Manufacturers of Wireless Weighing Systems

Opening the door to a wireless world!
Who is LSI?

- A pioneer in the design, manufacturing and distribution of wireless systems for cranes and lifting equipment
- Founded 1997 in Quebec City, Quebec, Canada, first product sales in March 2000
- Release of 3rd generation wireless technology, Dec 2006, 4th generation to be released late summer 2010, will offer up to 10 mile range
- Corporate offices: Quebec City-Quebec, Canada; Houston, TX and Dubai, UAE
- LSI Employs 80 employees company wide
- LSI grows at an annual rate of 30%
LSI Corporate Offices

Quebec Office

Dubai Office

Houston Office
The GS Series

- Utilizes market first Direct Sequence-Spread Spectrum-Two Way Communication

- Direct sequence technology is 20 years newer than frequency hopping technology and more efficient. We broadcast on multiple channels simultaneously, even if there is corruption on all channels, as long as we can piece together a clean transmission our signal will effectively get through.

- We can monitor up to 32 sensors simultaneously.

- Sensors ship as standard with D-cell lithium batteries. Transmitting daily for 8 hours-5 days a week, average battery life would be 2 years from 1-D cell lithium battery.
The GS Series - Continued

- Users can also use 1-D cell alkaline battery for the sensor power in the event that a D-cell lithium battery is not available. Up to 1 year of battery life.

- Sensors go into listening mode after the display is powered off, this conserves battery life.

- Standard transmission range is 4,000 feet or 1,300 meters.

- All LSI products feature a 2 year warranty against defects.

- LSI designs all products in-house. We have a diverse team of mechanical, electrical, software and wireless engineers.

- We do not outsource our wireless development, which gives us complete control of how and why it works.
GS550 Display

- Monitor any combination of: Load, Angle, Length, Radius, A2B, Wind Speed and Load Charts
- Stores up to 3500 pages of load charts
- Data logs up to 15,000 events
- Download data logger data via USB port
- Add load charts via USB port
- Update firmware wirelessly on any sensor from display
• The GS820 Display provides the user with the ability to monitor up to 20 fields of data at one time

• Data can be viewed in a graphical layout or as a text layout

• On board standard data logger records up to 32,000 events; download data logger via USB port

• Add up to 3,500 pages of load charts. Charts can be uploaded by user via the USB port

• Transflective LCD display technology automatically adjusts contrast and brightness to suit light conditions
• 8 programmable buttons provide for simple operator access to display menus
A GS820 Display monitoring 8 load cells and wind speed
GS820 Display Mooring Line

A GS820 Display monitoring 8 line riding tensiometers, rope payout, payout speed and wind speed in a mooring line application.
LSI will release stainless steel versions of the GS550 and the GS820 displays in mid June. These will have as standard CSA-US Class 1, Div 2 approval. They are designed for marine markets.
The GS320 Wireless Wind Speed Display has a communication range of up to 4,000 feet or 1,300 meters. Display will show wind speed in MPH or meter per second. Users can set wind speed limit alarm. An unlimited number of GS320 displays can be programmed to read one speed sensor. The wind speed sensor will not transmit after the GS320 has been powered off, this saves battery life in the sensor.
The GS375 Wireless Anti-Two Block Display has a communication range of up to 4,000 feet or 1,300 meters.

- Display can monitor two A2B switches at one time.
- Display will output visual and audible alarm for each installed switch.
- Display will engage optionally installed solenoid valves in the event of a two-block.
- Two-Block switches will not transmit after the GS320 has been powered off, this saves battery life in the two block switch.
Gateway Device

- Send wireless data directly from LSI wireless transmitters to a PC or PLC using an LSI Gateway
- Outputs can include RS232, RS485, Can Bus, 4-20mA
- Can receive up to 32 two-way communication signals or unlimited one way communication signals
- Two way communication signal assists with battery management, transmission level and on/off functions of transmitter box
LSI Wireless Transmitters

- LSI wireless transmitters can send data from the following sensor types:
  - Temperature
  - Pressure
  - On/off
  - Strain Gauge
GS Series Wireless Load Cells

