Leica Rod Eye 180
User Manual

Version 1.0
English

- when it has to be **right**

Leica Geosystems

Introduction

Purchase

Congratulations on the purchase of a Leica Rod Eye 180.

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 180 documentation/software:

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

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In this manual

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 herein.

DANGER, **WARNING**, **CAUTION** and **NOTICE** are standardized 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 table below 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 e.g. radio transmitters, lasers 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:

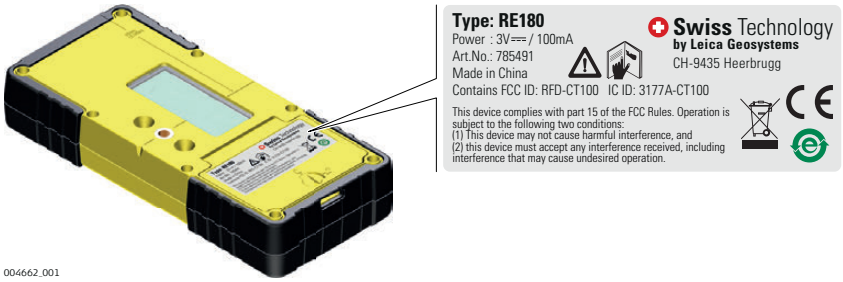
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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 180

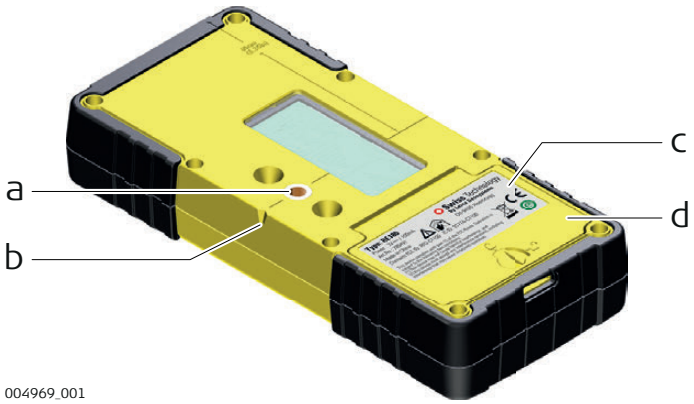


Instrument components part 1 of 2

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. Five 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, volume and capture 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

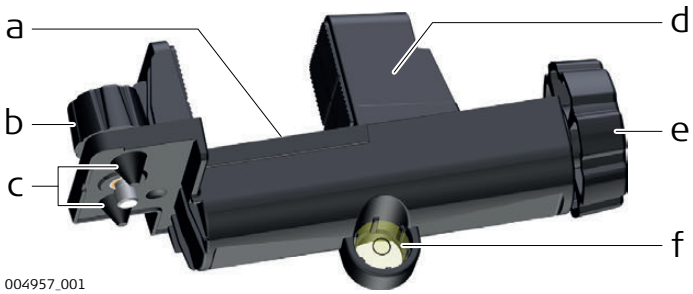
Component	Description
Bracket Mounting Hole	Location to attach the receiver bracket for normal operation.
Offset notch	Use to transfer reference marks. The notch is 85 mm (3.35") below to top of the detector.
Product label	The serial number is located inside the battery compartment.
Battery door	Refer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

Description of the Buttons

a) Bandwidth
b) Power
c) Laser man
d) Audio
e) X and Y Switches

Button	Function
Bandwidth	Press to change detection bandwidth.
Power	Press once to turn on the Receiver.
Laser man	Press to capture digital reading.
Audio	Press to change the audio output.
X and Y Switches	Press to select alternate or second axis for slope catching and slope monitoring.

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
Strobe rejection	The RE Digital is designed to reject and eliminate unwanted signals from strobe lights.
Beam finding	Passing the RE Digital 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.
Radio functions	The Rod Eye Digital RF receiver has a radio module incorporated that provides the user with special functions such as slope catching and slope lock for grades and plane alignment for batter board and facade application setups.

Menu access and navigation

To access the menu of the Rod Eye 180 Digital Receiver, press the Bandwidth button and Audio button simultaneously.

