

**As well as many Orbit dimensional measurement devices, Solartron Metrology also offers a range of electrical interface modules for third party sensors and for general instrumentation tasks. The Orbit modules and controllers are presented in this section.**

Controllers comprise a PCI card, USB and RS232 interfaces and a digital readout DRO.

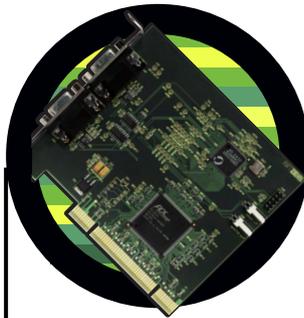
Modules comprise an Analogue Input Module for easy connection of third party transducers to the Orbit network (e.g. temperature, force, pressure), a Digital Input/ Output module for interfacing to switches or control lines and Encoder Input Modules allowing the interface of Rotary or Line Scale incremental type encoders (TTL).

- > PCI, USB, RS232 Controllers
- > Modules for Analogue input, Digital input/output, TTL input
- > Up to 31 modules per controller channel
- > A variety of technologies (inductive, optical and third party sensors)



# Orbit® Controllers

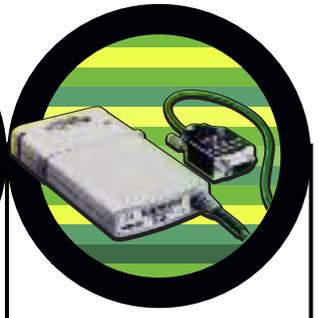
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**Orbit®**  
PCI Network card



**Orbit®**  
USB Interface  
Module (USBIM)



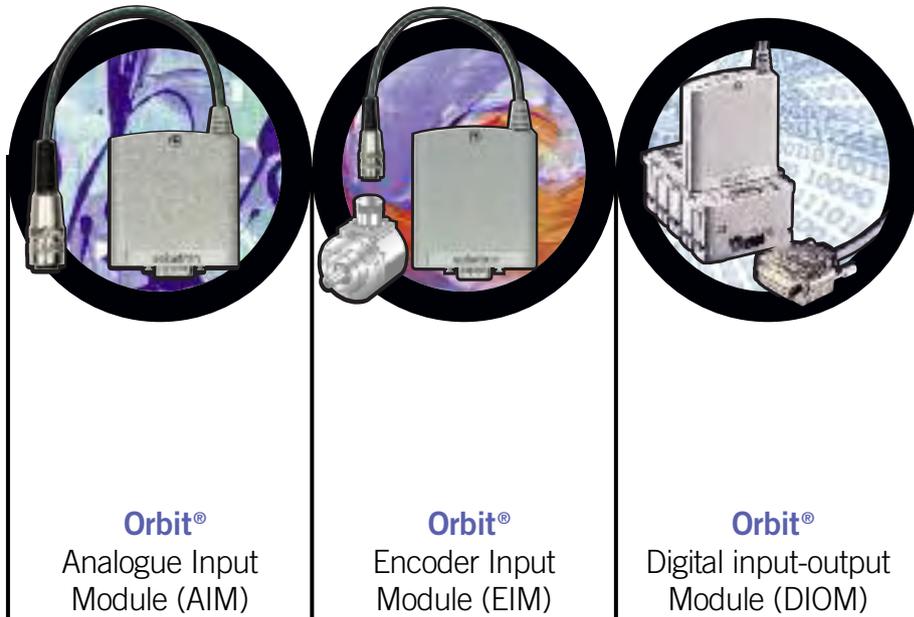
**Orbit®**  
R3232 Interface  
Module (RS232IM)

