January 2015

# GL412N/GL422N Hands-on Training



**Contractors-Tools.com** **1-877-866-5721**

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# GL412N/GL422N Controls


Menu button

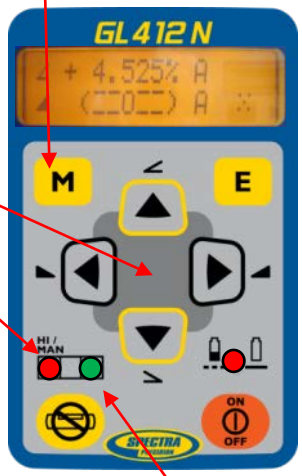
Enter button

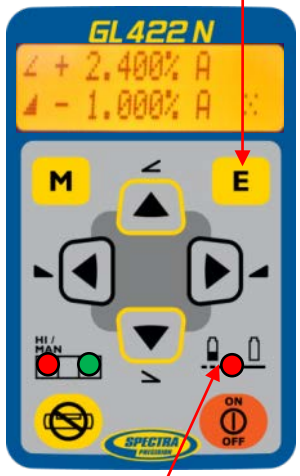
Slope/Alignment Buttons

HI-/Manual-Standby - LED

Power Button

Manual Mode/Escape/ Standby Button




Menu button

Enter button

Level-LED

Battery Status LED

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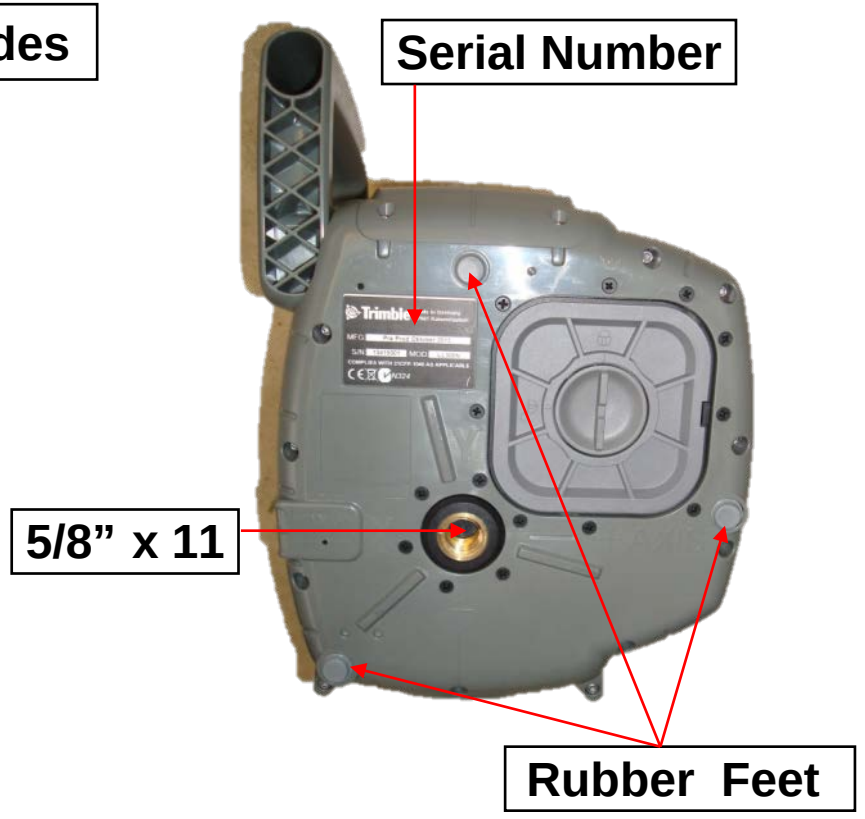
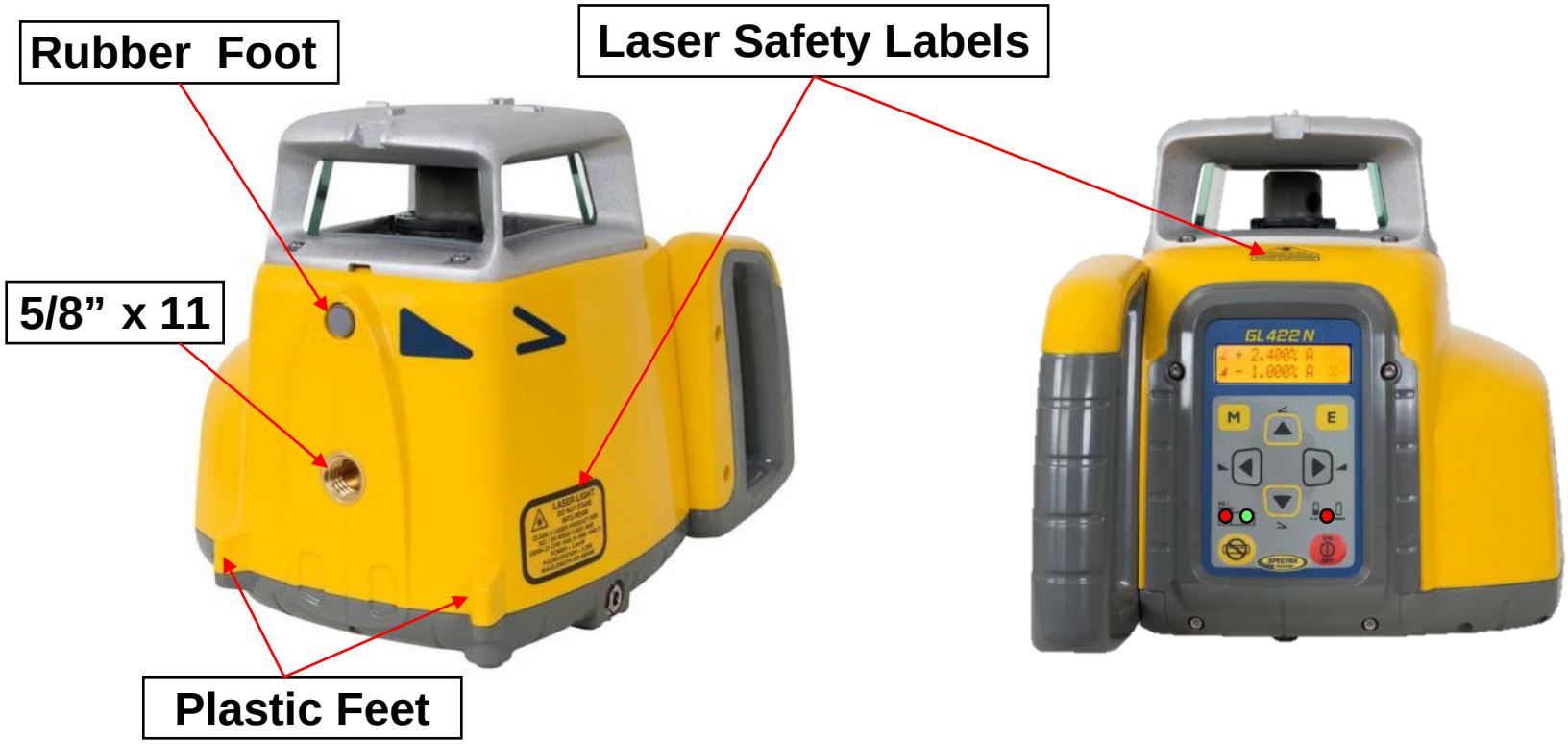
# GL412N/GL422N Peripherals

