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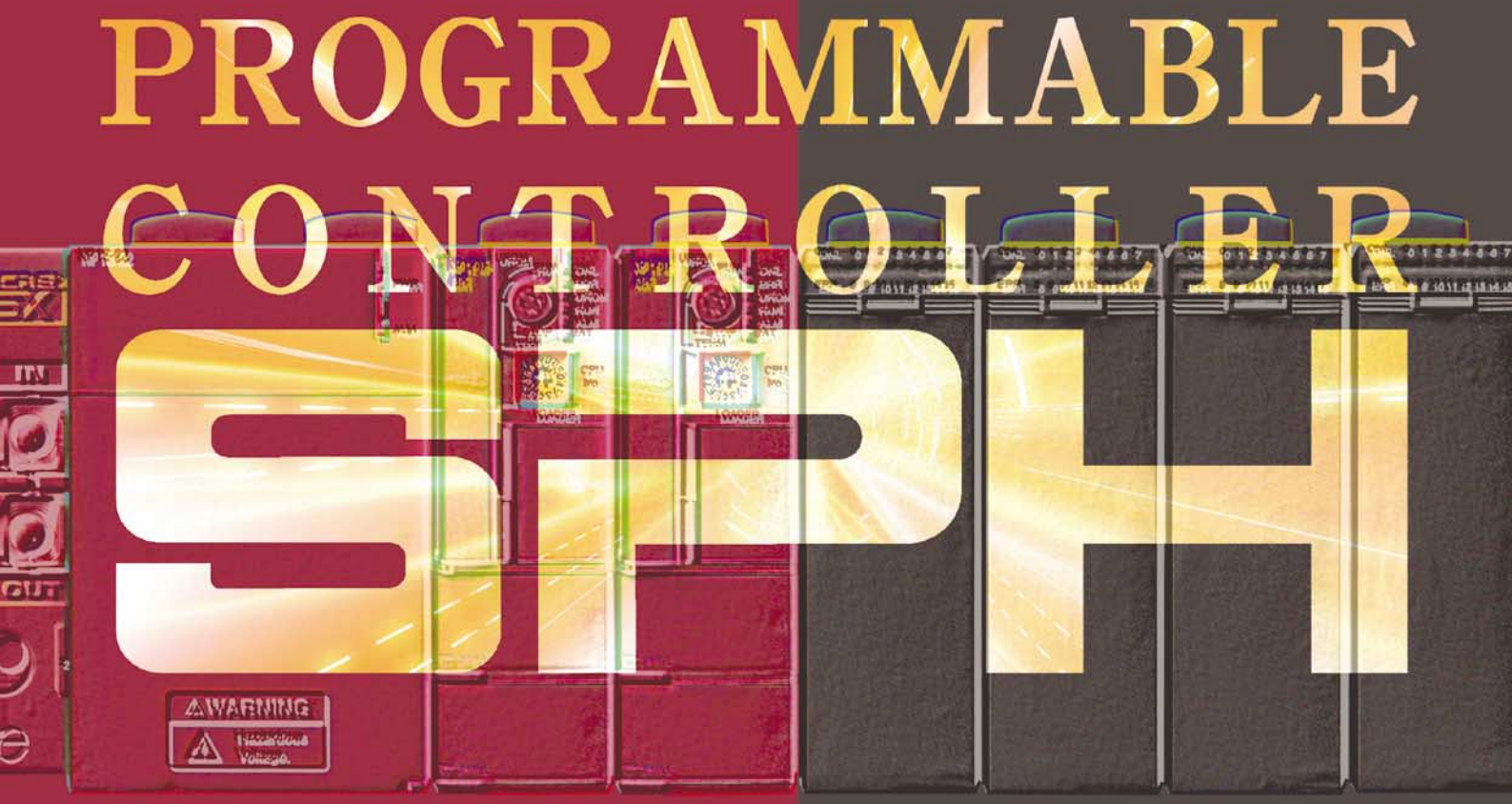
CE

Integrated Controllers MICREX-SX Series

Programmable Controllers



LEH982c

Control, operation and Supervisory Integrated Controllers

MICREX-SX Series

SPH

Realizes High-Speed Advanced Machine Control

I/O control with a program capacity of up to 256K steps and up to 8192 points enables suitable system configuration ranging from small through to large scale.
1ms program scan and I/O refresh are possible. Function and performance distribution are possible in multi-CPU system configuration with up to 8 CPUs.

Meets Increasing Demand for Higher Reliability

Compatible with CPU redundancy and power supply redundancy as standard functions. 1:1 warm standby or N:1 cold standby can be selected as required.

Open Network Oriented

Both the hardware and software conform to the IEC 61131 international standard for programmable controllers.
Compatible with Ethernet, LonWorks, FL-net, DeviceNet, PROFIBUS-DP, AS-i, and other diverse open networks.

Realizes Integrated Programming Support

Loaders for functional modules and POD, mainly loaders for programmable controllers realized on a personal computer, can be used in an integrated environment.
Sharing of variable names (labels) required for each loader, and mutual data reference at the time of programming and debugging, can be performed easily.

Applicable to Software Control

Operates on a personal computer and panel controller, and the functions provide software equivalent to each hardware.
Software PLC: Equivalent to the integrated controllers SPH
Software POD: Equivalent to the programmable operation display POD (TELLUS made of Hakko Electronics Co., Ltd.)
The SX Communication Middleware enables coordination with commercial SCADA software.
Note: This software accommodates system business talks. For details, contact our sales section.

Realizes Remote Monitoring, Maintenance Support, and Preventive Maintenance Using IT

On-site information can be obtained in optimal ways such as monitoring by the Web browser via the Internet or intranets, E-mail transmission when an error occurs, and remote operation using support tools to realize labor savings, planned maintenance, and more swift maintenance service.

