest online training material or download training material on your products. Keep up-to-date with the latest News on your products and register for Seminars or Courses in your country.

11: External Devices

External Devices: Overview

This section explains which external devices can be used with the GR10.

Portable browsers

- [Leica surveying controllers CS10 and CS15](#)
- Other web enabled devices

Besides the CS10 and CS15 any other device that comes with a web browser and a USB host connector can be used to configure the GR10. Follow the procedure as describes above for the CS10 and CS15. If no Internet Explorer but another web browser is available on the portable device use this other web browser instead.

Communication devices

- [Working with Radio, Modem and GSM devices: Overview](#)
- [Serial devices connected to a GFU housing](#)
 - Devices fitting into a GFU housing
 - Connecting a GFU device
 - Insert and remove a SIM card step-by step for an external GFU device
 - LED indicators
- [Slot-in devices](#)
 - Devices fitting into the GR10 Slot in (P3)
 - Insert and remove a slot-in-device step-by-step
 - Insert and remove a SIM card step-by-step
 - LED indicators

Routers, switches and hubs

Within a local network the GR10 has to be connected to some kind of network device. This may be a router, a switch or a hub providing a bandwidth of 10 or 100 MBit. Use a standard Ethernet cable with RJ45 connector and connect the one end with the RJ45 connector of the GR10. Then connect the other end with a RJ45 connector of the network device. As a result the GR10 is physically connected to the local network.

Please refer to section "Getting Started" to find more details on how the GR10 can be configured to allow access via TCP/IP protocol and how the web interface can be accessed.

Meteorological sensors

Meteorological sensors are used for measuring air pressure, temperature and relative humidity. The data from the meteo sensor is logged together with the GPS raw observations into the MDB and RINEX files. If RINEX logging is active, an additional meteo RINEX file is created that contains the data from the meteo sensor.

Data is logged into the same file as the GNSS raw observations (MDB) or into a file with the same file name but with the extension m (RINEX). No data is logged, unless raw observation logging is configured and a logging session is started.

- [Configure a meteo device step-by-step](#)

Tilt sensors

Tilt devices (such as the Leica NIVEL210) are used for measuring inclinations. The data from the tilt device is logged together with the GNSS raw observations into MDB files. When logging RINEX files, the tilt data is written into a special auxiliary file.

- [Configure a tilt device step-by-step](#)

Oscillators

An external oscillator can be used to provide a better quality time signal to the receiver than the receiver's own internal clock. The same external oscillator can also be used with a number of receivers so that each receiver is guaranteed to be tracking satellites using the same time signal. An external oscillator is attached to the receiver via the port OSC.

Select **Internal** to use the receiver's internal clock, or if an external oscillator is connected to the oscillator port, select the type of external oscillator and the frequency.

The following oscillator types can be used with a GR10:

- TCXO: A temperature compensated crystal oscillator (TCXO) is used.
- OCXO: An oven controlled crystal oscillator (OCXO) is used.
- Rubidium: A rubidium based external oscillator is used.
- Cesium: A cesium based external oscillator is used.

The external oscillator can work with 5 MHz or 10 MHz.

Click here for the technical specifications of the [external oscillator port](#) and the required cable.

Leica surveying controllers CS10/CS15

The CS10 and CS15 controllers can be used to configure a GR10. The following step-by-step guide explains how to access the web interface of the GR10 using a CS10 or CS15.

Step	Description
1	Power on the GR10
2	Power on the CS10 or CS15
3	Connect the mini USB connector of the USB cable (article number xxx) with the GR10.
4	Connect the standard USB connector of the USB cable with the CS10 or CS15.
5	On the CS10 or CS15 go to Start and open the Internet Explorer.
6	Type in 192.168.254.2 in the URL line of the Internet Explorer.

Working with Radio, Modem and GSM Devices

Working with Radio, Modem and GSM Devices: Overview

A variety of devices can be used with the GR10, including:

- GSM/Radio GFU devices connected via a serial port
- Slot-in devices
- External modems connected via a serial port
- External radios connected via a serial port

Related topics

[Serial Devices](#)

[Slot-in devices](#)

Serial Devices

Devices fitting into a GFU housing

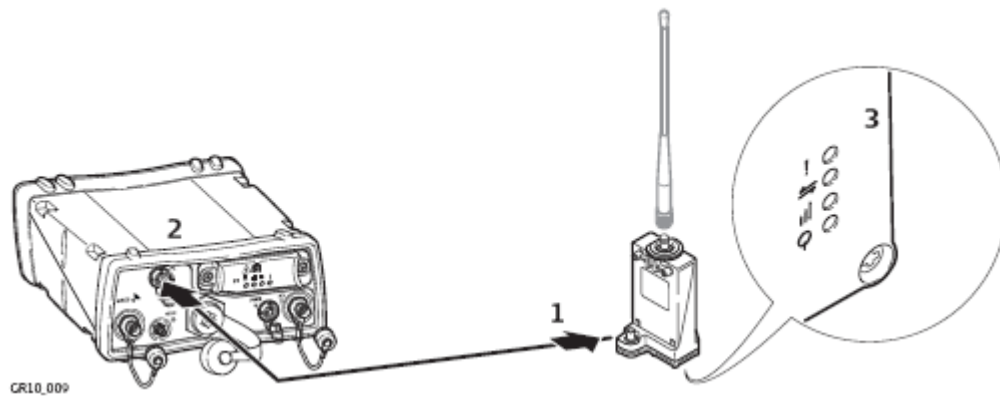
Digital cellular phones fitting into a GFU housing

Digital cellular phone	GFU housing
Siemens MC75	GFU24
CDMA MultiTech MTMMC-C (US)	GFU19, GFU26
CDMA MultiTech MTMMC-C (CAN)	GFU25

Radios fitting into a GFU housing

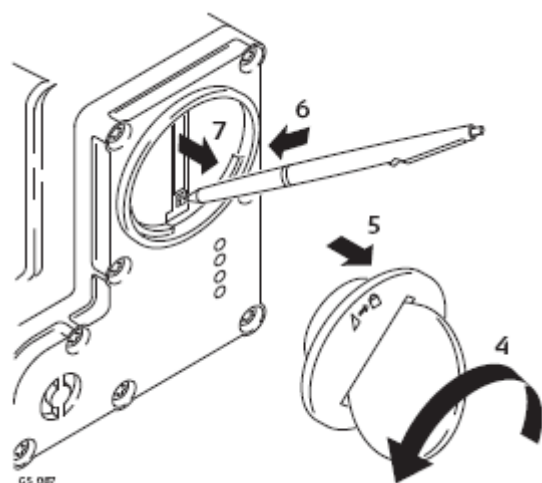
Radio	GFU housing
Satellite 3AS, transceiver	GFU14


Connecting a GFU device



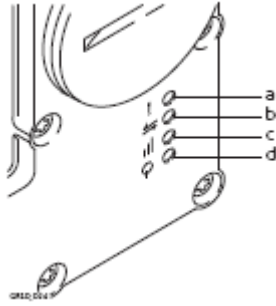
Step	Description
1	Connect the GEV167 GFU cable to the serial port on the GFU housing.
2	Connect the GEV167 GFU cable to the serial port on the GR10.
3	The GFU device is successfully connected to the instrument when the LEDs on the GFU are on.

Insert and remove a SIM card step-by step for an external GFU device



Step	Description
	The SIM card is inserted into a slot on the bottom of the GFU housing.
1	Take the SIM card, a coin and a pen.
2	Locate the SIM card screw, that covers the SIM card slot, on the bottom of the GFU housing.
3	Insert the coin into the groove of the SIM card screw.
4	Turn the coin anticlockwise to loosen the SIM card screw.
5	Remove the SIM card screw from the housing.
6	Using the pen, press the small button of the SIM card slot to eject the SIM card holder.
7	Take the SIM card holder out off the housing.
8	Put the SIM card into the SIM card holder, the chip facing up.
9	Insert the SIM card holder into the SIM card slot, the chip facing the connectors inside the slot.
10	Place the SIM card screw back on the housing.
11	Insert the coin into the groove of the SIM card screw.
12	Turn the coin clockwise to tighten the SIM card screw.

LED indicators



- a. Warning LED, available for Sateline SAS
- b. Data transfer LED
- c. Signal strength LED
- d. Power LED

Description of the LED's

IF the	on	is	THEN
Warning LED	GFU14 with Sateline 3AS	red	the device is in the configuration mode controlled from the PC via cable.
Data transfer LED	any device	off	data is not being transferred.
		green or flashing green	data is being transferred.
Signal strength LED	GFU19 (US), GFU25 (CAN), GFU26 (US) with CDMA MultiTech MTMMC-C	red	device is on, not registered on the network.
		flashing red	device is on, registered on the network.
		off	download mode or device is off.
	GFU24 with Siemens MC75	red	call is in progress.
		red: long flash, long break	no SIM card inserted, no PIN entered or network search, user authentication or network login in progress.
		red: short flash, long break	logged onto network, no call in progress.
		red: flashing	GPRS PDP context activated.
		red, long break red: long flash, short break	Packet switched data transfer is in progress.
		off	device is off.
GFU14 with Sateline 3AS	red or flashing red	the communication link, Data Carrier Detection , is okay on the roving receiver.	
	off	the DCD is not okay.	
Power LED	any device	off	power is off.
		green	power is okay.