# GL412N/GL422N Peripherals



# Installing The Batteries

- Enter the battery housing, by turning the battery-door knob counterclockwise
- Install/remove the rechargeable battery Pack. It is keyed to prevent miss-insertion. The cage prevents accidental charging of Alkaline batteries
- Do not try to open the cage for exchanging the rechargeable batteries
- Worldwide charger has plugs for US, EU, AU and GB
- Recharge time is about 10 hours

# Installing The Batteries


- If using 4 x D-cell Alkaline's, note the plus (+) and minus(-) diagram on the battery door. Do NOT try to install Alkaline batteries in the rechargeable battery Pack!

New warning label at the battery cage


- Special screws are used to ensure only autorized service centers can replace the batteries. Trying to open the cage will destroy the cage lid holders.

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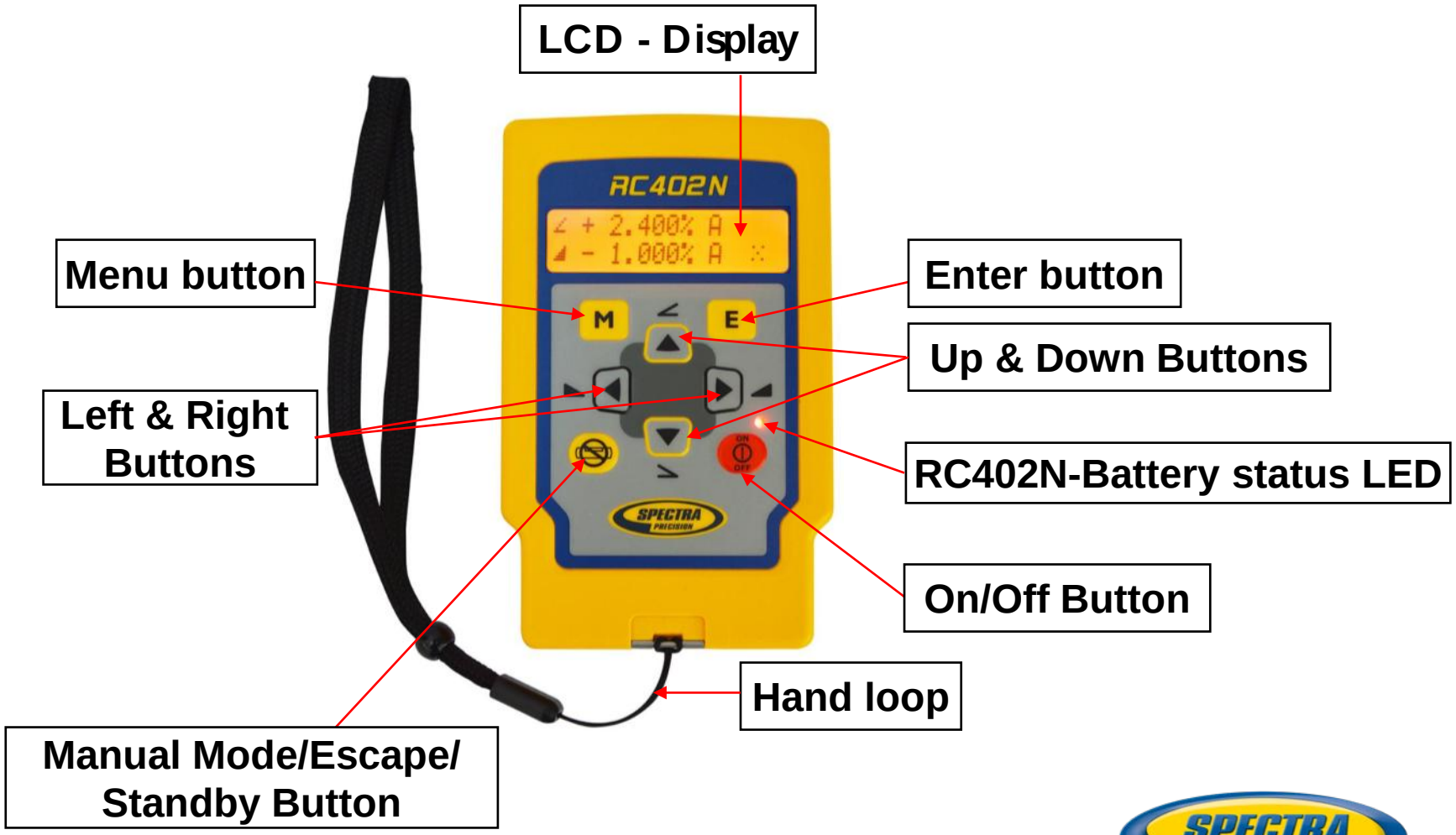
# RC402N Radio Remote Control



# RC402N Radio Remote Control

## Powering the RC402N

1. Open the battery door using a coin or similar pry device to release the battery door tab on the RC402N.
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.


## Turning On/Off the Radio Remote Control

Press the  button to turn on the radio remote control.

The remote control mirrors the functionality of the GL412N/GL422N keypad.

To turn off the radio remote control, press and hold the  button for 2 seconds.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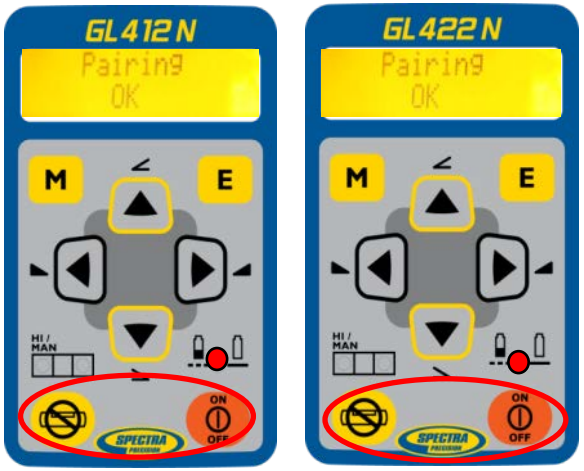
# Pairing the remote control with the transmitter