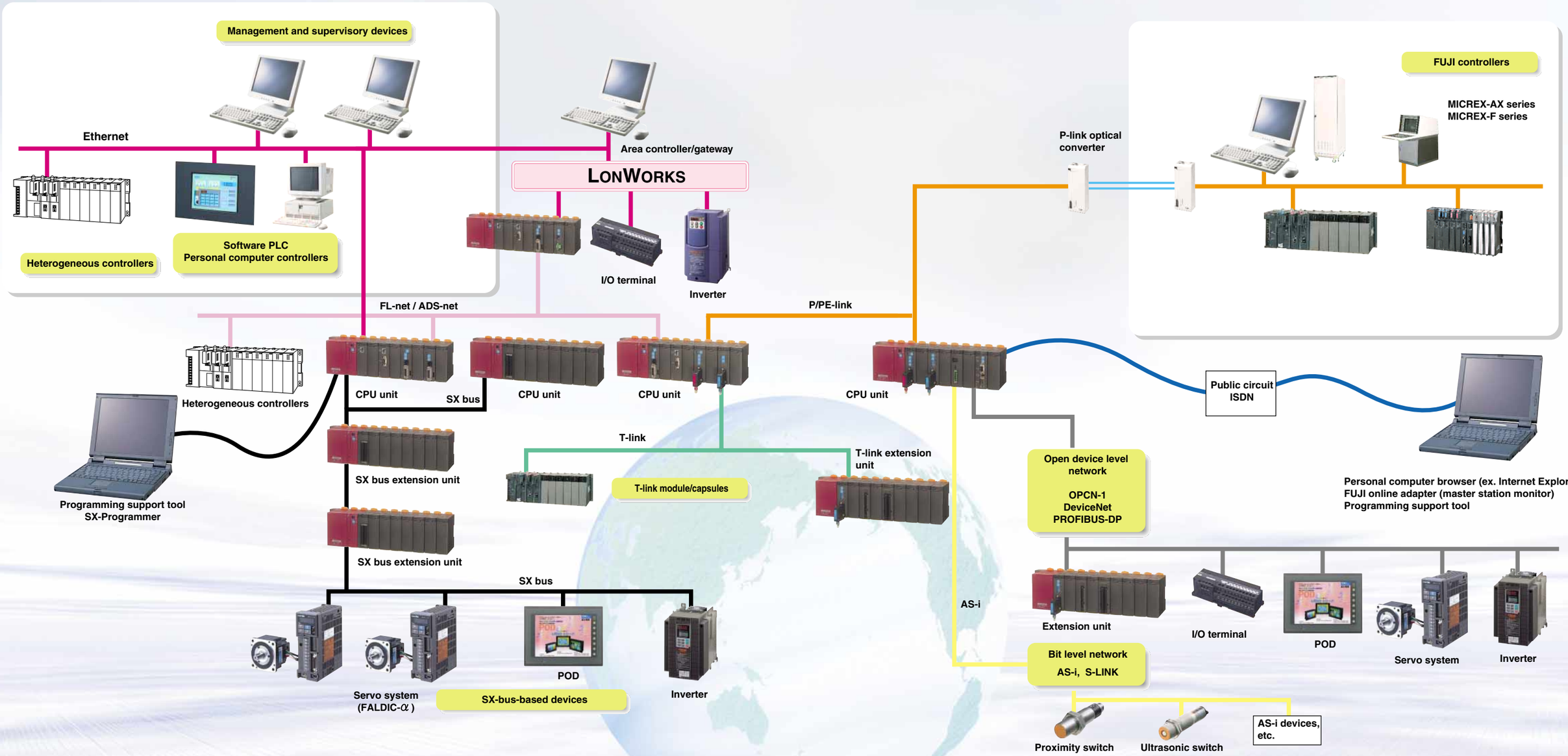
SPH2000 Integrates Control and Information/Communication SXXERO

With advanced data processing functions and large-capacity memory, expansion of application to the IT-related areas such as operation history of production systems/equipment, tracking of products, and recording when a facility fails, in addition to the conventional FA control, can be considered.

INDEX

SX Bus Diverse Network Systems Enabling Seamless Access

High-Speed Processing and Distributed Placement of SX Bus Enable Seamless Connection of Operation Display Units and Servo Inverter.
Network System Variety Strongly Backs Up Optimum System Configuration from A Small System with Embedded Machine to A Large-scale Hierarchical Distributed System.



LonWorks

Internationally noticeable open network for building management. System configuration as a device with distributed autonomous functions is enabled by the control functions incorporated in site devices. Replacement, update, addition, and removal of site devices can easily be performed.

FL-net (OPCN-2)

Open network at the FA application-type controller level established by the Manufacturing Science and Technology Center and the Japan FA Open Systems Promotion Group. Allows inter-connection with PC, CNC, and robots beyond the frame of a single manufacturer. The communication physical layer employs Ethernet.

PROFIBUS-DP

Device level open network established by the EN 50170 European standard, which best suits time-critical applications between an automation system and distributed devices (remote I/Os, inverters, etc.)

OPCN-1

Device-level open network established by Japan Electrical Manufacturers Association. Allows connection with PC and robots using the same signal line beyond the frame of a single manufacturer, very effective in open system improvement and optimization.

DeviceNet

Open device-level network which facilitates inter-connection of control equipment such as PCs, personal computers, sensors, and actuators. Wiring cost reduction by minimizing wiring, and multi-vendor equipment connection simplify an economical system configuration.

AS-i

Bit level network enacted to IEC62026 and EN50295. AS-i is suitable for distributing intelligent input device such as proximity switch, optoelectronic switch, push button and ultrasonic sensor.

Realizes High-Speed Advanced Machine Control

Ultra High-Speed 1ms Controller

1ms scan

- Program scan time of 1ms is implemented by increased instruction processing speed.
- Real number operation and high-precision positioning control have been put to practical use by dramatically improved floating-point operation speed.

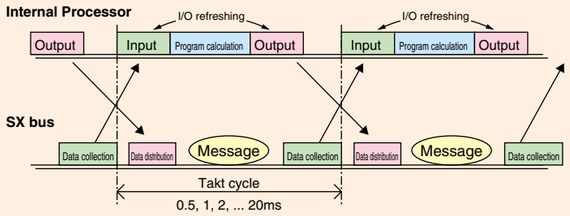
	SPH300	SPH200	SPH2000
Basic instruction LD	20ns	70ns	30ns
MOV	40ns	140ns	40ns
Floating-point operation instruction	80ns	56000 to 85000ns	> 270ns

* For details on each instruction word's processing speed and takt cycle, see the User's Manual (FEH200).

1ms I/O refreshing

- 1024-point input/output is refreshed in 1ms
- Tact control assures a fixed I/O refresh interval. The I/O refresh cycle can be set to 1ms, 2ms, or up to 10ms, which is suitable for processing requiring strict tact time.
- The SPH300 and SPH2000 allows tact time setting in 0.5ms units with a minimum setting of 0.5ms.

