DATA SHEET

AO02e

ABB Ability™ Symphony® Plus Hardware Selector

The AO02e Analog Output module processes up to sixteen (16) high-level, group-isolated, analog output field signals. Each channel is independently configurable for either 4 to 20 mA or 1 to +5 VDC ranges.

FC 221 (I/O Device Definition) sets AO module operating parameters and each output channel is configured using FC 223 (Analog Output CH) to set indivdual output channel parameters such as engineering units, High/Low Alarm limits, default value in event of loss of communication with controller, etc.

D/A resolution of each channel is 12 bits. The AO02e module has one D/A converter for each output channel.

The AO02e module provides short-circuit protection by limiting current to a maximum of 26 mA. In the current mode, the module will also detect an open circuit in less than 5 seconds.

The analog output channels are 1 x 16 group isolated.

Features and benefits

- Sixteen (16) independently configurable Analog Output channels supporting:
- 4 to 20 mA DC, or 1 to +5 VDC
- Up to 64 HART v5.4 secondary variables Total, max 4 sec vars per analog output CH
- Secondary HART variable update 2.5 typical, 8 max seconds
- 12-Bit D/A converter resolution
- Current mode load up to 750
- Accuracy is ±0.1 % of Full Scale Range where FSR = 25 mA or 6.25 VDC
- In HN800 operating mode, AO02e supports optional module redundancy

General info	
Article number	7PAA001447R11
Type	Analog Output with HART
Signal specification	4…20 mA, 1…+5 VDC
Life cycle status	ACTIVE
Number of channels	16
Signal type	High Level AO
HART	Yes
SOE	No
Redundancy	Yes
Form factor	Compact (127 mm)
Mounting	EMCB01S-XIO
MTBF (per MIL-HDBK-217-FN2)	PR: C = 162,004 Hours @ 30 ˚C 121,519 Hours @ 40 ˚C 53,989 Hours @ 70 ˚C
MTTR (Hours)	AO02e MTTR = 1 hour

Detailed data	
Module power requirements	44 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 Outputs: 4…20 mA,or 1…+5 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
Output load	Current Mode: 0 to 750 Ω, Voltage Mode: 22 kΩ to 1 MΩ
D/A Conversion	16 D/A converters Total, each CH has a dedicated converter
D/A Resolution	12-Bit
Accuracy, FSR	±0.1% FSR, FSR = 25 mA or 6.25 VDC
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 sec, when in current mode
Short circuit protection	Max 26 mA (in current mode only)

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-XIO, HBS01e-EPD, VBS01e-EPD
Module keying code for base	slot #1 = 7, slot #2 = 19

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

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