

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



- * 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 the CPSN-AI-1208LI, voltage input and current input is switchable in the switch setting of I/O module.
For voltage input, the input range and input type (single-ended input or differential input) can be switched by software command.
For current input, the differential input type is $\pm 20\text{mA}$ range.

With the CPSN-AI-2408LI, voltage input and current input are switchable in the switch setting of I/O module.
For voltage input, the input range and input type (single-ended input or differential input) can be switched by software command.
For current input, the differential input type is used and the input range is switchable.

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.

Included Items

- Product [CPSN- AI-1208LI or CPSN- AI-2408LI]...1
- Please read the following...1
- 10-pin Connector...1 (attached to the product)

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 October 2025.

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 *3	Voltage input *3	$\pm 10\text{V}, \pm 5\text{V}, \pm 2.5\text{V}, 0 - +10\text{V}$ (Set by software command) *1
	Current *3	$\pm 20\text{mA}$
Maximum input rating	At voltage input: $\pm 15\text{V}$ At current input: $\pm 24\text{mA}$	At voltage input: $\pm 20\text{V}$ At current input: $\pm 24\text{mA}$
Input impedance	At voltage input: $1\text{M}\Omega$ or more (Power ON), $10\text{k}\Omega$ (Power OFF) At current input: 249Ω	At voltage input: $1\text{M}\Omega$ 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: $\pm 10\text{LSB}$ At current input: $\pm 20\text{LSB}$	At voltage input: $0.1\% \text{FS}$ At current input: $0.2\% \text{FS}$ (when 40msec)
Channel switching rate	$10\mu\text{sec}/\text{ch}$	$0.208\text{msec} - 319\text{msec}$ *4
Conversion rate	Differ by the software	
Buffer memory	-	
Conversion start trigger	Software	Constant conversion
Digital filter	-	Normal (High-frequency noise removal) Power supply noise(50/60Hz) removal
Isolation	Bus Isolation	
Voltage resistance	500VDC	
Connector	2 pieces 3.81mm pitch 10-pin terminal	
Applicable wire	AWG28 - 16	
LED	-	A10 - A17 (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) \times 52.6(D) \times 84(H) (No projection included)	
Weight	50g	

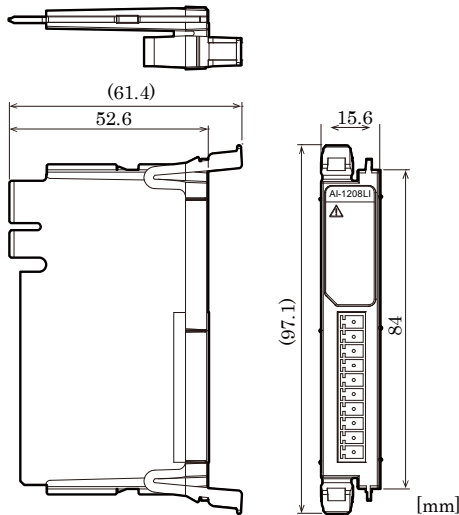
- *1 All the input channels can be switched together simultaneously.
- *2 The non-linearity error means an error of approximately 0.1% occurs over the maximum range at -20°C and 60°C ambient temperature.
- *3 Voltage input and current input are switchable in the switch setting of I/O module.
- *4 Switching rate can be set per channel.

Installation Environment Requirements

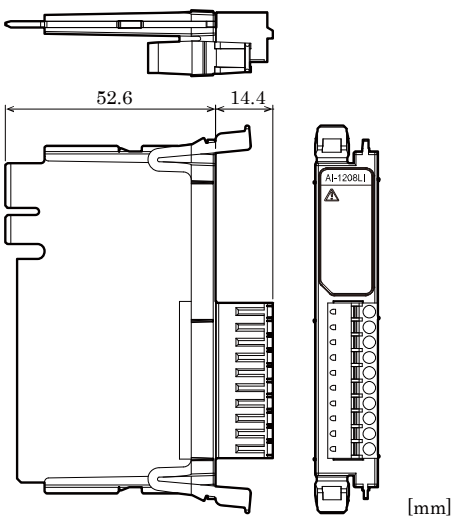
Item	CPSN-AI-1208LI	CPSN-AI-2408LI
Operating ambient temperature	-20 - +60°C (Wall installation at an angle of 0°) *1	
Operating ambient humidity	10 - 90%RH (No condensation)	
Non-operating ambient temperature	-20 - +60°C	
Non-operating ambient humidity	10 - 90%RH (No condensation)	
Floating dust particles	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), UKCA, ISED, KC	VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA, ISED

