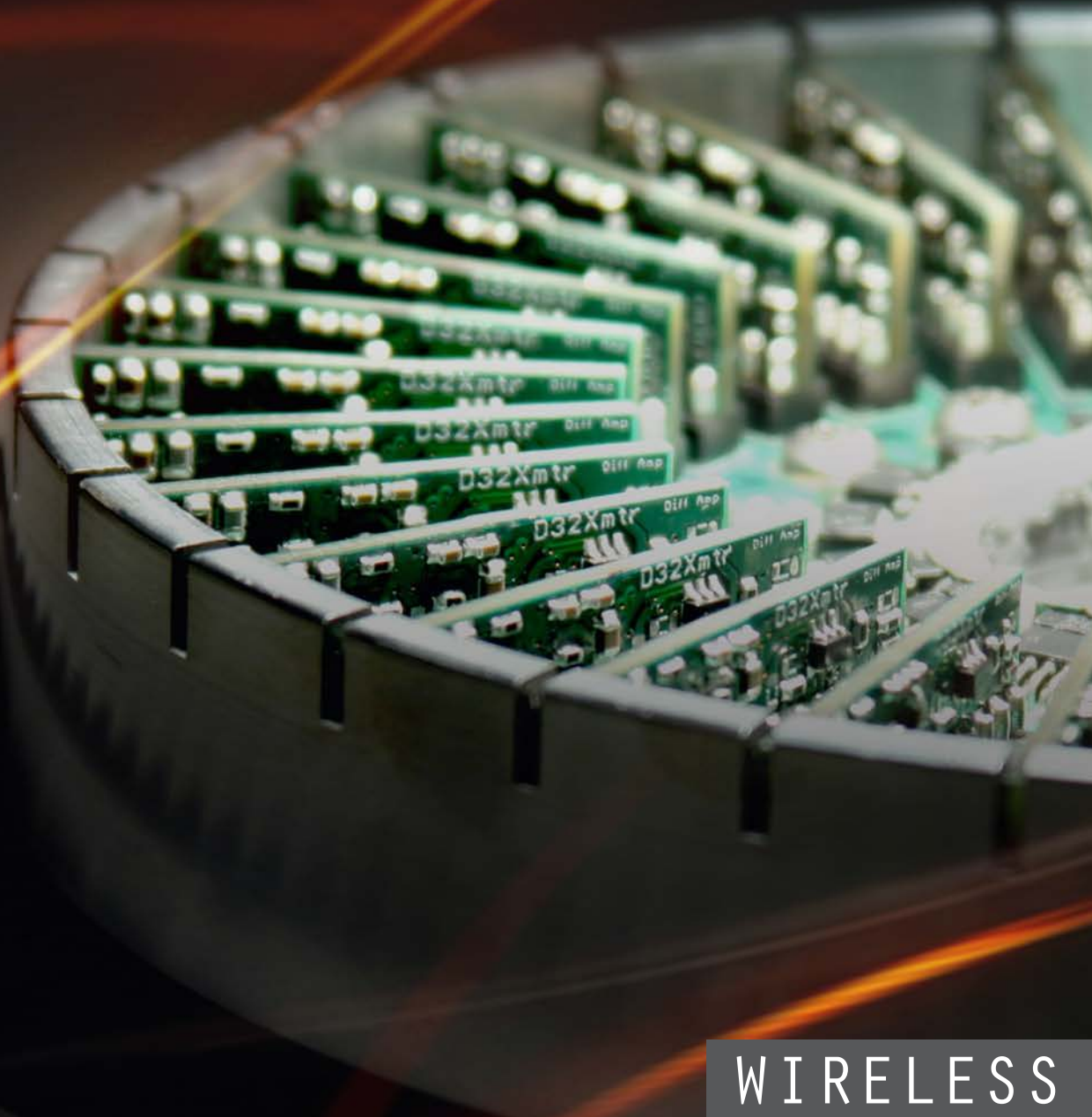


**IR**  **TELEMETRICS**



**WIRELESS  
MEASUREMENT  
SYSTEMS**

# REAL-TIME WIRELESS

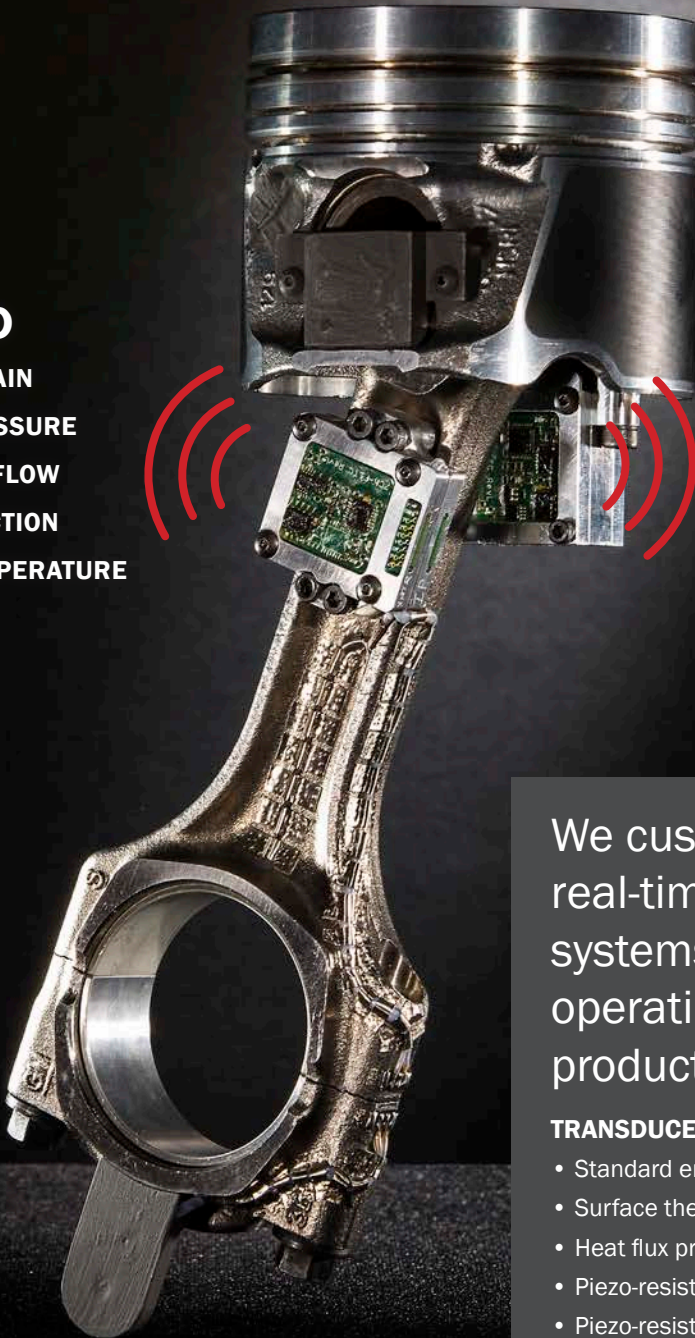
# DATA TRANSFER

## ROD

- STRAIN
- PRESSURE
- OIL FLOW
- FRICTION
- TEMPERATURE

