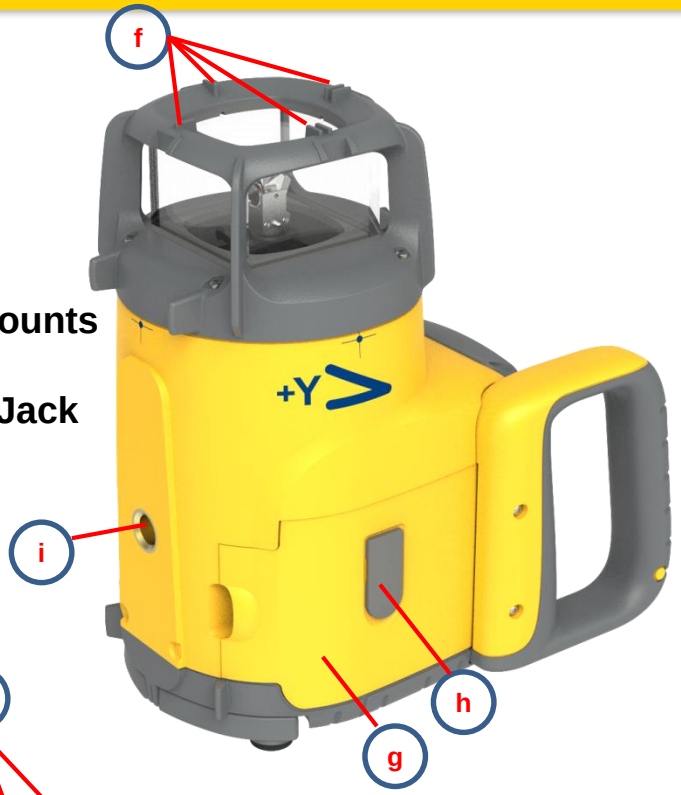
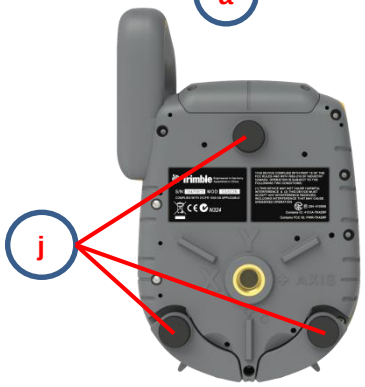
May 2017

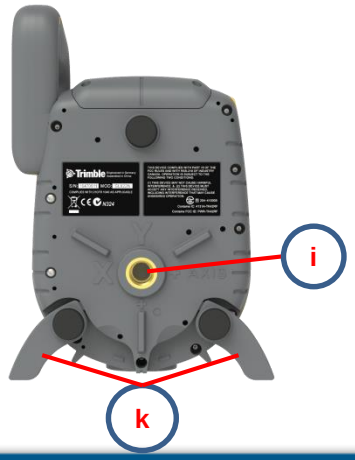
GL6X2N
Hands-On training

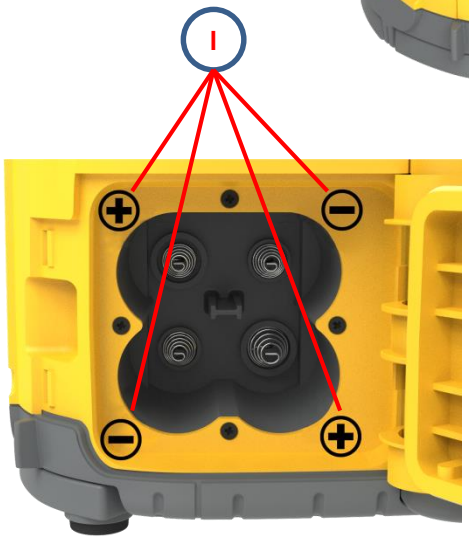
GL612N/622N Components

a - Keypad/LCD-Display
b - Handle
c - Rotor
d - Roll Cage
e - Axes Alignment Marks
f - Sighting Guides/Scope Mounts
g - Battery door
h - Rubber Cover/Recharge Jack
i - 5/8” x 11 Tripod Mounts
j - Rubber Feet
k -Turnable Legs
l - Plus and Minus Battery Diagrams



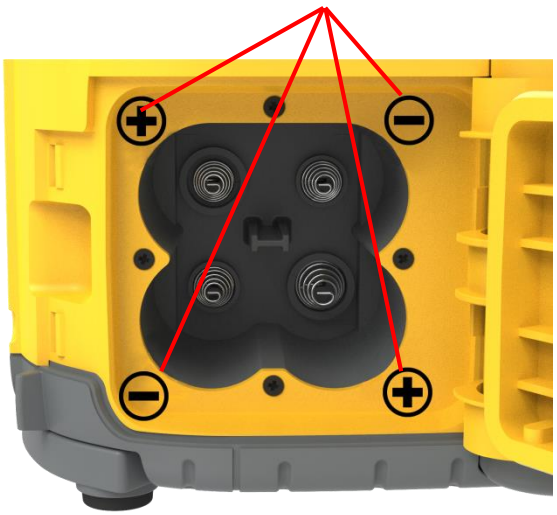






Powering the GL612N/GL622N

1 – GL is shipped with a rechargeable NiMH battery pack (Q104667).
2 – The charger (Q104781) can be used as a power supply when used Indoors
3 – The rechargeable battery pack can be charged inside as well as outside of the unit
4 – Alkaline batteries can be used as a backup
5 – An optional external power cable (Q104802) is available too
6 – Plus and minus symbols indicate how to put the alkalines into the battery compartment



