LSI ROBWAY

GS550 Underhook Display & Underhook Load Sensors

Installer and User's Manual
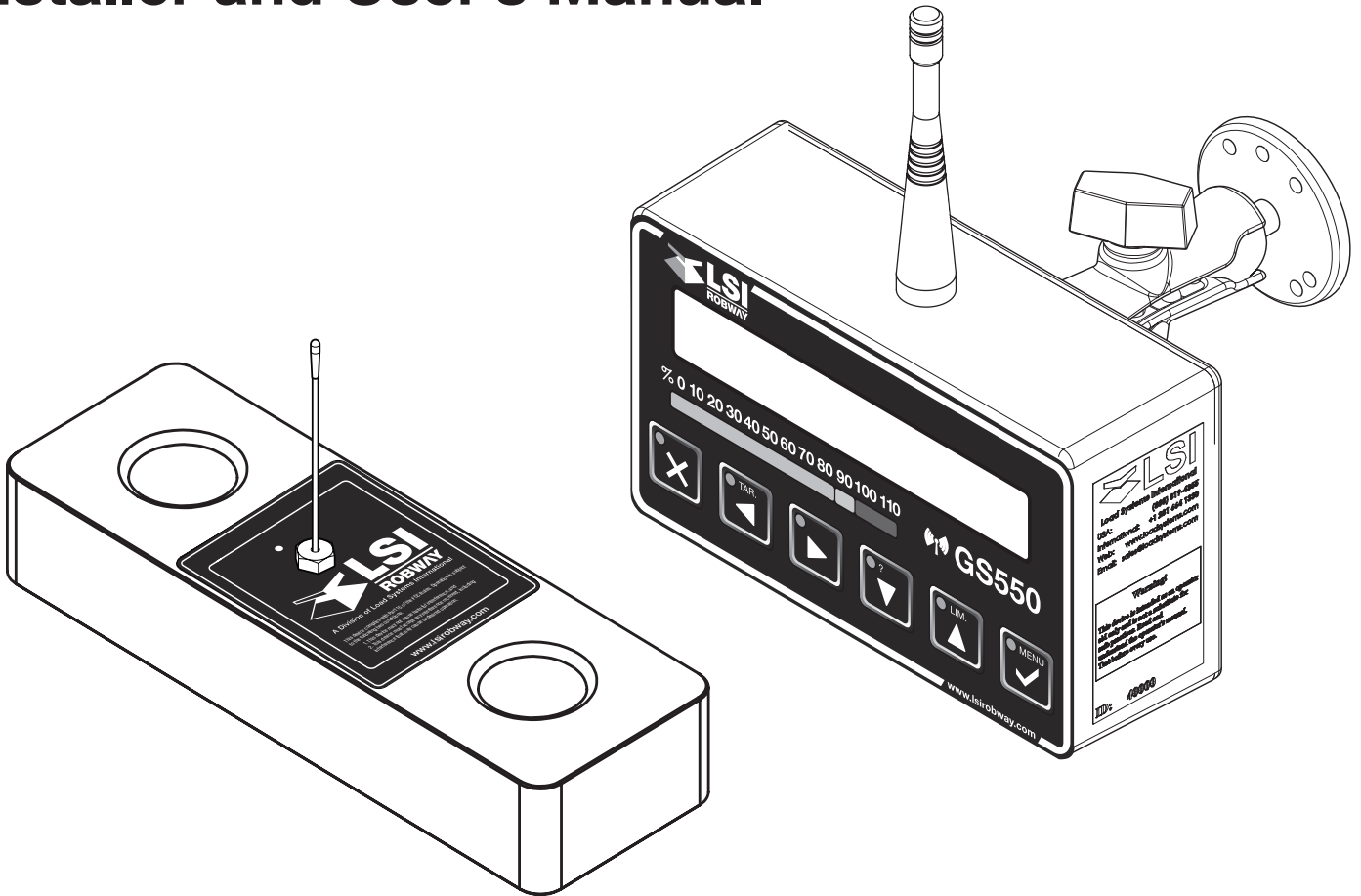
ENGLISH

TABLE OF CONTENTS

1: OVERVIEW

1.1 Introduction

The GS550 Underhook creates a two-way radio network with the sensors to bring required lift data to the operator. Hoist load can be detected and then indicated to the operator in real time. Furthermore the GS550 Underhook can be programmed to generate warnings and alarms, all triggered by adjustable thresholds and limits. The exact operational function of the GS550 Underhook system depends on the sensor configuration used. Refer to Section 3, Operation beginning on p. 7, to learn how to interact with the safety system.

1.2. About This Manual

This service manual describes how to install, calibrate, operate, and service the GS550 Display with Underhook-specific firmware settings.

While many sections of this service manual have information common to all GS550 Display setups, this manual focuses solely on the utilization of the Display within an Underhook setup.

1.2a. How To Provide Feedback To LSI-Robway

LSI-Robway welcomes your feedback on the accuracy and effectiveness of this document. Please send feedback to mail@lsirobway.com. Please include the title of the manual and version (this information is located in the Document Revision History on p. 27) with your feedback.

1.2b. How This Manual Is Updated.