## PISTON

- TEMPERATURE
- RING PRESSURE
- RING MOTION
- PIN MOTION
- STRAIN
- FRICTION

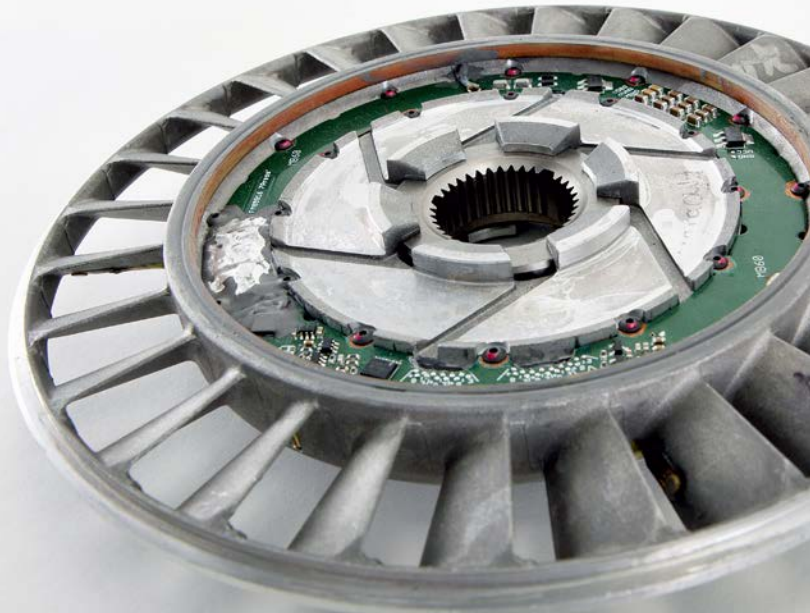


We custom build real-time data transfer systems for components operating in their production environment.

