DATA SHEET

AD11

ABB Ability™ Symphony® Plus Hardware Selector

The AD11 Analog Drive module processes up to 16 mixed-type field signals. The module provides 4x Analog Input, 4x Analog Output, 4x Digital Input, and 4x Digital Output signals.

FC 221 (I/O Device Definition) sets I/O module operating parameters and each input channel is configured using FC 222 (Analog Input CH), FC 223 (Analog Output CH), FC 224 (Digital Input CH), and FC 225 (Digital Out CH) to set individual I/O channel parameters such as engineering units, High/Low alarm limits, debounce period, SOE settings, default output setting in event of loss of communication with a controller, etc.

The Analog Input and Output channels support HART and are 1x8 group isolated. Secondary HART variables are available to be configured as part of the control strategy.

The Digital Inputs of the AD11 module support SOE (Sequence of Events)and are individually CH-2-CH isolated. The Digital Outputs of the AD11 module are transistor type, 24-48 VDC outputs capable of handling 250 mA and also are individually CH-2-CH isolated.

Features and benefits

- 16 mixed type field signal channels including:
- 4x AI: 4 to 20 mADC 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 20 HART v5.4 secondary variables Total, max 4 sec vars per Analog I/O CH
- 1 msec SOE timestamp reolution for 24 and 48 VDC DI

General info	
Article number	8VZZ004175R01 (AD11)
Type	Mixed I/O
Signal specification	AI: 4…20 mA, or 1…+5 VDC | AO: 4…20 mA, or 1…+5 VDC | DI: 24/48/110/125 VDC, 100/120 VAC | DO: 24 to 48 VDC
Life cycle status	ACTIVE
Number of channels	16
Signal type	4x AI + 4x AO + 4x DI + 4xDO
HART	Yes
SOE	Yes
Redundancy	No
Form factor	Standard (190 mm)
Mounting	Horizontal Row or Vertical Column
MTBF (per MIL-HDBK-217-FN2)	PR A: 138,503 Hours
MTTR (Hours)	1 Hours

Detailed data	
Module power requirements	100 mA (typical) @ 24 VDC ± 10%
Module power connection	POWER TB on cHBX01L or VBX01T
Field IO power	AI: 20mA @ 24 VDC ± 10% AO: 36mA (typical) 42mA (max) @ 24 VDC ± 10% 24 VCD DI: 4.8 mA(typical) 7.0 mA(max) 48 VDC DI: 4.6 mA(typical) 5.0 mA(max) 110 VDC DI: 5.0 mA(typical) 6.7 mA(max) 125 VDC DI: 4.5 mA(typical) 5.5 mA(max) 100 VAC DI: 5.0 mA(typical) 6.0 mA(max) 120 VAC DI: 5.o mA(typical) 6.0 mA(max)
Digital Input Turn ON / OFF voltage	24VDC: 17V(ON) 19V(OFF) 48VDC: 18V(ON) 28V(OFF) 110VDC: 74V(ON) 85V(OFF) 125VDC: 76V(ON) 92V(OFF) 100VAC: 54Vrms(ON) 64Vrms(OFF) 120VAC: 55Vrms(ON) 71Vrms(OFF)
Field IO Power, Digital Outputs	max 250 mADC @ 24 to 48 VDC
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	4x Analog Inputs: 4…20 mA or 1…+5VDC, 4x Analog Outputs: 4…20 mA or 1…+5VDC, 4x Digital Inputs: 24/48/110/125VDC or 100/120VAC, 4x Digital Outputs: 24/48VDC
No. of HART modems	1 HART modem per module
Max no. of secondary HART variables	Up to 20 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 AI Step change: Normal response = 2.4 seconds, Fast Response = 0.27 seconds
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	1 D/A converter for each AO channel
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 IO: 1x8 group isolated Digital IO: CH-2-CH isolated, 1500 V up to 1 minute
Open circuit detection time	Less than 5 seconds (for AI)
Short circuit protection	Current Mode: Max 96 mA per AI CH, 60 mA per AO
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	STATUS LEDs: R (Run) and F (Fault) + 1 thru 8 + Dx-1 thru Dx-4
Local availability	Mini USB connection on module front plate
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	HBS01-EPD, VBS01-EPD, VBS01-SFP
Module keying code for base	slot #1 = 11, slot #2 = 19

Dimensions	
Width	27 mm
Depth	106 mm
Height	190 mm
Weight	240 g

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