DATA SHEET

AI16e

ABB Ability™ Symphony® Plus Hardware Selector

The AI16e 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.

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.

Each input channel has a dedicated A/D converter that provides 24-bit resolution with polarity. The AI16e module will update all 16 input channels in 100 msecs.

In current mode, the AI16e module provides short-circuit protection by limiting current to a maximum of 96 mA. The AI16e module will also detect an open circuit in less than 400 msec.

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 100 msecs
- Accuracy from is ±0.03 % to ±0.1 of Full Scale Range (FSR)
- In HN800 operating mode, AI16e supports optional module redundancy

General info	
Article number	7PAA001446R11
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	Universal AI: High Level, mV, TC, and RTD
HART	No
SOE	No
Redundancy	Yes
Form factor	Compact (127 mm)
Mounting	EMB01S-UAI
MTBF (per MIL-HDBK-217-FN2)	PR: B = 185,127 Hours @ 30 ˚C 137,772 Hours @ 40 ˚C 52,055 Hours @ 70 ˚C (Hours)
MTTR (Hours)	AI16e MTTR = 1 hour

Detailed data	
Module power requirements	360 mA (typical) @ 24 VDC ± 10%
Module power connection	POWER TB on EMC-_B0x, cHBX01L or VBX01T
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 22 kΩ voltage mode
A/D Conversion	1 dedicated A/D converter for each channel
A/D Resolution	24-Bits with Polarity
A/D Update rate	100 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	400 msec, 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
Remote availability	HN800 device diagnostics via SPE

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	ISA S71.04 G3 compliant
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	EMB01S-UAI, HBS01e-UAI, VBS01e-UAI
Module keying code for base	slot #1 = 6, slot #2 = 18

Dimensions	
Width	27 mm
Depth	127 mm
Height	127 mm
Weight	204 g

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