

Directly Connected to SYSMAC CS/CJ Series via EtherNet/IP



- Monitors safety systems via EtherNet/IP.
- Equipped with master functions of DeviceNet Safety.
- Does not require external devices for connecting Safety Network Controller and EtherNet/IP.
- Increased maintainability in combination with OMRON's EtherNet/IP compatible PLC.
- 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 Controller	16	4	8	NE1A-SCPU01-EIP	1.1
	40	8	8	NE1A-SCPU02-EIP	1.1

Note: 1. The standard NE1A Controllers are equipped with spring-cage terminal blocks, but other screw terminal blocks are available if desired, e.g., to replace previous terminals.

2. Use the Network Configurator Ver. 2.2 or later to make NE1A-SCPU0□-EIP settings.

Specifications

Certified Standards

Certification body	Standards
TÜV Rheinland	NFPA 79-2007 ISO13849-1: 2008 IEC61508 part1-7/12.98-05.00 IEC61131-2: 2007 EN ISO13849-2: 2003 EN61000-6-4: 2007 EN61000-6-2: 2005 EN60204-1: 2006 EN ISO13850: 2006 (EN418: 1992) ANSI RIA15.06-1999 ANSI B11.19-2003
	UL508 UL1604 UL1998 NFPA79 IEC61508 CSA22.2 No.142 CSA22.2 No.213

Specifications

Item	Model	NE1A-SCPU01-EIP	NE1A-SCPU02-EIP
DeviceNet communications power supply voltage		11 to 25 VDC (Supplied via communications connector.)	
Unit 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, 280 mA	24 VDC, 330 mA
	I/O power supply *2	24 VDC, 40 mA (Input) 120 mA (Output)	24 VDC, 80 mA (Input) 150 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 mounting (IEC60715 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 interface		USB version 1.1	
Weight		570 g max.	800 g max.

*1. V0-G0: Internal control circuit

V1-G1 (G): For external input device, test output

V2-G2 (G): 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 min. between each terminal and ground
OFF current	1 mA max.
Input current	4.5 mA

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.

Test Output Specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.7 A max./output *
ON residual voltage	1.2 V max. between each output terminal and V1
Leakage current	0.1 mA max.

* The maximum current for simultaneously ON outputs is 1.4 A.
(T0 to T3: NE1A-SCPU01 (-V1) (-EIP), T0 to T7: NE1A-SCPU02) (-EIP)
A 15 to 400-mA, 24-VDC external indicator can be connected to T3: NE1A-SCPU01 (-V1) (-EIP), T3, and T7: NE1A-SCPU02 (-EIP).

Ethernet/IP Communications Specifications

Media access method	CSMA/CD
Modulation method	Baseband
Transmission path type	Star
Transmission speed	10 Mbps (10BASE-T) 100 Mbps (100BASE-T)
Transmission media	Shielded twisted pair cable (STP): Category 5, 5e
Transmission distance	100 m (distance between hub and node)
No. of cascade-connectable Units	No limit when a switching hub is used.

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		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.					
Communications power supply		11 to 25 VDC			
No. of connectable nodes		63			
Safety I/O communications	Unit version 1.0	Safety Master function •Max. no. of connections: 32 •Max. data size: Input 16 bytes or output 16 bytes (per connection) •Connection type: Single-cast, Multi-cast Safety Slave function •Max. no. of connections: 4 •Max. data size: Input 16 bytes or output 16 bytes (per connection) •Connection type: Single-cast, Multi-cast			
Standard I/O communications		Standard Slave function •Max. no. of connections: 2 •Max. data size: Input 16 bytes or output 16 bytes (per connection) •Connection type: Poll, Bit-strobe, COS, Cyclic			
Message communications		Max. message length: 502 bytes			

Function

Function Blocks

NE1A-SCPU□-EIP series Controller support the following logic functions and function blocks.

Logic Functions

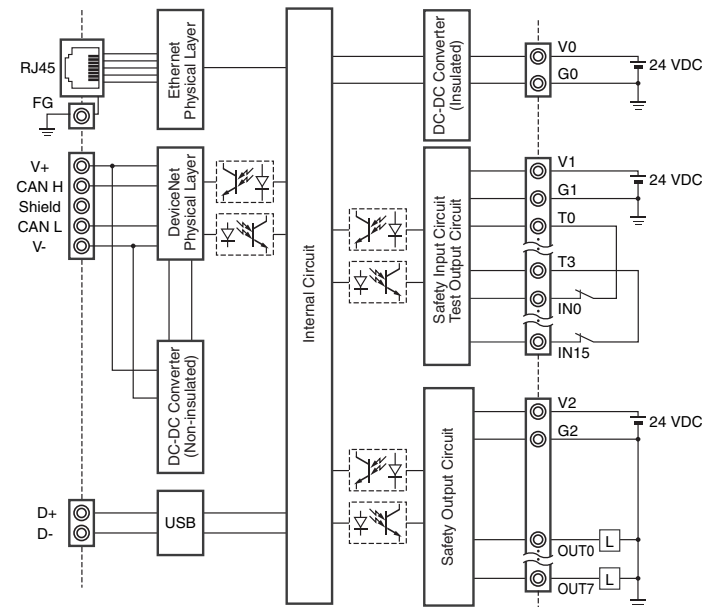
Name	Function list entry
NOT	NOT
AND	AND
OR	OR
Exclusive OR	EXOR
Exclusive NOR	EXNOR
RS Flip-flop	RS-FF
Comparator	Comparator

