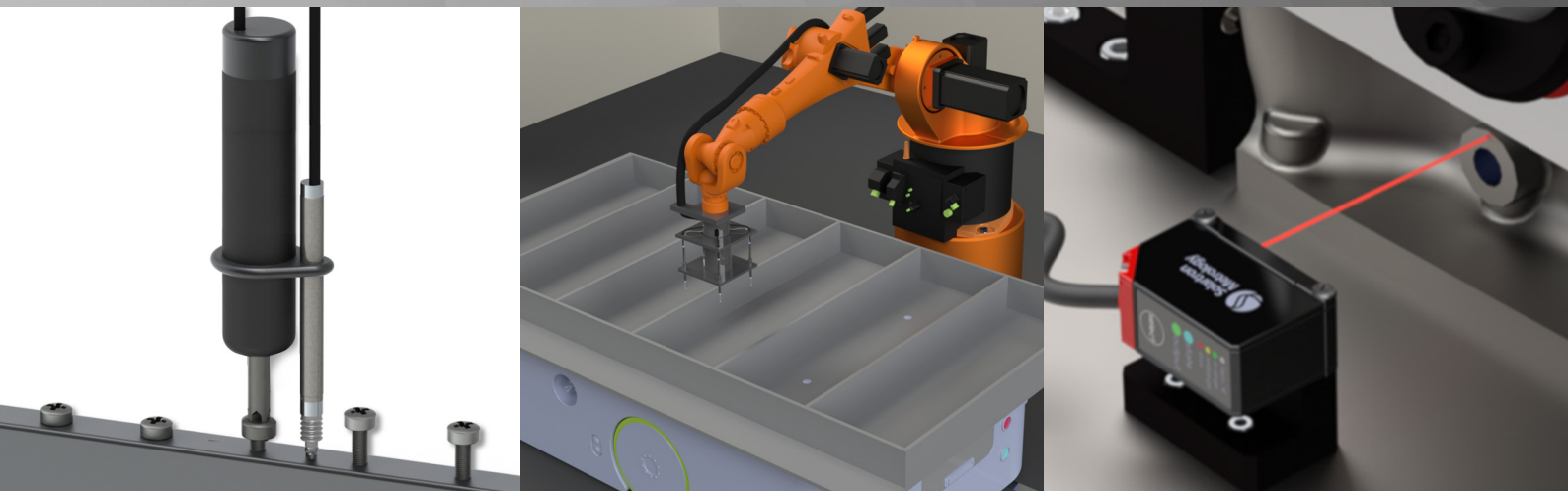




SENSORS FOR PROCESS AUTOMATION



RUGGED, LONG LASTING,
HIGH RESOLUTION

DISTANCE MONITORING, MASTERING & CALIBRATION, MONITORING TOOLING, MONITORING
COMPONENT PLACEMENT, MACHINING CENTRES, FLATNESS MONITORING, AND MORE

Experts In Metrology

Established in 1946, Solartron Metrology is a global leader in the innovation and manufacturing of linear measurement sensors and associated instrumentation.

All of our products are manufactured and assembled in our facility in the UK and are supported by a worldwide network of experts.

Our product range includes high precision Gauging Probes, Low Tip Force Probes for delicate materials, Specialized Gauging Sensors, Displacement Transducers, Non-Contact Sensors, Linear Encoders, and more.

Whether in the lab, on the shop floor, or out in the field, Solartron Metrology sensors deliver precise measurements for Test and Measurement, Process Engineering, and Quality Control applications.

Our sensors are trusted across a wide range of industries including Electric Vehicles, Automotive, Aerospace, Glass, Electronics, Semiconductor, Bearings, and beyond. Wherever precision and repeatability are crucial, Solartron sensors excel.






With a global network of sales offices, Solartron Metrology is well-equipped to meet your linear measurement needs. Whether you require local expertise or international support, we are committed to providing market-leading precision measurement solutions tailored to your specific requirements. Trust Solartron Metrology for cutting-edge sensors and transducers that deliver unparalleled accuracy and reliability.

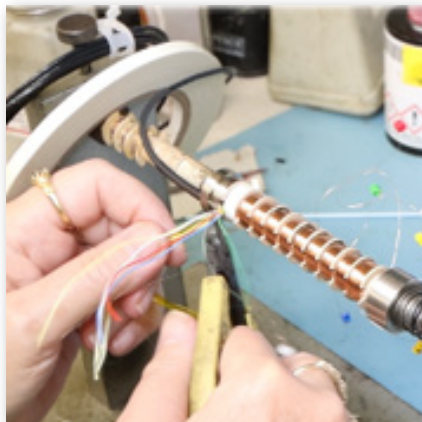


RUGGED BUILD & LONG DURABILITY

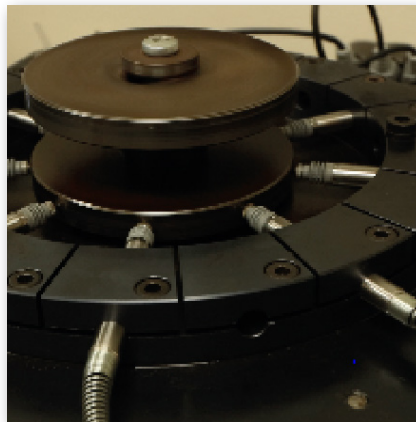


Solartron Metrology has manufactured linear measurement sensors in the UK for decades. Only the finest materials are used so that sensors consistently output steady readings for years. Additionally, our operators are highly skilled experts who are meticulously trained to build only the best quality products with speed and efficiency.

