

# Safety Network Controller

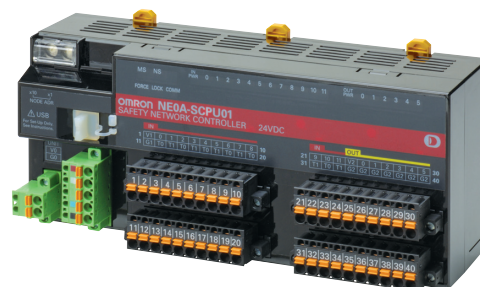
# NE0A-SCPU01

CSM\_NE0A-SCPU01\_DS\_E\_6\_4

## New Lineup for Safety Applications with Up to 12 Inputs



- Circuits for the required safety category are easy to build.
- The safety circuits you create can be registered as templates and reused, for easy standardization.
- A wide range of TÜV-certified templates is also available.
- The NE0A operating conditions can be monitored from a standard DeviceNet Master.
- Network distribution is possible by combining with an NE1A Safety Controller.
- ISO13849-1 (PLe) and IEC 61508 SIL3 certification.



## Ordering Information

Name	No. of I/O points			Model	Unit version
	Safety inputs	Test outputs	Safety outputs		
Safety Network Controllers	12 *	2	6	NE0A-SCPU01	Ver. 1.0

**Note: 1.** The standard NE0A Safety Network Controller is equipped with spring-cage terminal blocks, but screw terminal blocks are available if desired, e.g., to replace previous terminals.

**2.** Network Configurator version 2.1□ or higher must be used when using a NE0A-SCPU01 Safety Network Controller.

\*When using the NE0A-SCPU01 as a standalone Controller, one input each is required for the feedback input and manual restart.

## Specifications

### Certified Standards

Certification body	Standard
TÜV Rheinland	EN ISO 13849-1 EN ISO 13849-2 IEC 61508 EN 62061 EN 61131-2 IEC 61326-3-1
UL	UL508 ISA12.12.01 UL1998 IEC 61508-3

### Specifications

<b>Communications power supply voltage</b>	11 to 25 VDC supplied via communications connector	
<b>Internal circuit power supply voltage (V0) *1</b>	20.4 to 26.4 VDC (24 VDC -15%/+10%)	
<b>I/O power supply voltage (V1, V2) *1</b>		
<b>Current consumption</b>	<b>Communications power supply</b>	24 VDC, 15 mA
	<b>Internal circuit power supply</b>	24 VDC, 110 mA
	<b>I/O power supply *2</b>	24 VDC, 80 mA (Input) 80 mA (Output)
<b>Overvoltage category</b>	II	
<b>Noise immunity</b>	Conforms to IEC61131-2.	
<b>Vibration resistance</b>	10 to 57 Hz: 0.35 mm, 57 to 150 Hz: 50 m/s <sup>2</sup>	
<b>Shock resistance</b>	150 m/s <sup>2</sup> : 11 ms	
<b>Mounting method</b>	DIN Track (IEC 60715 TH35-7.5/TH35-15)	
<b>Ambient operating temperature</b>	-10 to 55°C	
<b>Ambient operating humidity</b>	10% to 95% (with no condensation)	
<b>Ambient storage temperature</b>	-40 to 70°C	
<b>Degree of protection</b>	IP20	
<b>Serial I/F</b>	USB version 1.1	
<b>Weight</b>	440 g max.	

\*1. V0-G0: Internal control circuit

V1-G1: For external input device, test output

V2-G2: For external output device

\*2. Not including power consumption for external devices.

## Safety Input Specifications

<b>Input type</b>	Sinking inputs (PNP)
<b>ON voltage</b>	11 VDC min. between each terminal and ground
<b>OFF voltage</b>	5 VDC max. between each terminal and ground
<b>OFF current</b>	1 mA max.
<b>Input current</b>	4.5 mA

## Safety Output Specifications

<b>Output type</b>	Sourcing outputs (PNP)
<b>Rated output current</b>	0.5 A max./output
<b>ON residual voltage</b>	1.2 V max. between each output terminal and V2
<b>Leakage current</b>	0.1 mA max.

## Test Output Specifications

<b>Output type</b>	Sourcing outputs (PNP)
<b>Rated output current</b>	60 mA
<b>ON residual voltage</b>	1.2 V max. between each output terminal and V1
<b>Leakage current</b>	0.1 mA max.