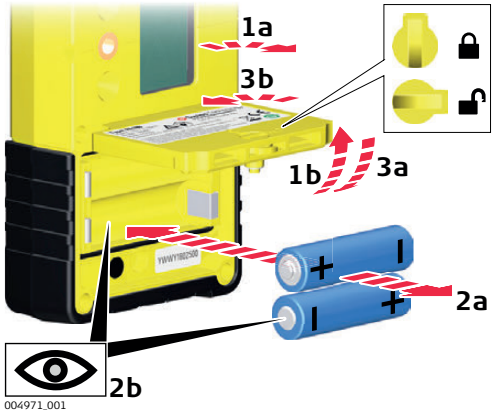
- Use the Bandwidth button and Audio button to change parameters.
- Use the Power button to scroll through the menu.

Menu

Menu	Function	Indication
UNT	Changes the unit of measure for the digital readout.	Units - mm/cm/in/ft ☞ Active unit flashes.
LED	Changes the brightness of the LED indicators.	LEDs - High/Low/Off
DRO	Turns on or off the digital readout.	Green LED is on: digital readout is on.
		Red LED is on: digital readout is off.
		☞ DRO flashes.
BAT	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.
		☞ Rugby icon flashes.
MEM	Turns on or off the position memory function.	Green LED is on: function is on.
		Red LED is on: function is off.
		☞ Full down arrow flashes.
RPS	Measures the head speed of the laser. ☞ Hold in rotating beam to measure the head speed.	Measured head speed is displayed.

Changing the alkaline batteries step-by-step

The small battery icon will appear empty on the Rod Eye 180 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** - Seven 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** - Four levels of volume are displayed: loud, medium, soft, off (no icon).
mm cm in ft	**Units of measure** - Five units of measure are displayed: mm (millimeter), cm (centimeters), in (inch), in (fractions), ft (feet).
	**Elevation indication** - Numeric value is displayed (dependent on the unit of measure chosen).
	**Accuracy indication** - Five levels of accuracy are displayed: Very fine, Fine, medium, Coarse, Very coarse.
	**Receiver low battery warning** - Three levels of battery life are displayed: full, low, empty.
	**Radio transmitting** - The radio transmission is displayed as: on, monitoring, flashing slowly and transmitting, flashing quickly.

4 Receiver

Description

The Rugby 820/840 is sold with the Rod Eye 180 Digital RF Receiver. Using the Rugby 820/840 together with the Rod Eye 180 enables the user to perform special functions such as automatic slope catching and monitoring, as well alignment of the vertical plane for batter boards and facade applications (Rugby 840).
Additional information on the Rod Eye 180 Digital RF Receiver can be found in the individual user manuals also located on this CD.

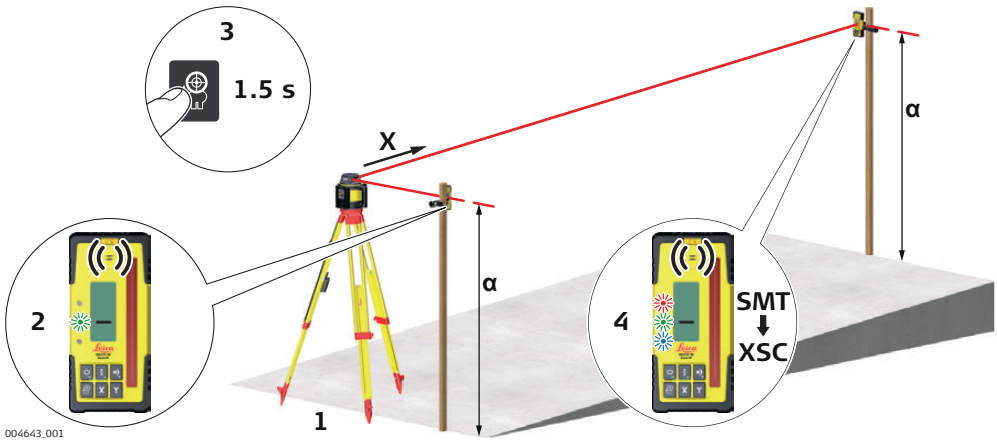
4.1 Pairing the Rod Eye 180 with the Rugby 820/840

Pairing step-by-step

The Rugby 820/840 and the Rod Eye 180 include radio devices that allow the user to automatically match an existing grade.
When purchased together, the Rugby 820/840 and Rod Eye 180 have been paired together at the factory. If purchasing a second receiver, the Rugby 820/840 and the Rod Eye 180 must first be paired together to be able to communicate with each other.

