GONIO 2
RXG-234 ARGOS Goniometer / Direct Receiver
User Manual
V1.0
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1. Highlights

The CLS Goniometer is a very highly sensitive direction finder that provides the direction as well as an indication of the signal power of an Argos transmitter for field recovery. It is fully compatible with:

A2 : Argos-2 low data rate transmitters
A3/ZE : Argos-3 and Argos-3-ZE low data rate transmitters
VLD-A4 : Argos-4 very low data rate transmitters

It can be used with two types of antenna:
- the Goniometer antenna
- a BNC (Bayonet Neill-Concelman) antenna

Mounted with the Goniometer antenna, the RXG-234 can be used as a direction finder as well as direct receiver. Depending on the Goniometer antenna altitude, the Argos platform transmission power and the environmental conditions, the Argos signal can be received by the RXG-234 from a few meters up to more than 100 km.

With a BNC antenna, the RXG-234 can only be used as a direct receiver. In this configuration, the Argos signal can be received by the RXG-234 from a few meters up to a few dozen km, depending on the transmission power.

In direct reception mode, GPS positions of the platform can be displayed directly on the Goniometer if the two conditions below are satisfied:
- the Argos platform is equipped with a GPS receiver,
- the message is not encrypted, and the latitude and longitude are coded simply

In this case, received Argos demodulated messages and Argos platform transmitter terminal (PTT) reception angle are displayed on the screen and available on the serial port.

An embedded GPS provides local positioning information. The CLS Goniometer is an autonomous device with up to 50 hours of operation.

GONIOMETER ANTENNA RECOMMENDATIONS

- Install the Argos Goniometer antenna as high as possible
- Don’t hold the antenna with your hands, only with a support
- Keep the antenna vertical during bearings searches
- Place the antenna pointer in your movement direction
- Wait for at least 3 collected signals before using a direction
- Be careful of incorrect measurements in noisy environments: multi path effects
- Don’t go directly in the bearings direction

PRECAUTION OF USE

- Store the Gonio in a dry place with temperature from -20°C and +50°C
- When charging the battery through USB, ensure that room temperature is from 0°C to 45°C
- Do not open or dismount the Gonio: doing so will cancel the warranty
- Use a microfiber cloth to clean the screen: ensure the Gonio is off. Do not use alcohol or detergent
- In case of salt water spray, clean with a microfiber cloth
- The battery should be fully charged before using the Gonio
- Do not bend the Goniometer antenna cable < 5cm radius, as it will add perturbation to the measurements
2. Product overview

Please ensure that all items listed in this section are in the case and have not been damaged during shipping.

2.1. List of supplies

Your Goniometer is delivered in a hard case with this user manual and:

![Gonio hard case](image)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gonio receiving antenna with 5 meter cables</td>
</tr>
<tr>
<td>2</td>
<td>Gonio receiver</td>
</tr>
<tr>
<td>3</td>
<td>Universal main power converter</td>
</tr>
<tr>
<td>4</td>
<td>USB Cable</td>
</tr>
<tr>
<td>5</td>
<td>Antenna mount</td>
</tr>
<tr>
<td>6</td>
<td>BNC antenna</td>
</tr>
</tbody>
</table>

In addition, an USB key is also provided with the following documents and software:

- ReadMe.txt
- CLS-DT-MEMO-14-045 - Recommendations for using the RXG234 goniometer ENG.pdf
- GONIO RXG 234 Installation and User Manual vvv.pdf (vvv : version number)
- Xerius_Driver.cat (for Windows 10)
- Xerius_Driver.inf (for Windows 10)
- RXG234 Communication Software xxx.exe (xxx : version number)
2.2. General view of the receiver

Front view (RXG-134 or RXG-234)

- Display screen
- GPS antenna
- ON/OFF Indicator
- ON/OFF - Navigation button
- Circular control pad
- Validation button
- Navigation button
- Arrow buttons
- Connector for USB and charger cable
- Receiving antenna connectors
- Top view

GPS antenna
2.3. Turn on/off and main screens

To turn ON/OFF the GONIO, press the right Navigation button close to the "ON/OFF" indicator until you hear a beep.

