GS010-V2

# Wireless Level Sensor (Inclinometer)

## Features:

- Resolution of 0.1 degrees
- Accuracy: typical: 0.3 degrees
- Available as a dual axis inclinometer
- Ruggedized water proof enclosure IP66
- 1 to 2 years battery life for typical applications
- Line of sight radio range of 4000 ft (1300m)
- No internal moving parts
- Operates from one 'D' cell battery lithium 3.6V or alkaline 1.5V.
- ISM License free band with wavelength and modulation optimized for radio communication in industrial environment.
- Industrial (-40°C to 85°C / -40°F to 185°F) tested industrial temperature ratings. Humidity 0 to 100%RH.
- Temperature compensated
- Potted electronics for increase water proof protection


*Inclinometer – GS010-01-V2*

Part number GS010-03-V2 is a dual axis mode. The sensor must then be installed with the antenna pointing up.

## Applications:

- Crane boom angle
- Hook block inclination
- Any moving equipment or slow moving parts
- Barge level monitoring

## General Description:

The angle sensor comes in three different configurations depending on the application:

Part number GS010-01-V2 is optimize for crane boom angle measurement type of application, the basic angle sensor reads from: -90° (pointing down) to +130°. Automatically detect left hand and right hand sides and switch sides.

Part number GS010-02-V2 will transmit angles between 0° and 360°. Zero degrees is when the angle sensor is level, such as laying on a table. If the sensor is tilted up, the angle will increase, to show 90° when pointing up. If the angel is lowered to point downward, its angle will show 359.9° and lower.

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## Ordering information

| Model | Description |
|---|---|
| GS010-01-V2 | Angle sensor: -90° to +130°. Automatically detect left hand and right hand sides and switch sides. |
| GS010-02-V2 | Angle sensor 0° to 360° |
| GS010-03-V2 | Dual axis, 'list and trim' angle sensor. |
| | |
| GS010-xx-CE-V2 | 868MHz frequency band |
| GS010-xx-CSA-V2 | 915MHz frequency band with class 1 division 1 certification |
| | |
| GS010-xx-P-V2 | Powered by external voltage source. Choose a cable length p/n LB550 |
| | |
| **Related part number** | |
| Solder lugs | included |

## Specifications

| Parameter | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **Accuracy** | | | | | |
| Resolution | | | 0.1 | | Degree |
| Accuracy | Depends on sensitivity adjustment.default=0.5 | 0.1 | 0.5 | 1.0 | Degree |
| **Sensitivity parameter adjustment** | | | | | |
| | Sensitivity=0% | | 1.0 | | Degree |
| | Sensitivity=100% | | 0.5 | | Degree |
| | Sensitivity=200% | | 0.1 | | Degree |
| **Radio Power** | | | | | |
| | GS010-01-PV-V2 | | 0.0054 | | Watts |
| | | | 7 | | dBm |
| **Radio Frequency** | | | | | |
| North American version | | 903 | 916 | 927 | MHz |
| European version | -CE | 868 | 869 | 870 | MHz |
| **Battery life** | | | | | |
| | Lithium 'D'cell battery life (depends on usage) | 12 | 24 | 28 | Months |
| | Alkaline 'D'cell battery life | 8 | 12 | 14 | Months |
| **Other** | | | | | |
| Weight | GS010-V2 | | 1 (0,45) | | lbs (kg) |

## Absolute Maximum Ratings

| Parameter | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Input voltage | | 0.9 | 3.6 | 5 | V |
| Temperature range | Operating | -40 | | +60 | ºC |
| | | (-40) | | (+140) | (°F) |
| Temperature range | Storage | -40 | | +85 | ºC |
| | | (-40) | | (+185) | (°F) |

## Certifications

FCC/IC/CE certification : FCC Part 15 Subpart C 15.247,15.205, 15.207 & 15.209
ETSI EN 300 220 (AA)

EMI/C - EN 61000-4-3, EN 301 489-1 - Clause 8.2, EN 61000-4-2

CSA certificate number – 80130757

CSA C22.2 No. 60079-0:19, 60079-11:14 (R2018), 61010-1-12, Update 1&2, Amd1:2018
UL 60079-0-2020, UL 60079-11-2018, UL 61010-1-2018

