Interface

Natural Resource Solutions

Natural Resource Solutions v1.1

Natural Resource Solutions

Interface offers various sensor technologies for research and development, extracting, processing, and preserving natural resources, including minerals, water, oil, timber, and agricultural yields. Our load cells and instrumentation are critical in measuring and monitoring forces, loads, and weight in different heavy machinery, production equipment, tools, and technologies used in the natural resources industry.

interface
FORCE MEASUREMENT SOLUTIONS

7418 East Helm Drive, Scottdale, AZ 85260 ▪ 480.948.5555 ▪ interfaceforce.com

Interface Natural Resources

Interface's force sensors and instrumentation are used for many different applications in the natural resource industry. Sustainability and the environment are a global focus. Enabling and enhancing the optimization of processes and equipment, material preservation, and efficiencies at scale is where Interface products make an impact.

Our load cells, torque transducers, multi-axis sensors, wireless telemetry systems, and instrumentation assist scientists, engineers, and researchers to accurately measure resource utilization, environmental impacts, and efficiencies in resource management. Our measurement solutions are used in the early stages of machine and tool designs to onsite monitoring equipment used in extraction processes, lifting, moving, and transporting materials.

Since 1968, Interface has worked with many applications in the natural resource industry. We provide solutions for R&D projects that help identify innovative ways to improve natural resource extraction while creating safer and more efficient processes.

Industry Leading Quality

Interface is celebrated for meeting and exceeding the quality needs for our customers. Our products are built in accordance with A2LA, International Standard ISO/IEC 17025:2005, and ANSI/NCSL Z540-1-1994. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system.

Every part we make is calibrated and tested before we ship it to our customer. It is our relentless commitment to quality and accuracy. It's our way to ensure you get the best in precision sensor technologies.

Accredited Laboratory

INTERFACE, INC.
Scottsdale, AZ

Calibration

ACCREDITED
Cert # 1991.01

Solution Capabilities

- Stainless steel and rugged designs for different temperatures and climates
- Digital and advanced instrumentation for accurate and reliable data
- Mobile testing units to take in the field or remote locations
- Environmentally sealed products
- Wireless telemetry system components for all types of environmental conditions
- Vast inventory of sensors and instrumentation for fast delivery
- Custom solutions designed to your exact requirements for safety equipment
- OEM engineered products

Natural Resources

The Interface products help scientists, engineers, and researchers to accurately measure resource utilization, environmental impacts, and efficiencies in resource management.

The natural resources sector encompasses extracting, processing, and utilizing Earth's valuable assets. Interface's sensor technologies are used in the early stages of machine and tool designs to onsite monitoring equipment used in extraction processes, lifting, moving, and transporting materials.

The natural resources industry is pivotal in the global economy, supplying essential raw materials for various sectors like agriculture, energy, and consumer goods. It encompasses the production of oil, gas, power, renewables, metals, and mining, with a total value exceeding a trillion dollars and steadily growing.

Interface's precision sensor technologies are indispensable within the natural resources sector. Our load cells and instrumentation are vital for measuring and monitoring forces, loads, and weights in various processes, equipment, tools, and technologies used in this industry. The data obtained from Interface's load cells offer significant value in research, development, and optimization efforts.

Timber Weighing and Harvesting

A timber company needs a weighing system for sustainable forest management. They need to measure the amount of timber harvested. Weighing and monitoring harvested timber helps with resource monitoring and contributes to the overall sustainability of the forestry industry. Interface suggests creating a truck weighing scale to weigh logging trucks before and after loading timber. Multiple **SSLP Stainless Steel LowProfile Universal Load Cells** with **WTS-BS-1E Wireless Transmitter Modules** are installed under the weighing bridge.

The load cells will transmit the force results wirelessly to the **WTS-BS-4 Industrial Base Station** connected to the customer's PC with the provided **Log100 software**. The **WTS-LD2 Wireless Large LED Display** can also display the weight inside for the driver to see in real-time. Results can also be viewed on the **WTS-HK-S Next-Generation Wireless Handheld** .

Wave Energy Generator

A customer has been tasked to create electricity by using the energy generated by ocean waves. As ocean waves generate electricity, an Interface load cell will measure tether line tension using a submersible **ITCA Tension and Compression 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 generated by the ocean waves, and data was later analyzed by the customer's data acquisition system (DAQ).

