TE SENSOR SOLUTIONS

TE SENSOR SOLUTIONS

TE Connectivity (TE) is a global technology leader, providing connectivity and sensor solutions essential in today's increasingly connected world. TE is one of the largest sensor companies in the world. Our sensors are vital to the next generation of data-driven technology. We offer an unmatched portfolio of solutions for applications across a wide range of industries, including Automotive, Industrial, Medical, Appliance, Aerospace & Defense, and Industrial and Commercial Transportation. Our technologies enable measurement capabilities such as pressure, temperature, position, vibration, humidity and fluid property, to name a few. Our engineers help transform concepts into creations — redefining what's possible using intelligent, efficient and high performing TE products and solutions proven in harsh environments.

MARKETS SERVED

SENSOR TECHNOLOGIES

AEROSPACE & DEFENSE

APPLICATION SOLUTIONS

When quality and reliability are paramount, aerospace & defense companies rely on our technology to help solve mission critical challenges. Our core competencies in high reliability sensors for harsh environments such as temperature extremes, RFI, EMI, vibration, and lightning strikes make us a leading choice in sensor technology. Our design engineering capabilities, as well as AS9100 certified sensor manufacturing facilities in North America, Europe and Asia Pacific, support Tier 1, 2 and 3 providers. Regional design and manufacturing capabilities enable us to provide ITAR-free designs and supply products closer to our customers. We work closely with the customer to provide stable, reliable and cost effective solutions that meet the extensive development cycles and qualifications critical to aerospace & defense.

Cockpit Controls

- Automatic autopilot disconnect force sensors
- Motorized potentiometers for position feedback
- Brake pedal position sensors
- Rotary panel switches and sensors
- Force sensors for flight data recording of pilot inputs
- Throttle quadrant position sensors
- Flap and spoiler lever position sensors

Flight Controls & Actuation

- High lift load sensors
- THSA secondary load path engagement sensors
- Aileron LVDT position sensors
- Resolvers for flap and slat position monitoring
- Force and position sensors for spoiler electromechanical actuation
- Brake actuator force sensors for rotorcraft

Landing Gear & Brakes

- Brake torque sensors
- Pressure sensors for nose wheel steering feedback
- Resolvers for steering position
- Load on wheels force sensors
- Center of gravity force sensors

Cabin, Galley & Cargo

- Cabin pressure indicator sensors
- Waste tank level sensors
- Environmental cabin control pressure sensors
- Cargo humidity sensors
- Galley temperature sensors
- Air quality temperature sensors
- Oxygen generation pressure transducers

Launch & Space

- Payload monitoring vibration sensors
- Thrust vectoring LVDT position sensors
- Electrical actuator position resolvers
- Booster separation potentiometers
- Cryogenic fuel pressure transducers
- Satellite temperature sensors
- Mirror/antenna position LVDT sensors

Engine, Turbine & APU

- Thermocouple harnesses for exhaust gas temperature
- LVDT for thrust reverser position monitoring
- Platinum 200 air temperature sensors
- Variable bleed valve LVDT position sensors
- Rotor track and balance accelerometers
- Health and Usage Monitoring Systems (HUMS) accelerometers
- Thermistor heater fuel tank level and flow

Military (Missile, Ground Vehicle, Marine, UAV)

- Missile fin actuation
- Fuel tank level and flow sensors
- Gun stabilization and shock measurement
- Tamper detection for missiles
- Electronic safe arm and fire
- Oil pressure and temperature sensors
- Airspeed and altitude sensors

APPLIANCES

Today's smart and green appliances are built using more efficient designs, meeting the latest regulations while saving energy, water and time. Customers rely on our sensor technologies to enable appliances to respond to human touch, sense vibration, adjust to loads, and operate more efficiently. We work to develop custom solutions that can monitor humidity and water levels, and temperature. Our products contribute to new levels of convenience and productivity in a wide range of household appliances.

APPLICATION SOLUTIONS

Clothes Dryer

- Humidity sensor monitors process humidity and stops the dryer when clothes are dry
- Thermopile measures clothing temperature to prevent overheating and fabric damage
- Force sensor measures payload weight at the beginning of the cycle

Cooktop

- Temperature sensor monitors glass surface temperature for cooking control and "hot" indication lights for user safety

Dishwasher

- Magnetoresistive (MR) sensor and magnet verifies spray arm rotation
- Temperature sensor measures water temperature and controls heating elements
- Liquid level sensor monitors water level and detergent dispenser level

Household Oven

- Temperature probe monitors cooking temperature
- Temperature sensor monitors pyrolytic cleaning temperature and controls door latch

Microwave Oven

- Humidity sensor monitors food moisture content during cooking
- Thermopile measures food temperature without physical contact
- Force sensor measures food weight on the turntable

Refrigerator

- Temperature sensor monitors the freezer and refrigerator cabinets as part of the control system
- Humidity sensor monitors humidity in produce drawers and compartments
- Humidity sensor monitors ambient room humidity to help manage frost prevention and doorframe condensation

Small Appliances

- Temperature sensor measures liquid and heating element temperatures in toaster ovens, coffee makers, and popcorn poppers
- Humidity sensor monitors relative humidity and steam production for espresso machines, and clothes steamers

Washing Machine

- Temperature sensor measures water temperature and controls heating elements
- Pressure sensor monitors water level
- Vibration sensor detects out-of-balance conditions during spin cycle
- Proximity sensor verifies door closed and latched before start of the wash cycle
- Force sensor measures payload weight at the beginning of the wash cycle

AUTOMATION & CONTROL

Automation & Control includes a wide range of industrial applications that span all markets, and at all levels, from the factory floor and process end users, to integrators and large scale OEM production. Industrial production is increasingly driven by greater automation, safety and energy efficiency. Our broad portfolio of products offers many options to meet custom performance, application and regulation/certification requirements.

APPLICATION SOLUTIONS

Pressure Sensing

- Analog and digital pressure sensing modules
- Altimeter pressure module
- Media isolated pressure sensing modules
- Heavy industrial pressure transducers
- Miniature pressure transducers
- Corrosion-resistant pressure transducers
- Differential pressure transducers

Fluid Sensing

- Ultrasonic liquid level sensors
- Fluid property sensors
- Submersible pressure sensors

Temperature Sensing

- RTDs
- Thermocouples
- Temperature probes

Motion Control

- String and linear potentiometers
- LVDTs and RVDTs
- Rotary encoders and tilt sensors

Vibration Sensing & Position/Presence Sensing/Detection

- LVDT
- Load cells
- MR sensors
- Accelerometers
- Inclinometers

Force & Torque Sensing

- Load cells and multicomponent force sensors
- Contact/non-contact torque sensors

Humidity Sensing

- Humidity sensing modules
- Digital humidity sensors and assemblies

AUTOMOTIVE

Data is critical for making vehicles safer, more connected and greener. Customers rely on our sensor technologies to provide data for control, adaptation and response of vehicle functions and features that increase safety, comfort, efficiency, and more. We work closely with customers to provide solutions for demanding and harsh applications such as automated transmissions, engines, clutch, brake and exhaust. Our products are found in vehicles traveling the world's roads and highways.

APPLICATION SOLUTIONS

Transmissions & Clutch

- Drive mode sensors and transmission range sensors for automated transmissions
- Speed sensors for automated transmissions
- Dual clutch transmission modules with position, speed and temperature sensing
- Neutral position or all gear detection for manual transmissions
- Clutch master and clutch slave cylinder sensors
- Pressure sensors for automated transmission hydraulic pressure measurement

Chassis & Brake

- Current sensing
- Brake light switches in the pedal box or on the brake master cylinder
- Brake pressure sensors
- Seat position sensors
- Weight classification
- Wheel speed sensors
- Chassis switches for convertible roof tops
- Impact sensors

Engine & E-Motor

- Engine air intake humidity, pressure and temperature sensing
- Direct injection pressure sensors
- Resolver sensors for E-Motors
- Actuator sensors for EGR or turbo charger

Cabin

- Humidity and temperature sensors

CONSUMER

Whether it's an altimeter built into a wearable band to measure how many steps we climb each day, or a sports watch charting the ascent up one of the world's highest mountain peaks, our miniature sensors are used to convey critical information for the dashboard of our daily lives. Our dive computer sensors help provide safety in leisure activities, while our piezo film enables your bed to monitor your heart rate, breathing and even how well you sleep. We've been making sensors for wearables before there were wearables. We're recognized for our technical skill in miniaturization, low power consumption, and high-performance. That's why our sensors are in harsh environments, from the world's highest parachute jump to the deepest dive.

APPLICATION SOLUTIONS

Mobile (Smart) Phones

- Barometric pressure sensor to measure altitude and in-building telemetry for emergency call
- Humidity sensor for personal environment adaption and home comfort control system

Multi-Function Watches

- Barometric pressure sensor to measure altitude and in-building telemetry
- Photo optic (SpO_2) sensor for heart-rate monitoring
- Altimeter to measure floors climbed and calorie estimation

Fitness Equipment

- Force sensor for pedal force and energy measurement

Sleep Monitors

- Piezo film detects body movement and vital signs to determine sleep phase and quality

Dive Computers

- Water pressure sensor to measure dive depth

Hobby Drone/Unmanned Aerial Vehicles (UAV)

- Barometric pressure sensor to regulate and report altitude and confirm vertical stability
- MR sensors for the camera 3D stabilization platforms
- NTC temperature sensors to monitor charging for high capacity LiPo batteries

Air Quality Monitors/ Room Comfort

- Humidity sensor for personal environment adaption and home comfort control system
- Miniature digital pressure sensor for barometric pressure

Weather Stations

- Miniature digital pressure sensor for barometric pressure and trend
- Miniature digital humidity sensor for atmospheric humidity and trend
- Reed switch or MR sensor for wind-speed measurement
- Temperature sensor for environmental monitoring

Smart Writing Tools

- Piezo film ultrasonic components in smartphone and whiteboard digitizers for graphics and handwriting capture

GPS Devices

- Barometric pressure sensor for altitude and navigation dead-reckoning

Cycle Computers

- Barometric pressure sensor for altitude profile and energy consumption

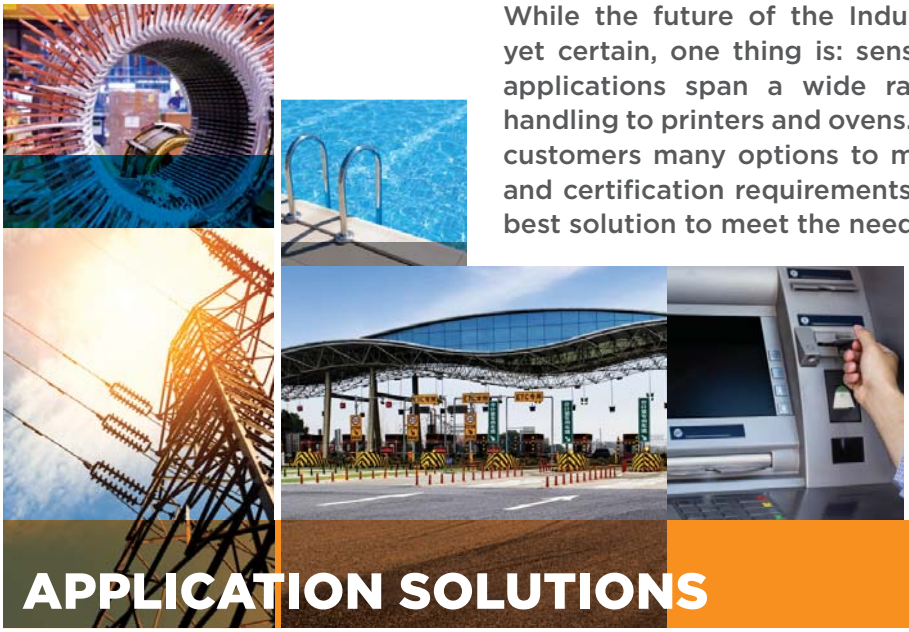
Smart Scales

- Force sensor for body weight
- Barometric compensation for air quality sensor

Smart Sensor Hub

- TE Connectivity offers a variety of smart sensor hub development tools optimized to aid engineers with integrating sensors into their product designs

INDUSTRIAL



While the future of the Industrial Internet of Things (IIoT) is not yet certain, one thing is: sensors will play a critical role. Industrial applications span a wide range of applications, from banknote handling to printers and ovens. Our broad portfolio of products offers customers many options to meet specific performance, application and certification requirements. We work closely to help identify the best solution to meet the needs of the customer.

APPLICATION SOLUTIONS

Pressure Sensing

- Analog and digital pressure sensing modules
- Altimeter pressure module
- Media isolated pressure sensing modules
- Heavy industrial pressure transducers
- Miniature pressure transducers
- Corrosion-resistant pressure transducers
- Differential pressure transducers

Fluid Sensing

- Ultrasonic liquid level sensors
- Fluid property sensors
- Submersible pressure sensors

Temperature Sensing

- RTDs
- Thermocouples
- Temperature probes

Motion Control

- String and linear potentiometers
- LVDTs and RVDTs
- Rotary encoders and tilt sensors

Vibration Sensing and Position/Presence Sensing/Detection

- LVDT
- Load cells
- MR Sensors
- Accelerometers
- Inclinometers

Force and Torque Sensing

- Load cells and multicomponent force sensors
- Contact and non-contact torque sensors

Humidity Sensing

- Humidity sensing modules
- Digital humidity sensors and assemblies

INDUSTRIAL & COMMERCIAL TRANSPORTATION





When performance and reliability count, engineers rely on us to help solve tough industry challenges such as emissions reduction, power train improvement and added comfort. We're a leader in providing sensor technologies and associated software/diagnostic capabilities built on market experience and technical expertise. We work closely with customers to design and provide solutions critical for a wide range of harsh and demanding applications, including exhaust, engines, transmissions, braking, suspension and cabins.

APPLICATION SOLUTIONS

Engine Management

- High pressure common rail exhaust manifold pressure, fuel pressure, oil pressure
- Humidity air intake monitoring, Nitrogen Oxide (NOx) emissions management
- Engine oil fluid level
- Coolant fluid level
- Low oil level switch
- Engine oil condition, fuel identification and quality
- Cam/crank shaft speed
- Engine oil temperature
- Air intake flow

Aftertreatment Systems

- Urea temperature, urea tank or urea pump
- In-line urea quality, direct integration to urea dosing line
- In-tank urea quality, level, heating and temperature assembly
- Urea pressure, urea tank or urea pump
- High temperature exhaust gas
- Valve position (EGR, SCR)

Transmission

- Transmission oil pressure
- Transmission oil level
- Clutch position
- Dual clutch transmission module
- Transmission oil quality
- Transmission input and output speed
- Transmission oil temperature

Vehicle Control & Management

- Anti-tilt and ride stability
- Hydraulic fluid condition
- Hydraulic fluid pressure
- Fuel level
- Short to long stroke boom position
- Hydraulic oil level
- Load pin
- Power steering fluid level single or multi-point
- Steering control, hydraulic spool valve
- Air brakes

Cabin & Occupant Safety

- Anti-fogging and HVACR
- Moving parts for rotary position
- Seat occupancy
- Cab and seat level
- Seat, handbrake and footbrake position
- Safety interlock switches
- HVACR system control
- Ambient air temperature
- Brake light switch

INTELLIGENT BUILDINGS

Buildings today require reliable solutions to confirm they are operating safely and efficiently. As a global designer and manufacturer of sensors and sensor-based systems, we work closely with building engineers in both the development and instrumentation of automated systems. Our sensors are designed and manufactured to exacting specifications, often on a custom basis. Together with our customers, we are working to solve today's toughest challenges. Our portfolio can address the breadth and depth of applications needed for today's intelligent buildings.

APPLICATION SOLUTIONS

Burners & Boilers

- Inlet and outlet water temperature
- Inside and outside air temperature
- Level detection

Chillers, Compressors & Heat Pumps

- Inlet and outlet refrigerant temperature and pressure
- Inside and outside air temperature
- Motor temperature, oil pressure, and temperature

Wall-mount Units & Field Devices

- Air temperature and humidity
- Damper position
- Air differential pressure

Variable Air Volume (VAV)

- Inlet and outlet air temperature and pressure
- Air humidity

Elevators

- Elevator car position

Security

- Door and window position

MEDICAL

Because accurate monitoring, diagnosis and treatment counts, today's medical devices rely on our high-performance sensor technologies to meet exacting specifications, including ISO 13485 certification and FDA registration. We are a leading provider of sensor solutions to the medical device market. Our engineers work with device manufacturers to provide application-specific, standard and custom requirements, from product concept through manufacturing. Our sensors meet the rigorous demands of a wide range of medical and healthcare applications.

APPLICATION SOLUTIONS

Cardiovascular Monitoring & Diagnosis

- Disposable blood pressure sensor
- Piezo film for electronic stethoscope
- Piezo film sensor for heart rhythm monitoring
- Photo optic sensors for pulse oximetry (SpO_2)
- Miniature NTC thermistors for thermo dilution
- Piezo ultrasonic transducers and temperature sensors for ultrasound imaging

Cardiovascular Treatment

- Force, pressure and temperature sensors for ablation catheter
- Silicon MEMS pressure sensor for angioplasty balloon inflating pump
- Temperature sensors and silicon MEMS pressure sensors for blood transfusion and oxygenation systems
- Silicon MEMS pressure sensor for contrast dye infusion
- Piezo film for discrete vital signs monitoring
- Temperature sensors for myocardial needle probes
- Piezo film and position MR sensor for pacemaker
- Variety of sensor solutions for ventilators and respirators

Patient Monitoring & Diagnosis

- Microfused load cell for body weight
- Piezoelectric transducers for bone density
- Piezo film for hospital bed vital signs
- Temperature sensor for skin temperature
- Pressure and temperature sensors for urinary catheters and urodynamic testing
- Variety of sensors for sleep apnea studies
- Thermopile for non-contact thermometry
- Thermistors for contact thermometry

Patient Treatment

- MR sensor for insulin pump
- Ultrasonic sensor for bubble and liquid level detection
- Variety of sensor solutions for dialysis machines, infusion pumps and smart beds
- Silicon MEMS pressure sensor for hospital gas monitoring
- Humidity and temperature sensors for premature newborn cabinet
- Variety of sensor solutions for ventilators and respirators
- Force sensors for infusion pumps

Surgical/Delivery

- Silicon MEMS pressure sensor and piezo film for assisted baby delivery
- Miniature temperature sensors for brain tumor hypodermic needle probes
- Force and pressure sensors for endoscopic surgery
- Low-cost miniature silicon MEMS pressure sensors for intrauterine monitoring during labor
- Silicon MEMS pressure sensor for ocular surgery
- Temperature sensor for patient warming/cooling
- Cable extension sensors and rotary encoders for robotic surgery
- Variety of sensor solutions for surgical devices and instruments
- Piezo film sensor for anesthesia delivery

Home & Mobile Health Care/Wearable Medical Devices

- Sensors for wearable health devices
- Sensors for mobile infusion and insulin pumps
- Sensors for mobile oxygen delivery
- Altitude pressure sensor for patient fall detection

OIL & GAS

The energy market continues to face new challenges with deeper drilling, higher temperatures and higher pressures. Our latest sensor technologies with new electronics, materials, and design packages provide safe, reliable, and accurate data measurements—all while enduring some of the harshest application environments on earth. By combining application expertise and global hazardous location certifications, our broad portfolio of standard designs and custom packages are helping to improve performance and reliability for the oil and gas industry.

APPLICATION SOLUTIONS

Sub-sea Valve Position Feedback

- Nickel alloy construction for maximum corrosion resistance for 30 year life expectancy
- Latest analog and digital signal processing including CANbus CiA443
- Sub-sea pressure up to 7,500 psi (517 bar)

Power Generation Valve Position

- Valve position measurement for high temperature steam, gas and nuclear turbines
- CSA and ATEX intrinsically safe certified for hazardous locations
- Signal conditioning with analog and digital RS-485 outputs

Down-hole Borescope Position Sensing

- High pressure designs (Vented designs up to 35,000 psi)
- Continuous operation at 400°F
- Custom designs and packages available

Upstream Well-head Monitoring

- Global certifications including UL, CSA, ATEX, and IECEx
- Latest sensing MEMS technology with solid stainless steel or alloy construction
- Low current consumption options for RTU/SCADA applications

Gas Compression

- Certified for Class I Divisions I and II, ATEX, and IECEx
- Gage, compound, bidirectional, absolute, and differential pressure ranges
- Compact designs

Offshore Rigs

- Intrinsically safe and explosion proof designs up to 20,000 psi (1,379 bar)
- IEC 61508 SIL2 certification
- High strength nickel alloy for high H2S content
- BOP transmitter packaging with sub-sea connectors

Hydraulic Fracturing Equipment

- Hammer union pressure transmitters with modular design
- Flush diaphragm pressure transducers for water pressure monitoring
- Robust temperature transmitters

Work Boats

- ABS type approval
- Flush diaphragm sensors for ballast level monitoring
- PVDF/PTFE submersible sensors for tank level measurement

Chemical Tanks & Totes

- Internally and externally mounted pressure transducers from 1 psi
- Optional PVDF/PTFE materials for corrosive liquids
- Intrinsically safe ratings for hazardous areas

TEST & MEASUREMENT

Our sensors for test and measurement applications support customers across all of our market verticals. Our sensor technologies and engineering capabilities are used for product research, development, testing and evaluation (RDT&E). Each of these critical areas has unique technology and performance requirements. We work closely with RDT&E engineers to determine the right solution, as our broad portfolio can address the breadth and depth of applications across a number of markets.

APPLICATION SOLUTIONS

Aero Test: Aerodynamic Research and Flight Testing

- Pressure scanners for turbine engine R&D for aircraft and power generation
- Pressure scanners to facilitate aerodynamic testing in wind tunnel
- Pressure scanners used in rotorcraft and aircraft flight testing

Auto Test: Automotive Safety & Design Testing

- Accelerometers for use in automotive crash testing
- Force sensors used in seat belts and crash test dummies
- Pressure and position transducers designed for use in motorsport

Road Traffic Monitoring

- Complete solutions and installation support for weigh-in-motion, speed and vehicle classification/count applications

Environmental Monitoring/ Water Monitoring

- Pressure sensors for monitoring water usage (i.e. waste water)
- Level transducers used in managing water resources (i.e. reservoir)

Test Equipment & Instrumentation

- Standard and custom sensors supporting aerospace and defense industries
- Broad array of sensors supporting general R&D in academic, public and private sectors

SENSORS & MARKETS

	Aerospace & Defense	Appliances	Automation & Control	Automotive	Consumer	Industrial	Industrial & Commercial Transportation	Intelligent Buildings	Medical	Oil & Gas	Test & Measurement
Automotive				●			●				
Digital Component					●						
Flow		●		●		●	●	●	●		
Fluid Property	●			●		●	●				
Force	●	●	●		●	●	●		●		●
Humidity	●	●		●	●	●	●	●	●		●
Liquid Level	●	●				●	●	●	●		
Photo Optic									●		
Piezo Film	●				●	●			●		
Position	●	●	●	●	●	●	●	●	●	●	●
Pressure	●	●	●	●	●	●	●	●	●	●	●
Rate and Inertial	●					●					●
Scanners and Systems											●
Temperature	●	●	●	●	●	●	●	●	●	●	●
Torque			●			●					●
Ultrasonic						●			●		●
Vibration			●			●					●
Water Level			●			●					●

Measurement Specialties (MEAS) Quality Certificates:

- AS/EN 9100
- ATEX
- ATEX 949EC
- CE-MDD
- CMDR–Health Canada
- EN 13980
- ESA 266
- ESCC266E
- ESCC 400C
- FDA
- ISO 13485
- ISO 14001
- ISO 9001
- Measuring Instruments Directive 2004/22/EC annex D
- NASA Qualified
- NSF-61 Water Quality
- PART21G
- TS 16949

American Sensor Technologies (AST) & Macro Sensors (MACRO) Approvals/Certifications:

- ABS
- ATEX
- CCOE
- CNEX
- CRN B31.3
- CSA
- CE
- EC 79
- IEC 61508
- IECEx
- ISO 9001
- KGS (Korean Gas Safety)
- UL

AUTOMOTIVE SENSORS

TE sensors have become an integral part of many modern vehicle architectures, or nervous systems. Our sensor technologies for passenger cars provide data for control, adaptation, and response of vehicle functions and features that make vehicles safer, greener and more connected.

