User Manual

Pocket Laser Range Finder with Compass

PLRF25C / PLRF25C BT

English, Version 1.2
II 2013

vectronix
General Information

Short Description PLRF25C / PLRF25C BT
The PLRF25C is a ruggedized, pocket size, handheld, one button operated laser range-finder with integrated digital magnetic compass, sighting optic and data interface. The PLRF25C is capable to provide distance, azimuth and inclination information. The version PLRF25C BT is additionally equipped with integrated Bluetooth functionality.

Meaning of the Symbols

⚠️ 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 and/or appreciable material, financial and environmental damage.

ℹ️ Information
Gives reference to an important information for analysis of that important text.
For safe use of the device, please note the safety directions included in the User Manual.

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**Warning**
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure. Do not open the device housing or attempt your own repairs. Do not manipulate or adjust the performance of the device.

**Warning**
Not following correct operating procedures or practices could result in personal injury or loss of life.

**Warning**
Distance measurements on reflective objects (e.g. traffic signs, number plates) may cause false readings.
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Safety Notices

Laser Safety: Class 1 according to IEC60825-1 Ed 2.0 (2007-03)

⚠️ Important!
Keep the instructions always in direct access for user and any personnel working at the instrument.

ℹ️ Intended purpose
The device
• is designed as a handheld observation and surveying aid;
• is to be used in addition to other instruments or techniques;
• must never be used as a sole surveying instrument.

The knowledge of this instruction and the local authorities instructions is the basic for a safe use of the instrument.
Limitations of use

The device must not be used in the vicinity of sensitive electrical equipment. All other usage limitations are mentioned in the technical specifications.

Inappropriate use

- Device deployment without prior knowledge of the operating instructions and safety notices.
- Changes and modifications to the device by the customer.
- Use of accessories not expressly approved by Vectronix AG.
- Working in explosive environment or underground.

- Testing or inspection of device not named as applications in the intended use.
- Use of the device without instruction.
- Use outside of the intended limits.
- Opening the device using tools, for example screwdriver.
- Use after misappropriation.
- Use of device with obviously recognizable damages or defects.

Inappropriate use brings the risk of

- injuries;
- instrument errors;
- damage to property;
- malfunction;
Obligation of the Operator

The person responsible for the product must ensure that
• the operators are qualified according to the local authorities directives;
• all users understand these directions and adhere to them.

Avoiding storage and transport damage
• When not in use, always keep the device in its pouch.
• Remove the battery prior to prolonged storage. Battery leakage can damage the device.

Avoiding measurement errors
• Observe the permissible storage temperatures.
• Do not expose the device to strong mechanical shocks or abrupt temperature transitions during transport (moisture condensation).
• Use the pouch and transit case or equivalent packaging for shipment.

• Note the factors affecting measurement accuracy (see pages 24, 25).
• Always perform test measurements after the device has been exposed to rough handling (vibration, falls, etc.), and before carrying out important measurement tasks.
Blinding hazard

- Do not look into powerful light sources with the device.
- Do not open the device. The built-in laser can cause eye injuries.

Explosion hazard

The battery must not be
- short-circuited;
- recharged;
- mechanically modified;
- placed in fire or exposed lonely or with the device to temperatures above +85°C (185°F).

Physical injury hazard

- Do not place the device on a vehicle parcel-shelf or dashboard – risk of injury when braking.

Environmental hazard

- The device does not contain extremely hazard materials. For handling and disposal of the battery and the electro-optical device the country specific regulations have to be respected.
- Deposit used batteries at a proper collection point.
Care and cleaning

The devices performance and serviceability are conditional on regular care and immediate attention to problems:

• Do not touch glass lenses with fingers.
• Do not soil the operating keys with oil or grease.
• Avoid abrupt temperature transition, since these can cause condensation moisture to develop inside the device.

The device does not need special care or cleansers. Therefore

• do not use any kind of impregnated cloth intended for cleaning spectacle lenses,
• do not use any solvent except water, e.g. no alcohol or cleansers.

