

# AI12e

## ABB Ability™ Symphony® Plus Hardware Selector



The AI12e Analog Input module processes up to sixteen (16) high level analog input field signals. Each channel is independently configurable for any of the supported high level 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.

The analog input channels are 1 x 16 group isolated and support HART.

### Features and benefits

- Sixteen (16) high level Analog Input signal channels including:
- 4 to 20 mA, 0 to 1 VDC, 0 to 5 VDC, 1 to 5 VDC, -10 to +10 VDC, 0 to +10 VDC
- Up to 64 HART v5.4 secondary variables Total, max 4 secondary variables per analog I/O CH
- Secondary HART variable update 2.5 typical, 8 max seconds
- ±0.1 % of Full Scale Range accuracy
- In HN800 operating mode, AI12e supports optional module redundancy

General info	
Article number	7PAA003099R1 (AI12e)
Type	Analog Input with HART
Signal specification	4...20 mA, 0...+1 VDC, 0...+ 5 VDC, 1...+5 VDC, -10...+10 VDC, 0...+10 VDC
Life cycle status	ACTIVE
Number of channels	16
Signal type	High Level AI
HART	Yes
SOE	No
Redundancy	Yes
Form factor	Compact (127 mm)
Mounting	EMB01S-XIO
MTBF (per MIL-HDBK-217-FN2)	PR: D = 126,435 Hours @ 30 °C 99,979 Hours @ 40 °C 59,072 Hours @ 70 °C
MTTR (Hours)	AI12e MTTR = 1 hour

Detailed data	
Module power requirements	76 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	4...20mA, 0...+1 VDC, 1...5+5VDC, -10...+10 VDC, or 0...+10 VDC
No. of HART modems	1 HART modem per module
Max no. of secondary HART variables	Up to 64 secondary variables Total, up to 4 variables per CH (HART v 5.4)
Secondary HART variable update rate	2.5 seconds typical, 8.0 seconds max
Input Impedance	250 Ω current mode (externally powered), >= 250 kΩ voltage mode
Output load	0 to 750 Ω Current mode, minimum 22kΩ voltage mode
A/D Conversion	1 A/D converter per module
A/D Resolution	16-Bits with polarity
A/D Update rate	100 msec for all channels
Accuracy, FSR	±0.01% FSR, FSR = 25mA or 20VDC
Temp effect on accuracy	Max ±0.003% per deg C
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 (current mode)
Short circuit protection	Max 96 mA per AI CH (current mode)
Normal mode noise rejection	-70 dB minimum
Common mode noise rejection	-90 dB minimum
DC common mode rejection	-90 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	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	EMB01S-XIO, HBS01e-EPD, HBS01e-FPH, VBS01e-EPD, VBS01e-FPH
Module keying code for base	slot #1 = 5, slot #2 = 19

Dimensions	
Width	27 mm
Depth	127 mm
Height	127 mm
Weight	181 g

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