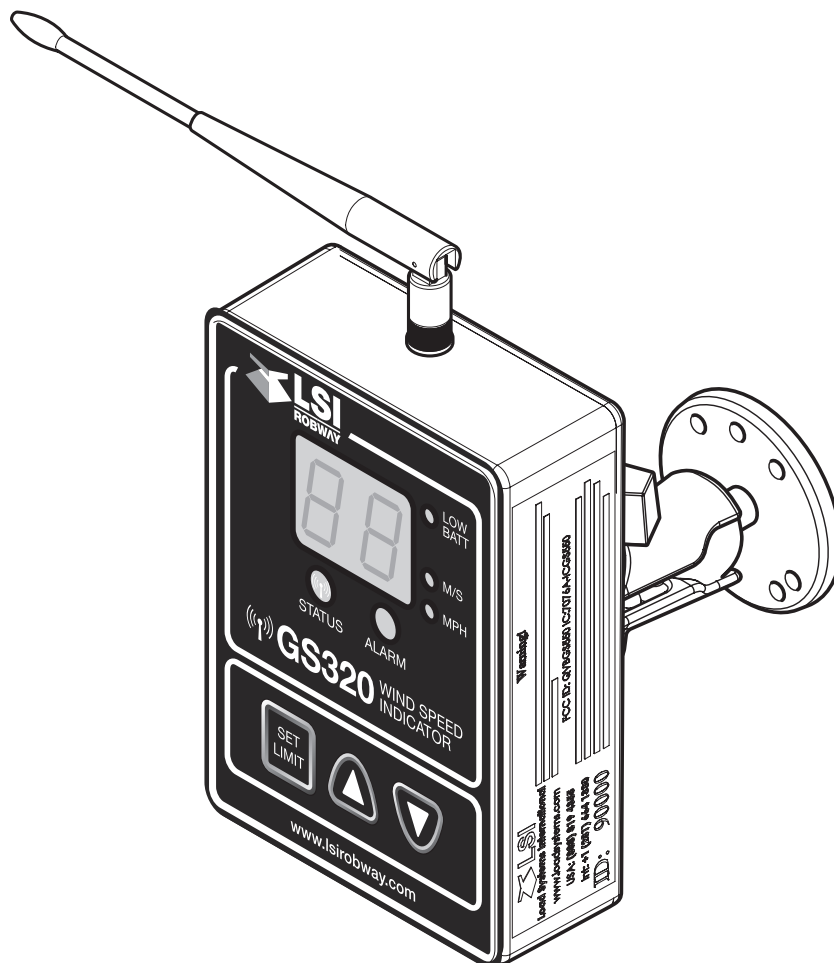


# GS320 Display & Wind Speed Sensor

## Installer and User's Manual



**ENGLISH**

## TABLE OF CONTENTS

<b>1: GENERAL</b>	<b>3</b>
1.1 Introduction	3
1.2 Recommended Operating Conditions	3
1.3 Start-Up	3
1.4 About This Manual	3
<b>2: OPERATION</b>	<b>4</b>
2.1 Units	4
2.2 Alarm Threshold	4
2.3 Listen-Only Mode	4
2.4 Display Settings	4
<b>3: MAINTENANCE</b>	<b>5</b>
3.1 Replacing the Sensor Battery	5
3.2 Replacing the Sensor Antenna	6
<b>4: INSTALLATION</b>	<b>7</b>
4.1 Display GS320	7
4.2 Power Supply Verification	8
4.3 Wireless Wind Speed Sensor GS020	9
<b>5: CERTIFICATION NOTES</b>	<b>10</b>
5.1 FCC and IC—Instructions to the User	10
5.2 CE	11
<b>6: LIMITED WARRANTY - APRIL 1<sup>ST</sup>, 2013</b>	<b>12</b>
6.1 Limited Warranty	12
6.2 Warranty Services Procedures	12
6.3 Exclusion of Other Warranties	12
6.4 Exclusion	13
6.5 Limitation of Liability	13
6.6 Recommended Practices	13
6.7 Choice of Law	13
6.8 Entire Agreement	13
6.9 Vienna Convention Excluded	13
<b>NOTES</b>	<b>14</b>
<b>REVISION HISTORY</b>	<b>15</b>

## LIST OF FIGURES

Figure 1: GS320 Display	4
Figure 2: Example of ID number 18820	4
Figure 3: Remove sensor box from mounting plate	5
Figure 4: Install the new battery	5
Figure 5: Apply non-corrosive RTV silicone	5
Figure 6: Unscrew the white nylon hex	6
Figure 7: Pull out the antenna	6
Figure 8: Coat the exposed metal foot of the antenna	6
Figure 9: Install the new antenna	6
Figure 10: Display dimensions (inches). Not to scale	7
Figure 11: Display mounting bracket footprint. Not to scale	7
Figure 12: Install the display and adjust orientation	7
Figure 13: Connection with green wire lockout and recommended Bosch relay	8
Figure 14: GS020 wireless wind speed sensor	9
Figure 15: Swivel orientation	9
Figure 16: Wind clearance	9
Figure 17: Radio line of sight – crane top view	9

# 1: GENERAL

## 1.1 Introduction

The wind speed indicator kit includes a GS320 display and a wind speed sensor. The GS320 creates a two-way radio network with the wind speed sensor to bring live readings on screen. The GS320 has a user-adjustable maximum wind speed limit and will generate an alarm when this limit is reached. Voltage is generated on the green wire when the system is in alarm mode; this can be used to activate a remote siren, light, or lockout function.