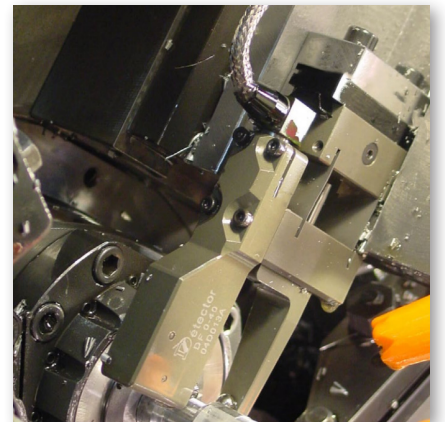
- 
High Resolution: Solartron transducers have resolution up to 0.01 microns, providing even the slightest shift in materials.
- 
Rapid Response: Solartron LVDT probes will provide a near instant response, with no timing loss, when any displacement is made in a laboratory or outdoor setting.
- 
No "Drift" of Measurement: Solartron LVDT sensors can maintain their accuracy and durability over several years, with no loss or drift of readings over time.



A transducer coil being wound by hand



Gauging probe designs are put through tough, rugged, CAM tests



SM probe mounted to the diameter gauge in a machining centre



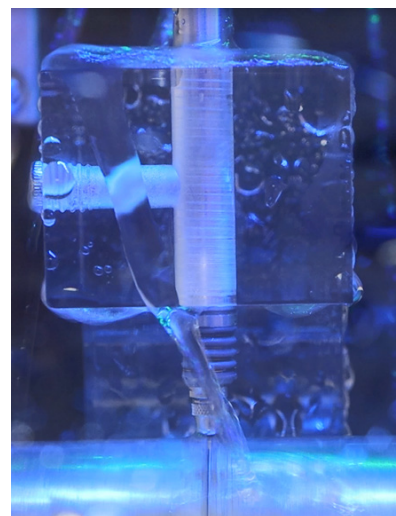
Enhance your Instrument Operation

Between Solartron Gauging probes and Displacement transducers, the configurations are endless.

Solartron can also build customised sensors for specific applications. Contact your local Solartron Representative for more information.



S-Series Displacement Sensors



IP68 sealed probe in action

G-Type

G-Type transducers have the signal conditioner mounted at the end of the probe. DC and 4-20mA available. These are ideal for simple single channel applications.

S Series

S Series from ± 2.5 to ± 150 or 0-5 full range minimum and 0-300 mm full range maximum in Digital, Current and Unipolar Voltage/DC product variants. Free Core, Guided, as well as with Universal Joint options. IP65, IP67, as well as Hi -Temp versions are available.

OP Series

The OP Series has a 9.5 mm body, and offers ranges from ± 1.5 or 0-3 mm up to ± 25 or 0-50 mm range. Free Core, Guided, as well as with Universal Joint options.

Temperature

High Temp Sensors up to 200 °C. Special probes with 316L stainless steel for low temperatures down to -40 °C.

Miniature Displacement

Compact Displacement transducers for applications where space is limited.

Vented Transducers

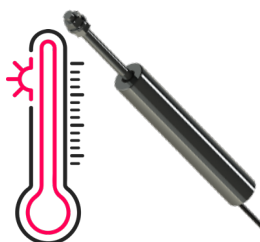
Special Vented transducers for pressurized environments up to 2000 bar.

IP 68 Sealed Probes

These probes sport a high ingress protection, allowing for use in wet or oily environments.

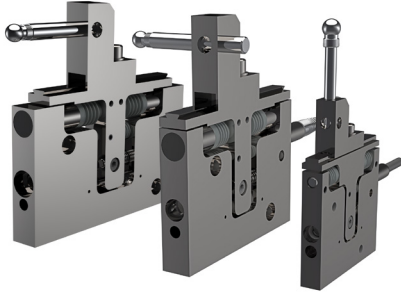


Optimum Series Displacement Sensors



High Temperature variation resistance

Block Gauges, Flexures, and Mini Probes

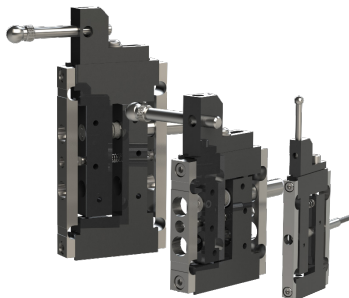


Block Gauges

Solartron's specialist gauging and measurement transducers are for applications where the standard pencil style probe will not fit.

Block Gauges

Solartron's Block Gauge make precision measurements of bores and cavities a simple and reliable process. The Block Gauges offer unrivalled ruggedness and accuracy.



Parallel Flexures

Flexures

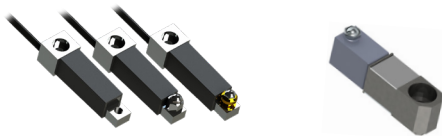
Solartron's Parallel Flexure Transducers the first choice for high speed precision gauging. With no sliding moving parts, the flexure will maintain performance for millions of cycles and are virtually free from hysteresis.