There are 4 main screens. They are given below in order of appearance after turning ON:

- RECEPTION screen (default screen at turn ON)
- FAVORITES menu
- RECEIVING PTT menu
- OPTION menu

To go from one screen to another, press the Navigation button under the "NEXT" or "PREV" labels on the screen. Same for the "INFO" label on the RECEPTION screen.

You can navigate through the items in a menu by pressing the Arrow buttons (left, right, up and down).

To select an item in a menu, press the Validation button in the middle of the control pad.

Details of the screens are given in chapter 5.
3. Antenna installation procedures

3.1. Goniometer antenna

1. Insert one of the two cables into the opening in the antenna mount.

2. Then insert the second cable.

3. Screw the mount into the antenna.
You may also pass the cables through the hole on the side of the antenna mount.

4. Connect both cables to the receiver.

*Note: The white pointer on the receiving antenna corresponds to the reference azimuth (0°) for the bearings received.*
Important: keep the antenna vertical and avoid touching it with your hands to prevent interference when the GONIO is receiving.

3.2. BNC antenna

Connect your BNC Argos antenna as shown in the figure below.

Gonio RXG-234 with BNC antenna
4. Quick start guide

Here is a quick start procedure to setup and get signals from an Argos platform through your Argos Goniometer in:

- Goniometer mode
- Direct reception mode

Information on both modes will be given in the procedure below.

The procedure is:

1. mount the antenna
2. power ON the GONIO RXG
3. setup the configuration
4. select your ARGOS platform as a favorite
5. choose your platform from the favorite platforms list
6. check results displayed in the RECEPTION screen
7. platform recovery

4.1. Mount the antenna

Mount and connect the Goniometer antenna or the BNC antenna according to section 3.1 or 3.2.

4.2. Power ON the equipment

Power ON your Goniometer by pressing the Navigation button close to the ON/OFF indicator (red circle on the picture below) until you hear a beep. After the initialization process, the RECEPTION screen will appear.

Note: When the GONIO is switched on for the first time, no information is displayed on the RECEPTION screen, in the FAVORITES PLATFORMS menu or in the RECEIVING PLATFORMS menu.
4.3. Setup the configuration

Configure the GONIO RXG with the parameters given in the table below, according to the measurements mode.

<table>
<thead>
<tr>
<th>Parameter/Mode (antenna type)</th>
<th>Goniometer (Goniometer antenna)</th>
<th>Direct Reception (Goniometer or BNC antenna)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS</td>
<td>ON (can be OFF)</td>
<td>ON</td>
</tr>
<tr>
<td>Direction mode</td>
<td>Gonio</td>
<td>GPS</td>
</tr>
<tr>
<td>Antenna mode</td>
<td>Gonio</td>
<td>Direct reception</td>
</tr>
</tbody>
</table>

Go to the OPTIONS menu by pressing the Navigation button under the NEXT label on the RECEPTION screen, the FAVORITE PLATFORMS menu and the RECEIVING PLATFORMS menu.

Enter the SETUP screens by selecting the SETUP option, using the Arrow buttons and the Validation button.
On the first screen of the SETUP menu, turn the Goniometer GPS ON by using the ARROW buttons and the Validation button.

Go to the second screen of the SETUP menu by pressing the Navigation button under the "NEXT" label.

Configure the direction and antenna mode parameters.

⚠️ **Configure the Argos Band where your beacon(s) is/are transmitting.**

The Selected Band is always displayed on the top left corner in all screens.

Validate the setting by pressing the PREV button and save the parameters by pressing the Navigation button under the "YES" label. You will be taken back to the Screen 1 of the SETUP menu.
4.4. Compass feature

It is possible to have a compass activated and thus to have the magnetic north displayed on the reception screen.

The activation is performed in the page 2 of the setup menu through the "Direction indicator" option by choosing Auto (compass/GPS) or Compass. The option "Fixed" means the Compass will not activated.