Powering the RC602N

1. Open the battery door using a coin or similar pry device to release the battery door tab on the RC602N. RC602N will be shipped with alkaline batteries Rechargeable batteries can be used optional but need to be charged externally
2. Insert two AA batteries noting the plus (+) and minus (-) diagrams inside the battery housing.
3. Close the battery door. Push down until it “clicks” into the locked position.

Standard Display

Battery status laser

Mask selection

Rotation speed

Button 1: **MENU**

Button 2: **Grade Entering Mode**

Button 3: **Manual mode**

Button 4: **Rotation/Scan**

Button 5, 8: **up/down arrow buttons**

Button 6, 7: **left/right arrow buttons**

Button 9: **ON/OFF button**

1 second to turn on the unit;

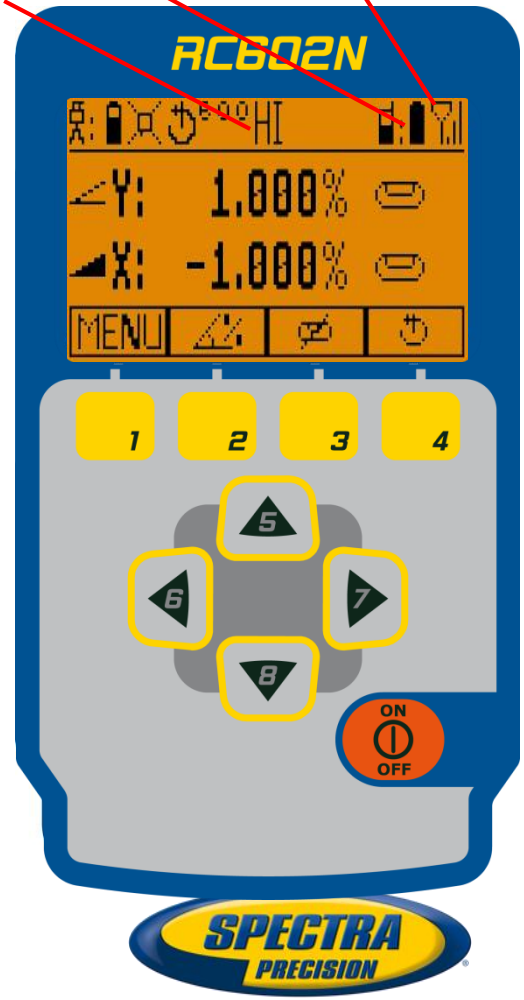
2 seconds to turn off the unit.

Leveling/Standby – LED (green/red)

Battery Status Remote Control

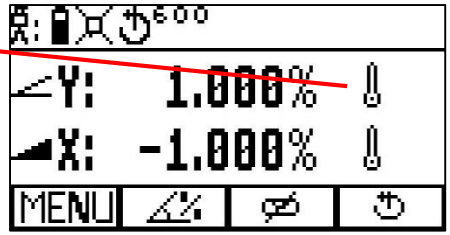
Radio Connectivity

HI alert

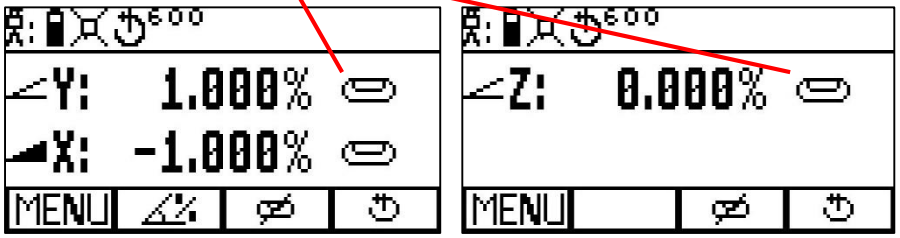


Turning On/Off the Laser

- Depending on the setup (horizontal) and if a grade value has been dialed in, the unit starts the temperature/reference check while the thermometer symbol is flashing.



- Don’t start a menu function before the reference check has been finished.
- When the temperature/reference check has been finished, the standard display appears and the bubble symbols flash until self-leveling has been completed.

