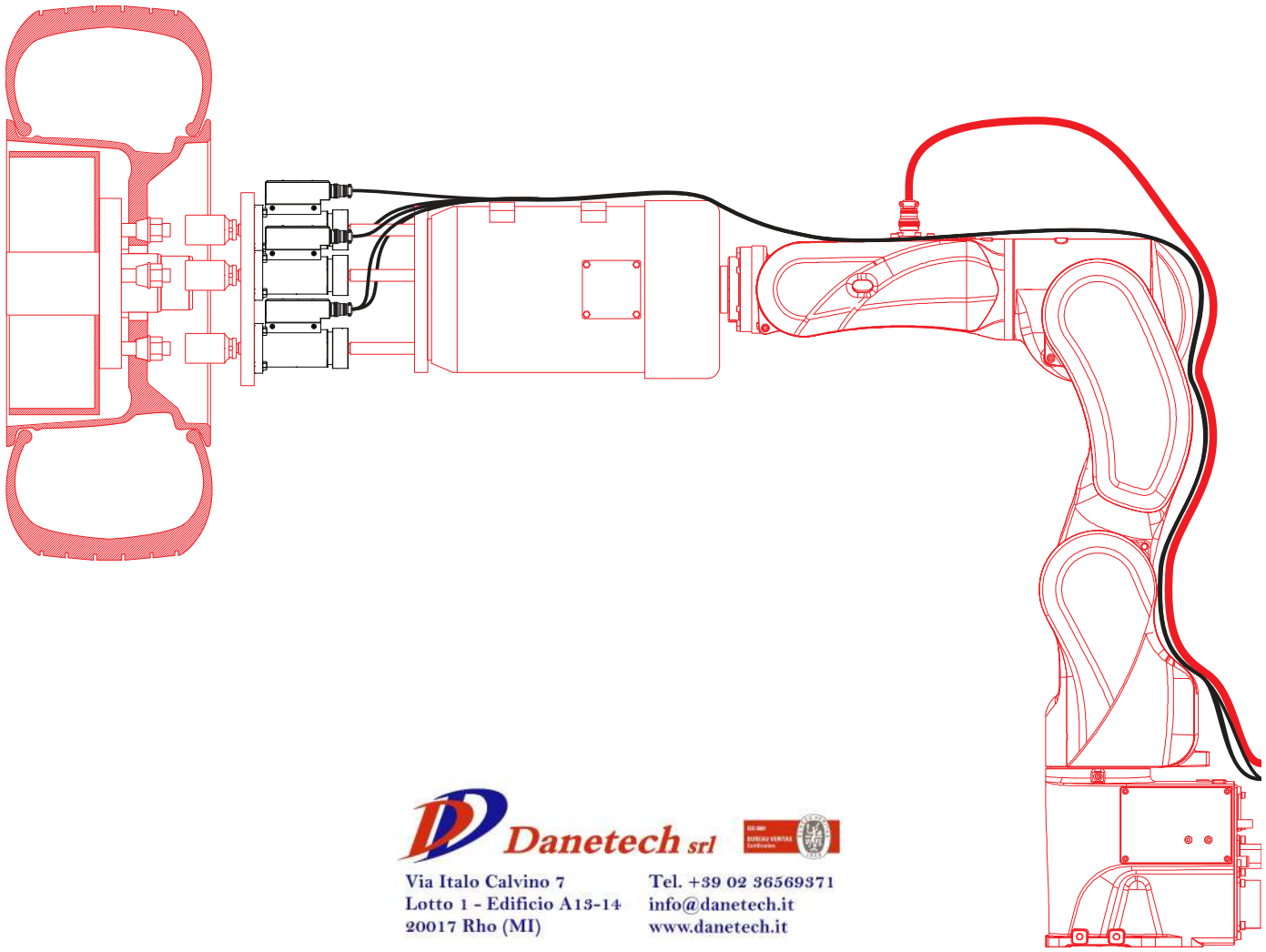
Interface

Application Notes Guide 2021



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Application Note Guide v 1.1 08-30-2021

Aerospace

Aircraft Engine Hoist
Load Pin

Industry: Aerospace

Summary

Customer Need / Challenge

An aerospace company wants to test their aircraft engine hoist in order to safely lift, remove, or install engines efficiently and safety.

Interface Solution

Interface's solution is to install WTSSHK-B-HL Wireless Bow Shackles to the aircraft engine hoist. A heavy load will be added to the hooks where the aircraft engine would be. Results from the heavy load will be sent wirelessly to both the WTS-BS-4 USB Industrial Base Station attached to the customers computer or laptop, and the WTS-1-HS Handheld display for single transmitters

Results

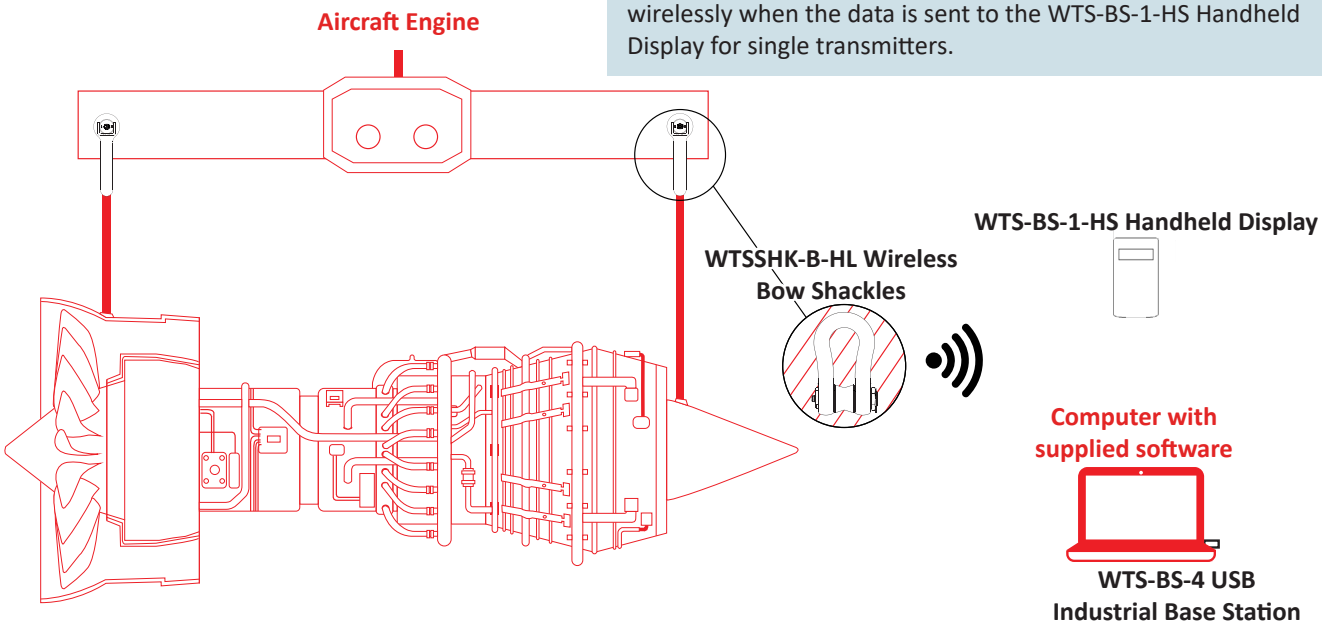
The customer was assured that the aircraft engine hoist was strong and secure enough to lift a heavy engine when installing or removing an engine inside of an aircraft.

Materials

- (2) WTSSHK-B-HL Wireless Bow Shackles
- WTS-BS-4 USB Industrial Base Station
- WTS-BS-1-HS Handheld Display for Single Transmitters
- Customer PC or Laptop

How It Works

1. 2 WTSSHK-B-HL Wireless Bow Shackles are installed onto the aircraft engine hoist.
2. A heavy load is attached to the hooks of the hoist and slings.
3. The WTSSHK-B-HL Wireless Bow Shackles measure the forces of the heavy load, and transmit the data wirelessly to the customers computer or laptop through the WTS-BS-4 USB Industrial Base Station. The customer can also view results wirelessly when the data is sent to the WTS-BS-1-HS Handheld Display for single transmitters.



Aircraft Lifting Equipment
Load Cell

Industry: Aerospace

Summary

Customer Need / Challenge

An aerospace company wants to check if the valves on their aircraft lifting equipment is working safely and properly.

Interface Solution

Interface's solution is to install a 1200 Standard High Capacity Load Cell in between the aircraft testing rig and the lifting jack. The load cell will measure the load's force safety valve when the lifting equipment opens. Results will be sent to the 9890 Strain Gage, Load Cell, & mV/V Indicator, where the customer can see it displayed in real-time.

Results

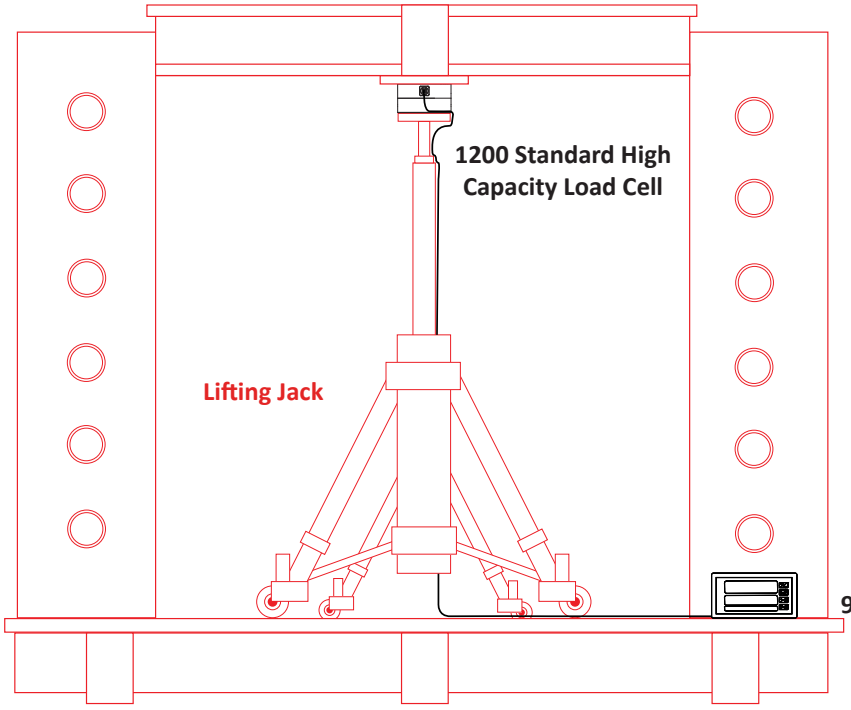
The customer was able to determine that the aircraft lifting equipment was working properly. Since they are ensured of its safe functionality, it can now be used on real aircrafts that need to be lifted.

Materials

- 1200 Standard High Capacity Load Cell
- 9890 Strain Gage, Load Cell, & mV/V Indicator

How It Works

1. A 1200 Standard High Capacity Load Cell is placed between the aircraft test rig and the lifting jack.
2. The1200 Standard High Capacity Load Cell measures the forces of the lifting jack, to ensure it can lift the rig properly.
3. Force results are sent 9890 Strain Gage, Load Cell, & mV/V Indicator, where the customer can view displayed results in real-time.



Aircraft Wing Fatigue Load Cell

Industry: Aerospace, Test and Measurement

Summary

Customer Need / Challenge

- Before any of the U.S. Navy's F/A-18 twin-engine supersonic fighter jets can be put into operation, the wings of the aircraft must undergo fatigue testing in a controlled environment to ensure that they are capable of withstanding the forces that will be encountered during real-world flight throughout the lifetime of the aircraft. Highly accurate measurements must be recorded in order to make sure that a near-exact replication of in-flight conditions are being achieved.

Interface Solution

- During fatigue tests, Interface Model 1248 Standard Precision Flange LowProfile™ Load Cells are installed in line with the hydraulic cylinders, which apply back-and-forth loading forces to the aircraft. This is carried out over the course of 18 months to simulate in-flight stresses and strains on the wings. Load cells are connected to indicators, which record output.

Results

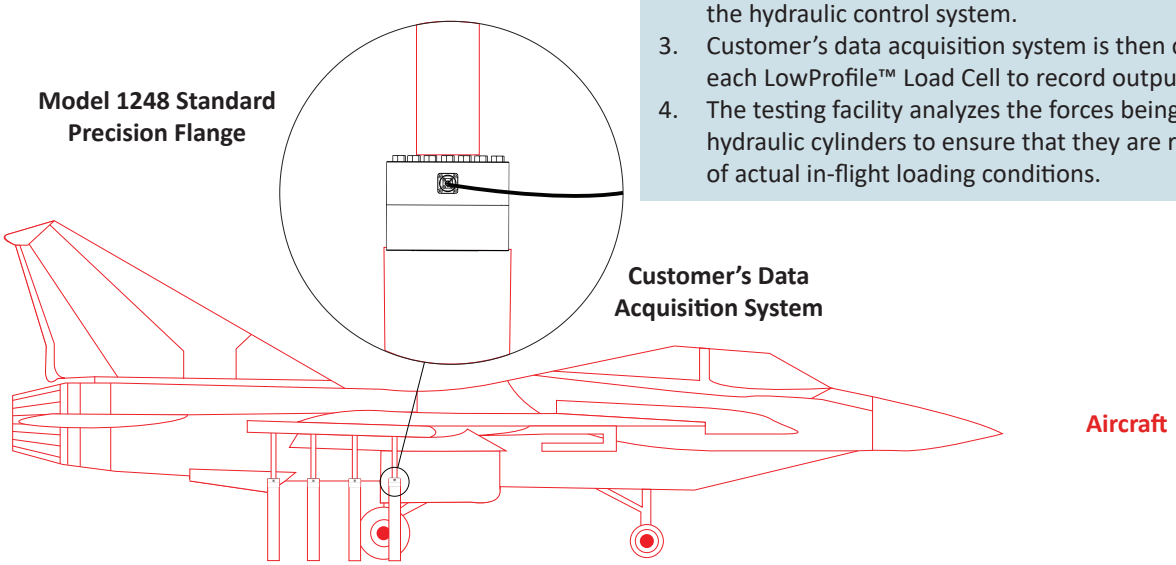
- Capable of withstanding more than 100 million ($1x10^8$) fully reversible load cycles, Interface's LowProfile™ fatigue-rated load cells have performed flawlessly in F/A-18 wing testing - with zero recorded failures in the many years that testing facilities around the world have been using them.

Materials

- Model 1248 Standard Precision Flange LowProfile™ Load Cell in 500 kN capacity with dual bridge option.
- Customer's data acquisition system.
- Customer's hydraulic control system.

How It Works

1. The F/A-18 is placed on a hydraulic testing bed where it is subjected to loading that simulates in-flight conditions.
2. Interface Model 1248 Standard Precision Flange LowProfile™ load cells are connected to each hydraulic cylinder that applies force to the wings and data is sent to the hydraulic control system.
3. Customer's data acquisition system is then connected to each LowProfile™ Load Cell to record output.
4. The testing facility analyzes the forces being created by hydraulic cylinders to ensure that they are representative of actual in-flight loading conditions.



Landing Gear Joint Testing
Load Pin

Industry: Aerospace

Summary

Customer Need / Challenge

An aerospace company wants to test their new spacecraft assembly and design by testing its landing gear joints. They want to ensure there are no flaws in the gear shock absorber design and can handle the applied forces when the craft lands from a flight.

Interface Solution

Interface's WTSLP Wireless Stainless Steel Load Pins can be installed and 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 in the customer's computer, and the WTS-BS-1-Ha Handheld Digital Display for multiple transmitters.

Results

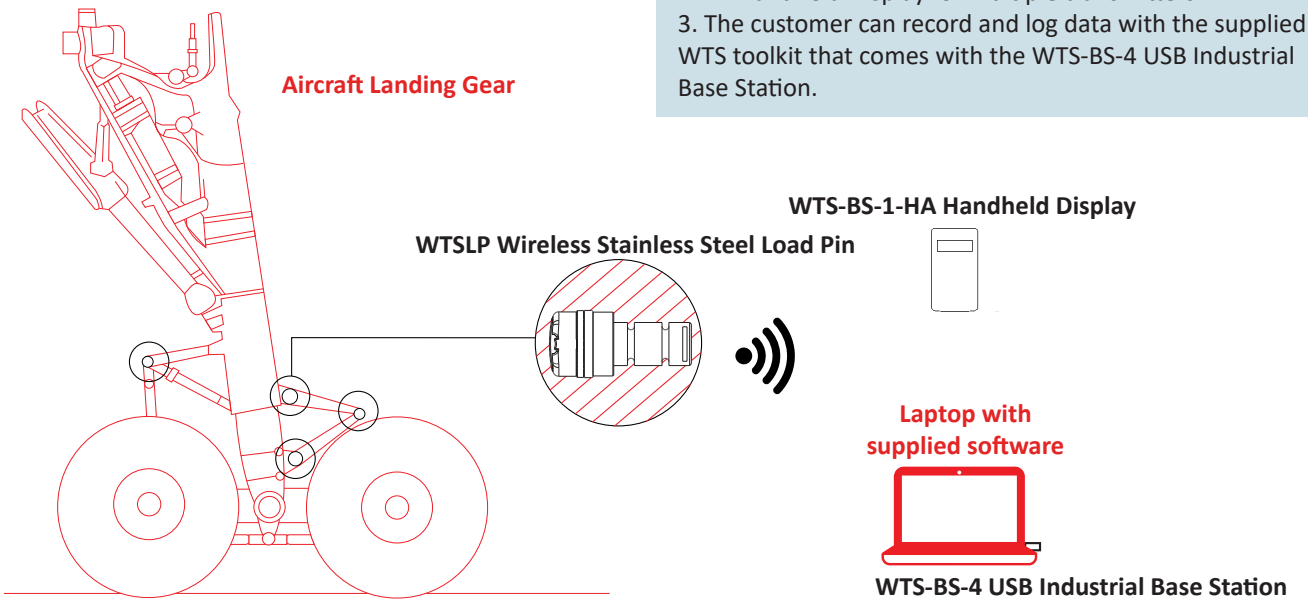
The customer was able to validate their spacecraft's landing gear structure is working effectively and safely.

Materials

- WTSLP Wireless Stainless Steel Load Pins
- WTS-BS-4 USB Industrial Base Station
- WTS Toolkit
- WTS-BS-1-HA Handheld Display for multiple transmitters
- Customer PC or Laptop

How It Works

1. The WTSLP Wireless Stainless Steel Load Pins are installed in the multiple articulating pin joints.
2. After multiple drop tests, the force measurements are transmitted wirelessly to the customer's computer through the WTS-BS-4 USB Industrial Base Station and the WTS-BS-1-HA Handheld Display for multiple transmitters.
3. The customer can record and log data with the supplied WTS toolkit that comes with the WTS-BS-4 USB Industrial Base Station.



Parachute Deployment & Deceleration Testing

Load Cell

Industry: Aerospace, Industrial Automation

Summary

Customer Need / Challenge

Spacecraft landing on a lunar or planetary surface require parachutes to deploy at high speeds under high loads. For example, NASA tested the Mars Science Laboratory parachute in an 80x120-foot wind tunnel at 80 mph speeds and loads up to 85,000 pounds.

Interface Solution

A 1000-series fatigue-rated LowProfile™ load cells with eccentric load compensation is employed to sustain and measure high loads with 300% overload protection.

Results

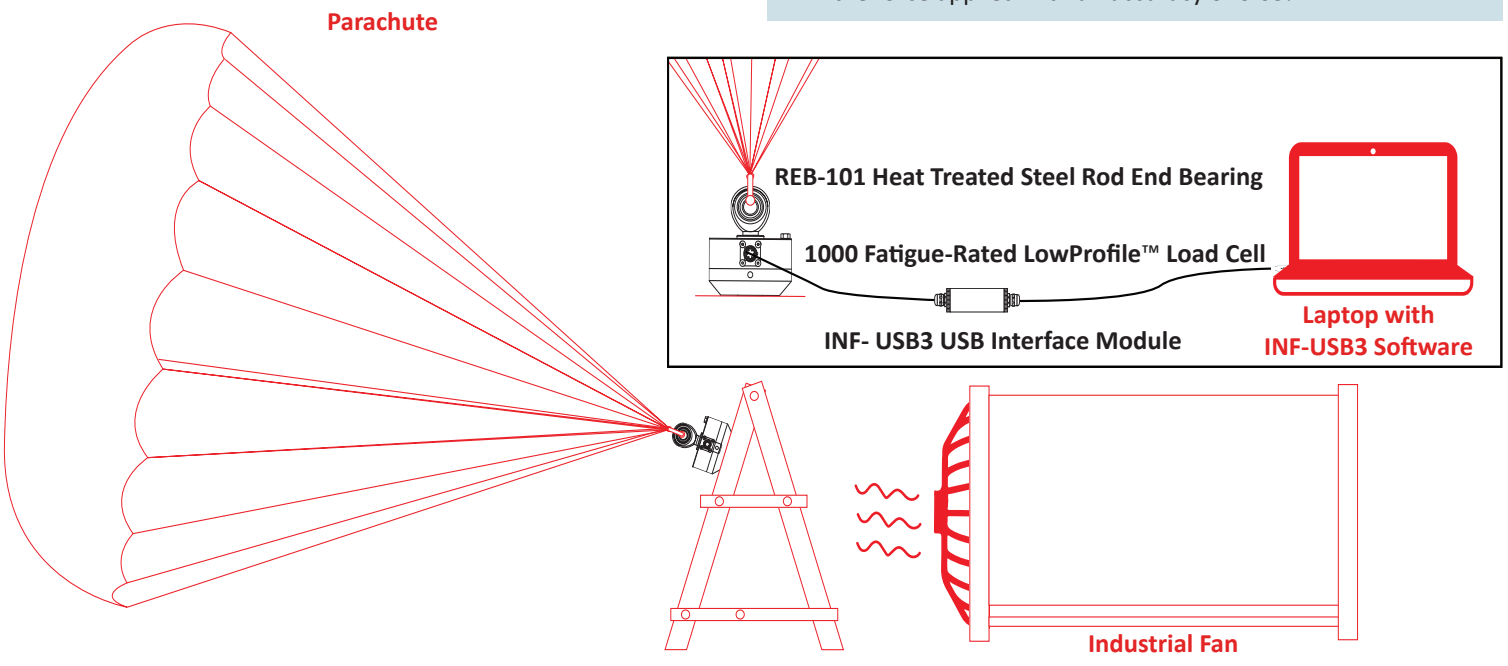
Load cells ensure accurate measurement of applied loads during parachute deployment testing. Multiple tests allow engineers to test various parachute packing techniques.

Materials

- 1000 Fatigue-Rated LowProfile™ Load Cells capacity up to 50K pounds-force (lbf).
- REB-101 Heat Treated Steel Rod End Bearing.
- INF-USB3 USB Interface Module.

How It Works

1. Support structure capable of sustaining required loads is built inside wind tunnel.
2. A single load cell is installed as part of the support structure and connected to the parachute deployment system.
3. After the wind tunnel is brought up to speed, a mortar launches the parachute, aiming toward the upper middle portion of the tunnel where speeds are highest.
4. As the parachute canopy deploys, the load cell(s) measure the force applied with an accuracy of 0.03%.



Reduced Gravity Simulation
Load Cell

Industry: Aerospace

Summary

Customer Need / Challenge

Develop a system to provide a full range of natural motion for a realistic simulation of reduced gravity environments. The system can simulate future missions to the moon, mars, asteroids, or any other celestial destination. The simulated weightlessness can train crew how to handle a wide range of microgravity activities, including walking, running, and jumping. The system can also be used for surface operation studies, suit and vehicle development, robotic development, and mass handling studies.

Interface Solution

Model 1100 series load cell is installed in-line with a steel support cable to actively measure the vertical load on the system. A control system, (which includes model 9860 High Speed Digital Indicator), monitors the load cell output and continuously offloads a portion of a human or robotic payload weight during all dynamic motions.

Results

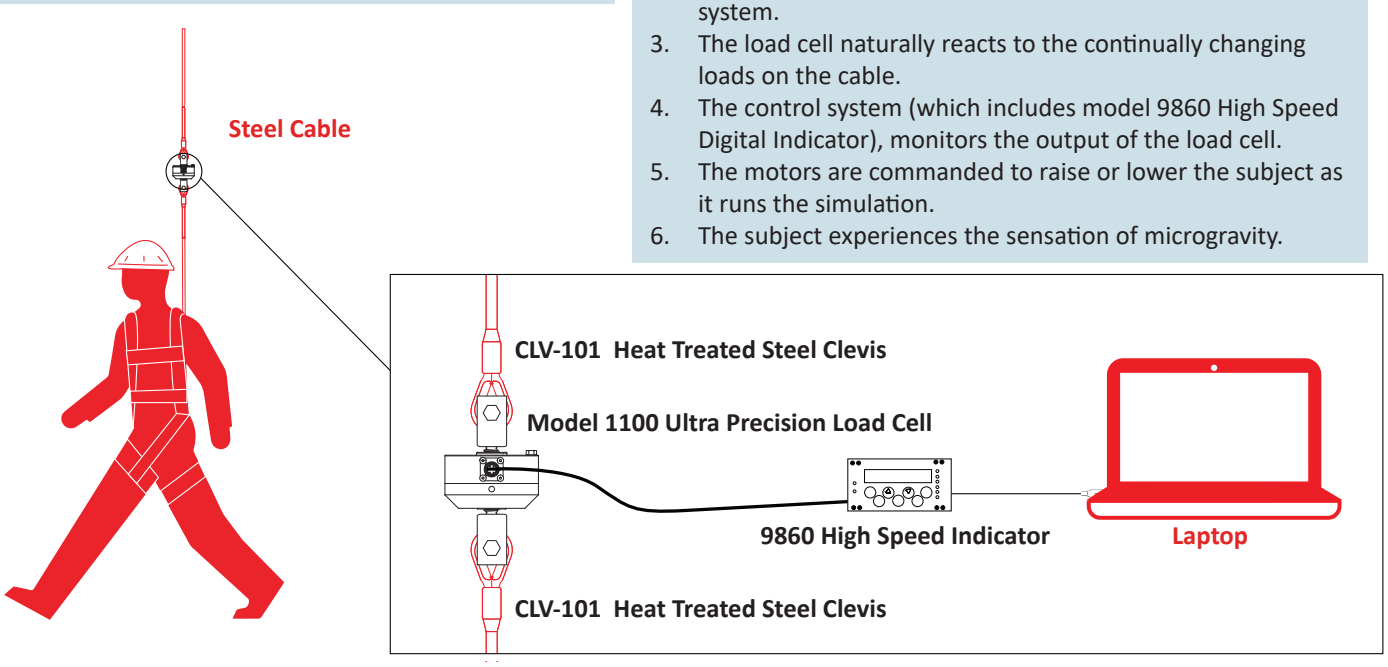
Using the precise feedback from the load cell, the control system is able to command a motor to raise or lower the subject to maintain a constant offload force. During the simulation, the system actively compensates for the movement of the subject to accurately reproduce a microgravity environment.

Materials

- Model 1100 Ultra Precision Load Cell.
- CLV-101 Heat Treated Steel Clevis.
- Model 9860 High Speed Digital Indicator.

How It Works

1. The 1100 series load cell is installed in the vertical axis steel cable.
2. The subject and simulation exercise are loaded into to system.
3. The load cell naturally reacts to the continually changing loads on the cable.
4. The control system (which includes model 9860 High Speed Digital Indicator), monitors the output of the load cell.
5. The motors are commanded to raise or lower the subject as it runs the simulation.
6. The subject experiences the sensation of microgravity.



Rescue Helicopter Hoist Test
Load Shackle

Industry: Aerospace

Summary

Customer Need / Challenge

A customer wants to test the strength of the cable line used in the hoist of their helicopter during rescue missions and situations. They want to see if both the cable and the hoist can withstand a heavy load safely, and for long periods of time while the helicopter is in flight.

Interface Solution

Interface, Inc.'s WTSSHK-D Wireless Crosby™ Load Shackle is attached to each mooring cable in use. Results are sent to the customers through the WTS-BS-4 USB Industrial Base Station when connected to the customer's supplied PC computer/ Laptop. Data can also be transmitted to the WTS-BS-1-HS Handheld Display for Single Transmitters, giving the customer the option to view mooring cable line tension.

Results

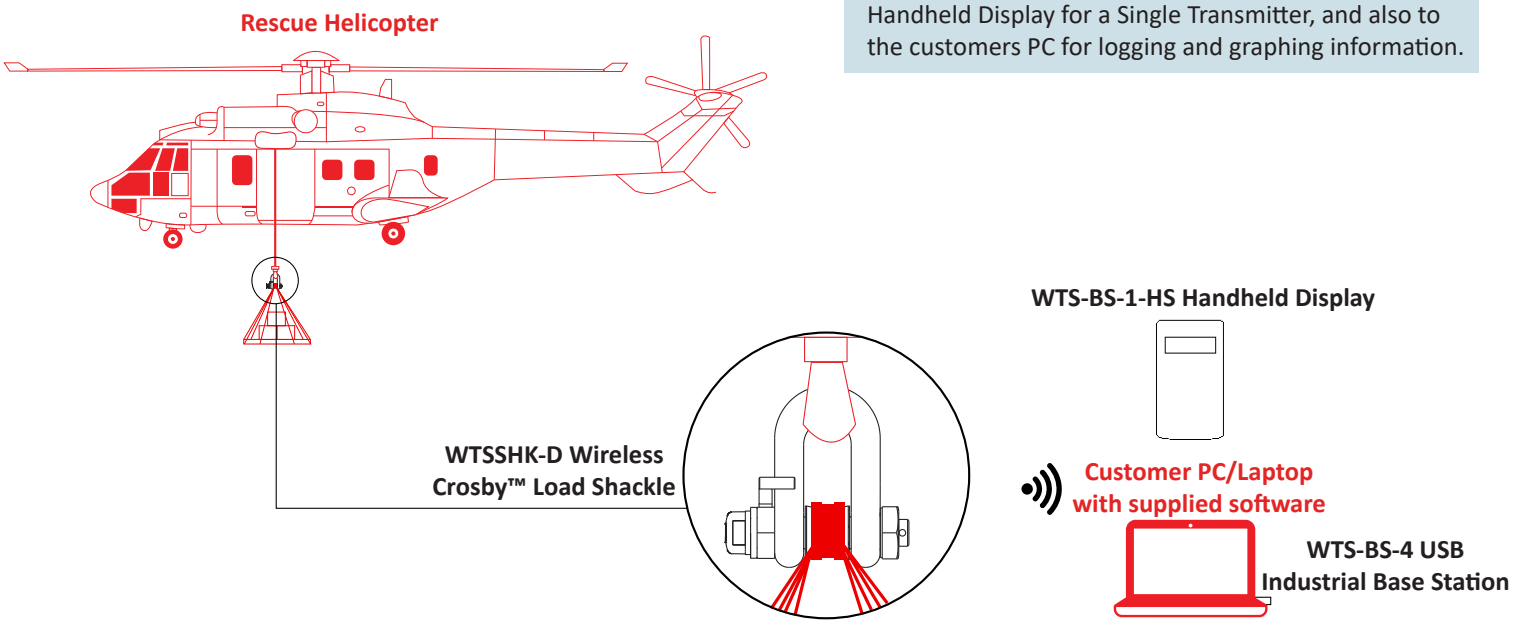
The customer was able to add a heavy load to the end of the helicopter hoist, to ensure it is strong and safe enough to carry both rescue personnel and objects while being in midair.

Materials

- WTSSHK-D Wireless Crosby™ Load Shackle
- WTS-BS-1-HS Handheld Display for Single Transmitters
- WTS-BS-4 USB Industrial Base Station
- WTS Toolkit & Log100 Software
- Customer supplied PC/Laptop

How It Works

1. The WTSSHK-D Wireless Crosby™ Load Shackle is installed at the end of the hoist.
2. A heavy load is attached to the shackle at its maximum capacity, and tested through mid flight in order to monitor the condition of the helicopter hoist.
3. Data is transmitted wirelessly to the WTS-BS-1-HS Handheld Display for a Single Transmitter, and also to the customers PC for logging and graphing information.



Rocket Structural Testing
Load Cell

Industry: Aerospace

Summary

Customer Need / Challenge

NASA's Space Launch System (SLS) core stage will be the largest ever built at 27 feet in diameter and 200+ feet tall. Core components including liquid hydrogen and oxygen tanks must withstand launch loads up to 9 million pounds-force (lbf).

Interface Solution

Interface load cells attached to hydraulic cylinders at various locations along test stands to provide precise test forces. Strain gages bonded to rocket structure surface and connected to data acquisition system for stress analysis.

Results

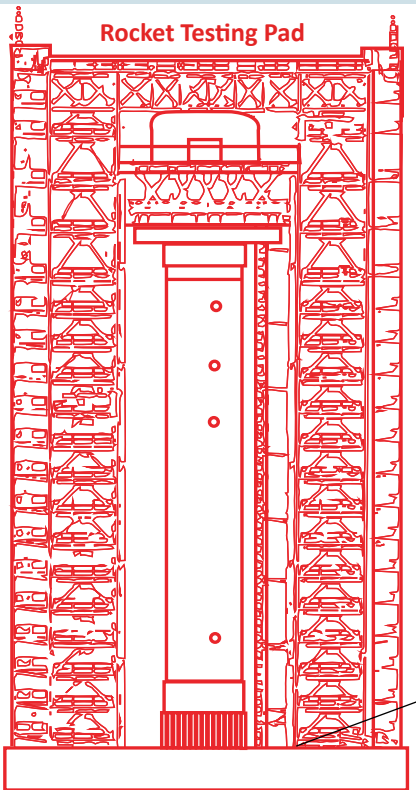
Engineers are able to measure loads applied at various areas on the rocket structure, verifying the structural performance under simulated launch conditions.

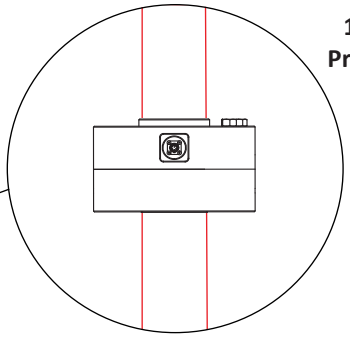
Materials

- 1200 High Capacity Standard Precision Low-Profile™ Load Cell Model 1260 for 600,000 lbf capacity.
- 1200 High Capacity Standard Precision LowProfile™ Load Cell Model 1280 for 1,000,000 lbf capacity.
- 1200 High Capacity Standard Precision LowProfile™ Load Cell Model 1290 for 2,000,000 lbf capacity.

How It Works

1. Marshall Space Flight Center in Hunstville, Alabama built a 215-foot twin tower static test stand to test the 185-foot hydrogen tank. A second 85-foot test stand was built to test oxygen tank and forward skirt.
2. The test stands contain hydraulic cylinders placed at strategic locations to push, pull or twist the structure to produce the required loads calculated by the test engineers to simulate actual launch conditions.
3. Multiple Interface 1200-series load cells of up to 2 million lbf capacity are attached in arrays to the hydraulic cylinders to measure the load being produced by each cylinder within 0.07%.
4. Load cell outputs are also fed back to the control system to control the cylinder forces. Temperature-compensated strain gages within each load cell reduce errors in output to 0.0008%/°F (0.0015%/°C).
5. Strain gauges bonded to the rocket structure being tested are connected to a data acquisition system for stress analysis.





1200 High Capacity Standard Precision LowProfile™ Load Cell

Wind Tunnel
Multi-Axis

Industry: Aerospace

Summary

Customer Need / Challenge

A major aerospace company was developing a new airplane and needed to test their scaled model for aerodynamics in a wind tunnel, by measuring loads created by lift and drag.

Interface Solution

A Model 6A154 6-Axis Load Cell was mounted in the floor of the wind tunnel, and connected to the scaled model by a "stalk". A Model BX8-AS was connected to the sensor to collect data.

Results

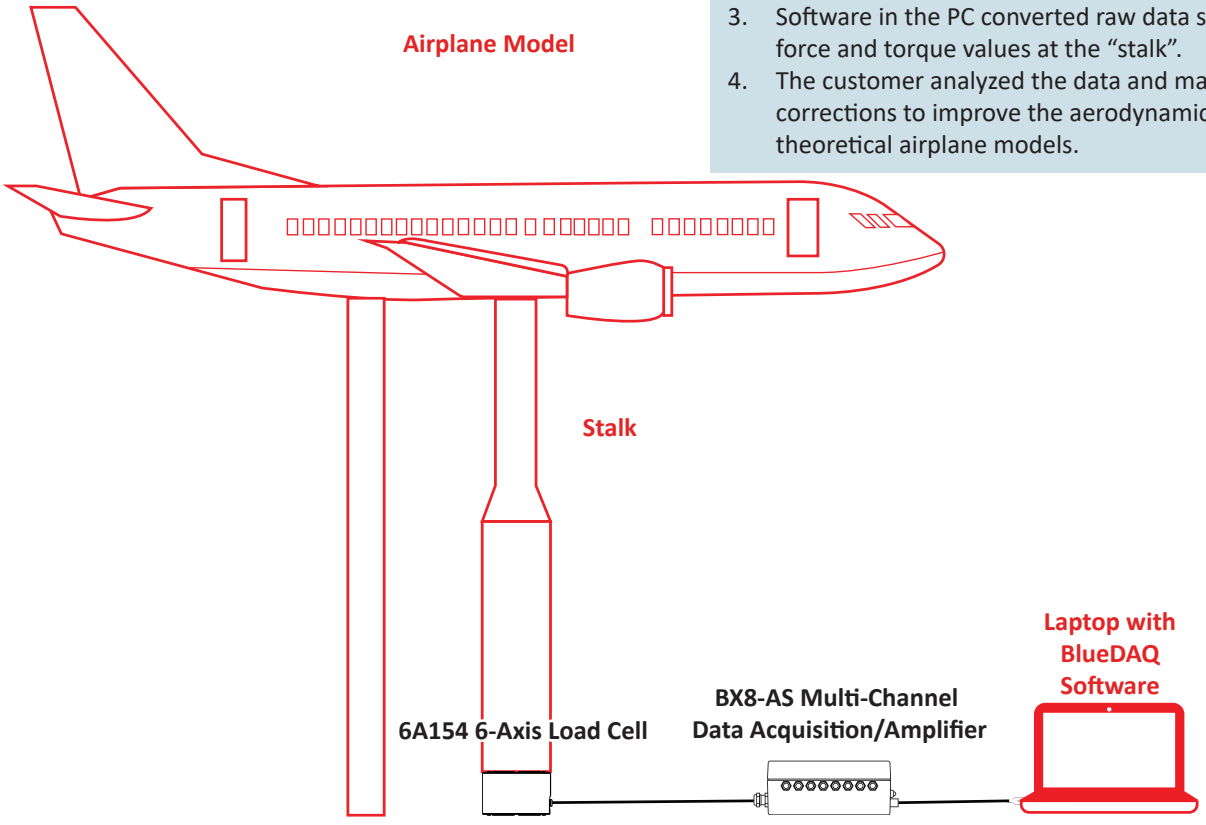
The company analyzed the collected data and made the necessary adjustments in their design to improve the aerodynamics of their theoretical airplane models.

Materials

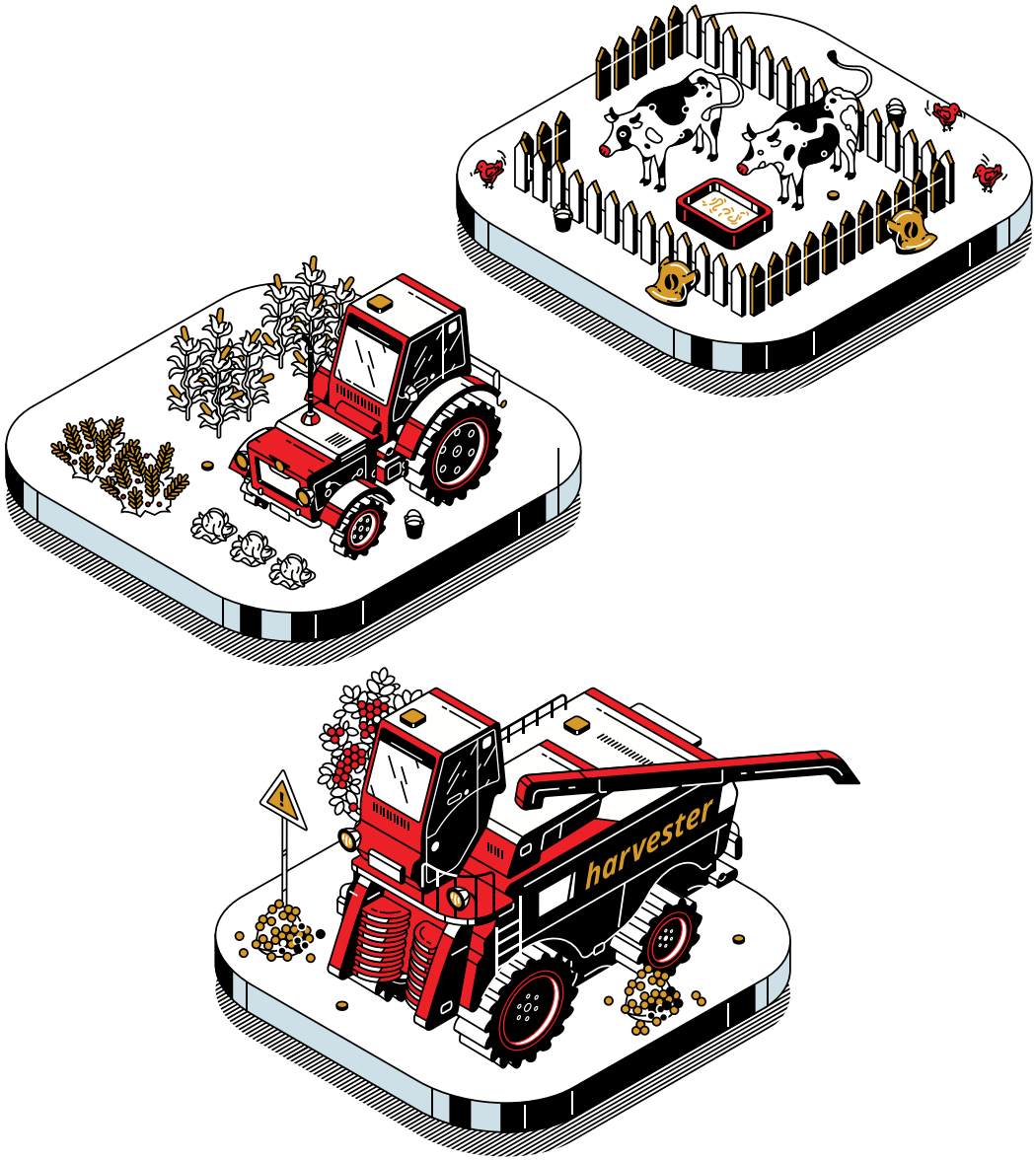
- 6A154 6-Axis Load Cell.
- BX8-AS Multi-Channel Data Acquisition/ Amplifier.
- BlueDAQ Software.

How It Works

1. The wind tunnel blew air over the scaled model creating lift and drag, which was measured and compared to the theoretical airplane models.
2. The output of the 6-Axis sensor was connected to the BX8-AS Amplifier, which was connected via USB cable to the PC.
3. Software in the PC converted raw data signals to actual force and torque values at the "stalk".
4. The customer analyzed the data and made the needed corrections to improve the aerodynamics of their theoretical airplane models.



Agriculture



BTS Equine Bridle Tension System

Interface Mini™ and BlueTooth®

Industry: Agriculture

Summary

Customer Need / Challenge

The customer needs to quantify the so-called "poll pressure." Bits designed to give strong poll pressure using simple pulley lever principles show a much attenuated transfer of the rein tension through the bit to the poll. The attenuation is readily understood when the equine mouth is recognized as a "floating" fulcrum degrading the otherwise required fixed pivot point of an ideal lever.

Interface Solution

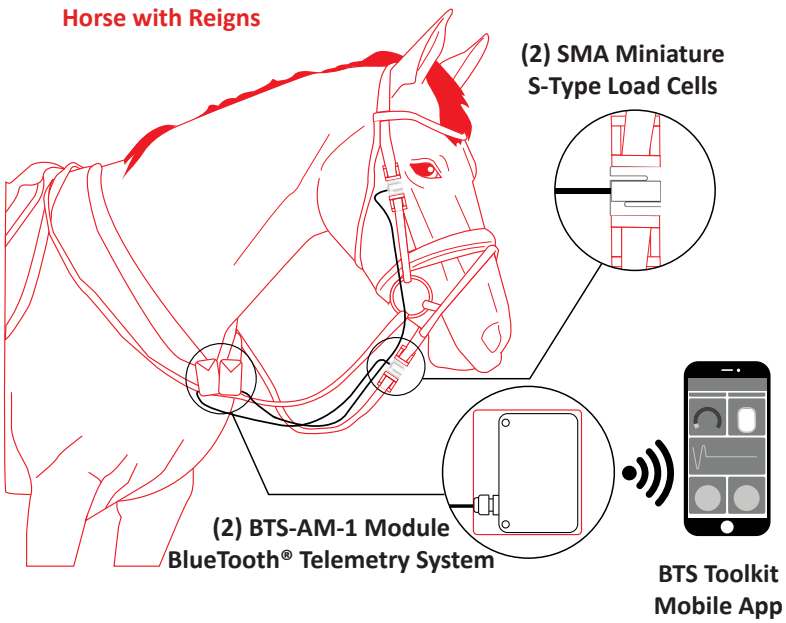
A BTS Equine Bridle Tension System, with 2 SMA Miniature S-Type Load Cells in both the line of the reins and that of the cheekpiece on one side of the horse, is used to study the dynamic response of the cheekpiece tension to rein tension in the ridden horse. Results are transmitted by the BTS-AM-1 Bluetooth Low Energy (BLE) Strain Bridge Transmitter Module to the BTS Toolkit Mobile App and displayed on a mobile device.

Results

The fundamental operation of the bits could in principle be discovered on the laboratory bench. But in practice of course, the equine mouth is expected to provide the fulcrum. Within the real experimental system comprising the rider's hands, the horse's mouth, and the bit, the elasticity of the equine mouth provides a "floating" fulcrum and a potential source of time-lag and decoherence between the dynamic rein and cheekpiece tensions.