LSI-Robway will issue new releases of this manual as new material becomes available. Refer to the Document Revision History on p. 27 of the manual.

1.2c. How to Contact LSI-Robway.

Please contact LSI-Robway if you encounter problems or require advice. Contact details are located on the back cover.

1.2d. Notifications Included in Document

The following notations may be used in this manual:

NOTE
✓ HINTS AND TIPS TO FACILITATE SYSTEM INSTALLATION OR UNDERSTANDING.

CAUTION
PROTECT YOURSELF AGAINST PRODUCT PERFORMANCE ISSUES, PRODUCT FAILURE, AND/OR PROPERTY DAMAGE.

WARNING
PROTECT YOURSELF AGAINST SERIOUS INJURY OR DEATH.

1.3. Before You Begin

WARNING
THE GS550 UNDERHOOK SYSTEM IS DESIGNED AS AN OPERATOR AID AND IS IN NO WAY A SUBSTITUTE FOR SAFE OPERATING PRACTICES.

WARNING
CAREFULLY READ AND UNDERSTAND THIS MANUAL BEFORE PROCEEDING.

2: INSTALLATION

NOTE

✓ *REFER TO THE OPERATION SECTION, BEGINNING ON P. 7, FOR DETAILED MENU NAVIGATION INSTRUCTIONS FOR ALL CALIBRATION PROCEDURES.*

WARNING

⚠ **INSTALLATION MUST BE MADE IN COMPLIANCE WITH LSI-ROBWAY INSTRUCTIONS AND USING LSI-ROBWAY SUPPLIED COMPONENTS ONLY.**

FAILURE TO INSTALL ALL PARTS, OR REPLACING PARTS OR COMPONENTS WITH PARTS OR COMPONENTS NOT SUPPLIED BY LSI-ROBWAY, MAY LEAD TO SYSTEM FAILURE, SERIOUS INJURY OR DEATH.

CAUTION

⚠ **DO NOT CRACK OR PUNCTURE THE FACE COVER MEMBRANE.**

DO NOT POWER WASH THE DISPLAY.

THE GS550 UNDERHOOK DISPLAY IS SPLASH- AND RAIN-PROOF. WATERPROOFING DEPENDS IN PART ON THE INTEGRITY OF THE MEMBRANE. POWER WASHING WILL VOID THE WARRANTY.
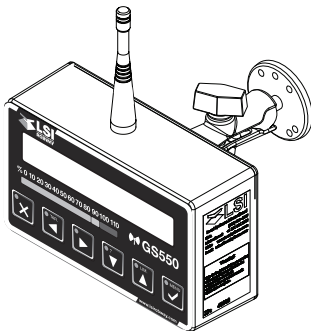
Figure: Display GS550 Underhook
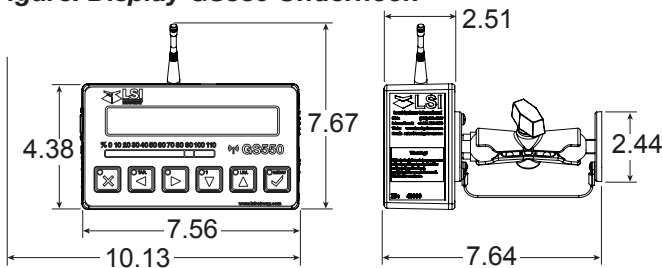
Figure: Display dimensions (inches). Not to scale.

2.1 Display GS550 Underhook

2.1a Mounting Bracket

The GS550 Underhook is provided with a mounting bracket that serves as an handle but can also be mounted on a support following the dimensions below.

The mounting bracket can also be fitted to any Ram Mounts compatible accessories (1" ball).
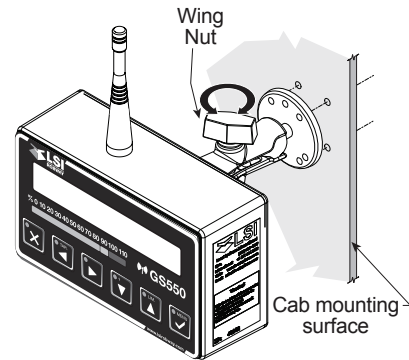
Figure: Display mounting bracket footprint. Not to scale.

a. Determine mounting location inside the cab. To ensure reliable radio communication between sensors and the GS550 Underhook, the antenna should not be in contact with metal and should have a direct and clear line of sight to the sensor antenna.

b. Drill 1/4" boltholes through the mounting surface with a 1/4" bit following either the two-, three-, or four-hole configuration.
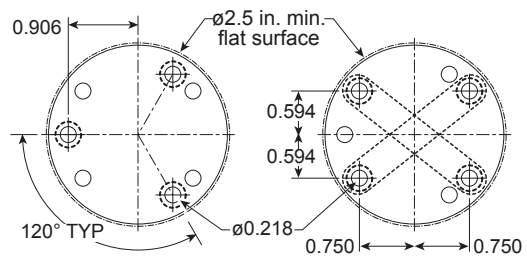
Figure: Configuration options for Mounting Bracket.

c. Install the display with bolts. Add washers and lock nut behind mounting surface. Tighten sufficiently. (Bolts, nuts, and washers not included with assembly.)

d. Loosen wing nut of the bracket arm. Adjust display orientation to facilitate operator viewing, then retighten wing nut.

