AMETEK®
ULTRA PRECISION TECHNOLOGIES

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SENSORS AND COMPONENTS

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QUALITY SYSTEMS SOLUTIONS GMBH

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Solartron Metrology
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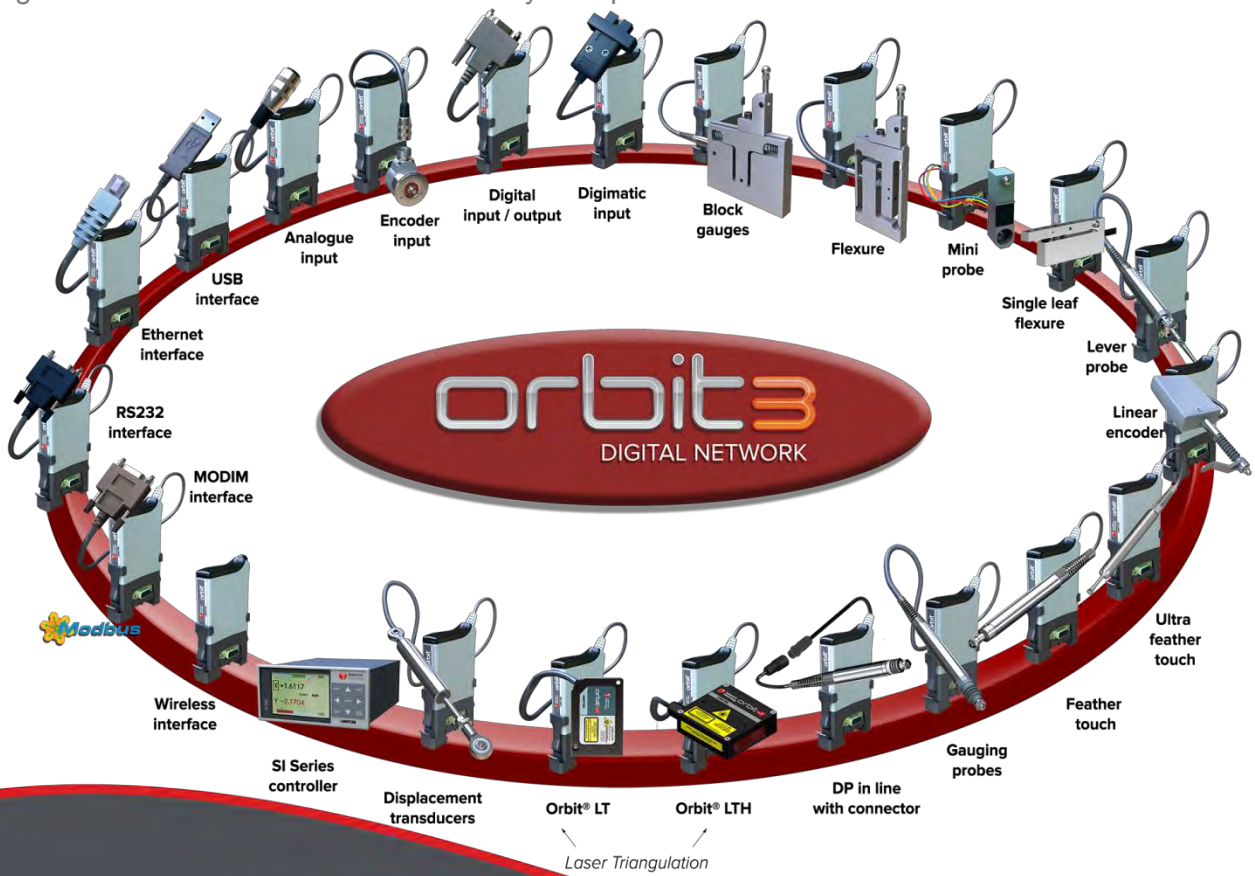
# orbit3
## Digital Measurement System

The Solartron Orbit® 3 Digital Measurement System, in conjunction with Solartron's wide range of transducers, including both contact and non-contact linear measuring transducers (gauging probes), specialist transducers and third party transducer interfaces, provides a limitless set of measuring system solutions, with numerous different interfaces to computers and PLC's, making Orbit® 3 completely flexible.

