RCS1100 Series

User Manual

Version 1.2
English

Leica Geosystems

Congratulations on your purchase of an RCS1100 system !

This manual contains important safety directions *(refer to section "Safety directions")* as well as instructions for setting up the instrument and operating it. Read carefully through the User Manual before you switch on the instrument.

The instrument model and the serial number of your product are indicated on the type plate underneath.
Enter the model and serial number of your instrument in your user manual, and always refer to **this information** when you need to contact your **agency** or **service workshop**.

Model:_____ Serial no.: _____

Software version:_____

The symbols used in this User Manual have the following meanings:

DANGER :

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING:

Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.

CAUTION:

Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor injury and/or in appreciable material, financial and environmental damage.

Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

Contents

RCS1100 stands for Remote Control Surveying. The RCS1100 enables survey instruments of the TPS1100 and TPS1000 series to be remote controlled.

The control unit, the radio modem and the power supply are all contained in a compact, ergonomically-designed housing. The incorporated radio modem is used together with the TCPS26 radio modem as a basic station in the TPS1100.

Instruments in locations which are exposed, difficult to reach, or cramped, can be conveniently operated with the RCS1100 control unit.

Validity of the user manual

This user manual is valid for all RCS1100 units having a built-in radio modem.
Exceptions relating to the RCS1100 without built-in radio modem are indicated. The present manuel describes the software version 1.22.

Unpacking

The RCS1100 is supplied complete with the User Manual and with a software diskette / CD in a padded nylon bag. The outfit also includes an adapter which enables the RCS1100 to be connected to a GLS11 reflector pole. The bag has space for a spare GEB111/121 battery and for a TCPS26 radio modem.

The complete equipment and the accessories for Remote Control Surveying can be reliably transported in the container 667 337 (option), in which all of the components are clearly laid out for rapid installation.

The entire equipment has been designed for rough field conditions but we nevertheless recommend that you use the bags and containers provided when you transport it over long distances. Protect cables, plugs, batteries and antennae against the weather.

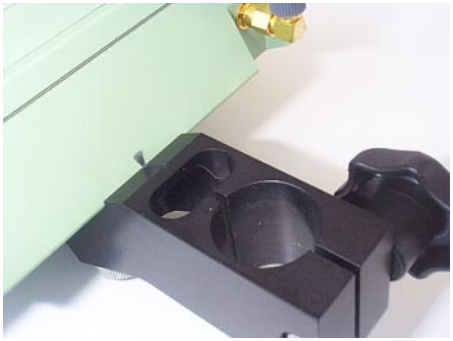
1 RCS1100
2 Holder for reflector pole
3 Battery GEB71
4 360° Reflector
5 Y-cable, Antenna extension
6 Battery GEB70
7 Battery GEB111
8 TCPS26 radio modem
9 Battery GEB121
10 User Manual, installation diskette
11 Antenna

Using the clamping screw provided, secure the reflector-pole adapter at the appropriate height on a GLS11 reflector pole. The adapter can remain on the reflector pole during transport.

Screw the antenna to the end of the antenna extension and connect the antenna extension to the reflector adapter.

Now connect the RCS1100 to the reflector-pole adapter by lining up the marks and tightening the screw. Connect the antenna extension to the RCS1100.
At short distances, or under favourable radio transmission conditions, you can leave out the antenna extension and connect the antenna directly to the RCS1100.

WARNING:
If the radio modem is switched on, do not carry the antenna closer than 15 cm to your body.



Connecting the RCS1100 (lining up the marks on housing and adapter)

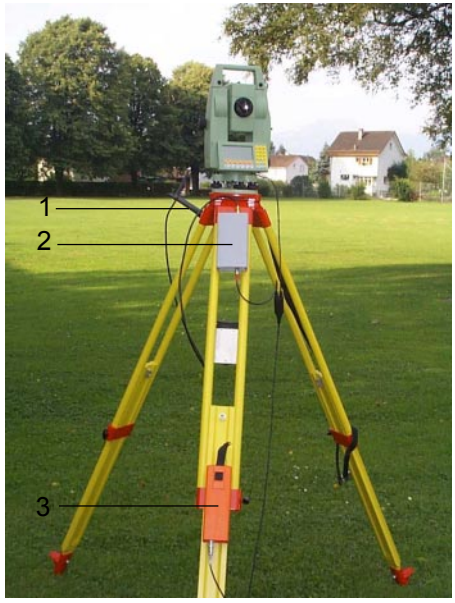
The angle bracket and the position of the antenna socket together ensure that the antenna is vertical.

If the RCS1100 is secured in another manner, make sure that the antenna is vertical, otherwise the transmission range will be restricted.

Reflctor pole, completely set up

Connect the following to the tripod of the instrument: The TCPS26 radio modem, the antenna extension with antenna, and the GEB70 or GEB71 external battery. Make sure that the antenna can transmit freely in the direction of work. The TCPS26 radio modem must be configured as the BASE modem.

Using the Y-cable, connect the survey instrument, the battery and the TCPS26 radio modem. Connect the antenna extension to the TCPS26.

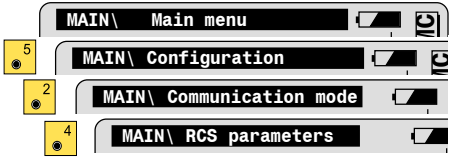


1 Antenna extension
2 TCPS26 radio modem
3 GEB70 external battery

The interface parameters on the TPS1100 / TPS1000 must be inspected and if necessary adjusted to the those for the TCPS26, which were set in the factory to the following values:

19200 baud
8 data bits
No parity

Setting the interface on the TPS1100:

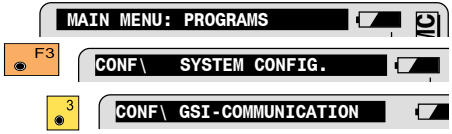


Set the following values

19200 baud
8 data bits
No parity

The remaining values are not relevant.