Materials

- (2) SMA Miniature S-Type Load Cells
- (2) BTS-AM-1 Module BlueTooth® Telemetry System
- BTS Toolkit Mobile App



How It Works

The SMA Miniature S-Type Load Cells are inserted into the line of the cheekpiece and reins on one side of the horse. The SMA Miniature S-Type Load Cells are resistive wire strip strain gages whose changes in potential difference, produced with strain, are transferred to transmitters which send the data by the BTS Bluetooth® Telemetry System to a receiver connected to a USB port of a PC/ laptop. The BTS-AM-1 Bluetooth® Low Energy (BLE) Strain Bridge Transmitter Modules are held inside modified camera cases attached to a breastplate on the horse. The rider is therefore not carrying any of the electrical equipment. Before the data is collected and after the cheekpiece is pretensioned, the SMA Miniature S-Type Load Cells are tared to zero. This makes it possible in some cases to see negative net values for cheekpiece tension when rein tension is applied to the cheek. The rider takes a normal contact on both reins and performs ridden exercises in the three lower gaits, and the natural resistive counter-contact from the body of the horse provides pairs of force data from the rein and cheekpiece. Because the cheekpiece is directly attached to the headpiece, we can assume that forces seen in the cheekpiece are those that are applied to the poll of the horse.

Chicken Weighing
Load Beam
Industry: Agriculture

Summary

Customer Need / Challenge

A customer wants a weighing system to help them determine a specific weight for their chickens. They need a weighing system that will ensure accurate weight measurements to keep their birds at their weight in order to sell to supermarkets. They also need a system that will be able to undergo harsh conditions and unusual temperatures.

Interface Solution

Interface's SPI Low Capacity Platform Scale Load Cell is able to undergo strained temperatures and transmits highly accurate results. A plate can be put on top of the SPI, and then a chicken can be weighed on top of the plate. Data results can be displayed on the 480 Bidirectional Digital Weight Indicator.

Results

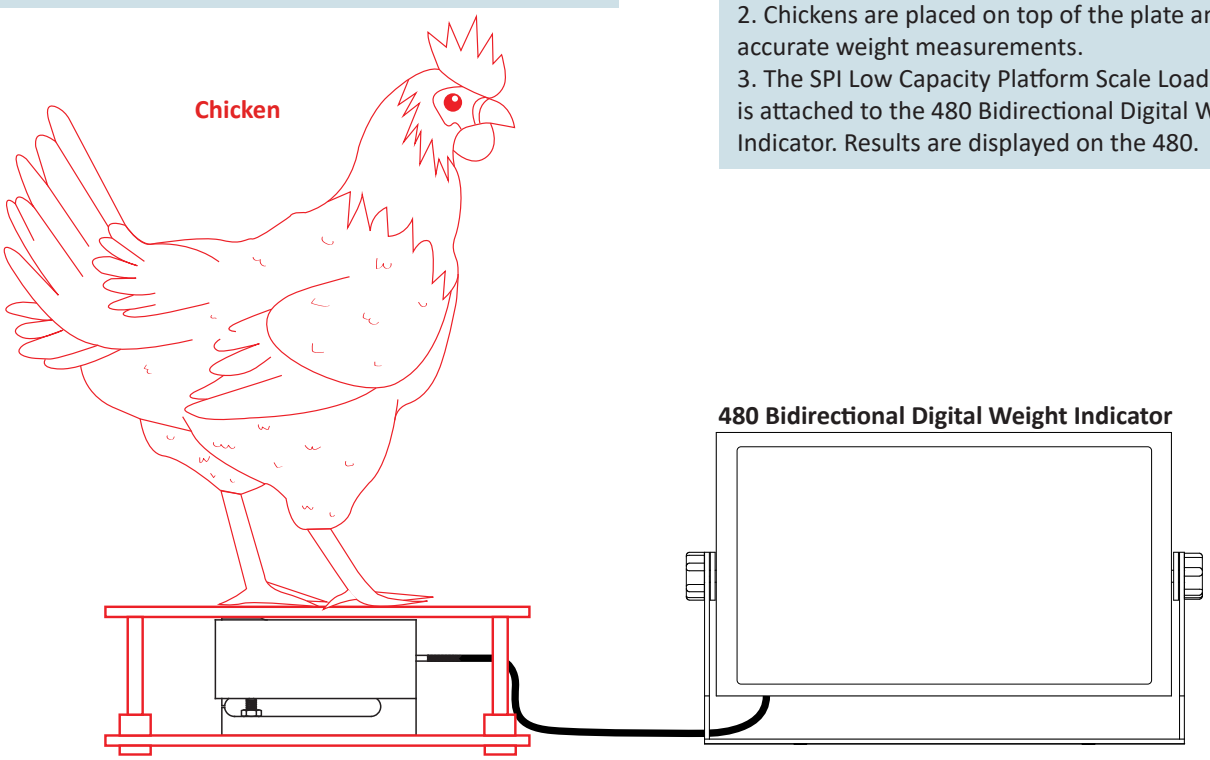
The customer is able to weigh their chickens, and maintain their weight through the accurate results from Interface's SPI Low Capacity Platform Scale Load Cell.

Materials

- SPI Low Capacity Platform Scale Load Cell
- 480 Bidirectional Digital Weight Indicator

How It Works

1. Metal plates are attached on the top and the bottom of the SPI Low Capacity Platform Scale Load Cell.
2. Chickens are placed on top of the plate and SPI for accurate weight measurements.
3. The SPI Low Capacity Platform Scale Load Cell is attached to the 480 Bidirectional Digital Weight Indicator. Results are displayed on the 480.



Livestock Weighing System
Load Beam

Industry: Agriculture

Summary

Customer Need / Challenge

A rancher wants to accurately weigh their cows for multiple reasons. They want to make sure their cows are at a healthy weight, and also want to maintain their weight. But they also want to know the optimal time for breeding based on the weight of their livestock.

Interface Solution

Interface's solution is to bolt 4 SSB Sealed Beam Load Cells at the bottom of a metal platform, that is placed on the inside of the customer's cattle cage. Once the cow has walked onto the plate, the SSB Sealed Beam Load Cells will measure the force pressure applied. With all 4 connected to JB104SS Junction Box, which is then connected to the 480 Bidirectional Weight Indicator, combined accurate weight results will be displayed.

Results

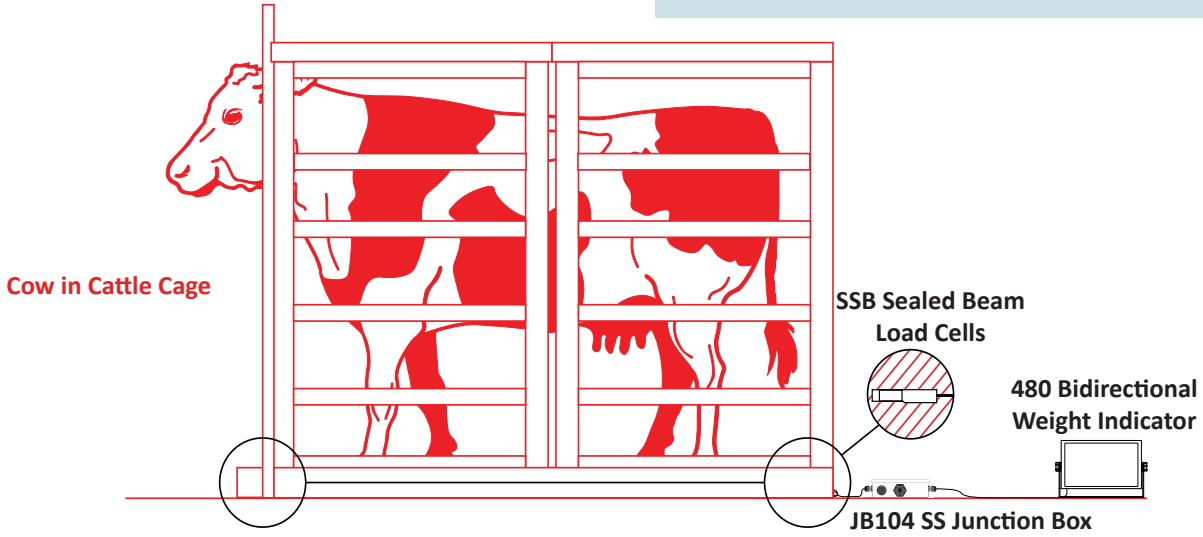
The customer was able to determine accurate weight measurements of their livestock in order to keep them healthy, or, to determine when was a good time to breed.

Materials

- (4) SSB Sealed Beam Load Cells
- JB104SS Junction Box
- 480 Bidirectional Weight Indicator

How It Works

1. (4) SSB Sealed Beam Load Cells are bolted to the bottom of a metal platform, which was placed inside a cattle cage.
2. A cow was led inside the cattle cage, where it was weighed on the metal platform.
3. The multiple SSB's were wired together to a JB104SS Junction Box, which was then connected to the 480 Bidirectional Weight Indicator to measure the combined results of the 4 SSB Sealed Beam Load Cells.



Poultry Feeder Monitoring
Torque Transducer
Industry: Agriculture

Summary

Customer Need / Challenge

A customer wants to monitor the motor that operates their poultry feeders. The poultry feeders must give out an equal distribution of feed per poultry house.

Interface Solution

Interface's solution is to use the T5 Standard Precision Pedestal Mount Shaft Style Rotary Torque Transducer, with the speed/angle option, which will be attached between a poultry feeder and a motor with Interface's couplings. Torsion measurements can be graphed and logged sing the 9850 Torque Transducer and Load Cell Indicator.

Results

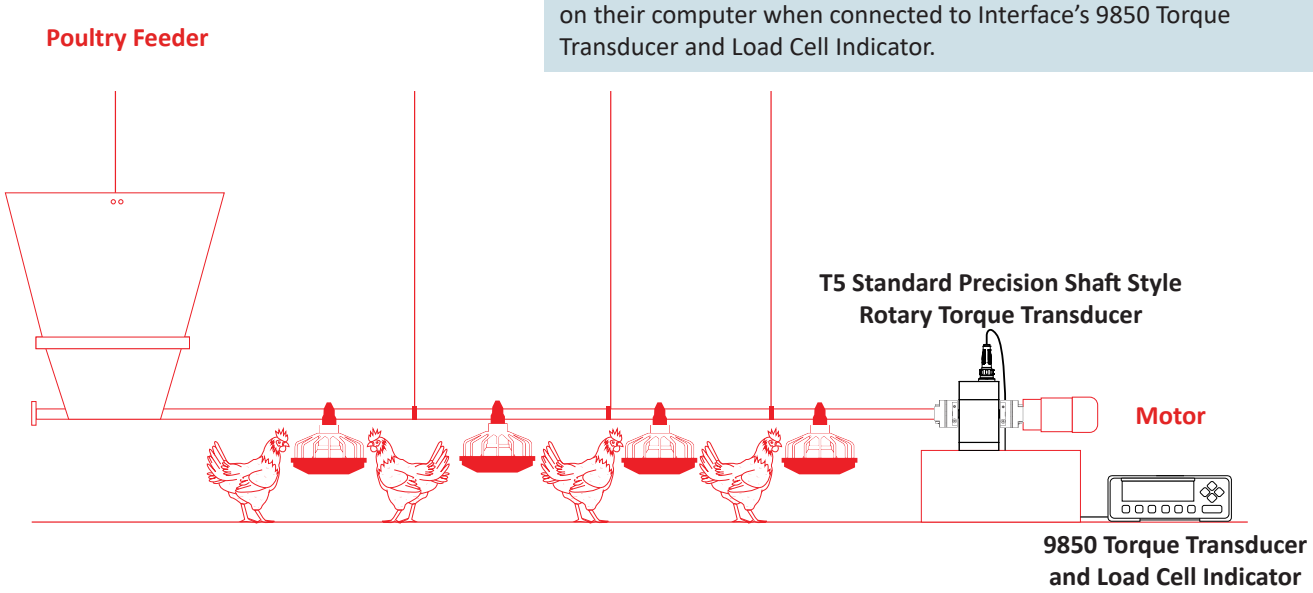
The customer was able to monitor their poultry feeders, and that every feeder got the same amount of food distributed to it.

Materials

- T5 Standard Precision Pedestal Mount Shaft Style Rotary Torque Transducer
- 9850 Torque Transducer and Load Cell Indicator

How It Works

1. The T5 Standard Precision Pedestal Mount Shaft Style Rotary Torque Transducer is attached with Interface's Couplings in between the poultry feeder and the motor.
2. The T5 can measure the torque to see if any of the feed is stuck, which would stop the motor from being dispensing the food. It can also detect if the motor is depending too much food with the angle measurement, and also count the number of rotations so the food is dispensed is at the same amount each and every time.
3. The customer was able to log and graph the torque results on their computer when connected to Interface's 9850 Torque Transducer and Load Cell Indicator.



Silo Grain Dispensing

Load Cell and Wireless Telemetry System

Industry: Agriculture

Summary

Customer Need / Challenge

A silo is returning grain into a dispensing container. A customer wants to measure and record the grain being put in and out of their grain dispensing container, as it dispenses content into a carrier truck for transportation. The customer would also prefer a wireless solution.

Interface Solution

Interface suggests a wireless solution, by installing WTS 1200 Standard Precision LowProfile™ Wireless Load Cells at the legs of the grain dispensing container. The 1200 can measure the distribution correlation of the grain as it inputted and outputted from the container. Results will be transmitted and displayed using the WTS-BS-1-HA Handheld Display for multiple transmitters, and will be logged and graphed using the WTS-BS-4 USB Industrial Base Station.

Results

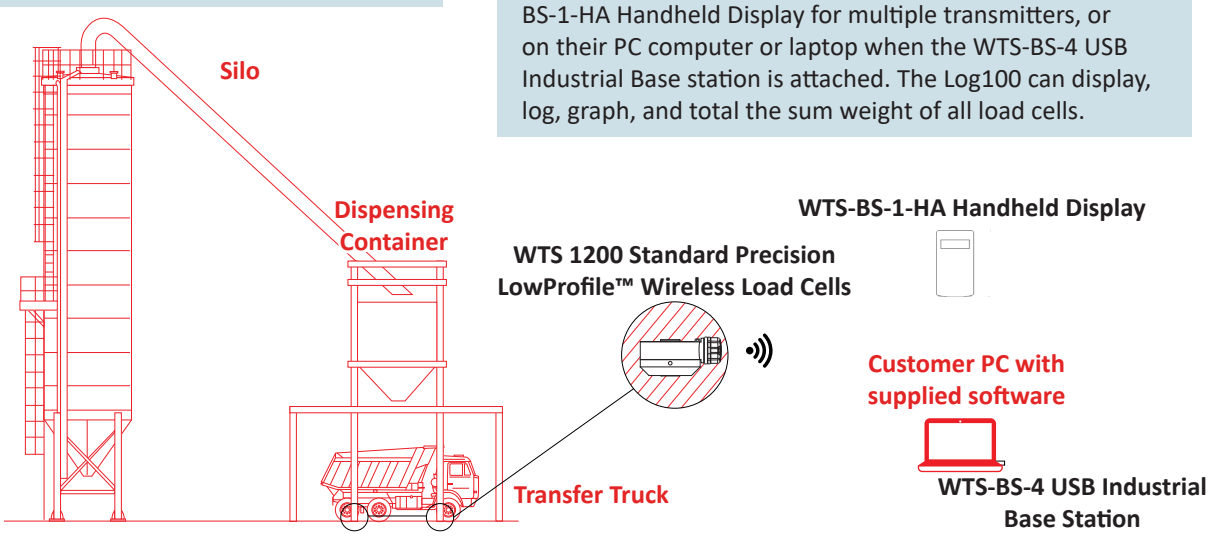
The customer was able to log and graph the measurement results of the grain content that the silo dispenses into the grain dispensing container, and also when the grain is dispensed into the carrier truck.

Materials

- WTS 1200 Standard Precision LowProfile™ Wireless Load Cells
- WTS-BS-4 USB Industrial Base Station
- WTS-BS-1-HA Handheld Display for multiple transmitters
- WTS Toolkit and Log100 Software
- Customer PC or Laptop

How It Works

1. Multiple WTS 1200 Standard Precision LowProfile™ Wireless Load Cells are installed at the legs of the grain dispensing container.
2. As the silo puts grain into the grain dispensing container, force measurements of the distribution is measured and totaled using the supplied Log100 Software.
3. The customer can view real-time results using the WTS-BS-1-HA Handheld Display for multiple transmitters, or on their PC computer or laptop when the WTS-BS-4 USB Industrial Base station is attached. The Log100 can display, log, graph, and total the sum weight of all load cells.



Silo Monitoring and Weighing
Load Cell

Industry: Agriculture

Summary

Customer Need / Challenge

A customer wants weigh and monitor the content inside their silo.

Interface Solution

Using Interface, Inc.'s A4200 Zinc Plated or A4600 Stainless Steel Weigh-check Load Cells, paired with 1280 Programmable Weight Indicator and Controller, the customer is able to monitor the amount of content by weight in their silo.

Results

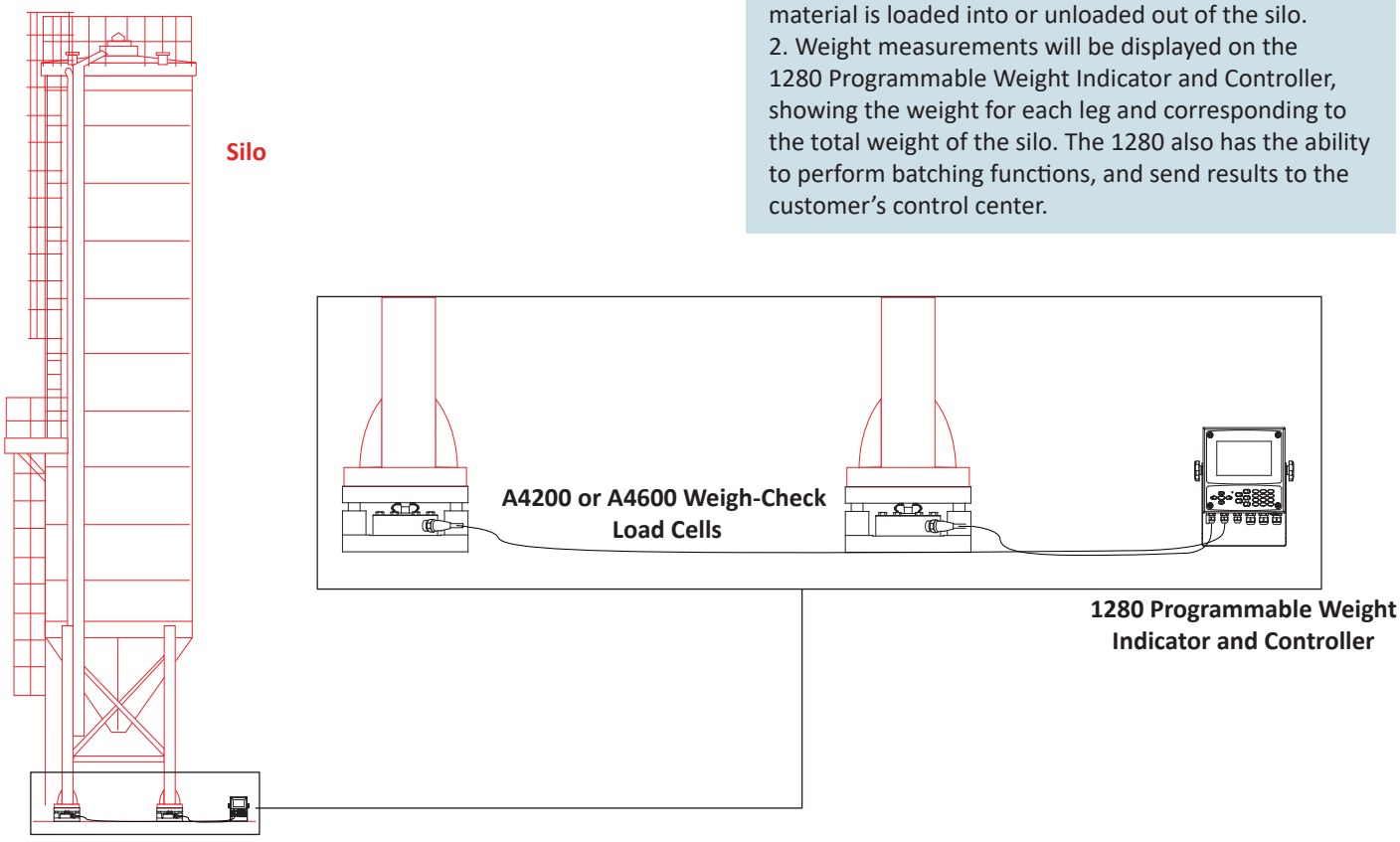
The customer was provided a customizable solution to monitor and weigh their silo with Interface, Inc.'s load cells and instrumentation. Results from the 1280 Programmable Weight Indicator and Controller was sent to the customer's control center.

Materials

- A4200 or A4600 Weigh-Check Load Cells
- 1280 Programmable Weight Indicator and Controller

How It Works

1. The A4200 or A4600 Weigh-Check Load Cells is installed under the legs of the silo, or base of the silo. The Weigh-Check Load Cell will measure the load as material is loaded into or unloaded out of the silo.
2. Weight measurements will be displayed on the 1280 Programmable Weight Indicator and Controller, showing the weight for each leg and corresponding to the total weight of the silo. The 1280 also has the ability to perform batching functions, and send results to the customer's control center.



Tractor Linkage Draft Control Load Pin

Industry: Agriculture

Summary

Customer Need / Challenge

A farmer wants to measure the forces applied on their tractor's draft control, between the tractor and any linked on attachments. Measuring the force will help the farmer be able sense any strains on the hitch of the tractor, and will be needed in order to apply any specific settings to the draft control when the tractor encounters rough terrain.

Interface Solution

Interface's WTSLP Wireless Stainless Steel Load Pin is a wireless load pin that can be installed directly in the hitch, replacing the normal shear pin of the tractor. Force results are transmitted wirelessly to the WTS-BS-4 USB Industrial Base Station, where the customer can view the results on their PC computer or Laptop with the supplied WTS toolkit. The customer can also view results on the WTS-BS-1-HS Handheld Display for Single Transmitters in real-time.

Results

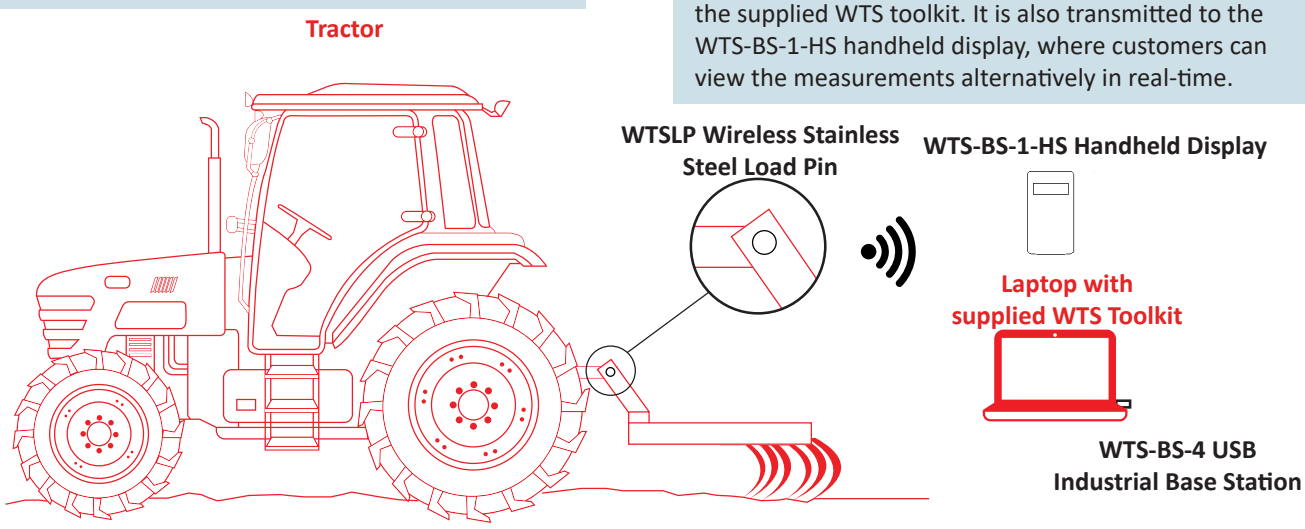
The customer is able to determine the specific draft control settings for their tractor after using Interface's custom solution Wireless Load Pin and Wireless Telemetry System products.

Materials

- WTSLP Wireless Stainless Steel Load Pin
- WTS-BS-1-HS Handheld Display for Single Transmitters
- WTS-BS-4 USB Industrial Base Station
- WTS Toolkit (graphing, logging, and set up software, included with WTS-BS-4)
- Customer PC Computer or Laptop

How It Works

1. The WTSLP Wireless Stainless Steel Load Pin is installed where the tractor's original shear pin would be located.
2. An implement is installed to the hitch.
3. The force results are measured and relayed to the wireless telemetry systems, such as the WTS-BS-4 USB Industrial Base Station, where the customer is able to review the results on their PC computer or laptop with the supplied WTS toolkit. It is also transmitted to the WTS-BS-1-HS handheld display, where customers can view the measurements alternatively in real-time.



Tractor PTO Torque Testing

Torque Transducer

Industry: Agriculture

Summary

Customer Need / Challenge

A customer wants to measure the torque and speed of their tractor's PTO (power takeoff test) system. They want to ensure the tractor's PTO system is functioning properly, and they want to measure the torque being delivered to an implement.

Interface Solution

Interface's solution is to use their T27 Bearingless Hollow Flange Style Rotary Torque Transducer to measure the tractor's torque and speed of their tractor's PTO system.

Results

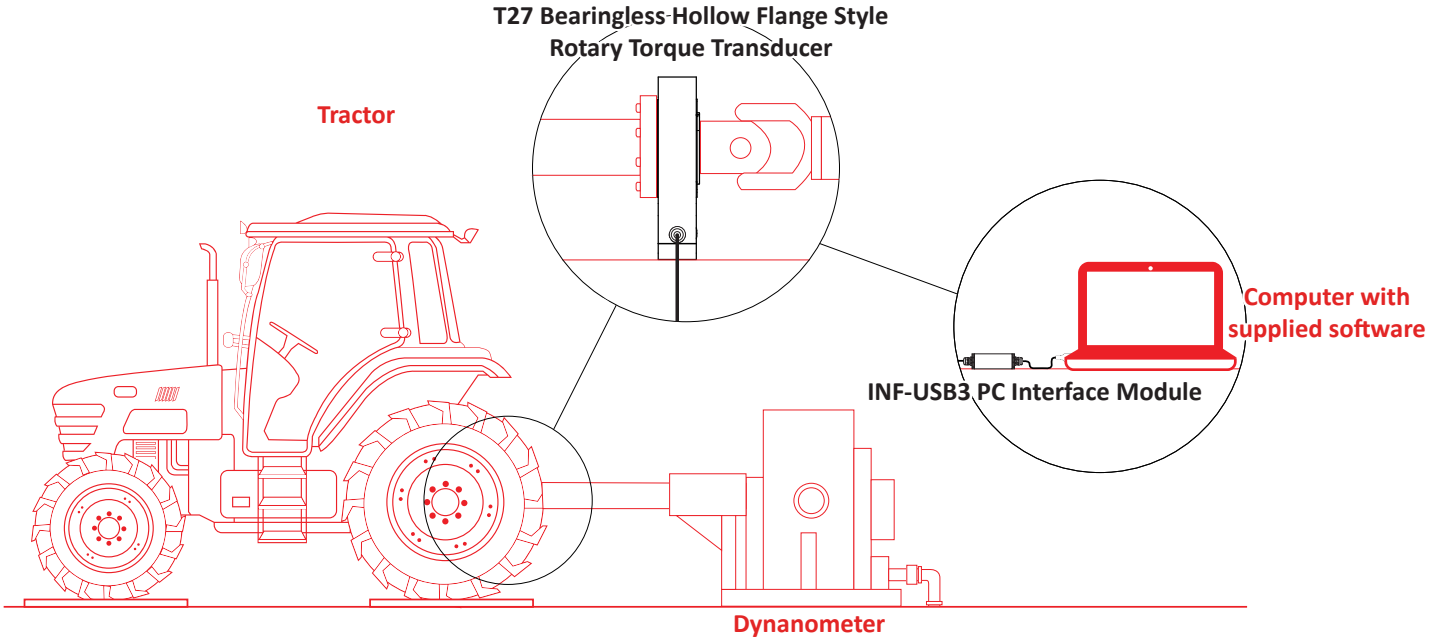
Interface's T27 Bearingless Hollow Flange Style Rotary Torque Transducer successfully and accurately measured the torque and speed of the tractor's PTO system.

Materials

- Customer supplied dynamometer
- T27 Bearingless Hollow Flange Style Rotary Torque Transducer
- INF3-USB Universal Serial Bus Single Channel PC Interface Module
- Supplied configuration, display, graphing, and logging software
- Customer PC or Laptop

How It Works

1. The T27 Bearingless Hollow Flange Style Rotary Torque Transducer is bolted to the tractors PTO shaft. A dynamometer is attached on the other end.
2. The T27 Bearingless Hollow Flange Style Rotary Torque Transducer measures the tractor's torque and speed with high accurate results.
3. With the INF3-USB PC Interface Module the customer was able to display, graph, and log the recorded torque and speed of the tractor's PTO system with the supplied INF3-USB software.



WTS Equine Bridle Tension System

Interface Mini™ and Wireless Telemetry System

Industry: Agriculture

Summary

Customer Need / Challenge

The customer needs to quantify the so-called "poll pressure." Bits designed to give strong poll pressure using simple pulley lever principles show a much attenuated transfer of the rein tension through the bit to the poll. The attenuation is readily understood when the equine mouth is recognized as a "floating" fulcrum degrading the otherwise required fixed pivot point of an ideal lever.

Interface Solution

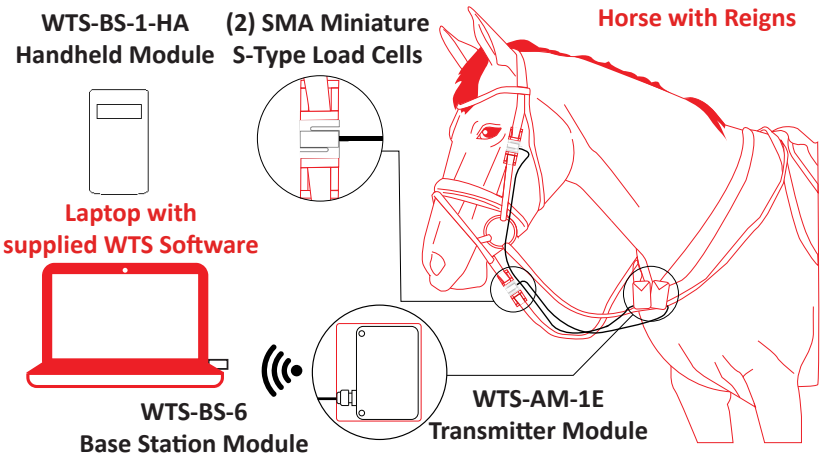
A WTS Equine Bridle Tension System, with 2 SMA Miniature S-Type Load Cells in both the line of the reins and that of the cheekpiece on one side of the horse, is used to study the dynamic response of the cheekpiece tension to rein tension in the ridden horse. Utilizing the Wireless Telemetry System (WTS), the valuable data can be displayed and/or recorded in real time using a PC and/or a handheld receiver depending on the requirements and preferences of the customer.

Results

The fundamental operation of the bits could in principle be discovered on the laboratory bench. But in practice of course, the equine mouth is expected to provide the fulcrum. Within the real experimental system comprising the rider's hands, the horse's mouth, and the bit, the elasticity of the equine mouth provides a "floating" fulcrum and a potential source of time-lag and decoherence between the dynamic rein and cheekpiece tensions.

Materials

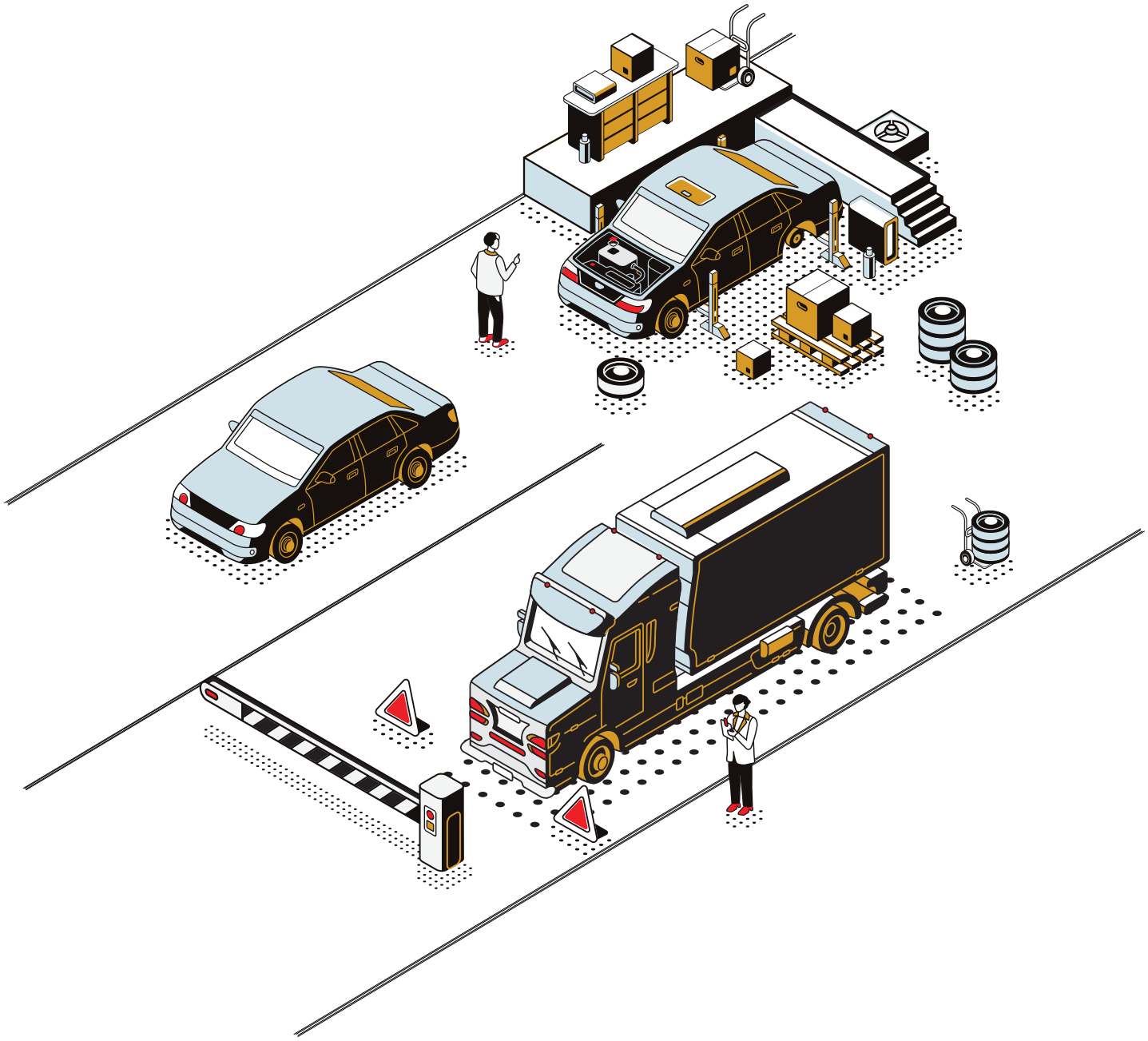
- (2) SMA Miniature S-Type Load Cells
- (2) WTS-AM-1E Wireless Strain Bridge Transmitter Module
- WTS-BS-1-HA Wireless Handheld Display for Multiple Transmitters
- WTS-BS-6 Wireless Telemetry Dongle Base Station
- WTS Toolkit Software & Log100 Software included
- Customer supplied PC/Laptop



How It Works

The SMA Miniature S-Type Load Cells are inserted into the line of the cheekpiece and reins on one side of the horse. The SMA Miniature S-Type Load Cell's are resistive wire strip strain gages whose changes in potential difference, produced with strain, are transferred to transmitters which send the data wirelessly to a receiver connected to a USB port of a PC/laptop or a WTS-BS-1-HA Handheld Module. The WTS-AM-1E Transmitter Module are held inside modified camera cases attached to a breastplate on the horse. The rider is therefore not carrying any of the electrical equipment. Before the data is collected and after the cheekpiece is pretensioned, the SMA Miniature S-Type Load Cells are tared to zero. This makes it possible in some cases to see negative net values for cheekpiece tension when rein tension is applied to the cheek. The rider takes a normal contact on both reins and performs ridden exercises in the three lower gaits, and the natural resistive counter-contact from the body of the horse provides pairs of force data from the rein and cheekpiece. Because the cheekpiece is directly attached to the headpiece, we can assume that forces seen in the cheekpiece are those that are applied to the poll of the horse.

Automotive and Vehicle



AxialTQ™ Engine Dynamometer

Torque Transducer

Industry: Automotive and Vehicle, Test and Measurement

Summary

Customer Need / Challenge

- The customer needs to measure the torque and the speed (RPM) produced by an engine and calculate it simultaneously.

Interface Solution

- The Interface AxialTQ Wireless Rotary Torque Measurement System was developed in direct collaboration with over 30 end-users who shared their wish-lists for operational priorities, user interface, design, features, real-world field issues and more.

Results

- The Interface AxialTQ Wireless Rotary Torque Measurement System accurately and simultaneously measured and calculated the torque and rotational speed (RPM) of the engine in real-time while collecting the data.

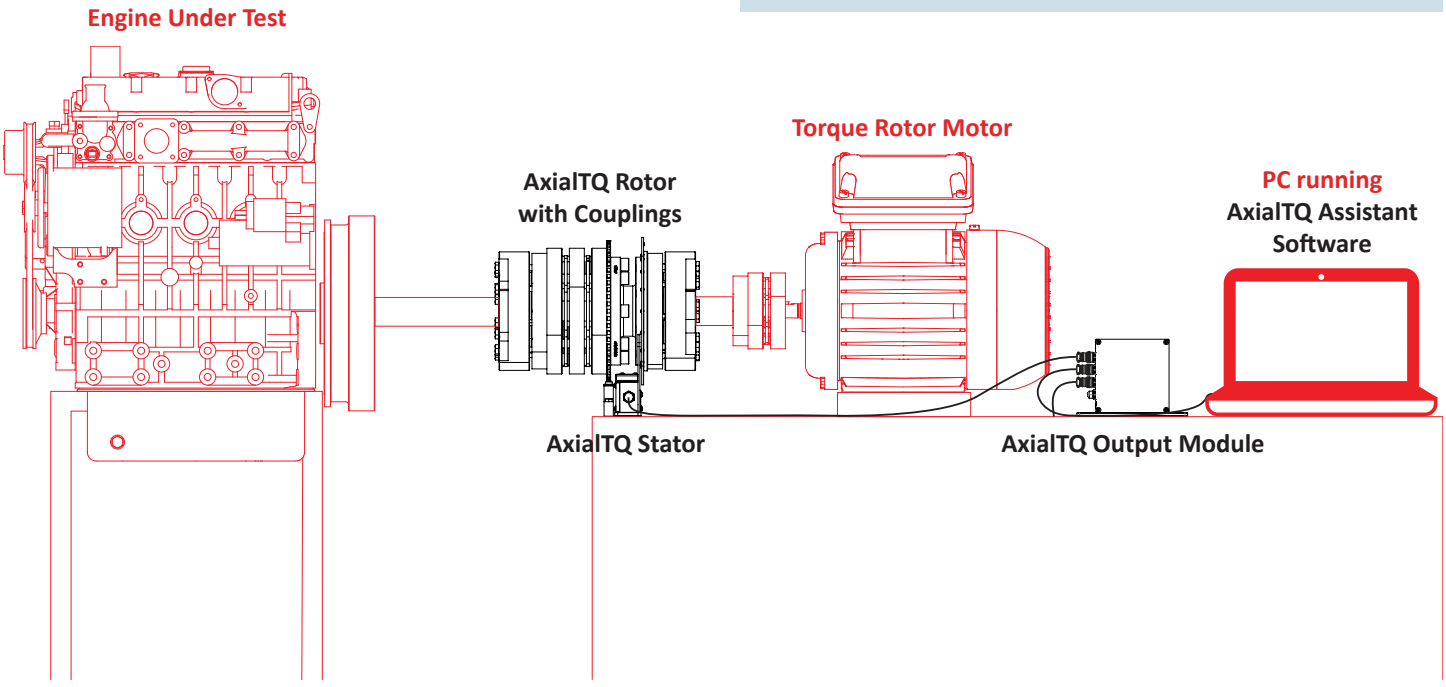
Materials

Interface Solution

- AxialTQ Wireless Rotary Torque Transducer
- AxialTQ Output Module
- Customer PC running AxialTQ Assistant Software

How It Works

- The AxialTQ rotor senses the torque with a high precision sensing element and strain gages. The electrical output is converted from an analog to a digital signal in the rotor. The high accuracy of the system is based on this combination of the proven sensing element technology with next generation electronics to provide the highest quality torque measurement available in the industry.



Bluetooth®
Interface Mini™
Industry: Automotive

Summary

Customer Need / Challenge

- The customer needs to measure brake pedal force when the pedal is pressed during automobile testing.

Interface Solution

- As the pedal is pressed, force is measured by the BPL-300-C Brake Pedal Load Cell. Results are transmitted by the BTS-AM-1 Bluetooth Low Energy (BLE) Strain Bridge Transmitter Module to the BTS Toolkit Mobile App and displayed on a mobile device.

Results

- The customer objective has been achieved when a brake test was executed the force measurement was simultaneously displayed and graphed for examination in real time in the tested vehicle.

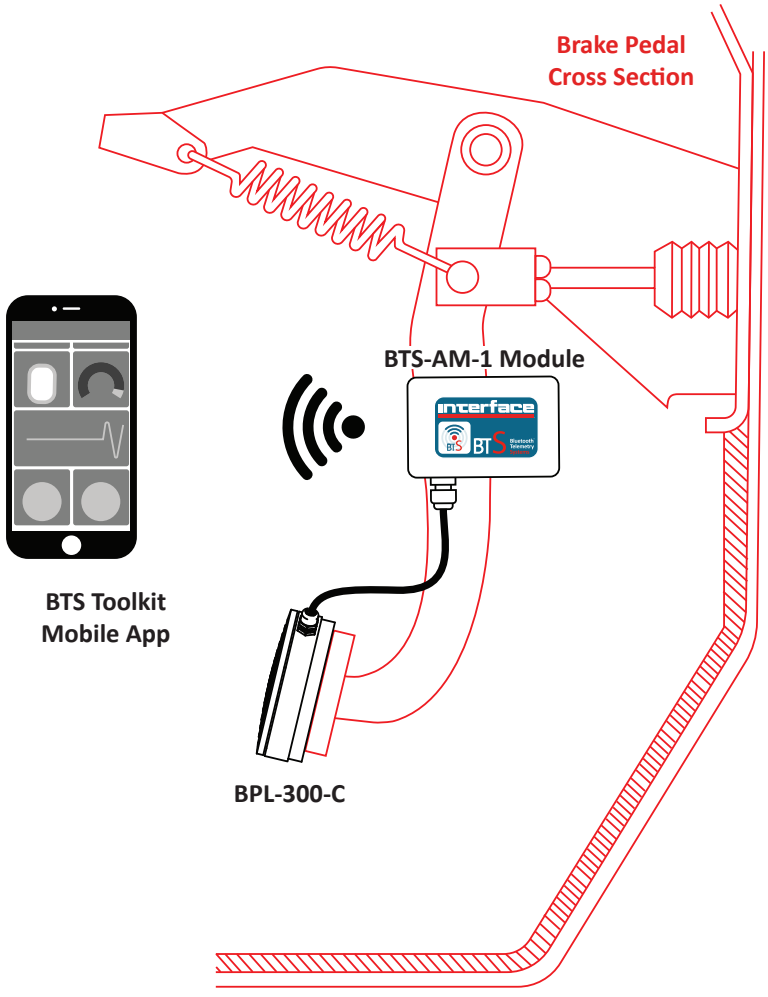
Materials

- BPL-300-C Brake Pedal Load Cell
- BTS-AM-1 Bluetooth Low Energy (BLE) Strain Bridge Transmitter Module
- BTS Toolkit Mobile App on iPhone or Android Devices

How It Works

1. The Interface BPL-300-C is securely mounted on the top of the brake pedal.
2. The load cell is connected to the BTS-AM-1 Module.
3. The BTS-AM-1 Module transmits via Bluetooth to the BTS Toolkit Mobile App.
4. The BTS Toolkit Mobile App runs on iPhone or Android devices.
5. Brake test is performed and results are displayed in real time.

The BTS Toolkit Mobile App is available for Apple iOS and Android devices and is available for download at the Apple App Store and Google Play Store.



Engine Dynamometer
Load Cell

Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

Internal combustion engines are by far the most common power source for land vehicles. From a 2-stroke motor in a lawn mower, to a V-8 stock car engine, horsepower and torque are the bench marks of engine performance. Engine manufacturers and aftermarket suppliers use an engine dynamometer (dyno for short) to accurately measure an engines performance. An engine dyno isolates an engine's power output to help quantify its overall performance, applying a load directly to the engine and utilizing a load cell to measure the torque absorbed by the loading mechanism. Horsepower is then calculated using the torque and RPM of the engine.