- *1 -20°C to +50°C with a vertical installation at an angle of 90° to the left/right, -20°C to +55°C 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



With the connector attached



Optional Products

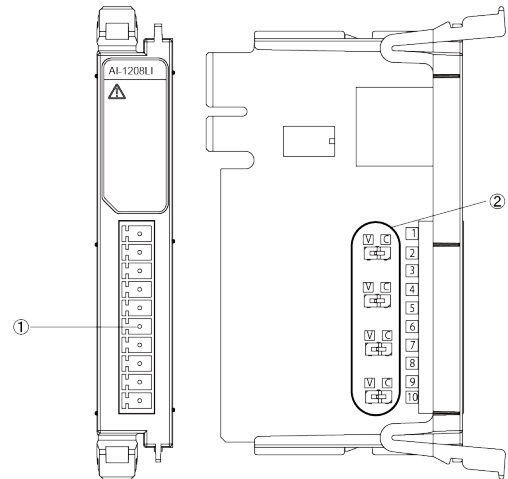
Product Name	Model type	Description
CPU unit	CPSN-MCB271-S1-041	Remote I/O CPU unit
	CPSN-MCB271-1-041	Remote I/O CPU unit LAN 2-channel model
	CPSN-PCB271-S1-041	CODESYS Modbus Master CPU unit
USB I/O Unit - Module Type	CC-USB271-CPSN4	USB I/O Unit - Module Type (4 slot) *1
Bracket	CPS-PWD-30AW24-01	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)

*1 Available with our device driver API-TOOL.

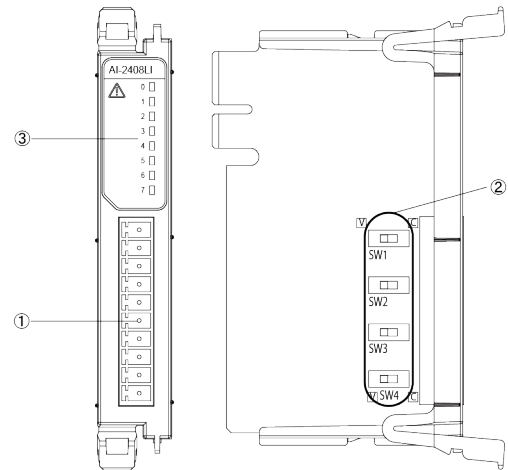
* Visit the Contec website regarding information on the optional products.

Name of each parts

CPSN-AI-1208LI



CPSN-AI-2408LI

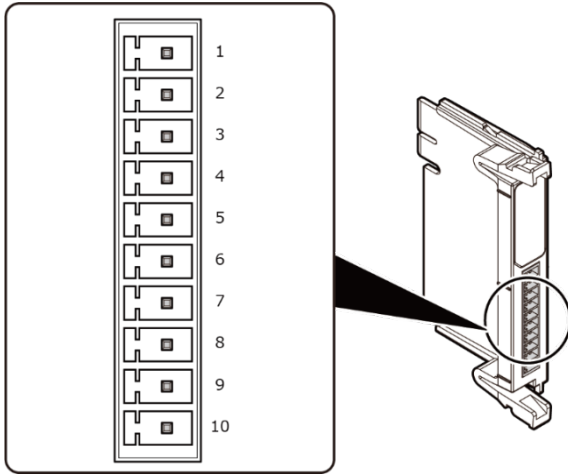


- (1) Interface Connector: Connector for analog input. Use the 10-pin connector, included in the package.
- (2) Switch: Use this to switch between "voltage input" and "current input".
- (3) Indicate the status of analog input.

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)



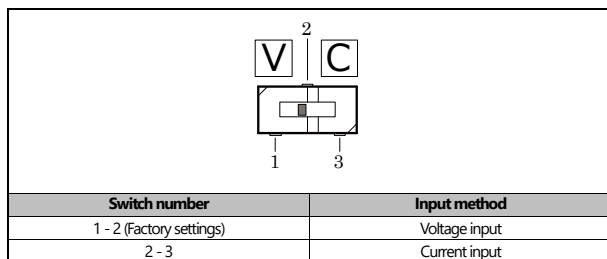
Single-Ended Input (Voltage)			Differential Input (Voltage, Current)		
Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	AI0	This indicates the analog input signals of AI0.	1	AI0(+)	This indicates the analog input signals of AI0 (+)
2	AI1	This indicates the analog input signals of AI1.	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".