4.5. Compass calibration feature (new feature)

If too close from a magnetized surface or piece, you should use the “Compass Calibration” feature on the SETUP 1/2

Then follow the instructions. The procedure to calibrate the goniometer is intuitive and well described in the screens below.
4.6. Select your ARGOS platform as a favorite

The RECEIVING PTT screen displays all Argos transmitters whose signals have been received, in real time. Select your Argos platform in the list by using the arrows and the validation button. *(Note: Only hexadecimal Argos IDs are displayed; you may get the hexadecimal ID of your Argos platform from your ArgosWeb account: 🗝️ -> Platforms or ask your User Services Group (useroffice@cls.fr or userservices@clsamerica.com).*

The detected modulation is indicated for each ID: A2 / A3 / ZE

Note: If a beacon is transmitting two modulation, two lines will be displayed and they are considered as two different platforms.

Once your Argos platform is selected you may access the FAVORITES PLATFORMS screen setup:
We advise to setup the *Label* as the Argos decimal ID.

**Repeat period**: is not mandatory, the Gonio will take this information if specified. If not specified, the Gonio will calculate the repetition period of the beacon with the delta time of the received messages.

**Frequency Band**: The band where was detected the Message/Platform

**Frequency Mode**:  
- Wide (default) – all the defined band will be listened by the Gonio
- Narrow – the Gonio listen only the close to the detected frequency (specified bellow when selected) . To be used in environment with noise/many transmitter and focusing on only one specific platform.

Once your favorite Argos platform details are setup, click on **VALID** to save.

### 4.7. Choose among the favorite platforms

Go to the *FAVORITE* screen, select your Argos platform in the list and click on **PREV** to access the *RECEPTION* screen.

For each Favorite, the detected modulation and frequency band is displayed.

Favorite that are not in the currently selected band are “transparent” (meaning that they cannot be received). if you select it, the Gonio will ask to switch band.

### 4.8. RECEPTION screen

Platform information can be displayed on the RECEPTION screen in two different ways:  
Goniometer mode and direct reception mode (direction mode in screen 2 of SETUP menu).
4.9. The Argos platform recovery can start

**Goniometer Mode**

A. Place the white pointer of the receiving antenna toward your reference azimuth (0°). For terrestrial searches we suggest to place the white pointer toward the North, or for recovery at sea, place the white pointer on the bow axis.

B. Wait for at least 5 received signals before you start to move in a direction.

C. After 5 signals, you get an average bearing direction and signal strength.

D. Move forward with an angle from 30° to 60° with the average bearing direction.

E. When the signal strength gets higher, stop moving and wait for at least 3 received bearings. Then repeat actions from C. to E. until you recover your Argos platform.

**Direct reception Mode**

In the case of a GPS decoded platform, the distance and direction to the platform from the Gonio are displayed directly on the screen. Do not forget that the direction is given relative to the North.
5. Details of the screens

The screens are described in the following sections, in the order of appearance after turn ON.

5.1. RECEPTION screen

To turn ON the GONIO, press the ON/OFF button until you hear a beep. When initialization is complete, the *RECEPTION screen* is displayed:

![Reception screen (direction finder display)](image)

This screen allows you to monitor the selected platform. The information displayed on the screen is as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Battery level</td>
</tr>
<tr>
<td>(2)</td>
<td>Gonio GPS activation</td>
</tr>
<tr>
<td>(3)</td>
<td>Platform hexadecimal ID</td>
</tr>
<tr>
<td>(4)</td>
<td>Estimated time to next reception (negative time means the reception is overdue)</td>
</tr>
<tr>
<td>(5)</td>
<td>Received signal strength</td>
</tr>
<tr>
<td>(6)</td>
<td>Reference azimuth (red/white pointer at the bottom of the antenna)</td>
</tr>
<tr>
<td>(7)</td>
<td>Direction from the azimuth reference: 37° instantaneous direction, Ø 37° averaged direction</td>
</tr>
<tr>
<td>(8)</td>
<td>Date Time of the last received message</td>
</tr>
</tbody>
</table>

Press *INFO* (left navigation button) to display more details on the last received message.
This screen provides details of the most recent message received:

- **Date**: Date and time the message was received
- **Freq**: Frequency of the received signal, in Hertz
- **Length**: Message length in bits, after Argos preamble (FFFE2F not included)
- **Level**: Level of the received power (Signal strength)
- **Data**: Useful data (raw message) contained in the Argos message

Pressing the *RETURN* button (left navigation button) takes you back to the *RECEPTION* screen.