Lens cleaning

Particles of dirt should be blown off or removed using a soft brush. Finger prints may be cleaned first by wiping with a damp cloth, followed by soft, clean optical tissue or chamois leather.
Cleaning the casing
Wipe the casing with a damp cloth. Pay special attention to dirt and grease around the button. Blow out the device interface cable socket, and clean it carefully. Allow the device to dry fully before packing.

Cleaning the interface cable
Protect the cable from damp and dirt as much as possible! Wipe the cable with a damp cloth. Blow out soiled cable plugs with clean air, and leave them to dry.
## Technical Data

<table>
<thead>
<tr>
<th><strong>Optics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observation</strong></td>
<td>monocular</td>
</tr>
<tr>
<td><strong>Magnification</strong></td>
<td>6x</td>
</tr>
<tr>
<td><strong>Objective diameter</strong></td>
<td>30 mm</td>
</tr>
<tr>
<td><strong>Field of view</strong></td>
<td>6° / 106 mil</td>
</tr>
<tr>
<td><strong>Focus</strong></td>
<td>fixed (50m to infinity)</td>
</tr>
<tr>
<td><strong>Dioptic setting</strong></td>
<td>+4dpt to -4dpt</td>
</tr>
</tbody>
</table>
## Magnetic Compass (azimuth and inclination)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Azimuth units</td>
<td>360° / 6400mil / 6300mil / 6000mil</td>
</tr>
<tr>
<td>Accuracy (1σ)</td>
<td></td>
</tr>
<tr>
<td>Azimuth</td>
<td>± 10mil / ±0.6°</td>
</tr>
<tr>
<td>Inclination angle</td>
<td>± 3mil / ±0.2°</td>
</tr>
<tr>
<td>Display resolution</td>
<td>1° / 1 mil</td>
</tr>
<tr>
<td>Max. inclination and bank angle</td>
<td>±45°</td>
</tr>
<tr>
<td>Compass calibration</td>
<td>menu driven</td>
</tr>
<tr>
<td>Declination</td>
<td></td>
</tr>
<tr>
<td>Array (adjustable)</td>
<td>± 179.9°</td>
</tr>
<tr>
<td>Increment</td>
<td>0.1° / 1 mil</td>
</tr>
</tbody>
</table>
**RangeFinder**

<table>
<thead>
<tr>
<th>Laser type</th>
<th>1550 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye safety</td>
<td>Class 1</td>
</tr>
<tr>
<td>Standard</td>
<td>IEC60825-1 Ed 2.0 (2007-03)</td>
</tr>
<tr>
<td>Range Performance</td>
<td>5m to &gt;4000m</td>
</tr>
<tr>
<td>Specified Performance</td>
<td>2500m*</td>
</tr>
<tr>
<td>Accuracy (1σ)</td>
<td>±2 m (&gt;50m to &lt;1500m)</td>
</tr>
<tr>
<td></td>
<td>±5 m (&lt;50m / &gt;1500m)</td>
</tr>
<tr>
<td>Display Resolution</td>
<td>1m / 1ft / 1yd</td>
</tr>
</tbody>
</table>

* at visibility 15km, 2.3 x 2.3m target size, albedo 0.4, detection probability >90%
## Miscellaneous

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
<td>1x 3V lithium battery, type CR123A</td>
</tr>
<tr>
<td><strong>Battery capacity (20°C)</strong></td>
<td>&gt; 3000 measurements</td>
</tr>
<tr>
<td><strong>Immersion</strong></td>
<td>1m, 30min</td>
</tr>
<tr>
<td>Standard</td>
<td>1m, 30min</td>
</tr>
<tr>
<td>Optional</td>
<td>10m, 30min</td>
</tr>
<tr>
<td><strong>Operational temperature range</strong></td>
<td>-35°C to +63°C / -31°F to +145°F</td>
</tr>
<tr>
<td><strong>Storage temperature range (without battery)</strong></td>
<td>-40°C to +85°C / -40°F to +185°F</td>
</tr>
<tr>
<td><strong>Weight with battery and rubber cover</strong></td>
<td>500g / 1.1lbs</td>
</tr>
<tr>
<td><strong>Dimensions with rubber cover</strong></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>131mm / 5.2in</td>
</tr>
<tr>
<td>Width</td>
<td>88mm / 3.5in</td>
</tr>
<tr>
<td>Height</td>
<td>56mm / 2.2in</td>
</tr>
<tr>
<td><strong>Tripod interface</strong></td>
<td>1/4 inch thread</td>
</tr>
<tr>
<td><strong>Data interface:</strong></td>
<td></td>
</tr>
<tr>
<td>PLRF25C / PLRF25C BT</td>
<td>RS232</td>
</tr>
<tr>
<td>PLRF25C BT</td>
<td>Bluetooth (Serial Port Profile)</td>
</tr>
</tbody>
</table>
Getting started