Slot-in Devices

Devices fitting into the GR10 slot-in port (P3)

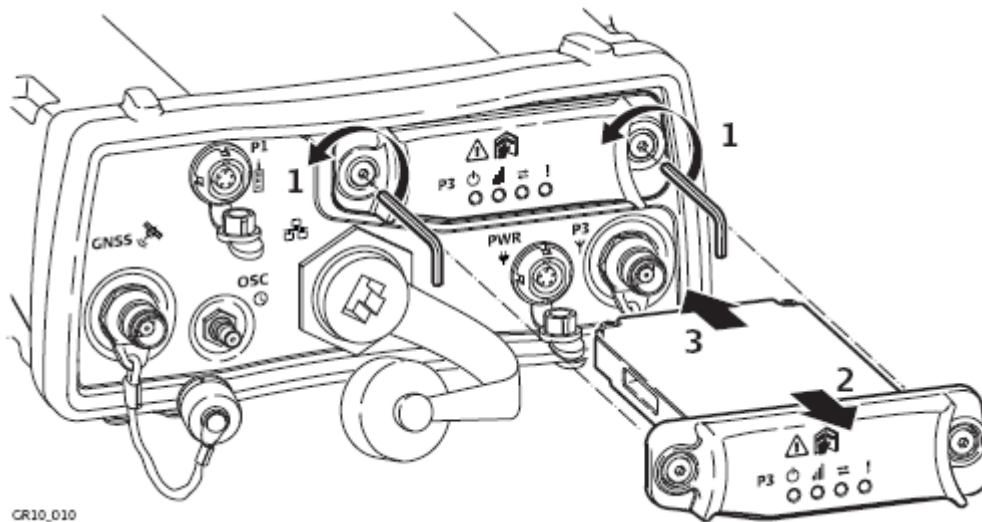
Digital cellular phones fitting into the GR10 slot-in port (P3)


Digital cellular phone	Device
Telit 3G GSM/GPRS/UMTS	SLG1-2

Radios fitting into the GR10 slot-in port (P3)

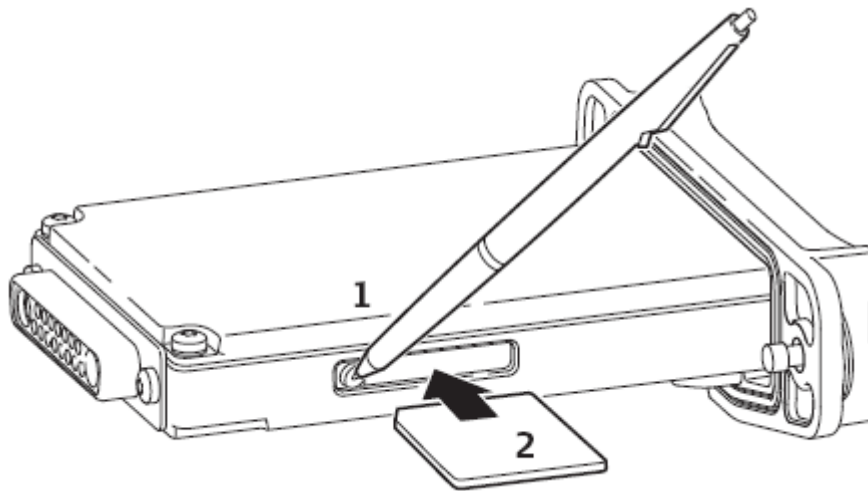
Radio	Device
Satellite TA11	SLR1-2

Insert and remove a slot-in-device step-by-step





Step	Description
1	Loosen the screws of the Communication Slot-in port (P3) with the Allen key that is supplied with the slot-in device.
2	Remove the compartment cover and attach to the slot-in device.
3	Insert the slot-in device into the P3 Slot-in port.
	The LED's on the device must face downwards.
4	Tighten the screws. All screws have to be tightened to ensure that the instrument is waterproof.
5	Attach the antenna for the slot-in device to Communication Slot-in port Antenna (P3) which is located below the Slot-in port next to the Power port (PWR).

Insert and remove a SIM card step-by-step

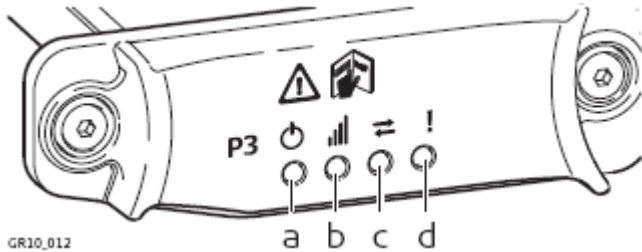


GR10_011

Step	Description
	The SIM card is inserted into a slot on the side of the SLG1-2.
	Take the SIM card and a pen.
1	Using the pen, press the small button of the SIM card slot to eject the SIM card holder.
2	Take the SIM card holder out of the SLG1-2.
3	Place the SIM card into the SIM card holder, the chip facing up.
4	Insert the SIM card holder into the SIM card slot, the chip facing the connectors inside the slot.

LED indicators


Each slot-in-device for a radio or digital cellular phones has Light Emitting Diode indicators on the bottom side. They indicate the basic device status.




- a. Mode LED, available for Satellite TA11
- b. Signal strength LED
- c. Data transfer LED
- d. Power LED

IF the	on	is	THEN	
Mode LED	SLR1-2 with Satellite TA11	red	the device is in the programming mode controlled from the PC via cable.	
Data transfer LED	any device	off	data is not being transferred.	
		flashing green	data is being transferred.	
Signal strength LED	SLG1-2 with Telit 3G	red	call is in progress.	
		red: long flash, long break	no SIM card inserted, no PIN entered or network search, user authentication or network login in progress.	
		red: short flash, long break	logged onto network, no call in progress.	
		red: flashing red, long break	GPRS PDP context activated.	
		red: long flash, short break	Packet switched data transfer is in progress.	
		off	device is off.	
		SLR1-2 with Satellite TA11	red	the communication link, Data Carrier Detection , is okay on the roving instrument.
			flashing red	the communication link, Data Carrier Detection , is okay on the roving instrument, but signal is weak.
Power LED	any device	off	power is off.	
		green	power is okay.	

Configure a meteo device step-by-step

Step	Description
1	Use the serial cable (article number XXX) which is connected to the meteo device and plug it into the serial port the GR10.
2	In the web interface go to page GNSS management / Data streams / Incoming data steams.
3	Click on button Create new data stream to open the wizard.
4	Select Meteo as device type and use the Continue button.
5	Select the specific meteo device and the data rate you would like to use and use the Continue button.
6	Tick the Activate data stream check box and use the Save button.
	Make sure that the settings of serial port (P1) are identical to the settings of the serial port of the meteo device.

Configure a tilt device step-by-step

Step	Description
1	Use the serial cable (article number XXX) which is connected to the tilt device and plug it into the serial port the GR10.
2	In the web interface go to page GNSS management / Data streams / Incoming data steams.
3	Click on button Create new data stream to open the wizard.
4	Select Tilt as device type and use the Continue button.
5	Select the specific tilt device and the data rate you would like to use and use the Continue button.
6	Tick the Activate data stream check box and use the Save button.
	Make sure that the settings of serial port (P1) are identical to the settings of the serial port of the tilt device.

External Oscillator


Background information

An external oscillator can be used to provide a better quality time signal to the GR10 than the internal clock, for example, through the use of a rubidium or caesium oscillator.

The same external oscillator can also be used with a number of receivers so that each GR10 is guaranteed to be tracking satellites using the same time signal. An external oscillator is attached to the GR10 via the port OSC.

Click here for the technical specifications of the [external oscillator port](#) and the required cable.

Configure an external oscillator with a GR10

Step	Description
1	Connect the oscillator cable with the external oscillator.
2	Find the external oscillator port (OSC) on the back of the GR10.
3	Connect the other end of the oscillator cable with the external oscillator port (OSC).
4	In the web interface go to GNSS management / Tracking .
5	Select the oscillator type and the frequency and use the Save button.
6	After this the external oscillator is used by the GR10 instead of the internal oscillator.
	If an external oscillator is selected but not connected, the receiver will not track any satellite signals.

12: Default settings

Default settings: Overview

There are two ways of regaining the default receiver settings.

1. Format all settings and reset the complete receiver configuration.
2. Reset the receiver settings for certain settings only.

Menu option	Description
Format receiver settings via Web interface step-by-step	Detailed information on the reformatting of the receiver settings using the Web interface.
Format receiver settings via instrument buttons step-by-step	Detailed information on the reformatting of the receiver settings using the instrument buttons.
Restore default values	A description of which buttons to use to restore default values.

Related topics

[Receiver setup: Tools](#)

[Appendix F: GR10 default settings](#)

Format receiver settings via Web interface step-by-step

Background information

The **Receiver setup / Tools** page allows formatting the complete system configuration.



You can select to keep the communication settings or overwrite all settings.

The following communication settings will **not** be reset:

- Spider and remote access ports
- Network connection settings (Ethernet, mobile internet)
- DynDNS settings
- Web server settings
- Changes in the device configuration if the device is used for mobile internet setup or for Spider or remote access
- The installed language

Format receiver settings step-by-step

Follow these steps format the receiver settings.

Step	Description
1	Select Receiver setup / Tools / Tools tab.
2	In Format receiver settings , select Keep communication settings or Reset all .
	<p>If Keep communication settings is selected, the following communication settings will not be reset</p> <ul style="list-style-type: none"> • Spider and remote access ports • Network connection settings (Ethernet, mobile internet) • DynDNS settings • Web server settings • Changes in the device configuration if the device is used for mobile internet setup or for Spider or remote access • The installed language
3	Press  Format receiver settings .
4	After the system format is completed, the receiver reboots with all settings set back to the default settings.
5	The Web interface will be redirected to the login page.

Related topics

[Receiver setup: Tools](#)

[Appendix F: GR10 default settings](#)

[Format receiver settings via instrument buttons step-by-step](#)

Format receiver settings via instrument buttons step-by-step








Background information

The receiver settings can be deleted without the web interface by using the **Power** and **Function** button on the receiver.

For detailed information on the instrument buttons go to [User Interface GR10 / Keyboard](#).

Format receiver settings step-by-step

Follow these steps format the receiver settings.

Step	Description
	Make sure the receiver is turned on.
1	Activate the dual button functionality. Press and hold both the  Function button and  Power button for 2s until all LEDs are flashing red.
2	After 1s, the  Raw data logging LED starts flashing green.
3	Press the  Function button (4 times) until the  Power LED starts flashing green.
4	Press the  Function button for 3 s to set all configured instrument settings back to factory default values.
5	After the system format is completed, the receiver reboots with all settings set back to the default settings.