### TRANSDUCER TYPES INCLUDE:

- Standard embedded thermocouples
- Surface thermocouples
- Heat flux probes
- Piezo-resistive pressure transducers
- Piezo-resistive accelerometers
- Foil & semi-conductor strain gauges
- Inductive non-contact proximity sensors
- IRT quadrature rotation sensors
- IRT gear rotor flow meters





# ANALOG TELEMETRY SYSTEMS

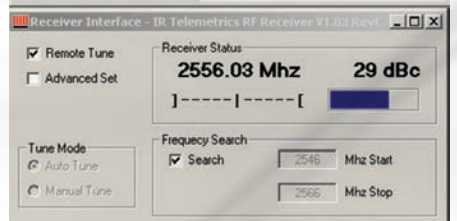
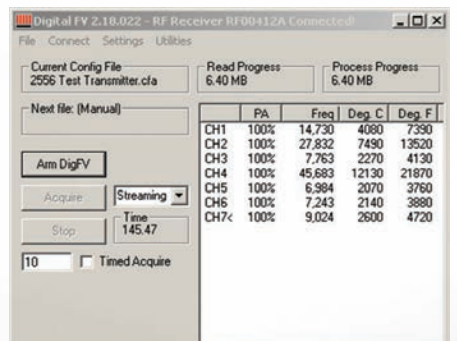
Our analog telemetry systems withstand the most extreme environments with battery or inductive power supplies.

The analog telemetry systems we develop utilize a high frequency RF signal and a double FM technique to provide accurate transmission of temperature, pressure, or other measurements under the most extreme environments. From high temperature environments to extreme g-loading, our analog systems hold up where other technologies fail—they are the choice of engine, turbine, and transmission manufacturers.

Transmitted measurements are demodulated by our analog receivers, such as our Model 5060, then demuxed by our proprietary DigFV data acquisition software operating on a standard PC. The results are immediately exportable to standard text formats for further analysis.

## SPECIFICATIONS

- Operating temperature: 185 °C
- Operating pressure: tested to 500 PSI
- G-loading: up to 6,000g reciprocating, 50,000g rotating
- Bandwidth: 10kHz
- Accuracy: +/- 1% full scale range





## 8 - CHANNEL DIGITAL

# TELEMETRY SYSTEMS

### Our 8-channel digital telemetry systems deliver economical data transmission.

We achieve high simultaneous data transfer rates in our digital transmitters using our proprietary infrared transmission technology or inductive coupling technology. This system simultaneously transmits data from 8 independent sensors at a 12.5 kHz sampling rate per channel, often used to transmit measurements from rotating or reciprocating components.

With up to 8 channels and 12.5k samples per second, this is an economical solution suitable for measurements on rotating equipment. The system is available in multiple channel configurations, allowing real-time data acquisition of both steady state and transient conditions. The 8-channel digital transmitter can measure temperature, pressure, strain, and acceleration in any combination.

#### SPECIFICATIONS

- Maximum number of data channels: 8
- Sample rate: 12.5 kS/s
- Resolution: 12 Bit
- Maximum operating temperature for transmitter: 150 °C
- Maximum g-loading rotation: 50,000 g's



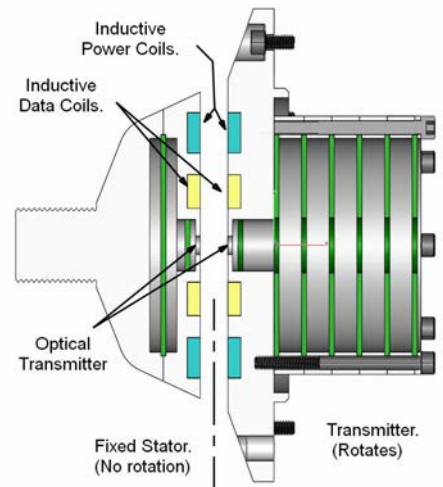


# 32-CHANNEL DIGITAL TELEMETRY SYSTEMS

Our 32-channel digital telemetry systems provide unrivaled high-speed data transmission.