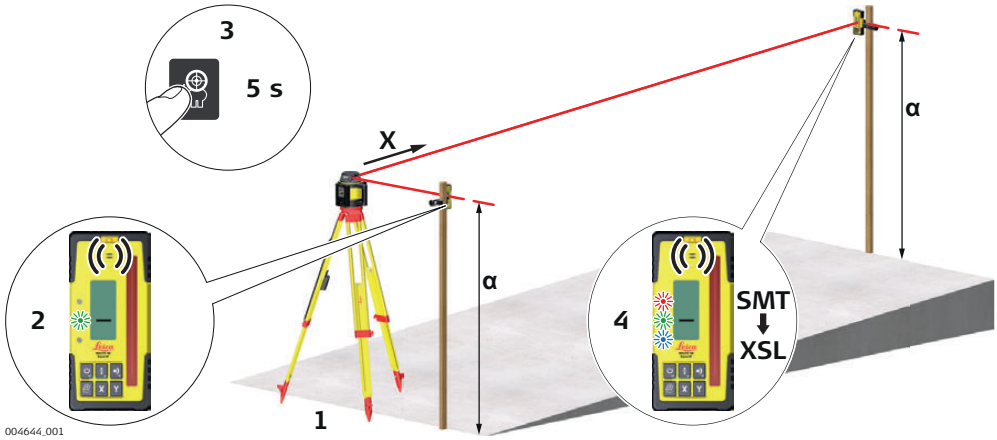
Step	Description
1.	Turn off the Rugby and the Rod Eye 180.
2.	Press and hold the Power button on the Rugby for 5 seconds to turn on the Rugby in pairing mode. The Rugby beeps five times.
3.	Press and hold the Power button on the Rod Eye 180 for 5 seconds.
☞	If successful, the X-axis LED and the Y-axis Indicator LED flash green and the Rugby beeps five times quickly when the pairing was successful. Also the green LED on the receiver will flash five times to indicate a successful pairing. If not successful, the X-axis Indicator LED and the Y-axis Indicator LED flash red five times quickly if the pairing was not successful. Also the red LED on the receiver will flash five times to indicate an unsuccessful paring.

Smart Targeting using the Rugby, step-by-step



Step	Description
1.	Set up the Rugby at the base of a slope with the X-axis pointing in the direction of the slope.
2.	At the base of the slope, adjust the height of the receiver on the rod until the on-grade (centre-line) position is indicated on the receiver by: • the centre bar • the green flashing LED • a solid audio tone • the digital display
3.	Move to the top of the slope and press the laser man button for 1.5 seconds to start the smart targeting process. The receiver shows **SMT**, then **XSC** for X-axis slope catching.
4.	The Rugby searches for the receiver until the on-grade position is found. Once the on-grade position, the receiver will flash all three LEDs simultaneously one time and the receiver returns to normal operation.
5.	After this signal the receiver can be moved and used as normal. The sloped axis is in Manual mode and should be checked from time to time to ensure the Rugby has not moved.

Smart Target Lock using the Rugby, step-by-step



Step	Description
1.	Set up the Rugby at the base of a slope with the X-axis pointing in the direction of the slope.
2.	At the base of the slope, adjust the height of the Rod Eye 180 Digital Receiver RF on the rod until the on-grade (centre-line) position is indicated on the receiver by: • the centre bar • the green flashing LED • a solid audio tone • the digital display
3.	Move to the top of the slope and press the laser man button for 5 seconds to start the smart target and lock process. The receiver will show **SMT**, then **XSL** during the X-axis slope lock process.
4.	The Rugby searches for the receiver until the on-grade position is found. Once the on-grade position is found, the receiver will flash all three LEDs simultaneously one time and the receiver returns to normal operation. The display will show **LOC** while the receiver is in lock mode. ☞ To turn off lock mode on the receiver, hold the power button for 1.5 seconds.

Dual Receiver setups using the Rugby

It is possible to use the Smart Targeting feature of the Rod Eye 180 Digital RF Receiver to catch and monitor both axes of the laser. To do this, perform the actions above for the first axis, and then repeat the actions for the second axis using a second receiver.

☞ To use the Smart Target feature to slope catch and monitor both axes, it is necessary to have two receivers.

☞ Once the lock and monitoring process is started, the receivers must remain in place.

Individual axis can be selected for the Smart Targeting procedure by first pressing the X or Y button on the receiver keypad and the laser man button.