Setting the interface on the TPS1000:

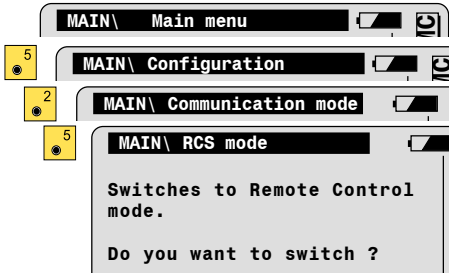


Set the following values:

19200 baud
8 data bits
No parity

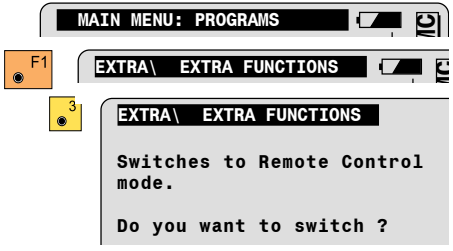
For details, refer to the TPS1000 Systems Handbook.

Setting the interface on the TPS1100:



Confirm with "YES".

Setting the interface on the TPS1000:

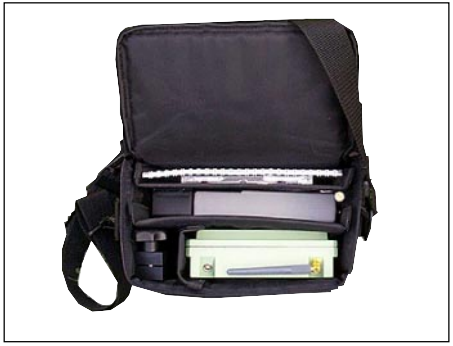


Confirm with "YES".

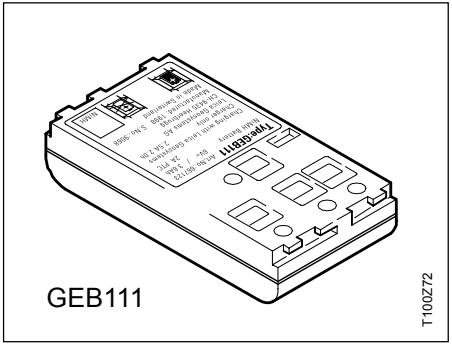
After all connections and settings have been inspected, the RCS1100 can be switched on. This automatically brings the TPS1100 into the RCS mode. After a few seconds, the display of the TPS1100 appears on the RCS1100.

Trouble-shooting

Error	Cause / remedy
No data transfer when starting up (short distance between TCPS26 and RCS1100)	Case 1 - Green LED on TCPS26 does not shine: Inspect battery charge, and cables for TCPS26 Case 2 - Message "No signal" on RCS1100: Inspect battery charge in RCS1100 **or** *possible link numbers* for RCS1100 and TCPS26 are not the same. Case 3 - Green LED shines and message appears on RCS1100: Set interface paarmeters correctly on TPS and TCPS26.
Data transfer possible, but transmission fault	Case 1 - Red LED on TCPS26 flashes: Inspect interface parameters. Case 2 - Red LED on TCPS26 does not flash: Connecting cable is defective
Data transfer is very slow	Disturbance from other transmitters in the 2.4 Ghz frequency band: Change *link number* in RSC1100 and TCPS26.
Interruption during data transfer	Message "No signal" on RCS1100:Operation is at the limit of the range, or there is no visual communication between RCS1100 and TCPS26. Establish visual communication, reduce distance, use antenna extension.



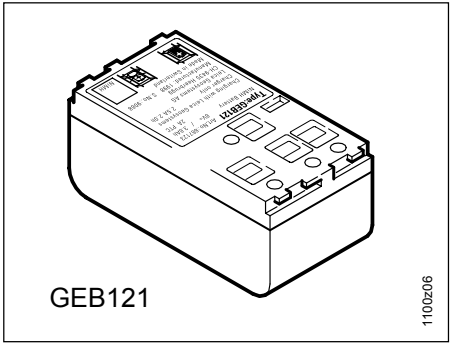
Before packing up the RCS1100 and the TCPS26 in the bag, unscrew the antennae and remove the battery from the RCS1100. For maximum protection during transport, pack the units as shown in the diagram.



Your Leica Geosystems instrument is operated with rechargable plug-in batteries. The GEB111 is the preferred battery for use with the RCS1100, but the GEB121 may also be used.

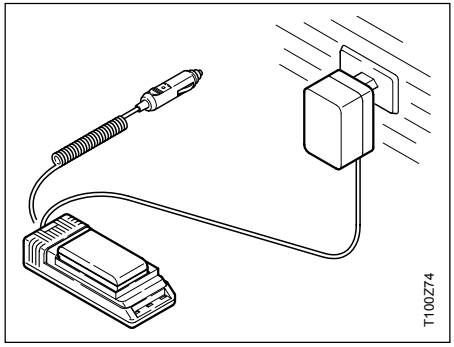
Only use batteries, charging sets and accessories recommended by Leica Geosystems.

In order to fully exhaust battery capacity it is absolutely necessary with new batteries to carry out 3 to 5 complete charging/discharging cycles.



After first charging of batteries you can start immediately with your job. As a result, the batteries will be discharged. Because the operating time of the battery can be very short until full capacity is reached it is recommended to have ready a second battery and the GKL122 battery charger. Using the charger, the battery can be charged/discharged several times before use.

