

# AD11e

## ABB Ability™ Symphony® Plus Hardware Selector



The AD11e Analog Drive module processes up to sixteen (16) mixed-type field signals. The AD11e provides 4x AI, 4x AO, 4x DI, and 4x DO signals.

FC 221 (I/O Device Definition) sets AD11e module operating parameters and each I/O channel is configured using FC 222 for Analog Inputs, FC223 for Analog Outputs, FC224 for Digital Inputs, and FC225 for Digital Outputs.

The analog I/O channels are 1x8 group isolated and support HART. The digital I/O channels provide CH-2-CH isolation, and the digital inputs support SOE (Sequence of Events).

The digital outputs of the AD11e module are open-collector transistor type, 24-48 VDC outputs capable of handling up to 250 mA.

### Features and benefits

- Sixteen (16) mixed field Input/Output signal channels including:
- 4x AI: 4 to 20 mA or 1 to +5 VDC
- 4x AO: 4 to 20 mA or 1 to +5 VDC
- 4x DI: 24/48/110/125 VDC, or 100/120 VAC
- 4x DO: 24-48 VDC max 250 mA
- Up to four (4) secondary HART (v5.4) per analog I/O channel
- 1 msec SOE timestamp resolution for 24 and 48 VDC DI
- In HN800 operating mode, AD11e supports optional module redundancy

General info	
Article number	7PAA001452R11
Type	Mixed I/O
Signal specification	4...20 mA, 1...+5 V, 24/48/110/125 VDC, 100/120 VAC, 24-48 VDC
Life cycle status	ACTIVE
Number of channels	16
Signal type	4xAI, 4xAO, 4xDI, 4xDO
HART	Yes
SOE	Yes
Redundancy	Yes
Form factor	Compact (127 mm)
Mounting	EMB01S-CIO
MTBF (per MIL-HDBK-217-FN2)	PR: B = 141,529 Hours @ 30 °C114,373 Hours @ 40 °C65,974 Hours @ 70 °C
MTTR (Hours)	AD11e MTTR = 1 hour

Detailed data	
Module power requirements	46 mA (typical) @ 24 VDC ± 10%
Module power connection	POWER TB on EMC_B0x, cHBX01L or VBX01T
Field IO power	AI: 20 mA (typical)@ 24 VDC ± 10% AO: 36 mA (typical) 42mA (max) @ 24 VDC ± 10% Per DI Channel: 24VDC: 4.8 mA(typical) 7.0 mA(max) 48VDC: 4.6 mA(typical) 5.3 mA(max) 110VDC: 5.0 mA(typical) 6.7 mA(max) 125VDC: 4.5 mA(typical) 5.5 mA(max) 100VAC: 5.0 mA(typical) 6.0 mA(max) 120VAC: 5.0 mA(typical) 6.0 mA(max)
Digital Input Turn ON / OFF voltage	24VDC: 18 V (ON) 17 V (OFF) 48VDC: 20 V (ON) 18.5 V (OFF) 110VDC: 80 V (ON) 74 V (OFF) 125VDC: 80 V (ON) 74 V (OFF) 100VAC: 61 VAC (ON) 60 VAC (OFF) 120VAC: 64 VAC (ON) 63 VAC (OFF)
Field IO Power, Digital Outputs	24-48 VDC ± 10%, 250 mA max
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	4xAI: 4...20mA or 1...+5VDC, 4xAO: 4...20mA or 1...5+5VDC, 4xDI: 24/48/110/125VDC or 100/120VAC, 4xDO: 24/48VDC
No. of HART modems	1 HART modem per module
Max no. of secondary HART variables	Up to 32 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
SOE timestamp accuracy	1 msec for 24/48VDC DI, 15 msec for 110/125VDC DI, 20 msec for 100/120VAC DI
Output response time	95% of Step change 2.4 seconds (Normal response) 0.27 seconds (Fast response)
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 for all 4 AI channels
A/D Resolution	Configurable from 12 to 16-Bits
A/D Update rate	100 msec for all channels
D/A Conversion	x D/A converters, each channel has a dedicated D/A converter
D/A Resolution	12-Bits
Accuracy, FSR	±0.1% FSR, FSR = 25 mA or 6.25 VDC
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	Analog I/O is 1x8 group isolated, Digital I/O is CH-2-CH isolated, 1500 V up to 1 minute
Open circuit detection time	Less than 5 seconds (for AI)
Short circuit protection	Max 96 mA per AI CH (current mode)
Normal mode noise rejection	-70 dB minimum (Normal AI Response mode), -37 dB minimum (Fast AI Response mode)
Common mode noise rejection	-90 dB minimum (Normal AI Response mode), -53 dB minimum (Fast AI Response mode)

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-CIO, HBS01e-EPD, VBS01e-EPD
Module keying code for base	slot #1 = 11, slot #2 = 19

Dimensions	
Width	27 mm
Depth	127 mm
Height	127 mm
Weight	191 g

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