

Orbit[®] Analogue Input Module

For fast and simple networking of a wide range of sensors into a PC, PLC or Digital Readout



Features

- ▶ Interfaces to Excel[®], LabVIEW[®] or user application program
- ▶ Up to 31 Sensors per Network, 372 Sensors per PC
- ▶ Wide Range of Voltage & Current Input Options
- ▶ Choice of Connectors or Wire Ended
- ▶ Low Noise
- ▶ Programmable Resolution (14, 16, 18 Bit Resolution)
- ▶ Programmable Measurement Bandwidth
- ▶ High Acquisition Rate - 3906 Readings/Second Maximum Rate
- ▶ Mix with Solartron Digital Gauging Probes, Linear Encoders & Digital I/O

Description

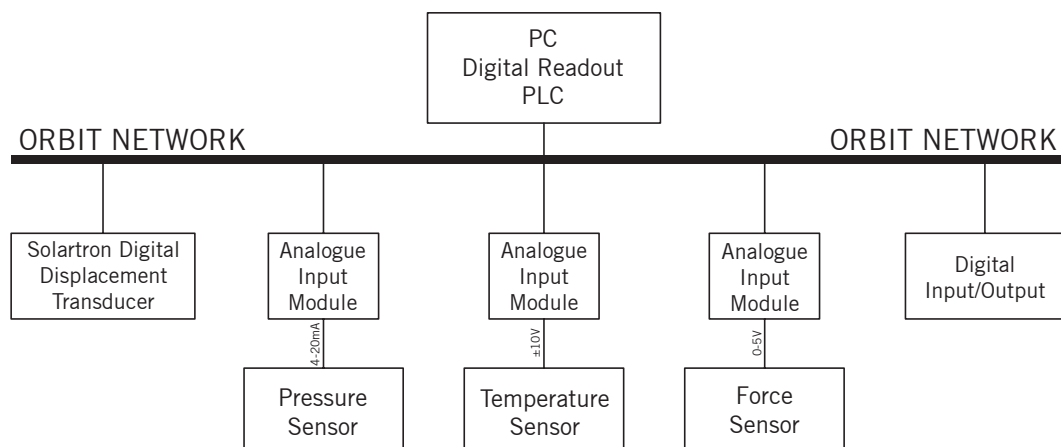
The Analogue Input Module (AIM) acts as a gateway for interfacing third party sensors to the Solartron Orbit Network. The AIM can accept almost any sensor with a DC voltage or current output, this allows sensors such as pressure, temperature, force, etc to co-exist on one network and to share that same network with Solartron's broad range of digital displacement and dimensional measurement transducers.

Readings from the sensors can be taken directly into a PC, PLC or Solartron Digital Readout. For PC applications, the *Orbit Windows Support Pack*, which includes a standard *Windows DLL Library* and a *Com-Object Library*, allows readings to be acquired into any Windows application. Driver support is provided for LabVIEW[®] and other high level software as well as for the users' own applications programs. Furthermore, the *Excel Support Pack* allows the interfacing of sensors that satisfy specific output voltage criteria.

The AIM incorporates a high accuracy, low noise, digitising circuit capable of high acquisition rates of up to 3906 readings/second for dynamic applications. Furthermore, the AIMS in an Orbit system can be synchronised to acquire readings simultaneously. Additionally, where high resolution is required, unwanted noise can be minimised through programming the measurement bandwidth stepwise from 6 Hz to 460 Hz.

A range of connector options is available to suit individual customer requirements.

Example Configuration



The Orbit Network System

Orbit is a simple solution to building measurement systems without incurring the high costs normally associated with bespoke networks.

Analogue Input Modules plug together using the 'T-Con' system (fig. 1). The 'T-Con' is an ingenious accessory that can be used individually, daisy chained using computer cable, or banked together in blocks to form a multi-channel nest. Each AIM is housed in a "PIE" (Probe Interface Electronics) connector, which neatly slots into the 'T-Con' via a 'D-Type' connector. A positive locking mechanism on the 'T-Con' prevents the PIE connector being accidentally dislodged while allowing instant removal and replacement.

Solartron's Digital Displacement Transducers, Digital Gauging Probes and Linear Encoders share the same PIE / T-Con connection system and Orbit protocol. These products can therefore be mixed with Analogue Input Modules and other Orbit products to create the required sensor system. Orbit devices can be used in any combination, in any position and each is factory programmed with a unique identifier.