### 5.2. FAVORITE screen

The screen below shows three platforms that have been saved as favorites. They can be selected using the up and down arrows on the control pad. Pressing the validation button takes you to the favorites configuration screen.

Press the *PREV* navigation button to begin searching for the platform.

The Edit screen of the FAVORITE PLATFORMS is obtained after selecting a platform in the RECEIVING platform screen.
This screen provides the following options:

- **ID Type**: Choose the ID type: 20 or 28 bits
- **ID Hex**: ID in hexadecimal format
- **Label**: Set a name for the Argos platform or use the Decimal Argos ID as the label
- **GPS Indications**: NO if no template has been set for this platform.
  YES + Format Name if the GNSS info as been defined (for direction reception mode). The setting of the platform is performed via the PC through the USB connection (see section 6.8).
- **Repeat period**: Configure the repetition period, if known, otherwise it will be calculated on reception

To edit a field, select it using the arrow buttons then press the validation button. Modify the field using the up and down arrows, then press the validation button to confirm the changes.

Once all the desired changes have been made, press the validation button to return to the Favorites screen.

### 5.3. RECEIVING PLATFORMS screen

Press the **PREV** navigation button from the **OPTIONS** screen to go to the **RECEIVING PLATFORMS** screen, which displays, in real time, all transmitters whose signals have been received.
Received Platforms screen

For each transmitter signal received, this menu displays the date and time the message was received (columns 1 and 2) its hexadecimal ID number (column 3) and the Modulation detected (column 4).

Select the desired platform using the arrows, and then press the validation button. This platform is now added to your favorites and can be customized.

5.4. OPTION Menu

In the main menu you will find the OPTION menu.

1. Select a menu using the arrows on the control pad, then press the validation button.
2. To return to the previous screen (OPTIONS), press the PREV navigation button.

The different menus displayed on the screen are:

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) USB menu</td>
<td>to activate the USB connection (only available when connected to a PC)</td>
</tr>
<tr>
<td>(2) FFT menu</td>
<td>to display the Argos band signals received (spectral analysis mode)</td>
</tr>
<tr>
<td>(3) Setup menu</td>
<td>to configure the Goniometer’s operating parameters</td>
</tr>
</tbody>
</table>
5.4.1. SETUP menu

Select the option you wish to change using the arrows on the control pad, then press the validation button. The setup menu is displayed on 2 pages.

On page 1, the options are:
- **Audio**: Activate or deactivate the beeps heard when pressing the buttons
- **Backlight**: Enable or disable the backlight
- **Contrast**: Change the contrast of the screen
- **Acquisition GPS**: Activate or deactivate the Goniometer’s GPS
- **GPS**: Choose the GPS data format (decimal, degrees-minutes-seconds, degrees-minutes-decimal seconds)
- **Declination**: indication the degree to be set to compensate for the magnetic north. Set to 0° by default.
- **Compass calibration**: This function allows you to calibrate the internal compass. You select the menu and turn the gonio several times on these three axes as you will do with your Iphone. The compass calibration is necessary when a magnet has been too close to the gonio.
- **Year, Month, Day, Hour, Minute**: Set the date and time
  
  *Note*: If the Goni GPS is activated, this parameter will be automatically updated and it will be in UTC.
- **AllTooFavorite**: If ON, all receiving platforms ID will be automatically added as favorites (up to 64 favorites limit). This allow you to records all Argos transmissions on a Band.
- **Distance**: Select the unit of distance used (kilometer, nautical mile, mile)
- **Direction Comp**: Add an offset to the reference azimuth ️⚠️ To be left at 0°
- **Temp**: Measured temperature
- **Vbat**: Battery voltage level
On page 2, the options are:

- **Direction mode**: Select GPS or Gonio Display mode:
  
  o **Gonio**: will display the instantaneous direction of the received signal, on the RECEPTION screen. The reference for this direction is the white pointer at the bottom of the Gonio antenna.