Instrument Overview

a) Rubber Cover
b) Push Button
c) Eyecup
d) Objective – Day Optics
e) Objective – Transmitter
f) Interface Protection Cap
g) Interface Connector (5-Pin LEMO)
h) Battery, CR123A
i) Battery Case Cover
j) Tripod Mount (1/4 inch)
k) Type label (Name, Part Number, Serial Number)
Changing the battery

Open the battery compartment. Insert one lithium battery type CR123 with +(positive) pole facing to the objectives. Close the battery cover.

The device monitors the condition of the batteries. If the display shows \textit{BATT LOW}, this indicates that the battery is almost used up. You can still get readings, but the battery needs to be replaced at the next occasion. The message \textit{BATT LOW} may also appear under cold conditions, since low temperature reduces the performance of the batteries.

Remove the battery before storing.
Diopter adjustment

Focus on an object farther than 100 m away and rotate the eyepiece to obtain a sharp image.
Standard setting: 0 diopter

If the device is being used by different people, remember your personal diopter setting.
Reticle

**Glass reticle**
The device is equipped with an engraved glass reticle.
-Line to line spacing: 10 mil
-Line to point spacing: 5 mil

1 mil corresponds to 1 m spacing at a distance of 1 km.

**Electronic reticle**
An illuminated aiming mark can be activated for the use under poor lighting conditions.
General Operations

The device is operated entirely by one push button only.

ℹ️ You can prolong the display period by holding down the button while the result is displayed.

The button operation is indicated by the following symbols:
- press down the button and keep it pressed
- release the button
- press and release the button quickly (click)
- number of clicks (e.g. 3 clicks)
- press and hold down the button for the indicated time (e.g. >2 seconds)

Hold the device steady during measurement. The device displays the measurement result, then switches itself off automatically after a few seconds.
Signs And Symbols Measurement Results

Complete Measurement  Distance Between Two Objectes  Abreviations Units

Distance (air-line)  Distance (air-line)  Meter
Horizontal Distance  Distance (air-line)  Feet
Vertical Distance  Distance (air-line)  Yard
Azimuth  Distance (air-line)  Mil
Inclination Angle  Distance (air-line)  Degree
Overview Menu

Complete Measurement with data transfer 1x
Distance between two points and Fall of Shot (optional) 2x
Distance Gate 3x
Compass Calibration 4x
Declination 5x
Settings (Configuration, Units & Interface) 6x
Built-In-Test 7x
Default Settings 8x
# Measurement Functions

## Factors affecting measurement range

<table>
<thead>
<tr>
<th>Reflective properties</th>
<th>Size of the target</th>
<th>Oblique surfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Reflective properties" /></td>
<td><img src="image2.png" alt="Size of the target" /></td>
<td><img src="image3.png" alt="Oblique surfaces" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Atmospheric conditions</th>
<th>Vibration</th>
<th>Lighting conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4.png" alt="Atmospheric conditions" /></td>
<td><img src="image5.png" alt="Vibration" /></td>
<td><img src="image6.png" alt="Lighting conditions" /></td>
</tr>
</tbody>
</table>
Factors influencing azimuth accuracy

The device has a digital compass that works similar to a magnetic compass. Metal objects, magnetic fields and electronic devices (e.g. radio) can cause error in directional readings. Nonmagnetic metals and alloys do not affect the compass readings.