Related topics


[Keyboard](#)

[Appendix F: GR10 default settings](#)


[Format receiver settings via Web interface step-by-step](#)

Restore default values

The default settings can be restored only for certain pages.

Access the page and press the  Restore default values button.

This will fill all fields in this page with the factory default settings.

Then press  to store the default settings and overwrite the user defined configuration in this page.

13. Technical Data

GR10 Technical Data

Tracking Characteristics

Instrument technology

SmartTrack+

Satellite reception

GR10: Multi-frequency, GPS, GLONASS and/or Galileo

Instrument channels

GR10: Up to 16 channels continuous tracking on L1, L2 and L5 (GPS); up to 14 channels continuous tracking on L1 and L2 (GLONASS); up to 14 channels continuous tracking on E1, E5a, E5b and Alt-BOC (Galileo); four channels tracking SBAS.

Depending on the satellite systems and signals configured in [GNSS management: Tracking](#), a maximum number of 120 channels is allocated.

Supported codes and Phases

GPS

Type	L1	L2	L5
GR10	Carrier phase, C/Acode	Carrier phase, C code (L2C) and P2-code	Carrier phase, code

GLONASS

Type	L1	L2
GR10	Carrier phase, C/Acode	Carrier phase, P2-code

Galileo

Type	E1	E5a	E5b	Alt-BOC
GR10	Carrier phase, code	Carrier phase, code	Carrier phase, code	Carrier phase, code

GPS Carrier tracking

Condition	GR10
L1, AS off or on	Reconstructed carrier phase via C/A-code.
L2, AS off	Reconstructed carrier phase via P2-code.
L2, AS on	Switches automatically to patented P-code aided technique providing full L2 reconstructed carrier phase.

GPS code measurements

Condition	GR10
L1, AS off	Carrier phase smoothed code measurements: C/A-code.
L1, AS on	
L2, AS off	Carrier phase smoothed code measurements: P2-code and/or L2C code.
L2, AS on	Carrier phase smoothed code measurements: Patented Pcode aided code and/or L2C code.

Carrier phase and code measurements on L1, L2 and L5 (GPS) are fully independent with AS on or off.

Code and Phase Measurement Precision (irrespective whether AS off/on)

Carrier phase L1 / L2 *	0.2mm rms / 0.2 mm rms
Code (pseudorange) on L1 / L2	2cm rms / 2cm rms

Satellites tracked

GR10: Up to 16 simultaneously on L1, L2 and L5 (GPS) + up to 14 simultaneously on L1 and L2 (GLONASS) + up to 14 simultaneously on E1, E5a, E5b and Alt-BOC (Galileo) + up to four SBAS

Accuracy

Accuracy is dependent upon various factors including the number of satellites tracked, constellation geometry, observation time, ephemeris accuracy, ionospheric

disturbance, multipath and resolved ambiguities.

The following accuracies, given as root mean square, are based on measurements processed using Leica Geomatic Office (LGO) and on real-time measurements.

The use of multiple GNSS systems can increase accuracy by up to 30% relative to GPS only.

Differential code

The baseline precision of a differential code solution for static and kinematic surveys is 25 cm.

Differential phase in post-processing

Normal baseline with GR10 plus AS10

Static		kinematic	
Horizontal	Vertical	Horizontal	Vertical
5 mm + 0.5 ppm	10 mm + 0.5 ppm	10 mm + 1 ppm	20 mm + 1 ppm

Long baseline with GR10 plus AR25

Static	
Horizontal	Vertical
3 mm + 0.5 ppm	6 mm + 0.5 ppm

Technical Data

Dimensions

The dimensions are given for the housing without the sockets.

Type	Length [cm]	Width [cm]	Thickness [cm]
GR10 - without rubber bumpers	21.0	19.0	7.8
GR10 - with rubber bumpers	22.0	20.0	9.4

Weight

GR10 weight:

Type	Weight [kg]
Without bumpers	1.50
With bumpers	1.67

Recording

Data can be recorded on the SD card.



The figures shown are accurate to 1%. They are dependent on the additional tracking settings configured on the instrument.

4 GB card, GPS (L1+L2+L5), 12 satellites

Rate	MDB only	RINEX only	Hatanaka only
1s	2180 hours	450 hours	1700 hours
	3700 hours zipped	1700 hours zipped	4500 hours zipped
30s	56550 hours	12650 hours	49700 hours
	95780 hours zipped	47380 hours zipped	108000 hours zipped

4 GB card, GPS + GLONASS (L1+L2), 12/10 satellites

Rate	MDB only	RINEX only	Hatanaka only
1s	1400 hours	330 hours	1220 hours
	2400 hours zipped	1240 hours zipped	3280 hours zipped
30s	38400 hours	9100 hours	36400 hours
	65000 hours zipped	34000 hours zipped	74800 hours zipped

4 GB card, GPS + GLONASS + Galileo (L1+E5a+E5b+Altbc), 12/10/10 satellites

Rate	MDB only	RINEX only	Hatanaka only
1s	840 hours	185 hours	680 hours
	1400 hours zipped	700 hours zipped	1800 hours zipped
30s	23800 hours	5050 hours	20400 hours
	40300 hours zipped	19000 hours zipped	41350 hours zipped

Power**24 V Power supply**

Condition	Power consumptions [w]
Logging at 1 Hz, with only the power supply and antenna connected:	3.1 W
Logging and streaming at 1 Hz, with power supply, antenna and ethernet connected:	3.5 W

Power consumption: 3.5 W typically, 24V@150mA
 External supply voltage: Nominal 12 V DC (, GEV71 car battery cable to a 12 V car battery), voltage range 10.5 V-28 V DC

Operating times

Designed for continuous operation.

Battery external

Type: NiMH
 Voltage: 12 V
 Capacity: GEB171: 9.0 Ah

Environmental specifications**Temperature**

Type	Operating temperature [°C]	Storage temperature [°C]
GR10	-40 to +65	-40 to +80
Leica SD cards	-40 to +85	-40 to +85

Protection against water, dust and sand

Type	Protection
GR10	IP67 (IEC 60529) Dust tight Waterproof to 1 m temporary immersion

Humidity

Type	Protection
GR10	Up to 100 % The effects of condensation are to be effectively counteracted by periodically drying out the instrument.

Connector types

Type	Protection
PWR	LEMO-1 female, 5 pin
Serial P1	LEMO-1 female, 8 pin
GNSS antenna	TNC female
P* Slot-in antenna	TNC female
Oscillator	MMCX female
Ethernet	RJ45 ruggedised

Serial ports

Type	Description	Default setting
P1	Baud rates 2400-115200 baud, incl. RTS/CTS	115200/N/8/1/N

Data output

- Raw data
- Almanac
- Ephemeris
- Position data

External oscillator input

External clock input:

Frequency:	5 MHz or 10 MHz
Input impedance:	50 Ω nominal
Input VSWR:	2:1 maximum
Signal level:	0 dBm minimum to +13.0 dBm maximum
Frequency stability:	± 0.5 ppm maximum
Wave shape:	Sinusoidal
Connector:	MMCX female

Internal Oscillator aligned to GPS time within 10 nanoseconds.

Please remove the External oscillator port cover before connecting the cable.

Ethernet network interface

IEEE Standards:	8002.3 10BASE-T Ethernet
	802.3u 100BASE-TX Fast Ethernet
	802.3 Auto-negotiation
Link Speed:	10/100 Mbit/s, Half/Full Duplex
Protocol:	CSMA/CD
Connector:	Ruggedised RJ45

GNSS Antennas Technical Data

Antenna Technical Data

Description and use

The antenna is selected for use based upon the application. The table gives a description and the intended use of the individual antennas.

Type	Description	Use
AR25	Dorne & Margolin GPS, GLONASS, Galileo, Compass antenna element with 3D choke ring ground plane. Optional protective radome.	High end applications. For example, monitoring tectonic plate movements, first order control, reference station.
AT504GG	Dorne & Margolin GPS, GLONASS L1/L2 antenna element with gold anodised choke ring ground plane. Complies with IGS type 'T' antenna, JPL design. Optional protective radome.	High end applications. For example, monitoring tectonic plate movements, first order control, reference station.
AR10	GPS, GLONASS, Galileo, Compass reference station antenna with large ground plane and built-in radome.	General use for standard and high accuracy reference station and monitoring applications.
AS10	Compact geodetic GPS, GLONASS, Galileo antenna with built-in ground plane.	Standard network RTK and monitoring applications.

Dimensions

Type	AR25	AT504GG	AR10	AS10
Height	20.0 cm	14.0 cm	14.0 cm	6.2 cm
Diameter	38.0 cm	38.0 cm	24.0 cm	17.0 cm

Connector

AR25:	N female
AT504GG:	N female
AR10:	TNC female
AS10:	TNC female

Mounting

All antennas:	5/8" Whitworth
----------------------	----------------

Weight

AR25:	7.6 kg, radome 1.1 kg
AT504GG:	4.3 kg, radome 1.1 kg
AR10:	1.1 kg
AS10:	0.4 kg

Electrical data

Type	AR25	AT504GG	AR10	AS10
Voltage	3.3 V to 12 V DC	4.5 V to 18 V DC	3.3 V to 12 V DC	4.5 V to 18 V DC
Current	50 mA max	50 mA typical	100 mA max	35 mA typical
Frequency GPS:	L1, L2 (including L2C), L5	L1, L2 (including L2C).	L1, L2 (including L2C), L5	L1, L2 (including L2C), L5.
Frequency GLONASS:	L1, L2, L3.	L1, L2.	L1, L2, L3.	L1, L2.
Frequency Galileo:	E2-L1-E1, E5a, E5b, E5a+b (Alt- BOC), E6.	-	E2-L1-E1, E5a, E5b, E5a+b (Alt- BOC), E6.	E2-L1-E1, E5a, E5b, E5a+b (Alt-BOC).
Frequency Compass:	B1, B2, B3.	-	B1, B2, B3.	B1, B2.
Gain (typically)	40 dBi	29 dBi	29 dBi	27 dBi
Noise Figure (typically)	< 1.2 dBi max	3 dBi	< 2 dBi	< 2 dBi

Environmental specifications

Temperature

Type	Operating temperature [°C]	Storage temperature [°C]
AR25	-55 to +85	-55 to +90
AT504GG	-40 to +70	-40 to +70
AR10	-40 to +70	-55 to +85
AS10	-40 to +70	-55 to +85

Protection against water, dust and sand

Type	Protection
All antennas	IP67 (IEC 60529) Dust tight Protected against water jets Waterproof to 1 m temporary immersion

Humidity

Type	Protection
All antennas	Up to 100 % The effects of condensation are to be effectively counteracted by periodically drying out the instrument.