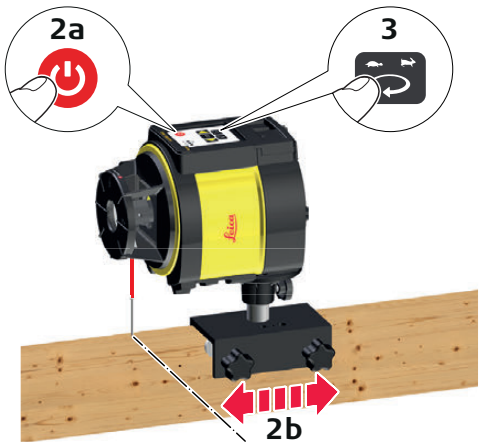
Action	Buttons
To slope catch the X-axis: Press **X** plus Laser Man for 1.5 seconds	1x X + 1.5 s
To slope catch and lock the X-axis: Press **X** plus Laser Man for 5 seconds.	1x X + 5 s
To slope catch the Y axis: Press **Y** plus Laser Man for 1.5 seconds.	1x Y + 1.5 s
To slope catch and lock the Y-axis: Press **Y** plus Laser Man for 5 seconds.	1x Y + 5 s

Description

The Rugby 840 and the Rod Eye 180 Digital Receiver create a vertical plane of laser light that acts as a virtual string line for batter board setups.

Setup

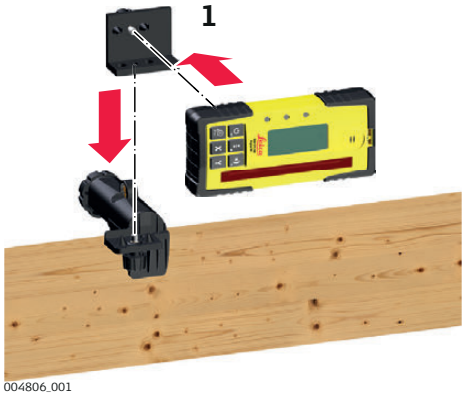
Laser setup

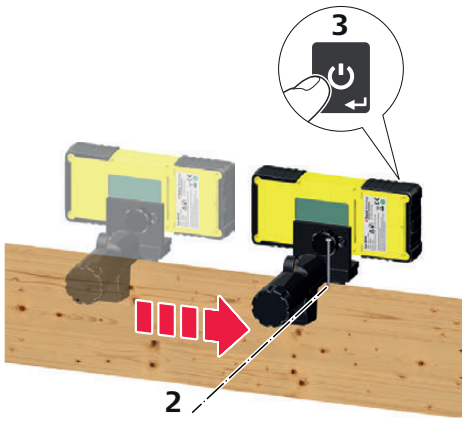


004805_001

Step	Description
1.	Mount the Rugby to the clamp and then the clamp to the batter board.
2.	Turn on the Rugby. The laser beam will automatically point downwards so that the laser and the clamp can be positioned directly over the surveyed reference nail.
3.	Set the head rotation to the fastest speed (10 rps).

Receiver setup

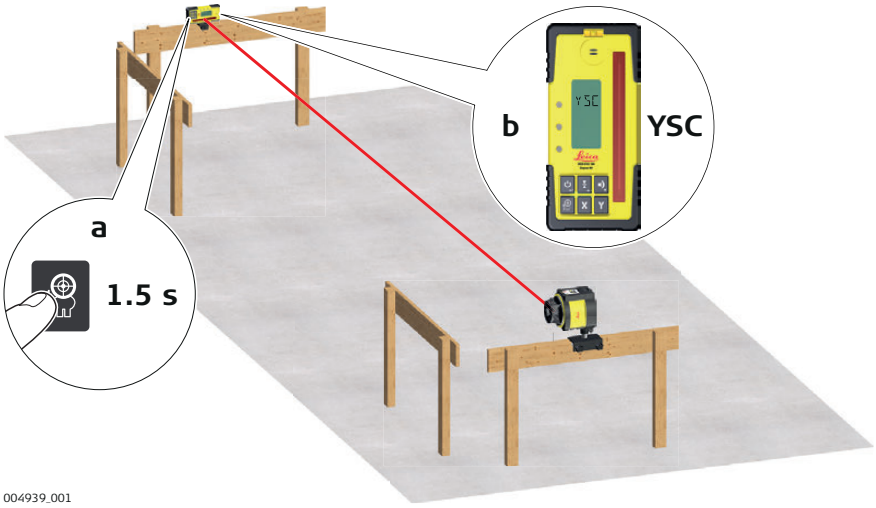




004806_001

Step	Description
1.	Mount the receiver to the receiver bracket using the 90° adapter.
2.	Attach the bracket to the batter board. The top of the receiver bracket should be tight against the surveyed reference nail.
3.	Turn on the receiver.

