CONPROSYS nano Series
Analog Input Module
CPSN-AI-1208LI
Analog Input Module 24bit ADC
CPSN-AI-2408LI

This product is an expansion I/O module that adds an analog input interface to the CPU unit of the CONPROSYS nano series.

The CPSN-AI-1208LI contains 12-bit resolution analog input.

The CPSN-AI-2408LI contains 24-bit resolution analog input.

One module can be used as single-ended voltage input with 8 channels, differential voltage input with 4 channels, or differential current input with 4 channels and the functions are switchable.

* The contents in this document are subject to change without notice.
* Visit the CONTEC website to check the latest details in the document.
* The information in the data sheets is as of January 2020.

* The photograph is a CPSN- AI-1208LI.
* Specifications, color and design of the products are subject to change without notice.

Features

Bus Isolated Analog Input
This product contains bus isolated analog voltage input and analog current input. As the analog input supports differential input, accurate measurement can be performed even when potential differences with the signal source occur.

Capable of supporting multiple input range and types.
With software command, the CPSN-AI-1208LI can support the input range of ±10V, ±5V, ±2.5V, and 0 - +10V. The input type can be switched between single ended input and differential input.

Also, the range can be switched to current input of ±20mA with the switch on the I/O module.

With software command, the CPSN-AI-2408LI can support the input range of ±10V, ±5V, ±2.5V, 0 - +10V, and 0 - +5V. The input type can be switched between single ended input and differential input.

Also, the range can be switched to current input of ±20mA, 0 -+20mA with the switch on the I/O module.

Easy installation and removal
This product can be installed in and removed from the CPU unit without any tools.

Adaptable to a wide range of temperature between -20 and +60°C
The product is capable of operating in the temperature between -20 and + 60°C. It can be installed in the various environments.

No electrolytic capacitor
Without an electrolytic capacitor, which has a limited life, we are creating the product with a longer life.

Digital Filter Within [available with the CPSN-AI-2408LI]
Slowing the speed of switching channels with software command removes high-frequency noises.
Moreover, 50/60Hz noises can be removed by setting to the power noise removal mode.

Specifications

Function specifications

Item	CPSN-AI-1208LI	CPSN-AI-2408LI
Input type *1	Single-Ended Input or Differential Input (Set by software command)	
Input range *1	±10V, ±5V, ±2.5V, 0 - +10V (Set by software command) ±20mA (Switch setting)	±10V, ±5V, ±2.5V, 0 - +10V, 0 - +5V (Set by software command) ±20mA, 0 - +20mA (Switch setting)
Maximum input rating	At voltage input : ±15V At current input : ±24mA	At voltage input : ±20V At current input : ±24mA
Input impedance	At voltage input : 1MΩ or more (Power ON), 10kΩ(Power OFF) At current input : 249Ω	At voltage input : 1MΩ or more At current input : 249Ω
Input channel	8ch (Single-Ended Input), 4ch (Differential Input) * Current input is supported for differential input only.	
Resolution	12-bit	24-bit
Non-Linearity error *2	At voltage input : ±10LSB At current input : ±20LSB	At voltage input : 0.1%FS At current input : 0.2%FS (when 40msec/ch)
Channel switching rate	10μsec/ch	208usec/ch - 319msec/ch
Conversion rate	Differ by the software	
Buffer memory	-	
Conversion start trigger	Software	Constant conversion
Digital filter	-	Power supply noise(50/60Hz) removal High-frequency noise removal
Isolation	Bus Isolation	
Voltage resistance	500VDC	
Connector	2 pieces 3.81mm pitch 10-pin terminal	
Applicable wire	AWG28 - 16	
LED	-	AI0 - AI7 (Green)
Electricity consumption	5V 0.21A (Max.) 3.3V 0.01A (Max.)	5V 0.14A (Max.) 3.3V 0.06A (Max.)
Physical dimensions (mm)	15.6(W)×52.6(D)×84(H) (No projection included)	
Weight	50g	

*1 All the input channels of range and types should be switched together simultaneously.
*2 The non-linearity error means an error of approximately 0.1% occurs over the maximum range at -20°C and 60°C ambient temperature.
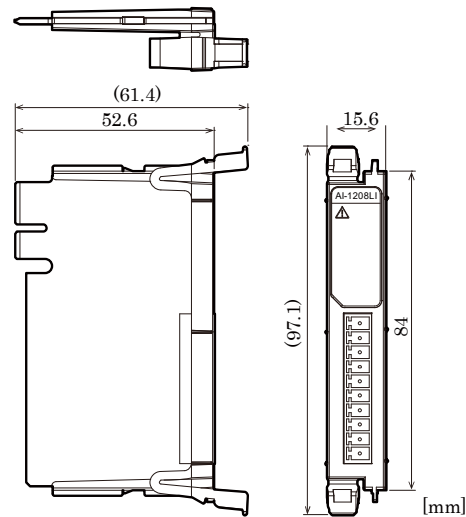
Packing List