Function Blocks

Name	Function list entry
Reset	Reset
Restart	Restart
Emergency Stop Monitoring	E-STOP
Light Curtain Monitoring	Light Curtain Monitoring
Safety Gate Monitoring	Safety Gate Monitoring
Two Hand Controller	Two Hand Controller
Off-Delay Timer	Off-Delay Timer
On-Delay Timer	On-Delay Timer
User Mode Switch Monitoring	User Mode Switch
External Device Monitoring	EDM
Routing	Routing
Muting	Muting
Enabling Switch Monitoring	Enable Switch
Pulse Generator	Pulse Generator
Counter	Counter
Multi Connector	Multi Connector

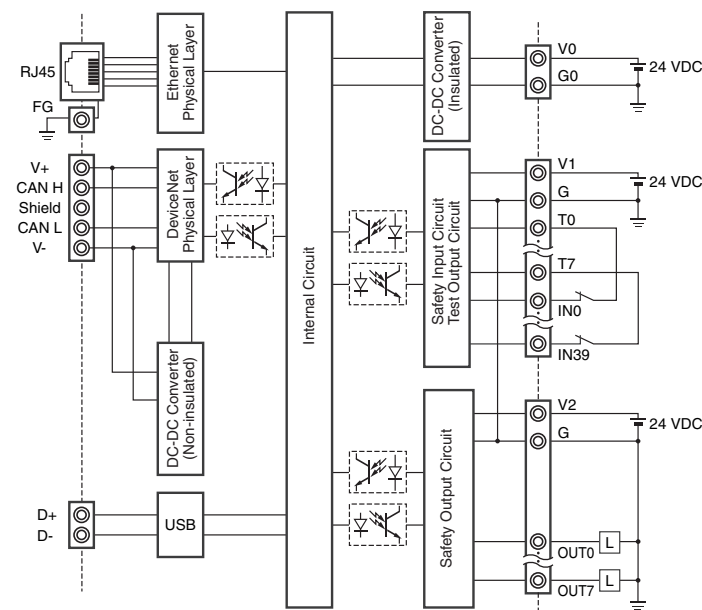
Internal Circuit Diagrams

NE1A-SCPU01-EIP



Terminal name	Description
V0	Power supply terminal for internal circuit The two V0 terminals are internally connected.
G0	Power supply terminal for internal circuit The two G0 terminals are internally connected.
V1	Power supply terminal for external input device and test output
G1	Power supply terminal for external input device and test output
V2	Power supply terminal for external output device
G2	Power supply terminal for external output device
IN0 to IN15	Safety input terminal
T0 to T3	Test output terminal Connected to IN0 to IN15 safety inputs. Each test output terminal outputs a different test pulse pattern. Terminal T3 also supports a current monitoring function for the output signal. Example: Muting lamp
OUT0 to OUT7	Safety output terminals

NE1A-SCPU02-EIP

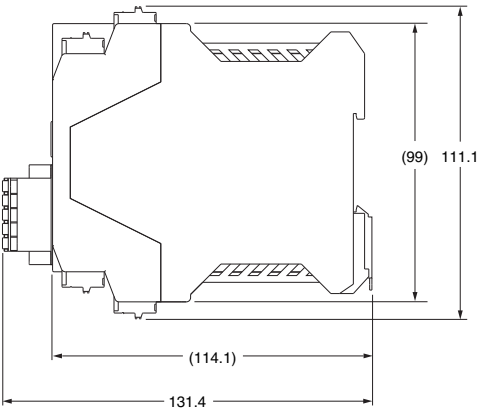
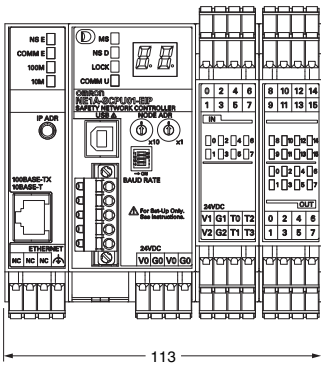