## 1.2 Recommended Operating Conditions

### Supply voltage:

9 to 30 volts

### Current requirements:

maximum 1 amperes

### Output wire voltage:

0 volts or supply voltage – 0.7 volts

### Output wire current capability:

0.75 amperes

### Operating temperature:

-40°C to +85°C (-40°F to 185°F)

## 1.3 Start-Up

On power up, the display will show two horizontal lines and the green status light will flash.



Once a reliable radio communication network is established, the display lights will remain lit without flashing. If the status light flashes continuously for more than 30 seconds, the GS320 may not be correctly programmed for the wind speed sensor. To correctly program the GS320 for the wind speed sensor, follow the **Wind speed ID number** procedure in Section 2, **Operation** on p. 4 of this manual.

### WARNING

THE GS320 SYSTEM IS DESIGNED AS AN OPERATOR AID AND IS IN NO WAY A SUBSTITUTE FOR SAFE OPERATING PRACTICES.

## 1.4 About This Manual

### WARNING

READ CAREFULLY AND UNDERSTAND THIS MANUAL BEFORE PROCEEDING.

This service manual describes how to install, operate and maintain the GS320 Display & Wind Speed Sensor.

While many sections of this service manual have information common to all LSI-Robway displays, this one is specific to the Wind Speed Sensor pairing.

### 1.4a How To Provide Feedback To LSI-Robway

LSI-Robway welcomes your feedback on the accuracy and effectiveness of this document. Please send feedback to [doc@lsirobway.com](mailto:doc@lsirobway.com). Please include the title of the manual and version (this information is in the Document Revision History on p. 15) with your feedback.

### 1.4b 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. 15 of the manual.

### 1.4c 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.**

## 2: OPERATION



Figure 1: GS320 Display

### 2.1 Units

The GS320 indicates wind speed in miles per hour (mph) or metres per second (m/s). Current units are indicated by a small green light.

To change units press and hold the **Down** button for 5 seconds. Verify the alarm threshold every time the current units are changed.

### 2.2 Alarm Threshold

Press the **Set Limit** button to see the alarm threshold.

#### NOTE

**EVERY TIME THE UNITS ARE CHANGED, THE LIMIT MUST BE VERIFIED AND RE-ADJUSTED IF REQUIRED.**

To change the limit, press and hold down the **Set Limit** button, and use the **Up** or **Down** buttons repeatedly to increase or decrease the limit.

### 2.3 Listen-Only Mode

When the GS320 is started, it wakes up the wind speed sensor programmed to it and takes control of the sensor. This means that if a second display is programmed for the sensor, it will take control of it; the sensor will no longer acknowledge communication from the first display. The GS320 can be programmed to operate in "listening mode". In this mode the GS320 will display information from the programmed sensor without becoming the network controller.

#### CAUTION

**A SENSOR CAN HAVE ONLY ONE NETWORK CONTROLLER AT A TIME. TO RECEIVE COMMUNICATION FROM A SENSOR WITHOUT TAKING CONTROL OF THAT SENSOR, THE DISPLAY MUST FIRST BE PROGRAMMED IN "LISTEN-ONLY MODE."**

### 2.4 Display Settings

This section describes how to manually change the ID number the GS320 will listen to, and how to change some other display behaviors. Changing the wind speed ID number is required only if the wind speed sensor is changed and the display must be manually set to listen to another one.

Press and hold the **Up** and **Down** buttons simultaneously for 5 seconds. The display will beep and then indicate the currently programmed wind speed sensor ID number, one digit at a time. The ID number must contain six digits; if the ID number is 120, the first three digits are "000."

1. Press **Set Limit** button to change from one screen to the next.

2. To change a digit, use the **Up** and **Down** buttons.

"**Ld**" means Listening De-activated (default). Press **Down** to change to "**LA**."



"**LA**" means Listening Mode Active. Another GS320 display must be the master of the wind speed sensor.



"**OS**" means Output Standard: fail safe output (default). The output provides power when wind speed is safe, below the limit. Press Down to change to "**OI**."



"**OI**" means Output Inverted: the output wire is energized when wind speed is above the limit. This could be use to power an external siren or horn.



"**SA**" means Save. When this screen is displayed, press the **Down** button to save the ID number and above options and then exit.



"**CA**" means Cancel. Press the **Down** button to exit without saving. The system will retain the previously set ID number and options.

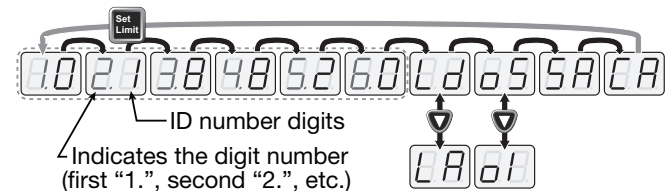


Figure 2: Example of ID number 18820

## 3: MAINTENANCE

### 3.1 Replacing the Sensor Battery

#### CAUTION



PROTECT THE INTERIOR OF THE SENSOR FROM DIRT AND HUMIDITY AT ALL TIMES.

#### NOTE



BOTH LITHIUM OR ALKALINE BATTERIES CAN BE USED; HOWEVER, A LITHIUM BATTERY WILL LAST ABOUT 2.5X LONGER.

1. Unscrew the two allen screws about a quarter of an inch.
2. Insert a flat bladed screwdriver in the battery cover notch to pry the box away from the mounting plate. The silicone seal may cause some resistance.