Product [CPSN- AI-1208LI or CPSN- AI-2408LI]...1
10-pin Connector...1 (attached to the product)
Product Guide & Warranty Certificate...1
Serial Number Label...1

Installation Environment Requirements

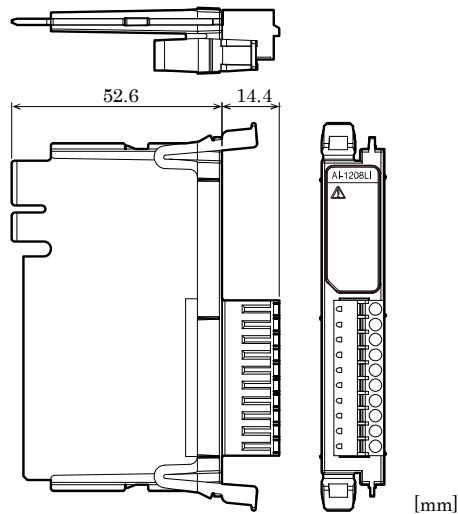| Item		Description
Operating ambient temperature		-20 - +60℃ (Wall installation at an angle of 0°) *1
Operating ambient humidity		10 - 90%RH (No condensation)
Non-operating ambient temperature		-20 - +60℃
Non-operating ambient humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-noise resistance	Line noise	Signal Line /±1kV (IEC61000-4-4 Level 3, EN61000-4-4 Level 3)
	Static electricity resistance	Touch /±4kV (IEC61000-4-2 Level 2, EN61000-4-2 Level 2) Air /±8kV (IEC61000-4-2 Level 3, EN61000-4-2 Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz *2 /semi-amplitude vibration 0.15mm, 57 - 150Hz/2.0G 40minutes each in X, Y, and Z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Shock resistance		15G half-sine shock for 11ms in X, Y, and Z directions (JIS C 60068-2-27 -compliant, IEC 60068-2-27 -compliant)
Standard		VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive)

*1 -20°C to +50°C with a vertical installation at an angle of 90° to the left/right, -20°C to +55ºC for the horizontal installation.
*2 With the optional DIN rail fitting power supply: 10 - 55Hz (for details, see the User's Guide of the optional power supply).

Physical Dimensions

(61.4)
52.6
15.6
(97.1)
84
[mm]

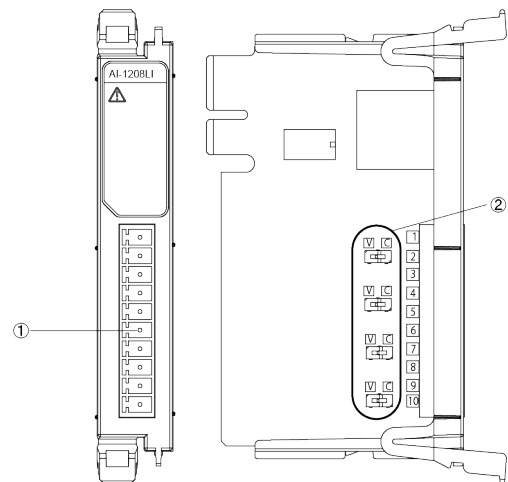### With the connector attached

52.6
14.4
[mm]

List of Options

CPU unit
CPSN-MCB271-S1-041 :   Remote I/O CPU unit

CPSN-MCB271-1-041 :   Remote I/O CPU unit LAN 2-channel model

CPSN-PCB271-S1-041 :   CODESYS Modbus Master CPU unit

DIN rail mounting power supply
CPS-PWD-30AW24-01 :   DIN rail mounting power supply 30[W]
                                            (Input: 100 - 240VAC, output: 24VDC 1.3 A)

CPS-PWD-90AW24-01 :   Fitting power supply 90W
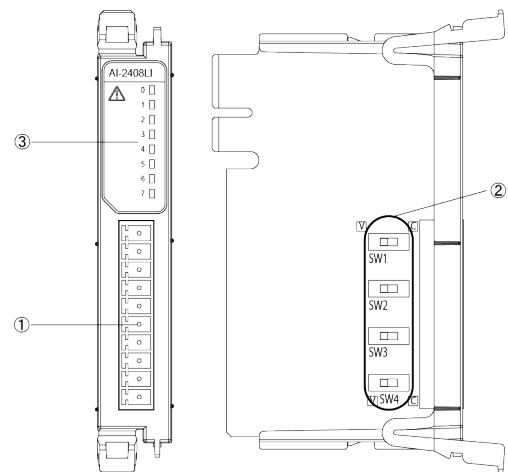   (Input: 100 - 240VAC, Output: 24VDC 3.8 A)

* Visit the Contec website regarding information on the optional products.

