

CONPROSYS nano Series
Analog Input Module 16bit ADC
CPSN-AI-1604LI



* 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 product, voltage input and current input are switchable in the switch setting of I/O module.

The voltage/current input is a differential input method, and the input range can be switched by software.

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.

Included Items

Product [CPSN-AI-1604LI]...1

10-pin Connector...1 (attached to the product)

Please read the following...1

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-MCB271-S1-081	Remote I/O CPU unit LAN 2-channel, 8slot model
	CPSN-PCB271-S1-041	CODESYS Modbus Master CPU unit
	CPSN-EOB471EC-41	Remote I/O CPU unit (EtherCAT, 4slot)
	CPSN-EOB471EC-81	Remote I/O CPU unit (EtherCAT, 8slot)
USB I/O Unit - Module Type	CC-USB271-CPSN4	USB I/O Unit - Module Type (4 slot) *1
DIN rail fitting power supply	CPS-PWD-30AW24-01	Fitting power supply 30W (Input: 100 - 240VAC, Output: 24VDC 1.3A)
	CPS-PWD-90AW24-01	Fitting power supply 90W (Input: 100 - 240VAC, Output: 24VDC 3.8A)

*1 Available with our device driver API-TOOL

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

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-1604LI contains 16-bit resolution analog input. One module can be used as 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 February, 2026.

Specifications

Function specification

Item	Description
Input type *1	Differential Input
Input range *1	Voltage input *3
	Current *3
Maximum input rating	At voltage input: ±20V At current input: ±30mA
Input impedance	At voltage input: 1MΩ or more At current input: 249Ω (Typ.)
Input channel	4ch (Differential Input)
Resolution	16-bit
Non-Linearity error *2	At voltage input: ±8LSB At current input: ±20LSB
Channel switching rate	10μsec/ch
Conversion rate	Differ by the software
Buffer memory	-
Conversion start trigger	Software
Digital filter	-
Isolation	BusIsolation
Voltage resistance	500VDC
Connector	2 pieces 3.81mm pitch 10-pin terminal
Applicable wire	AWG28 - 16
LED	-
Electricity consumption	5V 0.25A (Max.) 3.3V 0.01A (Max.)
Physical dimensions (mm)	15.6(W)×52.6(D)×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.

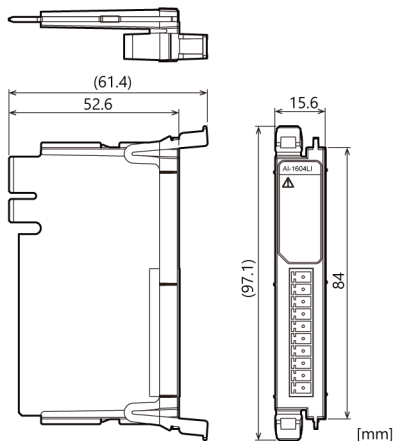
Installation Environment Requirements

Item	Description	
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	

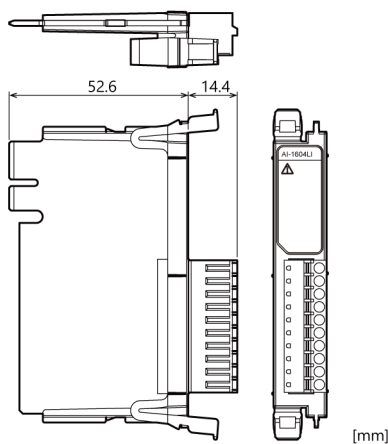
*1 -20°C to +50°C with a vertical installation at an angle of 90° to the left/right, -20°C to +55°C for the horizontal installation.

*2 With the optional DIN rail fitting power supply: 10 - 55Hz (for details, see the User's Guide of the optional power supply).