NOTE

✓ *IF THE NUTS ARE ON THE OUTSIDE OF THE CAB, CAULK WITH SILICONE BETWEEN THE WASHERS AND THE CAB TO PREVENT WATER ENTRY.*

2.2 Start-Up

The GS550 Underhook must be correctly programmed for the system sensors installed. If a sensor is missing or has a problem, a message will be displayed on the GS550 Underhook. Press the **Info** button to get more details on the problem.

This process may take up to one minute. The delay is created by the battery management function.

Press and hold the **Exit** button to temporarily stop the buzzer if needed.

WARNING

⚠ *THE GS550 UNDERHOOK SYSTEM IS DESIGNED AS AN OPERATOR AID AND IS IN NO WAY A SUBSTITUTE FOR SAFE OPERATING PRACTICES.*

WARNING

⚠ *INSTALLATION MUST BE MADE IN COMPLIANCE WITH LSI-ROBWAY INSTRUCTIONS AND USING LSI-ROBWAY SUPPLIED COMPONENTS ONLY.*

FAILURE TO INSTALL ALL PARTS, OR REPLACING PARTS OR COMPONENTS WITH PARTS OR COMPONENTS NOT SUPPLIED BY LSI-ROBWAY, MAY LEAD TO SYSTEM FAILURE, SERIOUS INJURY OR DEATH.

Load Cell

Underhook GS550 Display

Figure: Key components in a typical system installation. Your product may vary. Not to scale.

2.3 Load Cell

WARNING

⚠ *CAPACITY FOR LOAD CELLS AND SHACKLES/ACCESSORIES ARE CALCULATED FOR LOADS ALONG THE INTENDED AXIS OF LOAD (VERTICAL ON HOOK ASSEMBLIES, HORIZONTAL WHERE APPROPRIATE); SIDE LOADING OR TWISTING MAY CAUSE UNDUE STRESS ON THE LOAD CELL/LIFTING ACCESSORIES CAUSING LOAD DROPS. RIGGING MUST BE DONE IN A WAY THAT TWISTING IS AVOIDED TO PREVENT SIDE LOADING.*

CAUTION

⚠ *FOR OPTIMAL PERFORMANCE AND SIGNAL RECEPTION, ENSURE A CLEAR LINE OF SIGHT BETWEEN THE LOAD CELL ANTENNA AND THE GS550 UNDERHOOK DISPLAY.*

CAUTION

⚠ *THE LOAD CELL MUST BE CENTERED ON THE SHACKLE TO AVOID UNEVEN LOADING ON THE PLATE KIT ASSEMBLY.*

CAUTION

⚠ *THE LOAD CELL ANTENNA SHOULD NOT BE IN CONTACT WITH METAL.*

3: OPERATION

3.1 GS550 Underhook Display

The GS550 Underhook displays detailed information on the backlit, two line liquid crystal display (LCD); warnings and alarms are also communicated by the display buzzer.

Parts of line   Hoist indicator   Tare Indicator   Load   Working Load Limit

USB Port

```
1  🐵 🐵    15000 lb
   🐵 🐵   915000 lb
```

Liquid Crystal Display (LCD)

% 0 10 20 30 40 50 60 70 80 90 100 110

Bar Graph
Indicates the load on the hoist as a percent of the working load limit.

((ᴵ)) **GS550**

Keypad

TAR. ◄ ▶ ▼ LIM.▲ MENU ✓

Tare Warning Light
The total load is not displayed when tare light is on.

Info Alert Light
Press Info when the info light flashes to see critical alert messages.

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Exit /Alarm Bypass
Use this key to exit up from menus. This button is also used as a temporary Alarm override.

Tare / Back
Use Tare to zero any rigging weight. Also used to navigate through menu screens.

Next
Used in the menu to select next item.

