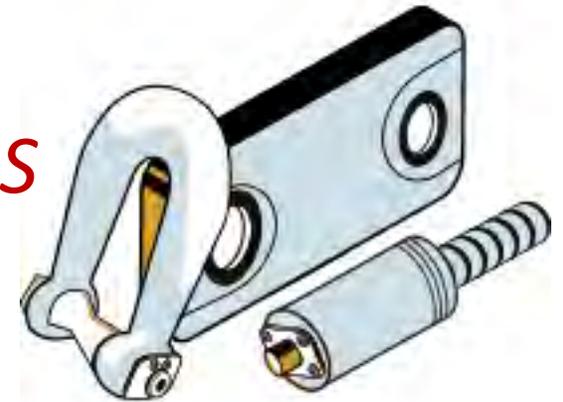


# LOAD PINS, LOAD SHACKLES, AND TENSION LOAD LINKS

*APPLICATION REFRESHER + BONUS FAQs*



# MOST FREQUENTLY ASKED APPLICATION QUESTIONS

- **What are the fastest-growing industry use cases for load pins, shackles, and tension load links?**
  - Aerospace, Manufacturing, Factory Retrofitting, Maritime, Aquaculture, Energy, Lifting Equipment and Weighing
- **Are the sensor devices IP-rated?**
  - Yes, always. We offer IP65, IP66, IP67 and IP68.
- **Are load pins, shackles, and tension load links ATEX-approved?**
  - They can be by request. This is common. As well as IECEx approvals.
- **Do you offer submersible options?**
  - Yes! We can even offer deep sea-certified measurement solutions with a proven track record of use cases in aquafarming, wave energy, and maritime projects.
- **What is the lead time for any custom solutions?**
  - The current “state of the state” is one week for design and up to 8 weeks (or less) for build and shipping. Expedite options are available for additional costs and availability.

# MOST FREQUENTLY ASKED APPLICATION QUESTIONS

- **Are there standard load pins that can be ordered and shipped from inventory?**
  - Yes, the ILMP Standard Load Pin and ILPW Standard Wireless Load Pin are in inventory for sale.
- **Are all load measuring load pins and tension load links custom?**
  - No, we offer standard load pins and tension load links with designs that can reduce the time required for a custom request by several days, improving lead times.
- **What are the average lead times for standard products?**
  - Interface does have a stocking program. Please consult with our application engineers to determine today's lead time, as it can move to less than two weeks from order to ship.
- **How long does it take to quote a custom load pin?**
  - It depends on the customer's specification requirements, which are detailed using the load pin configuration tool. The average time to quote is currently less than three business days. Build to ship is under eight weeks for most products, though check with Interface on exact lead times.

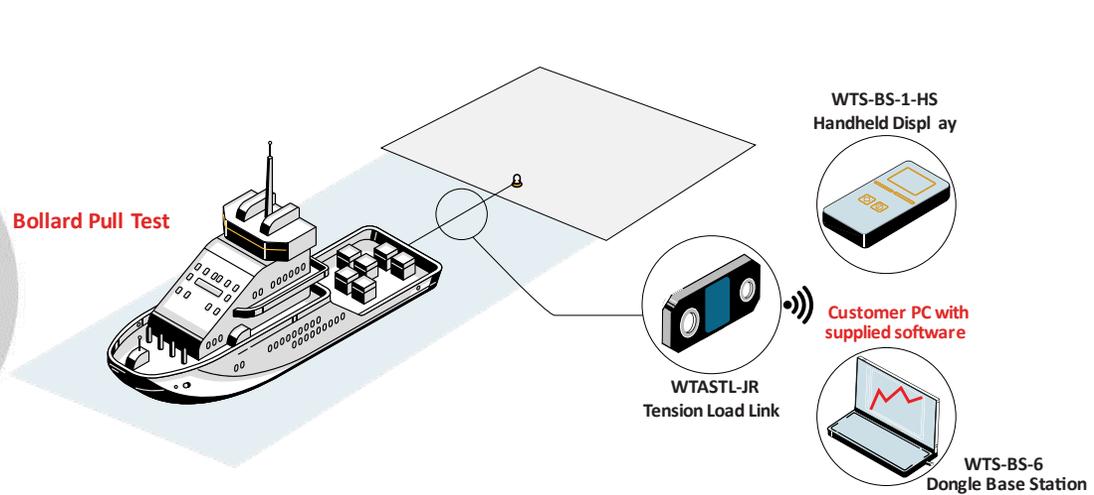
# MOST FREQUENTLY ASKED APPLICATION QUESTIONS