Alignment

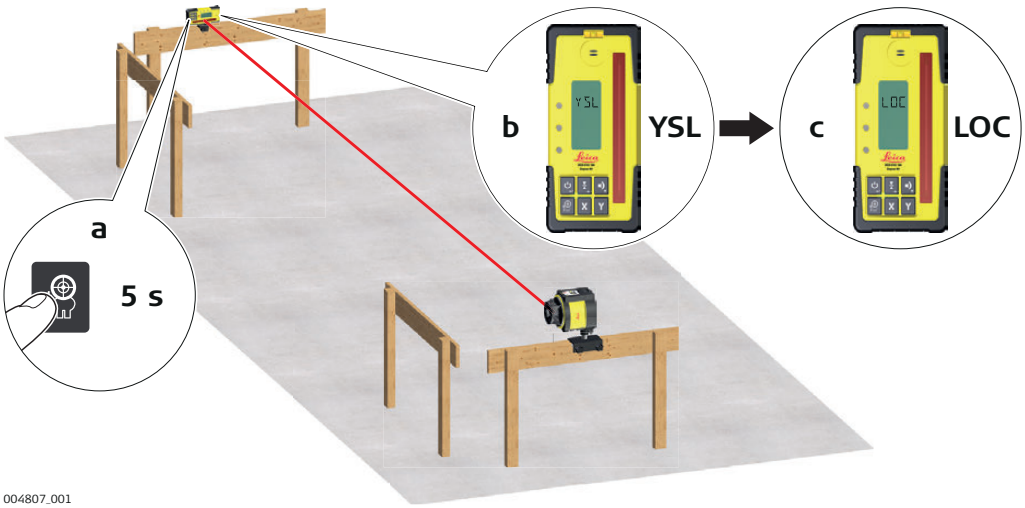


- Use the remote control to move the rotating laser beam left or right until the receiver displays an on-grade position.

OR

- Use the Smart Target function of the receiver to automatically align the vertical rotating plane to the receiver. Press the Laser man button on the receiver for 1.5 seconds to start the alignment process. The receiver will display **YSC**.

Monitoring



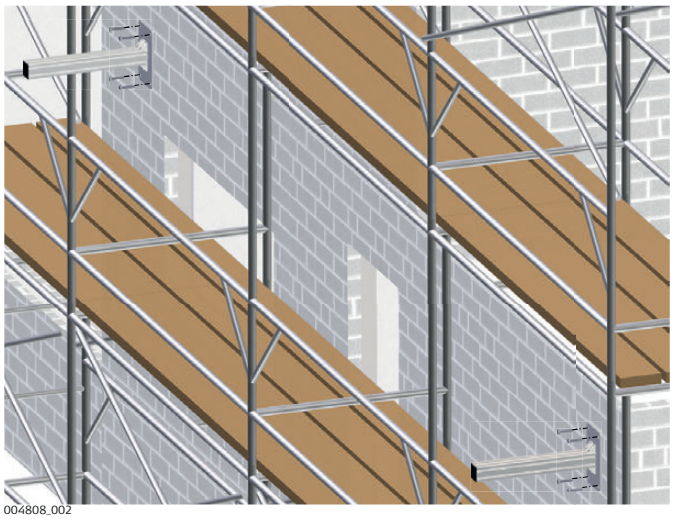
Use the Smart Target function of the receiver to automatically align and then monitor the laser beam. Press the Laser Man button on the receiver for 5 seconds to start the alignment and slope catching and lock/monitoring process. The receiver will display **YSL**, then **LOC** when the process is complete.

Description

The Rugby 840 and the Rod Eye 180 Digital Receiver create a vertical plane of laser light that is aligned to the building and acts as a constant reference for facade installations.

