CONPROSYS nano series
Digital Output Module
CPSN-DO-16L
Digital Output Module Built-in power supply
CPSN-DO-16BL

*The photograph is a CPSN-DO-16L.

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

CPSN-DO-16L has the opto-coupler isolated Output 16 channels (current sink output) whose response time is 200μsec or less. This product can also be used with an external circuit power supply of 12 to 24 V.

CPSN-DO-16BL has the opto-coupler isolated Output 16 channels (current sink output) whose response time is 200μsec or less. This product's carries an opto-coupler driving power supply.

* Specifications, color and design of the products are subject to change without notice.
* 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 May, 2024.

Features

Opto-coupler isolated Output (supporting current sink output)
This product has the opto-coupler isolated Output 16 channels (current sink output) whose response time is 200μsec or less.

Internal circuit power supply (CPSN-DO-16BL only)
The CPSN-DO-16BL 's carries an opto-coupler driving power supply.

Output circuits include zener diodes for surge voltage protection.
Zener diodes are connected to the output circuits to protect against surge voltages. The rated output is 35VDC, 500mA to the maximum per channel.

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.

Included Items

Product ...1
Please read the following ... 1

Optional Products

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 HUB 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.

Specifications

Function specification

Item		CPSN-DO-16L	CPSN-DO-16BL
Output			
Output type		Opto-coupler Isolation Open Collector Output (Current sink type) (negative logic) *1	
Isolation		Opto-coupler Isolation	
Voltage Resistance		AC1000Vrms	AC500Vrms
Output rating	Output Voltage	35VDC (Max.)	
	Output Current	500mA (per channel) (Max.), 2A/16 channels total	
Residual Voltage with Output ON		0.5V or less (Output current ≤ 500mA)	
Response time		Within 200μsec *2	
Number of output signal channels		16 (shared common)	
LED		DO00 – DO07 (Green), DO10 – DO17 (Green)	
Common			
Connector		MIL connector 20-pin (2.54mm pitch 10 x 2 lines)	
Applicable wire		Flat cable with MIL connector	
External circuit power supply *3		12 - 24VDC (±10%)	-
Electricity consumption		- 3.3V 0.16A (Max.)	5V 0.08A (Max.) 3.3V 0.16A (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   Response time of the photocoupler.

*3   The digital output circuit is equipped with a fuse for preventing overcurrent. Use a power supply that has overcurrent protection or a 300 W or lower power supply.

### Installation Environment Requirements

Item		Description
Operating ambient temperature *1		-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)

| Item		Description
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, UKCA, CE Marking (EMC Directive Class A, RoHS Directive)

*1   Output current derating is required.

*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

[mm]
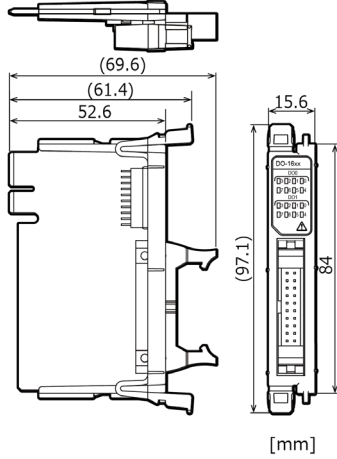
Nomenclature of Product Components
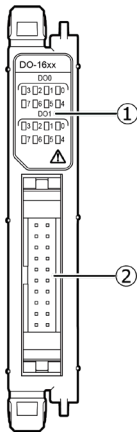
No.	Name	Function
1	LED Indicator	Displays the digital output status.
2	Interface Connector	This is a connector for digital output. Use the 10-pin connector, included in the package.

Interface Connector

Digital Input Connector < CPSN-DO-16L >

Pin Assignment
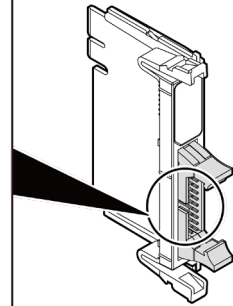
Pin No.	Signal Name	Description
1, 2	PCOM	This connects the positive-side of the external power. This is common from DO00 to DO17.
3, 4	MCOM	This connects the negative-side of the external power. This is common from DO00 to DO17.
6, 8, 10, 12, 14, 16, 18, 20	DO07 - DO00	This indicates the output signals. It connects the input signals from the other devices.
5, 7, 9, 11, 13, 15, 17, 19	DO17 - DO10	This indicates the output signals. It connects the input signals from the other devices.

