

Alpha 915

Voltage, Thermocouple Resistance
and Strain Gauge Module



What is the Alpha 912 RTD, Resistance and Voltage Input Module?

The 915 provides 20 two-pole channels, which can be used for thermocouple, voltage or current measurement. Pairs of these channels can be combined to make four pole measurements for four and three pole resistive, PRT and thermistor sensors. Current energised full bridge strain gauge measurements with four poles are also supported for strain gauge bridges, pressure transducers and load cells. Any odd numbered channel can be paired with the following even channel number to form a four pole channel. Measurements can be made with up to 19 bit resolution and 1uV integrity. Thermocouples are cold junction compensated and can be monitored for failure or deterioration during normal operation automatically. Types K,J,T,R,S,E,B and N are supported by the standard firmware. Current measurements can be made using an external current shunt or with an internal calibrated shunt if specified at time of supply. Resistance, PRT and thermistor measurements can be made with 3 or 4 Terminal sensors with sensitivities of 1mOhm. The PT100 PRT standard and the Fenwall UUB31J1 thermistor are supported in the standard firmware. Strain bridges with 1000 to 100 Ohm resistance can be measured. The firmware assumes a 350 Ohm bridge for scaling, The measurement resolution of a 350ohm strain gauge bridge with two active gauges can be as high as 0.1uE. Initial bridge unbalance can be compensated for. The bridge current supply for strain gauge measurements is pulsed therefore reducing errors due t heating effects of the sensors

The 915 can be programmed to integrate signals to be measured over one or more complete mains cycles (50 - 60 Hz) allowing measurements to reject large levels of mains borne interference superimposed on microvolt signals. During a measurement an auto-ranging facility ensures an input channel is measured on the best range to maintain maximum measurement resolution. A choice of measurement conversion resolutions and speed are provided. These features together with a digital filter function and precision hardware design achieve excellent performance for all measurement functions. Measurements, measurement linearisation, measurement processing and communications are concurrent tasks for optimum performance. Calibration is performed by applying reference inputs and issuing commands to the module. No internal access is required.

As with most other modules in the Alpha series a local serial interface can be used to program and monitor operation locally, independent of the primary communications on the RS485 network. This can be very convenient during installation or used later to diagnose application problems at each measurement site. Up to 99 Alpha series modules can operate on an RS485 network.

Features

Voltage , Thermocouple Resistance and Strain Gauge Module

Highly convenient cage clamp two part screw terminals used for all primary channel connections.

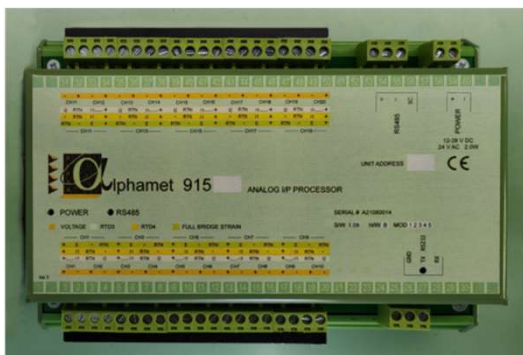
Up to 19 bit resolution with 1uV integrity

Programmable Measurement Types

Scaling, alarm levels, filter functions

Second local programming and diagnostic Interface

High speed communications



Partnership Courtyard,
Ramparts Road, Dundalk, Ireland
Tel: +353 42 9332399

2626 South Loop West, Suite 620,
Houston, TX, 77054, USA
Tel +1 281 969 7529

sales@measuresoft.com

www.measuresoft.com

measuresoft



Specifications Details

Number of channels / module:	20
Number of 4 pole channels:	Up to 10
Number of 3 pole channel:	Up to 10
Connector type input channel:	Two part screw terminal High quality cage clamp
Measurement modes:	T/C
Voltage	uV DC mV DC
Resistance	4-20mA ext shunt 4 Terminal Resistance 3 Terminal Resistance
Strain full bridge	Full bridge strain

A-D Converter

5 Measurement resolutions are supported:	19 bits at 10 measurements/s 18 bits at 20 measurements/s 17 bits at 40 measurements/s 15 bits at 100 measurements/s 13 bits at 200 measurements/s
--	--

In addition a channel filter function can be applied to any channel.

Voltage Measurement

Input voltage ranges	+10V to-10V +1.5V to-1.5V +180mV to-180mV +23mV to-23mV
----------------------	--

Automatic range selection is supported.

DC measurement accuracy	+/- 0.015% of reading + 0.01% of range + 6uV
Temperature coefficients DC voltage	25ppm rdg + 0.1uV/°C
Measurement sensitivity	<0.25uV on +23mV>-23mV range at 18bits

Note: Displayed sensitivity depends on reporting format.
Additional error at 200/sec mode of 0.05% of range.

Resistance Measurement

Measurement Ranges:	2000 ohm 256 ohm 32 ohm
---------------------	-------------------------------

Sensing Current: <0.75 mA (switched)

Accuracy 256R 0.02%rdg + 0.015% rng 4 Terminal Mode +2 mohm

RTD Measurement

PT100	-50 to 400°C -150 to 600°C 4 Terminal Mode	+/-0.2°C +/-0.4°C
-------	--	----------------------

Full Strain Measurement

350 ohm Bridges	
Accuracy full bridge (repeatability)	5uE
Sensitivity at 18 bits	0.1uE (2 active gauge)

GF=2)	
Energisation	5mA pulsed
120 OHM Bridges	
Accuracy full bridge (repeatability)	10uE
Sensitivity at 18 bits	0.6uE (1 active gauge)

GF=2)	
Energisation	5mA pulsed

DS915A04 Refers to 1.09 firmware. All Specifications subject to change without notice. Correct at time publication.

Interference Rejection

AC Common mode rejection ratio channel group:	<0.1uV/V
AC Single channel common mode rejection ratio:	<1uV/V
DC channel common mode rejection ratio:	<5uV.V
AC series mode rejection ratio 50 or 60 Hz +/- 0.05% (Applies to 17,18,19 bit measurements).	<1 mV/V
Maximum voltages operating:	
Max. voltage between any (+) and (-) inputs:	12V
Max. voltage between any two (-) input terminals:	11V
Max. voltage between any two terminals:	22V

Overload Protection

Channel Overload Protection	Passive 50V continuous 150V for short periods
-----------------------------	---

Isolation

Isolation test voltage between channel group and power supply or RS485: Tested at 1000V

Input current of instrument amplifier 5nA

Input Impedence of operating >10m 0-12V

Auxiliary Channel Specification:

Output switch ratings: 50mA @ 28VDC max
Outputs 1,2: Non isolated
Suitable for driving small relays with isolated external supply.

1.0A at 48V AC/DC

Output 3 Relay outputs:

Contact closure to 0v
External switch must be isolated

Digital input:

Power Requirement

Connector 2-pole screw terminal

Voltage 24V AC
12 to 28V DC

Current 200mA at 12V
120mA at 24V

General

RS485 INTERFACE See Manual
Baud rates to 153KB

LOCAL SERIAL INTERFACE Rx Tx 5V Levels
Compatible with most RS232 peripherals
Baud Rates to 38K4

STATUS LED'S Power / Fault
Communication RS485
Communication RS232

Size 180*117*60mm

Weight 600g

Mounting DIN rail

Operating Temperature Range -20 to 70°C

Relative Humidity (noncondensing) <90% 0 to 40°C

Vibration 3g 0hz to 400Hz in 3 planes

Programming storage Secure flash memory

Stated Accuracy's are at 21° C