- **First, make sure the transmitter and the remote control are turned off. Then press and hold the button and turn on the transmitter.**
  - **The laser's battery LED flashes fast.**
- **During the next 6 seconds repeat the same steps on the remote control.**

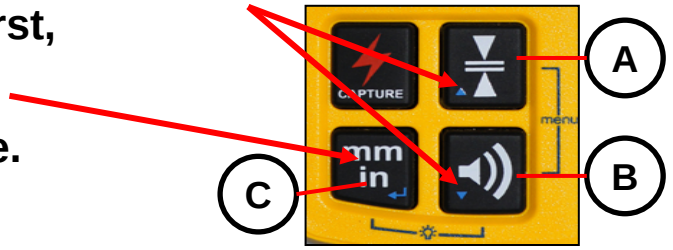



- **The Laser's red battery LED flashes fast, then the laser and RC402N display show Pairing OK for one second and then the same function as the laser is actually working to indicate the transmitter has been matched with the remote control.**

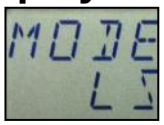
# Pairing the HL760 receiver with the transmitter

**Make sure the transmitter is turned off.**

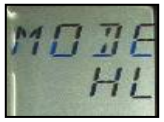
**First, turn on the receiver, then press and hold the (A) and (B) buttons for two seconds. After two seconds, the display shows MENU first, then RDIO.**




**Press and release the mm in button – display shows the current radio mode.**

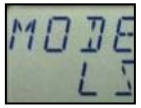



**or**




**or**


**If not already set to LS, press mm in (C) button (current mode flashes) then press (A) or button (B) until Mode LS is displayed.**
**Press mm in (C) button again to enter selection.**




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

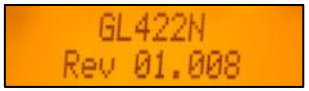

**Press the mm in (C) button again – the display shows PAIR and a rotating bar.**
**Then press and hold the button and turn on the transmitter (Battery LED flashes fast). After completing, PAIR/OK will be displayed.**



**The laser pairs now automatically with the new receiver and turns back to the standard function.**
**Press and release the HL760 button two times to exit the menu at the receiver.**
**A laser symbol and an antenna is lit to confirm the receiver is ready for communication with the laser.**

# Turning On/Off the Laser


- To turn the unit on, press and release the ON/OFF button
  - The unit always powers up in automatic self-leveling mode
  - The LCD shows Initialisation and then for one second the model number and Software Rev.


  - All LEDs are turned on for 2 seconds.
  - At the LCD, the last used grade values, the mask mode and battery status will be displayed.
  - The battery symbol disappears after few seconds and comes back if the batteries are getting low.

# Turning On/Off the Laser


- Green LED flashes during self-leveling once a second.
- When leveled, the green LED lights solid for the first five minutes or 30 seconds (depending on Settings), then flashes every 4 seconds indicating the laser remains level and the HI-alert has been activated
- If a grade value has been dialed in, the unit starts the temperature/reference check while the thermometer symbols are flashing.

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- When the temperature/reference check has been finished, the standard display appears and the A symbols flash until self-leveling has been completed. 

- Pressing and holding the E button shows the actual rotation speed and the internal temperature. 

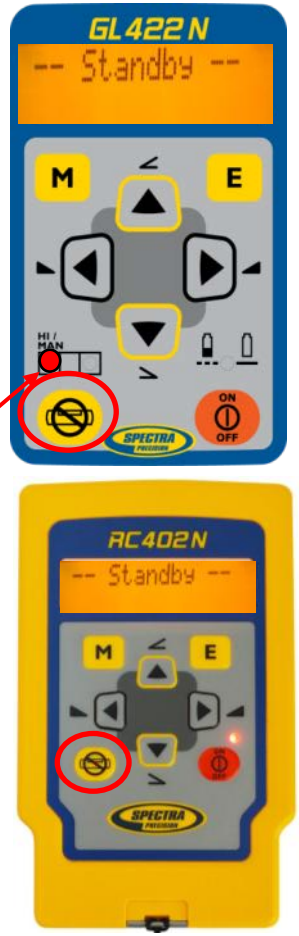

To turn the unit off, press and hold the ON OFF button for 2 seconds!