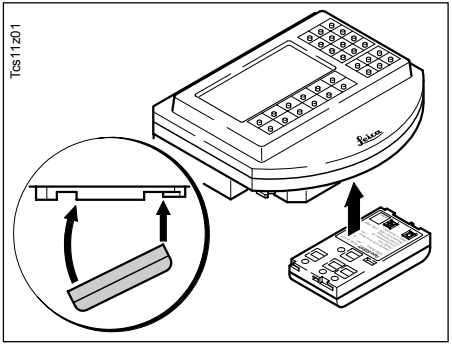
Charging batteries



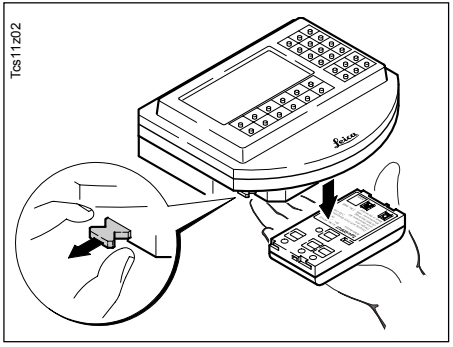
To charge the battery, use the GKL111 or GKL122 charger as described in the instructions provided with that charger.

The chargers are not intended for outdoor use. Adhere to the safety directions.

Inserting and removing batteries



The battery for the RCS1100 fits into a compartment on the underside of the instrument. Push it fully against the side opposite to the catch and then click it into position on the same side as the catch.



To remove the battery, hold it to prevent it from falling and pull out the lever of the catch by about 2mm.

Description of the instrument

The RCS1100 can remotely control almost all of the functions and applications of TPS1100 and TPS1000 series instruments.
The RCS1100 consists of the keyboard and LCD display from the TPS1100, the radio module of the TCPS26, and the power unit.

Because its keyboard and LCD are the same as those in the TPS1100, the RCS1100 is operated in exactly the same way. If the TPS1000 is used, the keyboard template for assigning the keys is applied.

The functions and settings of the RCS1100 are called by keeping the illumination key or function key pressed for at least two seconds:

1. Brightness of LCD display
2. Contrast of LCD display
3. Configuration of beep
4. Heating for LCD display
5. Sleep mode
6. Configuration of internal radio module and of TCPS26
7. Configuration of serial interface
8. Language
9. Operating mode of TPS1100

The status of the battery, and the radio contact, are monitored and can be displayed. If the radio contact is interrupted for a long period, or if the battery charge sinks below a certain level, a warning is displayed.

The RCS1100 has loadable software covering the requirements for controlling the TPS1100/TPS1000 and the local functions. The software also includes all available language elements for the local functions. The software is loaded with the up-load function of the SurveyOffice in the same way as for the TPS1100. The charging procedure is controlled entirely by the SurveyOffice.

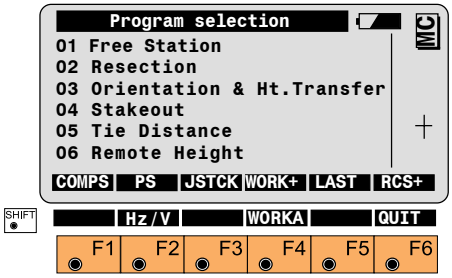
New languages are continually being added for the local functions of the RCS1100. If you cannot find the language which you want, contact your Leica Geosystems agency.

Allocation of keys

The allocation of the keys on the RCS1100 is the same as on the TPS1100.
When the RCS1100 is switched on, the TPS1100 automatically changes to LOCK mode (prism tracking).

The key PROG activates special functions for aligning the TPS1100 with the prism.
The shape of the search window is rectangular (default size: Hz = 30 gon, V = 15 gon). The dimension of the search window in RCS mode can be defined in the "RCS Searching Window" function.

The target functions are required :
- to achieve the first LOCK
- for LOCK replacement in the event of LOCK loss (through longer viewing interruptions).



F1 Sets the TPS1100 to compass mode, enabling the TPS1100 to be targeted on the prism with the help of a compass.

F2 Starts PowerSearch.

F3 In the joystick mode, the TPS1100 can be turned horizontally or vertically with the aid of the cursor keys.

F4 Activate/deactivate working area.

F5 Turns the TPS1100 to the last point stored.

F6 Switches on/off the RCS operating mode.

SHIFT F2 By entering relative or absolute angle values, the TPS1100 can be turned by the corresponding amount or set to the angle value required.

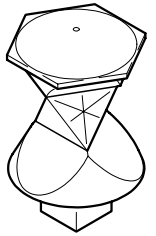
SHIFT F4 Define a working area.

Working in RCS mode is hardly different from working in the normal measuring mode. A switchover is possible on the TPS1100 at any time. The great advantages of the RCS are:

- one-person operation is possible
- when surveying you are at the site of the action, i.e. where the points are being recorded or set out
- you do not have to assess the situation from the instrument location.

It is essential to protect the measurement location. The actions and effects of personnel, machines and the weather can damage the instruments.

After the TPS1100 has been set up and the RCS mode activated, the TPS1100 must be approximately lined up with the reflector in order that a LOCK operation can be carried out on the reflector. TPS1100 instruments equipped with the option PowerSearch are already in LOCK mode after the PowerSearch routine is completed - no lining up is required. After the TPS1100 has locked on the reflector, it follows all movements of the reflector and is set centrically on it. It is therefore advisable to work with the 360° reflector (GRZ4) since this does not require aligning towards the instrument.



360°reflector (GRZ4)

1000Z25

The approximate alignment of the TPS1100 to the reflector can also be performed manually from the instrument.

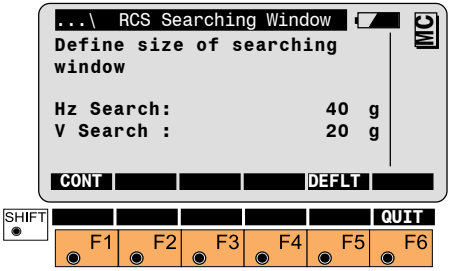
In the measurement display screen the search process can be started at any time. As in normal operation, this happens when you initiate a distance measurement ("**DIST**" or "**ALL**"). The TPS1100 now locks on to the reflector.

