Leica Rod Eye 120G
User Manual

Version 1.1
English

- when it has to be **right**

Leica Geosystems

Introduction

Purchase

Congratulations on the purchase of a Leica Rod Eye 120G.

Read and follow the User Manual on the accompanying DVD before using the product.

- This Quick Start Guide contains first use directions as well as initial, basic instructions for setting up the product and operating it.
- Keep all documentation for future reference!

Available documentation

Refer to the following resources for all Rod Eye 120G documentation/software:

- the Leica Rugby CD
- https://myworld.leica-geosystems.com

Leica Geosystems Address Book

On the last page of this manual, you can find the address of Leica Geosystems headquarters. For a list of regional contacts, please visit **http://leica-geosystems.com/contact-us/sales_support**.

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1 Safety Directions

1.1 General

Description

The following directions enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards.

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

About Warning Messages

Warning messages are an essential part of the safety concept of the instrument. They appear wherever hazards or hazardous situations can occur.

Warning messages...

- make the user alert about direct and indirect hazards concerning the use of the product.
- contain general rules of behaviour.

For the users' safety, all safety instructions and safety messages shall be strictly observed and followed! Therefore, the manual must always be available to all persons performing any tasks described here.

DANGER, **WARNING**, **CAUTION** and **NOTICE** are standardised signal words for identifying levels of hazards and risks related to personal injury and property damage. For your safety, it is important to read and fully understand the following table with the different signal words and their definitions! Supplementary safety information symbols may be placed within a warning message as well as supplementary text.

Type	Description
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 or moderate injury.
NOTICE	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result 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.

1.2 Definition of Use

Intended use

- Remote control of product.
- Data communication with external appliances.

Reasonably foreseeable misuse

- Use of the product without instruction.
- Use outside of the intended use and limits.
- Opening the product using tools, for example screwdriver, unless this is permitted for certain functions.
- Modification or conversion of the product.

WARNING

Adverse use can lead to injury, malfunction and damage.
It is the task of the person responsible for the equipment to inform the user about hazards and how to counteract them. The product is not to be operated until the user has been instructed on how to work with it.

1.3 Limits of Use

Environment

Suitable for use in an atmosphere appropriate for permanent human habitation: not suitable for use in aggressive or explosive environments.

DANGER

Local safety authorities and safety experts must be contacted before working in hazardous areas, or close to electrical installations or similar situations by the person in charge of the product.

1.4 Responsibilities

Manufacturer of the product

Leica Geosystems AG, CH-9435 Heerbrugg, hereinafter referred to as Leica Geosystems, is responsible for supplying the product, including the user manual and original accessories, in a safe condition.

Person responsible for the product

The person responsible for the product has the following duties:

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

1.5 Electromagnetic Compatibility EMC

Description

The term Electromagnetic Compatibility is taken to mean the capability of the product to function smoothly in an environment where electromagnetic radiation and electrostatic discharges are present, and without causing electromagnetic disturbances to other equipment.

WARNING

Electromagnetic radiation can cause disturbances in other equipment.

Although the product 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.

CAUTION

There is a risk that disturbances may be caused in other equipment if the product is used with accessories from other manufacturers, for example field computers, personal computers or other electronic equipment, non-standard cables or external batteries.

Precautions:

Use only the equipment and accessories recommended by Leica Geosystems. When combined with the product, they meet the strict requirements stipulated by the guidelines and standards. When using computers or other electronic equipment, pay attention to the information about electromagnetic compatibility provided by the manufacturer.

CAUTION

Disturbances caused by electromagnetic radiation can result in erroneous measurements.

Although the product meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that the product may be disturbed by intense electromagnetic radiation, for example, near radio transmitters, two-way radios or diesel generators.

Precautions:

Check the plausibility of results obtained under these conditions.

CAUTION

If the product is operated with connecting cables attached at only one of their two ends, for example external supply cables, interface cables, the permitted level of electromagnetic radiation may be exceeded and the correct functioning of other products may be impaired.

Precautions:

While the product is in use, connecting cables, for example product to external battery, product to computer, must be connected at both ends.

1.6 FCC Statement, Applicable in U.S.

The greyed paragraph below is only applicable for products without radio.

