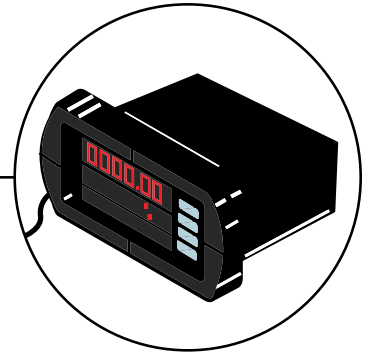
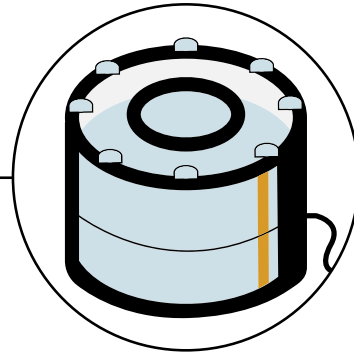
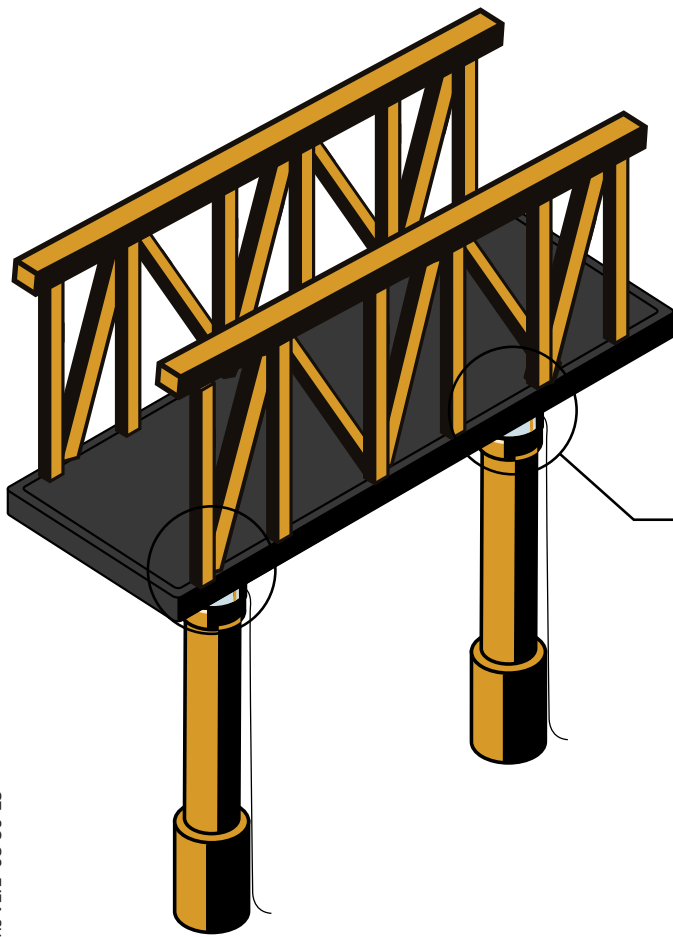


# Interface

## Infrastructure Solutions



Infrastructure Solutions v1.1 08-30-23

**Interface**  
FORCE MEASUREMENT SOLUTIONS.

The World Leader in Force Measurement Solutions™



# Infrastructure Solutions

The infrastructure industry has long depended on Interface's durable and reliable products for all types of projects including the planning, construction and maintenance of transportation systems, communication structures, water and electrical facilities. Interface products are critical in creating and managing sustainable infrastructure around the world.



## Infrastructure

Among the various tools and technologies used to build and test infrastructure designs, sensors play a substantial role. Interface has served infrastructure industry suppliers and customers since our founding in 1968.

Force and torque measurement products including Interface load cells, torque transducers, load pins, load shackles, tension links, and instrumentation are utilized in a wide variety of infrastructure applications including construction and maintenance of bridges, roads, transportation systems, communication structures, water and electrical facilities, and numerous inventions that are used to build, test, support, maintain and monitor performance of these critical projects around the world.

### Industry Leading Quality

Interface is recognized by infrastructure material and equipment suppliers, construction companies, civil engineers and municipalities for product reliability, accuracy, and innovative design.

For more than five decades, Interface continues to be recognized for meeting and exceeding the quality needs for our customers. Our products are built in accordance with A2LA, International Standard ISO/IEC 17025:2017 and ANSI/NCSL Z540-1-1994. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system.



