Safety Network Controller

NE0A-SCPU01

CSM_NE0A-SCPU01_DS_E_6_1

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	NFPA 79-2007 ISO13849-1:1999 IEC61508 part1-7/12.98-05.00 IEC61131-2:2007 EN ISO13849: 2006 EN ISO13849-2:2003 EN ISO 13850:2006 (EN418: 1992) EN61000-6-4:2007 EN61000-6-2:2005 EN60204-1:2006 ANSI RIA15.06-1999 ANSI B11.19-2003
UL	UL508 UL1604 UL1998 NFPA79 IEC61508 CSA22.2 No.142 CSA22.2 No.213

Specifications

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

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

Test Output Specifications

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

Safety Output Specifications

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

DeviceNet Communications Specifications

Communications protocol	DeviceNet compliant
Connection form	Multi-drop system and T-branch system can be combined (for trunk line and branch lines)
Communications speed	500/250/125 kbps
Communications media	Special cable, 5 conductors (2 for communications, 2 for power supply, 1 for shielding)
Communications distance	See table below
Communications power supply	11 to 25 VDC
No. of connectable nodes	63
Safety I/O communications	Safety Slave function • Max. no. of connections: 2 (one each for inputs and outputs) Multi-cast inputs can be used to enable communications with up to 15 Safety Masters. • Connection type: Single-cast, multi-cast
Standard I/O communications	Standard Slave function • Max. no. of connections: 2 • Connection type: Poll, bit-strobe, COS, cyclic
Message communications	Max. message length: 502 bytes

Communications speed	Max. network length	Branch length	Total branch length
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.

Note: Figures in parentheses ( ) indicate values when a thin cable is used.

Functions

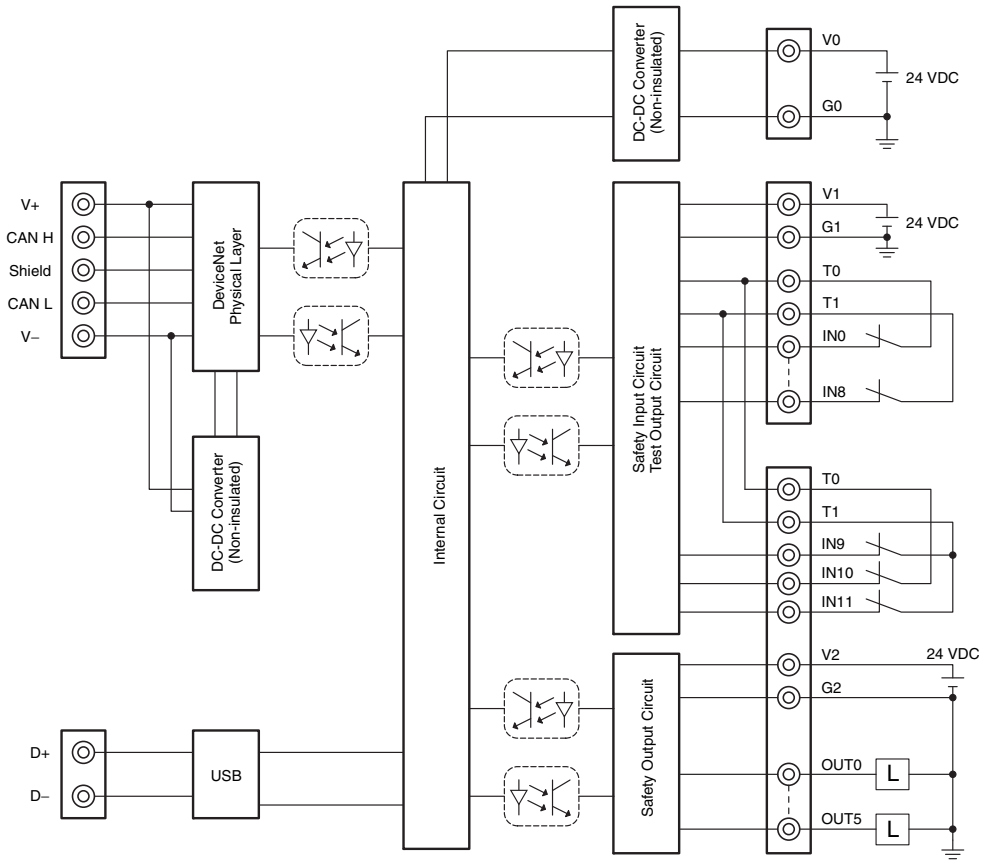
The following function blocks are available for designing safety circuits with the NE0A-SCPU01. These function blocks can be selected and assembled using the interactive wizard format to efficiently design safety applications.

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

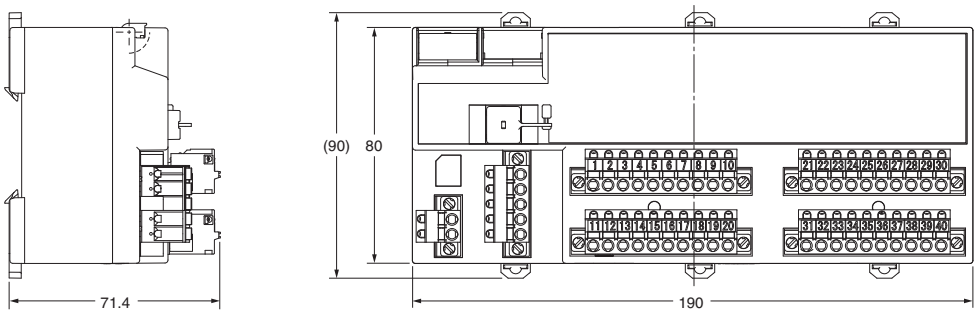


Terminal No.	Terminal name	Description
---	V0	Power supply terminal for internal circuit (24 VDC)
---	G0	
1	V1	Power supply terminal for external input device and test output (24 VDC)
11	G1	
24	V2	Power supply terminal for external output device (24 VDC)
34	G2	
2 to 10	IN0 to IN8	Safety input terminal Terminals IN10 and IN11 are used only for connecting a reset switch or EDM feedback.
21 to 23	IN9 to IN11	
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

(Unit: mm)

NE0A-SCPU01



Safety Precautions

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

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