Starting from the RCS 1100, an approximate alignment of the TPS1100 to the reflector can take place with the functions available under PROG. The search process can then be started with F1.

These functions will be later described in more detail.

With this function the dimensions of the RCS Searching Window can be defined. If an automatic reflector search is started by pressing ALL or DIST in RCS mode, a search window with the predetermined dimensions is scanned at the current position of the telescope.

5 / 1 / 0 8 Activates the function RCS Searching window.



Hz Search extent of search window in Hz-direction

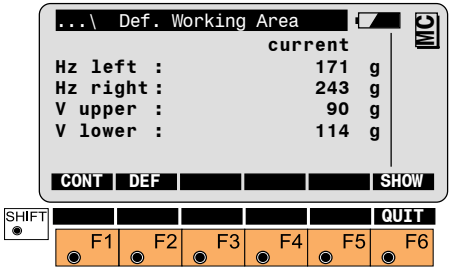
V Search extent of search window in V-direction

F1 To confirm the displayed values and leave the dialog.

F5 Returns all values to default values.

With this function a Working Area can be defined in which the instrument automatically searches for the reflector when working in RCS mode.

PROG SHIFT F4 Activates the function Definition of a Working Area.



Hz left left boundary of working area

Hz right right boundary of working area

V upper upper boundary of working area

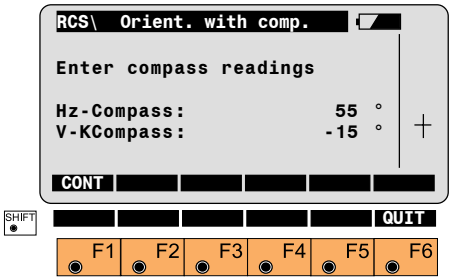
V lower lower boundary of working area

F1 To confirm the displayed values and return to the previous dialog.

F2 To define a new working area by pointing the telescope to two opposite corners of the working area (left corner - opposite right corner).

F6 To position the telescope to the upper left / lower right corner of the defined Working Area.

PROG F1 Activates the compass mode.



In order to use the compass mode we recommend you to use a hand-held compass with 360° rotatable Hz circle and incorporated V circle, e.g. RECTA DP6 or SILVA Ranger 15 / 25.

Compass mode is suitable for aligning the TPS1100 over longer distances.

To establish the link between TPS1100 and compass, proceed as follows:

Step 1:
Perform the Hz orientation on the TPS1100.

Step 2:
Turn the TPS1100 until Hz shows 0.000 (irrespective of the angle units being used).

Step 3:
Look into the telescope of the TPS1100 and select a prominent target.

Step 4:
Aim the compass at the same prominent target and turn the Hz circle of the compass until the compass needle is at 0° or at N (north). Do not turn the Hz circle again.

Aim towards the TPS1100 with the compass from the prism:
- To lock the prism for the first time
- if you lose the LOCK setting.

Read off from the compass:
- the Hz angle indicated by the compass needle (0° to 360°)
- the V angle (+90° to -90°, horizontal = 0°)

and enter these values in the RCS 1100.

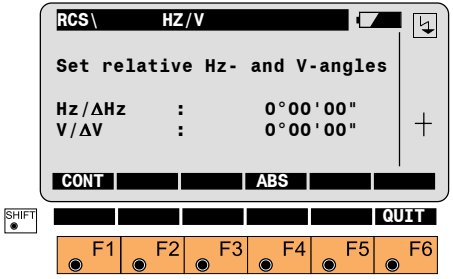
F1 Quits the compass mode and starts the search mode.

PROG F2 Starts the quick prism search using PowerSearch. This function is only available on instruments equipped with the optional PowerSearch sensor.

Two different search modes are available. If no working area has been defined the instrument rotates 360º around its standing axis. In this way, PowerSearch scans the entire horizon.

If a working area has been defined, then PowerSearch is only active within the defined limits.

PROG SHIFT F2 Activates the Hz/V mode.



In Hz/V mode, the TPS1100 can be turned by set angle values.

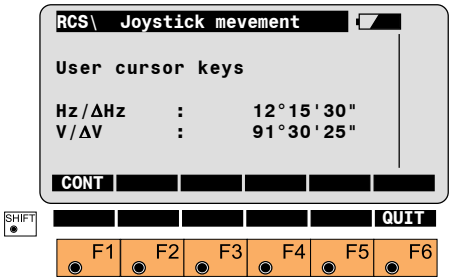
The input options are:

- absolute angle values which relate to the orientation of the TPS1100.
- relative angle values which cause the TPS1100 to turn away from its present position by the amount entered.

F1 Quits the Hz/V mode and starts the search mode.

F4 Switches between absolute (ABS) and relative (REL).

PROG F3 Activates the joystick mode.



In the joystick mode, the cursor keys on the RCS 1100 can be used to turn the TPS1100. The EGL guide light, if available, is switched on automatically.

ON Turns telescope slowly to the right (left).

ON ON Turns telescope rapidly to the right (left).

PgUp Turns telescope slowly upwards (PgDn downwards).

PgUp PgUp Turns telescope rapidly upwards (PgDn PgDn downwards).

To stop the rotary movement, press any cursor key.

F1 Quits joystick mode and starts search mode.

PROG F4 Activates the function activate/deactivate working area.

If the instrument is in RCS mode and the determined working area is activated then the entire working area is scanned for the reflector if the target was not found by the standard search method at the current position of the telescope. If the working area is deactivated only the standard search methods at the current position of the telescope are performed.

The instrument follows the reflector even if the reflector is outside the Working Area.

If the target is lost outside the Working Area a local search will be started. If the reflector was not found the predefined Working Area is scanned.

On instruments with the optional PowerSearch, the working area can be used to limit PowerSearch to a certain area and when activated, PowerSearch only scans within the defined limits.