- Load cells ship pre-calibrated; no test weights are needed
- Available in standard sizes of: 5K, 12K, 18K, 35K, 60K, 100K, 170K; single part capacity
- Temperature compensated for increased accuracy
- 0.1% accuracy on single part, 1% accuracy on multi-part
- Install on ball, block or boom tip dead end
Our wireless load cell range

Pictured is our range of wireless load cells:

5K, 12K, 18K, 35K, 60K, 100K, 170K; single part capacity
Load Cell Skip Frame

• LSI load cells are built for rugged applications. There are applications however that require additional protection for a load cell installed on a single part of line

• The “quick slip” design allows the user to simply slip the Skip Frame over the load cell and secure it into place utilizing the existing load cell adaptor plate pin for a quick, no-nonsense installation

• Available in 3 sizes for the 12K/18K load cells, the 35K load cell and the 60K load cell
GS Series Wind Speed

- User settable limits in display
- Wind gust alarms
- Two versions: 3 mph or 1 mph accuracy with an NIST traceable calibration certificate
- Wind speed sensor will not transmit when display is off
- Up to two years of battery life from 1-D cell lithium battery
GS Series Angle Sensor

- No moving parts
- 3/10ths of a degree of accuracy
- Can be left or right hand mounted
- Easy setup, bring boom to zero degrees, use green leveling light, tighten down
- -130 to +90 degree range, 360 degree range option, rail/barge-list/heel barge crane option
GS075 Series Wireless A2B Switch

- All-In-One design incorporates switch into weight and chain assembly
- Simplifies installation time and cost
- Provides exceptional line of sight
- Up to 5 years battery life
- Replaceable switch mechanism
GS075-B Standard A2B Switch

• The GS075-B version of the A2B switch allows users to hang the A2B switch from the boom tip.

• Users can use the standard LB011 switch mounting bracket, order a PB312 hanger bracket that bolts to the body of the A2B switch.

• The LB012A standard weight & chain assembly hangs from the bottom of the switch.
Wireless Line Riding Tensiometer

- Eliminates hard wired signal cable and cable storage reel
- Calibration data stored in transmitter
- Available sizes from ½” – 2-1/4” inch wire rope diameter
- Wireless rope payout/rope speed option available
- Mooring line option
- We can often adapt our wireless transmitter to existing competitive products
Wireless Load Pins

- A load pin is an ideal solution when hook height is an issue
- Varying sizes & capacities can be custom built
- Calibration data is stored in the transmitter
Intrinsically Safe Option

- All LSI boom sensors are available with an option for CSA-US Class 1, Div 1 intrinsically safe (explosion proof) or ATEX Zone 0,1 for Europe

- LSI GS550 and GS820 displays are available with a CSA-US Class 1, Div II option
The BEST mechanical Anti-Two Block Switch that money can buy!

Features wiring for normally open or closed, user replaceable switch, 4.7K resistor built in as standard, large cable gland option for Manitowoc cranes.
NEW LSI Cable Reel with Angle/Length Transmitter (Available July 2010)

- Very small foot print
- Terminate cable at end of first telescoping section on proportional boom
- Transmitter transmits Angle/Length to cab display, eliminates cable between reel & display
- 32’ extension length
- Calibration data stored in transmitter
- Green cable reel is current version, silver one is new
Wireless Slew Sensor
(Available July 2010)

• Market’s first wireless slew sensor
• Wireless transmitter eliminates cable between sensor and display
• Fast, simple calibration
• Will communicate with GS550 and GS820 displays
• Scheduled for production release July 2010
2.14 Slew Sensor Installation

2.14a Encoder Gear Verification
Verify that the slew (swing) sensor was supplied with the correct gear for your application.

- Roll the encoder gear on the crane slew gear; it should roll without slipping.
- The distance between the leading edges (X) of the encoder teeth should correspond to the gear model shipped with your order.

Example: PIN PA133-01 corresponds to a slewing gear with tooth leading edges 2 mm apart.

2.14b Slew Encoder Location
1. Install the slew encoder near the crane slew gear where it will roll freely on the slew gear when the crane slows.
2. Make sure that the slew encoder does not come into contact with any other parts of the crane through the full motion of the crane upper body.

2.14c Slew Encoder Orientation
The slew encoder bracket is designed so that the encoder can be installed on either bottom, top or side surfaces. If the surface on which the sensor is to be installed is not at a square angle to the slew gear, the mounting plate can be bent and/or cut.