**Orbit® 3 – The Total Measurement System from Solartron Metrology**

### FEATURES

- **Excellent metrology performance**, high **accuracy,** high resolution and excellent **repeatability**
- Excellent lifetime value – low maintenance costs due to the high reliability of mechanics and electronics
- Wide range of compatible transducers
- **Fast reading rates** with **high data integrity**
- Network up to 150 different transducers with one interface
- Communicate with any computer or PLC
- Range of Software drivers and tools for easy set up




## Precision. Quality. Reliability

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# Digital Measurement System

Orbit® 3 is the latest high performance offering from Solartron Metrology. Originally developed to provide a simple means of connecting Solartron Linear Measuring Transducers into networks by eliminating the need to use analogue transducers and amplifiers which required individual channel set up and ongoing maintenance. Calibrating the transducer and electronics together makes the system very linear across it's full measurement range, thus removing the need for expensive minimum and maximum gauging masters.

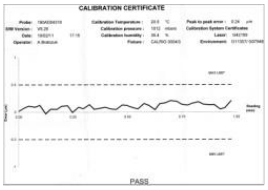
The Orbit® system has been continually developed since its introduction in 1998, using in-service data and customer feedback to produce a modern fast digital measurement system that works with a wide range of Solartron and third party sensors. Orbit® 3 provides solutions for many measurement applications, including temperature, load cells, pressure sensors, linear displacement, structural monitoring, gauging and many more.

## Orbit® 3 Building Blocks

The system comprised of measurement modules with and without attached transducers, controllers that provide the link between a PC or PLC and the network, software drivers and applications for ease of data capture, specialist cables for high speed data with enhanced integrity, and various specialist power supply modules. All the Orbit® products are fully EMC compliant. The range is further enhanced by digital readouts and the Orbit® ACS products, both of which are ideal for small systems.

Orbit® 3 Module and TCON

Orbit® 3 Modules on DIN rail




Calibration traceable to UK National Standard

Status indicators on modules

The network is based on DIN Rail mounted modules which employ the unique TCON connection system to allow easy expansion or replacement of measuring modules. TCONs can be left permanently in place and modules/transducers swapped. Status indication lamps on each module show the health of the module.

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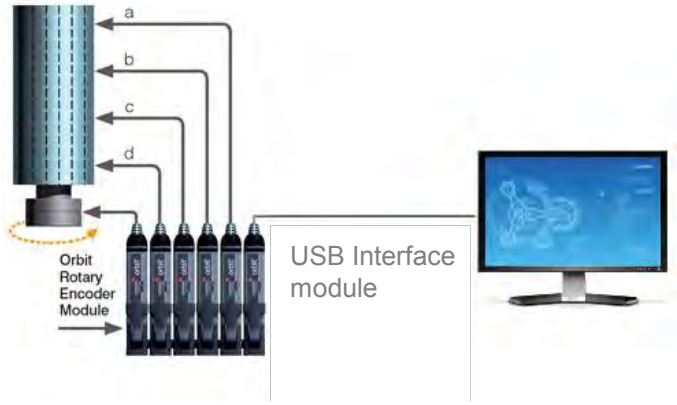
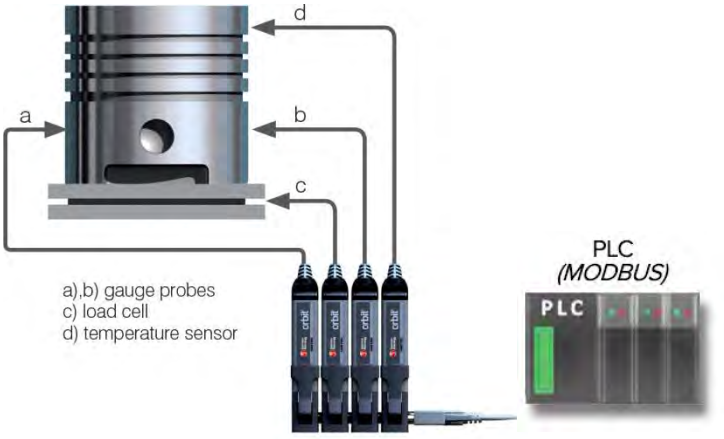
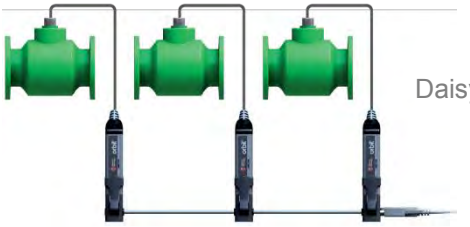
# Orbit® 3 Digital Measurement System: Applications