Last point stored

PROG F5 Activates the LAST function.

If the LOCK mode is lost, this function can be used to turn the TPS1100 back to the last point stored. When the movement is complete, the TPS1100 automatically starts to search for the prism.

Switching the RCS mode

PROG F6 Switches on/off the RCS mode.

For using the remote control the RCS mode must be switched on.

FNC F3 Activates the lock interruption/relock.

This function serves to interrupt the LOCK mode and later to reinstate it, e.g. if the prism is placed on the ground during stakeout or if the TPS1100 is also to be targeted on a second prism.

If this function is called up in the RCS-mode the Joystick dialog is automatically started. The ATR remains active, i.e. if the reflector reappears in the field of view it is immediately relocked.

PROG Hold for min. 2 seconds.

The complete contents of the respective display is transfered if the display is incomplete due to disturbances to the radio link. The function is only available on the RCS.

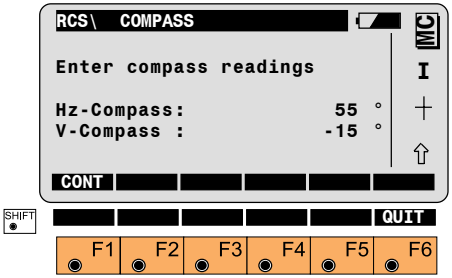
The instrumentation is set up and prepared in the same way as the TPS1100. The keyboard and display differ somewhat from those in the other series and so a keyboard template must be used with the RCS1100. The presentation in the RCS1100 of the dialogues from the TPS1000 differs slightly, but this does not in any way restrict the operation.

The functions specific to the RCS are described in detail in the appropriate section of the user manual for the TPS1000.

The greatest differences are in the display of the icons; this is due to the different dimensions of the display. The time, and the battery status of the TPS1000, are displayed alternately in the title line.

Instead of two lines of three status fields, one line of four status fields is displayed on the right-hand margin.

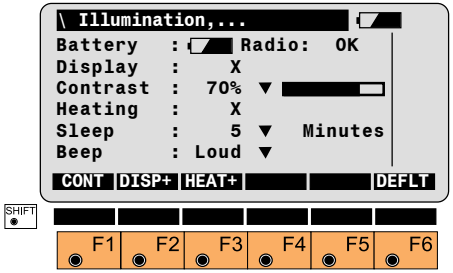
1. The first position normally shows the status for the memory card. The operating mode is not shown, because remote control is only possible in RCS mode.
2. The second position normally shows the telescope face. If the compensator cannot be read out at this time, the current display of the telescope face is superimposed. If the compensator has been switched off, the symbols for the compensator and for the telescope face are displayed alternately.
3. The third position shows the status symbol for the automatic target recognition (LOCK).
4. The last position shows the key mode.



The operating concept for the local functions is the same as in the TPS1100 and is therefore not explained at this point.

Illumination, battery and monitoring of functions

Keep the key pressed down for more than two seconds. The battery status and the quality of the radio link are displayed.

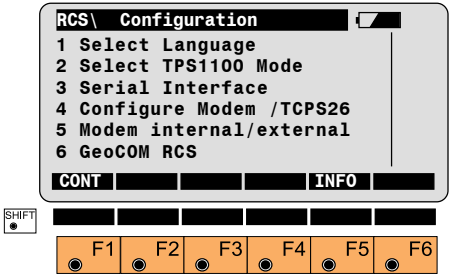


The contrast of the display can be altered. The display illumination and the heating at temperatures below -10°C (high power consumption!) can be switched on and off.

The key beep and the automatic switchoff of the RCS1100 can be altered.

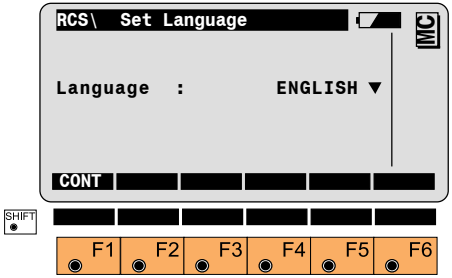
Configurations and settings

Keep the FNC key pressed down for more than two seconds. The available functions are displayed.



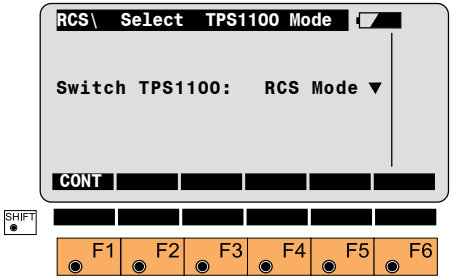
Select Language

Select the required language from the list field.



The choice of language is valid only for the local functions.

Select TPS1100 Mode



Select the mode for the TPS1100

RCS Mode: The TPS1100 can be operated in RCS mode.

GeoCOM: The TPS1100 can be operated in GeoCOM mode (transparent mode).

OFF: Switches off the TPS1100.

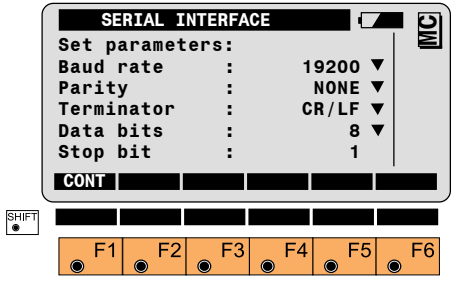
Data may be lost if the TPS1100 is switched off during an application.

Sleep: Switches the TPS1000 to the sleep mode.

Applications which involve the automatic repetition of measurements may be interrupted if the instrument is switched to the sleep mode.

If a TPS1000 instrument is connected, these functions are not available.

Serial Interface



Set the parameters in accordance with requirements.