# Activating/Deactivating Standby mode

**Standby mode helps to increase the battery life and controls the laser setup during breaks. The self-leveling and rotation will be stopped and the beam will be turned off while the HI alert is still active.**

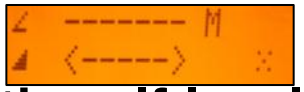
- **Press and hold the button at the laser or remote control for 3 seconds to activate the Standby mode.**
  - **The HI/MAN LED at the laser flashes red every 5 seconds while the displays shows Standby.**

- **To deactivate Standby mode and restore full operation of the laser, press and hold the button at the laser or remote control again for 3 seconds.**

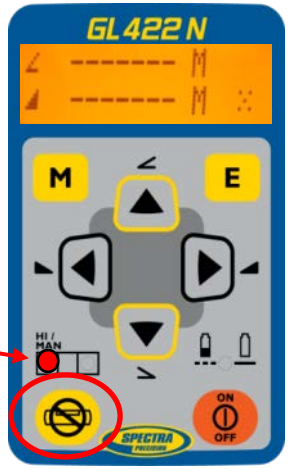


# Activating/Deactivating Manual Mode

- **"Manual" bypasses the laser's automatic leveling, to use the laser in slope or vertical mode**
- **Press and release the button at the transmitter or remote control**
  - **Manual LED will flash red once a second**
- **Horizontal setup - change the slope using the arrow buttons at the laser or remote control. ( Y-axis: / X-axis: )**
- **When set up vertical, the buttons adjust the vertical slope; the buttons can be used for fine line adjustments.**



- **To resume automatic self-leveling mode, press the button again.**





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# Mask Mode using the standard method

**Mask Mode – allows you to electronically turn off the laser beam (electronic shutters) in up to 3 lighthouse windows to prevent interference with other receivers on the jobsite.**

- **To activate the mask mode on the + or -Y-axis, press the ▲ ▼ button at the laser or remote control, then within <1 second press and release the ⊘ button.**

- **To activate the mask mode on the + or -X-axis, press the ◀ ▶ button at the laser or remote control, then within <1 second press and release the ⊘ button.**

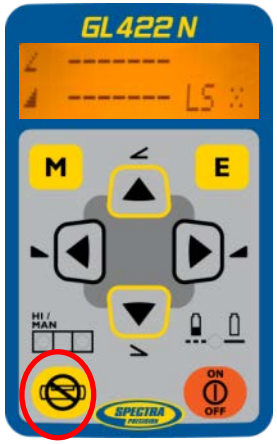

**The display indicates which side of the laser the beam has been electronically turned off.**

**Note: The unit always powers up with the mask mode deactivated (default).**

# Line Scan – Vertical Setup (Standard mode)

**When setting up the unit vertical, Line Scan centers the rotor horizontally and can be used to align the laser reference to a desired line position. Line Scan can be activated as a standard feature as well as using the menu.**


- **Pressing and releasing the  buttons simultaneously starts Line Scan while the rotor checks the limits of the X- axis (beeps) and stops at the center position (all laser LEDs are turned off) .**




- **Pressing the  button stops the movement and changes the unit into manual mode.** 
- **Fine corrections left and right can be done using  buttons.**
- **Press and release the  button again to change the unit back to full automatic mode.** 

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# Menu functions

Press and release button M 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 actual available function will be marked in arrow brackets >> <<.

A down arrow at the the right site indicates that the user can scroll down through the menu using the ▼ arrow button.

After going to the next menu row, an up/down arrow at the the right site indicates that the user can scroll up/down through the menu using the ▲ ▼ buttons.

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

Press and release the ▲ ▼ buttons until the desired function at the selected menu row is marked.

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

Menu functions when set up horizontal (GL4X2N)


Menu functions when set up vertical (GL4X2N)

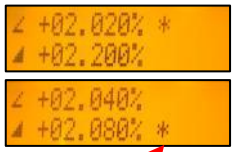
# Y- X- Grade Entering – Step and Go mode

Press and release button M to open the menu. >>Grade<< will be shown.


Press/release E button to show the actual grade value.


Button M ➔ escape/return to the standard display.

Press and hold button ◀ OR ▶ to change X- axis grade value (only GL422N) after the comma; press and hold button ▲ OR ▼ for changing Y -axis grade value after the comma.




Press and hold buttons ◀ ▶ 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 buttons ▲ ▼ simultaneously starts Y- axis quick change mode .

Note: An asterisk at the right side indicates which grade value will be changed. The speed of the grade value change increases with the amount of time the button is held down.

Note: The grade value for both axes increases in 1.00% increments. 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 +15% to -10%.

The laser will self-level to the required grade position after confirming the grade change with the E button.