Info / Down
When the orange light flashes, press Info to see any critical alert messages. Also used to move numeric numbers and choices in the menu.
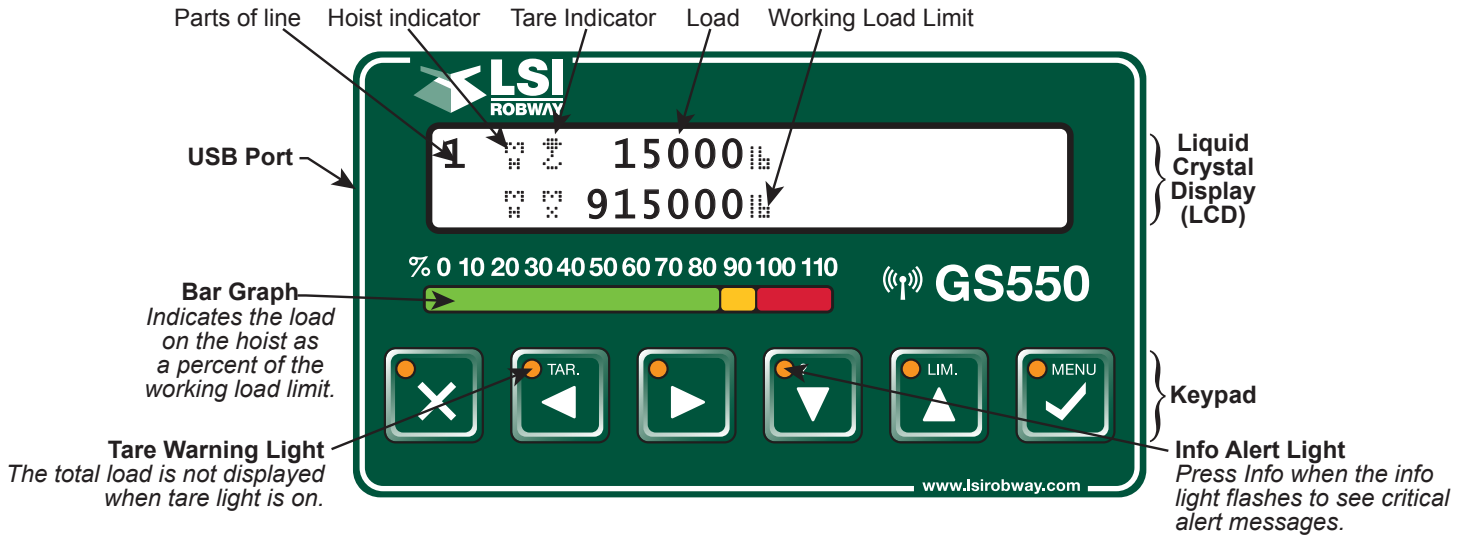
Limit / Up
Set the overload alarm by pressing this key.
Used in the menu to modify numeric values / choices.

Menu / Enter
Access the system menus and also used to confirm changes within.

Alarm/Overload
To set the Alarm setpoint, do the following:
- Press LIM. Key
- Change Flashing limit reading as required.
- Press Exit to return to normal weighing mode.

Tare
Tare is used to eliminate rigging and slinging weights, to do this do the following:
- Press TAR. Key
- Press Menu to select/deselect the Tare function.
- Press Exit to return to normal weighing mode.

3.1a USB Port
The USB port is used to download data from the data logger or to upload a new firmware using a USB mass storage device (USB key). For more information on how to use this, refer to section 5: USB Tool, beginning on p. 15 of this manual.

3.1b Tare

Zero the hook and rigging weight:
- Press **Tare** to enter the tare menu.
- Use **Next** to select the load sensor.
- If no tare value is displayed, then press **Tare** to create a tare value equal to the weight on the load sensor. Example: with hook block and rigging only. Load display is net weight (gross weight minus tare value).
- To remove a tare value, press **Tare**.
- Press **Exit** to return to the operation display.

	LCD INDICATOR	LCD LOAD
No Tare Value		Gross Weight
Tare Value		Net Weight

3.1c Info

Press **Info** to see critical system alerts and battery status. Press **Next** to advance from one page to the next.

Standard info menu pages include firmware number and version

Table: Information Menu Alerts

```
Load                ID:  G15000
Sensor  maximum  limit
```

Description:

The sensor indicates a value greater than the operator adjusted limit:

Verify operator adjusted limits in the limit menu.

> **WARNING**
>
> *DO NOT OPERATE THE CRANE BEYOND THE LIMITS SPECIFIED BY THE MANUFACTURER.*

Alert:

```
Load                ID:  G15000
Sensor  low  battery
```

Description:

Less than 10% of battery life remains in the sensor:

Schedule battery replacement for the next available opportunity. Typically several weeks of operation remain from the moment the sensor low battery warning is first triggered.

Alert:

```
Load                ID:  G15000
No  communication
```

Description:

The display is not receiving communication from the sensor:

Verify that the sensor ID number programmed matches the ID number of the sensor installed on the crane. Go to menu **5A1**.

3.1d Limit

Set Hoist Limits

Press **Limit** and then **Enter** to access the *Sensor Limits* menu. The *Sensor Limits* menu displays the limits for each sensor in the sensor list on successive pages.

Use **Next** to scroll from one limit to the next.

Use **Up** and **Down** to adjust a limit.

When using GS550 Underhook, the load limit is typically set to the lesser of the rope limit and the hoist limit.

> **NOTE**
>
> ✓ *PRESSING UP AND DOWN SIMULTANEOUSLY WILL RETURN A LIMIT TO THE FACTORY DEFAULT SETTING. THE FACTORY DEFAULT MAXIMUM LIMIT FOR LOAD SENSORS IS 10,000 LB.*

> **NOTE**
>
> ✓ *WHEN THE WEIGHT UNITS ARE TONS, THE MINIMUM LOAD LIMIT INCREMENT IS 0.1 TON.*

3.1e Parts of Line

The load sensor often shares the weight with multiple parts of line. For accurate load indication the GS550 must be programmed for the number of parts of line.

1. Go to menu *1) Parts of Line*.

2. Use *Next* and *Back* to select the load sensor; typically sensor number one is associated with sheave one (the main hoist) and sensor number two is associated with sheave two (the auxiliary hoist) etc.