The single leaf flexure offers the gauge builder access to even more measurement points. With careful use of extension arms measurements can be made inside slots or between features where a conventional pencil probe cannot reach.



Single Leaf Flexures

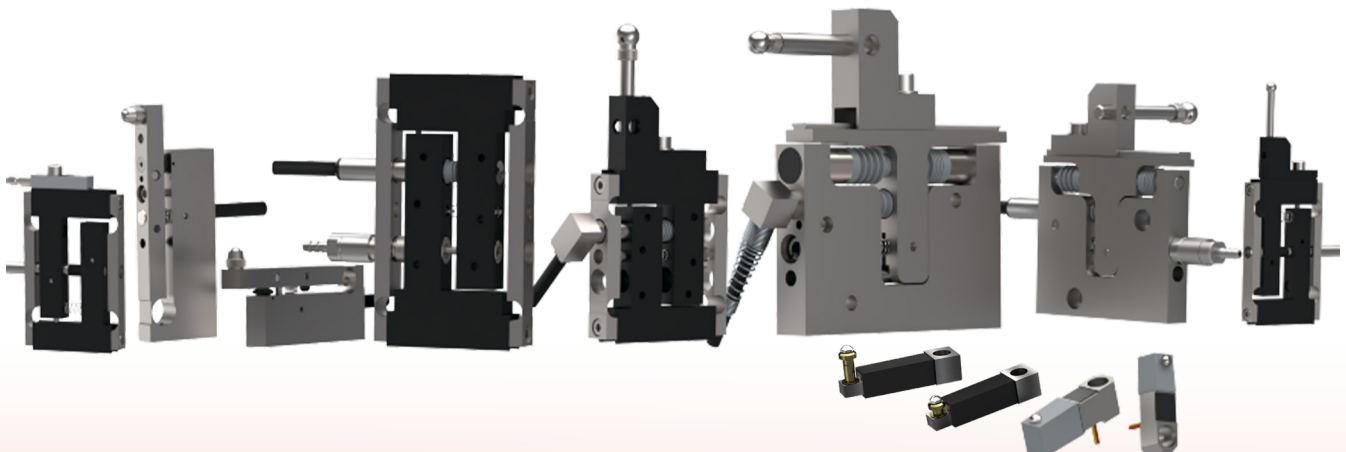
The Miniature Single Leaf Flexure is another variant of the flexure based contact probes. The miniature single leaf flexure has a calibrated range of 0 – 500 microns and provides the means for alternative configurations of contact tip mounting.



Miniature Flexures (left) & Mini Probes (right)

Mini Probes

The Mini Probe is a compact, low profile transducer that is ideal for measurement in confined spaces, such as bores.



The Specialist Transducer range, including Parallel Flexures, Single Leaf Flexures, Miniature Single Leaf Flexures, Mini Probes, and Block Gauges

Non-Contact Measurement

Solartron Metrology offers specialised sensors for monitoring or checking distances in awkward settings.

For applications where a contact gauging sensor is unsuitable, Solartron offers a range of high performance Non-Contact Laser Triangulation Sensor.

Orbit® LT

The range of precision laser triangulation sensors are fully Orbit® Enabled and compatible with all Solartron Readouts and Gauging Software.

The laser performs extremely well on pieces of metal, even if they are reflective. This is partially due to an oval beam, which helps compensate for irregularities or roughness. We have demonstrated this laser to some customers, and it performed extremely well. One agent in China tested it by placing a mirror-like gauge block underneath the beam, and said it performed better than any other laser they had tried.

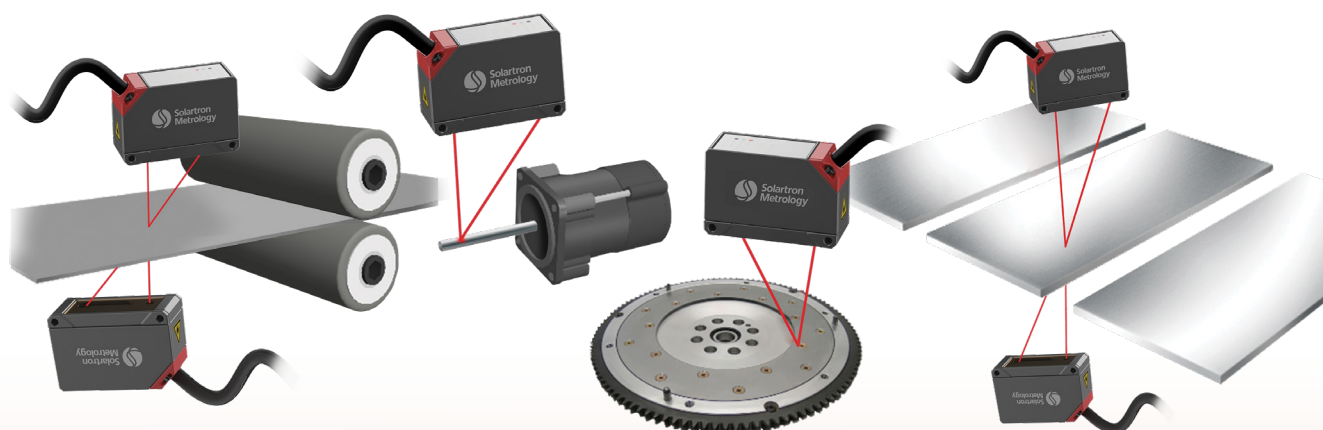
As with our past lasers, Orbit LT2 can be networked contact probes and other sensors via Orbit. This has been a key advantage for customers that want just one connection into a PC or PLC for all of their sensors.



