

CONPROSYS nano Series  
Digital I/O Module Opto-Isolation  
**CPSN-DIO-08SL**



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

**Features**

**- The shared inputs and outputs realizes bi-directional signal controlling**

Since the digital I/O channels are shared, each I / O pin can be used as an input or an output without changing the wiring.

**- Opto-coupler Isolated Input /Output**

This product has the 8 channels of opto-coupler isolated input (current sink output supported) and the 8 channels of opto-coupler isolated Voltage output (current sink type) whose response speed is within 200µsec respectively.

**- Supportable of wide range of external power supplies**

The product can support the wide range of external power supplies between 5V to 24VDC (-5% to +10%).

**- Diodes for each input channel to prevent a backward flow**

With backward flow prevention diodes on each input channel, backflow to an external power supply can be avoided when the power is off. Additionally, signals of 24V system can be input when 12V of the external power supply is used.

**- Input /Output circuits include Zener diodes for surge voltage protection**

Zener diodes are connected to the input /output circuits to protect against surge voltages.

**- Easy installation and removal**

This product can be installed in and removed from the CPU unit or USB I/O Unit - Module Type 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.

**- Equipped with the LED for an operation check**

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

**- No electrolytic capacitor**

Without an electrolytic capacitor, which has a limited life, we are creating the product with a longer life.

This product is an expansion I/O module that adds a bi-directional digital input and output interfaces to the CPU Unit or USB I/O Unit - Module Type of the CONPROSYS nano series.

The CPSN-DIO-08SL has the 8 channels of opto-coupler isolated input/output (current sink output type) whose response speed is within 200µsec. This product can also be used with an external circuit power supply of 5 to 24 VDC.

- \* 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 November, 2023.

**Specification**

Function Specifications

Item	Description	
<b>Input</b>		
Input type	Opto-coupler is isolated input (supports current sink output) (negative logic) *1	
Maximum input current	4mA or less	
Input ON current	1mA or more	
Input OFF current	0.16mA or less	
Interrupt	8 interrupt input signals are arranged into a single output of interrupt signal. An interrupt is generated at the falling edge (HIGH-to-LOW transition) and the rising edge (LOW-to-HIGH transition). (setting can be done by software command)	
Input pulse filter	-	
<b>Output</b>		
Output type	Opto-coupler isolated Voltage outputs (current sink type) (negative logic) *1	
Output rating	Output Voltage	26.4VDC (Max)
	Output Current	100mA (Max) (per 1 point)
Maximum voltage drop at ON	0.5V or less (Output current ≤ 50mA), 1.0V or less (Output current ≤ 100mA)	
Isolation specification	Opto-coupler isolation	
Isolation voltage resistance	AC1000Vrms	
Response time	Within 200µsec	
Number of output signal channels	8 (shared common)	
LED	DIO00 - DIO07 (Green)	
Connector	2 pieces 3.81mm pitch 10-pin terminal	
Applicable wire	AWG28 - 16	
External circuit power supply *2	5 - 24VDC (-5% to +10%)	
Internal circuit power supply	-	
Electricity consumption	3.3V 0.06A (Max)	
Physical dimensions (mm)	15.6(W)×52.6(D)×84(H) (No projection included)	
Weight	50g	

\*1 Data "0" and "1" correspond to the Low and High levels, respectively.

\*2 The fuse of the rated current 2A for overcurrent prevention is provided in the digital output circuit. Use a power supply with overcurrent protection, or use a power supply with amperage capable of blowing the fuse (3.8A and greater).

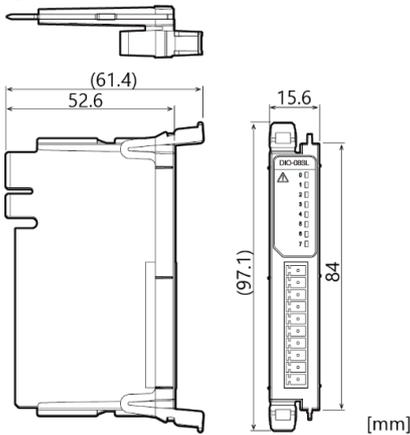
Installation Environment Requirements

Item	Description	
Operating ambient temperature	-20 - +60°C (Wall installation at an angle of 0°) -20°C to +55°C with a vertical installation at an angle of 90° to the left/right or with a plane installation	
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 *3 /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	