- **What is the smallest capacity and dimension load pin we can offer?**
  - The smallest capacity is typically 125 - 200kg using aluminum, 200kg for 17-4 PH. However, the pin diameter will play a part in determining this. NOTE: Big diameter + small load = no go. The smallest dimension is  $\varnothing 9.4\text{mm}$  (0.37 inch) for downhole gauging.
- **What is the largest capacity and dimension load pin we can offer?**
  - We have manufactured a 1750 tonne pin but have quoted higher load-rated pins of 2000te. As with the first question on small capacity, size comes into play. The overall size is more of a restriction than the rating because we have size limitations for our ovens and machinists. The largest dimension is 1500mm (60 inches), the maximum length we can handle.
- **Do load pins require in-situ calibrations and service recalibrations?**
  - Yes, ideally, it is an in-situ calibration because it includes the effects of the mating hardware.

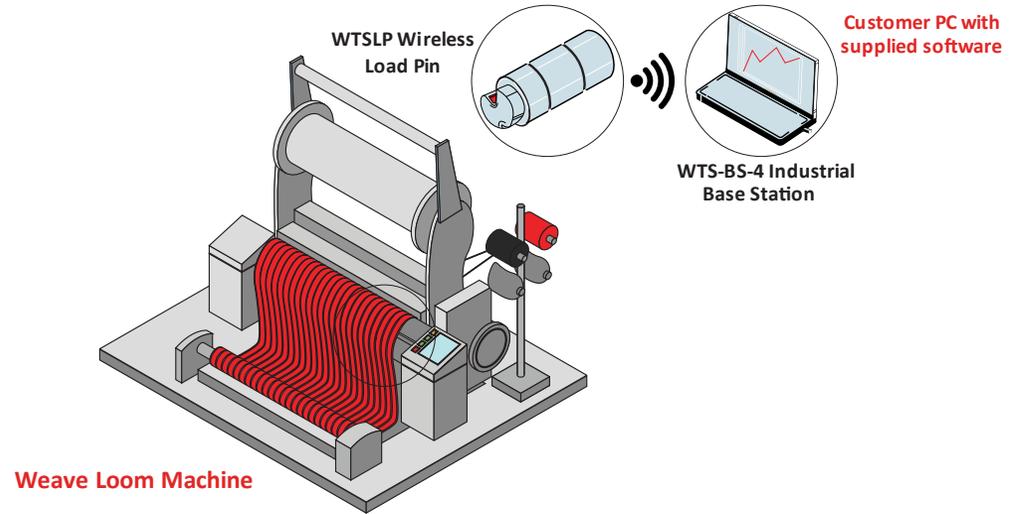
# MOST FREQUENTLY ASKED APPLICATION QUESTIONS

- **Can load pins be modeled for various application uses by the customer**
  - Yes, there are use cases for interchangeable load pins requested by engineering design houses and test labs. The hardware determines whether an “easy” match is ensured.
- **How does friction on the load pins with sheaves or rotating elements affect the pin?**
  - It can cause wear, which grease ways with zerk fittings, bearings, or bushings can mitigate.
- **Does the wire wrap angle affect the pin’s output?**
  - Yes, it has a significant impact. For example, at a 90-degree wrap angle, the pin will see 1.5x the line tension. This is something to understand for cranes and lifting equipment.
- **Does the customer have different cable, connector, and wireless options for pins and shackles?**
  - Yes, various standard options are customizable to suit the application. IP ratings will dictate some connections. For example, SubConn connectors are required for deep-sea applications.
- **What instrumentation is the most popular with load pin applications?**
  - 4-20 mA output will dictate the instrument, as well as wireless to 4-20 are options.