Orbit® LT (Laser Triangulation Sensor)



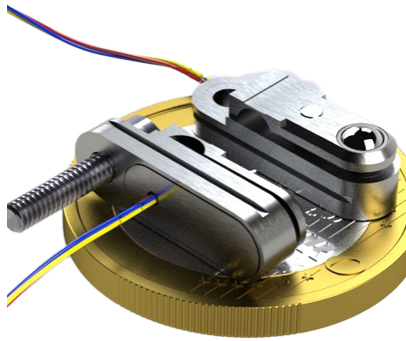
An LT2 sensor measuring the surface of a beverage can



A variety of measurement solutions on metallic surfaces using the Orbit® LT

High Precision Bore Gauging

MicroFLEX



MicroFlex compared to a Euro coin



WiGauge™ Wireless Hand Tool with custom attachment and MicroFlex Flexures for bore gauging

MicroFlex

MicroFlex, a Micro Single Leaf Flexure ideal for bore gauging, has Solartron quality ruggedness and accuracy in a tiny package. Measuring at 16.5 mm long, 5 mm wide, and 5.5 mm high, this flexure offers a 0.4 mm measurement range. For maximum performance, the body was built using 17-7PH Steel.

Customisation of the MicroFlex also offers an optional pack of shims and tip type options, such as Tungsten Carbide, Ruby, and Silicon Nitride. For easier mounting, an option for right angle or axial cable connections is also available.

With WiGauge™ Wireless Hand Tools and MultiChannel Tools, bore gauging is made easy, offering a cable-free solution with rugged & precise tools. The MultiChannel Hand Tool can be integrated with up to 8 Solartron transducers to form multifunctional wireless gauges, such as snap gauges or multi-sensor bore gauges.

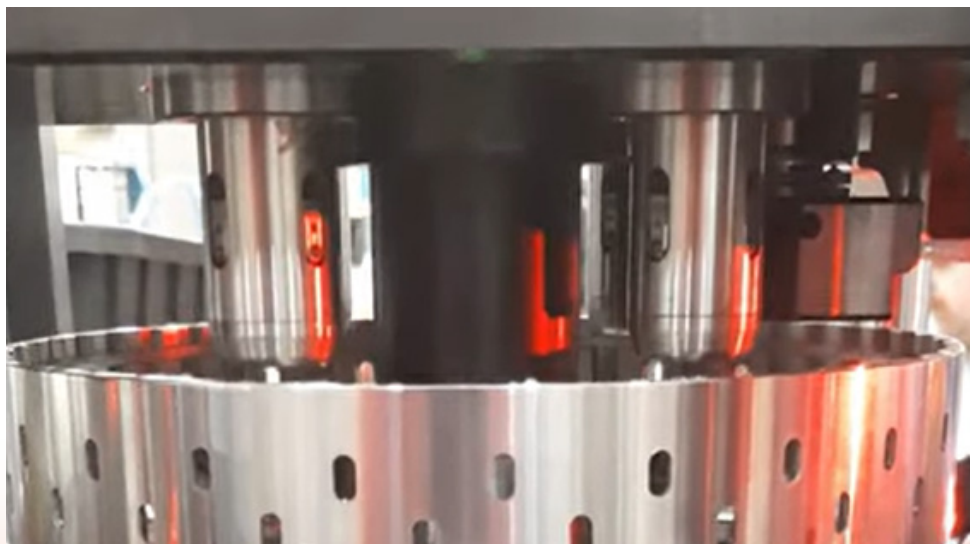


Image courtesy of Landau Gage, www.landaugage.com. Fixture using MicroFlex Flexures to gauge multiple inner diameters at once.

Multiple Output Options

Connectivity Made Easy

Solartron offers both digital and analogue options for signal output to PC, PLC, Datatrackers, and others.

Signals over USB, Ethernet, Wireless, analogue DC or 4.20 mA are also available.

Output Option

Solartron's Orbit Network can connect probes, displacement transducers, lasers, and third party sensors on one stack, and easily output to a PC or other.

Solartron also offers a multitude of DC, TTL, and Current Signal Conditioners.