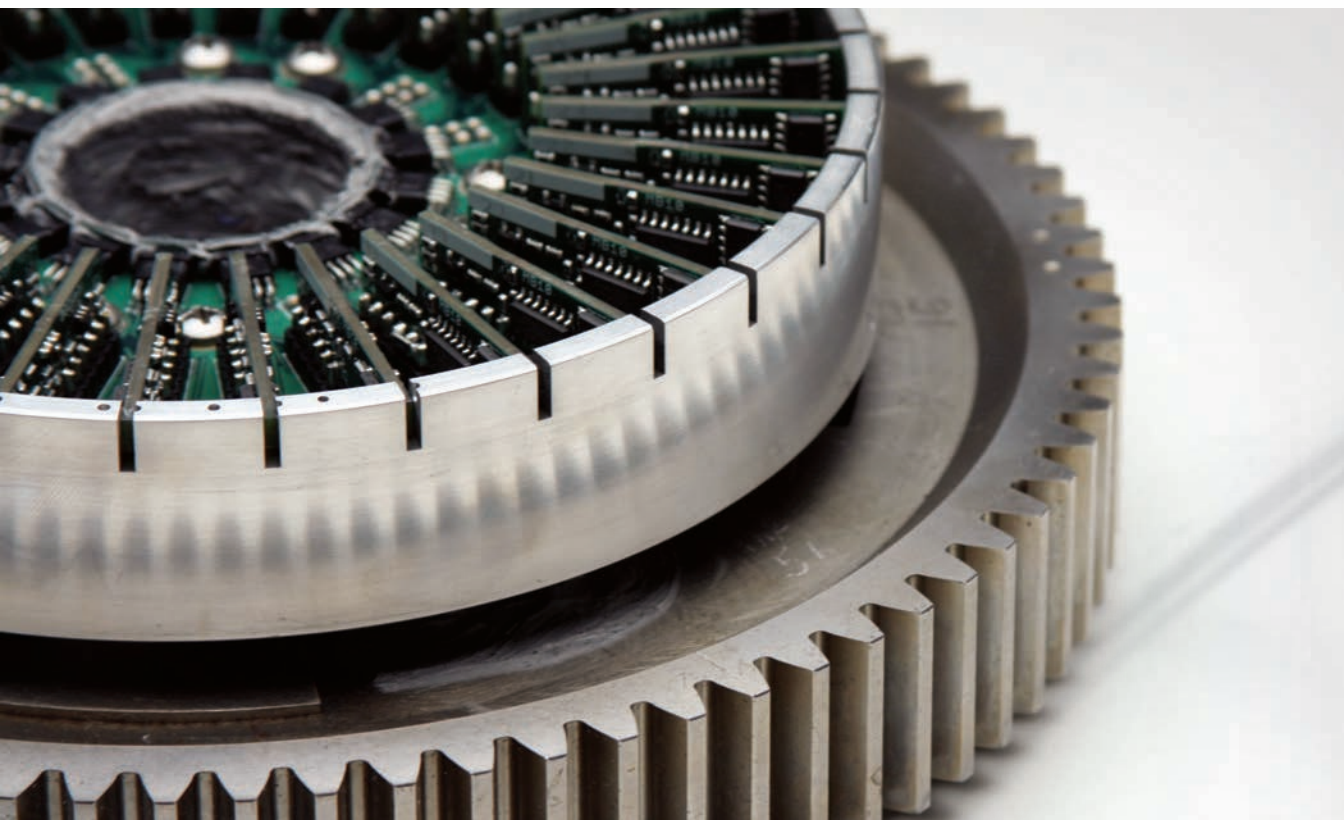
The 32-channel transmitter delivers high data transfer rates using our proprietary infrared transmission technology or inductive coupling technology. Simultaneously transmitting data from 32 independent sensors at 50 kHz sampling rate measured on rotating or reciprocating components, we set a new standard for high performance telemetry systems. The 32-channel system can transmit using IR LEDs or transmit inductively, coil to coil.