Interface Solution

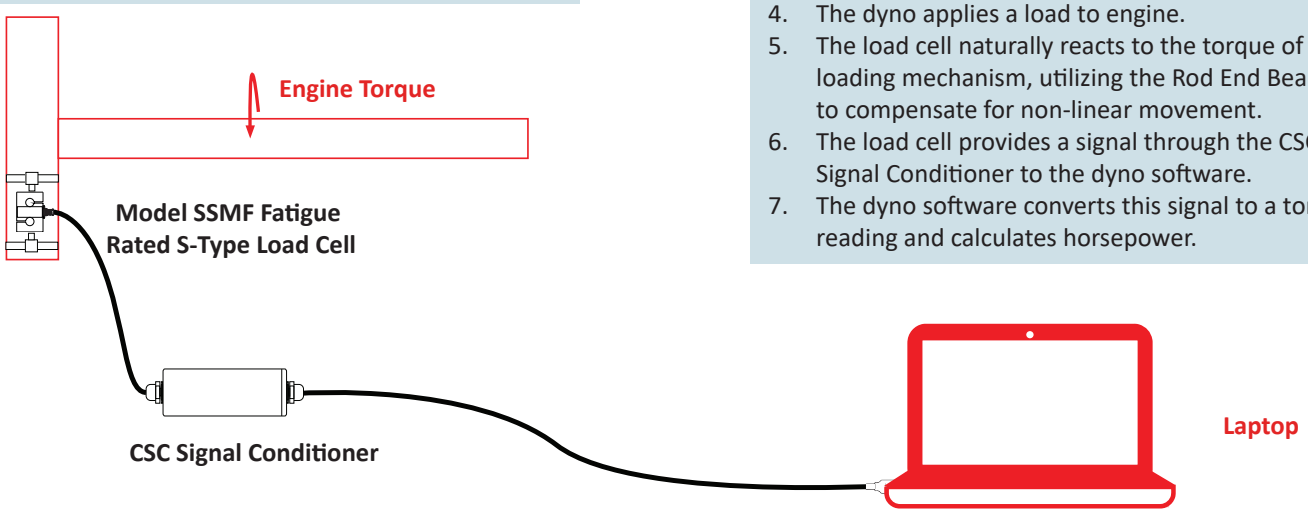
A precision S-Type Load Cell is attached to a torque arm which "feels" the torque from the engine loading system. The Interface Model SSMF is a great choice because it is fatigue-rated for 1x107 fully reversed cycles, and is environmentally sealed to withstand harsh environments. Utilizing the Model CSC Signal Conditioner provides a clear signal to a data-acquisition system.

Results

The load cell reacts precisely with the amount of torque being produced by the engine and provides accurate signals to the data-acquisition system. Engineers are then able to analyze the power transfer for the engine and optimize for performance.

Materials

- Model SSMF Fatigue Rated S-Type Load Cell.
- Rod End Bearings.
- CSC Environmentally Sealed Signal Conditioner.



How It Works

1. The engine is loaded and secured into the dyno.
2. All support systems are installed and tested.
3. The engine is started.
4. The dyno applies a load to engine.
5. The load cell naturally reacts to the torque of the loading mechanism, utilizing the Rod End Bearings to compensate for non-linear movement.
6. The load cell provides a signal through the CSC Signal Conditioner to the dyno software.
7. The dyno software converts this signal to a torque reading and calculates horsepower.

Engine Head Bolt Tightening Torque Transducer

Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

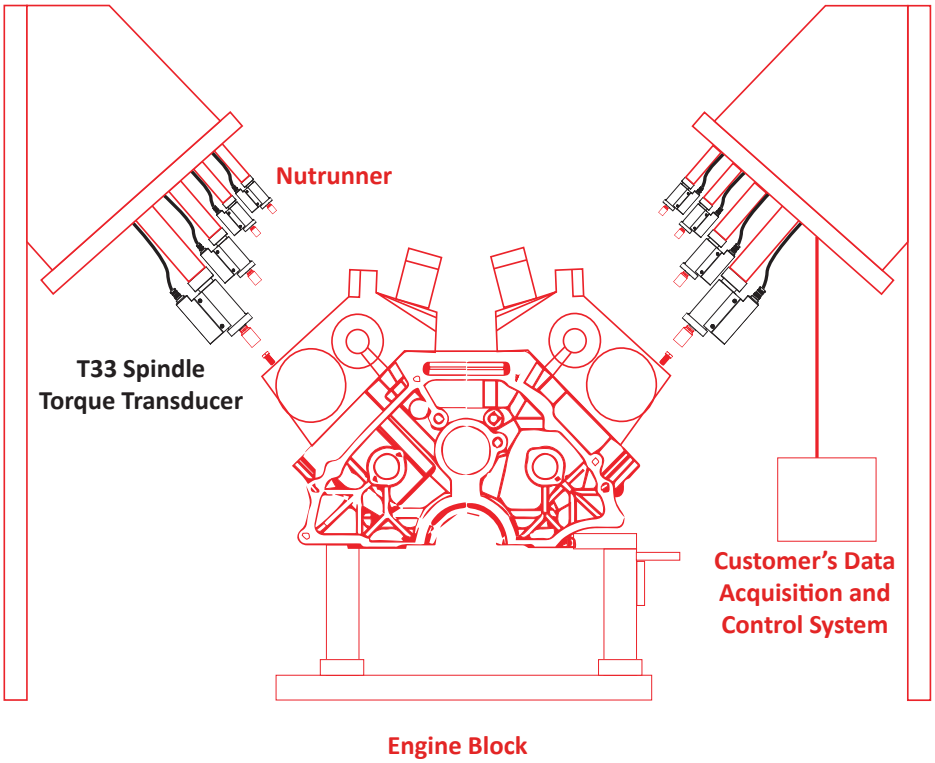
An industrial automation company was building an automated assembly machine for an auto manufacturing plant. They needed to tighten all of the head bolts on an engine on their assembly line to a specific torque value. Having the head bolts precisely and consistently tightened to the engine block is critical to the operation of the engine.

Interface Solution

Several Interface Model T33 Spindle Torque Transducers were installed in their new machine to control torque and angle, and ensure the head bolt was properly tightened. The square drive of the T33 allowed the customer to fix their tool directly to the end of the torque sensor, streamlining the installation.

Results

The head bolts were correctly installed according to manufacturer specifications, producing an engine that meets performance and reliability expectations of the auto manufacturing plant.



Materials

- T33 Spindle Torque Transducer.

How It Works

1. Several Interface Model T33 Spindle Torque Transducers are installed in-line with the nutrunner/screwing spindle.
2. Fastening tools are attached to the end of each T33.
3. The machine comes down and screws on the engine head bolts.
4. The torque and angle profile are sent to the customer's machine controller.
5. Based on the feedback received by the machine controller, the automation will pass the engine to the next step in the assembly line or fail and have the engine evaluated further.

Fastening Work Bench
Torque Transducer
Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

- Customer is looking for a way to increase productivity by creating a fastening work bench for screw installation with related data collection. This increased productivity will come through the use of automated tooling and torque transducer measurements which are included as a part of an organized and efficient process.

Interface Solution

- Interface supplied a Model T15 Hex Drive Rotary Torque Transducer with integrated USB output for this project. USB output can measure and record torque, rotational speed and angle.

Results

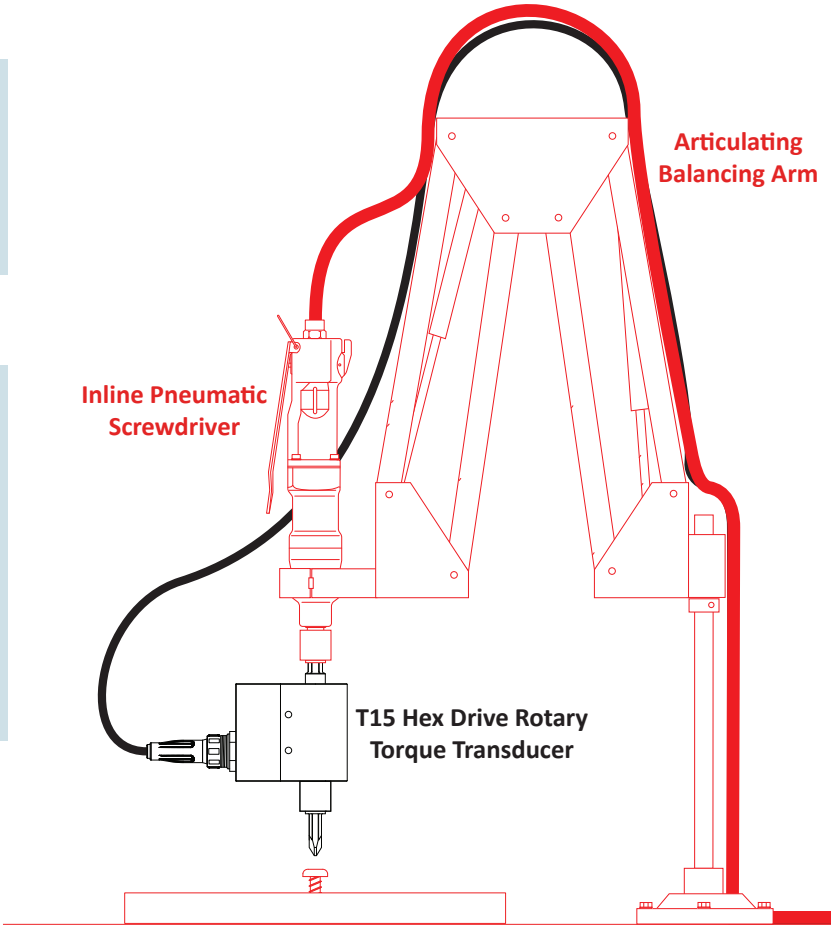
- Customer was able to use many different screwdriver bit types with ease of installation due to the quick release feature of Model T15.

Materials

- T15 Hex Drive Rotary Torque Transducer with integrated USB Output Option
- T-USB-VS Software
- PC Computer
- Inline Electric or Pneumatic Screwdriver
- Articulating Balancing Arm

How It Works

1. Customer attaches T15 Hex Drive Rotary Torque Transducer to an electric or pneumatic screwdriver.
2. Customer attaches bit to T15 Hex Drive Rotary Torque Transducer.
3. T15 Hex Drive Rotary Torque Transducer is connected to USB and supplied software is loaded.
4. Customer performs fastening operations and fastening details are automatically recorded to the PC.



In-Motion Rail Weigh Load Cell

Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

A rail station owner wanted to collect data on the load profiles for rail cars as they were entering into the station in-motion. The customer wanted to build their own low cost set-up using components from Interface Inc. and their existing PC setup for the purpose of logging weight load characteristics in order to diagnose possible side to side loading issues, overload issues, wheel flats or wheel impact issues, at any rail car speed.

Interface Solution

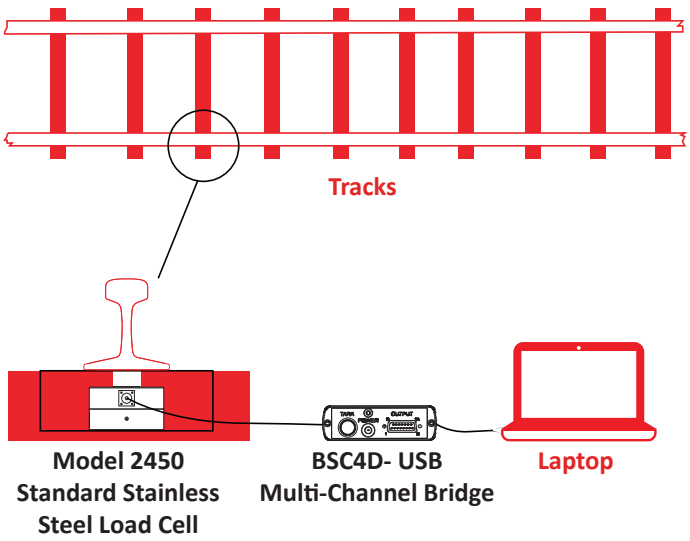
(12) Model 2450 50K capacity standard stainless steel load cells were mounted in to metal fabricated box-like structures and bolted into 6 consecutive cement rail ties, 1 on each side of each tie under the rail with a direct line of force with the rail. The cells were split into three groups of four: front, middle, and back. Each group of cells was connected to a dedicated BSC4D that accepted four load cell inputs. The BSC4D were connected to a PC through a USB hub.

Results

After all the connections were made the operator had a valuable tool for monitoring load characteristics which were used to detect a number of diagnostic conditions. The manager saved cost by creating his own set-up in-house for in-motion rail car load measuring as compared to alternative solutions/ proposals from other competitors.

Materials

- (12) Model 2450 50K capacity Standard Stainless Steel Load Cell.
- (3) Model BSC4D-USB Multi-Channel Bridge.
- Amplifier & PC Interface Module.



How It Works

1. The customer made a special fixture that allowed for the mounting of the Model 2450 50K Capacity Standard Stainless Steel Load Cell. On the top there was a plate with a threaded rod which threaded into the load cell and on the bottom was an encasement that ensured proper clearance, stability, and proper enclosure from the elements.
2. The cement rail ties were modified on both sides underneath the rail area to provide a recessed clearance for the cell fixtures. The fixtures were then fastened into the tie. Each tie has 2 fixtures. There were 6 ties altogether. There were 2 ties (4 cells) per group: front, middle, and back.
3. The load cells within the installed fixtures were connected via cables to the appropriate BSC4D -USB Multi-Channel Bridge Amplifier & PC Interface Module, using proper protective accessories and maintaining clearance from any potential snag or crush points.
4. The interface modules were each connected to a PC through a USB hub.
5. The PC had the BlueDAQ software installed that came with the interface modules.
6. After the set-up was complete the operator had full access to logged load data from all 12 load cells which was used to diagnose railcar issues.

Lug Nut Assembly
Torque Transducer
Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

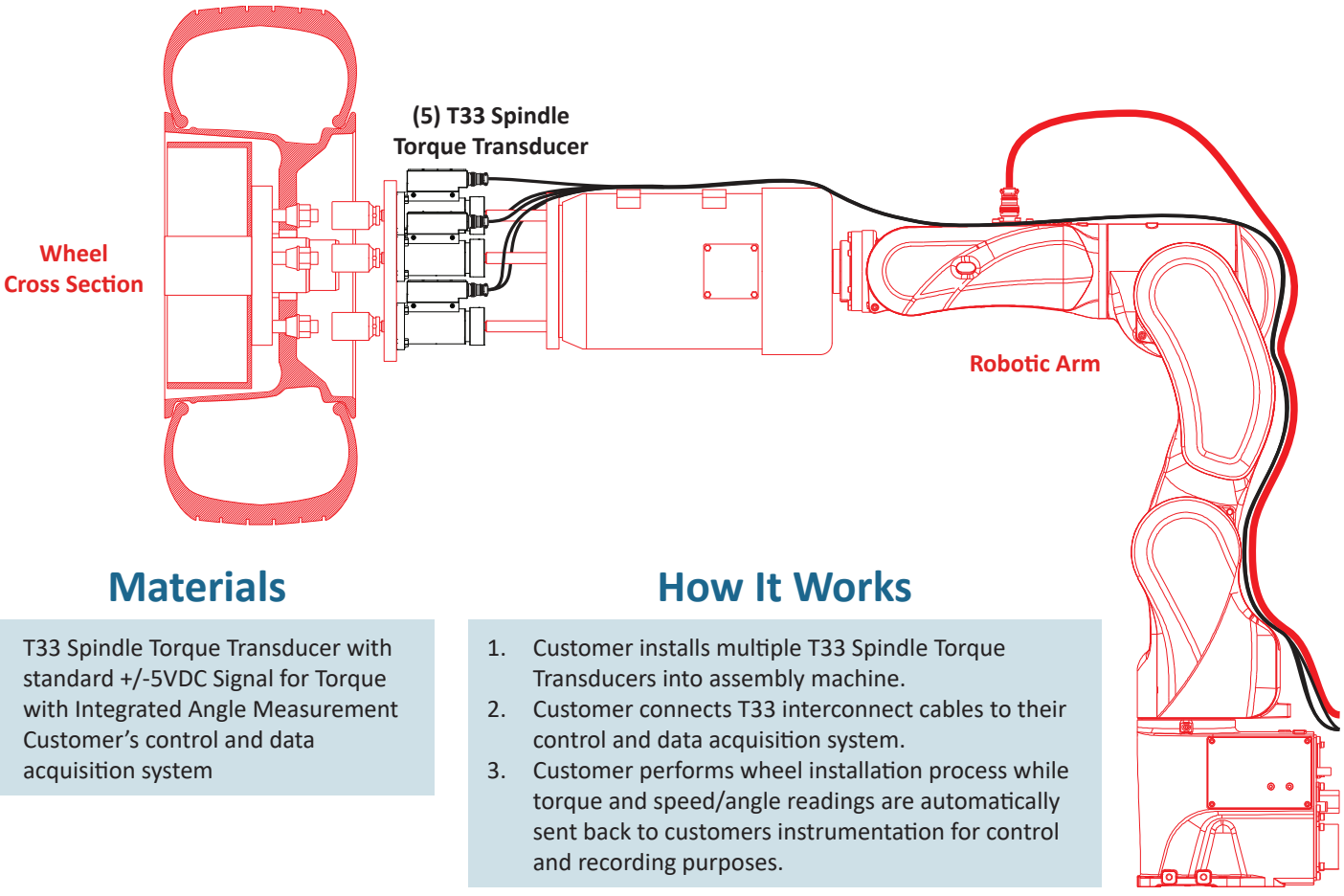
- Customer is looking for a way to increase productivity for automobile wheel installation while ensuring that the lug nuts are installed to the proper torque values for safety purposes.

Interface Solution

- Interface supplied 5 each Interface Model T33 Spindle Torque Transducers for use in customer's Wheel Installation Assembly Machine which come standard with +/-5VDC analog output for torque measurements and a 360 pulse, 2-track encoder for Speed/ Angle measurement.

Results

- Customer was able to perform 5 simultaneous torque measurements during wheel installation in seconds. Model T33 Spindle Torque Transducer provided a +/-5VDC Signal for torque and TTL Signal for angle measurement back to customer's control system so proper values could be applied and recorded.



Materials

- T33 Spindle Torque Transducer with standard +/-5VDC Signal for Torque with Integrated Angle Measurement
- Customer's control and data acquisition system

How It Works

1. Customer installs multiple T33 Spindle Torque Transducers into assembly machine.
2. Customer connects T33 interconnect cables to their control and data acquisition system.
3. Customer performs wheel installation process while torque and speed/angle readings are automatically sent back to customers instrumentation for control and recording purposes.

Race car Suspension Testing
Load Cell

Industry: Automotive and Vehicle, Test and Measurement

Summary

Customer Need / Challenge

- Race car suspensions require fine tuning for best performance on various tracks.
- Simulation of bumps, banking and other track conditions result in off-axis loading.

Interface Solution

- Interface 1200-series load cell mounted on top of each post in a 4-, 5-, or 7-post rig allows race teams to measure forces during simulated laps. Moment compensating design of 1200-series load cells provide accurate readings during off-axis loading.

Results

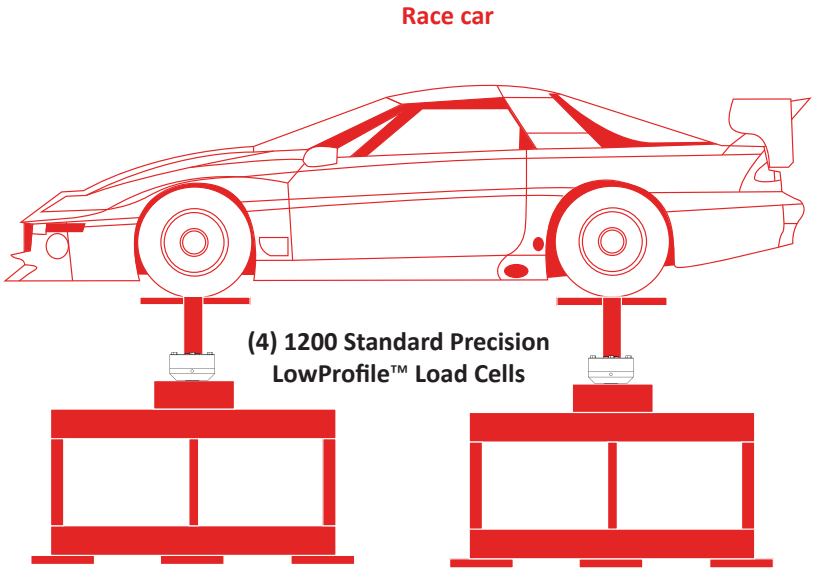
- Highly accurate (0.04%) measurement of loads applied to individual suspension points.

Materials

- (4) 1200 Standard Precision LowProfile™ Load Cells.

How It Works

1. A multiple-post vehicle suspension test rig is built into or under the floor of a race team facility. A 4-post rig tests forces at each wheel; 5-post rig adds a rear suspension point and a 7-post rig tests aerodynamic forces in addition to road (wheel) loading.
2. An Interface 1200-series load cell is mounted on each post.
3. Hydraulic actuators individually apply forces to each post to simulate the surface conditions of the track.
4. Load cells measure the aggregate of the forces being applied from both the post on which the load cell is mounted and forces from other posts being applied to the vehicle (such as when simulating a banked surface).
5. Load cell output is fed to the control system to determine cylinder force required to produce the correct force to simulate the track condition.



Seat Testing Machine
Multi-Axis

Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

- An Automotive Seat Manufacturer was conducting durability testing on their seats. During testing, the customer was consistently overloading and replacing their single-axis load cells. After a thorough inspection, it was discovered that this was due to bending moments that had never been quantified.

Interface Solution

- An Interface Model 6A68C 6-Axis load cell was installed in their existing test machine. The 6-Axis Sensor was intentionally oversized allowing the customer to measure the unidentified bending moments while preventing any damage to the 6-Axis Sensor. A Model BX8 was used to graph, log, & store the data collected at the sensor.

Results

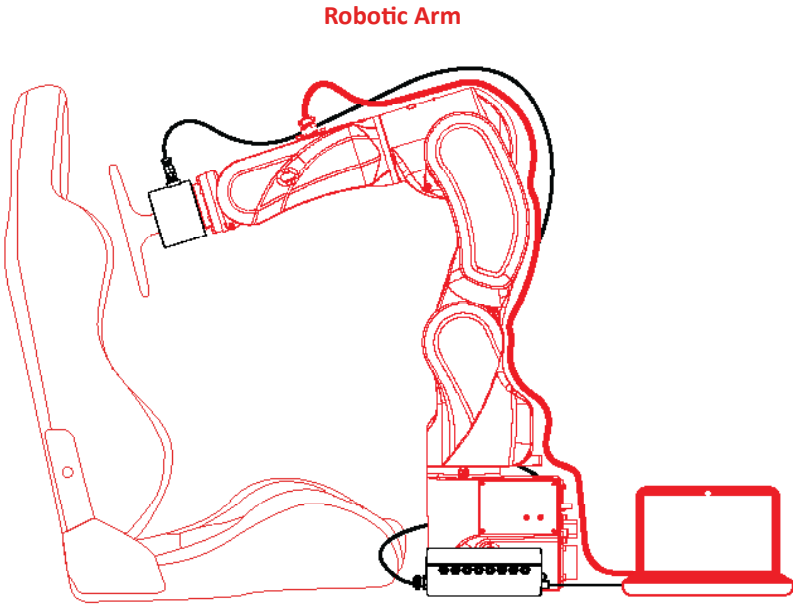
- The customer was able to identify previously unknown bending moments, permitting them to choose how they would like to proceed with testing.
- Select a more appropriate single-axis load cell capacity, capable of withstanding the entire combined loads; including the bending moment.
- Continue using a 6-Axis Sensor to take measurements.
- Redesign their testing fixture to eliminate bending moment.

Materials

- Model 6A68C 6-Axis Load Cell.
- Model BX8- AS Multi-Channel Bridge Amplifier & PC Interface Module with Software.
- Appropriate Cabling.

How It Works

1. The model 6A68C 6-Axis sensor is installed between simulated seated human and the robotic arm.
2. The model BX8- AS connected between the 6-Axis Sensor and the customer's PC Laptop.
3. The testing machine repetitively places simulated human in tested seat.
4. The 6-Axis sensor measures loads in all six axes (Fx, Fy, Fz, Mx, My, Mz).
5. The sensor's output is fed to the BX8 and to the PC laptop where it is displayed using the included software.



BX8- AS Multi-Channel Bridge Amplifier

WTS Pedal Force Testing

Interface Mini™

Industry: Automotive

Summary

Customer Need / Challenge

- To meet certain vehicle safety protocols, pedal force must be measured and recorded. In order to quantify the quality of the braking system, the relationship between pedal force and braking force at the axle must be ascertained, either during an on-road stopping test or in a simulated indoor environment with a dynamometer, where pedal force can be measured.

Interface Solution

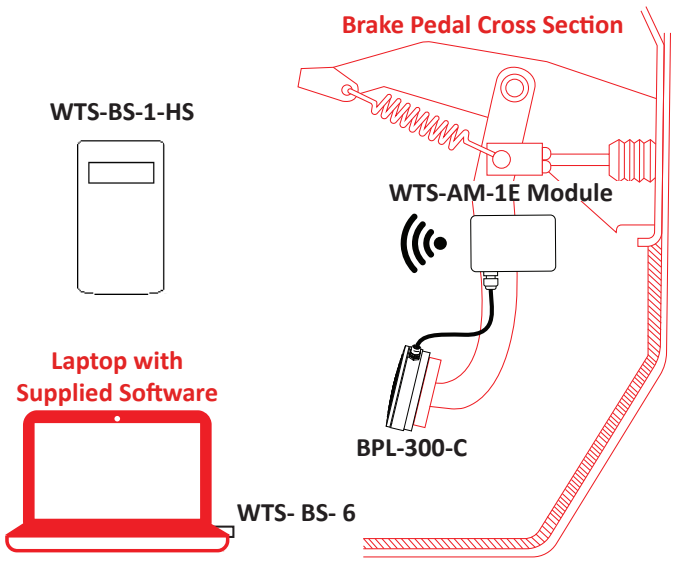
- Using an Interface Model BPL Pedal Load Cell along with the Model Wireless Telemetry System (WTS) provides a solution that measures the force being applied during the use of a brake pedal cycle. Utilizing wireless telemetry with the following Interface components, the valuable data can be displayed and/or recorded in real time using a PC and/or a handheld receiver depending on the requirements and preferences of the customer.

Results

- The relationship between pedal force and axle braking force is measured and recorded to ensure compliance with required safety regulations. Any necessary calibrations, adjustments, or modifications to the braking system can be assessed by whether the results of the brake testing fall within appropriate ranges of a pre-determined testing protocol.

Materials

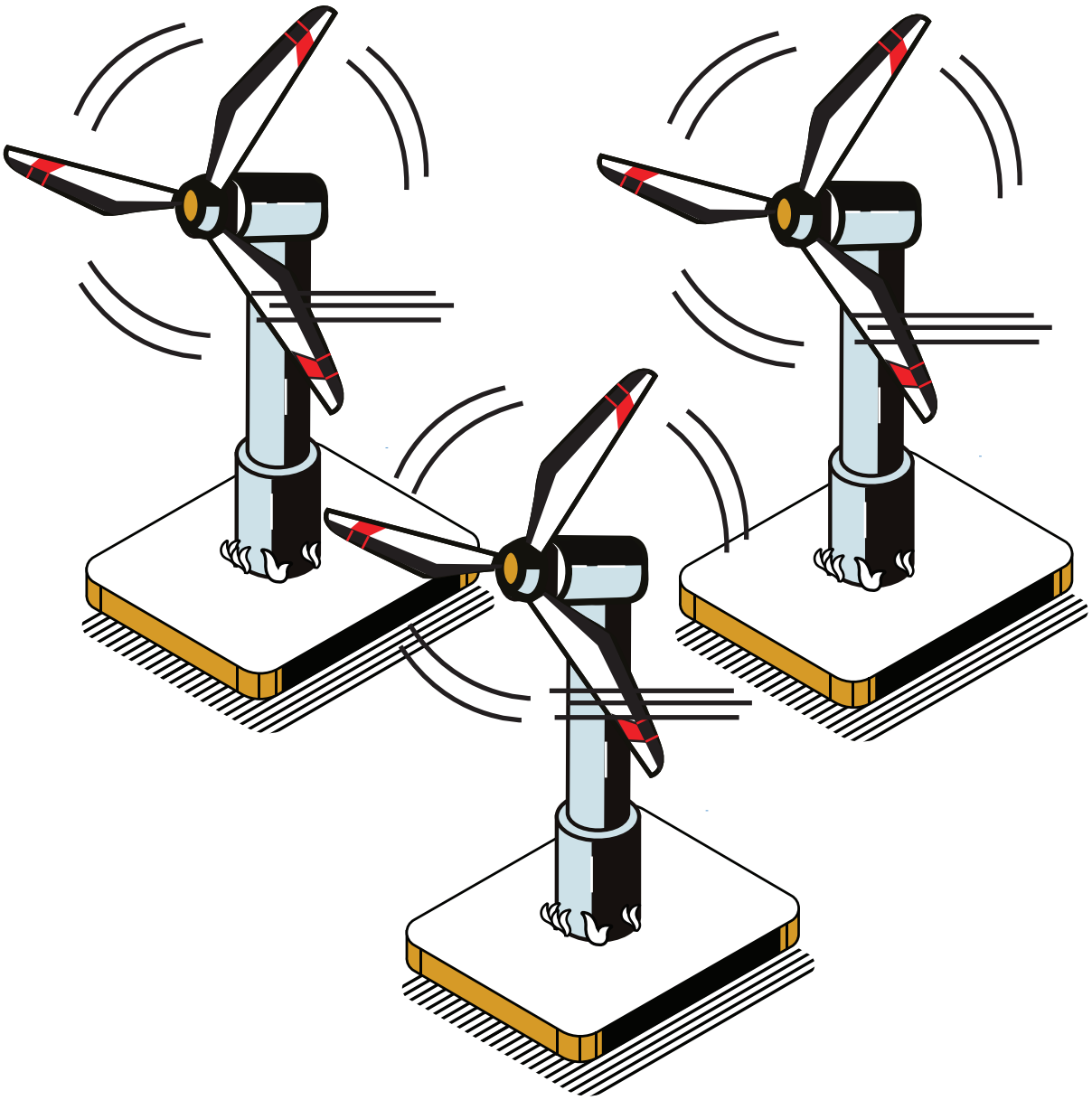
- Model BPL Pedal Load Cell (mounting equipment - straps included)
- Model WTS Wireless Modules:
  - Transmitter Module (WTS-AM-1E)
  - Handheld Module (WTS-BS-1-HS)
  - Base Station Module (WTS-BS-6)



How It Works

1. Model BPL Pedal Load Cell Load is installed onto pedal so that the output cable to the transmitter has clearance from any snagging throughout the entire pedal pumping cycle.
2. Mount the transmitter WTS-AM-1E in a safe location so that there is enough slack in the cable for a full pedal pumping cycle. The Module transmits wirelessly to the WTS Toolkit App.
3. Using WTS Wireless System with the receiver (WTS-BS-6), force readings from the load cell can be displayed, logged and graphed directly on a PC. To do so, plug in the WTS-BS-6 receiver into USB port on the PC, install the WTS Toolkit software, and finally pair the transmitter to the receiver as outlined in the documentation with the software.
4. Using WTS Wireless System with the handheld receiver (WTS-BS-1-HS), force readings from the load cell can be displayed on a wireless battery powered receiver.

Energy



Wave Energy Generator
Load Cell

Industry: Energy

Summary

Customer Need / Challenge

A scientist has been tasked to create electricity by using the energy that is generated by ocean waves.

Interface Solution

As electricity is generated by ocean waves, an Interface load cell will measure tether line tension using a submersible 3200 Hermetically Sealed LowProfile® Precision Stainless Load Cell. The mooring line was attached to the load cell base and the platform generator was connected to the load cell hub. This measured the forces that were generated by the ocean waves and data was later analyzed by the customer's Data Acquisition System (DAQ).

Results

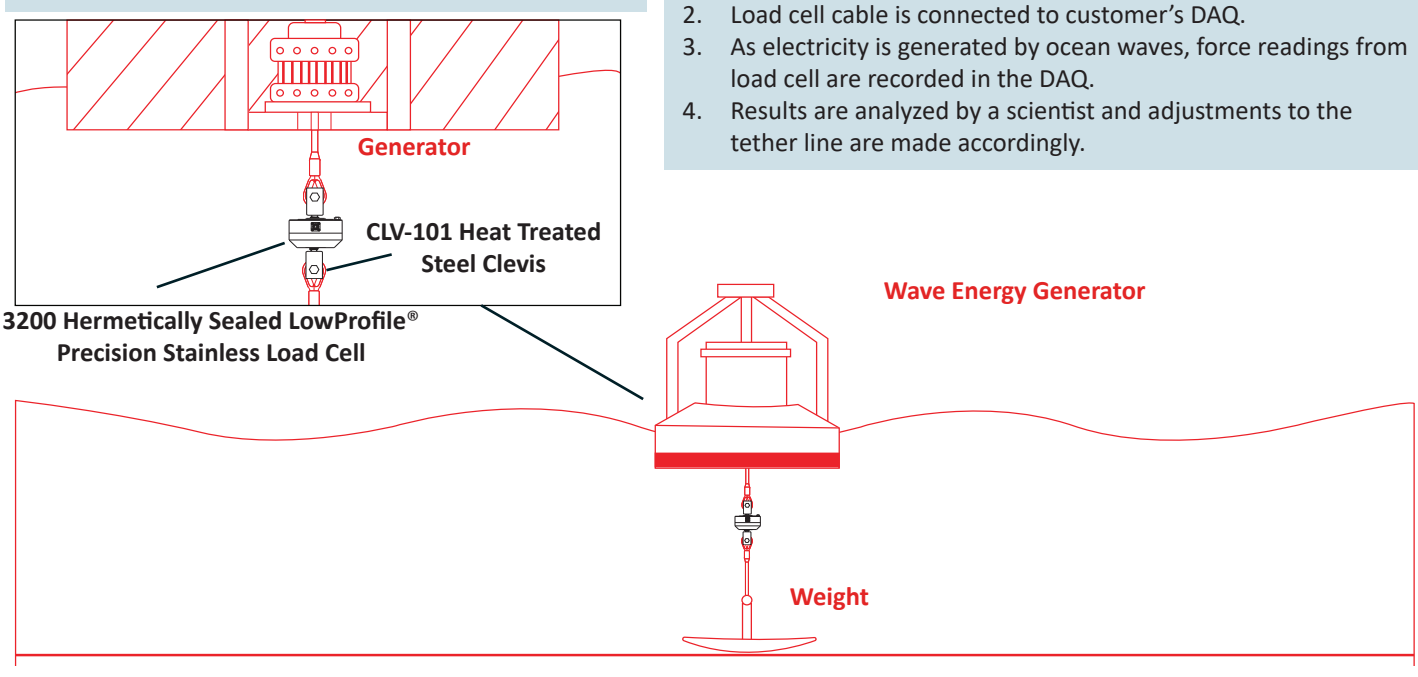
Scientists used force data to make adjustments to tether line. Also, if tether line breaks free, the scientist can be notified immediately to reattach the tether line.

Materials

- 3200 Hermetically Sealed LowProfile® Precision Stainless Load Cell.
- CLV-101 Heat Treated Steel Clevis.

How It Works

1. 3200 Hermetically Sealed LowProfile® Precision Stainless Load Cell is connected between a mooring line on the sea floor and a wave energy generator platform.
2. Load cell cable is connected to customer's DAQ.
3. As electricity is generated by ocean waves, force readings from load cell are recorded in the DAQ.
4. Results are analyzed by a scientist and adjustments to the tether line are made accordingly.



Windmill Energy
Torque Transducer
Industry: Energy

Summary

Customer Need / Challenge

Customer wants to improve the performance of a windmill by adjusting the blade pitch and measuring the torque generated as power ramps are studied.

Interface Solution

Interface Model T2 is coupled between windmill blade propeller and electric generator. Information will be sent to customer's Data Acquisition System (DAQ).

Results

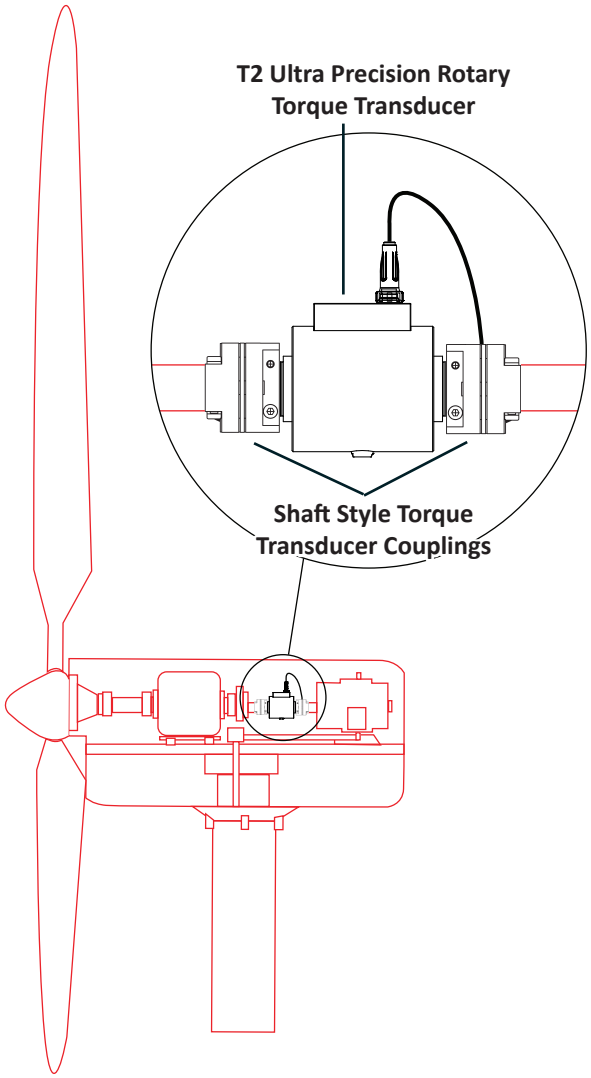
Customer was able to use torque data to determine the optimal blade pitch for the windmill. The windmill will generate more power and with less stress on the bearings.

Materials

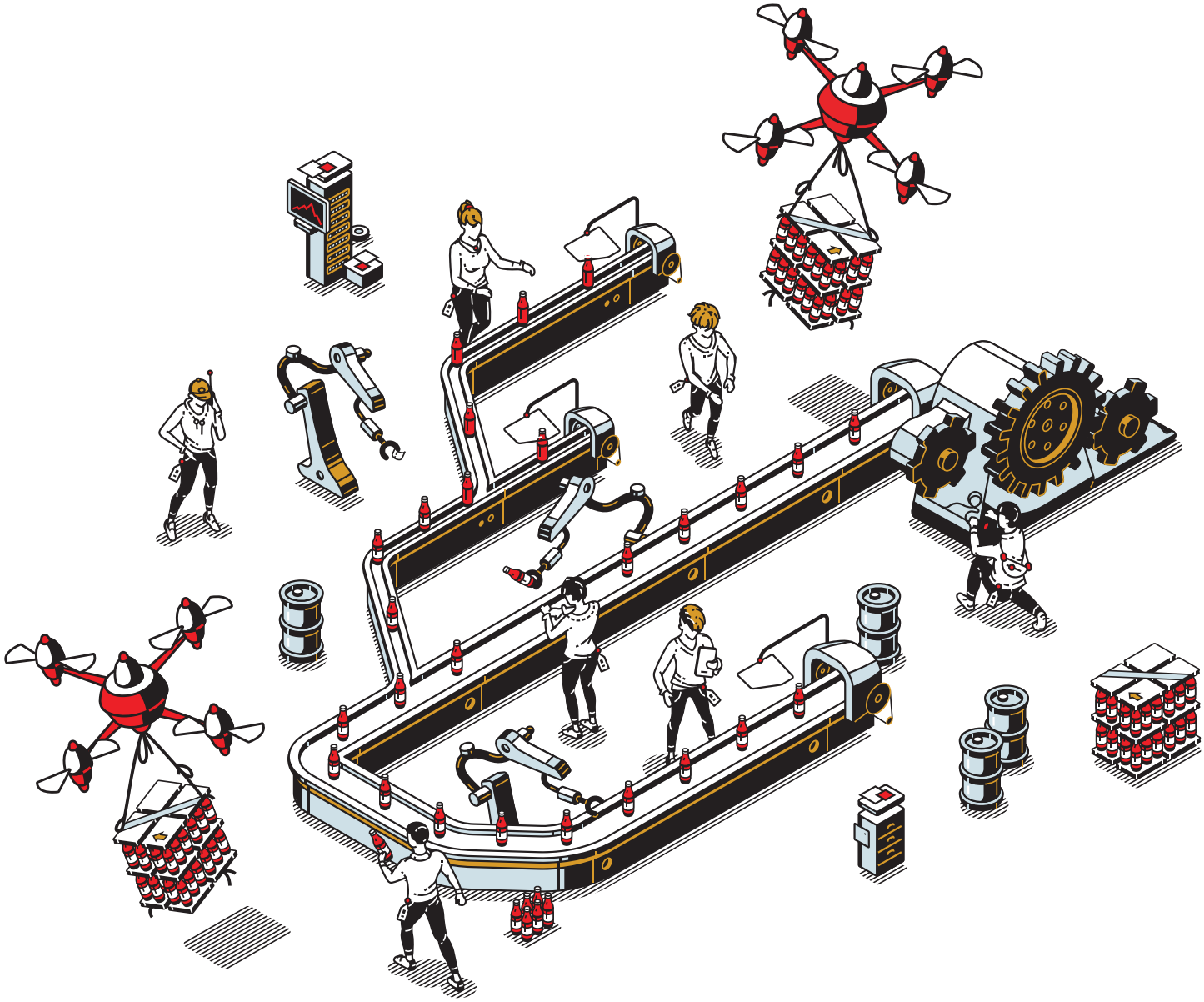
- Model T2 Ultra Precision Rotary Torque Transducer.
- Interface Shaft Style Torque Transducer Couplings.

How It Works

1. Model T2 Torque Transducer is installed between windmill propeller and electric generator using Interface torque couplings.
2. Model T2 is connected customer's DAQ.
3. Tests are performed and torque data is logged into customer's DAQ.
4. Results are examined by customer and optimal blade pitch is determined.



Industrial Automation



Bolt Fastening-Force
Load Washer

Industry: Industrial Automation, Test and Measurement

Summary

Customer Need / Challenge

Over-tightening bolts during installation can cause damage to the objects being installed.

Interface Solution

Using Interface Model LWCF Load Washers along with Interface Instrumentation can provide a solution that monitors the force being applied during bolt tightening.

Results

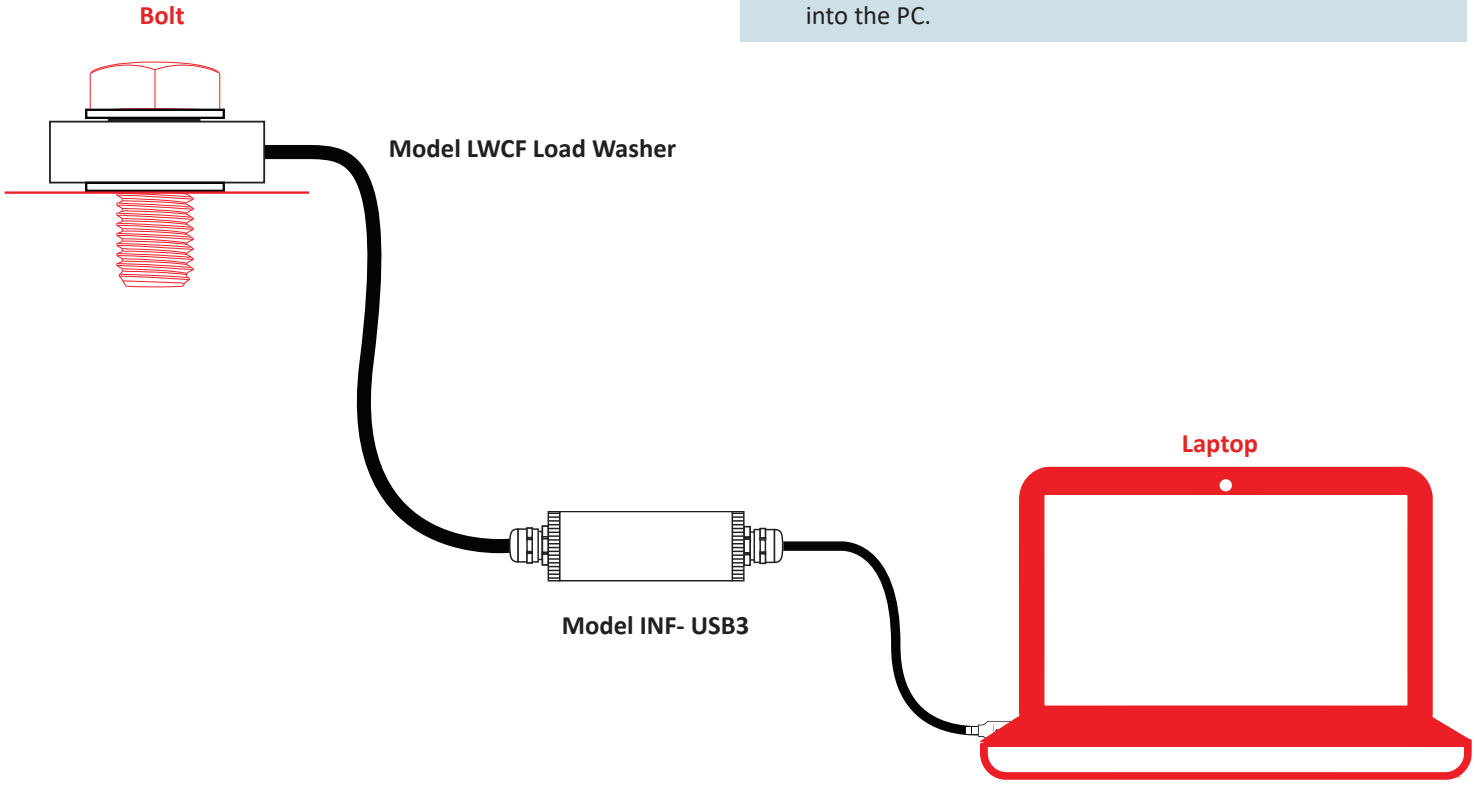
Bolts are tightened to the correct force targets and objects are installed undamaged.

