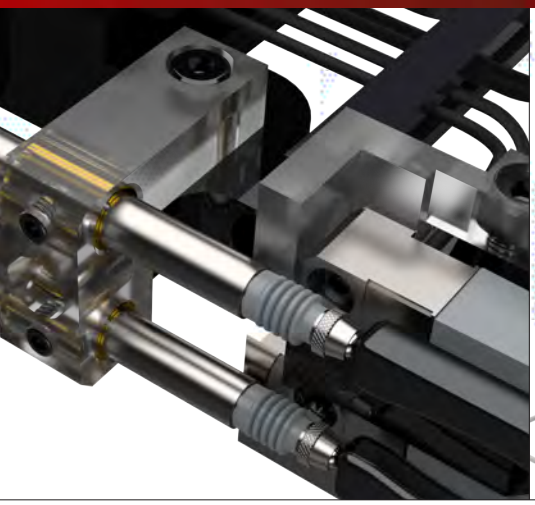
Solartron Metrology

AMETEK

# DIGITAL GAUGING & MEASURING SOLUTIONS



orbit®

DIGITAL MEASURING NETWORK

“Working with our customers and partners to provide complete precision linear  measurement solutions”

“配合客户和合作伙伴提供完整的精密线性测量解决方案”

“Travailler avec nos clients et partenaires pour fournir des solutions de mesures linéaires précises et complètes”

“Zusammenarbeit mit Kunden und Partnern für die Bereitstellung präziser Messlösungen”

“Lavoriamo con i nostri clienti e partner per fornire soluzioni di misura lineare complete ed accurate”

“お客様へ高精度のリニア測定を実現するためのソリューションを提供します。”

“Trabalhando com nossos clientes e parceiros para fornecer soluções precisas em medição linear”

“Сотрудничество с клиентами и партнерами обеспечивает наилучшие комплексные решения в области высокоточных систем линейных измерений”

“Trabajamos con nuestros clientes y socios para proporcionarles soluciones completas en medides lineares de precísíon”

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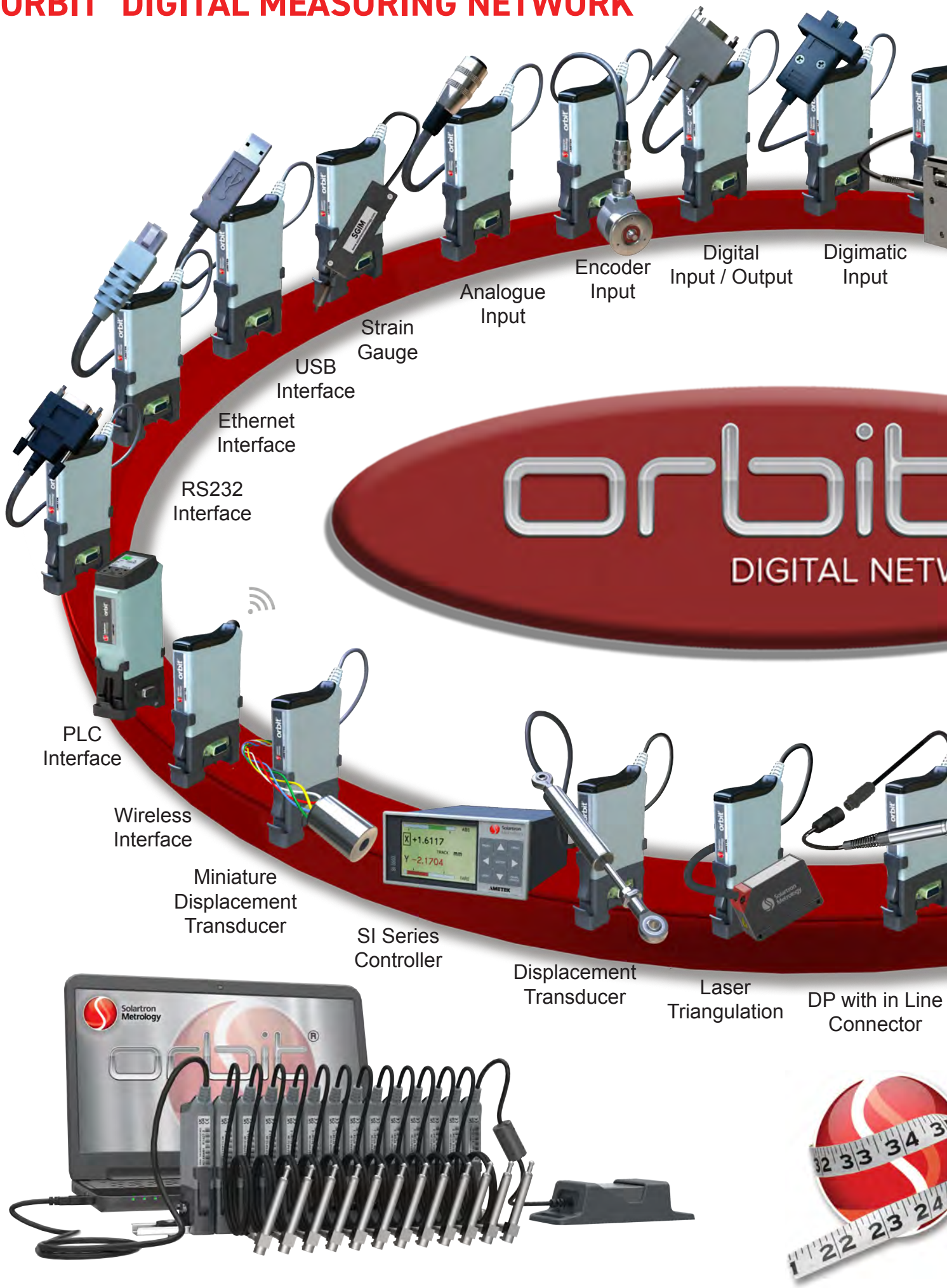
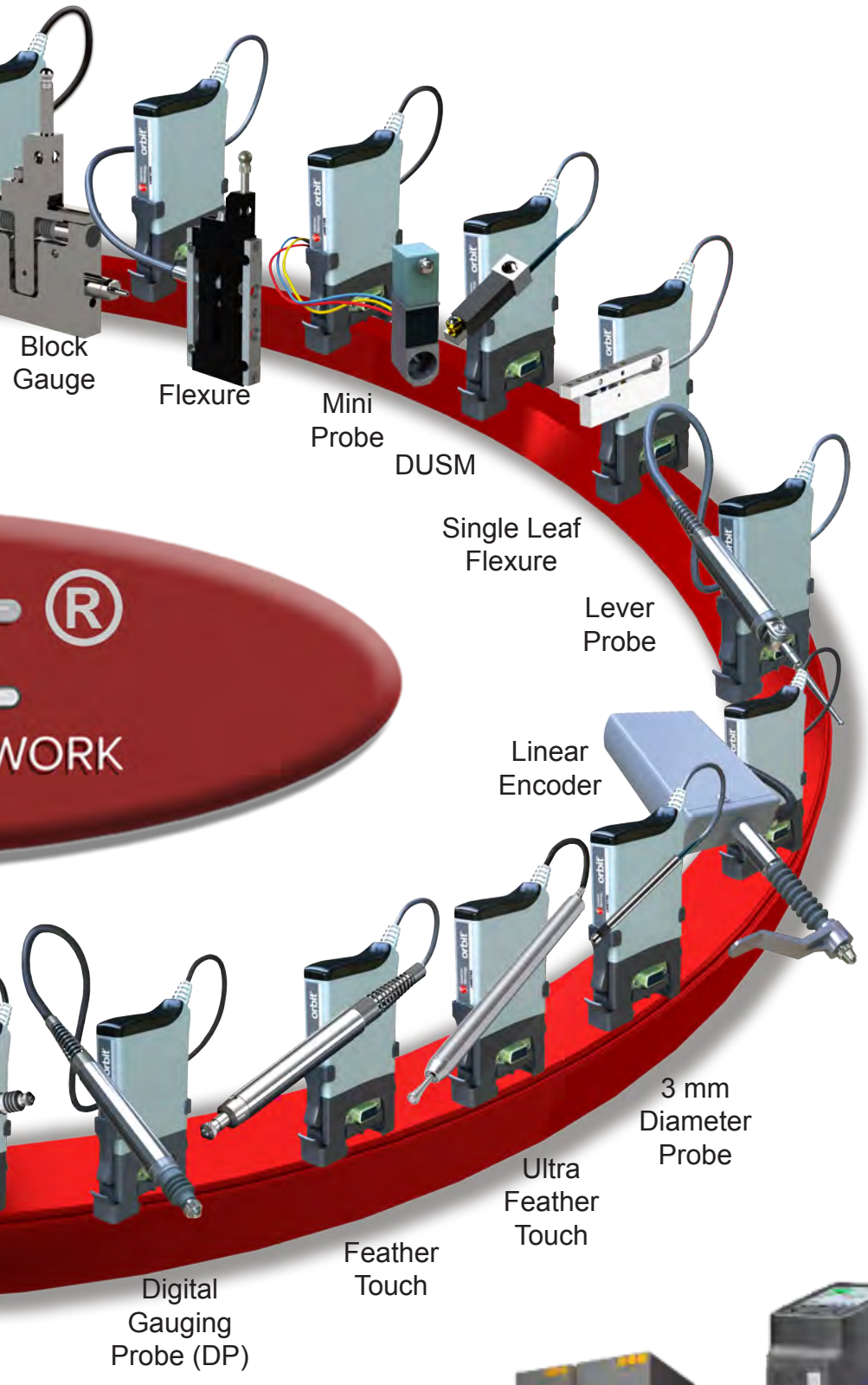
# ORBIT® DIGITAL MEASURING NETWORK





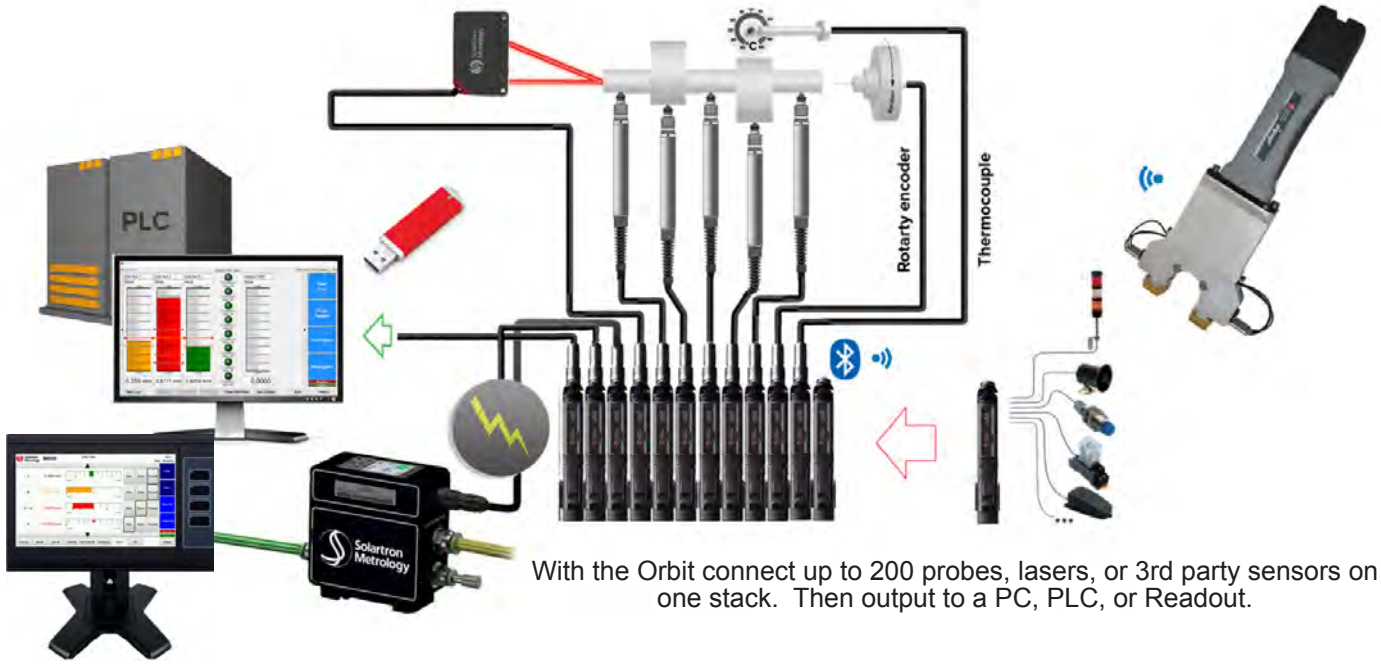

**Higher performance does not mean higher costs.**
Quality standards in industry and research are becoming tighter, while demands for cost savings continue to increase. Orbit® provides the way forward for all precision measurement or positioning needs, whether on the production line or in the laboratory.

Orbit® provides a complete solution for integrating different measurement position and control sensors smoothly and simply into network solutions.

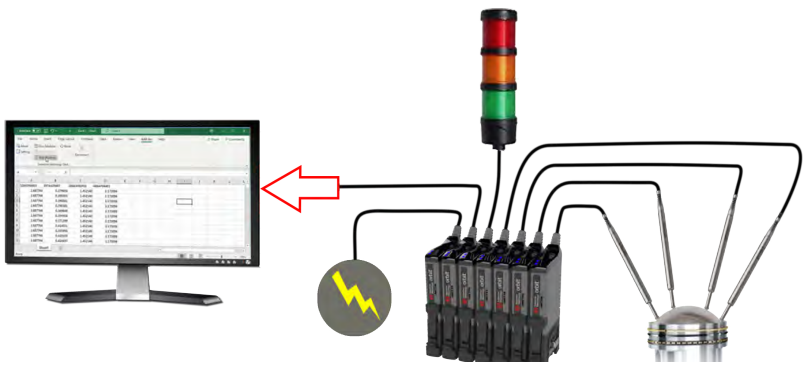
The Orbit® system architecture consists of a rugged mechanical design coupled with a high degree of electrical protection and excellent noise immunity, ensuring valid accurate data when it is needed.

All Solartron products have undergone rigorous testing to ensure a long and productive life.

# ORBIT® CONNECTIVITY



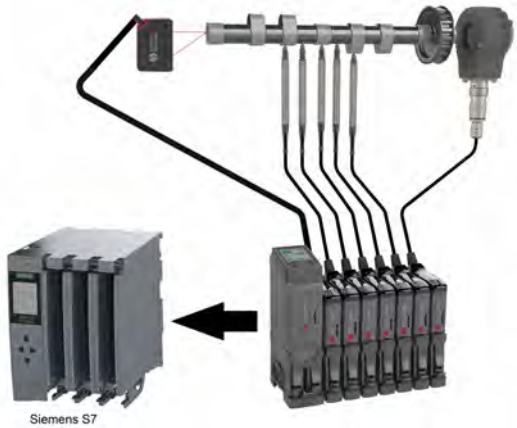

With the Orbit connect up to 200 probes, lasers, or 3rd party sensors on one stack. Then output to a PC, PLC, or Readout.



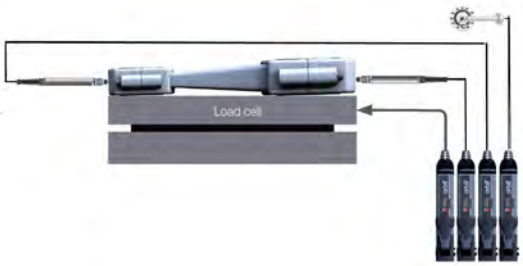
Solartron/s Digital Input/Output Module (DIOM) allows for simple I/O to a PLC or light tower.

Easily network and power both contact and non-contact sensors.

EtherNet/IP
EtherCAT
PROFINET
Modbus TCP/IP
CC-Link




Solartron's Protocol Interface Module (PIM) provides connection into the world's most popular PLC interfaces.




Use Orbit to synchronize and output 3rd party sensors, such as a load cell and thermocouple.

# ORBIT® APPLICATIONS

As major global sensor manufacturers, Solartron Metrology covers a wealth of sensor technology for displacement measurement in many different industries and applications.

Constantly evolving our range of metrology and measurement sensors and transducers for a greater variety of linear measurement applications, we have the technology, the commitment and the resources to help you conduct accurate precision measurement.

## BEARING INDUSTRY

High Resolution, Repeatability, and Rugged build make Solartron probes and ideal choice.

## EV BATTERY POUCH

Check flatness, thickness, and other critical dimensions.

## CONNECTING ROD

Flexures can be used to check Inner Diameter, as well as distances between center points.

## PROCESS MONITORING

Use Contact probes to monitor distances travelled, including the distance a screw is inserted into a metal sheet.

## TURBINE BLADE

Solartron probes can check multiple points instantaneously.

## GLASS

Feather Touch and Ultra Feather Touch probes will not scratch or dent a curved piece of glass or delicate material.

## BORE GAUGING AND ALIGNMENT

Mini probes can be used to check ID, alignment, roundness, and other properties.

# SELECT A SENSOR FOR THE ORBIT® NETWORK

Choose from a full array of linear measurement sensors, each with their own application advantages

## CONTACT MEASUREMENT

### DIGITAL PROBES AND TRANSDUCERS

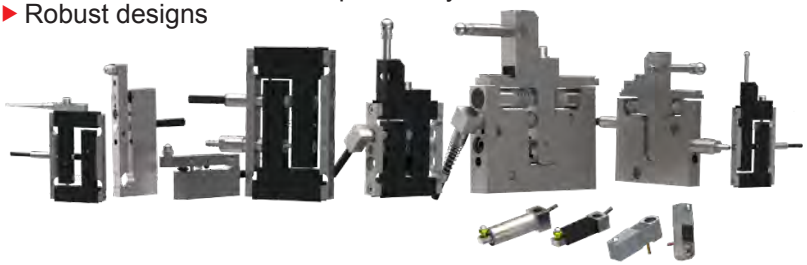
- Accurate
- Repeatable
- Robust
- Small size
- Low tip force
- Long life
- Displaces light, dirt and oil
- Absolute measurement
- Works on all surfaces
- Best cost vs performance
- Can be used in most environments
- Very wide range of products

### "FEATHER TOUCH" PROBES WITH LOW TIP FORCE

- Tip forces from 20 g to as low as 3 g
- Ideal for glass, delicate surfaces, or easily damaged materials
- Nylon, Silicon Nitride and Ruby tips available
- Same high accuracy and resolution as digital probe

### Specialised Sensors

- Sensors for hard to reach areas, such as bores or gaps
- Multiple ranges and sizes
- Excellent resolution and repeatability
- Robust designs

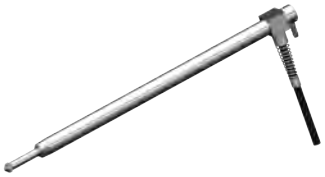


### Linear Encoder

- Glass Scale
- Best Accuracy over full scale range

## CUSTOM PRODUCTS

At Solartron Metrology our experienced design team have worked closely with customers to produce customised measurement solutions. If you require a specialised sensor to solve your measurement problem then please contact your local Solartron representative.

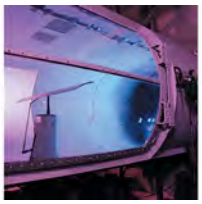


Example: Customised Feather Touch Probe

- Built for glass industry
- Long 30 mm travel, but with 5 mm range at end of stroke
- Ensures tip is clear when glass removed
- R/A Outlet with Steel Braided Cable

Automation

Metrology



Bench Test

Medical

- Position feedback
- Level measurement
- Machine alignment
- Assembly checking
- Closed loop control
- Tool positioning

# NON-CONTACT MEASUREMENT

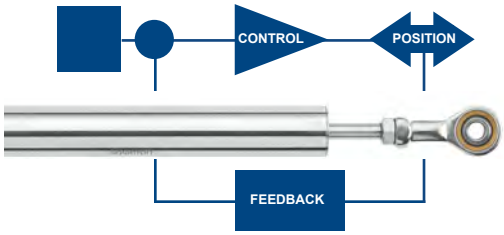

## LASER TRIANGULATION

- Orbit® LT2 (Higher Precision) and Orbit® LT1 (Basic Precision) models
- Very Compact: Just 20 mm wide
- No extra controller needed
- Connect with other sensors via the Orbit® Network
- Easy setup and adjustments

## OTHER PRODUCTS

## POSITION CONTROL AND DISPLACEMENT MEASUREMENT

Solartron offers full ranges of displacement sensors for industrial position, laboratory and test environments. Nearly all of these sensors can be integrated with the flexible Orbit® Measurement Network.




Displacement transducers have been used in the following areas...


Energy


Transport


Test


Structures


Electronics

- Motion control
- Distance control
- Crack monitoring
- Structure monitoring
- Material testing
- Research

## KEY APPLICATION FACTORS

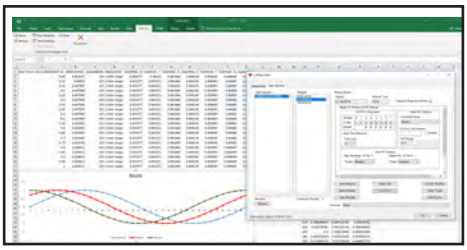
- Material
- Surface roughness
- Tolerance
- Speed in which it must be measured
- Contact allowed?
- Non-contact feasible?
- Environment
- Humidity
- Temperature
- Vibration
- Mounting of sensors
- Contact your local Solartron representative for the best sensor recommendation

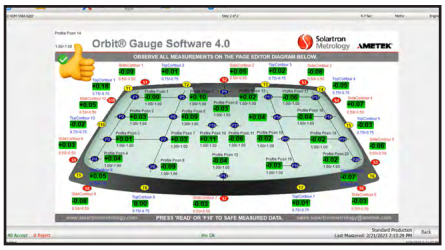
# USING THE ORBIT® DIGITAL MEASURING NETWORK

The Orbit® Measuring Network is a modular system that can be put together quickly, easily and cost effectively allowing many different types of sensors, not just linear probes, to be simply interfaced. Key elements of the network are the software drivers and library giving the network vast scope for high speed data capture and process.

## WHAT DO

| GO STRAIGHT INTO A SPREADSHEET | USE BASIC SOFTWARE PACKAGE | USE FULL SOFTWARE PACKAGE |
|---|---|---|
| Install the Orbit® Support Pack for Windows®<br><br>Install the Excel® Add-In<br><br>Read data from Orbit® into Excel®, Post Process and generate graphics | Install the Orbit® Support Pack for Windows®<br><br>Use Orbit® GCS<br><br>Display the transducer readings, log data to a file | Install the Orbit® Support Pack for Windows®<br><br>Install Orbit® Gauge Software 4.0<br><br>Full blown package with SPC, automation connections, and multiple data output formats |




**Orbit® Gauge Software 4.0** is a full blown software package that can handle manual, semi-automated, and fully automated applications. It can run over 200 sensors and output data in multiple SPC formats.

**OrbitGCS** is a simple to use application which gives the user the ability to set up a network and display the data in graphical format on a PC.

Data can also be logged to **Excel®**. The Excel® add-in can be used to facilitate building application specific spreadsheets.

Solartron also supports LabVIEW® with Orbit® for direct connection. Solartron also supplies drivers to connect to **Linux** operating systems.

# USING THE ORBIT® DIGITAL MEASURING NETWORK

Connect Orbit® to SPC, Excel®, or build your own program with the Orbit® Support Pack. Use our PLC interface modules or Readouts for a stand alone system.

## YOU NEED?

| CREATE YOUR OWN PC PROGRAM OR CONNECT TO EXISTING SOFTWARE | USE A PLC | STAND ALONE SYSTEM |
|---|---|---|
| Install the Orbit® for Windows® Support Pack<br><br>Use the simple proven Orbit® Library commands to get data from the Orbit® Network. For high speed synchronised data capture use the high speed measurement modes like Dynamic and Readburst. | Protocol Modules for standard PLCs (Modbus®TCP/IP, EtherNet/IP®, Profinet®, EtherCat®, CC-Link®) | No Software Required |
| | Simple PC based configuration tools for easy set up | Range of Readouts available with different functions |


The Orbit® Library is specifically designed for the Microsoft®. Net Framework that is included with all Windows® operating systems from Windows XP® onwards. Using this library greatly simplifies the development of Orbit® systems. One of the main features of the Orbit® Library is the ability to get data from the network in several ways, providing solutions to many common measurement problems.

## FEATURES

- Windows® 11, 10, 8.1, 7, and XP in both 64 bit and 32 bit
- Orbit® Library - based on Microsoft .NET Framework
- Orbit GCS Application – free simple application removes need to write software
- Excel® Add In - Orbit® straight into Excel®
- Orbit® Library Test application contains source code for all Orbit® commands which may be used by customers to develop own applications
- Language specific programming examples
- Detailed documentation and help files

# ORBIT® - A UNIVERSAL TRUTH

Data is only of value when it is processed from a reliable source

All standard transducer cables feature a polyurethane sheath with a foil screen layer for excellent electrical screening. The cable is very flexible

Hardened stainless steel

Titanium core carrier, inert and able to withstand lateral shock

Internal screen to protect from magnetic fields

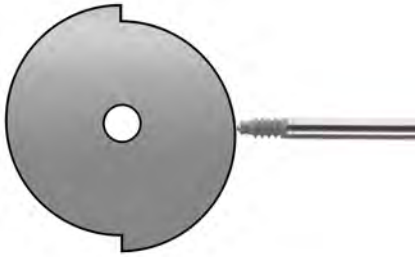
Tight tolerance bearing with carbon/ chrome balls providing good repeatability with long life

Anti rotation device designed to be strong and provide great repeatability even with probe tip off centre

Indicator lamps show power and data transmission active


Strong, and lightweight body with internal electrical screening

PIE (Probe Interface Electronics)



Probe design endures a harsh “stepped cam” test where probe is actuated with a sideload. Repeatablity is maintained during the test.

35 mm DIN rail mount for PIE, strong, lightweight construction. Holds the sensor address

Solartron Digital Transducers calibrated using laser interferometers are error mapped to significantly improve linearity. In gauging applications this minimises number of setting masters required, reducing investment costs and ongoing cost of ownership.

## UNERRING DATA COLLECTION + POWERFUL PROCESSING = ROCK SOLID RESULTS

Good original data can be ruined by noisy signal conditioning and poor immunity from electrical interference which in turn affects the repeatability of results. Orbit® processes and transmits clean, repeatable data from sensors at high speeds of up to 3906 readings per second.

A reliable sensor is essential to any data processing system. All Solartron Orbit® based sensors and mechanical interfaces are designed to generate reliable data, not just from new but for millions of cycles.

Data is only of use if it can be displayed and/or acted on. Orbit® offers a range of displays and readouts, interface modules and software for both PC and PLC based systems. The Excel® Add-In provides a simple way to get data into Excel®. PLC systems are addressed with various interfaces.

# ORBIT® DIGITAL MEASURING PROBES

Contact gauge probes often provide the most cost effective solution for a wide range of measuring and positioning applications. These have excellent sideload capabilities and can last over 100 million cycles.

## DP/S - SPRING PUSH

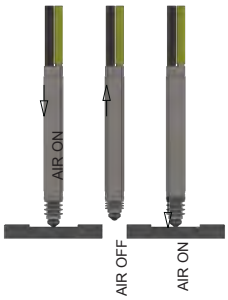
- 0.5, 1, 2, 5, 10, 12, 20, 30 mm measuring ranges
- Accuracy as low as <0.1 µm
- Up to 0.01 µm resolution
- Up to 0.05 µm repeatability
- Tip force of 0.7 N (options available)
- IP65 Sealing

DP/0.5/S Probe

The DP range of spring push probes is the work horse of the gauging industry. Very high resolution, excellent linearity and high data speeds are coupled with outstanding measurement repeatability. Long life precision bearings and IP65 sealing ensures that the probes maintain their performance for millions of measurements.

## DP/P - PNEUMATIC PUSH

- 2, 5, 10, 12, 20, 30 mm measuring ranges
- Accuracy as low as <0.1 µm
- Up to 0.01 µm resolution
- Up to 0.05 µm repeatability
- Tip force of 0.7 N (0.4 bar of pressure)
- IP65 Sealing
- Pneumatic gaiter actuation
- **Vacuum retract option available**




Pneumatic transducers are ideal for use in automatic gauging applications or for accessing details that would be difficult or impossible to reach with spring push transducers. The standard range of Pneumatic Probes comes with IP65 sealing to ensure a long working life in wet or oily environments.

## DJ/P - PNEUMATIC PUSH

- 2, 5, 10, 12, 20 mm measuring ranges
- Actuation is by a built in piston, separate from gaite
- Same performance as standard Pneumatic probe

Air Exit

Jet “J Type” probes are similar to standard pneumatic transducers except that actuation is by an inbuilt piston. High tip forces are available but as air is vented through a port close to the front of the probe, they have a lower IP rating. These probes will continue to operate even if the gaiter becomes punctured.

## DSP/S - DIGITAL SHORT PROBES

- 8mm Diameter Probes that are up to 25% shorter than Standard Digital Probes
- Same linearity, resolution, and repeatability as standard probes.
- Special 4 mm range probe available.
- Right angle versions also available.

Considerably shorter than standard digital displacement sensors and much shorter than conventional LVDT sensors, the short range of digital short probes (DSP/S) still maintain all of the advantages of LVDT sensors while providing superior performance.

## D12P - RUGGED PROBES FOR HARSH ENVIRONMENTS

- Thicker, more rugged design for harsh environments
- 5 mm diameter shaft inside 12 mm diameter body
- Excellent strength and sideload capability
- IP65 Sealing

The Rugged digital probe is an option for environments where a standard probe may be easily damaged. The base performance of these products is identical to the ø8 mm range. Contact Solartron for details.

# PROBE OPTIONS

## INLINE CONNECTOR

- Calibration data for probe loaded onto chip inside plug
- Simple probe replacement without any need for software programming
- Available with Standard Digital Probes, Flexures, and Block Gauges
- Connector has IP67 rating
- Small Diameter Connector for ease of installation
- Resolution programmable to <0.01 µm
- Traceable Calibration


## IP 68 SEALING

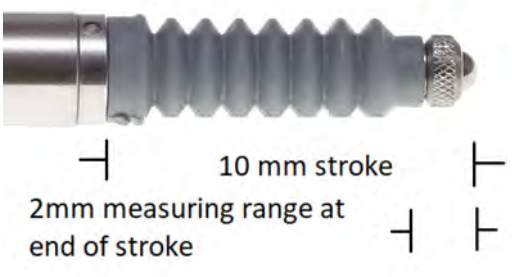
- Probe sealed by hand at all points of ingress
- IP68 sealing validated by 3rd party
- Available on standard spring and pneumatic probes (not available with Jet Probes or Feather Touch)
- Ideal for Oily or Wet Environments


## CABLE CUSTOMISATION

- Customisable cable lengths up to 10 meters
- Various cable protections available

## RIGHT ANGLE OUTLETS

- Ideal for tighter spaces
- No change in probe performance




## OFFSET PNEUMATIC PROBES

- Pneumatic probes that have a 10 or 20 mm stroke, but only 2 or 5 mm measurement range at end of stroke
- Example of DP/10/2/P

# TECHNICAL SPECIFICATIONS

| **PRODUCTS** *(Note 4)* | **STANDARD, SPRING, PNEUMATIC, VACUUM, JET, RUGGED** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Spring Push Axial Cable | DP/0.5/S | DP/1/S | DP/2/S | DP/5/S | DP/10/S | DP/12/S | DP/20/S | DP/30/S | DP/10/2/S |
| Pneumatic Axial Cable | N/A | N/A | DP/2/P | DP/5/P | DP/10/P | DP/12/P | DP/20/P | DT/30/P | DP/10/2/P |
| Vacuum Axial Cable | | | DP/2/V | DP/5/V | DP/10/V | DP/12/V | DP/20/V | | N/A |
| Pneumatic Axial Cable Jet | | | DJ/2/P | DJ/5/P | DJ/10/P | DJ/12/P | DJ/20/P | | DJ/10/2/P |
| Digital Short Probe - Spring | | | DSP/2/S | DSP/5/S | N/A | N/A | N/A | N/A | N/A |
| Digital Short Probe - Pneumatic | | | N/A | N/A | N/A | | | | |
| 12mm Diameter Rugged Probe | | | | D12P/5/S | D12P/10/S | | | | |
| Diameter | 8h6 | | | | | | | | |
| **MEASUREMENT PERFORMANCE** | | | | | | | | | |
| Measurement Range (mm) | 0.5 | 1 | 2 | 5 | 10 | 12 | 20 | 30 | 2 |
| Accuracy (% of Reading) *(Note 1)* | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 0.07 | 0.1 | 0.05 |
| Accuracy (% of Reading) *(Note 1)* - with In line Connector | N/A | 0.20 | 0.20 | 0.15 | 0.15 | 0.15 | 0.15 | 0.2 | 0.20 |
| Repeatability (worst case) µm *(Note 2)* | 0.10 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.25 | 0.5 | 0.15 |
| Repeatability (typical) µm *(Note 3)* | 0.05 | 0.05 | 0.05 | 0.05 | 0.07 | 0.07 | 0.10 | 0.25 | 0.05 |
| Resolution (µm) | 0.01 | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.08 | 0.12 | 0.01 |
| Pre Travel (mm) | 0.03 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| Post Travel (mm) | 0.05 | 0.35 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 8.85 |
| Tip Force (N) at Middle of Range ±20% (Note 7) | | | | | | | | | |
| Spring Push | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.85 | 0.70 |
| 12mm Diameter Spring Push | | | | 0.80 | 0.80 | | | | |
| Pneumatic at 0.4 bar Minimum (Note 6) | N/A | N/A | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | N/A | 0.70 |
| Pneumatic at 1 bar Maximum (Note 6) | N/A | N/A | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 | N/A | 2.60 |
| Pneumatic Jet ±30% at 1 bar | N/A | N/A | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | N/A | 0.85 |
| Temperature Coefficient %FS/ºC | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.01 |
| **ENVIRONMENTAL** | | | | | | | | | |
| Sealing for Probe | IP65 with gaiter or IP50 without gaiter | | | | | | | | |
| Sealing for Probe Interface Electronics | IP43 for module and TCON | | | | | | | | |
| Storage Temperature (°C) | -20 to +80 | | | | | | | | |
| Probe Operating Temperature with Gaiter (°C) | +5 to +80 | | | | | | | | |
| Probe Operating Temperature without Gaiter (°C) | -10 to +80 | | | | | | | | |
| **ELECTRONICS OPERATING** | | | | | | | | | |
| Temperature (°C) | 0 to +60 | | | | | | | | |
| EMC Emission | EN61000-6-3 | | | | | | | | |
| EMC Immunity | EN61000-6-2 | | | | | | | | |
| Probe life (Operating Cycles) | 100 million cycles (no side load), > 10 million cycles in most applications | | | | | | | | |
| **MATERIAL** | | | | | | | | | |
| Probe Body | Stainless Steel | | | | | | | | |
| Probe Tip (options) | Nylon, Ruby, Silicon Nitride, Tungsten Carbide | | | | | | | | |
| Gaiter *(Note 5)* | Fluoroelastomer or Silicon | | | | | | | | |
| Cable | PUR | | | | | | | | |
| Electronics Module | ABS | | | | | | | | |
| **ELECTRONICS INTERFACE (ORBIT®)** | | | | | | | | | |
| Orbit® Interface options | PC: USB, Ethernet®, RS232, R5485, Bluetooth™, PLC: MODBUS® TCP/IP, EtherNet/IP®, Profinet®, EtherCat®, CC-Link® | | | | | | | | |
| Reading Rate | Up to 3906 readings per second | | | | | | | | |
| Bandwidth of Electronics (Hz) user selectable | 460, 230, 115, 58, 29, 14, 7, 4 | | | | | | | | |
| Power | 5±0. 25 VDC @ 0.06 A typical | | | | | | | | |

- Note 1: Accuracy 0.1 µm or % reading whichever is greater
- Note 2: Repeated operation against a carbide target with side load applied to the bearing using max-min
- Note 3: Repeated operation against a carbide target standard deviation from average (68%)
- Note 4: Right angle outlet versions of all of the standard 8h6 diameter probes for measuring ranges 2 mm to 20 mm are available, part description add R after first two letters e.g DPR/2/S is right angled version of DP/2/S
- Note 5: Different gaiter materials available for specific applications - Fluoroelastomer standard option.
- Note 6: PNEUMATIC ACTUATION: For continual reliable operation and to maximise working life, the air supply should be clean and dry. 60% maximum relative humidity, filtered to better than 5µm particle size.
- Note 7: VACUUM OPERATION: 0 to 0.27 Bar Absolute.