Countermeasures
• A compass calibration must be performed after every battery change (see page 30)
• Observe the minimum safe distances shown above when making azimuth measurements or compass calibration.
Complete measurement with data transfer (slope distance, horizontal and vertical distance, azimuth, inclination)

Press and hold the button. The azimuth appears and is updated continuously. Sight the object with the aiming mark.

Hold the device steady as you release the button. The slope distance $D$ is displayed. If no distance could be detected, $D----$ appears.

While the display is on, click the button to get the horizontal distance $H$. Repeat the step above to obtain the vertical distance $V$, the azimuth $AZI$ and the inclination angle $INC$.

The measurement data (distance, azimuth and inclination) is transmitted to the interface just after a measurement is taken.
Multiple object measurement

Up to three distances in the line of sight can be obtained with a single measurement. To use this feature the function 3DIS ON must be activated (see page 37).

Perform a measurement as described before. If more than one distance has been detected, it is indicated with a number (1, 2 or 3) at the very left.

While the display is on, click the button repeatedly to display all the obtained measurement values. The order of the shown ranges is: strongest, 2nd strongest and 3rd strongest detected signal.

Always the distance with the strongest signal will be transmitted to the interface.
Distance between two objects

Click the button one time then immediately press and hold it down. The azimuth appears and is updated continuously. Sight the first object with the aiming mark.

Release the button to measure the first point. PT1 OK followed by DO PT2 is displayed. Immediately press and hold down the button again. Sight the second point.

Release the button to measure the second point. The distance $D$ between the two points is displayed.
Distance gate

In certain cases, it may be useful to limit the closest distance the device will measure. Click the button three times in rapid succession. DIS-GATE appears briefly followed by the current setting.

Click the button to scroll through the available values. 

DIS-GATE is displayed when a distance within the set distance gate is measured.

To store the desired setting, press and hold down the button for >2 seconds. The setting is not changed if CANCEL is displayed.
Compass calibration

General instructions

How?
There is a choice of two calibration procedures
• **12 point calibration** (recommended) provides best precision.
• **4 point calibration** May achieve adequate precision for many applications if time does not permit a 12 point calibration.

When?
• After every battery change
• After the device has been exposed to strong magnetic fields.
• After parts have been attached or removed to the device (e.g. night vision device)

Where?
In a open area (e.g. a field) at an adequate distance from buildings and metallic objects (see page 25). Ensure that there are no buried pipes, cables, etc. in the vicinity.

Never calibrate the compass inside a building or in the vicinity of disruptive magnetic fields.

Check the stored declination after every compass calibration and correct if necessary.
Calibration instructions

The device needs to be moved in various directions during calibration. Instructions for the movements appear successively in the display:

**UP:** turn up  
**DOWN:** turn down  
**ROT 90°:** rotate 90°  

**TLT RIGH:** Tilt the right side of the device down.  
**HOLD POS:** Hold the device steady at the current position  
**TLT LEFT:** Return to horizontal.

**Important:**  
When the **HOLD POS** instruction is displayed, immediately hold the device still and wait for the next instruction. Perform each movement slowly and steadily, until the next instruction is displayed.

Always turn in the same direction for all **ROT 90°** instructions.
Perform compass calibration

Click the button four times in rapid succession. DMC CAL appears briefly followed by the first available calibration procedure.

Click the button to scroll through the available calibration procedures. Press and hold down the button for >2 seconds to start the displayed procedure.

Follow the instructions in the display.
Results

The calibration result is displayed at the end of the procedure. GOOD indicates a successful calibration. If the result is BAD, perform a 12 point calibration until a GOOD is obtained. Consider to move to an alternative location.

Magnetic interferences can still lead to inaccurate measurements, even if the calibration was successful. For this reason the compass accuracy should be verified after a successful calibration by performing several azimuth measurements on known landmarks and compare the results.