Synchronised high-speed profiling of a rotating cylinder

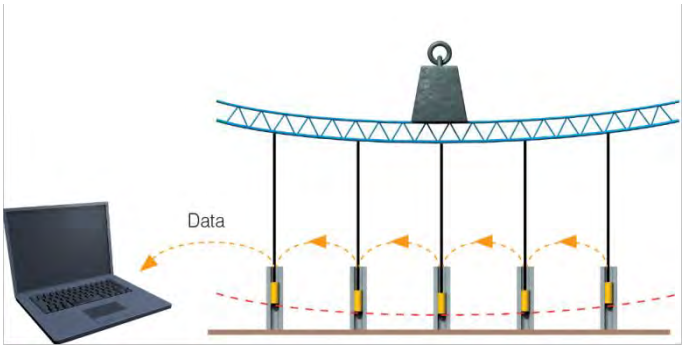
Check the diameter, weight, and temperature of a piston, all with one connection to PLC



Daisy chained pressure sensors

Network Displacement Transducers to monitor change in a structure



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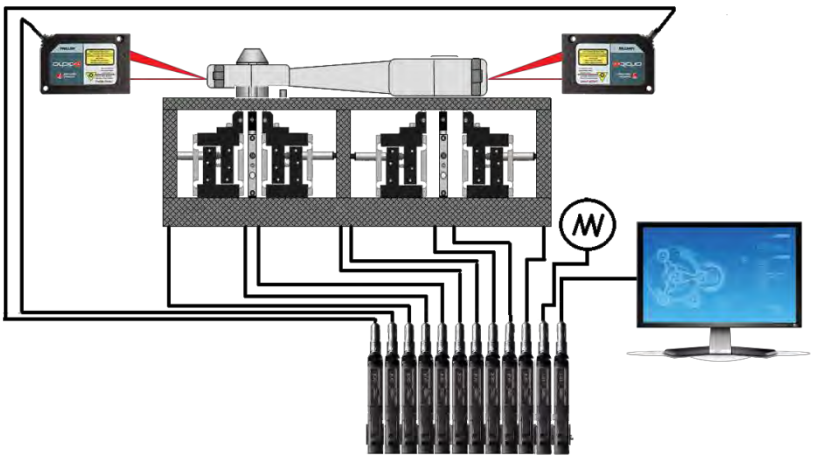
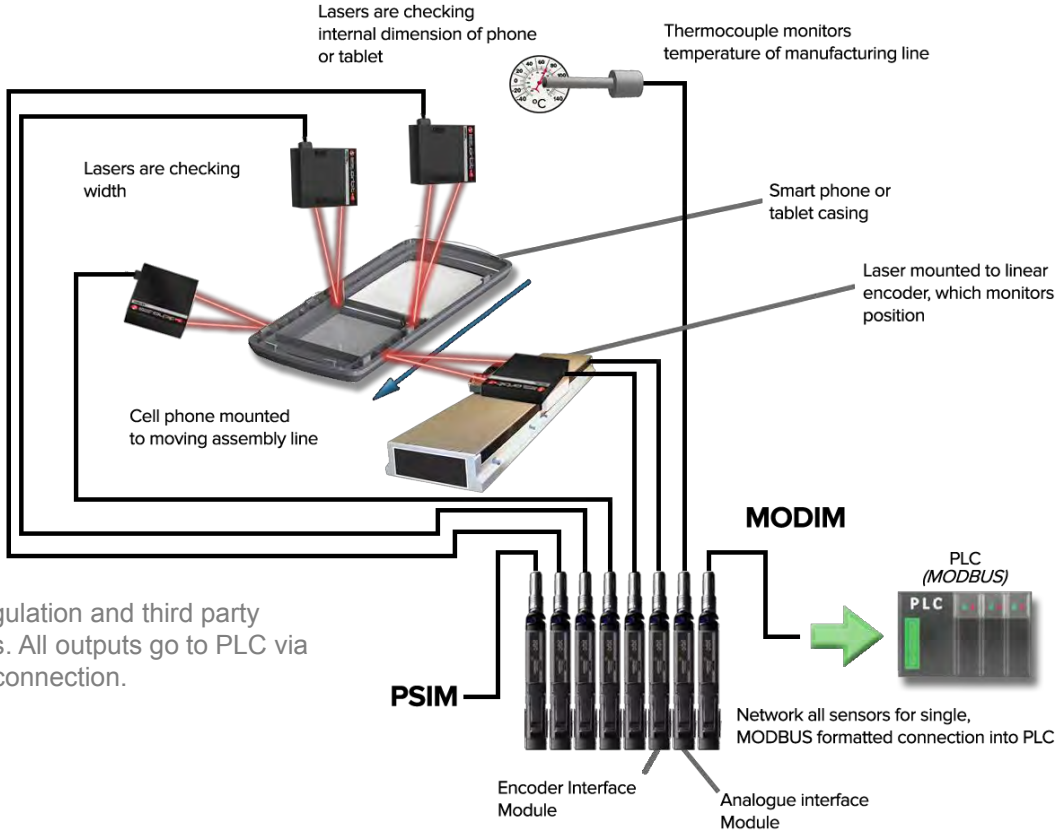
# Orbit® 3 Digital Measurement System: Applications