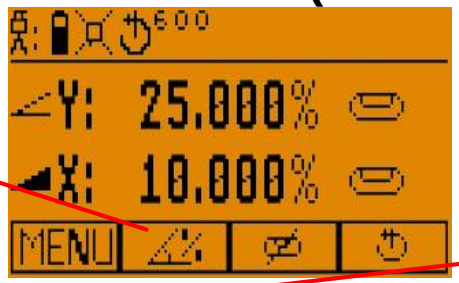


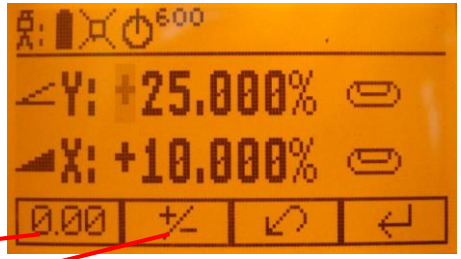
- If the self-leveling can’t be finished based on the selected sensitivity, an error message appears

Standard Features

X-Y- grade entering: Digit Select mode (Default)

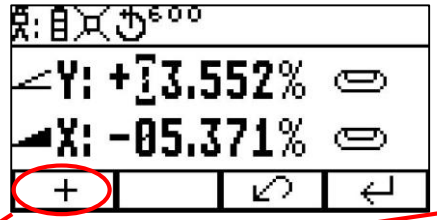
- button **2: Grade Entering Mode.**

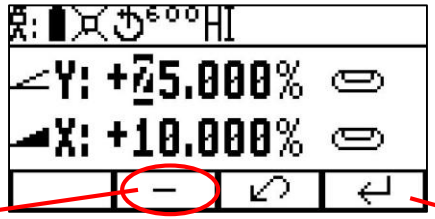




- button **1 ➔ quick set to 0%**
- button **2 ➔ change the sign** of the grade value

- Press and release **button 5 or 8** (down or up) to move the **cursor** to the **X- or Y-axis**.
- Pressing and releasing **button 6 or 7 (right or left) moves the cursor** to the **right/left.**





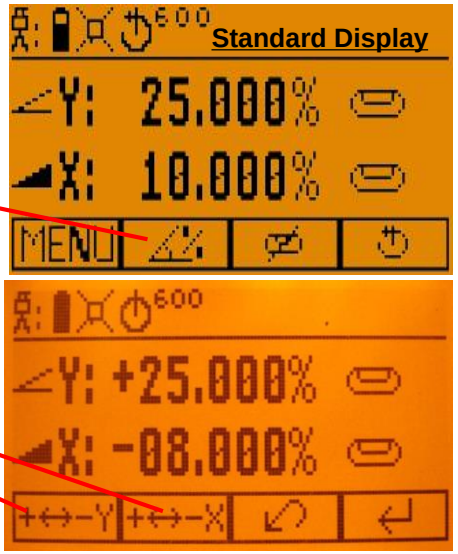
- Use **button 1 or 2** (Plus or Minus) to **set** the desired **digit.**
- button **3** ➔ return to the standard display
- The laser will self-level to the required grade position after **confirming** the grade change with **button 4**.

Note: The bubble symbols at the laser's LCD will flash until the laser has been self-leveled to the requested grade position.

Standard Features

X-Y-grade entering

Step and Go mode



Quickly press and release button **2** starts the **grade entering mode**.
Both grade values will be shown.
Press/release button **1** ➔ grade reverse Y
Press/release button **2** ➔ grade reverse X
Press/release button **3** ➔ return to the standard display.
Quickly press and release button **4 to** confirm the selected grade value and return to the standard display

- Press and hold **button 6 or 7 (left/right) to** change X- axis grade value after the comma; press and hold **buttons 6 + 7 simultaneously** starts **X-axis quick change mode** where the grade value in front of the comma will be **set to 0% and** then starts changing **in 1% increments.**
- Press and hold **button 5 or 8 (up/down)** for changing Y -axis **grade value;** press and hold **buttons 5 + 8 simultaneously** starts **Y - axis quick change mode** where the grade value in front of the comma will be **set to 0% and** then starts changing **in 1% increments**
- **Note:** When the grade value for either axis reaches its highest amount, the grade value switches to the lowest value for that axis. For example, the value switches from +25% to -25%.
- The laser will self-level to the required grade position after **confirming the grade change** with **button 4**.
- **Note:** The bubble symbols at the laser's LCD will flash until the laser has been self-leveled to the requested grade position.

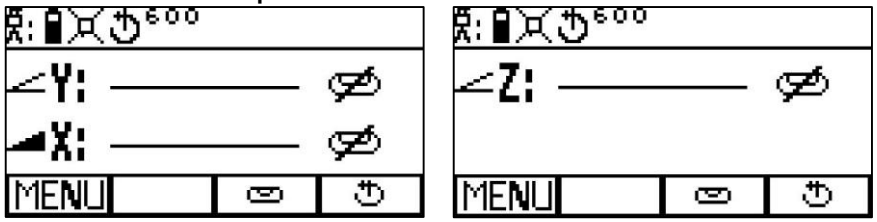
Standard Features

Using the Rotation mode

Repeatedly pressing the **button 4** toggles through **300, 600, 750 rpm** regardless if the unit is in automatic or manual mode.

Manual mode

- Pressing and releasing **button 3 at the Standard Display** activates/deactivates the **manual mode** regardless if set up horizontal or vertical.
- Manual mode is indicated by horizontal lines next to the axes symbols. An additional bubble helps to adjust the laser on the cross axis when set up vertical.



- **In Manual mode (horizontal), the Y-axis can be sloped** by pressing the **Up-(5) and Down-(8)-** Arrow buttons on the laser‘s keypad or the remote control. **Additionally, the X-axis can be sloped** by pressing the **Left-(6) and Right-(7)** Arrow-buttons on the laser or remote control.
- **In vertical mode,** the **up and down arrow buttons** adjust the **Z-axis slope,** and the **left and right arrow buttons** align the laser beam to the **right/left side.**
- To resume automatic self-leveling mode, press the **manual button 3** again.