⚠ CAUTION

To implement input/output of this product with our device driver, it is necessary to specify logical ports and logical bits when executing each function.

Digital Input Connector < CPSN-DO-16BL >
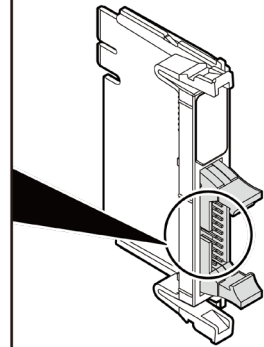
Pin Assignment

Pin No.	Signal Name	Description
1, 2	Reserved	This pin cannot be used. Please read the following precautions.
3, 4	MCOM	This connects the negative-side of the external power. This is common from DO00 to DO17.
6, 8, 10, 12, 14, 16, 18, 20	DO07 - DO00	This indicates the output signals. It connects the input signals from the other devices.
5, 7, 9, 11, 13, 15, 17, 19	DO17 - DO10	This indicates the output signals. It connects the input signals from the other devices.

⚠ CAUTION

- To implement input/output of this product with our device driver, it is necessary to specify logical ports and logical bits when executing each function.

- Leave "Reserved" pins unconnected. Connecting these pins may cause a fault in the product's.
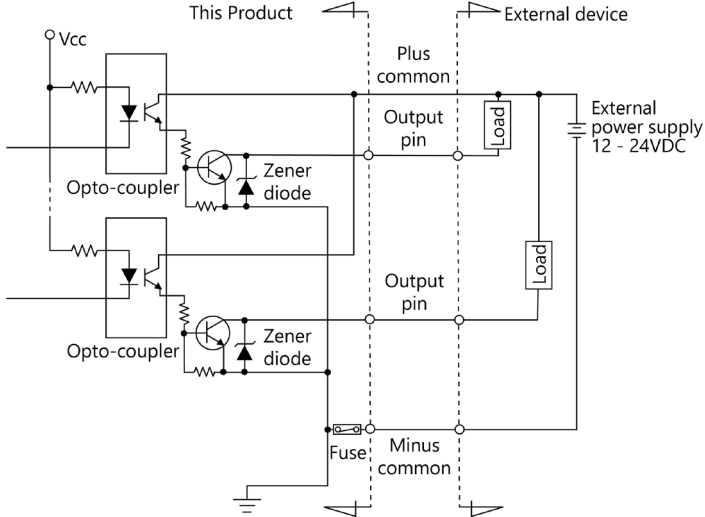
Digital Output

The equivalent circuit of the digital output interface part is shown in the following figure.

Connect this interface to a device that is driven by current such as a relay or an LED. The CPSN-DO-16L also requires an external power supply for driving the opto-coupler. The turning ON/OFF of the device that is driven by current is controlled with a digital value.

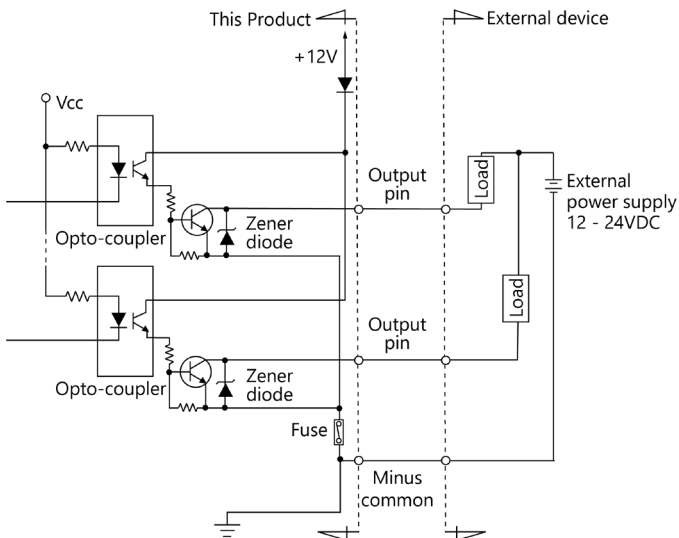The maximum rated output current is 500 mA per channel.