Materials

- Model LWCF Load Washer
- Model INF-USB3 PC Interface Module which comes with logging and graphing software
- Customer supplied bolt and nut

How It Works

1. Model LWCF Load Washer is installed between the bolt head and nut. The load washer will measure the load as torque is applied to the nut.
2. Using Model INF-USB3 PC Module, force readings from the load cell will be displayed, logged, and graphed directly into the PC.



Candy Stamp Force Testing
Load Cell

Industry: Industrial Automation

Summary

Customer Need / Challenge

- Manufacturers of hard shell candies often stamp text or logos on the candy shells.
- Stamping too hard breaks the candy shell. Stamping too light results in an uneven or incomplete imprint.

Interface Solution

- A test apparatus uses an Interface Model WMC Mini Load Cell attached to hydraulic actuators to measure the compression force required.

Results

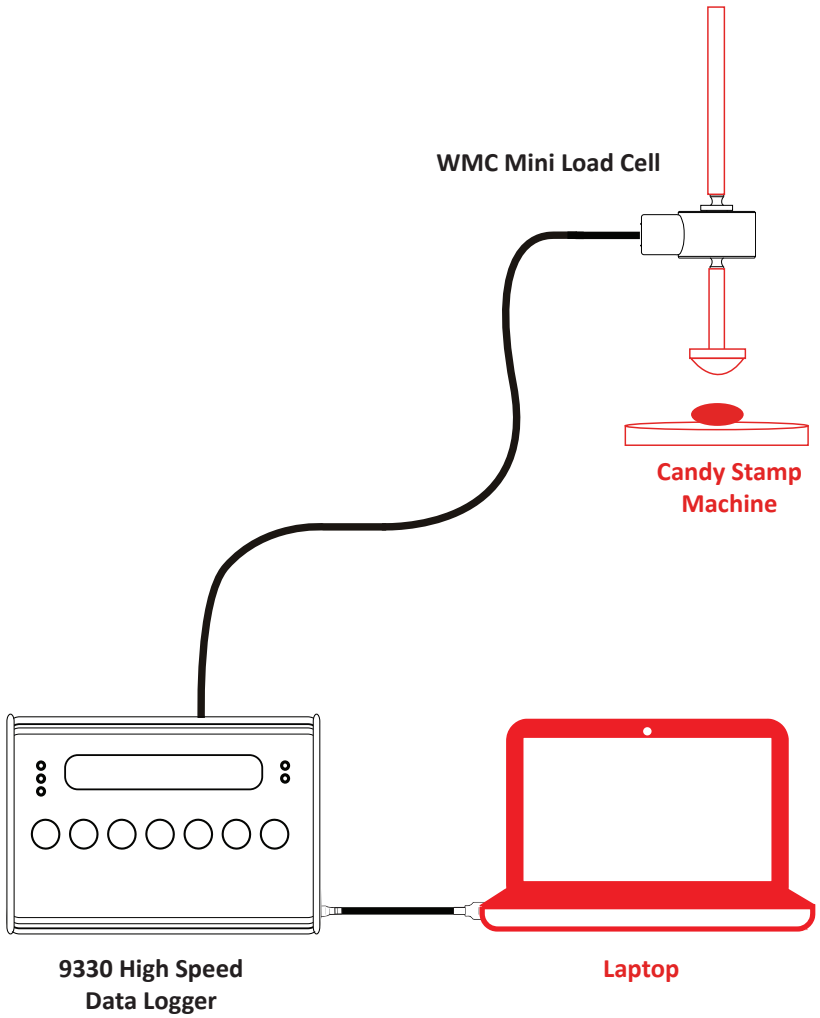
- Engineers determine specific force needed to properly apply the imprint without breaking the candy shell.

Materials

- WMC Sealed Stainless Steel Mini Load Cell.
- 9330 High Speed Data Logger.

How It Works

1. A hard shell candy is placed in a support under the test apparatus.
2. An Interface Model WMC Mini Load Cell is mounted between the hydraulic actuator and the candy being tested.
3. Force applied by the hydraulic actuator bends the top of the sealed load cell while the resistance from the candy bends the bottom of the load cell.
4. The two ends of the load compress toward the center where strain gages convert the applied force to an electrical signal.
5. Electrical signals are sent to the Interface Model 9330 and displayed in lbs. A USB connection to a laptop running the included graphical software shows the force profile as the load is applied.
6. The test engineer continues to apply hydraulic force until the shell cracks.



Chemical Reaction-Mixing Torque Transducer

Industry: Industrial Automation

Summary

Customer Need / Challenge

- An end product is made by mixing various raw materials together in a mixing tank.
- To ensure product quality and safety, it's important that the ingredients are mixed properly without under or over-mixing.
- To do this, the density and viscosity of the mixture must be continuously analyzed during the mixing process.

Interface Solution

- Mount the mixing motor to a hollow flange reaction torque transducer to measure mixing torque.

Results

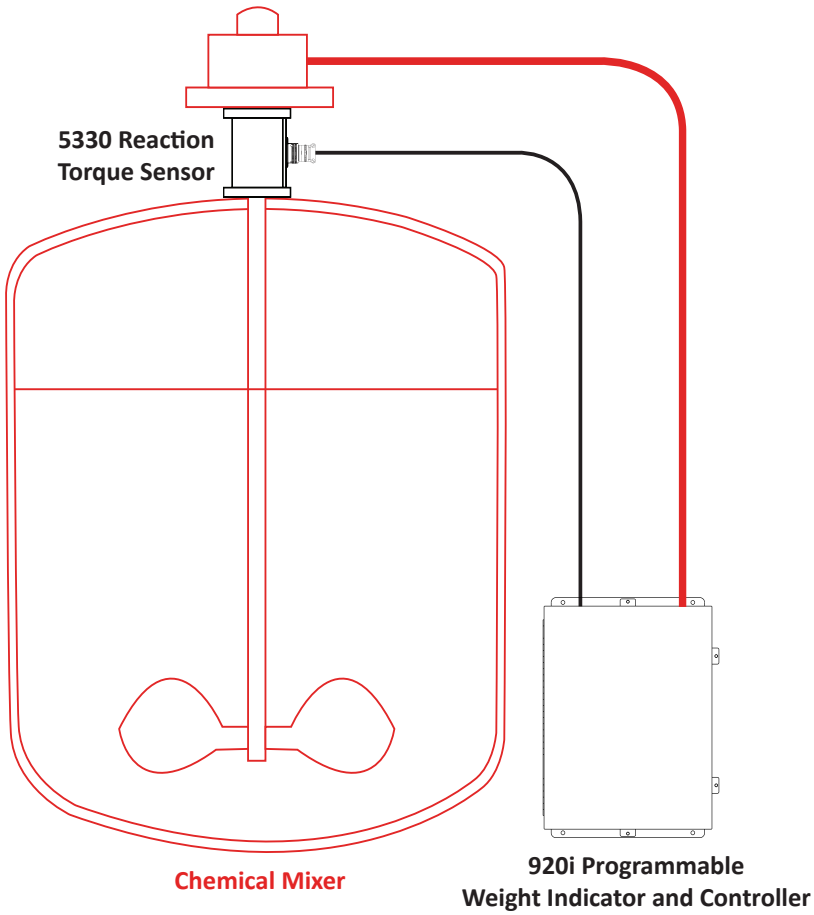
- Customer is able to determine ideal density and viscosity based on torque measurements in order to monitor the ingredient mixing and maintain product quality and safety.

Materials

- 5330 Reaction Torque Sensor.
- 920i Programmable Weight Indicator and Controller.

How It Works

1. The 5330 Reaction Torque Sensor is mounted to the adapter plate between the mixing motor and the tank lid.
2. The motor shaft passes through the hollow sensor and mobilizes the mixer shaft and blades.
3. The sensor measures the torque and feeds information back to the 920i Programmable Weight Indicator and Controller.
4. Mixing speed and duration is controlled.



Commercial Food Processing
Load Cell

Industry: Industrial Automation

Summary

Customer Need / Challenge

A food processing plant wants accurate results of their in-motion check weigher when food is weighted and processed down the belt. They want to ensure production line efficiency and food quality. The customer also wants real-time results of their food being weighed, and a load cell that can endure the food industry's grubby environment.

Interface Solution

Multiple of Interface's SPI High Capacity Platform Scale Load Cells can be installed in the customer's in-motion check weigher at the specific points where the food is weighed on the belt. The SPI High Capacity Platform Scale Load Cells delivers precise weighing results. When connected to the 920i Programmable Weight Indicator and Controller, will give the customer real time results of the weight of the food being processed. The 920i Programmable Weight Indicator and Controller can read up to four scale channels in real-time.

Results

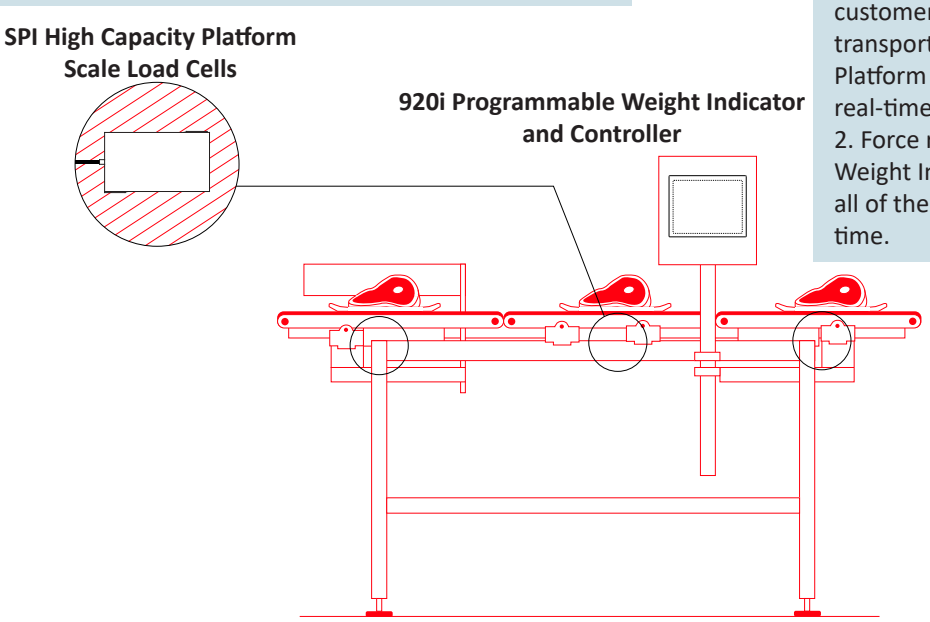
The customer got precise weighing results in real-time of the food being processed on their in-motion check weigher. They were also able to view all of the load cells in use simultaneously with Interface's instrumentation.

Materials

- SPI High Capacity Platform Scale Load Cells
- 920i Programmable Weight Indicator and Controller

How It Works

1. The SPI High Capacity Platform Scale Load Cells are installed under the weighing points of the customer's in-motion check weigher. As the food is transported across the belts, the SPI High Capacity Platform Scale Load Cells will measure its weight in real-time.
2. Force results are sent to the 920i Programmable Weight Indicator and Controller, where it can read all of the load cells simultaneously and in real-time.



Food In-Motion Check Weigher

Drone Parcel Delivery

Load Cell and Torque Transducer

Industry: Industrial Automation

Summary

Customer Need / Challenge

- Rapid delivery of packages has now migrated to the use of “Delivery Drones”.
- Customer needs to weigh the payload (force) of package being delivered while measuring the amount torque it takes from the propeller motors to lift and fly this package to its destination.

Interface Solution

- A 1200 Series Standard of Precision Low Profile Load Cell to measure payload and six T2 Series Ultra Precision Shaft Style Rotarty Torque Transducers to measure torque.

Results

- The 1200 Series load cell accurately measured the payload weight and the T2 torque transducers accurately measured the propeller motors torque. This information, was communicated to the droids on-board processor for monitoring and recording this information during flight.

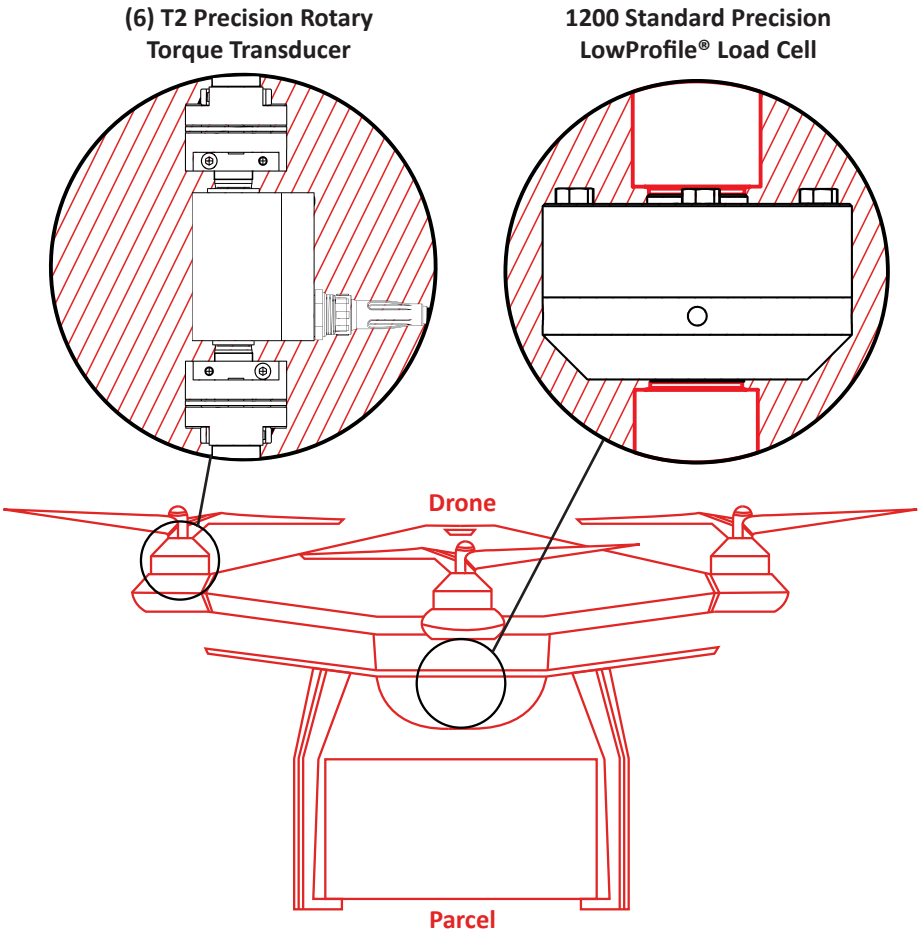
Materials

Interface Solution

- Model T2 Series Ultra Precision Rotary Torque Transducer with Model T2 compatible couplings which were supplied by Interface.
- Model 1200 Series Standard Precision Load Cell with customer supplied payload carriage device.

How It Works

1. Model 1200 Series Standard Precision Load Cell is connected to the drone body on one side and the payload carriage device on the other. Once connected to the drones processor, weight of payload is immediately communicated and stored.
2. Six Model T2 Series Ultra Precision Rotary Torque Transducers are connected to the six propeller motors and propellers using twelve couplings (2 per torque transducer). Once connected to the drones processor, torque values are immediately communicated and stored.



Friction Testing
Multi-Axis

Industry: Industrial Automation, Test and Measurement

Summary

Customer Need / Challenge

A testing laboratory was looking to replace two single axis load cells used in their friction testing machine with one sensor that could measure force on the x, y, and z axis simultaneously.

Interface Solution

An Interface Model 3A60 3-Axis load cell was installed on their existing machine with an Interface BSC4D-USB Multi-Channel PC Interface hooked directly to a PC laptop to monitor and log the data in real time.

Results

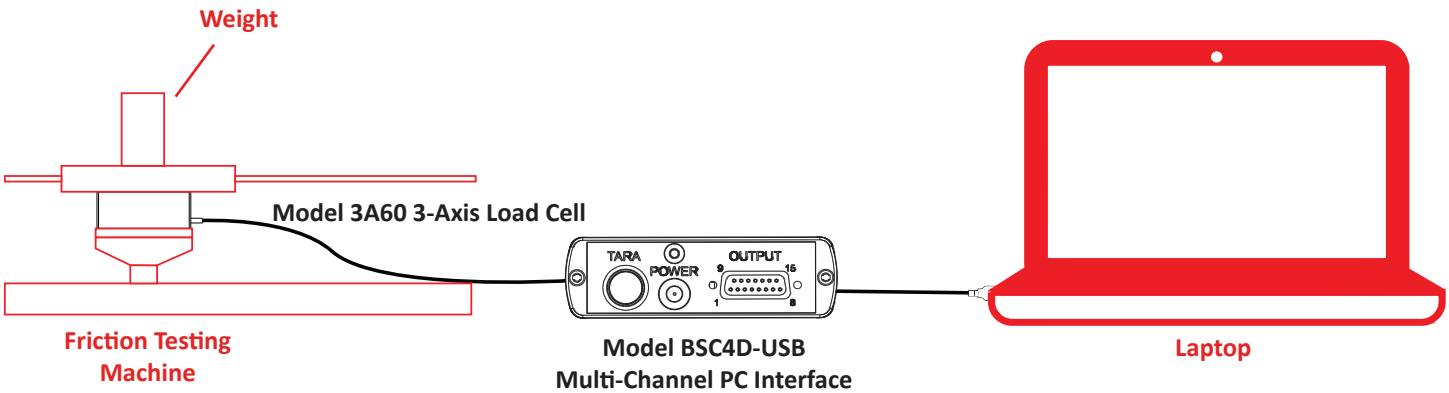
The testing laboratory was able to simplify their sensor set-up and improve their data collection, creating more value for their end customer.

Materials

- Model 3A60 3-Axis Load Cell.
- Model BSC4D-USB Multi-Channel PC Interface.
- Module which includes BlueDAQ – display, graphing, and logging software.
- Appropriate cabling.

How It Works

1. The 3-Axis load cell is installed between the arm of the friction testing machine and the test specimen.
2. The BSC4D is installed between the 3-Axis load cell and the PC laptop.
3. Weights are placed on the top of the arm to create a down force.
4. The machine arm drags the test specimen across the material resting on the bed.
5. The 3-Axis load cell measures the forward/back force (x), side to side force (y) and down force (z) being applied to the test specimen.
6. The sensor's output is fed to the BSC4D and to the PC laptop where it is displayed using the included software.



Fuel Pump Optimization - Rotary Torque

Torque Transducer

Industry: Industrial Automation

Summary

Customer Need / Challenge

A nationally renowned race team was using a flow bench to measure fuel pump performance. They wanted to determine if they could reduce the power consumption of the pump by further analyzing the precise torque it produced.

Interface Solution

An Interface Model T25 High Speed Rotary Torque Transducer was integrated into the pump drive to directly measure the torque required to spin the pump.

Results

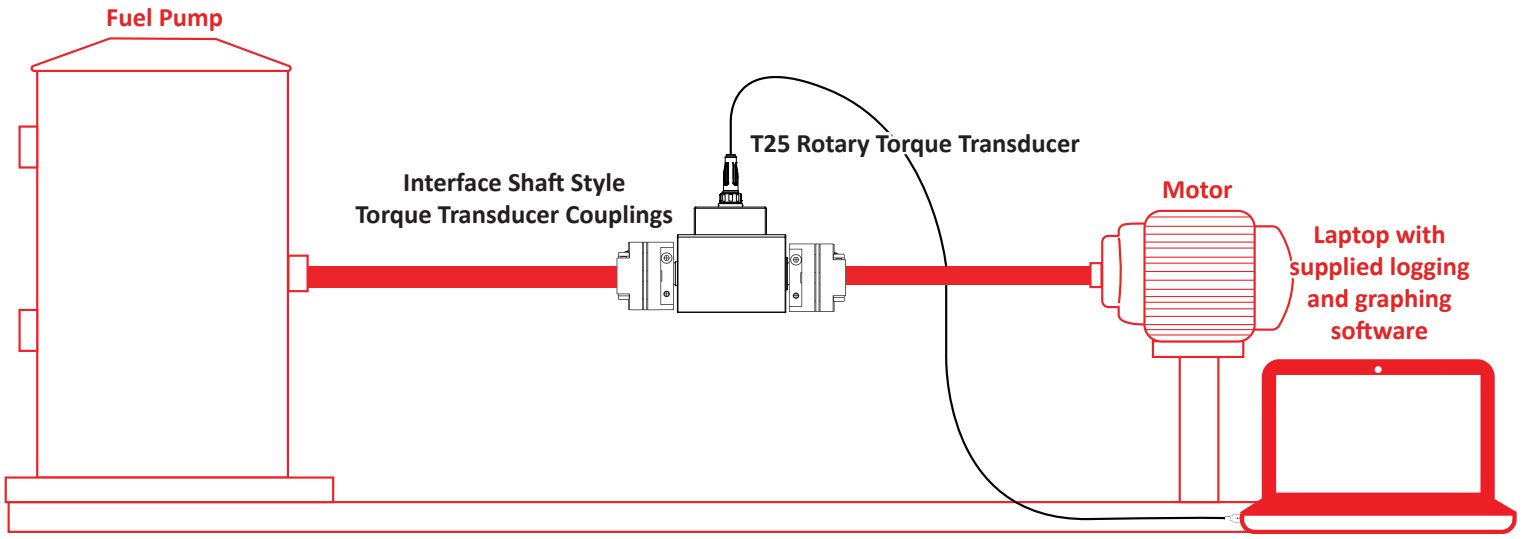
Using this data collected from the T25 in conjunction with the pressure and volume measurements of the fuel flow, the race team was able to characterize fuel pump performance vs. drive line torque, and then minimize the required drive power while maintaining the needed pressure and flow for efficient fuel delivery.

Materials

- T25 Rotary Torque Transducer with USB logging and graphing option.
- Interface Shaft Style Torque Transducer Couplings.

How It Works

1. The electric motor spins the fuel pump.
2. The Model T25 Rotary Torque Transducer measures the torque required to spin the pump.
3. The Data feeds to the PC Software for analysis. The software displays Torque, RPM & Horsepower.
4. Flow bench measures pressure and volume of fuel flow.
5. The Fuel pump is tuned to minimize required drive power while maintaining the required pressure and flow for proper fuel delivery.



Furniture Fatigue Cycle Testing

Load Cell

Industry: Industrial Automation

Summary

Customer Need / Challenge

To meet safety protocols in relation to the manufacturing of various furniture products, fatigue testing, shock testing, and proof testing must be rigorously performed before diffusion into the marketplace. Force testing simulations on furniture products are critical in determining the posted max loads in order to protect manufacturers from liability due to damages that might result from the misuse of those products and overloading.

Interface Solution

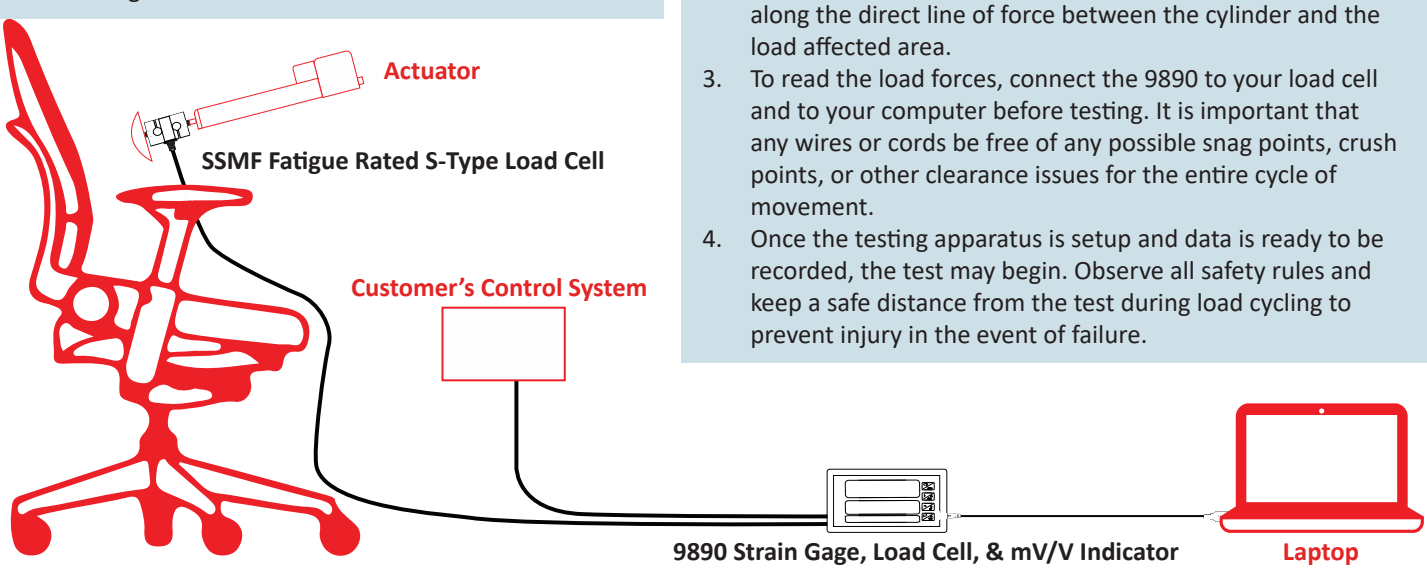
Using an Interface Model SSMF Fatigue Rated S-Type Load Cell along with Interface Model 9890 Strain Gage, Load Cell, & mV/V Indicator provides a solution that measures the force being applied in fatigue cycle testing of a furniture product, in this case testing the rocking mechanism in an office chair. Unlike other similar load cells, the Model SSMF is fatigue rated making it highly suitable for fatigue testing. No fatigue failure of any fatigue-rated Interface load cell, used within it's ratings, has ever been reported.

Results

The furniture manufacturer was able to obtain accurate data about the rocking mechanism the office chair as it was fatigue cycled into failure. Adjustments were made to the design to improve the safety and life of the furniture, ensuring product quality and protecting the manufacturer from future liability.

Materials

- Model SSMF Fatigue Rated S-Type Load Cell.
- 9890 Strain Gage, Load Cell, & mV/V Indicator, which comes standard with logging and configuration software.



How It Works

1. Determine the feature on the product to be tested, and build an apparatus that will focus loads into that area.
2. Once the load applicators or cylinders are in place, install the Model SSMF Fatigue Rated S-Type Load cell somewhere along the direct line of force between the cylinder and the load affected area.
3. To read the load forces, connect the 9890 to your load cell and to your computer before testing. It is important that any wires or cords be free of any possible snag points, crush points, or other clearance issues for the entire cycle of movement.
4. Once the testing apparatus is setup and data is ready to be recorded, the test may begin. Observe all safety rules and keep a safe distance from the test during load cycling to prevent injury in the event of failure.

Harness Durability Testing
Load Cell

Industry: Industrial Automation, Test and Measurement

Summary

Customer Need / Challenge

Harnesses are often used to strap humans of various weights to safety equipment or sports gear. Harness manufacturers must determine load and durability factors for harnesses and their attachment points.

Interface Solution

A drop test apparatus uses an Interface 1200 Standard Precision LowProfile® Load Cell attached to a cable and loaded harness. The loaded harness is dropped from a specified height to measure the force generated during sudden stop at maximum cable extension.

Results

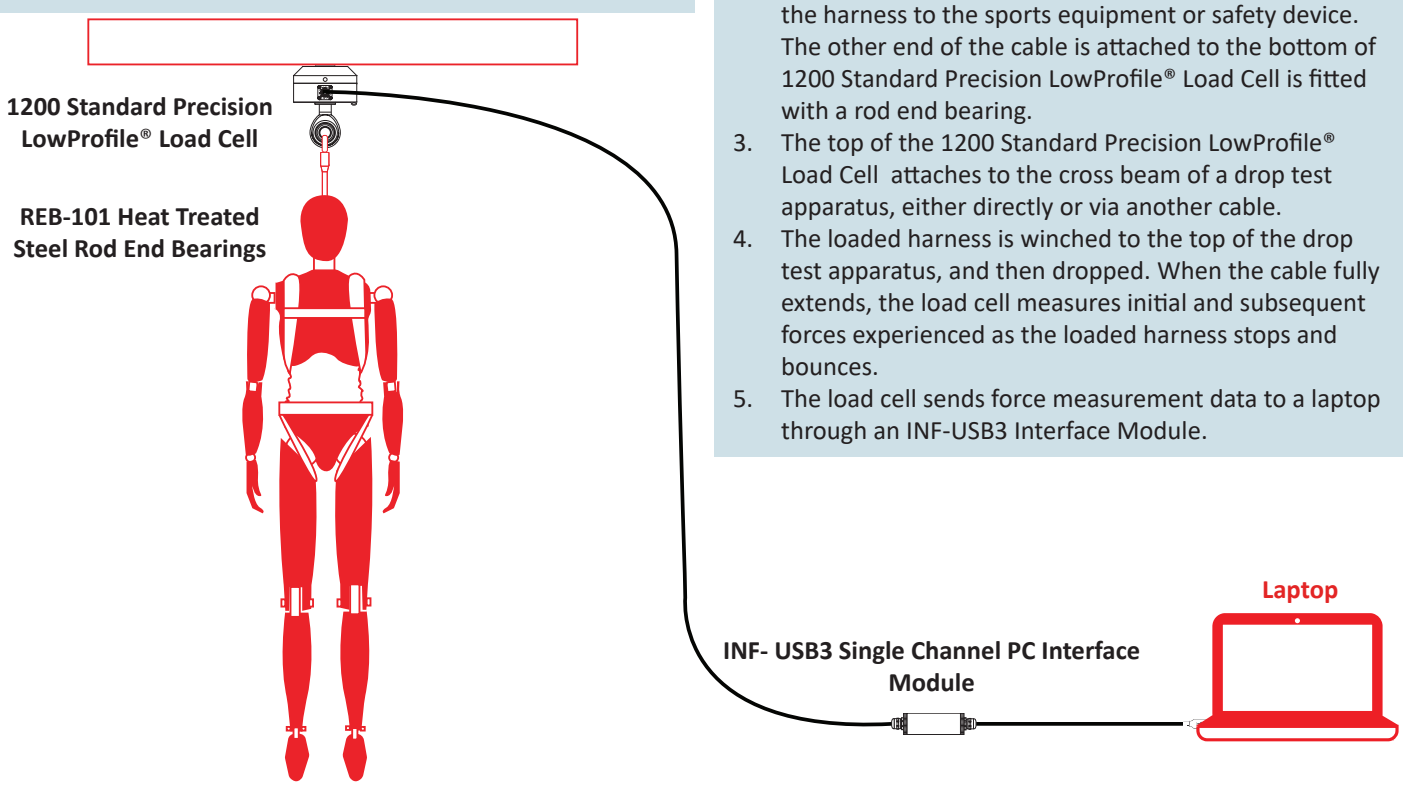
Engineers determine the total force on the harness for various body weights dropped from maximum usage heights to set harness limits. Tests can be repeated numerous times to determine fatigue and durability limits.

Materials

- 1200 Standard Precision LowProfile® Load Cell.
- REB-101 Heat Treated Steel Rod End Bearings.
- INF-USB3 Single Channel USB Interface Module with supplied software.

How It Works

1. Test engineers place the harness to be tested on a dummy of known weight.
2. The loaded harness is attached to one end of a cable. Ideally this is the same type of cable used to attach the harness to the sports equipment or safety device. The other end of the cable is attached to the bottom of 1200 Standard Precision LowProfile® Load Cell is fitted with a rod end bearing.
3. The top of the 1200 Standard Precision LowProfile® Load Cell attaches to the cross beam of a drop test apparatus, either directly or via another cable.
4. The loaded harness is winched to the top of the drop test apparatus, and then dropped. When the cable fully extends, the load cell measures initial and subsequent forces experienced as the loaded harness stops and bounces.
5. The load cell sends force measurement data to a laptop through an INF-USB3 Interface Module.



Industrial Robotic Arm
Multi-Axis

Industry: Industrial Automation

Summary

Customer Need / Challenge

A manufacturer of a robot arm needs to measure force and torque when the arm picks up and places objects.

Interface Solution

Interface supplied Model 6A40A 6-Axis Load Cell with Model BX8-HD44 Data Acquisition/Amplifier.

Results

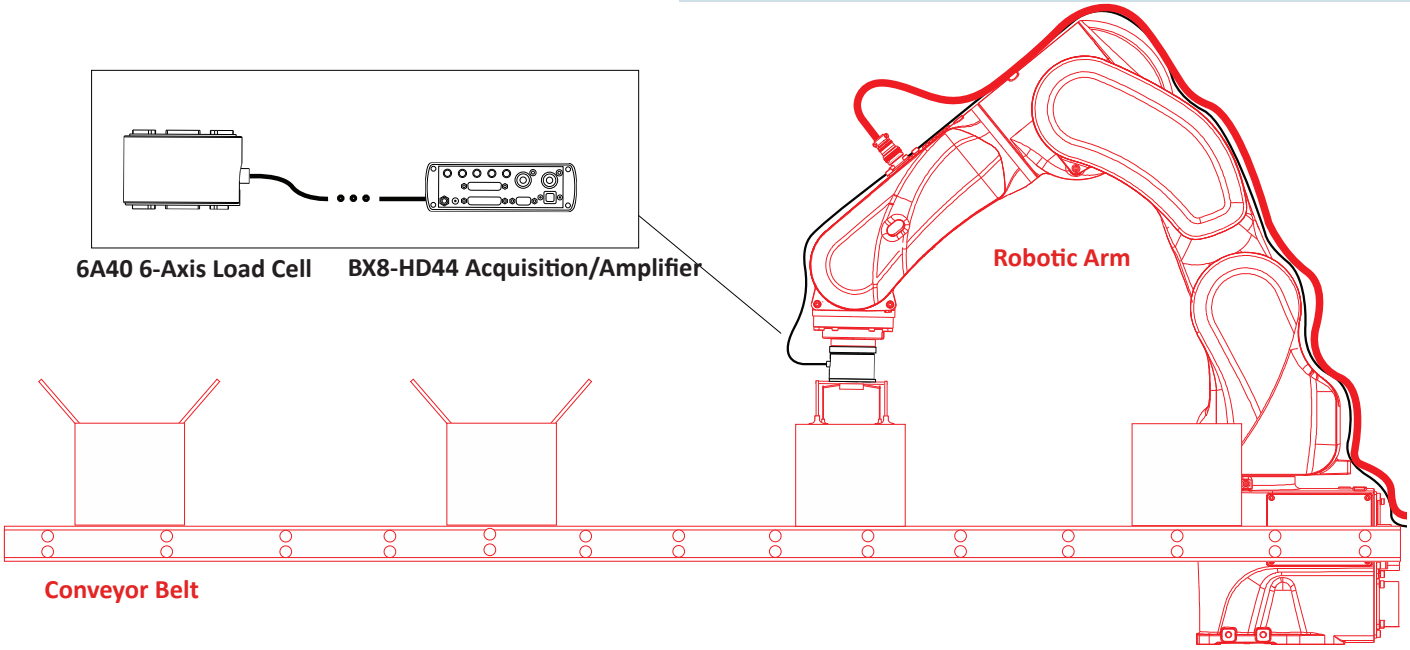
The 6A40-6 Axis Load Cell was able to measure all forces and torques (F_x, F_y, F_z, M_x, M_y, M_z) and the BXB-HD44 Data Acquisition/Amplifier was able to log, display, and graph these measurements while sending scaled analog output signals for these axes to the robot's control system

Materials

- 6A40 6-Axis Load Cell.
- BX8- Data Acquisition/Amplifier with includes BlueDAQ configuration, logging, display and graphing software.
- Customer's robotic arm and control system.

How It Works

1. Customer installed 6A40 6-Axis Load Cell between robot flange and robot grabber.
2. 6A40 6-Axis Load Cell was connected to BX8-HD44 Data Acquisition/Amplifier.
3. Customer connected analog outputs to their control system.
4. Result, customer is now able to measure forces and torques in 6 axes and send a scaled analog output signal to their robotic arm control system.



Lifting Heavy Objects
Wireless Telemetry System
Industry: Industrial Automation

Summary

Customer Need / Challenge

Customer needs to use a crane to move heavy construction materials around the work site and need to monitor the weight of these objects as they are lifted.

Interface Solution

Interface Model WTSSHK-B Wireless Load Shackle are connected in crane load string to measure forces. Model WTS-BS-1-HA Battery Powered Handheld Display is used to wirelessly receive load information and display results.

Results

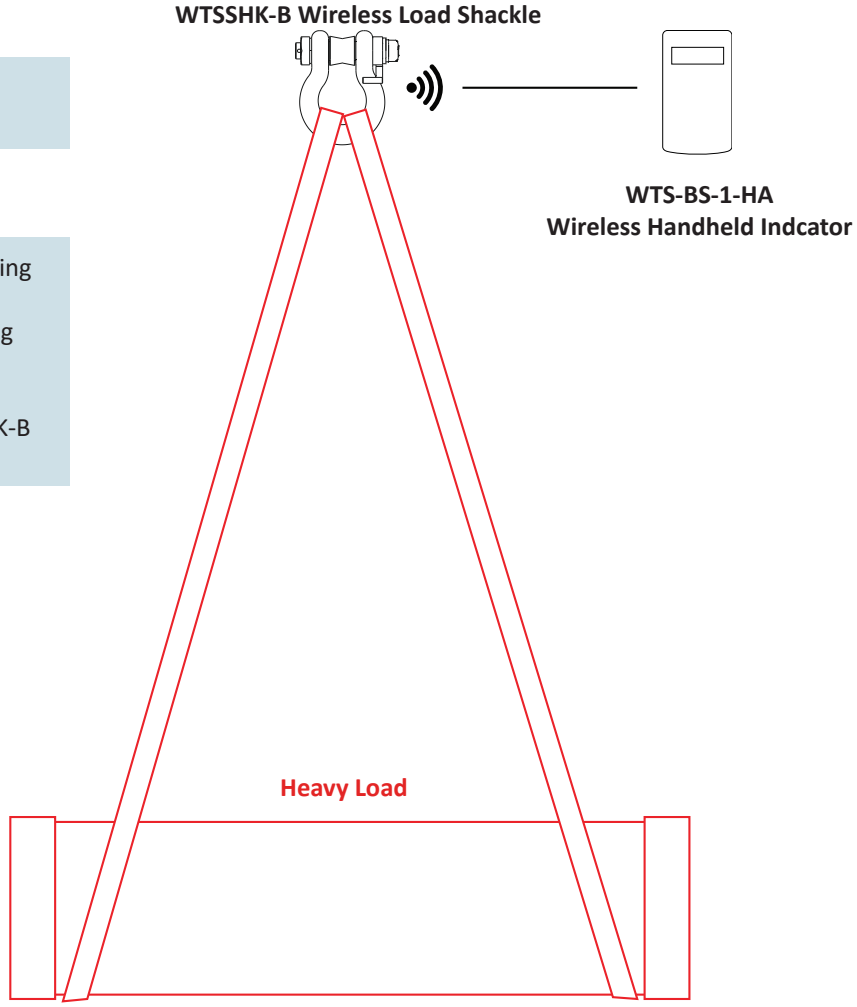
Customer is successfully lifting and reading weight (wirelessly) on a handheld display while material is being relocated.

Materials

- WTSSHK-B Wireless Load Shackle.
- WTS-BS-1-HA Wireless Handheld Indicator.

How It Works

1. Wireless Load Shackle is connected in the load string of the crane.
2. Customer connects straps to the item that is being lifted and to the load shackle.
3. WTS-BS-1-HA Battery Powered Handheld Display will wirelessly display force readings from WTSSHK-B Wireless Load Shackle.



Robotic Arm

Load Button Load Cells

Industry: Industrial Automation

Summary

Customer Need / Challenge

- The Customer needs to lift and move delicate objects, like a glass bottle, in an automated environment with a robotic arm without causing damage to the objects that are being lifted and moved.

Interface Solution

- 2 ConvexBT Load Button Load Cells are used in the grips of the robotic arm to measure the amount pressure being applying to the object it is lifting and moving. The DMA2 DIN Rail Mount Signal Conditioner converts the signal received from the 2 ConvexBT Load Button Load Cells from mV/V to volts to the PLC Controller which tells the robotic arm to stop clamping pressure when a specified amount of pressure is applied to the object.

Results

- The 2 ConvexBT Load Button Load Cells accurately measured the amount of pressure applied to the object the robotic arm was lifting and moving without causing any harm or damage to the object.

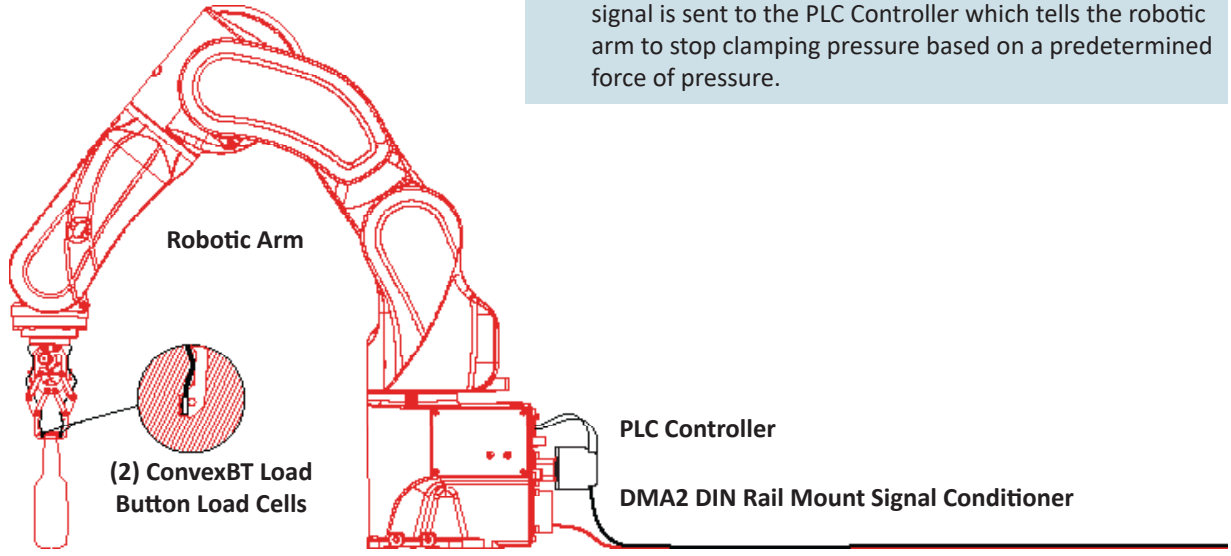
Materials

Interface Solution

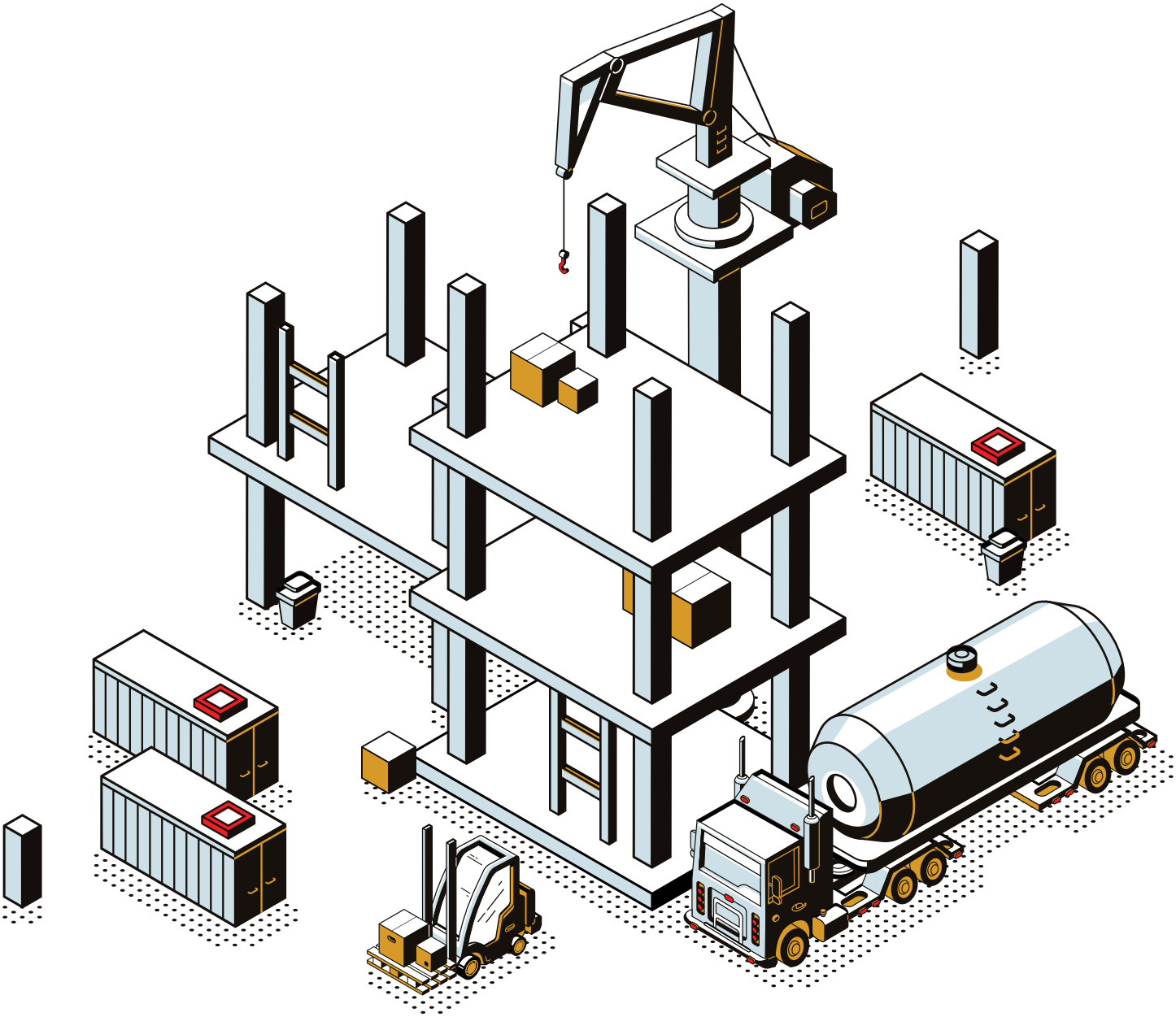
- (2) ConvexBT Load Button Load Cells
- DMA2 DIN Rail Mount Signal Conditioner
- PLC Controller

How It Works

- The 2 ConvexBT Load Button Load Cells are connected underneath a rubber grip pad on both sides of the robotic arms clamping device. When the rubber grips make contact with the object it is grabbing pressure is applied to both of the ConvexBT Load Button Load Cells a signal is sent to the PLC Controller which tells the robotic arm to stop clamping pressure based on a predetermined force of pressure.