Only one cable is needed to connect up to the 31 modules removing the need for bulky and costly wiring harnesses. This in turn connects to an Orbit Network Card, RS232 Interface Module, or a Solartron Digital Readout.

The Orbit Network Card plugs into a PCI or ISA slot in the PC. Each card can interface to 2 Orbit Networks, each with 31 modules connected. Up to 6 cards can be used together, giving a total of 372 sensors / Orbit modules in one PC. Alternatively devices on the Orbit Network can be connected to the RS232 port on a PC or PLC, using the RS232 Interface Module. Up to 31 sensors / modules can be connected to one RS232 Interface Module and multiple modules can be used in a system.

For systems using the RS232 Interface Module, the 5 V power required by the Orbit Network is provided by a Power Supply Interface Module (PSIM). The PSIM is also recommended for longer cable runs and where a number of sensors are to be used in a network.



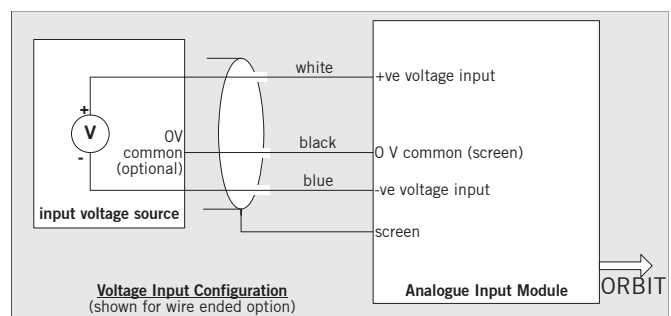
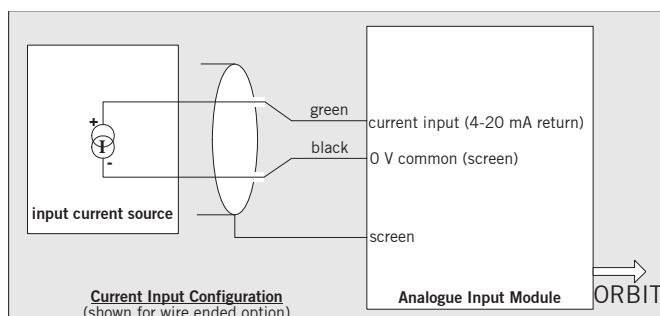
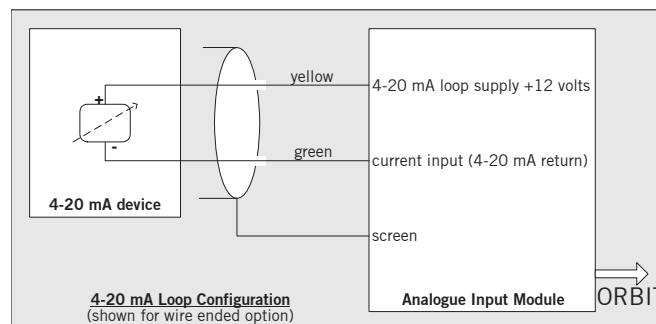
Fig. 1
A Block of T-Cons and PIE Connectors

Solartron Metrology supplies a broad range of transducers that plug directly into the Orbit network, these can be grouped with other sensors on a single network. Solartron's range of transducers includes the Digital Displacement Transducer range, featuring rugged design and zero hysteresis. Also compatible with the Orbit Network are Solartron's range of precision Digital Gauging Probes and Linear Encoders which provide measurement ranges from 0.5 mm to 100 mm. All these devices offer the benefit of long life operation, excellent repeatability and high accuracy (up to 1 micron for 100 mm stroke).

Special Applications of the Orbit Analogue Input Module

The AIM can be configured to operate with a variety of physical sensors that require a special interface, for example, the PT100 temperature sensor, load cell and strain gages. The AIM can provide an excitation signal for these types of transducers and the digitizing circuit constantly monitors the excitation voltage and corrects for any changes thus eliminating the need for a highly stable excitation signal. Please contact Solartron technical support for further assistance.