# ORBIT® LOW TIP FORCE PROBES

## DT - FEATHER TOUCH - SPRING AND PNEUMATIC

- Low tip force as low as 0.18 N (options available)
- 2, 5, 10, 20 & 30 mm Measuring Ranges
- Full range of tips available
- Pneumatic or Spring actuation
- IP50 Sealing
- Excellent sideload capability

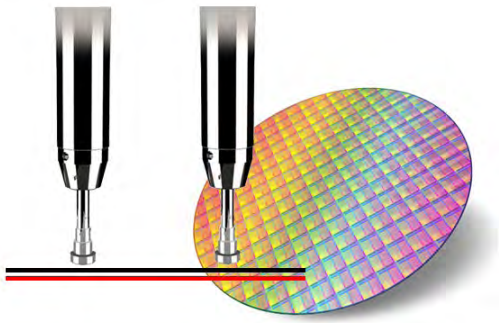
Feather Touch transducers have been designed especially to gauge or measure delicate surfaces such as car windscreens, pharmaceutical bottles, electro-mechanical components and plastic parts. Where as a traditional transducer exerts a tip force of approximately 0.7 N, the Feather Touch can exerts a mere 0.18 N when used in the horizontal position. This reduction is achieved by replacing the gaiter with a close tolerance gland. Despite the low volume of air flow the bearing is constantly purged, avoiding the build up of dust.

## DW - ULTRA FEATHER TOUCH - SPRING AND PNEUMATIC

- Ultra Low tip force of 0.03 to 0.06 N
- 10 mm Measuring Range
- Nylon and Ruby tips available
- Pneumatic or Spring actuation
- IP50 Sealing

The Ultra Feather Touch probe has so light a tip force, it is a viable alternative to a non-contact sensor in many applications. With various tips available in ruby and nylon, the UFT is already being used to check glass, rubber, semi-conductor wafers and other delicate materials.

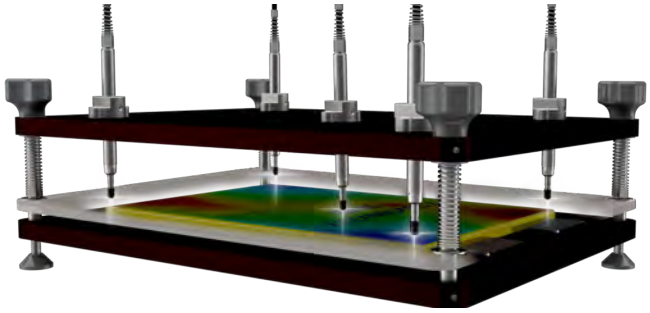
APPLICATION: GLASS THICKNESS



APPLICATION: SEMI CONDUCTOR WAFER

APPLICATION: HARD DISK DRIVE CASE

APPLICATION: CURVATURE AND SHAPE OF GLASS



APPLICATION: CHECKING PRISMATIC BATTERY CELL EXPANSION

# TECHNICAL SPECIFICATIONS

| **PRODUCTS** *(Note 4)* | **FEATHER TOUCH** | | | | | | **ULTRA FEATHER TOUCH** |
|---|---|---|---|---|---|---|---|
| Spring Push Axial Cable Feather Touch | DT/2/S | DT/5/S | DT/10/S | DT/20/S | N/A | DT/10/2/S | DW/10/S |
| Pneumatic Axial Cable Feather Touch | DT/2/P | DT/5/P | DT/10/P | DT/20/P | DT/30/P | DT/10/2/P | DW/10/P |
| Diameter | 8h6 | | | | | | |
| **MEASUREMENT PERFORMANCE** | | | | | | | |
| Measurement Range (mm) | 2 | 5 | 10 | 20 | 30 | 2 | 10 |
| Accuracy (% of Reading) *(Note 1)* | 0.05 | 0.05 | 0.06 | 0.07 | 0.10 | 0.05 | 0.06 |
| Accuracy (% of Reading) *(Note 1)* - with In line Connector | 0.20 | 0.15 | 0.15 | 0.15 | 0.20 | 0.20 | 0.15 |
| Repeatability (worst case) µm *(Note 2)* | 0.15 | 0.15 | 0.15 | 0.25 | 0.50 | 0.15 | 0.15 |
| Repeatability (typical) µm *(Note 3)* | 0.05 | 0.05 | 0.07 | 0.10 | 0.25 | 0.05 | 0.05 |
| Resolution (µm) | 0.01 | 0.02 | 0.04 | 0.08 | 0.12 | 0.01 | 0.04 |
| Pre Travel (mm) | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| Post Travel (mm) | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 8.85 | 0.85 |
| Tip Force (N) at Middle of Range ±20% *(Note 7)* | | | | | | | |
| Spring Push Feather Touch | 0.30 | 0.30 | 0.30 | 0.30 | N/A | 0.30 | 0.03 to 0.06 |
| Pneumatic Feather Touch ±30% at 0.3 bar *(Note 6) (Note 7)* | 0.18 | 0.18 | 0.18 | 0.18 | N/A | 0.18 | 0.06 |
| Pneumatic Feather Touch ±30% at 1 bar *(Note 6) (Note 7)* | 1.10 | 1.10 | 1.10 | 1.10 | 0.85 | 1.10 | 0.25 |
| Temperature Coefficient %FS/ºC | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 |
| **ENVIRONMENTAL** | | | | | | | |
| Sealing for Probe | IP50 | | | | | | |
| Sealing for Probe Interface Electronics | IP43 for module and TCON | | | | | | |
| Storage Temperature (°C) | -20 to +80 | | | | | | |
| Probe Operating Temperature (°C) | -10 to +80 | | | | | | |
| Electronics Operating Temperature (°C) | 0 to +60 | | | | | | |
| EMC Emission | EN61000-6-3 | | | | | | |
| EMC Immunity | EN61000-6-2 | | | | | | |
| Probe life (Operating Cycles) | 100 million cycles (no side load) > 10 million cycles in most applications | | | | | | > 10 million |
| **MATERIAL** | | | | | | | |
| Probe Body | Stainless Steel | | | | | | |
| Probe Tip (options) | Nylon, Ruby, Silicon Nitride, Tugnsten Carbide | | | | | | |
| Cable | PUR | | | | | | |
| Electronics Module | ABS | | | | | | |
| **ELECTRONICS INTERFACE (ORBIT®)** | | | | | | | |
| Orbit® Interface options | PC: USB, Ethernet®, RS232, R5485, Bluetooth™ | | | | | | |
| | PLC: MODBUS® TCP/IP, EtherNet/IP®, Profinet®, EtherCat®, CC-Link® | | | | | | |
| Reading Rate | 3906 readings per second, per Orbit Module | | | | | | |
| Power | 5±0.25 VDC @ 0.06 A typical | | | | | | |

- Note 1: Accuracy 0.1 µm or % reading whichever is greater
- Note 2: Repeated operation against a carbide target with side load applied to the bearing using max-min
- Note 3: Repeated operation against a carbide target standard deviation from average (68%)
- Note 4: Right angle outlet versions of all of the standard 8h6 diameter probes for measuring ranges 2 mm to 20 mm are available, part description add R after first two letters e.g DPR/2/S is right angled version of DP/2/S
- Note 5: Different gaiter materials available for specific applications - Fluoroelastomer standard option
- Note 6: Pneumatic Actuation: For continual reliable operation and to maximise working life, the air supply should be clean and dry. 60% maximum relative humidity, filtered to better than 5µm particle size.
- Note 7: Maximum Pressure for Ultra Feather Touch is 1 Bar.

# ORBIT® COMPACT AND NARROW BODY PROBES

## D6P - 6 MM DIAMETER - SPRING AND PNEUMATIC

- 2, 5, and 12 mm Measuring Ranges
- 6 mm Diameter body
- Same resolution and repeatability as 8 mm probes
- Excellent when points are in close proximity
- IP65 rating with Spring Probes, no rating for Jet Pneumatic Probes.
- Also available as Feather Touch option

With the D6P probes, a 25% diameter reduction over conventional probes has been achieved, yet performance and life expectancy has been maintained. Long life precision bearings ensure that probes maintain their performance for millions of cycles.

6 mm Probes Checking Flatness of a Coin

## D3P/D3T - 3MM DIAMETER - SPRING PUSH

- 1 mm Measuring Range
- 3 mm Diameter body
- IP50 Sealing
- Also available as Feather Touch option


3 mm Probe

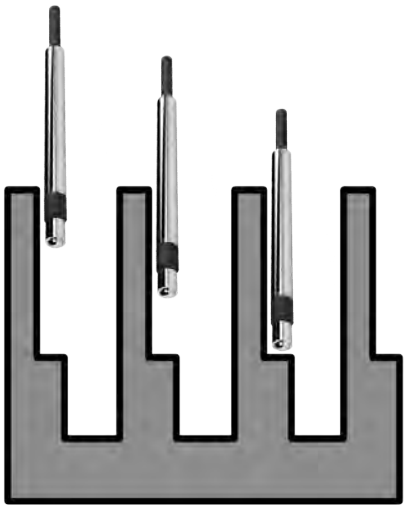
Quite possibly the world's thinnest probe, the tiny 3 mm diameter allows for even tighter packing densities for measuring features on intricate parts.


## DZ - ULTRA SHORT SPRING

- 1 or 2 mm measuring ranges
- Tip force 0.7 N (options available)
- IP65 Sealing
- Spring actuation
- R/A Outlets available
- Use where space is a premium

DZR Pneumatic Probe

The DZ range of probes are the shortest available on the market, with a full calibrated measuring range of 1mm or 2mm. The unique bearing design creates a compact probe body while still maintaining the performance of a standard Digital Orbit probe.



APPLICATION: 3MM CHECKING RIDGES

APPLICATION: DZ PROBE CHECKING ID OF RING

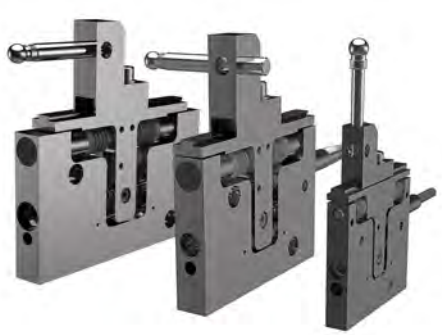
# TECHNICAL SPECIFICATIONS

| **PRODUCTS** *(Note 4)* | **COMPACT** | | | **NARROW BODY** | | | |
|---|---|---|---|---|---|---|---|
| Spring Push Axial Cable | DZ/1/S | DZ/2/S | N/A | D6P/2/S | D6P/5/S | N/A | D3P/1/S |
| Spring Push Feather Touch | N/A | N/A | | D6T/2/S | N/A | | D3T/1/S |
| Pneumatic Axial Cable | | | DZR/2/P | N/A | | | N/A |
| Pneumatic Axial Cable Jet | | | N/A | D6J/2/P | D6J/5/P | D6J/12/P | N/A |
| Diameter | 8h6 | | | 6h6 | | | 3h6 |
| **MEASUREMENT PERFORMANCE** | | | | | | | |
| Measurement Range (mm) | 1 | 2 | 2 | 2 | 5 | 12 | 1 |
| Accuracy (% of Reading) (Note 1) | 0.10 | 0.10 | 0.1% or 0.5 µm | 0.05 | 0.05 | 0.10 | 0.20 |
| Accuracy (% of Reading) (Note 1) - with In line Connector | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.50 | 0.30 |
| Repeatability (worst case) µm (Note 2) | 0.05 | 0.05 | 0.25 | 0.05 | 0.05 | 0.25 | 0.5 |
| Repeatability (typical) µm (Note 3) | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 | 0.1 | 0.25 |
| Resolution (µm) | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.05 | 0.01 |
| Pre Travel (mm) | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.075 |
| Post Travel (mm) | 0.35 | 0.35 | 0.45 | 0.85 | 0.85 | 0.85 | 0.30 |
| Tip Force (N) at Middle of Range ±20% | | | | | | | |
| Spring Push | 0.70 | 0.70 | N/A | 0.70 | 0.70 | N/A | 0.50 |
| Pneumatic at 0.4 bar Minimum | N/A | N/A | 0.7 | N/A | N/A | N/A | N/A |
| Pneumatic at 1 bar Maximum | N/A | N/A | 2.6 | N/A | N/A | N/A | N/A |
| Pneumatic Jet ±30% at 1 bar (Note 6) (Note 7) | N/A | N/A | N/A | 0.70 | 0.70 | 0.50 | N/A |
| Temperature Coefficient %FS/ºC | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 | 0.01 | 0.03 |
| **ENVIRONMENTAL** | | | | | | | |
| Sealing for Probe | IP65 for spring probe with Gaiter, IP40 with Feather Touch, no IP rating for Jet probes | | | | | | IP50 (Std), IP40 (FT) |
| Sealing for Probe Interface Electronics | IP43 for module and TCON | | | | | | |
| Storage Temperature (°C) | -20 to +80 | | | | | | +5 to +65 |
| Probe Operating Temperature with Gaiter (°C) | +5 to +80 | | | | | | +5 to +65 |
| Probe Operating Temperature without Gaiter (°C) | -10 to +80 | | | | | | N/A |
| Electronics Operating Temperature (°C) | 0 to 60 | | | | | | |
| EMC Emission | EN61000-6-3 | | | | | | |
| EMC Immunity | EN61000-6-2 | | | | | | |
| Probe life (Operating Cycles) | > 10 million | | | | | | |
| **MATERIAL** | | | | | | | |
| Probe Body | Stainless Steel | | | | | | |
| Probe Tip (options) | Nylon, Ruby, Silicon Nitride, Tungsten Carbide | | | | | | |
| Gaiter (Note 5) | Fluoroelastomer | | | | | | |
| Cable | PUR | | | | | | |
| Electronics Module | ABS | | | | | | |
| **ELECTRONICS INTERFACE (ORBIT®)** | | | | | | | |
| Orbit® Interface options | PC: USB, Ethernet®, RS232, R5485, Bluetooth™ | | | | | | |
| | PLC: MODBUS® TCP/IP, EtherNet/IP®, Profinet®, EtherCat®, CC-Link® | | | | | | |
| Reading Rate | 3906 readings per second | | | | | | |
| Bandwidth of Electronics (Hz) user selectable | 460, 230, 115, 58, 29, 14, 7, 4 | | | | | | |
| Power | 5±0.25 VDC @ 0.06 A typical | | | | | | |

- Note 1: Accuracy 0.1 µm or % reading whichever is greater
- Note 2: Repeated operation against a carbide target with side load applied to the bearing using max-min
- Note 3: Repeated operation against a carbide target standard deviation from average (68%)
- Note 4: Right angle outlet versions of all of the standard 8h6 diameter probes for measuring ranges 2 mm to 20 mm are available, part description add R after first two letters e.g DPR/2/S is right angled version of DP/2/S
- Note 5: Different gaiter materials available for specific applications - Fluoroelastomer standard option
- Note 6: D6P/2/P @ 0.8 bar, D6J/5/P and D6J/12/P at 0.9 bar
- Note 7: PNEUMATIC ACTUATION: For continual reliable operation and to maximise working life, the air supply should be clean and dry. 60% maximum relative humidity, filtered to better than 5µm particle size.

# ORBIT® DIGITAL SPECIALIST TRANSDUCERS

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

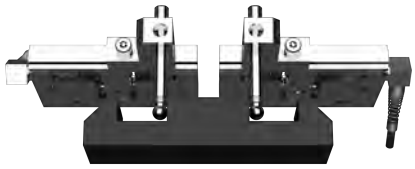


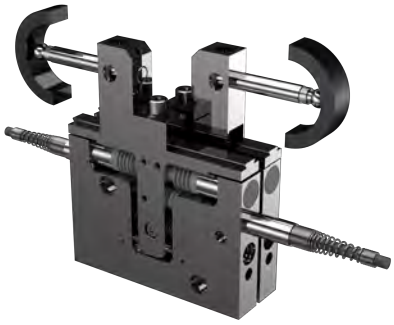
## DK - BLOCK GAUGE

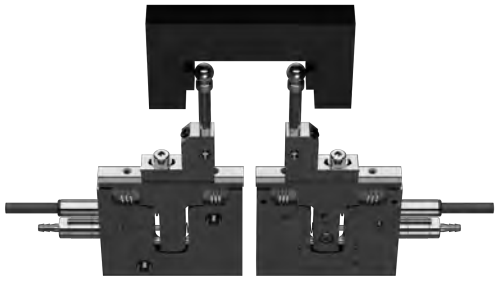
- Accuracy better than 1 µm
- Excellent Repeatability to 0.25 µm
- Measurement ranges of 2, 5 & 10 mm
- Spring or Pneumatic Actuation
- Multiple configurations with Top Tools and Tip holders

Solartron's Block Gauge make precision measurements of bores and cavities a simple and reliable process. More generally, the use of these devices is recommended in applications where space and access is limited and where the use of axial probes is not possible. The 2 mm Block Gauge is only 8 mm wide.

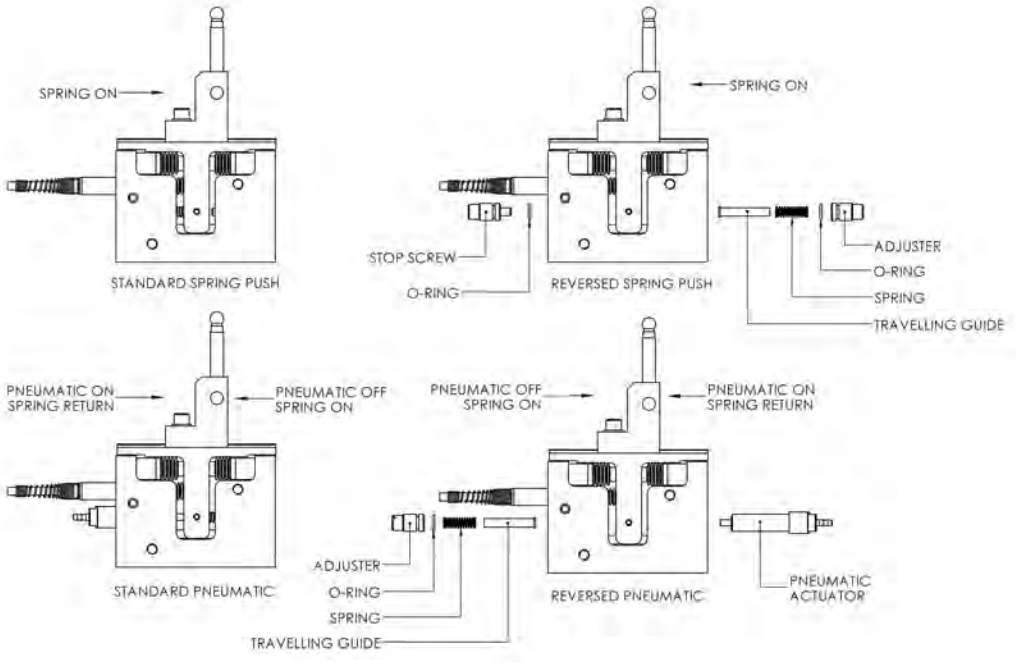
The Block Gauges offer unrivalled ruggedness, accuracy and repeatability. All three units are extremely versatile and provide datum surfaces and all the adjustments required for precision gauging applications. Block Gauges have robust precision linear bearings with minimal clearance, which limits unmeasured movements, maintaining good repeatability even when the contact tip is mounted off centre.







## SPRING AND PNEUMATIC CONFIGURATIONS




Spring and Pneumatic kits enable the automatic loading of components. Pneumatic actuation coupled with a spring controls the tip force for accurate measurements.

# ORBIT® DIGITAL SPECIALIST TRANSDUCERS

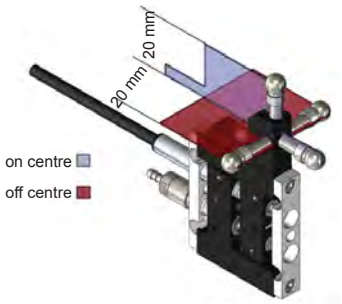
## DU - FLEXURES - SPRING AND PNEUMATIC

- 0.5, 1, and 2 mm ranges
- Width as thin as 4 mm (0.5 mm range)
- Accuracy better than 1 µm
- Repeatability to 0.05 µm
- Pneumatic or spring actuation (pneumatic 1 and 2 mm only)
- Removable leaves for ease of repair
- IP65 Protection

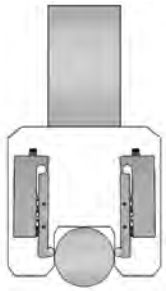
Parallel Flexures with Stylus Attachment

Parallel Flexures with high resolution and excellent repeatability make Solartron's 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.

Flexures can be mounted such that there is little or no stress through the gauge line enabling precision profiling of moving materials such as rotating shafts, brake discs etc. With resolution better than 0.05 µm at speeds up to 3906 readings per second, the flexure with Orbit® provides an excellent dynamic solution.

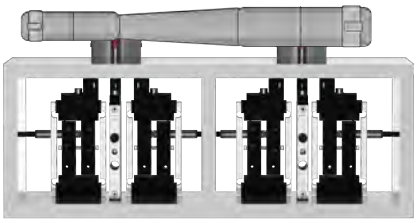



| REPEATABILITY DU/1 & DU/2 | |
|---|---|
| On centre | < 0.1 µm |
| Off centre | < 0.5 µm |



APPLICATION: ROD DIAMETER

APPLICATION: BEARING CHECK



APPLICATION: CONNECTING ROD

## DUS - SINGLE LEAF FLEXURES

- 0.5 mm range
- Spring actuation
- Normal or reverse actions
- Extension arms
- IP65 Protection

With the same advantages as the parallel flexure 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.

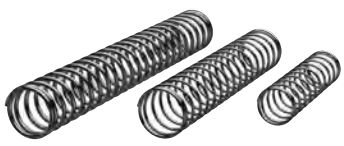
## BLOCK GAUGE AND FLEXURE ACCESSORIES

**Tips** (see page 40)
Standard M2.5 thread

**Tips carriers**
4 mm Ø, choice of 20, 30, 40 mm length (all). 6 mm Ø, choice of 20, 30, 40 mm length (5 & 10 mm block gauges only)

**Tool holders**
4 mm bore (all) 6 mm (5 & 10 mm block gauges only)

**Pneumatic Actuators**
3mm hose Ø nozzle fitted as standard. Can accept M5 threaded commercial couplings



**Alternative Springs**
A set of springs (of different forces) is included with each gauge. Replacements can be ordered individually or as sets.

# ORBIT® DIGITAL SPECIALIST TRANSDUCERS

Compact, rugged sensors for bore gauging and other applications with a tight fit.

## MSLF - MICRO SINGLE LEAF FLEXURE

- Measures just 16.5 long x 5 wide x 5.5mm High.
- 0.4mm measurement range
- 17-7PH Steel Body for Maximum Performance.
- Mounting can be accomplished using an M2 screw or gripping from the side
- Axial or Right Angle cable options available
- Ideal for mounting in Bore Gauge Equipment.
- Tungsten Carbide, Ruby, & Silicon Nitride Tip Options available.
- Optional pack of shims so probe is at proper level in a pocket


## DUSM - MINI FLEXURE

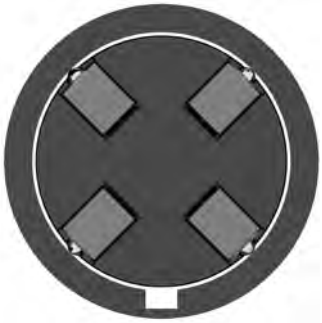
- Accuracy better than 1 µm
- Excellent Repeatability <0.5 µm
- Measurement range 0.5 mm
- IP68 Sealing
- Multiple Tip Configurations
- Robust design in compact package

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.

The gauge body mounting to the fixture is accomplished using a single M2.5 screw. Contact tip mounting is attached by using either the integral M3 locking thread insert, primarily intended for use with length extensions, OEM's fixed length contact tips or with Solartron's tip adapter, which when applied with Solartron's dedicated tip allows for 1 mm of height adjustment.

## DM - MINI PROBE

- Accuracy better than 1 µm
- Measurement ranges 0.5 and 1 mm
- Spring Actuation



The Mini Probe is a compact, low profile transducer that is ideal for measurement in confined spaces, such as bores. The transducer is based on a parallel spring structure that ensures excellent repeatability over a long working life, even when rotated in bores that have key slots or lubrication ports.

A Tungsten Carbide contact tip is fitted as standard but a selection of customer replaceable tips with an M2 thread is available for special applications.

Repeatability depends on the alignment of the mini probe whether on axis or cross axis as shown in the diagram.

# ORBIT® DIGITAL SPECIALIST TRANSDUCERS

## DL - LEVER PROBE

- Accuracy better than 3 µm
- Measurement range 0.5 mm
- Spring Actuation
- 2 g to 20 g tip force

Solartron's Digital Lever Probe has been conceived for the precision measurement market. The probe is ideally suited to applications where the use of axial measuring probes is not possible, and where a low tip force and a high number of probing points are required. It's simple design and exceptional reliability result in a reduced cost of ownership without any reduction in performance.

Due to it's cylindrical housing geometry, the Lever Probe can be mounted in any attitude relative to the intended target, although the stylus motion must be normal to the intended measurement.

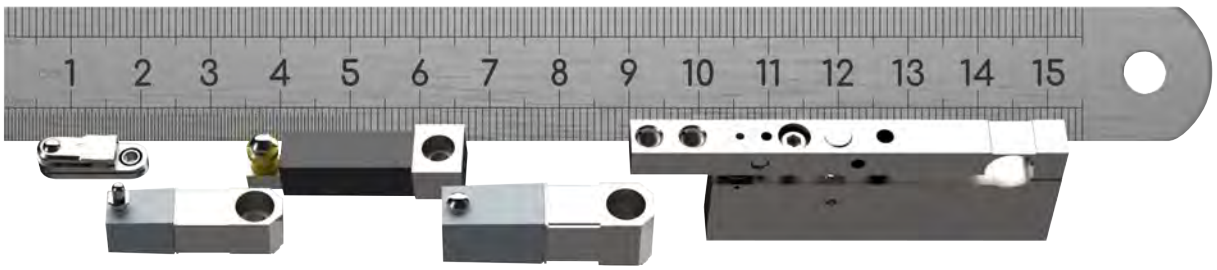
## LEVER PROBE MOUNTING BLOCKS AND STYLI

| Ball Ø |
|---|
| 0.38 |
| 0.79 |
| 1.59 |
| 2.54 |

Dovetail
Mounting Block

8 mm peg
mounting block


Application: Check
Camshaft Bearings and
Alignment



# ORBIT® DIGITAL SPECIALIST TRANSDUCERS

| | BLOCK GAUGES | | | LEVER | |
|---|---|---|---|---|---|
| Axial Cable Outlet | DK/2 | DK/5 | DK/10 | DL/0.5/S | |
| Radial Cable Outlet | DKR/2 | DKR/5 | DKR/10 | N/A | |
| Product Body Width (mm) | 8 | 12 | | 9.5 | |
| **MEASUREMENT PERFORMANCE** | | | | | |
| Measurement Range (mm) (Note 3) | 2 | 5 | 10 | 0.5 | |
| Accuracy (% of Reading) (Note 1) | 0.05 | 0.05 | 0.08 | 1.2 (Note 5) | |
| Repeatability (µm) (Note 2) | <0.25 | <0.25 | <0.5 | On Axis | Cross Axis |
| Range:0-100 µm nominal | N/A | N/A | N/A | N/A | N/A |
| Range:100-250 µm nominal | N/A | N/A | N/A | N/A | N/A |
| Range:500-1000 µm nominal | N/A | N/A | N/A | <0.15 | <0.3 |
| Range:250-500 µm nominal | N/A | N/A | N/A | N/A | N/A |
| Resolution (µm) | 0.01 | 0.02 | 0.04 | 0.01 | |
| Pre Travel (mm) | 0.15 | 0.15 | 0.15 | 0.02/0.03 | |
| Post Travel (mm) | 0.85 | 0.85 | 0.85 | 0.06 | |
| Tip Force (N) at Middle of Range ±20% (Horizontal) (Note 7) | | | | | |
| Spring Push | 1.5 | 1.5 | 1.5 | 0.05-0.2 | |
| Pneumatic at 2 bar | | Note 6 | | N/A | |
| Temperature Coefficient (µm/ºC) | 0.2 | 0.5 | 1 | 0.1 | |
| **ENVIRONMENTAL** | | | | | |
| Sealing | | IP65 | | IP43 | |
| Sealing for Probe Interface Electronics | IP43 for Module and TCON | | | | |
| Storage Temperature (ºC) | -20 to +80 | | | | |
| Block Gauge Operating Temperature (ºC) | -20 to +80 | | | | |
| Micro Single Leaf Flexure Operating | +5 to +80 | | | | |
| Temperature with Gaiter (ºC) | 0 to +80 | | | | |
| Electronics Operating Temperature (ºC) | 0 to +60 | | | | |
| EMC Emissions | EN61000-6-3 | | | | |
| EMC Immunity | EN61000-6-2 | | | | |
| MSLF Vibration | | | | | |
| Shock | Do not subject Block Gauge to excessive shocks. This may damage the bearings. | | | | |
| **MATERIAL** | | | | | |
| Block Gauge Body | Stainless Steel | | | | |
| MSLF Probe Body | | | | | |
| Probe Tip (options) (Note 4) | Nylon, Ruby, Silicon Nitride, Tungsten Carbide | | | Tungsten Carbide | |
| Gaiter | Fluoroelastomer or Silicon | | | | |
| Cable | | | | | |
| Electronics Module | | | | | |
| **ELECTRONICS INTERFACE (ORBIT®)** | | | | | |
| Orbit® Interface Options | USB, Ethernet®, RS232, R5485, | | | | |
| Reading Rate | | | | | |
| Bandwidth of Electronics (Hz) user selectable | | | | | |
| Power | | | | | |

- Note 1: Accuracy 0.1 µm or % whichever greater, assume 20 mm arm for block gauges and Applicable Parallel Flexures
- Note 2: Repeatability for Flexures depends on the configuration of the tip and holder - see diagram
- Note 3: DU/0.5/S - Range is at 50 mm from flex point, extension arms will multiply this parameter, for DUSM range is with no extension arm fitted
- Note 4: Lever Probe has tips in diameters of 2.54 mm, 1,59 mm, 0.79 mm, 0.38 mm mounting thread 1-72 UNF
- Note 5: Lever Probe accuracy with arm normal to axis of the stylus

# TECHNICAL SPECIFICATIONS





| PARALLEL FLEXURES | | | | | | SINGLE LEAF FLEXURES | | |
|---|---|---|---|---|---|---|---|---|
| DM/0.5/S | | DM/1/S | | DU/0.5/S | DU/1/S | DU/2/S | DUS/0.5/S | DUSM/0.5/S | MSLF/0.4/S |
| N/A | | N/A | | N/A | DUR/1/S | DUR/2/S | N/A | N/A | N/A |
| 6.5 | | 7.5 | | 4 | 8 | | 6 | 8.5 | 5 |
| | | | | | | | | | |
| 0.5 | | 1 | | 0.5 | 1 | 2 | 0.5 | 0.5 | 0.4 |
| 0.05 | | 0.05 | | 0.10 | 0.10 | 0.10 | 0.10 | 0.05 | 0.05 |
| On Axis | Cross Axis | On Axis | Cross Axis | <0.1 | <0.1 | <0.1 | <0.1 | 0.5 | 0.5 |
| 0.10 | 0.10 | 0.10 | 0.10 | N /A | N/A | N/A | N/A | N/A | N/A |
| 0.25 | 0.15 | 0.10 | 0.10 | N/A | N/A | N/A | N/A | N/A | N/A |
| 0.5 | 0.25 | 0.15 | 0.15 | N/A | N/A | N/A | N/A | N/A | N/A |
| N/A | N/A | 0.3 | 0.2 | N/A | N/A | N/A | N/A | N/A | N/A |
| 0.01 | | 0.01 | | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 0.01/0.02 | | 0.015/0.025 | | 0.03/0.06 | 0.05/0.1 | 0.05/0.1 | 0.02/0.03 | 0.01/0.02 | 0.02/0.05 |
| 0.07 | | 0.07 | | 0.29 | 0.4 | 0.4 | 0.05/0.1 | 0.07 | 0.19 |
| | | | | | | | | | |
| 0.85 | | 0.85 | | 0.5 | 1.5 | 1.5 | 1.25 | 0.8 ±50% | 90 |
| N/A | | | | N/A | 1 | 1 | N/A | N/A | N/A |
| 0.08 | | 0.8 | | 0.5 | 0.5 | 0.5 | 0.5 | 0.1 | 0.3 |
| | | | | | | | | | |
| IP60 | | | | IP65 | | | IP65 | IP68 | IP40 |
| IP43 for Module and TCON | | | | | | | | | |
| -20 to +80 | | | | | | | | | |
| -20 to +80 | | | | | | | | | |
| +5 to +80 | | | | | | | | | |
| 0 to +80 | | | | | | | | | |
| 0 to +60 | | | | | | | | | |
| EN61000-6-3 | | | | | | | | | |
| EN61000-6-2 | | | | | | | | | |
| | | | | | | | | | 10g up to 2kHz |
| Do not subject any flexure products to excessive loads, follow instructions when adjusting. | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | 17-7PH |
| Nylon, Ruby, Silicon Nitride, Tungsten Carbide | | | | | | | | | Fixed (1.25mm Rad Ball) |
| Fluoroelastomer | | | | | | | | | N/A |
| PUR | | | | | | | | | |
| ABS | | | | | | | | | |
| | | | | | | | | | |
| MODBUS® TCP/IP, EtherNet/IP®, Bluetooth™, Profinet®, EtherCat® | | | | | | | | | USB, Ethernet, RS232 |
| 3906 Readings per second | | | | | | | | | |
| 460, 230, 115, 58, 29, 14, 7, 4 | | | | | | | | | |
| 5±0.25 VDC @ 0.06 A typical | | | | | | | | | |

- Note 6: Block gauge tip force is dependent on mounting attitude and spring for the pneumatic block gauge it is also air pressure and balancing spring combination
- Note 7: Tip Force (gf) at Middle of Range ±30% for MSLF
- Designation Title/Measurement Range/Type (Spring Actuation, Pneumatic Actuaton, Vacuum Type): DK: Block Gauge, DM: Mini Probe, DU: Parallel Flexures, DUS: Single Leaf Flexures, DUSM: Miniature Single Leaf Flexure, DL: Lever Probe

# ORBIT® NON-CONTACT LASER TRIANGULATION

For applications where a contact gauging sensor is unsuitable, Solartron offers a range of high performance Non-Contact Laser Triangulation Sensor.
The range of precision laser triangulation sensors are fully Orbit Enabled and compatible with all Solartron Readouts and Gauging Software.