  ![Gonio Display](image1)

  o **GPS (for decoded GNSS platforms only)**: will display differential direction between the Gonio position and the platform position, on the RECEPTION screen. The reference for this direction is North.

  ![GPS Display](image2)
- **Antenna position**: Select the position of the antenna (up or down)
- **Cable length**: Indicate the length of the antenna cable used. By default, 5m.
- **Antenna mode (type of computation to be performed)**:
  - Gonio: select this mode if you are using the equipment as a direction finder. The Gonio antenna has to be connected for correct results. Ensure that the display mode is compatible with this option.
  - Direct reception: select this mode if you are using the equipment for direct reception. Both Gonio and BNC antenna can be connected. Ensure that the display mode is compatible with this option.
  - Gonio extended: for expert users (to be described later).
- **Proximity**: Activate/disactivate the proximity mode (when you are very close (<100m) to the platform, this mode attenuate the signal)
- **Direction indicator (activation of the compass)**:
  - Fixed: compass not activated (north is always on the top).
  - Compass or Auto (Compass/GPS): compass activated. The principle of the two options will be described later
- **Argos Band**: Select the Band where your platforms are transmitting
  - B1 [401.610-401.690]
  - B2 [401.530-401.610]
  - B3 [401.460-401.540]
  - B4 [401.390-401.470]
  - B5 [401.310-401.390]
  - B6 [401.110-401.190]
  - B7 [401.010-401.090]
  - B8 [399.970-400.050]
  - B9 [399.900-399.980]
5.4.2. GPS INFO menu

This menu displays GPS-related information of the Goniometer when it is locked onto the GPS network.

This menu displays information given by the GPS:

- **Last reception**: Date of the last GPS acquisition in YY/MM/DD HH:MM:SS format
- **Latitude**
- **Longitude**
- **Altitude**
- **Speed**
- **Direction**: GPS Heading computed by the GONIO RXG
- **Nb sat**: Number of GPS satellites within view of the GONIO RXG

**GPS icon meanings**:

![GPS Activated and Position OK](image)

GPS Activated and **Position OK**

![GPS Activated but Unable to Position](image)

GPS Activated but **Unable to Position**

![GPS not Activated](image)

GPS **not Activated** (go to Setup ½ to activate)
5.4.3. FFT menu

The FFT menu allows you to display a graph of the spectrum, once the frequency of the signal has been analyzed.

Example of FFT display

5.4.4. USB menu

Press on USB to connect to a PC. See chapter 6.

USB menu selection
6. PC connexion (USB Communication mode)

You may connect your Goniometer to a PC through a USB link. The USB communication software will allow you to:

A. Load new firmware versions onto the Goniometer
B. Configure the Goniometer through a user friendly setup menu
C. Download all messages recorded into the Goniometer for your favorite platforms (up to 200 000 MSG), in XLS format.
D. Easily setup new Argos platforms in the Goniometer as favorites
E. Automatically record all received Argos messages (Favorites and non-Favorites platforms) in the log file while Goniometer is connected, in the (usually log_S/N.txt in User/Documents/RXG-234 Comm Software/directory). $NPR and $NPRF format description accessible on upon request to CLS.
F. Access the HyperTerminal mode: all the Argos platforms received by the Goniometer will be displayed in real time (as in the log file).
G. Choose a format for GNSS position decoding (so GNSS positions transmitted in the Argos message can be decoded, in real time, by the Gonio)
Prior to the first connection, the following are necessary:

- Be sure to have the latest version of Java software installed on your computer (minimum java 1.8) [https://www.java.com/](https://www.java.com/)
- install the RXG-234 Comm Software on your PC (see below).