● **Operating Timing**



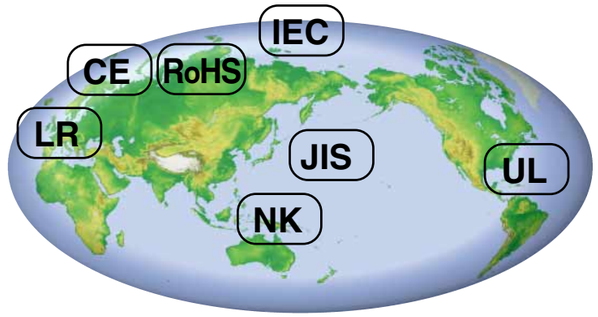
Controller Conforms to International Standard

Conforms to IEC 61131 international standard

- Both the hardware and software conform to the IEC 61131 international standard for programmable controllers.
- The programming language conforms to the IEC 61131-3 international standard.

Conforming to international standard

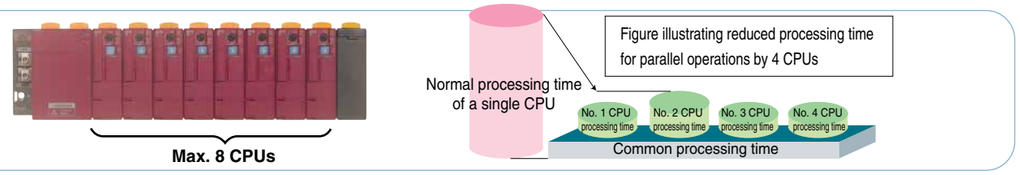
- Conforms to the CE marking, UL standards and RoHS directive (conforming one after another) as well as IEC standard.
- Conforms to the LR shipping standard (England).



Multi-CPU System Applicable to Up to 8 CPUs (SPH300/SPH2000)

Parallel processing with up to 8 CPUs

Alleviates the load for each CPU allowing high speed processing of a large application program.
For example, the load can be distributed for advanced processing and sequence control processing with additional CPUs. I/O refresh control is performed automatically even if parallel processing by multiple CPUs is performed.



Redundant System Assuring System Safety and Reliability (SPH300)

1-to-1 warm-standby feature

This redundancy configuration enables continued operation without system downtime if a CPU fails.
(Control may temporarily stop due to fault detection and CPU changeover.)

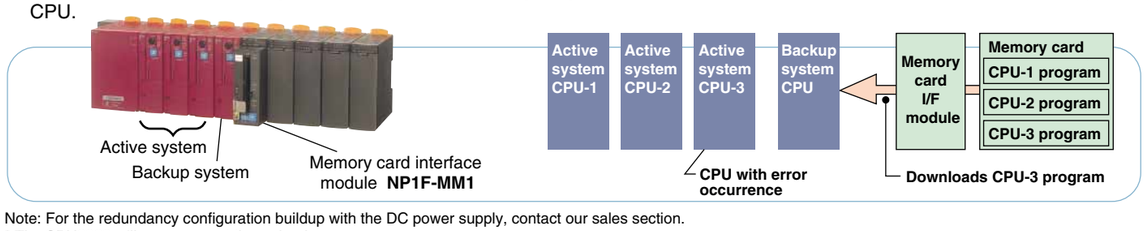
- The same program is stored in CPUs for the active and backup systems, allowing constant data value equalization.

N-to-1 backup feature

This redundancy configuration enables reduction of the number of CPUs to one, though, when a CPU fails, data retained in the active system and that in the standby system are not equalized.

- Data retained by the active system is not taken over. The backup system CPU performs initial start.

- Programs can be intensively controlled by a memory card.
  Programs for N units of systems can be stored on a memory card, which is installed in the memory card interface module for centralized control of the programs. The same processing programs as on the down CPU are downloaded to the backup system CPU.



Note: For the redundancy configuration buildup with the DC power supply, contact our sales section.
* The SPH2000 will soon support the redundancy.

Improves Programming Development Efficiency

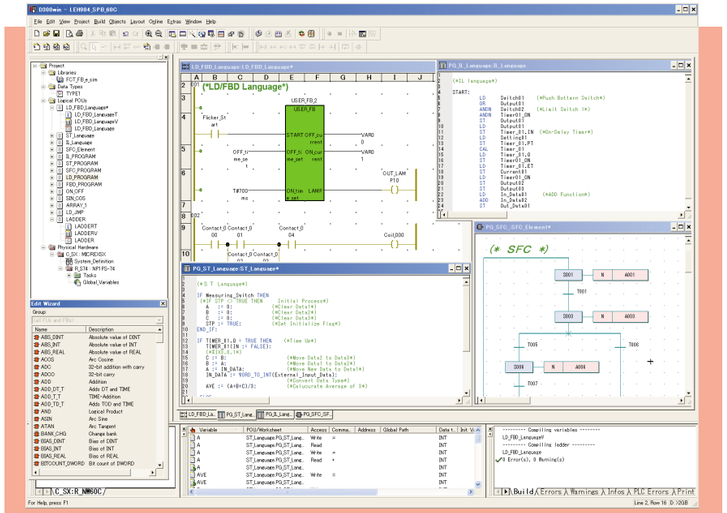
Two Types of Programming Support Tools in Accordance with Development Style

These are Windows-compatible programming support tools conforming to the IEC 61131-3 International Standard.
With the language architecture conforming to the standards, programs understandable by anyone in the world can be created.

SX-Programmer

Expert (D300win)

Development Efficiency Oriented Support Tools



Usage

Improvement of software development efficiency

Programming in units of POU or worksheets allows the use of the structured design method by which a program is created by dividing it by functionality or process. This method enables multiple designers to divide the program design among them so that substantial reduction in the program creation time can be achieved.

Programming of the same techniques as those of microcomputers and personal computers

The ST language is similar to PASCAL and the C language so that programs can be created using the same techniques as those of microcomputers and personal computers for complex calculations that are hard to implement using the Ladder language. Programs and circuits that are frequently used can easily be reused by making them FB (function blocks).

Features

Accommodates a mixture of code written in two or more programming languages.

- The Expert (D300win) completely supports five types of program representations specified by the standards.
- It allows the programmer to code the combination of representations best suited for the control target.