# INTERFACE LCM SOLUTION REFRESHER

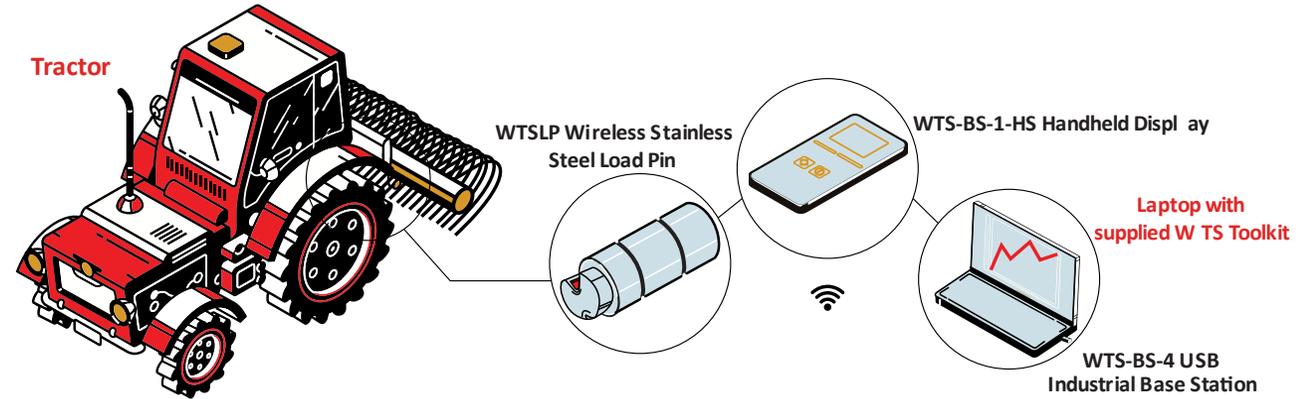
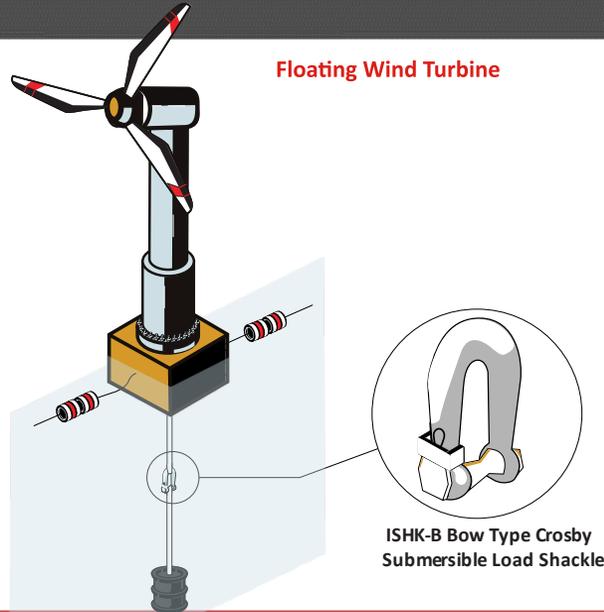


Interface's **WTASTL-JR Aluminum Compact Wireless Tension Load Link** can be attached to the vessel's pulling line and the bollard. Force results are wirelessly transmitted to the customer's PC using the **WTS-BS-4 USB Industrial Base Station** or to the **WTS-BS-HA Handheld Display** for single transmitters.



Interface suggests integrating their **WTSLP Wireless Stainless Steel Load Pins** into the beam for a tension monitoring system. The WTSLP captures the tension results in real-time and sends the data to the customer's PC through the **WTS-BS-4 Industrial USB Base Station with supplied Log100 software**.