ENGINE/EXHAUST SENSORS

							
	Multi-Coil Resolver (MCR) Sensor	**Single-Coil Resolver (MCR) Sensor**	**Turbocharger Pneumatic Actuator Position Sensor**	**Turbocharger Pneumatic Actuator Position Sensor**	**MEAS LMM-H03 / LMM-H04**	**MEAS U86B**	**MEAS Radial Leaded Thermistors**
Industry	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car
Application	E-motor for hybrid and electrical vehicles	E-motor for hybrid and electrical vehicles	Turbo charger	Turbo charger	Air intake of combustion engine	Urea pressure	Ambient air temperature
Functions	Measuring rotor position of E-motor	Measuring rotor position of E-motor	Measuring piston position of pneumatic actuator (Vacuum)	Measuring piston position of pneumatic actuator (Vacuum)	Mass air flow (MAF)	Vehicle engine control	Temperature monitoring
Technology	MCR (Multi-coil resolver)	SCR (Single-coil resolver)	PLCD	3D Hall (Moving magnet)	Flow sensor	Pressure sensor	Temperature sensor
Features	• Non-contact measurement of rotor position • Analog output • High accuracy • Temperature up to 150°C • Rotational speed up to 20,000 rpm • Adaptable to pole pairs of E-motor	• Non-contact measurement of rotor position • Analog output • High accuracy for high temperature applications • Slim design for IMG applications in combination with oil • Rotational speed up to 20,000 rpm • Adaptable to pole pairs of E-motor	• Non-contact travel measurement inside the actuator • Unguided magnet • Wear and tear free • High life time accuracy	• Non-contact travel measurement inside the actuator • Unguided magnet • Wear and tear free • High life time accuracy	• High sensitivity at low heater temperatures • Fast response time • True air temperature sensor • Hot film anemometer component • Hybrid package	• Amplified • Mountable with o-ring seal • Stainless Steel wetted surface • ASIC calibrated • Absolute, sealed gage • Analog output • Cable option	• Epoxy or glass coated • Radial, beads • Interchangeable • Moisture resistant • Stability

BRAKE SENSORS

					
	Brake Cylinder Position Sensor	**Brake Light Sensor**	**Brake Light Sensor (Self-Adjusting Features)**	**Wheel Speed Sensor (Option 1)**	**Wheel Speed Sensor (Option 2)**
Industry	Passenger car	Passenger car	Passenger car	Truck / Passenger car	Truck / Passenger car
Application	Regenerative braking	Pedal box	Pedal box	Anti-lock brake system	Anti-lock brake system
Functions	Measuring piston position of brake master cylinder	Measuring brake pedal position	Measuring brake pedal position	Wheel speed detection	Wheel speed detection
Technology	Active PLCD (Moving magnet)	Hall switch (Magnet integrated in sensor)	Hall switch (Magnet integrated in sensor)	Hall (Magnet integrated in sensor)	Hall (Magnet integrated in sensor)
Features	• Non-contact travel measurement through cylinder wall • Optional redundancy	• Easy adjustment to brake pedal • High switching point accuracy • No wear and tear • Two and three wire interface available	• Easy adjustment to brake pedal (Self-adjusting features) • High switching point accuracy • Redundancy	• Long life time and high reliability • Compact size and comparative price • Flexible design depending on customer requirements • Non-contact hall sensor • Rapid response time • Tone wheel detection	• Long life time and high reliability • Compact size and comparative price • Flexible design depending on customer requirements • Non-contact hall sensor • Rapid response time • Tone wheel detection

CHASSIS SENSORS







	Hall Switch Cable Assemblies	Seat Track Position Sensor (Option 1)	FIS/Z-FIS Front Impact Sensor	P-SIS Side Impact Sensor	Weight Sensor	MEAS H2TG / H2TD Series	MEAS Ni1000ST
Industry	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car
Application	Convertible roof systems	Dual staged airbag	Front impact detection	Side impact detection	Passenger detection	Anti-fogging and HVACR	Engine oil and transmission oil temperature
Functions	Digital position detection	Measuring seat track position	Measuring acceleration data for front impact detection	Measuring the quick increase of pressure within cavities of passenger car door to determine the airbag deployment	Measuring seat weight to classify passenger for airbag deployment	Dewpoint and windshield temperature measurement	Thermal compensation, thermal management
Technology	Hall switch (Magnet integrated in sensor)	Hall switch (Magnet integrated in sensor)	MEMS	MEMS	Strain gage technology	Humidity sensor	Temperature sensor
Features	• Variety of cable assembly with integrated hall switches	• Triggered by seat track (= no moving magnet) • Current interface • Small geometry • Diagnostics ability due to two-wire interface	• Small package and robust design • PS15-A data transmission mode	• Small package and robust design • PAS4 data transmission mode	• High resolution of weight • Very small package (Integration to seat track) • Sensor array with ECU for in system calibration • Mechanical overload protection • Very robust design	• Electronics fully protected with potting material • Analog or digital (LIN) output • Cost effective solution	• Harsh environment compatible • Very small dimensions • Very short response time • Good linearity • High temperature coefficient • Low power consumption

CLUTCH SENSORS





	Dual Clutch Position Sensor	Clutch Position Sensor (Option 1)	Clutch Position Sensor (Option 3)	Clutch Position Sensor (Option 4)	Clutch Position Sensor (Option 5)
Industry	Passenger car	Passenger car	Passenger car	Passenger car	Passenger car
Application	Dual clutch transmission	Cruise control, engine management, interlock, electrical park brake	Automated Manual Transmission (AMT)	Automated Manual Transmission (AMT)	Automated Manual Transmission (AMT)
Functions	Measuring piston position of clutch actuator	Measuring piston position of clutch master cylinder	Measuring piston position of concentric slave cylinder inside the gearbox	Measuring piston position of concentric slave cylinder	Measuring piston position of concentric slave cylinder inside the gearbox
Technology	Active PLCD (Moving magnet)	Hall (Moving magnet)	Passive PLCD (Moving magnet)	Passive PLCD (Moving magnet)	Passive PLCD (Moving magnet)
Features	• Two sensors in one housing • Small and robust design • Oil sealed design	• Non-contact measurement through cylinder wall • Up to three switching points or travel measurement up to 40 mm	• Non-contact travel measurement • Robust design (Temperatures up to 160°C) • Signal processing in transmission controller	• Non-contact travel measurement • Short term peak (Temperatures up to 150°C)	• Non-contact travel measurement • Robust design (Temperatures up to 160°C) • Signal processing in transmission controller

PLATFORM SENSORS

Hall Switch SW01P

Industry	Passenger car
Application	Body and chassis
Functions	Digital position detection
Technology	Hall switch (Magnet integrated in sensor)
Features	• Triggered by ferromagnetic part (= no moving magnet) • Current interface • Diagnostics ability due to two-wire interface • Temperature range -40°C up to 150°C

Hall Sensor T40MC2

Industry	Truck / Passenger car
Application	Engine, transmission, clutch, chassis, brake
Functions	Measuring travel position
Technology	Hall (Moving magnet)
Features	• Non-contact measurement up to 40 mm • Highly insensitive to vibration • Temperature up to 150°C • Analog or PWM interface • Small geometry • Optional redundancy • Supply 5 V (Optional 12 V) • 4-way MCON connector interface

PLCD-15M

Industry	Passenger car
Application	Transmission, chassis, engine
Functions	Measuring travel or angle position
Technology	Active PLCD (Moving magnet)
Features	• Angle up to 120° • Highly insensitive to vibration • Temperature up to 150°C • Redundancy possible • Analog or PWM interface • Supply 5 V (Optional 12 V) • 4-way MQS connector sealed • Wide range of magnet design

PLCD-25M

Industry	Passenger car
Application	Transmission, brake, clutch, steering, engine
Functions	Measuring travel or angle position
Technology	Active PLCD (Moving magnet)
Features	• Measuring range 15-28 mm • Highly insensitive to vibration • Temperature up to 150°C • Redundancy possible • Analog or PWM interface • Supply 5 V (Optional 12 V) • 4-way MQS sealed • Wide range of magnet design

PLCD-50M

Industry	Passenger car
Application	Transmission, brake, clutch, steering, engine
Functions	Measuring travel or angle position
Technology	Active PLCD (Moving magnet)
Features	• Angle up to 120° • Highly insensitive to vibration • Temperature up to 150°C • Redundancy possible • Analog or PWM interface • Supply 5 V (Optional 12 V) • 4-way MQS connector sealed • Wide range of magnet design

Speed Sensor

Industry	Passenger car
Application	Transmission
Functions	Measuring gear speed
Technology	Hall (With integrated magnet)
Features	• Triggered by ferromagnetic gear wheel • Current interface with direction detection • Sealed connector interface • Diagnostics ability due to two-wire interface • IP6K9 • Temperature range -40°C up to 150°C

TRANSMISSION SENSORS

All Gear Detection Sensor

Industry	Passenger car
Application	Manual Transmission (MT)
Functions	Measuring gear and shift position
Technology	3D hall solution
Features	• Non-contact rotary and travel measurement integrated in one housing • Robust design

Drive Mode Sensor

Industry	Passenger car
Application	Automated Transmission (AT)
Functions	Measuring drive mode position (PRND) inside the gearbox
Technology	Active PLCD (Moving magnet) or hall
Features	• Non-contact travel measurement • Robust and oil sealed design • High measurements accuracy • No wear and tear

DCT Transmission Sensor Module

(For shift fork position, gear speed and temperature)

Industry	Passenger car
Application	Dual Clutch Transmission (DCT)
Functions	Measuring shift fork position, gear speed and temperature inside transmission
Technology	Active PLCD, hall and NTC
Features	• Sensor module with integrated speed (2X), position (4X) and temperature sensor • Oil sealed 12 pin pass through connector system • Highly insensitive against vibration, temperature and pollution inside the transmission

Speed Sensor SP1M

Industry	Passenger car
Application	Transmission
Functions	Measuring gear speed
Technology	Hall (With integrated magnet)
Features	• Triggered by ferromagnetic gear wheel • Current interface with direction detection • Sealed connector interface • Diagnostics ability due to two-wire interface • IP6K9 • Temperature range -40°C up to 150°C

Neutral Position Sensor

Industry	Passenger car
Application	Start-stop application
Functions	Measuring gear lever position inside manual transmission
Technology	Hall (Moving magnet)
Features	• Non-contact measurement • Oil tight connector interface • High life time accuracy • Small magnet design • Diagnostics ability due to three-wire interface

DIGITAL COMPONENT SENSOR DEVELOPMENT TOOLS

Many of our digital sensor products are available in low power and small form factors. They are suited for wearable and miniature devices that are used to collect and share critical data for health monitoring, fitness, air quality, aerospace, battery powered, and related applications. To increase knowledge sharing and reduce time to market, we have teamed with semiconductor manufacturers to design and provide plug and play tools for Xplained Pro Sensor Hub, MicroChip PicTail, and Digilent Pmod™ based development platforms. In addition, we offer several wireless demo/development tools to help engineers quickly achieve their design objectives with wireless applications. These tools are supported with software/firmware drivers, documentation, and graphic user interfaces to make the development process easy.

WIRELESS DEMO AND DEVELOPMENT KITS

	MEAS Environmental Sensor Tag	MEAS Wireless M5600 Series	MEAS Wireless U5600 Series	MEAS Wireless FX1951
Type	Humidity, Temperature, Pressure	Pressure	Pressure	Force
Specifications	• 0 - 100% RH • 20°C to 85°C • 300 to 1,200 mbar	• 50 - 15K psi • Type G/S/C	• 2 - 10K psi • Type G/S/C/A	• 0 - 50 lbf
Communication	Standard 2.4 GHz wireless communication	Standard 2.4 GHz wireless communication	Standard 2.4 GHz wireless communication	Standard 2.4 GHz wireless communication
Application	iOS 7.0+ Android™ 4.3+	iOS 7.0+ Android™ 4.3+	iOS 7.0+ Android™ 4.3+	iOS 7.0+ Android™ 4.3+

PICTAIL PLUS

	MEAS HTU21D(F), MS5637, MS8607, TSYS01*
Type	Humidity, Temperature, Pressure
Specifications	• 0 - 100% RH • -20°C to 85°C • 300 to 1,200 mbar
TE Demo	PicTail Plus
Partner Board	Microchip Explorer 16

*Temperature System Sensor (TSYS) Series

PERIPHERAL MODULES

Digilent Pmod™






	MEAS HTU21D(F)	MEAS MS5637	MEAS MS8607	MEAS TSYS01*	MEAS TSYS02D*	MEAS KMA36(A)
Type	Humidity	Pressure	Pressure, Temperature, Humidity	Temperature	Temperature	Angular Position
Specifications	• 0 to 100% RH • -40 to 125°C • 3.3 to 5.5 V	• 10 to 2,000 mbar • -40 to 85°C • 1.5 to 3.6 V	• 10 to 2,000 mmar • -40 to 85°C • 0 to 100% RH • 1.5 to 3.6 V	• -40 to 125°C • 2.2 to 3.6 V	• -40 to 125°C • 1.5 to 3.6 V	• 0 to 360° • -25 to 85°C • 2.9 to 6.0 V
Accuracy	±3% RH	±2 mbar	±3% RH, ±2 mbar, ±1.0°C	±0.1°C	±0.2°C	±0.1°
Comm. Interface	I²C	I²C	I²C	I²C	I²C	I²C
Board Connections	6 x 2 x 0.1" header input & output	6 x 2 x 0.1" header input & output	6 x 2 x 0.1" header input & output	6 x 2 x 0.1" header input & output	6 x 2 x 0.1" header input & output	6 x 2 x 0.1" header input & output
Compatibility	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections	Development systems compatible with Digilent Pmod™ connections

WING BOARDS






	MEAS HTU21D(F)	MEAS MS5637	MEAS MS8607	MEAS TSYS01*	MEAS TSYS02D*	MEAS KMA36(A)
Type	Humidity	Pressure	Pressure, Temperature, Humidity	Temperature	Temperature	Angular Position
Specifications	• 0 to 100% RH • -40°C to 125°C • 3.3 to 5.5 V	• 10 to 2,000 mbar • -40 to 85°C • 1.5 to 3.6 V	• 10 to 2,000 mbar • -40°C to 85°C • 0 to 100% RH • 1.5 to 3.6 V	• -40°C to 125°C • 2.2 to 3.6 V	• -40°C to 125°C • 1.5 to 3.6 V	• 0 to 360° • -25°C to 85°C • 2.9 to 6.0 V
Accuracy	±3% RH	±2 mBar	±3% RH, ±2 mBar, ±1.0°C	±0.1°C	±0.2°C	±0.1°
Comm. Interface	I²C	I²C	I²C	I²C	I²C	I²C
Board Connections	10 x 2 x 0.1" header input & output	10 x 2 x 0.1" header input & output	10 x 2 x 0.1" header input & output	10 x 2 x 0.1" header input & output	10 x 2 x 0.1" header input & output	10 x 2 x 0.1" header input & output
Compatibility	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform	Configured to operate with the Xplained Pro development platform

DRIVERS






	MEAS HTU21D(F)	MEAS MS5637	MEAS MS8607	MEAS TSYS01*	MEAS TSYS02D*	MEAS KMA36(A)
Type	SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux® / Android™	SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux® / Android™	SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux® / Android™	SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux® / Android™	SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux / Android™	SAMD2x Microchip PIC24x Family FPGA Bare Metal - Linux® / Android™
Language	ANSI C Coding	ANSI C Coding	ANSI C Coding	ANSI C Coding	ANSI C Coding	ANSI C Coding

*Temperature System Sensor (TSYS) Series

FLOW SENSORS

We manufacture reliable and accurate mass air flow (MAF) sensors for a variety of automotive, medical and industrial gas flow applications. Our flow switches are suitable for hot and cold potable water due to rugged brass housings and the ability to operate from a small head of water. They are typically mounted in a well-defined channel, directly in the flowing media. Our flow switches are designed for water control, power shower, central heating systems, circulation pump protection, cooling and leak detection. They feature reed switch reliability and are easy to install.

MASS AIR FLOW SENSORS

	MEAS LMM-H03	MEAS LMM-H04
Package	Hybrid	Hybrid
Type	• Hot film anemometer component • Bidirectional	• Hot film anemometer component • Unidirectional
Operating Temp.	-40°C to 125°C	-40°C to 125°C
Unique Features	High sensitivity at low heater temperatures, fast response time, true air temperature sensor	High sensitivity at low heater temperatures, fast response time, true air temperature sensor
Calibration / Accuracy	Dependent on electronics	Dependent on electronics
Dimensions (mm)	23 x 10.15 x 1.1	24 x 10.15 x 1.1
Typical Applications	Air intake of combustion engine, spirometer, industrial gas flow	Air intake of combustion engine, spirometer, industrial gas flow

FLOW SWITCHES

	MEAS FS-01	MEAS FS-02	MEAS FS-05	MEAS FS-06	MEAS FS-90/1
Package	Noryl®	Noryl®	Brass	Brass	Copper
Type	Flow switch for direction of liquid and gas flow	Flow switch for direction of liquid and gas flow	Flow switch for direction of liquid and gas flow	Flow switch for direction of liquid and gas flow	Flow switch for direction of liquid and gas flow
Max. Pressure	10 bar at 20°C	10 bar at 20°C	10 bar at 20°C	10 bar at 20°C	10 bar at 20°C
Operating Temp.	-30°C to 85°C	-30°C to 85°C	-30°C to 100°C	-30°C to 100°C	-30°C to 85°C
Unique Features	Triac, normally open, close on flow	SPST reed switch, normally open, close on flow	Triac, normally open, close on flow	SPST reed switch, normally open, close on flow	SPST reed switch, normally open, close on flow
Dimensions (mm)	106 x 32 x 32	106 x 32 x 32	113 x 53 x 36	113 x 53 x 36	153 x 25 x 15
Typical Applications	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Leak detection, flow sensing, mains water control, cooling systems, circulation pump protection

FLUID PROPERTY SENSORS

We offer distinct technologies to measure fluids. Our tuning fork technology is coupled with efficient software algorithms for accurate measurement of viscosity, density and dielectric constant. Dedicated applications include oils (engine, hydraulic, transmission), fuels, fluid monitoring, and others. Our urea quality sensors, based on Near Infra-Red (NIR) technology or ultrasonic measurement perform an analysis of the Diesel Exhaust Fluid (DEF) fluid to provide urea concentration and secure misfilling protection to the Selective Catalytic Reduction (SCR) systems. Our highly reliable reed switch technology is combined with temperature measurement for level sensing. Robust design enables fluid property sensors to operate under diverse pressure, flow and temperature conditions to bring real-time fluid monitoring to engines, fuel systems, SCR systems, compressors, transmissions, gear boxes and many other industrial applications. Our new water-in-oil measurement sensor supplements the existing fluid quality range of products.

DEF FLS SENSORS

DEF Level Sensors

	FLS RB Series	FLS RC Series	FLS P Series	FLS PU Series
Package	Rubber header and stainless steel body	Rubber header and stainless steel body	Plastic header and stainless steel body	Plastic header and stainless steel body
Type	Combined level sensor, temperature sensor, filter, DEF draw and return heater, collar header	Combined level sensor, temperature sensor, filter, DEF draw and return heater, bayonet header	Combined level sensor, temperature sensor	Combined level sensor, temperature sensor, filter, DEF draw and return heater, bayonet header
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Features	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header • Various collar adapter options	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header	• Available in a range of sizes • High reliability • Reed switch technology	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header

	AHM/L FLS AHM/L Series	TZS FLS TZS/I Series	TKD FLS TZS/I Series
Package	Rubber header and stainless steel body	Plastic header and stainless steel body	Plastic header and stainless steel body
Type	Combined level sensor, temperature sensor, filter, DEF draw and return heater, collar header	Combined level sensor, temperature sensor, filter, DEF draw and return heater, bayonet header	Combined level sensor, temperature sensor, filter, DEF draw and return heater, SAE locking ring header
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Features	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header • Various collar adapter options	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen • DEF feed and return connections can be incorporated into the header	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen • DEF feed and return connections can be incorporated

DEF SCR SENSORS

DEF Level Quality Sensors

	QLS RB Series	QLS RC Series	QLS PL Series
Package	Rubber header and stainless steel body	Rubber header and stainless steel body	Plastic header and stainless steel body
Type	Combined level sensor with quality measurement, temperature sensor, filter, DEF draw and return heater, collar header	Combined level sensor with quality measurement, temperature sensor, filter, DEF draw and return heater, bayonet header	Combined level sensor with quality measurement, temperature sensor, filter, DEF draw and return heater, screwed header
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operating Range	0% to 62.5% mass urea	0% to 62.5% mass urea	0% to 62.5% mass urea
Urea Concentration Accuracy	±2%	±2%	±2%
Features	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header • Integrated quality sensor • Various collar adapter options	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header • Integrated quality sensor	• Available in a range of sizes • Foot options (Compact, normal and extended sizes) • High reliability • Reed switch technology • Using coolant system to thaw frozen tank • DEF feed and return connections can be incorporated into the header • Integrated quality sensor • Bayonet adaptor option

	AHUQ QLS AHM Series	TZLQ QLS TZS/L Series
Package	Rubber header and stainless steel body	Plastic header and stainless steel body
Type	Combined level sensor, temperature sensor, filter, DEF draw and return heater, collar header	Combined level sensor with quality measurement, temperature sensor, filter, draw and return heater, bayonet header
Operating Temp.	-40°C to 85°C	-6°C to 55°C
Urea Concentration Accuracy	±1% at -6°C to 55°C	±1% at -6°C to 55°C
Features	• Available in a range of sizes • High reliability • Reed switch technology • Using coolant system to thaw frozen DEF feed and return connections can be incorporated into the header • Integrated quality sensor • Various collar adapter options	• Available in a range of sizes • Foot options (Compact, normal and extended sizes) • High reliability • Reed switch technology • Using coolant system to thaw frozen • DEF feed and return connections can be incorporated into the header • Integrated quality sensor

FLUID PROPERTY SENSORS

MEAS FPS2800

Package	Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring
Type	Engine oil quality sensor
Operating Range	Viscosity from 0.5 to 50 mPa-s Density from 0.65 to 1.5 g/cc Dielectric from 1.0 to 6.0
Operating Temp.	-40°C to 150°C
Unique Features	• Rugged construction for high pressure and high flow environments • CAN communication protocol (SAEJ1939 compliant)
Calibration	Factory calibrated with NIST traceable standards
Dimensions (mm)	73.3 x 30 x 30
Typical Applications	Lubricating oil quality for industrial and commercial vehicles

FORCE SENSORS

We are a pioneer in the design and manufacture of precision force sensors for applications that require high performance or unique packaging, including electromechanical flight control, test and measurement and ultra-low cost OEM load cells for medium to high volumes. Based on our proprietary piezoresistive silicon strain gage (Microfused) technology, our sensors combine durability and long-term stability in extremely low cost packages. Our flight-qualified sensors monitor secondary load path engagement and supply real-time information from primary flight control forces to the flight data recorder (Black Box). Other applications include force feedback for the autopilot automatic disconnect function and flap jam detection systems. Our OEM and Test and Measurement (T&M) load cells offer custom packaging and electronics with analog or digital outputs, suited for both low and high force environments.

LOAD CELLS

Low Cost OEM

	MEAS FX19	MEAS FS19	MEAS FS20
Package	Low profile “coin cell” design	Stainless steel housing with flexible PCB	Miniature; drop in replacement for industry standard
Operating Mode	Compression	Compression	Compression
Unique Features	• Ultra low cost, low strain design • Essentially unlimited cycle life	• Low cost • Small size and light weight	• Load cell design operates at very low strains • Not subject to lead die fatigue
Ranges (Lbf)	10, 25, 50, 100	1, 2, 4, 6	1.5, 3
Max. Over-range	2.5X	2X	10 lbf
Output / Span	100 mV	100 mV	1.0 to 4.0 V
Combined Linearity & Hysteresis	±1.0% FSO	±1% FSO	±1.0% FSO
Operating Temp.	-40°C to 85°C	0°C to 40°C	0°C to 70°C
Dimensions (mm)	Ø25.00 x 29.50 x 8.00	Ø9.5 x 3.45	30.708 x 17.272 x 8.255
Typical Applications	Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices	Infusion pump, load sensing, contact sensing, weighing, household appliances	Infusion pumps, contact sensing, medical devices, consumer appliances

	MEAS FC22	MEAS FC23
Package	Plastic housing, button, flange mounting	Stainless steel housing button shape for higher weight loads
Operating Mode	Compression	Compression
Unique Features	• Low cost button shape • Essentially unlimited cycle life	• Industry standard low profile all stainless steel design • Resistant to off-axis loads
Ranges (Lbf)	25, 50, 100	250, 500, 1,000, 2,000
Max. Over-range	2.5X	1.5X and 2.5X
Output / Span	100 mV, 0.5 to 4.5 VDC	100 mV
Combined Linearity & Hysteresis	±1.0% FSO	±1.0% FSO
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	Ø26.00 x 42.00 x 19.50	Ø31.75 x 10.20
Typical Applications	Infusion pumps, robotics end-effectors, exercise machines, contact sensing, appliances	Batch weighing, robotics, assembly line force, printing presses, pumps, winch and hoist

LOAD CELLS

Standard




	MEAS ELHM, ELHS	MEAS FN1010	MEAS FN3002	MEAS FN2420
Package	High capacity dual stud or button style	Load pin design	Very high capacity dual stud	Very high capacity load button
Operating Mode	Tension and compression	Tension and compression	Tension and compression	Compression
Unique Features	• Tension and compression or compression only • High stability metal foil strain gage (ELHM) • High output semiconductor strain gage (ELHS) • NIST traceable calibration provided	• Keyed anti-rotation slot • Bidirectional available • Optional watertight construction	• Threaded male fitting • Integrated amplifier • Optional rod end	• High stiffness • Optional load button • Optional high level output module
Ranges N (Lbf)	1K to 50K (200 to 10K)	10K to 2K (2K to 400K)	10K to 2K (2K to 400K)	20K to 5K (4K to 1K)
Max. Over-range	1.5X FS	1.5X FS	1.5X FS	1.5X FS
Output / Span	10 mV (ELHM) 200 mV FSO (ELHS)	±20 mV (4 V; ±5 V; 4 - 20 mA optional)	±20 mV (4 V; ±5 V optional)	20 mV (4 V; 5 V)
Non-linearity	0.3% to 0.5% FSO	±1% FS	±0.25% FS	±0.25% FS
Hysteresis	Combined with linearity	Combined with linearity	Combined with linearity	Combined with linearity
Optional Operating Temp.	-50°C to 120°C (ELHM), -20°C to 80°C (ELHS)	-20°C to 80°C	-40°C to 150°C	-40°C to 150°C
Dimensions (mm)	Application dependent	Application dependent	Application dependent	Application dependent
Typical Applications	Robust general purpose, low deflection design, machine tool, linkage forces	Crane monitoring, offshore, load-limited devices	Assembly forces, tool force, offshore	Calibration presses, robotics and effectors, laboratory and research

Test and Measurement Miniature




	MEAS ELAF	MEAS XFC200R	MEAS XFL212R	MEAS XFTC300 Series
Package	Button, dual stud	Small diameter load button	Low profile load button	Low/high capacity dual stud
Operating Mode	Tension and compression	Compression	Compression	Tension and compression
Unique Features	• Low cost • Small, low profile design • Low off-axis response • NIST traceable calibration provided	• High stiffness • High overload capacity • Static and dynamic	• Extremely flat • Integrated load button • Small diameter	• High stiffness • High overload capacity • Threaded male / female fitting
Ranges N (Lbf)	50 to 10K (10 to 2K)	2 to 10K (0.4 to 2K)	5 to 500 (1 to 100)	2 to 2K (0.4 to 400)
Max. Over-range	2.5X FS	2X to 4X FS	2X FS	2X to 4X FS
Output / Span	100 mV (0.5 - 4.5 V optional)	100 mV	100 mV	100 mV (4 V; ±5 V optional)
Non-linearity	±0.25% FS	≤ ±0.5% FS	≤ ±0.5% FS	≤ ±0.5% FS
Hysteresis	±0.25% FS	≤ ±0.5% FS	≤ ±0.5% FS	≤ ±0.5% FS
Optional Operating Temp.	-40°C to 120°C	-40°C to 150°C	-40°C to 150°C	-40°C to 150°C
Dimensions (mm)	Ø12.70 x 9.53 or 8.80 Ø15.88 x 12.70 or 11.70 Ø31.75 x 10.20	Ø10 to Ø16	Ø12.5 x 3.5	Application dependent
Typical Applications	Theatrical rigging loads, assembly forces, weighing, thrust measurements, product validation testing	Material test, measuring tools, robotics and effectors	Dental and biomechanical, surface mount assembly system, production validation test	Material test, tool forces, robotics end effectors

LOAD CELLS

S-Beam Standard

	MEAS FN3030	MEAS FN9620	MEAS FN3148	MEAS FN7110
Package	S-beam	S-beam	S-beam with stops	Dual S-beam range
Operating Mode	Tension and compression	Tension and compression	Tension and compression	Tension and compression
Unique Features	• Optional rod ends • Optional high level output • Optional high compensation temperature	• High accuracy • IP68 • Entry level	• Very high accuracy • High resolution • Mechanical stops	• High resolution • Optional high level output • Double range
Ranges N (Lbf)	50 to 100K (10 to 20K)	500 to 10K (100 to 2K)	10 to 2K (2 to 400)	10, 100 to 1K, 10K (2, 20 to 200, 2K)
Max. Over-range	1.5X FS	1.5X FS	5X to 100X FS	1.2X FS of the higher range
Output / Span	±20 mV (4 V; ±5 V optional)	±10 mV to ±20 mV	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)
Non-linearity	±0.1% FS	±0.05% FS	< ±0.05% FS	±0.1% FS of each range
Optional Operating Temp.	-40°C to 150°C	-40 to 90°C	-40°C to 120°C	-20°C to 80°C
Dimensions (mm)	Application dependent	56 x 20 x 60	Application dependent	60 x 30 x 100
Typical Applications	Laboratory and research, process control, customized options	Test bed, dynamic fatigue testing, robotics and effectors	Product validation tests, medical instruments, weighing	Product validation tests, process control, robotics and effectors

