

GS030-V2

Crane Slew-Angle Wireless Measurement Sensor

Features

- Resolution of 0.1°
- Accuracy: typical: 0.5° over 360°
- Range: 0 to 360°
- Rugged water proof enclosure IP66
- Potted electronics for increased water protection
- Industrial tested environments: -40°C to 85°C (-40°F to 185°F); 0 to 100% relative humidity.
- Temperature compensated
- Radio range with line of sight: 4000 ft. (1300 m)
- ISM license free radio; wavelength and modulation optimized for radio communication in industrial environments.
- Operates with one 'D' cell battery lithium 3.6V or alkaline 1.5V.
- 1 to 2 years battery life for typical applications

Application

Crane slew angle measurement. The slew angle is the angle of rotation of the crane boom (upper) relative to the crane carrier (lower). Slew angle is also sometimes referred to as swing angle.

General Description

The slew sensor is composed of two parts, the encoder assembly and the sensor transmitter. They are connected together with 6 ft. (2 m) of cable. The slew sensor sends the current crane slewing angle to the cab mounted display for limit monitoring, load chart selection, work area definition and crane function lockout.

Several gear models are available to adapt the slew sensor to slewing rings with different tooth sizes. Consult the gear selection section in this document for more details.



Slew encoder assembly p/n GS031-V2



Slew sensor transmitter p/n GS030-V2

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Ordering Information

Model	Description
GS030-V2	Slew Sensor Transmitter - 916MHz frequency band
GS030-CE-V2	Slew Sensor Transmitter - 868MHz frequency band
GS030-CSA-V2	Slew Sensor Transmitter - Intrinsically Safe CSA Class 1 Division 1 (916MHz)
GS030-10-V2	Slew Sensor Transmitter - Intrinsically Safe (868 MHz)
GS031-V2	Slew encoder assembly
GS031-10-V2	Slew encoder assembly - Intrinsically Safe.
PA133-01 to PA133-05	Mating gears for the GS031-V2, see the gear selection section later in this document
TA011	Replaceable sensor transmitter antenna

Sensor kit examples:

A) GS030-V2 + GS031-V2 + PA133-xx

B) Typical European system: GS030-CE-V2 + GS031-V2 + PA133-xx

B) Typical Class 1 div 1 system: GS030-CSA-V2 + GS031-V2 + PA133-xx

Specifications

Parameter	Test Condition	Min	Typ	Max	Unit
Slew Angle					
Resolution			0.1		Degree
Accuracy	Depends on sensitivity adjustment (default = 0.5°)	0.1	0.5	1.0	Degree
Sensitivity adjustment					
	Sensitivity=0%		0.9		Degree
	Sensitivity=100%		0.5		Degree
	Sensitivity=200%		0.1		Degree
Radio Power					
	GS032-FCC-V2	0.0054			
		7			W dBm
Radio Frequency					
North American version	GS030/-CSA-V2	903	916	927	MHz
European version	GS030-CE/-10-V2	868	869	870	MHz
Battery life	'D' cell battery life depends on usage	12	24	28	Month
Other					
Weight	GS030-V2	2.1			lb
		(0.95)			(kg)
Weight	GS031-V2	1			lb
		(0.45)			(kg)

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Absolute Maximum Ratings

Parameter	Test Condition	Min	Typ	Max	Unit
Input voltage		0.9	3.6	5	V
Temperature range	Operating	-40 (-40)		+60 (+140)	°C (°F)
Temperature range	Storage	-50 (-50)		+70 (+158)	°C (°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

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.



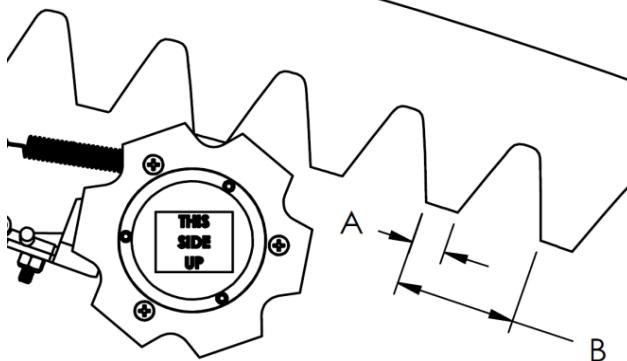
WARNING: Only use Tadiran TL-5930 3.6V or Saft LS33600 cell 3.6V text.

l'avertissement: Utilisez uniquement du texte Tadiran TL-5930 3.6 V ou Saft LS33600 3.6 V.

