DATA SHEET

AI16ev

ABB Ability™ Symphony® Plus Hardware Selector

The AI16ev Universal Analog Input module processes up to sixteen (16) high-level, CH-2-CH isolated, analog input field signals. Each channel is independently configurable for high-level (4 to 20 mA or 1 to +5 VDC), RTD, mV, and TC analog input signal ranges.

The AI16ev Universal Analog Input module is a Form/Fit/Function replacement for ASI23 Analog Signal Input HR i/O modules.

FC 215 (Enhanced Analog Slave Definition) sets the analog input module operating parameter. FC 216 (Enhanced Analog Input Definition) is configured to set individual input channel parameters, such as signal type, engineering units, signal ranges, etc.

Each input channel has a dedicated A/D converter that provides 24-bit resolution with polarity. The AI16ev module will update all 16 input channels in 180 milliseconds.

In current mode, the AI16ev modules provide short-circuit protection by limiting current to a maximum of 96 mA. The AI16ev module will also detect an open circuit in less than 400 milliseconds.

Features and benefits

- Sixteen (16) independently configurable Analog Input channels supporting:
- Hi Lvl: 4 to 20 mADC, 0/1... +5 VDC, or -10/0...+10 VDC
- 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
- RTDs: 100 Ω Platinum U.S. Lab & Industry Std., 100 Ω Platinum European Std., 120 Ω Nickel, Chinese 53 Ω Copper, 10 Ω Copper
- A/D resolution is 24-Bit
- A/D update of all 16 Channels in 180 msecs
- Accuracy from is ±0.03 % to ±0.1 of Full Scale Range (FSR)

General info	
Article number	7PAA004000R11
Type	Universal Analog Input
Signal specification	Hi Lvl: 4…20 mA, 0/1…+5 VDC, -10/0…+10 VDCmV: -100/0…+100 mV Thermocouple: Type B, E, J, K, L, N(14 or 28 AWG), R, S, T, U or Chinese E, S RTD: 100 Ω Platinum U.S. & Euro Std, 120 Ω Nickel, Chinese 53 Ω Copper, and 10 Ω Copper
Life cycle status	ACTIVE
Number of channels	16
Signal type	High Level AI
HART	No
SOE	No
Redundancy	No
Form factor	HR MMU
Mounting	MMU
MTBF (per MIL-HDBK-217-FN2)	PR A: 163,562 hours @ 30 °C 123,109 hours @ 45 °C 47,643 hours @ 70 °C
MTTR (Hours)	8 Hours

Detailed data	
Module power requirements	2.13 A (typical) @ 5 VDC ± 10% 43 mA (typical) @ 24 VDC ± 10%
Module power connection	POWER from MMU
Field IO power	20 mA per CH @ 24 VDC ± 10%
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 channels
Signal ranges and types	Analog Inputs: High Level: 4…20 mA, 0/1…+5 VDC, -10/0…+10 VDCmV: -100/0…+100mVThermocouple: Type B, E, J, K, L, N(14 or 28 AWG), R, S, T, U or Chinese E, SRTD: 100 Ω Platinum U.S. Lab & Industry Std., 100 Ω European Std, 120 Ω Nickel, Chinese 53 Ω Copper, and 10 Ω Copper
TC Cold Junction Compensation	± 0.5 °C Reference Accuracy
Input Impedance	Current: 10 MΩ minimum (mV & TC), 250 Ω (4 to 20 mA)Voltage: 100 kΩ minimum (V, mA)
Output load	0 to 750 Ω Current mode, minimum 22kΩ voltage mode
A/D Conversion	1 dedicated A/D converter for each channel
A/D Resolution	24-Bits with Polarity
A/D Update rate	180 msec for all 16 channels
Accuracy, FSR	Current Mode: ± 16 µA (± 0.1% of FSR, where FSR = 16 mA)Voltage Mode: ± 8 mV (0 ± 0.04% of FSR, FSR = 20 VDC)RTD: ± 0.25 Ω (0 ± 0.05% of FSR, FSR = 500 Ω)mV: ± 0.06 mV (0 ± 0.03% of FSR, FSR = 200 mV)
Temp effect on accuracy	±0.003% of FSR per °C maximum, from 0 to 70 °C
Field signal to Logic isolation	Galvanically isolated, 1500 V up to 1 minute
Channel isolation	Individual CH-2-CH isolated, 1500 V up to 1 minute
Open circuit detection time	< 1 sec, when in current mode
Short circuit protection	Max 96 mA (in current mode only)
Normal mode noise rejection	-80 dB minimum
Common mode noise rejection	-120 dB minimum

Diagnostics	
Front plate LED's	R (Run), F (Fault), P (Primary), and B (Backup) + 8 Diagnostic & Status LEDs
Local availability	R (Run), F (Fault), P (Primary), and B (Backup) + 8 Diagnostic & Status LEDs

Environment and certification	
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
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	Standard = ISA S71.04 G1, ISA S71.04 G3 compliant versions SPCxxxA 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 61000-6-2, 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

Compatibility	
Use with MTU	NTAI06, NIAI05
Module keying code for base	slot #1 = 6, slot #2 = 18

Dimensions	
Width	35.6 mm
Depth	177.8 mm
Height	298.5 mm
Weight	420 g

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