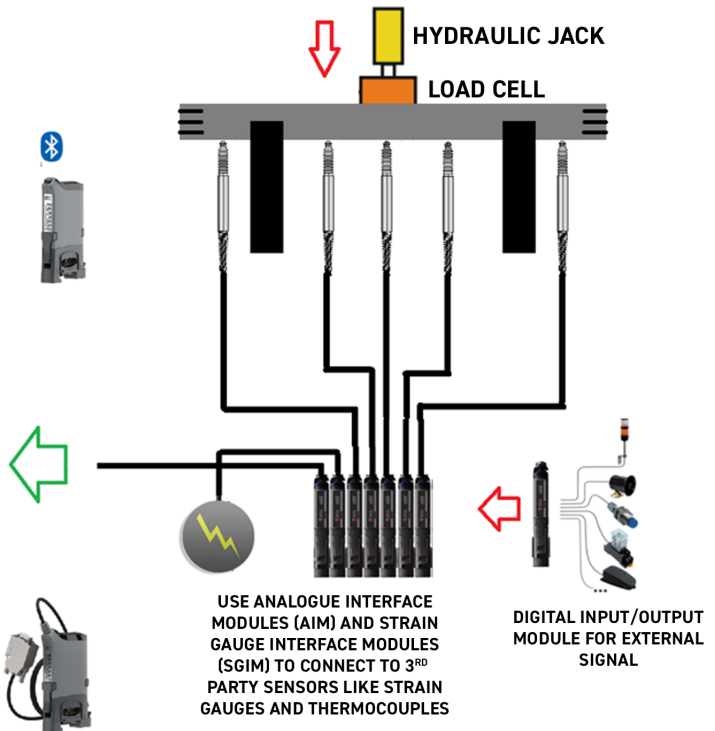
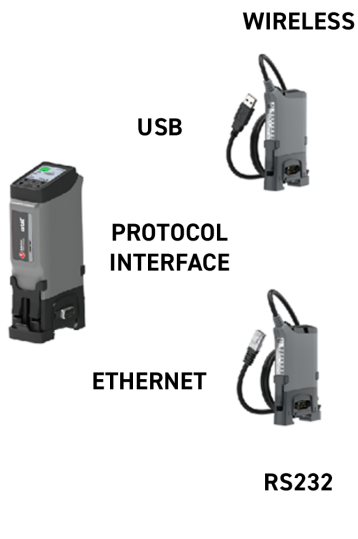
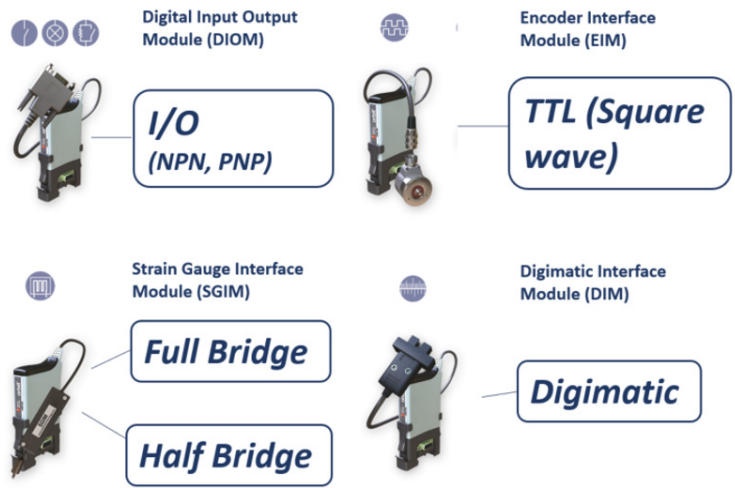
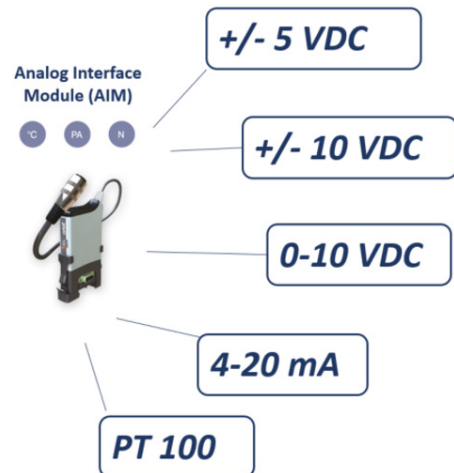
Solartron's NEW Compass (SC1 & SCD1) line of single channel signal conditioners offers LVDT connections, with DC output, Serial, I/O, or output to PC.

Orbit® ACS

For simple 1, 2, or 4 channel applications, Solartron Metrology offers Orbit® ACS. The base readout has I/O, serial output, and the ability to set tolerances.

Take Simultaneous Measurements

In this application, a load cell, two contact probes, and a thermocouple are all connected on one synchronised network.



Example of output options

Monitoring Dimensions of Tooling

Easy, Cost-Effective Set-Up



WiGauge™ Single Channel Wireless Hand Tool checking lens molds

Checking Molds of Lenses

One cell phone component made with the highest accuracy is the camera lens. These are typically manufactured with a high precision mold, with tight tolerances and no blemishes. One key quality factor is checking the diameter of the lens mold itself, to make sure it has not worn or drifted from its tight dimensions.

Solartron Metrology WiGauge™ have been used to check lens molds, with high accuracy and excellent resolution (0.1 μm for Single Channel Wireless Hand Tools) along with a quick reading and easy set-up.

Check Dimensions of Rollers

In the printing and metals industry, giant metal rollers are used to unspool sheets of paper or aluminium for printing or stamping. The diameter, balance, and roundness of these rolls are critical to the process, and must be checked frequently.

Solartron Digital Probes (DP), in conjunction with its Orbit® Digital Measurement Network, provide a cost-effective solution to check metal rolls quickly and reliably. A DP records the roll profile shapes and a 2nd DP is used as a diagnostic tool to measure roll motion. An Encoder Interface Module (EIM) can then be used to tie the readings of a rotary encoder with Orbit® for a synchronised output into a PC.



A demonstration of data being recorded live via the Orbit® Network



The Orbit® Digital Measurement Network connecting various products to record data



High Resolution Measurements

Measurement in Extreme Elements

Solartron can build custom sensors that can withstand the most extreme heat and cold. One example is custom built AXR probe that can operate down to $-40\text{ }^{\circ}\text{C}$.