Infrastructure



Aerial Lift Overload Control Load Cell

Industry: Infrastructure, Test and Measurement

Summary

Customer Need / Challenge

A manufacturing company for aerial lifts wants to test its self-propelled boom lift to ensure it can operate at heavy capacities when in use, and at different angles. They want to prevent any accidents in case of a lifting overload, for the safety of any working individual who uses it.

Interface Solution

Interface's solution is to attach the 3A160 3-Axis Force Load Cell to the bottom of the bucket of the boom lift. The 3A160 3-Axis Force Load Cell gives high accuracy results, which can be displayed using the 920i Programmable Weight Indicator and Controller in real time.

Results

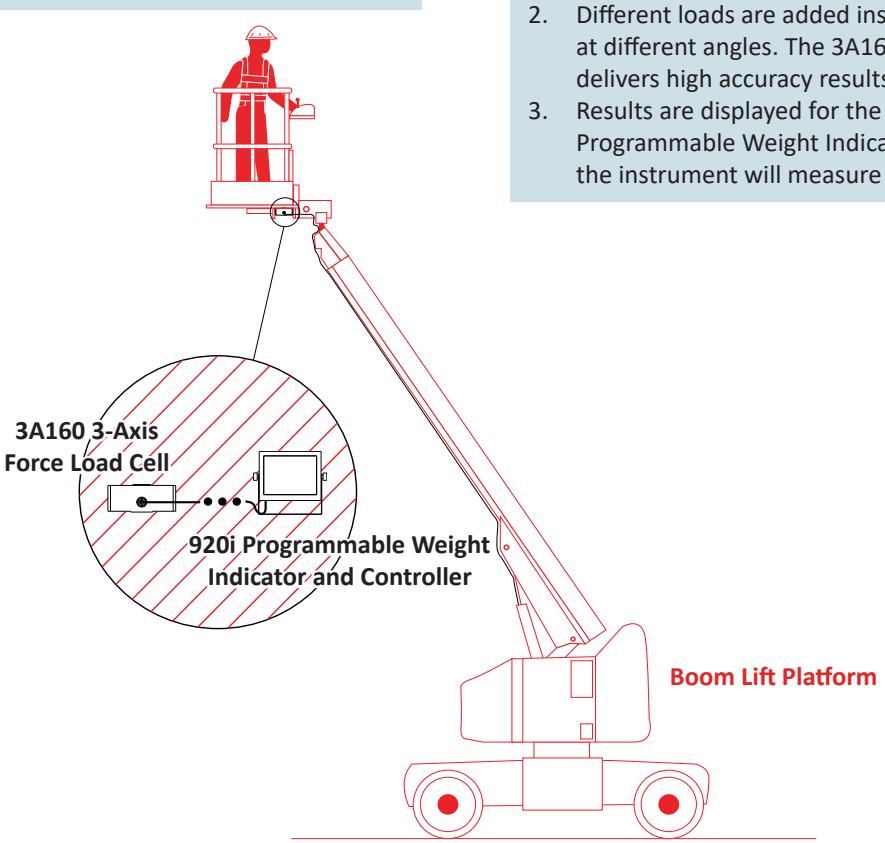
The manufacturing company tested their aerial boom lifts and determined it was safely operable when maximum capacities has been reached.

Materials

- 3A160 3-Axis Force Load Cell
- 920i Programmable Weight Indicator and Controller

How It Works

1. The 3A160 3-Axis Force Load Cell is installed where the lift's arm ends at the bottom of the boom lift's bucket.
2. Different loads are added inside the boom lift's bucket, at different angles. The 3A160 3-Axis Force Load Cell delivers high accuracy results at each capacity.
3. Results are displayed for the customer using the 920i Programmable Weight Indicator and Controller, where the instrument will measure all three bridges.



Bridge Seismic Force Monitoring Solution

Load Pin

Industry: Industrial Automation

Summary

Customer Need / Challenge

Customer would like to monitor seismic activity that occurs to a bridge by using force sensors and then continuously monitoring bridge forces before, during and after earthquakes occur. Customer would prefer a wireless solution so they would not need to run long cables on the bridge.

Interface Solution

Using Interface Inc. WTSLP Load Pin custom made to fit their needs along Interface Inc. WTS Wireless Telemetry System continuous force monitoring was able to take place without long cables.

Results

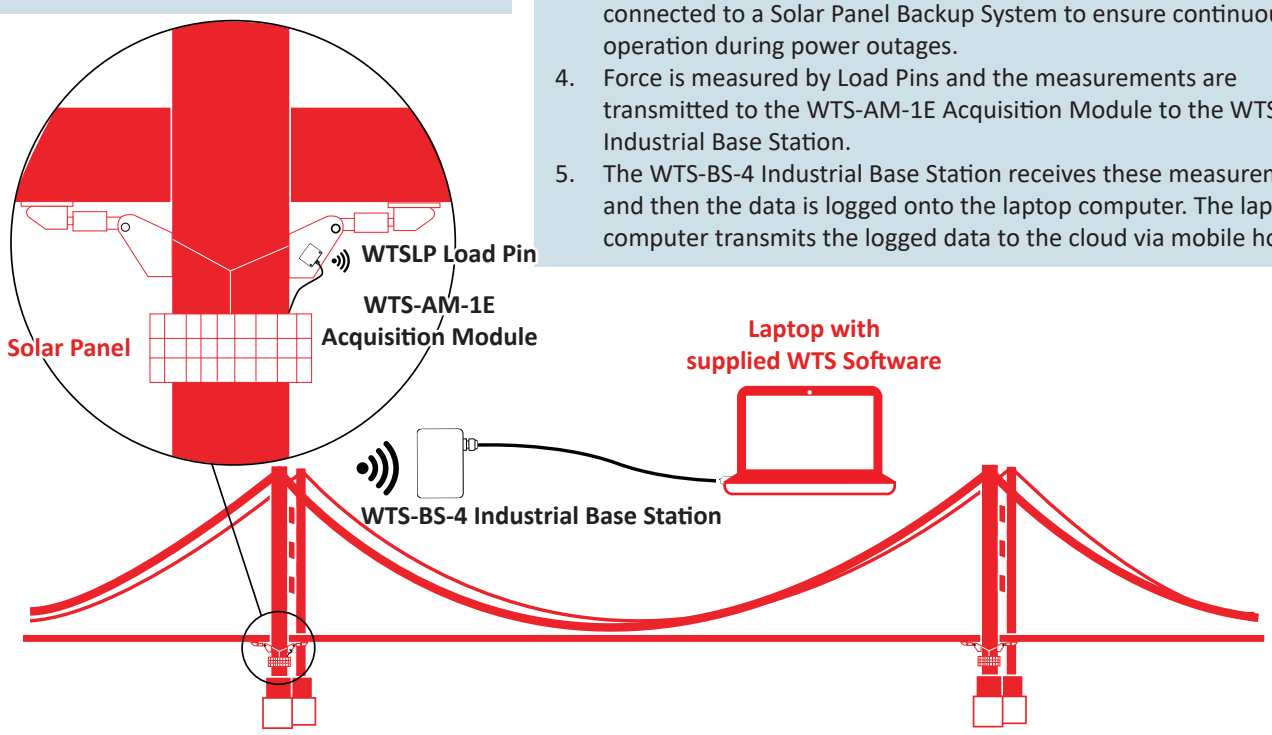
Customer was able to monitor continuous loads, log information to the cloud and review information.

Materials

- WTSLP Load Pin.
- WTS-AM-1E Acquisition Module.
- WTS-BS-4 Industrial Base Station.
- Customer's Data Acquisition System.
- PC computer with supplied WTS Software.
- Solar Panel.

How It Works

1. WTSLP Load Pins and the WTS-AM-1E Acquisition Module are installed onto the bridge. The WTS-AM-1E Acquisition Module is installed in a way that will be a clear line of site.
2. WTS-BS-4 Industrial Base Station is connected to the PC computer and installed up to 800 meters of the WTS-AM-1E Acquisition Module.
3. WTS-AM-1E Acquisition Module and Laptop Computer are also connected to a Solar Panel Backup System to ensure continuous operation during power outages.
4. Force is measured by Load Pins and the measurements are transmitted to the WTS-AM-1E Acquisition Module to the WTS-BS-4 Industrial Base Station.
5. The WTS-BS-4 Industrial Base Station receives these measurements and then the data is logged onto the laptop computer. The laptop computer transmits the logged data to the cloud via mobile hot spot.



Concrete Dam Flood Monitoring

Interface Mini™

Industry: Infrastructure

Summary

Customer Need / Challenge

A customer wants to monitor and be notified if a concrete dam has reached high flooding levels.

Interface Solution

Interface's WMC Miniature Sealed Stainless Steel Load Cells with multiple WTS-AM-1E Wireless Acquisition Modules connected to them, are small in size and perfect for measuring tension and compression. Multiple WMC's can be installed around the arch of the dam, so when flooding occurs, the WMC can transmit data and notify the customer through one of our Wireless Telemetry Systems.

Results

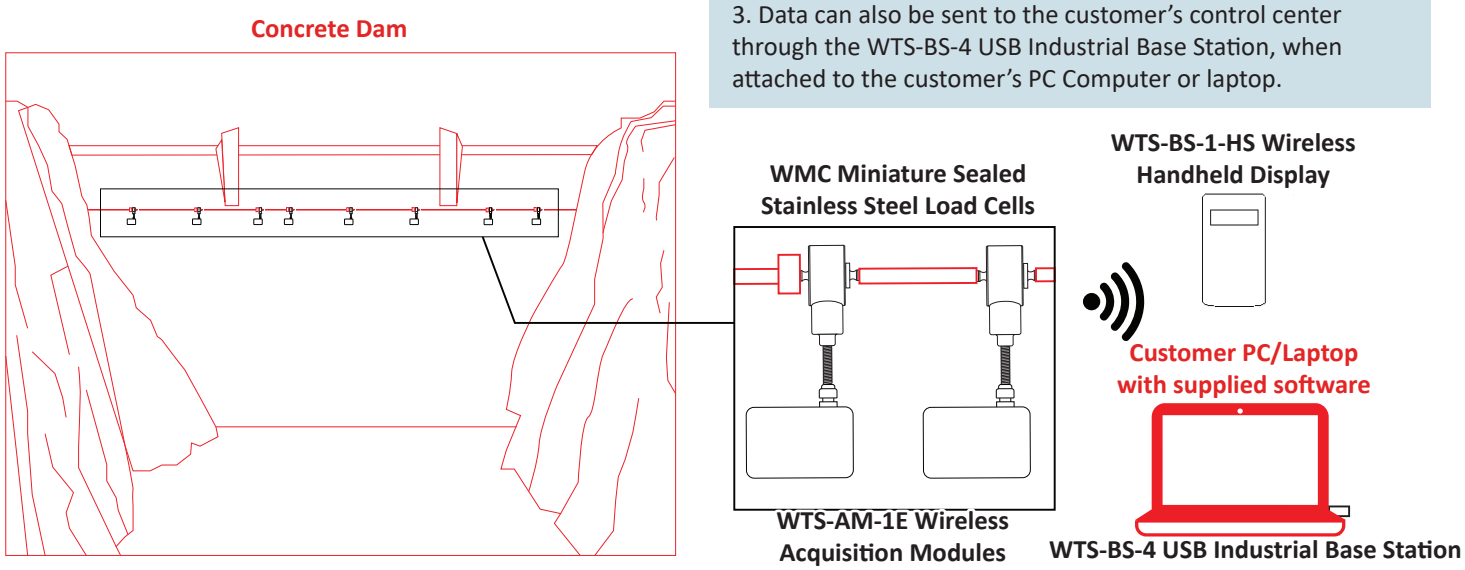
The customer was notified wirelessly when flood level became too high for the dam in their control center.

Materials

- WMC Miniature Sealed Stainless Steel Load Cells
- WTS-AM-1E Wireless Acquisition Modules
- WTS-BS-4 USB Industrial Base Station
- WTS-BS-1-HS Wireless Handheld Display for Single Transmitters
- Customer PC Computer or Laptop

How It Works

1. Multiple WMC Miniature Sealed Stainless Steel Load Cells with multiple WTS-AM-1E Wireless Acquisition Modules connected to them, are anchored to the concrete dam at the maximum height preferred.
2. If flooding occurs, the force from the water triggers the WMC's, and data is transmitted wirelessly to the customer's WTS-BS-1-HS Wireless Handheld Display for single transmitters.
3. Data can also be sent to the customer's control center through the WTS-BS-4 USB Industrial Base Station, when attached to the customer's PC Computer or laptop.



Hydraulic Jacking System Testing
Load Cell

Industry: Infrastructure

Summary

Customer Need / Challenge

A heavy lift company wants to test their hydraulic jacking system has the ability to lift heavy loads and objects, like a bridge during construction. They want to monitor the forces being applied to ensure the hydraulic jack is not only safe to use, but works well enough to avoid any potential structural issues. They also want the results in real-time.

Interface Solution

Interface's 1200 Standard High Capacity Load Cell can be attached in between the hydraulic jack and a heavy load. The 1200 Standard High Capacity Load Cell will measure the forces of the hydraulic jack as it lifts the load cell located in between the jack and the object. With the 9890 Strain Gage, Load Cell, & mV/V Indicator, the customer is also able to see the results in real-time.

Results

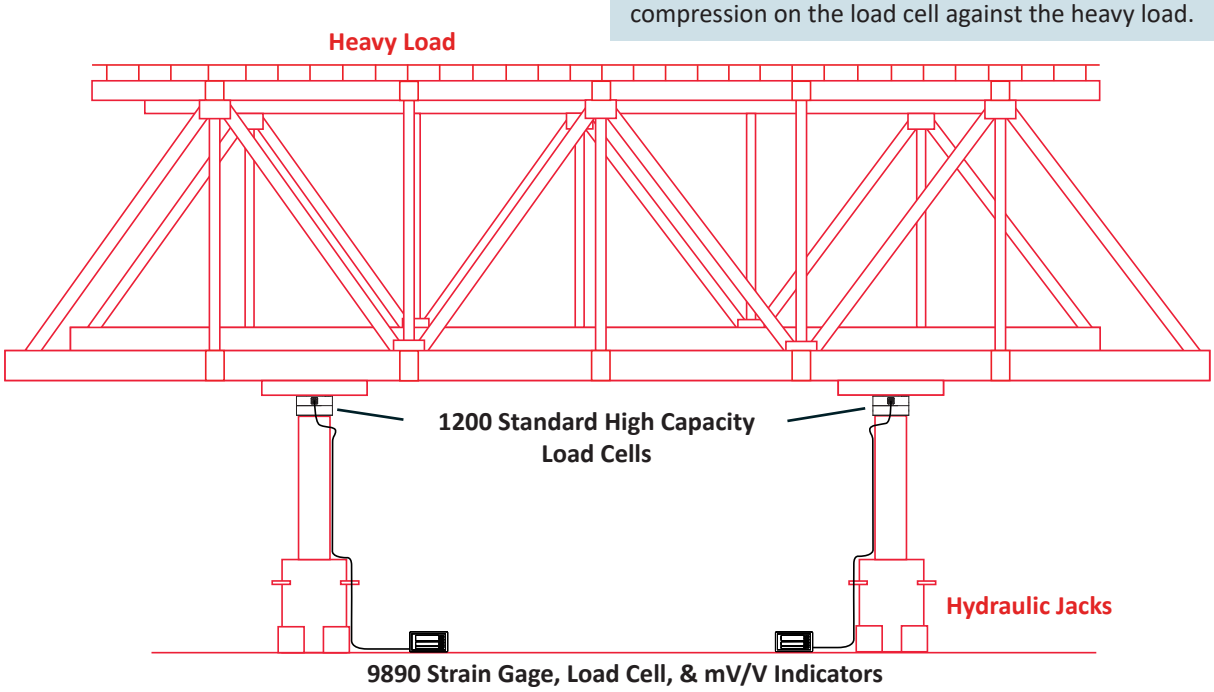
The heavy lift company tested their hydraulic jack, resulting in it being safe and functions properly to be sold. It also ensures buyers that the hydraulic jack system upholds its use of continuous heavy load lifting or moving, and maintains structural probity.

Materials

- 1200 Standard High Capacity Load Cell
- 9890 Strain Gage, Load Cell, & mV/V Indicator

How It Works

1. Multiple 1200 Standard High Capacity Load Cell's are located in between the hydraulic jack and a heavy lifting load.
2. The 1200's will be connected to its own 9890 Strain Gage, Load Cell, & mV/V Indicator to give accurate and real-time results of the forces from hydraulic jacking system when it puts compression on the load cell against the heavy load.



Hydropower Turbine Generator Monitoring

Torque Transducer

Industry: Infrastructure

Summary

Customer Need / Challenge

A customer wants to monitor and detect any turbine generator faults in their hydroelectric power plant located on a river.

Interface Solution

Interface's solution is to use the T2 Ultra Precision Shaft Style Rotary Torque Transducer and attach it to the turbine generator with Interface's Shaft Style Torque Transducer Couplings. When water from the river pushes through the penstock to the outflow, it moves the turbine blades, creating electricity through the generator shaft. Torsion measurements can be graphed and logged with the 9850 Torque Transducer and Load Cell Indicator- catching any unusual fluctuations and vibrations.

Results

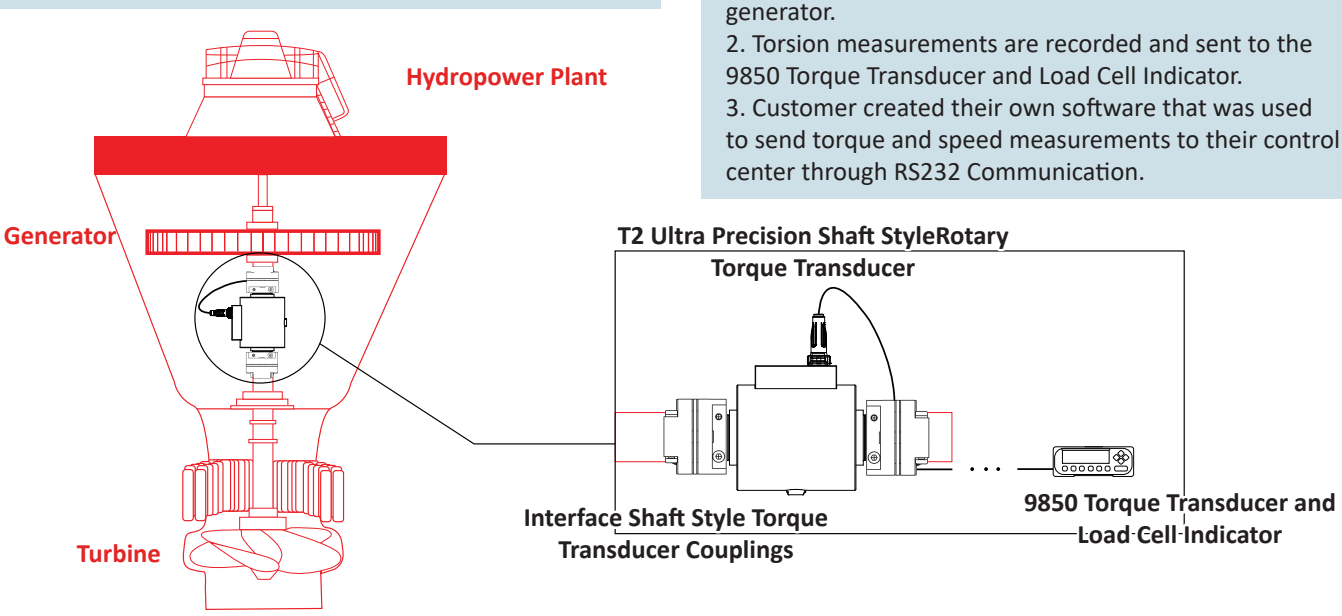
The customer was able to monitor, graph, and log the torque measurement results of the turbine generator.

Materials

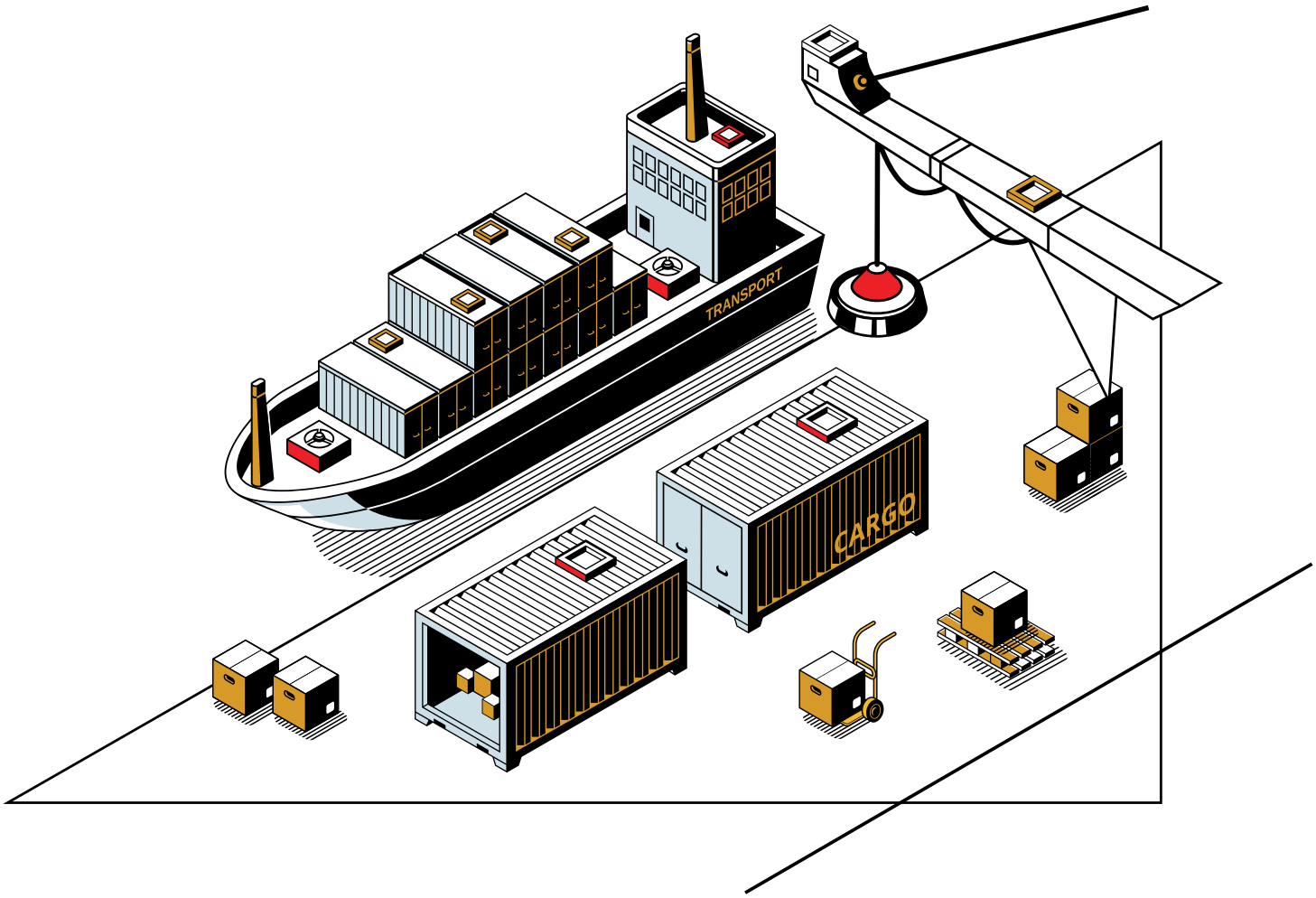
- T2 Ultra Precision Shaft Style Rotary Torque Transducer
- Interface Shaft Style Torque Transducer Couplings
- 9850 Torque Transducer and Load Cell Indicator

How It Works

1. The T2 Ultra Precision Shaft Style Rotary Torque Transducer is installed with Interface's Shaft Style Torque Transducer Couplings onto the hydropower turbine generator.
2. Torsion measurements are recorded and sent to the 9850 Torque Transducer and Load Cell Indicator.
3. Customer created their own software that was used to send torque and speed measurements to their control center through RS232 Communication.



Maritime



Crane Block Safety Check
Load Pin

Industry: Industrial Automation

Summary

Customer Need / Challenge

A customer wants a system to detect if their crane block can lift heavy loads securely, in order to keep working conditions and personnel safe. If lifting capacities are exceeded, the customer wants a system to alarm them in real-time.

Interface Solution

Interface, Inc.'s WTSLP Wireless Stainless Steel Load Pin can replace the existing load bearing pin in the crane block in order to measure the force being applied by the heavy load. Data will be transmitted and displayed through both the WTS-BS-4 USB Base Station (when paired with the customer's supplied PC computer/ Laptop) and the WTS-BS-1-HA Wireless Handheld for real-time results. The WTS-RM1 Wireless Relay Output Receiver Module will also trigger an alarm when maximum capacity has been reached.

Results

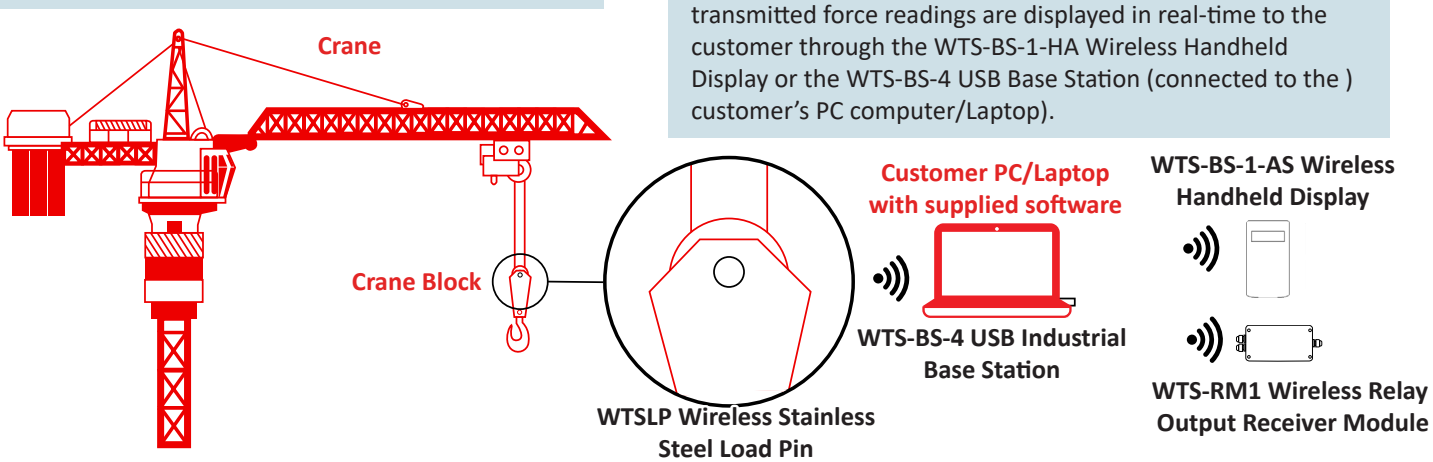
The WTSLP Wireless Stainless Steel Load Pin, combined with the WTS products, was able to measure and determine force applied the moment a heavy load is lifted. The results were transmitted wirelessly, and ensured the customer whether or not the crane block was safely operational during production.

Materials

- WTSLP Wireless Stainless Steel Load Pin
- WTS-RM1 Wireless Relay Output Receiver Module
- WTS-BS-1-HA Wireless Handheld Display for Multiple Transmitters
- WTS-BS-4 USB Industrial Base Station
- WTS Toolkit Software & Log100 Software Included
- Customer PC/Laptop

How It Works

1. WTSLP Wireless Stainless Steel Load Pin is installed, replacing the normal load bearing pin on the block of the crane. A heavy load is added to the end of the block.
2. The WTS-RM1 Wireless Relay Output Receiver Module captures the data transmitted from the WTSLP Wireless Stainless Steel Load Pin and uses this to trigger and alarm when the setpoint is reached. Simultaneously, these transmitted force readings are displayed in real-time to the customer through the WTS-BS-1-HA Wireless Handheld Display or the WTS-BS-4 USB Base Station (connected to the) customer's PC computer/Laptop).



Crane Capacity Verification
Tension Link

Industry: Industrial Automation

Summary

Customer Need / Challenge

A customer wants to verify that their crane is strong enough to safely lift a heavy load, at it's rated maximum load capacity. A wireless solution is needed to avoid long cables, and to have a faster installation time.

Interface Solution

Interface, Inc's Model WTSLTL Lightweight Wireless Tension Link Load Cell can measure the load's maximum capacity. The WTS-RM1 Wireless Relay Output Receiver Modules also can trigger an alarm that can be set when the maximum capacity of weight/ force has been reached. The data is transmitted and can be reviewed with the WTS-BS-1-HS Wireless Handheld Display, or, on the customer's PC/ Laptop.

Results

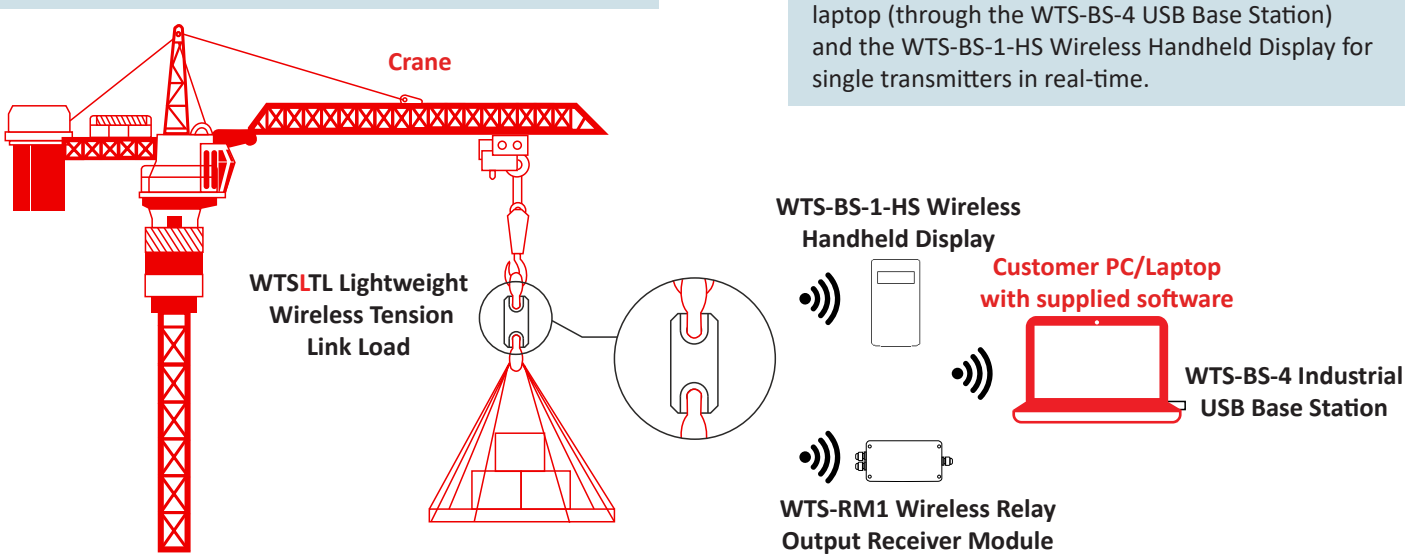
Customer was able to verify if the crane is safe and functional enough to lift it's working load limit (WLL) or safe working load (SWL) capacity. The data is transmitted and logged to the customer's PC/laptop, or to a handheld device in real-time.

Materials

- WTSLTL Lightweight Wireless Tension Link Load Cell
- WTS-RM1 Wireless Relay Output Receiver Module
- WTS-BS-1-HS Wireless Handheld Display for Single Transmitters
- WTS-BS-4 Industrial USB Base Station
- WTS Toolkit Software & Log100 Software Included
- Customer PC/Laptop

How It Works

1. The WTSLTL Lightweight Wireless Tension Link Load Cell is installed on the crane, lifting an item that maxes out to the crane's working load limit (WLL).
2. The WTSLTL transmits data to the WTS-RM1 Wireless Relay Output Receiver Module and can trigger an alarm when the capacity has been reached. Information is also transmitted both to the laptop (through the WTS-BS-4 USB Base Station) and the WTS-BS-1-HS Wireless Handheld Display for single transmitters in real-time.



Crane Force Regulation
Load Pin

Industry: Industrial Automation

Summary

Customer Need / Challenge

Customer wants to regulate the maximum amount of heavy loads being lifted, so that production time can be both safe for workers and efficient. The customer wants to complete lifting duties faster and with little or no expense. A wireless solution is preferred, so that there would be no long cable interference during production.

Interface Solution

With Interface Inc. WTSLP Wireless Stainless Steel Load Pin, this product can be custom made to be used for any and all types of cranes. It is also great for lifting both short and long distances. Paired with the WTS Wireless Telemetry System, force is measured and logged.

Results

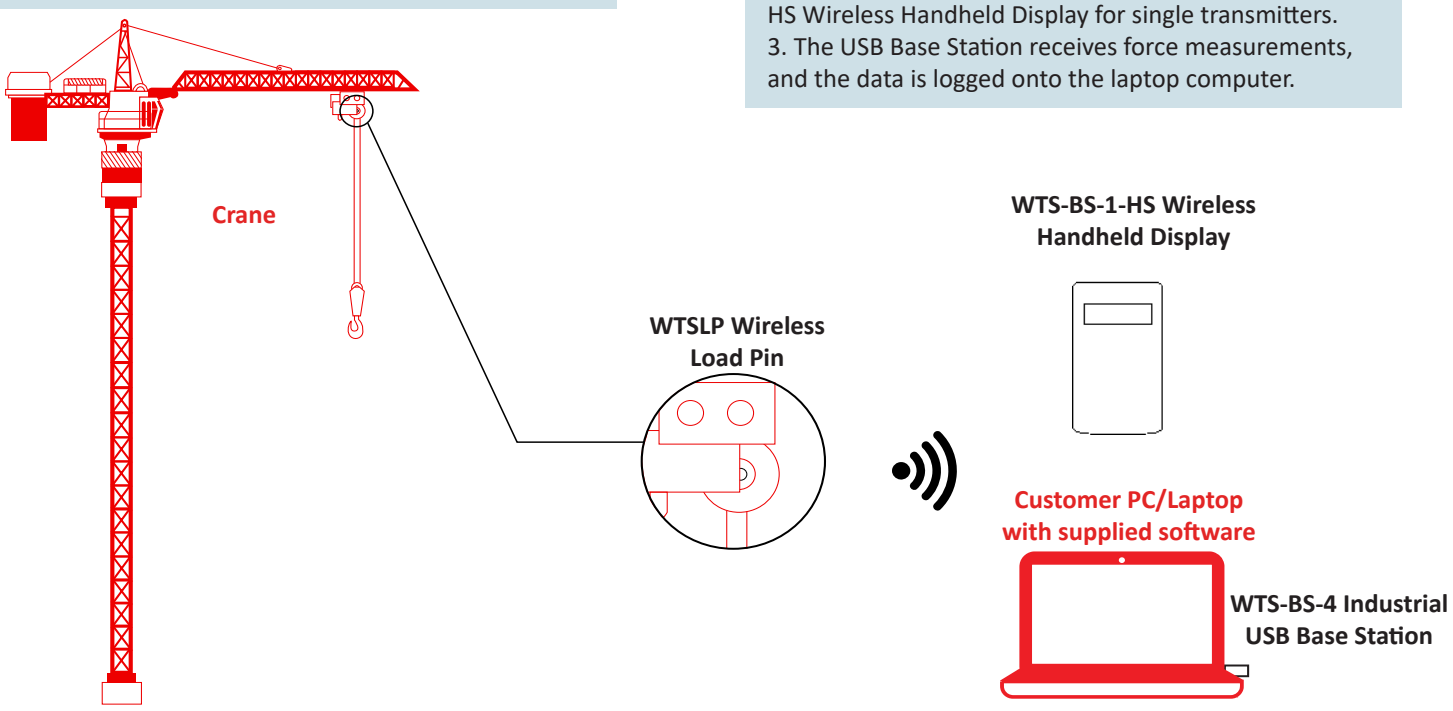
Customer was able to monitor the continuous force from the crane, and gather information on loads being lifted. Data is transmitted and logged to the customer's PC/laptop and is available to be reviewed.

Materials

- WTSLP Wireless Load Pin
- WTS-BS-4 Industrial USB Base Station
- WTS-BS-1-HS Wireless Handheld Display for Single Transmitters
- WTS Toolkit Software & Log100 Software Included
- Customer PC/Laptop

How It Works

1. The WTSLP Wireless Load Pin is installed at the turning block of the crane.
2. WTS-BS-4 Industrial USB Base Station is connected to the customers PC Computer/laptop via USB port. The WTSLP can wirelessly transmit information up to 600 meters in distance to both the laptop or the WTS-BS-1-HS Wireless Handheld Display for single transmitters.
3. The USB Base Station receives force measurements, and the data is logged onto the laptop computer.



Commercial Fishing Wire Rope Testing

Tension Link

Industry: Maritime

Summary

Customer Need / Challenge

A commercial fishing owner wants to measure the force tension of the wire fishing rope connected to the fishing cage or net when their vessel goes to catch. They want to ensure the wire rope is strong enough and safe enough to hold the maximum capacity of fish caught in the cage or net.

Interface Solution

Interface's WTSTL Wireless Tension Link Load Cell was attached between the end of the cable, and the end that hooks onto the fishing net. This tension link will be able to measure the forces of the full net of fish, or, a heavy load at maximum capacities. The data information can be transmitted to both the WTS-BS-1-HS Handheld Display for Single Transmitters, or to the customers computer laptop through the WTS-BS-4 USB Industrial Base Station.

Results

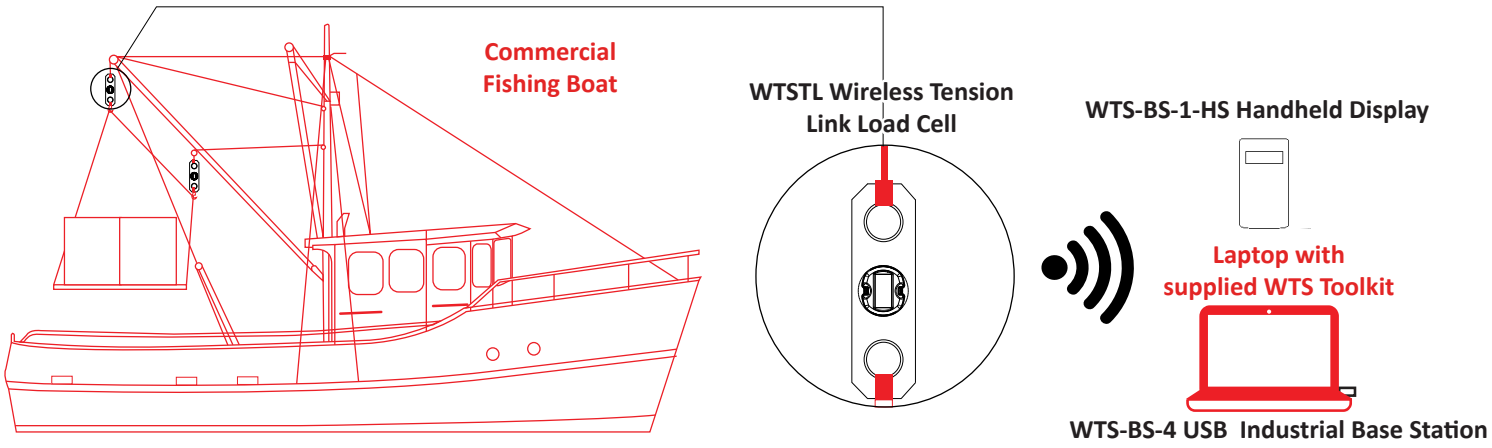
The customer was able to determine if the fishing cable on their vessel was strong enough to hold the fish cage or net at maximum capacity when out catching.

Materials

- WTSTL Wireless Tension Link Load Cell
- WTS-BS-1-HS Handheld Display for Single Transmitters
- WTS-BS-4 USB Industrial Base Station
- WTS Toolkit (graphing, logging, and set up software, included with WTS-BS-4)
- Customer PC Computer or Laptop

How It Works

1. The WTSTL Wireless Tension Link Load Cell is attached at the end of the wire fishing rope.
2. A heavy load that reaches maximum capacity for the wire rope, was added to the end of the WTSTL Wireless Tension Link Load Cell.
3. Force measurements are transmitted to the WTS-BS-1-HS Handheld Digital Display for Single Transmitters and to the customers computer or laptop through the WTS-BS-4 USB Industrial Base Station. With the WTS Toolkit (included with the WTS-BS-4) the customer is able to graph and log the data results with this software onto their computer.



Hydrofoil Testing in Wave Tank
Load Cell

Industry: Automotive and Vehicle

Summary

Customer Need / Challenge

Hydrofoil design is a delicate balance between performance and complexity. Finding the right shape without using overly complex angles to achieve the desired amount of lift is crucial when designing a successful hydrofoil. Once an engineer's concepts are ready for testing, using the best force measurement equipment is required to sense the subtle differences between hydrofoil designs.

Interface Solution

Lift and drag are the most important characteristics of a hydrofoil. Model 3A120 3-Axis load cell is needed to read these forces. The Fz senses lift and the Fx and Fy sense the drag. Using a model BSC4D-USB bridge amplifier increases the visibility of the load cells output signals.

Results

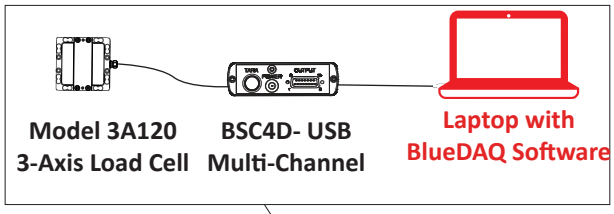
When using the load cell and bridge amplifier, the engineers are able to record the real world lift and drag forces the hydrofoils are having on the water craft. This data allows a more in-depth comparison of proposed hydrofoil designs to find the best model for the job.

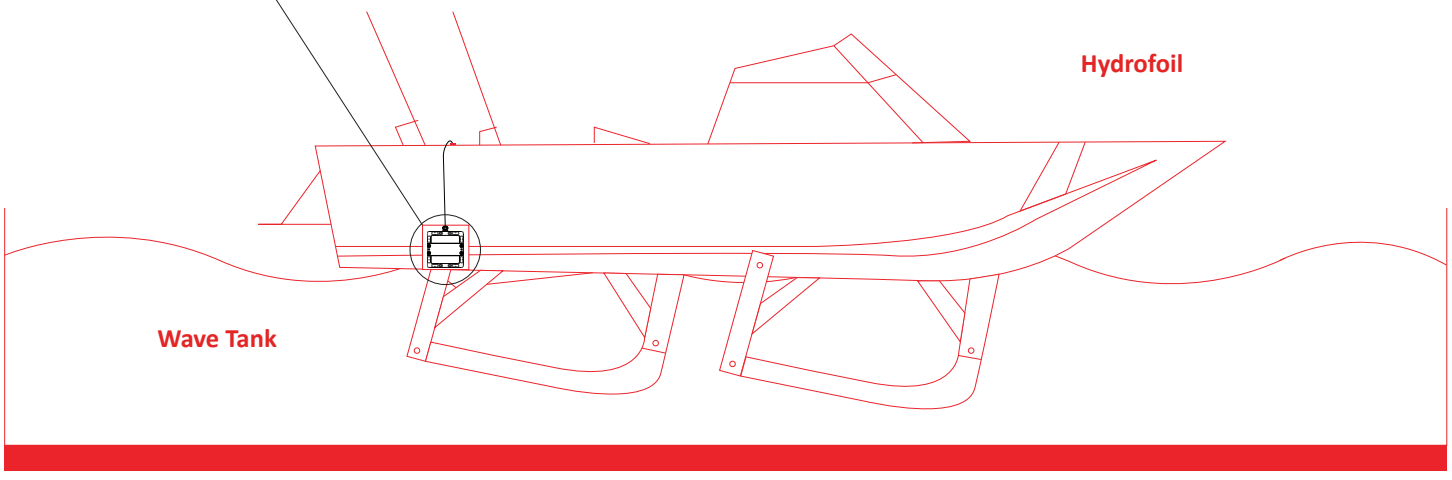
Materials

- Model 3A120 3-Axis Load Cell.
- BSC4D-USB Multi-Channel, which includes BlueDAQ display, graphing, and logging software & PC Interface Module.

How It Works

1. Model 3A120 3-Axis load cell is fixed to the hull of the water craft.
2. 2. The BSC4D-USB is connected to the load cell.
3. The hydrofoil boom is attached to the 3-Axis load cell.
4. The 3-Axis load cell and bridge amplifier are protected in a waterproof housing.
5. The water craft is placed in a wave tank or current simulator.
6. The 3-Axis load cell naturally reacts to the lift and drag loads of the hydrofoil.
7. The data is logged and stored via the BSC4D-USB on a PC laptop.





Mooring Line Tension Testing

Tension Link

Industry: Maritime

Summary

Customer Need / Challenge

Due to the changing weather conditions, mooring cable lines undergo wear and tear. A customer wants to ensure all mooring lines for ships or vessels are securely docked at the same loading tension, so that they do not risk the mooring lines to break or cause damage.

Interface Solution

Interface, Inc.'s WTSLTL Lightweight Wireless Tension Link can be attached to each mooring cable in use. Results are sent to the customers through the WTS-BS-4 USB Industrial Base Station when connected to the customer's supplied PC computer/Laptop. Data can also be transmitted to the WTS-BS-1-HA Handheld Display for Multiple Transmitters, giving the customer the option to view multiple mooring cable line tensions.