## Solution Capabilities

- Stainless steel and rugged designs for different infrastructure projects
- Intrinsically safe products used in harsh environments
- Wireless telemetry system components used for monitoring and testing
- Instrumentation for accurate and reliable data for performance monitoring
- Specialized sensors that range in sizes of miniatures to jumbos to support large-scale projects and single part monitoring
- Custom solutions designed to your exact safety and regulatory specification
- OEM engineered products for high-production counts used in equipment and machines
- Weighing and lifting sensors for safety monitoring during construction
- Preferred force and torque measurement technologies used by engineers in design specs for quality and accuracy

## Infrastructure Solutions

# Test and measurement are critical in the infrastructure industry. Civil engineers, project managers, governments, equipment suppliers, and construction companies utilize Interface sensors.

## Concrete Dam Flooding

A customer was looking for a solution to monitor a concrete dam and be notified when it reached high flooding levels. Interface provided WMC Miniature Sealed Stainless Steel Load Cells with multiple WTS-AM-1E Wireless Acquisition Modules connected to the load cells. This solution proved to be small enough and perfect for measuring compression and tension on the dam. The WMC modules are installed on the arch of the dam and transmit data and notify the customer through Interface's Wireless Telemetry System when flooding occurs.

## Bridge Seismic Force Monitoring Solution

A contractor for a large municipality wanted to monitor seismic activity that occurs to a bridge using force sensors that would continuously monitor activity before, during and after earthquakes. They also wanted a wireless solution to avoid running long cables on the bridge. Interface provided an LP Load Pin custom made to fit the need precisely as designed. The load pin was used in conjunction with our WTS Wireless Telemetry System to monitor the force on the load without cables. Using this solution, the customer was able to monitor continuously, log results to the cloud and review the data in real-time.

## Aerial Lift Overload Control

Beyond construction, Interface is supplying equipment manufacturers for use in construction and infrastructure maintenance projects. We provided a top manufacturing company for aerial lifts precision tools to test its self-propelled boom lift. The solution needed to ensure the lift could operate at heavy capacities when in use, and at different angles. The lift required a design that was proven to prevent any accidents in case of a lifting overload, for the safety of anyone working on or near the equipment. Interface proposed used our three multi-axis sensor model 3A160 3-Axis Force Load Cells to the bottom of the bucket of the boom lift. The 3A160 3-Axis Force Load Cell provides high accuracy and the measurements could be displayed using the 920i Programmable Weight Indicator and Controller in real-time. The company used these products to test their aerial boom lifts and determined it was safely operable at maximum capacities.

## Types of Infrastructure Applications Using Interface Measurement Solutions

- Highways and Bridge Construction
- Road Load Tests
- Concrete Dam Measurement and Flood
- Transportation Heavy Equipment Testing
- People Movers for Airports
- Train Brakes Testing
- Power Generation Equipment
- Cranes and Heavy Object Lifting
- Conveyor Belts
- Structural Testing
- Geotechnical Monitoring
- Road Load Tests
- Weight Bridges and Transportation Scales
- Truck and Aircraft Weighing
- Housing Mainframe Monitoring
- Skyscraper Construction Monitoring
- Building Foundation Capacity Measurement
- Bridge Seismic Force Monitoring
- Telecommunication Structures
- In-Motion Rail Weighing