Low Profile and Pan-cake

	MEAS FMT	MEAS FN3050, FN3000	MEAS FN9630, FN9635	MEAS FN7325
Package	Washer	Pan-cake	Very high accuracy pan-cake	Custom design and ranges available upon request
Operating Mode	Compression	Tension and compression	Tension and compression	Multiaxial force and torque
Unique Features	• High stiffness • 1.5X over-range • High temperature	• High stability • All FN3050 have same housing • Optional high level output	• High stability • High accuracy • Minimal cross effect • Connection flange supplied (FN9635)	• Measures load and torque in 3 directions • Fatigue rated • Minimal cross effects
Ranges N (Lbf)	20K to 320K (4K to 64K)	100 to 1000K (20 to 200K)	10K to 200K (2K to 40K)	5K to 250K (1K to 50K)
Max. Over-range	1.5X FS	1.5X FS (10X FS with stops)	1.5 x FS	1.2X FS
Output / Span	15 to 20 mV	15 to 20 mV (4 V; ±5 V optional)	20 mV	±100 to 150 mV (4 V; ±5 V optional)
Non-linearity	1 to 5% FS	±0.1% FS	±0.08% FS	±1% FS
Hysteresis	Combined with linearity	±0.1% FS	±0.08% FS	Combined with linearity
Optional Operating Temp.	-40°C to 150°C	-40°C to 150 °C	-40°C to 90°C	-20°C to 80°C
Dimensions (mm)	Application dependent	Application dependent	Application dependent	Application dependent
Typical Applications	Robotics, process control, bolt clamping for bridges	Static fatigue tests, laboratory and research, robotics	Static fatigue tests, weighing calibration, robotics	Structure testing, crash testing, industrial test benches

AUTOMOTIVE DESIGN AND TEST SENSORS

MEAS FN4055

Package	Seat belt sensor
Operating Mode	Tension
Unique Features	• Low operating ranges • Protected against overload • Compatible with most seat belts
Ranges N (Lbf)	100 to 300N (20 to 60)
Max. Over-range	5X FS
Output / Span	20 mV
Non-linearity	±0.25% FS
Hysteresis	Combined with linearity
Optional Operating Temp.	-40 to 120 °C
Dimensions (mm)	63.5 x 63.5 x 12.7
Typical Applications	Auto crash testing, tension at the belt receptacle

MEAS FN4070, FN4080

Package	Seat belt buckle sensor
Operating Mode	Tension
Unique Features	• High operating ranges • Detachable tongue and cable • Compatible with most seat belts
Ranges N (Lbf)	250 to 50K (50 to 10K)
Max. Over-range	1.5X FS
Output / Span	15 to 20 mV
Non-linearity	±0.5% FS
Hysteresis	Combined with linearity
Optional Operating Temp.	-20°C to 80°C
Dimensions (mm)	Application dependent
Typical Applications	Auto crash testing, tension at the belt receptacle

MEAS FN2317

Package	Hand brake
Operating Mode	Compression
Unique Features	• Easily installed • Ergonomic design • Fits most vehicles
Ranges N (Lbf)	500 to 1K (100 to 200)
Max. Over-range	1.5X FS
Output / Span	±20 mV (4 V optional)
Non-linearity	±0.5% FS
Hysteresis	Combined with linearity
Optional Operating Temp.	-20°C to 80°C
Dimensions (mm)	100 x 20 x 15
Typical Applications	Hand brake, test bed

MEAS FN2114, FN2570

Package	Brake pedal
Operating Mode	Compression
Unique Features	• High accuracy • Extra flat • Compact • Rugged design
Ranges N (Lbf)	200 to 3K (40 to 600)
Max. Over-range	1.5X FS
Output / Span	15 to 20 mV (4 V optional)
Non-linearity	< ±1% FS (FN2114) < ±2.5% FS (FN2570)
Hysteresis	Combined with linearity
Optional Operating Temp.	-20°C to 80°C
Dimensions (mm)	Application dependent
Typical Applications	Brake pedal, clutch pedal, test bed

MEAS FN7080

Package	Gear stick design
Operating Mode	Multi-axial
Unique Features	• Measures force in three directions • Replaces gear knob • Ease of mounting
Ranges N (Lbf)	50 to 500 (10 to 100)
Max. Over-range	1.2X FS
Output / Span	±7.5 mV (4 V; ±5 V optional)
Non-linearity	< ±0.3% FS
Hysteresis	Combined with linearity
Optional Operating Temp.	-20°C to 80°C
Dimensions (mm)	Ø25 spherical
Typical Applications	Change gear force measurement, roughness of material

MEAS FCA7300

Package	Steering wheel adaptable
Operating Mode	Multi-sensing
Unique Features	• Dual torque and angle range • Steering velocity measurement • Fits all road vehicles
Ranges N (Lbf)	10 to 200 Nm (7 lbf-ft to 150 lbf-ft)
Max. Over-range	10X FS
Output / Span	±10 V
Non-linearity	±0.1% FS
Hysteresis	±0.1% FS
Optional Operating Temp.	-20°C to 80°C
Dimensions (mm)	Ø195 x 50
Typical Applications	On car road test, truck and buses steering test, armored vehicles steering test

MEAS EL20-S458

Package	Special purpose design optimized for automotive crash test environments
Operating Mode	Seat belt tension
Unique Features	• Low mass titanium design for use in high shock environments • Mass optimized to minimize acceleration induced errors during SAE J2570 ATD and ISO 6487 • Optional high level and linearized outputs • Smoothed edge design and optional slotted titanium axles eliminate drag errors and dummy damage • Ultra robust cable is user replaceable
Ranges N (Lbf)	5K and 15K (1,000 and 3,200)
Max. Over-range	2X
Output / Span	10 mV (0.5 to 4.5 V optional)
Non-linearity	1.0% to 3.0% FSO.
Hysteresis	Combined with linearity
Optional Operating Temp.	-40°C to 120°C
Dimensions (mm)	Application dependent
Typical Applications	Seat belt forces, safety and restraint system crash test, parachute tether and riser forces

ELECTRONICS / DISPLAYS

	MEAS ARD154	MEAS CPA150	MEAS M210	MEAS M905
Package	Din rail mountable	Hand held indicator	Front panel or housed in case	Front panel or housed in case
Operating Mode	Signal conditioning for wheatstone bridge sensors	Portable display suited for strain gage type sensors	Signal conditioning and display meter	Display suited for process or strain gage type sensors
Unique Features	• Suited for full bridge strain gage sensors • 120 to 10,000 Ohm bridge impedance • ±10 V analog or 0/4 to 20 mA current output • 2 kHz or 20 kHz max. bandwidth • Calibration pushbutton from 0.1 to 10 mV/V	• Suited for 1 or 2 sensors • 7½ digits (±9999999) • Front panel programming • 45 hour life battery • Calibration pushbutton from 0.1 to 10 mV/V	• Analog output: ±10 V • Red LED display: ±2,000 count • High bandwidth: 1,000 Hz at -3 dB • Low noise level	• Suited for process or strain gage type sensors • 5 digits: -19999 to 19999 • Front panel programming • 11 point scaling • Plug-in option boards
Ranges N (Lbf)	Application dependent	Application dependent	Application dependent	Application dependent
Output / Span	±10 V max.; 4 to 20 mA or 0 to 20 mA	Display only	±10 VDC	±10 VDC or 4 to 20 mA with option
Accuracy	0.01% FS	± 0.005% FS	±0.05% FS	±15 bits, 20 sample/sec
Optional Operating Temp.	-10°C to 60°C	-10°C to 50°C	0°C to 50°C	-10°C to 60°C
Dimensions (mm)	99 x 17.5 x 112	90 x 34 x 152 (3.54 x 1.34 x 5.98)	96 x 48 x 155	96 x 48 x 60
Typical Applications	Test stands, power plants, manufacturing systems, test and measurement, test bed regulation, automat interfaces	Outdoor punctual measurements, test and measurement, portable calibration device	High bandwidth test bed display, monitoring, laboratory and research, process control equipment	Display on test bed, monitoring, laboratory and research

HUMIDITY SENSORS

We offer a complete range of calibrated and amplified products that measure relative humidity (RH). Based on our robust patented capacitive technology, these sensors provide accurate measurement of dew point and absolute humidity by combining relative humidity and temperature measurements. Our sensors are qualified for the most demanding applications, including automotive, heavy truck, aerospace and home appliances. We offer a variety of output signals such as digital (Frequency, I^2C) and analog voltage, as well as, customized and proprietary output signals including PWM, PDM, LIN and CAN.

HUMIDITY AND TEMPERATURE (NTC) COMPONENTS

Analog Output

Digital Output

	MEAS HS1101LF	MEAS HTU2X Series	MEAS HTU2XF Series
Package	Through hole TO39 with side opening plastic cap	DFN type	DFN type
Type	Capacitive humidity	Digital RH and NTC temperature	Digital RH and NTC temperature
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-60°C to 140°C	-40°C to 125°C	-40°C to 125°C
Unique Features	• Robust and recognized component • Suitable for most humidity applications • Cost effective solution	• Low power consumption • Fast response time • Very low temperature coefficient • I^2C interface or PWM interface or SDM interface	• Low power consumption • Fast response time • Very low temperature coefficient • I^2C interface or PWM interface or SDM interface • Optimal filter
Accuracy	180 pF, ±3 pF at 55% RH	±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C	±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C
Dimensions (mm)	10 x 10 x 19	3.0 x 3.0 x 1.0	3.0 x 3.0 x 1.0
Typical Applications	Applications requiring a robust humidity sensor in automotive, home appliance, outdoor, HVACR, consumer, printer, meteorology	Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier	Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier

HUMIDITY AND TEMPERATURE (NTC) MINI-MODULES

Analog Voltage and Digital Output

	MEAS HTU3535PVBM/Wire	MEAS HTU383X/Wire	MEAS HTG351xCH
Package	Cost effective, small size mini-module	Cost effective small size mini-module	Cost effective small size mini-module
Type	Analog voltage RH and NTC temperature	Digital RH and NTC temperature	Analog voltage RH and NTC temperature
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C
Unique Features	• PTFE filter (Optional) • Electronics fully protected (5 V) • Multiple connector choices (JST, Samtec board to board through hole) • Based on HTU21	• PTFE filter (Optional) • Electronics fully protected (5 V) • Multiple connector choices (JST, Samtec board to board through hole) • Based on HTU21	• Electronics fully protected with potting material (3.3 V or 5 V) • Multiple connector choices (JST, Samtec board to board through hole)
Calibration	±3% RH at 55% RH; ±0.25°C at 25°C	±3% RH at 55% RH; ±0.25°C at 25°C	±3% RH at 55% RH; ±0.25°C at 25°C
Dimensions (mm)	27 x 11.9 x YY (Depending on the connector, from 6 to 10.8 mm length)	27 x 11.9 x YY (Depending on the connector, from 6 to 10.8 mm length)	27 x 11.9 x 6.7
Typical Applications	Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor	Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor	Humidity and temperature plug and play transducers for OEM low cost consumer applications

HUMIDITY AND TEMPERATURE (NTC) PROBES

Analog Output

	MEAS HM1500LF	MEAS HM1520LF	MEAS HTM2500LF
Package	Probe, RH only	Probe, RH only	Probe, RH and temperature
Type	Cost effective analog voltage RH probe	Dedicated to low RH accurate measurement	Cost effective analog voltage RH
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-40°C to 60°C	-40°C to 60°C	-40°C to 85°C
Unique Features	• Electronics fully protected with potting material • Optional wiring length and connectors	• Electronics fully protected with potting material • Optional wiring length and connectors	• Electronics fully protected with potting material • Optional wiring length and connectors
Calibration	±3% RH at 55% RH	±3% RH at 10% RH	±3% RH at 55% RH ±0.25°C at 25°C
Dimensions (mm)	57 x 11 x 11 (Standard wire length of 200 mm)	57 x 11.5 x 11.5 (Standard wire length of 200 mm)	86 x 11.5 x 11.5 (Standard wire length of 200 mm)
Typical Applications	Medical, telecommunication cabinets, green houses, process control, industrial	Medical, drying cabinets, low humidity, meteorology	Hygrostat, data loggers, baby cabinets

HUMIDITY AND TEMPERATURE (NTC) SENSORS

Frequency Output Systems (Digital)

	MEAS HTF3000LF
Package	PCB for board to board
Type	Frequency output for RH, direct NTC for temperature
Operating RH Range	0 to 100% RH
Operating Temp.	-40°C to 85°C
Unique Features	• Voltage supply from 3 to 8 VDC • Through hole or SMD • T and R available
Calibration	±3% RH at 55% RH ±0.25°C at 25°C
Dimensions (mm)	12.5 x 18.5 x 11.2
Typical Applications	Passenger comfort improvement, hygrostat, HVACR, printer

E&V HUMIDITY AND TEMPERATURE MODULES

	MEAS H2TG, H2TD Series*	MEAS H2TD368x*	MEAS HTM2500B6Cy*
Package	Cost effective module for automotive defogging application	Cost effective module for truck defogging application	Engine probe for truck and automotive
Type	• Dew point and windshield temperature measurement • Analog or digital (LIN) output	• Dew point and windshield temperature measurement • LIN output	• Dew point measurement • Analog output
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 105°C
Unique Features	• Electronics fully protected with potting material	• Optional bracket and cover for installation • Electronics fully protected with potting material • 12 V or 24 V power supply	• Electronics fully protected with potting material
Calibration	±1.5°DP at 10°C ±0.8°C at 25°C	±1.5°DP at 10°C ±0.8°C at 25°C	±3% RH at 55% RH ±0.8°C at 25°C
Dimensions (mm)	27 x 32 x YY (Depending on the connector, from 6 to 10.8 mm length)	22 x 43 x 10	70 x 64.5 x 54.5 (Integrated connector)
Typical Applications	Fogging and cabin energy control	Fogging and cabin energy control	Humidity and temperature engine control

	MEAS HTD2800B11C6*	MEAS HTD2610*
Package	Trican engine probe for truck and automotive	Engine probe for truck and automotive
Type	• Temperature, humidity, pressure measurement • CAN output	• Dew point measurement • LIN output
Operating RH Range	0 to 100% RH 0 to 150 g/Kg	0 to 100% RH
Operating Temp.	-40°C to 125°C	-40°C to 125°C
Pressure Range	1 kPa to 115 kPa	—
Unique Features	• Configurable CAN Frame • Self diagnostic capabilities to comply with J1939, EPA / EURO and CARB requirements	• 12 V power supply
Calibration	SH: ±2.5 g/Kg Temperature: ±2°C at 25°C Pressure: ±1% FS	±1° DP at 25°C
Dimensions (mm)	76.3 x 64.3 x 55.9 (Integrated connector)	62.24 x 24.0 x 54.0 (Integrated connector)
Typical Applications	Emission control application such as NOx control with air intake measurements, engine management	Humidity and temperature automotive passenger car, engine and emission management

*Custom options available. Please consult factory.

LIQUID LEVEL SENSORS

Our full range of liquid level sensors help address critical requirements for the construction, off-road, and automotive industries. TE solutions include sensors for measuring power steering fluid, coolant, windscreen wash, fuel and oil. Our pride is our experience in serving the heavy duty vehicle markets: truck and bus, emergency, military, recreational, luxury and coach. We also offer level sensors for storage and collection tanks, vending machines, showers for the disabled, heat exchangers, washing machines, central heating systems and boilers. To meet the unique requirements of the food and beverage industry, TE offers a range of standard cost-effective products. We also provide thousands of sensors annually to marine engine manufacturers.

LIQUID LEVEL SENSORS

High or Low Level Sensing

						
	LS304-31	**LS304-51N**	**LS309-31**	**LS309-51N**	**LS504-31**	**LS504-51**
Package	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled PPS	Glass filled PPS
Type	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
Unique Features	SPDT reed switch	SPDT reed switch	SPST reed switch	SPST reed switch	SPDT reed switch	SPDT reed switch
Max. Pressure	2.0 bar	4.7 bar	2.0 bar	4.7 bar	2.0 bar	4.7 bar
Operating Temp.	-30°C to 130°C	-30°C to 130°C	-30°C to 130°C	-30°C to 130°C	-30°C to 110°C	-30°C to 110°C
Dimensions (mm)	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27
Typical Applications	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water

						
	LS509-31	**LS509-51**	**LS804-31**	**LS804-51**	**LS809-31**	**LS809-51**
Package	Glass filled PPS	Glass filled PPS	Glass filled polypropylene	Glass filled polypropylene	Glass filled polypropylene	Glass filled polypropylene
Type	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
Unique Features	SPST reed switch	SPST reed switch	SPDT reed switch	SPDT reed switch	SPST reed switch	SPST reed switch
Max. Pressure	2.0 bar	4.7 bar	2.0 bar	4.7 bar	2.0 bar	4.7 bar
Operating Temp.	-30°C to 110°C	-30°C to 110°C	-30°C to 105°C	-30°C to 105°C	-30°C to 105°C	-30°C to 105°C
Dimensions (mm)	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27
Typical Applications	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems

PHOTO OPTIC SENSORS

Optic-based sensors include both photo optic components and complete sensor solutions. Our component series features dual LED, bi-wavelength emitters and spectrally paired photo detectors. Our optics are suited for medical applications where selection of peak wavelength is a priority, such as pulse oximetry (SpO_2). We also package our optics into complete probe assemblies for pulse oximetry monitoring applications. Our SpO_2 probe platform includes reusable finger clips, soft silicone boots, and a range of disposable sensors.

PHOTO OPTIC SENSORS

Photo Optic Components

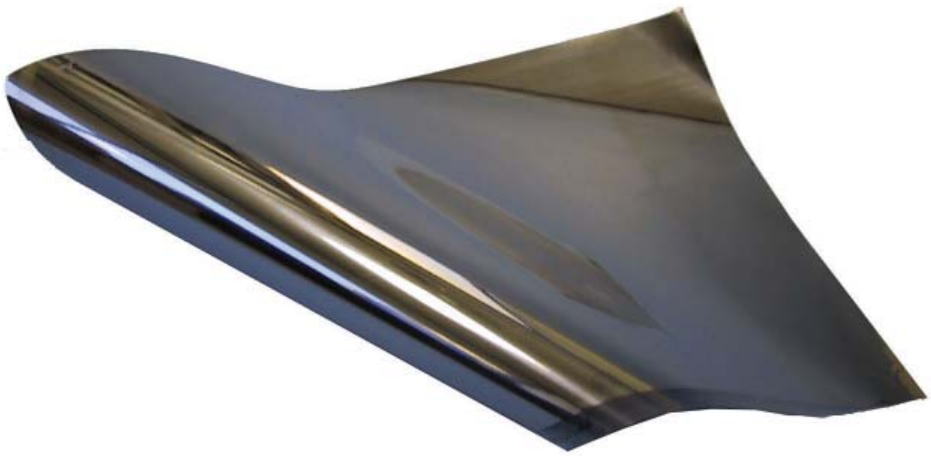
	MEAS ELM-4000	MEAS EPM-4001
Package	Lead frame	Lead frame
Type	Emitter assembly	Detector assembly
Range	660 nm / 880-940 nm	—
Unique Features	• Low cost • Dual drive • Clear epoxy lens	• Low cost • Fast response • High efficiency
Accuracy	Sensor dependent	Sensor dependent
Operating Temp.	-55°C to 70°C	-55°C to 70°C
Dimensions (mm)	4.4 x 5.1 x 1.9	4.4 x 5.1 x 1.8
Typical Applications	Pulse oximetry, finger and ear probes, disposable	Pulse oximetry, finger and ear probes, disposable

Pulse Oximetry (SpO_2)Probe Platforms

	MEAS Disposable Sensor	MEAS Finger Clip Sensor	MEAS Soft Sensor
Package	Biocompatible	Biocompatible	Silicon boot
Type	Sensor platform	Sensor platform	Sensor platform
Range	Adult / neonatal	Adult	Adult / pediatric
Unique Features	• Latex free • Lightweight • Microfoam / cloth	• Soft pads • Lightweight • Easily cleaned	• Ease of use • Lightweight • Latex free
Accuracy	Sensor dependent	Sensor dependent	Sensor dependent
Operating Temp.	-55°C to 70°C	-55°C to 70°C	-55°C to 70°C
Typical Applications	Pulse oximetry	Pulse oximetry	Pulse oximetry

PIEZO FILM SENSORS

Our piezo film sensors provide durable vibration, accelerometer, or dynamic switch elements for a wide range of markets and applications. Piezoelectric fluoropolymer film has unique capabilities and produces voltage or charge proportional to dynamic strain. The film is suited for many different custom designs, configurations and applications, including versatile coaxial cable used for everything from security to musical instrument amplification.



PIEZO FILM

	MEAS DT1, SDT1	MEAS Piezo Cable	MEAS CM-01	MEAS FLDT1	MEAS LDTC Analog PCB
Package	Unshielded element with twisted pair or shielded element with shielded cable	Shielded coaxial 20 gage piezo cable	Metallized plastic housing	Unshielded film element with screen printed leads	Evaluation PCB platform for vibration sensor
Type	Flexible film, adhesive mount	Polymer jacketing, armored jacketing	Contact microphone	Flexible film, adhesive mount	Amplified analog output
Range	15 mV/με up to 1% strain	μPa sensitivity	40 V/mm; 8 Hz to 2.2 kHz	15 mV/με, up to 1% strain	1 Hz to 117 Hz
Unique Features	• Thin, flexible, robust • Withstands >2% strain • Ultra-low power (Self generating)	• Continuous lengths of up to 1 km • Shielded construction	• Low noise • Shielded construction • High sensitivity	• Thin, flexible • Leads screen printed on film • Connects to standard connector	• Low power • High sensitivity • Analog and digital signal access points
Accuracy	±20% (Typical)	±20% (Typical)	—	±20% (Typical)	±20%
Operating Temp.	-40°C to 70°C (Higher available custom)	-40°C to 85°C	5°C to 60°C	-40°C to 70°C; (Higher available custom)	-20°C to 85°C
Dimensions (mm)	Application dependent	Ø3 (Continuous lengths)	Ø18 x 11 high	12 x 30 active; (Custom available)	33 x 46
Typical Applications	Dynamic strain gage, contact microphone, acoustic pickup	Perimeter and fence security, geophone, impact sensors, intrusion detection, seat occupancy (e.g. airbag), patient bed vital signs monitor	Electronic stethoscope, contact microphone, vibration	Event timing, dynamic strain, motion detection	Vibration sensing, wake-up sensor, activity sensor

	MEAS Laboratory Amplifier	MEAS 80 KHz Transducers	MEAS NDT-1	MEAS Tamper Box	MEAS ACH-01	MEAS LDTC Family
Package	Bench top	Pin mounted	Adhesive mounted	Flat film or box mounted	Ceramic base, plastic cover, shielded cable	Piezo film elements with or without mass
Type	Piezo film lab amp	Air ultrasound transducer	High frequency ultrasound transducer	Tamper detection sensor	Adhesive mount	Cantilever beam with vertical or horizontal pins
Range	0.1 Hz to 100 kHz	80 kHz	3 MHz	Application dependent	±250 g (Typical)	±10 g (Typical)
Unique Features	• Voltage or charge mode settings • Multi-pole high-pass and low-pass filters • Adjustable gain	• Small size • Low mechanical Q • Shielded package	• Flexible • High bandwidth, low Q • Low impedance	• Low power • Custom shapes and sizes • High security	• Extremely high bandwidth • Low cost • Ultra-low power	• Very low cost • High sensitivity (1 V/g) • Ultra-low power (Self generating)
Accuracy	Application dependent	Application dependent	Application dependent	Application dependent	±20% (Typical)	±20% (Typical)
Operating Temp.	0°C to 40°C	-20°C to 80°C	-20°C to 60°C	-40°C to 85°C	-40°C to 85°C	-40°C to 70°C
Dimensions (mm)	150 x 100 x 100	Ø6 x 9	12 x 30	Application dependent	18.80 x 13.21 x 6.10	19.05 x 6.35 x 6.35
Typical Applications	Low frequency dynamic strain, pyroelectric signals, machine vibration, piezo cable and traffic sensor interface	Air ranging, ultrasonic mouse, digitizers	Thickness measurement, speed of sound measurement, pulse/echo NDT	Encryption modules, POS card readers, PIN entry devices	Vibration sensing, gear box and high speed monitoring, high speed bearings and centrifuges, speaker motional feedback	Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring

POSITION SENSORS

We are a leading manufacturer of industrial linear and angular position, tilt and fluid level sensors. Both off-the-shelf and custom position sensing solutions are available featuring our core technologies, including inductive, potentiometric, magnetoresistive, hall effect, reed switch, electrolytic and capacitive sensing. Sophisticated designs and manufacturing techniques provide reliable and cost effective solutions for a broad range of harsh applications such as automotive, power generation, subsea, hydraulics, medical, HVACR, process controls, factory automation, security systems, military/aerospace and nuclear. TE position sensors are available with analog and digital outputs. Our comprehensive range of signal conditioning instrumentation enables us to meet the specific needs of OEMs and end users.