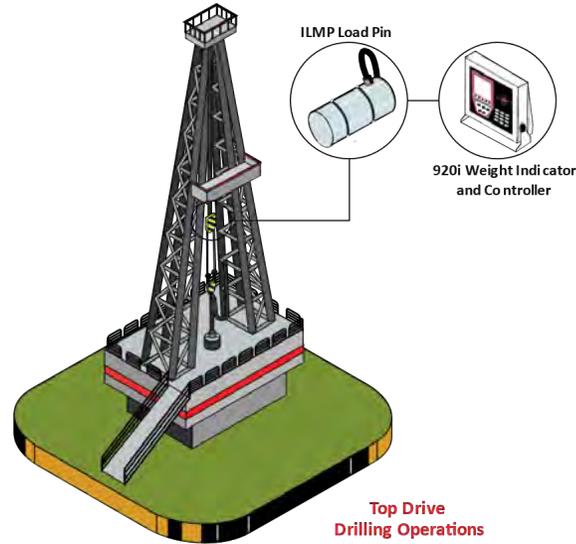
# INTERFACE LCM SOLUTION REFRESHER



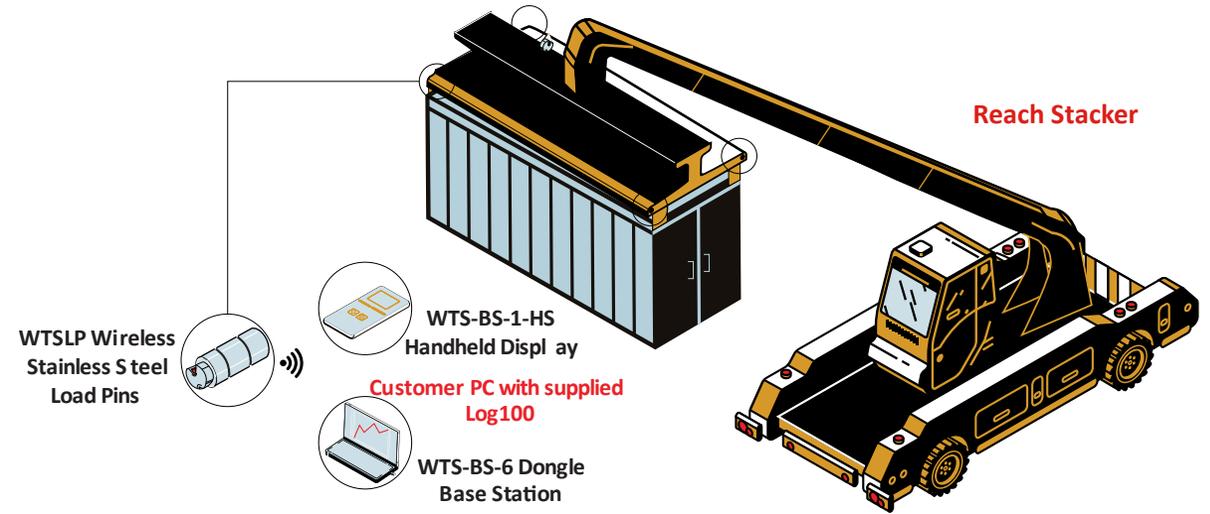
Interface's **ISHK-B Bow Type Crosby™ Submersible Load Shackle Load Cell** is attached to the floating wind turbine's mooring line, which is connected to an anchor. With customer instrumentation, the customer can monitor the force tension of the mooring line based on the force results captured by the load cell.

The **WTSLP Wireless Stainless Steel Load Pin** is installed directly in the hitch, replacing the tractor's standard shear pin. Force results are transmitted wirelessly to the **WTS-BS-4 USB Industrial Base Station**, which can also view results in real-time on the **WTSBS-1-HS Handheld Display for Single Transmitters**.

# INTERFACE LCM SOLUTION REFRESHER

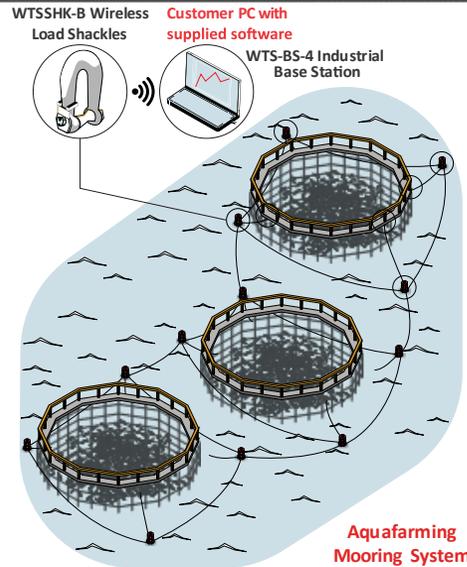


Interface suggests using their **ILMP Standard Stainless Steel Load Pin** for this top drive drilling oil and gas application. The ILMP is installed at the traveling block, and during drilling operations, it detects the force or weight of the top drive. Force results are monitored and displayed for the customer using the **920i Programmable Weight Indicator and Controller**.



Interface's **WTSLP Wireless Stainless Steel Load Pins** are installed into the corners of the lifting mechanism of the reach stacker, where heavy-loaded containers are lifted and moved. The force results are then wirelessly transmitted to either the **WTS-BS-1-HS Wireless Handheld Display for Single Transmitters** or directly to a PC with the **WTS-BS-6 Wireless Telemetry Dongle Base Station**.

# INTERFACE LCM SOLUTION REFRESHER



Interface's **WTSSHK-B Wireless Crosby™ Bow Load Shackle** is submersible and can be attached to the mooring lines connected to buoys and the fish farming structure. The mooring line system can be monitored as the shackles transmit data wirelessly to the customer's PC through the **WTS-BS-4 Wireless Base Station with supplied Log100 software**.