<b>Computer Interface</b>			
Bus	PCI	USB 2.0 full speed	RS232 (up to 115.2 kB)
Operating system	Microsoft Windows		
<b>Network Interface</b>			
Signal	RS485		
Protocol	Orbit		
Number of Orbit modules (with external PSIM) <sup>1</sup>	Up to 62	Up to 31	
Number of Orbit modules (without external PSIM) <sup>2</sup>	Up to 10 depending on module type	Up to 4 depending on module type	0
Baud Rate	187.5kB or 1.5MB		187.5 kB
Measurement Modes supported <sup>3</sup>	All modes	Standard/Buffered	
<b>Environmental</b>			
Operating Temp. Range (°C)	0 to +60		
Storage Temp. Range (°C)	-20 to +85		
IP Rating	-	IP43	
<b>Mechanical &amp; Connections</b>			
Computer connections	PCI card slot	USB socket type A	RS232 port
Dimensions (mm)	-	65 x 61 x 18 excluding connector (refer to PIE drawings)	
Weight (g)	89	160	
Material	-	Die Cast Aluminium	

<sup>1</sup> 1 PSIM required per channel

<sup>2</sup> The specifications quoted are dependant on the power available from the computer in use

<sup>3</sup> Orbit Modes are explained in the Technologies section of this catalogue

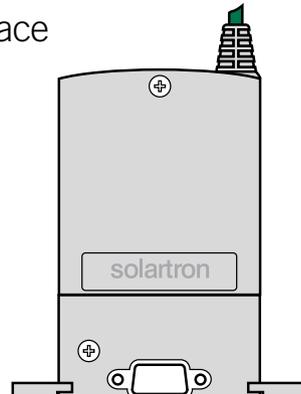


	<b>Orbit® Analogue Input Module (AIM)</b>	<b>Orbit® Encoder Input Module (EIM)</b>	<b>Orbit® Digital input-output Module (DIOM)</b>
<b>Power Requirement</b>			
Voltage Range (VDC)	5 ±0.25		
Current Consumption <sup>1</sup> (mA)	Up to 145 depending on input type	40	25 all outputs on
<b>Single Input<sup>2</sup></b>			
Input Type	Analogue voltage or current	Incremental Encoder	8 channel Input/Output
Input Voltage (V)	0-24, 0-10, 0-5, ±10, ±5	30 max	0 to 30
Input Currents (mA)	4-20, ±20, 0-20	< 10	1/Channel
Options	Special PT100 module available	Single ended or differential, HTL	-
<b>Single Output</b>			
Voltage output	-		Open drain up to 30 V
Current Output	-		50 mA for each output
Reading Speed	Up to 3906 readings/second		240 readings per second
Interpolation rate	-	x1, x2, x4 programmable	-
<b>Measurements performance</b>			
Warm-up	95% accuracy after 5 mins		
Linearity (%FSO)	0.05		
Bandwidth	460 Hz	1.2 MHz max in/out frequency	DC
Measurement Modes	Standard/Dynamic/Buffered		Standard
<b>Environmental</b>			
Operating Temp. Range (°C)	0 to +60		
Storage Temp. Range (°C)	-20 to +85		
IP Rating	IP43		
<b>Mechanical &amp; Connections</b>			
Transducer	Various connector options		
Enclosure - Size (mm)	65 x 61 x 18 excluding connector (refer to PIE drawings)		
Weight (g)	160		
Material	Die cast Aluminium		

<sup>1</sup> Excludes sensor consumption  
<sup>2</sup> Transducer interface

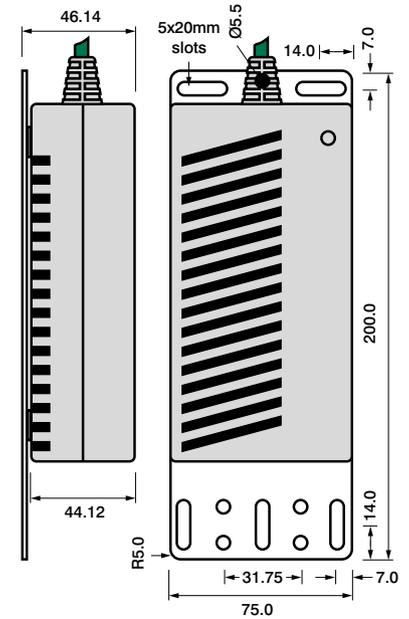
## Power Supply Interface Module (PSIM)

For use with multi-channel systems needing more power than available from the computer. The power supply can also extend the network beyond the normal 10m per port limit up to 1Km