ANISOTROPIC MAGNETORESISTIVE (AMR) SENSOR COMPONENTS

Magnetoresistive (MR)

MEAS KMY, KMZ

MEAS MS32

MEAS KMT32B, KMT37

	MEAS KMY, KMZ	MEAS MS32	MEAS KMT32B, KMT37
Package	SOT-223, E-line 4 pin	TDFN	TDFN, SO-8
Type	Linear low field sensor	Low field switch sensor	Angle sensor
Range	-2 to 2 kA/m magnetic field	1 to 3 kA/m magnetic switching field	180° angle
Unique Features	• High sensitivity • Low hysteresis • Linear to uniaxial field strength	• Linearized ratiometric output • Temperature compensated switching point	• High accuracy • High resolution
Output	Ratiometric with output voltage range 20 mV/V	Ratiometric with output voltage range 10 mV/V	Sine and cosine signals with output voltage range 20 mV/V
Resolution	Typ. 0.1% of range	Typ. 0.1 kA/m	Typ. 0.01° to 0.1°
Accuracy	Typ. 1.0% of range	Typ. 0.1 kA/m	Typ. 0.1° to 1.0°
Operating Temp.	-40°C to 150°C	-25°C to 85°C	-40°C to 150°C (175°C on request)
Dimensions (mm)	SOT: 6.6 x 7.0 x 1.6 E-line: 16 x 4.2 x 2.4	TDFN: 2.5 x 2.5 x 0.8	TDFN: 2.5 x 2.5 x 0.8 SO-8: 5 x 4 x 1.75
Typical Applications	Non-destructive material testing, spray arm detection in dish washers, magnetic imaging, brake pedal position	Piston position switch, reed switch replacement	Steering position, flow meters, rpm meters, rotary encoders

MEAS KMT36H

MEAS KMXP Series

MEAS KMA36

	MEAS KMT36H	MEAS KMXP Series	MEAS KMA36
Package	TDFN 2.5 x 2.5	DFN 2 x 6	TSSOP
Type	Angle sensor	Linear displacement sensor	Angle sensor
Range	360° angle	Absolute within pole pitch, else incremental	360° angle
Unique Features	• High accuracy • High resolution • 360° full turn	• For pole pitch • KMXP 1000: p= 1 mm • KMXP 2000: p= 2 mm • KMXP 5000: p= 5 mm	• Low cost MR encoder for rotational and incremental measurements
Output	Three 120° phase shifted output signals with output voltage range 20 mV/V	Sine and cosine signals with output voltage range 20 mV/V	Voltage 0 - 5 V, I²C, customer specific
Resolution	Typ. 0.01° to 0.1°	0.01% to 0.1% of pole pitch	Typ. 0.1°
Accuracy	Typ. 0.1° to 1°	0.1% to 1.0% of pole pitch	Typ. 0.3°
Operating Temp.	-40°C to 150°C	-40°C to 125°C	-25°C to 85°C
Dimensions (mm)	TDFN: 2.5 x 2.5 x 0.8	DFN: 2 x 6 x 0.8	TSSOP20: 6.5 x 6.4 x 1.2
Typical Applications	Steering position, gage readings, rotary encoders	Roller conveyors, circular saws, bending machines etc.	Knobs, small robotics, angular / linear position

ANGULAR POSITION TRANSDUCERS—INDUCTIVE

Absolute

	MEAS RVIT-Z	MEAS R60D	MEAS R30A
Package	PCB for OEM volumes	Servo mount with ball bearing	Servo mount with ball bearing
Resolution	Infinite	Infinite	Infinite
Excitation	DC voltage	DC symmetrical ±15 VDC	AC operated
Output	DC voltage, DC current, digital	±7.5 VDC	AC voltage
Range	Up to ±75°	±60°	±30° to ±60°
Unique Features	• Absolute position	• Absolute position • Low momentum of inertia	• Absolute position
Operating Temp.	-25°C to 85°C	-25°C to 85°C	-55°C to 150°C
Dimensions (mm)	Custom	Aluminum case size 11 (Ø27 mm)	Aluminum case size 11 (Ø27 mm)
Typical Applications	Viscometers, valve position, robotics, HVACR vane position, ATM's, joysticks	Dancer arm position, rotary actuator position feedback, throttle lever position feedback, ball valve position, textile manufacturing equipment, printing presses	Machine tool equipment, rotary actuator feedback, valve positioning, power generation valve position

ANGULAR POSITION—ENCODERS

Absolute

	MEAS ED-18	MEAS ED-22	MEAS R36
Package	Medium duty with sleeve or ball bearing	Medium duty with sleeve bearing	Heavy duty shaftless
Resolution	Analog 1.4°	Analog 1.4°	Analog 1.4°
Max. Speed	300 RPM (Sleeve bearing) 3000 RPM (Ball bearing)	300 RPM	—
Excitation	5 VDC	5 VDC	5 VDC
Unique Features	• Low profile • Excellent stability • No optical degradation	• Encapsulated electronics, sealed unit • Highly resistant to vibration • No optical degradation	• Rugged housing • Shaftless • No optical degradation
Output	Voltage or current	Voltage	Voltage
Range	360°	270°	180°
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	25.4 x 25.4 x 33.78	Ø19.1 x 37.1	37.36 x 25.4 x 7.62
Typical Applications	Feedback sensor or human machine interface device, servomotor position and speed control	Low-cost, non-contact human machine interface potentiometer replacement	Feedback sensor or human machine interface device, rudder control, servomotor position and speed control

ANGULAR POSITION—ENCODERS

Absolute

	MEAS H005, H009 Series	MEAS H009, 1200 Series Dual Output
Package	• 12.7 mm - 22.19 mm / 500 in - .875 in housing diameter • 3.170 mm / .1248 in shaft diameter • 16.9 mm - 17.4 mm / .670 in - .680 in housing length	• 22.23 mm / .875 in housing diameter • 3.170 mm / .1248 in shaft diameter • 26.1 mm / 1.03 in housing length
Range	Up to 359 degrees	Up to 359 degrees (Dual output)
Output Options	Analog / PWM / Serial	Analog / PWM / Serial
Resolution	12-bit analog / PWM 14-bit serial (SPI)	12-bit analog / PWM 14-bit serial (SPI)
Absolute Linearity	±0.2%	± 0.2% (Dual output)
Nominal Supply	5 volts	5 volts (Dual output)
Operating Temp.	-40°C to 150°C	-40°C to 150°C
Rotational Life	> 100 million cycles (Bearing life)	> 100 million cycles (Bearing life)
Typical Applications	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

Incremental

	MEAS ED-19	MEAS ED-20
Package	Medium duty with sleeve or ball bearing	Medium duty with ball bearing
Resolution/ Accuracy	1024, 400, 256 CPR (Others on request)	1024, 400, 256 CPR (Others on request)
Max. Speed	300 RPM (Sleeve bearing) 3000 RPM (Ball bearing)	3000 RPM
Excitation	5 VDC	5 VDC (NPN and LVD), 12 - 32 VDC (HVD)
Unique Features	• Sleeve or ball bearing • No optical degradation	• Resistant to contamination • Metallic threaded bushing mounting • No optical degradation
Output	Quadrature (TTL level, open collector)	Quadrature (NPN, LVD and HVD)
Range	360°	360°
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	25.4 x 25.4 x 33.78	Ø31.75 x 33.24
Typical Applications	Feedback sensor or human machine interface device, servo / stepper motor position and speed control	Feedback sensor or human machine interface device, servo / stepper motor position and speed control

TILT SENSORS

Single Axis

	MEAS E-Series
Package	Ceramic housing
Type	Inclination sensor module
Range	±5°, ±15°
Output	Voltage
Unique Features	• Easy to handle • Minimal temperature drift • Good long term stability
Accuracy	±0.2° to ±0.5°
Operating Temp.	-25°C to 85°C
Dimensions (mm)	29 x 17 x 16.5
Typical Applications	Road construction, building monitoring, weighing systems, mobile and stationary cranes, platform leveling

	MEAS AccuStar EA
Package	LCP housing
Type	Inclinometer sensor module
Range	±45° to ±60°
Output	Voltage
Unique Features	• Compact • Low power • Vertical and horizontal mount
Accuracy	0° to 10° ±0.1% accuracy 10° to 60° ±0.75% reading
Operating Temp.	-30°C to 65°C
Dimensions (mm)	65.91 x 51.56 x 30.5
Typical Applications	Wheel alignment, construction, equipment, antenna positioning, robotics, crane / boom angle

	MEAS APS System
Package	Plastic housing
Type	Inclination system
Range	±45°, ±90°
Output	Analog / digital
Unique Features	• Stand alone system • Separate system and sensor
Accuracy	0° to 10° ±0.1% accuracy 10° to 45° ±0.75% of reading
Operating Temp.	-25°C to 65°C
Dimensions (mm)	127.5 x 88 x 32.2
Typical Applications	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment

	MEAS G-Series
Package	Aluminum housing IP67
Type	Inclinometer
Range	±10°
Output	Switch
Unique Features	• Programmable • EMC standard • High switch accuracy
Accuracy	±0.25°
Operating Temp.	-25°C to 85°C
Dimensions (mm)	80 x 75 x 57.5
Typical Applications	Lift platforms, building device control, train inclination monitoring, position switch

	MEAS IT9000
Package	Aluminum or stainless
Type	Inclinometer
Range	±45° to ±240°
Output	Voltage divider, 4 - 20 mA
Unique Features	• Rugged industrial design, IP67 / 68 • Submersible • Designed for brutal environments • CSA, CENELEC certification for hazardous area applications
Accuracy	±1%
Operating Temp.	-34°C to 90°C
Dimensions (mm)	Ø130 x 100
Typical Applications	Waste water control, tainter gates, draw bridges, heavy industrial applications

	MEAS AccuStar IP66
Package	Aluminum housing IP66
Type	Inclinometer
Range	±3° to ±45°
Output	Current
Unique Features	• EMI and RFI rated • CE pending • Water tight enclosure
Accuracy	0° to 10° ±0.1% linearity 10° to 45° ±1% linearity
Operating Temp.	-25°C to 60°C
Dimensions (mm)	98.04 x 63 x 35.05
Typical Applications	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment

TILT SENSORS

Dual Axis

	MEAS DPL, DPN Series	MEAS DOG2 Series	MEAS DPG Series	MEAS D Series
Package	PCB board	Plastic PA 6.6 housing, IP67	Aluminum housing IP67	Aluminum housing IP67
Type	Inclination board module	Inclinometer	Inclinometer	Inclinometer
Range	±2° to ±30°	±25°, ±45°, ±90°	±5° to ±30°	±5° to ±30°
Output	Voltage / RS 232 / SPI	Voltage / Current / J1939 / CANopen®	RS232 / Voltage	RS232 / Voltage / Current / Switch / PWM / CANopen®
Unique Features	• High resolution • Minimal temperature drift • User configurable	• Plug and play • Wide measurement range • Cost-efficient • Cable with connector • Fast MEMS sensor	• CE approved • Rugged housing • Easy to use • User configurable	• High accuracy • Rugged housing • Programmable • CE approved
Accuracy	±0.05° to ±0.8°	< ± 0.5° (Full temp. range)	±0.05° to ±0.3°	±0.04° to ±0.8°
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	45 x 45 x 20	70.5 x 45 x 15	84 x 70 x 34.2	84 x 70 x 46
Typical Applications	Laser leveling, weighing systems, mobile and stationary cranes, hydraulic leveling, building monitoring, wind power	Off road vehicle, fork lift, truck leveling, man lift, harvester, farm machine, tip over protection, solar panel control	Platform leveling, road construction machines, tunnel drilling, mobile leveling	Drilling machines, mobile and stationary cranes, wind power, antenna / radar leveling

PROXIMITY SENSORS

	MEAS PS801	MEAS PS811	MEAS PS831	MEAS PS2011AB	MEAS PS2021AB	MEAS PS2031AB	MEAS PS501
Package	Stainless steel	Nylon 6.6	Stainless steel	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6
Type	• Proximity sensor • Used with proximity magnet	• Proximity sensor • Used with proximity magnet	• Proximity sensor • Used with proximity magnet	• Proximity sensor • Used with proximity magnet	• Proximity sensor • Used with proximity magnet	• Proximity sensor • Used with proximity magnet	• Proximity sensor • Used with proximity magnet
Unique Features	SPST reed switch, normally open	SPST reed switch, normally open	SPST reed switch, normally open	SPST reed switch, normally open	SPST reed switch, normally closed	SPDT reed switch	SPST reed switch, normally open
Operating Temp.	-30°C to 120°C	-30°C to 110°C	-30°C to 130°C	-30°C to 105°C	-30°C to 105°C	-30°C to 105°C	-30°C to 130°C
Dimensions (mm)	Ø12 x 65	Ø10 x 38	Ø12 x 32	29 x 7 x 20	29 x 7 x 20	29 x 7 x 20	Ø6 x 32
Typical Applications	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication

PROXIMITY MAGNET

MEAS PM101

Package	Glass filled nylon 6.6
Type	• Proximity magnet • Used with proximity sensor
Unique Features	Housed magnet
Operating Temp.	-30°C to 105°C
Dimensions (mm)	29 x 7 x 20
Typical Applications	Door interlocks, hook switches, security systems, safety interlocks, position indication

MEAS PM50

Package	Glass filled nylon 6.6
Type	• Proximity magnet • Used with proximity sensor
Unique Features	Housed magnet
Operating Temp.	-30°C to 70°C
Dimensions (mm)	Ø6 x 32
Typical Applications	Door interlocks, hook switches, security systems, safety interlocks, position indication

MEAS PM81

Package	Nylon 6.6
Type	• Proximity magnet • Used with proximity sensor
Unique Features	Housed magnet
Operating Temp.	-30°C to 120°C
Dimensions (mm)	Ø10 x 38
Typical Applications	Door interlocks, hook switches, security systems, safety interlocks, position indication

MEAS PM83

Package	Stainless steel
Type	• Proximity magnet • Used with proximity sensor
Unique Features	Housed magnet
Operating Temp.	-30°C to 120°C
Dimensions (mm)	Ø12 x 32
Typical Applications	Door interlocks, hook switches, security systems, safety interlocks, position indication

LINEAR POSITION TRANSDUCERS

Cable Extension Transducers

MEAS PT1, PT5

Range	0 - 2 to 0 - 250 inches
Output	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™, RS-232
IP Rating	IP65, IP67 (PT5)
Enclosure	Aluminum and abs plastic (PT1)
Accuracy	±0.04% to ±0.25%
Unique Features	• Designed for most factory environments • Industry standard output signals • User serviceable • Compact design (PT1)
Operating Temp.	-40°C to 90°C
Dimensions (mm)	85 x 100 x 70 (PT1) 100 x 175 x 80 (PT5)
Typical Applications	Factory automation, industrial, die casting, injection molding

MEAS PT8000

Range	0 - 2 to 0 - 60 inches
Output	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet™, RS-232
IP Rating	IP67, IP68
Enclosure	Aluminum or stainless
Accuracy	±0.04% to ±0.25%
Unique Features	• Heavy duty, submersible • Designed for extreme industrial and marine environments • CSA, CENELEC certification for hazardous area applications • High accuracy, high acceleration • Free-release proof with VLS option • M12 and DEUTSCH connector options
Operating Temp.	-40°C to 90°C
Dimensions (mm)	90 x 140 x 135
Typical Applications	Steel mills, lumber and paper mills, factory automation, die-casting, injection molding, mobile construction and mining

MEAS PT9000

Range	0 - 75 to 0 - 1700 inches
Output	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet™, RS-232
IP Rating	IP67, IP68
Enclosure	Aluminum or stainless
Accuracy	±0.04% to ±0.25%
Unique Features	• Heavy duty, submersible • Proven workhorse for long stroke applications • Designed for extreme industrial and marine environments • CSA, CENELEC certification for hazardous area applications • Free-release proof with VLS option • M12 and DEUTSCH connector options
Operating Temp.	-40°C to 90°C
Dimensions (mm)	200 x 135 x 125
Typical Applications	Mobile hydraulic boom position, water resource management, mining and tunnel boring equipment, telescoping mechanism position, theatre stage control

LINEAR POSITION TRANSDUCERS

Cable Extension Transducers

	MEAS M150, MTA	MEAS MT2, MT3	MEAS SM, SP
Range	0 - 1.5 to 0 - 5 inches	0 - 3 to 0 - 30 inches	0 - 2.5 to 0 - 50 inches
Output	Voltage divider	Voltage divider, incremental encoder	Voltage divider, 0 - 10 VDC, 4 - 20 mA
Environment / IP Rating	IP50	IP50, IP67 (MT3A)	IP50, IP67 (SP)
Enclosure	Aluminum	Aluminum and polycarbonate	Polycarbonate with stainless steel bracket
Accuracy	±0.4% to ±1%	±0.25% to ±1.1%	±0.25% to ±1%
Unique Features	• M150: one of the world's smallest stringpots • Designed for space-critical and testing applications	• Designed for test applications • Dual-axis measuring cable alignment • Tracks high-acceleration linear position up to 136g's • High-frequency response • GAM EG 13 certification	• In-stock • Compact design • M12 connection • Adjustable mounting bracket • Free-release tolerant • Custom configurations for OEMS
Operating Temp.	-40°C to 85°C (M150) -55°C to 100°C (MTA)	-55°C to 125°C	-18 to 70°C (SM) -40°C to 85°C (SP)
Dimensions (mm)	19 x 19 x 10 (M150)	55 x 45 x 55	120 x 140 x 140
Typical Applications	Aerospace, automotive instrumentation, automotive crash testing, automotive and motorcycle racing	Automotive crash testing, aerospace and flight testing	Factory automation, light industrial, seismic testing, racing instrumentation, medical imaging systems, fume hood position

	MEAS SG, SR	MEAS SK1, SK6	MEAS PTX, PT101
Range	0 - 80 to 0 - 175 inches	0 - 250 and 0 - 400 inches	0 - 2 to 0 - 100 inches
Output	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, CANbus	4 - 20 mA, 0 - 10 V, voltage divider, CAN J1939, CANopen®, Encoder drive	Voltage divider, 0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA, incremental encoder, velocity output (DV301)
Environment / IP Rating	IP67	IP67	IP50
Enclosure	Polycarbonate with stainless steel bracket	Polycarbonate with stainless steel bracket	Aluminum
Accuracy	±0.35% to ±0.5%	±.25% FS	±0.04% to ±0.25%
Unique Features	• In stock • Low cost, high value stringpot • Versatile stainless steel mounting bracket • Simple one-button user scalable stroke range (SR) • Custom configurations available for OEM customers	• In stock • Compact design • M12 connectivity • Adjustable mounting bracket	• Original classic design • High precision • Proven track record
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 90°C
Dimensions (mm)	100 x 120 x 200	120 x 140 x 140	Model and range specific
Typical Applications	Outdoor mobile construction equipment, outrigger positioning, hydraulic lifts, water and power controls	Mobile construction equipment, factory automation	Aerospace testing, architectural and structural testing, factory automation

LINEAR POSITION TRANSDUCERS—INDUCTIVE

Absolute

	MEAS HR	MEAS M12	MEAS HC
Package	AISI-400 series stainless steel	AISI-304 series stainless steel	AISI-400 series stainless steel
Linearity	±0.25% of range	±0.25% of range	±0.25% of range
Excitation	AC operated	AC operated	AC and DC operated versions
Output	AC voltage	AC voltage	AC or DC voltage, 4 - 20 mA loop or RS-485
Range	±0.05 to ±10 inches	±10 to ±100 mm	±0.05 to ±10 inches
Unique Features	• Large bore to core clearance • Broad range of excitation frequencies • Variety of options • Mild radiation resistance option	• Metric series • High stroke to length ratio • Constant sum of secondaries • Excellent temperature coefficient	• Hermetically sealed • Welded connector • Double shielding • Intrinsically safe version • CE mark for DC versions
Operating Temp.	-55°C to 150°C (220°C optional)	-55°C to 150°C (220°C optional)	-55°C to 150°C (AC); 0°C to 70°C (DC)
Diameter (mm)	20.6	12	19
Typical Applications	General industrial	Hydraulic spool valve position feedback, flight simulators, aircraft flight control feedback	Harsh environments, submersible applications, process controls, valve position feedback

	MEAS XS-C	MEAS DC-SE	MEAS XS-D
Package	AISI-304 series stainless steel	AISI-400 series stainless steel	AISI-400 series stainless steel
Linearity	±0.25% of range	±0.25% of range	±2% of range
Excitation	AC operated	8.5 to 28 VDC	AC operated
Output	AC voltage	0 - 5 VDC (4 wire), 1 - 6 VDC (3 wire)	AC voltage
Range	±0.25, ±0.5 and ±1 inches	0 - 0.1 to 0 - 6 inches	±1 to ±10 inches
Unique Features	• High pressure • Bulkhead mounting • Hermetically sealed welded assembly	• CE mark • Low current consumption (6 mA typical) • Synchronous demodulation • Shielded cable	• Very high stroke to body length ratio
Operating Temp.	-55°C to 150°C	-25°C to 85°C	-55°C to 150°C
Diameter (mm)	19	19	20.6
Typical Applications	Hydraulic actuators, other pressurized vessels	Positioning sensing feedback, battery operated systems, test labs, ram guide, platen position	Where sensor installation length is restricted, ideal replacement for linear potentiometers

Other models available, please consult MEAS website library.

LINEAR POSITION TRANSDUCERS—INDUCTIVE

Absolute

	MACRO HSTA/R	MACRO HLR/HLIR	MACRO SSI/R
Package	AISI-410 stainless steel	AISI-410 stainless steel	Alloy 625
Linearity	±0.25% of range	±0.25% of range	±0.10% of range
Excitation	AC operated	AC (HLR) or DC (HLIR)	AC or DC operated
Output	AC voltage	AC voltage or 4-20 mA	AC or 4-20 mA loop digital CANbus available
Range	±0.050 to ±10.0 inches	±1 to ±10 inches	±1.0 to ±10.0 inches
Unique Features	• IP68 rating, hermetically sealed • Mild radiation resistant (30 Mrad) optional • Axial or radial connector with thru-bore construction	• UL/ULC or CSA intrinsically safe rating • Intrinsically safe: Class I Division I, Class I Division II • ATEX certified • 1/2" NPT conduit thread	• Operating pressure to 5,000 psi (7,500 psi proof) • Seawater submersible IP68 • Standard Seacon connector • Axial or radial connection
Operating Temp.	-55°C to 200°C standard (Contact factory for higher temperature)	-50°C to 100°C (Per Macro Sensors instructions)	-40°C to 80°C
Diameter (mm)	19	19	23.9
Typical Applications	High temperature steam and gas valves, nuclear power plants, harsh and corrosive environments, environments with heavy dust, dirt, and humidity	Gas turbine servo controls, fuel valve position feedback, petrochemical process plants	Off-shore drilling platforms, pipeline monitoring, choke valves, mooring cables, extensometers, pulp and paper mills

	MACRO HPGS 750	MACRO CD375	MACRO GHSE/R
Package	AISI-410 stainless steel	AISI-410 stainless steel	AISI-410 stainless steel
Linearity	±0.25% of range	±0.25% of range	±0.1% of range
Excitation	AC operated	AC operated	DC operated
Output	AC voltage	AC voltage	0 - 10 VDC
Range	±0.050 to ±10.0 inches	± 0.025 to ±1 inches	0.100 to 4 inches
Unique Features	• Radial screw-on 38999 connector • IP68 rating, hermetically sealed • Designed for high vibration applications	• Compact design • Operating pressure to 20,000 psi+	• Spring loaded design • IP68 rating, hermetically sealed • Axial and radial connection • Low pressure air-extend / spring-retract version available (GHSER 750-A)
Operating Temp.	-55°C to 200°C	-55°C to 200°C	-20°C to 70°C
Diameter (mm)	19	9.5	19
Typical Applications	Nuclear power generation equipment, hydraulic cylinder position, steam valve positioning, power generation equipment, corrosive environments, high-vibration environments	Machine tools, robotic grippers, medical equipment, valve position sensing, hydraulic cylinder, down-hole equipment	Industrial gaging systems, replaces dial indicators, fabricated metal products gaging

LINEAR POSITION TRANSDUCERS—INDUCTIVE

Dimensional Gaging Products

	MEAS LBB Spring-Extend	MEAS LBB Air-Extend	MEAS PCA 375	MEAS GC	MEAS Ultimate-Precision Digital LBB
Linearity	±0.2% of range	±0.2% of range	±0.5% of range	±0.25% (Voltage) to ±0.5% (4 - 20 mA) of range	Accuracy ±0.2%
Excitation	AC operated	AC operated	AC operated	AC or DC voltage	5 VDC USB (Bus or external)
Output	AC voltage	AC voltage	AC voltage	AC or DC voltage, RS-485, or 4 - 20 mA loop	RS485; USB
Range	±0.02 to ±0.20 inches	±0.04 and ±0.1 inches	±0.02 to ±1 inches	±0.05 to ±2 inches	1, 2, 5 and 10 mm
Unique Features	• 0.000004 inch (0.1 µm) repeatability • Removable tungsten carbide contact tip • Double shielded LVDT • Repairable	• 0.000004 inch (0.1 µm) repeatability • Removable tungsten carbide contact tip • Double shielded LVDT • Repairable	• Longer strokes • IP65 cable exit • Accepts industry standard contact tips • Heavy duty return spring	• Hermetically sealed • Welded MS connector (MIL-C-5015) • CE mark for DC versions • Special tips available • Air extend spring retract available	• Plug-and-play • 14-bit resolution • COM libraries provided • CE mark • USB adapter and power supply available
Operating Temp.	-40°C to 70°C	-40°C to 70°C	-20°C to 70°C	-55°C to 150°C (AC) 0°C to 70°C (DC)	0°C to 60°C
Diameter (mm)	8 or 9.5	8 or 9.5	9.5	19 mm body, 1/2 - 20 threads	Stackable gage system
Typical Applications	Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems	Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems	High density gaging fixtures, resistance weld verification, pressing applications, X-Y stage position feedback, rough casting inspection	Harsh environments, environments requiring hermetic seal, high temperatures (150°C for AC units)	Multi-channel electronic dimensional gaging, precision dimensional measurement, optics inspection systems, SPC data collection, hand tools

LINEAR POSITION ENCODERS

Incremental

	MEAS ED32i
Package	IP67 aluminum
Range	Magnetic scale, 5 mm pole pitch, typically up to 100 m absolute version up to 100 mm range on request
Excitation	5 VDC
Output	5 V TTL ABZ differential quadrature; RS-485
Resolution	≥10 µm; field programmable
Max. Speed	4 m/s
Unique Features	• Contactless incremental measurement • Very high accuracy, programmable resolution • High speed up to 4 m/s • Error detection, missing scale function • Adapter plate for easy mounting
Operating Temp.	-25°C to 85°C
Dimensions (mm)	60 x 20 x 10
Typical Applications	Linear displacement measurement in industrial and medical applications

ANGULAR POSITION—POTENTIOMETERS

	MEAS 6000 Series Servo Mount	MEAS 6200 Series Bushing Mount
Package	• 12.7 mm - 50.8 mm / 0.500″ - 2.00″ housing diameter • 3.170 mm - 6.34 mm / 0.1248″ - 0.2498″ shaft diameter • 12.7 mm - 1.74 mm / 0.500″ - 0.680″ housing length • 11.11 mm - 47.62 mm / 0.438″ - 1.875″ mounting pilot diameter	• 12.7 mm - 50.8 mm / 0.500″ - 2.00″ housing diameter • 3.170 mm - 6.34 mm / 0.1248″ - .2498″ shaft diameter • 12.7 mm - 1.74 mm / 0.500″ - 0.680″ housing length • 3/8 32 NEF thread / 10.31 mm / 0.4062″ pilot diameter
Resistance	1K - 20KΩ	1K - 20KΩ
Range	Up to 355°	Up to 355°
Linearity	± 0.5%	± 0.5%
Output Smoothness	<0.1%	<0.1%
Resolution	Infinite	Infinite
Operating Temp.	-65°C to 125°C	-65°C to 125°C
Rotational Life	50 million cycles / minute	50 million cycles / minute
Typical Applications	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

	MEAS 6900 Series Element/Wiper/Insulator	MEAS 6100 Series Hollow Shaft
Package	• 17.81 mm - 45.85 mm / 0.702″ - 1.805 in element outside diameter • 4.724 mm - 11.05 mm / 0.186″ - 0.435″ element inside diameter • 3.175 mm -6.35 mm / 0.125″ - 0.250 shaft insulator inside diameter • 4.064 mm - 7.80 mm / 0.160″ - 0.307″ mating wiper inside diameter • 5.08 mm / 0.200″ assembled package height	• 27.94 mm - 66.5 mm / 1.100″ - 2.62″ housing diameter • 3.175 mm - 19 mm / 0.125″ - 0.752″ hollow shaft diameter
Resistance	1K / 5K / 10KΩ	1K - 20KΩ
Range	Up to 350°	Up to 355°
Linearity	± 0.5%	± 0.5%
Output Smoothness	< 0.1%	< 0.1%
Resolution	Infinite	Infinite
Operating Temp.	-65°C to 125°C	-65°C to 125°C
Rotational Life	50 million cycles / minute	50 million cycles / minute.
Typical Applications	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

ANGULAR POSITION—POTENTIOMETERS

MEAS RT8, RT9

Package	Aluminum or stainless IP67, IP68
Resolution	±0.15% to ±1.25%
Unique Features	• Absolute rotary • Designed for heavy industrial applications • CSA, CENELEC certification for hazardous area applications
Output	Voltage divider, 0 - 5 V, 0 - 10 V, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™
Range	0 - 0.125 to 0 - 200 turns
Operating Temp.	-40°C to 90°C
Dimensions (mm)	Ø65 x 100 (RT8) Ø115 x 60 (RT9)
Typical Applications	Valve control, airport passenger loading bridge, water management, factory automation

LINEAR POSITION—POTENTIOMETERS

MEAS MLP, CLP

Package	Aluminum body, steel rod, IP65, IP67
Range	0 - 0.5 to 0 - 6″ (MLP) 0 - 1 to 0 - 10″ (CLP)
Linearity	±0.5 to ±1% (MLP) ±0.1 to ±0.2% (CLP)
Excitation	Up to 40 VDC max.
Output	Voltage divider
Resolution	Essentially infinite
Max. Speed	10 m/s
Unique Features	• Extended temperature range, miniature design • First choice for auto racing applications • Perfect for high cycle applications
Operating Temp.	-40°C to 90°C
Dimensions (mm)	Diameter / cross section: Ø9.5 mm (MLP) 15 mm x 15 mm (CLP)
Typical Applications	Vehicle testing, autosport instrumentation, structural and architectural testing and robotics.