Supported representations

IL (Instruction List)
LD (Ladder Diagram)
FBD (Function Block Diagram)
ST (Structured Text)
SFC (Sequential Function Chart)

Excellent documentation function

- The documentation preparation function of the Expert (D300win) has been substantially improved. Not only can it print drawing numbers, dates, page, and drawing borders, but also company logos and comments.

Simulation function

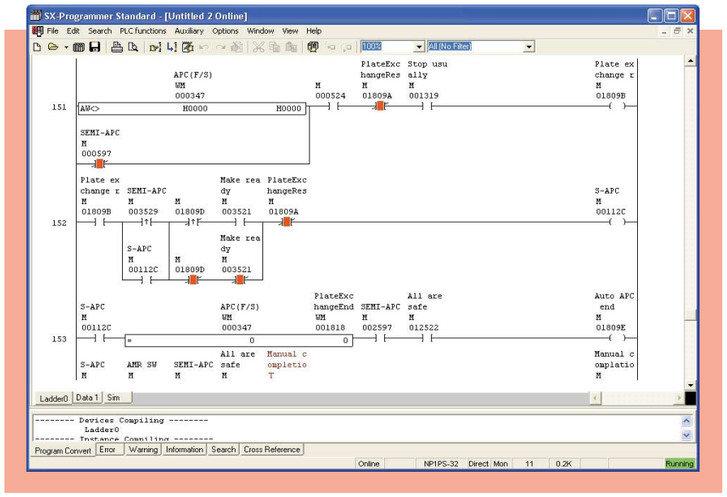
- The simulation function allows the user to conduct test runs of programs using the Expert (D300win) built-in PLC function in place of a real machine.

Programmable Operation Display (POD) cooperation function

- The Expert (D300win) has implemented function module support and POD cooperation support functions as common support tools.
- The function module support can be operated with the programming supporting tool connecting CPU module.

Standard

Operability Oriented Support Tools



Usage

Ladder operation for on-site maintenance personnel

Supports the full keyboard operations useful for on-site maintenance personnel.
Editing and download can be performed immediately after activation.

Utilization of programming resources

Program and comment resources of the models MICREX-F series and FLEX-PC series of Fuji Electric can be reused by Copy&Paste. Screens, operability, and programming can be handled with a sense of the personal computer loader with which you are already familiar.

Features

Multi-language support

- Supports not only Ladder, but also ST and FBD.
- The programming language can be selected depending on the control content.

Rich program development environment

- Addressing is used in all programming and all programs can be changed online.
- Supports structured design and components using FB (function block).
- Comments edited and created by the spreadsheet software (EXCEL) can directly be copied as program comments.

Resume function

- When started up, automatically displays previously edited or monitored position.
- In online mode, displays previously monitored position and starts monitoring.
- In offline mode, displays previously edited position and shifts to Edit mode.

Failure diagnostic/Debug function

- Failure diagnosis is easy because you can analyze failure information while checking the configuration information.
- Provides powerful debugging functions, including stepwise execution, condition monitoring, sampling trace and failure diagnosis.

SX Bus Meets Diverse Demands for System Extension

Basic SX Bus Configuration

Ultra Fast SX Bus Preserves Distributed Installation and Expandability Up To 254-module Direct Bus Connection.

SX bus implements distributed installation of equipment.
The total length of the SX bus is 25m. Up to 25 extension base boards, PODs, and other SX-bus-based devices can be connected within 25m. (Up to 25km for optical transmission)

Free topology is implemented by T branches.
Use of T branches allows detailed, distributed installation of the SX bus. Expansion units and diverse equipment arranged in tree structure can be connected in the optimum way.

SX bus implements connecting maximum 254 modules.
The number of modules that can be connected to the SX bus is a maximum 254 units. CPU modules, the communication modules, the positioning modules, the function modules, and the standard I/O modules can be connected up to 254.

Classification of System Configuration

Limit of modules connected in single configuration

Module Type	Max. Connected Units
Power module	Not limited in the number of power modules to be connected.
CPU module	8 units (1 unit for the SPH200)
P/PE-link module	Total 8 units of FL-net modules, P/PE-link modules and LE-net/LE-net loop/LE-net loop2 modules
Type A module	8 units (remote I/O master module)
Type B module	A total of 16 units including the SX bus communication unit of POD.
Type C module	238 units including Type A and B connected modules (excluding processor link modules and AS-i master module)

Note: For details informastions, refer to the each manuals.
* Each remote I/O master module has, in addition to the normal mode, the following two modes:
Extension mode: Function to extend the total number of input/output words of devices that can be connected to one master module unit from a maximum of 128 words (2048 points) to a maximum of 512 words (8192 points) (extended to a maximum of 510 words for the PROFIBUS-DP master). However, the total number of input/output words for one CPU unit is a maximum of 512 words, which is equal to a total of the number of input/output words of the SX bus and that of the remote I/O master module.
I/O extension mode: Function to extend, in addition to the extension mode, the total number of input/output words of devices that can be connected to one CPU unit from a maximum of 512 words (8192 points) to a maximum of 4096 words (65536 points). This mode is used when the total number of input/output words exceeds 512 words by connecting multiple remote I/O master modules to one CPU unit (Note that, by using this function, the input/output response time becomes longer in proportion to the number of mounted remote I/O master modules).

Module classification

Type A	Type B		Type C
• OPCN-1 master module (**NP1L-JP1**) • OPCN-1 slave module (**NP1L-JS1**) • DeviceNet master module (**NP1L-DN1**) • PROFIBUS-DP master module (**NP1L-PD1**) • PROFIBUS-DP slave module (**NP1L-PS1**) • T-link master module (**NP1L-TL1**) • T-link slave module (**NP1L-TS1**)	• Web module (**NP1L-WE1**) • Ethernet module (**NP1L-ET1/ET2**) • FL-net module (**NP1L-FL2/FL3**) • ADS-net module (**NP1L-AD1**) • P-link module (**NP1L-PL1**) • PE-link module (**NP1L-PE1**)	• LE-net module (**NP1L-LE1**) • LE-net loop module (**NP1L-LL1**) • LE-net loop2 module (**NP1L-LL2**) • General-purpose communication module (**NP1L-RS1/RS2/RS4**) • Memory card I/F module (**NP1L-MM1**)	• All modules other than those of Type A and B * The AS-i master module is also included in category C.