Possible causes of calibration failures:
- the device was moved while HOLD POS was displayed.
- movements were performed to fast or jerkily.
- the location is to close to magnetic disturber.
Declination

Declination explanation

- Within the context of using PLRF25C, declination is understood as the deviation between magnetic north (MN) and grid north (GiN).
- Anyway, depending on the country or region declination possibly can be understood as deviation between magnetic north (MN) and geographical north (GgN).

To get the correct azimuth from PLRF25C in a certain coordinate system:

1. The deviation between magnetic north (MN) and grid north (GiN) of the specified coordinate system must be known.
2. This deviation must be set in the DECLNATN menu (see page 36).

- **Declination D:** Angle between GgN and MN
- **Declination d:** Angle between GiN and MN
- **Meridian convergence c:** Angle between GiN and GgN
When working with geographical coordinates $GgN = GiN$ and therefore the declination $D = d$.

Declination $d$ is negative when MN lies west (left) of GiN and is positive when MN lies east (right) of GiN.

The declination is displayed in the currently selected angular unit (see page 37)

The stored declination value:
• is retained when the measurement units are changed.
• is retained when the battery is exhausted or replaced.
• is factory set to zero (0).
Declination setting / correction

Click the button five times in rapid succession. DECLNATN appears briefly followed by currently set declination value. The first digit is blinking.

Set digit by digit from left to right. Click to change the value of the blinking digit. Press and hold for more than two seconds to store the current digit.

Storing the very last digit stores the complete set value. The setting is not changed if CANCEL is displayed.
In sub-menu **CONFIG**, the following functions can be activated and deactivated:
- Measuring 3 distances
- Electronic reticle
- Night Vision Mode.

In the sub-menu **UNITS**, the following units can be selected:
- Distance: Meter, Yard, Feet, Angle: $360^\circ$, 6000mil, 6300mil, 6400mil

In the sub-menu **INTRFACE**, the available interface settings can be set. The choice depends on the model and on the options installed.

The selected setting is marked with the star symbol (*).
Change Settings

In the menu **SETTINGS** there are three sub-menus: **CONFIG**, **UNITS** and **INTERFACE**. Click the button 6 times in rapid succession. **SETTINGS** appears briefly followed by the first sub-menu **CONFIG**.

Click the button to scroll through the available submenus. Press and hold down the button for >2 seconds to enter the desired sub-menu. To store the desired setting, press and hold down the button for >2 seconds. The setting is not changed if **CANCEL** is displayed at the end.
**Measuring 3 distances**

*Function: 3DIS ON / 3DIS OFF*

3DIS ON allows to obtain up to three distances in the line of sight with a single measurement (see page 27).

**Electronic reticle**

*Function: ERET ON / ERET OFF*

ERET ON activates the electronic aiming mark which is useful for poor lightning conditions.

**Night vision mode**

*Function: NVIS ON / NVIS OFF*

NVIS ON reduces the display brightness. This is needed in combination with an attached night vision device.
Click the button seven times in rapid succession. B-I-T appears briefly, the Built-In-Test starts automatically.

Passed is indicated with \( \checkmark \), failed with \( \times \). In this case, please contact the customer support.
Click the button to scroll through the various items. Press and hold down to show all information of an item.

1. Model: e.g. PLRF25C
2. Software Version: 
   e.g. SW 01_12_00
3. Enabled Options:  
   e.g. F05-DAGR-PLGR
4. Memory Test:  
   Passed ✓ or Failed ✗
5. Display Test:  
6. System Test: Passed ✓ or Failed ✗
7. Battery Level:  
   ✓ OK = Good / ✗ BAD = Bad
8. Measuring Counter:  
   Number of range measurements (e.g. 127)
9. Temperature:  
   Temperature inside the device in degree Celsius (e.g. +28°C)
Set Default Settings

Click the button eight times in rapid succession. SET-DEF appears in the display followed by NO. Click again until YES is shown.

Press and hold down the button for >2 seconds to store the default settings. The default settings are not stored if CANCEL is displayed.