Note: The A symbols at the LCDs will flash until the laser has been self-leveled to the requested grade position.

# Y- X- Grade Entering – Digit Select mode (Default)


Press and release button M to open the menu. >>Grade<< will be shown.


Press/release button E ➔ Both grade values will be shown and a cursor flashes at the +Y sign.


Press/release button M ➔ escape/return to the standard display.

Pressing and releasing buttons  moves the cursor to the right/left and in a circle to the next row.

Use buttons   to change the sign (grade reverse) and set the desired digit.

For quick toggling the cursor between the X-(only GL422N) and Y-axis, press and release button  .

Press and hold the button  for 2 seconds sets the grade value of the actual axis to 0%.

Quickly press and release button E to confirm the selected grade value and return to the standard display.

The laser will self-level to the required grade position.

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

# Selecting the Rotation speed

**Press and release button M to open the menu.**

**Repeatedly press the button ▼ until >>Rotation<< will be marked.**


**Press and release button E ➔ both rotation speeds will be shown while the actual rotation speed is marked in brackets.**


**Press/release button E ➔ escape/return to the standard display.**

**Repeatedly pressing buttons ▲ ▼ toggles between 300 and 600 rpm (Default) regardless if the unit is in automatic or manual mode.**


**Press and release button E to confirm the selected rotation speed.**

# 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 100 m (330 ft) located on the Y-axis of the laser.**

1. **Set up the laser at the first elevation point and align it to the second desired slope/ elevation hub using the sighting guides on the sunshade.**

2. **Attach the HL760 receiver to a grade rod. Check the laser beam elevation close to the laser.**

# Automatic Grade Match using the RC402N

3. Press and release the M button and select >>Grade Match<<. 


4. Set the grade rod with the receiver attached to it on the second desired slope/elevation hub.

   NOTE: DO NOT change the receiver position at the rod

5. Press and release button E to open the Grade Match submenu; then press button E to start Grade Match (GM Y).



Exiting of Grade Match can be done anytime by pressing the button where the unit goes always back to automatic mode.

# Automatic Grade Match using the RC402N

**6.** **The laser starts to search for the receiver.**


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



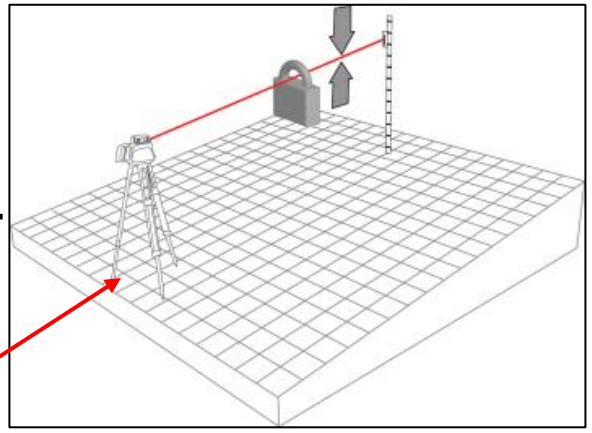
**7. When Grade Match has been completed, the HL760 goes back to the standard elevation display while the laser goes back to automatic grade mode.**
**The remote control as well as the laser display show the final measured grade value.**

**8. Check the elevations along the direction of the slope.**

# Automatic Horizontal - PlaneLok

**The PlaneLok mode can be activated in horizontal automatic 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 100 m (330 ft) located on the + or - Y-axis of the laser.**

**For keeping vertical alignments fixed to a direction or slope position, PlaneLok can be used on the Z-axis (only GL422N) or X-axis.**



1. **Set up the laser at the first elevation point and align it to the second desired slope/elevation hub using the sighting guides on the sunshade.**

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.**

# Automatic Horizontal - PlaneLok

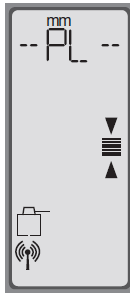
3. Press and release button M and select >>PlaneLok<<.


4. Press and release button E to open the PlaneLok submenu; then press button E to start PlaneLok (PL Y)



.

5. The laser starts to search for the receiver while all displays show a flashing PL.
   The HL760 display shows a flashing –PL– during the time the laser is searching and adjusting the beam to the on-grade position.





6. When PlaneLok is complete, –PL– stops flashing at the HL760 and Laser / RC402N display.


Exiting of PlaneLok can be done by pressing button or any HL760 button where the unit goes always back to automatic mode.