Special MENU Features

Menu Functions (Radio controlled)

Press and release **button 1** at the Standard Display to **enter the MENU.**

The menu offers always only the features which can be selected depending on the setup (horizontal or vertical).

The **selected icon** will be **highlighted.** A down arrow at the the right site indicates that the user can **scroll down** through the menu using the **button 8** (down arrow).

Note: As soon as the menu has been opened, button **2 (question mark)** can be used to open a help text which explains the selected function more in detail.

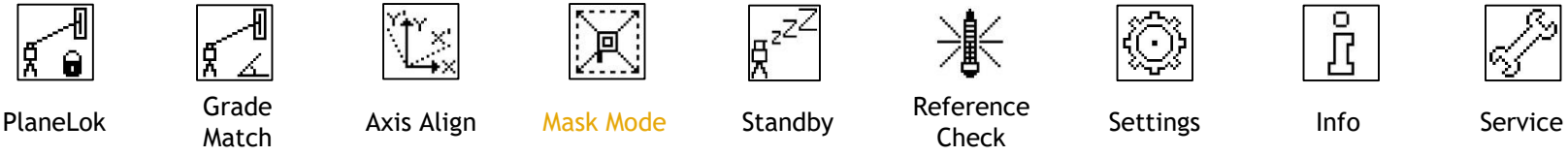
After going to the **next menu row, a up/down arrow** at the the right site indicates that the user can **scroll up/down through the menu rows** (4 different screens) using the **buttons 5/8** (up/down arrows).

Pressing and releasing **button 3** changes the unit always **back to the standard or previous display.**

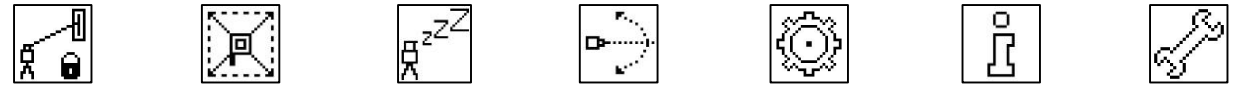
Press and release the **buttons 6/7** until the **desired icon** at the selected menu row is **highlighted.**

Press and release **button 4** to **open the submenu** OR **start the selected function.**

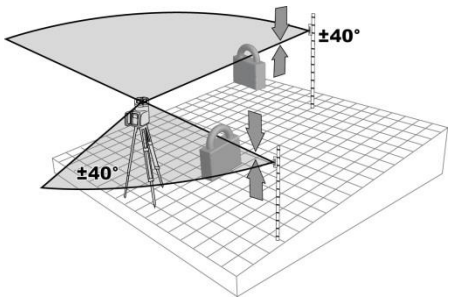
Menu functions when set up horizontal (GL622N)



Menu functions when set up vertical

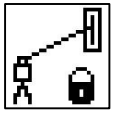


Automatic PlaneLok mode



The PlaneLok mode can be activated in horizontal and vertical automatic and manual mode. In PlaneLok mode when set up horizontal, the beam will be locked to a fixed elevation point (up to 150 m (490 ft) located on one axis at each side of the laser. For keeping vertical alignments fixed to a direction point, PlaneLok can be used in both directions on the X-axis.

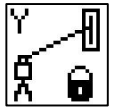
1. Set up the laser over the reference point.
2. Attach the HL760 receiver to a grade rod. Place the receiver at the second point and adjust it to the On-grade position. The receiver should be permanently mounted at this location and at the desired elevation.
3. Use the sighting guides on the top of the laser to align the laser to the receiver. Turn the laser on the tripod until it is roughly aligned to the receiver's position (the alignment range on both axes is +/-40).
4. Press and release the **MENU button** at the Standard Display and **select PlaneLok.**

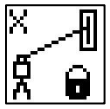


Horizontal setup

Vertical setup

5a. When set up horizontally, press and release **button 4 to open the PlaneLok submenu; select** the **desired PlaneLok axis** then press **button 4 to start PlaneLok.**



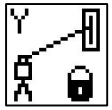


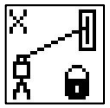
(X only GL622N)

Note: The laser starts to search for the receiver. A flashing **Receiver and Lock symbol** appears at the selected axis and becomes solid when PlaneLok has been completed.

Automatic PlaneLok mode

5b. When set up vertically, press and release **button 4 to open the PlaneLok submenu; select** the **desired PlaneLok axis** then press **button 4 to start PlaneLok.**





(Y only with GL622N)

Note: When used in **vertical mode,** the **receiver** has to be placed with the **photocell on the bottom side.**

The HL760 display shows a flashing **–PL–** during the time the laser is searching and adjusting the beam to the on-grade position.

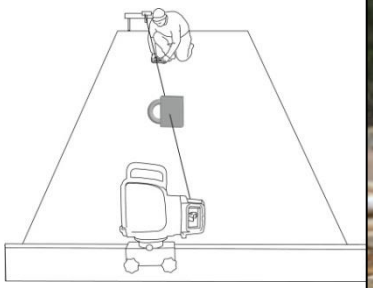
When PlaneLok is complete, **–PL– stops flashing** at the HL760 display.