Solartron Flexure Contact Transducers and Non Contact Laser Triangulation Transducers. Connected to PC via USB Controller.




Laser Triangulation and third party Transducers. All outputs go to PLC via one simple connection.

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# Orbit® 3 Digital Measurement System: Controllers

## Solartron provide a wide range of Orbit® 3 controllers which interface to PC's and PLC's

| | USBIM | ETHIM | RS232IM | RS485IM | WIM | MODIM |
|---|---|---|---|---|---|---|
| |  |  |  | |  |  |
| Connection | **USB 2.0** | Ethernet | **RS232** | RS485 | **Bluetooth** | MODBUS RTU |
| Data Rate (max) Baud | **12MB** | 10/100 MB | **115200B** | 115200B | **3Mbps** | 115200B |
| No of Modules | **150** | 150 | **150** | 150 | **150** | 150 |
| No of Module powered [1] | **4** | 0 | **0** | 0 | **0** | 0 |
| Measuerment Modes [3] | **All** | Static, Readburst | **Static, Readburst** | Static, Readburst | **Static, Readburst** | MODBUS |
| Readings per second [2] | **3906 (max)** | 300 (typical) | **150 (typical)** | 150 (typical) | **25 (typical)** | MODBUS |
| Nominal Power Requirment mA @ 5V (No load) | **250** | 350 | **62** | 62 | **120** | 62 |

**Note 1** **The USB controller can power up to 4 Orbit® Modules of most types. Some products require additional power supply modules.**

**Note 2** **Readings per second for up to 16 modules.**

**Note 3** **See measurement mode table.**

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# CONNECT TO THIRD PARTY SENSORS

Solartron offer a range of modules to provide interfaces to other transducers and control processes. The flexible AIM (Analogue Input Module) can take inputs from any transducer with a voltage of current output, the EIM (Rotary) Encoder Input Module provides a route to angle information which can facilitate part profiling and the DIOM provides control inputs and outputs.