The probes are mounted on the antennas at the ALMA Project (Atacama Large Millimeter/submillimeter Array) in Northern Chile, where temperatures vary from -20 to $+40\text{ }^{\circ}\text{C}$.

The probes, which measure the angle change in the antennas, were chosen over two competitors due to their rugged build and high resolution.



ALMA Project Site



Custom AXR Probe able to withstand high temperature differences

Platform Attitude Positioning

6 Solartron sensors are measuring the position of the upper platform and sending the information to the cylinder to set its level. In doing so, the powered laser installed on the upper plate will have the proper angle and altitude very accurately.

6 x AS/75/F KAPTON Cable, 6 x 50 m extension Standard PTFE cable, 6 x DRC with Sync. Long and unique cables with 30 wires within.



Probes measuring top platform position (Fixture from Symétrie in France, www.symetrie.fr)

Plane Simulation

Solartron instrumented plane simulators for civil defence. The hydraulic positioning of the cockpit was made by SM sensors. The movement inputted on the commands by the pilot are calculated real-time, sending the required position of the hydraulic cylinders to the SM sensors to measure the position. These calculations then provide a continuous command loop, allowing a real time refresh of positioning information.



Plane Simulation

Easy Setup



A 5-Axis machine using Digital Probes (DP) with a Wireless Interface Module (WIM) (Photo courtesy of Optifive in France, www.optifive.com)

Solartron offers calibrated sensors to check automation and machining centres before usage.

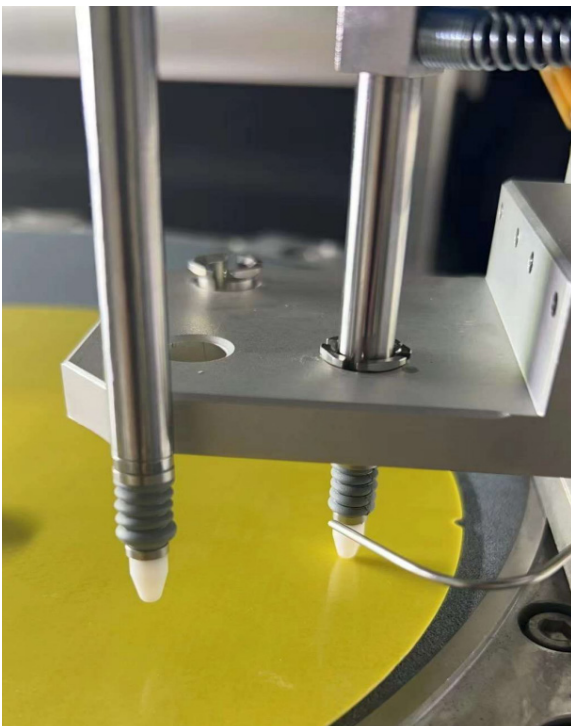
5-Axis Machines

Optifive in France offers a system that utilises Solartron Digital Probes (DP), along with a Wireless Interface Module (WIM) to calibrate a 5-axis machine. Most of the new 5-axis machine designs include a software package for compensation/calibration tool or process options. With 3 DPs connected to a touch interface via USB or wireless, the software will know the accuracy of the machine and subsequently will calculate the new values of the rotating tool centre point (RTCP, Traori).

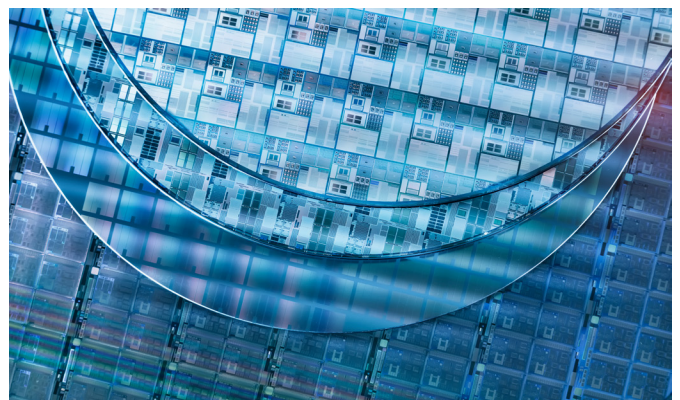
Semi-Conductor Wafer Grinders

For semi-conductor wafers, machines will grind the wafer down to a certain thickness. With such a high tolerance requirement, the height of the grinder in relation to the base plate must be ground to the wrong height, and be scrapped.

Solartron uses digital probes to “master” a semi-conductor grinder. Advantages include an easy setup, high resolution, and a rapid response.