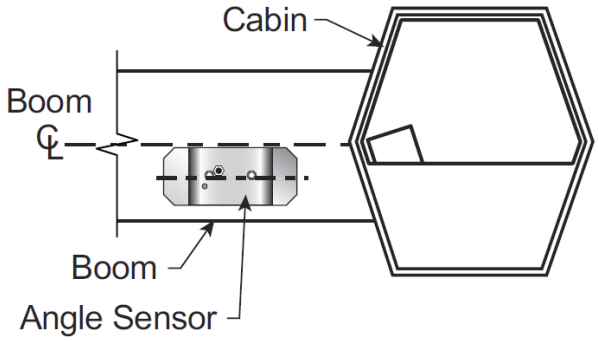
Class I, Division 1, Group A, B, C & D T4
Ex ia IIC T4 Ga
Class I, Zone 0, AEx ia IIC T4 Ga

Ambient Temperature: -20°C to 40°C

**WARNING: Only use Tadiran TL-5930 3.6V or Saft LS33600 cell 3.6V text.**

**l'avertissement: Utilisez uniquement du texte Tadiran TL-5930 3,6 V ou Saft LS33600 3,6 V.**

## Installation

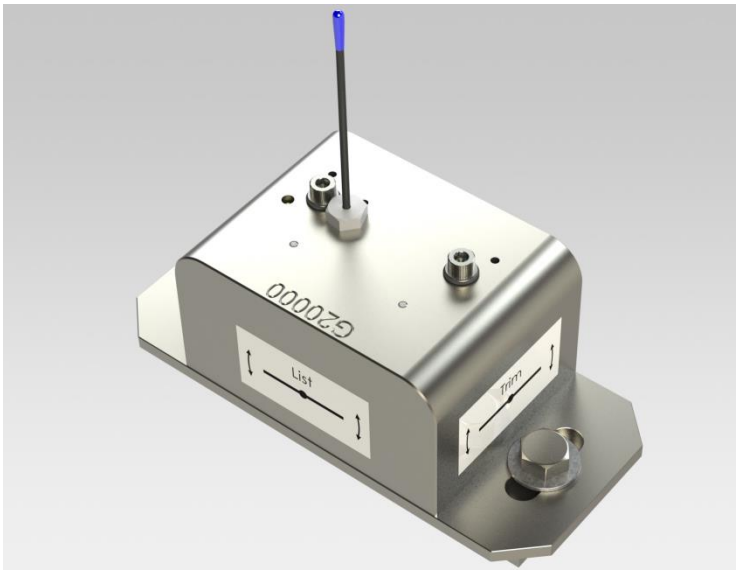



**Example: transmitter installation on the side of a crane boom**

**Part number GS010-01-V2 & GS010-02-V2:**
The GS010-V2 series angle sensors can be turned on by starting up the receiver to which they are programmed. The angle sensor can then assist in levelling itself with the red and green LED.

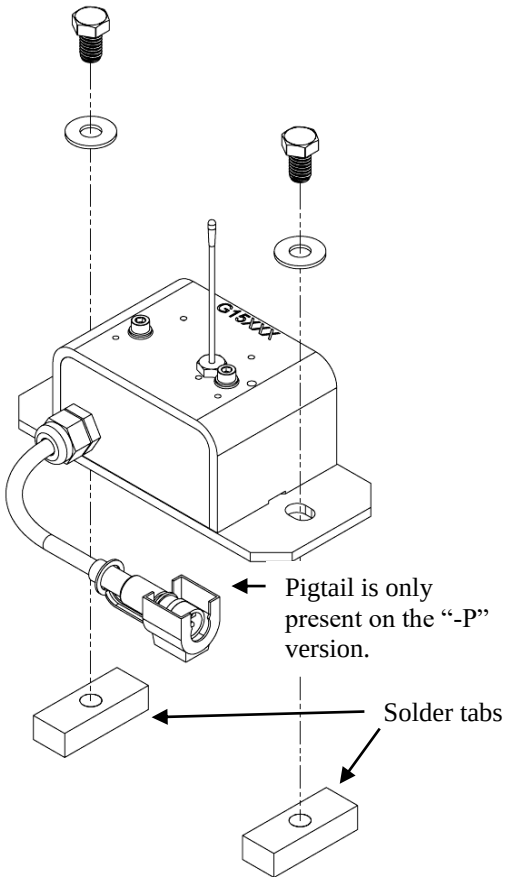
1. Determine the angle sensor position.
    a. The GS010-01-V2 boom angle sensor can be mounted on either side of the boom.
    b. The GS010-02-V2 360° angle sensor must be mounted on the port side of the jib.
    c. The angle sensor must be level with the boom or jib centerline.
    d. The top / bottom axis of the angle sensor must be within 15 degrees of vertical
    e. The angle sensor should have a clear line of sight to the cabin mounted display.
    f. The angle sensor antenna should not contact a metal object.
2. Install the welding pads; keep the angle sensor at least three feet from the weld site and any connecting metal objects while welding.
3. Mount the angle sensor to the weld pads with the screws and washers provided.
4. Verify angle indication at the receiving end.