Available in multiple channel configurations, our 32-channel digital transmitter allows for real-time data acquisition of both steady state and dynamic conditions. It can convey data for temperature, pressure, strain, and acceleration in any combination.



## SPECIFICATIONS

- Maximum number of data channels: 32
- Sample rate: 50 kS/s
- Resolution: 14 Bit
- Maximum operating temperature for transmitter: 125 °C
- Maximum g-loading rotation: 50,000 g's



# WIRELESS DATA TRANSFER

- FROM ANY COMPONENT
- FOR ANY TRANSDUCER TYPE
- IN ANY ENVIRONMENT

3 ROD BOLTS



2 ROD



1 PISTON



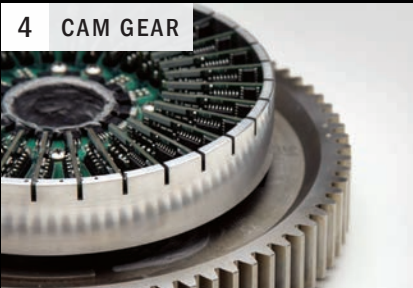
6 VALVE



5 CAM SHAFT



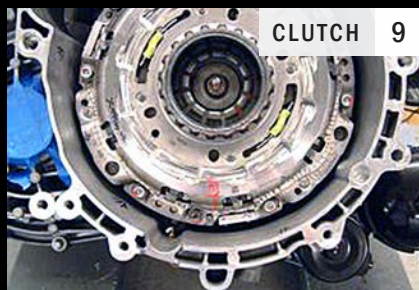
4 CAM GEAR







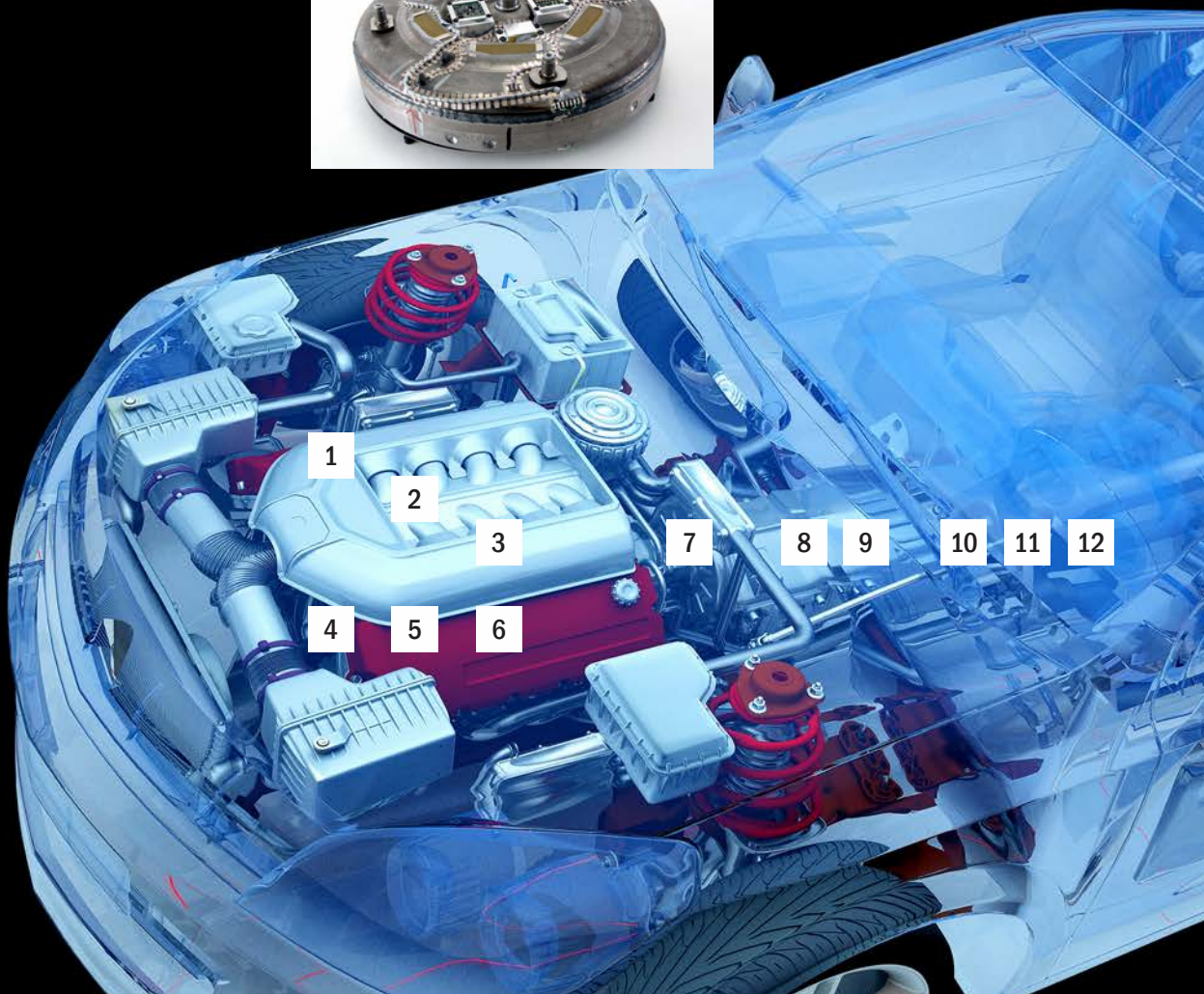
CRANK SHAFT 7



CLUTCH 9



TORQ CONV 8



1

2

3

7

8

9

10

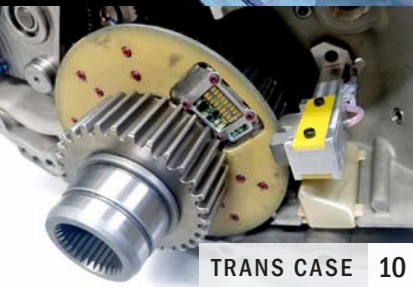
11

12

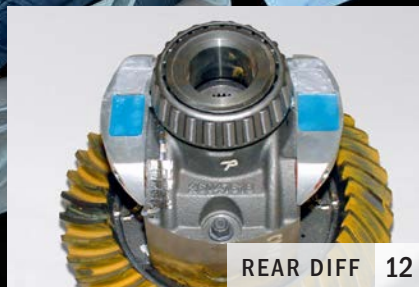
4

5

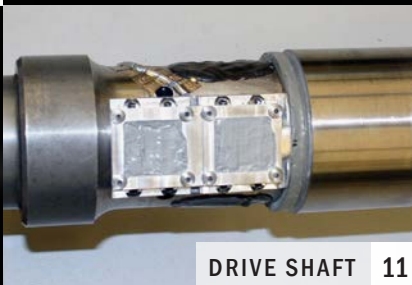
6



TRANS CASE 10



REAR DIFF 12



DRIVE SHAFT 11

# LIQUID FLOW TRANSDUCER

Liquid flow measurement technology enables engineers to optimize performance.

Our liquid flow transducer utilizes custom built gear-rotor technology along with our proprietary rotation sensor—coupled to its wireless transmitter—to provide fluid flow rate, total quantity of flow, and direction of flow. This transducer can be installed in small passageways due to our custom fabrication capabilities.