Two custom nylon-tip Pencil Probes gauging the flatness of a semi-conductor wafer



Semi-Conductor Wafers

Monitoring Placement of Components

Multiple Distance Monitoring Options

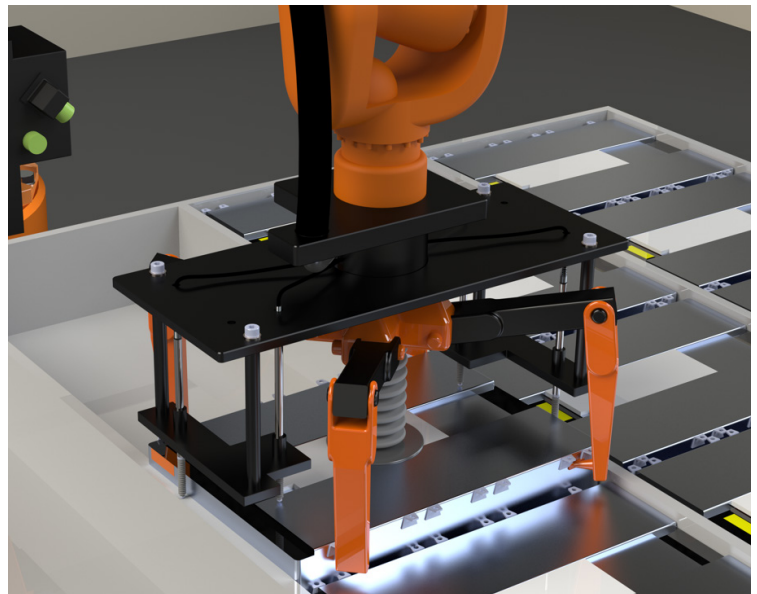
Placement of Pack into Battery Cell

In Electric Vehicles (EV) battery cells are often loaded via a robot into a larger battery pack, before being sealed and shipped to an auto assembly factory. The tolerances between the cells and the larger pack are extremely tight to prevent rattling, and placement of the cells must be done quickly, as they must fit dozens of smaller battery cells into one unit. The robot must also get position feedback placing the battery cell into the pack, otherwise it could load the cell improperly or even damage it.

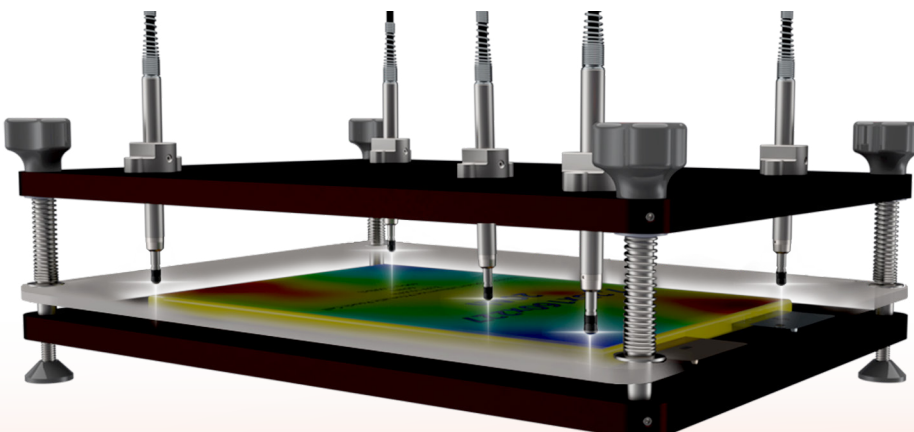
Solartron Metrology offers multiple gauging options for monitoring the placement of a cell into a battery pack. In this case, standard Solartron spring gauging probes are used to monitor the height of the robot in relation to the pack frame as the battery cell is placed inside. Advantages include rapid response, and high resolution.



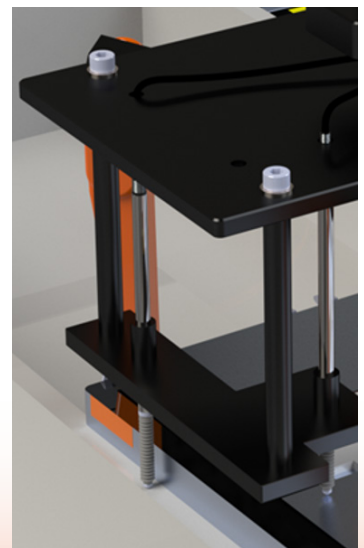
Demonstration of Battery Placement



Demonstration of Battery Placement



Flatness of an EV Prismatic Battery Cell being gauged by multiple Solartron Pencil Probes



Monitoring Flatness & Placement

An Easily Implemented System



Component flatness being measured by G-Type Probes.

Semi-Conductor Components

For automation of electronic components, such as semi-conductors, the equipment for the wafers must maintain flatness. Solartron transducers can be used to monitor the flatness or height of these components using products from our vast range of equipment.

Valve Positioning

Solartron probes are used to measure the positioning of valves, allowing a varying volume of fluid or gas to pass through the pipes when in the correct position.



Monitoring Part or Fixture Placement

Solartron sensors, such as Orbit® LT, can be used to ensure a part is mounted properly in a fixture before a machining step or measurement is taken. With the Orbit® Digital Measurement Network, Go/No-Go Signals are easy to implement.



A demonstration of the Orbit® Network working to measure multiple points on a component.

Swift & Precise

Checks for Rod Straightening Machines

In the automotive industry, rods and transmission components must be aligned or straightened, as they have no met specifications after being manufactured. These machines, called alignment or distortion machines, require high precision measurement components with quick feedback. These rods could be bent just a fraction of a degree.