Terminal name	Description
V0	Power supply terminal for internal circuit The two V0 terminals are internally connected.
G0	Power supply terminal for internal circuit The two G0 terminals are internally connected.
V1	Power supply terminal for external input device and test output
G	Power supply terminal for external input device and test output
V2	Power supply terminal for external output device
G	Power supply terminal for external output device
IN0 to IN39	Safety input terminal
T0 to T3	Test output terminal Connected to IN0 to IN19 safety inputs. Each test output terminal outputs a different test pulse pattern. Terminal T3 also supports a current monitoring function for the output signal. Example: Muting lamp
T4 to T7	Test output terminal Connected to IN20 to IN39 safety inputs. Each test output terminal outputs a different test pulse pattern. Terminal T7 also supports a current monitoring function for the output signal. Example: Muting lamp
OUT0 to OUT7	Safety output terminals

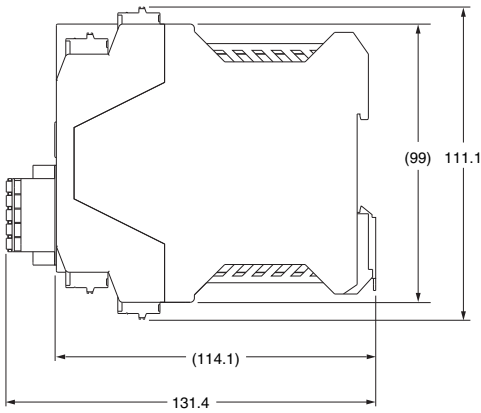
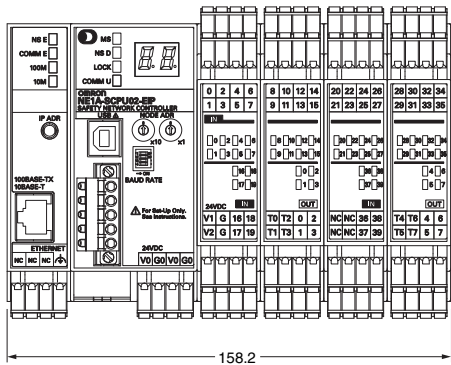
Dimensions

(Unit: mm)

NE1A-SCPU01-EIP



NE1A-SCPU02-EIP



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 User's Manual (Cat. No. Z916)

Functions Supported According to Unit Version

○: Supported, ---: Not supported

Model	NE1ASCPU01-EIP	NE1ASCPU02-EIP
Unit version	Unit version 1.0/1.1	Unit version 1.0/1.1
Function		
Logic processing functions		
Maximum program size (total number of function blocks)	254	254
New Function Blocks <ul style="list-style-type: none"> • RS flip-flop • Multiconnector • Muting • Enable Switch Monitoring • Pulse Generator • Counter • Comparator 	○	○
Selecting a rising edge as the reset condition for Reset and Restart function blocks	○	○
Using local I/O status in logic programming	○	○
Using overall Unit status in logic programming	○	○
Program execution wait functions	○	○
I/O control functions		
Monitoring contact operation counter	○	○
Mounting total ON time monitor	○	○
DeviceNet communications functions		
Number of safety I/O connections for Safety Master	32	32
Selecting operating mode for safety I/O communications when communications errors occur	○	○
Attaching local output data to send data during slave operation	○	○
Attaching local I/O monitor data to send data during slave operation	○	○
Functions to communicate with devices existing on other networks (Off-Link connection)	○	○
System startup and error recovery functions		
Storing log of nonfatal errors in nonvolatile memory	○	○
Adding function block errors to error log	○	○
Ethernet/IP communications functions		
I/O communications	○	○
Message communications	○	○
Read/write of target I/O area	○ (Unit version 1.1 or higher)	○ (Unit version 1.1 or higher)
Routing between DeviceNet and EtherNet/IP		
I/O routing	○	○
Message routing	○	○
UDP/IP message communications functions		
Message communications by UDP/IP	○ (Unit version 1.1 or higher)	○ (Unit version 1.1 or higher)

Unit Versions and Network Configurator Versions

Network Configurator version 2.2□ or higher must be used when using a NE1A-SCPU01-EIP or NE1A-SCPU02-EIP.
Network Configurator version 3.3□ or higher must be used when using a NE1A-SCPU01-EIP or NE1A-SCPU02-EIP Safety Logic Controller with unit version 1.1.

○ : Applicable, ×: Not applicable

Model	Network Configurator					
	Ver. 1.3□	Ver. 1.5□	Ver. 1.6□	Ver. 2.0□/2.1□	Ver.2.2□	Ver.3.3□
NE1A-SCPU01-EIP Unit version 1.0	×	×	×	×	○	○
NE1A-SCPU02-EIP Unit version 1.0	×	×	×	×	○	○
NE1A-SCPU01-EIP Unit version 1.1	×	×	×	×	○ (*1)	○
NE1A-SCPU02-EIP Unit version 1.1	×	×	×	×	○ (*1)	○

*1: It can be used as unit version 1.0.

Note: 1. Users who use Network Configurator version 1.5□ or earlier can upgrade to version 1.6□ at no charge.

2. When using Network Configurator version 1.6□, there are no operational differences in the NE1A-SCPU01-V1 and NE1A-SCPU02.

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