No. of connectable base boards/units

Unit for supplying SX bus transmission power	Unit for receiving SX bus transmission power
• Base board (power ON) • SX bus optical converter (external 24V connected) • SX bus electrical repeater (external 24V connected)	• I/O terminal • SX bus optical converter (external 24V not connected) • UG30/20 series (POD) • PCI-bus-based high performance CPU board (built in personal computer) • AC servo FALDIC-α series • Base board (power OFF) equivalent to 3 units above

* Up to 10 units for receiving SX bus transmission power can be continuously connected to each of the IN and OUT connectors of the unit for supplying SX bus transmission power.

Other connection notes

- Be sure to install the power supply module and at least one module other than the power supply module to the left of each base board.
- Up to 25 base boards including the T branch unit can be connected.
- Basically, base boards (power supply) in one configuration should be turned ON at one time. However, if it is necessary to turn OFF some base boards (power supply) for application convenience, up to 3 continuous base boards can be turned OFF in one configuration.

Contents

KD03-041A

■ **General specifications**

Item		Specification	
Physical environmental condition	Operating ambient temperature	0 to 55°C	IEC 61131-2
	Storage temperature	-25 to +70°C	
	Relative humidity	20 to 95%RH no condensation	
	Pollution degree	2 (Free from conductive dust)	
	Corrosion immunity	Free from corrosive gases. Not stained with organic solvents	
	Operating altitude	2000m or less above sea level (Transport condition: 70kpa or more)	
Mechanical service condition	Vibration	Half amplitude: 0.15mm, Constant acceleration: 19.6m/s^2 two hours for each of three axes, total six hours.	
	Shock	Acceleration peak: 147m/s^2 three times for each of three axes	
Electrical service condition	Electrostatic discharge	Contact discharge: ± 6kV Aerial discharge: ± 8kV	IEC 61000-4-2
	Radiated, radio-frequency, electromagnetic field	80 to 1000MHz (10V/m)	IEC 61000-4-3
	EFT/B (Electrical fast transient/burst)	± 2kV (excluding the communication line)	IEC 61000-4-4
	Lightning impulse surge	± 4kV common mode, ± 2kV normal mode	IEC 61000-4-5
	Conducted radio frequency	150kHz to 80MHz, 10V	IEC 61000-4-6
	Power frequency magnetic field	50Hz, 30A/m	IEC 61000-4-8
	Damped oscillatory wave	± 2kV, 1MHz ring waves	IEC 61000-4-12
	Square wave	± 1.5kV rise time 1ns, pulse width 1μs 50Hz	
Construction		Panel-mounting type IP30	
Cooling		Self-cooling	

Power Supply Module: NP1S-□□

NP1S-22/NP1S-42

NP1S-91

KD03-057A

■ Features

- Redundant power supply module (**NP1S-22/NP1S-42**)
  Redundancy of the power supply has been realized by supplying the power from multiple (up to 3) power supply modules. The redundant configuration of the power supply section with the highest failure rate can improve the system reliability.
- Small capacity power supply module (**NP1S-81/NP1S-91**)
  The use of the 100V AC or 200V AC small capacity power supply module (single slot) on the 3-slot and 6-slot basis allows effective use of one slot.

■ Power supply specifications

Item	Specification			
Type	**NP1S-22**	**NP1S-42**	**NP1S-22**	**NP1S-91**
Rated input voltage	100 to 120V AC / 200 to 240V AC	24V DC	200 to 240V AC	100 to 120V AC
Voltage tolerance	85 to 132V AC / 170 to 264V AC	19.2 to 30V DC	170 to 264V AC	85 to 132V AC
Rated frequency	50/60Hz	—	50/60Hz	
Dropout tolerance	1 cycle or less (Rated voltage, rated load)	10ms or less (Rated voltage, rated load)	1 cycle or less (Rated voltage, rated load)	
AC waveform distortion factor	5% or less	—	5% or less	
Ripple factor tolerance	—	Three-phase full-wave rectification can be used 5% or less	—	
Leakage current	0.25mA or less			
Inrush current	22.5Ao-p or less (Ta=25°C not repeated)	150Ao-p or less 2ms or less	25Ao-p or less (Ta=25°C not repeated)	22.5Ao-p or less (Ta=25°C not repeated)
Power consumption	110VA or less	45W or less	50VA or less	40VA or less
Rated output voltage	24V DC (22.8 to 26.4V DC)			
Output current	0 to 1.46A		0 to 0.625A	
Isolation method	Transducer			
Dielectric strength	2900Vrms AC, 1 second, between power input terminals and ground	560Vrms AC, 1 second, between power input terminals and ground	1800Vrms AC, 1 second, between power input terminals and ground	
Insulation resistance	10MΩ or more (500V DC megger)			
No. of occupied slots	2 slots		1 slots (specialized for the 3-slot and 6-slot basis)	
Alarm output	Relay NC contact output (Monitoring of output voltage: 24V DC, 0.3A or less)		None	
Multiple power supply	Compatible		None	
Mass	Approx. 330g	Approx. 360g	Approx. 180g	

CPU Module: NP1P □ - □□

■ Features

- Ultra high-speed processing
  The CPU module carries out ultra high-speed processing as bellow;
  The SPH300 processes basic instructions in 20ns,
  the SPH200 processes basic instructions in 70ns,
  and the SPH2000 processes basic instructions in 30ns.
- Multi-CPU configuration (SPH300/SPH2000)
  Up to 8 CPUs can be configured, effective for high-speed control by load distribution.
- Redundancy (SPH300)
  1-to-1 hot standby feature and N-to-1 backup feature improves the system safety and reliability.
  (The SPH2000 will soon support the redundancy)
- IEC 61131-3
  Complete compliance with the IEC 61131-3 international standard languages enables programming understood worldwide.

