CONPROSYS Series
Thermocouple Module

CPS-SSI-4C

* Specifications, color and design of the products are subject to change without notice.

This product is an expansion I/O module that adds a thermocouple interface to the CPU unit of the CONPROSYS series.
Four channels of differential inputs are provided for one module.

* 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, 2025.

Features

Compatible with various types of thermocouple inputs
This product is compatible with a wide range of thermocouple input types such as J(IEC60584-1), K(IEC60584-1), E(IEC60584-1), N(IEC60584-1), R(IEC60584-1), S(IEC60584-1), and T(IEC60584-1).

Cold junction compensation function within
As cold junction compensation is integrated in the product, there is no need to install a temperature sensor for cold junction compensation externally, and temperature can be measured simply by connecting a thermocouple.

Compact design
Compact design, 25.2 (W)×94.7(D)×124.8 (H), features flexibility in installation.

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.

Installation easy with two pieces of terminal support and DIN rail
You can install and remove a terminal connector without a screwdriver so that it can shorten the time of the replacement. As the product can be not only mounted on DIN rail, but also is removable along the side rails, replacing is simple and easy as well.

Equipped with LED for an operation check
The product has LED for an operation check, which helps you visually confirm the communication status of each interface.

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

Included Items

Product [CPS-SSI-4C] ...1
10-pin connector (attached to the product) ... 1
Please read the following ... 1

Specifications

Function specification

Item	Description
Input type	Differential input
Input channel	4ch
Resolution	24-bit
Conversion speed *1	251ms (Conversion speed per thermocouple per channel)
Buffer memory	The latest data only
Compatible thermocouple sensor	J (IEC 60584-1), K (IEC 60584-1, JIS C1602), E (IEC 60584-1), N (IEC 60584-1), R (IEC 60584-1), S (IEC 60584-1), T (IEC 60584-1)
Conversion tolerance	Thermocouple type K, J, E, N, T: Within ± [0.3°C + Measured temperature x 0.12% (0°C or higher) or 1% (0°C or lower) Thermocouple type R, S: Within ± [1.2°C + Measured temperature x 0.12%]
Allowable signal source resistance	300Ω or less *3 *4
Cold junction sensor	Integrated
Cold junction tolerance *2	Within 3.6°C
Isolation	Bus isolation
Isolation withstand voltage	500VDC
Connector	3.81mm pitch 10-pin terminal
Applicable wire	AWG30 - 16
LED	Status (Green, Red)
Electricity consumption	0.1A (Max.)
Physical dimensions (mm)	25.2(W)×94.7(D)×124.8(H) (No projection included)
Weight	200g
Installation method	Quick mounting on the 35mm DIN rail

*1 It is the conversion time of the measurement value. Communication time is not included.
*2 It is the measured value under the condition of wind speed of 0 - 0.5m/s in the thermostatic bath.
*3 If the resistance value of the wiring distance (round trip) exceeds the allowable signal source resistance value, an error exceeding the conversion error specification may occur.
*4 If the cable length exceeds 30 m, it is not CE (EMC standard) compliant.

⚠ CAUTION

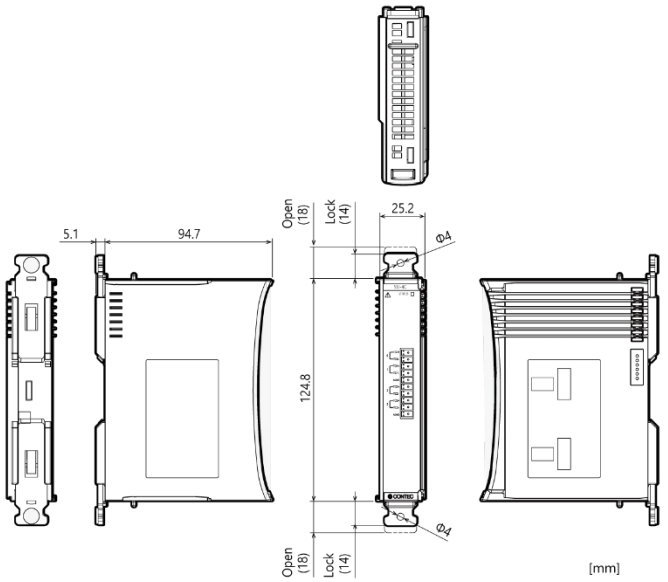
You can set the modules as you desire to the configurable controller up to 16 modules.
The total current consumption of the modules should be less than 3.3A.

Installation Environment Requirements

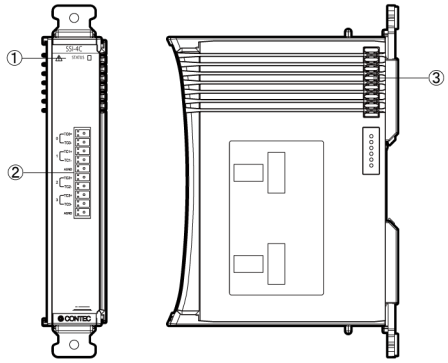
Item		Description
Operating ambient temperature		-20 - +60°C
Operating ambient humidity		10 - 90%RH (No condensation)
Non-operating ambient temperature		-20 - +60°C
Non-operating ambient humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-noise 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 *5/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

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

Physical Dimensions



Component Name



No.	Name	Function
1	Stack Bus	Used for power supply and communication with the configurable type module.
2	LED Indicator	This indicates status of the product.
3	Interface Connector	Connector for thermocouple measurement. Use the 10-pin connector included in the package.