**WTSLP Wireless Stainless Steel Load Pins** replace the normal pin joints. The spacecraft undergoes multiple drop tests at different heights, where the forces applied on the load pins are measured. The force results are transmitted wirelessly to the **WTS-BS-4 USB Industrial Base Station** to a computer and the **WTS-BS-1-HA Handheld Digital Display** for multiple transmitters.

# Product Categories



Load Pin



Load Shackle



Tension Load link

# Capabilities

- Standard products in stock
- Custom product design
- Prototype product design
- Batch manufacturing
- Packaged system designs
- Short lead times
- Downhole strain gauging
- In-house machining, fabrication, and welding In-
- Calibration
- Fast turnaround time for quotations



# Load Pin Examples



These 400klbf (178 tonne) rated stainless steel load pins will be **installed in a hoist** to provide load monitoring and overload protection.

They feature two independent strain gauge bridges and cable exits for additional protection/assurance. In the unlikely event of an issue being identified with the first bridge, the load pin output can be immediately switched to the second bridge.

They also feature integral amplifiers to provide a 4-20mA output for simple PLC integration.



2.5te load pin for a customer in Iceland who wanted to **upgrade their crane** to enable them to measure the weight of aluminum and steel rolls.

We designed and manufactured a load pin to fit within the winch assembly, with an anti-rotation bracket to ensure correct positioning. We also supplied a large-digit wall-mounted display to enable them to easily see the resulting loads.



16,800kN rated load pins. With a 340mm and 900mm long diameter, each weighs in at a hefty 620kgs. They are dual bridge and bi-directional, with integral ICA4 amplifiers to provide a 4-20mA output. They also have a 450mm long greaseway and come supplied with 3.2 (with intent) material certification. Due to the high load rating, the load pins will be calibrated and proof-loaded at NPL (National Physical Laboratory). They will be used on an **offshore wind farm project** to aid the installation of wind turbines by providing load monitoring of structural components.



These load pins have been specially designed for a customer in the US to fit within a **latch mechanism** to measure the force required to operate the latch. Rated to 12.5k lbs (5.7 tonnes), they provide a standard mV/V output and are supplied with 4 core robotics cables.

# Load Pin Examples



These are 1000-tonne-rated load shackle pins. They have been manufactured to suit GN Rope H10 1000te bow shackles (which were shipped via sea freight) and have two independent strain gauge bridges, each with an amplifier to provide a 4-20mA output.

These robust load shackles are ideal for a wide range of **heavy lift weighing** and safe load monitoring applications, as they are simple to install and operate.



These load-monitoring pins have been designed for installation in the joints of **giant fish cages**. The load pins will monitor the loads the cage structure is subjected to due to the extreme environmental conditions. The load pins are suitable for submersion and have been tested to 25psi (15m), each attached to a T24-ACM-SA that converts the mV/V signal to a wireless signal. The data is transmitted to a wireless base station connected to a tablet, where the data can be stored and the loads on each load pin viewed.



These 1750-tonne rated load pins were designed and manufactured for **crane rental and heavy lifting** services. With a diameter of 300mm and an overall length of 655 mm, they will be installed in a pad eye arrangement that forms part of a lifting assembly. The calibration, which features integral amplifiers to provide a 4-20mA output and weighs over 360 kg, was performed at the National Physical Laboratory (NPL) using its 3000-tonne calibration test machine.



These load pins have been despatched to a leading manufacturer of **mooring equipment** and will be installed in **quick-release mooring hooks** to monitor mooring line loads. Environmentally sealed to IP68, they are suitable for submersion to 50m and have been pressure tested to 10psi. They have also been machined to include external circumferential greaseways, have integral amplifiers to provide 4-20mA output and for additional protection have been supplied with 4 core steel armoured cable. They are ATEX certified for hazardous area use.

# Load Pin (Large to Small)



10,400kN (1060 tonne) load pin will be installed in an **offshore A-Frame crane** to monitor load lifting operations. This stainless steel load pin has a whopping 400mm diameter, is 1075mm long, and weighs over **1 tonne**. The load pin features a 550mm greaseway, has an integral amplifier to provide a 4-20mA output, and is environmentally sealed to IP67. Calibration was carried out in our 1500-tonne test machine (shown below), and an accuracy of better than 0.5% of the rated load was achieved. It was despatched to a crane manufacturer specializing in providing lifting solutions to the **wind energy, marine and offshore** industries.