2.14d Slew Encoder Installation
1. Find a rigid, level space near the slew gear to install the slew encoder mounting bracket.
2. Weld the mounting bracket in place or install with 1/4 in. screws. The screws can be installed directly on the crane plate or a custom weld plate can be built and welded on the crane.

WARNING! Keep the slew encoder away from any connecting metal structures when welding mounting bracket to the boom. Proximity to welding may cause permanent damage to the slew encoder and render the system inoperable.

3. Once the mounting bracket is installed, screw on the encoder with the nuts and bolts provided. Put tension on the spring by inserting the cotter pin in the middle hole in front of the hinge.
Slew Sensor Setup Page 2

2.14e Slew Transmitter Location

**IMPORTANT!** To ensure reliable radio communication between the slew sensor and the GS550 display, the following conditions must be respected:

- The antenna of the slew transmitter should not be in contact with metal.
- The antenna should point to the left or to the right of the boom; it should not point directly to, or away from, the GS550 display.
- The antenna should have a clear line of sight to the GS550 display; in most cases this means mounting the transmitter outside of the crane structure on the same side of the boom as the operator's cab.

The slew transmitter is connected to the slew encoder with a 6 ft. cable but it can be installed beside the transmitter if convenient; the cable can be cut to the length required.

2.14f Slew Transmitter Installation

**IMPORTANT!** The transmitter must be installed such that it does not interfere with the crane through all normal movements. It may be installed at any angle as long as the cover can be removed when required to change the battery.

2.14g Cable Length Adjustment

If the cable between the encoder and transmitter is too long, it can be cut to the desired length.

1. Remove the cover from the transmitter using either a flat or a Phillips #2 screwdriver.
2. Using a small flat screwdriver, loosen the 6 screws of the terminal block and remove the wires from it. Lay down the transmitter cover on a clean surface.
3. Loosen the cable gland with a 3/4 in. wrench and pull the cable from the inside of the transmitter box until you reach the desired length. Tighten the gland back with the wrench. Do not to overtighten.
4. Cut the cable excess, leaving about 4 in. in the transmitter box. Remove the sheath to about 2 in., remove the shield and remove the individual sheaths on the 6 wires to about 1/4 in. Connect the 6 wires in the terminal block respecting the color codes and tighten the terminal block screws.
5. Replace the transmitter cover and screw it in place.
6. Test the sensor for proper function: start-up the display and move the encoder wheel.

2.15 Slew sensor calibration

The slew sensor need to be calibrated on the crane where it is installed before utilisation.

1. Go to Menu 481A, select the slew sensor and press Enter. Press Next to start the slew calibration wizard.
2. Menu 1A (CHARGE GEAR RATIONAL): Enter the beech count of crane's slew gear.
3. Menu 2A3 (SLOT SPEED TEETH): Enter the beech count of the gear of the slew sensor installed.
4. Menu 2A5 (ADJUST CENTER SLEW VALUE): Enter the current position of the slew (swing).
5. Menu 2A5 (Reverse motion): Depending on how the slew sensor is installed, the rotation direction may be reversed. The slew should go up when you swing to right (paddles).
6. Menu 5A (Press Enter to Save CRANE): the settings will be saved in the sensor.
3.9 Work Area Management Programming

Note: It is important to follow the orientation indication from the display (left or right) to make sure the system sets the limits correctly.

CAUTION! To use the orange lockout as a work area approach limit instead of a general lockout, see menu 4.4.

3.9a Fixed limits programming

These limits are settable in a learning mode by positioning the crane on the limit and pressing a button to make the system accept that limit.

1. Slow free zone area setting: The crane operator sets the approach warning point, the left and right limits, and the safe zone area. The system saves the values and defines a working area. It will warn the operator when approaching and exceeding the slow speed limit.
   a. Press Limit, select Work Area Limits and then A) DESIRE WORK AREA YYYY.
   b. Menu A1) Move the crane to the left limit and press Enter.
   c. Menu A2) Move the crane to the right limit and press Enter.
   d. Menu A3) Move the crane between limits (safe zone area) and press Enter to activate system.
   e. To set the slow approach warning, go to menu 4.4, enter the approach value using Up and Down and press Enter to save changes.