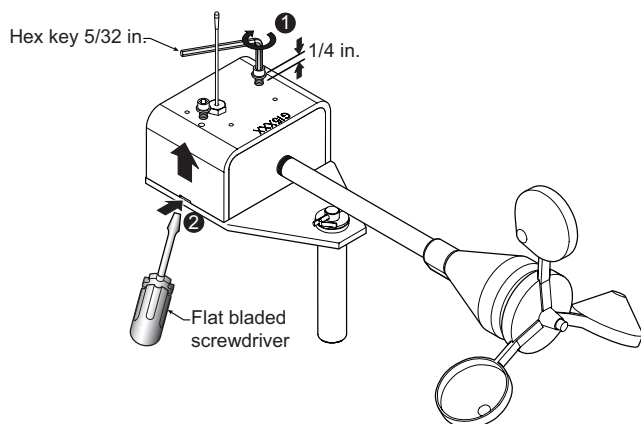


Figure 3: Remove sensor box from mounting plate

3. Remove the battery by hand.
4. Remove the remaining silicone from both the box and the mounting plate.
5. Install the new battery: insert the positive end and then push in the direction of the positive pole.

#### NOTE



A 3.6 VOLT LITHIUM "D" CELL BATTERY WILL PROVIDE ABOUT TWO YEARS OF BATTERY LIFE, WHILE AN ALKALINE "D" CELL BATTERY WILL PROVIDE LESS THAN ONE YEAR OF BATTERY LIFE\*.

\* Actual battery life will vary greatly depending on the application, the frequency of use, the age and quality of the battery, etc.

New high quality "D" cell battery: 3.6 V lithium, or "D" 1.5 V alkaline

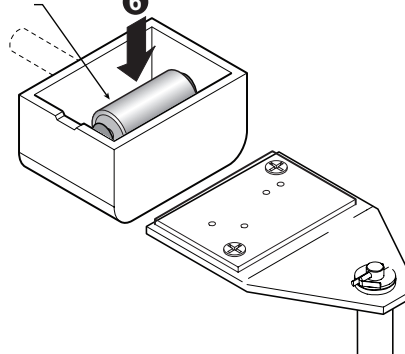


Figure 4: Install the new battery

6. Apply a non-corrosive RTV silicone all around the edge of the mounting plate to create a new seal without bubbles or breaks.

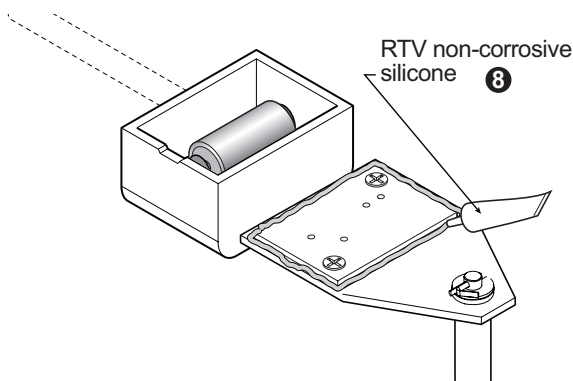


Figure 5: Apply non-corrosive RTV silicone

7. Reposition the box over the mounting plate and screw in the hex screws. Do not over-tighten.

## 3.2 Replacing the Sensor Antenna

Heavily damaged antennas (ripped out, sheared off, wire exposed and fraying etc.) should be replaced to ensure effective communication between the sensor and the cabin mounted display unit.

This procedure may be followed without removing the sensor from the crane if it is safe to do so.

### CAUTION

**THE INTERIOR OF THE SENSOR MUST BE PROTECTED FROM DUST, GRIME, AND WATER AT ALL TIMES.**

1. Place the crane, boom, jib, or ball hook such that the sensor is safely accessible.
2. Clean dust, grime, and water from the sensor.
3. Identify the short black whip antenna and the white hex bolt securing it.
4. Inspect the antenna for signs of obvious physical damage.
5. Carefully unscrew the white nylon hex bolt completely and slide it up the antenna.

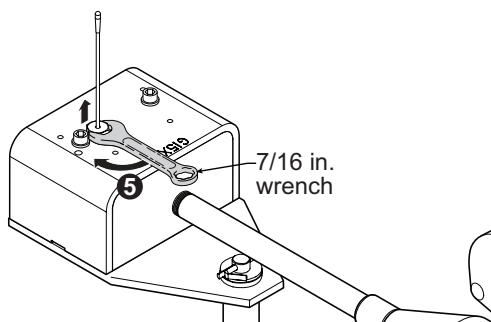


Figure 6: Unscrew the white nylon hex

6. Grip the antenna by the base of the black plastic sheathing and pull it straight out of the hole in which it is seated. Place the old antenna aside.

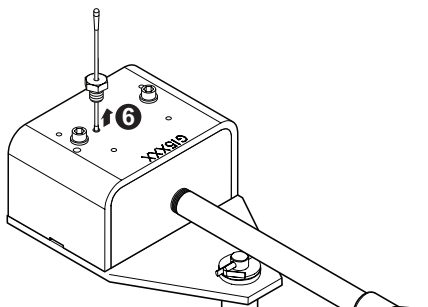


Figure 7: Pull out the antenna

7. Slide the white nylon hex bolt to the middle of the length of the new antenna.
8. Coat the exposed metal foot of the new antenna with an electrical insulating compound by carefully inserting it in the mouth of the compound tube.