## DeviceNet Communications Specifications

<b>Communications protocol</b>	DeviceNet compliant			
<b>Connection form</b>	Multi-drop system and T-branch system can be combined (for trunk line and branch lines)			
<b>Communications speed</b>	500/250/125 kbps			
<b>Communications media</b>	Special cable, 5 conductors (2 for communications, 2 for power supply, 1 for shielding)			
<b>Communications distance</b>	<b>Communications speed</b>	<b>Max. network length</b>	<b>Branch length</b>	<b>Total branch length</b>
	500 kbps	100 m max. (100 m max.)	6 m max.	39 m max.
	250 kbps	250 m max. (100 m max.)		78 m max.
	125 kbps	500 m max. (100 m max.)		156 m max.
<b>Note:</b> Figures in parentheses ( ) indicate values when a thin cable is used.				
<b>Communications power supply</b>	11 to 25 VDC			
<b>No. of connectable nodes</b>	63			
<b>Safety I/O communications</b>	Safety Slave function <ul style="list-style-type: none"> <li>Max. no. of connections: 2 (one each for inputs and outputs)</li> <li>Multi-cast inputs can be used to enable communications with up to 15 Safety Masters.</li> <li>Connection type: Single-cast, multi-cast</li> </ul>			
<b>Standard I/O communications</b>	Standard Slave function <ul style="list-style-type: none"> <li>Max. no. of connections: 2</li> <li>Connection type: Poll, bit-strobe, COS, cyclic</li> </ul>			
<b>Message communications</b>	Max. message length: 502 bytes			

## Functions

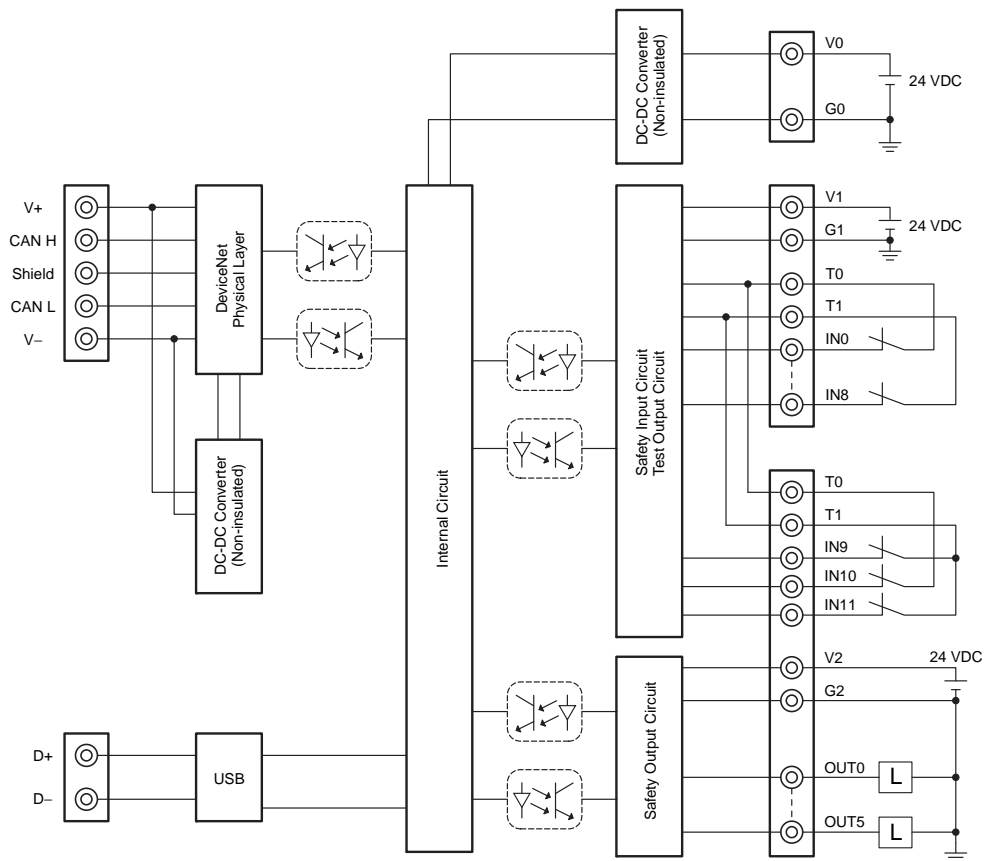
The following function blocks are available for designing safety circuits with the NE0A-SCPU01. These function blocks can be selected and assembled using the interactive wizard format to efficiently design safety applications.