| | AIM | EIM | DIOM | DIM | SGIM |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| Input Type | **Analogue** | Pulse (TTL) | **Discrete** | DIM | **Voltage (mV)** |
| Typical Input | **load cells, temperature transducers, airgauge** | Rotary Encoder | **Switch** | Digitmatic Transducer | **Strain Gauge** |
| Input Range [1] | **±10V, ±5V, 0-10V, 0-5V 4-20mA, PT100** | 30V @ 10mA | **30V @ 1mA** | As pre transducer | **10 range 3.2 - 399 x (313 - 2.95 mV)** |
| Input Frequency | **460Hz** | 1.2MHz | **N/A** | N/A | **6 - 500 Hz** |
| Input Channels | **1** | 1 | **8** [2] | 1 | **1** |
| Output Range | **N/A** | N/A | **Discrete Drive up to 30V @ 50mA** | N/A | **N/A** |
| Measuerement Modes [3] | **All** | All | **All** | Static | **All** |
| Readings per second | **3906** | 3906 | **3906** | Readings on request | **3906** |
| Nominal Power Requirment mA @ 5V (No load) | **78** | 49 | **42** | 29 | **122** |

**Note 1** **AIM: Other ranges available on request**
**Note 2** **Each channel can be connfigured as either input or output**
**Note 3** **See measurement mode table**

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# POWER SUPPLY INTERFACE MODULES (PSIM)

PSIMs are used to power a network of Orbit® modules and sensors from an AC or DC power source. Most Solartron sensors and modules run on 5V, except Orbit® LT and Orbit® LTH which also require 24VDC. Certain PSIMs can output both voltages.

The AC PSIM is supplied connected to a mains power Module with the appropriate mains lead.
The DC PSIM is supplied with a standard 2 m cable.

## Technical Specification

| Product | | AC PSIM | DC PSIM | DC PSIM/24/5 | Aux AC PSIM/24 |
|---|---|---|---|---|---|
| Primary Output | VDC | 5 | 5 | 5 | 24 |
| | Current (A) | 1.8 | 1.8 | 1.8 | 1.0 |
| Secondary Output | VDC | None | None | 24 (Note 1) | None |
| | Current (A) | None | None | Note 2 | None |
| Max No of Orbit Modules | | 31 | 31 | 31 | (Note 3) |
| Supply Voltage | VAC | 100 to 240 | N/A | N/A | 100 to 240 |
| | VDC | N/A | 10 to 30 | 10 to 30 | N/A |
| Supply Frequency | Hz | 50-60 | DC | DC | 50-60 |
| Supply Connection (Note 4) | | IEC320Plug | 2 m Cable | 2 m Cable | IEC320Plug |

## 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: 24V output of DC PSIM will track the DC input.

Note 2: 24V current depends on external supply.

Note 3: the Aux AC PSIM only supplies 24V auxillary power for products that require additional 24V in addition to the standard 5V, these PSIMs do not power the Orbit® Network.

Note 4 : The country specific mains cable is supplied when ordering.

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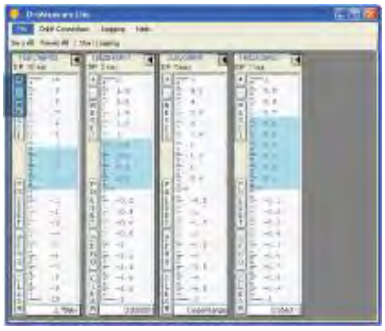
# SOFTWARE DRIVERS

Connect Orbit® to SPC, Excel, or build your own program with the Orbit® Support Pack

## FEATURES

- Windows 8, 7, and XP 64 bit and 32 bit Compatible
- Managed Code based on Microsoft .NET Framework
- OrbMeasureLite Application – basic system up and going out of the box
- Orbit® Library Tester contains source code for all Orbit® commands which may be used by customers to develop own applications
- Language specific programming examples



Orbit® Measure Lite Demo

To download the latest support packs for free, go to www.solartronmetrology.com

# MEASUREMENT MODES

Several different Orbit® measurement modes are available with the support pack and interface modules

| Measurement Mode | Description | Application |
|---|---|---|
| Static | In this mode the Orbit Modules are communicated with on an individual basis. Each module is asked for its measurement data by the controller as required. | Static measurment of attributes |
| Dynamic | Dynamic mode is a method to obtain synchronised data from transducer/modules on the Orbit network at high speeds up to 3906 readings per second. Data capture can be triggered from an Encoder Input Module or from the Controller Module. | Profiling, High Speed monitoring. |
| Readburst | ReadBurst command retrieves a single, synchronised block of readings from transducers/modules on the Orbit Network. | High Speed Synchronised readings |