■ Performance specifications

			SPH200		SPH300			
Type			**NP1PH-08**	**NP1PH-16**	**NP1PS-32**	**NP1PS-32R**	**NP1PS-74**	**NP1PS-74R**
Control system			Stored program, Cyclic scanning system (default task), periodic task, event task					
Input / Output connection method			Direct connection I/O (SX bus), remote I/O (DeviceNet, OPCN-1, and other remote I/O links)					
I/O control system			SX bus: Tact synchronization refresh. Remote I/O link: Refresh at 10-ms fixed intervals (not synchronized with scan)					
CPU			16-bit OS processor, 16-bit execution processor		32-bit OS processor, 32-bit execution processor			
Programming language			IL language (Instruction List), ST language (Structured Text), LD language (Ladder Diagram) FBD language (Function Block Diagram), FSC elements (Sequential Function Chart) To IEC 61131-3					
Instruction execution speed	Sequence instruction		70ns or more/instruction		20ns or more/instruction			
	Applied instruction		140ns or more/instruction		40ns or more/instruction			
Program memory capacity			8192 steps	16384 steps	32768 steps		75776 steps	
Program steps in a POU			4096 steps		8192 steps			
Memory * 1	I/O memory (I/Q)		512 words (Max. 8192 points)		512 words (Max. 8192 points)			
	General memory (M)		4096 words	8192 words	8192 words		32768 words	
	Retain memory (M)		2048 words	4096 words	4096 words		16384 words	
	Instance memory for User FB (M)		2048 words	4096 words	4096 words		16384 words	
	Instance memory for system FB (M)		4096 words	8192 words	16384 words		65536 words	
		Timer	128 points	256 points	512 points		2048 points	
		Integrating timer	32 points	64 points	128 points		512 points	
		Counter	64 points	128 points	256 points		1024 points	
		Edge detection	256 points	512 points	1024 points		4096 points	
		Others	2048 words	4096 words	8192 words		32768 words	
	System memory (M)		512 words		512 words			
Temporary area			4096 words		8192 words			
Available basic data type * 2			BOOL, INT, DINT, UINT, UDINT, REAL, TIME, DATE, TOD, DT, STRING, WORD, DWORD					
No. of tasks			Default tasks (Cyclic scanning): 1, Periodic tasks: 4, Event tasks: 4 (Total of 4 tasks when Periodic task is used)					
No. of POUs in program			2000 (including POUs in the library)					
Interface * 3	User ROM card (CF)		ROM for SPH200	ROM for SPH200	–	○	–	○
	USB * 4		–	–	–	○	–	○
	Ethernet * 5		–	–	–	–	–	–
Diagnostic function			Self-diagnosis (memory check, ROM sum check), System configuration supervising, Module fault monitoring					
Security function			Set limits to download/upload of the projects, reference, and clear etc,. by the password.					
Calendar			Up to 31 Dec. 2069 23:59:59 ±27sec/month (when active)		Up to 31 Dec. 2069 23:59:59 ±27sec/month (when active) When multi-CPU system is used, time is synchronized.			
Battery backup			Backup range: Application programs, system definitions, ZIP files, data memory, calendar IC memory Battery used: Lithium primary battery Backup time (at 25°C): 5 years Replacement time (at 25°C): Within 5 minutes		Backup range: Data memory, calendar IC memory Battery used: Lithium primary battery Backup time (at 25°C) **NP1PS-32/32R**: 5 years, **NP1PS-74/74R**: Approx. 1.3 years * 6 Replacement time (at 25°C): within 5 minutes			
Memory backup by flash ROM (contained in CPU module)			Application programs, system definitions, and ZIP files can be saved in the user ROM card.		Application programs, system definitions, and ZIP files can be saved in the flash memory built in the CPU.			
Memory backup by user ROM card (optional)			Application programs, system definitions, and ZIP files can be saved in the user ROM card.		Application programs, system definitions, zip files, compressed projects and User's data can be saved in user ROM card (compact flash card).			
Internal current consumption			24V DC 85mA or less		24V DC 200mA or less			
Mass			Approx. 170g		Approx. 200g (**NP1PS-32/NP1PS-74**) Approx. 220g (**NP1PS-32R/NP1PS-74R**)			

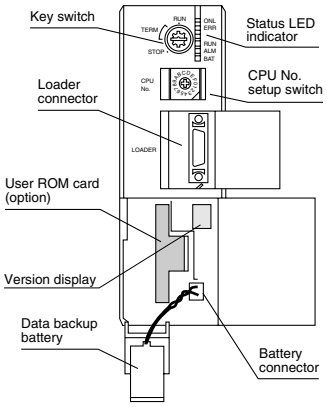
- Compatible with USB and user ROM
  The SPH300 of the USB and user ROM versions with separate formats are offered (**NP1PS-32R/74R/117R/245R NP1PM-48R/NP1PM-48E/NP1PM-256E**).
- Large-capacity battery (optionally available)
  SPH300 (74K/117K/245K steps) can extend the memory backup time to 3.5 years (25˚C) by adding the large-capacity battery as an option.
- CPU built into Ethernet
  In SPH2000, CPU built into Ethernet is prepared by another model (**NP1PM-48E/256E**).