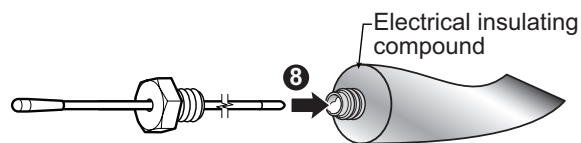


Figure 8: Coat the exposed metal foot of the antenna

9. Hold the new antenna by the black plastic sheathing and guide it through the hole in the sensor box. Carefully seat the antenna in its mating connector. When the antenna is correctly seated, pulling on it will be met with light resistance.

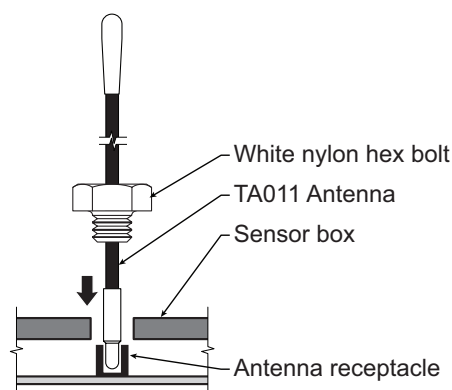


Figure 9: Install the new antenna

10. Carefully re-thread, screw-in and tighten the white nylon hex bolt to secure the antenna in place. **Do not overtighten.**
11. Reinstall the sensor if necessary.
12. Verify that the sensor functions properly.



## 4: INSTALLATION

### 4.1 Display GS320

#### 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.**

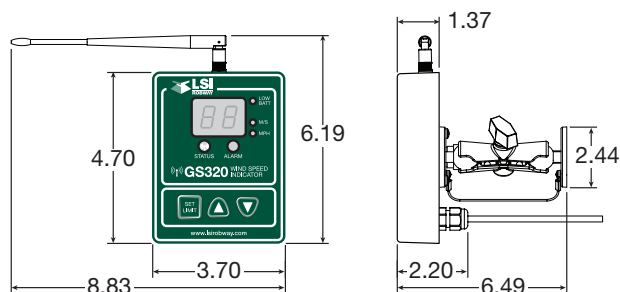
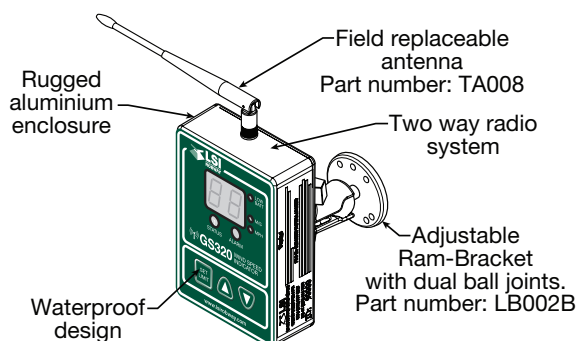


Figure 10: Display dimensions (inches). Not to scale

#### 4.1a Mounting Bracket

1. Determine the mounting location; the display may be installed either inside or outside the cab. It can be mounted on the dash, on a sidewall, or on the ceiling of the cab.

To ensure reliable radio communication between wind speed sensor and the GS320, the antenna should not be in contact with metal and should have a direct and clear line of sight to the sensor antenna. The mounting bracket requires a flat surface of at least 2.5 inches in diameter on both sides and where the back of the surface is accessible in order to tighten the nuts.

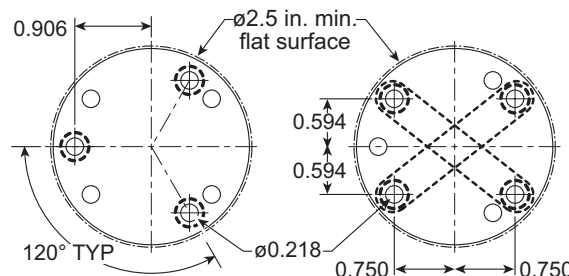


Figure 11: Display mounting bracket footprint. Not to scale

2. Drill 1/4-inch boltholes through the mounting surface with a 1/4-inch bit following either the two-, three-, or the four-hole configuration.
3. Install the display with bolts. Add washers and lock nut behind the mounting surface and tighten sufficiently (bolts, nuts and washers not included).

#### NOTE

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

4. Loosen the wing nut of the bracket arm to adjust display orientation to facilitate viewing by the operator and then tighten it back up.

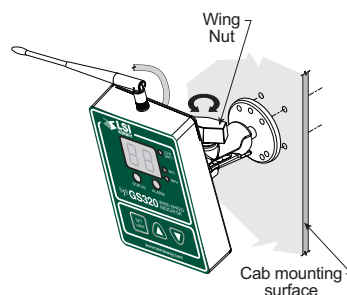


Figure 12: Install the display and adjust orientation

## 4.1b Antenna Position

**For optimal performance, the antenna should be positioned on its side such that it is parallel to the sensor antenna** (but not pointing directly to or directly away from it).

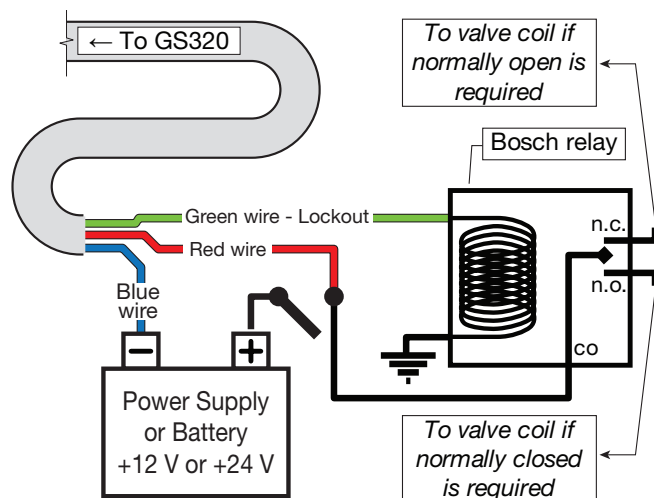
- Adjust the antenna position with the articulating base.
- The antenna should have 5 inches of clear space all around it.
- The antenna should have an unobstructed line of sight to all sensor antennas at all boom angles.