3. Use *Up* and *Down* to adjust the number of parts of line.

4. Press *Enter* to save any changes. Press *Exit* twice to return to the operation display.

3.3 Display abbreviations

ITEM	SYMBOL
Main hoist	M̲H̲
Maximum	M̲X̲
Communication not established	NoRx
Tare (net weight)	⤓
Gross weight	⤒

3.4 System Menu

WARNING

SYSTEM LIMITS ARE NOT MONITORED WHEN THE DISPLAY IS IN MENU MODE. *DO NOT OPERATE THE CRANE LIFTING MACHINERY IN MENU MODE. DO NOT NAVIGATE SYSTEM MENUS WHILE OPERATING THE CRANE.*

There are four basic menus (level one) used to program, consult and control the GS550 Underhook system:

      1) Parts of Line;
      3) Display Settings;
      4) Installation;
      5) System Diagnostic.

The basic menus include nested sub-menus (levels two, three and four) designed to address specific tasks including adjusting values, choosing from lists and following "wizards" to navigate step-by-step processes.

3.4a Menu Numbers

Menus are identified by a number in the upper left corner. The basic menus (level one) are numbered one through five. Level two menus are lettered alphabetically. Level three menus are numbered. Level four menus are alphabetized.
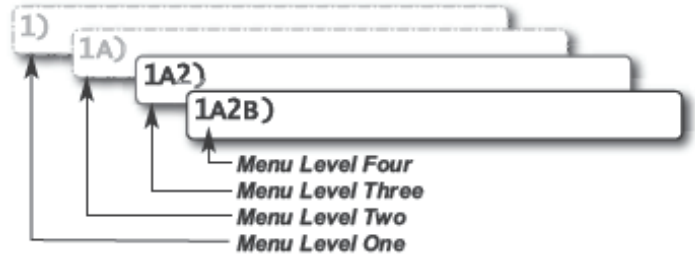
Figure: Menu Numbers

3.4b Menu Navigation

From the operation display press *Menu* to see the basic menus (level one). Press *Enter* to drill down one level and enter a selected menu. Press *Exit* to leave a menu and return up one level. Press *Next* to move to the next page within a menu; press *Back* to move to the previous page within a menu. Use Up and Down to modify numeric values and to move through a list of choices.

NOTE

✓ *MOST MENUS AND LISTS ARE CIRCULAR. PRESS NEXT/DOWN ON THE LAST ENTRY TO RETURN TO THE FIRST.*

3.4c Password Protection

The submenus of menu *4) Installation* are protected by a password by default. Password settings can be adjusted in menu *4H) Password Settings*. If the user password is forgotten, it can be changed as long as the administrator password is known.

NOTE

✓ *FORGOT YOUR PASSWORD? CALL LSI-ROBWAY TECHNICAL SUPPORT (REFER TO THE BACK COVER OF THIS MANUAL FOR INFORMATION).*

3.4d GS550 Underhook Menu Outline

Only sections relevant to Underhook operation have been listed.

Menu levels with an asterisk (*) after the title are accessible to the operator without a password under the default factory settings.

1) Parts of Line*

3) Display Settings*

   3A) Weight units*

   3C) Display language*

   3D) Light intensity*

   3E) LCD contrast*

   3F) Backlight mode*

4) Installation*

   4A) Sensor List

      4A1) Sensor type and radio identification number

      4A2) System selected configuration number

      4A3) Configuration number selection mode

   4B) Sensor Calibration

      4B1) Automatic value calibration wizard

      4B2) Manual parameter calibration

      4B3) Reset sensor parameters

   4F) Data Logger

      4F1) Data logger mode

      4F2) Adjust date

      4F3) Adjust time

   4G) Lockout Settings

      4G1) Warning level

      4G2) Alarm level

   4H) Password Settings

      4H1) Set administrator password

      4H2) Set user password

      4H3) Tare menu password protection

      4H4) Limit menu password protection

      4H5) Info menu password protection

      4H6) System start-up password protection

      4H7) Parts of Line menu password protection

      4H9) Display Settings password protection

      4H10) Sensor List password protection

      4H11) Sensor Calibration password protection

      4H15) Data logger password protection

      4H16) Lockout Settings password protection

      4H18) System Diagnostic password protection

      4H19) Alarm Bypassed protection

   4I) Network Options

      4I1) Display mode

      4I2) Set-up sensor repeater

      4I3) Last repeater programmed

      4I4) Install update

5) System Diagnostic*

   5A) System Sensors Diagnostic*

   5B) Radio Network Diagnostic*

      5B1) Radio network background noise*

      5B2) List last 32 sensors received*

      5B3) Search for sensors*

   5D) Display Diagnostic*

      5D1) Time and date*

      5D2) Time clock battery test*

      5D3) External power supply voltage*

      5D4) Internal temperature*

      5D5) GS550 base station identification number*

      5D6) GS550 power source / battery level*

      5D7) Radio (certification and frequency)*

4: SETUP

4.1 Sum Load Indication

When sum load indication is programmed the sum of the loads on the pre-determined load sensors is indicated by the operation display. To activate sum load indication program a "Sum load cell" in the sensor list. The "ID number" is used to identify the load sensors to be summed.

Sum maximum limit. The maximum limit for the sum load can be adjusted in the limit menu; the default maximum limit for sum load indication is 10,000 lbs or 4,535 kg.