The standard parameters for the TCPS26 are:

Baud	19200
Data bits	8
Parity	none

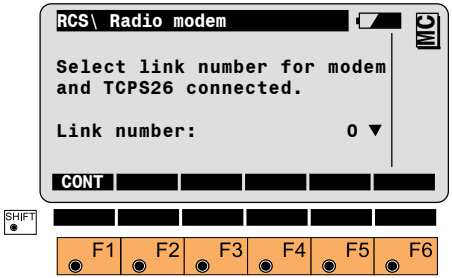
To ensure the correct transfer of data, the settings on the TPS1100 and on the RCS1100 must be the same.

Configure Modem / TCPS26

Disturbances to the radio link can be improved by changing the link number, which must then be altered in the internal radio module and at the same time in the TCPS26.

1. Connect the TCPS26 with a Y-cable to the serial interface of the RCS1100 and to the external battery.
2. Switch on the RCS1100.
3. Press the FNC key for more than two seconds to display the configuration dialogue.
4. Pull out the plug of the TCPS26 and plug it back in to switch on the TCPS26.

5. Call up the function "Radio/ ConfigureTCPS26".
6. Select a link number between 0 and 15.
7. Press the F1 key. The link number is now set correctly in the internal radio module and in the TCPS26.

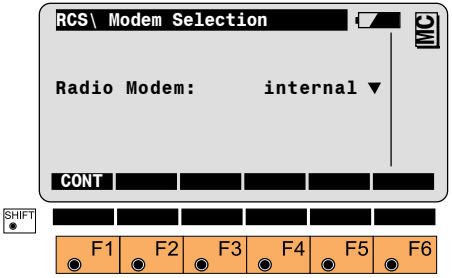


If the baud rate of the RCS1100 differs from that of the TCPS26, keep repeating step 4 above until they agree, when the interface parameters of the RCS1100 will be matched automatically.

If two external TCPS radio modems are used, these must be set in turn to the same link number.

Modem internal / external

It can be ascertained whether the radio modem being used is internal or external.



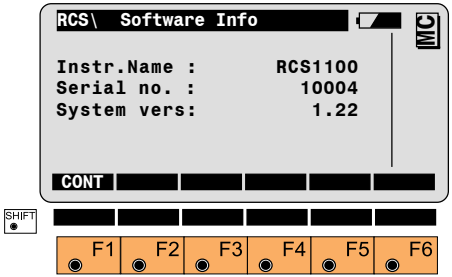
If an external radio modem is used, the interface parameters must be set correctly.
This change will only take effect after switching on/off the RCS1100.

GeoCOM RCS

In order to load a new software version the RCS1100 must be set into the GeoCOM mode. In most cases this happens automatically if the Software Upload of the Leica SurveyOffice is used.

Software Info

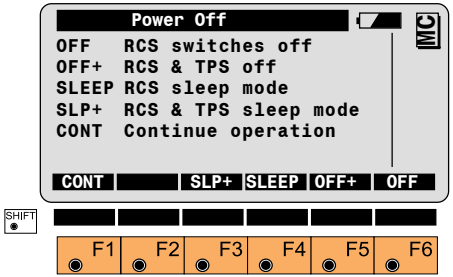
F5 Activates the function Software Info.



Displays instrument name, serial no., and the current system version.

There are different Power Off options available.

Off ON Activates the function Power Off.



F1 Exits Power Off display and returns to the program.

F3 Sleep mode RCS & TPS.

F4 Sleep mode RCS.

F5 RCS & TPS off.

F6 Only RCS switches off.

Transport and Storage


When transporting or shipping the equipment always use the original Leica Geosystems packaging (transport case and shipping cardboard).

Never carry the instrument loose in a **road vehicle**. It can be affected by shock and vibration. Always carry it in its in its transport case or bag and secure it.

When transporting the instrument by by **rail, aircraft** or **ship** use the Leica Geosystems original packaging (transport case or shipping cardboard) or another suitable packaging securing the instrument against shock and vibrations.


Always remove the battery before transporting the instrument. Pack the battery so that no short-circuiting can occur.


When storing the equipment, particularly in summer and inside a vehicle, take the storage **temperature limits** (-40°C to + 70°C / -40°F to +158°F) into account.

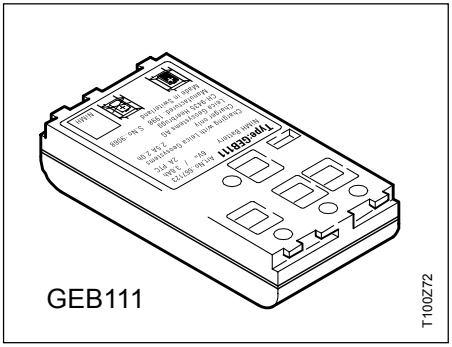

If the instrument becomes wet, leave it unpacked.
Wipe down, clean, and dry the instrument (at not more than 40 °C/ 108°F), transport case, foam inserts, and accessories. Pack up the equipment only when it is perfectly dry.

Cleaning

- Blow away any dust before cleaning.
- Use only a clean, soft and lint-free cloth for cleaning. If necessary, moisten the cloth with pure alcohol.
  Use no other liquids; these may attack polymer components.


Cables and plugs
Keep plugs clean and dry.
Blow out any dirt lodged in the plugs of the connecting cables.
If you unplug connecting cables during the measurement, you may lose data.
Always switch off the instrument before removing the connecting cables.

WARNING:
Use a battery charger in a dry room only, never outdoors. Charge batteries only at an ambient temperature between +10°C and +30°C (50°F to 86°F). We recommend a temperature of 0°C to +20°C (32°F to 68°F) for storing the batteries.



For further information, please refer to *the section "Inserting and removing batteries"*, or to the instructions provided with the battery.

Only use batteries, charging sets and accessories recommended by Leica Geosystems.