With positive displacement technology, our flow transducer is capable of measuring very small flow rates. Nearly any moving machinery component with internal fluid flows can be instrumented with this transducer coupled to our wireless data transmitters.



# ANGULAR VELOCITY

# & ROTATION SENSOR



Our rotation sensor provides accurate angular data from operating systems.

Utilized to measure the rotational displacement, direction, velocity, acceleration, and number of rotations over the course of a test cycle, our rotation sensor generates values that provide insight to a wide range of system parameters used to inform lubrication and bearing design.

By optimizing these factors, engineers can reduce losses and improve overall system performance and efficiency. For years, leading manufacturers have relied on data from our rotation sensor to guide their design optimization.



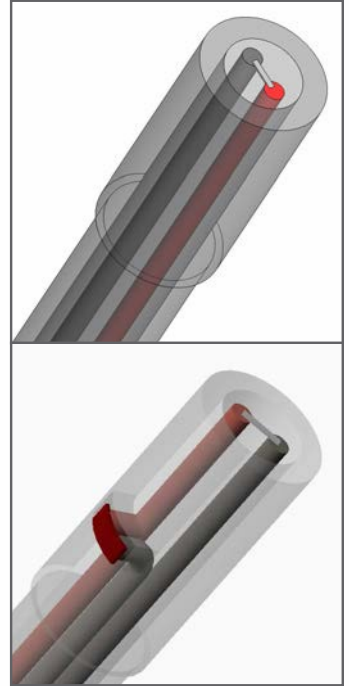
# SPECIALTY THERMOCOUPLES

## Fast response surface thermocouples and heat flux probes assist in the evaluation of heat transfer.

We custom build surface thermocouples which can measure high-speed transient surface temperatures, such as those encountered on the crown of a piston and can be especially significant for understanding the combustion event and for evaluating material property limits in the piston.