Cable length

Instrument	Antenna	Storage temperature [°C]
GR10	AR25 / AT504GG / AR10 / AS10	1.2, 2.8, 10, 30, 50 and 70

Related topics

[GNSS management: Select Antenna](#)

[GNSS management: Antenna management](#)

[GNSS management: Calculate the antenna height reading](#)

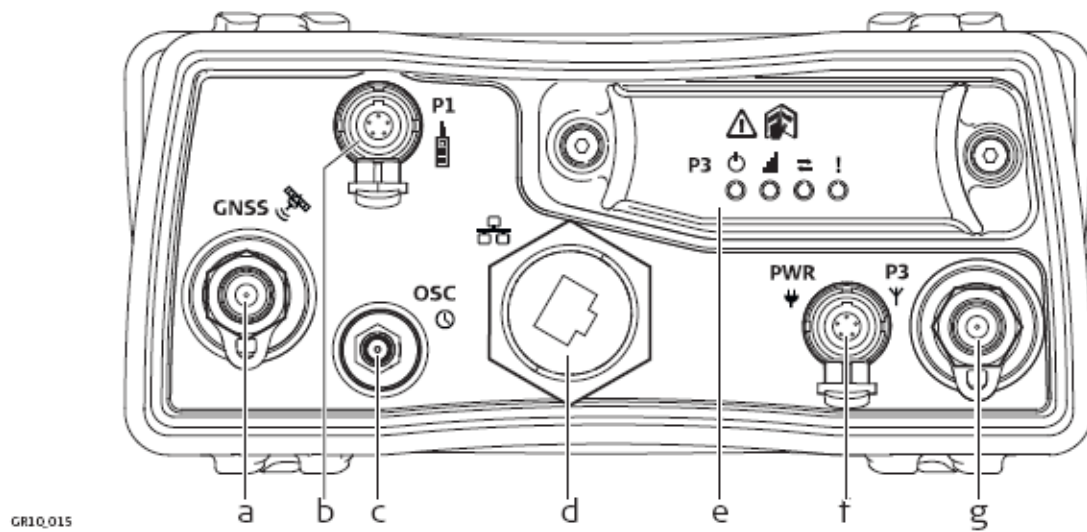
Appendix A: Ports & Pin Assignments

Ports & Pin Assignments: GR10

Description

Some applications require knowledge of the pin assignments for the GR10 ports. In this chapter, the pin assignments and sockets for the ports of the GR10 are explained.

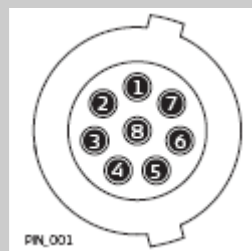
Ports at the instrument front panel



- a. **GNSS:** GNSS Antenna port TNC
- b. **P1:** Serial port, 8 pin LEMO
- c. **OSC:** Oscillator port
- d. **Ethernet port:** Ruggedised RJ45
- e. **P3:** Communication Slot-in port
- f. **PWR:** Power port, 5 pin LEMO, dual input
- g. **P3:** Communication Slot-in port Antenna, TNC

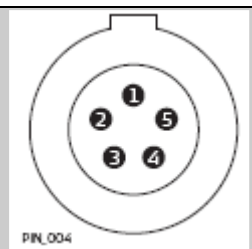
Pin assignments for Serial Port P1

Pin	Signal Name	Function	Direction
1	USB_D+	USB data line	In or out
2	USB_D-	USB data line	In or out
3	GND	Signal ground	-
4	RxD	RS232, receive data	In
5	TxD	RS232, transmit data	Out
6	ID	Identification pin	In or out
7	PWR	Power input, 10.5 V-28 V	In
8	TRM_ON/USB_ID	RS232, general-purpose signal	In or out



Pin assignments for Power Port, PWR

Pin	Signal Name	Function	Direction
1	PWR1	Power input, 11 V-28 V	In
2	ID1	Identification pin	In
3	GND	Signal ground	-
4	PWR2	Power input, 11 V-28 V	In
5	ID2	Identification pin	In



Sockets

Port P1: LEMO-1, 8 pin, LEMO EGI.1B.308.CLN
 Port PWR: LEMO-1, 5 pin, LEMO HMG.1B.305.CLNP

Appendix B: NMEA Messages

B1: NMEA Messages - Overview

Background information

National Marine Electronics Association is a standard for interfacing marine electronic devices. This chapter describes all NMEA-0183 messages which can be output by the receiver.

A Talker ID appears at the beginning of the header of each NMEA message. The Talker ID can be user defined or standard (based on the NMEA 3.0). This is normally GP for GPS.

- [B2: Used symbols for describing the NMEA formats](#)
- [B3: GGA - Global Positioning System Fix Data](#)
- [B4: GPK - Real-time Position with DOP](#)
- [B5: GPK\(PT\) - Real-time Position with DOP, Trimble Proprietary](#)
- [B6: GPK - Real-time Position with CQ](#)
- [B7: GLL - Geographical Position Latitude/Longitude](#)
- [B8: GNS - GNSS Fix Data](#)
- [B9: GSA - GNSS DOP and Active Satellites](#)
- [B10: GSV - GNSS Satellites in View](#)
- [B11: RMC - Recommended Minimum Specific GNSS Data](#)
- [B12: VTG - Course Over Ground and Ground Speed](#)
- [B13: ZDA - Time and Date](#)

B2: Used symbols for describing the NMEA formats

Background information

NMEA messages consist of various fields. The fields are:

- Header
- Special format fields
- Numeric value fields
- Information fields
- Null fields

Certain symbols are used as identifier for the field types. These symbols are described in this section.

Header

Symbol	Field	Description	Example
\$	-	Start of sentence	\$
--ccc	Address	<ul style="list-style-type: none"> • -- = alphanumeric characters identifying the talker <p>Options:</p> <p>GP = GPS only</p> <p>GL = GLONASS only</p> <p>GN = Global Navigation Satellite System</p> <ul style="list-style-type: none"> • ccc = alphanumeric characters identifying the data type and string format of the successive fields. This is usually the name of the message. 	GPGGA

Special format fields

Symbol	Field	Description	Example
A	Status	<ul style="list-style-type: none"> • A = Yes, Data Valid, Warning Flag Clear • V = No, Data Invalid, Warning Flag Set 	V
III.II	Latitude	<ul style="list-style-type: none"> • Degreesminutes.decimal 	4724.538950

		<ul style="list-style-type: none"> Two fixed digits of degrees, two fixed digits of minutes and a variable number of digits for decimal fraction of minutes. Leading zeros are always included for degrees and minutes to maintain fixed length. 	
yyyy.yy	Longitude	<ul style="list-style-type: none"> Degreesminutes.decimal Three fixed digits of degrees, two fixed digits of minutes and a variable number of digits for decimal fraction of minutes. Leading zeros are always included for degrees and minutes to maintain fixed length. 	00937.046785
eeeeee.eee	Grid Easting	At the most six fixed digits for metres and three fixed digits for decimal fractions of metres.	195233.507
nnnnnn.nnn	Grid Northing	At the most six fixed digits for metres and three fixed digits for decimal fractions of metres.	127223.793
hhmmss.ss	Time	<ul style="list-style-type: none"> hoursminutesseconds.decimal Two fixed digits of hours, two fixed digits of minutes, two fixed digits of seconds and a variable number of digits for decimal fraction of seconds. Leading zeros are always included for hours, minutes and seconds to maintain fixed length. 	115744.00
mmddy	Date	<ul style="list-style-type: none"> Monthdayyear - two fixed digits of month, two fixed digits of day, two fixed digits of year. Leading zeros always included for month, day and year to maintain fixed length. 	093003
No specific symbol	Defined field	<ul style="list-style-type: none"> Some fields are specified to contain predefined constants, most often alpha characters. Such a field is indicated by the presence of one or more valid characters. Excluded from the list of valid characters are the following that are used to indicate other field types: A, a, c, x, hh, hhmmss.ss, llll.ll, yyyy.yy. 	M

Numeric value fields

Symbol	Field	Description	Example
x.x	Variable numbers	<ul style="list-style-type: none"> Integer or floating numeric field Optional leading and trailing zeros. Decimal point and associated decimal-fraction are optional if full resolution is not required. 	73.10 = 73.1 = 073.1 = 73
hh_	Fixed HEX field	Fixed length HEX numbers	3F

Information fields

Symbol	Field	Description	Example
c--c	Variable text	Variable length valid character field	A
aa_	Fixed alpha field	Fixed length field of upper case or lower case alpha characters	N
xx_	Fixed number field	Fixed length field of numeric characters	1

Null fields

Symbol	Field	Description	Example
No symbol	Information unavailable for output	Null fields do not contain any information at all.	''

- Fields are always separated by a comma. Before the Checksum field there is never a comma.
- When information for a field is not available, the position in the data string is empty.