Floating Wind Turbine Monitoring

Floating or offshore wind turbines are being created to generate electricity at depths where normal turbines cannot. A customer would like to measure the tension of the mooring line of each turbine on their floating wind farm. They want to monitor the tension of the mooring line that keeps the turbine in place to detect crack initiation or potential fractures. Interface's **ISHK-B Bow Type Crosby™ Submersible Load Shackle Load Cell** can be attached to the floating wind turbine's mooring line, which is attached to an anchor. With customer instrumentation, the customer can monitor the force tension of the mooring line based on the force results captured by the load cell.

HIGHLIGHT: Geothermal Well Drilling

Customer Challenge

Geothermal energy is the heat derived from the Earth's interior, harnessed for various applications such as electricity generation and heating by utilizing the natural heat reservoirs found beneath the Earth's surface. A customer has a conventional geothermal system and needs to drill a deep well into the Earth to tap into its natural heat reservoirs.

Interface Solution

Interface's **IPCD Pressure Compensated Downhole Load Cell** is a highly accurate load cell that was developed specifically for downhole tension and compression measurements in high temperature, high pressure well conditions, such as drilling to build or develop geothermal infrastructure. Precise tool string force measurements can be monitored real time through customer instrumentation.

Results

The customer effectively managed forces on the tool string throughout the well drilling process, preventing costly tool separation or damage.

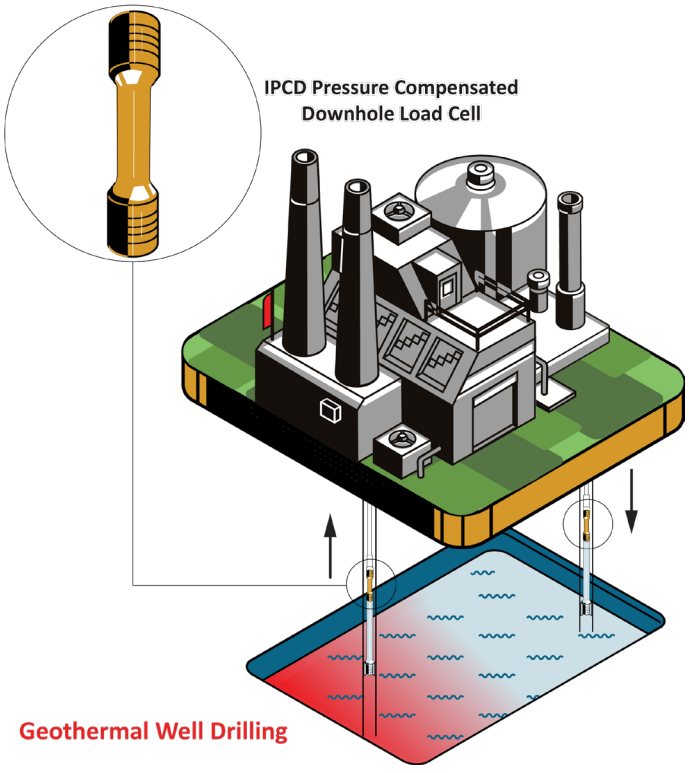
Materials

- **IPCD Pressure Compensated Downhole Load Cell**

- Customer Instrumentation

How it Works

The IPCD Pressure Compensated Downhole Load Cell is attached at the top of the tool string. The IPCD measures the forces between the cable head and the tool string during the well drilling. Connected to the customer's instrumentation, cable head tension is closely monitored during drilling to access geothermal energy. Interface's proprietary and maintenance-free dry pressure compensation technology minimizes measurement errors from the pressure effect.



Product Examples for Natural Resources

IPCD Pressure Compensated Downhole Load Cell
10K lbf
44.5 kN

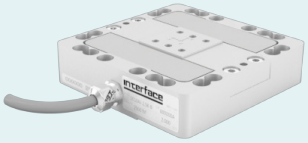
2400 Standard Stainless Steel Low Capacity Load Cell
100 lbf to 5K lbf
0.44 kN to 22 kN