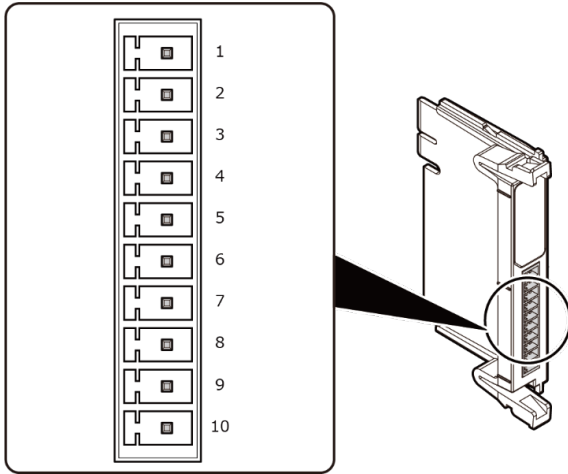## Name of each parts

CPSN-AI-1208LI

CPSN-AI-2408LI

(1) Interface Connector: Connector for analog input. Use the 10-pin connector, included in the package.
(2) Switch: Use this to switch between "voltage input" and "current input".
(3) Indicate the status of analog input.

Analog Input Connector

This product has 8 channels of analog input. Use the 10-pin connector included in the package to connect to external power.

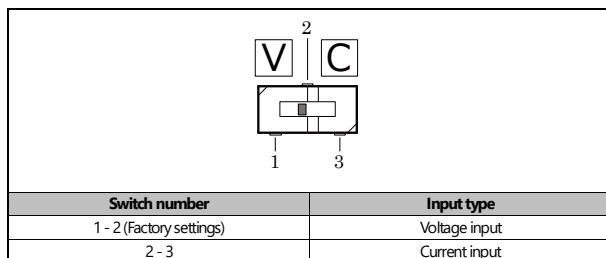Connector type: DEGSON 15EDGKC-3.81-10P-13 (or equivalent)

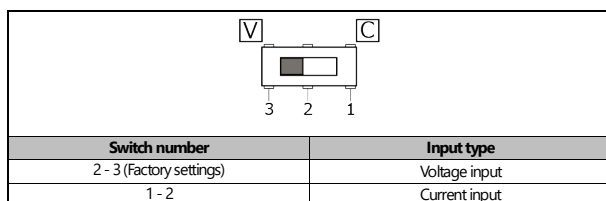| Single-Ended Input (Voltage)			Differential Input (Voltage, Current)		
Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	AI0	This indicates the analog input signals of AI0.	1	AI0(+)	This indicates the analog input signals of AI0 (+)
2	AI1	This indicates the analog input signals of AI1.	2	AI0(-)	This indicates the analog input signals of AI0 (-)
3	AI2	This indicates the analog input signals of AI2.	3	AI1(+)	This indicates the analog input signals of AI1 (+)
4	AI3	This indicates the analog input signals of AI3	4	AI1(-)	This indicates the analog input signals of AI1 (-)
5	AGND	This is an analog ground and shares channels of analog input signals.	5	AGND	This is an analog ground and shares channels of analog input signals.
6	AI4	This indicates the analog input signals of AI4.	6	AI2(+)	This indicates the analog input signals of AI2 (+)
7	AI5	This indicates the analog input signals of AI5.	7	AI2(-)	This indicates the analog input signals of AI2 (-)
8	AI6	This indicates the analog input signals of AI6.	8	AI3(+)	This indicates the analog input signals of AI3 (+)
9	AI7	This indicates the analog input signals of AI7.	9	AI3(-)	This indicates the analog input signals of AI3 (-)
10	AGND	This is an analog ground and shares channels of analog input signals.	10	AGND	This is an analog ground and shares channels of analog input signals.

Switch

Use this to switch between "voltage input" and "current input".

Factory settings of the CPSN-AI-1208LI are "1-2: Voltage input", and for the CPSN-AI-2408LI are "2-3: Voltage input".

CPSN-AI-1208LI

Switch number	Input type
1 - 2 (Factory settings)	Voltage input
2 - 3	Current input

CPSN-AI-2408LI

Switch number	Input type
2 - 3 (Factory settings)	Voltage input
1 - 2	Current input

LED Indicator

All of the LEDs are ON when single-ended input is set. The even-numbered LEDs light up and the odd-numbered LEDs go out when differential input is set. LEDs flash when voltage or current are input beyond the setting range.

The meaning of each LED is described below.

LED	Color	Display		Description
AI0 - AI7	Green	ON	🟩	Analog input normal
	Green	Flashing	🟩	Analog input error
	-	OFF	⬜	Differential input is set