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 radio 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:

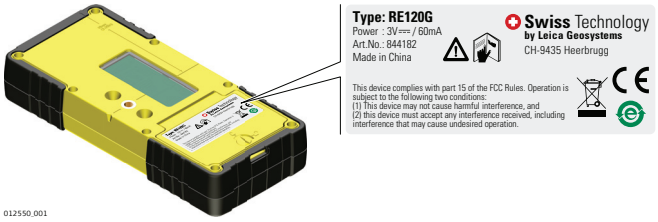
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

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

Labelling Rod Eye

Rod Eye 120G:

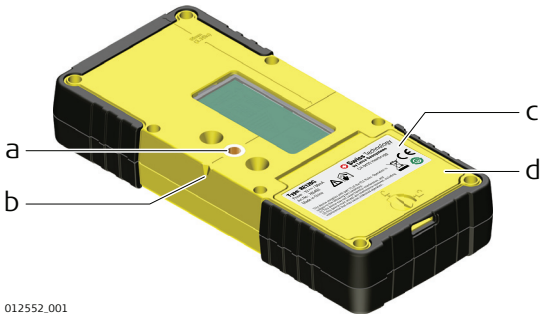


Instrument components part 1 of 2

a) Level vial
b) Audio Speaker
c) LCD window
d) LEDs
e) Laser Reception window
f) On-grade
g) Keypad

Component	Description
Level vial	Aids to keep the rod plumb when taking readings.
Audio Speaker	Indicates the detector's position: • High - Fast beeping • On-grade - Solid tone • Low - Slow beeping
LCD window	Front and rear LCD arrow indicate the detector's position.
LEDs	Display the relative position of the laser beam. Three channel indication: • High - Red • On-grade - Green • Low - Blue
Laser Reception window	Detects the laser beam. The reception windows must be directed towards the laser.
On-grade	Indicates the on-grade position of the laser.
Keypad	Power, accuracy and volume functions. Refer to "Description of the Buttons" for detailed information.

Instrument components part 2 of 2



a) Bracket Mounting Hole
b) Offset notch
c) Product label
d) Battery door

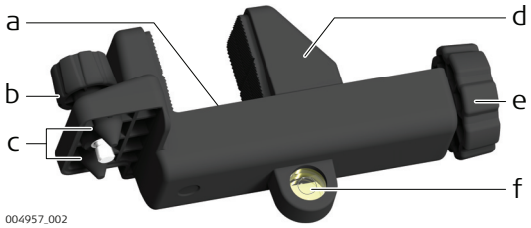
Component	Description
Bracket Mounting Hole	Location to attach the receiver bracket for normal operation.
Offset notch	Use to transfer reference marks. The notch is 85 mm (3.35") below to top of the detector.
Product label	The serial number is located inside the battery compartment.
Battery door	Refer to"Changing the alkaline batteries step-by-step" for detailed information.

Description of the Buttons

a) Power
b) Audio
c) Bandwidth

Button	Function
Power	Press once to turn on the Receiver.
Audio	Press to change the audio output.
Bandwidth	Press to change detection bandwidth.

Detector bracket



a) On-grade reference
b) Attachment knob
c) Alignment points
d) Locking clamp
e) Locking knob
f) Level vial

Component	Description
On-grade reference	The top edge of the bar aligns with the on-grade position.
Attachment knob	Attaches the clamp to the back of the detector.
Alignment points	Aligns and secures the clamp.
Locking clamp	Holds the receiver and bracket to the grade rod.
Locking knob	Turn to tighten the locking clamp to the grade rod.
Level vial	The aids to keep the rod plumb when taking readings.

Special features

Feature	Description
Beam finding	Passing the Rod Eye 120G through the laser beam will cause the sensor to beep twice quickly.
Out of beam display	If the detector is moved out of the detector range, the arrow display will indicate the direction to move to return to the laser beam.
Laser low battery	Alerts the user when the lasers's batteries are getting low.

Menu access and navigation

To access the menu of the Rod Eye 120G Receiver, press the Bandwidth button and Audio button simultaneously.

- Use the Bandwidth button and Audio button to change parameters.
- Use the Power button to scroll through the menu.

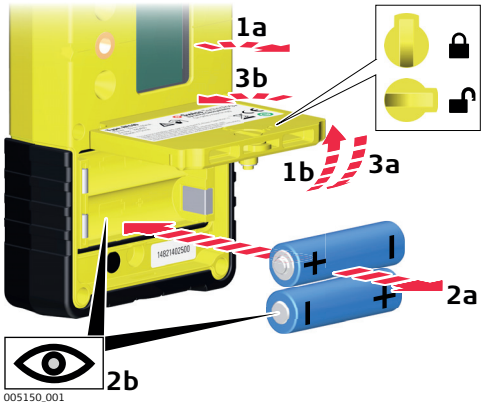
Menu

☞ MENU MODE - The blue LED will blink slowly indicating menu mode.

Menu	Function	Indication
UNT	Changes the unit of measure for the digital readout.	Units - mm/cm/in/ft ☞ Active unit flashes.
LED Red and Green LEDs change brightness to indicate this parameter.	Changes the brightness of the LED indicators.	Red and green LEDs - High/Low/Off
BAT The laser icon flashes to indicate this parameter.	Turns on or off the Laser low battery indication on the receiver.	Green LED is on: Laser low battery icon function is active.
		Red LED is on: Laser low battery icon function is not active.
MEM The down arrow bars are filling to indicate this parameter.	Turns on or off the position memory function.	Green LED is on: function is on.
		Red LED is on: function is off.