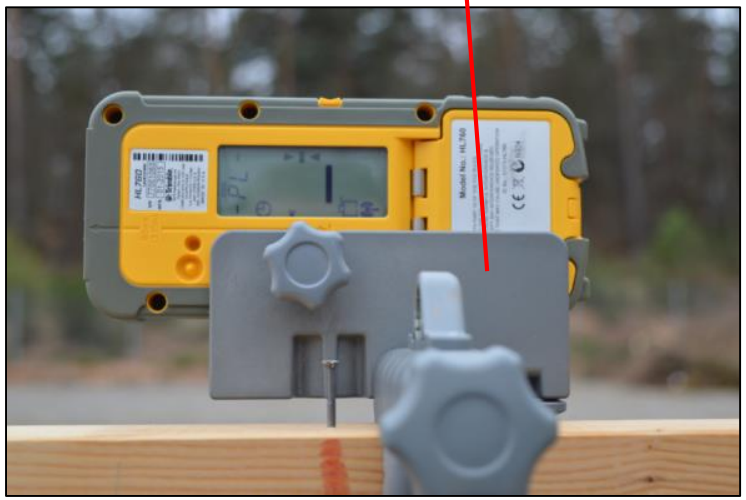
Note: The laser continues to servo to the receiver's signals.

6. **Exiting of PlaneLok** can be done by pressing **button 3 (ESC).**

Note: If the setup will be disturbed for a minute (beam will be blocked), an Alert comes up. After deleting the error message with **button 4** PlaneLok needs to be started again.

It's recommended to use the **batter board adapter M402** for setting up the GL6X2N and the **105516 vertical adapter** for setting up the HL760.





Steep Slope using PlaneLok

- Set up the GL6X2N at the bottom part of the steep slope area using the slope bracket **(M401 laser tilting base).**
- Check the laser beam elevation and place the receiver at the desired hub.
- Change the GL into manual mode and tilt the unit to the approx. steep slope position until the receiver on top starts to catch the beam.

Steep Slope using PlaneLok

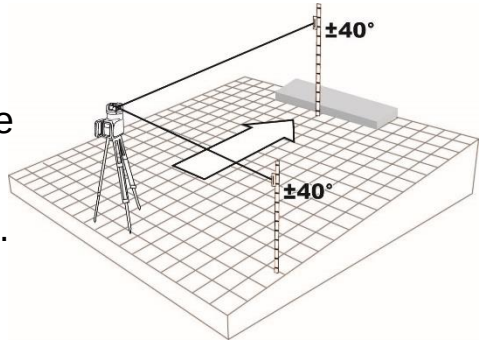
- Select PlaneLok at the menu and start automatic PlaneLok by pressing **button 4**.
- The transmitter starts searching for the receiver HL760 and locks the beam at the on-grade position.

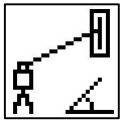
Automatic Grade Match mode

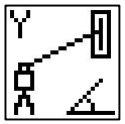
The Grade Match mode can be activated in horizontal automatic mode.

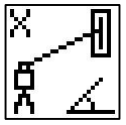
In Grade Match mode, the laser can be used to measure the existing grade value between two known elevation points (up to 150 m (490 ft) located on one axis at each side of the laser

1. Set up the laser over the reference point.
2. Attach the HL760 receiver to a grade rod. Check the laser's elevation next to the laser then position the receiver at the second point **WITHOUT** changing the receiver's elevation on the rod.
3. Use the sighting guides on the top of the laser to align the laser to the receiver. Turn the laser on the tripod until it is roughly aligned to the receiver's position (the alignment range on both axes is +/-40˚).
4. Press and release the **MENU button** at the Standard Display and **select Grade Match.**
5. Select the **desired Grade Match axis** then press **button 4 to start Grade Match**.









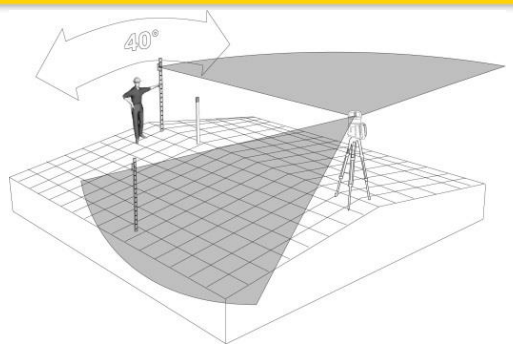
(X only GL622N)

Note: The laser starts to search for the receiver. A flashing **Receiver an angle symbol** appears at the selected axis and disappears when Grade Match has been completed.

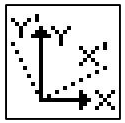
While the laser is searching and adjusting the beam to the on-grade position, the HL760 display shows a flashing **–GM–.** When Grade Match has been completed, the HL760 goes back to the standard elevation display. The remote control as well as the laser will display the final measured grade value.

