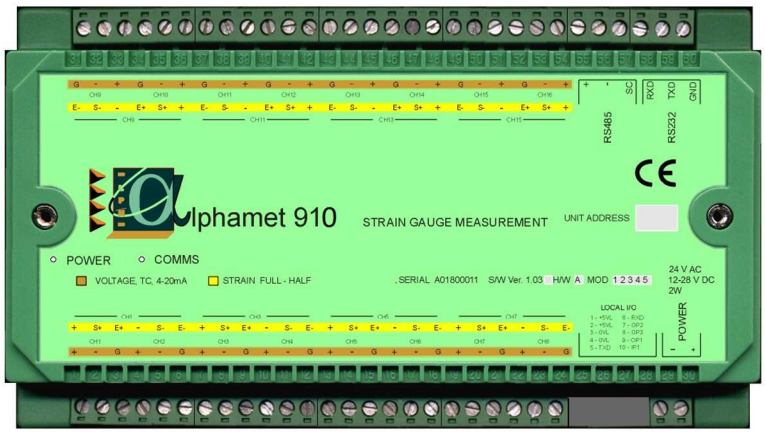
Alpha 910 THERMOCOUPLE MODULE

What is the Alpha 910 Thermocouple Module?

The 910 provides 20 channels of voltage and thermocouple measurement at up to 19 bit resolution and 1uV integrity. It is fitted with specialised thermocouple connectors allowing an accuracy of 0.5 ° C and °F to be achieved on the higher thermocouple output types. This includes cold junction compensation and all other errors. Thermocouples supported include the most popular types used in industry. Excellent performance is achieved in conditions of changing ambient temperature.
The module also automatically monitors the health of thermocouples and can report open circuits and thermocouples that have deteriorated. The module can be programmed to integrate signals to be measured over one or more complete supply cycles (50 or 60 Hz) allowing the 910 to reject large levels of power borne interference super imposed on micro-volt signals. A choice of integration times and a digital filter, that can be applied to any channel, combined with Alpha's high stability circuitry achieves excellent noise performance and rejection. The 910 supports an automatic range selection facility that enables maximum measurement sensitivity to be maintained for inputs that cross range thresholds.
Measurements are made continuously and can be returned in one of several formats most convenient for the supervisory software. Communications data rates up to 153.6KB are supported. All programming is stored in secure flash memory.
Three auxiliary outputs and one input are provided which can be used by the host and/or locally by the firmware to implement specific functions. Example uses are synchronisation to an external signal and local indication of status of input signals.



Features

Thermocouple, current and voltage measurements in compact module.

20 Channels per Module and Auxiliary I/O.

13 to 19 bit resolution. 10 to 200 measurements per second.

Purpose designed Isothermal connectors. Accurate Cold Junction Compensation.

Thermocouple health monitoring.

Programmable Measurement Types. Temperatures in ° C or ° F .

Scaling, alarm levels, filter functions.

Second local programming and diagnostic interface.

High speed communications.

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Specifications Details

Number of channels / module:	20
Number of poles / channel:	2
Connector type input channel:	Purpose designed Isothermal Black screw terminal
Measurement modes:	uV DC mV DC Thermocouple CJC temperature Sensor health
Thermocouple types:	K,J,T,R,S,E,B,N
Thermocouple compensation:	Dual sensors

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. This can average the most recent four measurements.

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 and°F
Measurement sensitivity	<0.5uV on +/-23mV range at 17bits

Note: Displayed sensitivity depends on reporting format.
Additional error at 200/sec mode of 0.06% of range.

Thermocouple Measurement Accuracy

Internal Cold junction compensation errors included:
(External compensation is also available)

Type	Range	Accuracy
K	-100 to 500 500 to1200 1200 to 1600	0.5°C 0.7 3.0
J	-50 to 360 360 to 800	0.5 0.7
T	-150 to 400	0.5
R	0 to 1600	2.0
S	0 to 1700	2.2
E	-50 to 290 290 to 1000	0.7 1.0
B	200 to 1600	4.5
N	-200 to 1600 -100 to 580 580 to 1300	1.3 1.1 1.3

Displayed sensitivity <0.1° C and °F
Thermocouple Health Monitoring automatic by resistance measurement sequence.
All Specifications subject to change without notice; correct at time of publication (Issue 4 specification relates to 1.02 firmware).

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 18,19,20 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 1500V at normal temperature and humidity

Auxiliary Channel Specification:

Output switch ratings:	
Outputs 1,2:	50mA @ 28VDC max Non isolated Suitable for driving small relays with isolated external supply.
Output 3 Relay outputs:	1.0A at 48 AC/DC
Digital input:	Contact closure to 0v External switch must be isolated

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 153.6KB
RS232 INTERFACE	RS232 Compatible Signals RX TX 0 to 5-volt signal levels 9k6, 19k2, 38.4k Baud 8 bits, even parity, one stop bit 3 pole screw connector
STATUS LED's	7
Function	Power / Fault Communication RS485 Communication RS232 Outputs 1-3 Dig. Input 1
Size	180*100*40mm
Weight	500g
Mounting	DIN rail Stackable
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 23° C