B3: GGA - Global Positioning System Fix Data

Syntax

```
$--GGA,hhmmss.ss,lll.ll,a,yyyy.yy,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx*hh<CR><LF>
```

Description of fields

Field	Description
\$--GGA	Header including Talker ID
hhmmss.ss	UTC time of position
lll.ll	Latitude (WGS 1984)
a	Hemisphere, North or South
yyyy.yy	Longitude (WGS 1984)
a	East or West
x	Position quality indicator 0 = Fix not available or invalid 1 = No real-time position, navigation fix 2 = Real-time position, ambiguities not fixed 3 = Valid fix for GNSS Precise Positioning Service mode, for example WAAS 4 = Real-time position, ambiguities fixed
xx	Number of satellites in use, 00 to 26.
x.x	HDOP
x.x	Altitude of position marker above/below mean sea level in metres. If no orthometric height is available the local ellipsoidal height will be exported. If the local ellipsoidal height is not available either, the WGS 1984 ellipsoidal height will be exported.
M	Units of altitude as fixed text M
x.x	Geoidal separation in metres. This is the difference between the WGS 1984 earth ellipsoid surface and mean sea level.
M	Units of geoidal separation as fixed text M
x.x	Age of differential GNSS data, empty when DGPS not used
xxxx	Differential reference station ID, 0000 to 1023
*hh	Checksum
<CR>	Carriage Return
<LF>	Line Feed

Examples

User defined Talker ID = GN

```
$GNNGGA,113805.50,4724.5248541,N,00937.1063044,E,4,13,0.7,1171.281,M,-703.398,M,0.26,0000*42
```

B4: GGK - Real-time Position with DOP

Syntax

\$--GGK,hhmmss.ss,mmddy,III.II,a,yyyy.yy,a,x,xx,x.x,EHTx.x,M*hh<CR><LF>

Description of fields

Field	Description
\$--GGK	Header including Talker ID
hhmmss.ss	UTC time of position
mmddy	UTC date
III.II	Latitude (WGS 1984)
a	Hemisphere, N orth or S outh
yyyy.yy	Longitude (WGS 1984)
a	E ast or W est
x	Position quality indicator 0 = Fix not available or invalid 1 = No real-time position, navigation fix 2 = Real-time position, ambiguities not fixed 3 = Real-time position, ambiguities fixed
xx	Number of satellites in use, 00 to 26.
x.x	GDOP
EHT	Ellipsoidal height
x.x	Altitude of position marker as local ellipsoidal height. If the local ellipsoidal height is not available, the WGS 1984 ellipsoidal height will be exported.
M	Units of altitude as fixed text M
*hh	Checksum
<CR>	Carriage Return
<LF>	Line Feed

Examples

Standard Talker ID

\$GNGGK,113616.00,041006,4724.5248557,N,00937.1063064,E,3,12,1.7,EHT1171.742,M *6D

User defined Talker ID = GN

\$GNGGK,113806.00,041006,4724.5248557,N,00937.1063064,E,3,13,1.4,EHT1171.746,M*66

B5: GGK-PT - Real-time Position with DOP, Trimble Proprietary**Syntax**

```
$PTNL,GGK,hhmmss.ss,mmddy,lll.ll,a,yyyy.yy,a,x,xx,x.x,EHTx.x,M*hh<CR><LF>
```

Description of fields

Field	Description
\$PTNL	\$ = Start of sentence delimiter, talker ID fixed with PTNL
GGK	GGK sentence formatter
hhmmss.ss	UTC time of position
mmddy	UTC date
lll.ll	Latitude (WGS 1984)
a	Hemisphere, N orth or S outh
yyyy.yy	Longitude (WGS 1984)
a	E ast or W est
x	Position quality indicator 0 = Fix not available or invalid 1 = No real-time position, navigation fix 2 = Not existing 3 = Real-time position, ambiguities fixed 4 = Real-time position, ambiguities not fixed
xx	Number of satellites in use, 00 to 26.
x.x	PDOP
EHT	Ellipsoidal height
x.x	Altitude of position marker as local ellipsoidal height. If the local ellipsoidal height is not available, the WGS 1984 ellipsoidal height will be exported.
M	Units of altitude as fixed text M
*hh	Checksum
<CR>	C arriage R eturn
<LF>	L ine F eed

Examples**Standard Talker ID**

```
$PTNL,GGK,113616.00,041006,4724.5248557,N,00937.1063064,E,3,12,1.5,EHT1171.742,M*4C
```

User defined Talker ID = GN

```
$PTNL,GGK,113806.00,041006,4724.5248557,N,00937.1063064,E,3,13,1.2,EHT1171.746,M*43
```


B6: GGQ - Real-time Position with CQ**Syntax**

```
$--GGQ,hhmmss.ss,mmddy,III.II,a,yyyy.yy,a,x,xx,x.x,x.x,M*hh<CR><LF>
```

Description of fields

Field	Description
\$--GGQ	Header including talker ID
hhmmss.ss	UTC time of position
mmddy	UTC date
III.II	Latitude (WGS 1984)
a	Hemisphere, N orth or S outh
yyyy.yy	Longitude (WGS 1984)
a	E ast or W est
x	Position quality indicator 0 = Fix not available or invalid 1 = No real-time position, navigation fix 2 = Real-time position, ambiguities not fixed 3 = Real-time position, ambiguities fixed
xx	Number of satellites in use, 00 to 26.
x.x	Coordinate quality in metres
x.x	Altitude of position marker above/below mean sea level in metres. If no orthometric height is available the local ellipsoidal height will be exported. If the local ellipsoidal height is not available either, the WGS 1984 ellipsoidal height will be exported.
M	Units of altitude as fixed text M
*hh	Checksum
<CR>	C arriage R eturn
<LF>	L ine F eed

Examples**Standard Talker ID**

```
$GNGGQ,113615.50,041006,4724.5248556,N,00937.1063059,E,3,12,0.009,1171.281,M*22
```

```
$GPGGQ,113615.50,041006,,,,08,,*67
```

```
$GLGGQ,113615.50,041006,,,,04,,*77
```

User defined Talker ID = GN

```
$GNGGQ,113805.50,041006,4724.5248541,N,00937.1063044,E,3,13,0.010,1171.281,M*2E
```

B7: GLL - Geographical Position Latitude/Longitude

Syntax

```
$-GLL,IIII.II,a,yyyyy.yy,a,hmmss.ss,A,a*hh<CR><LF>
```

Description of fields

Field	Description
\$-GGL	Header including talker ID
IIII.II	Latitude (WGS 1984)
a	Hemisphere, N orth or S outh
yyyyy.yy	Longitude (WGS 1984)
a	E ast or W est
hmmss.ss	UTC time of position
A	Status A = Data valid V = Data not valid
a	Mode indicator A = Autonomous mode D = Differential mode N = Data not valid
*hh	Checksum
<CR>	C arriage R eturn
<LF>	L ine F eed

The Mode indicator field supplements the Status field. The Status field is set to A for the Mode indicators A and D.

The Status field is set to V for the Mode indicator N.

Examples

Standard Talker ID

```
$GNGLL,4724.5248556,N,00937.1063059,E,113615.50,A,D*7B
```

User defined Talker ID = GN

```
$GNGLL,4724.5248541,N,00937.1063044,E,113805.50,A,D*7E
```

B8: GNS - GNSS Fix Data**Syntax**

```
$--GNS,hhmmss.ss,llll.ll,a,yyyy.yy,a,c--c,xx,x.x,x.x,x.x,x.x,xxxx*hh<CR><LF>
```

Description of fields

Field	Description
\$--GNS	Header including talker ID
hhmmss.ss	UTC time of position
llll.ll	Latitude (WGS 1984)
a	Hemisphere, N orth or S outh
yyyy.yy	Longitude (WGS 1984)
a	E ast or W est
c--c	Mode indicator N = Satellite system not used in position fix or fix not valid A = Autonomous; navigation fix, no real-time fix D = Differential; real-time position, ambiguities not fixed R = Real-time kinematic; ambiguities fixed
xx	Number of satellites in use, 00 to 99.
x.x	HDOP
x.x	Altitude of position marker above/below mean sea level in metres. If no orthometric height is available the local ellipsoidal height will be exported. If the local ellipsoidal height is not available either, the WGS 1984 ellipsoidal height will be exported.
x.x	Geoidal separation in metres
x.x	Age of differential data
xxxx	Differential reference station ID, 0000 to 1023
M	Units of altitude as fixed text M
*hh	Checksum
<CR>	C arriage R eturn
<LF>	L ine F eed

Examples**Standard Talker ID**

```
$GNGNS,113616.00,4724.5248557,N,00937.1063064,E,RR,12,0.9,1171.279,-703.398,0.76,0000*6C
```

```
$GPGNS,113616.00,,,,,08,,,,*69
```

```
$GLGNS,113616.00,,,,,04,,,,*79
```

User defined Talker ID = GN

```
$GNGNS,113806.00,4724.5248547,N,00937.1063032,E,R,13,0.7,1171.283,-703.398,0.76,0000*39
```

B9: GSA - GNSS DOP and Active Satellites

Syntax

\$-GSA,a,x,xx,xx,xx,xx,xx,xx,xx,xx,xx,x.x,x.x,x.x*hh<CR><LF>

Description of fields

Field	Description
\$-GSA	Header including talker ID
a	Mode M = Manual, forced to operate in 2D or 3D mode A = Automatic, allowed to automatically change between 2D and 3D
x	Mode 1 = Fix not available 2 = 2D 3 = 3D
xx	Numbers of the satellites used in the solution. This field is repeated 12 times. 1 to 32 = PRN numbers of GPS satellites 33 to 64 = Numbers of WAAS and WAAS like satellites 65 to 96 = Slot numbers of GLONASS satellites
x.x	PDOP
x.x	HDOP
x.x	VDOP
*hh	Checksum
<CR>	Carriage Return
<LF>	Line Feed

Examples

Standard Talker ID

\$GNGSA,A,3,01,11,14,17,19,20,24,28,,,,,1.5,0.9,1.2*26

\$GNGSA,A,3,65,66,67,81,,,,,,,,,1.5,0.9,1.2*29

User defined Talker ID = GN

\$GNGSA,A,3,01,11,14,17,19,20,23,24,28,,,,,65,66,67,81,,,,,,,,,1.2,0.7,1.0*27

B10: GSV - GNSS Satellites in View

Syntax

\$--GSV,x,x,x,xx,xx,xx,xxx,xx,.....*hh<CR><LF>

Description of fields

Field	Description
\$--GSV	Header including talker ID
x	Total number of messages, 1 to 4
x	Message number, 1 to 4
xx	Number of theoretically visible satellites according to the current almanac.
xx	PRN (GPS) / Slot (GLONASS) number of satellite
xx	Elevation in degrees, 90 maximum, empty when not tracking
xxx	Azimuth in degrees true North, 000 to 359, empty when not tracking
xx	Signal to Noise Ratio C/No in dB, 00 to 99 of L1 signal, null field when not tracking.
...	Repeat set PRN / Slot number, elevation, azimuth and SNR up to four times
*hh	Checksum
<CR>	Carriage Return
<LF>	Line Feed

Satellite information may require the transmission of multiple messages, specified by the total number of messages and the message number.