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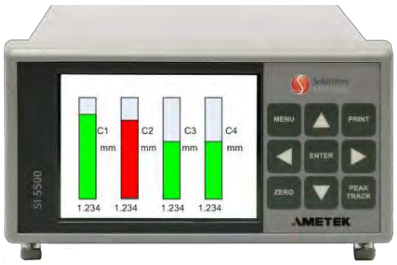
# READOUTS

Connect Orbit® transducers to a variety of stand-alone display units


**SI 3500**
- Dual input channels (A and B)
- Zero, Preset or Absolute
- Selectable metrology functions e.g. A+B, (A+B)/2
- Discrete Input and Outputs
- Serial Interface Port
- Data logging
- Analogue Outputs




**SI 5500**
- Up to 31 input channels; up to 16 displayed
- Zero, Preset or Absolute
- User programmable metrology functions with full maths capability
- Discrete Inputs and Outputs
- Serial Interface Port
- Data logging

orbitACS

Orbit® ACS is a specific range of products which integrate contact and non contact linear measurement transducers with an electronics module that includes an integral display. These products are excellent for a small number of measuring points, are stand alone (i.e. do not require PSIMS or Orbit® Controllers) and have an integral Modbus and ASCII interface plus flexible discrete I/O

See separate Orbit® ACS datasheet for more details

**SI 100**
•Single channel

**SI 200**
•Dual channel

**SI 400**
•Four channel

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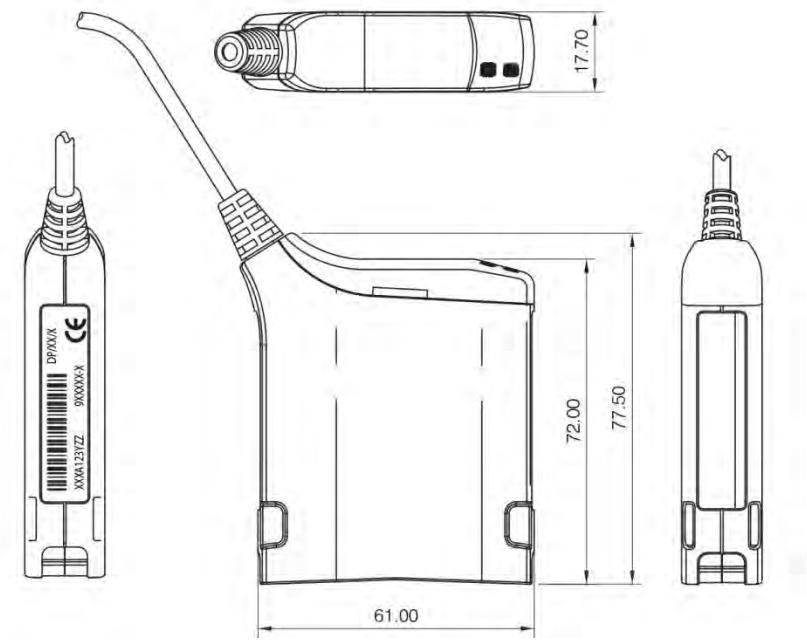
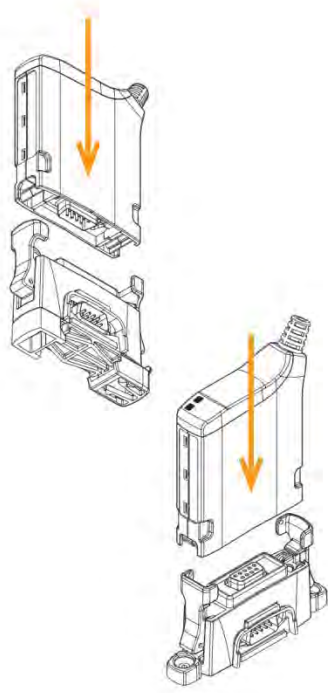
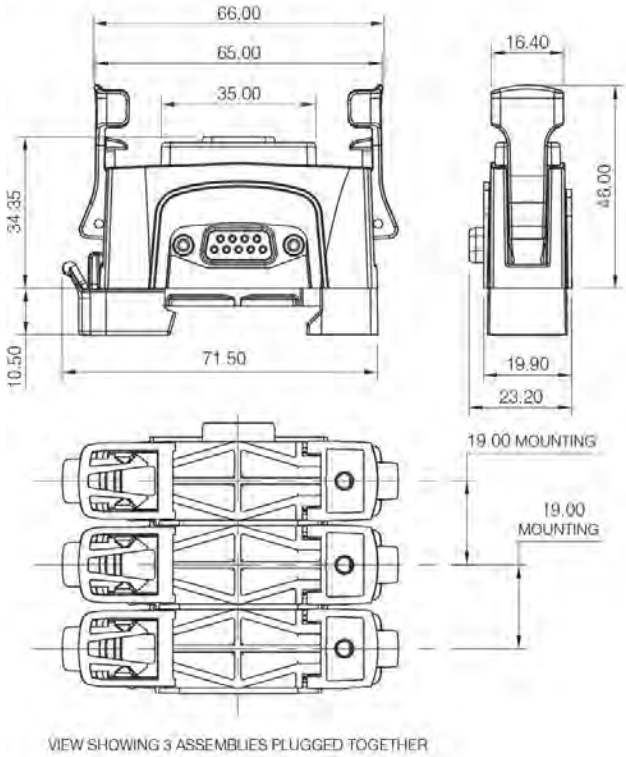
## PIE (Probe Interface Electronics)