Setup

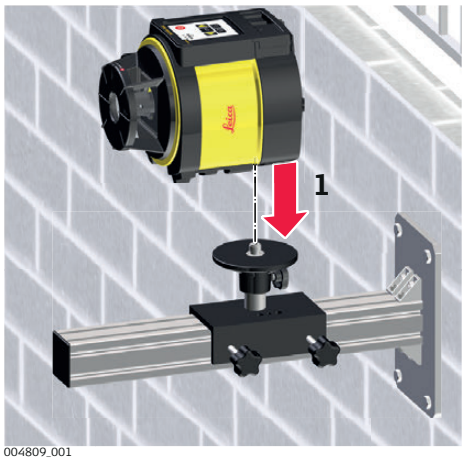
Mounting the facade adapter brackets

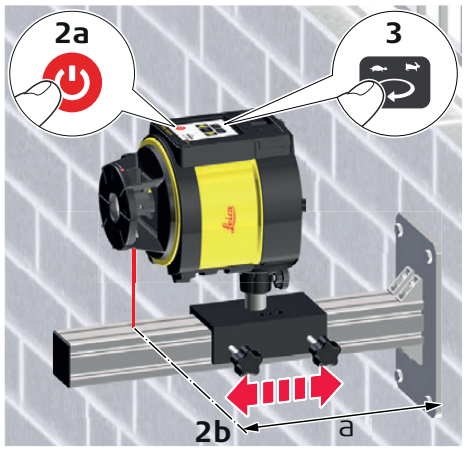


004808_002

Step	Description
1.	Mount the facade adapter brackets to the side of the building in locations where it is desired to have a laser and receiver setup.

Laser setup

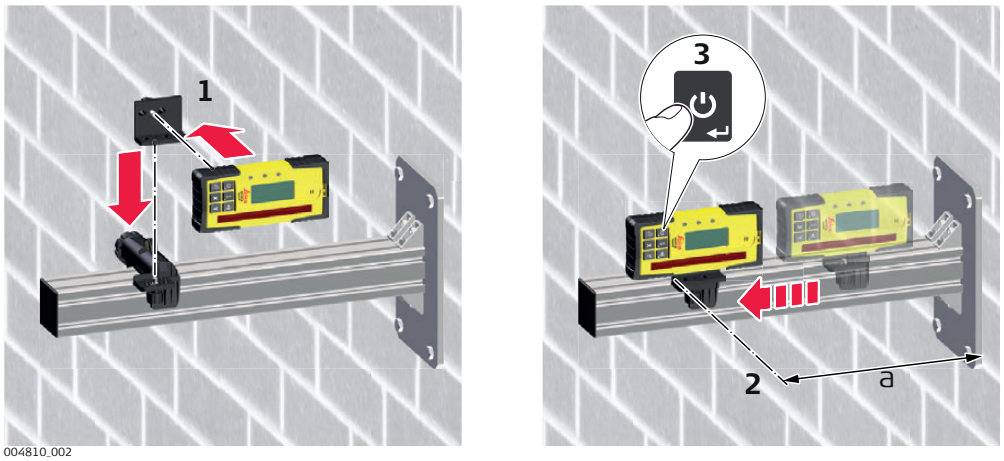




004809_001

Step	Description
1.	Mount the Rugby to the clamp and then the clamp to the facade adapter bracket.
2.	Turn on the Rugby. The laser beam will automatically point downwards so that the laser and the clamp can be positioned at the desired distance from the building's surface.
3.	Set the head rotation to the fastest speed (10 rps).

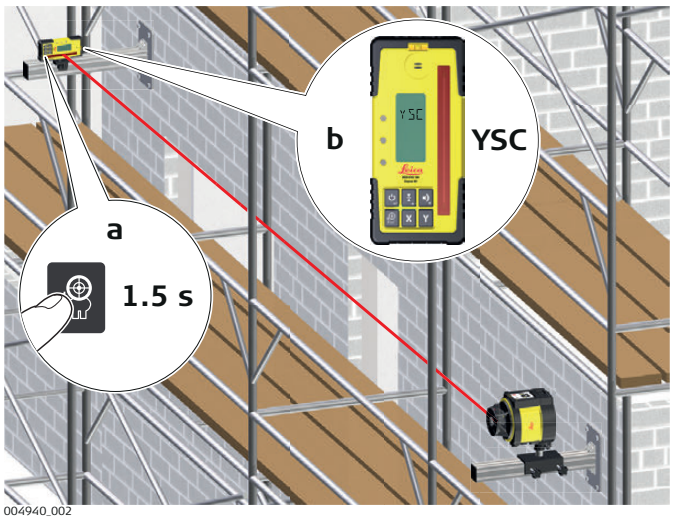
Receiver setup



004810_002

Step	Description
1.	Mount the receiver to the receiver bracket using the 90° adapter.
2.	Attach the bracket to the facade adapter bracket. The top of the receiver bracket should be set at the same distance from the building's surface as the laser for proper alignment.
3.	Turn on the receiver.

