

# RAI04

## ABB Ability™ Symphony® Plus Hardware Selector



The RAI04 Redundant Analog Input module processes up to 16 TC and mV, group isolated, input field signals. Each channel is independently configurable. FC 221 (I/O Device Definition) sets AI module operating parameters and each input channel is configured using FC 222 (Analog Input CH) to set individual input channel parameters such as engineering units, High/Low alarm limits, etc.

A/D resolution of each channel is 16 bits with polarity. The RAI04 module has 4 A/D converters, each serving 4 input channels. The module will update 16 input channels in 300 msec.

The AI04 module is automatically calibrated, hence there is no need for manual calibration. Cold Junction Compensation is configurable and can use the RTD embedded in the module mounting base, an external RTD connected to TB3 of module base, or a separate application input configured by the user.

### Features and benefits

- 16 independently configurable channels supporting:
- TC types: E, J, K, R, S, T, B, L, N (14 & 28 AWG), U
- Chinese TC types: E & S
- mV Ranges: 0 to 100 mV or -100 to +100 mV
- 16-Bit (with polarity) A/D resolution
- A/D update of all 16 Channels in 300 msec
- Accuracy is  $\pm 0.05\%$  of Full Scale Range where FSR = 200 mV

General info	
Article number	8VZZ000340H1 (RAI04)
Type	Redundant Analog Input
Life cycle status	ACTIVE
Number of channels	16
Signal type	mV/TC
HART	No
SOE	No
Redundancy	Yes
Form factor	Standard (190 mm)
Mounting	Horizontal Row or Vertical Column
MTBF (per MIL-HDBK-217-FN2)	PR A: 240,188 Hours
MTTR (Hours)	1 Hours

<b>Detailed data</b>	
Module power requirements	24 VDC ± 10%, 65 mA typical, 73 mA max
Module power connection	POWER TB on cHBX01L or VBX01T
Overvoltage category	Category I for power, inputs or outputs. Tested according to EN 61010-1
Max field cable length	600 meters (1968 feet)
Number of Channels	16 independently configurable AI channels
Signal ranges and types	Analog Inputs: mV: -100/0...+100mV or Thermocouple: Type B, E, J, K, L, N(14 or 28 AWG), R, S, T, U or Chinese E, S
TC Cold Junction Compensation	Configurable: 1) Embedded RTD in the mounting base 2) External RTD connected to TB3 of mounting base, or 3) Separate application input
A/D Conversion	4 A/D converters, each with 4 channels
A/D Resolution	16-Bits with Polarity
A/D Update rate	300 msec for all 16 channels
Accuracy, FSR	±0.05% of FSR, FSR = 200 mV
Field signal to Logic isolation	Galvanically isolated, 1500 V up to 1 minute
Channel isolation	1x16 group isolated, 1500 V up to 1 minute
Open circuit detection time	Less than 5 seconds
Normal mode noise rejection	-70 dB minimum
Common mode noise rejection	-90 dB minimum
DC common mode rejection	-90 dB minimum

<b>Diagnostics</b>	
Front plate LED's	STATUS LEDs: R (Run) and F (Fault) + 1 thru 8
Local availability	Mini USB connection on module front plate
Remote availability	HN800 device diagnostics via SPE

<b>Environment and certification</b>	
Temperature, Operating	-40 to +70 °C Tested according to IEC/EN 60068-2-1, IEC/EN 60068-2-2
Temperature, Storage	-40 to +85 °C Tested according to MIL-STD-810G
Relative humidity	20% to 95% @ 40°C non-condensing. Tested according to IEC/EN 60068-2-78, IEC/EN 61298-3
Vibration (operational sinusoidal)	5 to 60 Hz 0.137 mm (0.0054 in.), 60 to 150 Hz 1.0 G. Tested according to IEC/EN 60068-2-6
Vibration (transportation)	10 to 500 Hz. Tested according to MIL-STD-810G
Shock (storage)	15 G, 11 msec. Tested according to IEC/EN 60068-2-27
Drop	100 mm. Tested according to IEC/EN 60068-2-31
Protection class	IP20 according to EN 60529, IEC 529
Altitude (operational)	Sea level to 3,048 meters (10,000 ft.) Tested according to MIL-STD-810G
Altitude (storage)	Sea level to 12,192 meters (40,000 ft.) Tested according to MIL-STD-810G
Air quality	ISA S71.04 G1, ISA S71.04 G3 compliant versions SPCxxxA are also available
ESD immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-2, Severity level 3
Surge immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-5, Severity level 3
Electrical fast transient immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-4, Severity level 3
Radiated RFI immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-3, Severity level 3
Conducted Immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-6, Severity level 3
Magnetic field immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-8, Severity level 4
Radiated emission	Tested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment according to IEC/EN 61000-6-2, IEC/EN 61000-4-6, Severity level 3
Conducted emission	Tested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment
Voltage dips and interruption immunity	Tested according to IEC/EN 61000-6-2, IEC/EN 61000-4-11
CSA non-hazardous locations	Certified for use as process control equipment in an ordinary (non-hazardous) location
CSA hazardous, nonincendive locations	Class I, Division 2, Groups A, B, C, D
CE Mark	CE Mark EMC directive 2004/108/EC & Low Voltage Directive 2006/95/EC
RoHS compliance	RoHS Directive 2015/863
WEEE compliance	DIRECTIVE/2012/19/EU

<b>Compatibility</b>	
Use with MTU	HBR01-CJC, VBR01-CJC
Module keying code for base	slot #1 = 10, slot #2 = 17

<b>Dimensions</b>	
Width	27 mm
Depth	106 mm
Height	190 mm
Weight	227 g

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