The fields for the PRN / Slot number, Elevation, Azimuth and SNR form one set. A variable number of these sets are allowed up to a maximum of four sets per message.

Examples

Standard Talker ID

\$GPGSV,3,1,11,01,55,102,51,11,85,270,50,14,31,049,47,17,21,316,46*7A

\$GPGSV,3,2,11,19,31,172,48,20,51,249,50,22,00,061,,23,11,190,42*7E

\$GPGSV,3,3,11,24,11,292,43,25,08,114,,28,14,275,44,,,,*45

\$GLGSV,2,1,06,65,16,055,42,66,64,025,48,67,46,262,42,68,01,245,*64

\$GLGSV,2,2,06,81,52,197,47,83,07,335,,,,,,,,*68

User defined Talker ID = GN

\$GNGSV,3,1,10,01,55,100,51,11,86,263,50,14,31,049,47,17,22,316,46*65

\$GNGSV,3,2,10,19,30,172,48,20,52,249,51,23,12,190,42,24,12,292,42*6C

\$GNGSV,3,3,10,25,09,114,,28,14,274,44,,,,,,,,*62

B11: RMC - Recommended Minimum Specific GNSS Data**Syntax**

```
$--RMC,hhmmss.ss,A,lll.ll,a,yyyy.yy,a,x.x,x.x,xxxxx,x.x,a,a*hh<CR><LF>
```

Description of fields

Field	Description
\$--RCM	Header including talker ID
hhmmss.ss	UTC time of position
A	Status A = Data valid V = Navigation receiver warning
lll.ll	Latitude (WGS 1984)
a	Hemisphere, N orth or S outh
yyyy.yy	Longitude (WGS 1984)
a	E ast or W est
x.x	Speed over ground in knots
x.x	Course over ground in degrees
xxxxx	Date: ddmmyy
x.x	Magnetic variation in degrees
a	E ast or W est
a*hh	Mode Indicator A = Autonomous mode D = Differential mode N = Data not valid
<CR>	C arriage R eturn
<LF>	L ine F eed

Examples**Standard Talker ID**

```
$GNRMC,113616.00,A,4724.5248557,N,00937.1063064,E,0.01,11.43,100406,11.43,E,D*1C
```

User defined Talker ID = GN

```
$GNRMC,113806.00,A,4724.5248547,N,00937.1063032,E,0.00,287.73,100406,287.73,E,D*10
```

B12: VTG - Course Over Ground and Ground Speed**Syntax**

```
$--VTG,x.x,T,x.x,M,x.x,N,x.x,K,a*hh<CR><LF>
```

Description of fields

Field	Description
\$--VTG	Header including talker ID
x.x	Course over ground in degrees true North, 0.0 to 359.9
T	Fixed text T for true North
x.x	Course over ground in degrees magnetic North, 0.0 to 359.9
M	Fixed text M for magnetic North
x.x	Speed over ground in knots
N	Fixed text N for knots
x.x	Speed over ground in km/h
K	Fixed text K for km/h
a	Mode Indicator A = Autonomous mode D = Differential mode N = Data not valid
*hh	Checksum
<CR>	Carriage Return
<LF>	Line Feed

Examples**Standard Talker ID**

```
$GNVTG,11.4285,T,11.4285,M,0.007,N,0.013,K,D*3D
```

User defined Talker ID = GN

```
$GNVTG,287.7273,T,287.7273,M,0.002,N,0.004,K,D*3E
```

B13: ZDA - Time and Date**Syntax**

```
$--ZDA,hhmmss.ss,xx,xx,xxxx,xx,xx*hh<CR><LF>
```

Description of fields

Field	Description
\$--ZDA	Header including talker ID
hhmmss.ss	UTC time
xx	UTC day, 01 to 31
xx	UTC month, 01 to 12
xxxx	UTC year
xx	Local zone description in hours, 00 to ±13
xx	Local zone description in minutes, 00 to +59
*hh	Checksum
<CR>	Carriage Return
<LF>	Line Feed

This message is given high priority and is output as soon as it is created. Latency is therefore reduced to a minimum.

Examples**Standard Talker ID**

```
$GPZDA,091039.00,01,10,2003,-02,00*4B
```

User defined Talker ID = GN

```
$GNZDA,113806.00,10,04,2006,02,00*76
```


Appendix C: RTCM Messages

RTCM Message Types

Background information

Radio Technical Commission for Maritime services. Commission set up to define a differential data link to relay GPS correction messages from a monitor station to a field user.

RTCM v.2.x

Type	Description
1	Differential GPS Corrections. Message Type 1 provides the pseudorange correction (PRC(t)) for any user receiver GPS measurement time "t". The Type 1 Message contains data for all satellites in view of the reference station.
2	Delta Differential GPS Corrections. Upon a change in ephemeris, the reference station broadcasts a Type 2 message paired with a Type 1 message, and continues to broadcast Type 2 messages over a period of several minutes following a change in satellite navigation data in order to accommodate users coming on line. The message contains the difference in the pseudorange and range rate corrections caused by the change in satellite navigation data. The general format is the same as that of a Type 1 Message.
3	GPS Reference Station Parameters. Message Type 3 contains reference station information. It includes the GPS coordinates (Earth-Centered-Earth-Fixed (ECEF)) of the reference station antenna to the nearest centimeter. WGS-84 is the recommended reference datum. If a datum other than WGS-84 is used, Message Type 4 will be broadcast frequently to inform the users of the datum being used for the reference station coordinates.
9	GPS Partial Correction Set. The Type 9 Message serves the same purpose as the Type 1 Message, in that it contains the primary differential GPS corrections. However, unlike Type 1's, Type 9 Messages do not require a complete satellite set.
18	RTK Uncorrected Carrier Phases. GPS/GLONASS Satellite constellation indicator are used to differentiate between the satellite systems. Hence, there are individual messages for GPS and GLONASS satellites and for each frequency. The GNSS time of measurement is referenced to GPS time for GPS satellites and to GLONASS time for GLONASS satellites. Note that GLONASS satellites are supported in v2.3 only.
19	RTK Uncorrected Pseudoranges. GPS/GLONASS Satellite constellation indicator are used to differentiate between the satellite systems. Hence, there are individual messages for GPS and GLONASS satellites and for each frequency. The time of measurement is referenced to GPS time for GPS satellites and to GLONASS time for GLONASS satellites. Note that GLONASS satellites are supported in v2.3 only.
20	RTK Carrier Phase Corrections. Same handling as for Type 18. Note that GLONASS satellites are currently not supported.
21	RTK/High Accuracy Pseudorange Corrections. Same handling as for Type 19. Note that GLONASS satellites are currently not supported.
23 (v2.3 only)	Antenna Type Definition Record. Message Type 23 provides the information on the antenna type used on the reference station. The RTCM commission adopted the naming convention from the IGS equipment-naming table as supplied by the International GNSS Service Central Bureau (IGS CB). This table provides a unique antenna descriptor for antennas used for high-precision surveying type applications.
24 (v2.3 only)	Antenna Reference Point (ARP). Message Type 24 solves the problem of referencing the L1 phase center by utilizing the Antenna Reference Point (ARP), which is used throughout the International GNSS Service (IGS).

RTCM v3.0

Type	Description
1001	L1-Only GPS RTK Observables.
1002	Extended L1-Only GPS RTK Observables.
1003	Compact L1&L2 GPS RTK Observables.
1004	Extended L1&L2 GPS RTK Observables. Contains Signal to Noise Ratio (SNR).
1005	Stationary RTK Reference Station Antenna Reference Point (ARP).
1006	Stationary RTK reference station ARP coordinates with Antenna Height.
1007	Antenna Descriptor.
1008	Antenna Descriptor & Serial Number.
1011	GLONASS Basic RTK, L1&L2. The Type 1011 Message supports dual-frequency RTK operation, and does not include an indication of the satellite carrier-to-noise (CNR) as measured by the reference station.
1012	GLONASS Extended RTK, L1&L2. The Type 1012 Message supports dual-frequency RTK operation, and includes an indication of the satellite carrier-to-noise (CNR) as measured by the reference station.
1013	System Parameters.
1033	Receiver and Antenna descriptors including serial number and firmware version information.
4029	Leica Proprietary Message

RTCM v 3.1

Type	Description
1019	GPS ephemeris data.
1020	GLONASS ephemeris data.