# HIGHLIGHT: Hydropower Turbine Generator Monitoring

## 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 to catch any unusual fluctuations and vibrations.

## Results

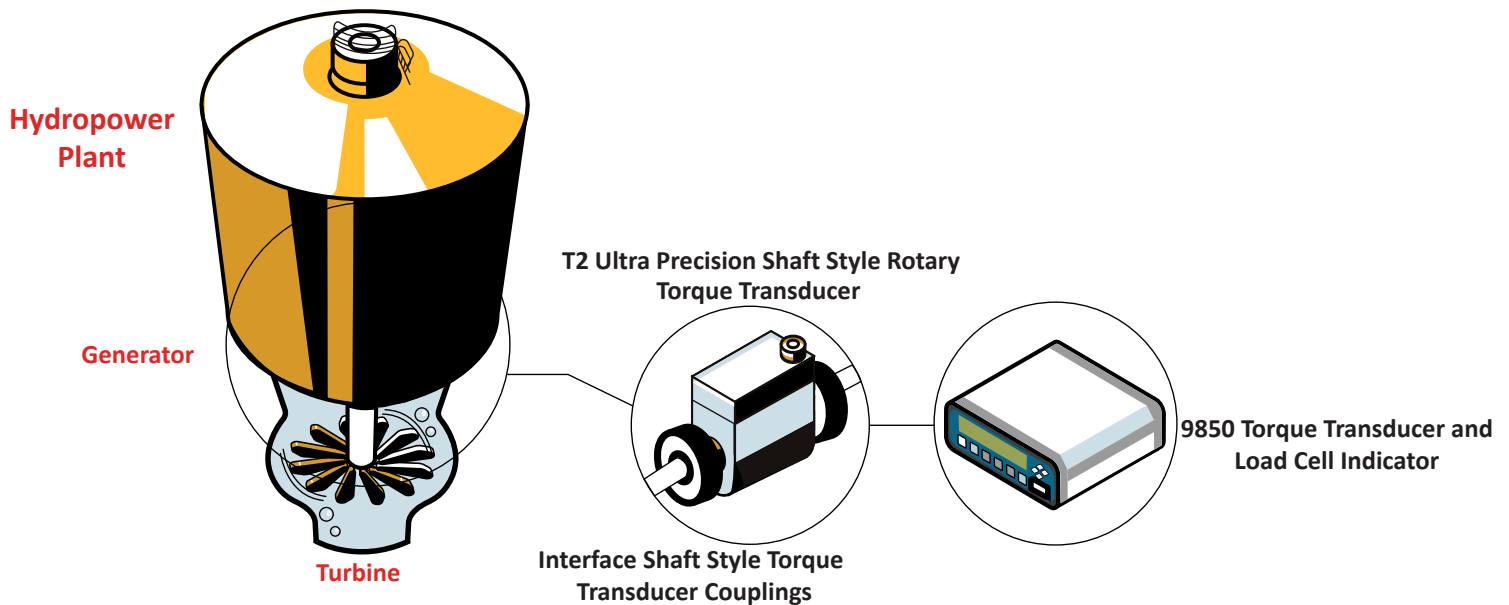
The customer was able to monitor, graph, and log the torque measurement results of the turbine generator.

## 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

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





# Product Examples for Infrastructure Solutions



**1200 Standard Precision LowProfile™ Load Cell**  
300 lbf to 100K lbf  
1.33 kN to 445 kN



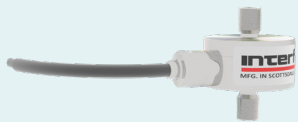
**1100 Ultra Precision LowProfile™ Load Cell**  
300 lbf to 200K lbf  
1.33 kN to 890kN



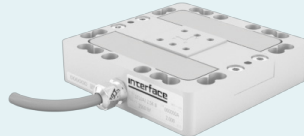
**2400 Standard Stainless Steel Low Capacity Load Cell**  
100 lbf to 5K lbf  
0.44 kN to 22 kN



**T2 Ultra Precision Shaft Style Rotary Torque Transducer**  
0.9 lbf-in to 177K lbf-in  
0.1 Nm to 20K Nm



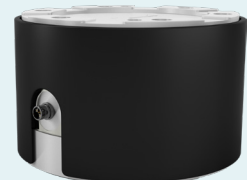
**WMC Sealed Stainless Miniature Steel Load Cell**  
5 lbf to 500 lbf  
22 N to 2,200 N



**3AXX 3-Axis Force Load Cell**  
Force: 4.5 lbf to 112K lbf  
Force: 10 N to 500 kN



**6A Series 6-Axis Standard Capacity Load Cells**  
Force: 11.2 to 22.5K lbf  
Torque: 8.85 to 88.5K lb-in  
Force: 50 to 100K N  
Torque: 1 to 10K Nm



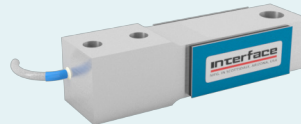
**6A Series 6-Axis High Capacity Load Cells**  
Force: 11.2K to 180K lbf  
Torque: 88.5K to 354K lb-in  
Force: 50K to 800K N  
Torque: 10K to 40K Nm