In order to reach full capacity with the new batteries it is essential to carry out three to five complete charging/ discharging cycles.

Your Leica Geosystems instrument is operated with rechargable plug-in batteries. The GEB111, an NiMH battery, is the preferred one for use with the RCS1100, but the GEB121 may also be used.

Intended use of instrument

The following directions should enable the person responsible for the RCS1100, and the person who actually uses the instrument, to anticipate and avoid operational hazards.

The person responsible for the instrument must ensure that all users understand these directions and adhere to them.

Permitted uses

The RCS1100 is intended for the following applications:

- Starting of the RCS1100
- Remote control of TPS models
- Recording, editing and managing of measurements
- Data transmission to external appliances (transparent mode)
- Running of applications programs
- Transmitting and receiving measurements

Prohibited uses

- Activation of the RCS1100 without previous instruction
- Use outside of the intended limits
- Disabling safety systems and removal of hazard notices
- Opening the instrument using tools (screwdriver, etc.), unless this is specifically permitted for certain functions
- Modification or conversion of the instrument
- Activation after misappropriation
- Use with accessories from other manufacturers without the prior express approval of Leica Geosystems (only the antennae provided by Leica may be used)
- Inadequate protection at the measurement location (e.g. when carrying out measurements on roads)
- Control of machines, objects in motion or similar with the RCS1100 Remote Control System

WARNING :
Adverse use can lead to injury, malfunction, and damage.
It is the task of the person responsible for the instrument to inform the user about hazards and how to counteract them. The RCS1100 is not to be used until the user has been properly instructed how to use it.

Limits of use

Environment:
Suitable for use in an atmosphere appropriate for permanent human habitation: not suitable for use in aggressive or explosive environments. Use in rain is permissible for limited periods.

Refer to section "Technical data".

Responsibilities

Area of responsibility for the manufacturer of the original equipment Leica Geosystems AG, CH-9435 Heerbrugg (hereinafter referred to as Leica Geosystems):

Leica Geosystems is responsible for supplying the product, including the user manual and original accessories, in a completely-safe condition.

Responsibilities of the manufacturers of non-Leica Geosystems accessories:

The manufacturers of non-Leica Geosystems accessories for the RCS1100 are responsible for developing, implementing and communicating safety concepts for their products, and are also responsible for the effectiveness of those safety concepts in combination with the Leica product.

Responsibilities of the person in charge of the instrument:

WARNING:

The person responsible for the instrument must ensure that it is used in accordance with the instructions. This person is also accountable for the training and deployment of personnel who use the instrument and for the safety of the equipment when in use.

The person in charge of the instrument has the following duties:

- To understand the safety instructions on the product and the instructions in the user manual.
- To be familiar with local regulations relating to accident prevention.
- To inform Leica Geosystems immediately if the equipment becomes unsafe.
- To ensure that the national laws, regulations and conditions for the operation of radio transmitters are respected.

WARNING:

The absence of instruction, or the inadequate imparting of instruction, can lead to incorrect or adverse use, and can give rise to accidents with far-reaching human, material, financial and environmental consequences.

Precautions:

All users must follow the safety directions given by the manufacturer and the directions of the person responsible for the instrument.

WARNING:

The **charger** must not be used in damp or inclement conditions. If moisture penetrates the charger, the user may receive an electric shock.

Precautions:

Use the charger only indoors, in dry rooms. Protect it from damp. If the charger is damp, do not use it.

WARNING:

If you open the **charger**, either of the following actions may cause you to receive an electric shock:

- Touching live components
- Using the charger after incorrect attempts to carry out repairs.

Precautions:

Do not open the charger yourself. Only a Leica Geosystems-approved service technician is entitled to repair it.

DANGER:

Because of the risk of electrocution, it is very dangerous to use reflector poles in the vicinity of electrical installations such as power cables or electrical railways.

Precautions:

Keep at a safe distance from electrical installations. If it is essential to work in this environment, first contact the safety authorities responsible for the electrical installations and follow their instructions.

WARNING:

By surveying during a thunderstorm you are at risk from lightning.

Precautions:

Do not carry out field surveys during thunderstorms.

WARNING:

During target recognition or stakeout procedures there is a danger of accidents occurring if the user does not pay attention to the environmental conditions around or between the instrument and the target (e.g.: obstacles, excavations or traffic).

Precautions:

The person responsible for the instrument must make all users fully aware of the potential dangers.

WARNING:
Inadequate securing of the surveying site can lead to dangerous situations, for example in traffic, on building sites, and at industrial installations.
Precautions:
Always ensure that the survey site is adequately secured. Adhere to the regulations governing accident prevention and road traffic.

CAUTION:
With the remote control on TPS models, it is possible that extraneous targets will be picked out and measured.
Precautions:
When measuring in remote control mode, always check your results for plausibility.

WARNING:
If computers intended for use indoors are used in the field, there is a danger of electric shock.
Precautions:
Adhere to the instructions given by the computer manufacturer with regard to field use in conjunction with Leica Geosystems instruments.

CAUTION:
If the accessories used with the instrument are not properly secured, and the equipment is subjected to mechanical influences (e.g. shocks, falling), the equipment may be damaged or people may sustain injury.
Precautions:
When setting-up the instrument, make sure that the accessories (connecting cables etc.) are correctly adapted, fitted, secured and locked in position. Avoid subjecting the equipment to mechanical shock.

CAUTION:
During the shipping or disposal of charged batteries it is possible for inappropriate mechanical influences to constitute a fire hazard.

Precautions:
Before shipping or disposing of equipment, discharge the battery (by running the instrument until the batteries are exhausted).

WARNING:
If the equipment is improperly disposed of, the following can happen:

- If polymer parts are burnt, poisonous gases are produced which may impair health.
- If batteries are damaged or are exposed to a high heat source, they can explode and cause poisoning, burning, corrosion or environmental contamination.
- By disposing of the equipment irresponsibly you may enable unauthorized persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and rendering the environment liable to contamination.