Digital Output circuit (Current sink type) <CPSN-DO-16L >

⚠ **CAUTION**

When supplying power, all output will be OFF.

Digital Output circuit (Current sink type) <CPSN-DO-16BL >
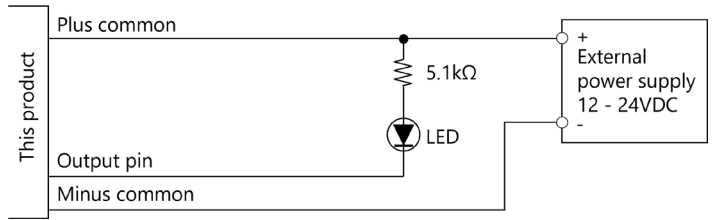

⚠ **CAUTION**

When supplying power, all output will be OFF.
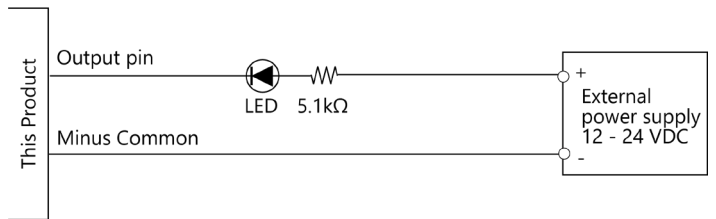
Example of connecting the product to LED

< CPSN-DO-16L > (current sink type)

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.
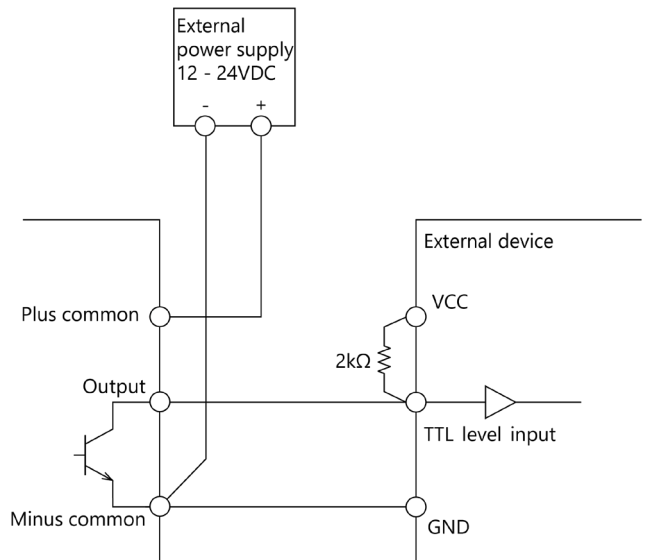
< CPSN-DO-16BL > (current sink type)

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 of connecting the product to TTL level input

Example connection of Output and TTL level input (Current sink type) < CPSN-DO-16L >

Example connection of Output and TTL level input (Current sink type)
< CPSN-DO-16BL >

External device

VCC

2kΩ

Output

TTL level input

Minus common

GND
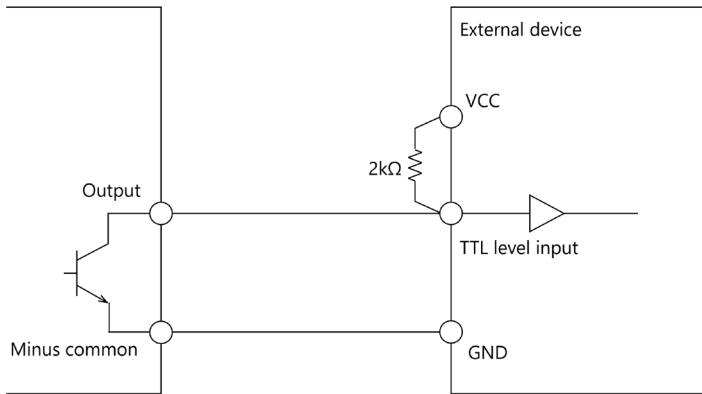
Derating

The characteristic of derating by way of the output current is shown in the following figure.

Use this product within the derating range. Failing to do so may lead to malfunctions.

Characteristic of derating by way of the output current