These tiny load pins are rated at **10,000N (1te)**, they have a diameter of just 10mm and an overall length of 50mm but still offer a 3:1 safety factor. They are also bidirectional, so they have been calibrated in two directions to enable measurement of forces applied from both above and below the load pin.

# Load Shackle Examples



An international Science Agency has purchased these 4.75 tonne-rated submersible shackles, which will be used for a research project that requires them to be deployed for 12 months subsea to monitor the tension on a deep-water mooring array used to **monitor ocean currents**.

They have been manufactured with SubConn connectors and are suitable for permanent use at depths up to 4500m.



With a lead time of just 2 days from receipt of order, these 12te and 17te wireless load shackles are for a shipyard. They will be used on a **boat lift crane** to monitor lifting loads and ensure weight is evenly distributed throughout the lift.

This particular customer has purchased several of these load shackles over the last few years and is expanding its stock to enable it to instrument more of its cranes.



These four 200te **ATEX** load shackles are for a single-point **mooring buoy** load monitoring application. Manufactured using GN Rope H10 shackles, they feature 4-20mA output and have been supplied with anti-rotation and connector protection brackets.

Suitable for use in Hazardous Areas Zones 1 and 2, these load shackles also have environmental sealing to IP67 and, for additional protection, come with a 4-core PUR armored cable.



A 1000te telemetry load shackle will be utilized on one of the **world's leading oil and gas service providers' offshore pipelaying vessels**. This particular pipelaying vessel is operating in the Zohr gas field, an offshore natural gas field located in the Egyptian sector of the Mediterranean Sea.

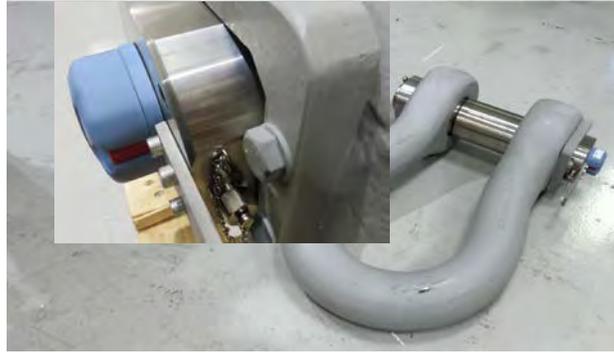
The load shackle (a GN Rope H14 wide body) has been supplied with 3.2 material certifications, including ultrasonic testing to ASTM A388 and magnetic particle testing to ASTM E709. ABS witnessed all testing and final calibration.

# Load Shackle Examples



These two 120 tonne load shackles are for a leading solutions provider to **offshore loading and bunker** operators.

The load shackles are GN RopeD15s, and have been supplied with anti rotation brackets, SubConn connectors complete with protective cage assembly, and two spacers for load centralisation. 3.1 Material certification was also supplied.



For an **Oil & Gas production system, these two 200te load shackles** can be used wirelessly or via cable. They will be used for a calm buoy refurbishment project and located at the bow of a vessel. They will be used wirelessly. However, in the event of extreme weather conditions, the client wants the option of being able to switch to a cabled output. The load shackles have two independent strain gauge bridges, one connected to an ICA5 amplifier to provide 4-20mA output and the other for the wireless signal. When operating wirelessly, a T24- AO11 analog output module is also used to convert the signal to a 4-20mA, so measurement data can be displayed on the PMD Process display also supplied. The Lumberg connector comes with a sealing cap to protect it from the environment when not in use.



This 25te subsea load shackle is for a **turbine** company. At their request, it was designed without stainless steel components to minimize corrosion.

The load pin, nut, and bracket (generally manufactured from 17-4PH) were instead made using EN25T, which was then finished with an Epoxy pre-coat, followed by a 2-part Epoxy red paint. It also has an integral amplifier to provide a 4-20mA output and has been fitted with a SubConn connector.



These 6.5-tonne rated SHK-B cabled load shackles are standard range, 24 units with optional M12 connectors were required.

Perfect for lifting/weighing in rugged and harsh environments, these load shackles are available in load ratings from 1 tonne to over 1000 tonnes and can be customized to suit specific applications, including ATEX/IECEX hazardous area certified, amplified outputs, submersible, and supplied with full 3.2 material certification.