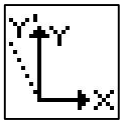
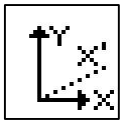
Note: If Grade match can't be completed by checking the limits, the laser comes with an Error message (Grade Match has Failed) which can be deleted with **button 4 (OK).**

Automatic Axis Alignment mode (only GL622N)



Automatic Axis Alignment mode adjusts automatically the direction the grade axis is pointing to the receiver's location by an electronically simulation of rotating the unit on its base to match the hub.
Using Axis Alignment, the laser axes can be aligned to one direction hub (up to 150 m (490 ft) located on one axis at each side of the laser.

1. Set up the laser over the reference point.
2. Place the grade rod with the attached HL760 receiver at the desired direction hub.
3. Use the sighting guides on the top of the laser to align the laser to the receiver. Turn the laser on the tripod until it is roughly aligned to the receiver's position. (the alignment range on both axes is +/-40°).
4. Press and release the MENU button at the Standard Display and select **Axis Align**. 
5. Adjust the receiver into the beam before starting the automatic Axis Alignment to reduce the time needed for finishing the alignment.
5. Select the **desired axis** then press **button 4** to **start Axis Align**.

Note: The laser starts to search for the receiver while **-AA-** is flashing at the HL760 LCD.

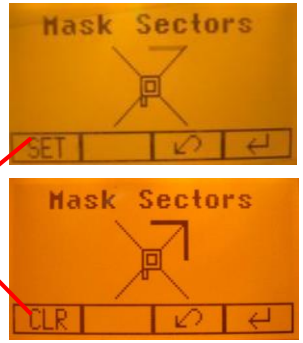
Note: A flashing **Alignment symbol**  appears at the selected axis, becomes solid when Axis Alignment has been completed and then disappers while the flashing bubbles come back. A short line on top of Y and X confirms an Axis Alignment has been completed.

SPECTRA PRECISION

Mask Mode / Standby mode

Mask mode

Select the Mask icon and press and release **button 4** to open the **Mask setting menu**.
Depending on which side or corner the beam should be turned off, the required sector can be selected.
Press and release the **buttons 5** to **8** for moving a short flashing line around the mask mode symbol**.**
For **selecting the sector** where the bar is flashing, press and release **button 1** (**SET**).
After setting the first sector, **button 1** changes to show **CLR** which offeres the capability of deleting the selected mask sector again. Use **button 5** to **8** to move the flashing bar to other required areas and repeat the setting process.
When all areas have been set, press **button 4** to **store the mask sector selection** until the unit will be turned off.
Note: The unit always powers up with the mask mode deactivated (default).



Activating/Deactivating Standby mode

Press and release the MENU button at the Standard Display and select **Standby**.
Pressing and releasing **button 4** activates the Standby mode.
The self-leveling will be stopped and the beam will be turned off while the HI alert is still active.
The display shows the standby symbol and the Level/Standby LED flashes red every 5 seconds. To deactivate Standby mode and restore full operation of the laser, press and release **button 4**.

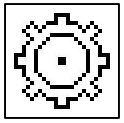
Temp Reference Check / Settings

Start Reference Check

When working during temperature changes and over long distances the product requires a frequent reference check to maintain accuracy. The transmitter will do reference check on a regular basis. When carrying out work where accuracy is paramount it is advised to manually prompt a reference check.

Press and release the MENU button at the Standard display and select Reference Check. Button **4** starts the reference check considering the current temperature inside the housing. While the procedure the rotation will be stopped.

Note: A grade value has to be entered before the unit starts the reference check.



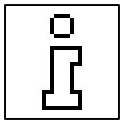
Setting Menu

Press and release the MENU button at the Standard Display and select Settings.

Press and release button 4 to open the Setting Menu; select the desired function then press button 4 to open the selected submenu function OR start the selected function.

Please see the Setting Menu details at the end of the user guide.

Info

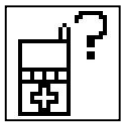


Info

Press and release the MENU button at the Standard Display and select **Info.**

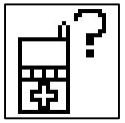
Buttons 6/7 can be used to toggle between **GL, RC** and **Runtime**

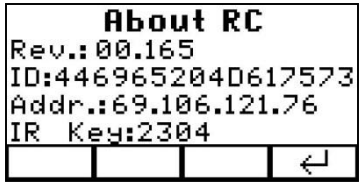
Press and release **button 4** to confirm the selection.


The GL/RC information (software version, ID, etc.) or the runtime of the GL will be displayed.

Additional detailed RC information is available using the RC602N menu :

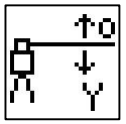


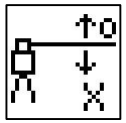


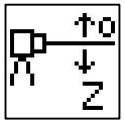
Service

Press and release the MENU button at the Standard Display and select **Service**.

Buttons 6/7 can be used to toggle between **Calibration Y** and **Calibration X** OR **Calibration Z** when set up vertically.