Program sum load indication:

1. Go to menu **4A1)** *Sensor list*.
2. Press **Next** repeatedly to advance to the next available sensor position, usually following the four load sensors.
3. Determine the sum load cell "ID number". For example: ID 1234 to indicate the sum of load sensors No. 1, No. 2, No. 3, and No. 4, or ID 34 to indicate the sum of load sensors No. 3 and No. 4.
4. Use **Up** and **Down** to adjust the ID number.
5. Press **Next**.
6. The sensor type should flash; use **Up** and **Down** to select the sensor type "Sum load cell."
7. Press **Enter** to save any changes.
8. Press **Next** to program the imbalance sensor or press **Exit** three times to return to the operation display.
9. Adjust the sum maximum limit in the limit menu.

4.2 Sensor List

All sensors in the GS550 Underhook system are programmed in the sensor list. The GS550 Underhook uses information from all sensors in the sensor list. Conversely the GS550 Underhook will not use or display information from sensors that are not programmed to the sensor list. If a sensor is removed from the crane then it must be removed from the sensor list. If a sensor is replaced the sensor list must be updated with the new ID number.

> **NOTE**
> ✓ *TO ENSURE COMMUNICATION, SENSORS MUST BE AT LEAST SIX FEET FROM THE GS550 UNDERHOOK DISPLAY.*

4.2a How to Add a Sensor to the GS550 Underhook

1. Determine the radio identification number (ID) of the sensor to be added. This number between 10000 and 999999 is engraved on the sensor.
2. Go to menu page **4A1)**.
3. Advance to the next empty sensor position in the sensor list. Press **Next** repeatedly until the LCD shows "**No sensor**" on the bottom line. Up to four (4) load cells and one (1) summation may be added to the sensor list.
4. The ID number should flash; this means it is adjustable. Use **Up** and **Down** to program each sensor ID.

> **NOTE**
> ✓ *PRESSING THE UP AND DOWN BUTTONS SIMULTANEOUSLY WILL GO DIRECTLY TO A PARTICULAR NUMBER:*
> *PRESSED ONCE: TO NUMBER 30000*
> *PRESSED TWICE: TO NUMBER 25000*
> *PRESSED THREE TIMES: TO NUMBER 0*

5. Press **Next**.
6. The sensor type ("**No sensor**") should flash; this means it is adjustable. Use **Up** and **Down** to select the sensor type.
7. Press **Enter** to save any changes made to the sensor list.
8. Press **Exit** three times to return to the main operation display.

4.2b How to Remove a Sensor from the GS550 Underhook

1. Determine the sensor to be removed. If more than one sensor of the same type has been added to the sensor list then determine the radio identification number (ID) of the sensor to be removed before proceeding. A sensor ID number between 10000 and 999999 is engraved on each sensor.
2. Go to menu page *4A1)*.
3. Press *Next* repeatedly to advance to the page of the sensor list showing the ID of the sensor to be removed.

NOTE

✓ *PRESS NEXT AND BACK SIMULTANEOUSLY TO REMOVE THE SENSOR FROM THE SENSOR LIST. THE ID NUMBER WILL REVERT TO 0 AND THE SENSOR TYPE WILL REVERT TO "NO SENSOR."*

---

4. The sensor ID should flash, press *Next*, the sensor type should flash; this means it is adjustable. Use *Up* and *Down* to select "*No sensor*". This will remove the sensor from the sensor list but retain the sensor ID.
5. Press *Enter* to save any changes made.
6. Press *Exit* three times to return to the display.

```
4A1) No 1        ID: G11023
Load cell
```

```
4A1) No 1        ID: 0
No sensor
```

Figure: Menu 1A) - the sensor list

4.3 Password Settings

Two levels of access are available: administrator and user. The administrator password is required to change the user password. In the event both the administrator and the user passwords are lost please call *LSI-Robway* technical support. Menus accessible from the operation display can be individually protected by the user password.

1. Go to menu *4H1) Set administrator password.*
2. Menu *4H1) Set administrator password:* Press *Next* three times to advance to the set user password page or, to change the administrator password, use *Up* and *Down* to adjust the flashing letter and then use *Next* to advance to the next letter. Press *Enter* to save changes.
3. Menu *4H2) Set user password:* Press *Next* three times to advance to the tare menu protection page or, to change the user password, use *Up* and *Down* to adjust the flashing letter and then use *Next* to advance to the next letter. Press *Enter* to save changes.
4. Menu *4H3) Tare protected:* use *Up* and *Down* to switch between "*YES*" and "*NO*" and press *Next* to advance to the next menu page.
5. Repeat step 4 to adjust password protection for each menu as required. Press *Enter* at any time to save changes made. Press Exit at any time to return to menu *4) Installation*. If there are any unsaved changes the display will request confirmation: press *Enter* to save before quitting or press *Exit* to quit without saving.

4.4 Data Logger

The GS550 Underhook includes a data logger that records all significant events including actual sensor values and a date and time stamp. The data logger memory can hold over 16,000 records, equivalent to several days or several years of operation depending on the recording mode selected and machine use. The data can be extracted using a USB mass storage device (USB key) and then transferred to a personal computer for analysis.

