DATA SHEET

AS01

ABB Ability™ Symphony® Plus Hardware Selector

The AS01 Auto Synchronizer module provides automatic breaker closure during generator to line synchronization, or during Peer-to-Peer bus synchronization. The AS01 automatically matches voltage, frequency, and phase, and is also capable of detecting a dead bus to initiate safe breaker closure from a live bus to a de-energized bus. In addition to the main synchronization circuit, the AS01 uses an independent built-in synchronization check circuit for maximum safety and reliability.

The AS01 module supports 2 analog “BUS” input channels, 7 digital input channels, and 7 digital output channels. The AS01 uses these I/O channels to implement high precision bus matching algorithms for generator to line or line to line synchronization. The AS01 is part of a distributed modular I/O system.

Features and benefits

- 2 Bus input channels, each electrically duplicated
- Rated up to 134 VAC, 40 to 70 Hz
- 2 A/D converters, 16-Bit unipolar resolution
- Accuracy is ±0.1 % of Full Scale Range where FSR = 134 VAC
- 7 Group isolated 24-48VDC Digital Inputs
- 7 CH-2-CH isolated, high load, Form A contact Digital Outputs
- Available G3 conformally coated

General info	
Article number	2VAA008174R01
Type	Auto Synchronizer
Signal specification	AI: 0…120VACDI: 24…48 VDCDO: Form A contact
Life cycle status	ACTIVE
Number of channels	16
Signal type	2x AI + 7x DI + 7x DO
HART	No
SOE	Yes
Redundancy	No
Form factor	Standard (190 mm)
Mounting	Horizontal Row or Vertical Column
MTBF (per MIL-HDBK-217-FN2)	PR D: 241,065 Hours
MTTR (Hours)	1 Hours

Detailed data	
Module power requirements	24 VDC ± 10%, 175 mA typical, 205 mA max
Module power connection	POWER TB on cHBX01L or VBX01T
Field IO power	DI: 3.5 mA typical 5.0mA max @ 24 - 48 VDC ±10%
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	CH1-2: max 1.0 A @ 120 VAC / 150 VDCCH3-7: max 400mA @ 60 VDC / 40 VAC
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	14 Total (2x AI, 7x DI, 7x DO) Channels
Signal ranges and types	Analog Inputs: 0…120VACDigital Inputs: 24-48 VDCDigital Outputs: Form A Contact, (CH1-2) 120 VAC / 150 VDC, (CH3-7) 60 VDC / 40 VAC
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 resolution for 24 - 48 VDC
Output response time	95% of AI Step change: Normal response = 2.4 seconds, Fast Response = 0.27 seconds
Input Impedance	≥ 15 kΩ
Output load	0 to 750 Ω Current mode, minimum 22kΩ voltage mode
A/D Conversion	2 A/D converters, each with 4 input channels
A/D Resolution	16-Bit Unipolar
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	±0.1% FSR, FSR = 134 VAC
Temp effect on accuracy	Max ±0.003% per deg C
Field signal to Logic isolation	UL1577 1000 VRMS for 1 minute
Channel isolation	Digital Inputs are group isolated, Digital Outputs are CH-2-CH isolated
Open circuit detection time	Less than 5 seconds (for AI)
Short circuit protection	Max 2.7mA on DI Channels 1-2
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) + I/O CH Status
Local availability	Mini USB connection on module front plate
Remote availability	HN800 device diagnostics via SPE

Environment and certification	
Temperature, Operating	-20 to +55 °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, IEC 529
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 G1, ISA S71.04 G3 compliant versions SPCxxxA are 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 accTested according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipmentording 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-TCM, VBS01-TCM
Module keying code for base	slot #1 = 12, slot #2 = 22

Dimensions	
Width	27 mm
Depth	106 mm
Height	190 mm
Weight	294 g

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