SPH300			SPH2000				
NP1PS-117	**NP1PS-117R**	**NP1PS-245R**	**NP1PM-48R**	**NP1PM-48E**	**NP1PM-256E**	Type	
Stored program, Cyclic scanning system (default task), periodic task, event task						Control system	
Direct connection I/O (SX bus), remote I/O (DeviceNet, OPCN-1, and other remote I/O links)						Input / Output connection method	
SX bus: Tact synchronization refresh. Remote I/O link: Refresh at 10-ms fixed intervals (not synchronized with scan)						I/O control system	
32-bit OS processor, 32-bit execution processor			32-bit OS processor			CPU	
IL language (Instruction List), ST language (Structured Text), LD language (Ladder Diagram) FBD language (Function Block Diagram), FSC elements (Sequential Function Chart) To IEC 61131-3						Programming language	
20ns or more/instruction			30ns or more/instruction			Sequence instruction	Instruction execution speed
40ns or more/instruction			40ns or more/instruction			Applied instruction	
119808 steps		250880 steps	49512 steps		262144 steps	Program memory capacity	
8192 steps						Program steps in a POU	
512 words (Max. 8192 points)						I/O memory (I/Q)	Memory * 1
131072 words		262144 words	65536 words		1703936 words	General memory (M)	
32768 words		130048 words	8192 words		262144 words	Retain memory (M)	
32768 words		66560 words	8192 words		65536 words	Instance memory for User FB (M)	
65536 words			16384 words		65536 words		
2048 points			512 points		2048 points	Timer	
512 points			128 points		512 points	Integrating timer	
1024 points			256 points		1024 points	Counter	Instance memory for system FB (M)
4096 points			1024 points		4096 points	Edge detection	
32768 words			8192 words		32768 words	Others	
512 words			512 words			System memory (M)	
8192 words			32768 words/Task, 4096 words/POU			Temporary area	
BOOL, INT, DINT, UINT, UDINT, REAL, TIME, DATE, TOD, DT, STRING, WORD, DWORD						Available basic data type * 2	
Default tasks (Cyclic scanning): 1, Periodic tasks: 4, Event tasks: 4 (Total of 4 tasks when Periodic task is used)						No. of tasks	
2000 (including POUs in the library)						No. of POUs in program	
–	○	○	○	○	○	User ROM card (CF)	Interface * 3
–	○	○	○	○	○	USB * 4	
–	–	–	–	○	○	Ethernet * 5	
Self-diagnosis (memory check, ROM sum check), System configuration supervising, Module fault monitoring						Diagnostic function	
Set limits to download/upload of the projects, reference, and clear etc,. by the password.						Security function	
Up to 31 Dec. 2069 23:59:59 ±27sec/month (when active). When multi-CPU system is used, time is synchronized.						Calendar	
Backup range: Data memory, calendar IC memory Battery used: Lithium primary battery Backup time (at 25°C) **NP1PS-117/117R**: Approx. 1.3 years, **NP1PS-245R**: Approx. 0.7 years, **NP1PM-48R/48E/256E**: 5 years * 6 Replacement time (at 25°C): within 5 minutes						Battery backup	
Application programs, system definitions, and ZIP files can be saved in the flash memory built in the CPU.						Memory backup by flash ROM (contained in CPU module)	
Application programs, system definitions, zip files, compressed projects and User's data can be saved in user ROM card (compact flash card).						Memory backup by user ROM card (optional)	
24V DC 200mA or less			24V DC 200mA or less			Internal current consumption	
Approx. 200g (**NP1PS-117**) Approx. 220g (**NP1PS-117R/NP1PS-245R**)			Approx. 200g			Mass	

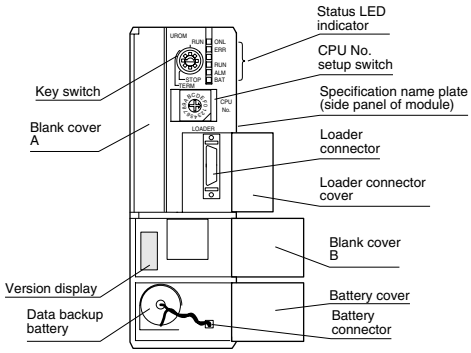
Note: * 1 The area sizes of standard memory, retain memory, the instance memory for user FBs, and the instance memory for system FBs can freely be increased or decreased. Default values are shown in the above table.
* 2 This depends on each instruction.
* 3 O: Standard equipment, –: No equipment
* 4 Specification of USB
Applicable standard of USB: USB1.1
USB connector: USB-B type (**NP1PS-32R/74R/117R/245R**), USB-miniB type (**NP1PM-48R/48E/256E**).
* 5 The Ethernet interface is 10Base-T/100Base-TX.
* 6 Backup time (25˚C) when a large-capacity battery (optionally available) is used:
NP1PS-74/74R: approx. 3.5 years, **NP1PS-117/117R**: approx. 3.5 years, **NP1PS-245R**: approx. 2 years.
(No large-capacity battery can be mounted on **NP1PH-08/16**, **NP1PS-32/32R**, and **NP1PM-48R/48E, NP1PM-256E**.)

■ Outer view

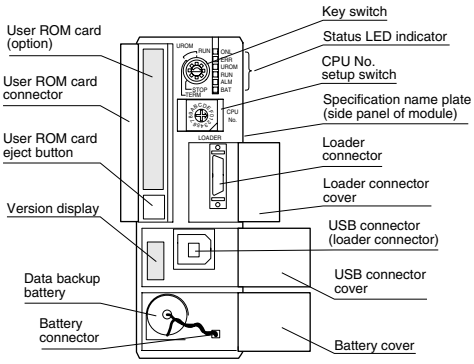
• SPH200 (**NP1PH-08/NP1PH-16**)



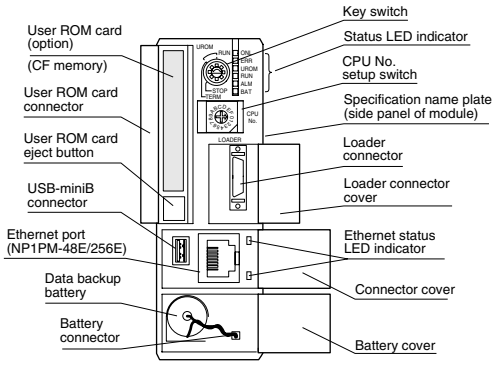
• SPH300 (**NP1PS-32/NP1PS-74/NP1PS117**)



• SPH300 (**NP1PS-32R/NP1PS-74R/NP1PS-117R/NP1PS-245R**)

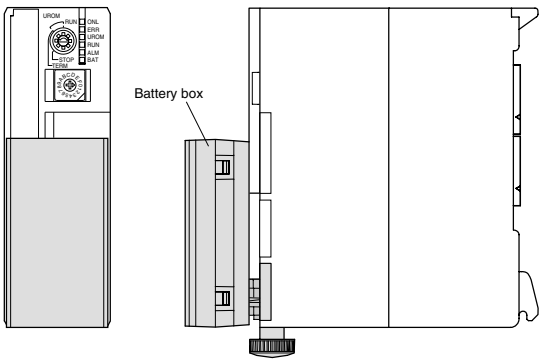


• SPH2000 (**NP1PM-48R/NP1PM-48E/NP1PM-256E**)

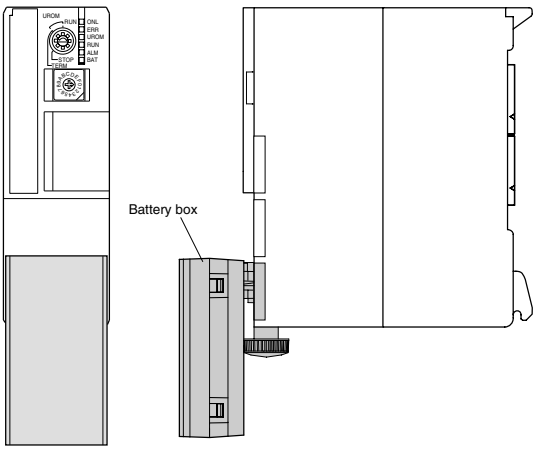


• Mounting of the battery box (optinal)