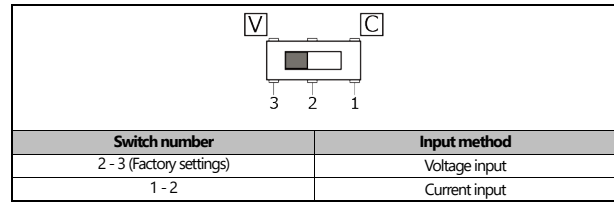
Factory settings of the CPSN-AI-1208LI are "1-2: Voltage input", and for the CPSN-AI-2408LI are "2-3: Voltage input".

CPSN-AI-1208LI



The switch settings for voltage input and current input should be the same for all channels. When current input is set, only differential input is available for the input type.

CPSN-AI-2408LI



For differential input, differing setting of voltage input and current input can be set per input channel. When single-ended input is set, voltage input should be set for switch setting in all channels.

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.

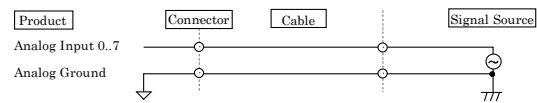
The meaning of each LED is described below.

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

An example connection of single-ended voltage input

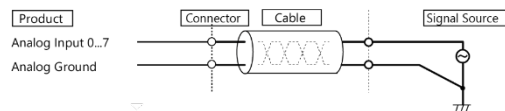
Connection using a flat cable

The example below uses a flat cable to connect the Module to an external device. For each analog input channel, connect separate signal and ground wires on Connector.



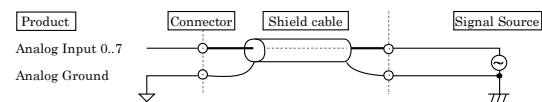
Connection using a twisted cable

The example below uses a twisted cable to connect the Module to an external device. Use this type of cable if the external device is located at a distance from the product. For each analog input channel, connect input of the external device and ground wires on one-to-one basis.



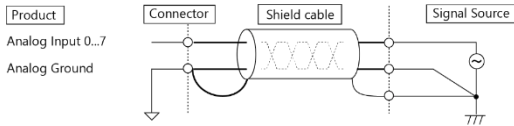
Connection using a coaxial cable

The example below uses a coaxial cable to connect the Module to an external device. Use this type of cable if the distance between the signal source and the product is long. For each analog input channel, connect the core wire to the signal line and connect the shielding to ground.



Connection using a shielded cable

The example below uses a two-conductor twisted shield cable to connect the Module to an external device. Use this type of cable if the external device is located at a distance from the product or if the connection requires higher noise immunity. For analog input channel of the product and for ground, connect the core wire to the output of the external device and to ground respectively. Also, connect the shielding to ground.



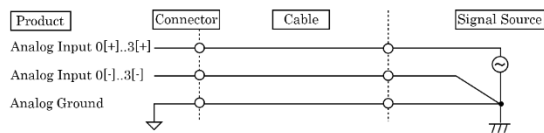
CAUTION

- If the signal source contains over 1MHz signals, the signal may affect the cross-talk noise between channels.
- If the cable between the product and the signal source is too long, data may not be input properly. The recommended cable length is within 1.5 meters.
- Analog input signal should not exceed the maximum input rating of the analog input voltage based on the analog ground. If it exceeds the maximum, this product may be damaged.
- When the input pin is not connected, conversion data is undefined. Connect all the unused analog input channels to analog ground.
- An input pin may fail to obtain input data normally when the signal source connected to the pin has high impedance. If this is the case, change the signal source to one with lower output impedance or insert a high-speed amplifier buffer between the signal source and the analog input pin to reduce the effect.

An example connection of differential voltage input

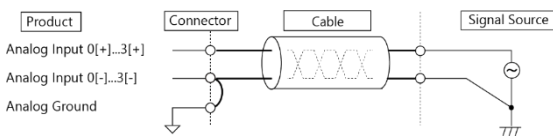
Connection using a flat cable

The example below uses a flat cable to connect the Module to an external device. For each analog input channel, connect the "+" input to the signal and connect the "-" input to the signal source ground. Also connect the analog ground on the module to the signal source ground.