## KEY FEATURES

- Very Compact: Just 20 mm wide
- No extra controller needed
- Connect with other sensors via the Orbit® Network, both contact and 3rd Party
- Easy setup and adjustments

## LT2

- High precision for metallic and reflective surfaces
- Linearity up to 6 µm, with repeatability up to 0.1 µm
- Sample rate up to 4 khz
- “Oval” spot that is ideal for checking metallic surfaces
- “Adaptive Surface Adjustment:” Laser automatically adjusts beam intensity based on surface for optimum repeatability
- Software Drivers offer different measurement modes and averaging adjustments for peak repeatability

## LT1

- 25 and 100 mm ranges
- Linearity up to 12 µm, with repeatability of up to 1 µm
- Sample rate up to 1 khz
- Excellent price/performance ratio

# TECHNICAL SPECIFICATIONS

| PRODUCT | | LT1/25/25/R | LT1/50/100/R | LT2/20/10/R |
|---|---|---|---|---|
| **MEASUREMENT RANGE** | | 25 | 100 | 10 |
| SMR (Start of Measuring Range) | mm | 25 | 50 | 20 |
| MMR (Middle of Measuring Range) | mm | 37.5 | 100 | 25 |
| EMR (End of Measuring Range) | mm | 50 | 150 | 30 |
| PSS (Position of Smallest Spot) | mm | 31 | | 25 |
| **MEASURING PERFORMANCE** | | | | |
| Accuracy *(Note 3)* | µm | 12 | 50 | 6 |
| Resolution | µm | 0.4 | 1.5 | 0.15 |
| Repeatabily *(Note 2)* | µm | 1 (Typical) | 6 (Typical) | 0.1 (Typical) |
| | | 2.5 (Max) | 10 (Max) | 0.5 (Max) |
| Temperature Stability | ±% FSO/ deg C | 0.015% | 0.01% | 0.015% |
| **SAMPLE RATE (SR)** *(Note 1)* | | | | |
| SR 1 | kHz | 1 | 1 | 4 |
| SR 2 | kHz | 0.5 | 0.5 | 2 |
| SR 3 | kHz | 0.25 | 0.25 | 1 |
| SR 4 | kHz | N/A | N/A | 0.5 |
| SR 5 | kHz | N/A | N/A | 0.25 |
| SR 6 | kHz | N/A | N/A | N/A |
| SR 7 | kHz | N/A | N/A | N/A |
| **OPTICAL PARAMETERS** | | | | |
| Light source | nm | 670 (Red) | | |
| Class | | Class 2 in accordance with DIN EN 60825-1: 2015-07 | | |
| Power | mW | 0.2 | | |
| **LASER SPOT SIZE (x, y)** | | | | |
| SMR (Start of Measuring Range) | mm | 0.100, 0.140 | 0.75, 1.100 | 0.140, 0.720 |
| MMR (Middle of Measuring Range) | mm | 1.120, 0.130 | | 0.065, 0.680 |
| EMR (End of Measuring Range) | mm | 0.390, 0.500 | | 0.140, 0.660 |
| PSS (Position of Smallest Spot) | mm | 0.055, 0.050 | | 0.065, 0.680 |
| **PHYSICAL PARAMETERS** | | | | |
| Weight (Laser head) | grams | 30 | 30 | 60 |
| Materials (Laser head) | | Aluminium | | |
| **ENVIRONMNETAL** | | | | |
| Laser Head Operating Temperature | °C | 0 to +50 | | |
| Laser Head Storage Temparature | °C | -20 to +70 | | |
| Orbit Electronics Operating/Storage Temperature | °C | 0 to +60 | | |
| Sealing (Laser Head/Electronics) | | IP65/IP43 | | |
| Laser Head Shock | | 15g/6 ms | | |
| Laser Head Vibration | | 20g/2-500Hz | | |
| EMC (Emission) | | EN61000-6-3 | | |
| EMC | | EN61000-6-2 | | |
| **ELECTRONICS INTERFACE** | | | | |
| Orbit Interface Options | | USB/Ethernet/RS232/Bluetooth | | |
| Reading Rate | | Up to 3906 Readings/sec | | |
| PLC Inteface (using PIM adapter) | | Ethernet/IP, ProfiNet, EtherCAT, MODBUS® TCP/IP, CC-Link | | |

- Note 1: Programmable via Orbit
- Note 2: At sampling rate of 1 kHz for LT1, 2kHz for LT2
- Note 3: Laser calibrated to white photographic paper. Performance will vary depending on measurement surface, sample rate, and other factors

# WIRELESS MEASUREMENT

For applications where cables are cumbersome, Solartron offers Single Channel and Multi Channel Wireless gauging solutions. Both employ Class 1 Bluetooth capability, with up to 15 metre data transmission. Connect through Orbit or directly to a PC.

## WIGAUGE™ SINGLE CHANNEL

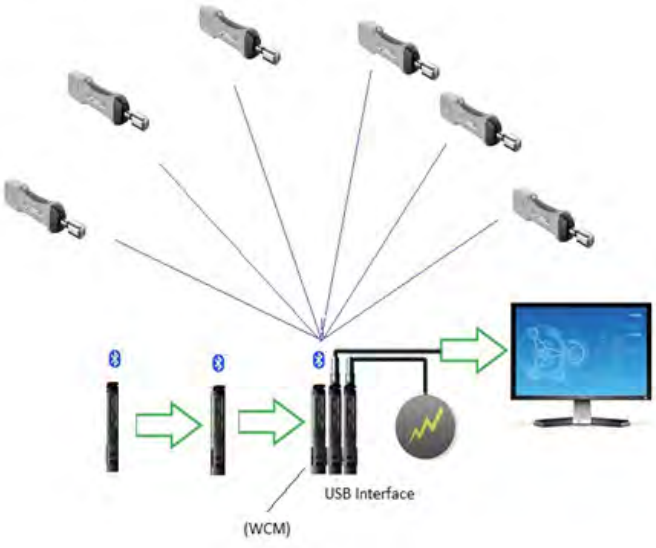
- Fit Wi Gauge with bore heads to check inner diameters
- M10 & M6 mm fixing threads, which fit most common bore heads
- LCD Screen option
- < 0.1 µm resolution (user selectable)
- Multiple WiGauges™ can connect to a single system
- 10 hours battery life (based on continuous data transmission)
- Inductive and Plug-In Charging options
- IP65 protection
- Pass/fail range lamps
- Audio indication of data transmission

## WIGAUGE™ MULTI CHANNEL

- Handle can be integrated with up to 8 Solartron transducers to form multifunctional wireless gauges, such as snap gauges or multi-sensor bore gauges
- Mounting plate on end of handle to attach custom tooling
- < 0.1 µm resolution
- 5 hours battery life (based on continuous data transmission) off charger.
- Inductive battery charging system
- IP65 protection (Handle)
- Audio indication of data transmission

## WIGAUGE™ WIRELESS CONNECTION MODULE

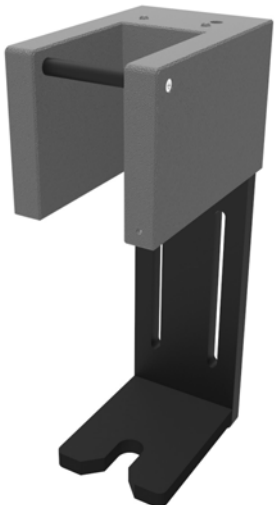
Use the Wireless Connection Module to output WiGauges™ directly into the Orbit Network. The Wi Gauges can then be run with Orbit GCS and others. Up to 6 WiGauge™ units can be connected to a WCM at once, and all data be saved and synchronized with other Solartron Sensors.

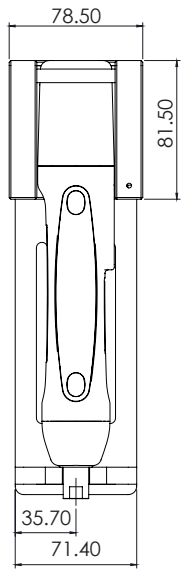


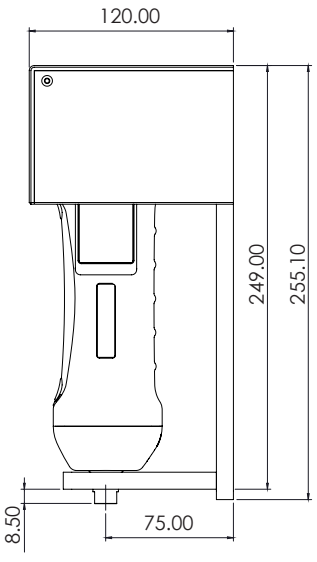

# TECHNICAL SPECIFICATIONS

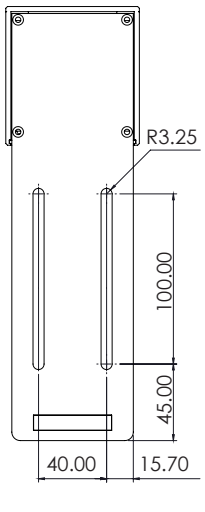
| | SINGLE CHANNEL | MULTI CHANNEL |
|---|---|---|
| | WHT/10/S | WHTM/n (n=1 to 8) |
| **WHT PERFORMANCE** | | |
| Measurement Range / Accuracy / Resolution / Repeatability | Depends on Head Fitted | Depends on sensors used |
| **PROBE MEASUREMENT PERFORMANCE** | **INTERNAL** | **EXTERNAL** |
| Accuracy (% of Reading) (Note 1) | 0.06 | Depends on sensors used |
| Repeatability | 0.07 | Depends on sensors used |
| Resolution (µm) | 0.05 | Depends on sensors used |
| **PROBE MECHANICAL INTERFACE** | **INTERNAL** | **EXTERNAL** |
| Pre Travel (mm) | 0.15 | Depends on sensors used |
| Post Travel (mm) | 0.85 | Depends on sensors used |
| **ELECTRONICS INTERFACE** | | |
| Bluetooth™ | Class 1: Range 15 m<br>Class 2 and Class 3 selectable | |
| Reading Rate | Up to 100 readings per second | |
| **ENVIRONMENTAL** | | |
| Sealing | IP65 (excluding head interface) | |
| Operating Temperature (°C) | +5 to +60 | |
| EMC Emissions | EN61000-6-3 | |
| EMC Immunity | EN61000-6-2 | |
| Power | Rechargeable Battery Pack | |
| **MATERIAL** | | |
| Body | ABS and Nylon | |
| Internal | Stainless Steel | |
| **DISPLAY** | | |
| Type | Colour LCD | |
| Protection | Acrylic Sealed Cover | |

▸ Note 1: Accuracy 0.1 µm or % reading whichever is greater






**VARIOUS INDUCTIVE CHARGER CRADLE OPTIONS AVAILABLE**

# ORBIT® LINEAR ENCODERS

## LE - LINEAR ENCODER

- Spring, free, pneumatic, cable release
- 0.4 µm accuracy
- 0.05 µm resolution

**ACCESSORIES - FINGER LIFT**

The **Digital Linear Encoder** range of gauges consists of high accuracy optical probes designed for use in applications where consistent sub micron measurement accuracy is required. In contrast to traditional gauging probes, the accuracy is maintained along the entire measurement range.

The Digital Linear Encoder can be connected directly to a Solartron Digital Readout, a PC or a PLC via Solartron's Orbit® Network. The option to take readings with a resolution of <0.1 µm at speeds of up to 3906 readings per second per encoder into the Orbit® Network, provides detailed profiling.

The proven high repeatability is a testament to the excellent mechanics and bearing used in the range.

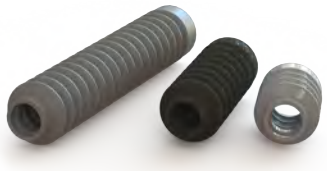
| **PRODUCTS** | | |
|---|---|---|
| Spring Push | LE/12/S | LE/25/S |
| Pneumatic | LE/12/P | LE/25/P |
| **MEASUREMENT PERFORMANCE** | | |
| Measurement Range (mm) | 12 | 25 |
| Mechanical Range (mm) | 13 | 26 |
| Accuracy ± µm | 0.4 | |
| Repeatability (worst case) µm | 0.1 | |
| Resolution (µm) | 0.05 | |
| Ref. Mark Position from end stop (mm) | 3 (nominal) | |
| Maximum Gauging Speed ($ms^{-1}$) | 0.5 | |
| Tip Force (N) at Middle of Range ±20% | | |
| Up / Down/ Horizontal (Spring Push) | 0.1 / 0.6 / 0.5 | |
| Temperature Coefficient (µm/°C) | -0.35 to -0.5 | -0.4 to -0.7 |
| **ENVIRONMENTAL** | | |
| Sealing for Probe no gaiter | IP50 | |
| Sealing for Probe with gaiter | IP65 | |
| Sealing for Probe Interface Electronics | IP43 | |
| Storage Temperature (ºC) | -20 to +70 | |
| Probe Operating Temperature (ºC) | +10 to +50 | |
| Electronics Operating Temperature (ºC) | 0 to +60 | |
| EMC Emissions | EN61000-6-3 | |
| EMC Immunity | EN61000-6-2 | |
| Probe Life (Operating Cycles) | >10 million | |
| **MATERIAL** | | |
| Case | Aluminum | |
| Shaft | Stainless Steel | |
| Probe Tip (Options) | All available options | |
| Gaiter | Fluoroelastomer | |
| Cable | PUR | |
| Electronics Module | ABS | |
| **ELECTRONICS INTERFACE (ORBIT®)** | | |
| Orbit® Interface Options | USB, Ethernet®, RS232, R5485, MODBUS® TCP/IP, EtherNet/IP®, EthernetCat®, Profinet®, Bluetooth™ | |
| Reading Rate | 3906 readings per second | |
| Power | 5±0.25 VDC @ 0.06A typical | |

# ORBIT® ACCESSORIES & POWER SUPPLIES

## ACCESSORIES

### REPLACEMENT GAITERS

Gaiters can be replaced when damaged. Only pneumatic push probes require gaiter rings.

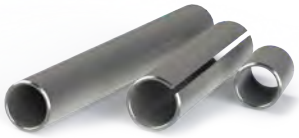


### RETROFIT RIGHT ANGLE ADAPTOR

For use with spring push gauging probes.
Part Number: 203224

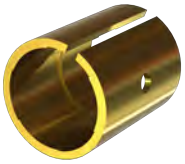
### IMPERIAL ADAPTOR SLEEVES

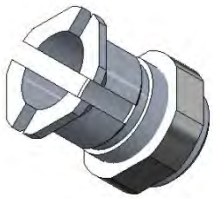
Adapter Sleeves can be used to increase the body diameter of 8 mm sensors to 9.512 (3/8”). Available in lengths from 12 to 127 mm. Available with or without a split.



### CLAMPING COLLET

For use with all 8 mm diameter probes. The clamping collet distributes the clamping forces evenly around the probe body. Using the supplied grub screw, the probe can be loosened while holding the collet in place. Part number: 806466-SX (10 mm)
805048-SX (9.5 mm)





### CLAMPING TOOL

### POWER SUPPLY (PSIM)

Solartron supply quality regulated power supplies for the Orbit® Measurement System in a number of configurations. We highly recommend the use of these to ensure optimum performance.

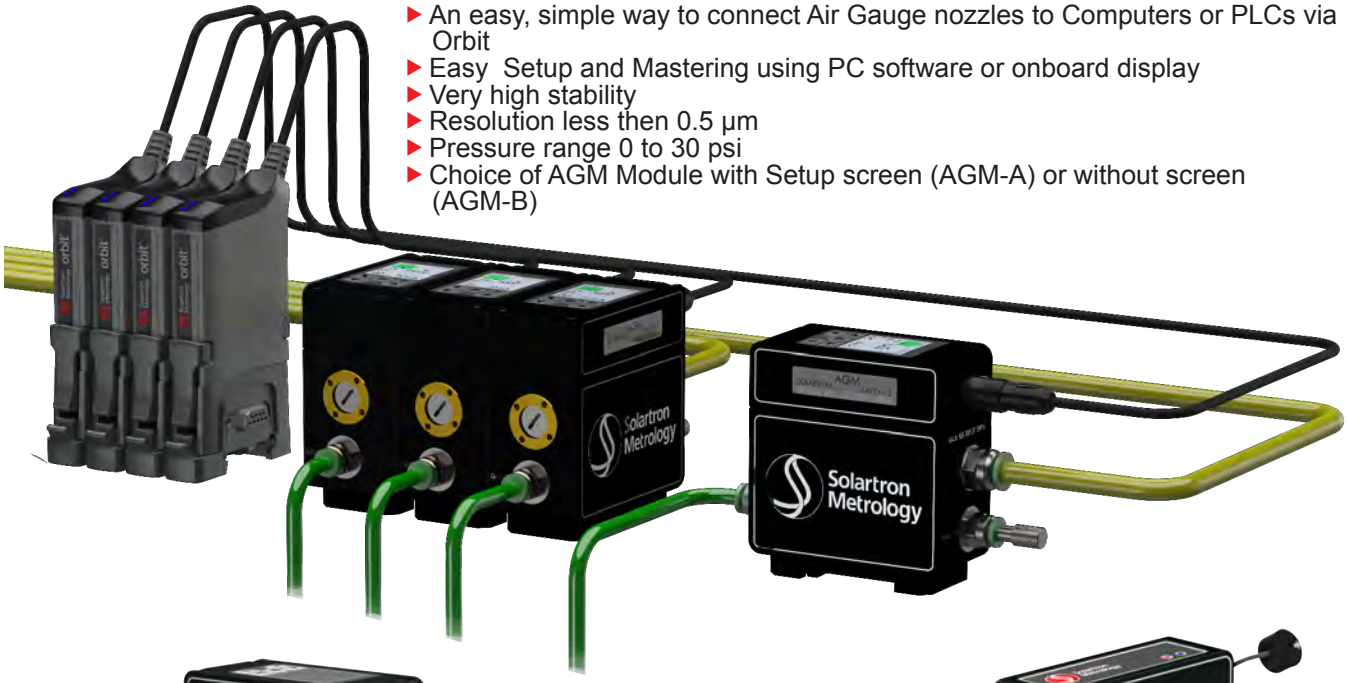
### PSIM LITE

| TECHNICAL SPECIFICATIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Product | | AC PSIM | AC PSIM/24/5 | DC PSIM | DC PSIM/24/5 | Aux AC PSIM/24 | PSIM Lite |
| Primary Output | VDC | 5 | 5 | 5 | 5 | 24 | 5 |
| | Current (A) | 1.8 | 1.8 | 1.8 | 1.8 | 1.0 | 1.8 |
| Secondary Output | VDC | None | 24 (Note 5) | None | 24 (Note 5) | None | None |
| | Current (A) | None | 1.0 | None | (Note 2) | None | None |
| Max No Of Orbit® Modules | | 31 | 31 | 31 | 31 | (Note 3) | 5 |
| Supply Voltage | VAC | 100 to 240 | 100 to 240 | N/A | N/A | 100 to 240 | N/A |
| | VDC | N/A | N/A | 10 to 30 | 10 to 30 | N/A | 5 |
| Supply Frequency | Hz | 50-60 | 50-60 | DC | DC | 50-60 | DC |
| Supply Connection (Note 4) | | IEC320 Plug | | 2 m cable | 2 m cable | IEC320 Plug | USB Plug |
| **ENVIRONMENTAL** | | | | | | | |
| Sealing | IP43 for Module and TCON | | | | | | |
| Storage Temperature (°C) | -20 to +70 | | | | | | |
| Operating Temperature (°C) | 0 to 60 | | | | | | |
| EMC Emissions | EN61000-6-3 | | | | | | |
| EMC Immunity | EN61000-6-2 | | | | | | |
| Weight and Dimensions | Standard Orbit® Module | | | | | | |

- Note 1: 24 V output of DC PSIM will track the DC input
- Note 2: 24 V current depends on external supply
- Note 3: The Aux AC PSIM only supplies 24 V auxiliary power for products that require additional 24 V in addition to the standard 5 V, these PSIMs do not power the Orbit® Network
- Note 4: The country specific mains cable is supplied when ordering
- Note 5: Primary Output of 5V will power Orbit Modules, as well as most Gauging probes. Secondary Output of 24V will power Orbit Lasers and other sensors with that power requirement

# AIR GAUGE INTERFACE MODULE (AGM)

- An easy, simple way to connect Air Gauge nozzles to Computers or PLCs via Orbit
- Easy  Setup and Mastering using PC software or onboard display
- Very high stability
- Resolution less then 0.5 µm
- Pressure range 0 to 30 psi
- Choice of AGM Module with Setup screen (AGM-A) or without screen (AGM-B)





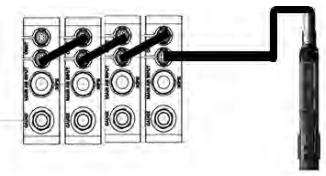

## AGM-A

- Display included on module
- One Orbit PIE module per AGM-A
- Calibrate air gauging on module or via Orbit PC software

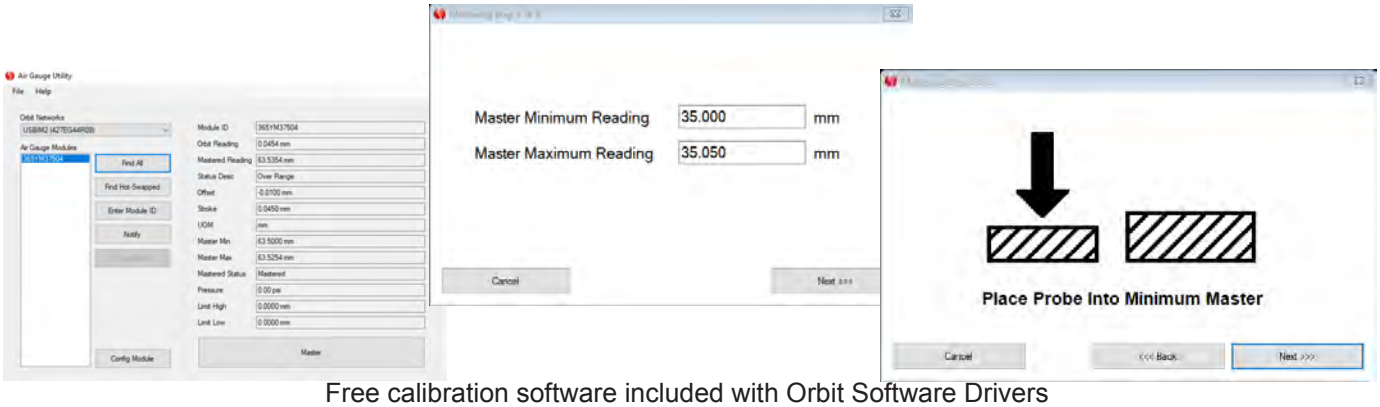

## AGM-B

- Connect up to 20 AGM-B modules
- Calibrate air gauging via Orbit PC software

Use display screen to calibrate air gauging, as well as set high and low limits

AGM-B  Modules connect together via cable, then output into Orbit via PIE module

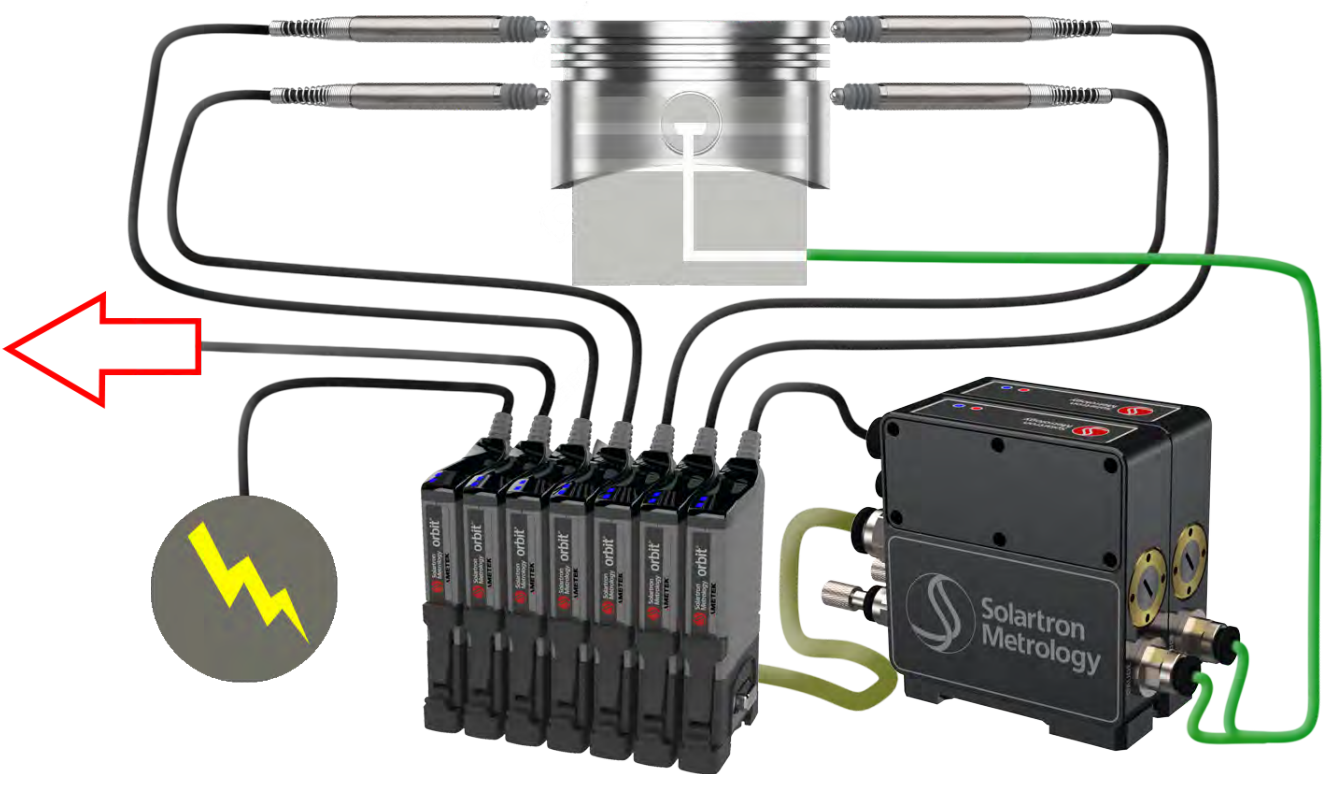



Free calibration software included with Orbit Software Drivers

# TECHNICAL SPECIFICATIONS

| PRODUCT SPECIFICATIONS | AGM - A | AGM - B |
|---|---|---|
| Range (Note 1) | Typical up to 50 µm | |
| Repeatability (Note 1) | Typical <1 µm | |
| Resolution (Note 1) | 0.5 µm | |
| Input Pressure Range (psi) | 0 to 30 | |
| **FEATURES** | | |
| Mastering | Min Max | |
| Integrated colour display | Used for set up and display of measurement | N/A |
| Units | mm, inches or mil | |
| **INTERFACES** | | |
| Orbit3 Electronics | Fully compatible with ALL Solatron Orbit Controllers and Measurement Modes | |
| Air Gauge Interface | Single Channel operating at 30psi | |
| **ENVIRONMENTAL** | | |
| Sealing | IP65 (excludes air connections) | |
| Operating and Storage Temperature °C | 0 to +60 | |
| EMC Emissions | EN61000-6-3 | |
| EMC Susceptibility | EN61000-6-2 | |
| **MECHANICAL** | | |
| Mounting | Din Mount | |
| Materials | Aluminium / Steel / ABS | |

▶ Note 1: Actual performance depends on Air Gauge Head



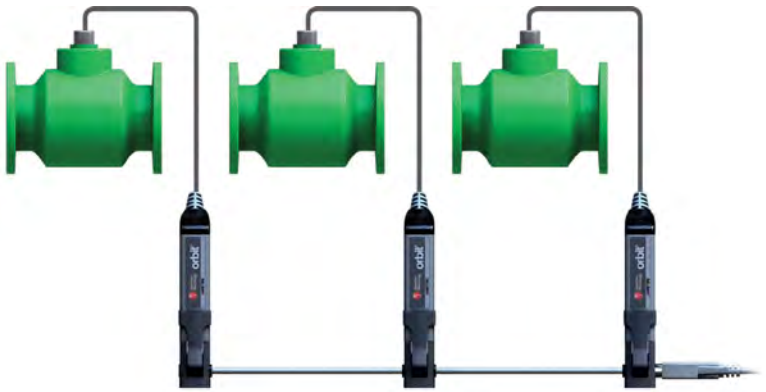

Air Gauging can be combined with Contact probes for completed Digital measurement system

# SPECIAL ORBIT® MODULES

Solartron offers a range of modules for 3rd party sensors and general instrumentation tasks that expand the Orbit® Digital Measurement System for applications that are not just linear measurement.