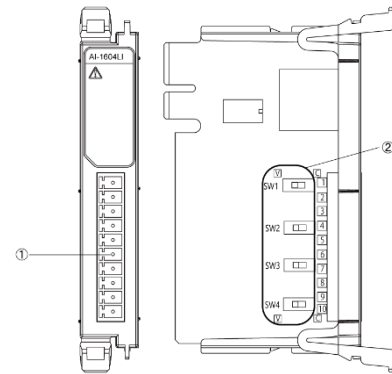
Physical Dimensions



With the connector attached



Name of each parts



No.	Name	Function
1	Interface Connector	This is a 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	LED Indicator	Indicate the status of analog input

Analog Input Connector

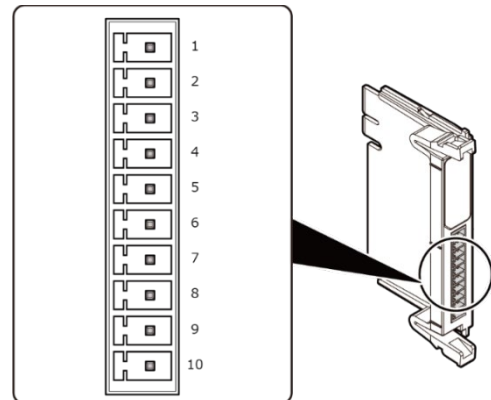
This product has 8 channels of analog input. Use the 10-pin connector included in the package to connect to external power.

Mounted Connector

10-pin European style terminal block (3.81mm pitch, 10 x 1 row)
MC 1.5/10-G-3,81 P26 THR [Phoenix Contact] or equivalent

Compatible Connector

10-pin European style terminal block (3.81mm pitch, 10 x 1 row)
FK-MCP 1.5/10-ST-3,81 [Phoenix Contact] or equivalent

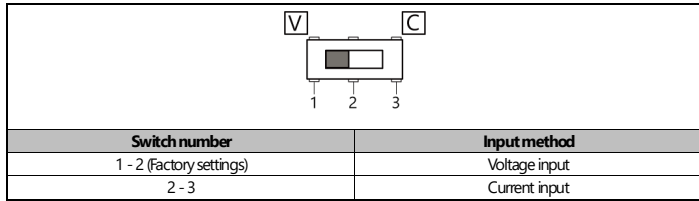


Differential Input (Voltage, Current)		
Pin No.	Signal Name	Description
1	AI0(+)	This indicates the analog input signals of AI0 (+)
2	AI0(-)	This indicates the analog input signals of AI0 (-)
3	AI1(+)	This indicates the analog input signals of AI1 (+)
4	AI1(-)	This indicates the analog input signals of AI1 (-)
5	AGND	This is an analog ground and shares channels of analog input signals
6	AI2(+)	This indicates the analog input signals of AI2 (+)
7	AI2(-)	This indicates the analog input signals of AI2 (-)
8	AI3(+)	This indicates the analog input signals of AI3 (+)
9	AI3(-)	This indicates the analog input signals of AI3 (-)
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 product is "1-2: Voltage input".



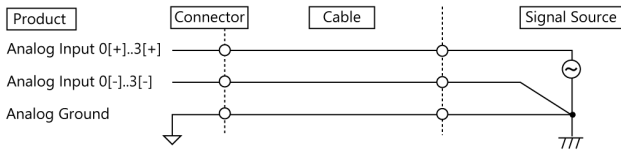
Voltage input and current input can be set differently for each input channel

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.

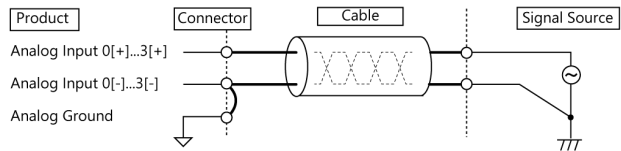


Connection using a twisted cable

The example below uses a twisted cable to connect the Module to an external device.

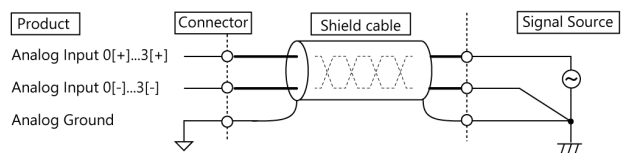
Use this type of cable if the external device is located at a distance from the product.

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.

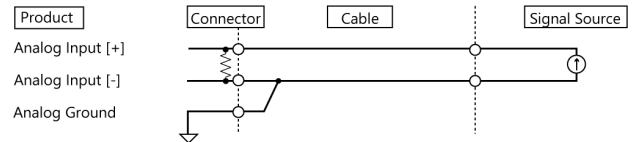
- When the pin of [+] input or [-] input is not connected, conversion data is undefined.
- Connect both the pin [+] input and [-] input of unused channels to analog ground.