4.4a Recording Modes

Adjust the data logger recording mode as required:
1. Go to menu **4F1) Data logger mode**.
2. Use **Up** and **Down** to select the data logger recording mode.
3. Automatic modes only: press **Next** to advance to the adjustment page for the interval (automatic recording mode), variation (automatic variation recording mode), or threshold (automatic peak recording mode).
4. Press **Enter** to save any changes.
5. Press **Exit** three times to return to the operation display or press **Next** to adjust the data logger.

NOTE

✓ *ALL ALERTS ARE RECORDED BY THE DATA LOGGER REGARDLESS OF THE RECORDING MODE SELECTED.*

Recording Modes description:

Alarm only: Record alarms only. All the other data logger modes also record alarms.

All data: All communications between a display and its sensors are recorded.

User input: This option is not available for the GS550 Underhook.

Automatic peak: In the automatic peak mode the data logger analyzes the measured weight and records the peak value only. One threshold per load cell must be adjusted. When the weight drops by more than the peak threshold the peak weight is recorded. Only one event is recorded for each pick when the threshold is adjusted

correctly. When the automatic peak data logger mode is selected on menu **4F1** (see step 3 above) press Next to go to menu **4F1**) and then use **Up** and **Down** to adjust the peak threshold for the first load cell. Press **Next** to repeat for the second load cell etc. Up to four load cells can be programmed for automatic peak data logging.

Automatic recording: A record is added at a specified interval. When the automatic recording data logger mode is selected on menu **4F1** (see step 3 above) press **Next** to go to menu 4F11) and then use **Up** and **Down** to adjust the record interval in seconds.

Automatic variation: A record is added when load increases by more than the operator adjusted percentage. When the automatic variation data logger mode is selected on menu **4F1** (see step 3 above) press **Next** to go to menu **4F11**) and then use **Up** and **Down** to adjust the variation threshold.

4.4b Date and Time
Adjust the data logger date and time as required:
1. Go to menu **4F2)** Adjust date.
2. The last two digits of the year should be flashing: use **Up** and **Down** to adjust the year.
3. Press **Next** to adjust the month.
4. Use **Up** and **Down** to adjust the month.
5. Press **Next** to adjust the day.
6. Use **Up** and **Down** to adjust the day.
7. Press **Next** to adjust the time.
8. The hour should be flashing: use **Up** and **Down** to adjust the hour from 00 (midnight) to 23 (11 pm).
9. Press **Next** to adjust the minute.
10. Use **Up** and **Down** to adjust the minute.
11. Press **Next** to adjust the second.
12. Use **Up** and **Down** to adjust the second.
13. Press **Enter** to save any changes.
14. Press **Exit** three times to return to the operation display.

4.5 Display Settings

Program the display for operator preferences in menu **3) Display Settings**.

4.5a Weight Units

The weight units for load display may be selected according to operator preference. Length units are associated with weight units by default; see the table below.

1. Go to **menu 3A) Weight units**.

2. Use **Up** and **Down** to select the weight units for load display.

3. Press **Menu** to save changes. Press **Next** to advance to the language adjustment page or press **Exit** twice to return to the main display.

Table: Weight Units

UNIT	EQUIVALENT	WEIGHT
Pound (lb)	1 lb	0.4536 kg
Kilogram (kg)	2.205 lb	1 kg
Short ton (t) **United States**	2000 lb	907.2 kg
Long ton (T) **United Kingdom**	2240 lb	1016 kg
Tonne (t) **International System (SI)**	2205 lb	1000 kg
Kilopound (kip)	1000 lb	453.6 kg
Kilonewton	224.81 lb	101.97 kg

4.5b Language

1. Go to menu **3C) Display language**.

2. Press **Up** and **Down** to change the display's operating language.

4.5c Contrast

Adjust the LCD contrast to optimize visibility.

1. Go to menu **3E) LCD contrast adjustment**.

2. Use the **Up** and **Down** **buttons** to adjust the display contrast.

3. Press **Next** to advance to the backlight adjustment page or press **Exit** twice to return to the operation display.

4.5d Backlight Mode

Adjust the LCD backlight control mode to conform to viewing and power supply conditions.

1. Go to menu **3F) Backlight mode**.

2. Use **Up** and **Down** to select the backlight control mode. The LCD backlight can be always on, always off, or on a four second timer. In the four second timer mode the backlight will come on for four seconds when any button is pressed.

3. Press **Menu** to save changes, then press **Next** to advance to the backlight adjustment page or press **Exit** twice to return to the main display.

4.5e Light Intensity

Adjust the intensity of the LEDs (light emitting diodes) to facilitate viewing in bright sunlight or in reduced visibility:

1. Go to menu **3D) Light intensity adjustment**.
2. Use **Up** and **Down** to adjust the intensity of the lights on the display.
3. Press **Menu** to save changes, then press **Next** to advance to the contrast adjustment page or press **Exit** twice to return to the main display.
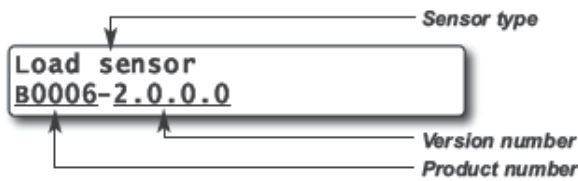
4.6 System Diagnostic

Diagnose system issues with the sub menus of menu **5) System Diagnostic**.