# How to attach the HL vertical adapter to the receiver

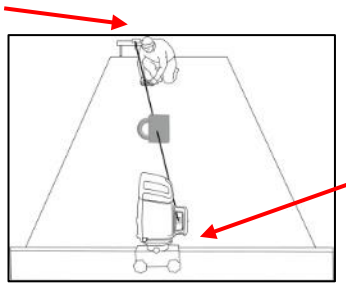
1 - attach the HL vertical adapter to the receiver

2 - attach the adapter for the receiver to the HL vertical adapter

3 - HL vertical adapter/receiver combo ready for vertical applications

3 - mount the HL vertical adapter/receiver combo at the batter board

# Automatic Vertical - PlaneLok



**When setting up the transmitter vertical, PlaneLok can be used at the Z- or X-axis.**

**1. Press and release the M button and select >>PlaneLok<<.** 


**2. Press and release button E to open the PlaneLok submenu; to select the Z-axis (only GL422N) for vertical slope alignment** 


**or the X-axis for vertical direction alignment** 


**use the ▲ ▼ buttons; then press button E to start PlaneLok X.** 


**Note: When used in vertical mode, the receiver has to be placed with the Photocell on the bottom side. For getting the best performance and a longer operating range set up the HL760 at least 0.5 m (2 ft) above the ground.**

**Any loss of signal over an extended period of time (1 minute) causes the laser to go into the HI-alert condition (beam turns off, rotor stops and a warning message occurs at the LCD along with an audio signal).**

**PlaneLok mode can be reactivated after the Error message** 


**has been deleted with the E button.**

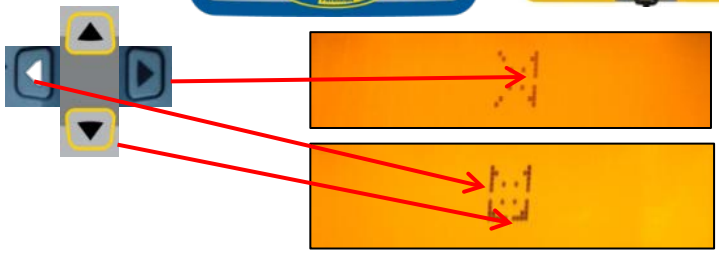
# Mask Mode using the menu

- Press and release the M button at the Standard Display and select >>Mask Mode<< using the ▲ ▼ buttons.



- Press and release the E button, the mask symbol occurs.

- For selecting the side, press and release one of the arrow buttons.



- When all areas have been set, press button E to store the mask sector selection.


The displays indicate which side of the laser the beam has been turned off electronically.

Note: The unit always powers up with the mask mode deactivated (default).

# Temperature (Reference) Check; Info

## Temperature (Reference) Check

**Before starting some grade work which is very sensitive an additional Reference Check can be started manually.**

**Press and release the M button at the Standard Display and select >>Temp Check<<.**


**Pressing and releasing the E button starts the Reference Check considering the current temperature inside the housing.**

**While the rotor checks the correct position the rotation will be stopped for a short moment.**

## Info

- **Press and release the M button and select >>Info<<.**


**buttons can be used to toggle between About LS, Runtime and Radio.**


- **Press and release the E button; the laser information (software version, serial number.), the total runtime and the radio channel of the laser can be displayed.**

# Line Scan using the menu

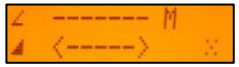
**When setting up the unit vertical, Line Scan centers the rotor horizontally and can be used to align the laser reference to a desired line position.**


- **Press and release the M button at the Standard Display and select >>Line Scan<<.** 

- **Press and release the E button starts Line Scan.**

**The rotor checks the limits of the X- axis and stops at the center position in automatic mode. (LS is flashing** 

**while all laser LEDs are turned off)**

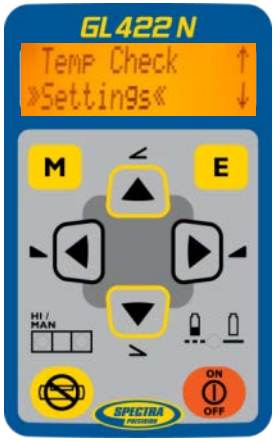
**Pressing the**  **button at the laser or RC402N stops the movement and changes the unit into manual mode.** 


**Line position corrections left and right can be done using the**  **arrow buttons.**

**Press and release the**  **button at the laser or RC402N to change the unit back to full automatic mode.**

# Settings menu / Settings: HI-Alert selection

## Setting Menu




Press and release the M button at the Standard Display and select >>Settings<<.