Alignment

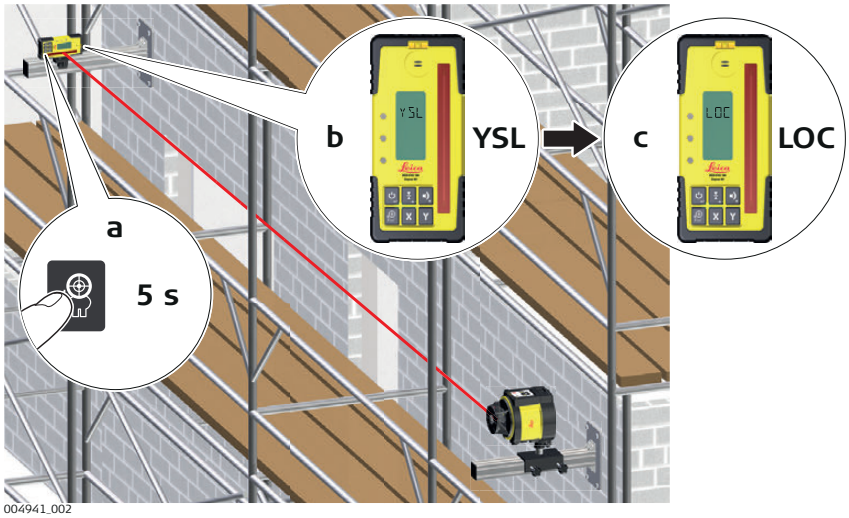


004940_002

- Use the remote control to move the rotating laser beam left or right until the receiver displays an on-grade position.

OR

- Use the Smart Target function of the receiver to automatically align the vertical rotating plane to the receiver. Press the Laser man button on the receiver for 1.5 seconds to start the alignment process. The receiver will display **XSC**.



004941_002

Use the Smart Target function of the receiver to automatically align and then monitor the laser beam. Press the Laser Man button on the receiver for 5 seconds to start the alignment and slope catching and lock/monitoring process. The receiver will display **YSL**, then **LOC** when the process is complete.

6 Automatic Field Calibration - Rugby 820/840

About

This procedure is unique to the Rugby lasers and uses the digital readout of the Rod Eye 180 receiver to measure, then adjust the plane of each axis.

Description

Objective: To rotate the laser to all four axes, then allow the receiver to adjust the beam automatically.

Setup

Step	Description
1.	Pair the receiver to the laser (if not already done). Refer to for more information.
2.	Mount the laser on a flat, level surface or tripod.
3.	Turn on the laser and align the X-axis toward the receiver position.
4.	Mount the receiver to a fixed position (e.g., a stationary grade rod) approximately 30 meters (100 ft) from the laser.
5.	Turn on the receiver and position the height of the receiver near or at the on-grade position. It is not necessary to be exact.
6.	Turn off the receiver.
7.	Turn on the receiver in **CAL** mode by pressing both the power and Laser man button for five seconds.
8.	The display will show **CAL**. 
9.	Return to the laser and note the colour and activity of the X and Y LEDs.

☞

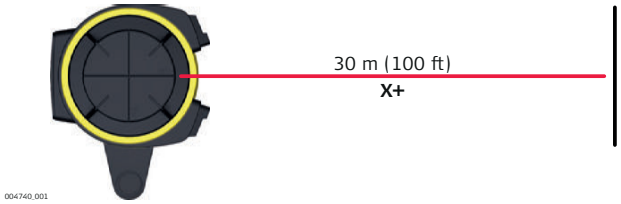
- With each rotation it may take up to 10 seconds for the calibration process to identify the axis being checked, i.e. before the LED starts to blink red.
- Each step of the process is very exact and may take 1 minute to complete before the LED turns to green.
- It is important to note the colour and blink sequence to know the status of each axis in the process.
- It is not necessary to follow the steps in the exact order, but different rotation sequences will result in different LED indications.
- Increasing the distance beyond 30 meters (100 ft) between the laser and receiver will not increase the accuracy of the calibration process.

Calibrating step-by-step

The following table defines and displays the LED indications that will be seen during each step of the field calibration process.

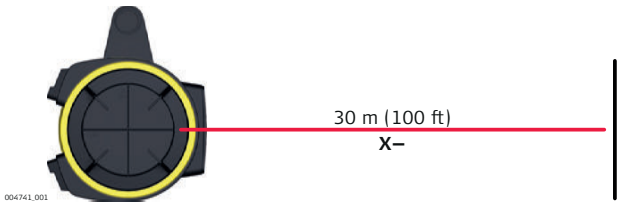
X-axis LED	Y-axis LED	X	Y	X-axis status	Y-axis status	Actions
Red on	Red on			X-axis not aligned	Y-axis not aligned	Rotate laser until the X-axis LED is flashing red.