**WTSSHK-B Wireless Crosby™ Bow Load Shackle**  
26.5K and 265K lbf  
12 to 120 MT



**WTSTL Wireless Tension Link Load Cell**  
11K lbf to 220.4K lbf  
5 mt to 100 mt



**SSB Sealed Beam Load Cell**  
50 lbf to 10K lbf  
222 N to 44.48 kN



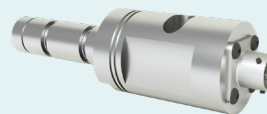
**5400 Series Flange Style Reaction Torque Transducer**  
1K lbf-in to 500K lbf-in  
110 Nm to 55K Nm



**920i Programmable Weight Controller and Indicator**  
Display up to four scale channels per screen  
32 scale accumulators



**9850 Pulley Belt Style Rotary Torque Transducer**  
Works with torque transducers, load cells, encoders, LVDTs and speed pickups  
7800 samples/sec/channel



**LP Stainless Steel Load Pin**  
Capacities up to 3,000K lbf (1,360 MT)  
Designed to replace pins or bolts that carry a load



**9890 Strain Gage, Load Cell, & mV/V Indicator**  
±15, ±25, ±150, ±250 mV  
Bipolar Input Ranges  
Powers up to 12 x 350 ohm Sensors



**INF-USB3 Universal Serial Bus Single Channel PC Interface Module**  
±3 mV/V, ±4.5 mV/V ±5 VDC, ±10 VDC  
4-20 mA, 12 ±8 mA and 5V TTL



**BSC4D Multi-Channel Bridge Amplifier and PC Interface Module**  
5 lbf to 500 lbf  
22 N to 2,200 N



**BX8 8-Channel Data Acquisition System and Amplifier**  
±5V, ±10V, 4-20mA, and 0-20 mA Outputs  
8-Channel Synchronized Sampling



**WTS Wireless Telemetry System**  
17.7 lbf-in to 44.3K lbf-in  
2 Nm to 5K Nm

## Providing for Infrastructure Challenges

From dams to roads and bridges, the infrastructure industry is the backbone of our society and the need for accurate and durable sensor technologies used in the development and monitoring of these structures is never going away.

The global infrastructure market is nearly \$4B and growing, with an estimated sub-sector in global construction growing between 8-10%, with no slowing down. The expenditures around the world are often funded by governments; however, the design, build and maintenance are part of a large supply chain. This includes machine and equipment makers, material and civil engineering groups, construction companies and contractors. All of these are frequent buyers of Interface's precision line of sensor technologies.

One of the factors accelerating growth in the infrastructure industry is accurate and reliable test and measurement equipment, which is necessary to ensure durability, quality, and safety in all infrastructure projects.

Our precision load cells, rugged load pins, wireless and digital instrumentation, along with multi-axis sensors and robust torque transducers are a top choice for those engaged in infrastructure engineering projects design and build, along with testing and maintenance. Core to the industry is accuracy and reliability, thus turning to Interface solutions is essential to any infrastructure project's success.

## Expert Engineers

Our Interface expert engineers can help you design customizable force measurement solutions for all types of applications. Our engineers have designed products used for civil infrastructures such as structural monitoring, vibrational monitoring, load bearing testing, tunnels, bridges, and road construction.

The range of projects we supply force and torque measurement solutions are broad. When accuracy, quality and reliability matter in design, testing, construction, and assessing current and limitations for safety requirements, we are able to provide solutions that meet the exact specifications.

Interface is a provider of choice, based on a history of high performance in standard, engineered to order and custom solutions. It begins early in the process, during the planning and design. Our engineers work as a part of your team to guarantee you get the exact solution that fits your requirements.

Whether you need a single load cell, shackle or instrument or hundreds of custom load pins, we can help. For sales, service, or support go to [www.interfaceforce.com](http://www.interfaceforce.com) or call us for immediate help.

# Infrastructure Solutions

- High Capacity Load Cells
- LowProfile™ Load Cells
- Intrinsically Safe Load Cells
- Stainless Steel Load Cells
- Torque Transducers
- Interface Mini™ Load Cells
- Load Pins
- Load Shackles
- Tension Links
- Multi-Axis Sensors
- Instrumentation
- Wireless Telemetry Solutions
- Digital Instrumentation
- Custom Systems

*If you know what you need and are ready to talk to our application engineers, email or call today!*

**To learn more  
about the Interface  
infrastructure  
solutions provided  
call 480-948-5555.**

**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.