Note:

- All information displayed on the PC comes from the memory of the Goniometer
- All settings performed on the computer will be transferred to the Goniometer
- The Refresh Platforms action will not clear the Platform IDs from the Receiving Platforms screen on the Goniometer, it will only take place on the PC screen

When you connect Goniometer for the first time to your computer, Windows will automatically install required drivers and recognize the USB connection as “XERIUS RS232”:

When using the USB connection please insure that the PC will not go to sleep, otherwise when happening, the connection will be cut.

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6.1. Installation of the USB Communication software

1. The USB communication software is on the USB key provided with the package. You can check on cls-telemetry website if you have the latest version.

2. Launch the communication software by double clicking on RXG234 Communication Software.exe.

3. Follow the instructions.

4. You may receive a warning concerning a Windows key registry that cannot be updated, you can ignore and continue:

5. Once installed, quit this installation program and connect the Goniometer before starting the software.
6.2. USB connection

1. Connect your Goniometer to the PC with the USB cable
2. Turn on the Goniometer
3. Select the « USB » menu:

- Once in the USB mode, launch the RXG234 Comm Software on your PC.
When you connect Goniometer for the first time to your computer, Windows will automatically install required drivers and recognize the USB connection as “XERIUS RS232”: 
• It will automatically recognize the port connected to the Goniometer.
• A screen similar to the one shown at the beginning of the chapter will appear on your PC.

6.3. Updating the Goniometer firmware

• To load a new firmware version click on "Load New Firmware version".
• A screen will allow you to go through the directory and select the firmware file as shown below.

• Once you click "Open", the PC will start uploading the firmware to the Goniometer.

• The PC communication application will reboot and ask you if you want to load your saved data. Answer NO
6.4. Configuring the Goniometer

- To configure the Goniometer (equivalent to the Setup Menu of the equipment) click on "Edit Configuration".
- You will have access to the two following configuration screens below.
6.5. Receiving platforms

- All received platforms appear in the white frame under their hexadecimal number
- You may erase this list by clicking on the Refresh Platform button
- To add a platform to the favorite platforms:
  - select the platform
  - choose whether it has a 28 bit ID or not (note that all Argos IDs are now 28bit)
  - click on Add to Favorites
  - the ID will move from this list to the Favorite Platforms list
6.6. Favorite platforms

Selecting a platform ID will allow you to Edit Platform attribute:

- enter a label or the decimal ID for this platform (limited to 19 characters)
- choose a GNSS predefined-format for direct reception mode (please ask CLS if you need to add a new decoding format)

Examples of format declared in the goniometer:

- delete a favorite platform (this will not removed the messages from internal memory)

On the bottom part you can also:
• "Add Platform": enter a new hexadecimal ID and it will appear in the list of your Favorite Platforms, once saved
• “Get All messages” display all the memory recorded messages and eventually export them (see below)
• "Delete all platforms": all favorite platforms will be deleted
• "Delete all messages": erase all messages for all platform (remove all data registered into internal memory)

6.7. Template information for direct reception

The parameters displayed during the direct reception mode (bearing and distance to platform) are calculated using the GNSS information from the platform and the goniometer. The GNSS information from the platform is extracted from the user message by the goniometer and then it calculate the distance and heading comparing to Goniometer own GPS position.

In order to have the format of your platform declared in the goniometer software please contact CLS. Note that the messages of your platform shall not be encrypted.

6.8. Viewing and Exporting data

• Clicking on get All Messages you can view and export data recorded on the Goniometer for the defined favorite platforms.
• To add a platform to the favorites, select it in the "receiving platforms" and click "Add to favorites".
• To view the data from a favorite platform, select it and click "get All messages", and you will see a screen like the one shown on next page.