MEAS 5903, 5905 Series
Linear Motion

Package	• 7.94 mm - 12.7 mm / 0.312″ - 0.500″ housing diameter • 1.98 mm - 3.18 mm / 0.078″ - 0.125″ shaft diameter
Resistance	1K / 5K / 10K
Range	5903 series - up to 50.8 mm / 2″ stroke 5905 series - up to 101.6 mm / 4″ stroke
Linearity	±1%
Output Smoothness	<0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Stroke Life	50 million cycles min
Typical Applications	Critical position feedback applications in commercial, industrial, medical, aircraft and military markets

LVDT / RVDT INSTRUMENTATION

MEAS LVM-110, LiM-420

Package	Open circuit board
Supply	DC voltage
Output	DC voltage or current
Operating Temp.	0°C to 55°C
Unique Features	• Master / slave for multi-up applications • Dip switch selectable excitation frequencies • Plug-in PCB or wire termination • Small form factor
Dimensions (mm)	63 x 56 x 21
Typical Applications	OEM applications

MEAS LDM-1000

Package	DIN rail mount
Supply	10 to 30 VDC
Output	DC voltage and current
Operating Temp.	-25°C to 85°C
Unique Features	• Operates with 4, 5 & 6 wire LVDT / RVDTs • Adjustable zero, span and phase • Status LEDs • CE mark
Dimensions (mm)	115 x 99 x 23
Typical Applications	Automotive test track instrumentation, gas and steam turbine controls, factory automation

MEAS ATA-2001

Package	1/8 DIN panel mount
Supply	115 and 220 VAC, 50 - 400 Hz
Output	DC voltage and current
Operating Temp.	-40°C to 85°C
Unique Features	• Push button programmable • Splash proof front panel • LED status lights • Mounting hardware included • CE mark
Dimensions (mm)	267 x 99 x 49
Typical Applications	Precision metrology labs, power generation valve position monitoring

MEAS PML 1000

Package	1/8 DIN panel mount
Supply	90 to 265 VAC, 50 - 60 Hz or 24 VDC
Output	DC voltage and current (RS-485 optional)
Operating Temp.	10°C to 55°C
Unique Features	• 5 digit LED display • Auto-calibration • Programmable • Splash proof front panel • Mounting hardware included • CE mark
Dimensions (mm)	173 x 97 x 49
Typical Applications	Remote monitoring stations, measurement test stands, process monitoring

MEAS MP 2000

Package	1/4 DIN panel mount
Supply	100 to 240 VAC, 47 - 63 Hz
Output	DC voltage and RS-232
Operating Temp.	0°C to 55°C
Unique Features	• Programmable set point controller • Dual channel with math functions • Digital I/O • Large LCD display • Splash proof front panel
Dimensions (mm)	178 x 92 x 92
Typical Applications	LVDT based weighing systems, pass / fail parts sorting, quality inspection

MACRO LVC-4000

Package	DIN rail mount
Supply	9 to 30 VDC
Output	RS-485, DC voltage, and 4-20 mA
Operating Temp.	-20°C to 75°C
Unique Features	• Push-button calibration • Digital RS-485 interface • Master / slave excitation synchronization (Up to 16 channels) • Supports all standard AC LVDTs, RVDTs, and VR half-bridge sensors
Dimensions (mm)	114.5 x 99 x 22
Typical Applications	Gas and steam turbine controls, automotive test instrumentation, factory automation

MACRO LVC-4500

Package	DIN rail mount
Supply	9 to 30 VDC
Output	RS-485, DC voltage, and 4-20 mA
Operating Temp.	-20°C to 75°C
Unique Features	• Push-button calibration • Diff / sum ratiometric conditioning • Digital RS-485 interface • Master / slave excitation synchronization (Up to 16 channels) • Supports all standard AC LVDTs, RVDTs, and VR half-bridge sensors
Dimensions (mm)	114.5 x 99 x 22
Typical Applications	Gas and steam turbine controls, automotive test instrumentation, factory automation

MACRO MMX Mini Module

Package	DIN rail mount
Supply	15 to 30 VDC
Output	DC voltage or 4-20 mA
Operating Temp.	0°C to 70 °C
Unique Features	• Push-button calibration • Flame retardant mini-module housing • Master / slave excitation synchronization (Up to 10 channels) • LED status lights • Supports all standard AC LVDTs, RVDTs, and VR half-bridge sensors
Dimensions (mm)	85.1 x 70.4 x 17.8
Typical Applications	Automotive test instrumentation, factory automation

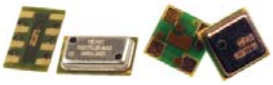
PRESSURE SENSORS

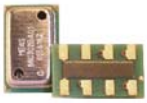
We design and manufacture pressure sensors ranging from the sensing element to system packaging for harsh environments. We are an industry leader for our range of both standard and custom pressure sensors, from board level components to fully amplified and packaged transducers. Based on piezoresistive Microelectromechanical (MEMS) and silicon strain gage (Microfused, Krystal Bond) technology, our sensors measure everything from inches of water column (<5 mbar) to 100K psi (7K bar). Sophisticated design and advanced manufacturing techniques create reliable cost-effective solutions for medical, HVACR, off road/heavy equipment and general industrial applications. We manufacture one of the world's lowest power and smallest package pressure sensors for altimeter/NAV applications. Our sensors are signal conditioned, calibrated over temperature and include digital or analog outputs.

BOARD LEVEL PRESSURE SENSORS

Digital Output and Altimeter

	MEAS MS4515DO, MS4525DO	MEAS MS5803	MEAS MS5837
Package	8 pin DIL	Surface mountable	Surface mountable
Type	Gage, compound (MS4515DO) Gage, absolute, differential, compound (MS4525DO)	Absolute	Absolute
Pressure Range	0 - 2 to 30" H_2O (MS4515DO) 0 - 1 to 150 psi (MS4525DO)	0 - 1 to 30 bar	0 - 30 bar
Output / Span	14-bit ADC SPI or I^2C	24-bit ADC I^2C and SPI (Mode 0, 3)	24-bit ADC I^2C
Resolution	—	12 µbar (MS5803-01BA) 0.5 mbar (MS5803-30BA)	0.2 mbar
Unique Features	• Optional gel coat, low power • Pressure and temperature measurement • Single supply of 3.3 or 5.0 VDC • Top, side barbed or manifold o-ring port • J lead or thru hole pins	• 24-bit digital sensor, software calibration and temperature compensation (I^2C and SPI), no external components • Supply voltage 1.8 to 3.6 V	• Supply voltage: 1.5 to 3.6 V • Excellent long term stability • Hermetically sealable for outdoor devices • Sealing designed for 1.8 x 0.88 mm o-ring
Linearity/Absolute Accuracy	0.25% / 1% TEB	±1.5 mbar at 25°C (MS5803-01BA) ±250 mbar at 0°C to 40°C (MS5803-30BA)	±400 mbar
Overpressure	300 psi	10 bar (1, 2 bar), 30 bar (5, 7, 14 bar) 50 bar(30 bar)	50 bar
Operating Temp.	-10°C to 85°C (MS4515DO) -25°C to 105°C (MS4525DO)	-40°C to 85°C	-20 to 85 °C
Dimensions (mm)	12.5 x 9.9	6.4 x 6.2 x 2.9	3.3 x 3.3 x 2.75
Typical Applications	Medical instruments, air flow measurements, process control, leak detection	Precision altimeter, diving and multi-mode watches, in-building navigation, variometers / flight instruments	Mobile water depth measurement systems, diving computers, adventure or multi-mode watches, data loggers





	MEAS MS5525DSO	MEAS MS5607, MS5611, MS5637	MEAS MS5805	MEAS MS8607
Package	SOIC-14	Surface mountable	Surface mountable	Surface mountable
Type	Gage, absolute, differential, compound	Absolute	Absolute	Absolute
Pressure Range	0 - 1 to 30 psi	10 - 2K mbar	10 - 2K mbar	10 - 2K mbar
Output / Span	24-bit ADC SPI or I^2C protocol	24-bit ADC I^2C	24-bit ADC I^2C	24 bit ADC I^2C
Resolution	—	0.016 mbar	0.02 mbar	0.016 mbar
Unique Features	• 24-bit digital small outline sensor • Pressure and temperature measurement • Single supply of 1.8 or 3.6 VDC • Barb, tube and hole package style options	• 24-bit digital sensor • 13 cm resolution (MS5607, MS5637) • 10 cm resolution (MS5611) • Supply voltage: 1.5 to 3.6 V (MS5637) Supply voltage: 1.8 to 3.6 V (MS5607, MS5611) • Low power, 0.6 µA (Standby ≤ 0.1 µA at 25°C)	• 24-bit digital sensor • 20 cm resolution • Supply voltage: 1.8 to 3.6 V • Sealing designed for 2.5 x 1 mm o-ring • Silicone gel protection • Waterproof	• Integrated pressure, humidity and temperature • Supply voltage: 1.5 to 3.6 V • Fully factory calibrated sensor
Linearity/Absolute Accuracy	0.25% / 2.5% TEB	±2.0 mbar at 25°C	±2.0 mbar at 25°C	±4 mbar
Overpressure	3X range	6 bar	5 bar	6 bar
Operating Temp.	-40°C to 125°C	-40 to 85°C	-40 to 85°C	-40°C to 85°C
Dimensions (mm)	12.5 x 7.9	3 x 3 x 0.9 (MS5637) 5 x 3 x 1 (MS5607, MS5611)	4.5 x 4.5 x 3.5	5 x 3 x 1
Typical Applications	Medical respirators, ventilators, factory automation, altitude and airspeed measurements, leak detection, home appliances	Smart phones, tablets , personal navigation devices, tire pressure monitoring, compressors	Mobile altimeter and barometer systems, bike computers, adventure or multi-mode watches, variometers, data loggers	Smart phones, tablets, HVACR, weather stations, printers, home appliances and humidifiers

BOARD LEVEL PRESSURE SENSORS

Amplified Output

	MEAS MS4515, MS4525	MEAS MS5525ASO
Package	8 pin DIL	SOIC-14
Type	Gage, differential (MS4515) Gage, absolute, differential, compound (MS4525)	Gage, absolute, differential, compound
Pressure Range	0 - 2 to 30" H_2O (MS4515) 0 - 1 to 150 psi (MS4525)	0 - 1 to 30 psi
Output / Span	10% to 90% or 5% to 95% of supply	10 - 90% VDC
Unique Features	• Ratiometric analog output sensor • Single supply of either 3.3 or 5.0 VDC • Top, side barbed or manifold o-ring port • J lead or thru-hole pins • Optional gel coat	• Temperature compensated • 2.75 to 5.5 VDC supply voltage • Amplified ratiometric analog output • Barb, tube and hole package style options
Accuracy	0.25% span / 1% TEB	±0.5% span / 2.5% TEB
Operating Temp.	-10°C to 85°C (MS4515), -25°C to 105°C (MS4525)	-25°C to 105°C
Dimensions (mm)	12.5 x 9.9	12.5 x 7.9
Typical Applications	Medical instruments, air flow measurements, process control, leak detection	Factory automation, altitude and airspeed measurements, medical instruments, leak detection

mV Output

	MEAS 1210, 1220, 1230, 1240	MEAS 13, 23, 33, 43, 17, 27, 37, 47	MEAS MS4425, MS4426
Package	8 pin DIL	TO-8	6 pin DIL
Type	Gage, absolute, differential	Gage, absolute, differential	Gage, absolute, differential
Pressure Range	0 - 5 and 10" H_2O 0 - 1 to 100 psi	0 - 1 to 250 psi	0 - 1 to 300 psi
Output / Span	50 mV and 100 mV typical	100 mV typical	60 mV, 90 mV, 100 mV, and 150 mV typical
Unique Features	• Temperature compensated • High performance UltraStable die (1230, 1240) • Current excitation (1210, 1230) • Voltage excitation (1220, 1240)	• Temperature compensated • High performance UltraStable die (17, 27, 37, 47) • Can gel fill for humid conditions	• Temperature compensated • High performance UltraStable die • Voltage excitation
Accuracy	±0.1% non-linearity	±0.1% non-linearity	±0.1% non-linearity
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-25°C to 85°C
Dimensions (mm)	15.2 x 14.7	Ø11.4, application dependent	15.2 x 13.7
Typical Applications	Medical instruments, air flow measurement, process control, factory automation, leak detection	Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection	Drop-in for 6 pin industrial sensor for PCB mounted medical

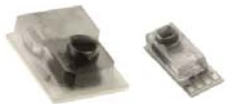
BOARD LEVEL PRESSURE SENSORS

mV Output

	MEAS MS1451, MS1471	MEAS MS52xx, MS54xx
Package	Surface mountable	Surface mountable
Type	Gage, absolute	Gage, absolute
Pressure Range	0 - 5 to 500 psi	0 - 1 to 12 bar
Output / Span	60 mV typical	150 mV, 240 mV
Unique Features	• Low cost • Coarse calibrated at room temp. (MS1471) • With gel to protect against moisture • Tube or hole	• Small size (MS54xx) • High linearity or high sensitivity options • Plastic tube or metal ring options • With gel to protect against moisture • High endurance (Option HM)
Accuracy	±0.25% non-linearity	±0.05%, ±0.15% FS non-linearity (MS52xx) ±0.05%, ±0.2% FS non-linearity (MS54xx)
Operating Temp.	-40°C to 125°C	-40°C to 125°C
Dimensions (mm)	7.6 x 7.6, application dependent	7.6 x 7.6, application dependent (MS52xx) 6.4 x 6.2 (MS54xx)
Typical Applications	Altitude measurement, barometric pressure, medical instrumentation, consumer appliances, tire pressure	Absolute pressure sensor systems, engine controls, high resolution altimeters, variometers, waterproof watches, diver computers, barometers, tire pressure monitoring systems (TPMS), medical instrumentation, pneumatic controls

DISPOSABLE MEDICAL PRESSURE SENSORS

mV Output



	MEAS 1620, 1630	MEAS Fully Assembled 1620 (Customized per customer specifications)
Package	Hybrid assembly	Plastic housing
Type	Gage	Gage
Pressure Range	-30 to 300 mmHg	-30 to 300 mmHg
Output / Span	5 µV/V/mmHg	5 µV/V/mmHg
Unique Features	• Low cost, disposable design • Supplied in tape and reel • Compliant to AAMI spec • ISO13485 certified	• Low cost, disposable design • Compliant to AAMI spec • Custom designs available
Accuracy	±1.0% FSO	±1.0% FSO
Operating Temp.	10°C to 40°C	10°C to 40°C
Dimensions (mm)	1620: 11.43 x 8.13 x 4.20 1630: 12.7 x 5.08 x 3.94	42.8 x 30.3 x 19.0
Typical Applications	Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation	Disposable blood pressure, kidney dialysis machines, surgical procedures and intensive care units. Ready to use, fully assembled disposable sensor units with cable, connector, stop cock, flush device in a plastic housing.

MEDIA ISOLATED PRESSURE SENSOR MODULES

Digital Output




	MEAS 85BSD	MEAS 86BSD	MEAS 89BSD	MEAS 154BSD
Package	• 13 mm diaphragm diameter • Weldable or threaded process fittings	• 16 mm diaphragm diameter • O-ring mount	• 9 mm diaphragm diameter • Threaded or weldable	• 19 mm diaphragm diameter • O-ring mount
Type	Gage, absolute	Gage, absolute	Absolute, sealed gage	Gage, absolute
Pressure Range	0 - 0.35 to 20 bar / 0 - 5 to 300 psi	0 - 0.07 to 20 bar / 0 - 1 to 300 psi	0 - 6 to 30 bar	0 - 1 to 300 psi
Output / Span	14-bit ADC I²C or SPI	14-bit ADC I²C or SPI	24-bit ADC I²C	14-bit ADC I²C or SPI
Unique Features	• Pressure and temperature read-out • Cable and connector options • Low power option	• Pressure and temperature read-out • Cable and connector options • Low power option	• Pressure and temperature read-out • Low power: 1 µA (Standby < 0.15 µA)	• Pressure and temperature read-out • Cable and connector options • Low power option
Accuracy	±0.25% span	±0.25% span	±0.3% span	±0.25% span
Total Error Band	±1.0% FSO	±1.0% FSO	±3.0% FSO max.	±1.0% FSO
Overpressure	2X	2X	2X	2X
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 85°C	-40°C to 125°C
Dimensions (mm)	Ø15.85 x 7.9	Ø15.82 x 9.3	Ø9.04 x 7.5	Ø19 x 13.8
Typical Applications	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, dive computers	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring

MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output



	MEAS 82, 85 with Fittings	MEAS 89 Button, 89 with Fittings	MEAS 86A Amplified
Package	Weldable (85) or process fitting	Weldable or process fitting	5/8" (16 mm) diameter o-ring mount
Type	Gage, absolute, vacuum gage	Sealed gage, absolute	Gage, absolute
Pressure Range	0 - 5 to 500 psi (85) 0 - 1 to 500 psi (82)	0 - 1K to 10K psi	0 - 1 to 150 psi
Output / Span	100 mV typical	100 mV typical	0.5 - 4.5 VDC
Unique Features	• Modular design	• High pressure • Modular design	• Small diameter, amplified output • Bar ranges available
Non-linearity	±0.3% FSO (1 psi) ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi)	±0.25% FSO	±1.0% FSO
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-20°C to 85°C
Dimensions (mm)	Fittings: application dependent	89 Button: Ø9.04 x 13.2 89 with Fittings: application dependent	Ø15.82 x 9.3
Typical Applications	Medical, process control, refrigeration compressor, oceanography, level systems	Air tank pressure, hydraulics, process control, robotics, refrigeration compressors, oceanography	Level measurement, OEM transmitters and transducers, process control

MEDIA ISOLATED PRESSURE SENSOR MODULES

Analog Output

	MEAS 82, 85, 85F, 86, 154N	MEAS DP86 O-Ring Mount, with Fittings/Cable	MEAS U86B
Package	• 3/4″ (19 mm) diameter o-ring mount (82, 154N) • 5/8″ (16 mm) diameter o-ring mount (86) • 1/2″ (13 mm) diameter o-ring flush mount (85F) • 1/2″ (13 mm) diameter o-ring mount (85)	• 5/8″ (16 mm) diameter o-ring mount or threaded process fittings	• Mountable with o-ring seal
Type	Gage, absolute, vacuum gage (82, 85, 86, 154N) Gage, absolute (85F)	Differential	Sealed gage, absolute
Pressure Range	0 - 1 to 500 psi (Absolute, gage: 82, 154N) 0 - 5 to 500 psi (Absolute, gage: 85, 86) 0 - 15 to 500 psi (85F, vacuum gage: 82, 85, 86, 154N)	0 - 1 to 500 psi	0 - 5 to 13 bar / 0 - 50 to 200 psi
Output / Span	100 mV typical	100 mV typical / sensitivity dependent	0.5 - 4.5 VDC (Ratiometric output)
Unique Features	• High performance • High stability for OEM applications • Minimizes trapped volume (85F)	• Wet/wet differential pressure • Line pressure max. 1000 psi	• Amplified
Non-linearity	±0.3% FSO (1 psi), ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi), ±0.1% FSO (85F)	±0.3% FSO (1 psi) ±0.2% FSO (5 psi) ±0.1% FSO (≥15 psi)	±0.5% FSO
Operating Temp.	-40°C to 125°C (82 / 85 / 86 / 154N), -20°C to 125°C (85F)	-40°C to 125°C	-7°C to 105°C
Dimensions (mm)	82: Ø19 x 6.48 86: Ø15.82 x 11.4 154N: Ø18.97 x 13.8 85F: Ø17.2 x 11.33 85: Ø15.85 x 9.3	O-ring: Ø15.82 x 17.5 Fittings: Application dependent	Ø15.82 x 13.6 Socket spacing: 31.75
Typical Applications	Hydraulic controls, process control, oceanography, refrigeration/compressors, pressure transmitters, level systems, dialysis machines, infusion pumps, medical systems	Level controls, tank level measurement, corrosive fluids and gas measurement systems, flow measurement	Urea level, urea pressure, air brakes, corrosive fluid measurement for E&V applications

TRANSDUCERS AND TRANSMITTERS

Wireless

	MEAS M5600, U5600
Type	Gage, sealed, absolute, compound
Pressure Range	0 – 50 to 15K psi (M5600) 0 – 5 to 10K psi (U5600)
Output / Span	24-bit ADC I²C
Unique Features	• Pressure and temperature • 2.3 – 3.6 V supply voltage • Compact and battery-powered • Weather resistant (IP66 and IP67) • Stainless steel and polycarbonate enclosure
Accuracy	±0.25% FS (M5600) Down to ±0.1% FS (U5600)
Operating Temp.	-20°C to 85°C
Dimensions (mm)	24 x 24 x 69
Typical Applications	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off-road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management
Agency Approvals	CE, FCC

Industrial

	MEAS MSP100	MEAS MSP300, MSP340
Type	Gage	Gage
Pressure Range	0 - 100 to 500 psi	0 - 100 to 10K psi (MSP300) 0 - 50 to 10K psi (MSP340)
Output / Span	100 mV typical	0 - 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
Unique Features	• Microfused • Low cost stainless steel isolated transducer • No threads needed for pressure connect • Highly customized for OEM application • Small size • Solid state reliability	• Microfused • Highly customized for OEM applications • Small size • Solid state reliability
Accuracy	±0.5% FSO	±1% FSO
Operating Temp.	0°C to 55°C	-20°C to 85°C
Dimensions (mm)	12.7 x 24.38 x 20.32	MSP300: 22.23 x 22.23 x 55.88 MSP340: 15.88 x 15.88 x 75.44
Typical Applications	Beverage dispensing systems, automation, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment	Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment
Agency Approvals	—	UL 508 (MSP300)

TRANSDUCERS AND TRANSMITTERS

Industrial

	MEAS US300	AST20HA, AST20PT, AST20SW	AST4000
Type	Gage, absolute	Gage, sealed gage, absolute	Gage, sealed gage, compound
Pressure Range	0 - 15 to 5K psi	0 - 1 to 60K psi	0 - 25 to 10K psi
Output / Span	0 - 10 mV/V, 0.5 - 4.5 V, 1 - 5 V, 4 - 20 mA	0.5 - 4.5 V [Ratiometric] 1 - 5 V 4 - 20 mA, 0 - 5 V, 0 - 10 V, switch (AST20SW)	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 1 - 10 V, 4 - 20 mA, 0.5 - 2.5 V
Unique Features	• UltraStable technology • Highly customized for OEM applications • Small size • Solid state reliability	• Excellent performance over temperature • Semi-custom designs available • Fault mode condition settings • Four standard sensor material options • Additional temperature output (AST20PT)	• Four standard sensor material options • Rugged construction • 100 V/m EMI/RFI protection • Semi-custom designs available
Accuracy	±0.15% FSO (15 - 1K psi), ±0.25% FSO (>1K psi)	±0.1% FSO	±0.5% FSO
Operating Temp.	-40°C to 105°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	15.88 x 15.88 x 98.00	Application dependent	Application dependent
Typical Applications	Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment	Test and measurement, industrial controls	Water, hydraulic equipment, HVACR, industrial controls
Agency Approvals	—	ABS, CE	UL/cUL508, ABS, CE

	MEAS M5200	MEAS U5200, U5300	MEAS D5100
Type	Gage, sealed, compound	Gage, sealed, absolute, compound	Differential wet/wet
Pressure Range	0 - 3.5 to 1K bar / 0 - 50 to 15K psi	0 - 0.14 to 700 bar / 0 - 2 to 10K psi	0 - 0.07 to 35 bar / 0 - 1 to 500 psi
Output / Span	0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V	0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V	80 mV / 100 mV, 0.5 - 4.5 VDC, 1 - 5 VDC, 4 - 20 mA
Unique Features	• Microfused technology • High performance at a low cost • Solid state reliability • ±1% FSO TEB (-20°C to 85°C) • Weatherproof • 17 - 4 PH or 316L SS	• UltraStable technology • High performance at a low cost • ±0.75% FSO TEB (-20°C to 85°C, >5 psi and ≤5000 psi) (U5200) • ±0.5% FSO TEB (-20°C to 85°C) (U5300) • Weatherproof • High accuracy (U5300)	• UltraStable technology • High performance at a low cost • Solid state reliability • ±1% FSO TEB (-20°C to 85°C) • Line pressure max. 1000 psi
Accuracy	±0.25% FSO	±0.1% FSO (>5 and ≤500 psi)	±0.3% FSO (<5 psi), ±0.25% FSO (5 psi), ±0.1 % FSO (≥15 psi)
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Dimensions (mm)	24 X 24 X 82 max.	24 X 24 X 82 max.	25.4 x 58.4 x 72.0
Typical Applications	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic and pneumatic systems, agriculture equipment, energy generation and management, military and aerospace test stands, calibration equipment, high accuracy applications, stationary motor fuel control, high end industry machinery	Process controls, tank level measurement, filter performance monitoring, corrosive fluids and gas measurement systems, flow measurement
Agency Approvals	CE (EMC)	CE (EMC), UL 508	CE (EMC)