## PSIM transformer

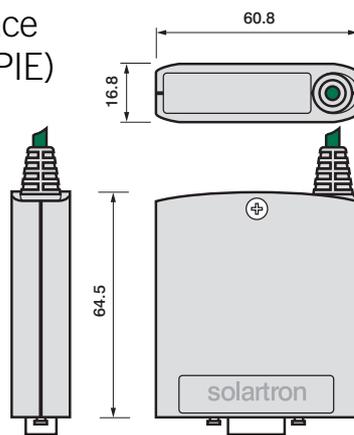
For use with Power Supply Interface Module versions PSIM-AC and PSIM-DC only.



Product type	PSIM-AC	PSIM-DC	PSIM-5V
Output voltage	5.1VDC @ 1.8A max.		
Operating Temp. Range (°C)	0 to +60		
Drive capability	Up to 31 Orbit modules dependent on type		
Supply voltage	90 to 264VAC @ 1 A max.	10 to 30VDC	+5VDC from regulated supply
Supply frequency (Hz)	47 to 440	-	-
Termination	IEC320 plug (supplied with 2m lead and local AC supply connector)	5m flying lead	5m flying lead (input directly to the module. There is no transformer)
Cable length (m)	2 (between module and power supply)		-
Dimensions	As PIE plus T-CON (see below). Module does not separate		

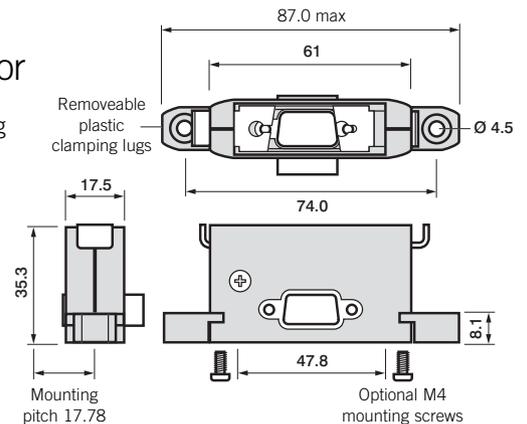
## Probe Interface Electronics (PIE)

Fitted to all Solartron Metrology digital products



## 'T-CON' connector

The 'building block' of Orbit digital networks



## Happy light

Connected on the last T-CON of the Orbit network the "happy light" plug will indicate green (on) when the power supply is within specification and flash when the network is active. It is highly recommended as an additional item to the Orbit network. Nominal dimensions are 47mm x 31mm x 15mm.



## Orbit<sup>®</sup> support pack for Windows<sup>®</sup>

Solartron Metrology provides software support for Microsoft Windows. This software is supplied with the Orbit Network Card, the USB Interface Module and the RS232 Interface Module. The Orbit Windows Support Pack software includes a COM Object Library for COM applications and Dynamic Link Libraries (DLLs) for lower level programming. Support is also provided for all major programming languages, such as VBA, VB, C++, Borland C Builder and Delphi. Example programs for these languages are available upon request. Download the latest drivers from [www.solartronmetrology.com](http://www.solartronmetrology.com)

## Orbit<sup>®</sup> support pack for Excel<sup>®</sup>

The Orbit Excel Support Pack enables the user to take readings from the Orbit Network and place values directly into cells of a Microsoft Excel spreadsheet. Following installation of the Excel support pack, a toolbar becomes available to the user and enables commands such as "Take Readings", "Zero Readings", "Close Link", etc.,. The Orbit Excel Support Pack disc contains examples to help you get started, each designed to show different aspects of the software. Download the latest drivers from [www.solartronmetrology.com](http://www.solartronmetrology.com)

## Orbit<sup>®</sup> examples for LabVIEW<sup>®</sup>

Solartron Metrology provides program examples to enable users to develop applications under the National Instruments LabVIEW environment. Examples are also provided to allow quick test application tests, such as taking measurement readings from Digital Probes or Linear Encoders into LabVIEW.