The default settings for the standard model are:
- Electronic aiming mark: ERET OF
- Distance Gate: OFF
- Declination: +000_0°
- Night Mode: NVIS OFF
- Multiple Object Measurement: 3DIS OFF
- Distance Unit: METER
- Angular Unit: 360°
- Interface Setting: PC

For customized versions, the default settings might be different.
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurements can not be taken - no function at all</td>
<td>The battery has run out</td>
<td>Replace battery (see page 18)</td>
</tr>
<tr>
<td></td>
<td>Battery contacts corroded</td>
<td>Clean battery contacts</td>
</tr>
<tr>
<td></td>
<td>Low temperature reduces performance of battery</td>
<td>Warm up battery</td>
</tr>
<tr>
<td></td>
<td>Extreme heat shortens batteries life</td>
<td>Do not store the battery at temperature over +70°C</td>
</tr>
<tr>
<td></td>
<td>The device is defective</td>
<td>Contact the customer support</td>
</tr>
<tr>
<td>Problem</td>
<td>Possible cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>----------</td>
</tr>
<tr>
<td>D---- is displayed after distance measurement</td>
<td>Distance is outside the specified range</td>
<td>Respect specified measurement range (see page 15)</td>
</tr>
<tr>
<td></td>
<td>Object too small or inaccurately targeted</td>
<td>Respect factors affecting measurement range (see page 24)</td>
</tr>
<tr>
<td></td>
<td>Bad weather conditions</td>
<td></td>
</tr>
<tr>
<td>AZI---- is displayed.</td>
<td>Tilt angle outside specified range</td>
<td>Respect specified tilt angles</td>
</tr>
<tr>
<td></td>
<td>Digital magnetic compass damaged</td>
<td>Contact customer support</td>
</tr>
<tr>
<td>INC---- is displayed.</td>
<td>Tilt angle outside specified range</td>
<td>Respect specified tilt angles</td>
</tr>
<tr>
<td></td>
<td>Tilt sensors are damaged</td>
<td>Contact customer support</td>
</tr>
<tr>
<td>Problem</td>
<td>Possible cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>⊙ GATE ⊙ is displayed after distance measurement</td>
<td>Measured distance is below selected distance gate</td>
<td>Reduce or turn off the distance gate (see page 29)</td>
</tr>
</tbody>
</table>

The following symbols are displayed during azimuth measurements:

- - - -
- - -
- - -
- - -
- - -

The allowed inclination and / or tilt angle has been exceeded

- tilted too far upwards
- tilted too far downwards
- tilted too far to the right
- tilted too far the left

Stay within specified inclination and / or tilt angle (see page 14)
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inaccurate azimuth values</td>
<td>Incorrect declination setting</td>
<td>Set correct declination (see page 36)</td>
</tr>
<tr>
<td></td>
<td>Disruptive magnetic fields at measuring position</td>
<td>Respect factors affecting azimuth measurement accuracy (see page 25)</td>
</tr>
<tr>
<td></td>
<td>Bad calibration</td>
<td>Perform compass calibration (see page 30)</td>
</tr>
<tr>
<td></td>
<td>Altered magnetic conditions within the instrument (e.g. battery change)</td>
<td>Perform compass calibration (see page 30)</td>
</tr>
<tr>
<td>Compass calibration can not be completed</td>
<td>Timing out of calibration</td>
<td>Follow the instructions slightly faster (see page 31)</td>
</tr>
<tr>
<td>Problem</td>
<td>Possible cause</td>
<td>Solution</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The electronic reticle is not visible</td>
<td>ERET OFF is set in the configuration menu</td>
<td>Select ERET ON in the configuration menu (see page 37)</td>
</tr>
<tr>
<td>BATT LOW is displayed</td>
<td>The battery is almost used up</td>
<td>Replace battery (see page 18)</td>
</tr>
<tr>
<td>The device measures objects in front or behind the intended object</td>
<td>3DIS OFF is set in the configuration menu, only the distance with the highest return signal is displayed</td>
<td>Select 3DIS ON in the configuration menu (see page 37)</td>
</tr>
<tr>
<td>NVIS ON is displayed after a measurement</td>
<td>The device is used during daylight conditions with NVIS ON selected in the configuration menu</td>
<td>Select NVIS OFF in the configuration menu (see page 37)</td>
</tr>
</tbody>
</table>
Data transfer

Connecting the interface cable

On the front side of the device is a socket for sending data to:
• personal computers or laptops
• modems
• fire control systems
• C4I systems

Our customer service will be pleased to inform you in details about the different possibilities.