Realtime message satellite signal support

Message format	GPS	GPS L5	GLONASS	Galileo
Leica	✓	-	✓	-
Leica 4G	✓	✓	✓	✓
CMR	✓	-	-	-
CMR+	✓	-	-	-
RTCM v 3	✓	✓	✓	-
RTCM 1,2 (v2.1)	✓	-	-	-
RTCM 1,2 (v2.2)	✓	-	-	-
RTCM 1,2 (v2.3)	✓	-	-	-
RTCM 9,2 (v2.1)	✓	-	-	-
RTCM 9,2 (v2.2)	✓	-	-	-
RTCM 9,2 (v2.3)	✓	-	-	-
RTCM 18,19 (v2.1)	✓	-	-	-
RTCM 18,19 (v2.2)	✓	-	✓	-
RTCM 18,19 (v2.3)	✓	-	✓	-
RTCM 20,21 (v2.1)	✓	-	-	-
RTCM 20,21 (v2.2)	✓	-	-	-
RTCM 20,21 (v2.3)	✓	-	-	-
RTCM 1,2,18,19 (v2.1)	✓	-	-	-
RTCM 1,2,18,19 (v2.2)	✓	-	✓	-
RTCM 1,2,18,19 (v2.3)	✓	-	✓	-
RTCM 1,2,20,21 (v2.1)	✓	-	-	-
RTCM 1,2,20,21 (v2.2)	✓	-	-	-
RTCM 1,2,20,21 (v2.3)	✓	-	-	-

Appendix D: Web interface: Directory Structure of the Menu Bar

Web interface: Directory Structure of the Menu Bar

Menu Bar

```
|--- Home
|
|
|--- Status
|
|
|----- Receiver Information
|         |-- Receiver
|         |-- Options
|
|----- Position
|
|----- Tracking
|         |-- General
|         |-- GPS
|         |-- GLONASS
|         |-- Galileo
|         |-- SBAS
|
|----- Data streams
|         |-- Outgoing data streams
|         |-- Incoming data streams
|
|----- Logging sessions
|
|----- Port summary
|
|----- Event log
|
|----- Network connections
|
|----- System resources
|
|--- GNSS Management
|
|----- Site name and coordinates
```

```
| |----- Tracking
| |
| |     |-- General
| |     |-- GPS
| |     |-- GLONASS
| |     |-- GALILEO
| |
| |----- Data streams
| |
| |     |-- Outgoing data streams
| |         |-- Create new data stream
| |
| |     |-- Incoming data stream
| |         |-- Create new data stream
| |
| |----- Logging sessions
| |
| |     |-- Sessions
| |         |-- Create new Logging session
| |
| |     |-- Smart clean-up
| |
| |----- FTP locations
| |
| |----- Antenna management
| |
| |     |-- Select antenna
| |     |-- Antenna management
| |
| |----- Wake-up sessions
| |
| |----- Receiver setup
| |
| |     |------- Network connections
| |
| |         |-- Ethernet
| |         |-- Mobile internet
| |
| |     |------- Access management
| |
| |         |-- User management
| |             |-- Create new user
| |
| |         |-- Access settings
| |
| |     |------- Spider and remote access
| |
| |     |------- Web server
```

```

|----- DynDNS
|
|----- FTP server
|
|----- Device management
|     |-- Modem/Phone
|     |-- Radio
|
|----- Event log
|
|----- Power management
|
|----- Tools
|     |-- Tools
|     |
|     |-- Firmware
|         |-- Upload new firmware
|     |
|     |-- Options
|         |-- Upload new option files
|     |
|     |-- Languages
|         |-- Upload new language files
|     |
|     |-- Receiver settings/Backup
|         |-- Backup current receiver settings
|         |-- Upload new receiver settings
|
|-- Help
|
|-- Support
|
|----- Properties
|
|----- Support tool
|
|----- Leica Active Assist
|
|----- Links
|
|-- Logout

```


Appendix E: Directory Structure of the Memory Device

Directory Structure of the Memory Device

```

|--- Data                                Storing raw data logging data
|   |
|   |
|   |----- Session1*
|   |
|   |----- Session2*
|   |
|   |----- Session3*
|   |
|   |
|   |
|--- Transfer                            Upload and download files
|   |
|   |
|   |----- Antenna                    Upload antenna files
|   |
|   |----- Firmware                  Upload firmware files
|   |
|   |----- Options                   Upload option files
|   |
|   |----- Language                  Upload language files
|   |
|   |----- Settings                  Upload system configuration

```

* The name of each of the subdirectories will be the configured logging [session name](#). For example an MDB, RINEX or Hatanaka raw data logging session.

Appendix F: GR10 default settings

Appendix F: GR10 Default settings

The following list shows default settings on the GR10 receiver.

The outcome of selecting the action [Format receiver settings](#) (**Reset all**) is listed for each default setting.

Access management

Setting	Default setting
Access to Web interface is	Fully restricted



Format receiver settings outcome

All users are deleted.

The Administrator account is restored with the **User name:** Admin and **Password:** 12345678.

The access rights are Administrator for the Web interface and Read/Write for FTP access to the SD card.

Antenna management

Setting	Default setting
Antenna	ADVNULLANTENNA
Height Reading	0
Measurement type	Vertical



Format receiver settings outcome

All user defined antennas are deleted. Default settings listed above are restored.

All default antennas are set back to their default values.



When using **Restore default values** in the **Antenna Management** page, all user defined antennas will not be deleted. All default antennas are set back to their default values.

Create new user page

Setting	Default setting
Username	Empty
Password	Empty
Confirm Password	Empty
Web interface user level	Status Viewer
FTP server access	Read only



Format receiver settings outcome

Default settings listed above are restored.

Data streams

Incoming data streams wizard

Setting	Default setting
Session type	Meteo
Device	Meteo Met4a
Data rate	4s
Activate data stream	Enabled

Outgoing data streams wizard

Setting	Default setting
Session type	Real time
Reference station ID	0
End of message	Nothing
Time slicing	Disabled
Connection type	TCP/IP server
TCP/IP port	Empty
Allow connections	1
Limit access range	1.1.1.1 to 254.254.254.254
Activate data stream	Enabled



Format receiver settings outcome

All incoming and outgoing data streams are deleted. Default settings listed above are restored.

Device management



Format receiver settings outcome

- All default devices are restored.
- All settings for the default devices are set back to factory defaults.
- All user defined devices are deleted.

DynDNS

Setting	Default setting
Service provider	Not used
Hostname	Empty
Username	Empty
Password	Empty



Format receiver settings outcome

Default settings listed above are restored.

Event log

Setting	Default setting
Autodelete log file entries	After 1 month
Enable event email	Disabled
Send email to	Empty
Email address of sender	Empty
Mail server (SMTP)	Empty
Mail server port	25
Mail server username	Empty
Mail server password	Empty
Send email every	1h



Format receiver settings outcome

All Event log messages are deleted. Default settings listed above are restored.

FTP server

Setting	Default setting
Enabled access to FTP server	Enabled
Allow anonymous access	Empty
FTP control port	21
FTP data port range	50000-51000
Session timeout	180 sec (3min)



Format receiver settings outcome

Default settings listed above are restored.

FTP location

New FTP location

Setting	Default setting
Name	Empty
FTP server host	Empty
FTP server port	21
FTP root directory	/
Username	Empty
Password	Empty
Send commands	Empty
Use passive mode	Enabled



Format receiver settings outcome

All configured FTP locations are deleted. Default settings listed above are restored.

Logging session

Logging session wizard

Setting	Default setting
Session name	Empty
Data type	MDB
Session priority	medium (Smart clean up warning displayed)
Session type	Continuous

Logging rate	1 sec
File length	1h
Dynamics	Static
Log doppler observations	Disabled

Zip files	Disabled
Directory naming convention	Session name/Site/Year/Month/Day of month
Choose FTP location	No FTP location
Delete files	Never



Format receiver settings outcome

All configured logging sessions are deleted. Default settings listed above are restored.

The according data on the SD card is not deleted. Format receiver settings does not reformat the SD card. Files must be deleted from the SD card manually or the SD card can be formatted from the web interface via **Receiver setup / Tools**.

Mobile ethernet

Setting	Default setting
Device	Not used
Pin code	Empty
Puk code	Empty
APN	Empty
Username	Empty
Password	Empty
IP address	Dynamic
Use default gateway	Disabled



Format receiver settings outcome

Default settings listed above are restored.

Network connections

Setting	Default setting
Receiver hostname	GR(serial number)

Obtain an IP address automatically	Enabled
IP address	192.168.0.3
Subnet mask	255.255.255.0
Default gateway	Assigned by DHCP
Preferred DNS server	Assigned by DHCP
Alternative DNS server	Assigned by DHCP

Device	Not used
Pin code	Empty
Puk code	Empty
APN	Empty
Username	Empty
Password	Empty
IP address	Dynamic
Use default gateway	Disabled



Format receiver settings outcome

All default settings listed above are restored.

Power management

Setting	Default setting
Serial port 1	Enabled
Reboot after power failure	Always



Format receiver settings outcome

Default settings listed above are restored.

Remote access wizard

Setting	Default setting
Connection type	TCP/IP server

TCP/IP port	Empty
Limit access range	1.1.1.1 to 254.254.254.254

Activate remote access	Enabled
------------------------	---------



Format receiver settings outcome

Default settings listed above are restored.

Spider and remote access



Format receiver settings outcome

All remote access ports are deleted.

Site name and coordinates

Setting	Default setting
Site name	Empty
Site code	Last four digits of serial number
Marker name	Empty
Marker number	Empty

Coordinate type	Geodetic
Latitude	all 0
Longitude	all 0
Ellipsoidal height	0

Time zone	(GMT) Greenwich mean time: Dublin, Edinburgh, Lisbon, London
-----------	--



Format receiver settings outcome

As listed.

Smart clean up

Setting	Default setting
Smart clean up	Disabled



Format receiver settings outcome

Default settings listed above are restored.

Tools



Format receiver settings outcome

All Firmware files, Options, Language files and Receiver settings backup files that were previously loaded on the SD card are still displayed after the receiver settings have been formatted.