Changing the alkaline batteries step-by-step

The small battery icon will appear empty on the Rod Eye 120G display when the batteries are low and need to replaced.



Step	Description
☞	The batteries are inserted under the battery door.
1.	Turn the locking mechanism to the open position to open the battery door.
2.	Remove the batteries from the battery compartment.
	To insert the batteries: Insert the batteries into the battery compartment, ensuring that the contacts are facing in the right direction. ☞ The correct polarity is displayed inside the battery compartment.
3.	Close the cover of the battery compartment and turn the locking mechanism to the closed position to lock the battery door.

LCD Display

Icon	Description
	Grade indication arrow - Five channels are displayed for above and below grade. • Arrow bars can be selected to represent the selected accuracy bandwidth. • Memory Display - if the receiver is moved out of the detection range, the arrow display indicates the direction to move to return to the laser beam (see MEM in menu to enable/disable).
	Laser low battery warning - The laser icon is displayed when the battery of the laser unit is almost depleted. This feature is laser dependent (see BAT in menu to enable/disable).
	Audio volume indication - Three levels of volume are displayed: loud, soft, off (no icon).
	Accuracy indication - Three levels of accuracy are displayed: fine, medium, coarse.
	Receiver low battery warning - Three levels of battery life are displayed: full, low, empty.

Conformity to national regulations

- FCC Part 15 (applicable in US)
- Hereby, Leica Geosystems AG, declares that the product Rod Eye 120G is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC and other applicable European Directives. The declaration of conformity may be consulted at http://www.leica-geosystems.com/ce.

  CE Class 1 equipment according European Directive 1999/5/EC (R&TTE) can be placed on the market and be put into service without restrictions in any EU Member state.
- The conformity for countries with other national regulations not covered by the FCC part 15 or European directive 1999/5/EC has to be approved prior to use and operation.
- Japanese Radio Law and Japanese Telecommunications Business Law Compliance.
  - This device is granted pursuant to the Japanese Radio Law (電波法) and the Japanese Telecommunications Business Law (電気通信事業法).
  - This device should not be modified (otherwise the granted designation number will become invalid).

Technical data

Working diameter (laser dependent):	400 m/1312 ft
Detection height:	70 mm/2.76 in
Detectable spectrum:	500 nm to 570 nm
Detectable accuracies	
Fine:	± 1.0 mm/± 0.04 in
Medium:	± 2.0 mm/± 0.08 in
Coarse:	± 3.0 mm/± 0.12 in
Audio volumes:	105 dBA/65dBA/Off
Automatic shut off:	10 minutes
Arrow display - channels:	15 channels
LED display channels:	3 channels
Anti-strobe protection:	-
Memory, last beam strike:	Yes
Beam finding (double beep):	Yes
Laser low battery indicator:	Yes
Warranty:	3 years
Environmental:	IP67
Batteries:	2 x 1.5 V "AA" - 50+ hours
Dimensions:	173 x 76 x 29 mm/6.8 x 3.0 x 1.1 in
Operating temperature:	-20°C to +50°C/-4°F to +122°F
Storage temperature (except batteries):	-40°C to +70°C/-40°F to +158°F

5 Care and Transport

5.1 Transport

Transport in the field

When transporting the equipment in the field, always make sure that you
- either carry the product in its original transport container,
- or carry the tripod with its legs splayed across your shoulder, keeping the attached product upright.

Transport in a road vehicle

Never carry the product loose in a road vehicle, as it can be affected by shock and vibration. Always carry the product in its transport container, original packaging or equivalent and secure it.

Shipping

When transporting the product by rail, air or sea, always use the complete original Leica Geosystems packaging, transport container and cardboard box, or its equivalent, to protect against shock and vibration.

Shipping, transport of batteries

When transporting or shipping batteries, the person responsible for the product must ensure that the applicable national and international rules and regulations are observed. Before transportation or shipping, contact your local passenger or freight transport company.

Field adjustment

Periodically carry out test measurements and perform the field adjustments indicated in the User Manual, particularly after the product has been dropped, stored for long periods or transported.

5.2 Storage

Product

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to "4 Technical Data" for information about temperature limits.

Li-Ion and alkaline batteries

For Li-Ion and alkaline batteries
- Refer to "Technical Data" for information about storage temperature range.
- Remove batteries from the product and the charger before storing.
- After storage recharge batteries before using.
- Protect batteries from damp and wetness. Wet or damp batteries must be dried before storing or use.

For Li-Ion batteries
- A storage temperature range of 0 °C to +30 °C / +32 °F to +86 °F in a dry environment is recommended to minimize self-discharging of the battery.
- At the recommended storage temperature range, batteries containing a 40% to 50% charge can be stored for up to one year. After this storage period the batteries must be recharged.

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