Microsoft<sup>®</sup>, Windows<sup>®</sup> 98, Windows<sup>®</sup> ME, Windows<sup>®</sup> 2000, Windows<sup>®</sup> XP, Windows NT<sup>®</sup>, Excel<sup>®</sup>, VBA and VB are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Delphi<sup>®</sup>, C++ Builder<sup>®</sup> are registered trademarks of Borland Software Corporation. LabVIEW<sup>®</sup> is a registered trademark of National Instruments. Orbit<sup>®</sup> is a registered trademark of Solartron Metrology.

# Digital readouts

72 DR600 and DR700



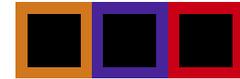
The purposeful ergonomic design of these digital readouts is intended for applications in various industrial environments. The 24 alphanumeric character information digital display guides the user through a series of menus from initial setup to gauging applications and arithmetic operations.

Solartron Metrology Digital Readouts operate with both Digital Linear Encoders and Solartron's range of Digital Probes. Following the success of the DR600 digital readout, Solartron Metrology introduced an even more sophisticated member of the Digital Readout family, the DR700. Whilst retaining all the features of the DR600 (Preset, alarms, RS232 output, Max, Min, Difference), the DR700 boasts a number of new functions; For example, the new "Scaling Factor" function can be used to compensate for angled or lever operated probes, or diameter when measured in a V block. It also enables measurement of angles or squares.

Other new functions include the "Gauging Mode" - allowing global pass/fail evaluation of up to 30 scan channels -and "Max A +Max B".

The DR700 can be used with multiple probe fixtures using Linear Encoders, Digital Probes or a combination of both - making it a truly versatile addition to the Solartron Orbit range.

Product type	DR600	DR700
Display Type	24 character alpha numeric display	
Display length	±999.9999mm or ±39.370078"	
Resolution	Down to 0.05µm or 0.000005"	
Range Lamps	Indicates Hi/OK/Lo for limited detection	
Input		
Signal Input	Orbit	
Number of Orbit modules (without external PSIM example)	Up to 10	
Number of Orbit modules (with external PSIM example)	Up to 30	
External input/output		
Single output	RS232 serial port (for printer or PC connection)	
Digital I/O	✓	✓
Motor drive	✓	✓
Measurement Configurations		
Individual Probe	✓	✓
Probe pair	✓	✓
Multiple Probes	✓	✓
Scan <sup>(1)</sup>	✓	X
Gauging Mode	X	✓
Electrical		
Power Supply (VAC)	96 to 244	
Line frequency (Hz)	47 to 440	
Environmental		
Storage Temperature range (°C)	-20 to + 60	
Operating Temperature range (°C)	0 to +40	
Humidity	0 to 95% non condensing	
Safety rating	EN61010-1	
EMC	Emission: EN50081-1 Immunity: EN50082-2	
IP Rating	Front panel: IP65 Unit: IP40	
Mechanical & Connections		
Dimensions (mm)	235 x 190 x 90	
Weight (kg)	2.25	



## Keypad functions DR600 and DR700

Zero	Single key operation to zero reading on display
Print	Reading sent to printer or PC via the RS232C interface (Baud rate selectable 300 to 57.6 Kbaud)
Motor Drive	Control of motor driven probes with 3 tip forces and 3 retraction speeds, for each orientation, (Tip down, up or horizontal) on Linear Encoders LE/50/M and LE/100/M
Program Select	10 different programs available. Each program may have its own preset, limits and probes, or pair of probes (A+B or A-B)
Units	Choice of mm or inches
Preset	10 memories enable 10 different preset values to be stored. Soft keys enable direct toggle between incremental and absolute datum
Maximum/Minimum	Stores maximum, minimum and difference values
Limits/Tolerance	High and Lo limit values, indication by range lamps. Outputs from the back panel permit control of relays for sorting components. 10 sets of limits can be stored
Multiple Probes	Up to 10 probes or pairs of probes (A+B or A-B) can be assigned different programs. Each probe can have its own Preset, Limits, Resolution and Direction
Probe Scan	Up to 30 probes, sharing the same preset limits etc. can be scanned
Mathematics	Two probes may be used in an A+B or A-B configuration
Resolution	Choice of 0.01 $\mu$ m, 0.1 $\mu$ m, 1 $\mu$ m, 10 $\mu$ m, 100 $\mu$ m or 1, 10, 100, 1000, 10,000 millionths inch Choice of 1, 2, 5 steps in least significant figure Note. Automatic inhibit of excessive resolution for probe in use
Count Direction	Increasing count can be assigned to retraction or extension of probe tip
Reference Mark	The reference mark enables a datum to be re-established - e.g. following a power down
Display Freeze	External initiation of measurement and display freeze
Lock	Password protection may be applied to any permutation of keys or features