Step 1 - Rotate and align the first side of the X-axis (X+)



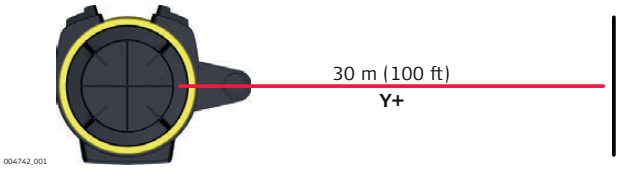
X-axis LED	Y-axis LED	X	Y	X-axis status	Y-axis status	Actions
Flashing red	Off			X-axis is levelling	Off	Wait until the first side of the X-axis is measured.
Flashing green	Red on			X-axis is half complete	Y-axis not aligned	Rotate laser 180° until the X-axis LED is again flashing red.

Step 2 - Rotate 180° and align to the opposite side of the X-axis (X-)



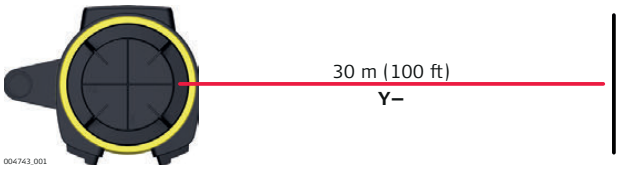
X-axis LED	Y-axis LED	X	Y	X-axis status	Y-axis status	Actions
Flashing red	Off			X-axis is levelling	Off	Wait until the reverse of the X-axis is measured.
Green on	Red on			X-axis is complete	Y-axis not aligned	Rotate laser 90° until the Y-axis LED is flashing red.

Step 3 - Rotate 90° and align to the first side of the Y-axis (Y+)



X-axis LED	Y-axis LED	X	Y	X-axis status	Y-axis status	Actions
Off	Flashing red	○	✳	Off	Y-axis is levelling	Wait until the first side of the Y-axis is measured.
Green on	Flashing green	●	✳	X-axis is complete	Y-axis is half complete	Rotate laser 180° until the X-axis LED is again flashing red.

Step 4 - Rotate 180° and align to the opposite side of the Y-axis (Y-)



X-axis LED	Y-axis LED	X	Y	X-axis status	Y-axis status	Actions
Off	Flashing red	○	✳	Off	Y-axis is levelling	Wait until the reverse of the Y-axis is measured.
Green on	Green on	●	●	X-axis is complete	Y-axis is complete	Done.

If the calibration process was successful, the X and Y LEDs will flash alternately three times, the beeper will sound and the Rugby will then turn off.
If the Rugby does not complete the procedure as noted above, the procedure has failed and must be repeated.

Conformity to national regulations

- FCC Part 15 (applicable in US)
- Hereby, Leica Geosystems AG, declares that the product Rod Eye 180 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.

Frequency band

2400 - 2483.5 MHz

Output power

< 100 mW (e. i. r. p.)

Antenna

Rugby 820/830	Chip antenna
Rod Eye 180, Digital RF Receiver	Chip antenna

Technical data

Working diameter (laser dependent):	1350 m/4430 ft
Detection height:	120 mm/5 in
Numeric readout height:	90 mm/3.5 in
Detectable spectrum:	600 nm to 800 nm
Detectable accuracies	
Very fine:	± 0.5 mm/± 0.02 in
Fine:	± 1.0 mm/± 0.04 in
Medium:	± 2.0 mm/± 0.08 in
Coarse:	± 3.0 mm/± 0.12 in
Very coarse:	± 5.0 mm/± 0.20 in
Audio volumes:	105 dBA/95 dBA/65dBA/Off
Automatic shut off:	10 minutes
Digital readout - units:	mm, cm, in, in (fractions), ft
Arrow display - channels:	15 channels
Anti-strobe protection:	Yes
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

8 Care and Transport

8.1 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 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 in charge of 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.

8.2 Storage

Product

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to "7 Technical Data" for information about temperature limits.

Li-Ion and alkaline batteries

For Li-Ion and alkaline batteries
- Refer to "7 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 -20°C to +30°C/-4°F to 86°F in a dry environment is recommended to minimise self-discharging of the battery.
- At the recommended storage temperature range, batteries containing a 50% to 100% charge can be stored for up to one year. After this storage period the batteries must be recharged.

Total Quality Management: Our commitment to total customer satisfaction.

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).

Ask your local Leica Geosystems dealer/sales representative for more information about our TQM program.

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- when it has to be **right**

Leica Geosystems