For instance, highly sensitive and high-speed surface thermocouples can distinguish between flame and liquid fuel impinging on the surface. These measurements increase the understanding of the physical combustion event and help improve the performance and efficiency of the engine.

A surface temperature measurement combined with a sub-surface temperature measurement built in the same transducer can also provide a heat flux measurement.



# HARSH ENVIRONMENT

## DATALOGGER

## Capture temperature or pressure under extreme conditions with our self-contained data logger.

Extreme environments are no match for our DX-50 datalogger. This sealed, compact device measures and records pressure or temperature in manufacturing, chemical, pharmaceutical, or food industries. Our harsh environment measurement system can be configured to operate in nearly any environment, including corrosive liquid immersion.

Keeping the complete design in-house enables us to machine the enclosure from corrosion resistant 316 L stainless or even Hastelloy. By packaging the entire system—transducer and datalogger—into a sealed, machined package, our customers can drop the system in high pressure or temperature environments.

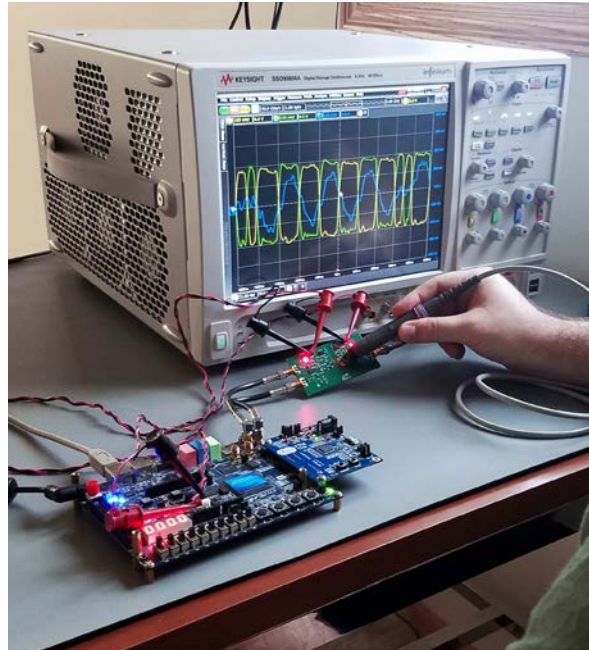


# ELECTRICAL ENGINEERING SERVICES

Leverage our decades of experience developing and deploying telemetry solutions.

With expertise in electrical engineering, we are able to obtain measurements that were not previously possible. Because we produce our systems completely in-house, our team of electrical and electronics engineers can assist with the design of:

- Custom electronics & boards
- Electronic sensors
- Electromechanical devices
- Electromagnetic systems
- Custom software & algorithms



# MECHANICAL ENGINEERING SERVICES



We get transducers where you need them.

Our engineering staff is highly experienced in component design, development, and validation.

We can assist your engineers with:

- Measurement techniques
- Test plan development
- Failure mode analysis
- Troubleshooting field problems
- Data interpretation & analysis

The comprehensive approach we follow with our customers enables us to ensure the successful execution of each measurement system. Our telemetry technologies and machine shop combine to yield extremely rapid execution of our engineering services.



TRUSTED BY OUR CUSTOMERS

FOR 26 YEARS



CATERPILLAR®



NAVISTAR

MAHLE



ROUSH.



KOHLER.



PACCAR



ETAGEN



# WIRELESS MEASUREMENT SYSTEMS

We can custom build a data transfer system for any internal/external component, regardless of the packaging constraints surrounding it, or the high speed and temperature it may be subjected to.



**IR**  **TELEMETRICS**

PO BOX 70 | HOUGHTON, MI 49931 | USA

+1 906.482.0012 | IRTELEMETRICS.COM