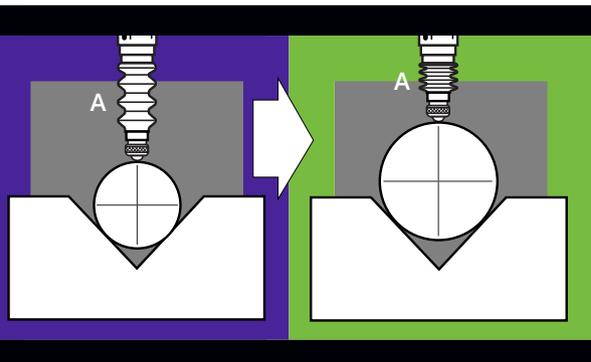
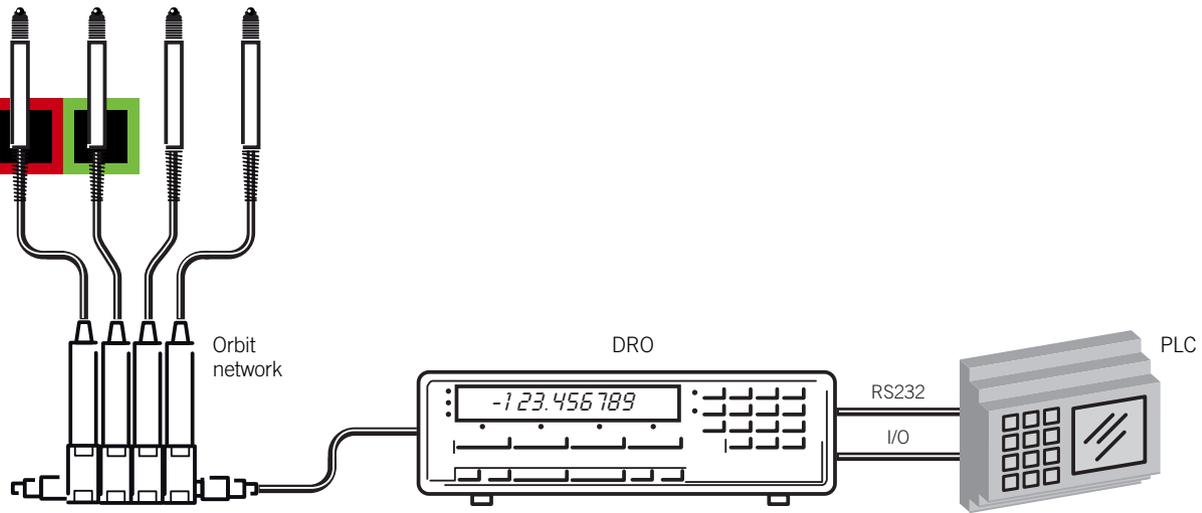
## Keypad functions DR700 only

