

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	7PAA001452R1 (AD11e)
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 °C 114,373 Hours @ 40 °C 65,974 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: 20mA (typical)@ 24 VDC ± 10% AO: 36mA (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: 17.7 V (ON) 17.5 V (OFF) 48VDC: 19.8 V (ON) 19.0 V (OFF) 110VDC: 77.0 V (ON) 75.0 V (OFF) 125VDC: 77.0 V (ON) 75.0 V (OFF) 100VAC: 60.8 VAC (ON) 60.7 VAC (OFF) 120VAC: 63.6 VAC (ON) 63.4 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	±0.01% FSR, FSR = 25mA or 6.25VDC
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	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-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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