## 4.1c Power Supply and Lockout Connection

- Connect the blue wire (ground) to the negative terminal of the battery or the panel connection; alternatively, bolt the blue wire to the body of the machine with a 1/4-inch or 5/16-inch bolt. The ground connection must be strong enough to sustain three amperes.
- Connect the red wire to a fused accessory source, rated at least three amperes, that supplies +12 or +24 volts when the machine is in use. The GS320 will automatically detect the voltage level and adjust itself.
- Lockout wire (if required): connect the green wire to a Bosch relay coil terminal. Connect the other coil terminal of the relay to the ground. When in safe condition, the green wire will energize at the battery positive level.
- Any current greater than one ampere on the green wire triggers an auto re-settable fuse. Current will resume flowing several seconds after the short circuit is eliminated.

### NOTE

**IF NO VOLTAGE IS PRESENT ON THE GREEN WIRE, REMOVE THE LOAD CONNECTED TO IT.**



**Figure 13: Connection with green wire lockout and recommended Bosch relay**

## 4.2 Power Supply Verification

The power from the crane needs to be checked in the DC and AC modes under the following conditions:

- Engine start-up
- Engine idling
- Engine revving up, during complete process (not just when it is revved up)
- Engine revving down (same process as above)
- Engine shut-down

The DC power should not exceed 30 VDC and the AC should be negligible (e.g. <1 VAC).



### 4.3 Wireless Wind Speed Sensor GS020

1. Remove the mounting rod from the wind speed sensor.
2. Determine the mounting rod position.

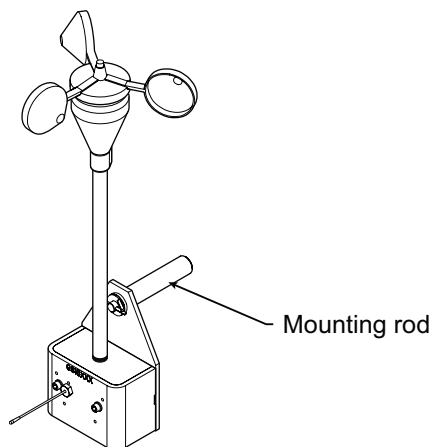


Figure 14: GS020 wireless wind speed sensor

#### CAUTION

**DO NOT WELD IN PROXIMITY TO LSI-ROBWAY SENSORS/TRANSMITTERS.**

- a. Install the mounting rod on the same side of the boom as the cabin mounted display, perpendicular to the boom, and at the highest point possible.
- b. The wind speed sensor must pivot freely on the mounting rod at all boom angles.
- c. The wind cups must be fully exposed to the wind and spin freely at all boom angles.

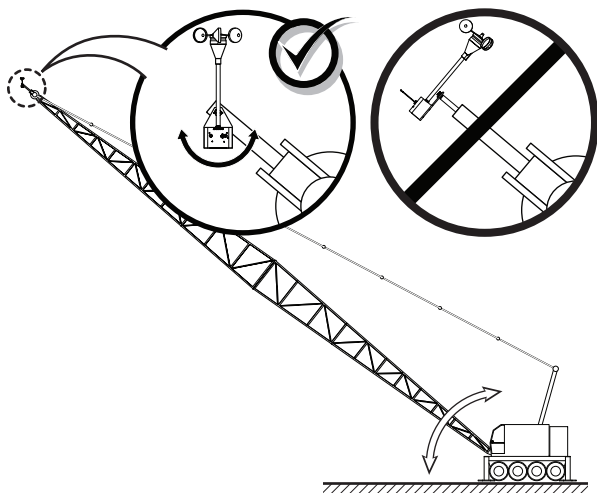


Figure 15: Swivel orientation

- d. There should be a clear and unobstructed line of sight between the wind speed sensor antenna and the cabin mounted display unit.

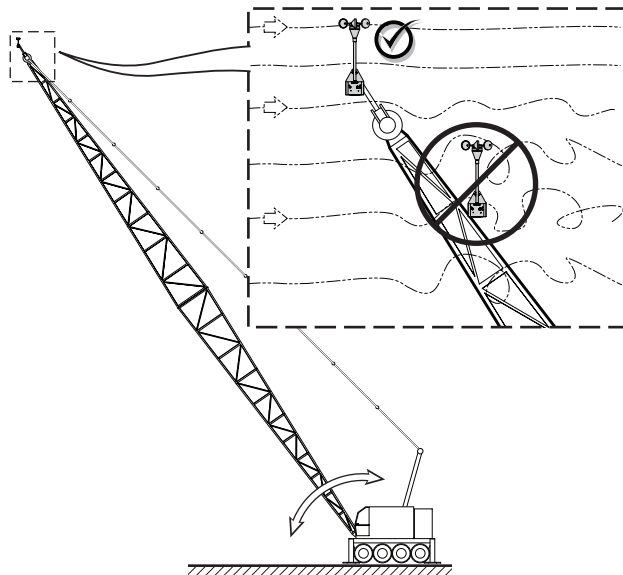


Figure 16: Wind clearance

- e. The transmitter antenna should not contact any metal object.
3. Weld or screw the mounting rod to the boom at the selected position.