**Part number GS010-03-V2:**
The List and Trim angle sensor is a dual axis angle sensor. It monitors tilt angles from its front to back and left to right axis (when the antenna points up) and wirelessly transmits the two angles on the LSI radio network. It is packaged in a rugged stainless steel enclosure able to resist to all outside environment.



## Dimensions

*Units are in inches [millimeters]*



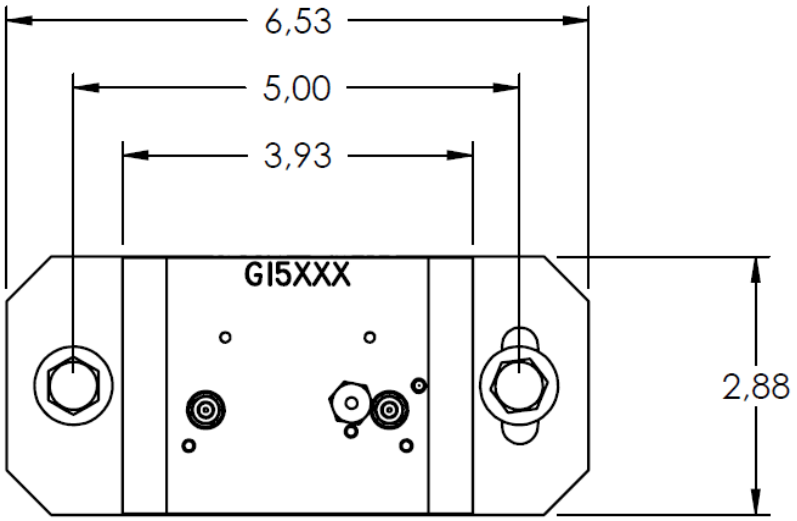




*Figure: shows the 'powered' version with a 2 wires pigtail*

The transmitter is supplied with two solder tabs and a set of screws. Weld the solder tabs, tap holes or use nuts to fix and hold the transmitter in place.

GS010-V2

PMN: GS010-01-PV-V2
HVIN: MB104-00-SD-A

## FCC Compliance Statement (USA)

FCC ID: S9E-GS200C

Compliance Statements: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including, an interference that may cause undesired operation.
Caution Statements:
• Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
• This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

## Industry Canada (IC) Compliance Statement

IC: 5817A-GS000C

Compliance Statements: This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: 1) This device may not cause interference., 2) This device must accept any interference, including interference that may cause undesired operation of the device.
Déclarations de conformité: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution Statements:
• This equipment complies with radio frequency exposure limits set forth by Industry Cananda for an uncontrolled environment.
• This equipment should be installed and operated with a minimum distance of 20 cm between the device and the user or bystanders.
Déclarations de mise en garde:
• Cet équipement est conforme aux limites d'exposition aux radiofréquences defines par Indstrie Canada pourun environment non contrôlé.
• Cet équipement doit être installé et utilisé aven un minimum de 20 cm de distance dispositif et l'utilisateur ou des tiers.

## Information to the User

NOTE: 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.