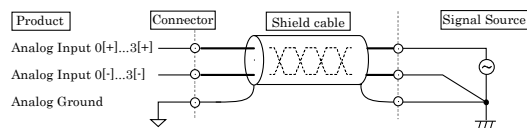
Connection using a twisted cable

The example below uses a twisted cable to connect the Module to an external device. Use this type of cable if the external device is located at a distance from the product. For each analog input channel, connect the "+" input to the signal and connect the "-" input to the signal source ground. Also connect the analog ground on the module to the "-" input.



Connection using a shielded cable

The example below uses a two-conductor twisted shield cable to connect the Module to an external device. Use this type of cable if the signal source is located at a distance from the Module or if the connection requires higher noise immunity. For each analog input channel, connect the "+" input to the signal and connect the "-" input to the signal source ground. Also connect the analog ground on the module and the signal source ground to the shielding.

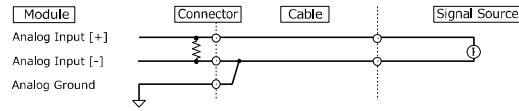


CAUTION

- If the signal source contains over 1MHz signals, the signal may affect the cross-talk noise between channels.
- When the analog ground is not connected, the conversion data is not determined.
- If the cable between the product and the signal source is too long, data may not be input properly. The recommended cable length is within 1.5 meters.
- Analog signal which input [+] Input, and [-] input should not exceed the maximum input rating of the analog input voltage. If it exceeds the maximum, this product may be damaged.
- When the pin of [+] input or [-] input is not connected, conversion data is undefined.
- Connect both the pin [+] input and [-] input of unused channels to analog ground.

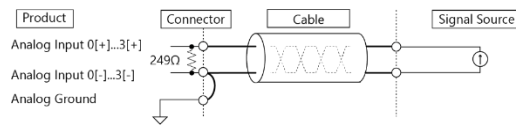
An example connection of differential current input

Connecting with two-terminal current output (using a flat cable)
Connect the [+] analog input channel of the module to the positive side of the current source, and the [-] to the negative side of the current source respectively. Also, connect the analog ground on the module to the [-] of the signal source.



Connection using a twisted cable

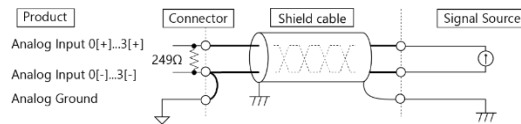
The example below uses a twisted cable to connect the Module to an external device. Use this type of cable if the external device is located at a distance from the product. Connect the [+] analog input channel of the module to the positive side of the current source, and the [-] to the negative side of the current source respectively. Also connect the analog ground on the module to the "-" input.



Connection using a shield cable

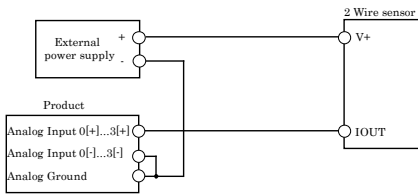
The example below uses a shielded two-conductor cable to connect the Module to an external device. Use this type of cable if the signal source is located at a distance from the Module or if the connection requires higher noise immunity and when the module is used in a place that is affected by lightning surge.

Connect the [+] analog input channel of the Module to the positive side of the current source, and the [-] to the negative side of the current source respectively. Also, connect ground of external device to ground of signal source using the shielding. At this time, make sure the potential difference between the [-] input of the Module and the analog ground is 0.5 V or less.

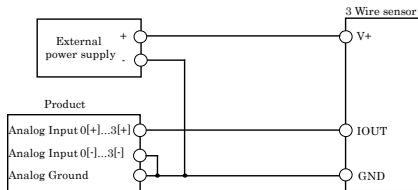


An example connection with current output sensor

[2-Wire Sensor Connection]



[3-Wire Sensor Connection]



⚠ CAUTION

- If the signal source contains over 1MHz signals, the signal may affect the cross-talk noise between channels.
- When the analog ground is not connected, the conversion data is not determined.
- Analog ground is shared by channels as they are not isolated. If the channels are effected by potential differences, isolate the between the channel and channel with an isolation converter, for example.
- Analog signal which input [+] input, and [-] input should not exceed the maximum input rating of the analog input voltage. If it exceeds the maximum, this product may be damaged.
- When the pin of [+] input or [-] input is not connected, conversion data is undefined.
- Connect both the terminal [+] input and [-] input of unused channels to analog ground.