Results

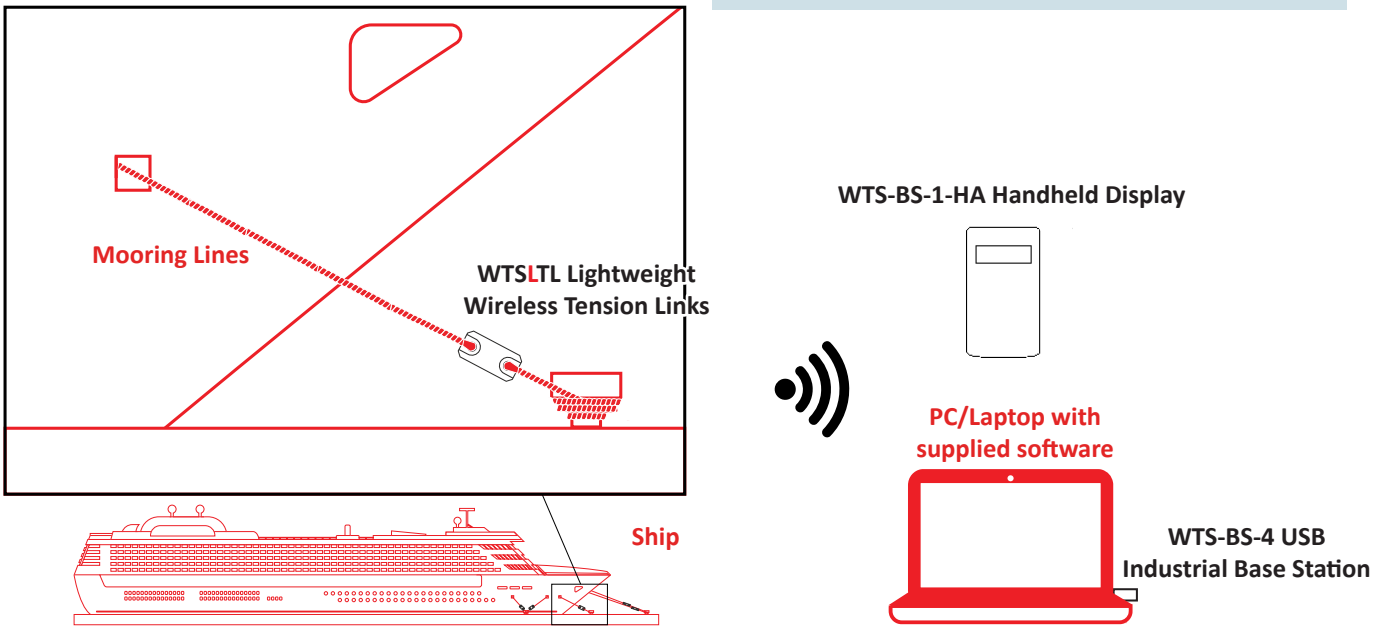
The customer was able to verify the tensions to multiple mooring cable lines. Thus, resulting in the security of their ship being safely docked.

Materials

- WTSLTL Lightweight Wireless Tension Links
- WTS-BS-4 USB Industrial Base Station
- WTS-BS-1-HA Handheld Display for Multiple Transmitters
- WTS Toolkit & Log100 Software
- Customer supplied PC/Laptop

How It Works

1. The WTSLTL Lightweight Wireless Tension Links are attached to all mooring cables being tested.
2. Force measurements are transmitted wirelessly in realtime to the customer's PC/Laptop through the WTS-BS-4 USB Industrial Base Station, or to the WTS-BS-1-HA Handheld Display for multiple transmitters.



Mooring Quick Release Hooks (QRH)

Load Pin

Industry: Maritime

Summary

Customer Need / Challenge

A customer wants to test their Quick Release Hook (QRH) system when their vessels are docked. They want to ensure the mooring lines are secured, but also, the quick release hooks are able to be easily and safely released

Interface Solution

Interface's WTSLP Stainless Steel Load Pin can be installed into the quick release hook, where forces from the mooring lines can be measured and displayed when paired with the WTS-BS-4 USB Industrial Base Station. The load tension forces are displayed in real-time on the customers PC or laptop. The WTS-RM1 Wireless Relay Output Receiver Module alarm can also be triggered for the customer when maximum safety work load capacities have been reached or are overloaded.

Results

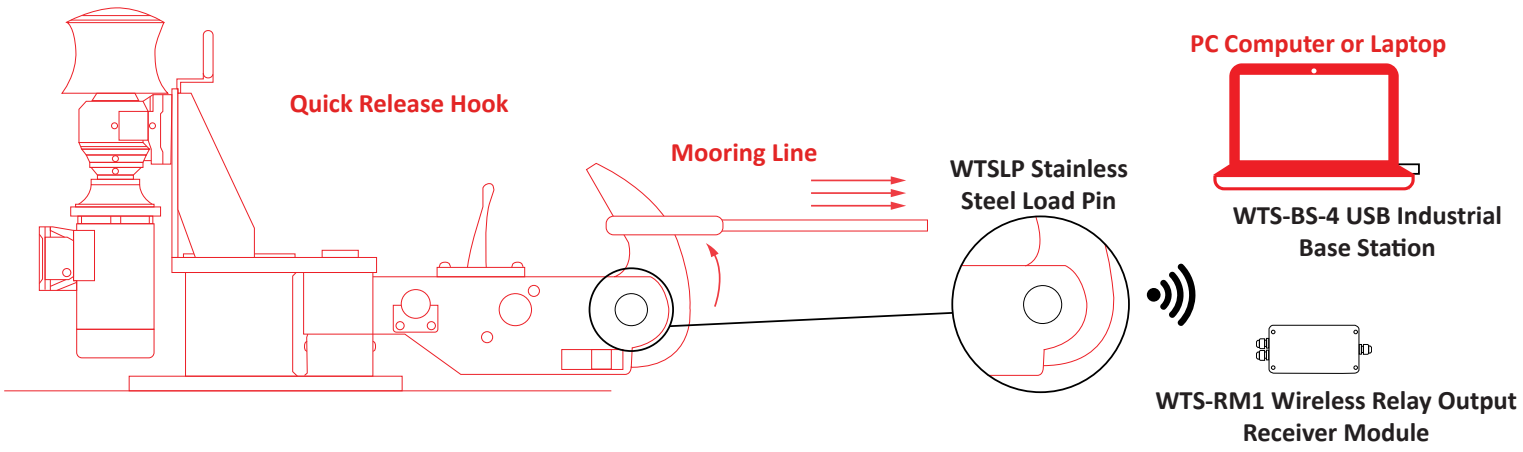
The customer was able to determine if their quick release hooks worked effectively within the safe working limit specifications, and was aware of any potential overload situations.

Materials

- WTSLP Stainless Steel Load Pin
- WTS-RM1 Wireless Relay Output Receiver Module
- WTS-BS-4 USB Industrial Base Station
- WTS Toolkit (graphing, logging, and set up software, included with WTS-BS-4)
- Customer PC Computer or Laptop

How It Works

1. The WTSLP Stainless Steel Load Pin is installed in the quick release hook.
2. Forces are measured and recorded using the WTS-BS-4 USB Industrial Base Station, and results are displayed on the customers PC computer or laptop.
3. When maximum capacities have been reached, the WTS-RM1 Wireless Relay Output Receiver Module triggers an alarm for the customer to be notified.



WTS Yacht Rigging Inspection
Load Shackle

Industry: Maritime

Summary

Customer Need / Challenge

A customer wants to have a complete rigging inspection to make sure the mast, still lines, and all movable hoisting lines are functional and meet the proper specifications for sailing. The customer wants to test the tension of the forestay, shroud, and backstay cables. They also want to test the tension of the movable lines when sailing.

Interface Solution

With Interface, Inc's WTSSHK-B Wireless Crosby™ Bow Load Shackle paired with the WTS-BS-1 Wireless Handheld Display for Unlimited Transmitters, the customer can switch and view between multiple shackles being tested. The WTS-BS-4 USB Industrial Base Station can also be attached to the customer's PC/Laptop to display realtime measurements from the shackles and log data.

Results

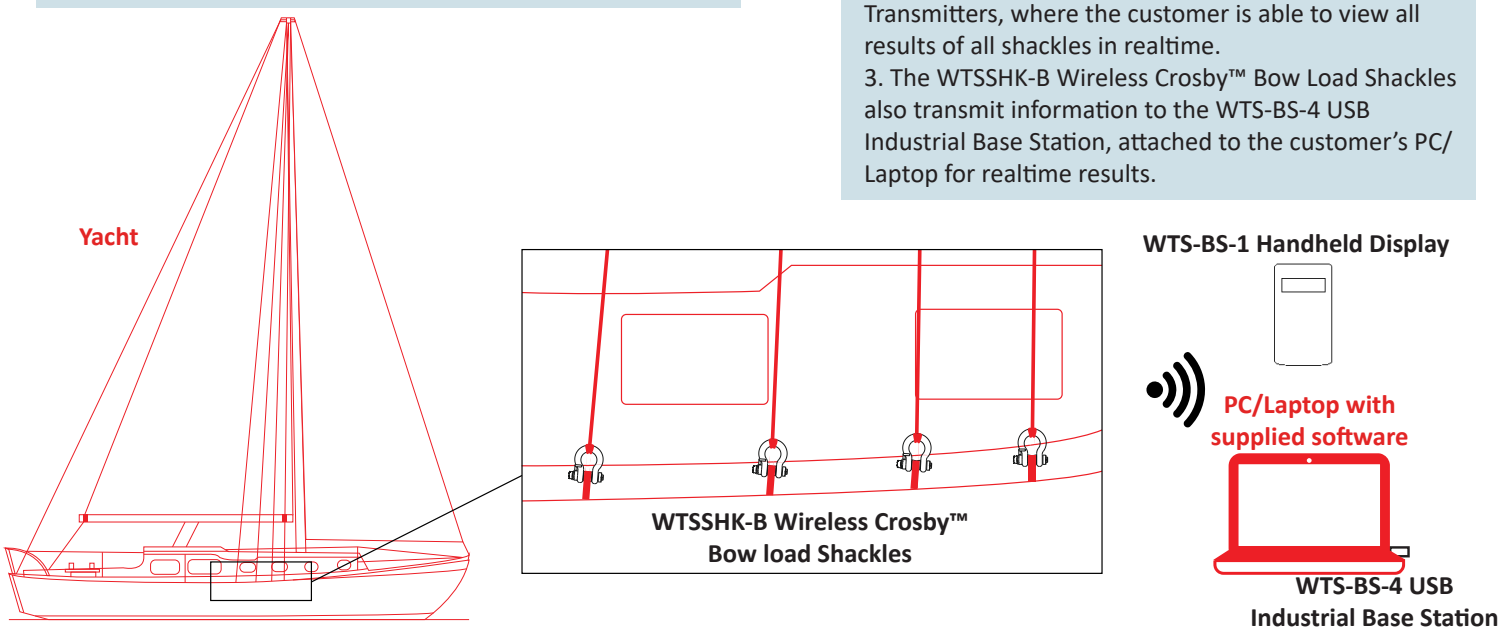
The customer was able to conduct both a running and standing rigging inspection of their ship or vessel, and was able to determine if all lines were functional and met safety standards.

Materials

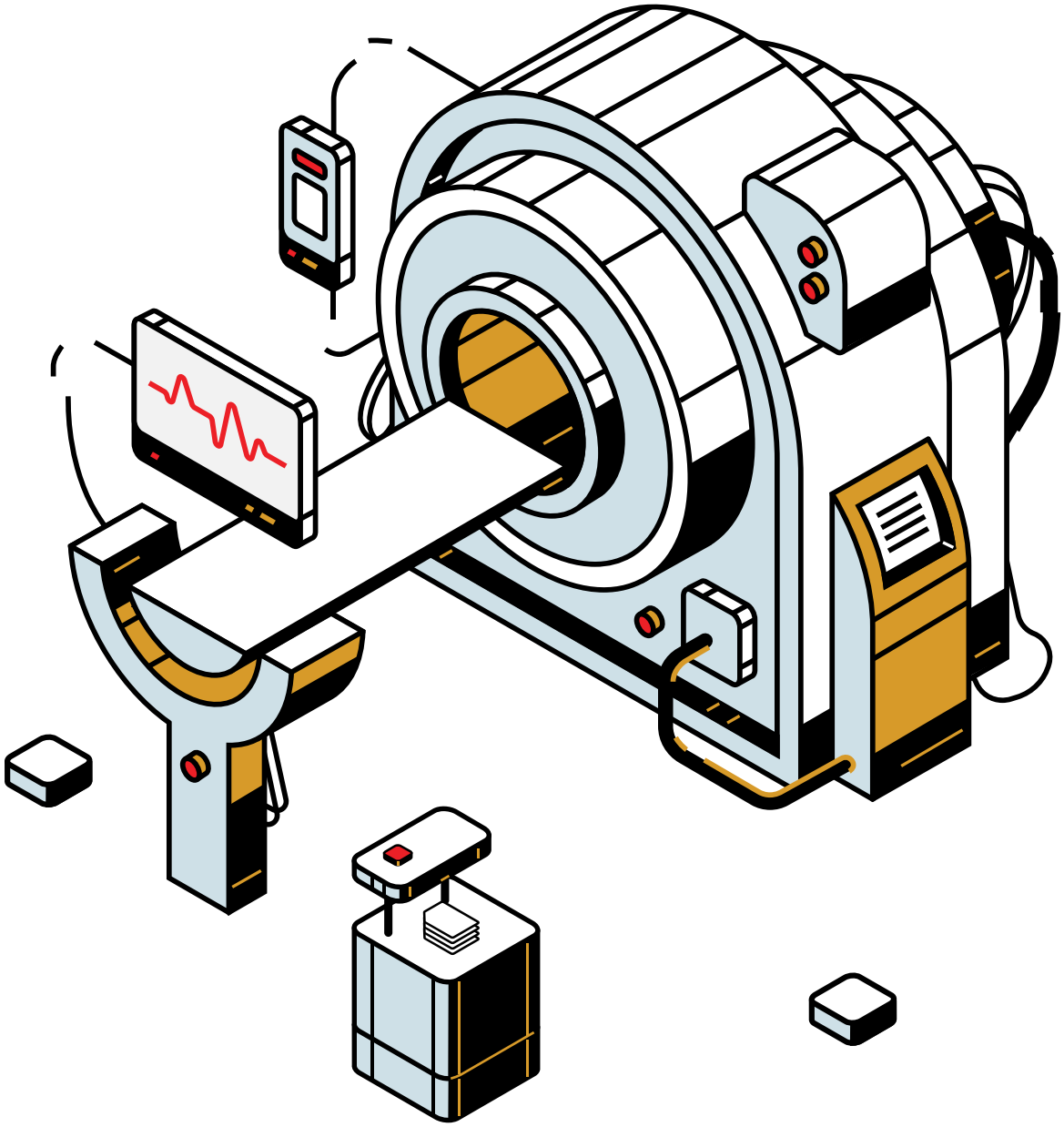
- WTSSHK-B Wireless Crosby™ Bow Load Shackles
- WTS-BS-4 USB Industrial Base Station
- WTS-BS-1 Handheld Display for Unlimited Transmitters
- WTS Toolkit & Log100 Software
- Customer supplied PC/Laptop

How It Works

1. WTSSHK-B Wireless Crosby™ Bow Load Shackles are attached to the vessels forestay, shroud, and backstay cables.
2. The measurement at a is transmitted wirelessly to the WTS-BS-1 Wireless Handheld Display for Unlimited Transmitters, where the customer is able to view all results of all shackles in realtime.
3. The WTSSHK-B Wireless Crosby™ Bow Load Shackles also transmit information to the WTS-BS-4 USB Industrial Base Station, attached to the customer's PC/Laptop for realtime results.



Medical and Healthcare



Ball and Socket Prosthetic Multi-Axis

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

- A medical device manufacturer was developing a new design for an artificial hip joint, and needed to validate load consistency, and the durability of their design.

Interface Solution

- A Model 6A40B 6-Axis Load Cell was mounted to the manufacturer's test machine, where loads were applied to simulate actual use. A Model BX8 was connected to the sensor to collect data.

Results

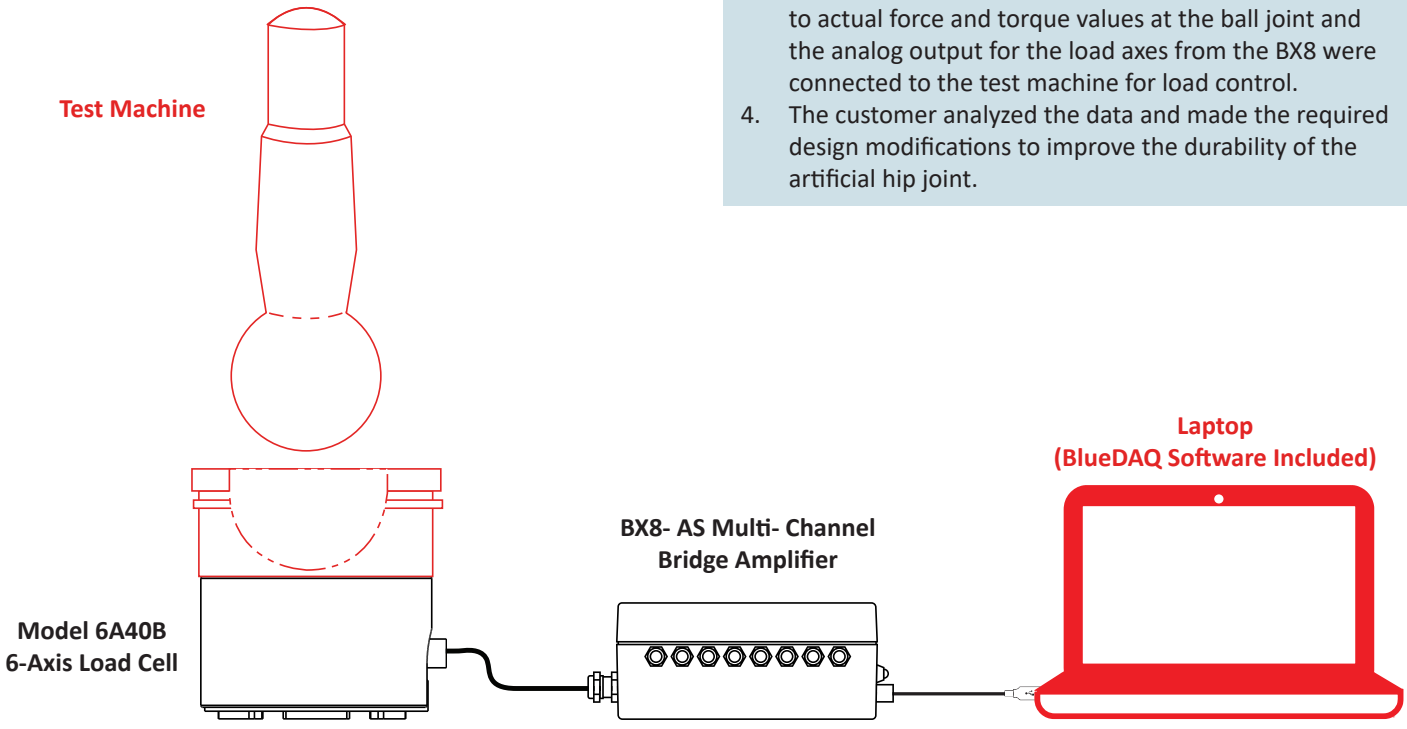
- After analyzing the data the manufacturer was able to improve the durability of their design.

Materials

- Model 6A40B 6-Axis Load Cell.
- BX8- AS Multi-Channel Bridge Amplifier with BlueDAQ Software.
- Customer PC for data logging and analysis.

How It Works

1. A test profile was set and the loads monitored and fed back into the test machine to control the loads.
2. The output of the 6-Axis sensor was connected to the Model BX8 Data Acquisition Amplifier which was connected via USB cable to the PC.
3. BlueDAQ Software in the PC converts raw data signals to actual force and torque values at the ball joint and the analog output for the load axes from the BX8 were connected to the test machine for load control.
4. The customer analyzed the data and made the required design modifications to improve the durability of the artificial hip joint.



Interventional Guidewire Quality Inspection

Torque Transducer Test Stand

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

A medical device manufacturing company needs to do quality checks on threaded ends of their interventional guidewire devices. The threaded end of the guidewire contains an extremely small 000-120 thread that needs to be tested with go and no-go gauges in order to see if it will mate with other critical sub assemblies. Previously, the gages were manually threaded on and results and performance were poor due to the "human element". The manufacturing company requests a custom made turnkey test stand designed for this specific request, that is both inexpensive and flexible for varying lengths and models of guidewires.

Interface Solution

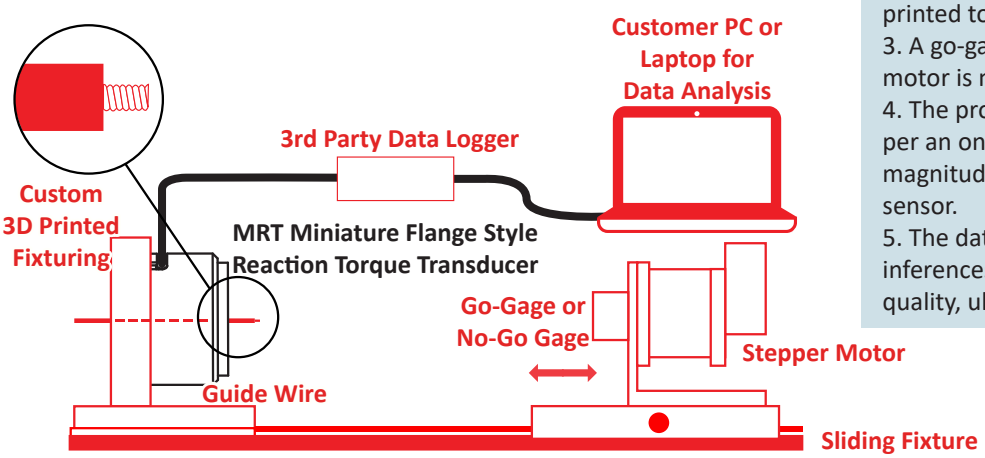
Interface suggests a system where the customer can axially load and insert the guidewire through the MRT Miniature Flange Style Reaction Torque Transducer, secure it, and use an automated stepper motor on a slide base to test the thread quality. When in use, the MRT measures the torque magnitudes of both no-go and go gauges which indicate quality of the threaded guidewire.

Results

The manufacturing company was able to test the quality of their guidewire threads for the different lengths and sizes produced. Data of the quality tests are recorded, logged, and saved on their PC computer using a specified third party data logger.

Materials

- MRT Miniature Flange Style Reaction Torque Transducer
- Custom designed and 3D Printed Tooling
- 3rd Party Data Logger
- Customer supplied PC or Laptop



How It Works

1. The MRT Miniature Flange Style Reaction Torque Transducer is attached to a 3D printed fixturing assembly, which is installed on the test stand base.
2. The guidewire is fed through the torque sensor and secured to it with additional custom 3D printed tooling.
3. A go-gauge or no-go gauge attached to a stepper motor is moved into position on the sliding base.
4. The program automatically actuates the motor per an onboard program, measuring torque magnitudes by the go/no-go gages and MRT sensor.
5. The data provided to the customer allows inferences to be made of good and bad thread quality, ultimately helping quality control.

Medical Bag Weighing
Load Cell

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

It is important to monitor the amount of material in a medical bag. Medical staff needs to know if a medical bag is empty or if the dispensing tubes are blocked. Force measurements can track this.

Interface Solution

Using Interface Model MB Miniature Beam or MBP Miniature Beam with built-in overload protection combined with Interface instrumentation, force readings can be captured, displayed and stored for this need.

Results

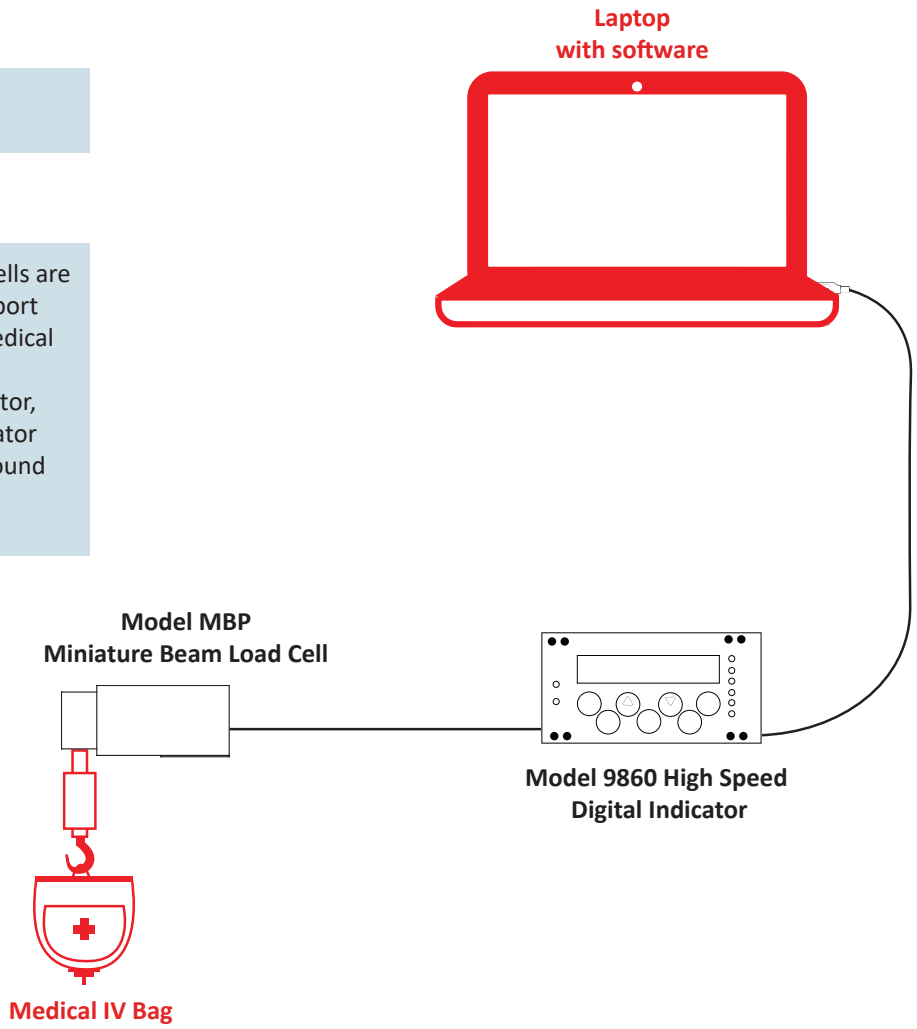
Health Professionals can review and monitor medical bag weights to ensure medicine is properly dispensed and bag is replaced when empty.

Materials

- Model MBP Miniature Beam Load Cell.
- Model 9860 High Speed Digital Indicator.

How It Works

1. Model MP or MBP Miniature Beam Load Cells are installed between the medical bag and support structure. The load cell will measure the medical bag weight that is hanging from it.
2. Using Model 9860 High Speed Digital Indicator, weight readings will display on a local indicator and can trigger open collector outputs to sound alarms or stop machines as needed.



Prosthetic Foot Performance
Multi-Axis

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

- Customer would like to know how a prosthetic foot responds as it is loaded during different stances.

Interface Solution

- Interface Model 3A120 3-Axis Load Cell was installed between the leg socket and the prosthetic foot. Model 3A120 was then connected to customer's portable data acquisition system.

Results

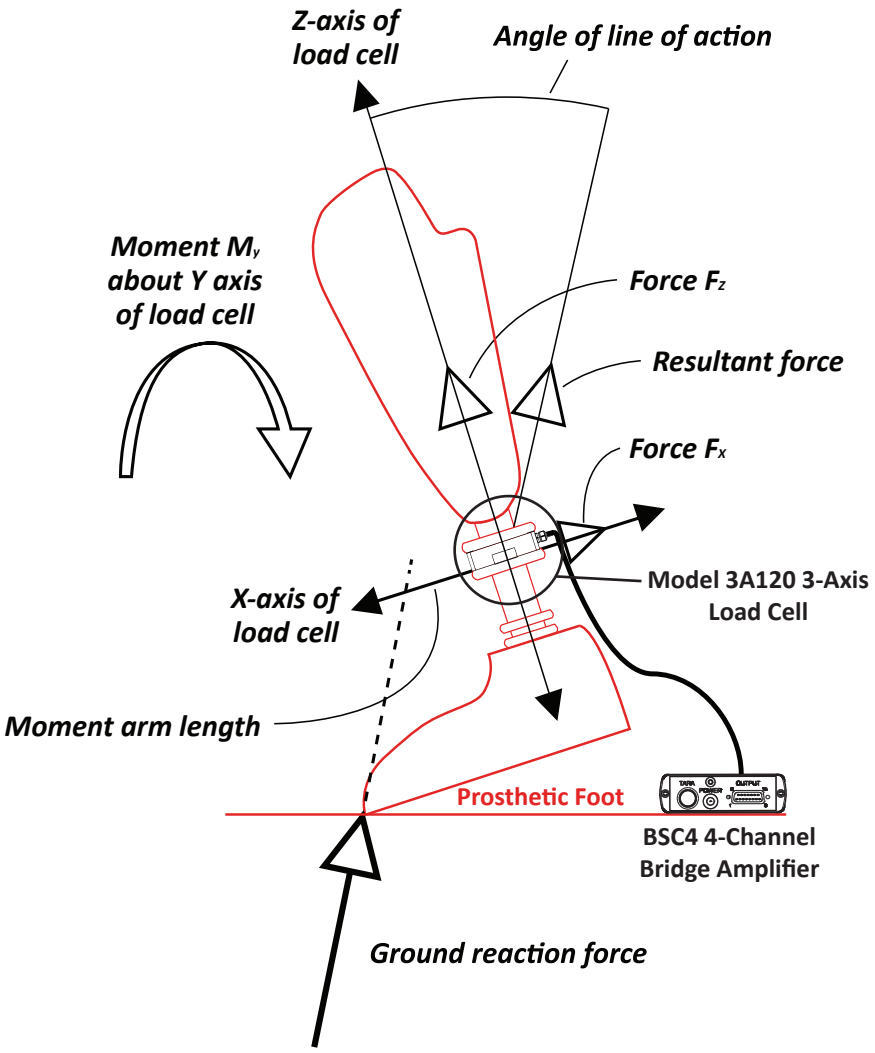
- Data was logged for X, Y, and Z axis. Customer was able to review the results and identify premature foot flat and dead spots during foot's use. They can now make improvements to the design.

Materials

- Model 3A120 3-Axis Load Cell.
- Portable Data Acquisition System.
- Prosthetic foot.

How It Works

1. Install Model 3A120 into prosthetic foot load stream.
2. Connect to customer's portable data acquisition system.
3. Review X, Y and Z force measurements to determine foot flat and dead spots.



Prosthetics Load and Fatigue Testing

Load Cell

Industry: Medical and Healthcare, Test and Measurement

Summary

Customer Need / Challenge

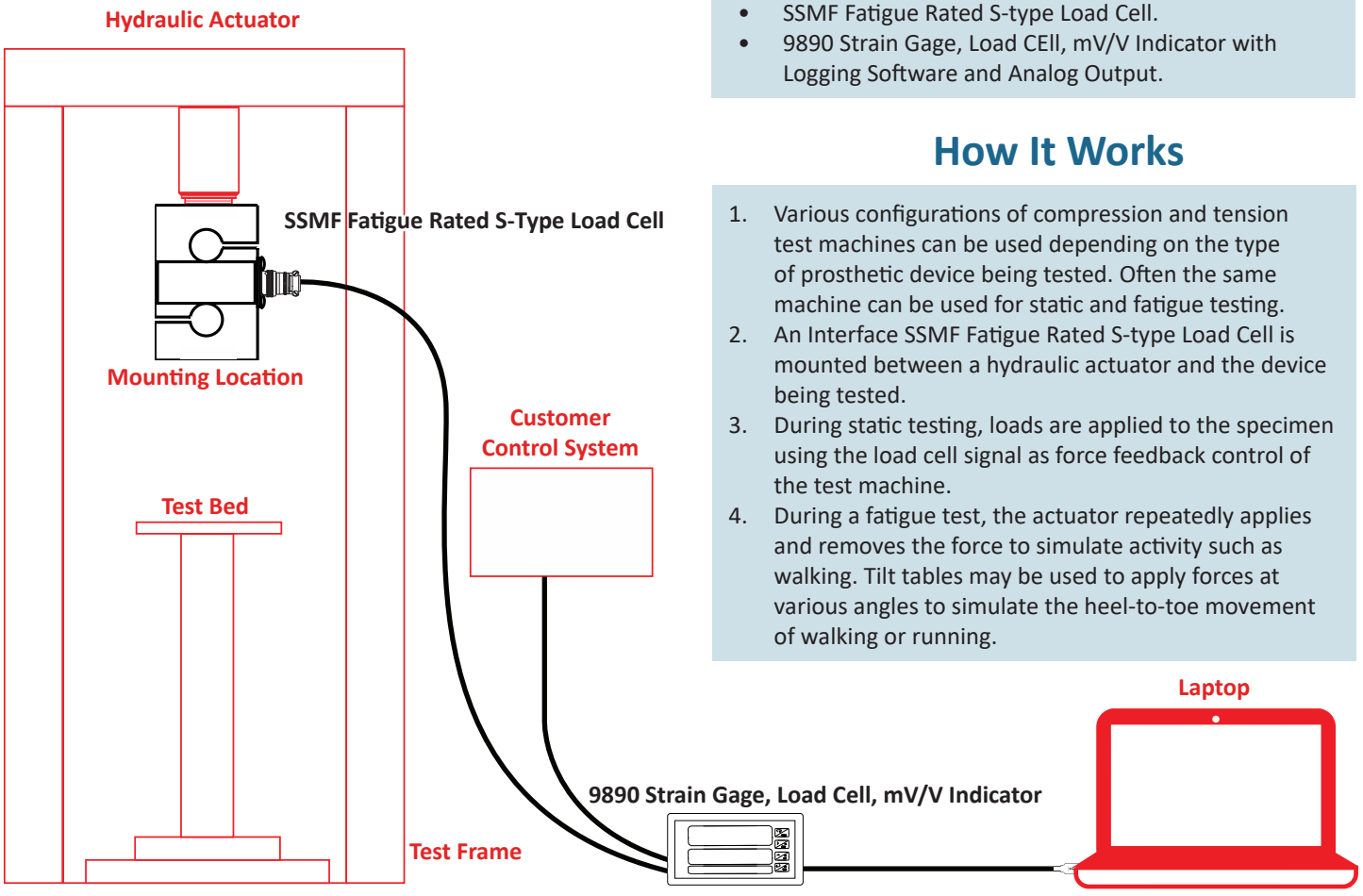
Prosthetic limbs must be tested for extreme loading that can occur during falls, accidents, and sports movements. Fatigue testing of prosthetic components determines the expected lifespan of the components under normal usage.

Interface Solution

A static load test apparatus uses SSMF Fatigue Rated S-type Load Cell attached to hydraulic actuators to apply and measure loads. A fatigue testing machine uses SSMF Fatigue Rated S-type Load Cell to apply and measure cyclic loads.

Results

Engineers determine whether prosthetic materials and designs will withstand the rigors of daily use and occasional highload situations.



Materials

- SSMF Fatigue Rated S-type Load Cell.
- 9890 Strain Gage, Load CEll, mV/V Indicator with Logging Software and Analog Output.

How It Works

1. Various configurations of compression and tension test machines can be used depending on the type of prosthetic device being tested. Often the same machine can be used for static and fatigue testing.
2. An Interface SSMF Fatigue Rated S-type Load Cell is mounted between a hydraulic actuator and the device being tested.
3. During static testing, loads are applied to the specimen using the load cell signal as force feedback control of the test machine.
4. During a fatigue test, the actuator repeatedly applies and removes the force to simulate activity such as walking. Tilt tables may be used to apply forces at various angles to simulate the heel-to-toe movement of walking or running.

Stent and Catheter Testing
Load Cell

Industry: Medical and Healthcare, Test and Measurement

Summary

Customer Need / Challenge

- Customer needs to apply known forces to stent and catheters to ensure they pass all necessary strength and flexibility testing.

Interface Solution

- Model MBP Overload Protected Beam Miniature Load Cell is placed behind the guide wire for the stent or catheter. The motor will spin the linear drive and push the load cell and guide the wire through the testing maze. Model MBP Overload Protected Beam Miniature Load Cell is connected to Model DIG-USB PC Interface Module. All forces are measured and stored on PC.

Results

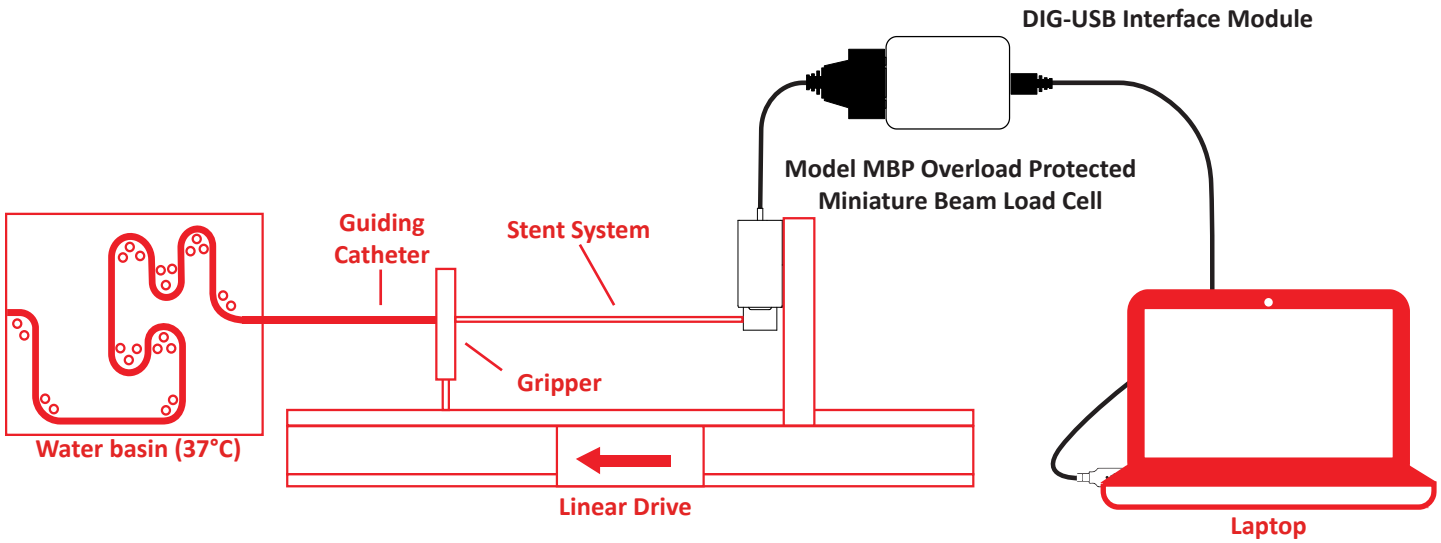
- Customer was able to perform required testing and log to PC, followed by being able to review results and take actions as needed.

Materials

- Model MBP Overload Protected Beam Miniature Load Cell.
- DIG-USB PC Interface Module.
- Interconnect cable.

How It Works

1. Install Model MBP Overload Protected Beam Miniature Load Cell onto linear guide.
2. Connect Model MBP Overload Protected Beam Miniature Load Cell to Model DIG-USB PC Interface Module.
3. Connect Model DIG-USB to customer's PC.
4. Forces measured by Model MBP Overload Protected Beam Miniature Load Cell will be displayed and logged onto customer's PC.



Surgical Stapler Force Verification

Load Button

Industry: Medical and Healthcare, Test and Measurement

Summary

Customer Need / Challenge

- A large medical manufacturer required a load button load cell for verification of the manual forces needed to activate their surgical stapler. In addition to measuring force to a very precise degree, the cell also needed to be relatively small, easy to mount, and provide reliable accuracy.

Interface Solution

- With a small diameter and capacities ranging from 100 – 1k lbf, the Interface LBMU Compression Load Button is ideal for surgical staple testing applications. The cell was mounted to the surgical stapler to enable force verification, and then connected to a 9890 Load Cell Indicator (installed in the customer's test rig) which recorded output.

Results

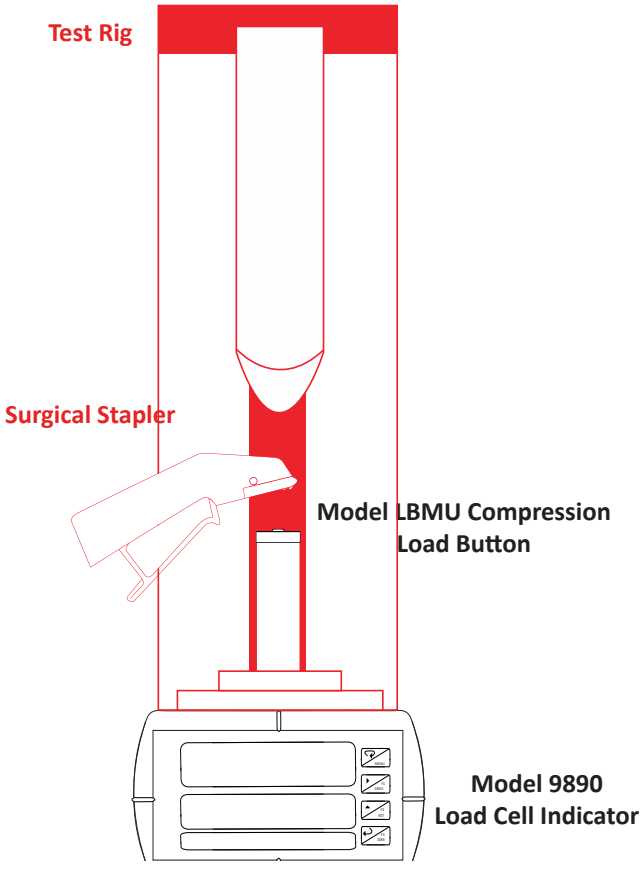
- After data was collected and analyzed, the medical manufacturer was able to optimize their design and minimize the excessive force applied by users (e.g., surgeons). The adjustments minimized hand fatigue and improved the stapler's performance in real-world surgical applications.

Materials

- Model LBMU Compression Load Button, 100 lbf Capacity.
- Model 9890 Load Cell Indicator with supplied software (Shown Mounted in customer test rig.)

How It Works

1. The LBMU Compression Load Button load cell is mounted beneath the surgical stapler to enable force verification.
2. The 9890 Load Cell Indicator with supplied software is connected to the load cell and PC for logging so that output can be recorded.
3. Testers then activate the stapler to simulate typical use, and the load cell converts applied force into signals, which are then fed to the indicator and displayed on the screen.
4. Data is then collected and analyzed in order to minimize the excessive force applied by users, and improve upon the overall design of the stapler.



Syringe Plunger Force Measurement

Multi-Axis

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

A manufacturer of syringes needed to measure the force required to dispense liquid from a syringe and ensure their product is within ISO guidelines.

Interface Solution

Interface supplied Model SMT Capacity Overload Protected S-Type Load Cell coupled with Model 9320 Battery Powered Handheld Indicator. This product was implemented into the customer's test frame for syringe testing.

Results

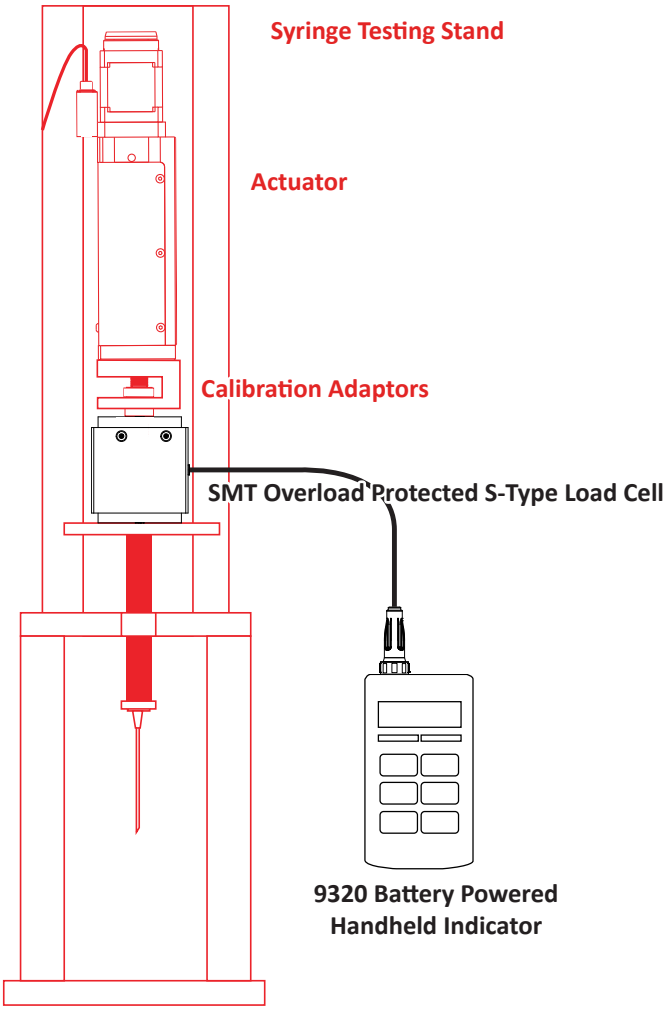
As the customer's load frame applied to the force of the syringe, Model SMT Capacity Overload Protected S-Type Load Cell measured the force applied to dispense this material. Model 9320 Battery Powered Handheld Indicator showed all measured forces and captured the peak values.

Materials

- SMT Capacity Overload Protected S-Type Load Cell.
- 9320 Battery Powered Handheld Indicator.
- Customer supplied calibration adaptors and calibration frame.

How It Works

1. SMT Capacity Overload Protected S-Type Load Cell measure the forces applied to dispense this material.
2. 9320 Battery Powered Handheld Indicator shows all measured forces.
3. The 9320 captures the peak values used to dispense this material for further evaluation.