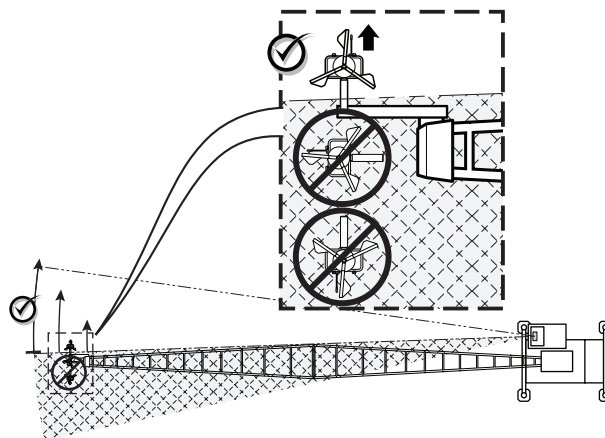


Figure 17: Radio line of sight – crane top view

#### NOTE

**ANGLE IRON CAN BE USED TO EXTEND THE MOUNTING POSITION TO BE CLEAR OF THE BOOM TOP.**

4. Re-position the wind speed sensor on the mounting rod. Add the washer and secure with the cotter pin.

## 5: CERTIFICATION NOTES

### 5.1 FCC and IC—Instructions to the User

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception.

#### **FCC ID: QVBGS300 IC: 7076A-ICGS300**

##### **RF Exposure Warning:**

This product complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. To comply with RF exposure requirements, the unit must be installed and operated with 20 cm (8 in.) or more between the product and your body. This product may not be collocated or operated in conjunction with any other antenna or transmitter.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 2.0 dB. Antennas not included in this list or having a gain greater than 2.0 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

##### **ANTENNA LIST**

LSI-Robway P/N:	TA008
Description:	1/2 wave dipole
MFG	Nearson
MFG P/N:	S467AH-915S

#### **FCC ID: QVBGS000 IC: 7076A-ICGS000**

##### **RF Exposure Warning:**

This product complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. To comply with RF exposure requirements, the unit must be installed and operated with 20 cm (8 in.) or more between the product and your body. This product may not be collocated or operated in conjunction with any other antenna or transmitter.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 3.0 dB. Antennas not included in this list or having a gain greater than 3.0 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

##### **ANTENNA LIST**

LSI-Robway P/N:	TA011
Description:	1/4 wave monopole
MFG	LSI-Robway

## 5.2 CE

### 5.2a Declaration of conformity



#### Declaration of Conformity According to EN 45014

**Manufacturer's Name:** Load Systems International Inc.

**Manufacturer's Address:**

**Canada:**

4495 Blvd. Wilfrid-Hamel, Suite 110  
Québec, QC, Canada, G1P 2J7

**United States of America:**

9223 Solon, Suite A  
Houston, TX 77064

**United Arab Emirates:**

Q3-171 SAIF Zone, P.O. Box 7976  
Sharjah - UAE

declare under our own responsibility that the products:

Model	Description
GC005-CE, GC005-ATEX-CE	5 000 lb Capacity Load Cell
GC012-CE, GC012-ATEX-CE	12 000 lb Capacity Load Cell
GC018-CE, GC018-ATEX-CE	18 000 lb Capacity Load Cell
GC035-CE, GC035-ATEX-CE	35 000 lb Capacity Load Cell
GC060-CE, GC060-ATEX-CE	60 000 lb Capacity Load Cell
GC100-CE, GC100-ATEX-CE	100 000 lb Capacity Load Cell
GC170-CE, GC170-ATEX-CE	170 000 lb Capacity Load Cell
GS001-CE, GS001-ATEX-CE	Load Transmitter With Pigtail 6 in.
GS002-CE, GS002-ATEX-CE	Load Transmitter With Pigtail 6 in for balanced cell
GS005-CE, GS005-ATEX-CE	Anti-Two-Block Transmitter
GS010-XX-CE, GS010-XX-ATEX-CE	Angle Sensor
GS011-XX-CE, GS011-XX-ATEX-CE	Angle Sensor With Length Input
GS012-CE	Angle Length Sensor
GS020-CE, GS020-ATEX-CE	Wind Speed Sensor
GS035-CE	Pressure Transducer
GS050-CE, GS050-ATEX-CE	Anti-Two-Block Sensor
GS075-CE	All-In-One Anti-Two-Block Switch Weight
GS2XX-CE	LSI Wireless Gateway
GS320-CE	Stand Alone Wind Speed Display
GS375-CE	Stand Alone A2B Display
GS550-CE, GS550-ATEX-CE	Standard GS display
GS550-03-CE	Hand-Held GS display
GS550-XX-CE	OEM GS display
GS820-CE	Graphical GS display


to which this declaration refers conform to the relevant standards or other standardising documents:

**Safety:** IEC 61010-1: 2<sup>nd</sup> ed. (2001), EN 61010-1: 2<sup>nd</sup> ed. (2001)

**Wireless:** EN 300 220-3 V1.1.1 (2000-09)

**EMC:** EN 301 489-3 V1.4.1 (2002-08)

Québec, April 1<sup>st</sup>, 2010

  
Eric Beaulieu  
Technologies Manager

### 5.2b CE Safety

#### WARNING

**WHEN SENSORS ARE USED, THE AMBIENT TEMPERATURE SHOULD NOT BE HIGHER THAN 84°C AND THE DISPLAY SHOULD NOT BE USED WHEN THE AMBIENT TEMPERATURE IS HIGHER THAN 59°C, OTHERWISE THERE CAN BE A BURN POSSIBILITY.**