The **Analogue Input Module (AIM)** allows the Orbit® network to be interfaced with a wide range of sensors that have current or voltage output. Typical sensors that may be connected are

- Force sensors
- Load Cells
- Pressure sensors
- PT100 Temperature sensors

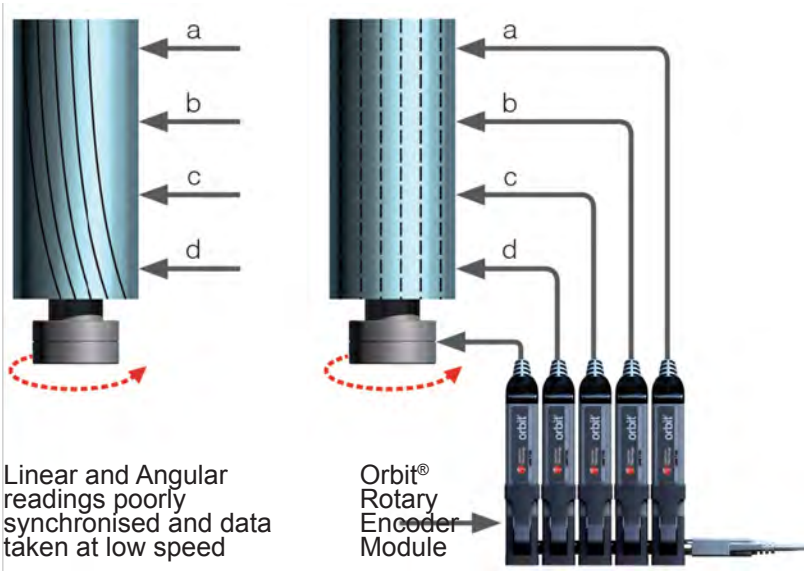


Daisy chain pressure sensors

To control or data acquisition system

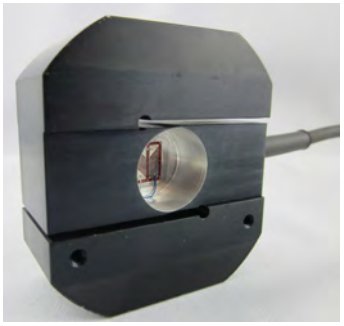
Applications include: Combining linear measurements using probes with air gauging via an AIM, temperature monitoring of parts or environment. The 4-20 mA input is especially useful where the sensor is a distance from the AIM, since the signal is current and does not suffer from voltage drop over long cabling.

The **Encoder Input Module (EIM)** provides a simple interface to incremental rotary encoders or linear encoders. This is especially useful when building machines to measure parts like CAM Shafts, making profiling easy to achieve. The EIM can also be used as the controller for high speed data collection where it is critical to synchronise measurements with position on a rotating part.




Linear and Angular readings poorly synchronised and data taken at low speed

Orbit® Rotary Encoder Module

Load Cell

The **Digital Input/Output Module (DIOM)** allows the Orbit® network to interface with discrete inputs, such as micro switches or proximity sensors which can be used to trigger a set of measurements. The output signals from the DIOM can be used interface to external components like relays or indicators to control a process or indicate a measured part is in or out of tolerance.

**Strain Gauge Input Module (SGIM)** is designed to connect to any common strain gauge

Strain Gauge

**Digimatic Input Module (DIM)** is designed to connect to any Digital gauge with a Digimatic Output, allowing hand tools to be integrated into the Orbit® Network.

# TECHNICAL SPECIFICATIONS

| | AIM | | EIM | DIOM | DIM | STRAIN GAUGE |
|---|---|---|---|---|---|---|
| |  | |  |  |  |  |
| **INPUT TYPE** | Analogue | Temperature | Pulse (TTL) | Discrete | DIM | Voltage (mV) |
| **TYPICAL INPUT** | Load cells, temperature transducers, airgauge | PT100 | Incremental Rotary or Linear Encoder | Switch | Digimatic Transducer | Strain Gauge |
| **STANDARD INPUT RANGE** | ±10 V, ±5 V, 0-10 V, 4-20 mA | -50 °C to 250 °C, -50 °C to 850 °C, -20 °C to 70 °C | 30 V @ 10 mA | 30 V @ 1 mA | As per transducer | 10 range 3.2 - 399 x (313 - 2.95 mV) |
| **LINEARITY (%FSO)** | 0.05 | 0.01 | N/A | N/A | N/A | N/A |
| **INPUT FREQUENCY** | 460 Hz | 460 Hz | 1.2 MHz | N/A | N/A | DC |
| **INPUT CHANNELS** | 1 | 1 | 1 | 8 | 1 | 1 |
| **OUTPUT RANGE** | N/A | N/A | N/A | Discrete Drive up to 30 V @ 5 mA<br>DIOM1 can sink up to 50ma, DIOM2 100ma / 200ma | N/A | N/A |
| **MEASUREMENT MODES** | All | All | All | All | Static | All |
| **READINGS PER SECOND** | 3906 | 3906 | 3906 | 3906 | Readings on request | 3906 |
| **NOMINAL POWER REQUIREMENT MA @ 5 V (NO LOAD)** | 78 | 78 | 49 | 42 | 49 | 122 |

**ATM TTL Convertor:** TTL RS422 is one of the most commonly used methods of communicating between Linear displacement sensors and Control or data Acquisition systems. Most sensors which offer this are incremental sensors and can lose position if moved too quickly. Solartron ATM is an absolute system and can never lose position even if power is interrupted.

| | |
|---|---|
| **TRANSDUCER** | All Solartron Transducers |
| **RESOLUTION (µm)** | 0.1 |
| **POWER** | +5 ±0.25 VDC @ 100 mA |
| **OUTPUT SIGNALS** | A and B, /A and /B TTL Square Wave RS422 levels |
| **FREQUENCY (kHz)** | 50, 100, 125, 250 and 500 (factory selectable) |
| **BANDWIDTH (Hz)** | 100 |
| **SEALING** | IP43 |

# ORBIT® INTERFACE MODULES

Orbit Interface Modules offer simple, easy to set up gateways over USB, Ethernet, Wireless Bluetooth, or Serial connections. In Dynamic 2 mode, the interfaces can output up to 3906 readings/module/second. (Up to 16 modules)

### RS232 INTERFACE MODULE (RS232 IM)

- RS485 Also Available

### ETHERNET INTERFACE MODULE 2.0 (ETHIM 2.0)

- Runs Dynamic modes over Ethernet

### USB INTERFACE MODULE (USBIM)

- USB 2.0
- Powers up to 4 modules
- USB Lite also available (Runs 4 modules)

### WIRELESS INTERFACE MODULE (WIM)

- Class I Bluetooth

## MEASUREMENT MODES

Orbit offers a variety of measurement modes to ideally match your application. (Consult manuals for full details)

- **STATIC:** Standard Measurement Mode where one module is queried at a time. Simple to set up.
- **DYNAMIC:** High Speed Synchronized readings for up to 31 modules.
- **DYNAMIC 2:** High Speed Synchronized readings, for up to 200 modules. Use Ultra High Speed mode. USBIM and ETHIM 2.0 only
- **READBURST:** One high speed synchronized reading of all modules on network.
- **BUFFERED:** Mode where up to 3000 readings are stored in module, then extracted on command.
- **DIFFERENCE MODE:** Maximum and Minimum readings are stored in module then extracted with command.

## NETWORK SPEEDS

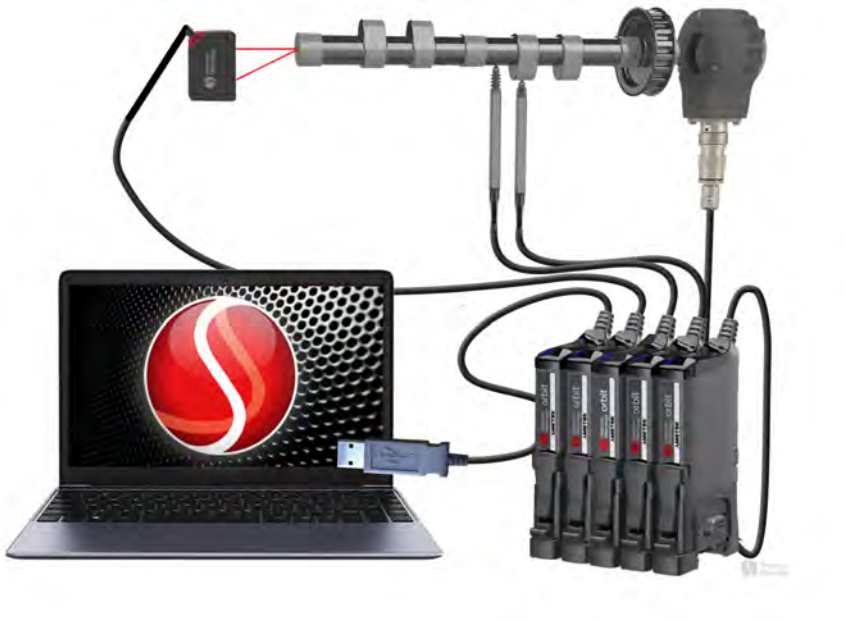
Orbit has three different network speeds. Standard covers most static applications.

| ORBIT READING RATE | BAUD RATE (BITS/SECOND) |
|---|---|
| Standard | 187.5K (Default) |
| High | 1.5M |
| Ultra High | 2.25M |

| MODULE TYPE | USB INTERFACE MODULE (USBIM) | USB LITE | ETHERNET INTERFACE MODULE 2.0 (ETHIM) | WIRELESS INTERFACE MODULE (WIM) | RS232 INTERFACE MODULE (RS232IM) | RS485 INTERFACE MODULE (RS485IM) |
|---|---|---|---|---|---|---|
| **INTERFACE** | USB 2.0 | USB 2.0 | Ethernet TCP/IP | Bluetooth™ | RS232 | RS485 |
| **DATA RATE** | 12Mbps | 12Mbps | 10/100Mbps | 3Mbps | 115.2Kbps | 115.2Kbps |
| **# OF MODULES FOR COMMUNICATION** | 200 | 4 | 200 | 200 | 200 | 200 |
| **# OF MODULES POWERED (Note 1)** | 4 | 4 | 0 | 0 | 0 | 0 |
| **NETWORK SPEEDS** | | | | | | |
| **Standard** | X | X | X | X | X | X |
| **High** | X | X | X | | | |
| **Ultra High** | X | X | X | | | |
| **ORBIT MEASURE-MENT MODES** | | | | | | |
| **Static** | X | X | X | X | X | X |
| **Dynamic** | X | X | X | | | |
| **Dynamic 2** | X | X | X | | | |
| **Readburst** | X | X | X | X | X | X |
| **Buffered** | X | X | X | X | X | X |
| **Difference** | X | X | X | X | X | X |
| **READINGS PER SECOND** | 3906 per module (max) for up to 16 modules | 3906 per module (max) for up to 4 modules | 3906 per module (max) for up to 16 modules | 25 (typical) | 150 (typical) | 150 (typical) |
| **POWERED BY** | USB port or PSIM | USB port or PSIM | PSIM | PSIM | PSIM | PSIM |

- Note 1: The USBIM and USB Lite can power up to 4 Orbit modules of most types. Some modules may require additional power supplies, such as Orbit LT Lasers.
- Note 2: USBIM, USB Lite, and ETHIM 2.0 can run up to 3906 readings per module per second in Dynamic 2 mode in Ultra High Speed setting. ETHIM dynamic speeds can be affected by Ethernet network

Dynamic readings can be triggered by PC or by Encoder via Encoder Interface Module. Refer to Orbit manual for details and setup.



# PROTOCOL INTERFACE MODULES (PIMs)

Connect Solartron's Orbit® Network to the world's leading PLC protocols

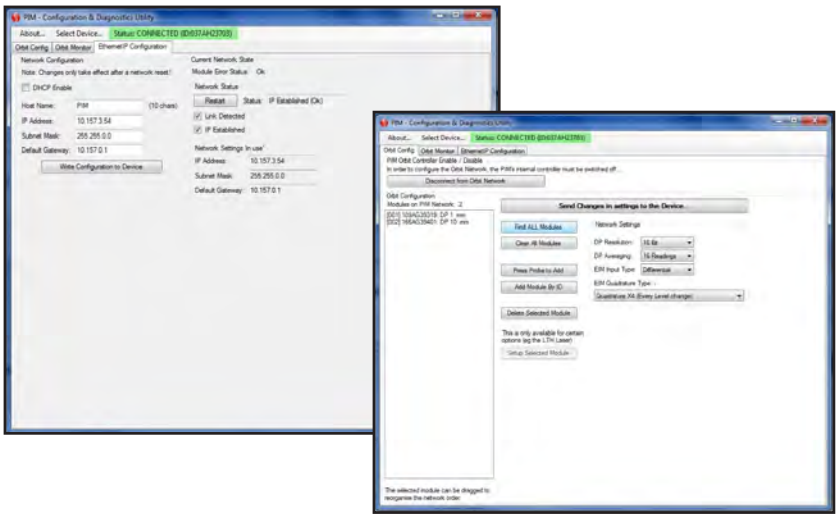

Solartron's Protocol Interface Module (PIM) provides a simple way of interfacing the Orbit® Digital Measuring Network to most Programmable Logic Controllers (PLCs). A distinct PIM is created for each protocol, including: Ethernet/IP™, ProfiNet™, EtherCAT™, Modbus TCP, & CC Link™

- Communicate with up to 150 Orbit modules with Explicit Messaging or 50 with Cyclic Messaging
- Power up to 10 Orbit modules (depending on type). A PSIM can be used when more than 10 is required
- Connect any Solartron Digital sensor including lasers
- Connect 3rd party sensors via the Analog Interface Module (AIM)

The PIM will also connect to Solartron Wi Gauges via the Wireless Connection Module (WCM)

Modbus Interface Module (MODIM) is also available as Modbus RTU over RS485 Serial

- Download free software pack from Solartron website, then connect PIM to computer via USB cable
- Set EtherNet/IP™ , PROFINET®, EtherCat and CC Link ™ settings such as DHCP enable, host name, IP address, subnet mask and default gateway.
- For PROFINET this can also be done through the standard PROFINET methods – TIA portal, Pronetta.
- The configuration application is also used to set Modbus settings such as baud rate, parity, Modbus address etc.



| PRODUCT | ETHERNET/IP® | PROFINET® | EtherCAT® | MODBUS TCP/IP | CC LINK® | MODBUS RTU (SERIAL) |
|---|---|---|---|---|---|---|
| Mesaging Types | Explicit and Cyclical | | | | Cyclic | RTU |
| Connections | 4 Cyclic, 6 Explicit | | | | 1 | 1 |
| CIP Services Supported | 0x4C - CIP Data Table Read | N/A | N/A | N/A | N/A | N/A |
| Reading Rate (Readings per second) | See Separate Data Set Below | | | | | |
| Power (Input) | +18 to +32 VDC | | | | | PSIM |
| Number of Orbit Modules powered | Up to 10 depending on Module type | | | | | 0 |
| Max Number of Orbit Modules using additional PSIMs | 150 Using Explicit Messaging | | | | 64 | 150 |
| | 50 Using Cyclic Messaging | | | | | |
| Display | Colour LCD with acrylic sealed cover | | | | N/A | None |
| Electrical Interface | Ethernet 2x RJ485 | | | | Screw Terminal | RS485 |
| | Micro USB Cable Configuration | | | | | RS485 to USB cable for configuration |
| **ENVIRONMENTAL** | | | | | | |
| Sealing | IP43 | | | | | |
| Storage Temperature | 0 to +60 | | | | | |
| Operating Temperature | +5 to +60 | | | | | |
| EMC Emissions | EN61000-6-3 | | | | | |
| EMC Immunity | EN61000-6-3 | | | | | |
| | EN 61326-1:2013 | | | | | |
| Shock | Do not subject to excessive shocks or loads | | | | | |
| **MATERIAL** | | | | | | |
| Protocol Interface Module | ABS, Nylon, Acrylic | | | | | |

- Note 1: Explicit messaging can read the following: measurment, status, max and min, from 150 sensors.
- Note 2: Cyclic measurement can read measurement and status synchronised from 50 sensors.
- Note 3: Only Ethernet/IP supports CIP Table

## PIM READING RATES (NOT APPLICABLE TO MODIM)

The PIM reads synchronised data from the Orbit Network. Reading rate is dependent on the number of Modules on the Orbit Network. For one module the PIM performs 318 sets of readings per second. As the number of modules increases the number of sets of readings reduces as shown in the table below.

| NUMBER OF MODULES | READING SETS/SECOND | TOTAL MODULES READ/ SECOND |
|---|---|---|
| 1 | 318 | 318 |
| 2 | 318 | 636 |
| 3 | 314 | 942 |
| 5 | 312 | 1560 |
| 10 | 208 | 2080 |
| 20 | 123 | 2460 |
| 30 | 90 | 2700 |
| 48 | 57 | 2736 |
| 64 | 41 | 2667 |

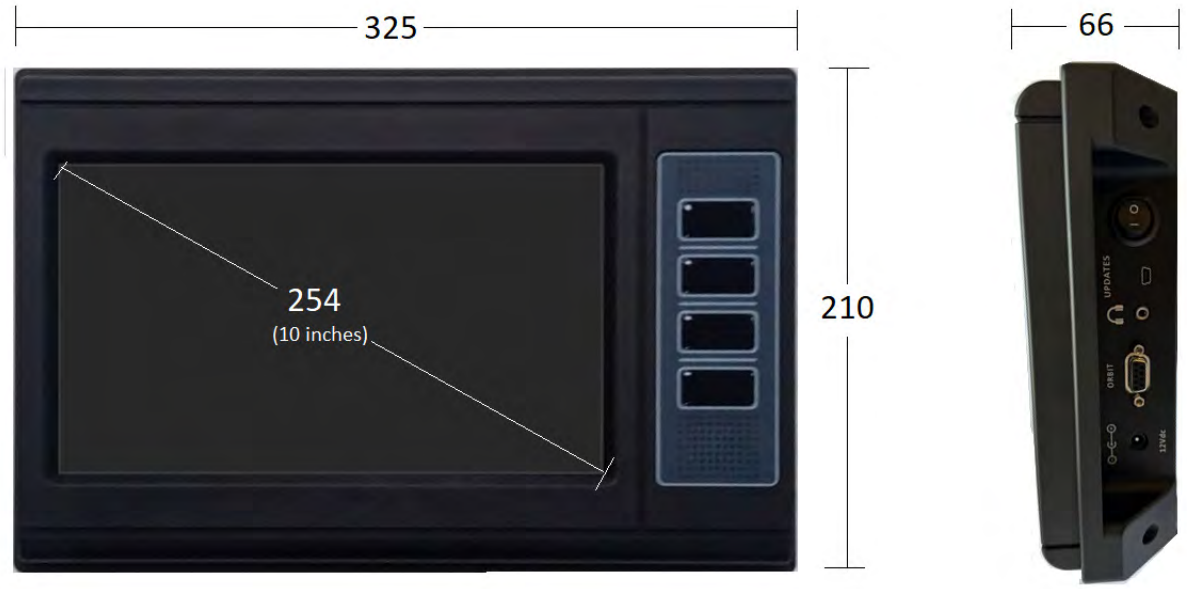

The Data rates will vary depending on the system and the numbers are indication only.

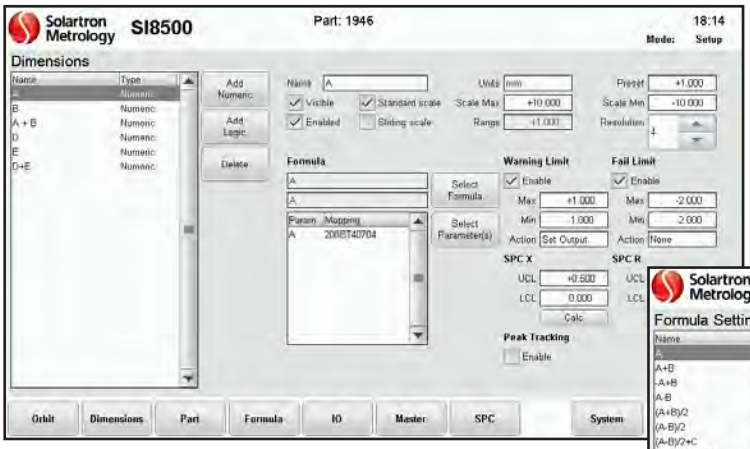
# SI 8500 DIGITAL READOUT

The SI 8500 provides the opportunity to collect measurement data with the purpose of optimizing manufacturing production analysis and control. User interface has been designed to ensure all users the maximum accessible data for industrial measurement applications.

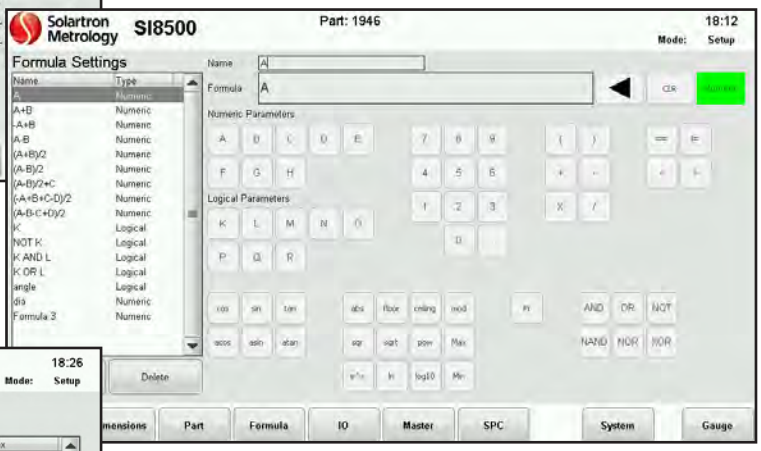

## KEY FEATURES

- Heavy duty aluminium casing with 10” Touch Screen. Built for an industrial environment.
- IP64 for front panel with four programmable keys.
- Connect with up to 64 Orbit Sensors
- Power up to 10 modules, including contact and non-contact sensors
- Easy & intuitive setup with touch screen
- Build your own custom formulas
- SPC and Mastering functions included
- I/O Connections for automation
- USB port for easy data output
- Footswitch plug
- Link to 3rd party sensors via Orbit connection modules, including air gauging
- Benchtop (with stand) or Panel Mount options (VESA Mounting Standard)

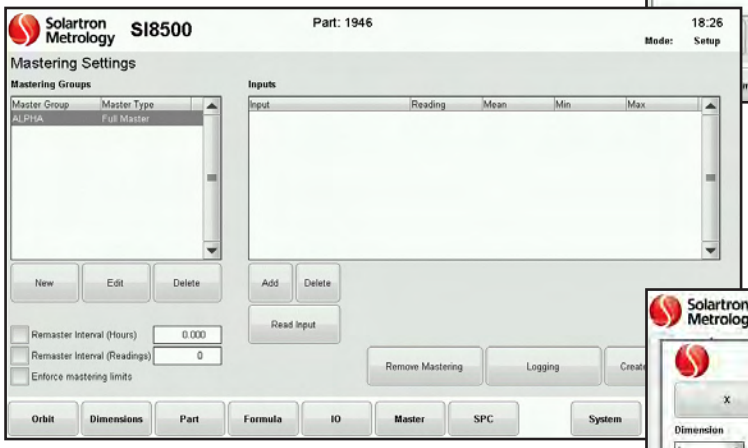




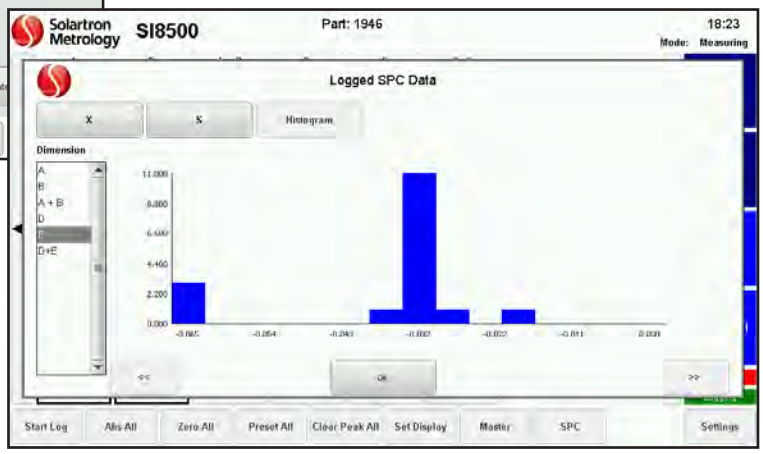

SET UP DISPLAY AND TOLERANCE FOR EACH DIMENSIONAL CHANNEL




BUILD CUSTOM FORMULAS AND STORE THEM FOR FUTURE USE




MASTERING SETTINGS ARE INCLUDED




STATISTICAL PROCESS CONTROL FUNCTIONS ARE INCLUDED

| PERFORMANCE | |
|---|---|
| Maximum Number of Orbit Modules | 64 |
| Maximum Number of Orbit Modules powered | 10 |
| Network Speed | Up to 1000 readings, per module, per second |
| Math Equations | Standard formulas pre-loaded. Customised formulas available. |
| Math Equations | .csv |
| **HARDWARE** | |
| Casing | Aluminium |
| Touch Screen | 254 mm (10-inch) touch screen, glass |
| Max Readings on screen | 4,8,or 16 vertical, horizontal bars |
| External Connections | I/O (NPN, PNP, TTL), Footswitch |
| Power | 100-240VAC |
| Storage Temperature (°C) | -20 to +80 |
| Operating Temperature (°C) | +5 to +60 |
| Sealing | IP 64 (front panel), IP 50 (rear) |
| Moutnings | VESA 75 x 75 or 100 x100 mm |
| Mountng Hole Threads | M4 X 12 |

# ORBIT® DIGITAL READOUTS

Solartron has a range of digital readouts to suit all applications from industrial panel mount to desk top units. Readouts can have from 1 to 31 channels of measurement and can be configured for custom applications.

| PRODUCT | No OF CHANNELS | I/O | COMMS | FUNCTIONS |
|---|---|---|---|---|
| SI100 | 1 | Yes | Yes | Pre Programmed |
| SI200 | 2 | Yes | Yes | Pre Programmed |
| SI400 | 4 | Yes | Yes | Pre Programmed |
| SI3500 | 2 | Yes | Yes | Pre Programmed |
| SI5500 | 31 | Yes | Yes | Programmable |

All of Solartron readouts work with all of Solartron Digital Transducers and Non-Contact Sensors, the performance of these sensors is not degraded in any way when used with the readouts.

## SI100, SI200 AND SI400

The SI100 is a single channel, stand alone system, while the SI200 also connects to an Orbit® probe for two channel measurements and the SI400 connects to up to 3 probes.


### FEATURES

- Integral Readout with colour LCD Screen and keypad
- Set tolerance and process limits via keypad
- Detachable probe plug on housing for easy installation
- Replace probe with no calibration or reprogramming (Inline plug option)
- Modbus output (RTU) over RS485 or RS232
- Programmable discrete I/O (4 inputs, 3 outputs)
- Multiple formulas available for SI200 (A+B, A-B, etc)
- Available with all Solartron transducers and lasers
- 24 VDC Power Supply
- SI200 and SI400 also available as a Stand Alone unit with no sensor attached to the housing

## SI3500 AND SI5500 READOUTS

Specially designed to work with Solartron Orbit® Digital Transducers, the SI3500 and SI5500 provide the user with solutions for small systems. Both readouts have intuitive menu systems for ease of set up and can be programmed to display readings, alarms, limits and other metrology functions. With discrete I/O and serial interfaces these readouts provide a neat solution to interface to other systems like PLC's.


SI5500 can connect to up to 31 Orbit® modules


### FEATURES

- Intuitive menu
- Accepts up to 31 Orbit® Sensors (SI5500)
- Suite of Mathematical Functions for each channel
- Auto colour change for in/out limit range
- User selectable bar panel or text display
- Auto course / fine resolution
- Gauging Mode
- Peak hold facility
- Data logging facility
- RS232 Connectivity
- 0.01 µm display resolution
- Available for Digital probes, Linear Encoders, Encoder Input modules and laser sensors
- Discrete I/O
- SI5500 powers both probes and lasers

# TECHNICAL SPECIFICATIONS

| SI100, 200 AND 400 STANDARD OPTIONS | | | x=100, 200, 400 | | | | |
|---|---|---|---|---|---|---|---|
| Actuation | Cable | Type | Description | | | | |
| Spring Push | Axial | Standard | SIxP/1/S | SIxP/2/S | SIxP/5/S | SIxP/10/S | SIxP/20/S |
| | Axial | Feather Touch | SIxT/1/S | SIxT/2/S | SIxT/5/S | SIxT/10/S | SIxT/20/S |
| Pneumatic | Axial | Standard | SIxP/1/P | SIxP/2/P | SIxP/5/P | SIxP/10/P | SIxP/20/P |
| | Axial | Feather Touch | SIxT/1/P | SIxT/2/P | SIxT/5/P | SIxT/10/P | SIxT/20/P |
| **PERFORMANCE AND FUNCTIONS** | | | | | | | |
| Measuring Range for Integral Probe (mm) | | | 1 | 2 | 5 | 10 | 20 |
| Performance | | | See Sensor Specifications | | | | |
| No. of Measurement Channels | | | SI100 Channel A, SI200 Channel A, B, SI400 Channels A, B, C and D | | | | |
| **Measurement Modes** | | SI100 | A, MAXA-MINA | | | | |
| | | SI200 | A, B, A+B, A-B, (A+B)/2, (A-B)/2, MAXA-MINA MAXB-MINB | | | | |
| | | SI400 | A, MAXA-MINA, B, MAXB-MINB, C, MAXC-MINC, D, MAXD-MIND | | | | |
| Measurement Units | | | mm, inches, mils | | | | |
| Measurement Types | | | Absolute, Zero, Preset, Track, (Peak + and Peak - SI100/200) | | | | |
| LCD Colour Display | | | Digital Measurement and Analogue Bar | | | | |
| Keypad | | | Membrane | | | | |
| Discrete Inputs | | | 4 User Programmable | | | | |
| Discrete Outputs | | | 3 User Programmable | | | | |
| Serial Communications | | | Modbus RTU or Solartron ASCII protocol | | | | |

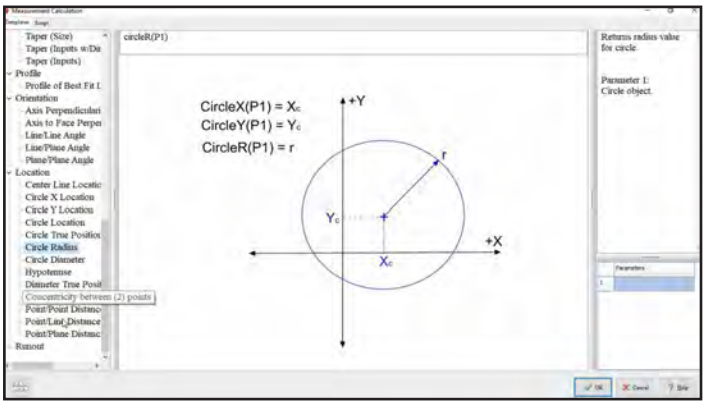
| PERFORMANCE AND FUNCTIONS | SI3500 | SI5500 |
|---|---|---|
| Number of Transducers | 1 or 2 | 1 to 31 |
| Display | 1 or 2 Channels | Up to 16 Channels |
| Length / Resolution | ±xx.xxxxx (mm) ±xx.xxxxx inches | ±xx.xxxxx (mm) ±xx.xxxxx inches |
| Indications | mm / inch, Lower and Upper Limits, Out of Range, Measurement Type and Mode | |
| Keypads | Print, Zero, Preset, Peak, Hold Track, Menu | |
| Measurement Type<br>Data Logging | A, B, A+B, (A+B)/2, (A+B)2, (B+A)/a<br>10,0000 readings via discrete inputs<br>or 1 ms to 24 hour time interval | User programmable with multiple 8 pages of data with 4000 readings per channel per page data triggered by discrete input of timed 1 ms to 25 hours |
| **INPUT AND OUTPUTS** | | |
| Orbit® Interface | Yes | Yes |
| Serial ACSII Interface | Yes | Yes |
| Inputs | Six isolated | Six isolated - user configurable |
| Outputs | Six isolated | Six isolated - user configurable |
| Analogue Output | 2 User selectable Voltage or<br>4-20 mA | None |
| **POWER AND ENVIRONMENTAL** | | |
| Operating Voltage | 24 VDC ± 10% | |
| Power for Transducers | 5 VDC up to 2 transducers | 5 VDC up to 31 transducers, 24 VDC up to 10 Lasers |
| Sealing Front Panel | IP65 | |
| Sealing Case | IP51 | |
| Sealing Rear Connections | IP51 | |
| Operating Temperature (°C) | 5 to +50 | |
| Storage Temperature (°C) | -20 to +50 | |
| EMC | Immunity EN61000-6-2<br>Emissions EN61000-6-3 | |
| **MECHANICAL** | | |
| Mounting | Bench or Panel | Bench or Panel |
| Dimensions WxHxD | Without bezel 132x67x160 / With Bezel 144x76x177 | |

# ORBIT® GAUGE SOFTWARE 4.0

Orbit® Gauge Software 4.0 (OGS4) is a redesigned standard off the shelf software package from Solartron Metrology. Based off the success from its predecessor Orbit® Gauge Software 3.0 (OGS3), OGS4 allows for a generic platform that can be used by process engineers, gauge technicians, and gauge OEMs to create MS Windows computer based inspection systems using standard Solartron Metrology hardware integrated with your gauge fixture.