Tracking and Oscillator

Setting	Default setting
Satellite system	GPS on, all other off
Satellite signals	GPS L1 and L2P(Y) on, all other off
Cut off angle	10°
Code smoothing	Smoothed
Message on loss of lock	Off
Use external oscillator	Internal



Format receiver settings outcome

All default settings listed above are restored.

Wake-up sessions

Create new Wake-up session wizard

Setting	Default setting
Name	Empty
Wake up at	next day, 0:00:00
Power down	after next day 1:00:00
No. of repeats	No repeats
Activate wake-up session	Enabled



Format receiver settings outcome

All configured Wake-up sessions are deleted. All default settings listed above are restored.

Web server

Setting	Default setting
Protocol	HTTP
Custom port	Empty
SSL certificate	Empty
SSL key	Empty



Format receiver settings outcome

Default settings listed above are restored.


Appendix G: Event log messages

Event log messages

The following table provides an overview of Event log messages you might encounter when working with the GR10.



The list does not cover all possible messages. The majority of the messages are self-explanatory and therefore no further explanations are given in the table below.

Message	Explanation / Action
Please consider running the support tool manually. Support information has been found on the receiver.	<ol style="list-style-type: none">1. Go to Support / Support tool page and enter all necessary information.2. In the comment box mention that support information has been found on your receiver and try to explain the latest changes done on the receiver.3. Then press the Mail icon  to send your support information to Network Reference Stations support.

Appendix H: Glossary

Glossary: Overview

A

[Antenna Reference Point \(ARP\)](#)

B

C

[CDMA](#)

D

[Dynamic Host Configuration Protocol \(DHCP\)](#)

E, F,

G

[GSM](#)

H

[Hatanaka](#)

I, J, K, L,

M

[MDB](#)

N

[Ntrip](#)

O, P, Q,

R

[RINEX](#)

S, T, U, V,

W

[WGS84](#)

X, Y, Z

Antenna Reference Point (ARP)

The **Antenna Reference Point** of an antenna is defined as the intersection of the BPA (Bottom of Pre-Amplifier) horizontal plane and the vertical symmetry axis of the antenna.

Phase center offsets are expressed in relation to the ARP.

Related topics

[GNSS Management: Calculate the antenna height reading](#)

CDMA

CDMA is a telecommunication standard for transmitting data packages using the Internet protocol.

Dynamic Host Configuration Protocol (DHCP)

A network application protocol used by devices (DHCP clients) to obtain configuration information for operation in an Internet Protocol network. This protocol reduces system administration workload, allowing devices to be added to the network with little or no manual intervention.

GSM

GSM (Global System for Mobile communications) is a telecommunication standard for transmitting data packages to mobile phones.

HATANAKA

A compact form of RINEX.

MDB

Leica proprietary database file format.

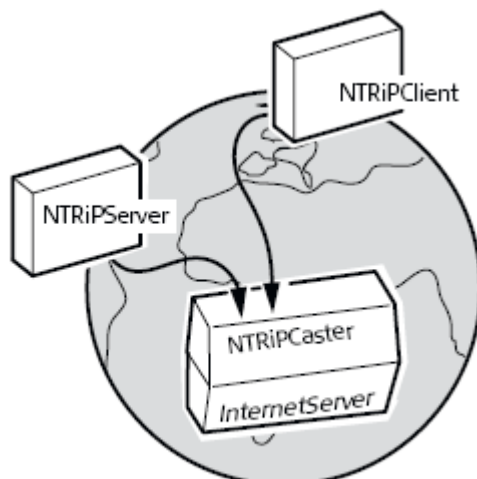
Ntrip

Networked Transport of RTCM via Internet Protocol

- is a protocol streaming real-time corrections over the Internet.
- is a generic protocol based on the Hypertext Transfer Protocol HTTP/1.1.
- is used to send differential correction data or other kinds of streaming data to stationary or mobile users over the Internet. This process allows simultaneous computer, laptop, PDA, or instrument connections to a broadcasting host.
- supports wireless Internet access through mobile IP networks like digital cellular phones or modems.

The Ntrip Server could be the GPS instrument itself. This setup means the GPS instrument is both the Ntrip Source generating the real-time data and also the NTRIP Server transferring this data to the Ntrip Caster.

Ntrip and its role in the Internet



GS_044

Ntrip Caster

The Ntrip Caster

- is an Internet server handling various data streams to and from the Ntrip Servers and Ntrip Clients.
- checks the requests from Ntrip Clients and Ntrip Servers to see if they are registered to receive or provide real-time corrections.
- decides whether there is streaming data to be sent or to be received.

Ntrip Client

The Ntrip Client receives data streams. This setup could be, for example a real-time rover receiving real-time corrections.

In order to receive real-time corrections, the Ntrip Client must first send

- a user ID
- a password
- an identification name, the so-called Mountpoint, from which real-time corrections are to be received

to the Ntrip Caster.

Ntrip Server

The Ntrip Server transfers data streams.

In order to send real-time corrections, the Ntrip Server must first send

- a password
- an identification name, the so-called Mountpoint, where the real-time corrections come from

to the Ntrip Caster.

Before sending real-time corrections to the Ntrip Caster for the first time, a registration form must be completed. This form is available from the Ntrip Caster administration centre. Refer to the Internet.

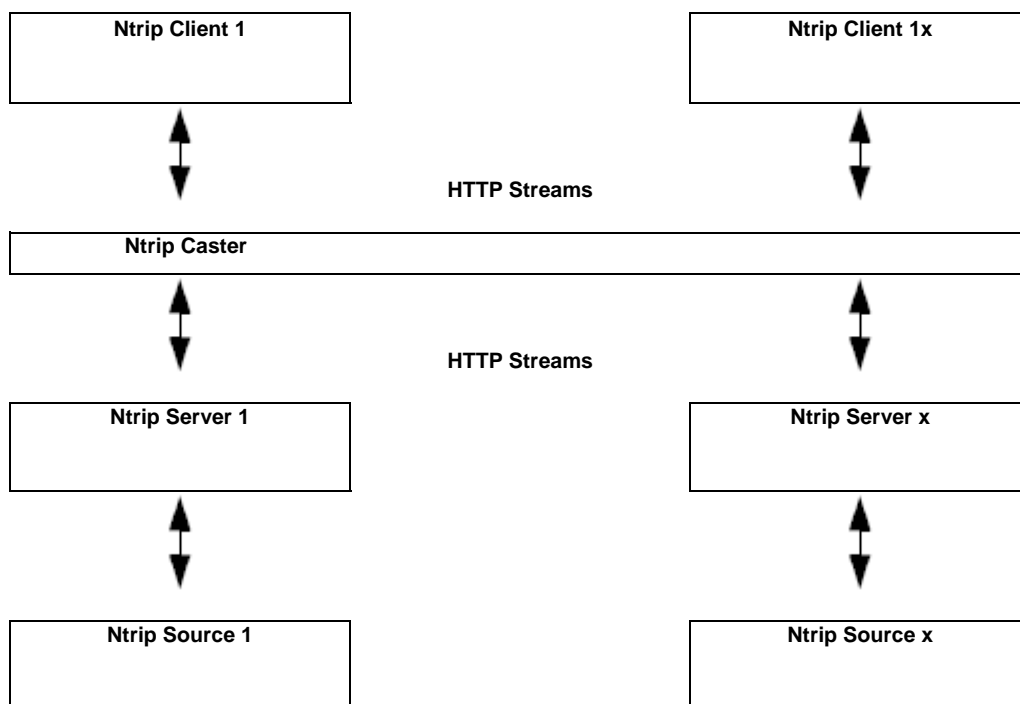
Ntrip Source

The Ntrip Source generates data streams. This setup could be base sending out real-time corrections.

Ntrip system components

Ntrip consists of three system components:

- Ntrip Clients
- Ntrip Servers
- Ntrip Caster



RINEX

RINEX stands for **R**eceiver **I**ndependant **E**Xchange format and has become a standard for GPS data. It is defined in the revised version 2 of the paper published by W. Gurtner and G. Mader in the CSTG GPS-Bulletin of September/October 1990 (Revisions: 1993 - 2006). GNSS Spider currently supports up to version 2.11 of the RINEX format.

The naming convention for RINEX files is as follows: **ssssdddhxx.yyt**

RINEX file component	Description
ssss	4 character station name (Site code).
ddd	GPS day of the year .
h	Hour of the day. If the file is created for the 1st hour of the day then h = a. h can have any value from a to x. The hour indicator refers to GPS time, not local time. Note: If a 24 hour file is created, then h = 0 (zero).
xx	Start time of RINEX file creation, given in minutes of the current hour. If you have 1hour files xx is not written.
yy	The year.
t	File type: o for observation files g for GLONASS observation files n for GPS observation files m for meteo files a for auxilliary files

For a complete description of the format on the internet see: National Geodetic Survey:

<http://www.aiub.unibe.ch/download/rinex/rinex211.txt>

WGS84

WGS 1984 is the global geocentric datum to which all GPS positioning information is referred to.

Whether providing corrections from just a single reference station, or an extensive range of services from a nationwide RTK network – innovative reference station solutions from Leica Geosystems offer tailor-made yet scalable systems, designed for minimum operator interaction whilst providing maximum user benefit. In full compliance with international standards, Leica Geosystems' proven and reliable solutions are based on the latest technology.

Precision, value, and service from Leica Geosystems.

When it has to be right.



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Total Quality Management – our commitment to total customer satisfaction.

Ask your local Leica Geosystems dealer for more information about our TQM program.

ACTIVE customer care

Leica Geosystems' customers benefit from service and support that spans time zones and geography. Our Active Customer Care program has packages to suit your needs, whether you use our simplest distance measuring device or the most sophisticated integrated solution.



Receivers:
Leica GRX1200+ Series
Leica GMX902 Series
Leica GMX901



Antennas:
Leica AR25
Leica AR10



Software:
Leica GNSS Spider
Leica SpiderWeb
Leica SpiderQC



Services:
Leica CrossCheck