Caution:
Incorrect handling can damage the socket or optional interface cable.
To plug:
1. Remove protection cap.
2. Align the respective markings on the plug and socket.
3. Slide the plug carefully into the socket until the locking mechanism engages.

To unplug:
1. Grasp the plug grip between two fingers,
2. Draw it carefully back to the stop to disengage the locking mechanism,
3. Pull back a little harder until the plug slips out of the socket.
4. Attach the protection cap.
Data transfer format to PC, PLGR and DAGR

5 pin connector

**Interface parameters**

- **Interface**: RS-232
- **Data transmission**: bidirectional
- **Baud rate**: 9600 bps
- **Parity**: none
- **Data bits**: 8
- **Stop bits**: 1
- **Handshake**: none
Standard extent of delivery:

1  PLRF25C / PLRF25C BT  4  909 492  Pouch, black
2  Rubber cover (1x)  5  909 493  User Manual
  909 394  Rubber cover, black  6  909 493  Short Instruction
  910 389  Rubber cover, green  7  906 430  Micro fibre lens cloth
  910 390  Rubber cover, desert tan  8  909 486  Neck Strap
3  667 002  3V Li-Battery, CR123A (1x)  9  909 211  Eyecup (Spare Part)
Accessories

Optional:
1 706 271  SEV48 data cable to PC
2 721 951  SEV63 data cable to PLGR and DAGR

for additional accessories (tripods, data cables, transport case, ...) contact the customer support.
## Options

### Overview Interface Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PC</strong></td>
<td>Setting for communication with PC. Data transfer via PC cable. Interface parameters (RS-232) see page 50.</td>
</tr>
<tr>
<td><strong>PLGR</strong></td>
<td>Setting for communication with Rockwell Collins GPS PLGR+96 / PLGR II. Data transfer via PLGR / DAGR cable.</td>
</tr>
<tr>
<td><strong>DAGR</strong></td>
<td>Setting for communication with Rockwell Collins GPS DAGR. Data transfer via PLGR / DAGR cable.</td>
</tr>
<tr>
<td><strong>BT</strong></td>
<td>Setting for wireless Bluetooth communication. Allows data transfer via Bluetooth and PC cable. The data format is the same as for the setting &quot;PC&quot; (only available on models with integrated Bluetooth function, PLRF25C BT).</td>
</tr>
</tbody>
</table>
Use the function **Complete Measurement with data transfer** to transmit measurement data (see page 26).

The PLRF is only an enhancement to basic fire support skills. Once a complete measurement is transferred and received, the user must verify the target location on a map and verify the measurements.
DAGR Settings

Setting the PLRF25C

• Store the interface setting DAGR, see page 37-38.

⚠️ Connect the interface cable to the DAGR J2 connector.

DAGR Setup:

1. MAIN MENU/System/Select function set
   • FUNCTION SET: Advanced

2. MAIN MENU/Receiver Setup/Power Saver
   • AUTO-OFF MODE/TIMER: Off
   • AUTO-STANDBY MODE: Off

3. MAIN MENU/Receiver Setup/GPS Setup
   • OPERATING MODE: Continuous

   • POWER ON OPERATING MODE: Continuous
   • FREQUENCY: L1 Primary
   • SV CODE: All-Y
   • ELEVATION HOLD: Auto

4. MAIN MENU/Communications/COM Port Setup
   • CONFIGURATION: Standard
   • LASER RANGE FINDER (LRF) TYPE: Other
   • COM Port: COM Port 1