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

The unit falls always back to the standard display when a selected submenu function has been confirmed with the E button.

## HI-Alert selection


- Select >> HI-Alert<<


and press and release button E to open the HI-Alert menu.

- The desired HI-alert: 5 min.(Default), 30 seconds and HI-Off)




can be selected using the ▲ ▼ buttons.

- Press and release button E to confirm the selected HI-Alert.

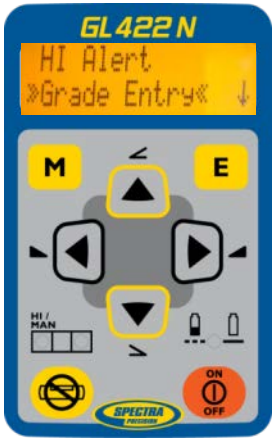
# Settings: Grade Entry / Grade Display selection

## Grade Entry selection

- Select >> Grade Entry<< 

using the ▲ ▼ buttons; then press and release button E open the Grade Entry menu.
- The desired Grade Entry method:
  Digit Select (Default) and Step + Go can be selected
  

  using the ▲ ▼ buttons.
- Press and release button E to confirm he selected method.




## Grade Display selection

- Select >> Grade Display<< 

using the ▲ ▼ buttons; then press and release button E open the Grade Display menu.
- The desired Grade Display mode:
  (Percent / Permille / Degree) can be selected
  

  using the ▲ ▼ buttons.
- Press and release button E to confirm the selected method.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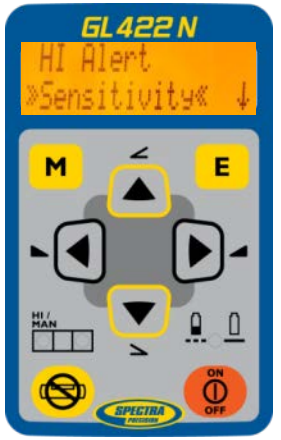
# Settings: Sensitivity / Language selection

## Sensitivity Selection




- Select >> Sensitivity<< HI Alert »Sensitivity« using the ▲ ▼ buttons; then press and release button E to open the Sensitivity menu.
- The desired Sensitivity: Low, Middle (Default) and High) can be selected using the ▲ ▼ buttons.

»Low« Middle | Low »Middle« | Middle »High«

- Press and release button E to confirm the selected Sensitivity.

## Language selection


- Select >> Language<< Sensitivity »Language« using the ▲ ▼ buttons; then press and release button E to open the Language menu.
- The required local Language can be selected using the ▲ ▼ buttons.

(EN, DE, IT, FR, ES, PT, NL, DA, NO, SV, FI, PL, TR, CZ)

»English« Deutsch | Italiano »Francaise« | Espanol »Portugues« | Nederlands »Dansk« | Norsk »Svenska« | Suomi »Polski« | Turkce »Cestina«

Press and release button E to confirm the selected Language.

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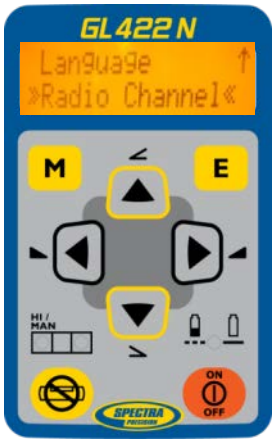
# Settings at the Laser: Radio Channel selection

## Radio Channel

- First, select >> Settings << 

at the laser's menu.
- Select >>Radio Channel<< 

using the ▲ ▼ buttons; then press and release button E to open the Radio Channel menu.
- The desired Radio Channel: 0 to 5 can be selected using the ▲ ▼ buttons. 


- Press and release button E to confirm the selected Radio Channel.

- After changing the Radio channel, the RC and HL needs to be paired again.

# Troubleshooting

**Any error message can be deleted with a short press of button E. 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 | Press the E button to deletet the error message |
| 120 | HI alert - Unit Height changed | Check laser beam elevation |
| 130 | Mechanical Limit during Grade Match / PlaneLok | Check if existing slope is above +/-9% |
| 140 | Laser beam blocked | Make sure there are no obstacles between the transmitter and the HL760 |
| 141 | Time Out - Alignment could not be completed in the allowed time | Check radio operating range/ connection; check stable laser setup |
| 150 | No receiver – HL760 Receiver not available for single axis automatic function | Make sure the HL760 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 |
| 155 | More than two paired receivers are available during automatic alignment function. | Make sure only two receivers are turned on. |
| 160 | X or Y level sensor defect | Contact service center |