Not only can the user integrate Solartron products, but through the Orbit® Network modules, third party measurement instrumentation can also be integrated to the software, which eliminates the need for multiple software packages. OGS4 is an intuitive complete software package for both simple and complex gauging stations…maximizing the users quality process.

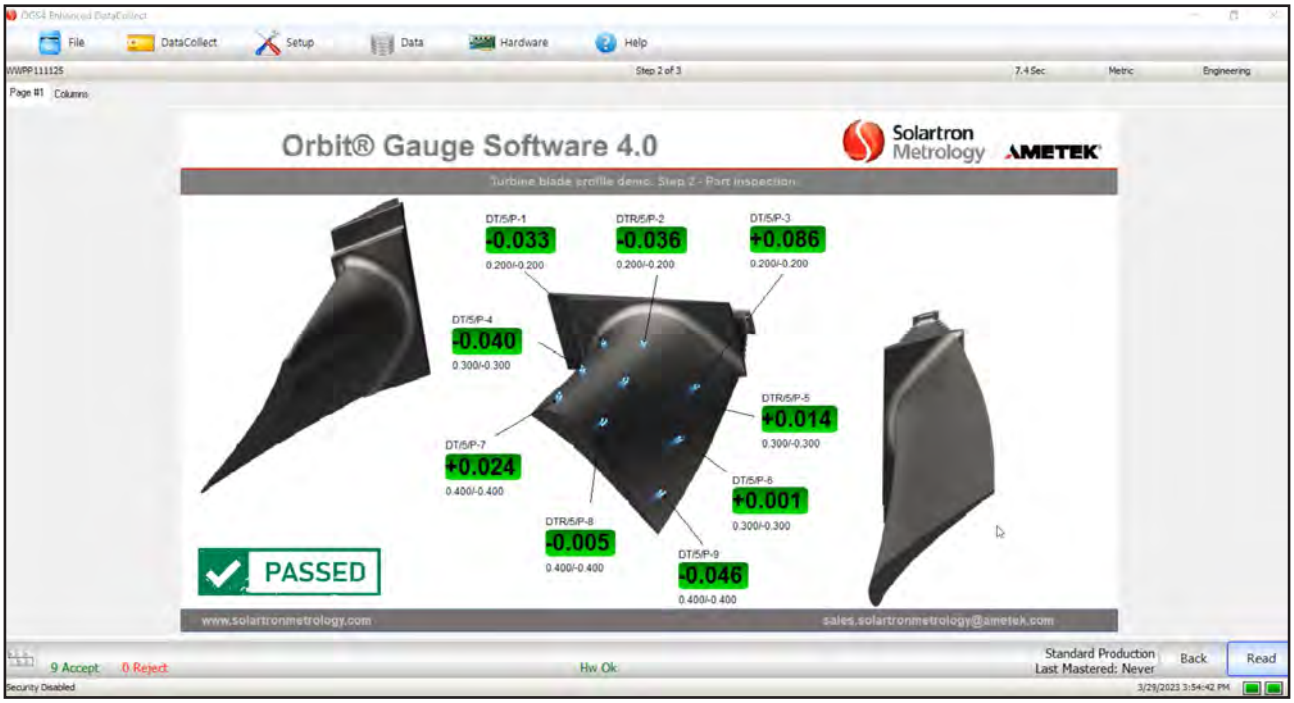

## SEQUENCING



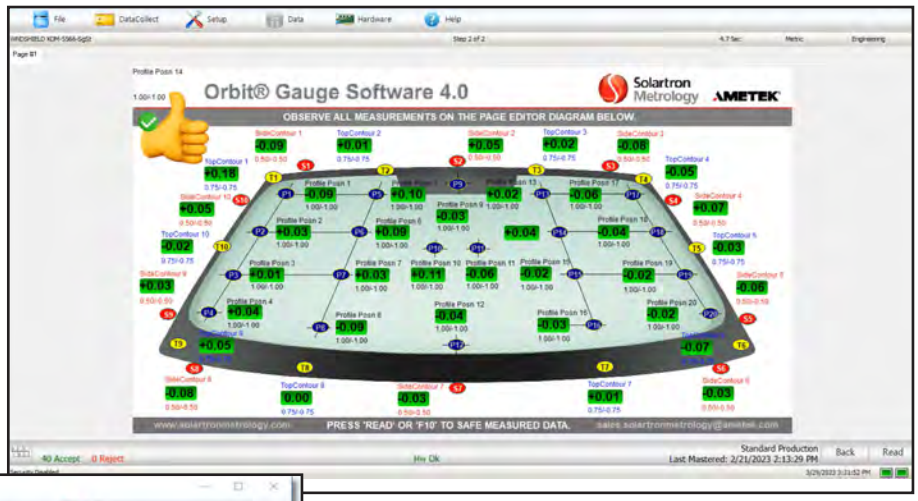

## PRE-LOADED FORMULAS

## KEY FEATURES

- Easy to program
- Supports manual, semi-automatic and automatic gauges/fixtures
- Guided Sequences
- Probe Verification
- Measurement Visualisation
- Recent Part History
- Data Export to Microsoft Excel, Q-Stat, QC-Calc, PLEX, and others
- Mastering for Measurement Integrity
- Customisation Service

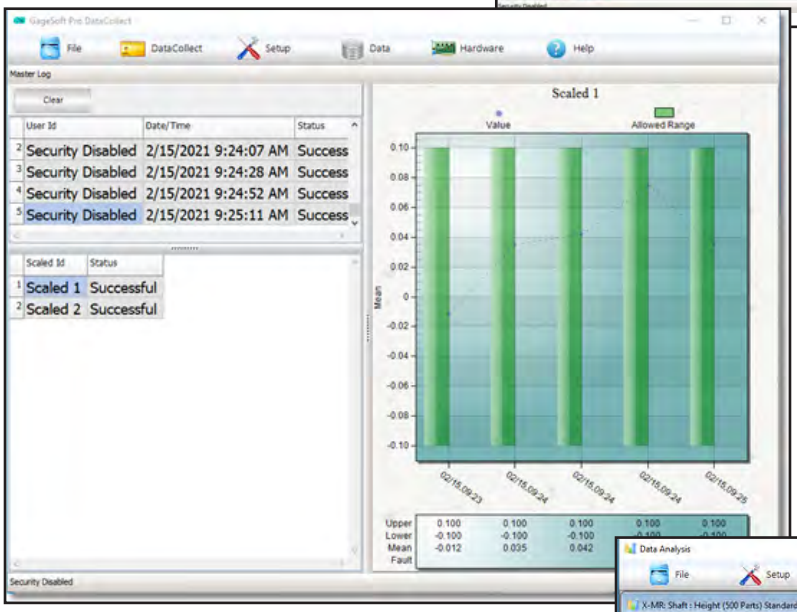


## RUN LARGE, COMPLEX SEQUENCES, UP TO 250 SENSORS



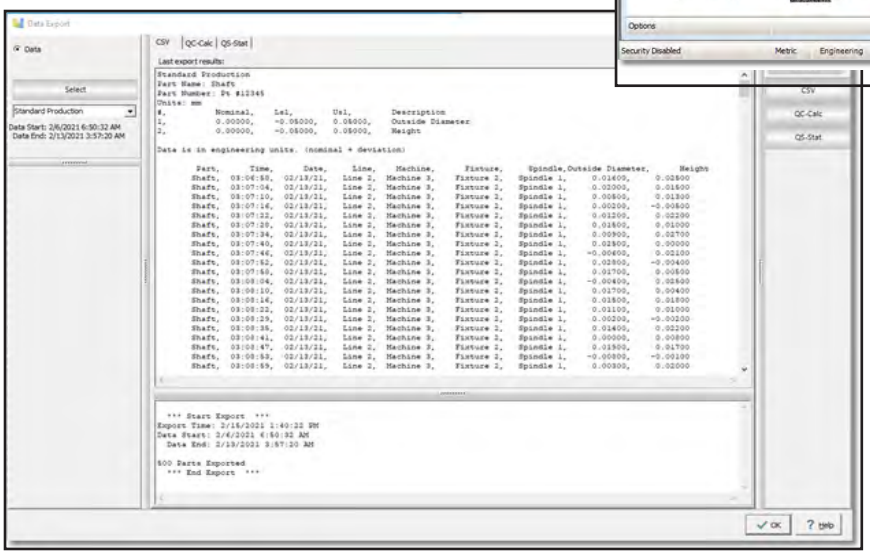

## MASTERING INTEGRITY

- Verification of sensor position
- Spread of mastering values
- Order of mastering process
- Recording of Mastering Log
- Forced Mastering based on time or number of parts measured




## SPC REPORTING

- Xbar-R
- X-MR
- Xbar-s
- X
- Histogram
- Part Data

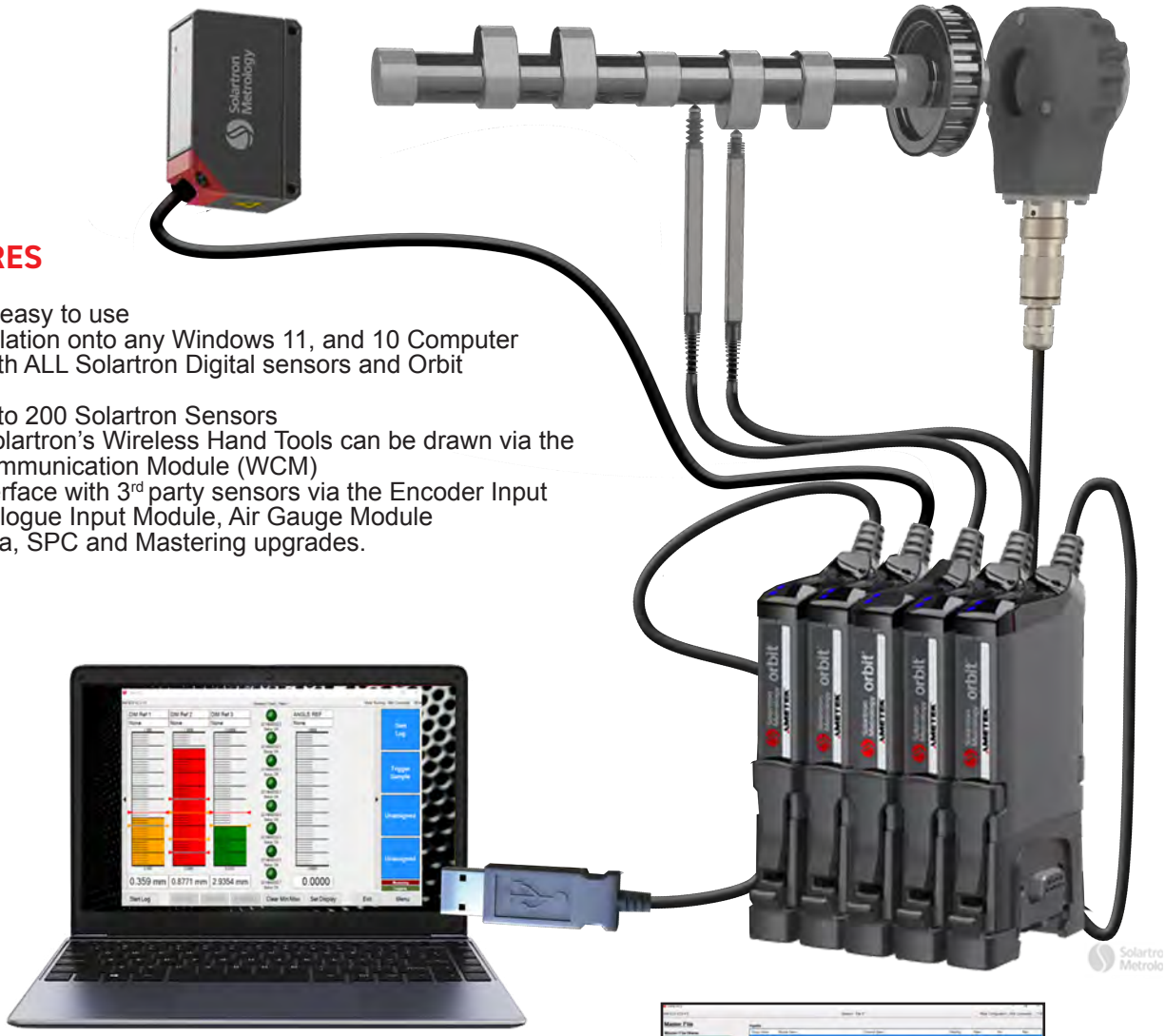




## DATA EXPORT FORMATS

- CSV
- QC-Calc
- Qs-Stat
- PLEX
- Mini-Tab
- Microsoft Excel

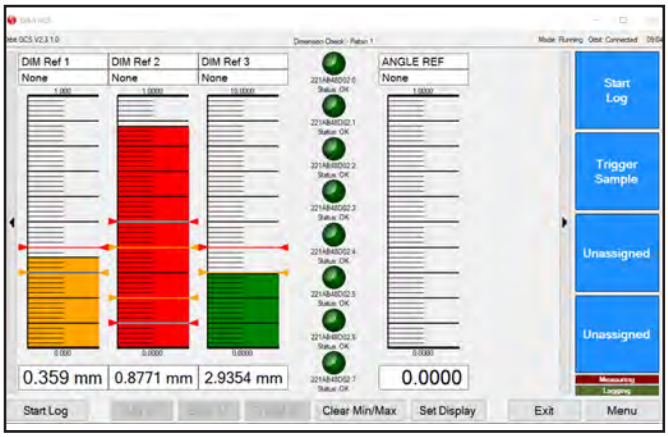
# GAUGE COMPUTER SOFTWARE GCS

Orbit GCS is an advanced gauging software built for the Orbit Network. It can be used to monitor inline and post process manufacturing dimensions and record measurement data.

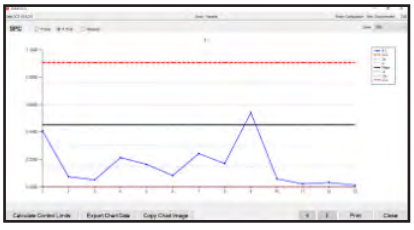


## KEY FEATURES

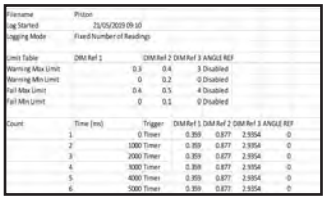
- Flexible and easy to use
- Simple installation onto any Windows 11, and 10 Computer
- Functions with ALL Solartron Digital sensors and Orbit Modules
- Interface up to 200 Solartron Sensors
- Data from Solartron's Wireless Hand Tools can be drawn via the Wireless Communication Module (WCM)
- GCS will interface with 3rd party sensors via the Encoder Input Module, Analogue Input Module, Air Gauge Module
- Math Formula, SPC and Mastering upgrades.



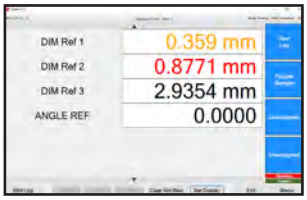

MASTERING UPGRADE (MONITORS THE QUALITY OF A GAUGE)



SPC UPGRADE (INCLUDES HISTOGRAMS, CALCULATIONS FOR UPPER CONTROL LIMIT, LOWER CONTROL LIMIT, CPK, PPK AND MORE)



DATA OUTPUT




OPTIONAL DRO DISPLAY

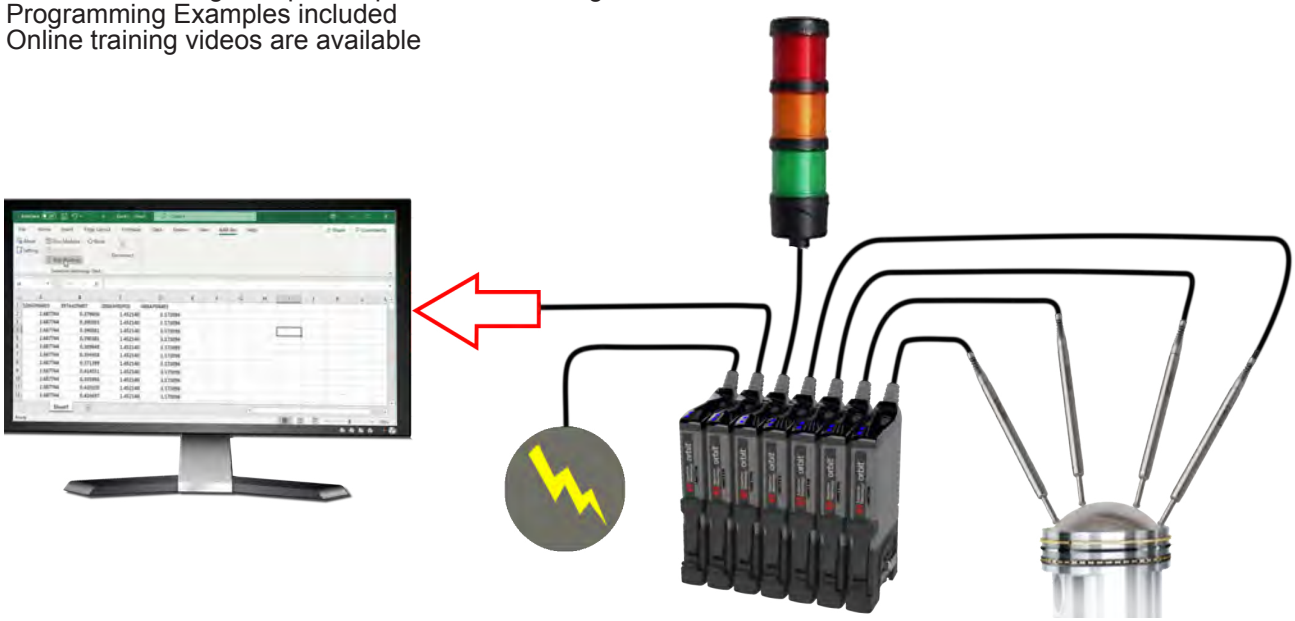
UPGRADE WITH FORMULA BUILDING

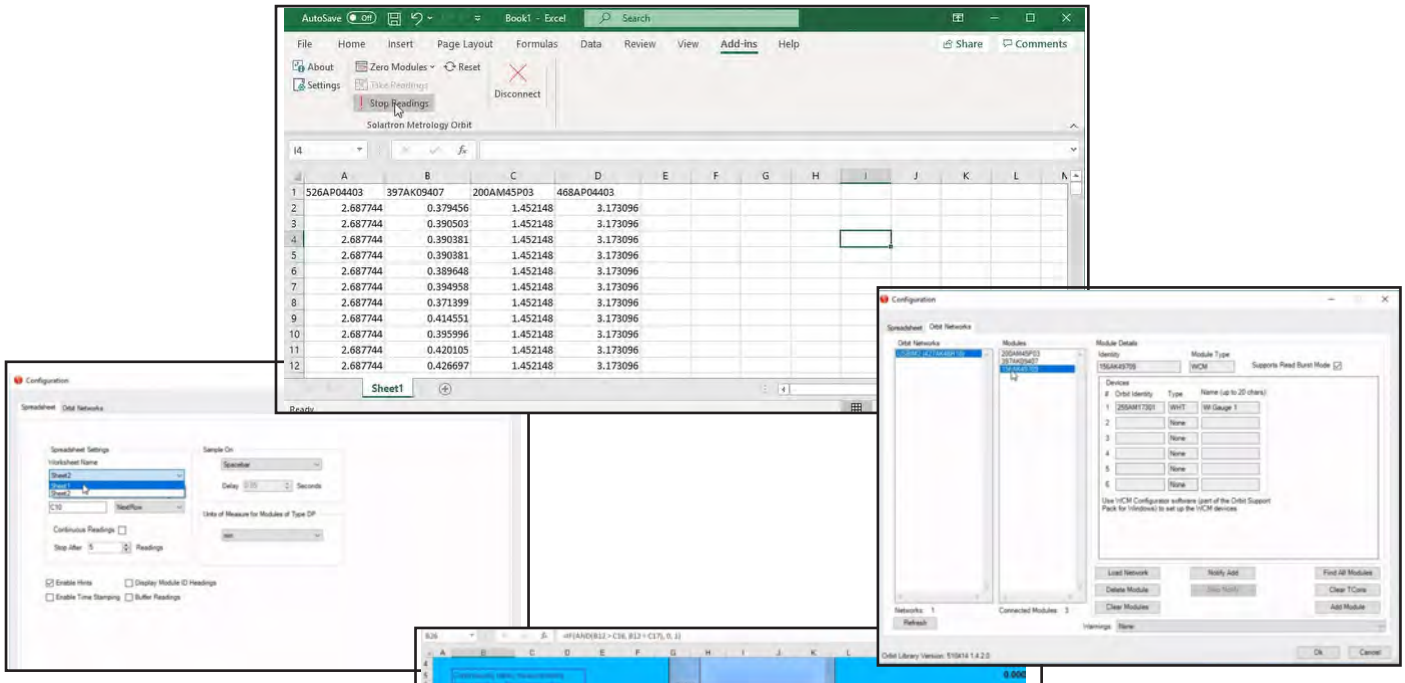
# EXCEL ADD-IN SOFTWARE

The Excel Add-In is a free, downloadable software pack that can be used to output Orbit readings into a spreadsheet.

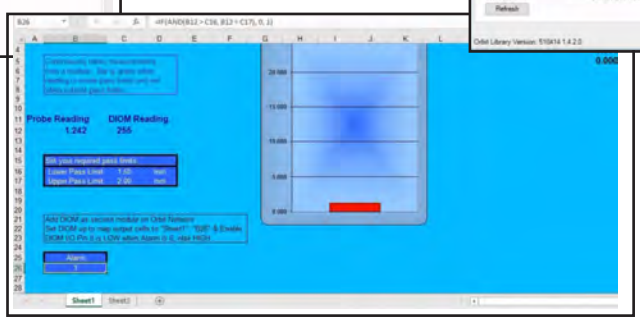
## KEY FEATURES

- Simple installation onto any Windows Computer with minimum Excel 2007
- Runs with USB, RS232, Ethernet TCP/IP and Wireless Interfaces
- Functions with all Solartron Digital Sensors
- Pull in WiGauge readings via the Wireless Connection Module
- Functions with Digital Input Output Module, Analog Interface Module and more
- Programming Examples included
- Online training videos are available





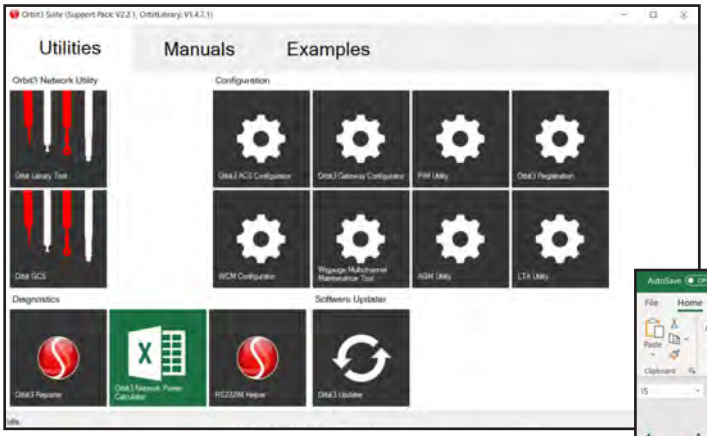
EASY CONFIGURATION SCREEN

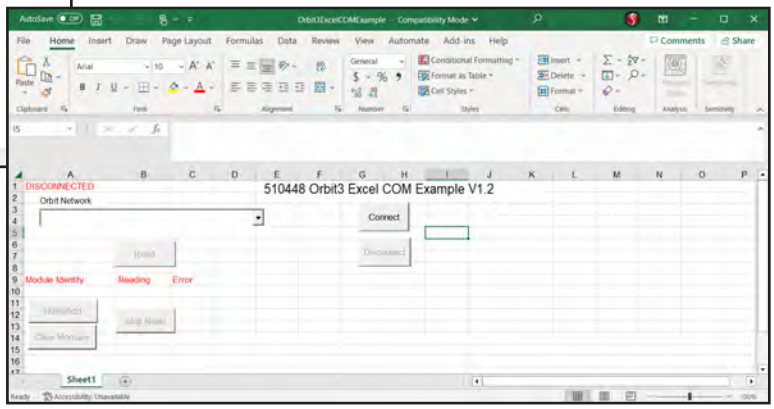


PROGRAMMING EXAMPLES

# ORBIT® SUPPORT PACK

Download free Orbit Support Pack Software drivers to test Orbit sensors, review manuals, utilize programming examples, and configure modules and gateways. It is designed with the Microsoft .NET framework (Windows 7 and above) and is continually updated.



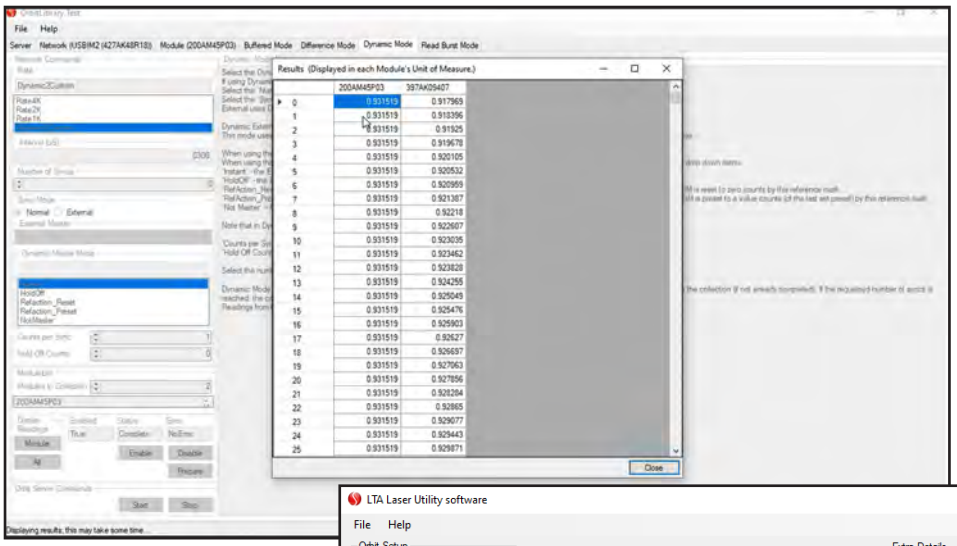




## SOFTWARE FEATURES

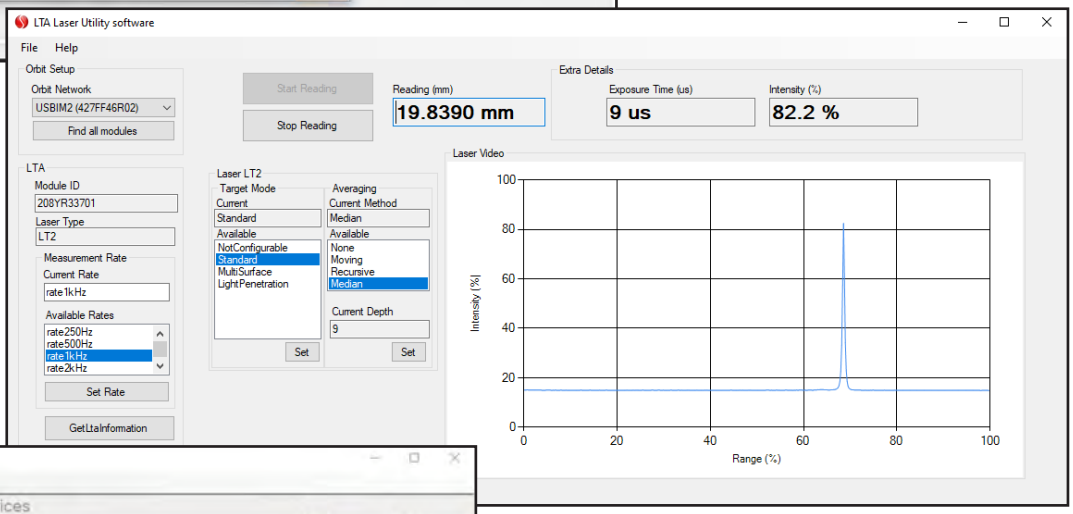
- **Orbit Suite** (pictured above): A software "dashboard" that displays all the utilities, manuals, and programming examples in one space.
- **Orbit Library Test:** Designed to demonstrate the functionality of the Orbit Library, as well as the different measurement modes.
  - Includes examples of all Orbit library commands
  - Source code included with full comments
- **Orbit Registration:** This utility is used for setting up the ETHIM 2.0 or RS232 Interface modules
- **Orbit Reporter:** If you are having difficulty connecting to Orbit, this can be used to help diagnose and troubleshoot. This program is used to find Orbit Controllers and Modules, as well as retrieve PC setup information.
- **Orbit Network Power Calculator:** This Excel based program helps determine power supply calculations and how many PSIMs must be used.
- **Orbit Updater:** This can be used to update the firmware of any Orbit Module
- **Module Utility Configurators:** The Orbit support pack has configurators for multiple modules, including the Orbit ACS modules, the Air Gauge Module, Multi Channel Wireless Handtool, Orbit LT, the Wireless Connection module, and others
- **RS232 IM Helper:** Use this program for designing non-Windows based programs with Orbit.
- **Manuals:** Manuals for all modules, and software products are loaded onto a separate tab
- **Programming examples:** This includes free Projects and programming examples for, C#, C++, Visual C++, and Excel COM VBA (pictured above)

- **LINUX:** Solartron also offers software drivers for the LINUX platform. They are free and available to download on the Solartron website.

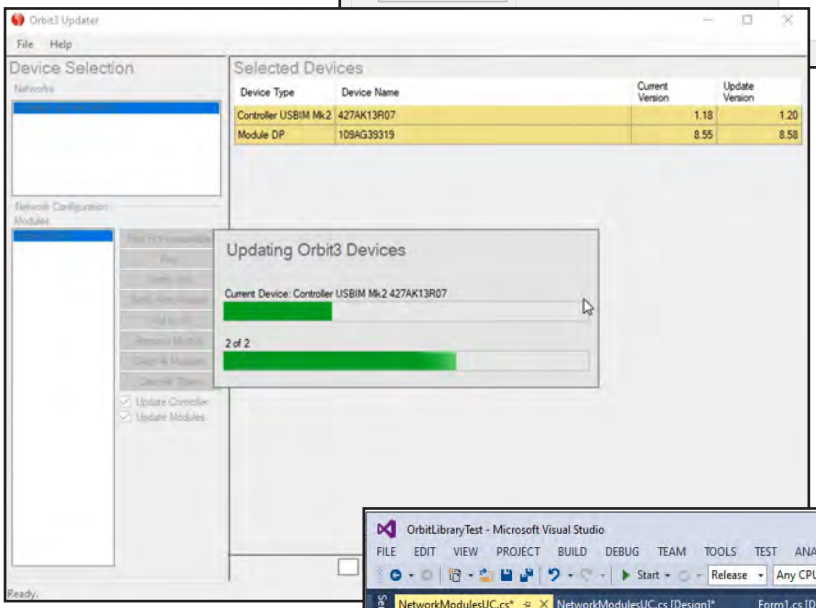
- **LABVIEW:** Solartron has software drivers that easily connect Orbit to LABVIEWTM from National Instruments. Please contact your local Solartron representative for details.



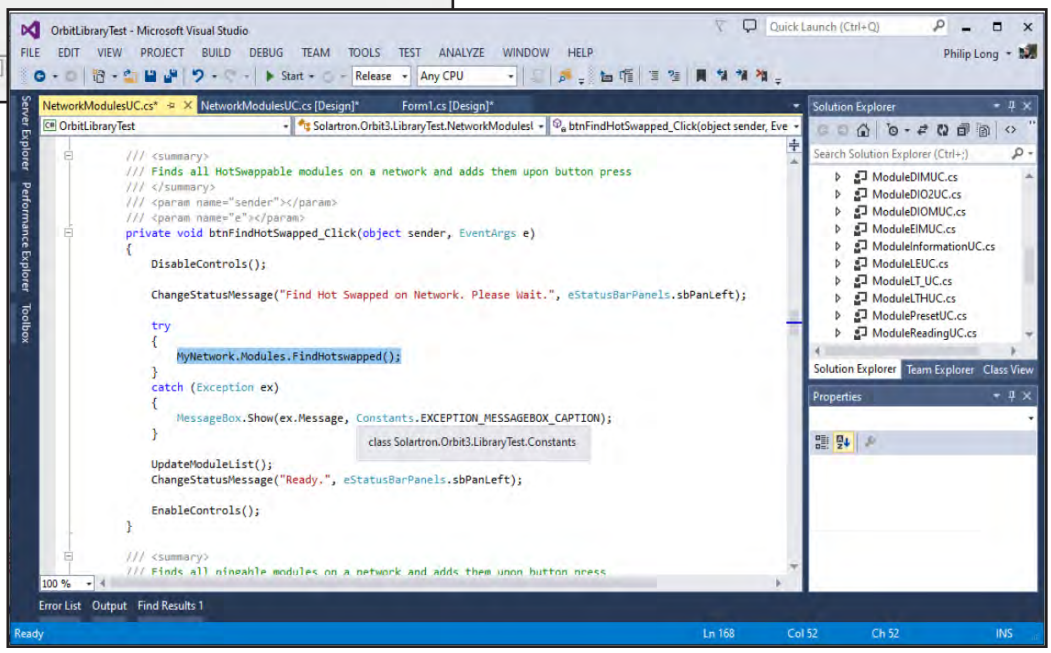
ORBIT LIBRARY TEST RUNNING DYNAMIC MODE




ORBIT LT UTILITY




ORBIT 3 UPDATER




CUSTOMISATION & PROGRAMMING

# DISPLACEMENT SENSORS

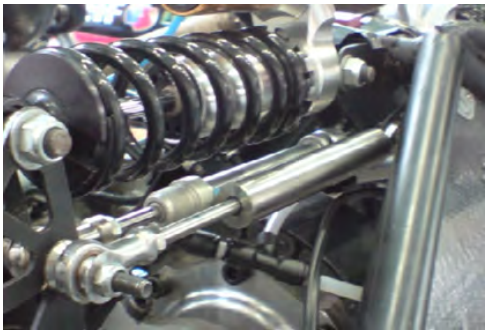
Solartron Metrology offers a full array of Displacement sensors for process control, distance monitoring, and research applications. Each series is customizable, with various outputs.  Most guided sensors can connect to the Orbit Network.