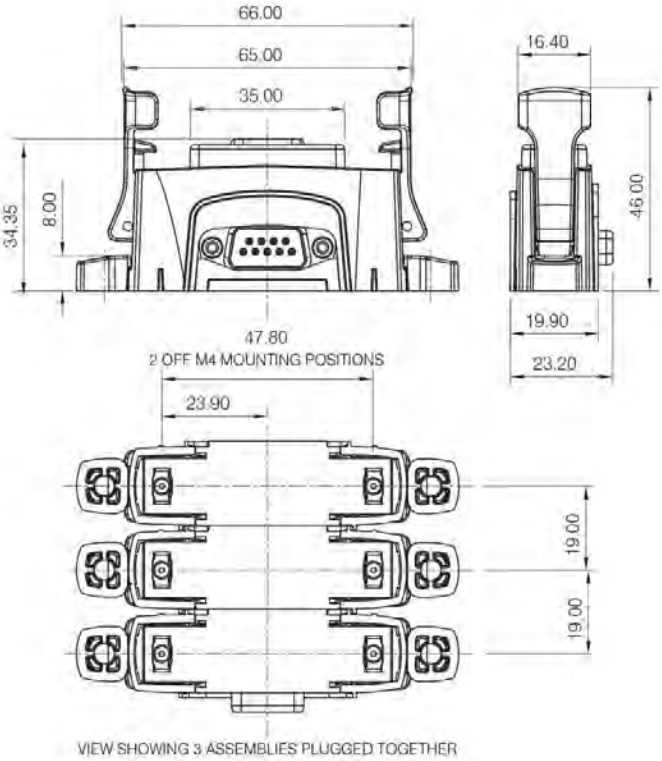



## T-CON Orbit network connector




VIEW SHOWING 3 ASSEMBLIES PLUGGED TOGETHER

T-CON with 32 mm DIN raise connector




VIEW SHOWING 3 ASSEMBLIES PLUGGED TOGETHER

T-CON with mounting feet option

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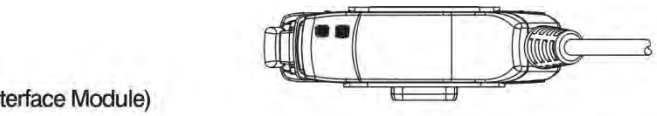