2. Maximum tip height area setting: The crane operator sets the approach warning point and the maximum tip height. The system saves the maximum value and defines a working area. It will warn the operator when approaching and exceeding the maximum tip height limit.
   a. Press Limit, select Work Area Limits and then B) DESIRE WORK AREA: MAX TIP HEIGHT.
   b. Menu B1) Move the crane to the maximum tip height and press Enter.
   c. Menu B2) Move the crane under the maximum limit (safe zone area) and press Enter to activate system.
   d. To set the tip height approach warning, go to menu 4.2, enter the approach value using Up and Down and press Enter to save changes.

3. Maximum radius area setting: The crane operator sets the approach warning point and the maximum radius. The system saves the maximum value and defines a working area. It will warn the operator when approaching and exceeding a maximum radius limit.
   a. Press Limit, select Work Area Limits and then C) DESIRE WORK AREA: MAX RADIUS.
   b. Menu C1) Move the crane to the maximum radius and press Enter.
   c. Menu C2) Move the crane under the maximum limit (safe zone area) and press Enter to activate system.
   d. To set the radius approach warning, go to menu 4.3, enter the approach value using Up and Down and press Enter to save changes.
3.9b Dynamic limits programming

1. Slew and maximum tip height: This mode will save the current height value as a max height value for each rotation degree for a maximum of 360 degrees. After the calibration (in normal operation), the system will warn the operator when approaching or exceeding one of the two limits: slew angle and max height.
   a. Press Limit and select Work Area Limits and then 0) DEFINE WORK AREA: SLOW AND HEIGHT.
   b. Menu F1) Move the crane to the left first point (slew and height) and press Enter.
   c. Menu F2) Define the maximum tip height outline limit with a right rotation and press Enter when reached the right ending point.
   d. Menu F3) Move the crane in the safe zone area and press Enter to activate system.
   e. To set the approach warning, go to menu 4.1) Work Area.

2. Slew and maximum radius: This mode will save the current radius value as a max radius for each rotation degree for a maximum of 360 degrees. After the calibration (in normal operation), the system will warn the operator when approaching or exceeding one of the two limits: slew angle and max radius.
   a. Press Limit and select Work Area Limits and then 0) DEFINE WORK AREA: SLOW AND RADIUS.
   b. Menu E1) Move the crane to the left first point (slew and radius) and press Enter.
   c. Menu E2) Define the maximum radius outline limit with a right rotation and press Enter when reached the right ending point.
   d. Menu E3) Move the crane in the safe zone area and press Enter to activate system.
   e. To set the approach warning, go to menu 4.1) Work Area.

3. Slew, maximum tip height and maximum radius: This mode will save the current tip height and radius value as a max tip height and max radius value for each rotation degree for a maximum of 360 degrees. After the calibration (in normal operation), the system will warn the operator when approaching or exceeding one of the three limits: slew angle, maximum tip height and maximum radius.
   a. Press Limit and select Work Area Limits and then 0) DEFINE WORK AREA: SLOW, HEIGHT, RADIUS.
   b. Menu 1) Move the crane to the left first point (slew, height and radius) and press Enter.
   c. Menu 2) Define the maximum tip height and radius outline limit with a right rotation and press Enter when reached the right ending point.
   d. Menu 3) Move the crane in the safe zone area and press Enter to activate system.
   e. To set the approach warning, go to menu 4.1) Work Area.

3.9c How to delete work area limits

Press Limit and select Work Area Limits. Press Enter. Select 0) ERASE WORK AREA LIMIT menu and press Enter.

3.9d Limit warning, alarm and lockout

1. Limit warning: The limit warning is adjustable for each type of limit. This warning is used to warn the operator that a work area limit is approaching. The display will produce an intermittent beep. Limit and info lights will be ON, a limit warning message will appear on the LCD. A lockout can be activated in the menu 4.4).

2. Limits alarm: when one of the three types of work area limits is reached, the display will trigger an alarm: a message will appear on the LCD, the buzzer will beep, Limit and info lights ON, lockouts activated.