Tablet Forming Machine Optimization

Load Cell

Industry: Industrial Automation, Medical and Healthcare

Summary

Customer Need / Challenge

A pharmaceutical tablet producer wanted to monitor the forces applied by the tablet forming machine in an effort to understand the relationship between raw material, die set, forming force, and motor cycle speed. The goal was to improve productivity and efficiency of the tablet forming process, while reducing losses (i.e. cracked tablets or voids) by adding a dimension of feedback that could be used to assign specific press adjustment criterion for given inputs.

Interface Solution

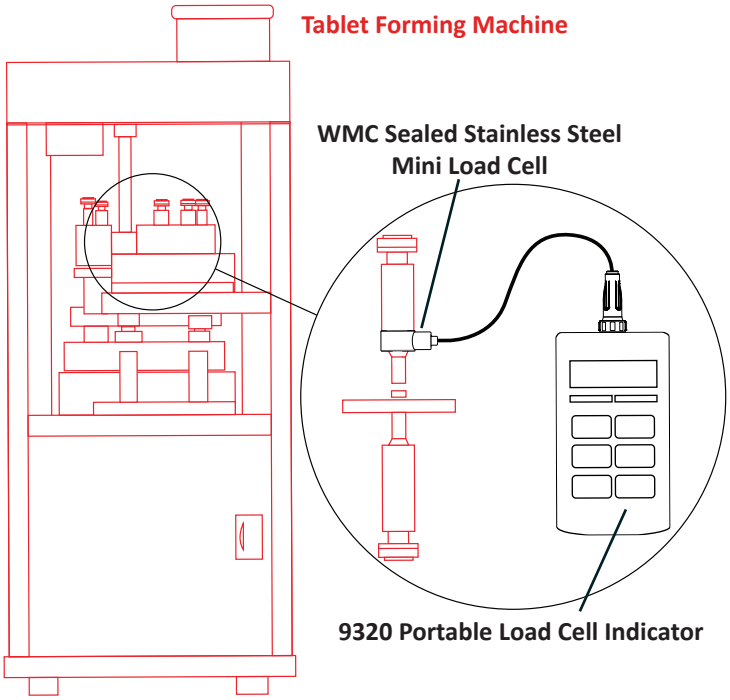
An Interface Model WMC Sealed Stainless Steel Mini Load Cell (10K lbf Capacity) was mounted in the section of the downward press bar. The machine was modified to accomplish this. The load cell was then connected to a Model 9320 Portable Load Cell Indicator to collect the needed data.

Results

After analyzing the data, the tablet producer was able to quantify adjustment levels by monitoring which forces produced the most optimal results for a given cycle speed, die set, and raw material. Productivity and efficiency was greatly improved by the enhancement of the data feedback.

Materials

- WMC Sealed Stainless Steel Mini Load Cell.
- 9320 Portable Load Cell Indicator.



How It Works

1. The customer made a custom fixture that allowed for the mounting of the WMC Sealed Stainless Steel Mini Load Cell between the downward press bar and the tablet, replacing a section of that downward press bar.
2. The output of the load cell was connected to the 9320 Portable Load Cell Indicator and set aside so that the cable did not interfere with the cycle and no snagging would occur. A cable tie was used to stow aside the cable and to ensure there was enough clearance for the entire cycle.
3. The customer then set out to establish a data correlation between the press forces for tablet forming and the outcome of the tablet itself for given raw materials, die sets, and speeds. Any variation in those variables warranted the possibility of a different optimal force.
4. The customer was then able to produce a set of guidelines to adjust the press force for the given inputs (raw materials, die sets, and speeds). These guidelines, when followed, increased productivity and efficiency while reducing losses by being able to calibrate the force.

Tablet Machine Hardness Tester Calibration

Interface Mini™

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

A customer wants to conduct a tablet hardness tester calibration in their tablet machine. The customer needs a load cell that specifically lays and measures the forces horizontally, due to the horizontal lay out of the tablet machine.

Interface Solution

Interface's MCC Miniature Compression Load Cell can measure forces on its side, with a small cable exit that attaches to the customer's tablet machine. This measures the force applied to the hardness testing mechanism inside of the machine. The BlueDAQ software included also records the results and compares it to the reference load cell. Data is sent to the 9330 Battery Powered High Speed Data Logging Indicator for the customer to view, log, and graph the results.

Results

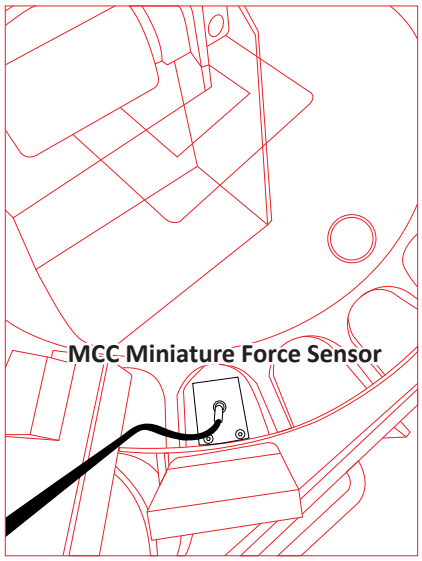
The customer successfully was able verify and calibrate the tablet machine's hardness tester in order to conduct accurate hardness testing on tablets. Compared to other load cells, Interface's MCC Miniature Compression Load Cell was perfect due to its small size, and convenient to measure the forces on its side.

Materials

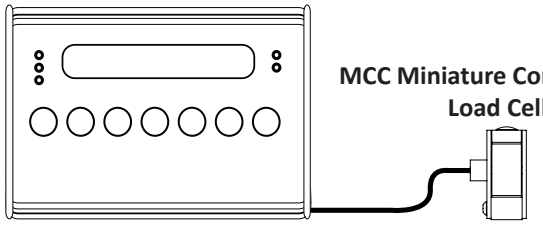
- MCC Miniature Compression Load Cell
- 9330 Battery Powered High Speed Data Logging Indicator
- BlueDAQ Software included with instrument purchase
- Customer's PC or Laptop

How It Works

1. The MCC Miniature Compression Load Cell is connected to the hardness testing mechanism inside of the tablet machine.
2. Calibration results are sent to the 9330 Battery Powered High Speed Data Logging Indicator, where data is logged and graphed.
3. Data is processed using BlueDAQ Software, which stores and logs data in the customer's PC computer or laptop.



Tablet Machine



Tablet Hardness Testing

Interface Mini™

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

A pharmaceutical tablet producer wanted to test and monitor the hardness of the tablets being created in their tablet forming machine.

Interface Solution

Interface's SML Low Height S-Type Load Cell was mounted to the hardness device inside the tablet forming machine. The SML Low Height S-Type Load Cell was then connected to the 9870 High-Speed High Performance TEDS Ready Indicator to record the force measurements.

Results

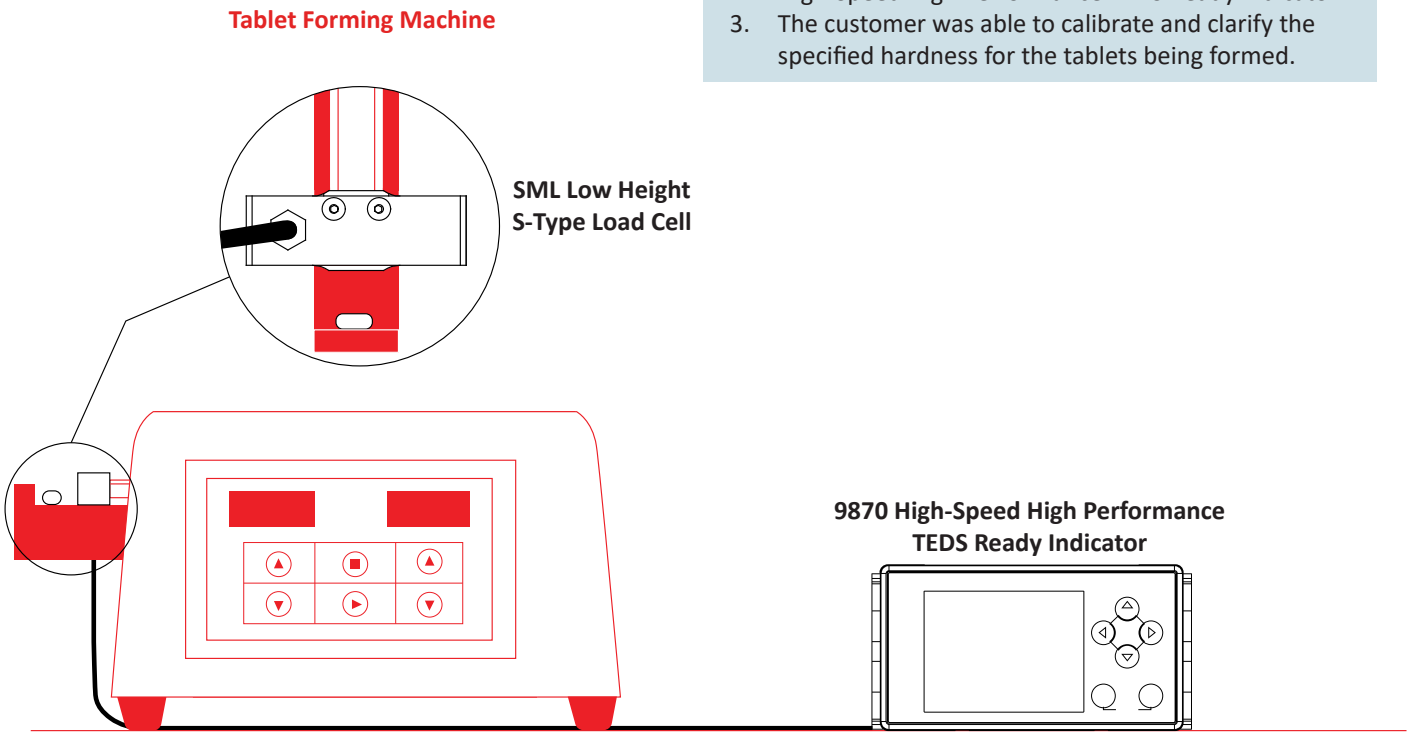
The tablet producer was able to verify and test the specific hardness needed for their tablets being produced by their tablet forming machine.

Materials

- SML Low Height S-Type Load Cell
- 9870 High-Speed High Performance TEDS Ready Indicator

How It Works

1. The SML Low Height S-Type Load cell was customized to fit into the hardness testing device inside the tablet forming machine.
2. The output of the SML was connected to the 9870 High-Speed High Performance TEDS Ready Indicator.
3. The customer was able to calibrate and clarify the specified hardness for the tablets being formed.



Vascular Clamp Force Load Button

Industry: Medical and Healthcare

Summary

Customer Need / Challenge

Customer wants to examine different types of vascular clamps to see which types will generate the best clamping force of surgery.

Interface Solution

Interface Model 9330 High Speed Data Logging Indicator and ConvexBT Load Button Load Cell were used to record the force measurements of these different clamps.

Results

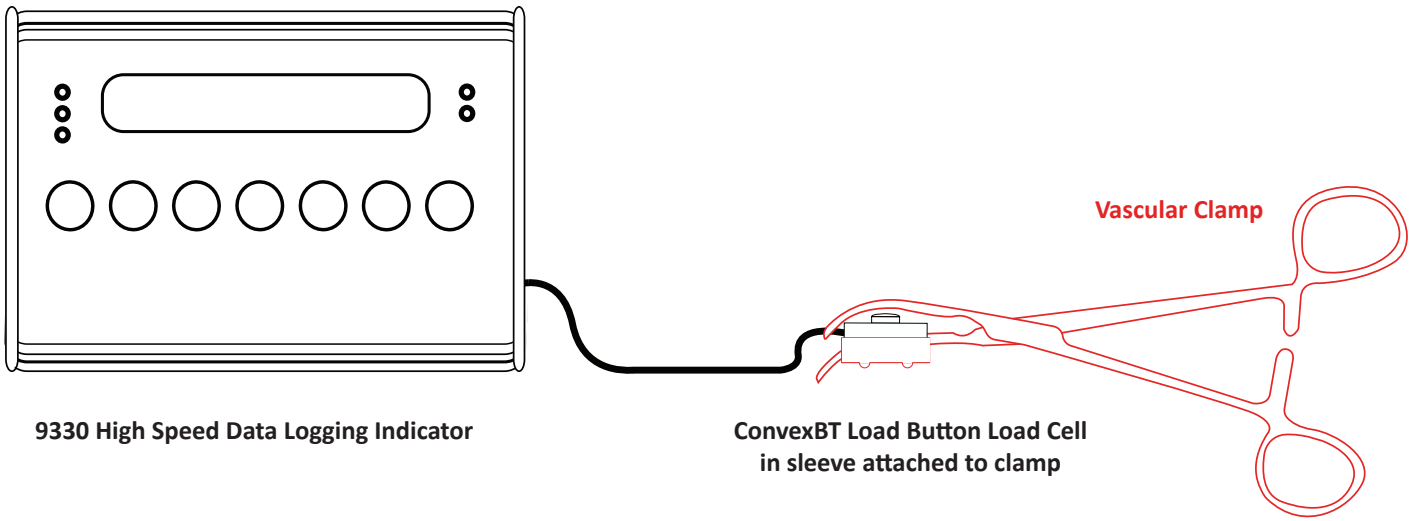
Customer was able to compare three different types of clamps and determine the best one to use during surgery.

Materials

- 9330 High Speed Data Logging Indicator
- ConvexBT Load Button load Cell
- Vascular clamps
- Load cell mounting hardware

How It Works

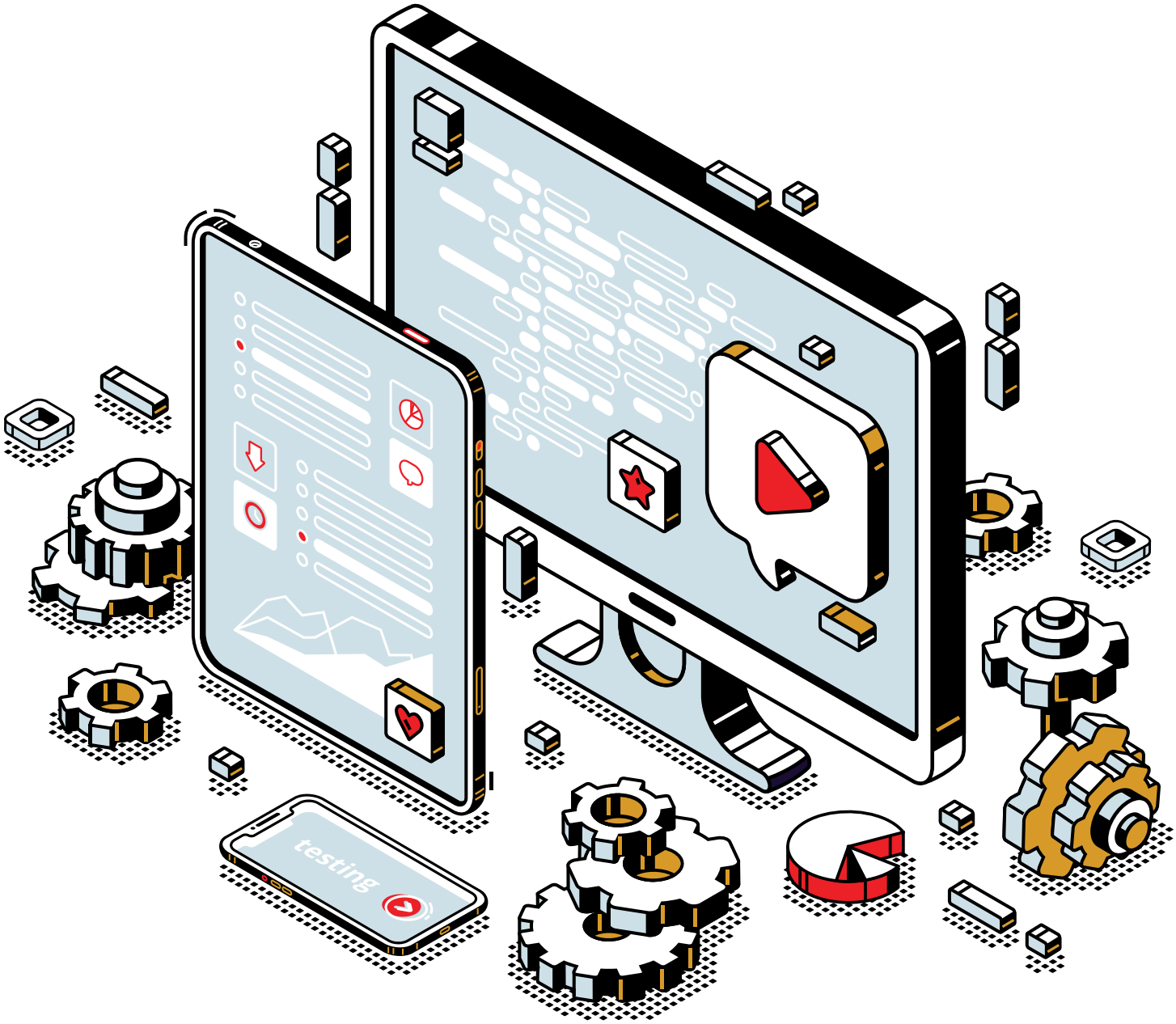
1. The ConvexBT is mounted to the jaw of the vascular clamp (this will require customer supplied fixtures).
2. 9330 High Speed Data Logging Indicator is connected to Model LBS Load cell.
3. Customer performs required tests and data is stored to SD card (can be stored directly to PC as well).
4. Customer downloads logging information from SD card to PC (if not directly logged to PC).
5. Customer evaluates results by reviewing logged data using a PC computer.



9330 High Speed Data Logging Indicator

ConvexBT Load Button Load Cell in sleeve attached to clamp

Test and Measurement



Aircraft Screwdriver Fastening Control

Torque Transducer

Industry: Test and Measurement

Summary

Customer Need / Challenge

An airplane manufacturer needs a solution where they can control the torque when fastening screws on their airplane models. They do not want to create any damage to materials, or apply too much torque when plane components are being fastened together.

Interface Solution

Interface's Model T15 Hex Drive Rotary Torque Transducer can be attached to the fastening work bench, measuring and recording torque, rotational speed, and angle of the screwdriver. The LWCF Clamping Force Load Cell is installed, measuring the forces applied on the screw being fastened. Results are sent to the SI-USB4 4-channel USB Interface Module, which is connected to the customer's PC or laptop where data is logged, graphed, and displayed.

Results

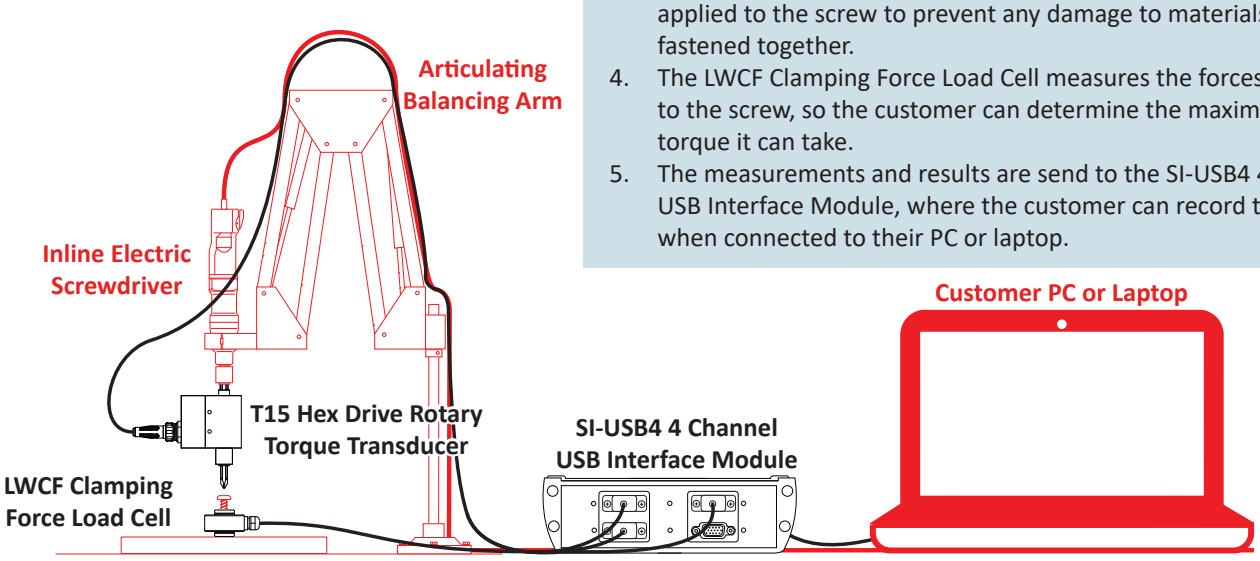
The airplane manufacturer was able to calibrate their screwdriver by measuring its torque, rotational speed, and angle, when attaching materials together for their airplane. They were also able to measure the forces being applied to the screw, to ensure it was not applying too much torque to the components.

Materials

- T15 Hex Drive Rotary Torque Transducer
- LWCF Clamping Force Load Cell
- SI-USB4 4-channel USB Interface Module
- Customer PC or Laptop

How It Works

1. The T15 Hex Drive Rotary Torque Transducer is attached to the screwdriver fastening bench.
2. The LWCF Clamping Force Load Cell is placed beneath the bolt head.
3. The T15 Hex Drive Rotary Torque Transducer measures the screwdrivers torque, rotational speed, and angle, in order for the customer to determine the right amount of torque needed to be applied to the screw to prevent any damage to materials being fastened together.
4. The LWCF Clamping Force Load Cell measures the forces applied to the screw, so the customer can determine the maximum torque it can take.
5. The measurements and results are send to the SI-USB4 4-Channel USB Interface Module, where the customer can record the results when connected to their PC or laptop.



Automotive Head Rest Testing
Load Cell and Instrumentation

Industry: Test and Measurement

Summary

Customer Need / Challenge

A manufacturer for automotive head rests wants to test the durability of their products. They want to do a number of fatigue testing and force testing on the head rests to make sure it meets durability and high quality standards.

Interface Solution

Interface's solution is to install Model 1000 Fatigue-Rated LowProfile™ Dual-Bridge Load Cell to the customer's actuator mechanism. This load cell is perfect for fatigue testing and reports highly accurate results through the fatigue cycling. The results are collected by using the SI-USB Universal Serial Bus Dual Channel PC Interface Module, which synchronizes the data directly from the load cell and the string pot (for measuring distance) to the customer's computer.

Results

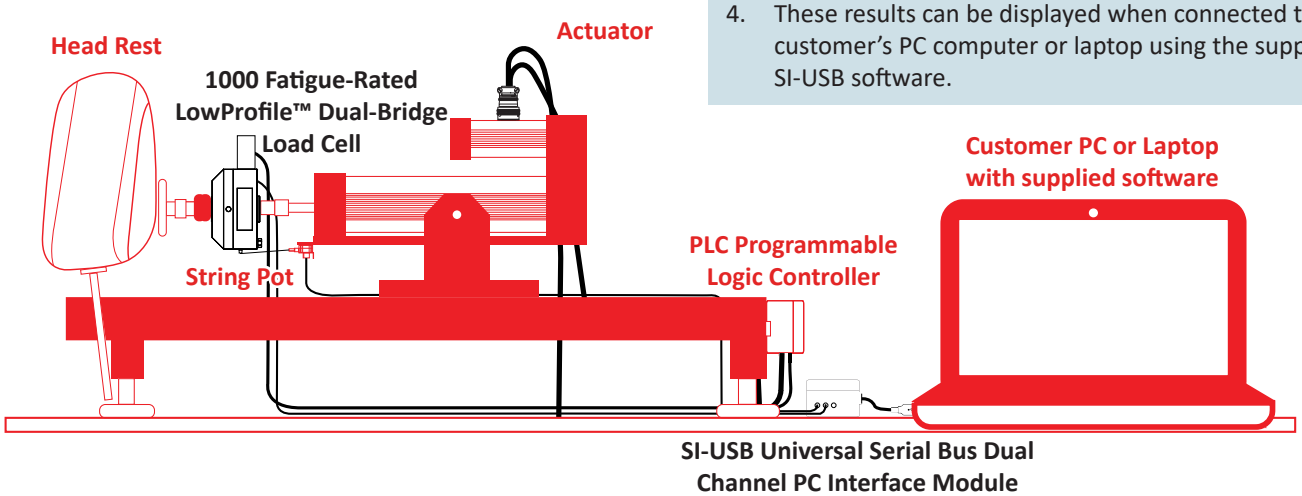
The head rest manufacturer was able to get highly accurate data through the fatigue testing cycle, using Interface's products.

Materials

- 1000 Fatigue-Rated LowProfile™ Dual-Bridge Load Cell
- SI-USB Universal Serial Bus Dual Channel PC Interface Module with included SI-USB software
- PLC Programmable Logic Controller
- String Pot
- Customer Actuator Mechanism
- Customer's PC or Laptop

How It Works

1. The 1000 Fatigue-Rated LowProfile™ Dual-Bridge Load Cell is installed at the end of the customer's actuator mechanism.
2. The head rest undergoes a cycle of fatigue testing, where the results are recorded using the 1000 Fatigue-Rated LowProfile™ Dual-Bridge Load Cell.
3. The data results are collected with the SI-USB Universal Serial Bus Dual Channel PC Interface Module.
4. These results can be displayed when connected to the customer's PC computer or laptop using the supplied SI-USB software.



E-Bike Torque Measurement

Torque Transducer

Industry: Test and Measurement

Summary

Customer Need / Challenge

An E-Bike manufacturer needs to test the torque on their electronic bicycles. They need a torque sensing system that measures how much force the bike rider is pedaling onto the pedals, because this determines how much electric power the bike's motor generates.

Interface Solution

Interface suggests installing the Model T12 Square Drive Torque Transducer where the pedal assist sensor would normally be. The T12 Square Drive Torque Transducer's results can be recorded, graphed, and logged using the SI-USB4 4 Channel USB Interface Module when connected to the customer's PC.

Results

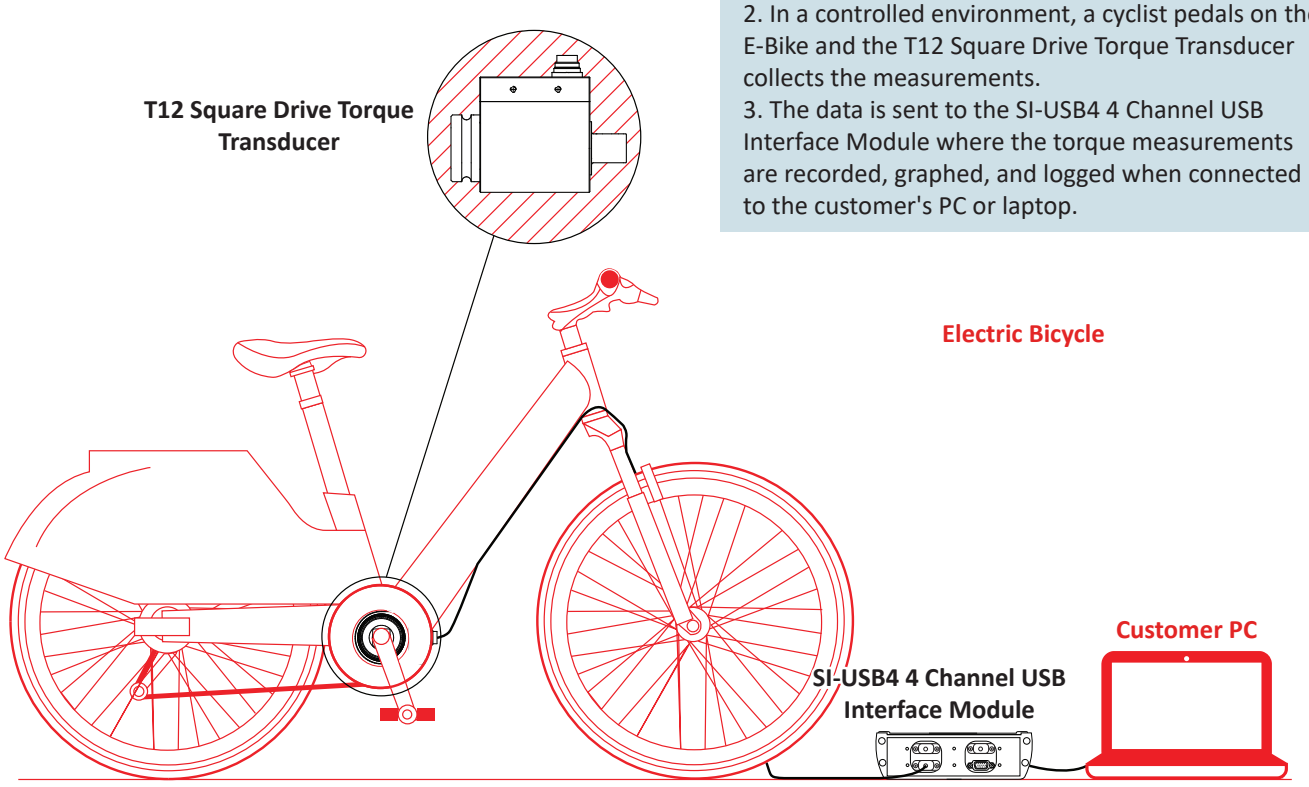
The E-Bike manufacturing company successfully tested the torque on their electronic bicycles with Interface's products and instrumentation.

Materials

- T12 Square Drive Torque Transducer
- SI-USB4 4 Channel USB Interface Module
- Customer PC or Laptop

How It Works

1. The T12 Square Drive Torque Transducer is installed and replaces where the outdated pedal sensor is normally located. The T12 is attached to the SI-USB4 4 Channel USB Interface Module.
2. In a controlled environment, a cyclist pedals on the E-Bike and the T12 Square Drive Torque Transducer collects the measurements.
3. The data is sent to the SI-USB4 4 Channel USB Interface Module where the torque measurements are recorded, graphed, and logged when connected to the customer's PC or laptop.



Bike Frame Fatigue Testing
Load Cell

Industry: Test and Measurement

Summary

Customer Need / Challenge

A bike manufacturing company wants to perform a fatigue test on their bike frames. They want to analyze the strength of their bike frames in order to ensure durability and high quality standards.

Interface Solution

Interface suggests installing Model 1000 Fatigue-Rated LowProfile™ Load Cell to the customer's bike frame fatigue tester. This load cell will provide the customer highly accurate results through the fatigue cycling. Results are collected using the INF-USB3 Universal Serial Bus Single Channel PC Interface Module, and displayed on the customer's PC or Laptop with Interface's provided software.

Results

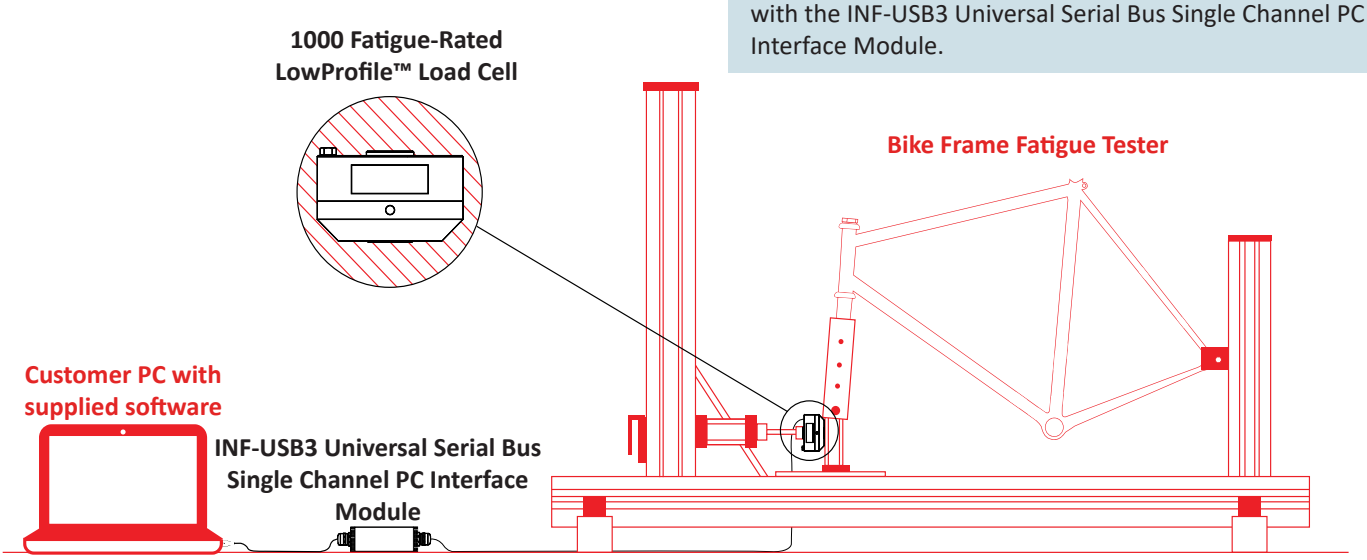
The bike manufacturing company successfully had their bikes undergo fatigue frame testing, receiving highly accurate results with Interface's load cell and instrumentation.

Materials

- 1000 Fatigue-Rated LowProfile™ Load Cell
- INF-USB3 Universal Serial Bus Single Channel PC Interface Module with supplied software
- Customer PC or Laptop

How It Works

1. The 1000 Fatigue-Rated LowProfile™ Load Cell is attached to the actuator of the fatigue testing machine.
2. The load cell undergoes a number of fatigue cycles on the bike frame, and records highly accurate results.
3. The data results are collected using the INF-USB3 Universal Serial Bus Single Channel PC Interface Module. These results can be displayed when connected to the customer's PC or laptop using the supplied software with the INF-USB3 Universal Serial Bus Single Channel PC Interface Module.



Bike Handlebar Fatigue Testing

S-Type

Industry: Test and Measurement

Summary

Customer Need / Challenge

A bike manufacturing company wants to test the handlebars for their bikes. They need to conduct fatigue tests on their handlebars to observe its structure and performance durability.

Interface Solution

Interface suggests using their Interface Mini™ products such as the SSMF Fatigue Rated S-Type Load Cells. Two of these S-type load cells can be attached on either end of the bike's handlebar stem, where it will measure the forces applied as the handlebar undergoes its fatigue test. Results can be measured, logged, and graphed with the SI-USB Universal Serial Bus Dual Channel PC Interface Module.

Results

Interface's products were used during the handlebar fatigue test to successfully test the bike handlebar's durability and overall structural quality.

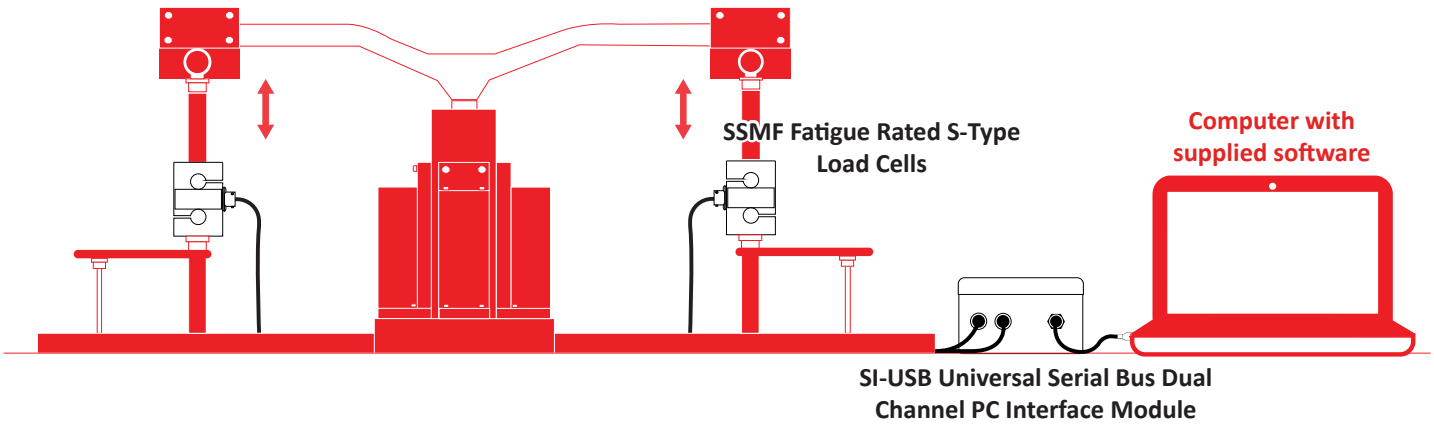
Materials

- (2) SSMF Fatigue Rated S-Type Load Cells
- SI-USB Universal Serial Bus Dual Channel PC Interface Module with supplied graphing software and analog output
- Customer PC or Laptop

How It Works

1. Two SSMF Fatigue Rated S Type Load Cells are installed to the actuators of the fatigue test machine, and the ends of the handle bars.
2. Forces are applied, and the two SSMF Fatigue Rated S Type Load Cells record and collect the data during the fatigue cycles.
3. Results are sent to the SI-USB Universal Serial Bus Dual Channel PC Interface Module where the results can be logged and graphed onto the customer's PC or laptop.

Handlebar Fatigue Tester



Bike Load Testing

Interface Mini™ and Wireless Telemetry System

Industry: Test and Measurement

Summary

Customer Need / Challenge

A mountain bike manufacturing company wants a system that measures their bike frames load capacities and vibrations on the frame. They want to ensure the bike's high quality and frame load durability during this final step of the product testing process.

Interface Solution

Interface suggests installing Model SSMF Fatigue Rated S-Type Load Cell, connected to the WTS-AM-1E Wireless Strain Bridge , between the mountain bike's seat and the bike frame. This will measure the vibrations and load forces applied onto the bike frame. The results will be captured by the WTS-AM-1E and transmitted to the customer's PC using the WTS-BS-6 Wireless Telemetry Dongle Base Station.

Results

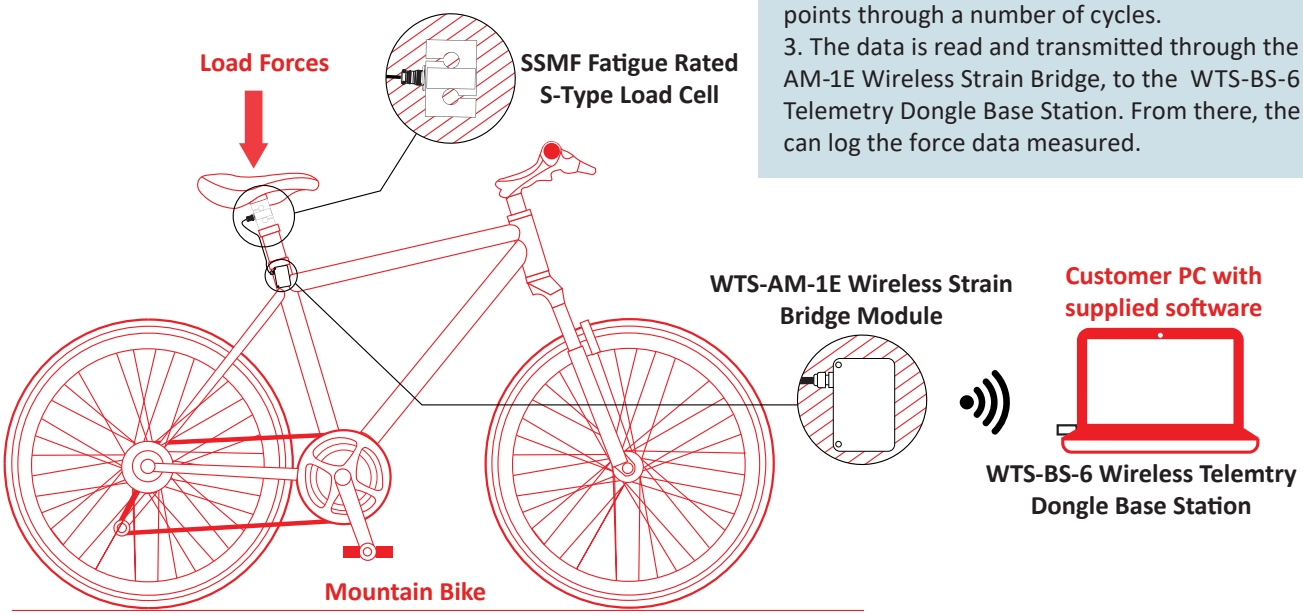
The mountain bike manufacturing company was able to gather highly accurate data to determine that their bikes met performance standards through this final testing.

Materials

- SSMF Fatigue Rated S-Type Load Cell
- WTS-AM-1E Wireless Strain Bridge
- WTS-BS-6 Wireless Telemetry Dongle Base Station
- Customer PC or Laptop

How It Works

1. The SSMF Fatigue Rated S-Type Load Cell is connected to the WTS-AM-1E Wireless Strain Bridge, and installed between the mountain bike's seat and the bike frame.
2. A heavy load is added to the seat, where the SSMF Fatigue Rated S-Type Load Cell measures the vibrations and load forces applied to the bike to indicate any stress points through a number of cycles.
3. The data is read and transmitted through the WTS-AM-1E Wireless Strain Bridge, to the WTS-BS-6 Wireless Telemetry Dongle Base Station. From there, the customer can log the force data measured.



Bike Power Pedals

S-Type and Wireless Telemetry System

Industry: Test and Measurement

Summary

Customer Need / Challenge

A bike manufacturer wants to test the functionality of their power pedals. They need a reliable system to measure how much force the cyclist pushes down onto the bike pedals, and they would prefer a wireless system that can be paired with their computer to review data results.

Interface Solution

Interface suggests 4 Model SML Low Height S-Type Load Cells installed within the bike's pedals. The 4 SMLs are paired with 2 WTS-AM-4 Wireless Strain Bridge Transmitter Modules, which will transmit the force data from the cyclist to the WTS-BS-6 Wireless Telemetry Dongle Base Station Dongle connected to the customer's PC or laptop. Interface will also provide the software needed with their wireless products.

Results

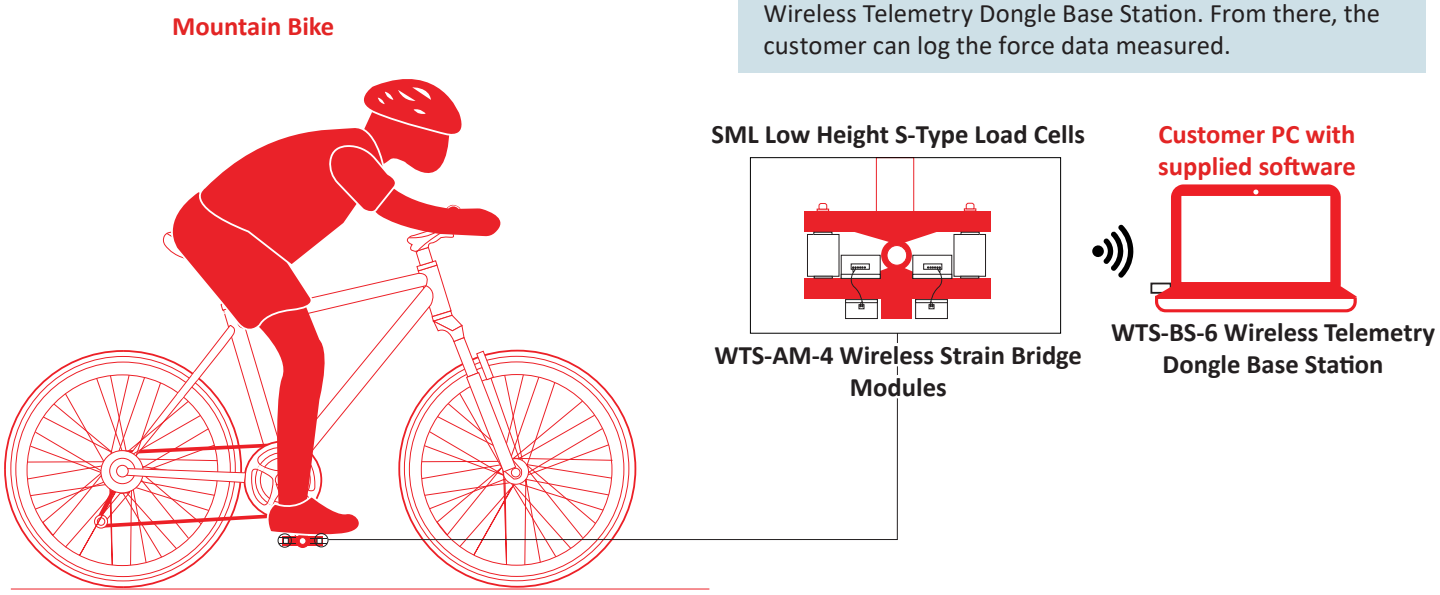
The bike manufacturer was able to measure the pedal power applied by the cyclist. The customer was able to measure and log the data wirelessly transmitted to their PC computer.

Materials

- (4) SML Low Height S-Type Load Cells
- (2) WTS-AM-4 Wireless Strain Bridge Transmitter Modules
- WTS-BS-6 Wireless Telemetry Dongle Base Station
- Customer PC or Laptop

How It Works

1. The SML Low Height S-Type Load Cells are installed inside the bike pedal, connected to the WTS-AM-4 Strain Bridge Transmitter Modules.
2. During the testing stage, a cyclist uses the bike and pushes force down onto the bike pedals.
3. The data is read and transmitted through the WTS-AM-4 Wireless Strain Bridge Modules, to the WTS-BS-6 Wireless Telemetry Dongle Base Station. From there, the customer can log the force data measured.



Bolt Fastening Force and Torque

Load Washer and Torque Transducer

Industry: Test and Measurement, Industrial Automation

Summary

Customer Need / Challenge

An Aerospace Company was working on a test plan that involved taking torque & compression measurements on fasteners with varying joint materials. The system required both high and low sampling rates, in addition to the capability of precisely measuring force and torque simultaneously. They required reliable accuracy and long-term stability. The test plan intended to provide verification of required force and torque specifications for fasteners, to ensure safety without compromising installation.