4.6a System Sensors Diagnostic

1. Go to menu **5A1)**.
2. Use **Back** and **Next** to select the sensor.
3. Press **Enter** to see sensor data.
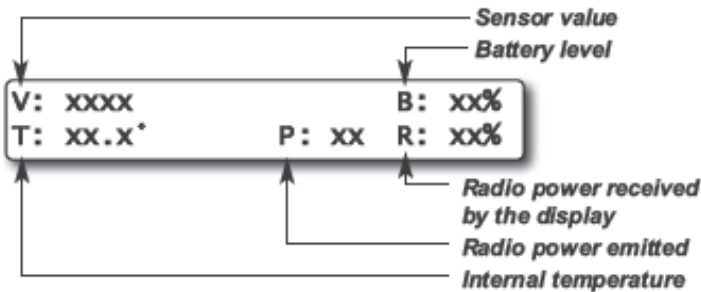
4. Press **Enter** to get the sensor firmware product and version numbers.

5. Press **Exit** five times to return to the main operation display.

4.6b Display Diagnostic

1. Go to menu **5D1) Time and Date**. The page shows the current time and date according to the GS550 internal clock.
2. Press **Next** to go to menu **5D2) Time clock battery**. Self-test pass or fail.
3. Press **Next** to go to menu **5D3) External power voltage**.
4. Press **Next** to go to menu **5D4) Display internal temperature**.
5. Press **Next** to go to menu **5D5) GS550 base station ID**. The base station ID should be the same as the GS550 display serial number printed on the top of the enclosure.
6. Press **Next** to go to menu **5D6) Battery level**. The battery level of the onboard rechargeable battery pack is indicated.

7. Press **Next** to go to menu **5D7) Radio**. "FCC", "IC" indicates Federal Communications Commission (U.S.A.) and Industry Canada certification, "CE" indicates European Community certification. The frequency used by the network is indicated on the second line.
8. Press **Exit** three times to return to the main operation display.

5: USB TOOL

Download data or upload capacity charts using a USB mass storage device (USB key).

CAUTION

⚠️ **THE LOAD CANNOT BE MONITORED DURING THE DOWNLOAD PROCESS.**
BEFORE TRANSFERRING (OR DOWNLOADING) DATA LOGGER OR FIRMWARE UPDATES, MAKE SURE THE CRANE/MACHINERY IS STOPPED AND IS IN A SAFE STATE.

Figure: Transfer charts or data logger files

5.1 Data logger transfer from Display

5.1a Transfer from display to USB device

CAUTION

⚠️ *FOR OPTIMAL PERFORMANCE AND SIGNAL RECEPTION, THE LOAD CELL ANTENNA SHOULD HAVE A CLEAR LINE OF SIGHT TO THE GS550 UNDERHOOK DISPLAY.*

1. Make sure there is at least 4 MB of available space on the USB key. Connect the USB key in the USB port, on the left side of the display.
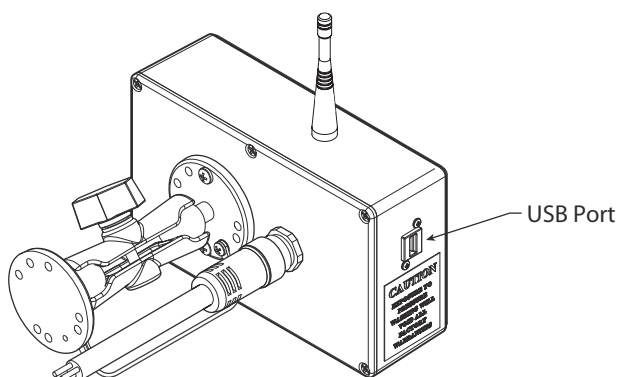

USB Port

Figure: Update firmware or download data logger files

2. After a short delay (about 2 seconds), "Copy datalog to USB" will appear on the LCD; press **Enter** to continue.
3. In most case, you will be prompted to enter a password; enter the download password given by *LSI-Robway* and press **Enter**.
4. Press **Enter** once again to confirm the data logger download "Data logger - Enter to transfer." This will begin the transfer.
5. Transfer progress is indicated on screen.
6. When the transfer is done, "Transfer successful" will appear for 2 seconds. Unplug the USB device. The GS550 Underhook will restart.
7. The crane is now ready for operation.

5.1b Transfer from USB device to PC

1. Connect the USB device to a computer.
2. The data logger file is located in the root directory of the USB device: "LSI_MM_dd_yyyy_hh_mm_ss.dtl" where the double letters represent the time and date of the USB transfer. The size of the USB transfer file should be 4096 kb.

5.2 Data Logger Viewer

The data logger viewer is a software application used to display the data logger log file on a personal computer (PC).

The data logger viewer converts the log file to a text (binary) file, and then displays the contents. Two reports can be produced and transferred to Excel, the full report and the wind speed report.

Figure: Data Logger Viewer