Column description:
1. record index
2. status of GPS from direction finder (in this case the GPS was not on)
3. Period validity (integrity control)
4. Date
5. Frequency of platform (Hz)
6. Instantaneous Reception direction relative to the Gonio antenna reference (deg.)
7. Signal level received from platform (dBm)
8. Transmission period (seconds)
9. Latitude of the Gonio (degrees)
10. Longitude of the Gonio (degrees)
11. Direction of the Gonio relative to the north (degrees)
12. Length of data, in bytes
13. Data content (message)
To export the data to an Excel file click the "export" button. You will be able to choose a filename and a directory for the file to be saved. The columns in the Excel file will be the same as the columns shown above.
Gonio Info

- Goniometer information is provided using the "Get Gonio Info" button, which opens the following screen:

![Gonio Info Screen](image)

6.9. HyperTerminal mode and log file

Once the PC is connected to the Goniometer through the USB, all received ARGOS messages are stored in the log file which is located under the installation directory of the communication software. The name of this file is as follows "Log XXXX.txt", where XXXX is the goniometer number (example : 0027). Below is an example of this file.

- the first record line will be the date, time at which you start the connection ("USB Connection to RXG234")
- then for each received ARGOS message you will have one line with:
  - date
  - time
  - type of reception (background or received when the HyperTerminal is opened)
  - the Goniometer command $NPR for a non favorite platform and $NPRF for a favorite platform, followed by several parameters which are explained below
The label “Background” is displayed in the log file when the HyperTerminal is OFF, and the label “Received” is displayed in the log file when the HyperTerminal is OPEN.

The commands and their parameters are as follows:

- NPR,i,y,m,d,h,mi,s,fr,f,ai,l,log,lag,dg,le,da
- NPRF,i,y,m,d,h,mi,s,fr,f,ai,am,l,p,log,lag,dg,le,da

where:

- \( i \): index of the platforms in the Favorite platforms screen
- \( y, m, d, h, mi, s \): year, month, day, hour, minutes, seconds
- \( id \): hexadecimal ID (28 bits)
- \( fr \): frequency (Hz)
- \( f \): 8 bits validity parameter on Gonio direction, on GPS (0,0,0,0,0, validity Gonio direction, validity GPS, 0)
- \( ai, am \): instantaneous angle and average angle
- \( l \): level
- \( p \): repetition period
- \( log, lag \): latitude and longitude of the Gonio (divide values by 60 000 for Decimal °)
- \( dg \): Gonio direction (not implemented yet)
- \( le, da \): message length and data message (in hexadecimal)

Below is a view when the HyperTerminal is opened. The recorded parameters are the same as in the log file.
# 7. Technical characteristics

<table>
<thead>
<tr>
<th>RXG-234 receiver &amp; AXG-134 antenna</th>
</tr>
</thead>
</table>
| **Frequency range (MHz) (to be selected)** | ○ B1 [401.610-401.690]  
○ B2 [401.530-401.610]  
○ B3 [401.460-401.540]  
○ B4 [401.390-401.470]  
○ B5 [401.310-401.390]  
○ B6 [401.110-401.190]  
○ B7 [401.010-401.090]  
○ B8 [399.970-400.050]  
○ B9 [399.900-399.980] |
| **Frequency stability** | ±3.5ppm over the temperature range |
| **Minimum detection sensitivity** | -131dbm (63nVrms @50Ω) |
| **Accuracy of angle measurement** | ±5° |
| **Resolution of the measurement of the angle** | ±1° |
| **Standard length of AXG134 antenna cables** | 5m |
| **Maximum length of AXG134 antenna cable with extension** | 25m |
| **Battery Charging Time (External Charger)** | 7h |
| **Battery charging time via USB** | 15h |
| **Internal Battery Capacity** | 6800mAh |
| **Autonomy (USB & GPS OFF)** | Approx. 50h @ 25°C |
| **Temperature range** | 0°C to +45°C for battery charging  
-20°C to +50°C in use |
| **Waterproof rating** | IP 66 |
| **GONIO RXG 234 dimensions** | 135mm x 92.5mm x 34mm |
| **GONIO RXG 234 weight** | 565gr |
| **Dimension of AXG 134 antenna** | 400mm x 65mm |
| **AXG 134 Antenna Weight (without cable)** | 650gr |