Precautions:
Dispose of the equipment appropriately in accordance with the regulations in force in your country. Always prevent access to the equipment by unauthorized personnel.

The term "electromagnetic acceptability" is taken to mean the capability of the RCS1100 to function correctly in an environment where electromagnetic radiation and electrostatic discharges are present, and without causing electromagnetic disturbances in other equipment or biological damage to humans or animals.

WARNING:
Electromagnetic radiation can cause disturbances in other equipment.

Although the RCS1100 meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that other equipment may be disturbed.

Only for RCS1100 **with** integrated radio modem:

WARNING:
Electromagnetic radiation can cause disturbances in other equipment, in installations (e.g. medical ones such as pacemakers or hearing aids) and in aircraft. It can also affect humans and animals.

Although the RCS1100 meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that other equipment may be disturbed or that humans or animals may be affected.

- Do not operate the RCS1100 in the vicinity of filling stations or chemical installations, or in other areas where an explosion hazard exists.
- Do not operate the RCS1100 near to medical equipment.
- Do not operate the RCS1100 in aircraft.
- Do not operate the RCS1100 for long periods with it immediately next to your body.
- Only use original Leica Geosystems accessories.

CAUTION:
There is a risk that disturbances may be caused in other equipment if the RCS1100 is used in conjunction with accessories from other manufacturers (e.g. field computers, personal computers, portable radios, non-standard cables, external batteries).
Precautions:
Use the equipment only with accessories from Leica Geosystems. When combined with the RCS1100, the strict requirements stipulated by the guidelines and standards are assured. When using computers and 2 way radios, pay attention to the information provided by the manufacturer regarding electromagnetic acceptability.

CAUTION:
Disturbances caused by electromagnetic radiation can cause faults in the transmission of data.

Although the RCS1100 meets the strict regulations and standards which are in force in this connection, Leica Geosystems cannot completely exclude the possibility that the RCS1100 may be disturbed by very intense electromagnetic radiation, for instance near radio transmitters, 2 way radios, diesel generators.
Precautions:
Check the plausibility of results obtained under these conditions.

WARNING:
If the RCS1100 is operated with cables attached at only one of their two ends (e.g. external power supply cables, interface cables, etc.), the permitted level of electromagnetic radiation may be exceeded and the correct functioning of other instruments may be impaired.
Precautions:
While the RCS1100 is in use, cables (e.g. instrument to external battery, instrument to computer) must be connected at both ends.

Only for RCS1100 **without** integrated radio modem:

WARNING:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

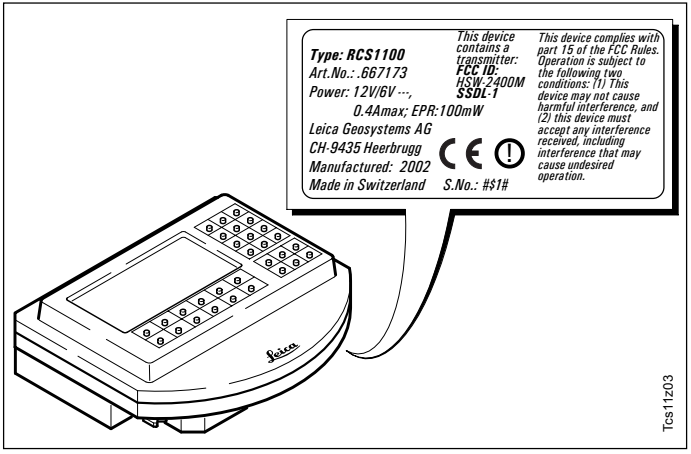
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING:

Changes or modifications not expressly approved by Leica Geosystems for compliance could void the user's authority to operate the equipment.

Product labelling:

This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.



Design
- Aluminium housing with integrated NiMH battery and with optional radio modem.

Battery GEB111
- Type: Nickel metal hydride (NiMH)
- Capacitance: 1.8Ah

Power supply

The voltage when using an external cable must be within the range 11.5V to 14V (DC)

Current consumption
- 12/6V=
- 0.4 Amax

Environment
- Splashproof and dustproof (IP53 in accordance with IEC 529)

Temperature

Operation: -20°C to +50°C (-4°F to +122°F)

Storage: -40°C to +70°C (-40°F to +158°F)

Dimensions
- 160 mm x 135 mm x 50 mm

Weight
- RCS1100 including modem 770g
- Battery GEB111 200g
- Reflector pole adapter 180g

Interface
- Conformable with RS232
- TxD, RxD, GND
- No hardware handshake

Baud rate
- 2400/4800/9600/19200/34800 bps
- Serial, asynchronous

Data format
- 7/8 data bits
- 1/2 stop bits
- Parity none/even/odd

Keyboard and display

Alphanumeric characters	Maximum 256
Character set	Expandet ASCII set as standard. An optional character set can be loaded in addition
Type of display	LCD
Size of display	8 rows of 32 characters
Graphics capability	Yes, 64 x 256 pixels

Plugs
- One five-pole Lemo-0 plug for external battery connection and data transfer

Conformity to national regulations

- FCC part 15 (applicable in U.S.)
- European directive 1999/5/EC on radio equipment and telecommunications terminal equipment (see CE Conformity Declaration).
- The conformity for countries with other national regulations not covered by FCC part 15 or European directives 1999/5/EC has to be approved prior to use and operation.

Frequency range
Limited to 2446.5 - 2483.5 MHz

Transmission power
< 100 mW (e.r.p.)

Antenna
- λ/2 -360° with SMA connector.

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Leica Geosystems AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).

Total Quality Management-
Our commitment to total customer satisfaction

Ask your local Leica Geosystems agent for more information about our TQM program.

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Leica Geosystems

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