**FOR THE OPERATOR'S SAFETY, TAKE ONLY THE AMBIENT TEMPERATURE RANGE INTO CONSIDERATION. THE DEVICE SHOULD BE USED WITHIN THE SPECIFIED RANGES.**

#### CAUTION

**THE IP OF EQUIPMENT CORRESPONDS TO 65.**

#### WARNING

**THE PROTECTION WILL BE IMPAIRED IF THE MATERIAL AND EQUIPMENT ARE USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER.**

## 6: LIMITED WARRANTY - APRIL 1<sup>ST</sup>, 2013

### 6.1 Limited Warranty

LOAD SYSTEMS INTERNATIONAL INC. (hereafter “LSI”) warrants its products (the “Products”) will be free from defects in materials and workmanship for a period as determined by the product family as indicated below (the “Warranty Period”).

warranty duration	product family
24 months	GC Series Load Cells, GD Series Line Riders, GP Series Load Pins GS001, GS002, GS003, GS004, GS005, GS007, GS010, GS011, GS012, GS020, GS030, GS031, GS035, GS050, GS075, GS101, GS106, GS110, GS112, GS220, GS221, GS222, GS224, GS550, GS820, LP Series Load Pins, LS051, LS055, PT00100
12 months	GS026, GS320, GS375

Unless otherwise specified, the default Warranty Period for the Products is 12 months after delivery of such product. Please consult LSI for any Product that is not listed in the above chart for further details.

The Warranty Period commences after delivery of such Products to the user (as evidenced on a LSI document) subject to installation and use in accordance with specifications described in the LSI Installer and User’s Manual, as amended from time to time, LSI technical materials and any related writings published by LSI with respect with such Products and any applicable industry standards.

During the Warranty Period, LSI or its designated service representative shall repair, or at its option, replace any Product that is confirmed to be defective by LSI, in its sole discretion, in accordance with the Limited Warranty Services Procedures described in this section.

### 6.2 Warranty Services Procedures

In order to benefit from this Limited Warranty, the purchaser must notify LSI’s customer service or LSI’s authorized distributor or representative originally responsible for the sale of the Products within 10 days of the occurrence of a suspected defect in materials or workmanship, and in any case prior to the expiry of the Warranty Period. Timely notification will permit the purchaser to obtain a Return Authorization Number which will indicate return procedures and terms and conditions of such returns. A proof of purchase of the Product, such as an invoice or a receipt certifying the validity of the Warranty, must be presented in order to obtain Limited Warranty coverage. In any event, even if a Return Authorization Number is provided to purchaser, LSI reserves the right to inspect the damaged

Product or part before its final decision to repair or replace the defective Product or part.

The Product or part shall be returned to LSI or its designated service representative, accompanied by the Return Authorization Number with prepaid shipping charges. The purchaser must insure the shipment or accept the risk of loss or damage during the shipment. Purchaser shall also pay any tariff or duty applicable to the return of the defective part or Product. LSI will, at its option, repair or replace the Product or part returned to LSI or to its designated service representative. LSI owns all parts or Products replaced, repaired or removed from a repaired Product. If LSI repairs a Product, the Product Warranty coverage Period is not extended and the Limited Warranty shall expire as if uninterrupted at the end of the last month of the original Warranty Period from shipping from LSI. If LSI replaces a Product, the replaced Product is warranted for the remainder of the original term or sixty consecutive (60) days, whichever is longer.

LSI reserves the right to require from the user or owner of the Products, prior to determining if the Limited Warranty coverage is applicable, that LSI receive the data logging equipment used with the Products and that LSI be authorized to retrieve all information from such data logging equipment in order to, among others, ensure that the written instructions and applicable standards, including safety margins, were respected and not exceeded during Product use. Failure by the owner or user of the Product to supply such information shall be deemed a material default of the terms and conditions of this Limited Warranty and shall be irrevocably construed as evidence that the Product was misused or abused. Consequently LSI shall irrevocably be relieved of any obligations to compensate the user or owner of the Product for any and all damages resulting from Product failures when data logging equipment, and access to its content, cannot be freely and readily provided, unhampered, to LSI.

LSI will pay ground freight transportation costs of replacement or repaired parts or Products to the destination in the countries in which it maintains a service center (currently Canada, continental United States of America, United Kingdom, Australia and the United Arab Emirates) (the “Territory”). LSI will not pay any transportation costs of replacement or repaired parts to a destination outside of the Territory. Shipping and handling costs to locations outside the Territory shall be the responsibility of and borne by Purchaser or Owner of the Product prior to any shipment by LSI. (Contact LSI to obtain a Return Authorization Number and the address to ship parts).

### 6.3 Exclusion of Other Warranties

THE ABOVE WARRANTY IS THE SOLE WARRANTY APPLICABLE AND THERE ARE NO EXPRESS, LEGAL OR IMPLIED WARRANTIES OR CONDITIONS IN RELATION TO ANY PRODUCTS INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, NON-INFRINGEMENT



OR FITNESS FOR A PARTICULAR PURPOSE AND THOSE OTHERWISE ARISING BY STATUTE OR OTHERWISE IN LAW OR FROM A COURSE OF DEALING OR USAGE OF TRADE, WHICH ARE EXPRESSLY DISCLAIMED. NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY LSI OR ITS EMPLOYEES OR REPRESENTATIVES SHALL CREATE A WARRANTY OR CONDITION OR IN ANY WAY INCREASE THE SCOPE OF LSI'S OBLIGATIONS. LSI DOES NOT WARRANT THAT THE BUSINESS RESULTS OBTAINED FROM THE USE OF THE PRODUCTS WILL BE APPROPRIATE OR ADEQUATE FOR THE PURCHASER.