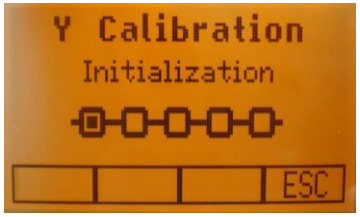


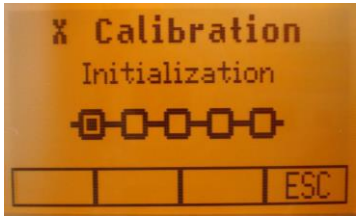


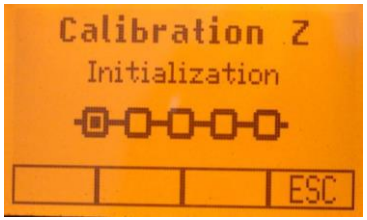


Press and release **button 4** to confirm the selection.

The calibration at the selected axis starts the field calibration procedure.





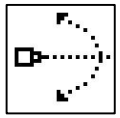


The **RC602N Service menu** offers one additional feature:

RF Connectivity

Press and release **button 4** to get a **status** of the current Radio connectivity.

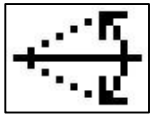
Special Features - Vertical Setup



Line Scan

Line Scan **centers the rotor horizontally** and can be used to align the plumb beam to a desired horizontal position.

Press and release the **MENU button 1** at the Standard Display and select **Line Scan**.



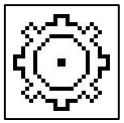
Pressing and releasing **button 4** activates the Line Scan mode while the rotor checks the limits of the X- axis and stops at the center position.

Pressing **button 3** (ESC) stops the movement and changes the unit into manual mode.

Corrections up and down can be done using **button 5/8**; for left/right corrections use **button 6/7**.

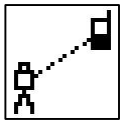
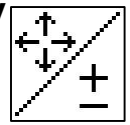
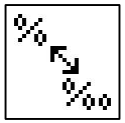
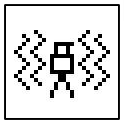
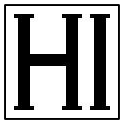
Press and release the manual button **3** to change the unit back to full automatic mode.

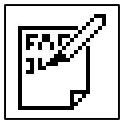
Setting Menu

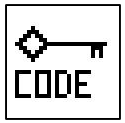


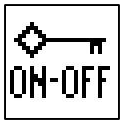
Press and release the **MENU button 1** at the Standard Display and select **Settings.**
Press and release **button 4** to open the **Setting Menu;** select the **desired function,** then press **button 4** to open the selected submenu function OR start the selected function.

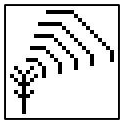
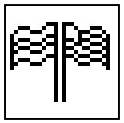
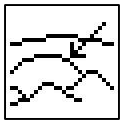
The Setting Menu offers the following functions:

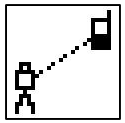
Pairing 
Grade Entry 
Grade Display 
Sensitivity 
HI-alert 

User Name 

Password Set 

Password On/Off 

RF-Channel 
Language 
Position Info 



Pairing

1. When in Settings, press and release **button 4** at the GL612N/622N to open the **Pairing menu.**
   The display shows the currently paired units (up to two receivers and two remote controls).
2. If already 2 remote controls have been paired, one of them has to be deleted using **button 1** (**CLR**).
3. Turn on the RC602N and select the Pairing menu and press button 4.
   The GL612N/622N pairs now automatically with the new remote control.

Pairing the transmitter with a new remote control

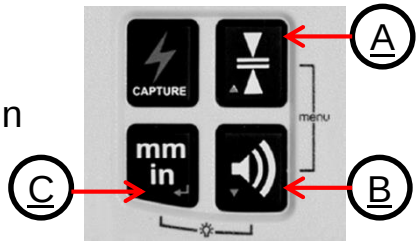
The **chain symbol** at **button 1** indicates the remote has not been paired before which means no radio connectivity is given.
Pressing the pairing **button 1** will initiate a pairing request.
The transmitter has to be in pairing mode as shown above.
Note: Make sure that pairing mode is selected only at one transmitter which is within the radio range of the remote during a pairing request. Otherwise pairing procedure can be confused.

Setting Menu

Pairing the transmitter with receiver (HL760)

To pair the transmitter and the receiver **select Settings** and press and release **button 4** to open the **Pairing menu**. The display shows the currently paired units (up to 2 receivers). If already 2 receivers have been paired, one or both of them have to be deleted using **button 1** (**CLR**).

Next, **turn on the receiver** then press and hold the Deadband (**A**) and the Audio (**B**) buttons for two seconds. After two seconds the display shows **MENU** first, then **RDIO**.



Press and release the Units (**C**) button – display shows the current radio mode.

If not already set to **LS**, press Units button (**C**) and then press Deadband or Audio button until **LS** is displayed. Press Units button (**C**) again to enter selection.

Press and release the Audio button (**B**) – display shows **PAIR**.

Press the Units button again – the display shows **PAIR** and a **rotating bar**. After completing **PAIR**, **OK** will be displayed.

The GL612N/GL622N pairs now automatically with the new receiver.

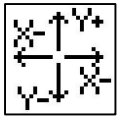
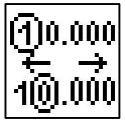
Press and release the HL760 Power button two times to exit the menu.