## S-SERIES

- 5mm to 300mm full measuring ranges
- Linearity better than 0.2%
- 19 mm diameter stainless steel body
- IP65 and IP67 options
- Excellent measuring range to body length
- Free Core, Guided, and Universal Joint options, plus other accessories
- Multiple output options with integrated electronics
- Large bore to core clearance for ease of installation
- Excellent magnetic screening
- Wide range of signal conditioning and instrumentation

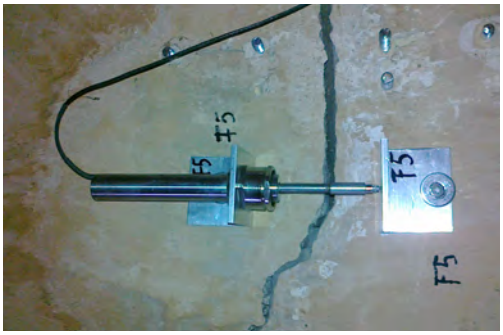

## OP SERIES

- 3, 12, 20, 24, and 50mm total measurement ranges
- Good measurement to body length ratio
- 9.5mm body diameter
- Free Core, guided, and Universal Joint options, plus other accessories
- Larger radial bore clearance
- Rugged Construction

APPLICATION: S-SERIES TRANSDUCER MONITORING AUTO FRAME

APPLICATION: TRANSDUCER MONITORING HEIGHT OF A DRILL FOR SCREW DEPTH




APPLICATION: DISPLACEMENT TRANSDUCER MONITORING A CRACK IN INFRASTRUCTURE

# MINIATURE DISPLACEMENT SENSORS

## SM

- Rugged Construction
- ± 1 or ± 3mm range
- 9.52mm body with short length

## MD

- Small Diameter (6mm or 8mm)
- Right angle cable outlet option
- ±1 or ± 3mm range
- 9.52mm body with short length

## DF

- ±1, ±2.5, or ±5mm ranges
- DC output
- Excellent repeatability
- Short body
- Low Power

For full technical data, please refer to Solartron Displacement Catalogue

## ANALOGUE SIGNAL CONDITIONING

For more general applications, Solartron offers signal conditions for analogue probes and displacement transducers.


### OD SERIES

- Conditioning electronics with 4-20 mA or DC Output


### BOXED INLINE CONDITIONING MODULE (BICM)

- Inline conditioner with DC output

### DIN RAIL CONDITIONER

- Rail mounted Signal Conditioner with DC or 4-20 mA output.

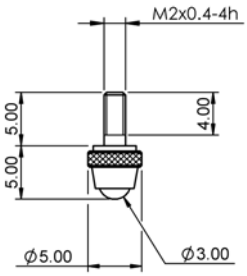
### G-TYPE

- Analogue probe with signal conditioning mounted on end.
- DC and 4-20mA options

# TRANSDUCER TIPS

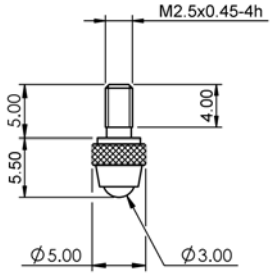
Contact size, shape and material are critical to ensure accurate measurements, for example a flat or knife tip makes measuring external diameters much simpler than using a point tip as probe alignment is not as critical. Tungsten Carbide is a good general purpose material while ruby offers longer life. Silicon Nitride is good for aluminium as Tungsten Carbide can mark aluminium parts.

Point Contact | Profiling | Cylindrical | Soft materials



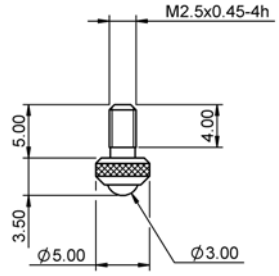

**∅ 3.00 mm Ball**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 806341 |
| Ruby | 807428 |
| Nylon | 807429 |
| Silicon Nitride | 807430 |



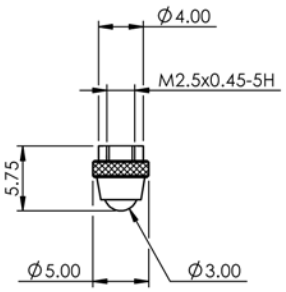

**∅ 3.00 mm Ball**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 804979 |
| Ruby | 804807 |
| Nylon | 805181 |
| Silicon Nitride | 804983 |



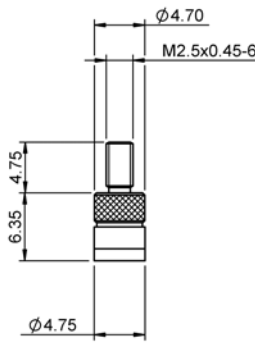

**∅ 3.00 mm Ball**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 802605 |
| Ruby | 807431 |
| Nylon | 803246 |
| Silicon Nitride | 807432 |



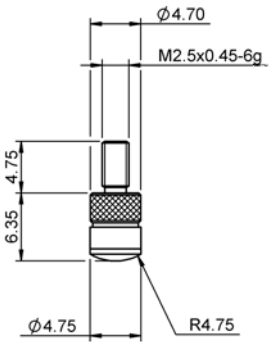

**∅ 3.00 mm Ball**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 804967 |
| Ruby | 804966 |
| Nylon | 804965 |
| Silicon Nitride | 805180 |



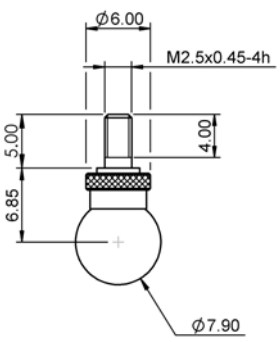

**∅ 3.18 mm Ball**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-033 |



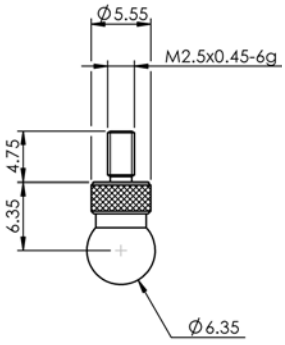

**∅ 6.35 mm Ball**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-034 |



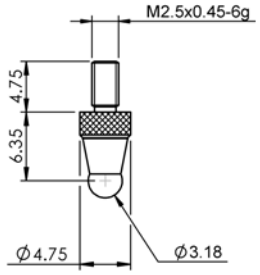

**∅ 7.9 mm Ball**

| Tip Material | Part no. |
|---|---|
| Ruby | 804828 |




**∅ 4.75 mm Dome**

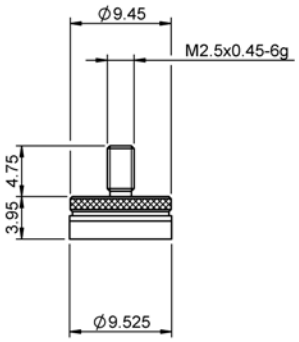
| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-005 |




**∅ 4.75 mm Flat**

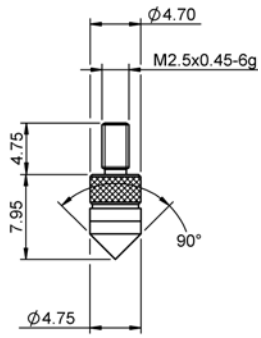
| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-004 |

# TRANSDUCER TIPS



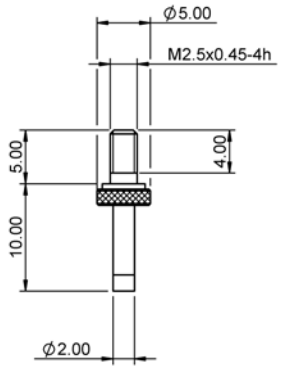

**∅ 9.52 mm Flat**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-007 |



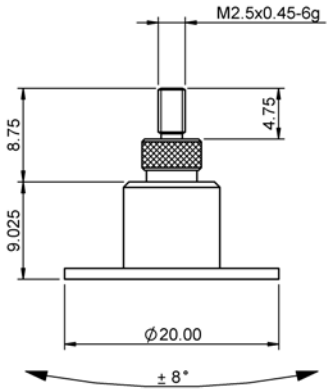

**90° Sharp Point**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-003 |



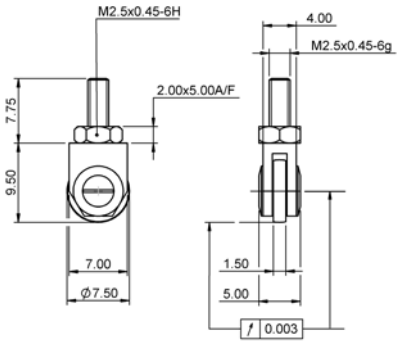

**∅ 2.0 mm Pin**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 206675 |



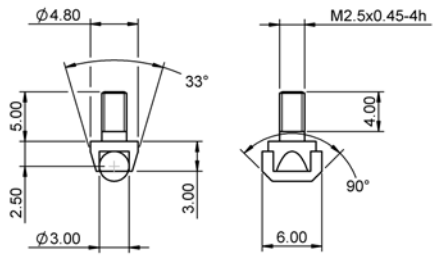

**Floating Tip**

| Tip Material | Part no. |
|---|---|
| Steel | 807434 |



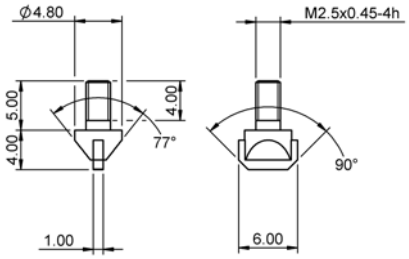

**1.5 x Ø 7.5 mm Wheel ⌀**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-027 |



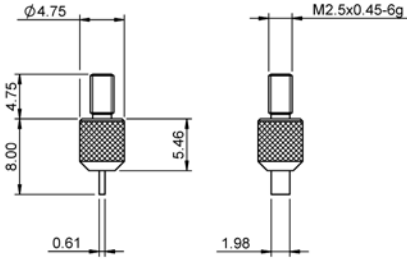

**∅ 3.0 mm Roller**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 209193 |



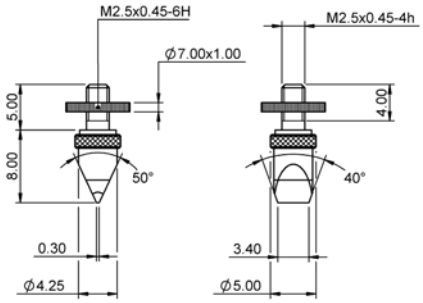

**1 x 6 mm Blade Edge**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 209194 |



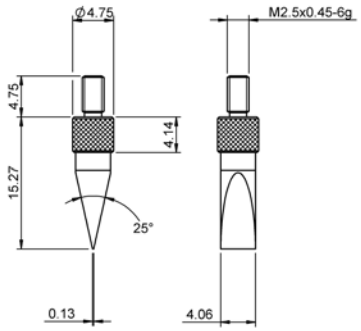

**0.6 x 2 mm Blade Edge**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-035 |




**Knife Edge**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 206674 |



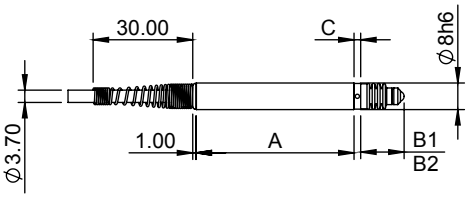

**0.1 x 4 mm Knife Edge**

| Tip Material | Part no. |
|---|---|
| T.Carbide | 008305-036 |

# ORBIT® TRANSDUCER DIMENSIONS

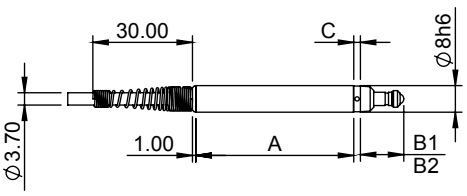
## **Standard Spring Push** (DP/S)

| | DP/2/S | DP10/2/S | DP/5/S | DP/10/S | DP/12/S | DP/20/S |
|---|---|---|---|---|---|---|
| **A** | 47.50 | 75.00 | 66.50 | 90.50 | 127.00 | 127.00 |
| **C** | 2.00 | 4.00 | 2.00 | 2.00 | 3.00 | 3.00 |
| **B1** | 14.25 | 25.50 | 18.00 | 25.50 | 28.50 | 45.00 |
| **B2** | 11.25 | 14.50 | 12.00 | 14.50 | 15.50 | 24.00 |
| **D** | 33.50 | 61.50 | 52.50 | 76.50 | 113.50 | 113.50 |

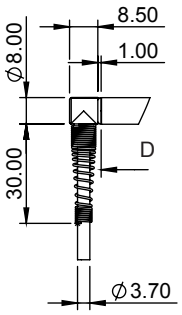



## **Feather Touch Spring Push** (DT/S)

| | DT/2/S | DT/5/S | DT/10/S | DT/20/S |
|---|---|---|---|---|
| **A** | 47.50 | 66.50 | 90.50 | 127.00 |
| **C** | 2.00 | 2.00 | 2.00 | 3.00 |
| **B1** | 14.25 | 18.00 | 25.50 | 34.00 |
| **B2** | 11.25 | 12.00 | 14.50 | 13.00 |
| **D** | 33.50 | 52.50 | 76.50 | 113.50 |

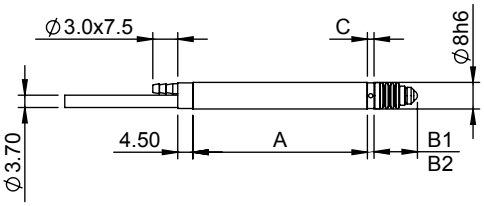



## **Radial Cable Outlet**
Plastic Adapter



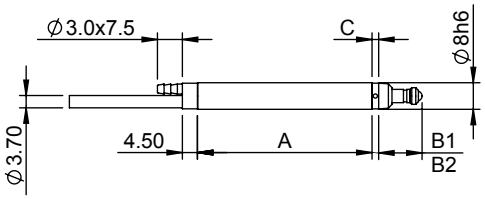

## **Pneumatic Push** (DP/P)

| | DP/2/P | DP10/2/P | DP/5/P | DP/10/P | DP/12/P | DP/20/P |
|---|---|---|---|---|---|---|
| **A** | 52.50 | 84.00 | 71.00 | 96.00 | 127.00 | 127.00 |
| **C** | 2.00 | 2.00 | 2.00 | 2.00 | 3.00 | 3.00 |
| **B1** | 14.25 | 25.50 | 18.00 | 25.50 | 28.50 | 45.00 |
| **B2** | 11.25 | 14.50 | 12.00 | 14.50 | 15.50 | 24.00 |
| **D** | 38.50 | 70.50 | 57.50 | 82.50 | 113.50 | 113.50 |

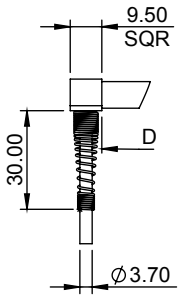



## **Feather Touch Pneumatic Push** (DT/P)

| | DT/2/P | DT/5/P | DT/10/P | DT/20/P |
|---|---|---|---|---|
| **A** | 52.50 | 71.00 | 96.00 | 127.00 |
| **C** | 2.00 | 2.00 | 2.00 | 3.00 |
| **B1** | 14.25 | 18.00 | 25.50 | 34.00 |
| **B2** | 11.25 | 12.00 | 14.50 | 13.00 |
| **D** | 38.50 | 57.50 | 82.50 | 113.50 |

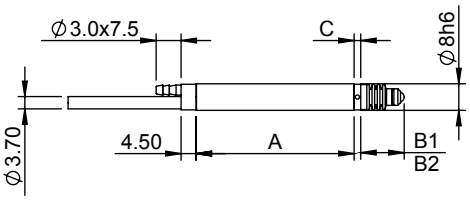



## **Radial Cable Outlet**
Fixed / Spring Push



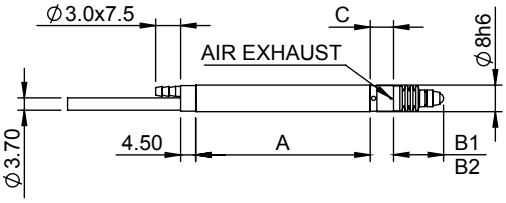

## **Vacuum Retract** (DP/V)

| | DP/2/V | DP/5/V | DP/10/V | DP/20/V |
|---|---|---|---|---|
| **A** | 47.50 | 66.50 | 90.50 | 127.00 |
| **C** | 2.00 | 2.00 | 2.00 | 3.00 |
| **B1** | 14.25 | 18.00 | 25.50 | 45.00 |
| **B2** | 11.25 | 12.00 | 14.50 | 24.00 |
| **D** | 33.50 | 52.50 | 76.50 | 113.50 |

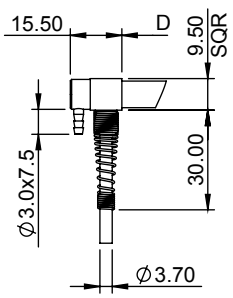



## **Gaiter Independent Pneumatic** (DJ/P)

| | DJ/2/P | DJ/5/P | DJ/10/P | DJ/20/P |
|---|---|---|---|---|
| **A** | 52.50 | 71.00 | 96.00 | 127.00 |
| **C** | 7.00 | 7.00 | 7.00 | 4.00 |
| **B1** | 16.25 | 20.00 | 27.50 | 46.00 |
| **B2** | 13.25 | 14.00 | 16.50 | 25.00 |
| **D** | 38.50 | 57.50 | 82.50 | 113.50 |

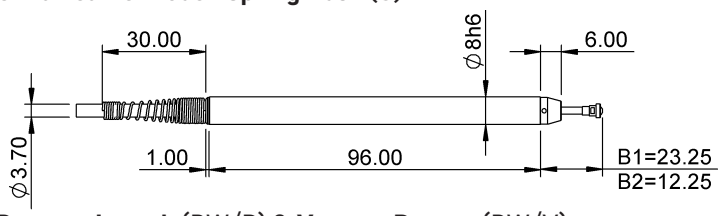



## **Radial Cable Outlet**
Fixed / Pneumatic Push

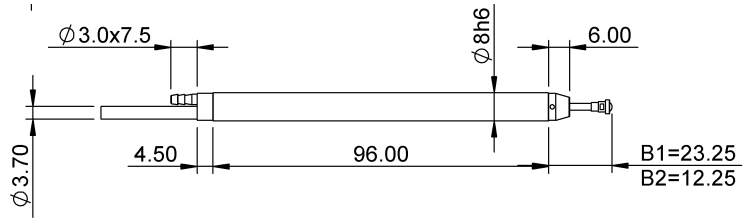


# ORBIT® TRANSDUCER DIMENSIONS

**Ultra Feather Touch Spring Push** (S)



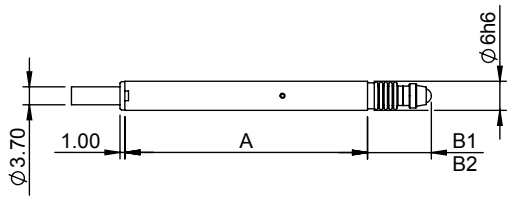

**Pneumatic push** (DW/P) **& Vacuum Retract** (DW/V)




**A -** Case length for axial cable outlet
**B1 -** Fully extended bearing assembly
**B2 -** Fully retracted bearing assembly
**C -** Lock ring dimension
**D -** Case length for radial cable outlet

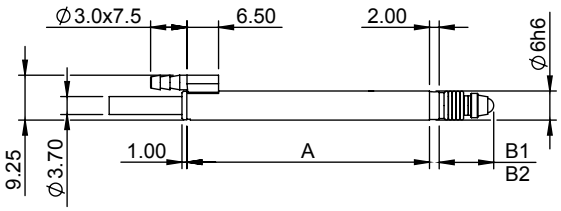
## 6 mm Diameter Body Spring Push (D6P/S)

| | D6P/2/S | D6P/5/S |
|---|---|---|
| A | 50.00 | 74.00 |
| B1 | 14.30 | 29.50 |
| B2 | 11.80 | 23.50 |

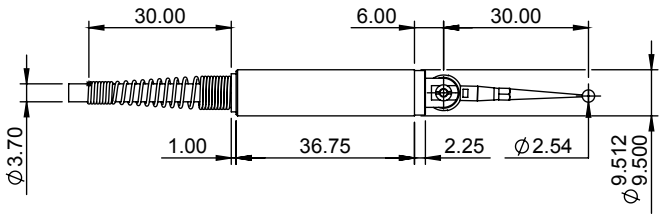



## 6 mm Diameter Body Gaiter Independent Pneumatic (D6J/P)

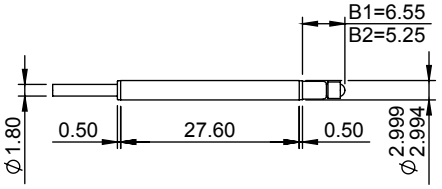
| | D6J/2/P | D6J/5/P | D6J12P |
|---|---|---|---|
| A | 50.00 | 80.00 | 87.00 |
| B1 | 14.00 | 30.00 | 37.00 |
| B2 | 11.00 | 24.00 | 24.00 |




## Lever Probe (DL)

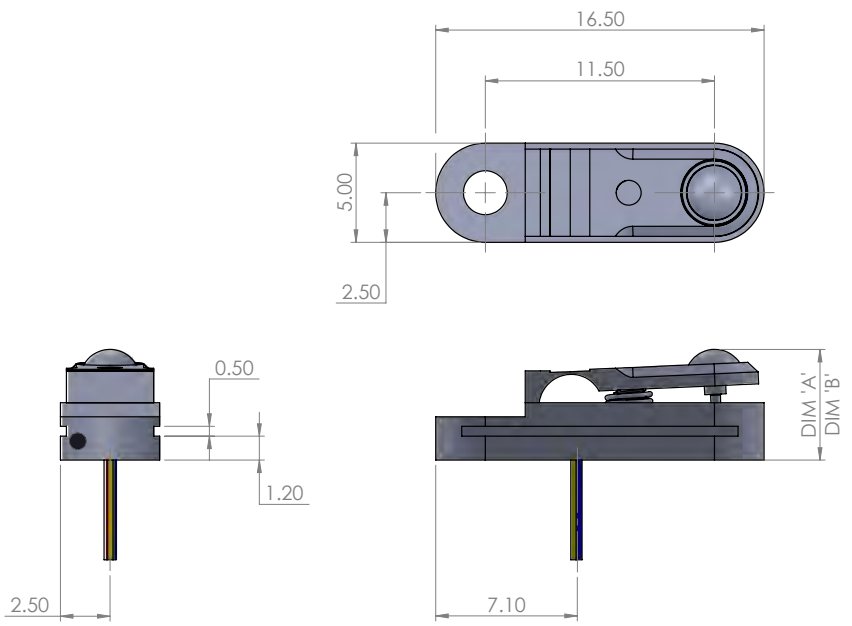



## 3 mm Diameter Body (D3P/S)

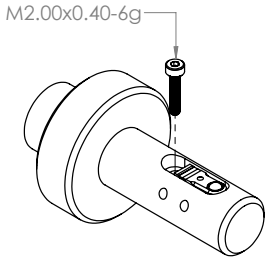


# ORBIT® TRANSDUCER DIMENSIONS

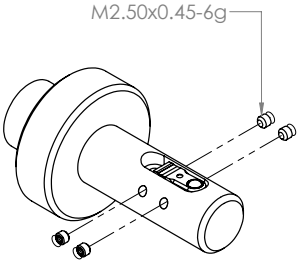
## **Micro Single Leaf Flexure** (MSLF)




MOUNTING OPTION

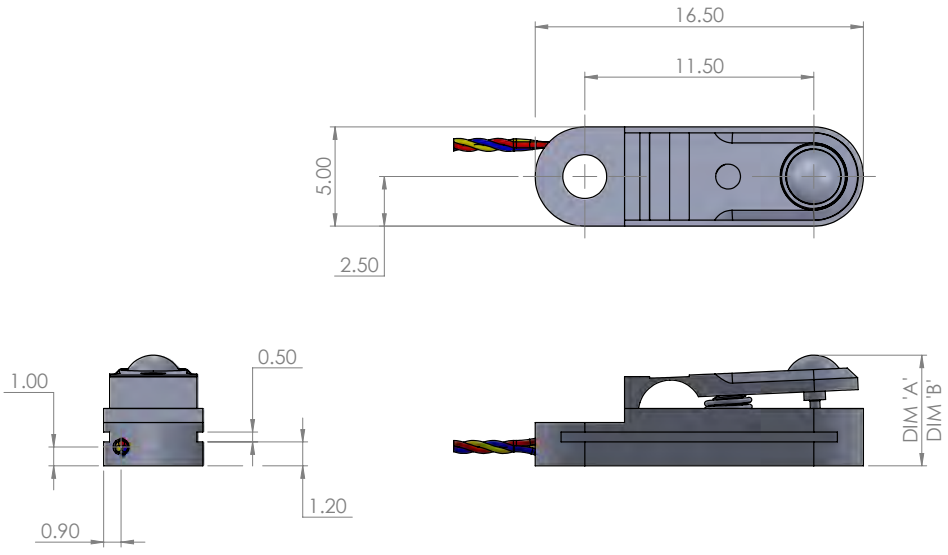



TOP MOUNT

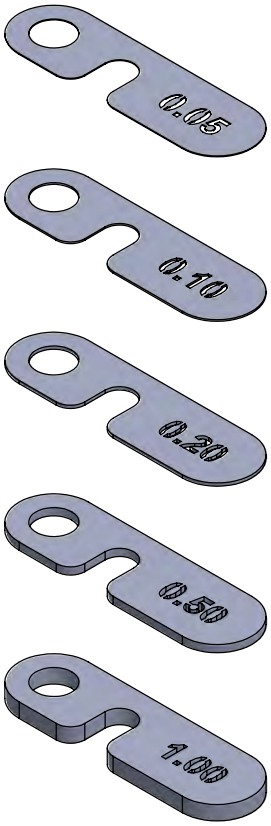



SIDE MOUNT

| | |
|---|---|
| **MEASUREMENT RANGE (mm)** | 0.4000 |
| **FULLY EXTENDED DIM 'A' (mm) MAXIMUM** | 5.55 |
| **PRE-TRAVEL (mm) NOMINAL** | 0.022 |
| **POST-TRAVEL (mm) MINIMUM** | 0.185 |
| **FULLY RETRACTED DIM 'B' (mm) MAXIMUM** | 4.94 |



# ORBIT® TRANSDUCER DIMENSIONS



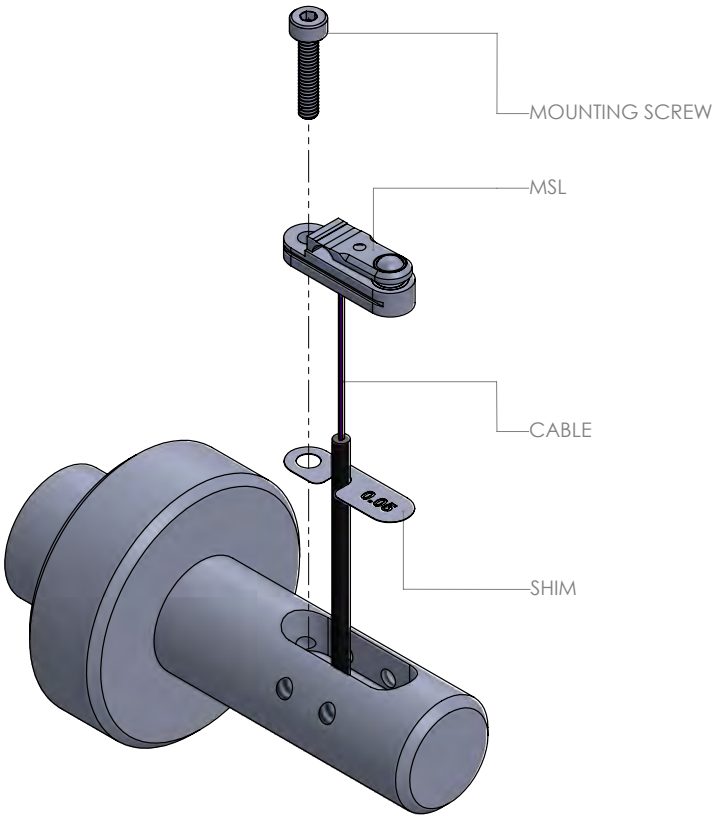

0.05 mm THICK

0.10 mm THICK

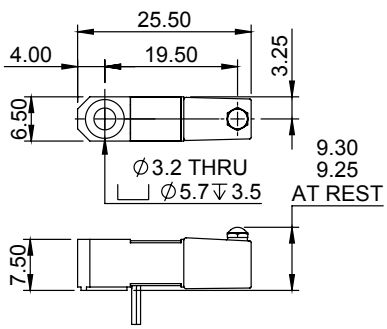
0.20 mm THICK

0.50 mm THICK

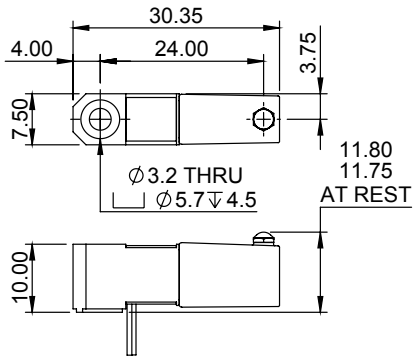
1.00 mm THICK




**Mini Probe** (DM)

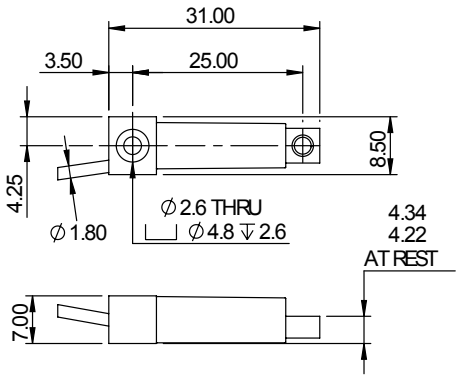



(DM/0.5/S)




(DM/1/S)

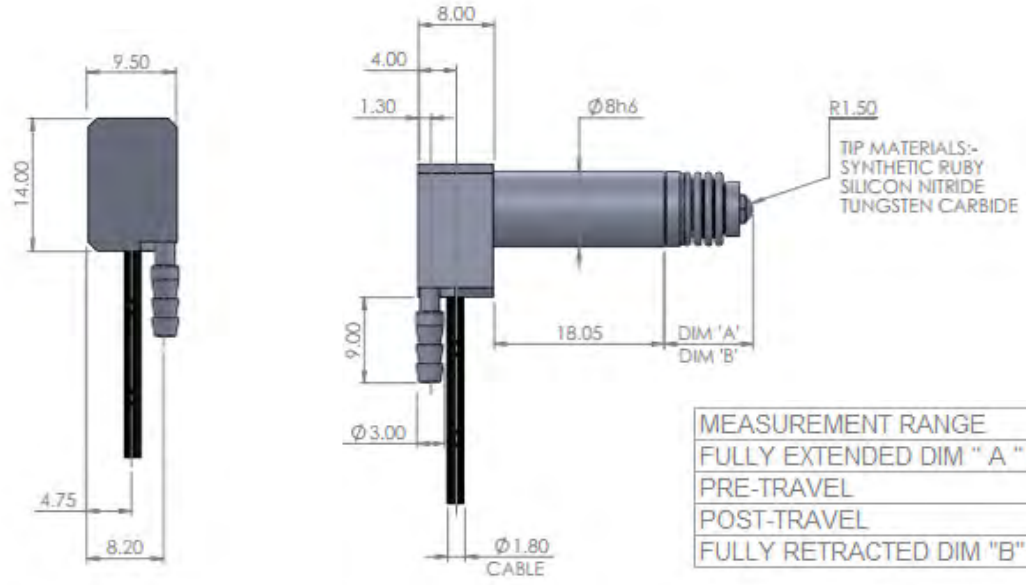
**Mini Single Leaf Flexure** (DUSM)




(DUSM/0.5/S)

# ORBIT® TRANSDUCER DIMENSIONS

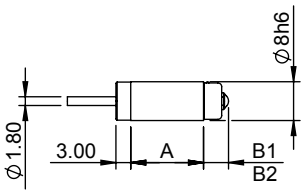
## DZ Compact Pneumatic Probes (DZR/P)