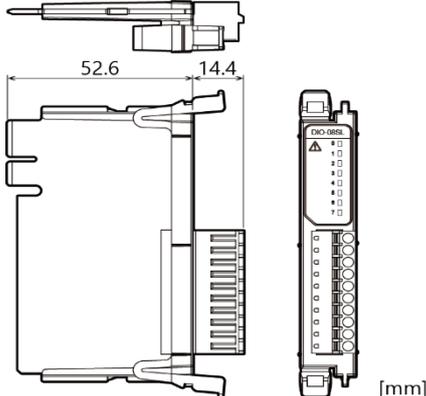
\*3 With the optional DIN rail fitting power supply: 10 - 55Hz (for details, see the user's guide of the optional power supply).

Physical Dimensions

Physical dimensions of CPSN-DIO-08SL



Physical dimensions of CPSN-DIO-08SL (with connector attached)



Packing List

- Product [CPSN-DIO-08SL] ...1
- 10-pin Connector (attached to the product) ...1
- Product Guide & Warranty Certificate ...1
- Serial Number Label ... 1

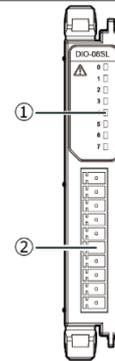
List of Options

Product Name	Model type	Description
CPU unit	CPSN-MCB271-S1-041	Remote I/O CPU unit *1
	CPSN-MCB271-1-041	Remote I/O CPU unit LAN 2-channel model *1
	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
DIN rail fitting power supply	CPS-PWD-30AW24-01	Fitting power supply 30W (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 for the latest optional products

Name of each parts



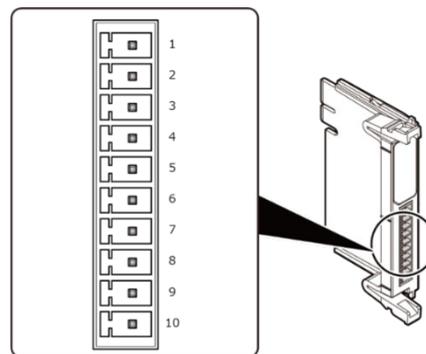
No.	Name	Function
1	LED Indicator	Displays the digital input / output status.
2	Interface Connector	This is a connector for digital input / output. Use the 10-pin connector, included in the package.

\* Turning on the LED of the digital output requires an external power supply.

Interface Connector

This product has 8 channels of digital input/output. Use the 10-pin connector included in the package.

Connector type: DEGSON 15EDGKC-3.81-10P-13  
PHOENIX CONTACT FRONT-MC1.5/10-ST-3.81  
(or equivalent)



Pin Assignment

Pin No.	Signal Name	Description
1	PCOM	This connects the positive-side of the external power. It shares with 8 channels of output signal (DIO0 - DIO7).
2	MCOM	This connects the negative-side of the external power. It shares with 8 channels of output signal (DIO0 - DIO7).
3 - 10	DIO0 - DIO7	It indicates the input/output signals. Each connects the input signal from the other device or outputs the signal to connect with the other device.

Cable

Use the digital input/output cable described below.

Cable	Use copper wires that withstand the temperature of 75 °C and higher.
Applicable wire	AWG28 - 16
Cable Length	Vary according to the environment where the product is used.