5. MAIN MENU/Display Setup/UNITS
   • MAGVAR TYPE: Calculated - WMM

⚠️ Azimuth in PLRF25C and azimuth on DAGR may be different due to declination setting.
• **DAGR Targeting Operations:**
  1. Conduct a combined measurement with data transfer, see page 26.
  2. Upon receipt of LRF SHOT RECEIVED dialog, review/evaluate Azimuth, Range, and Elevation Angle. The DAGR will allow the operator to show a total of three shots at one time. Once the operator determines that he has a good targeting solution he will highlight the desired shot and: Press ENTER to continue to FIRE SUPPORT pages or Press QUIT to discard shot without creating a waypoint.
  3. Check all data in the SAFETY CHECKS fields and ensure that no fields on the Fire Support Pages are blinking between grey and black text (indicates that calculation is based on invalid fix).
  4. To store the target location as a LRF Waypoint, highlight the STORED AS WP field, then push the ENTER key. DAGR highlights the first available unused waypoint or highlight the desired waypoint, then push the ENTER key. Edit Name, Remark, or Identity Type of waypoint if required.
PLGR+96 / PLGR II Settings

Setting the PLRF25C
• Store the Interface setting $PLGR$, see page 37-38.

Setting the PLGR+96 / PLGR II
• Set the tracking mode to CONT.
• Select the position format which corresponds to the map being used.
• Select the appropriate ELEV units.
• Select the appropriate ELEV reference.
• Select the appropriate ANG units.
• Select the ANG reference (Grid).
• Select the datum which corresponds to the map being employed.

⚠️ The proper datum must be selected. Improper datum selection will result in poor target position accuracy.
• Set the AUTOMATIC OFF TIMER to OFF.
• Set the SERIAL mode to standard.

Additional setting for PLGR II
• Configure port C to IP.
• Configure the remaining ports to IP (or RTCM-NMEA).
• Set the port C baud rate at 9600-9600.
• Change the LRF mode to TARGETING.

⚠️ Azimuth in PLRF25C and azimuth on PLGR+96 / PLGR II may be different due to declination setting.
Bluetooth Settings

Setting the PLRF25C BT

- Store the interface setting BT, see page 37-38
- PAIRING appears in the field of view. The Bluetooth module is turned on and allows the pairing with a Bluetooth receiver device. The pairing mode may be terminated manually by pressing the button or automatically after approx. 100sec. CANCEL is displayed for a short instant.

Messages

BT FAIL: Bluetooth data transfer failed
CANCEL: The Bluetooth module is shut down.
PAIRING: The Bluetooth module is turned on and ready for pairing with a Bluetooth receiver device
SUCCESS: The pairing process was completed successfully

The PLRF25C BT pairing PIN code is zero (0). The PLRF25C BT supports the Bluetooth SPP (serial port profile) service.
When not using Bluetooth it is recommended to permanently disable the Bluetooth communication by choosing the interface setting PC.

Transmission range depends on various influences. Best results are achieved with a "free line of sight" between PLRF25C BT and receiver device. Avoid shielding (e.g. hands around Bluetooth antenna or aluminum hard case for receiver device).

The integrated Bluetooth module complies with Part15 of the FCC Rules. Operation is subject to the following two conditions: (1) it may not cause harmful interferences, and (2) it must accept any interferences received, including interferences that may cause undesired operation.
Fall of shot - FOS

Click the button once, then immediately press and hold it down. The azimuth appears and is updated continuously. Sight the target with the aiming mark.

Release the button to measure the target. PT1 OK followed by DO PT2 is displayed. Immediately press and hold down the button again. Sight the fall of shot.

Release the button to measure the fall of shot. The distance (D) between the target and fall of shot is displayed.
Fall of shot - FOS (continued)

While the display is on, click the button repeatedly to display the FOS correction values.

Click button repetitive to obtain the corrections again.

Example:
Is a shot left, short and too low, the corrections given are:
RT for right, AD for add and UP for up.

RT 13M
AD 1M
UP 3M
Customer service

Our customer and information service will be glad to offer assistance if your instrument requires maintenance, if it sustains damage, or if you require any other information:

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