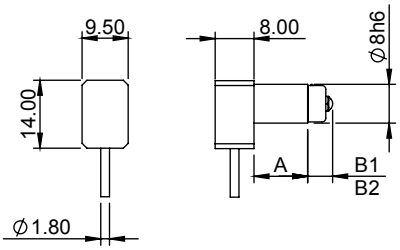

| | |
|---|---|
| MEASUREMENT RANGE | 2.00 |
| FULLY EXTENDED DIM " A " (mm) | 12.30 |
| PRE-TRAVEL | 0.15 |
| POST-TRAVEL | 0.45 |
| FULLY RETRACTED DIM "B" (mm) | 9.75 |

## Ultra Short Spring Push (DZ/S)

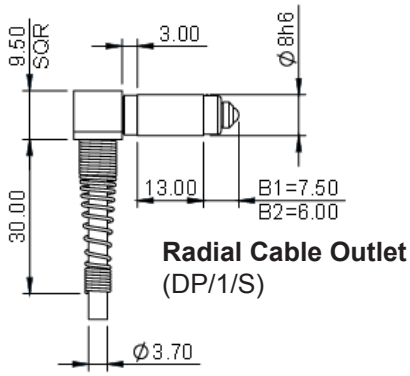
| | DZ/1/S | DZ/2/S | DZR/1/S | DZR/2/S |
|---|---|---|---|---|
| A | 15.00 | 19.50 | 11.00 | 15.50 |
| B1 | 5.15 | 6.25 | 5.15 | 6.25 |
| B2 | 3.65 | 3.65 | 3.65 | 3.65 |



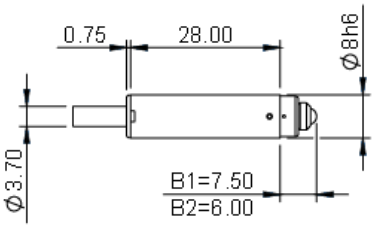

## Radial Cable Outlet (DZR/S)



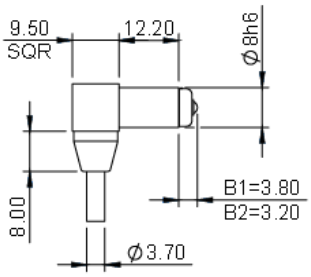

## Miniature Spring Push (DP/0.5/S & DP/1/S)




**Radial Cable Outlet**
(DP/1/S)



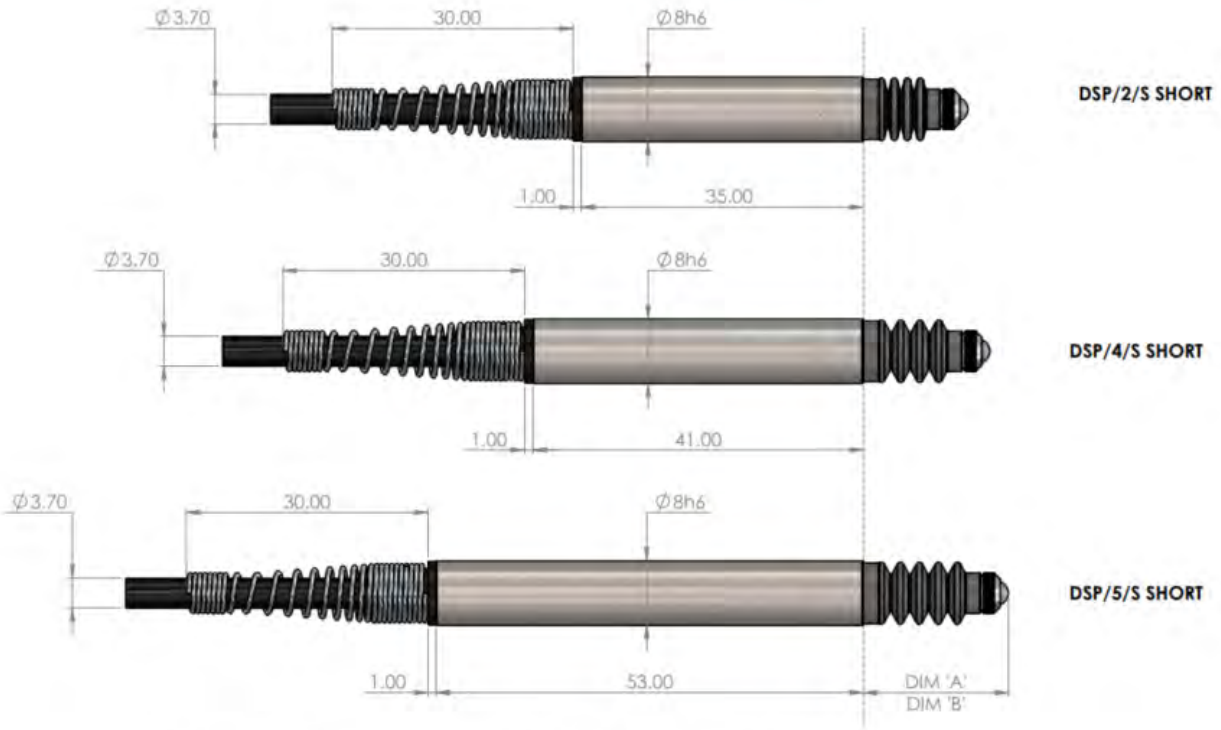

**Axial Cable Outlet**
(DP/1/S)




**Radial Cable Outlet**
(DP/0.5/S)

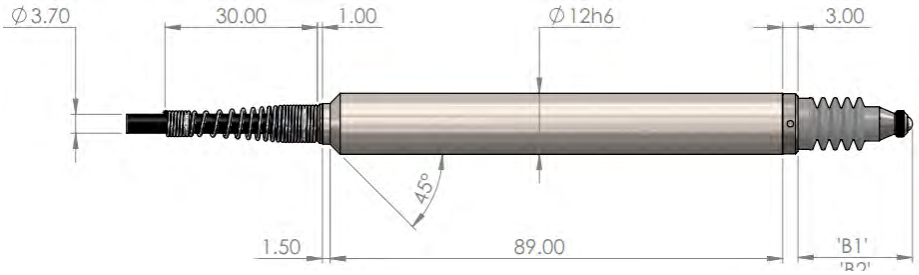
# ORBIT® TRANSDUCER DIMENSIONS

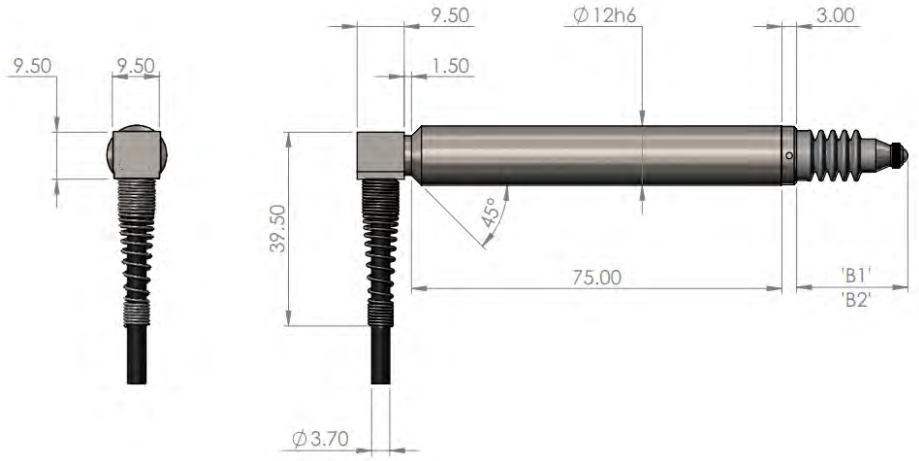
**Digital Short Probes** (DSP/S)

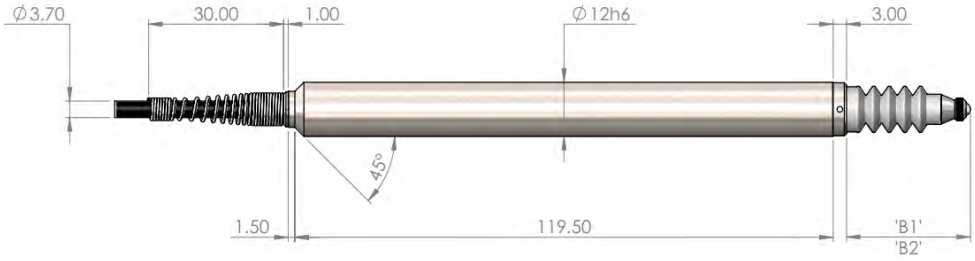


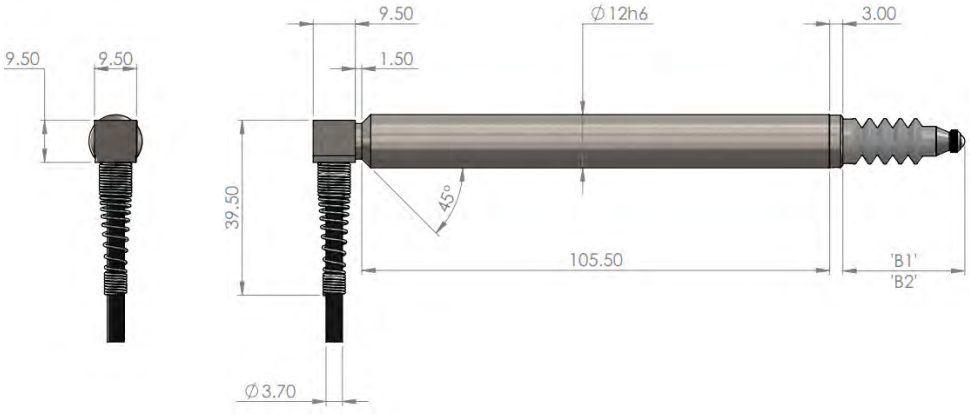

# ORBIT® TRANSDUCER DIMENSIONS

**12 mm Diameter Gauging Probes** (D12P/S)



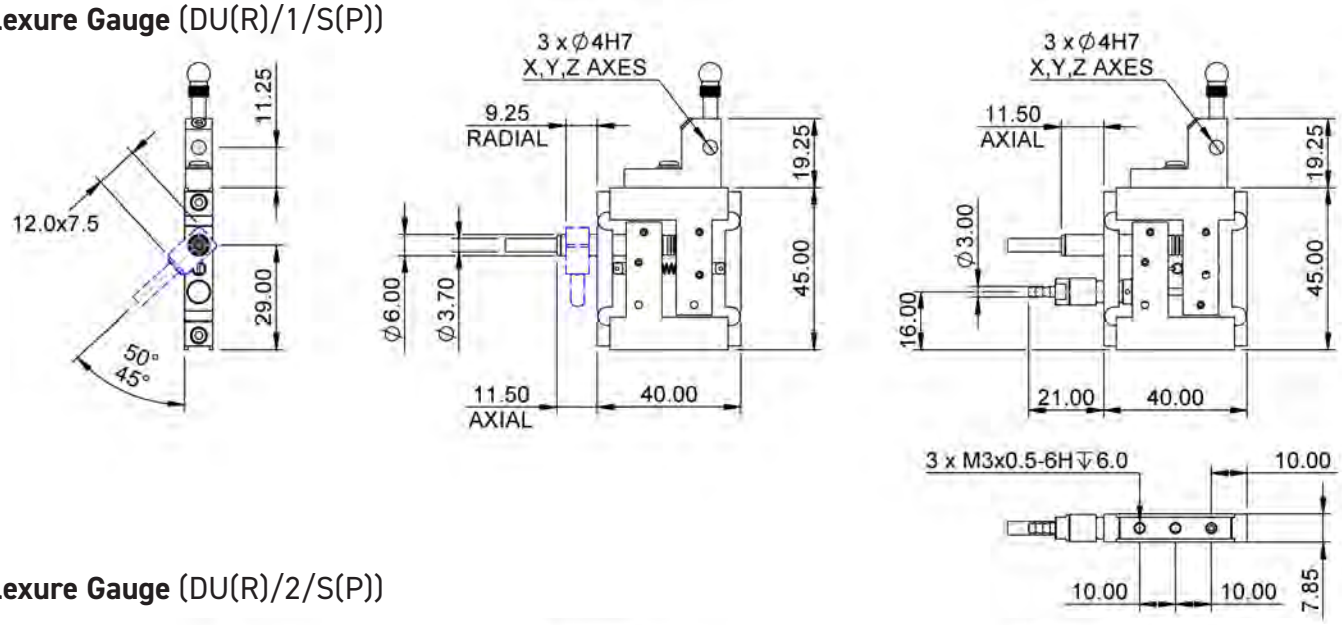



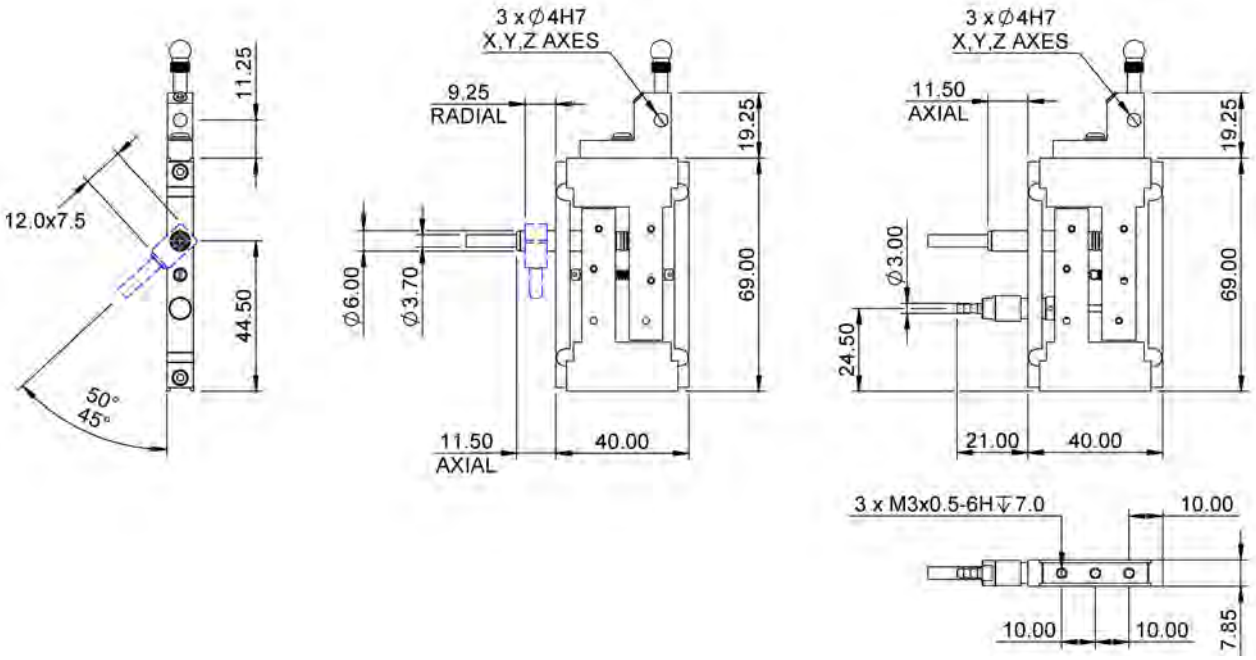



# ORBIT® TRANSDUCER DIMENSIONS

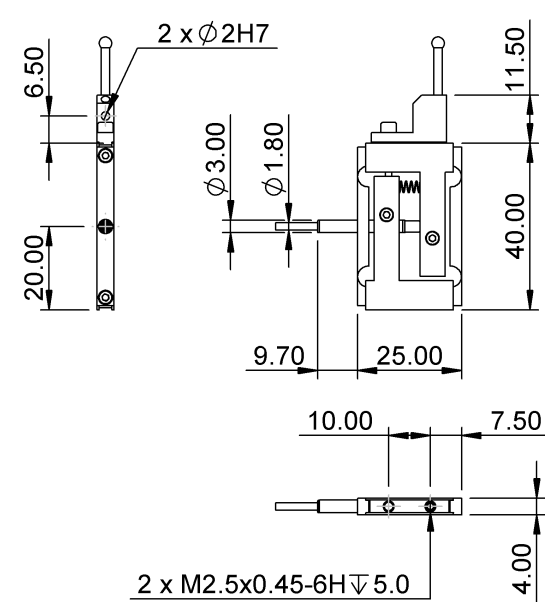
**Flexure Gauge** (DU(R)/1/S(P))



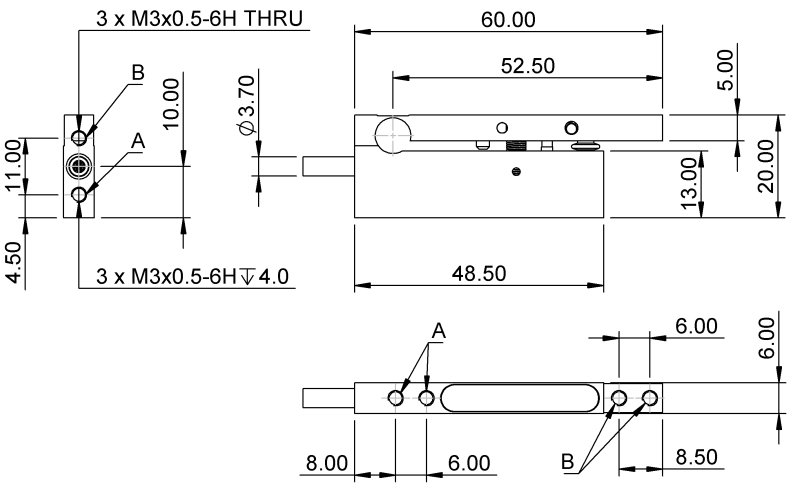

**Flexure Gauge** (DU(R)/2/S(P))




**Miniature Flexure Gauge** (DU/0.5/S)

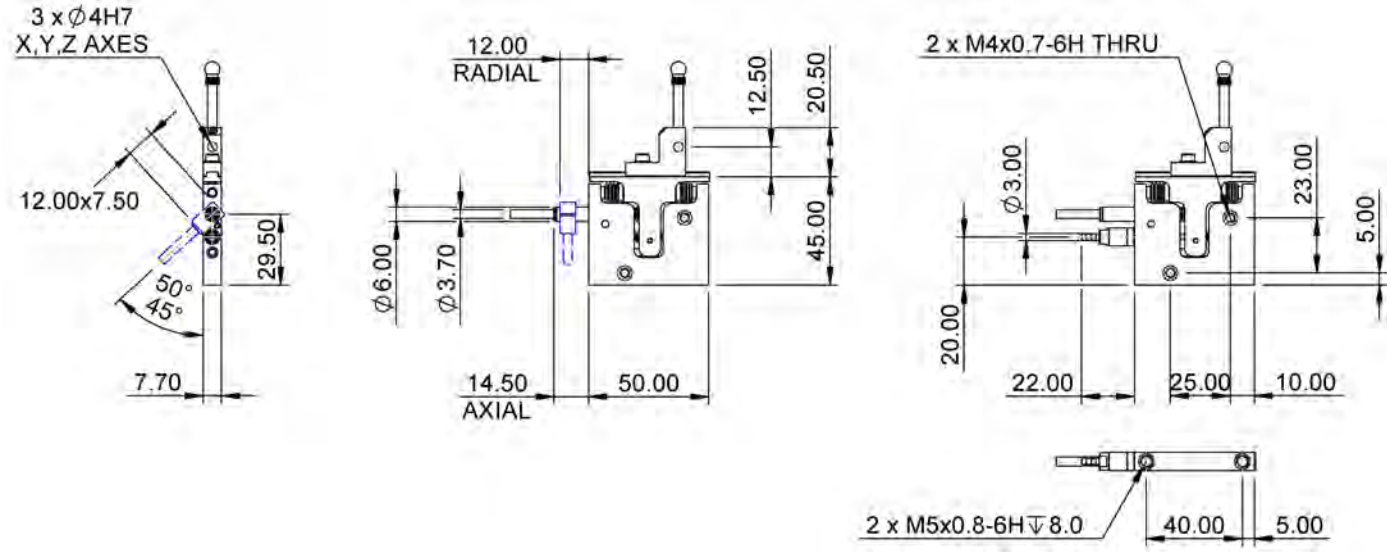



**Single Leaf Flexure** (DUS/0.5/S)

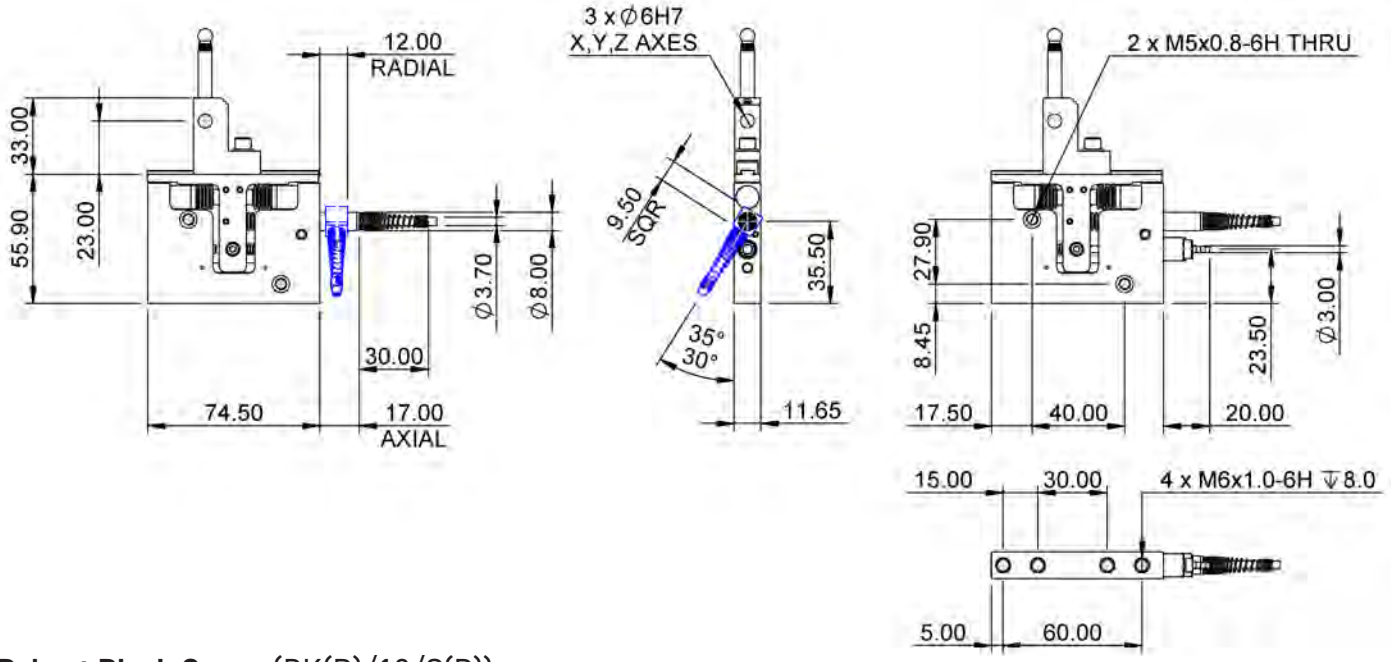


# ORBIT® TRANSDUCER DIMENSIONS

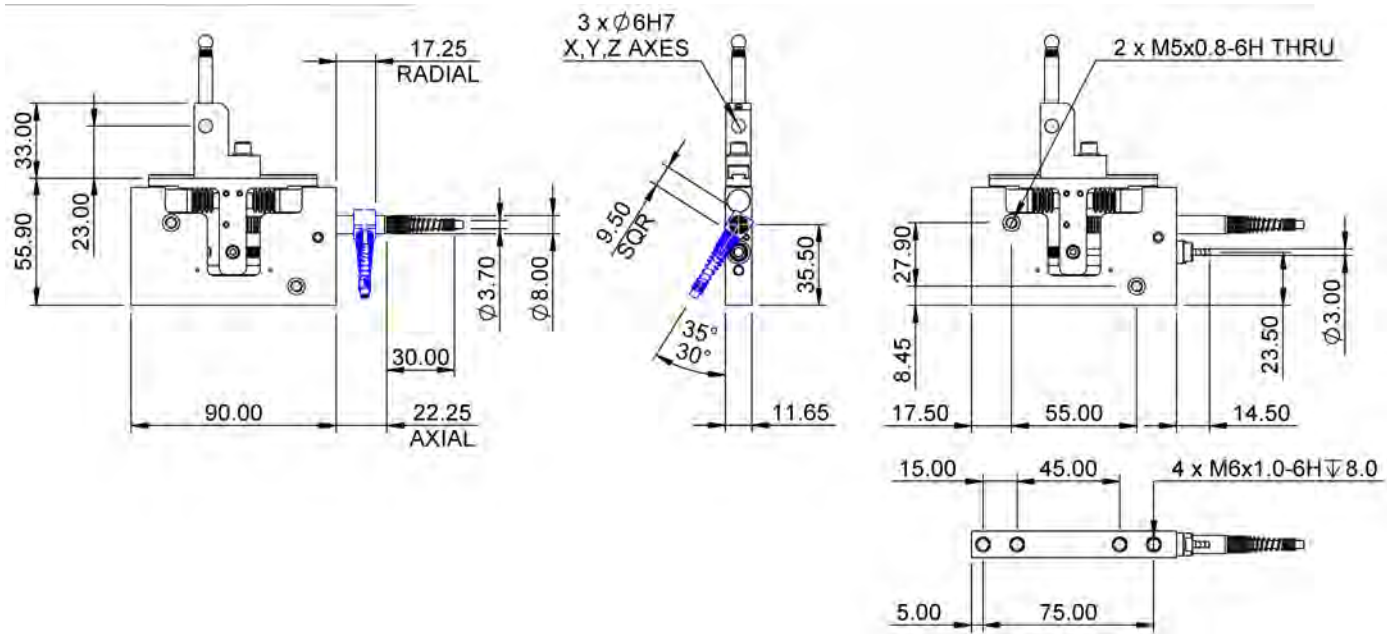
**Block Gauge** (DK(R)/2/S(P))