TRANSDUCERS AND TRANSMITTERS

Industrial

MEAS M7100, U7100

Type	Gage, no vent gage (M7100) Gage, sealed gage, absolute (U7100)
Pressure Range	0 - 10 to 700 bar / 0 - 150 to 10K psi (M7100) 0 - 1 to 10 bar / 0 - 15 to 150 psi (U7100)
Output / Span	0.5 - 4.5 VDC [Ratiometric output] 1 - 5 VDC [Regulated] (M7100) 0.5 - 4.5 VDC [Ratiometric output] (U7100)
Unique Features	• ±1% FSO TEB (-20°C to 85°C) • Solid state reliability • Survives high vibration and immersion • Microfused technology (M7100) • UltraStable technology (U7100) • Copper tube for HVACR (M7100)
Accuracy	0.25% FSO
Operating Temp.	-40°C to 125°C
Dimensions (mm)	26.7 x 26.7 x 50.0
Typical Applications	HVACR refrigeration controls, off road vehicles engine control, compressors, hydraulic, energy and water management
Agency Approvals	CE (EMC), UL 508

Heavy Industrial

MEAS P900, P981, P1200, P700, P9000

Type	Gage, absolute
Pressure Range	0 - 5 bar to 700 bar / 0 - 75 to 10K psi
Output / Span	0 - 5 VDC, 0 - 10 VDC, 4 - 20 mA
Unique Features	• High overpressure (10X over pressure) • Shock and vibration resistant • Heavy industrial grade transducer (P9000) • Advanced digital compensation / calibration • Mechanical over pressure stops • High temperature operation
Accuracy	0.1% to 0.2% FSO
Operating Temp.	-54°C to 120°C
Dimensions (mm)	Application dependent
Typical Applications	Steel mills, hydraulic controls, power generation equipment, torpedo depth, military and aerospace, vehicle braking systems
Agency Approvals	CE, CENELEC (Intrinsically Safe)

MEAS P101, P105, P125

Type	Gage
Pressure Range	0 - 10 to 7K bar / 0 - 150 to 100K psi
Output / Span	7.5 to 20 mV (4 V; 5 V optional)
Unique Features	• Stainless steel diaphragm • Female pressure connectors: M16 x 1.5, M20 x 1.5, 1/4 NPT • Metal to metal seal
Accuracy	±0.3% FSO
Operating Temp.	-20°C to 80°C
Dimensions (mm)	Ø29 x 85 max.
Typical Applications	Harsh environments, aggressive liquids
Agency Approvals	—

TRANSDUCERS AND TRANSMITTERS

Miniature

MEAS XP Series

Type	Gage, sealed, absolute
Pressure Range	0 - 1 to 350 bar / 0 - 15 to 5K psi (XP5, XPM10) 0 - 5 to 200 bar / 0 - 75 to 3K psi (XPM4) 0 - 100 to 1K bar / 0 - 1.5K to 15K psi (XPM6)
Output / Span	20 - 100 mV, 4 V FSO (Amplified)
Unique Features	• Titanium construction (XP5, XPM4) • Stainless steel housing (XPM6, XPM10) • Amplified output options (XP5, XPM6, XPM10) • Cable and connector options • For static and dynamic applications
Accuracy	Down to ±0.25% FSO (XP5, XPM6, XPM10), down to ±0.35% FSO (XPM4)
Operating Temp.	-40°C to 120°C
Dimensions (mm)	XPM4: M4 x 0.7 thread; Hex 8 XP5: M5 x 0.8 or 10-32 UNF thread; Hex 10 XPM6: M6 x 1 thread; Hex 12 XPM10: M10 x 1 thread; Hex 15
Typical Applications	Corrosive liquids and gases, braking system pressure, onboard equipment monitoring, military and aerospace, explosive test benches, robotics and effectors, laboratory and research, extreme miniature devices

MEAS XPC10

Type	Gage, sealed, absolute
Pressure Range	0 - 10 to 500 bar / 0 - 150 to 7.5K psi
Output / Span	12 mV FSO, 4 V FSO (Amplified)
Unique Features	• Amplified output available • For static and dynamic applications • Optional IP67 ingress protection • High temperature operation
Accuracy	Down to ±0.25% FSO
Operating Temp.	-40°C to 220°C
Dimensions (mm)	M10 x 1 or 3/8-24 UNF thread; Hex 15
Typical Applications	Aerospace, test benches, oven monitoring equipment, cooling regulation systems

TRANSDUCERS AND TRANSMITTERS
Miniature

	MEAS EB, EPRB	MEAS EPIH	MEAS EPB, EPB-PW, EPL
Type	Gage, sealed, absolute	Gage, sealed, absolute	Gage, sealed, absolute
Pressure Range	0 - 0.35 to 700 bar / 0 - 5 to 10K psi	0 - 0.35 to 20 bar / 0 - 5 to 300 psi	0 - 0.35 to 350 bar / 0 - 5 to 5K psi
Output / Span	0.5 to 4.5 VDC	12 mV to 75 mV	10 mV to 125 mV
Unique Features	• High accuracy • Miniature design • UltraStable technology • EMI protected • Combined pressure and temperature	• Diffused silicon diaphragm with a large variety of sizes and shapes available as small as 0.05" outside diameter • High frequency response (To 1.7 MHz) • Ultra-miniature design	• Miniature flush mountable • Flush stainless steel diaphragm, flanged or non-flanged • Bonded silicon gage, high frequency response (To 400 KHz) • IP68 ingress protection in Titanium construction (EPB-PW)
Accuracy	±0.25% FSO	±1.0% FSO	±0.5 to ±1% FSO
Operating Temp.	-40°C to 125°C (Available option up to 150°C)	-40°C to 120°C	-40°C to 120°C
Dimensions (mm)	11 body diameter	Application dependent	3.2 to 7 outside diameter
Typical Applications	Motor sport, hydraulic / pneumatic systems, automotive test stands, military and aerospace test stands	Aerospace testing, wind tunnels, biomedical testing, aircraft body and wing dynamics, high frequency measurements	Air flow testing, hydraulic pressure systems, air pressure systems, bearing studies, ballistics, water hammer, miniature scale model testing, centrifuge pore water pressure measurements
Agency Approvals	CE (EMC)	—	—

TRANSDUCERS AND TRANSMITTERS
Liquid Level

	MEAS U5700	AST45xx
Type	Gage, sealed, absolute, compound	Gage, absolute
Pressure Range	0 - 2 to 10K psi	0 - 1 to 100 psi (AST4500, AST4510, AST4520)
Output / Span	0.5 - 4.5 V, 1 - 5 V, 0 - 5 V, 0 - 10 V, 4 - 20 mA, 1 - 6 V	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V
Unique Features	• UltraStable technology • High accuracy • IP68 rated connection and submersible polyurethane jacketed cable • Optional Polyoxymethylene cap	• Intrinsically safe ratings • Material options including: 316L, alloy C276, and PVDF • Low power options • High quality cable options
Accuracy	0.1 % FSO	±0.25% FSO
Operating Temp.	-10°C to 60°C	-40°C to 85°C
Dimensions (mm)	22.23 x 22.23 x 98.04	Application dependent
Typical Applications	Industrial process control and monitoring, advanced HVACR systems, refrigeration systems, automotive test stands, off road vehicles, pumps and compressors, hydraulic / pneumatic systems, agriculture equipment, energy generation and management, liquid level applications	Diesel tanks, chemical tanks, water tanks
Agency Approvals	CE (EMC)	UL/CSA Class I Div I, ATEX/IECEx Exia, ABS, CE

TRANSDUCERS AND TRANSMITTERS

Hazardous Location

	AST43xx, AST44xx	AST46xx
Type	Gage, sealed gage, compound, absolute	Gage, sealed gage, compound, absolute
Pressure Range	0 - 1 to 15 psi (AST43LP, AST44LP) 0 - 25 to 20K psi (AST4300, AST4400, AST4401)	0 - 1 to 20K psi
Output / Span	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V	0.5 - 4.5 V [Ratiometric], 1 - 5 V, 4 - 20 mA, 0.5 - 2.5 V, switch (AST46SW)
Unique Features	• Available with 316L, alloy C276, or alloy 718 materials • Low current consumption options • Low power options • High proof and burst pressure	• Available with 316L, alloy C276, or alloy 718 materials • Low current consumption options • Low power options • Local display (AST46DS) • Additional temperature output
Accuracy	±0.25% FSO	±0.25% FSO (AST4600, AST46DS), ±0.1% FSO (AST46HA, AST46PT)
Operating Temp.	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	Application dependent	Application dependent
Typical Applications	Compressors, well sites, ships, factory automation, SCADA equipment, offshore equipment	SCADA/RTU, well sites, offshore equipment, hydraulic controls
Agency Approvals	UL/CSA Class I Div I and II, ATEX/IECEx Exia/Exn, CCOE, CNEx, ABS, CE	CSA Class I/II Div I, ATEX/IECEx Exd, ABS, CE

	AST5100, AST5300, AST5400
Type	Differential
Pressure Range	0 - 5 H_2O″ to 5K psi
Output / Span	0.5 - 4.5 V [Ratiometric], 0 - 5 V, 1 - 5 V, 4 - 20 mA
Unique Features	• Wide range of pressures available • Full line pressure on either side without zero shifts • Hazardous location approvals (AST5300, AST5400)
Accuracy	±0.25% FSO (AST5100, AST5300), 1% TEB (AST5400)
Operating Temp.	-40°C to 85°C
Dimensions (mm)	Application dependent
Typical Applications	Filter monitoring, flow measurement, tank level measurement
Agency Approvals	CSA Class I/II Div I and II, ATEX/IECEx Exd/Exn, ABS, CE

RATE AND INERTIAL SENSORS

TE Connectivity is a proven leader in providing electronic test and measurement solutions and inertial sensors for demanding industrial, military, aerospace, and research applications. Our accurate, rugged, and easy-to-use line of MEMS accelerometers, rate gyros, and inertial measurement systems meet the complex measurement needs of OEMs as well as test and measurement labs worldwide.

GYROS, ANGULAR RATE SENSORS

Plug and Play

	MEAS GY407D	MEAS 11206AC	MEAS 11207AC	MEAS 3120XB	MEAS 65210E
Package	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum
FS Range (°/s)	±300	±50, 180, 300, 600	±250, 300, 450	±50, 150, 300, 600, 1000, 1200	Up to ±20K on roll axis
Unique Features	• Digital output • Built-in analyses • Dynamic interface • Performance over temperature	• IdentiCal interchangeable sensor • Best performance over temperature • Gain and offset compensation • Expanded environmental tests	• IdentiCal interchangeable sensor • High stability • Low noise • Vibration-rejecting	• Performance over temperature • Rugged packaging • Power supply regulation • Temperature calibration data	• Complete six-degree of freedom (6DoF) and TM kit • External inputs • User configurable • Self-powered
Accuracy	±1.0% non-linearity	±0.1% non-linearity	±0.01% non-linearity	±0.1% non-linearity	Up to ±0.1% non-linearity
Excitation Voltage	8.5 - 36 VDC	8.5 - 36 VDC	10 - 36 VDC	8.5 - 36 VDC	8.5 to 36 VDC
Operating Temp.	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	36.50 x 25.40 x 17.50	24 x 24 x 27.30	24 x 24 x 27.30	24 x 24 x 28.30	Ø69.85 x 201.42 length
Typical Applications	Non-navigation heading, vehicle dynamics, test and measurement	Wind turbine, weapons testing, test and measurement	Wind turbine, weapons testing, test and measurement	Weapons testing, boat stabilization, test and measurement	Weapons separation testing, captive carry testing

	MEAS 620	MEAS 603	MEAS 633, 634
Package	Anodized aluminum	Anodized aluminum	Stainless steel
FS Range (°/s)	±500, 1500, 6000, 12K, 18K, 24K, 50K	±500, 1500, 6000, 12K, 18K, 24K	±100, 500, 1500, 6000, 12K, 18K, 24K
Unique Features	• Small, lightweight package • Insensitive to shock • SAEJ211 compliant	• MEMS triaxial rate sensor • SAEJ211 compliant • Shock resistant housing	• 6DoF analog sensor • Rugged, compact housing • Signal conditioned
Accuracy	±0.5% non-linearity	±0.5% non-linearity	±0.5% non-linearity
Excitation Voltage	5 - 16 VDC	5 - 16 VDC	5 - 16 VDC
Operating Temp.	-40°C to 105°C	-40°C to 105°C	-40°C to 105°C
Dimensions (mm)	16.5 x 11.4 x 7.9	20.8 x 20.8 x 14.5	21.3 x 21.3 x 15.2
Typical Applications	Automotive safety crash testing, roll-over testing, motor sports, biomechanics, weapons testing	Automotive safety crash testing, pedestrian impact, biomechanics, robotics	Aerospace testing, weapons testing, biomechanics, shock and impact testing

SCANNERS AND SYSTEMS

The test and measurement group of TE Connectivity provides data systems based on the electronic pressure and temperature scanners of legacy brand Pressure Systems (PSI). These products have been developed specifically for wind tunnel testing, flight testing and turbomachinery test and measurement applications. Extensive factory calibration combined with custom MEMS-like technology provide system solutions with high accuracy digital interface to host computers and networks. Pressure ranges are available from 1.3" H_2O (300 Pa) to 10,000 psi (69 MPa). Temperature inputs can be acquired from standard and custom thermocouples as well as RTDs. Software is included with each solution.

PRESSURE AND TEMPERATURE

NetScanner Complete Data Acquisition Devices

	MEAS 9116	MEAS 9146-R	MEAS 9146-T	MEAS 9022
Measurement Type	Pressure	Temperature	Temperature	Pressure
Media	Dry	RTD / TC / Volt	TC	Liquid
Accuracy	±0.05% FS	±0.25°C	±0.25°C	±0.05% FS
# of Channels	16	16 / 32	16	12
EU Throughput Rate	500 Hz	33 Hz	33 Hz	100 Hz
Enclosure	IP66 / 30 g vibration	IP66 / 30 g vibration	IP54 / 30 g vibration	IP64 / 30 g vibration
Typical Applications	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, third party transducers, close coupled requirements, high pressure

PRESSURE

NetScanner Complete Data Acquisition Devices

	MEAS 9032	MEAS 9034, 9038	MEAS 98RK-1, 9816	MEAS Flight Data System
Measurement Type	Barometer	Calibrator	Pressure	Pressure
Media	Dry	Dry	Dry	Dry
Accuracy	±0.01% FS	±0.01% FS	±0.05% FS	±0.05%
# of Channels	1	1	128	512
EU Throughput Rate	10 Hz	10 Hz	100 Hz	10 / 100 Base-T
Enclosure	Laboratory grade	Laboratory grade	19" rackmount / 4U	Flight grade
Typical Applications	Barometric monitor, precision reference	Calibration, transfer standard, verification testing	Turbine engine test, control room location	Flight testing

PRESSURE SCANNERS

Miniature High Density Pressure Scanners

	MEAS 64HD DTC	MEAS 32HD DTC	MEAS 64HD, 32HD, 16HD	MEAS MicroScanner
Type	Pressure	Pressure	Pressure	Pressure
Media	Dry	Dry	Dry	Dry
Accuracy	±0.03% FS	±0.03% FS	±0.05% FS	±0.05%
# of Channels	64	32	64, 32 or 16	16
Thermal Comp.	Active (DTC)	Active (DTC)	Passive	Active
Port Sizes (Inches)	0.040	0.040 or 0.063	0.040 or 0.63	Direct mount
Typical Applications	Wind tunnel research, flight test, on vehicle research	Wind tunnel research, flight test, on vehicle research	Wind tunnel research, flight test, on vehicle research	For confined space, wind tunnel, flight test

DATA ACQUISITION SYSTEMS

Multi-Scanner Data Acquisition Systems

	MEAS Optimus	MEAS Initium	MEAS Interface	MEAS Pneumatics
Type	Pressure scanning	Pressure scanning	A/D conversion	Quick disconnect
Media	Dry	Dry	Dry	Dry
Accuracy	±0.03% FS	±0.05% FS	±0.05% FS	—
# of Channels	2048	512	512	19, 31, 36, 55
EU Throughput Rate	2000 Hz	1200 Hz	2000 Hz	—
Enclosure	Laboratory grade	Laboratory grade	Miniature	Miniature
Typical Applications	Aerospace development	Wind engineering	In-model placement, Optimus System interface	Pressure connections for confined spaces

TEMPERATURE SENSORS

TE Connectivity is a leader in the design and manufacture of NTC thermistors, RTDs, thermocouples, thermopiles, digital output and customized sensor assemblies. Building on our long standing experience, we offer solutions for a wide range of temperature measurement, control and compensation applications. Our broad selection of temperature products meet the specific sensing demands of critical OEM applications, including medical, aerospace, automotive, instrumentation appliances, motor control and HVACR. You can count on us to provide engineering expertise and deliver high quality, cost-effective products and solutions for your application.

SENSING ELEMENTS—NTC

Analog Output

	MEAS Thermistor Chips	MEAS Radial Leaded Thermistors	MEAS Axial Leaded Thermistors
Package	Leadless chips, SMD 0402, 0603, 0805	Radial, beads	DO-35
Type	Gold or silver electrodes, surface mounted	Epoxy or glass coated	Glass coated
Resistance Range	Chip: 100 to 1MΩ / SMD:40 to 500KΩ	100 to 1MΩ	5KΩ to 100KΩ
Unique Features	• Wire bonding compatible • End band SMD	• Interchangeable • Moisture resistant • Stability	• Tight tolerance (±1%) • Max. stability using high density (HD) chip • Hermetically sealed • Tinned and nickel plated leads
Accuracy	±1% to 10%	0.25% to 20%	±1% to ±3%
Operating Temp.	-40°C to 125°C	-55°C to 280°C	-40°C to 300°C
Dimensions (mm)	Chip: 0.6 - 1.0 square SMD 0402: 1 x 0.5 x 0.7 SMD 0603: 1.6 x 0.8 x 1 SMD 0805: 2 x 1.25 x 1.2	0.4 to 4.9	2.0 x 4.0 body
Typical Applications	Temperature compensation, communication (DWDM), infrared sensing systems, PCB mounting temperature measurement	Temperature sensing for OEM, automotive, medical, HVACR	Refrigeration including cabinet sensing and evaporator coil, white goods, fire detection units, air-conditioning systems, PCB temp. sensing

	MEAS Space Qualified (Hi-Rel)
Package	Radial, bead, custom
Type	NTC, epoxy, glass, probes
Resistance Range	1KΩ to 100KΩ
Unique Features	• ESA and NASA approved • High reliability and accuracy
Accuracy	0.5% to 10%
Operating Temp.	-55°C to 160°C
Dimensions (mm)	From 2.4
Typical Applications	Instrumentation and compensation for aerospace applications

SENSING ELEMENTS—DIGITAL

Digital Output

	MEAS Temperature System Sensor (TSYS) Series
Package	QFN16, TDFN8
Type	I²C, SPI, PWM, SDM (Convertible to analog voltage)
Unique Features	• Low power • Small size • Calibrated and ready to use • 16-bit resolution
Accuracy	Up to ±0.1°C at -5°C to 50°C
Operating Temp.	-40°C to 125°C
Dimensions (mm)	QFN16: 4 x 4 x 0.85 TDFN8: 2.5 x 2.5 x 0.75
Typical Applications	Industrial control, replacement of precision RTDs, thermistors and NTCs, heating and cooling systems, HVACR

SENSING ELEMENTS—RTD

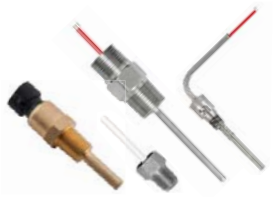
Analog Output

	MEAS Nickel RTD	MEAS Platinum Thin Film Chips
Package	• SOT 23 • Bare die on request	Leadless chips, SMD 1206
Type	• Thin film nickel structure on silicon substrate, protected with a passivation layer • SOT 23 package for SMT • Bare die for COB assembly	• Thin film platinum deposited on ceramic substrate • Contact pads on top and bottom side for NTC chip like assembly • Contact pads on both ends for SMT
Resistance Range	1000Ω	100Ω, 1000Ω (Other values on request)
Unique Features	• Harsh environment compatible • Automotive qualified • Very small dimensions • Very short response time • Good linearity • High temperature coefficient • Low power consumption • Good thermal connection of sensing element through leadframe-pin	• Long term stability • Interchangeability • Assembly like NTC chips • Very small dimensions • Short response time
Accuracy	Class B, according to former DIN 43760 standard	According to DIN EN 60751
Operating Temp.	-55°C to 160°C	-50°C to 400 °C
Dimensions (mm)	2.1 x 2.5 x 2.1 (SOT 23), 0.7 x 0.7 x 0.4 (Bare die)	1.5 x 1.5 (Top / bottom pads), 1.2 x 3.6 (SMT)
Typical Applications	Automotive, industrial, OEM, thermal compensation, thermal management	White goods, automotive, industrial, aerospace, medical, test and measurement

	MEAS Platinum Thin Film Sensors	MEAS Glass Wire Wound Sensors	MEAS Ceramic Wire Wound Sensors
Package	Wired component	GO, GX	CWW600, CWW850, CWW1000
Type	• Thin film platinum deposited on ceramic substrate, glass coated • Tube outline available • Connection via radial leads	Glass rod, radial leads	Ceramic rod, radial leads
Resistance Range	100Ω, 1000Ω (Other values on request)	100Ω (2X 100Ω on few versions)	100Ω (2X 100Ω on few versions)
Unique Features	• Long term stability • Interchangeability • Small dimensions • Short response time • High electrical insulation	• Aggressive environments (Acid, oil, solvent) • Small dimensions • Stability • No hysteresis • Short response time • Interchangeability	• High temperature • Stability • No hysteresis • Small dimension • Interchangeability
Accuracy	Class T (F0.1), A (F0.15), B (F0.3) according to DIN EN 60751	Class W0.3, W0.15, W0.1 according to IEC60751	Class W0.3, W0.15, W0.1 according to IEC60751
Operating Temp.	-50°C to 600°C (Standard) down to -200°C or up to 1,000°C (On request)	-200°C to 400°C	-200°C to 600°C (CWW600) -200°C to 850°C (CWW850) -200°C to 1000°C (CW1000)
Dimensions (mm)	2.0 x 2.3 x 1.1 (Standard) 1.2 x 4.0 x 1.1 (Standard) Other dimensions (On request)	Ø1.8 / length 5 mm to Ø4.5 / length 48 mm	Ø1.5 / length 8 mm to Ø4.5 / length 30 mm Ø2.7 / length 45 mm (CWW1000)
Typical Applications	White goods, automotive, industrial, aerospace, medical, test and measurement	Oil and chemical industry, aviation, aeronautic, food industry	Process industry, laboratories, reference sensors

SENSOR ASSEMBLIES

	MEAS Ring Sensors	MEAS Push-in Sensors
Package	• Ring for surface assembly • Threaded bolt, tube style	Brass, copper or stainless steel closed-end tube
Type	Epoxy potted element	Epoxy potted element, miniature design
Sensor Range	• NTC • RTD: Pt, Ni	• NTC • RTD: Pt, Ni • Thermocouple: Type J, K, T, E
Unique Features	• Surface mount sensing • For use where space is limited • Simple installation	• Corrosion resistant • Available with mounting tabs or clips
Accuracy	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	Varies: -50°C to 250°C	Varies: -50°C to 250°C
Dimensions (mm)	Case specific dimensions	Case specific dimensions
Typical Applications	Surface plates, heat exchangers, fluid pumping systems, generators	Boiler, liquid, evaporator, HVACR, industrial processes control, district heating and cooling, automotive, bearing monitoring, motors, gear boxes



	MEAS Screw-in Sensors	MEAS Refrigeration Molded Probes
Package	Brass, copper or stainless steel housing with integrated connector	PVC or TPE
Type	Epoxy potted element, rigid sheath	Overmolded
Sensor Range	• NTC • RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E	• NTC • RTD: Pt
Unique Features	• Corrosion resistant • Different thread types • Connectors available	• Mounting clips available
Accuracy	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	Varies: -50°C to 250°C	-40°C to 125°C
Dimensions (mm)	Custom lengths, diameters and threads available	8 x 30, 6.5 x 25, 6 x 50, 6 x 5 x 15
Typical Applications	Boiler, liquid, HVACR, industrial processes control, district heating and cooling, immersion	HVACR, industrial processes control

SENSOR ASSEMBLIES

	MEAS Pipe Mount Sensors	MEAS Outdoor Air Sensors	MEAS Pool and Spa Sensors	MEAS Boiler Sensors
Package	Copper or stainless steel housing	Metal housing with PVC sun shield with or without weatherproof box	Plastic or metal housing with o-ring seal designed for band clamp or backing nut	Brass housing
Type	• Overmolded • Epoxy potted	• Fully potted subassembly	• Overmolded subassembly	• Screw
Sensor Range	• NTC	• NTC	• NTC	• NTC • RTD: Pt, Ni, Cu
Unique Features	• Fast response time • Moisture resistant construction	• Easy installation – threads into mounting hole or standard handy box • Fully potted housing protects sensing element and provides fast, accurate response	• O-ring seals • Compatible with pool and spa chemicals	• Integrated connector • Corrosion resistant • Different threads types and connectors available
Accuracy	• NTC: custom tolerances available	±0.2°C at 0°C to 70°C	±0.2°C	• NTC: Custom tolerances available • Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	-40°C to 125°C	-40°C to 105°C	0°C to 90°C	Varies: -50°C to 250°C
Dimensions (mm)	Custom configurations available	Ø12 X 64	6.4 x 50	Custom lengths, diameters and threads available
Typical Applications	Industrial process, boiler control, HVACR, refrigeration, food service, energy management, test equipment	Residential and commercial building controls, energy management systems	Pools, hot tubs	Boiler control, liquid, industrial processes control, district heating and cooling, immersion