Classification of function block for safety circuit designs	Application	
Function blocks for safety input devices and setting input filter times	The following six parts can be selected for use as safety input devices. For Category 3 or 4 compliance, the filter monitoring time between signals can also be adjusted with redundant wiring for the necessary safety devices.	
	Emergency Stop Switches	
	Safety Door Switches	
	Limit Switches	
	Safety Light Curtains	
	Enabling Switches	
Mode Selectors		
Logic function blocks for input conditions	Select a Safety Light Curtain as the safety input device, and select a muting function when required.	
	No setting	Uses the ON/OFF status from the safety input device exactly as it is.
	OR operation	For switching maintenance areas with a Mode Selector. For applications such as a Safety Light Curtain muting function.
	AND/OR operations	
	AND operation	
OR/AND operations		
Function blocks for resets	Selects manual or auto reset.	
Logic function blocks for output conditions	For applications such as stopping all outputs for multiple safety devices.	
	No setting	Uses the ON/OFF status of the safety signal exactly as it is.
	AND operation	Selects the interlock conditions for the safety signal.
	OR/AND operations	
Function blocks for setting the welded contact check	Used to check the safety condition of an output device.	
	No setting	No checking of the output device (used for Category 2 or lower).
	EDM	Used to check for contact welding in a Relay or Contactor. Also used to change the setting for monitoring time.
Function blocks for safety output devices and setting output delay times	Logic For setting an auxiliary output (to output an error condition) and for setting the output delay.	

**Note:** There is a possibility that safety cannot be maintained when an OR part or an AND/OR part is selected for input logic, or an OR/AND part is selected for output logic. Sufficiently confirm safety prior to use.

# Internal Circuit Diagrams

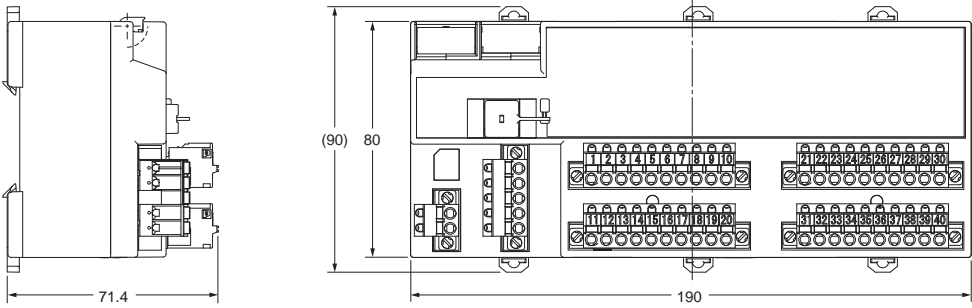
NE0A-SCPU01



Terminal No.	Terminal name	Description
---	V0	Power supply terminal for internal circuit (24 VDC)
---	G0	
1	V1	Power supply terminal for external input device and test output (24 VDC)
11	G1	
24	V2	Power supply terminal for external output device (24 VDC)
34	G2	
2 to 10	IN0 to IN8	Safety input terminal
21 to 23	IN9 to IN11	Terminals IN10 and IN11 are used only for connecting a reset switch or EDM feedback.
12 to 20 31 to 33	T0 to T1	Test output terminal Connected to IN0 to IN11 safety inputs. T0 and T1 output test pulses with different patterns. The T0 terminals are internally connected and the T1 terminals are internally connected.
25 to 30	OUT0 to OUT5	Safety output terminals
35 to 40	G2	Common terminal Terminals 34 to 40 are internally connected.

# Dimensions

NE0A-SCPU01



# Safety Precautions

Refer to the "Safety Precautions for All CIP Safety on DeviceNet Systems" for precautions. Be sure to read the following user's manual for other details required for correct use of the Safety Network Controller.  
CIP Safety on DeviceNet Safety Network Controller NE0A Series User's Manual (Cat. No. Z916)

## Terms and Conditions Agreement

### Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

### Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

### Limitation on Liability: Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

### Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

### Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

### Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

### Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

### Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.