**Robust Block Gauge** (DK(R)/5/S(P))

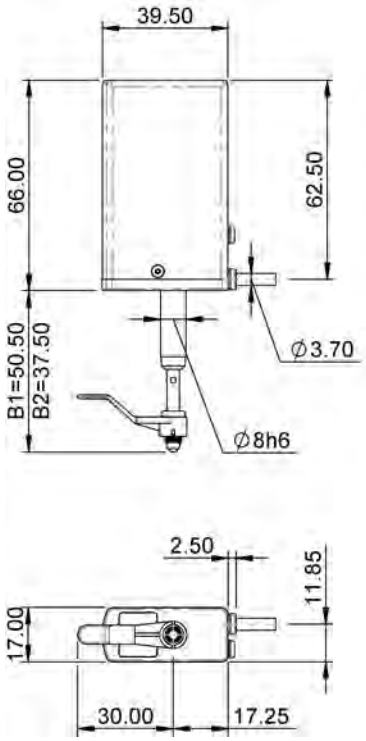



**Robust Block Gauge** (DK(R)/10/S(P))

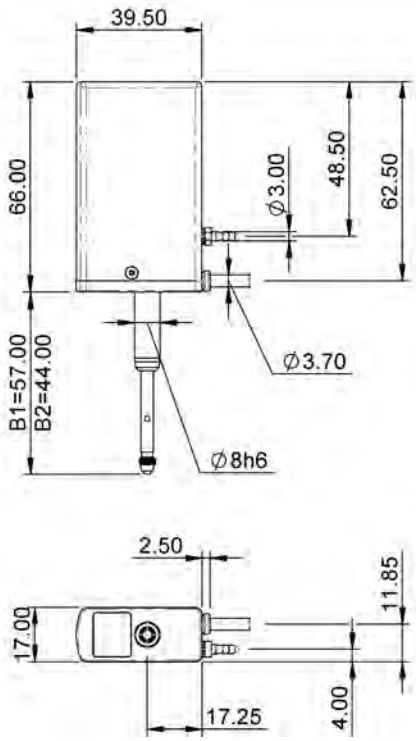


# ORBIT® TRANSDUCER DIMENSIONS

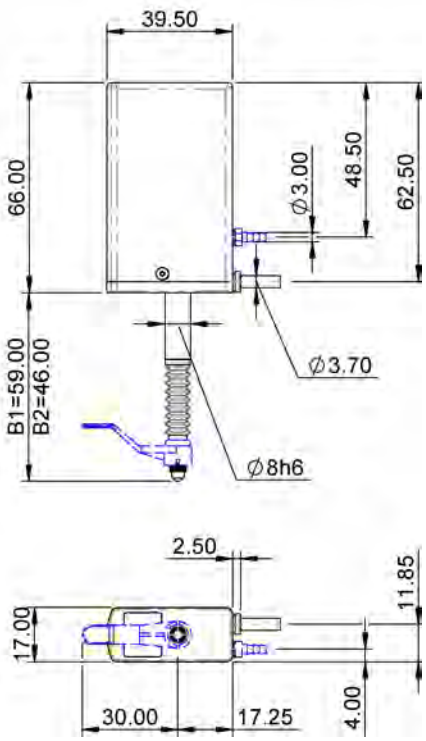
### LE/12/S - IP50



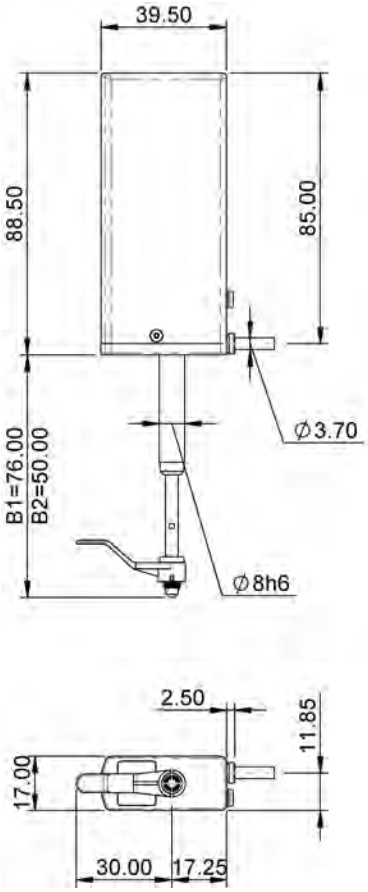

### LE/12/P - IP50



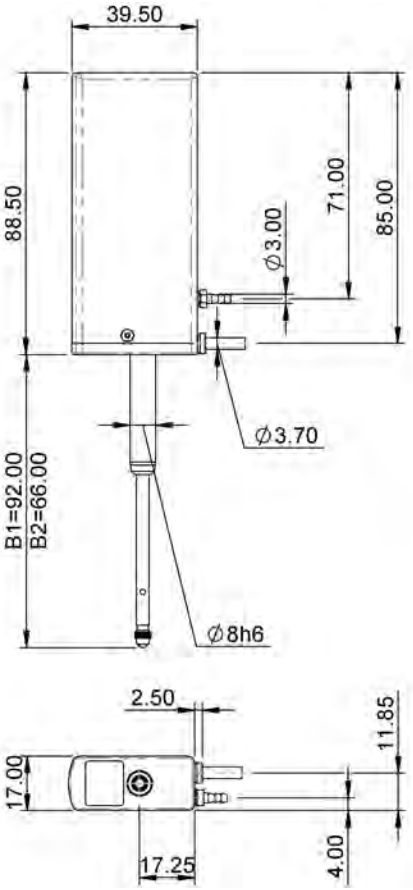

### LE/12/S(P) - IP65



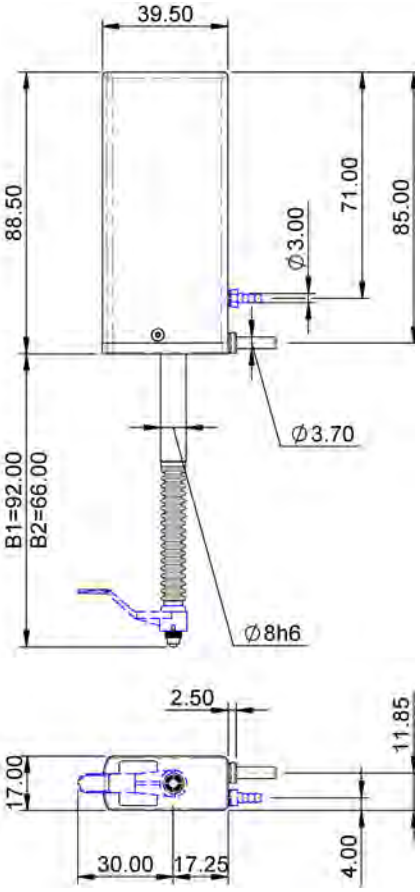

### LE/25/S - IP50




### LE/25/P - IP50




### LE/25/S(P) - IP65

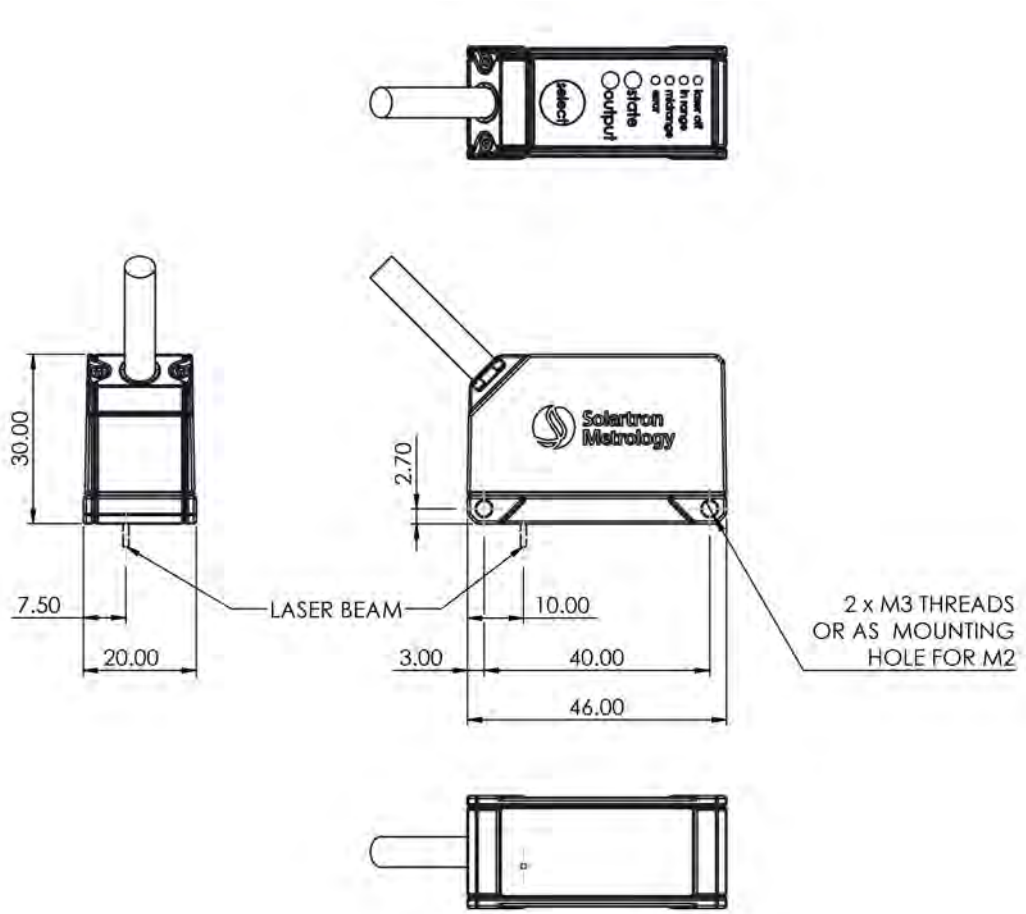



B1 - FULLY EXTENDED BEARING ASSEMBLY

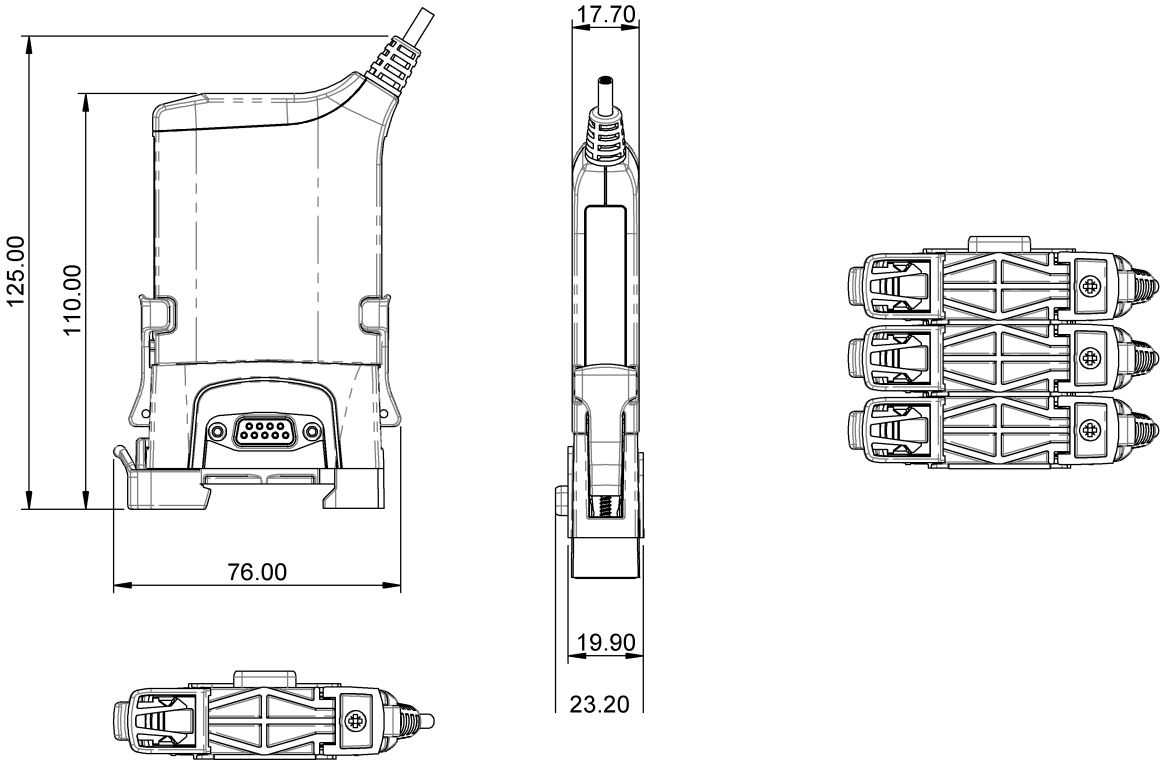
B2 - FULLY RETRACT BEARING ASSEMBLY

# ORBIT® DIMENSIONS

## Orbit LT

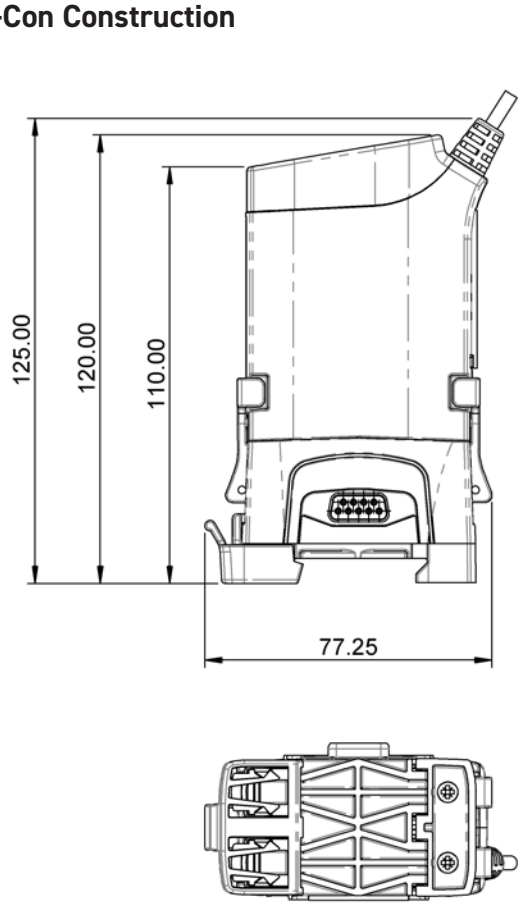


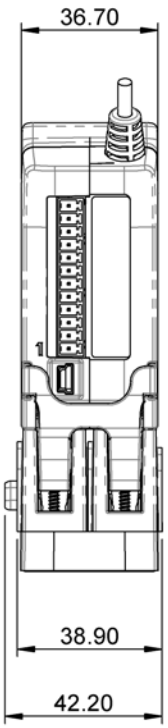

## Orbit T-Con Construction

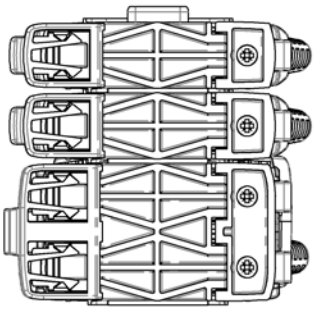


# ORBIT® DIMENSIONS

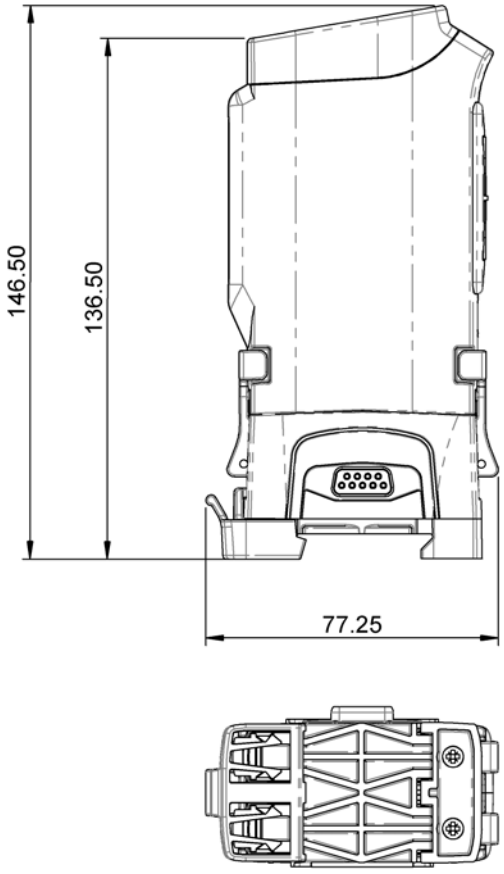
## ACS T-Con Construction

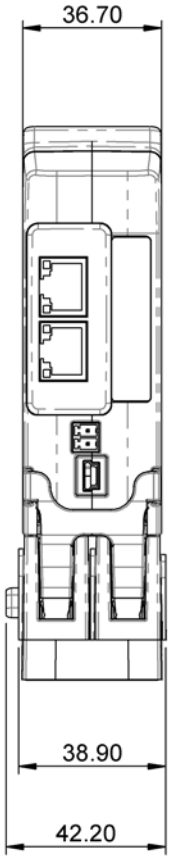


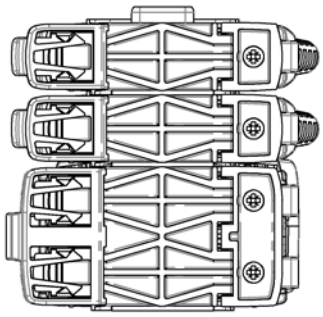



## PIM T-Con Construction



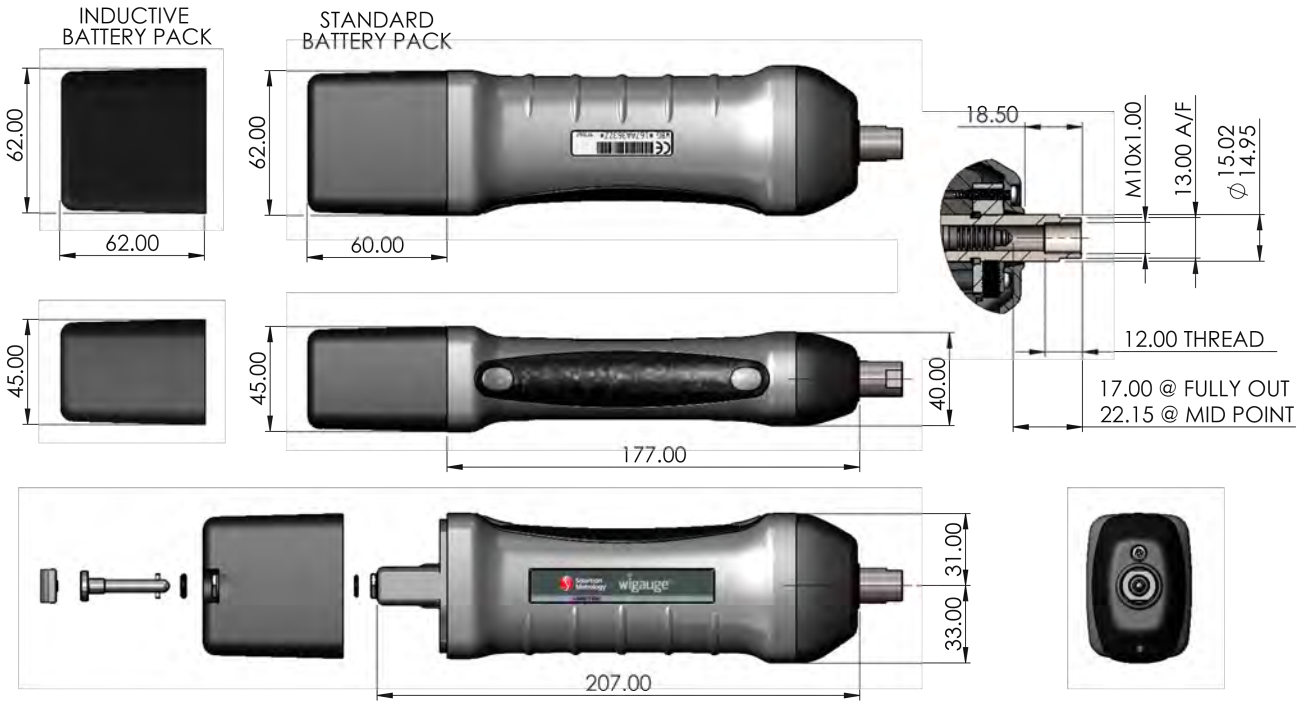



# ORBIT® DIMENSIONS

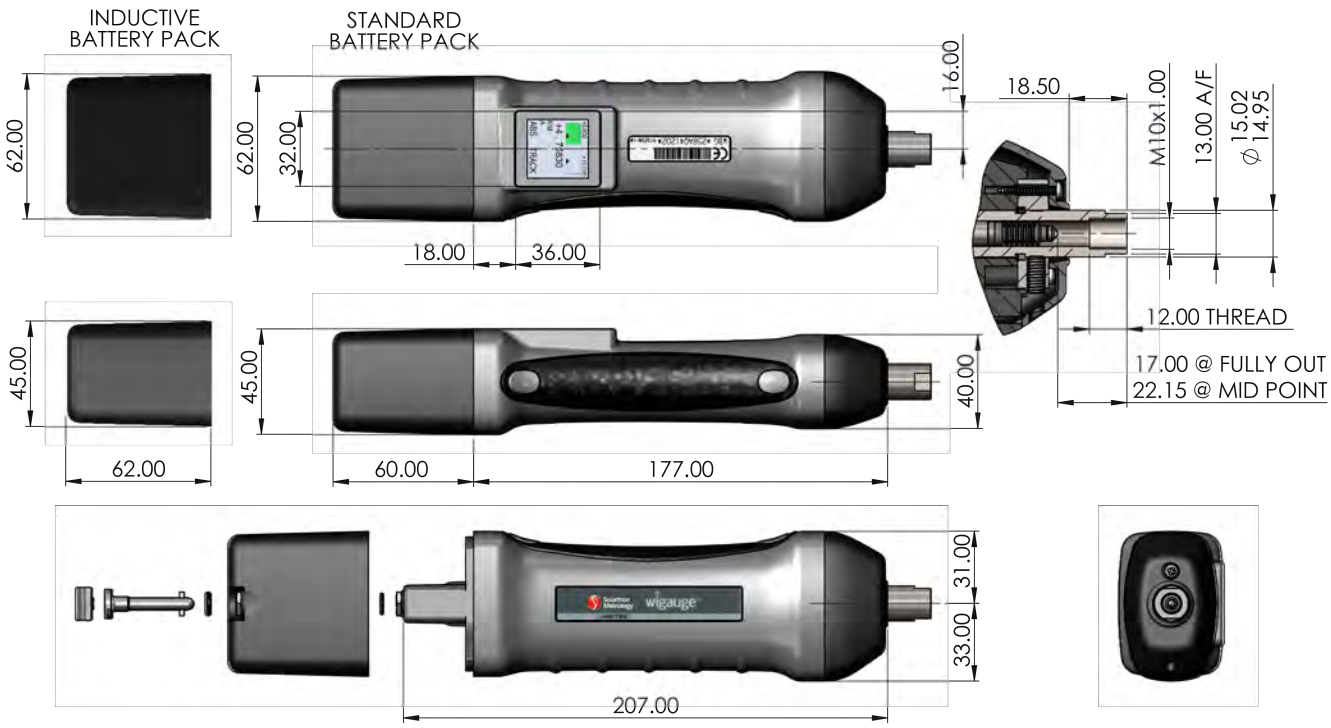
## WiGauge™ Wireless Hand Tool - Generation 1

540002-550



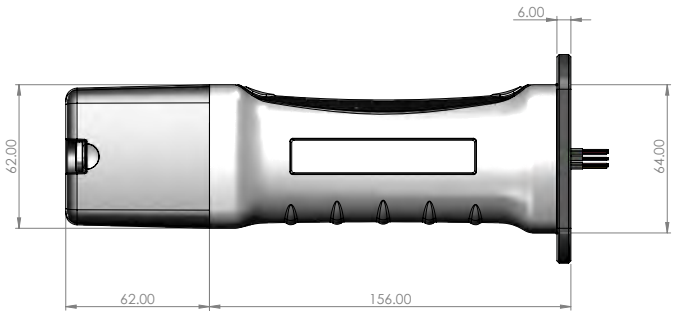

## WiGauge™ Wireless Hand Tool - Generation 2

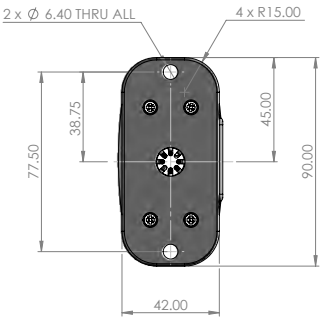
540002-552

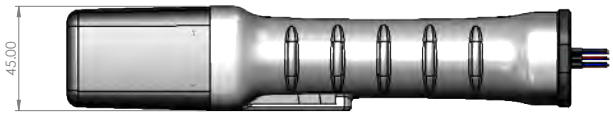


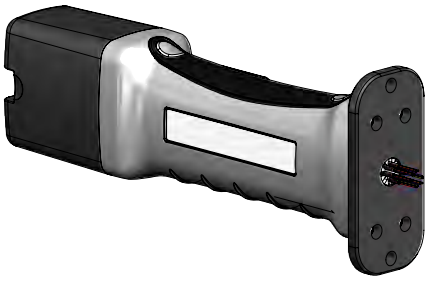
# ORBIT® DIMENSIONS

## WiGauge™ Wireless Hand Tool - Multi Channel

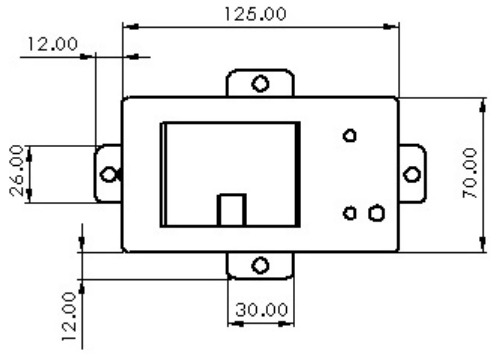


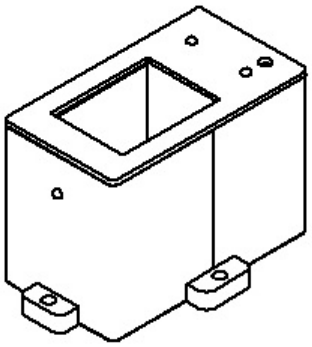



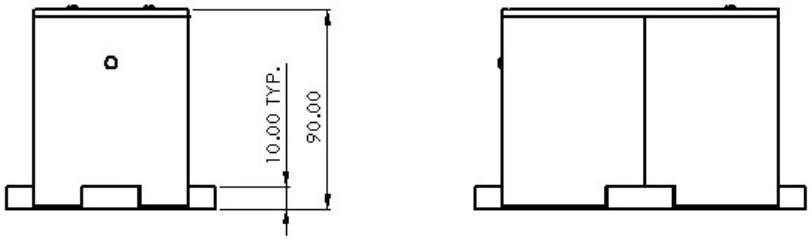



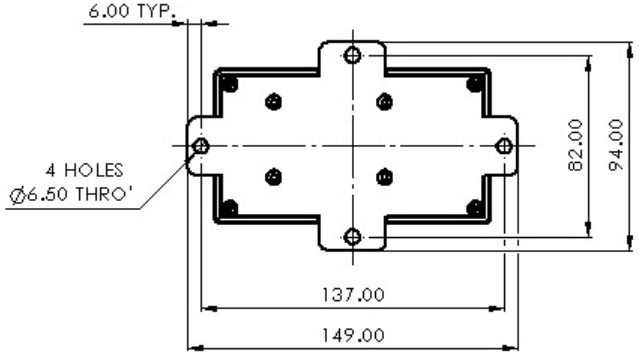



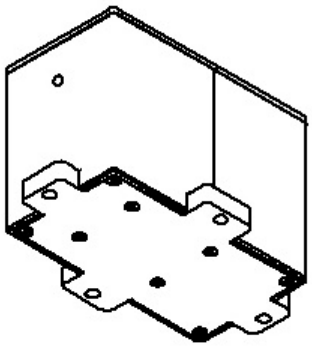
## WiGauge™ WHT Cradle



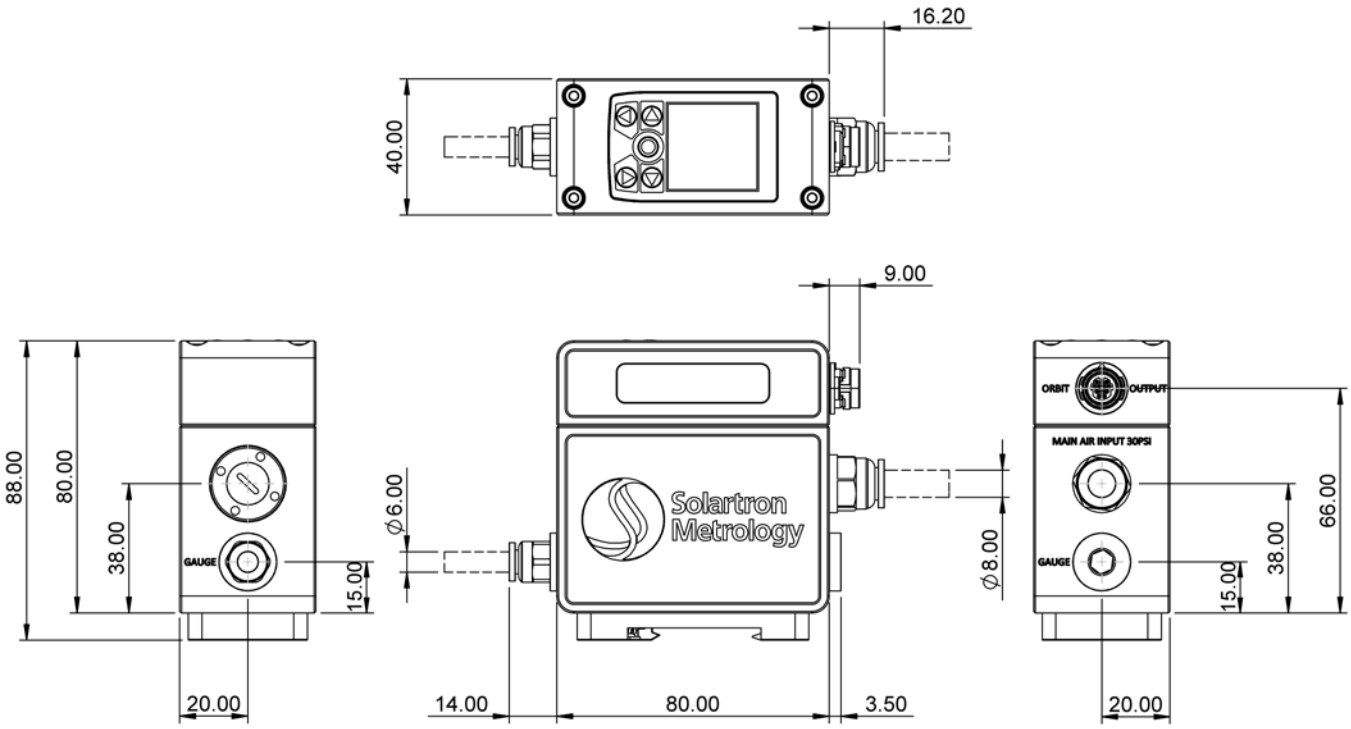


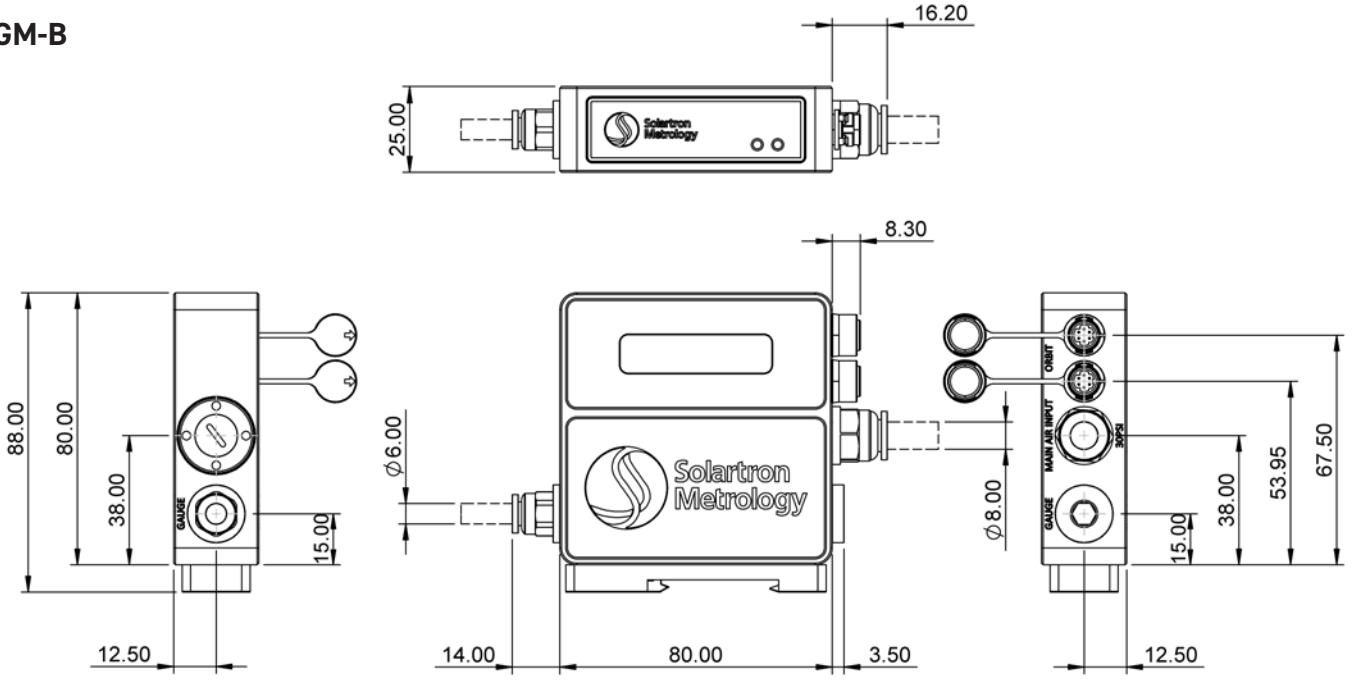



# AIR GAUGE (AGM) DIMENSIONS

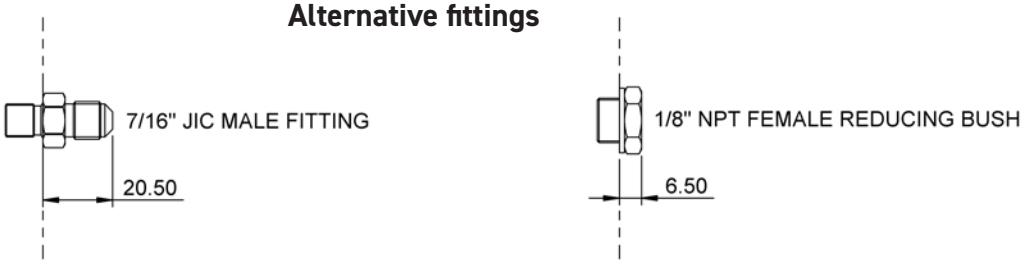
## AGM-A




## AGM-B




### Alternative fittings

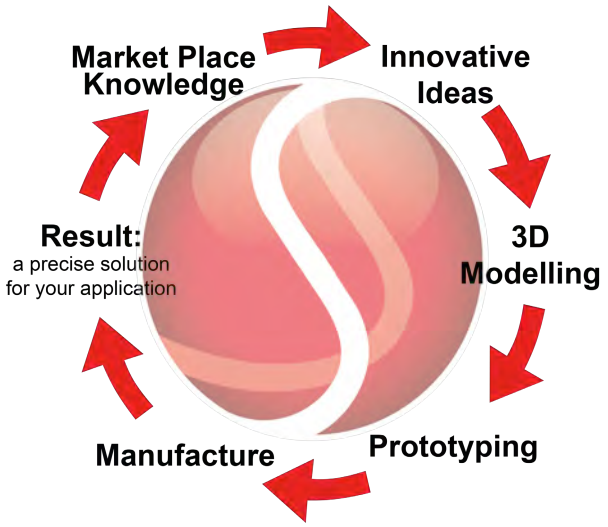


# TRIED, TESTED, AND APPROVED...

**Solartron Metrology is a world leader of high precision linear measurement solutions for quality control, test and measurement, and machine control.**

Originally established in 1946 as Faroll Research, Solartron Metrology is now part of the AMETEK Corporation, and manufacturers high-quality digital and analogue gauging probes, displacement transducers, linear encoders, non-contact sensors and various instrumentation.

Providing measurement sensors to the automotive, aerospace, electronics, materials, optics, semi-conductor and bearing industries, you can be sure that wherever you are, whatever your precision measurement application, as leading sensor manufacturers, we have the sensor technology, the commitment and the resources to help you make it better.




Quality and customer satisfaction have been central to the relationships that we have developed with our metrology & measurement customers over a period of many years. We are committed to providing the highest standards of sensor technology and service levels to all our metrology & measurement customers worldwide.

Solartron precision measurement sensors and transducers operate reliably in-use, maintaining their performance in demanding applications within many different industries.

Conformance to specification and reliability of precision measurement are primary considerations during development and manufacture of our sensors and transducers.

This is affected by the application of processes and procedures controlled within our linear measurement Quality Management System. All products are warranted for 12 months and servicing/ repair/calibration is provided where appropriate.

Our Quality Management System is certified to ISO 9001:2015 and operates throughout Solartron Metrology, helping us to measure, analyse and improve the precision measurement sensors and transducers and services that we provide.

We gained our original certification to ISO 9001 in 1990 and we are assessed on continuing basis by the British Standards Institution (BSI) which is a member body of ISO.

bsi.

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Solartron Metrology Limited
Steyning Way
Southern Cross Industrial Estate
Bognor Regis
PO22 9ST
United Kingdom

Holds Certificate Number: Q 09540

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

**The design, development and manufacture of position sensors (lvdt and other types) for industrial and aerospace applications. Associated signal conditioning equipment is included. Supplier of "factored" sensors and instrumentation products.**

For and on behalf of BSI:

Andrew Launn, EMEA Systems Certification Director

Original Registration Date: 1990-02-26
Latest Revision Date: 2021-02-03

Effective Date: 2021-03-10
Expiry Date: 2024-03-09

Page: 1 of 1

...making excellence a habit.

This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract.
An electronic certificate can be authenticated online.
Printed copies can be validated at www.bsigroup.com/ClientDirectory

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BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

CE RoHS COMPLIANT


# NOTES:

# GLOSSARY OF TERMS

## ACCURACY, PRECISION AND REPEATABILITY

- A sensor has limited use if a measured value cannot be accurately repeated.
- A sensor can be considered to be Precise in that its measured values are repeatable.
- A sensor can produce precise yet inaccurate readings.

Precise but not accurate

Accurate but not Precise

To be of true value, linear measuring sensors need to be both Accurate and Precise. Orbit® Digital Sensors are very linear over their full range, and are therefore accurate. They have excellent repeatability, and are therefore precise.

## ACCURACY

The accuracy of all Solartron Metrology Digital Sensors is quoted as % of reading, which is the method that is least open to interpretation (as opposed, for example, to best fit).

## ADAPTIVE SURFACE ADJUSTMENT

Orbit LT2 automatically adjusts beam intensity based on the surface for optimum repeatability

## HYSTERESIS

Hysteresis of a gauge probe is the difference from the true measurement when the direction of measurement is reversed.

## REPEATABILITY

Repeatability is defined as the ability of a sensor to provide measurements within a close distribution on the same measure and carried out in the same direction. Solartron uses a method of establishing repeatability where a side load is applied in four directions to reflect how sensors are used in most applications. Methods of establishing repeatability without applying a side load may produce better results but may not be representative of real life applications.

## RESOLUTION

The smallest increment a measurement instrument can detect and display—hundredths, thousandths, millionths.

## ORBIT® MODULE

A module that can be connected to the Orbit® System as part of a Network Channel. Modules perform various measurements and interface to the external world.

## ORBIT® INTERFACES AND GATEWAYS

Hardware that controls a network of modules and is used to provide a communication path between a PC or PLC and the Orbit® network.

## ORBIT® CHANNEL

A channel of an Orbit® Controller that is capable of supporting a network of modules. Channels are numbered either Channel 1 or Channel 2. (Channel 2 only exists depending on type of controller.)

## PIE

Probe Interface Electronics

## PLC

Programmable Logic Controller

## SPC

Statistical Process Control, an analytical technique that plots data over time.

## T CON

A 3 way connector containing a chip (E PROM) to provide the address of a sensor or module in the Orbit® Network.

INNOVATIVE
MEASUREMENT
TECHNOLOGY LTD.



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