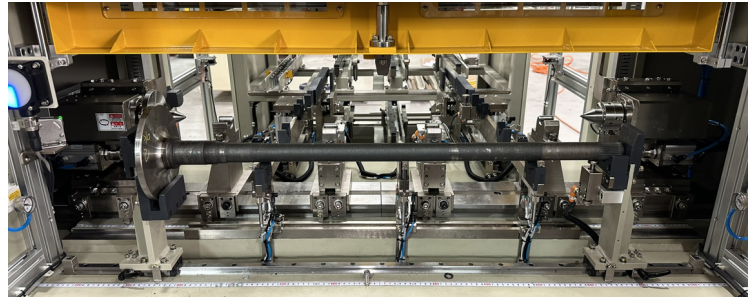
Solartron offers precise, rugged sensors that fit the needs for alignment and distortion machines, as well outputs that provide swift feedback into PCs or PLCs.

Automated Tool Insertion

The use of robots and automated processes is increasingly visible in industries across the world. Speed and less reliance on manpower is critical in many industrial processes. Pneumatic, Hydraulic, or Electrical insert tools or screwdrivers used in automated assembly systems are often fitted with a torque sensor to indicate when a component is pushed or screwed into position.

Torque sensors work well enough most of the time, but are often unable to indicate when a component is not correctly positioned. A poorly formed screw, for example, may produce sufficient torque to indicate that a component is correctly positioned when it has actually failed. Not identifying a failed action means that the sub assembly is passed down the line, which can prove costly.

Retrofitting a gauge probe onto an insert tool to give true position feedback is easy to do and has become commonplace in many high volume mechatronic assembly applications where components may be small or fragile and it is critical that they are positioned precisely. It is sometimes possible to build the position sensor into the insert tool, as demonstrated below.



Rod Bending Machine



Encoder Interface Module (EIM) connected to the Rotary Encoder



Solartron Gauging Probe helping gauge true position of the tool and screw.



Screwdriver incorrectly inserting a screw.



Position Sensor inside the insert tool.

Enhanced Quality Control

In the machining centre, a cutting tool is often required to cut or drill to a very specific dimension, or the part must be scrapped.

For this, measurement equipment with a high accuracy and quick response time are required.

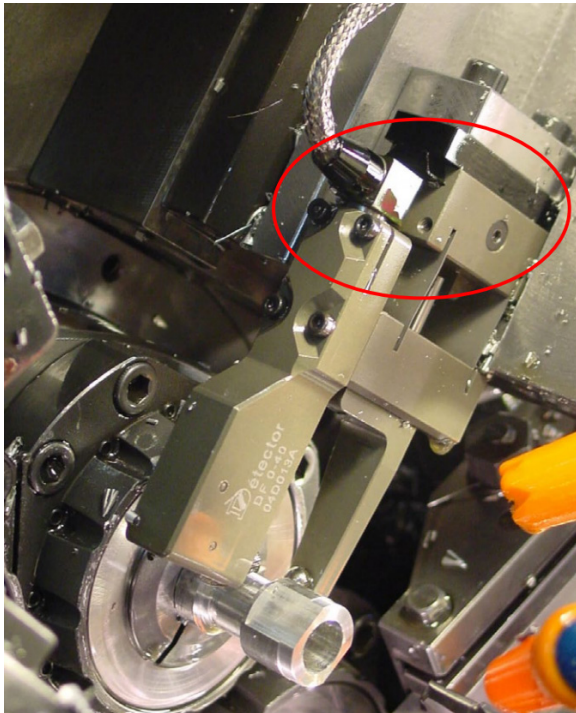
Gauges & Broken Tool Detectors

For manufacturers of length & diameter gauges and broken tool detectors in machining centres (such as Detector in France, www.detector-france.com), Solartron sensors are a great benefit. For distance monitoring applications, even the slightest movement might be critical.

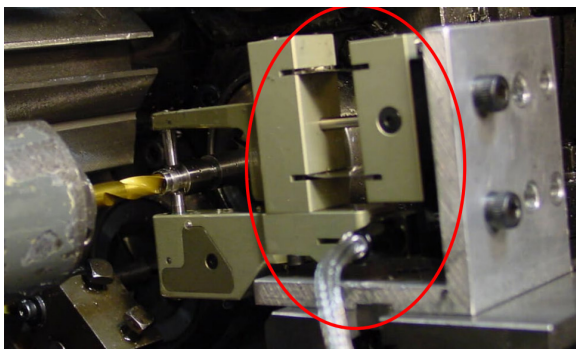
Solartron gauging probes provide resolution of up to $0.01 \mu\text{m}$ in a cost efficient package. Paired with a design that endures harsh testing for millions of cycle and IP 68 sealing for oily environments, these sensors will last for years.

Wireless Measurement of Bores

Solartron WiGauge™ have been used in machining centres to check various bores and similar dimensions. Readouts can be output via Bluetooth to a computer from up to 15 metres away.



A Solartron Gauging probe is mounted to their Diameter gauge in a machining centre. This is a custom right angle probe with Steel Braided Cable.



Steel Braided Cable inside machinery.



A Solartron probe is mounted into this Detector Length Measurer.



Steel Braided Cable.

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REAL PRECISION. REAL SOLUTIONS.

In the laboratory, on the shop floor or in the field, Solartron Metrology's products provide precise linear measurements for quality control, test and measurement and machine control.

Solartron Metrology is a world leader in the innovation, design and manufacture of precision digital and analogue dimensional LVDT gauging probes, displacement sensors, optical linear encoders and associated instrumentation.



Solartron Metrology pursues a policy of continuous development. Specifications in this document may therefore be changed without notice.

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