A laser symbol is lit to confirm the receiver works in GL mode.

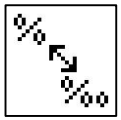
Setting Menu

Grade Entry

Select the Grade Entry icon and press and release **button 4** to open the **Grade Entry menu**.

Buttons 6/7 can be used to toggle between **Step and Go**  and **Digit Select.** 

Press and release **button 4** to **confirm the selection**.



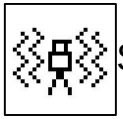
Grade Display

Select the Grade Display icon and press and release button **4** to open the Grade Display menu.

The desired Grade Display Mode (Percent/ Permille/Degree) can be selected using the buttons **6/7**.

Press and release **button 4** to confirm the selected display mode. 

Sensitivity Selection



Select the Sensitivity icon and press and release **button 4** to open the **Sensitivity menu**.

The desired Sensitivity: **Low**, **Mid** (Default) and **High**) can be selected using the **buttons 6/7**.

Press and release **button 4** to confirm the selected Sensitivity. 

Setting Menu

HI-alert Selection

Select the HI icon and press and release **button 4** to open the **HI-Alert menu**.

The desired HI-alert: **5 min**.(Default), **30 seconds** and **HI-Off**) can be selected using the buttons **6/7**.

Press and release button **4**
to confirm the selected HI-alert.

Depending on the HI settings, the green leveling LED flashes after 5 minutes or 30 seconds every 4 seconds to confirm the HI alert is active. If HI alert is turned Off, the green LED stays on solid after self-leveling has been completed.

User Name

Select the User name icon and press and release button **4** to open the **User name menu** (Cursor flashes).

One row for typing names in big font (15) and one row in small font (18) for letters or numbers are available.

Button **5** and **8** can be used to toggle between both rows.

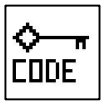
Changing the characters can be done using the buttons **1** and **2**.

Press and release **button 4** to confirm the **selected user name**.

The display falls back to the main menu.

Any time the unit will be powered up, the User info will be displayed for couple seconds.

Setting Menu



Set Password

Select the Set Password icon and press and release **button 4** to open the **Password menu**.

Use **button 1** to **8** to type in a password containing of **4 digits** and repeat the password at the second row.

Press and release **button 4** to **store the selected password**; unit falls back to the standard menu.

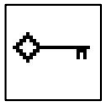
After powering up the unit, the standard display comes up if the correct password will be entered, otherwise the unit turns off automatically.

Password On/Off

Select the Set Password ON-Off icon and press and release **button 4** to open the **Password menu**.

Buttons 6/7 can be used to toggle between **Password On** and **Password Off** if a Password has been entered before.

Press and release **button 4** to **confirm the selection**.



Radio (RF) Channel

Select the RF Channel icon and press and release **button 4** to open the **Radio Channel menu**.

The desired RF Channel: **1** to **6** can be selected using the buttons **6/7**.

Press and release **button 4** to confirm the **selected RF Channel**.

Note: After changing the RF channel, the RC and HL needs to be paired again.

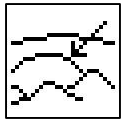
Setting Menu

Select Language

Select the Language icon and press and release **button 4** to open the **Language menu**.

Use **button 5** to **8** to select the required local language (EN, DE, IT, FR, ES, PT, NL, DA, NO, SV, FI, PL, TR, CZ).

Press and release **button 4** to **store the selected Language**; unit falls back to the standard menu.



Position Info

when working with high grade values the product requires the position info to maintain accuracy and avoid errors caused by different gravity. The user has the chance to provide the position info of the job site to the product. This is the degree of latitude as well as the altitude.

Chose Settings and navigate to the sub menu position info. Press button 4 to activate the submenu. With buttons 1 and 2 the different values can be increased/decreased. Also ‚+‘ or ‚-‘ for the latitude can be changed with buttons 1 and 2. With buttones 5, 6, 7 and 8 the cursor position can be changed.

Restore to default: scroll down to ‚Default position‘. Press button 1 (Set); the unit will change to default values; press button 4 to confirm the change.

Error Messages

Any error message can be deleted with a short press of **button 4 (OK).**
The table shows the related description and possible solutions.
The next service center should be contacted if a different error message as shown at the table will be displayed.

Error codes	Description	Solution
21	Temporary EEprom problem	Repeat pairing and re-enter the customer settings
120	HI alert - Unit Heigt changed	Check laser beam elevation
130	Mechanical Limit during Axis Alignment or Grade Match	Re-align the closer to the alignment point; check if existing slope is above +/-25%
131	Rake Angle Limit	Pre-tilt the unit closer to the alignment point
140	Laser beam blocked	Make sure there are no obstacles between the transmitter and the HL750
141	Time Out - Alignment could not be completed in the allowed time	Check radio operating range/ connection; check stable laser setup
150	No receiver - Receiver not available for single axis automatic function	Make sure the receiver is on and paired
152	No receiver - The laser searched for the receiver but could not find it	Check the operating range for auto function and restart the auto alignment
153	Lost Receiver - The laser searched and found the receiver but then lost it	Check the operating range for auto function and restart the auto alignment
160	X or Y level sensor defect	Contact service center