

# cAI01

## ABB Ability™ Symphony® Plus Hardware Selector



The cAI01 Analog Input module processes up to 8 high level, group isolated, analog input 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 AI module operating parameters and each input channel is configured using FC 222 (Analog Input Channel) to set individual input channel parameters such as engineering units, High/Low alarm limits, etc.

A/D resolution of each channel is configurable from 12 to 16 bits with polarity. The cAI01 module has one A/D converter for all 8 input channels. The module will update all 8 input channels in 100 msec.

The cAI01 module will also detect an open circuit in less than 5 seconds.

### Features and benefits

- 16 independently configurable channels supporting:
- 4 to 20 mADC or 1 to +5 VDC
- 12 to 16-Bit (with polarity) A/D resolution
- A/D update of all 8 Channels in 100 msec
- Accuracy is  $\pm 0.1\%$  of Full Scale Range where FSR = 25 mA or 6.25 VDC

General info	
Article number	2VAA008440R1 (cAI01)
Type	Compact Analog Input
Signal specification	AI: 4...20 mA, or 1...+5 VDC
Life cycle status	ACTIVE
Number of channels	8
Signal type	AI
HART	No
SOE	No
Redundancy	No
Form factor	Compact (127 mm)
Mounting	Horizontal Row or Vertical Column
MTBF (per MIL-HDBK-217-FN2)	PR B: 186,540 Hours
MTTR (Hours)	1 Hours

<b>Detailed data</b>	
Module power requirements	24 VDC $\pm$ 10%, 75 mA typical, 84 mA max
Module power connection	POWER TB on cHBX01L or VBX01T
Field IO power	20 mA/channel @ 24 VDC $\pm$ 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	8 Analog Input channels
Signal ranges and types	Analog Outputs: 4...20 mA, or 1...+5 VDC
Input Impedance	250 $\Omega$ current mode (externally powered), $\geq$ 250 k $\Omega$ voltage mode
Output load	0 to 750 $\Omega$ Current mode, minimum 22k $\Omega$ voltage mode
A/D Conversion	1 A/D converter per module
A/D Resolution	16-Bits with Polarity
A/D Update rate	100 msec for all 16 channels
Accuracy, FSR	$\pm$ 0.01% FSR, FSR = 25 mA or 6.25 VDC
Temp effect on accuracy	Max $\pm$ 0.003% per deg C
Field signal to Logic isolation	Galvanically isolated, 1500 V up to 1 minute
Channel isolation	1x8 group isolated, 1500 V up to 1 minute
Short circuit protection	Max 96 mA per CH
Normal mode noise rejection	-70 dB minimum
Common mode noise rejection	-90 dB minimum
DC common mode rejection	-90 dB minimum

<b>Diagnostics</b>	
Front plate LED's	STATUS LEDs: R (Run) and F (Fault) + 1 thru 8
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, 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 according to IEC/EN 61000-6-4, CISPR 11 + A1, CISPR 16-1-1, Group 1, Class A, ISM equipment 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	cHBS01-EPD, cHBS01-FPH, cVBS01-EPD, cVBS01-FPH
Module keying code for base	slot #1 = 02, slot #2 = 15

## Dimensions

Width	27 mm
Depth	106 mm
Height	127 mm
Weight	168 g

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