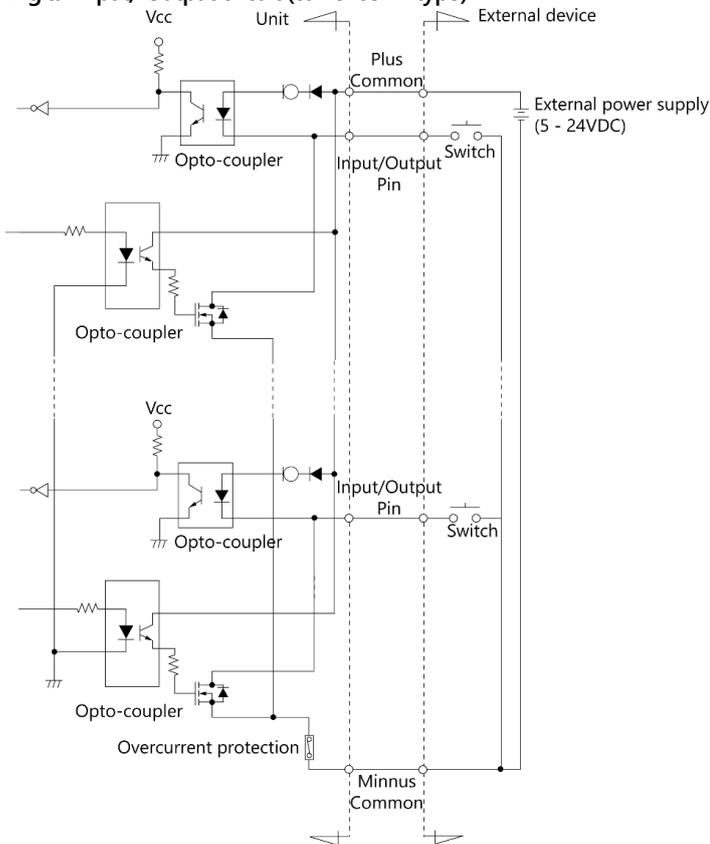
## Digital Input /Output Circuit

The equivalent circuit of the digital input/output interface part is shown in the following figure. When I/O pin is used as input, DI connects to an output device which can be current-driven such as a switch or a transistor.

It inputs the ON / OFF state of a device which can be current-driven as digital value. When I/O pin is used as output, DO connects to the device controlled by the current drive such as relay controlling or the LED. ON/OFF of the device controlled by the current drive is controlled by digital value. The connection requires an external power supply to drive I/O circuits.

As for signal I/O channels, opto-coupler isolated inputs (current sink output supported) and opto-coupler isolated Voltage outputs (current sink type) are shared. When using I/O pin for outputting, therefore, turning the output also turns on the corresponding input. When the output is OFF, the current equivalent to the maximum input current is sourced externally from the I/O pins.

### Digital Input/ Output circuit (current sink type)

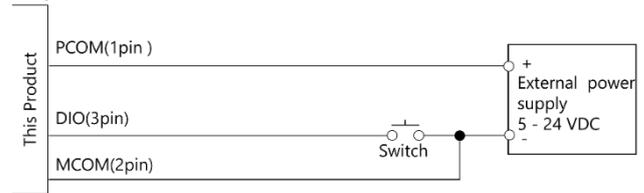


#### CAUTION

- When supplying power, all output will be OFF.

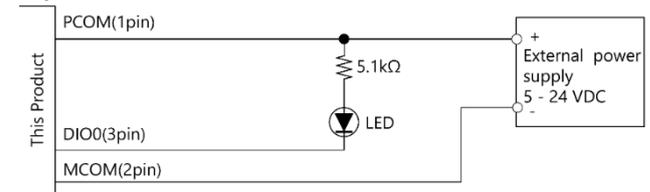
## Examples of connecting the product to a switch, the LED, and a transistor

### Example Connection to a Switch



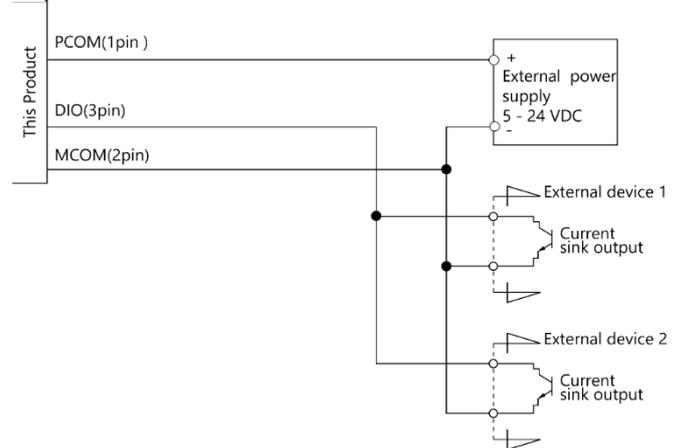
When the switch is "ON", the relevant bit indicates "1".  
When the switch is "OFF", the relevant bit indicates "0".

### Example Connection to the LED



The corresponding LED will be lit up when you output "1" into the appropriate bit.  
The corresponding LED will be turned off when you output "0" into the appropriate bit.

### Example Connection to a Transistor



It is possible to input from an external device with open collector output through a wired OR connection. In that case, the output of the external device and the internal output are also wired OR-connected.

#### CAUTION

- About the material of supplied connecting wires. Strip off 8 mm ± 0.5 mm of the wire's covering to use them.
- About a caution mark ⚠ on the product: Please use copper wires that withstand the temperature of 75 degrees Celsius and higher.