An example connection of differential current input

Connecting with two-terminal current output (using a flat cable)

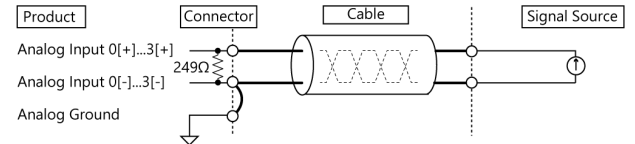
Connect the [+] analog input channel of the module to the positive side of the current source, and the [-] to the negative side of the current source respectively.

Also, connect the analog ground on the module to the [-] of the signal source.



Connection using a twisted cable

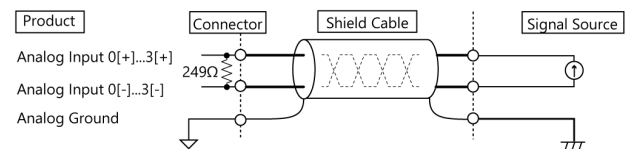
The example below uses a twisted cable to connect the Module to an external device. Use this type of cable if the external device is located at a distance from the product. Connect the [+] analog input channel of the module to the positive side of the current source, and the [-] to the negative side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



Connection using a shield cable

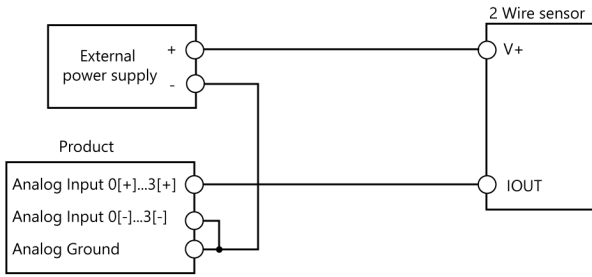
The example below uses a shielded two-conductor cable to connect the Module to an external device. Use this type of cable if the signal source is located at a distance from the Module or if the connection requires higher noise immunity and when the module is used in a place that is affected by lightning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

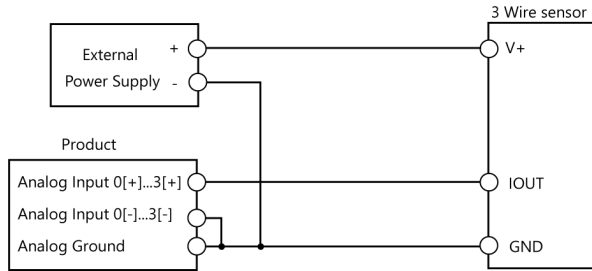


An example connection with current output sensor

[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.

Differences between this product and our earlier models

The CPSN-AI-1604LI is designed as a successor to the F&EIT Series ADI16-4(FIT)GY and can be used in the same way.

The differences between the CPSN-AI-1604LI's specifications and those of the ADI16-4(FIT)GY are shown below.

Differences between CPSN-AI-1604LI and ADI16-4(FIT)GY

Item	CPSN-AI-1604LI	ADI16-4(FIT)GY	
Input range	Voltage input	$\pm 10V, \pm 5V, \pm 2.5V, 0 - +10V$ (Set by software command)	Bipolar $\pm 10V$
	Current	$\pm 20mA, 0 - 20mA, 4 - 20mA$ (Set by software command)	0 - 20mA
Maximum input rating	At voltage input $\pm 30mA$	At voltage input 30mA	
Input impedance	At voltage input 249 Ω	At voltage input 250 Ω	
Connector	2 pieces 3.81mm pitch 10-pin terminal	FRONT-MC 1.5/12-STF-3.81 (made by PHOENIX CONTACT) or equivalent	
Conversion rate	Differ by the software	Number of conversion channels x 10 μ sec + 20 μ sec	
Buffer memory	*1	64-Word	
Interrupt	*1	Either IRQ5, IRQ7, IRQ9 *2	
Internal sampling timer	*1	10 μ sec - 1,073,741,824 μ sec*2	
Electricity consumption	5V 0.25A (Max.) 3.3V 0.01A (Max.)	5V 300mA (Max.)	
Physical dimensions (mm)	15.6(W) x 52.6(D) x 84(H) (No projection included)	25.2(W) x 64.7(D) x 94.0(H) (No projection included)	
Weight	50g	100g	

*1 Because this product operates by acquiring the latest analog input data at the time a command is executed, the sampling function is not supported in this specification.

*2 Available only when the ADI16-4(FIT)GYs connected to the CPU-SBxx(FIT)GY.