## **6.4 Exclusion**

This Limited Warranty does not cover and shall not apply to:

- Any Product that is misused or abused, including being altered, modified or repaired not in accordance with LSI written instructions or authorizations or used not in compliance with LSI's instructions and/or industry standards and practices;
- Any incidental costs or expense, such as shipping charges to LSI or an designated service representative as well as the technician out-of-pocket expenses including traveling, lodging and meal expenses, if any; The damages caused during the transport or the moving of the Product;
- Damages caused by accidents, abuse, misuse, a force majeure (described as events outside a LSI's or any Product user's control, including war, riot, strikes, embargoes) or external cause;
- Any cost, damage or expenses for field labor or any other expenses related to or arising from the replacement of defective parts.
- Products used for pile-driving, wire rope activated clamshell or dragline applications. If purchaser uses the Products for pile-driving, wire rope activated clamshell or dragline application, the Limited Warranty will be deemed to have been violated for abuse.
- Any costs associated with providing LSI with data logging equipment.

## **6.5 Limitation of Liability**

To the maximum extent permitted by applicable law, in no event will LSI be liable to the purchaser or any third party for any indirect, special, consequential, incidental or exemplary damages whatsoever, including but not limited to loss of revenue or profit, lost or damaged data, business interruption or any other pecuniary loss whether based on contract, tort or other causes of action, even if LSI has been advised of the possibility of such damages. In any event, the total liability of LSI arising from any cause of action or claim whatsoever, whether (1) in contract, (2) in tort (including negligence, whether sole, joint, contributory, concurrent or otherwise, but not including intentional, reckless or wanton tort), (3) under strict liability, (4) under any environmental or antipollution

law or regulation, (5) connected with any toxic or hazardous substance or constituent, (6) arising out of any representation or instruction, or under any warranty, (7) or otherwise, arising out of, connected with, or resulting from the design, manufacture, sale, resale, delivery, repair, replacement or use of Products or the furnishing of any service shall in no event exceed the price allocable to and paid to LSI for the individual unit of Products or service or part thereof which gives rise to the cause of action or claim.

SOME STATES OR JURISDICTIONS DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

## **6.6 Recommended Practices**

LSI recommends careful consideration of the following factors when specifying and installing the Products. Before installing a Product, the Installation, Operation, and Maintenance instructions provided with the unit must be read and understood and complied with.

## **6.7 Choice of Law**

This Limited Warranty shall be governed by and construed in accordance with:

- the laws of the Province of Quebec, Canada for products sold by LSI in Quebec;
- the laws of the Province of Ontario, Canada for products sold by LSI in Ontario and anywhere else in Canada; and
- the laws of the State of New York for products sold by LSI anywhere in the United States of America or anywhere else, excluding Canada.

## **6.8 Entire Agreement**

This document contains the entire agreement of the parties regarding the subject matter of the Product and supersedes all previous communications, representations, understandings and agreements, either oral or written, between you and LSI.

## **6.9 Vienna Convention Excluded**

The United Nations Convention on Contracts for the International Sale of Goods does not apply to this Limited Warranty.

NOTES



## REVISION HISTORY

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Version	Date	Summary of Change	Approved By
1.1	May 21, 2013	Updated formatting to LSI-Robway style.	B. Pimparé
1.2	July 30, 2013	Minor formatting and wording changes for internal consistency.	M. Young
1.3	Feb. 23, 2015	Logo & address updates, etc.	A. Latvatalo

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## **LSI-Robway technical support is available 24 hours a day, 7 days a week**

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**[techsupport@loadsystems.com](mailto:techsupport@loadsystems.com)**

### **USA**

**Load Systems  
International Corp.**  
9633 Zaka Road  
Houston, TX 77064  
Toll Free Tel: +1.888.819.4355  
Toll Free Fax: +1.888.238.4099  
Tel: +1.281.664.1330  
Fax: +1.281.664.1390  
[sales@loadsystems.com](mailto:sales@loadsystems.com)

### **UK**

**Load Systems UK Ltd.**  
Unit 5, Silverfield House  
Claymore Drive  
Aberdeen Energy Park, Bridge of Don  
Aberdeen AB23 8GD  
Scotland, UK  
Tel: +44 (0) 1224.392900  
Fax: +44 (0) 1224.392920  
[uksales@loadsystems.com](mailto:uksales@loadsystems.com)

### **AUSTRALIA**

**LSI Robway Pty Ltd.**  
32 West Thebarton Road  
Thebarton, South Australia 5031  
Tel: +61 (08) 8238.3500  
Fax: +61 (08) 8352.1684  
[sales@lsirobway.com.au](mailto:sales@lsirobway.com.au)

### **DUBAI – UAE**

**Load Systems International FZE**  
Q3-171 SAIF Zone  
PO Box 7976  
Sharjah, UAE  
Tel: 971.6.557.8314  
Fax: 971.6.557.8315  
[lsifzc@emirates.net.ae](mailto:lsifzc@emirates.net.ae)

### **CANADA**

#### **PRODUCTION AND R&D**

**Load Systems International Inc.**  
2666 boul. du Parc Technologique  
Suite 190, Québec, QC G1P 4S6  
Tel: +1.418.650.2330  
Fax: +1.418.650.3340  
[sales@loadsystems.com](mailto:sales@loadsystems.com)