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Gear Selection

Measure the dimensions 'A' and 'B' before ordering and LSI will provide the right mating gear for the slew sensor. The crane slew gear may be internal or external.

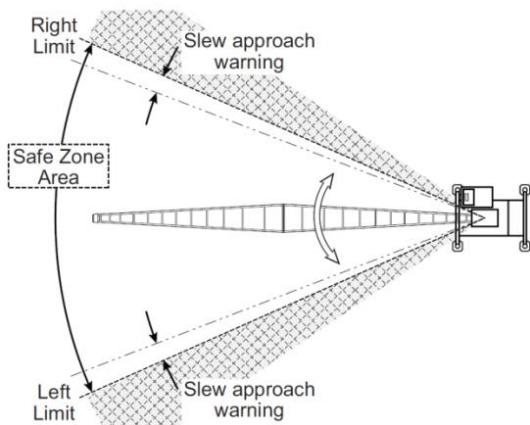


The dimensions "A" and "B" are all that is required to find the right mating gear.

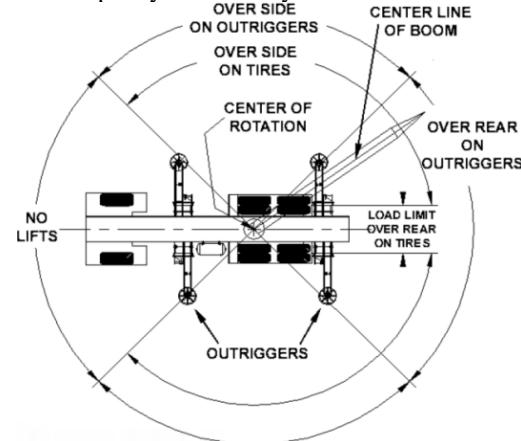
Application Details

Several applications are possible when the slew sensor is used with a compatible GS550-V2 or GS820-V2 display.

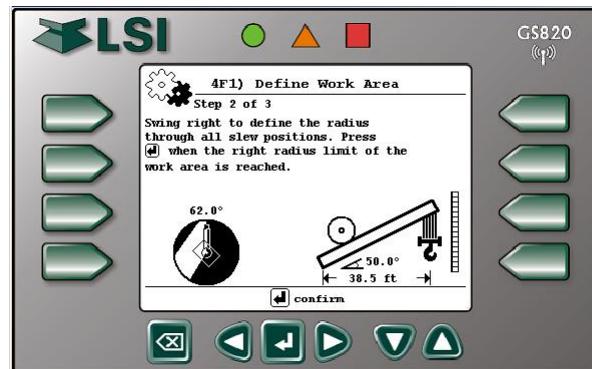
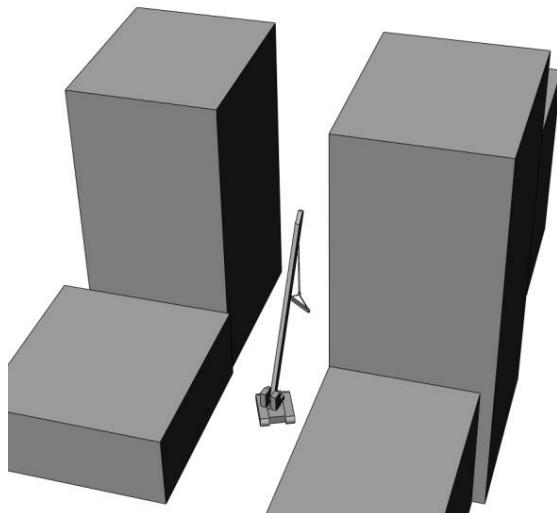
- 1) Set **slew angle limits** to limit rotation to the left or right. Crane function lockout can then be used to slow and stop the crane rotation safely when a slew angle limit is approached.



- 2) Select the correct load charts automatically based on **chart working area** when the slew sensor is used with a rated capacity indicator system.



- 3) Define **safe work areas** when the slew sensor is used with a load radius indicator system.