3. Lockout: two lockouts can be used for the alarm, one for the limit warning.

3.9e Mainscreen

When a slew sensor is installed, a screen showing the slew angle and its limits is displayed:

Slew angle:

When a work area is defined, a screen showing its limits is displayed in the mainscreen:

- The first line display the left and right limits of the slew sensor.
- The second line display the height and radius limits (if they are defined).
- In the case of a dynamic limit area, the value of the height and the radius are dynamic and change according to the value of the slew angle.
LSI will release a Load Moment Indicator using pressure transducers that will read the hydraulic lift cylinders pressure. The load value will be transmitted using a wireless transmitter. We expect to release this July 2010.
LSI has launched an Industrial Wireless Technology Division.

This division will offer wireless transmitter boxes, our wireless Gateway and our Dashboard software. This will allow anyone that needs to move a signal from a sensor such as a pressure sensor, limit switch, valve, etc using wireless technology versus a hardwired signal.

The Gateway will provide the capability to move up to 32 two way communication or unlimited one way wireless communication signals into a PC or PLC from LSI wireless transmitters.

The Dashboard software will allow the users to view sensor data onscreen using their PC. Any type of background image can be inserted onto the Dashboard. This could be a drawing, a picture, site plan, etc. Data can be viewed from any Gateway connected to the internet from any location in the world.
Dashboard Software
Ascorel Tower Crane Zoning/Anti-Collision System

- LSI distributes, installs and supports the market leading Ascorel Zoning/Anti-Collision system for tower crane applications.
- We have over 9 years of experience in the sales and support of zoning/anti-collision systems.
- The Ascorel 602 offers the users to monitor up to 16 cranes from one site.
- Users can view the crane site from any internet connection from the optional supervisor software.

Manufacturers of Wireless Weighing Systems

Opening the door to a wireless world!
An LSI wireless line riding tensiometer installed on a knuckle boom crane on a North Sea offshore workboat.
LSI wireless Line Riding Tensiometer System on workboat knuckle boom
Barge Mooring Line System
35K Load Cell on a lattice boom
4’ long remote LED display
d wired externally from a GS820 display
Wireless load cells on dead end
An LSI wireless rated capacity indicator adapted to a Demag hydraulic crane
LSI wireless line riders are used on the tallest building in the world - The Burj Khalifa

The LSI wireless system monitors load, angle, wind speed, chart capacity and as well data log's the productivity time to move the load from the ground to each floor.
Burj Khalifa wireless line rider
A two crane pick using LSI wireless load cells, odd parted on each block
An explosion proof LSI wireless load cell installed on a recessed lug on a ball.
LSI wireless load cells installed on a Marine Travel Lift boat lift
LSI wireless Wind Speed installed on a lattice boom tip
An LSI wireless rated capacity indicator with A2B installed on a hydraulic crane
LSI wireless load cell monitoring barge anchor line on Tacoma Narrows bridge project
4-170,000 lb wireless load cells installed on Kiewit Cat barge crane-each load cell is 16 parted
GS075 Wireless ALL-In-One Anti-Two-Block Switch/Weight & Chain
LSI Wireless Systems are installed on Lampson Transilifts
LSI Cable Reel with wireless length/angle transmitter installed on offshore crane
Competitive cable reel with LSI wireless length/angle transmitter installed
GS075 wireless anti-two-block installed on offshore crane
GS550 wireless display/receiver installed on offshore crane
GS010 wireless boom angle sensor installed on offshore crane
GS820 Main/Aux Hoist
Load Angle-Radius Indicator

- Load Angle:
- Radius Indicator:
- Installed offshore
GS018-18,000 lb CSA Intrinsically Safe Load Cell installed offshore
LSI 35,000 lb wireless load cell & wireless A2B switch
A Few Clients

- Shell Oil
- Exxon
- Linkbelt
- Manitowoc
- Seatrax
- Tech Crane
- ALL Crane
- Halliburton
- US Navy
- Oceaneering
- Essex Crane
- Canadian Coast Guard
We invite you to learn more about LSI Products & Services

- LSI provides technical support 24 hours a day, seven days a week
- Sales can be contacted via sales@loadsystems.com
- Technical support can be reached at techsupport@loadsystems.com
- Learn more about LSI wireless products by visiting our website @ www.loadsystems.com
- We look forward to working with you on your next requirement for a Crane Indicator or our Industrial Wireless Technology