	MEAS Oven Sensors	MEAS Urea Temperature Sensors	MEAS Exhaust Gas Temperature Probes
Package	Stainless steel housing	Plastic housing with screw hole mountings	EGT thermocouple probe
Type	• Pt element encapsulated into ceramic tube, with rigid stainless steel housing • High temperature cable	• Overmolded plastic housing with integrated 2 pin connector	• Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector • Option: CANbus interface (From 1 to 4 thermocouples, fully configurable)
Sensor Range	Pt100, Pt500, Pt1000 sensor	NTC	Thermocouple: Type K, N
Unique Features	• High temperature • Easy integration / installation • Higher dielectric strength according to type	• Temperature measurement of urea liquid used in Selective Catalytic Reduction (SCR) systems • Suitable for high pressure applications	• High temperature, robust design • Vibration and corrosion resistant • Fast response time
Accuracy	Class B, C according to IEC60751	• NTC: custom tolerances available • ±2%, 3% and 5% • Beta 25/85: 3976	Class 1 according to IEC584
Operating Temp.	-20°C to 750°C (According to version)	-40°C to 125°C	-40°C to 900°C
Dimensions (mm)	• OD Ø4 mm to Ø6 mm • Immersion length 35 mm to 100 mm • Custom mechanical interface and cable length	Sensor tip 8 mm diameter	• ØOD 4 to ØOD 8 • Custom immersion length and cable length
Typical Applications	Drying oven, domestic oven	Temperature measurement of urea liquid used in SCR systems	Automotive, truck, mining, power unit, racing

SENSOR ASSEMBLIES

	MEAS Micro-Thermocouples	MEAS Patient Monitoring Probes
Package	Fine gage thermocouples	Sensor with cable and connector
Type	• Micro sized thermocouple: 44 AWG, 40 AWG, 38 AWG, 36 AWG • Polymer encapsulated or bare junction	Reusable: Skin; 10FR and 12FR GP Disposable: Skin; 9FR and 12FR GP; 12FR, 18FR, 24FR Esoph/Stethoscope; 14FR, 16FR, 18FR Foley catheter
Sensor Range	Thermocouple type: T, K	400 series, 700 series (Reusable only)
Unique Features	• Welded or soldered junction • Low profile, fast response • Polyesterimide wire insulation	• Autoclavable reusables • Sterile disposables
Accuracy	Varies by type: standard, special and custom limits or error available	±0.1°C at 25°C to 45°C ISO-80601-2-56: ±0.2°C at 35°C to 42°C
Operating Temp.	Varies by type: Rated up to 240°C	-40°C to 100°C, Patient: 0°C to 50°C
Dimensions (mm)	Varies by thermocouple gage	Reusable: 3 m cable with sensor Disposable: Sensor <1 m; 3 m reusable adaptor cable
Typical Applications	Medical, catheters	Patient monitoring, laboratory

	MEAS TLH Reference Probe	MEAS USB Temperature Probe
Package	TLH100 / TLH600	Push-in probe with handle
Type	Rigid protective external stainless steel sheath and stainless steel handle, unique internal design to insure stability	• Versatile push-in probe with stainless steel sheath and plastic or stainless steel handle • High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface
Sensor Range	Pt100 sensor	Not applicable due to direct digital output
Unique Features	• Stability • Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC)	• USB conformal interface • Calibrated digital output, recalibration possible on request • Robust design for general purpose applications • Long term stability
Accuracy	Class B (TLH600), A (LTH100) according to IEC60751	±0.1°C for temperature range -5°C to 55°C ±0.2°C for temperature range -40°C to 160°C (Other accuracies on request)
Operating Temp.	-80°C to 350°C (TLH100) -180°C to 600°C (TLH600)	-55 °C to 160 °C for probe tip -40 °C to 85 °C for handle with electronics (Other temperature ranges on request)
Dimensions (mm)	OD Ø5 x 500 + handle Ø15 x 100 (Typical cable length = 2 m)	OD Ø6 x 200 + handle Ø19 x 100 (Typical cable length = 2,000)
Typical Applications	Laboratory, temperature sensors calibration by comparison	Laboratory, mobile research, test and measurement

SENSOR ASSEMBLIES

	MEAS Stator Sensors	MEAS Surface Sensors	MEAS Bearing Sensors
Package	• TPE / CPME • G11 epoxy glass laminated, Class F or H	• Silicone rubber or polyimide laminated element • SP683	• Copper alloy tip • Stainless steel, isolated stainless steel or epoxy glass case
Type	• Rigid flat, slot sensor • Cable or leadwire options	• Flat, flexible, rectangular sensor • Variety of designs available	• Rigid sheath • Tip sensitive • Cable / leadwire options
Sensor Range	• RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E	• RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E	• RTD: Pt, Ni, Cu • Thermocouple: Type J, K, T, E
Unique Features	• Extended sensitive length • Single or dual elements • Calibration available	• Surface sensing for curved or uneven surfaces • Noninvasive, simple installation • Adhesive backing option	• Cut-to-length • Copper tip for fast time response • Assemblies with fluid seal and spring loading • Single or dual elements
Accuracy	RTD: Class A, B according to IEC60751	RTD: Class A, B according to IEC60751	RTD: Class A, B, C according to IEC60751
Operating Temp.	Max. temperature: Class F, 155°C Max. temperature: Class H, 180°C Available up to 200°C	Varies: -50°C to 200°C Available up to 220°C	Sheath specific, up to 250°C
Dimensions (mm)	Custom dimensions available	Custom dimensions available	Custom lengths Standard sheath diameters: 4.78, 5.46, 6.35
Typical Applications	Monitor temperature between stator coils, electric motors, generators	Chemical and pharmaceutical industry, process industry, laboratory, aerospace, motor end windings of stator coils, generators	Bearing monitoring, electric motors, generators

	MEAS Thermocouple	MEAS Transmitter
Package	Screw-in or push-in design with cable extension, connector, or connecting head	Brass, copper and stainless steel housing, flexible sheath with integrated connector.
Type	• Collapsible Mineral Insulated (MI) with alloy sheath (Radius ≥5*OD) • Flexible cable with plastic or composite insulation • Rigid protection sheath: ceramic, quartz or alloy sheath	• Epoxy potted element • Screw-in
Sensor Range	Type T, J, K, N, R, S, B (According to TC type and insulation type)	4 - 20 mA output
Unique Features	• High temperature and high vibration level (For MI) • Available in small diameters for fast respond time • Grounded or ungrounded or apparent hot junction • Single or multiple measuring points	• Compact, welded design • Highly sensitive and stable • High vibration application • Good waterproof properties
Accuracy	Class 1 according to IEC584	0.5 or 1% FS
Operating Temp.	-40°C to 1,700°C (According to TC type and insulation type)	-20°C to 120°C
Dimensions (mm)	• OD Ø0.3 mm to Ø8 mm for MI • Ø0.15 mm for smallest flexible cable • Custom dimensions, fittings and cable lengths (From few centimeters to many meters)	• Customer sheath length, thread type • Probe diameter: Ø4.75 mm; Ø5 mm; Ø6 mm; Ø6.35 mm; Ø8 mm
Typical Applications	Aeronautic, process industry, medical, semiconductor industry (Spike, profile)	Heavy industry, general industrial monitoring

THERMOPILES

	MEAS TS Series TS318-3B0814, TS318-5C50, TS305-10C50	MEAS TSD Series Single Pixel Digital Output Series
Package	TO-18, TO-5	TO-5
Type	Thermopile sensor components	Digital thermopile sensor component
Temp. Range	Depends on applied electronics and calibration, filter types optimal for object temperature range -40°C to 300°C (Extended range: -60°C to 1,000°C)	Object temperature range 0°C to 300°C (Other temperature ranges available upon request)
Unique Features	• High signal output • Accurate reference sensors	• Calibrated and ready to use, I²C interface • Direct assembly to PCB, no additional components needed
Accuracy	Depends on applied electronics and calibration	Depends on temperature range, typical 1% full range
Operating Temp.	Ambient temperature range: -20°C to 85°C	Ambient temperature range: -20°C to +85°C
Dimensions (mm)	Ø9.15 x 4.4 (Body)	Ø9.15 x 4.4 (Body)
Typical Applications	Medical thermometer (Ear, forehead), pyrometer	Contactless temperature measurement, e.g. on moving parts like heated rolls, laminators, people detection, body temperature, microwave oven, air conditioner

	MEAS TSEV Single Pixel Series	MEAS TSEV Multi Pixel Series	MEAS TPT Series TPT300V
Package	OEM-module	OEM-module	IP65 stainless steel tube
Type	Single-pixel thermopile module	8-pixel-linear array thermopile module	Thermopile system for industrial use
Temp. Range	Object temperature range 0°C to 300°C (Other temperature ranges available upon request)	Object temperature range -20°C to 120°C	Object temperature range 0°C to 300°C
Unique Features	• Calibrated, Interfaces: I²C, SPI • Different field of views: 5° at 50%, 10° at 50%, 90° at 50%, others on request	• Calibrated and ready to use • Digital output • Small field of view	• Calibrated and ready to use • Digital or analog outputs • Small field of view
Accuracy	Depends on temperature range, typical 1% full scale, max. accuracy 0.1°C	Depends on temperature range, typical 2% full scale	Depends on temperature range, typical 1% full scale
Operating Temp.	Ambient temperature range: 0°C to 85°C	Ambient temperature range: -20°C to 85°C	Ambient temperature range: 0°C to 85°C
Dimensions (mm)	35 x 25 x 13 to 31	25 x 35 x 15.2	Ø18 x 111
Typical Applications	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner	Contactless temperature measurement, e.g. on moving parts or heated rolls, control of assembly lines, paper fabrication, drying applications

TORQUE SENSORS

Our torque sensors use advanced strain gage technology to satisfy the most demanding requirements for static and dynamic applications. We offer solutions for measuring reaction torque and rotating torque. Our torque meters complete with integral mechanical stops increase overload capacity and provide additional protection during mounting and operation. We offer a variety of small capacity sensors for dynamic and reaction torque measurements. Our combination sensors simultaneously measure reaction torques and forces with a single device. They can also detect angle position and provide velocity measurement. We can customize a wide range of available models to meet your specific needs.

TORQUE METERS

Reaction and Rotary

	MEAS CS1060	MEAS CS1120	MEAS CS1210	MEAS CD1050
Package	Square male coupling	Keyed shaft connections	Collar mechanical fittings	Square male couplings
Operating Mode	Reaction	Reaction	Reaction	Dynamic rotary
Unique Features	• Optional high level output • Static measurements	• Optional high level output • Excellent temperature stability	• High stiffness • Optional high level output	• Optional high level output • Rugged
Ranges Nm(Lbf-ft)	±5 to ±7K (±4 to ±5.6K)	±5 to ±2.5K (±4 to ±2K)	±160 to ±10K (±128 to ±8K)	±5 to ±7K (±4 to ±5.6K)
Max. Over-range	1.5X FS	1.5X FS	1.5X FS	1.5X FS
Output / Span	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)
Combined Non-linearity & Hysteresis	< ±0.25% FS	< ±0.25% FS	< ±0.25% FS	< ±0.25% FS
Optional Operating Temp.	-20°C to 100°C	-20°C to 100°C	-40°C to 150°C	-20°C to 80°C
Dimensions (mm)	Application dependent	Application dependent	Application dependent	Application dependent
Typical Applications	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Engine efficiency, robotics and effectors, laboratory and research

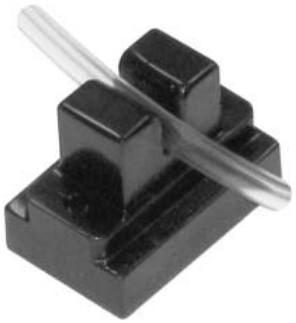
	MEAS CD1140	MEAS CD1095
Package	Keyed shaft couplings	Keyed shaft couplings
Operating Mode	Contactless	Dynamic rotary
Unique Features	• High accuracy • Built-in amplifier • Speed and angle detection	• High accuracy • Built-in amplifier
Ranges Nm(Lbf-ft)	±0.05 to ±20,000 Nm (±0.04 to ±16,000 lbf-ft)	±5 to ±2,500 Nm (±4 to 2,000 lbf-ft)
Max. Over-range	2X FS	1.5X FS
Output / Span	±10 V (Pulses / Rev. 6.0 / 360)	±20 mV (4 V; ±5 V optional)
Non-linearity	±0.1% FS	<±0.25% FS
Hysteresis	±0.1% FS	Combined with linearity
Optional Operating Temp.	0°C to 60°C	-20°C to 80°C
Dimensions (mm)	Application dependent	Application dependent
Typical Applications	Process control equipment, robotics and effectors, test and measurement	Process control equipment, robotics and effectors, test and measurement

AUTOMOTIVE DESIGN AND TEST SENSORS

	MEAS FCA7300
Package	Steering wheel adaptable
Operating Mode	Multi-sensing
Unique Features	• Dual torque / angle range • Steering velocity measurement • Fits all road vehicles
Ranges N (Lbf)	10 to 200 Nm (7 lbf-ft to 150 lbf-ft)
Max. Over-range	10X FS
Output / Span	±10 V
Non-linearity	±0.1% FS
Hysteresis	±0.1% FS
Optional Operating Temp.	-20°C to 80°C
Dimensions (mm)	Ø195 x 50
Typical Applications	On-car road test, truck and buses steering test, armored vehicles steering test

ULTRASONIC SENSORS

(air bubble, point level, continuous level monitoring)



TE Connectivity offers a wide range of level sensors using ultrasonic technology. Our ultrasonic sensors measure liquid level despite variations in transparency, viscosity, color or dielectric. These solutions include air bubble detection for medical pumps; point and continuous level sensors for the semi-conductor and high purity markets; and point level sensors for a variety of process control applications. We offer high accuracy, high frequency, short range continuous measurement sensors through air for process control. We also offer standard products that provide a system without moving parts, adjustments, or maintenance. TE works closely with OEMs to offer custom sensors suited for temperature ranges of -30°C to 150°C, pressures to 1,000 psi, various input/output configurations and multiple sensing points.

STANDARD CONTACT POINT LEVEL

	MEAS LL-01	MEAS LL-10	MEAS LL-100	MEAS LL-101
Type	Gap	Tip	Tip	Gap
Unique Features	• All 316L SS • Integral electronics • Miniature threads • No adjustment for viscosity, density	• All 316L SS • Integral electronics • No adjustment for viscosity, density	• All 316L SS • Integral electronics • No adjustment for viscosity, density • Remote electronics available	• High / normal fail-safe • Integral electronics • No adjustment for viscosity, density • Demand self-test • Remote electronics available
Input	5 - 30 VDC	5 - 30 VDC	DC and AC options	DC and AC options
Output	• 30 V, 3 W relay • Analog 4 - 20 mA power loop	• 1 A SPDT • Analog 4 - 20 mA power loop	10A DPDT or analog	10A DPDT
Pressure Range	250 psi	1000 psi	1000 psi	1000 psi
Operating Temp.	-30°C to 80°C	-30°C to 80°C	-40°C to 150°C	-40°C to 150°C
Actuation point	0.25 inches	Custom (2.25, 6, 12, 18, 24 inches)	Custom (2.25 to 36 inches)	Custom (1 to 36 inches)
Process Connection	1/4"NPT and 1/2"NPT	3/4"NPT	3/4"NPT	3/4"NPT
Cable	1, 4, 10, 20 feet	1, 4, 10, 20 feet	10 to 40 feet optional	10 to 40 feet optional
Approvals	CE	CE	CE	CE
Typical Applications	Medical waste tanks, histology processors, compressors, chillers, coolant reservoirs	Hydraulic reservoirs, storage tanks, pipe lines, sewage systems	Industrial tanks, pump protection, hydraulic supply lines, storage tanks	Food processing tank, chemical tanks, oil and fuel level, liquid pharmaceuticals

AIR-BUBBLE AND NON-INVASIVE POINT LEVEL

	MEAS AD-101	MEAS SL-630
Type	Non-invasive	Non-invasive
Unique Features	• Bubble detection from 1 to 10 mm (+) tube • Temperature option • Occlusion option • Fluid differentiation • 3.3 V and 5 V input option	• Stick on dry contact • Point level detection
Input	6 - 24 VDC standard	5 - 24 VDC
Output	Open collector	TTL (High), dry condition
Pressure Range	Atmosphere	Atmosphere
Operating Temp.	0°C to 65°C	-30°C to 70°C
Actuation point	—	Variable
Process Connection	—	Reusable sensor, disposable tape
Cable (Inches)	12	12
Approvals	CE	CE
Typical Applications	Infusion pumps, dialysis machines, apheresis, auto-transfusion	Chromatography, chemical analyzer, hemodialysis, reagent vessels

CONTACT MULTI-POINT LEVEL

	MEAS SL-900
Type	Contact
Unique Features	• Miniature • 10 µRA electropolished finish • 316 LSS body • Designed for high purity market
Input	Variable
Output	Dual color LED and ½ A relay
Pressure Range	250 PSIG
Operating Temp.	-30°C to 93°C
Actuation point	Variable
Process Connection	1/2", 3/4" VCR, male/female
Cable (Inches)	Up to 24" shielded with strain relief, 9 pin connector
Approvals	NEMA 1 housing
Typical Applications	Pharmaceutical and semiconductor industries, high pressure vessels

CONTINUOUS LEVEL

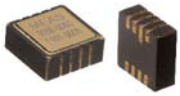
	MEAS SL-700	MEAS ML Series
Type	Continuous transmitter through liquid	Continuous transmitter through air
Unique Features	• Contact • Remotely mounted • 316 SS sensor • Configurable via RS-232	• Non-contact • Remotely mounted • 316 SS or epoxy sensor material • Configurable via RS-232
Input	24 VDC	24 VDC
Output	RS-232, analog, relay setpoints	RS-232, analog, relay setpoints
Pressure Range	250 psi	Atmosphere
Operating Temp.	-30°C to 93°C	-30°C to 70°C
Sensing Range	1.25" to 15" inches	0.5" to 5" inches
Process Connection	3/4" VCR, male/female	—
Accuracy	0.06"	±0.0075"
Elect Connection	Terminal block	Terminal block
Approvals	NEMA 1 housing	NEMA 1 housing
Typical Applications	Semiconductor tanks, ampoules and bubblers, high purity fluids, level in vacuum	Microplate well level, test tubes and vials, bottle fill level, surface flaw detection

VIBRATION SENSORS

TE has spent more than 20 years designing and manufacturing accelerometers based on our proprietary Microelectromechanical System (MEMS), bonded gage and piezoelectric ceramic/film technologies. Voltage mode piezoelectric is the most popular accelerometer design due to its high level output and wide bandwidth. We offer voltage mode accelerometers in the traditional 3-wire or 2-wire (IEPE) configurations. Charge mode piezoelectric accelerometers measure shock and vibration in high temperature environments. In addition to its high temperature operating capability when used with a high quality charge amplifier, a charge mode accelerometer offers dynamic range scalability. To measure motion (velocity, displacement) accurately, an accelerometer or with DC response is required. Incorporating MEMS technologies and the latest analog and digital ASICs, our DC accelerometers offer high performance and exceptional value. All products are EAR99 and RoHS compliant.

MEMS DC ACCELEROMETERS

Embedded



	MEAS 3022, 3028	MEAS 3052A, 3058A	MEAS 3038	MEAS 3255A
Package	Pins or pads	Pins or pads	SMD	SMD
Type	Board level	Board level	Board level	Board level
FS Range (g)	±2, 5, 10, 20, 50, 100, 200	±2, 5, 10, 20, 50, 100	±50, 100, 200, 500, 2000, 6000	±25, 50, 100, 250, 500
Unique Features	• mV output • Gas damping • Pin or pad option	• Temperature compensated • Gas damping • Pin or pad option	• Hermetically sealed • High over-range protection • Gas damping	• Self test enabled • Gas damping • Bidirectional mounting
Accuracy	±0.5% non-linearity	±0.5% non-linearity	±0.5% non-linearity	±1.0% non-linearity
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-54°C to 125°C	-40°C to 125°C
Dimensions (mm)	22.86 x 15.24 x 5.33	22.86 x 15.24 x 5.33	7.62 x 7.62 x 3.3	13.46 x 7.62 x 3.81
Typical Applications	Vibration and shock monitoring, tilt applications, motion control, impact testing	Vibration and shock monitoring, tilt applications, motion control, impact testing	Vibration and shock monitoring, embedded systems, shock testing, safe and arm	Vibration and shock monitoring, aerospace testing, impact testing, transportation

PIEZOELECTRIC ACCELEROMETERS

Embedded Single Axis

	MEAS 805, 805M1	MEAS 808, 808M1	MEAS 810M1	MEAS LDTC Family
Package	TO - 5	TO - 8	Board level	Piezo film elements with or without mass and pins
Type	Adhesive (Stud mount option)	Adhesive (Stud mount option)	SMD	Cantilever beam with vertical or horizontal pins
FS Range (g)	±50, 500 / ±20, 200	±10, 50 / ±4, 20	±25, 100	±10 (Typical)
Unique Features	• Hermetically sealed • Case grounded design • Bandwidth to 12 kHz	• Hermetically sealed • Case grounded design • Bandwidth to 8 kHz	• Small size, low cost • Dynamic response • 6 kHz bandwidth	• Very low cost • High sensitivity (1 V/g) • Ultra-low power (Self generating)
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±2.0% non-linearity	±20.0% (Typical)
Operating Temp.	-50°C to 100°C	-50°C to 100°C	-40°C to 125°C	-40°C to 70°C
Dimensions (mm)	Ø8.9 x 10.16	Ø15.2 x 16.6	12.70 x 15.24	19.05 x 6.35 x 6.35
Typical Applications	Machine monitoring, data loggers, permanent structures	Machine monitoring, data loggers, embedded applications	Data logging, impact detection	Wake-up switch, load imbalance, anti-theft devices, impact sensing, vital signs monitoring

PIEZOELECTRIC ACCELEROMETERS

Embedded Triaxial

	MEAS 832, 832M1	MEAS 834, 834M1
Package	SMD	SMD
Type	Board mount	Board mount
FS Range (g)	±25, 50, 100, 200, 500	±2000, 6000
Unique Features	• Low cost • Hermetically sealed • Piezo-ceramic	• Low cost • Hermetically sealed • Piezo-ceramic
Accuracy	±2.0% non-linearity	±2.0% non-linearity
Operating Temp.	-20°C to 80°C (832) -40°C to 125°C (832M1)	-20°C to 80°C (834) -40°C to 125°C (834M1)
Dimensions (mm)	18.8 x 14.22 x 4.32	18.8 x 14.22 x 4.32
Typical Applications	Data logging, asset monitoring, impact monitoring	Data logging, asset monitoring, impact monitoring

DC ACCELEROMETERS

Plug and Play, Unamplified

	MEAS 40A, 40B	MEAS 52F	MEAS 52, 52M30
Package	Anodized aluminum	Anodized aluminum	Plastic / anodized aluminum
Type	Screw mount	Screw mount	Adhesive mount
FS Range (g)	±25, 100, 250, 500, 1000, 2000	±50, 200, 500, 2000	±50, 200, 500, 2000
Unique Features	• Critically damped • SAE J211 / 2570 compliant • Compact	• Low cost • Gas damping • Over-range stops	• Low cost • Gas damping • Over-range stops
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-20°C to 80°C	-40°C to 90°C	-40°C to 90°C
Dimensions (mm)	16.7 x 10.0 x 5.0	11.2 x 10.2 x 3.8	9.65 x 4.83 x 3.3
Typical Applications	In-dummy and pedestrian crash testing	Vibration and shock monitoring, shock testing, safety impact testing, side-impact testing	Vibration and shock monitoring, shock testing, safety impact testing, side-impact testing

DC ACCELEROMETERS

Plug and Play, Unamplified

	MEAS 64B, 64C	MEAS 58	MEAS 1201, 1201F
Package	Anodized aluminum	Anodized Aluminum	Anodized aluminum
Type	Screw mount	Adhesive mount	Adhesive / screw mount
FS Range (g)	±50, 100, 200, 500, 2000, 6000	±50, 100, 200, 500, 2000	±50, 100, 200, 500, 1000
Unique Features	• SAE J211 / 2570 compliant • Flexible, rugged cable • Over-range stops	• Low noise cable • Small package • Light weight	• Small size • Flexible, rugged cable • Over-range stops
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-40°C to 121°C	-20°C to 85°C	-20°C to 85°C
Dimensions (mm)	12.19 x 4.83 x 4.83	14.0 x 6.35 x 6.35	8.89 x 8.89 x 9.4
Typical Applications	In-dummy crash and impact testing	Crash testing, impact testing, off road testing	On-vehicle crash and impact testing, vibration and shock monitoring

	MEAS 3801A	MEAS 3700	MEAS EGAXT	MEAS EGCS-D0, EGCS-D1S	MEAS EGCS-S425	MEAS EGCS-D5
Package	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Anodized aluminum	Stainless steel
Type	Stud mount	Screw mount	Adhesive / screw mount	Screw / stud mount	Screw mount	Screw mount
FS Range (g)	±2, 10, 20, 50, 100, 200, 500, 2000	±50, 200, 500, 2000, 6000	±5 through 2500	±5 through 10,000	±50, 100, 250, 500, 1000, 2000	±50, 100, 250, 500, 1000, 2500, 5000, 10000
Unique Features	• Hermetically sealed sensor • Gas damping • 10,000 g over-range protection	• No zero shift • mV output • 20,000 g over-range protection	• Sub-miniature • Lightweight • 10,000 g over-range protection	• Rugged housing • Critically damped • 10,000 g over-range protection	• Critically damped • Compact • Mechanical stops	• Rugged design, miniature • Critically damped • In-line amplifier option
Accuracy	±0.5% non-linearity	±2.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-54°C to 121°C	-54°C to 121°C	-40°C to 120°C	-40°C to 120°C	-20°C to 80°C	-40°C to 100°C
Dimensions (mm)	15.88 x 15.24	14.22 x 8.13 x 3.81	7.2 x 4.6 x 4.6	D0: 19.05 x 19.05 x 7.62 D1S: 12.7 x 12.7 x 15.24	14.73 x 9.9 x 4.83	14.2 x 12.7 x 5.6
Typical Applications	Impact testing, structural testing, test and instrumentation, environmental testing	Impact and shock testing, structural testing, drop testing, aerospace testing	Flight test and control, launch, crash, impact testing, robotics	General purpose, machine control, destructive testing, engine testing	Auto safety testing for side impact, on-vehicle, sled and in-dummy	Impact and shock testing, drop testing, structural testing

DC ACCELEROMETERS

Plug and Play, Amplified

	MEAS 4000A, 4001A
Package	Anodized aluminum
Type	Screw mount
FS Range (g)	±2, 5, 10, 20, 50, 100, 200
Unique Features	• Integral connector option • Gas damping • Low power
Accuracy	±1.0% non-linearity
Excitation Voltage	8 - 32 VDC
Operating Temp.	-20°C to 85°C
Dimensions (mm)	18.54 x 18.54 x 8.64
Typical Applications	Low frequency monitoring, transportation, vibration monitoring, motion control

	MEAS 4602, 4604
Package	Anodized aluminum
Type	Screw mount
FS Range (g)	±2, 5, 10, 30, 50, 100, 200,
Unique Features	• Exceptional temp. compensation • High over-range • Hermetically sealed
Accuracy	±1.0% non-linearity
Excitation Voltage	8 - 36 VDC
Operating Temp.	-54°C to 125°C
Dimensions (mm)	21.08 x 21.59 x 7.62
Typical Applications	Flight testing on engines, flutter test, weapons development