Analogue Input Module Wiring Configurations



Technical Specification

Inputs

Voltage Input	0 V to +24 V 0 V to +10 V 0 V to +5 V ±10 V ±5 V (Input Impedance = 200 KΩ)
Current Input	4-20 mA ±20 mA 0-20 mA (Input Impedance = 10 KΩ)
Measurement Bandwidth	Programmable from 6 Hz to 460 Hz

Outputs

Resolution	14 bits (16 or 18 bits programmable)
Reading Speed	Up to 3906 readings/second (Dynamic Measurement 4K Mode)

Performance

Linearity	Better than 0.02% FSO
Offset Voltage	
0-5 V Input Range	2.5 mV
0-10 V Input Range	5 mV
±5 V Input Range	5 mV
±10 V Input Range	10 mV
0-24 V Input Range	12 mV
Offset Current	
4-20 mA Input Range	20 μA
±20 mA	40 μA
Temperature Coefficient	
Offset	0.05% FSO/°C
Span	0.02% FSO/°C
Warm Up Time	95% accuracy met after 5 minutes from switch on (assuming an ambient temperature of between 10°C and 30°C)
Calibration & Measurement Accuracy	Calibrated to appropriate input range

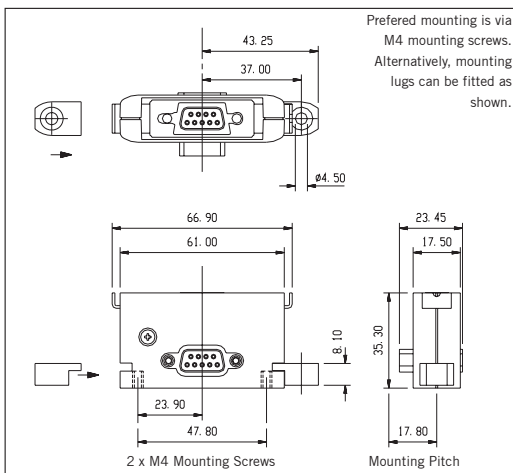
Environmental

Storage Temperature	-20°C to +85°C
Operating Temperature	0°C to +60°C

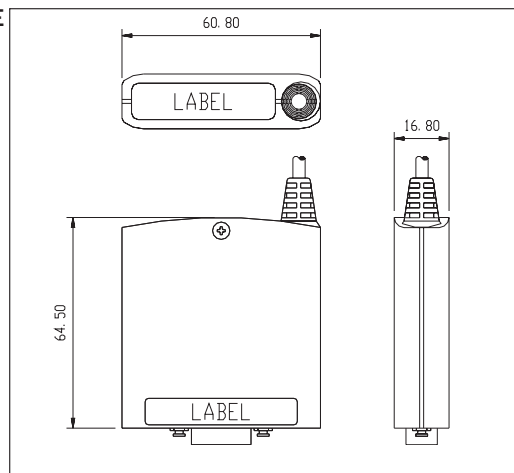
Electrical Interface

Operating Voltage	5 V ±0.25 VDC (powered from Orbit Network)
Operating Current	
In Voltage Configuration	80 mA
In Current Configuration	80 mA
In 4-20 mA Configuration	145 mA
Interface	Orbit Network

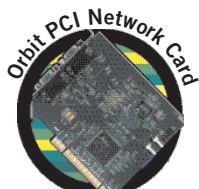
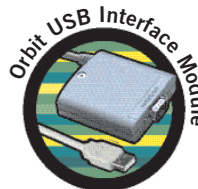
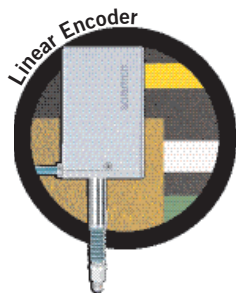
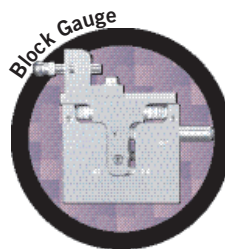
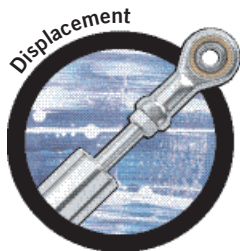
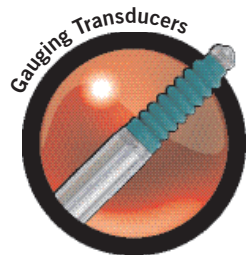
T-CON



PIE



Also Available at Solartron Metrology



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