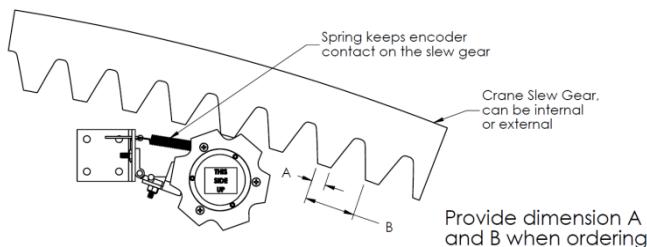


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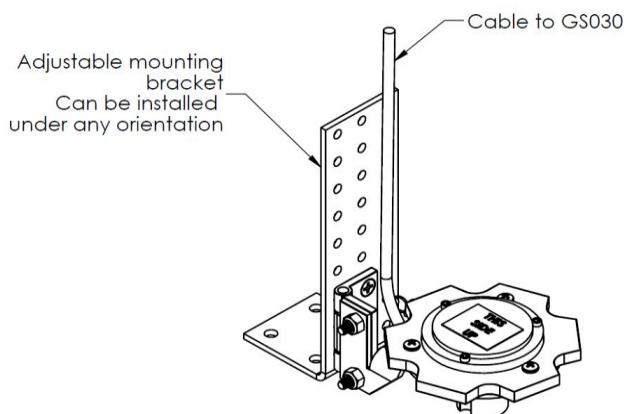
Installation

Slew encoder assembly

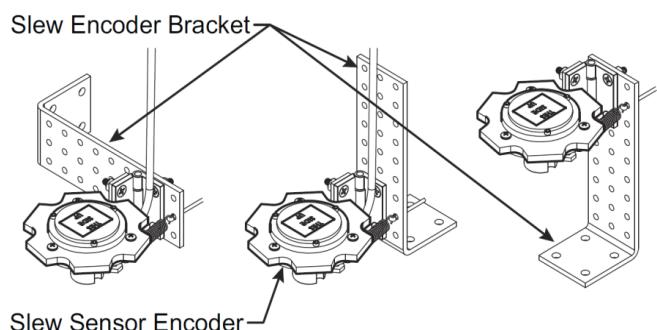
Install the slew encoder assembly near the crane slew gear where it will roll freely on the slew gear as the crane rotates. The slew sensor transmitter is connected to the slew encoder with a 6 ft. (1.8m) cable; install the transmitter where convenient within the reach of the cable; the cable can be cut down to the length required.



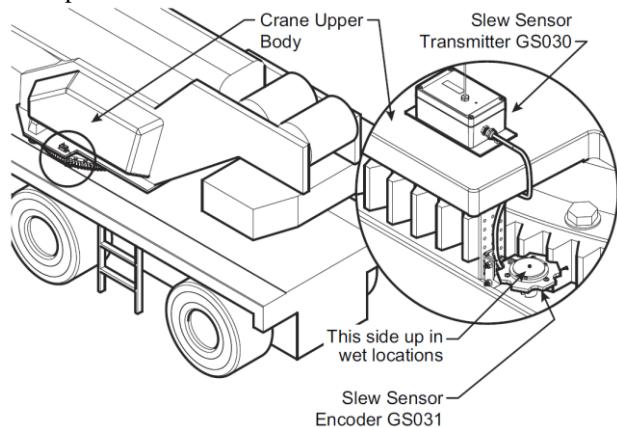
The slew encoder mounting bracket can be installed in several different ways to best position the encoder gear.



Examples for mounting bracket installation:



Example of an installation on a crane:



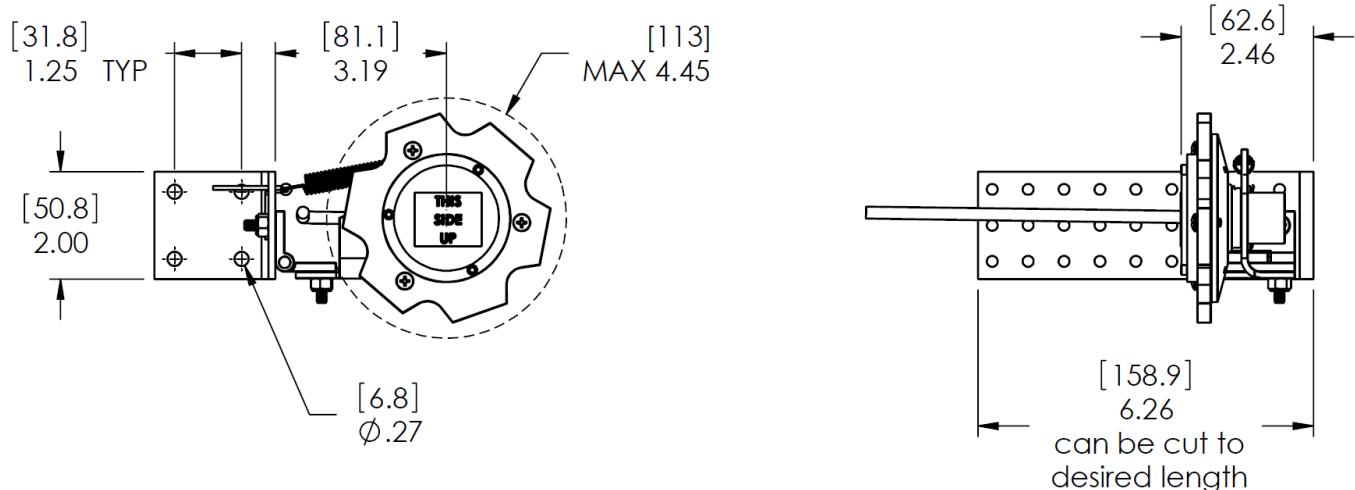
Slew sensor transmitter

Screw the slew transmitter to a flat surface with $\frac{1}{4}$ in. screws. If needed, weld pads can be used to facilitate transmitter installation. Tie wraps can be used to secure the cable between the encoder and transmitter.

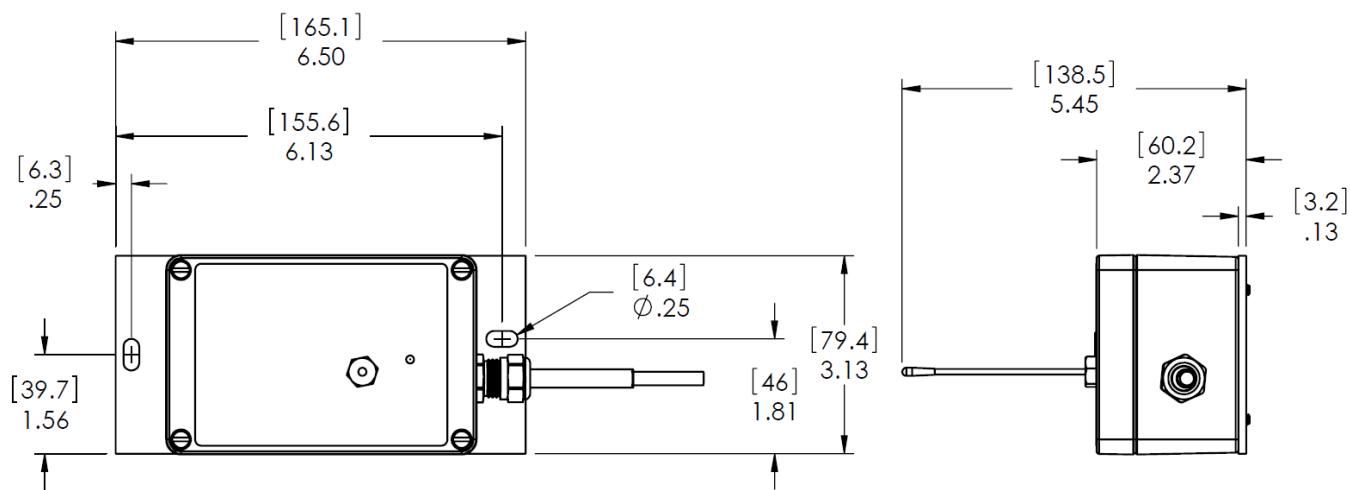
Before first use, calibrate the slew sensor by following the instructions on the GS550-V2 or GS820-V2 display and in the manual. Note: the number of teeth on the crane slew gear is required.

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Dimensions



Slew encoder assembly (not to scale)



Slew sensor transmitter (not to scale)

Units are in inches [millimeters]

Materials:

The GS031-V2 encoder is made of stainless steel and anodized aluminum with a zinc plated mounting bracket. The hinge and spring are made of stainless steel.

The GS030-V2 transmitter is made of powder coated aluminum mounted on a stainless steel plate.

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PMN: GS032-FCC-V2
HVIN: MB103-00-SD-A

FCC Compliance Statement (USA)

FCC ID: S9E-GS200D

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-GS000D

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 Canada 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 définies par Indstrie Canada pour un environnement non contrôlé.
- Cet équipement doit être installé et utilisé avec 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.