	MEAS 4610, 4610A
Package	Anodized aluminum
Type	Screw mount
FS Range (g)	±2, 10, 30, 50, 100, 200, 500
Unique Features	• Low noise ranges • Temperature compensation • High over-range • Hermetically sealed
Accuracy	±1.0% non-linearity
Excitation Voltage	8 - 36 VDC
Operating Temp.	-40°C to 115°C
Dimensions (mm)	21.59 x 25.4 x 7.62
Typical Applications	Rail motion control, modal analysis, flight test, structural test

	MEAS 4801A
Package	Stainless steel
Type	Stud mount
FS Range (g)	±2, 10, 20, 50, 100, 200, 500, 2000
Unique Features	• Hermetically sealed sensor • Integral connector • Signal conditioned
Accuracy	±1.0% non-linearity
Excitation Voltage	8 - 36 VDC
Operating Temp.	-55°C to 125°C
Dimensions (mm)	13.33 x 20.83
Typical Applications	Impact testing, structural testing, test and instrumentation, environmental testing

	MEAS 4807A
Package	Stainless steel
Type	Screw mount
FS Range (g)	±2, 5, 10, 20, 30, 50, 100, 200, 500
Unique Features	• Ultra low noise • Micro-g resolution • Hermetically sealed • Detachable cable
Accuracy	±1.0% non-linearity
Excitation Voltage	8 - 18 VDC
Operating Temp.	-55°C to 125°C
Dimensions (mm)	18.54 x 18.54 x 8.64
Typical Applications	Seismic, structural monitoring, flight testing, trains, machine control, road test

	MEAS 4810A
Package	Stainless steel
Type	Screw mount
FS Range (g)	±2, 5, 10, 20, 30, 50, 100, 200
Unique Features	• UltraStable MEMS • Hermetically sealed • Signal conditioned
Accuracy	±1.0% non-linearity
Excitation Voltage	8 - 36 VDC
Operating Temp.	-55°C to 125°C
Dimensions (mm)	25.4 x 29.1 x 7.6
Typical Applications	Low frequency monitoring, road testing, motion analysis

DC ACCELEROMETERS

Plug and Play, Triaxial

	MEAS EGAXT3	MEAS 53/53A	MEAS 68CM1	MEAS 4630, 4630A	MEAS 4020, 4030	MEAS 606M1
Package	Stainless steel	Anodized aluminum	Stainless steel	Anodized aluminum	Molded plastic	Nitrile rubber pad
Type	Stud mount	Adhesive mount	Screw mount	Screw mount	Screw mount	Removable
FS Range (g)	±5 through 2500	±50, 200, 500, 2000	±500, 1000, 2000	±2, 5, 10, 30, 50, 100, 200, 500	±2, 6	±25
Unique Features	• Sub-miniature • Lightweight • 10,000 g over-range protection	• Low cost • Gas damping • Low power	• World SID • Gas damping • Low power	• Low noise ranges • Temperature compensated • High over-range • Hermetically sealed	• Low cost • Biaxial, with triaxial option • DC response • Rugged construction	• 0.7 damping ratio • Triaxial, hermetic • Seat pad accelerometer • 606M2 IEPE option
Accuracy	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity	±1.0% non-linearity
Operating Temp.	-40°C to 120°C	-20°C to 85°C	-20°C to 85°C	-40°C to 115°C	-40°C to 85°C	-20°C to 85°C
Dimensions (mm)	12.7 x 12.7 x 12.7	18.29 x 13.21 x 7.11	12.7 x 12.7 x 12.7	26.16 x 26.16 x 23.37	71.2 x 40.0 x 15.2	199 x 4
Typical Applications	Flight test, crash, shock monitoring	Auto safety, passenger comfort, transportation, NVH analysis	Auto safety, in-dummy crash, on-vehicle crash	Road testing, motion control, structural testing	Structural monitoring, seismic array, bridge testing	Off road equipment, amusement rides, commercial aircraft

CHARGE MODE, PIEZOELECTRIC ACCELEROMETERS

Plug and Play

	MEAS 7500A	MEAS 7501A	MEAS 7502A	MEAS 7504A, 7505A	MEAS 7514A	MEAS 7531A
Package	Stainless steel	Titanium	Titanium	Stainless steel	Stainless steel	Titanium
Type	Center-hole mount	Center-hole mount	Adhesive mounting	Stud mount	Stud mounting	Adhesive mount
Sensitivity (pC/g)	20, 13, 7	5.6	1.8	5.6	100, 50, 30, 20, 13	1.8
Unique Features	• Single axis, shear mode • Hermetically sealed • Isolated mounting surface • Wide bandwidth	• Single axis, shear mode • Hermetically sealed • Bandwidth to >15 kHz	• Single axis, shear mode • Hermetically sealed • <1 g • Wide bandwidth	• Single axis, shear mode • Top and side connector option • >15 kHz Bandwidth	• Single axis, shear mode • >12 kHz bandwidth • High sensitivity	• Triaxial, shear mode • Miniature, light weight • >10 kHz bandwidth
Operating Temp.	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C
Dimensions (mm)	8.38 x 22.35	5.84 x 14.48	4.40 x 11.94	11.11 x 14.10 (7504A) 11.11 x 19.05 (7505A)	14.99 x 14.99	11.02 x 13.6 x 11.02
Typical Applications	Gearbox vibration monitoring, flight test, high temp. applications	Gearbox vibration monitoring, flight test, high temp. applications	Small structures monitoring, minimal mass loading, high temp. applications	Small structures monitoring, general purpose, high temp. applications	Low frequency vibration, general purpose, high temp. applications	High temp. applications, flight testing, structural monitoring

VOLTAGE MODE, PIEZOELECTRIC (IEPE) ACCELEROMETERS

Plug and Play






	MEAS 7100A, 7101A	MEAS 7102A	MEAS 7108A	MEAS 7104A, 7105A	MEAS 7131A, 7132A	MEAS 7120A, 7122A
Package	Stainless steel / titanium	Titanium	Stainless steel	Stainless steel	Titanium	Titanium
Type	Center-hole mount	Adhesive mount	Adhesive mounting	Stud mounting	Adhesive / stud mounting	Adhesive mounting
Sensitivity (mV/g)	100, 10, 5	100, 50, 20, 10, 5	100, 10	100, 50, 20, 10, 5	500, 100, 50, 10, 5, 2.5	100, 10
Unique Features	• Single axis, shear mode • Isolated mounting surface • Hermetically sealed • Wide bandwidth, >10 kHz	• Single axis, shear mode • Wide bandwidth • <1 g weight	• Single axis, shear mode • Wide bandwidth • Welded construction • Small size	• Single axis, shear mode • Wide bandwidth • Top and side connector option	• Triaxial, shear mode • >12 kHz bandwidth • 4-pin connector • Hermetically sealed	• Single axis, shear mode • Miniature cube • 10 - 32 connector • Hermetically sealed
Operating Temp.	7100A: -55°C to 150°C 7101A: -55°C to 125°C	-55°C to +125°C	-55°C to 125°C	-55°C to 125°C	-55°C to 125°C	-55°C to 125°C
Dimensions (mm)	7100A: 9.9 x 22.35 7101A: 5.84 x 14.48	4.40 x 11.94	9.53 x 10.16	7104A: 11.11 x 14.10 7105A: 11.11 x 19.05	7131A: 11 x 11 x 11 7132A: 15.24 x 20.32 x 13.46	10.16 x 10.16 x 19.16
Typical Applications	Flight testing, general purpose, vibration monitoring	Small structures monitoring, minimal mass loading, general purpose testing	Vibration monitoring, modal testing, general purpose	General purpose IEPE accel, vibration monitoring, lab testing	General purpose, modal testing, vibration monitoring	Modal testing, vibration monitoring, small structures monitoring

VOLTAGE MODE, PIEZOELECTRIC ACCELEROMETERS

Plug and Play






	MEAS 8042	MEAS 8011, 8021-01	MEAS 8032-01	MEAS 8711-01	MEAS 8011, 8021-AR/AP	MEAS 8011, 8021-VR/VP
Package	Titanium	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Type	Stud mount	Stud / center-hole mount	Stud mount	Stud mount	Stud / center-hole mount	Stud / center-hole mount
Sensitivity (mV/g)	500, 100, 10	500, 100, 10	100, 10	1000, 500, 250, 100	4 - 20 mA RMS or peak	4 - 20 mA RMS or peak
Unique Features	• Industrial applications • Submersible • IP68, >100 meters • 16 kHz bandwidth	• Industrial accelerometer • Case isolated, internal shielding • Reverse wiring protection • ±1.0% non-linearity	• Industrial accelerometer • Case isolated, internal shielding • Low cost • Molded strain relief	• Industrial accelerometer • Case isolated, internal shielding • Low cost	• Industrial accelerometer • Case isolated, internal shielding • 50, 20, 10, 5 g ranges	• Velocity transmitter • Case isolated, internal shielding • 0.5 to 5.0 in/sec
Operating Temp.	-20°C to 80°C	-55°C to 125°C	-55°C to 100°C	-55°C to +125°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	22.23 x 48.26	22.23 x 48.26	14.3 x 45.3	22.23 x 50.80	22.23 x 48.26	22.23 x 48.26
Typical Applications	Submersed pump monitoring, underwater research, gearbox monitoring	Industrial applications, machine monitoring, intrinsic safety	Industrial applications, machine monitoring	Industrial applications, machine monitoring, wind turbines	Industrial applications, machine monitoring, intrinsic safety	Industrial applications, machine monitoring, intrinsic safety

ELECTRONICS

Signal Conditioners

					
	MEAS 121	**MEAS 130**	**MEAS 140/142**	**MEAS 160**	**MEAS 161**
Type	Bench top	In-line charge converter	Auto-zero inline amplifier	Bench top	Bench top
# of Channels	3	1	1	1	4
Gain Range	0.001 to 9999	0.1, 1, 10	10, 25, 50, 100, 200, 500	1, 10	0.001 to 999.9
Unique Features	• Universal DC amplifier • Low noise operation with auto-zero • For bridge type sensors • µP controlled, programmable • Low pass filter options	• Low noise • Small package • Wide bandwidth • BNC male or female	• ±1.5 mV auto-zero • For bridge type sensor (140) • For strain gage (142) • Lowest noise • 5 to 30 VDC excitation	• Economical IEPE power supply • Portable, compact • Rechargeable battery	• Charge and IEPE conditioner • Sensitivity normalization • LCD display • Support IEEE 1451.4 TEDS • 10 V peak linear output • Selectable LP filter
Dimensions (mm)	301 x 258 x 102	Ø13.8 x 52.2	56.9 x 25.4 x 12.7	3.95 x 2.83 x 1.58	310 x 180 x 115
Typical Applications	Instrumentation labs, test benches, R&D facilities	Instrumentation labs, high temperature testing PE accelerometer	Instrumentation labs, test benches, R&D facilities	Instrumentation	Instrumentation labs, PE / IEPE sensors

WATER LEVEL SENSORS

We are a leader in the water resources monitoring market with long standing experience in the design and manufacture of water level and water quality sensors. Our expertise in media isolated pressure sensors offers unique advantages in creative product development and consistent product performance. Water level transducers can be customized and are available in a wide range of accuracies, materials, and cabling. With your choice of analog or digital output, our sensors are easily adapted to any data system. Or, use self-powered units with onboard memory for long term deployment. We also provide water quality instrumentation for analyzing lakes, rivers, estuaries, and aquifers worldwide. Our CTD models measure conductivity, temperature, and depth critical to water resources improvement and preservation.

WATER LEVEL DATA LOGGERS

	MEAS TruBlue Logger 555 Level, 575 Baro, 585 CTD	MEAS TruBlue Logger 255 Level	MEAS TruBlue Logger 275 Baro
Accuracy	±0.05% FS TEB (TruBlue 555, 575, 585) 1% of reading or 20 µs/cm (TruBlue 585)	0.05% FS TEB	0.05% FS TEB
Range	0 - 692 ft (TruBlue 555, 585) 8 - 16 psia (TruBlue 575) 5 - 200,000 µs/cm (TruBlue 585)	0 - 658 ft H_2O	8 - 16 psia
Max. Over-range	2X FS (TruBlue 555, 585) 32 psia (TruBlue 575)	3X full scale	3X full scale
Output	RS-485, SDI - 12	RS 485, SDI - 12	RS 485, SDI-12
Data Logging Memory	8 MB	8 MB or 56 MB	8 MB or 56 MB
Operating Temp.	0°C to 50°C	0°C to 50°C	0°C to 50°C
Dimensions (mm)	Ø19.0 x 390.0	Ø19.0 x 222.0	Ø19.0 x 222.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, barometric pressure monitoring	Flood and storm monitoring, wave studies and rapid sampling, stream and stage gaging, slug and pump test, aquifer characterization	Barometric pressure monitoring

DIGITAL LEVEL SENSORS

	MEAS KPSI 500, 501	MEAS KPSI 351, 353, 355
Accuracy	±0.05% FS TEB (KPSI 500) ±0.01 ft H_2O (KPSI 501)	±0.10% FS TEB (KPSI 353) ±0.05% FS TEB (KPSI 355) ±0.01 ft H_2O (KPSI 351)
Range	10 - 230 ft (KPSI 500) 10 - 50 ft (KPSI 501)	10 - 230 ft (KPSI 353, 355) 10 - 50 ft (KPSI 351)
Max. Over-range	2X FS	2X FS
Output	SDI - 12, RS-485	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 197.0	Ø19.0 x 243.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research	Groundwater monitoring, surface water monitoring, oceanographic research

DIGITAL TEMPERATURE SENSORS

	MEAS KPSI 380
Accuracy	±0.1°C
Range	-20°C to 60°C
Connection	Open port nosepiece
Output	SDI - 12, RS-485
Operating Temp.	-20°C to 60°C
Dimensions (mm)	Ø19.0 x 127.0
Typical Applications	Groundwater monitoring, surface water monitoring, storm water, dam operations and stream gaging

ANALOG LEVEL SENSORS

1″ Bore

	MEAS KPSI 700, 710, 720	MEAS KPSI 730, 735
Accuracy	±1.00%, ±0.50%, ±0.25% FSO	±0.10%, ±0.05% FSO
Range	Custom ranges from: 2.3 - 700 ft H_2O (Vented) 10 - 700 ft H_2O (Sealed) 35 - 700 ft H_2O (Absolute)	Custom ranges from: 5 - 700 ft H_2O (Vented: KPSI 730) 0 - 5 ft H_2O to 0 - 700 ft H_2O (Sealed, Absolute: KPSI 730) 6 - 700 ft H_2O (Vented KPSI 735)
Max. Over-range	2X FS	2X FS
Output	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC
Operating Temp.	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 86.6	Ø25.4 x 86.6
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, life stations, landfill leachate	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, life stations, landfill leachate
Agency Approvals	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)

0.75” Bore

	MEAS KPSI 320, 330, 335, 342	MEAS KPSI 300DS
Accuracy	±0.10%, ±0.05% FSO (KPSI 330, 335) ±0.25% FSO (KPSI 320) ±0.25% FS TEB (KPSI 342)	±0.50% FSO
Range	Custom ranges from: 5 - 700 ft H_2O (Vented: KPSI 320, 330, 335) 10 - 700 ft H_2O (Vented KPSI 342) 0 - 5 ft H_2O to 0-700 ft H_2O (Sealed: KPSI 330, 342) 10 - 700 ft H_2O (Sealed: KPSI 320) 35 - 700 ft H_2O (Absolute: KPSI 320, 330, 342)	Custom ranges from: 700 - 6,921 ft H_2O
Max. Over-range	2X FS	2X FS
Output	4- 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC (KPSI 320, 330, 335) 4 - 20 mA (KPSI 342)	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC
Operating Temp.	-20°C to 60°C (KPSI 320, 330, 335) -20°C to 85°C (KPSI 342)	-20°C to 60°C
Dimensions (mm)	Ø19.0 x 151.0	Ø19.0 x 215.0
Typical Applications	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate, tailrace and forebay monitoring	Down hole, level control, pump control
Agency Approvals	CE, WEEE, RoHS, UL and FM (Intrinsically safe) (KPSI 320, 330, 335) CE, WEEE, RoHS (KPSI 342)	CE, WEEE, RoHS

LEVEL SENSORS

OEM Level Sensors

	MEAS KPSI 705	MEAS KPSI 745, 750	MEAS LTA, LT Series
Accuracy	±0.25% FSO	±0.25% FSO	±0.25% FSO
Options	Optional ETFE	Optional standoff (KPSI 745)	Optional lightning protection
Range	Custom ranges from 6 - 115 ft H_2O	Custom ranges from 10 - 115 H_2O	0 - 1 psi up to 0 - 300 psi Custom ranges available
Max. Over-range	2X FS	2X FS	2X FS
Output	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC	4 - 20 mA, 0 - 5 VDC, 0 - 2.5 VDC, 0 - 4 VDC, 0 - 10 VDC, 1.5 - 7.5 VDC	4 - 20 mA
Operating Temp.	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	Ø25.4 x 86.6	KPSI 745: Ø88.9 x 279.4 (With standoff) Ø88.9 x 253.3 (Without standoff) KPSI 750: Ø104.1 x 279.4	LTA: Ø25.4 x 93.0 LT: Ø25.4 x 170.5 (Dependent on fitting)
Typical Applications	Wastewater, lift stations, pump control, slurry tank liquid level, tank level	Wastewater, lift stations, pump control, slurry tank liquid level, tank level	Pump control, tank liquid level, landfill leachate monitoring, construction bypass pumping, dewatering, lift station monitoring, submersible tank liquid level, liquid line pressure, slurry tank liquid level, wastewater
Agency Approvals	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, with optional UL, CUL, and FM (Intrinsically safe)

NON-SUBMERSIBLE PRESSURE TRANSDUCERS

OEM Level Sensors

	MEAS LTB, LTR Series	KPSI 27, 28	KPSI 30
Accuracy	±0.25% FSO	±0.5%, ±0.25%	±0.1%
Options	Optional lightning protection	IP68 submersible option	IP68 submersible option
Range	0 - 11.5, 23.1, 34.6, 69.2, 115.4 ft H_2O Custom ranges available	1 - 300 psi (Vented) 5 - 2000 psi (Sealed) 15 - 2000 psi (Absolute)	2 - 300 psi (Vented) 5 - 500 psi (Sealed, absolute)
Max. Over-range	2X FS	2X FS	2X FS
Output	4 – 20 mA, 0 – 5 VDC, 0 – 10 VDC, 0 – 2.5 VDC, 0 – 4 VDC, 1.5 – 7.5 VDC	4-20 mA, 0-5 VDC, 0-2.5 VDC 0-4 VDC, 0-10 VDC, 1.5-7.5 VDC	4-20 mA, 0-5 VDC, 0-2.5 VDC 0-4 VDC, 0-10 VDC, 1.5-7.5 VDC
Operating Temp.	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	LTB: Ø104.1 x 206.5 LTR: 287.1 with overmold conduit connection, 253.5 with gland seal conduit connection	Ø25.4 x 86.6	Ø25.4 x 86.6
Typical Applications	Pump control, tank liquid level, landfill leachate monitoring, construction bypass pumping, dewatering, lift station monitoring, submersible tank liquid level, liquid line pressure, slurry tank liquid level, wastewater	Line pressure monitoring, pump and lift stations, pump control, tank level monitoring, underwater research	Line pressure monitoring, pump and lift stations, pump control, tank level monitoring, underwater research
Agency Approvals	CE, WEEE, RoHS, with optional UL, CUL, and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)	CE, WEEE, RoHS, UL and FM (Intrinsically safe)

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GLOSSARY OF COMMON SENSOR TERMS

Calibration
Testing of a sensor to confirm output is within a specified range for particular values of the input.

Compensated Temperature Range
The temperature range in which the sensor meets the specifications for Thermal Zero Shift and Thermal Sensitivity Shift.

DeviceNet™
Device level network for industrial automation.

Excitation
The recommended voltage with which a standard sensor should be excited.

Full Scale Output (FSO)
Full Scale Output (FSO) is the span between the lowest range limit and the highest range limit of the sensor. Published values are approximate values and may vary with each sensor.

Hysteresis
Hysteresis is the difference in sensor output signal at a specific input when applied in the increasing and then decreasing sectors of a single cycle of short time duration at constant temperature. It is expressed as a percentage of FSO.

Natural Frequency
Natural Frequency is the frequency at which the sensor's active sensing element goes into resonance and responds with maximum movement for a specific applied input.

Non-linearity
Non-linearity is the deviation of the sensor output signal from a theoretical straight line which has been fitted to the data points of an actual calibration. It expresses the maximum deviation of all data points in that calibration and is sometime expressed as a percentage of FSO, usually as a ±% error band, or % of reading.

Non-Repeatability
Non-repeatability is the deviation in sensor output signal levels when a specific input is applied in consecutive cycles of short time duration under the same conditions, such as temperature and direction of increasing or decreasing input. It can be determined by performing two consecutive short time duration calibration cycles and can be expressed as ±%FSO.

Operating Temperature
The temperature range within which a sensor will meet all of its stated specifications while powered and in operation.

Over-range Limit
The over-range limit is the maximum input to which the sensor can be exposed without damage.

Plug and Play
Sensors designed for end-users who expect sensors to meet calibration performance standards once power and signal cables are properly connected to instrumentation.

Root Mean Square
The square root of the arithmetical mean of a set of squared instantaneous values

Sealing
Sealing is the assembly method by which the sensor is protected from moisture in the surrounding environment. The most desirable sealing method is hermetically seal. This can be achieved by joining the individual piece parts together by soldering, welding, brazing, glassing, or other commonly accepted manufacturing processes. Another common sealing method is epoxy seal. It is achieved by joining the piece parts by applying adhesive or potting compound to mitigate the incursion of moisture into the sensor assembly.

Sensitivity
The sensor's change in output per the unit change in the physical parameter being measured. The change may be linear or non-linear.

Thermal Sensitivity Shift (TSS)
The change in sensitivity of the sensor as a function of temperature. It is usually expressed as a percent reading change in sensitivity for a specified change in temperature such as ±0.01%/°C and is generally linear with moderate temperature changes. The Thermal Sensitivity Shift can be eliminated or minimized by using sensitivity numbers determined at or near the temperature of use.

Thermal Zero Shift (TZS)
The change in the Zero Offset as a function of temperature is the Thermal Zero Shift. It may be expressed as either a %FSO for a specific temperature change such as ±0.01%FSO/°C or in voltage units such as ±0.2 mV/°C and it is not a linear function.

Total Error Band (TEB)
Typically expressed as a percentage, the TEB is the combination of possible errors for a sensing device within its measurement range and temperature of operation.

GLOSSARY OF COMMON SENSOR ABBREVIATIONS

ABS	American Bureau of Shipping
AC	Alternating Current
ANSI	American National Standards Institute
ASIC	Application-Specific Integrated Circuit
ATEX	Appareils destinés à être utilisés en ATmosphères EXplosibles
BOP	Blow Out Prevention
CAN	Controller Area Network
CE	Communauté Européenne
CENELEC	European Committee for Electrotechnical Standardization
CSA	Canadian Standards Association
CT	Computed Tomography
cUL	Tested to Canadian Standards by Underwriters' Laboratories
DC	Direct Current
DCS	Distributed Control System
DEF	Diesel Exhaust Fluid
DTC	Digital Temperature Compensation
ECU	Engine Control Unit
EGR	Exhaust Gas Recirculation
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ESA	European Space Agency
FLS	Field Loadable Software
FM	Factory Mutual
FPGA	Field Programmable Gate Array
FS	Full Scale
FSO	Full Scale Output
FT LBS	Foot Pounds
GPS	Global Positioning System
HUMS	Health Usage and Monitoring System
HVACR	Heating, Ventilation, Air Conditioning, and Refrigeration
HVD	High-Voltage Differential
HZ	Hertz
I²C	Inter-Integrated Circuit
IEC	International Electrical Commission
IECEx	International Electrotechnical Commission Explosive
IEEE	Institute of Electrical and Electronics Engineers
IEPE	Integral Electronic Piezoelectric
IP	Ingress Protection
ISO	International Organization for Standardization
ITAR	International Traffic in Arms Regulations
kHz	Kilohertz
LED	Light Emitting Diode
LIN	Local Interconnect Network
LVD	Low Voltage Differential
LVDT	Linear Variable Displacement Transducers
mA	Milliamp
MAF	Mass Air Flow
mbar	Millibar
MCR	Main Control Room
MEMS	Microelectromechanical Systems
mHZ	Megahertz
mm	Millimeter
MQS	Military Qualification Standards
MR	Magnetoresistive
mV	Millivolt
NAV	Navigation
NASA	National Aeronautics and Space Administration
NEMA	National Electrical Manufacturers Association
NIST	National Institute of Standards and Technology
NOx	Nitrogen Oxide
NPT	National Pipe Tapered
NSF	National Science Foundation
NTC	Negative Temperature Coefficient
OEM	Original Equipment Manufacturer
PCB	Printed Circuit Board
PDF	Portable Document Format
PDM	Pulse Density Modulation
PE	Piezoelectric
PLCD	Permanent Magnet Linear Displacement Sensor
PPS	Polyphenylene Sulfide
PSI	Pounds Per Square Inch
PSIA	Pounds Per Square Inch-Absolute Reference
PSID	Pounds Per Square Inch-Differential Reference
PSIG	Pounds Per Square Inch-Gage Reference
PSIS	Pounds Per Square Inch-Sealed Gage Reference
PTFE	Polytetrafluoroethylene
PUDF	Public Use Data File
PWM	Pulse Width Modulation
R&D	Research and Development
RDT&E	Research, Development, Test & Evaluation
RFI	Radio Frequency Interference
RH	Relative Humidity
RMS	Root Mean Square
RoHS	Restriction of Hazardous Substances
RPM	Revolutions Per Minute
RTD	Resistance Temperature Detector
RTU	Remote Terminal Unit
RVDT	Rotary Variable Differential Transformer
SAE	Society of Automotive Engineering
SCADA	Supervisory Control and Data Acquisition
SCR	Selective Catalytic Reduction
SDI-12	Serial Data Interface at 1200 Baud
SMD	Surface Mount Device
$Sp0_2$	Pulse Oximeter Oxygen Saturation
SPDT	Single Pole, Double Throw
SPI	Serial Peripheral Interface
SPST	Single Pole, Single Throw
T&M	Test & Measurement
TDFN	Thin Duel Flats No Leads
TE	TE Connectivity
TEB	Total Error Band
TESS	TE Sensor Solutions
THSA	Trimmable Horizontal Stabilizer Actuators
TPMS	Tire Pressure Monitoring System
TSYS	Temperature System Sensor
UAV	Unmanned Aerial Vehicle
uC	Microcontroller
UL	Underwriters Laboratories
USB	Universal Serial Bus
VAV	Variable Air Volume
VDC	Volts Direct Current
WEEE	Waste Electrical and Electronic Equipment

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