Interface Solution

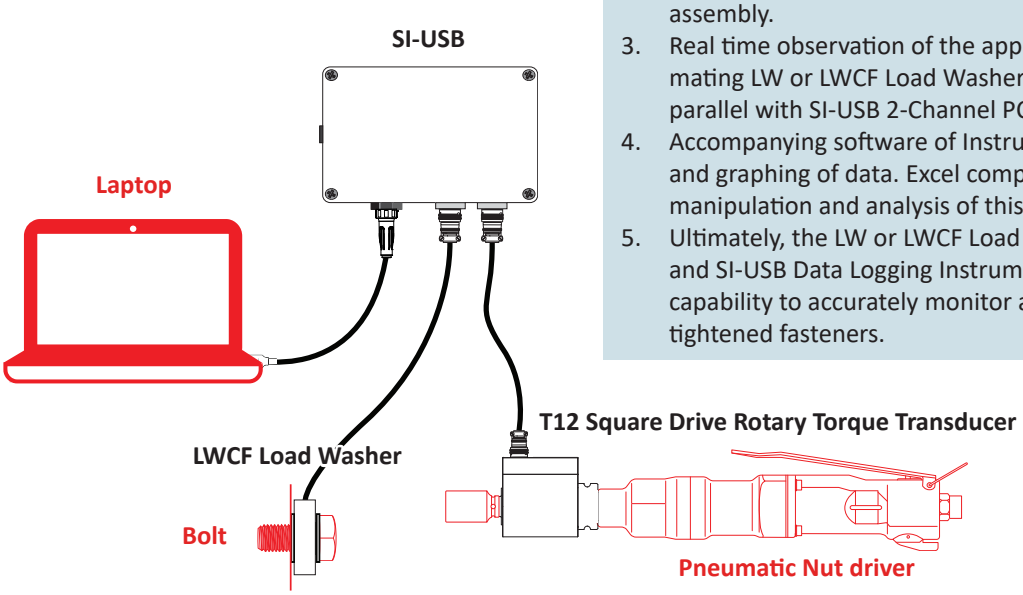
Using a Model LW or LWCF Load Washer in conjunction with a Model T12 Square Drive Rotary Torque Transducer, the customer was able to align force and torque measurements to desired levels. This was accomplished by combining the sensors with the high sample rate of the data logging and graphing capabilities of the SI-USB, capturing real-time force and torque levels for examination.

Results

The fasteners were tightened to the specified force and torque requirements and were safely installed without impairment to themselves or the joint material. The customer was able to measure the rapid event effectively and accurately.

Materials

- Model LW or LWCF Load Washer.
- Rotary Torque Model T12.
- SI-USB Universal Serial Bus Dual Channel PC Interface Module.



How It Works

1. Interface's Model LW or LWCF Load Washer is installed between the bolt head and nut. The load washer will measure the load as torque is applied to the nut.
2. A Model T12 Square Drive Rotary Torque Transducer is installed in-line with the electric nut runner to measure applied torque within assembly.
3. Real time observation of the applied force and torque is provided by mating LW or LWCF Load Washer and Rotary Torque Transducer in parallel with SI-USB 2-Channel PC Interface Module.
4. Accompanying software of Instrumentation enables customer logging and graphing of data. Excel compatible file then allows for further manipulation and analysis of this data.
5. Ultimately, the LW or LWCF Load Washer, Rotary Torque Transducer, and SI-USB Data Logging Instrumentation configuration offers End-user capability to accurately monitor applied load and rotational torque of tightened fasteners.

Gaming Simulation Brake Pedal

Interface Mini™

Industry: Test and Measurement

Summary

Customer Need / Challenge

A gaming company wants to switch from the standard racing pedals, to a load cell based pedal system for their racing simulation game. Compared to the standard racing simulation pedals, load cell pedals are more advanced and offer more accurate results. They want a wireless system that will measure the strength of the pressure received by the pedals that will detect the perfect amount of braking power.

Interface Solution

Interface's BPL Pedal Load Cell can be installed onto the gaming brake pedal to measure the force applied when someone puts their foot on it. Forces are measured and recorded using the WTS-AM-1E Wireless Strain Bridge Transmitter Modules, where data is transmitted to the WTS-BS-6 Dongle Base Station when connected to the customer's PC or laptop.

Results

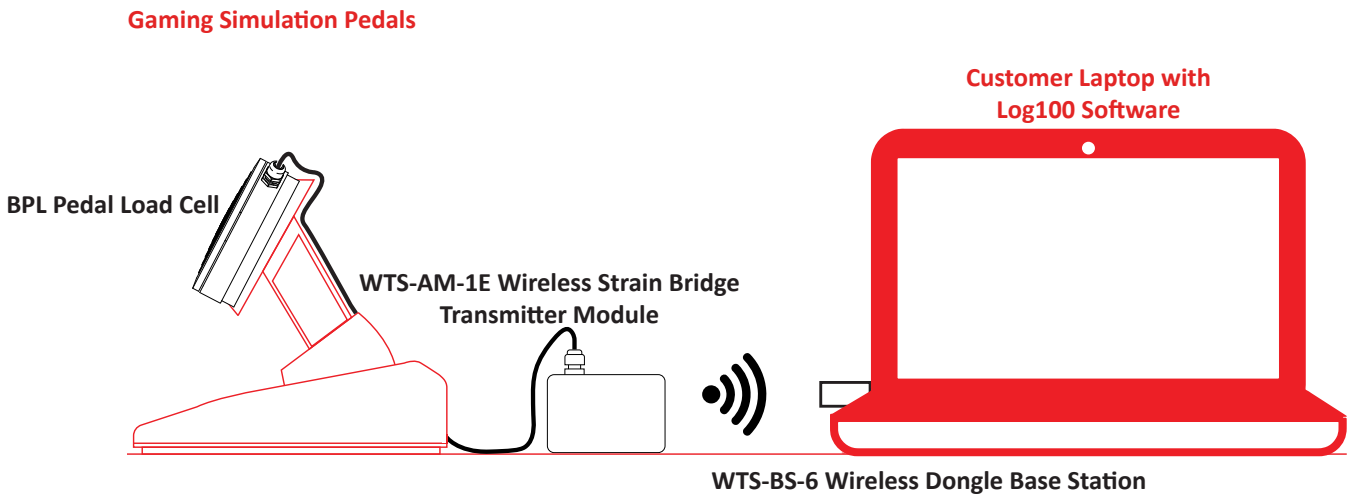
Interface's BPL Pedal Load Cell measured and recorded the pedal forces applied to their racing gaming brake pedals. In comparison to traditional simulation pedals that measure the distance of the pedals when pressed, Interface's load cell pedal system provided a more realistic experience for gamers.

Materials

- BPL Pedal Load Cell
- WTS-AM-1E Wireless Strain Bridge Transmitter Module
- WTS-BS-6 Wireless Telemetry Dongle Base Station
- Log100 Software
- Customer PC or Laptop

How It Works

1. The BPL Pedal Load Cell is installed onto the gaming brake pedal, and is connected to the WTS-AM-1E Wireless Strain Bridge Transmitter Module.
2. The BPL Pedal Load Cell measure the forces applied by the gamer when they put pressure onto the brake pedal.
3. The force results are wireless transmitted to the customer's laptop through the WTS-BS-6 Wireless telemetry Dongle Base Station. The customer was able to log, graph and record using the supplied Log100 Software.



Garbage Truck On-Board Weighing

Torque Transducer

Industry: Test and Measurement

Summary

Customer Need / Challenge

A garbage disposal company wants to test the load capacity of their garbage truck bins, so they know when it has reached maximum capacity.

Interface Solution

Interface's solution is to customize and install 4 SSB Sealed Beam Load Cells under the garbage box body, on either side. When trash continues to be piled inside the box body, it will push more force down onto the SSB Sealed Beam Load Cells. When maximum load capacity has been reached, the results can be reviewed and displayed when connected to the 482 Battery Powered Bidirectional Weight Indicator in real time.

Results

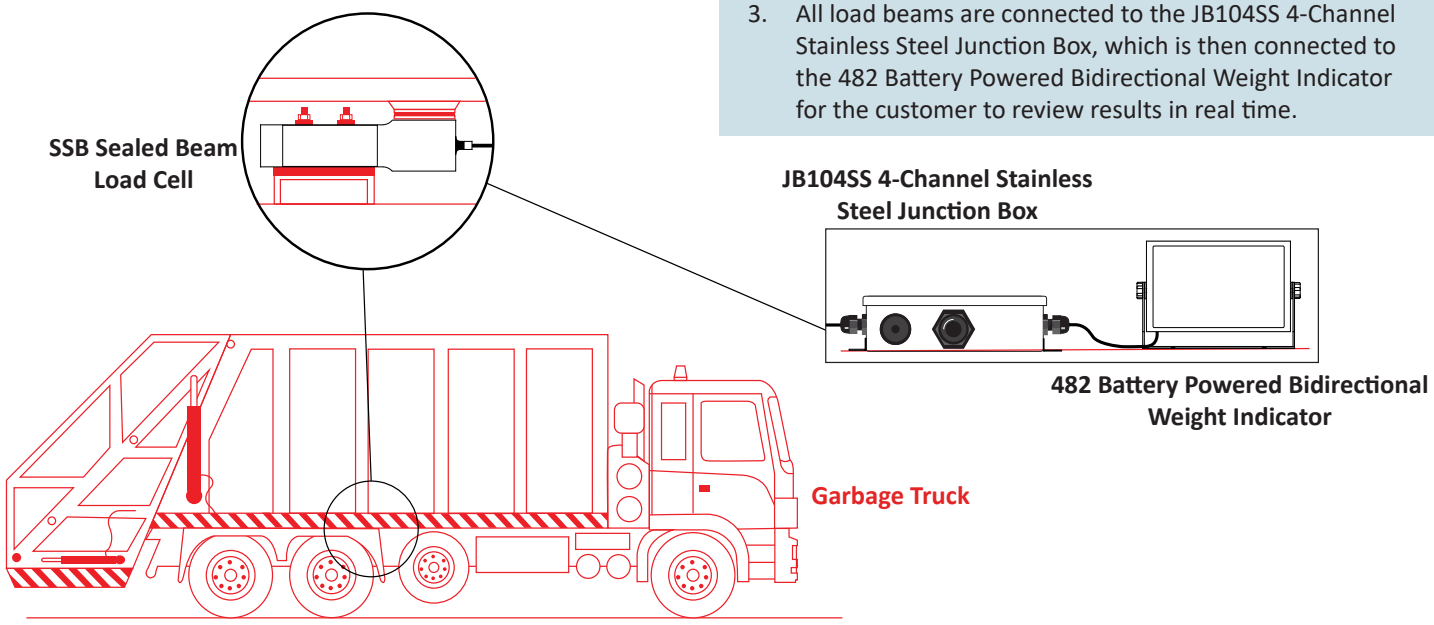
The customer was able to test the maximum load capacity of the garbage bin attached to the truck, so they know when to empty the truck's garbage at the transfer station.

Materials

- (4) SSB Sealed Beam Load Cells
- JB104SS 4-Channel Stainless Steel Junction Box
- 482 Battery Powered Bidirectional Weight Indicator

How It Works

1. The SSB Sealed Beam Load Cells are installed under the truck's garbage box body, on opposite sides.
2. As more trash is collected into the box body, more force weight is added and measured using the SSB Sealed Beam Load Cells.
3. All load beams are connected to the JB104SS 4-Channel Stainless Steel Junction Box, which is then connected to the 482 Battery Powered Bidirectional Weight Indicator for the customer to review results in real time.



Linear Test Stand
Load Cell

Industry: Test and Measurement

Summary

Customer Need / Challenge

Customer would like to crush test a specimen in their linear stand. The customer would like to use force to determine when the deformation actually occurs.

Interface Solution

Interface provided Model 1210 Precision LowProfile® Load Cell with internal amplification of 0-10VDC Output.

Results

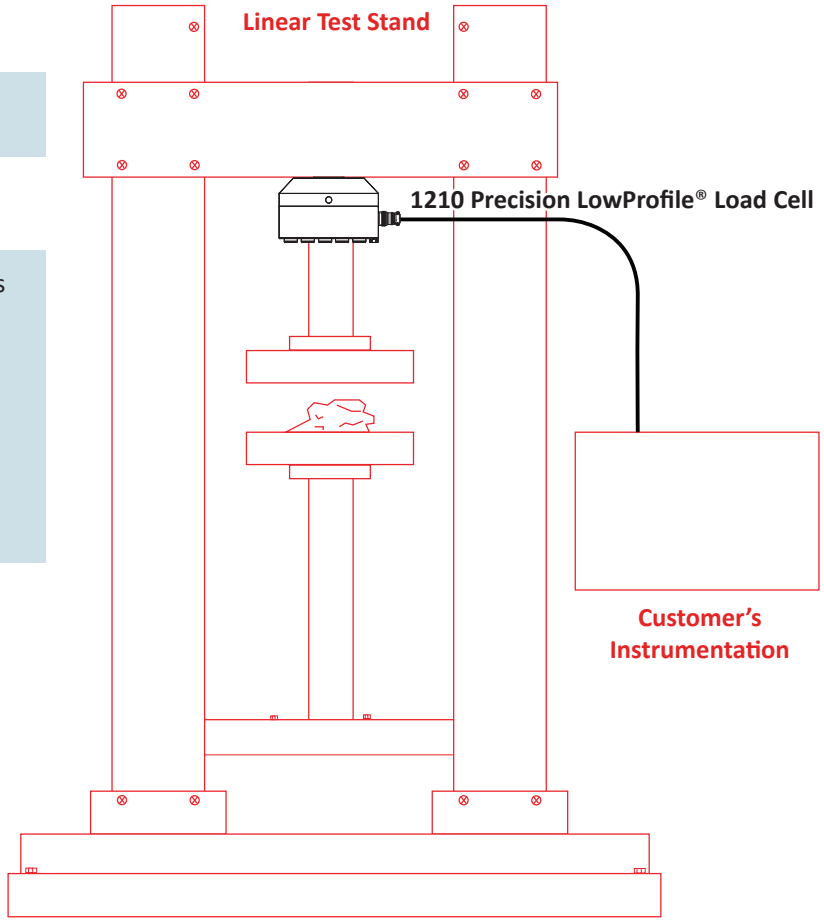
Amplified Model 1210 Precision LowProfile® Load Cell was installed into the load string of the customer's load frame and the scaled analog output from the load cell was connected to the customer's instrumentation. When the force levels reached the crushing point, the customer's software was able to read the output of the amplified load cell and record the value.

Materials

- 1210 Precision LowProfile® Load Cell.
- Customer supplied linear test stand.

How It Works

1. Amplified 1210 Precision LowProfile® Load Cell was installed into the load string of the customer's load frame.
2. Scaled analog output from the load cell was connected to the customer's instrumentation.
3. When the force levels reached the crushing point, the customer's software was to read the output of the amplified load cell.
4. Customer's instrumentation recorded the value.



Mobile Force System
S-Type and Instrumentation
Industry: Aerospace

Summary

Customer Need / Challenge

A customer wants a mobile measurement system that can perform force tests to their helicopter. They need a portable system that can both withstand extreme temperatures, marine environments, and be able to function in marine environments. A rechargeable battery supply is also required to operate the load cells.

Interface Solution

Interface's solution is to create a portable case with multiple SSM Sealed S-Type Load Cells installed in the case. There will also be multiple 9890 Strain Gage, Load Cell, and mV/V Indicators. With the mobile force case, load cells and indicators are safely secured in the box, and can be easily removed when needed to measure force results. This mobile force system can be transported and withstand extreme temperatures, marine environments, and rugged environments- while all load cells and indicators are safe from damage.

Results

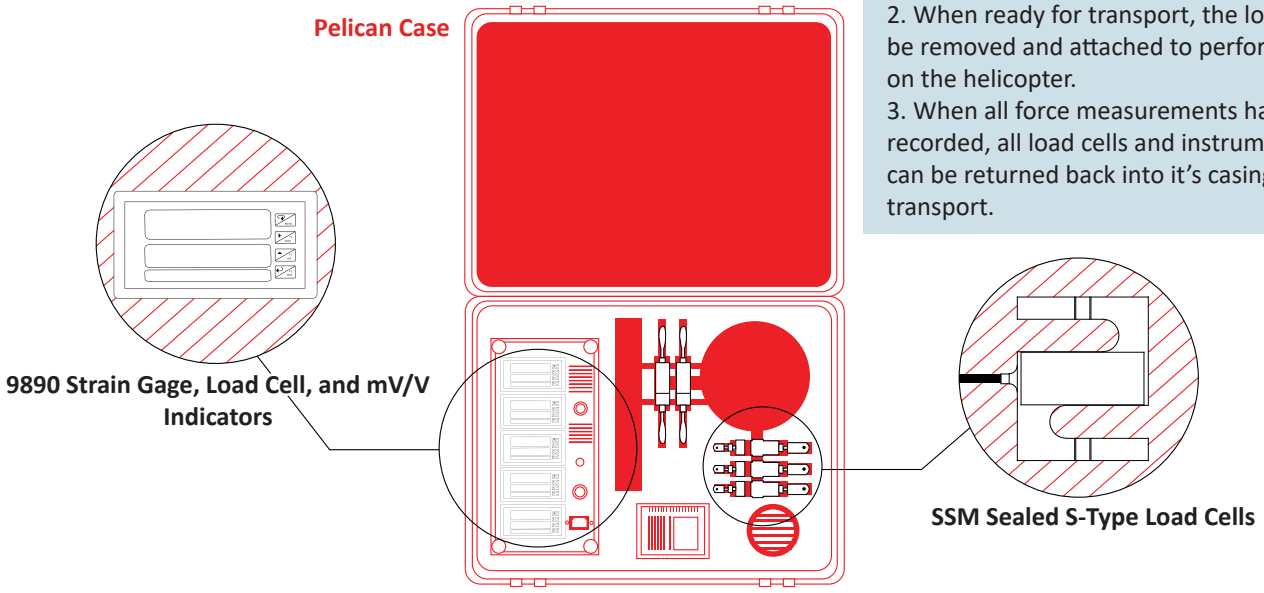
The customer was able to easily perform force tests with Interface's mobile portable system. They remained independent of any confined lab or testing facility, and now have a testing system that is versatile to the mobility requirements of test engineers.

Materials

- SM Sealed S-Type Load Cells
- 9890 Strain Gage, Load Cell, and mV/V Indicators
- Custom made Pelican case

How It Works

1. The SSM Sealed S-Type Load Cells and the 9890 Strain Gage, Load Cell, and mV/V Indicators are installed safely in the custom made mobile case.
2. When ready for transport, the load cells can be removed and attached to perform force tests on the helicopter.
3. When all force measurements have been recorded, all load cells and instrumentation can be returned back into it's casing for further transport.



Mountain Bike Shocks Testing
Load Cell

Industry: Test and Measurement

Summary

Customer Need / Challenge

A mountain bike manufacturing company wants to test the durability of the forks on the front of their bikes, and the rear shocks of their bikes as well. They want to test the front suspension, and ensure that the bikes shocks absorption is working properly for bike riders.

Interface Solution

Interface suggests installing the 1000 High Capacity Fatigue-Rated LowProfile™ Load Cell in a fatigue frame using the company's bike forks. The forks undergo a fatigue test for a number of hours. Test results from the 1000 High Capacity Fatigue-Rated LowProfile™ Load Cell will be sent to the INF-USB3 Universal Serial Bus Single Channel PC Interface Module where the customer can view, log, and graph the results on their PC computer or laptop with provided software.

Results

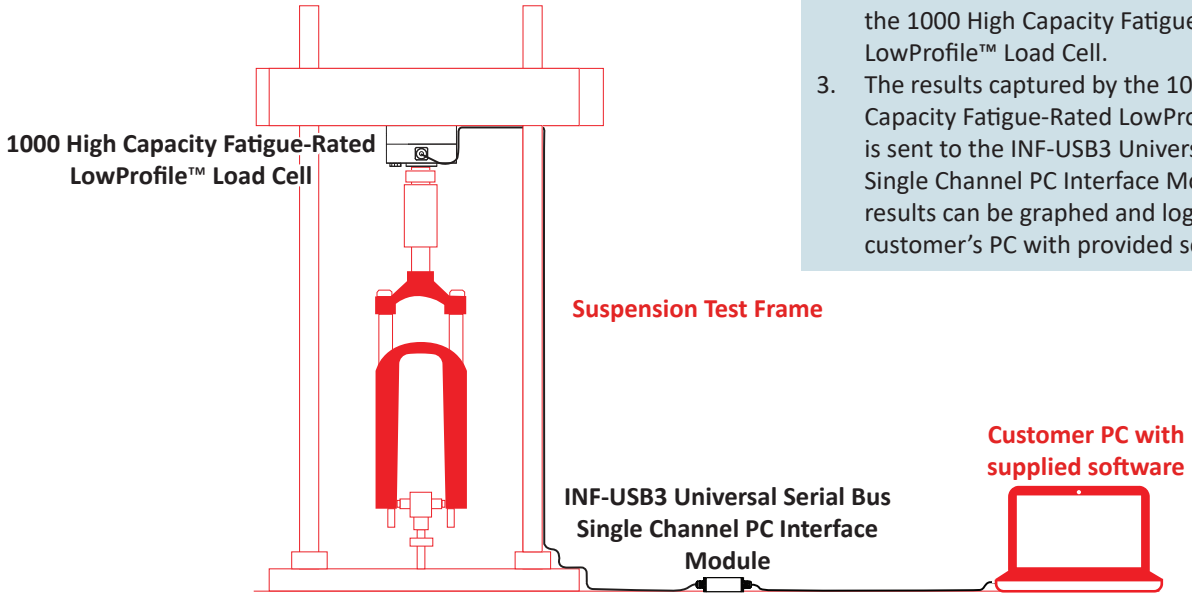
The customer was able to test the bike's front and rear shocks using Interface's products. They determined if there were any weak spots in the forks or if it was working properly.

Materials

- 1000 High Capacity Fatigue-Rated LowProfile™ Load Cell
- INF-USB3 Universal Serial Bus Single Channel PC Interface Module
- Customer's PC or Laptop

How It Works

1. The 1000 High Capacity Fatigue-Rated LowProfile™ Load Cell is attached to the actuator of the fatigue testing machine.
2. The bike's forks undergoes a fatigue cycling test where force results are collected by the 1000 High Capacity Fatigue-Rated LowProfile™ Load Cell.
3. The results captured by the 1000 High Capacity Fatigue-Rated LowProfile™ Load Cell is sent to the INF-USB3 Universal Serial Bus Single Channel PC Interface Module, where results can be graphed and logged on the customer's PC with provided software.



Snack Weighing and Packaging Machine

Interface Mini™

Industry: Test and Measurement

Summary

Customer Need / Challenge

A snack manufacturing brand wants to weigh the amount of their snacks that is automatically dispersed into the bags during the packaging process. In this case, they want to weigh their potato chips being packaged. The company wants to ensure the potato chips are at the exact weight needed due to regulatory standards.

Interface Solution

Interface's solution is to use multiple SPI Platform Scale Load Cells, and install it to the potato multi-head weigher and packaging machine. The SPI Platform Scale Load cells are installed inside of the mount that attaches the head weigher to the packaging machine. Force results from the potato chips are read by the load cells and sent to the ISG Isolated DIN Rail Mount Signal Conditioner, where the customer is able to control the automated production from their command center.

Results

The customer was able to determine the weight of the potato chips being distributed into their bags with highly accurate results. They also were able to control the automated production process with the provided instrumentation. They will use this same weighing method for other snacks that need to be packaged.

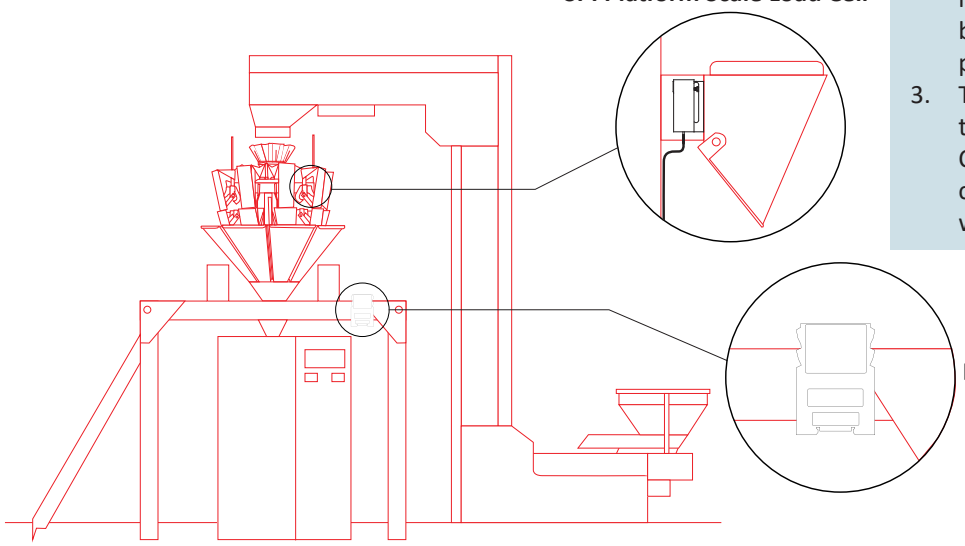
Materials

- Multiple SPI Platform Scale Load Cells
- ISG Isolated DIN Rail Mount Signal Conditioner

How It Works

1. Multiple SPI Platform Scale Load Cells are installed onto the insides of the head weighers of the packaging machines.
2. When potato chips are dispensed into the heads, the SPI Platform Scale Load Cells will measure the force applied to the head weighers, then the potato chips will be released and dispensed into the bag packaging process.
3. The force measurements can be read using the ISG Isolated DIN Rail Mount Signal Conditioner, where the customer is able to control the automatic production controls when connected to their command center.

Snack Weighing and Packaging Machine



Spring Compression Testing
Multi-Axis

Industry: Test and Measurement

Summary

Customer Need / Challenge

A customer wants to test the performance of their springs, but also the functionality of their spring test stand with a wireless solution.

Interface Solution

Interface suggests using one of their 5200XYZ 3-Axis Force Moment Load Cell,and installing it into the customer's spring compression frame. The 5200XYZ 3-Axis Force Moment Load Cell will measure the force compression of the spring, connect to multiple WTS-AM-1E Wireless Strain Bridge Transmitter Modules, which will display the information wirelessly to the 9812-WTS-AL4-3, and also triggers an alarm if needed.

Results

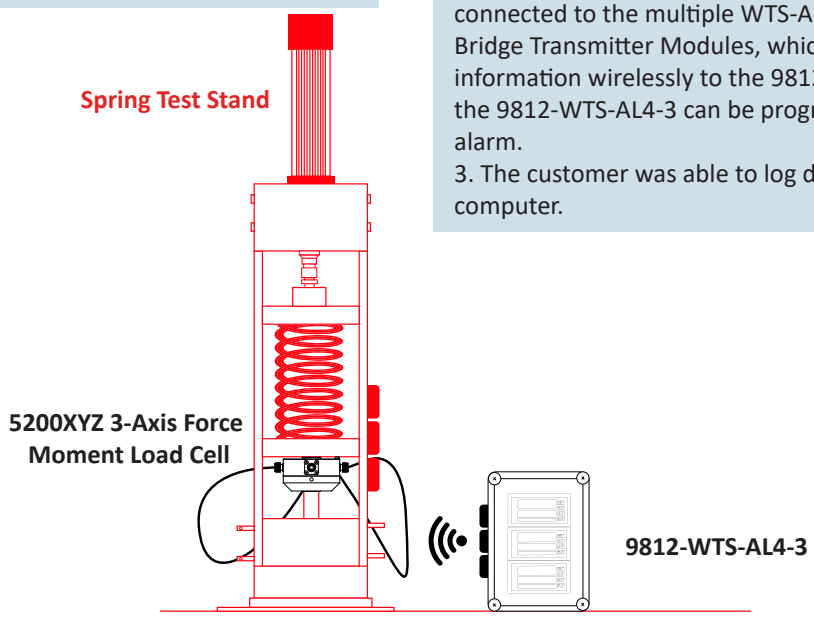
The customer was able to wirelessly get compression results on the spring being tested. They were also able to verify their spring compression test stand was working effectively.

Materials

- 5200XYZ 3-Axis Force Moment Load Cell
- WTS-AM-1E Wireless Strain Bridge Transmitter Module
- 9812-WTS-AL4-3
- Customer Spring Test Stand
- Customer PC or Laptop

How It Works

1. The 5200XYZ 3-Axis Force Moment Load cell is installed into the customer's spring compression frame, under the spring itself, containing 3 total outputs.
2. The spring was compressed, and force measurements read by the 5200XYZ 3-Axis Force Moment Load Cell is connected to the multiple WTS-AM-1E Wireless Strain Bridge Transmitter Modules, which then transmits output information wirelessly to the 9812-WTS-AL4-3. If needed, the 9812-WTS-AL4-3 can be programmed to trigger an alarm.
3. The customer was able to log data onto their PC computer.



Tank Weighing & Center of Gravity
Load Cell

Industry: Test and Measurement, Industrial Automation

Summary

Customer Need / Challenge

Customer needs to monitor the amount of material in a tank by weight and locate the center of gravity.

Interface Solution

Using Interface Model A4200 Zinc Plated or A4600 Stainless Steel Weigh-check Load Cells, along with Interface Instrumentation, Interface Inc. provided a solution that monitors the amount of material by weight in their tank while locating the Center of Gravity.

Results

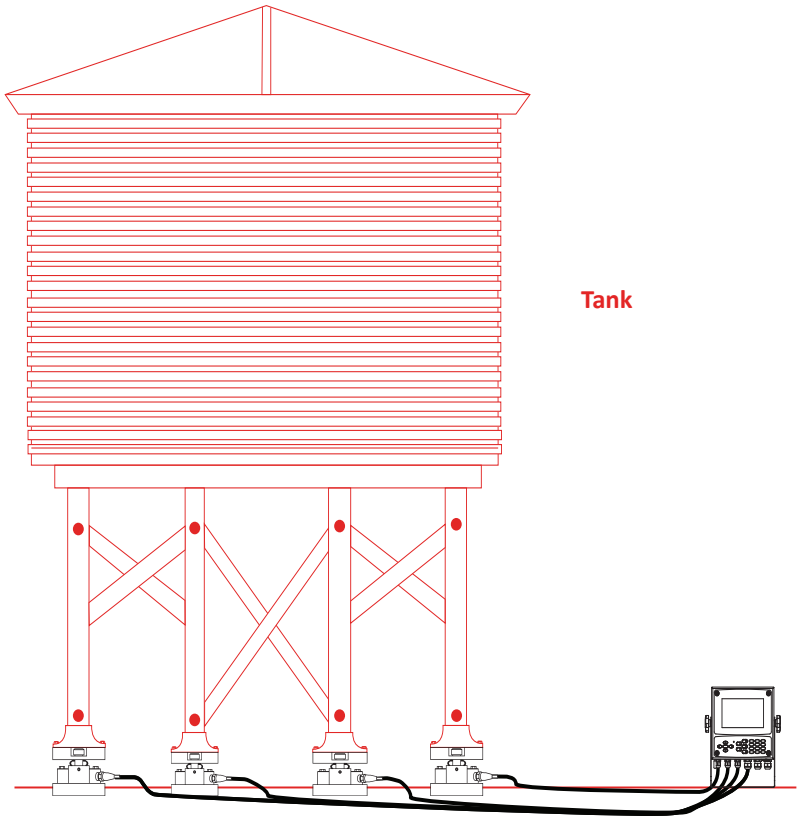
Tank weights are monitored so refilling, dispensing or emptying takes place safely while monitoring center of gravity.

Materials

- Model A4200 Zinc Plated or Model A4600 Stainless Steel Weigh-check Load Cells.
- Model 1280 Programmable/Controller.
- Setup & Scaling of Load Cells and Instrument by Interface, Inc.

How It Works

1. Model A4200 or A4600 Weigh-check Load Cell is installed between the support arm of tank and support pedestal of tank. The Weigh-check Load Cell will measure the load as material is loaded into or unloaded out of the tank.
2. Model 1280 Programmable/Controller will use weight measurements and display the weight for each leg and corresponding total weight.
3. Model 1280 Programmable/Controller will use weight measurements in conjunction with programmed formula to calculate the relevant Center of Gravity.



Torque Verification
Torque Transducer

Industry: Test and Measurement, Automotive and Vehicle

Summary

Customer Need / Challenge

Customer wants to perform regular torque testing on his ratchet-type torque wrench while recording these values for future examination.

Interface Solution

Interface supplied Model TS15 Square Drive to Flange Reaction Torque Transducer with Model INF-USB3 PC Interface Module for the customer to use.

Results

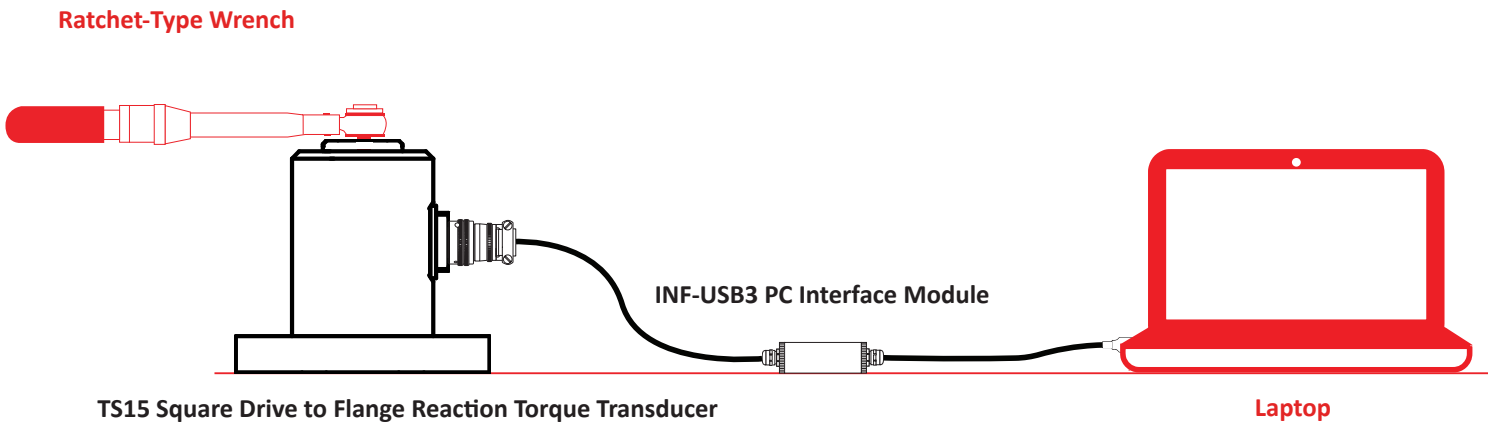
Customer was able to easily insert their ratchet-type torque wrench into the TS15 Square Drive, perform their calibration checks and view the results while logging them to their PC Computer.

Materials

- TS15 Square Drive to Flange Reaction Torque Transducer.
- INF-USB3 PC Interface Module with included configuration, display, graphing and logging software.
- Customer supplied ratchet-type wrench.

How It Works

1. Customer mounted TS15 to work bench through flange.
2. Customer inserted the ratchet-type torque transducer into the TS15 Square Flange Reaction Torque Transducer.
3. Customer performs calibration checks and views the results while logging them to the PC Computer.



Water Bottle Dispensing and Weighing

Interface Mini™

Industry: Test and Measurement

Summary

Customer Need / Challenge

A water bottle manufacturer wants to dispense the right amount of fluid into their bottles, and then weigh the water bottles to ensure it is at the labeled weight on their product packaging. This is both to minimize waste, but also to meet the standard requirements.

Interface Solution

Interface suggests using the MBP Miniature Beam Load Cell, and attaching it under a plate or platform the water bottle is placed on while it is being filled with fluids. The force weight is measured by the MBP Miniature Beam Load Cell, and connected to the 9870 High Speed High Performance TEDS Ready Indicator where results are captures, displayed, and can be recorded by the customer based on their needs.

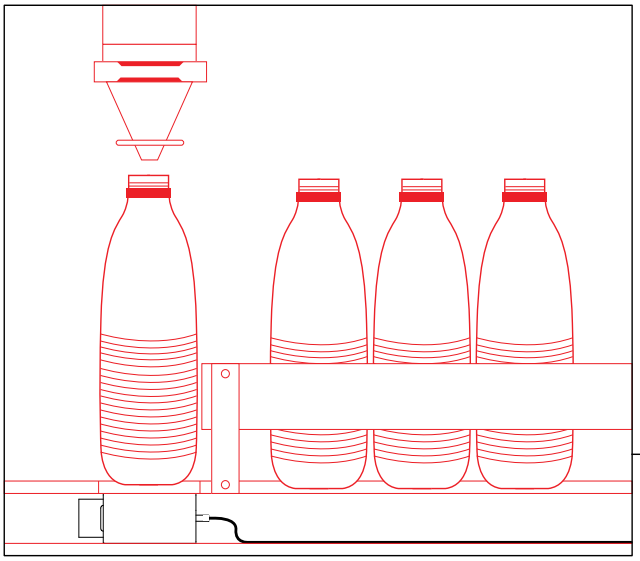
Results

The water bottle manufacturer received high accurate results of each water bottle being weighed in real time.

Materials

- MBP Miniature Beam Load Cell
- 9870 High Speed High Performance TEDS Ready Indicator

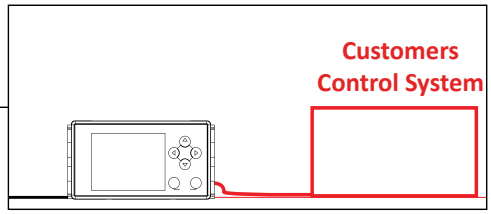
Water Bottle Dispensing Assembly



MBP Miniature Beam Load Cell

How It Works

1. The MBP Miniature Beam Load Cell is installed under the mechanism that dispenses water into the water bottles, with a plate or platform on top.
2. After the fluid is dispensed into the water bottle, the MBP Miniature Beam Load Cell measures the forces applied.
3. Connected to the analog output of the customer's control center, the 9870 High Speed High Performance TEDS Ready Indicator will display and record highly accurate result.
4. If the bottle does not meet the standard weight requirements, the quality department will be notified that it needs to be quarantined and sent for review.



9870 High Speed High Performance TEDS Ready Indicator

Waste Management Container Weighing

Load Cell

Industry: Test and Measurement, Infrastructure

Summary

Customer Need / Challenge

A waste management company wants to measure the capacity of their waste containers in order to know when it is time to dispose the waste.

Interface Solution

Interface's Model WTS 1200 Standard Precision LowProfile™ Wireless Load Cells can be installed at the bottom of each waste container leg to measure the sum weight of the container. The data is transmitted to the WTS-BS-4 USB Industrial Base Station with the supplied Log100 software.

Results

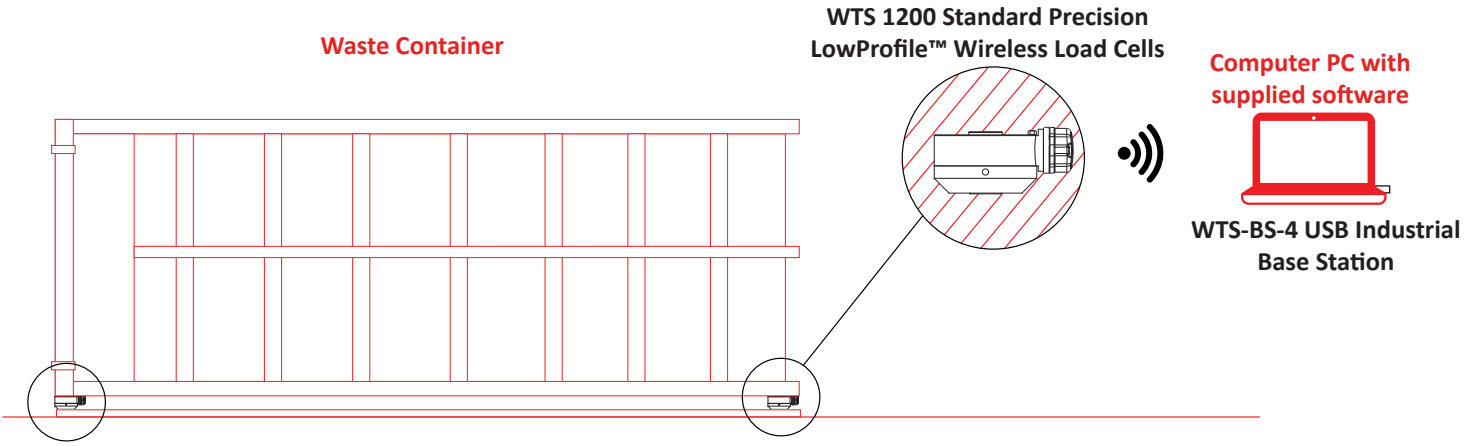
The customer was able to determine when their waste container was at full capacity in order to dispose of the waste, or to transfer it.

Materials

- (4) WTS 1200 Standard Precision LowProfile™ Wireless Load Cells
- WTS Toolkit and Log100 Software
- WTS-BS-4 USB Industrial Base Station
- Computer PC or Laptop

How It Works

1. Four WTS 1200 Standard Precision LowProfile™ Wireless Load Cells are installed and mounted to the bottom of the waste container legs.
2. The load cells collect the force measurements and sum the total weight of the waste container. The data is transmitted to the customer's laptop through the WTS-BS-4 USB Industrial Base Station using the Log100 Software. Data can be logged, graphed, and sent to the cloud using the supplied software.



Verification Test Stand
Load Cell

Industry: Test and Measurement

Summary

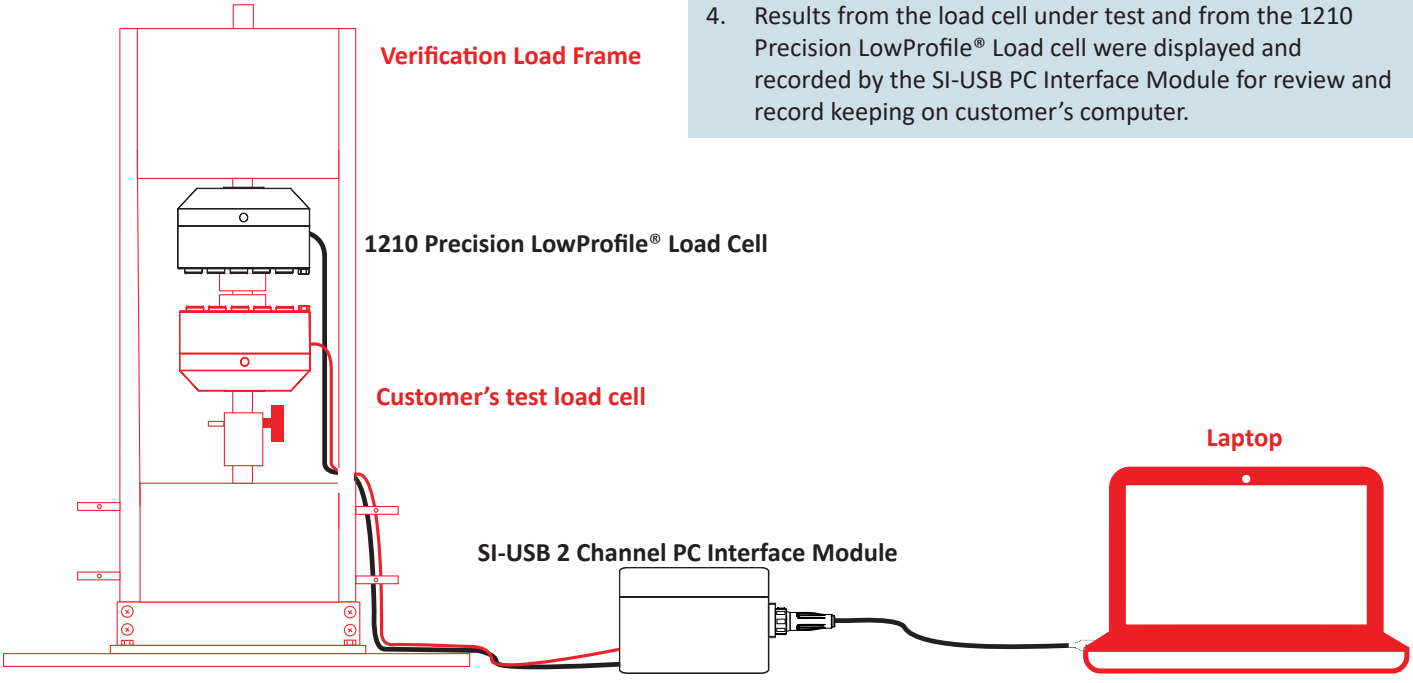
Customer Need / Challenge	Interface Solution	Results
Customer is looking for a way to verify if the load cell is in “good working order” for an upcoming test.	Interface proposed a solution with the customer’s supplied verification load frame, Model 1210 Precision LowProfile® Load Cell, connected with Model SI-USB 2-Channel PC Interface Module.	Customer installed their load cell and Model 1210 Precision LowProfile® Load cell into the verification load frame, and applied forces were displayed and recorded by Model SI-USB PC Interface Module for review and record keeping on customer’s computer.

Materials

- 1210 Precision LowProfile® Load Cell.
- SI-USB 2-Channel PC Interface Module with included setup, logging, and graphing software.
- Customer’s verification load frame.
- Customer’s test load cell.
- Customer’s supplied PC computer.

How It Works

1. Customer installed their load cell to the customer’s verification load frame, connecting it to 1210 Precision LowProfile® Load Cell.
2. Customer applied the specific load by turning the manual actuator.
3. Applied forces were measured by the 1210 Precision LowProfile® Load Cell.
4. Results from the load cell under test and from the 1210 Precision LowProfile® Load cell were displayed and recorded by the SI-USB PC Interface Module for review and record keeping on customer’s computer.



Interface is the world's trusted leader in technology, design and manufacturing of force measurement solutions.
Our clients include a "who's who" of the aerospace, automotive and vehicle, medical device, energy, industrial manufacturing, test and measurement industries.

Interface engineers around the world are empowered to create high-level tools and solutions that deliver consistent, high quality performance. These products include load cells, torque transducers, multi-axis sensors, wireless telemetry, instrumentation and calibration equipment.

Interface, Inc., was founded in 1968 and is a US-based, woman-owned technology manufacturing company headquartered in Scottsdale, Arizona.

Interface
FORCE MEASUREMENT SOLUTIONS

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