Optional Products

Product Name	Model type	Description
CPU unit	CPS-MCS341-DS1-111	Configurable Type CPU module
	CPS-MCS341-DS1-131	Configurable Type CPU module + OPC UA server + MTConnect
	CPS-MCS341Q-DS1-131	Configurable Type CPU module +920MHz LAN (Japanese Only)
	CPS-MGS341G5-DS1-130	M2M Gateway for PLC Stack CPU Module 4G Model (Japanese Only)
	CPS-MGS341-DS1-131	M2M Gateway for PLC Stack CPU Module
DIN rail fitting power supply	CPS-PWD-90AW24-01	Fitting power supply 90W (Input: 100 - 240VAC, Output: 24VDC 3.8 A)
	CPS-PWD-30AW24-01	Fitting power supply 30W (Input: 100 - 240VAC, Output: 24VDC 1.3 A)

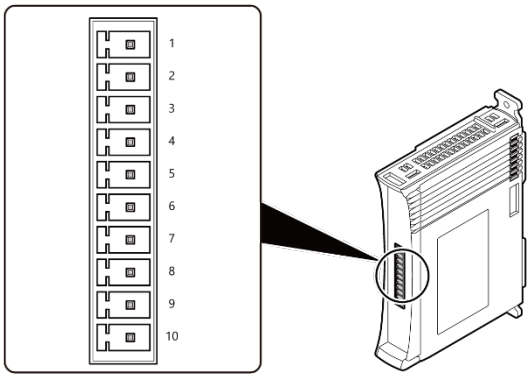
* Visit the CONTEC website for the latest optional products.

Interface Connector

Four channels of thermocouple inputs are provided.
Use the 10-pin connector included in the package.

- 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)
FRONT-MC1,5/10-ST-3,81 [Phoenix Contact] or equivalent



Pin Assignments

Pin No.	Signal Name	Description
1	TC0+	Thermocouple input terminal (positive side) of channel 0.
2	TC0-	Thermocouple input terminal (negative side) of channel 0.
3	TC1+	Thermocouple input terminal (positive side) of channel 1.
4	TC1-	Thermocouple input terminal (negative side) of channel 1.
5	AGND	This is an analog ground and shares channels of analog input signals.
6	TC2+	Thermocouple input terminal (positive side) of channel 2.
7	TC2-	Thermocouple input terminal (negative side) of channel 2.
8	TC3+	Thermocouple input terminal (positive side) of channel 3.
9	TC3-	Thermocouple input terminal (negative side) of channel 3.
10	AGND	This is an analog ground and shares channels of analog input signals.

Thermocouple Input

Input type of thermocouple is differential input and four channels are provided for the product.

Compatible thermocouples types are K, J, E, N, T, R, and S.

Setting thermocouples type requires software command. (Default :K type)

The measuring temperature range per thermocouples type is listed below.

Even if the measuring temperature range is exceeded, it is possible to measure up to the measuring temperature limit, however the temperature tolerance may exceed the specified value.

Measuring temperature range

Thermocouples type	Measuring temperature range
K	-100°C - 1372°C
J	-100°C - 1200°C
E	-100°C - 1000°C
N	-100°C - 1300°C
T	-100°C - 400°C
R	0°C - 1768°C
S	0°C - 1768°C

Measuring temperature limit

Thermocouples type	Measuring temperature range	
	Lower-limit temperature	Upper-limit temperature
K	-265°C	1372°C
J	-210°C	1200°C
E	-265°C	1000°C
N	-265°C	1300°C
T	-265°C	400°C
R	-50°C	1768°C
S	-50°C	1768°C

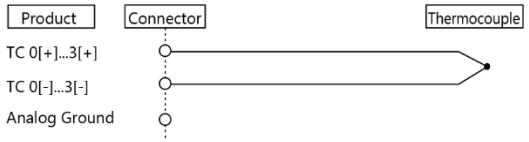
⚠ CAUTION

- When adjusting the temperature with such as an air conditioner, take measures to prevent the product from being exposed directly to the air.
- Right after the product is started, the measuring temperature may exceed the specified tolerance. Warm up the product for at least 30 minutes before use.

Example of thermocouple connection

The following figure shows an example of thermocouple connection. Connect the positive and negative terminals of each thermocouple to the positive and negative sides of each thermocouple input channel.

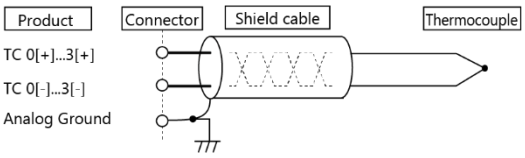
Thermocouple connection



Example of shielded thermocouple connection

The following figure shows an example of shielded thermocouple connection. Use shielded thermocouple cable if the distance between the temperature measuring place and the product is long or if you want to provide better protection from noise. Connect the positive and negative terminals of each thermocouple to the positive and negative sides of each thermocouple input channel. Then, connect the analog ground of this product to the shielded braid and earth ground the shielded braid.

Example of thermocouple connection (Shielded)



⚠ CAUTION

When using the product in an overly noisy environment, use a shielded thermocouple and earth ground the shield.