3200 Precision Stainless Steel Load Cell
2.5 lbf to 100K lbf
12.5 kN to 445 kN

2400 Standard Stainless Steel High Capacity Load Cell
7.5 lbf to 50K lbf
33.4 kN to 250 kN

ITCA Tension and Compression Load Cell
2.2K lbf to 330.6K lbf
1 MT to 150 MT

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

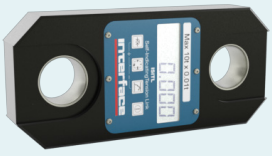


3AXX 3-Axis Force Load Cell
Force: 4.5 lbf to 112K lbf
Force: 10 N to 500 kN

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

ISHK-B Bow Type Crosby™ Cabled Load Shackle
2.2K and 2205K lbf
1 to 1K MT

ISHK-D 'D' Type Crosby™ Cabled Load Shackle
2.2K to 77.2K lbf
1 to 35 MT



ISITL Self-Indicating Tension Link
2.2K to 661K lbf
1 to 300 MT

WTSLTL Lightweight Wireless Tension Link
2.2K to 661K lbf
1 to 300 MT

920i Programmable Weight Indicator and Controller
32 scale accumulators
100 setpoints, 30 configurable setpoint types

480 Bidirectional Weight Indicator
Powers up to 10 Load Cells
Measurement Rate up to 40Hz

BX8-HD15 BlueDAQ Series Data Acquisition System
±5V, ±10V, 4-20mA, and 0-20 mA Outputs
8-Channel Synchronized Sampling

9870 High-Speed High Performance TEDS Ready Indicator
Powers up to 4x 350 ohm sensors
Stores up to 6 sensor calibrations

WTS-HK-S Next-Generation Wireless Handheld
Connect up to 12 transmitters
Provides summation of up to 12 transmitters

WTS-BS-6 Wireless Telemetry Dongle Base Station
Compact & Portable Logging
Fast Configuration
500m Wireless Range

WTS-BS-4 Wireless Base Station with USB Interface
Up to 800 m (2,625 ft) range
Simple plug & play USB
Configure & calibrate the WTS range

BTS-AM-1 Bluetooth Telemetry System
"AA" Battery Powered Bluetooth
Strain Gage Transmitter

Interface Helps Create Sustainable Practices

Interface's force measurement systems create highly accurate force, weight, and load measurements for precise natural resource management. Used in several different applications, Interface understands their load cells contribute to sustainable practices by ensuring precise data to create efficient operations. We want to minimize natural resource depletion and other environmental disruptions while maintaining Earth's resource utilization.

Natural Resource Industry Use Cases with Interface's products:

- **Resource Innovation**: Sensor technologies are utilized in R&D, identifying innovative ways to improve natural resource extraction, processing efficiency, and safety.
- **Mining and Quarrying Equipment Design and Testing**: Load cells and torque transducers can measure and monitor forces, loads, and weight in mining and quarrying equipment, such as excavators, loaders, and crushers.
- **Logging and Forestry Machine Regulatory and Safety Monitoring**: Load cells can monitor the forces and loads on logging and forestry machines, such as harvesters and forwarders.
- **Ground Stability Monitoring**: Interface sensors can monitor ground stability in mines, quarries, and construction sites.
- **Drilling Optimization**: Interface specialized load cells often measure and monitor the forces and loads on drilling rigs. This data can optimize the drilling process by adjusting the weight on the bit and the penetration rate.
- **Soil Preparation and Agrarian Management Devices**: Load cells and torque transducers can measure and monitor the forces and loads on soil preparation, farming tractors, and harvesters.
- **Water Resource Management**: Interface transducers can monitor river, stream, and canal water flow. This data can manage water resources effectively and predict flooding risks.
- **Dam Safety**: Load cells, such as load pins, help monitor the structural integrity, stability, and management of dams and spillways.
- **Mineral Processing Tools and Machines**: Load cells and torque transducers can measure and monitor the forces and loads on mineral processing tools and machines, such as crushers, grinders, and conveyors. They are frequently used in designing vehicles and equipment, specifically in weight optimization.

Interface products have the versatility and durability to meet the demands of the expansive natural resources industry. Equipment manufacturers, environmental scientists, machine component makers, and civil engineers rely on Interface. Contact us to learn more about our products and solutions

Natural Resources

- Intrinsically Safe Load Cells
- High Capacity Load Cells
- LowProfile™ Load Cells
- Torque Transducers
- Load Pins
- Load Shackles
- Multi-Axis
- Instrumentation
- Wireless Telemetry Solutions
- Gold Standard ™ Calibration
- Digital Instrumentation

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 natural resource 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.

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