Scaling Factor	This function of the DR700 allows the user to apply a Scaling Factor (range $\pm 0.01$ to $\pm 100.0$ ) to any program. Typical uses: V-block measurement, display of angle from two probes at a fixed distance apart and correction of cosine error (for probe at small angle from 90°).
Max A + Max B	Displays the maximum deviation of probe B. A typical application for this mode is as a means of measuring the amount of squareness and bend of a shaft on a cutting tool.
Gauging Mode	Used in measuring against a master part, Gauging Mode provides a global Pass/Fail evaluation for up to 30 scan channels (using the range lamps). Each scan channel can have individual probe A+B or A -B measurement, with its own limits and presets. Gauging Mode can have a maximum of 30 probes using Digital Probes and Linear Encoders.
Autosense Mode	Autosense Mode is designed to enable the automatic selection of a program when the tool associated with that program is used. It is intended for applications where only one tool is in use at any one time. Each program must use a unique probe (or probes) with a number of tools ranging from 1 to 9, which will be associated with programs 1 to 9. Designed for hand tools using Digital Probes or Linear Encoders, the reading is automatically displayed on the DR700 when the tool is in its active measuring range.
Peak Mode	Peak Mode will take a number of readings (2 to 99) from a single Digital Probe or Linear Encoder, using a manual trigger to store each reading. The DR700 will then analyse and display a calculated result in any of the following ways: Maximum, Minimum Peak, Peak Range (max-min) and Average of the Peak readings.

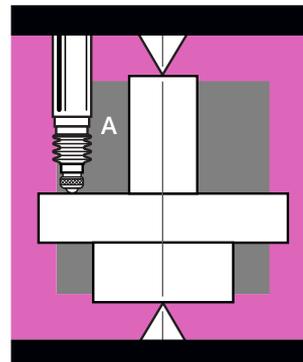


# Digital readouts

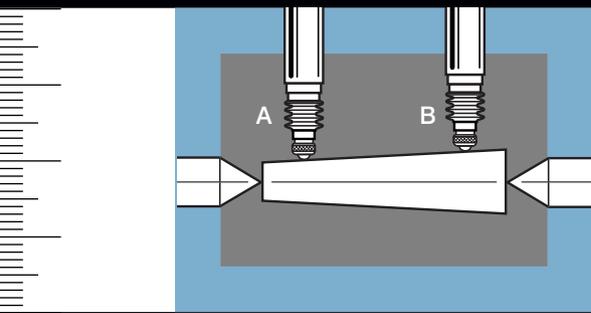
## 74 Measuring techniques and applications



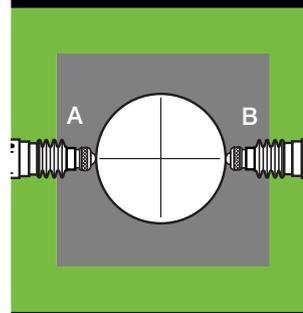
DR700 scaling factor



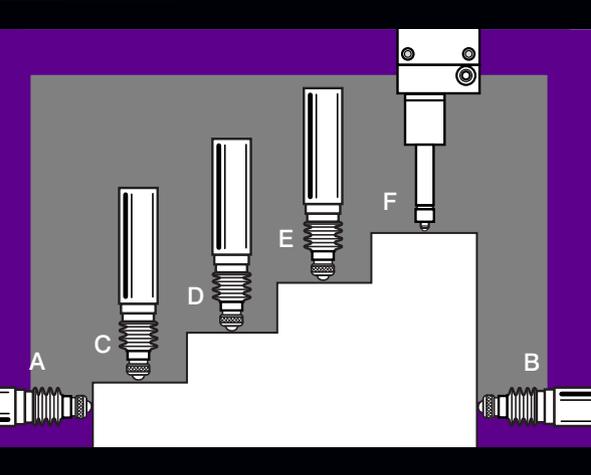
T.I.R. MAX - MIN



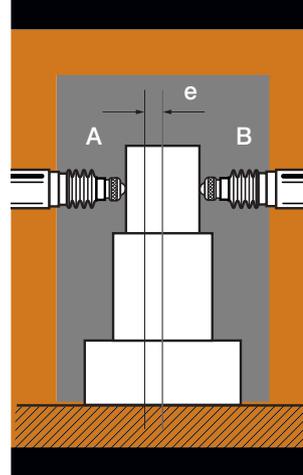
Taper measurement independent of component dimensions A-B



Diameter measurement independent of eccentricity A+B



DR700 gauging mode (up to 30 probes) Enables global pass/fail evaluation of up to 30 scan channels. Each channel can be either an individual probe, A+B or A-B, and has its own set of limit and preset values. C,D,E,F & A-B



DR700 scaling mode  $e = \frac{A - B}{2}$  MAX - MIN