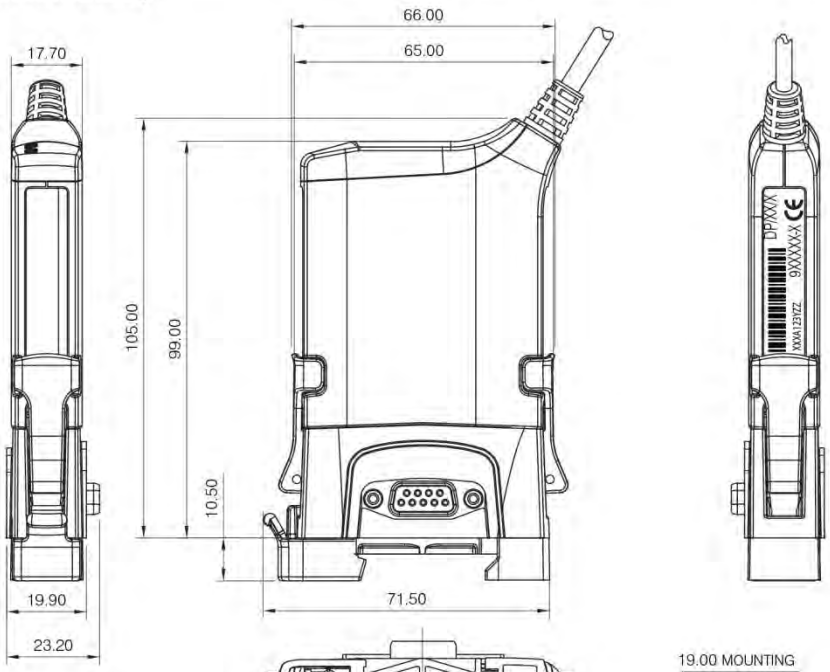
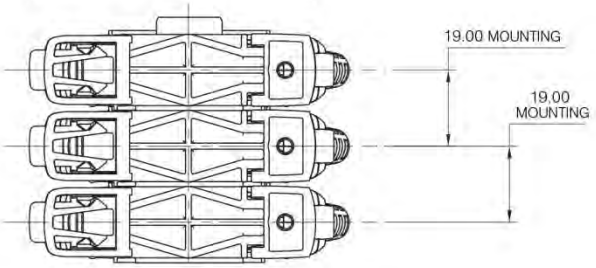
## PSIM (Power Supply Interface Module)

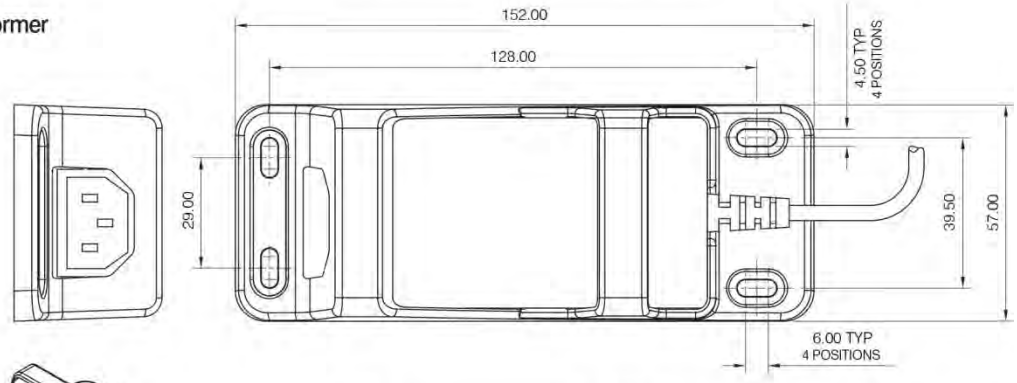


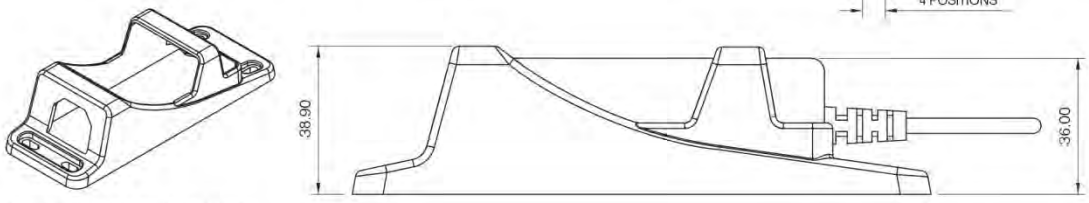



VIEW SHOWING 3 ASSEMBLIES PLUGGED TOGETHER

## PSIM transformer




3D VIEW OF MOUNTING BRACKET