# Tension Load Link Examples



This stainless steel toggle load link is installed on the rollers of a **conveyor belt** in a port that loads fertilizer and sulfur onto vessels for onward transportation. Because of the corrosive nature of the material being moved, the load link has been designed with a high level of environmental sealing and connectors and cable that can withstand the potentially corrosive environment. The load link will be used to monitor the loads on the conveyor belt to ensure no clogging or blocking. It has been supplied with fork/fork end fittings.

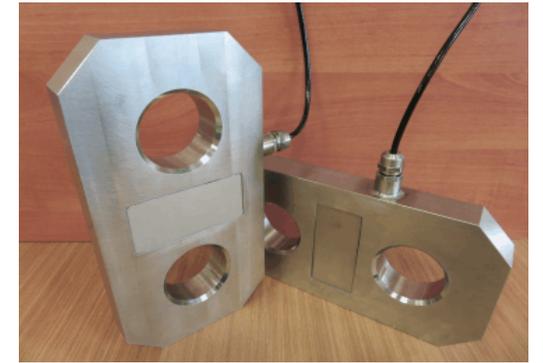


These 15-off stainless steel wireless load links are rated 50 tonnes for a **wireless telecoms infrastructure** provider.

They will be installed on 15 mast guy wires to monitor the load tension they are subjected to. The load links have a wireless transmission range is up to 800 metres and the unique wireless housing allows speedy access to the batteries without the need for any tools, via two clips. Also supplied was a T24-HR roaming hand-held display unit, which allows the viewing of the load data of the individual guy wires by simply standing near/walking past the load link.



This 120kN stainless steel load link with integral data logging has been designed for an **underground cable-pulling application**. The load link had to be designed with smooth edges to minimize the risk of snagging. It was a stand-alone device with a long battery life and an integrated data acquisition system capable of recording data every second. The load link holes were sized to suit Crosby G209A shackles, and the unit pressure was tested to 10psi to ensure suitability for use in potentially waterlogged environments. The load link measures the tension applied to the cable as it is pulled through the conduit to ensure it stays within operational limits and to identify any instances where the cable has become snagged or caught.



These stainless steel load links are for a **container terminal using RTG cranes**. They provide real-time load monitoring. The load measurement data provided will help eliminate overload incidences, improve safety, and reduce the risk of damage to the crane. The load links incorporate an integral amplifier to provide a 4-20mA output to facilitate the direct transfer of data to the terminal PLC system. They are also environmentally sealed to IP67 to ensure they are suitable for continuous long-term operation in a marine port/terminal setting.

# Tension Load Link Examples



Each load link pair has a separate strain gauge bridge to give dual redundancy for additional safety protection and provides a 4-20mA output. They will be used on super heavy lift cranes to provide load monitoring to ensure there are no overload incidents.

The load links have been manufactured from Strenx 960 steel. At 830mm x 350mm, they exactly replicate the size of the **crane's existing link plates**.



The **offshore renewable energy** sector uses this 10kN-rated tension load cell.

Based on our standard stainless steel TOG load cell range designed primarily for wire rigging/line load monitoring, this model features an eye/eye configuration with standard mV/V output. Suitable for use in exposed conditions, this load cell is ideally suited for this demanding environment.



FA 20,000 lbf (9 te) steel load link that has a proof load of 500% and ultimate breaking load of over 1000%.

As a supplier of industrial **weighing solutions** for heavy industry, safety is paramount, hence their requirement for a load link with such a high safety factor.

The load link, manufactured from stainless steel and environmentally sealed to IP67, achieves an accuracy of 0.1% of the rated load.



**Ex'd certified** load links, each rated to 5 tonnes with 15 metres of cable.

We offer ATEX load links as part of our standard range, which ranges from 5 tonnes to 100 tonnes. Options include longer cables and amplified outputs.

- [Products Online](#)
- [Load Pin Configurator](#)
- [Webinar Use Cases for Load Pins](#)
- [Brochure](#)
- [How to Use the Configurator – Training](#)
- [Application Notes](#)
- Videos – [PRODUCT FAMILY](#)
  - [LP CUSTOM LOAD PIN](#)
  - [WTSLP](#)
  - [ICPW](#)
  - [WTSSHK-B](#)
  - [WTSATL](#)
  - [WTSATL-B JR](#)

## Load Pins

Tension Links

Load Shackles