Up mounting



Low mounting



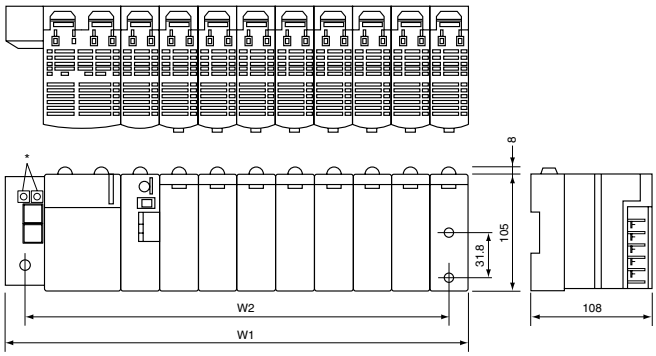
Note: 1) Note that, if the battery box is up-mounted, the loader cannot be connected.
2) No battery box can be mounted on SPH200 (NP1PH-08/NP1PH-16), SPH300 (NP1PS-32/ NP1PS-32R), and SPH2000 (NP1PM-48R/NP1PM-48E/ NP1PM-256E).

Base Board: NP1B □ - □□

Name	Type	No. of slots	Maximum no. of modules	Internal current consumption	Mass	Remarks
Standard base board	**NP1BS-03**	3 slots	2 (Not contain the power supply)	35mA or less	Approx. 250g	SX bus 3 slots, processor bus 2 slots
	NP1BS-06	6 slots	5 (Not contain the power supply)	45mA or less	Approx. 420g	SX bus 6 slots, processor bus 4 slots
	NP1BS-08	8 slots	6 (Not contain the power supply)	50mA or less	Approx. 540g	SX bus 8 slots, processor bus 3 slots
	NP1BS-11	11 slots	9 (not contain the power supply)	60mA or less	Approx. 720g	SX bus 11 slots, processor bus 3 slots
	NP1BS-13	13 slots	11 (Not contain the power supply)	70mA or less	Approx. 840g	SX bus 13 slots, processor bus 3 slots
High-performance base board	**NP1BP-13**	13 slots	11 (Not contain the power supply)	70mA or less	Approx. 840g	SX bus 13 slots, processor bus 10 slots
Station number setting switch incorporated standard base board	**NP1BS-08S**	8 slots	6 (Not contain the power supply)	60mA or less	Approx. 550g	SX bus 8 slots, processor bus 3 slots
	NP1BS-11S	11 slots	9 (not contain the power supply)	70mA or less	Approx. 730g	SX bus 11 slots, processor bus 3 slots
	NP1BS-13S	13 slots	11 (Not contain the power supply)	80mA or less	Approx. 850g	SX bus 13 slots, processor bus 3 slots
Station number setting switch incorporated high-performance base board	**NP1BP-13S**	13 slots	11 (Not contain the power supply)	80mA or less	Approx. 850g	SX bus 13 slots, processor bus 10 slots
Station number setting switch incorporated hot plugging high-performance base board	**NP1BP-13D**	13 slots	11 (Not contain the power supply)	80mA or less	Approx. 850g	SX bus 13 slots, processor bus 10 slots

Note) High performance base board is used for the P/PE-link high-speed handling of large amounts of data or for the multi-CPU configuration with the system processing speed increased. The standard base board is sufficient for a system operating at the normal processing speed.

■ Dimensions, mm



* Station number setting switch:
Incorporated the station number setting switch incorporated base board.

No. of slots	W1	W2
3	133	115
6	238	220
8	308	290
11	413	395
13	483	465

Note) When the connector is mounted, depth is max. 195.3 mm.
The bracket is already mounted on the base board.

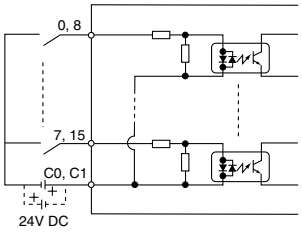
Digital Input Module: NP1X □

■ Performance specifications

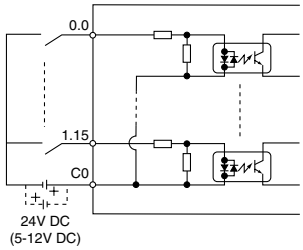
Type	Input	No. of input points	Rated voltage	Rated current	Operating voltage		Input delay time		Isolation method	Status indication	No. of points /common	External wire connection	Internal current consumption (24V DC)	Mass
					OFF to ON	ON to OFF	OFF to ON	ON to OFF						
NP1X1606-W	DC input, sink/ source	16	24V DC	7mA	15 to 30V	0 to 5V	1 to 100ms Variable by parameter setting		Photocoupler	LED indication	8 (x 2)	Terminal block	35mA or less	Approx. 150g
NP1X1607-W			48V DC	5mA	34 to 60V	0 to 10V							35mA or less	Approx. 150g
NP1X3206-W		32	24V DC	4mA	15 to 30V	0 to 5V					32 (x 1)	Connector	50mA or less	Approx. 130g
NP1X3202-W			5 to 12V DC	3 to 9mA	3.5 to 13.2V	0 to 1V							50mA or less	Approx. 130g
NP1X6406-W		64	24V DC	4mA	15 to 30V	0 to 5V					32 (x 2)		85mA or less	Approx. 180g
NP1X0810	AC input	8	100 to 120V AC	10mA	80 to 132V	0 to 20V	Approx. 10ms	Approx. 10ms			8 (x 1)	Terminal block	35mA or less	Approx. 130g
NP1X1610		16									16 (x 1)		40mA or less	Approx. 170g
NP1X0811		8	200 to 240V AC		160 to 264V	0 to 40V					8 (x 1)		35mA or less	Approx. 130g

■ Internal circuit diagram

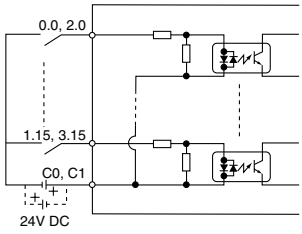
NP1X1606-W, NP1X1607-W



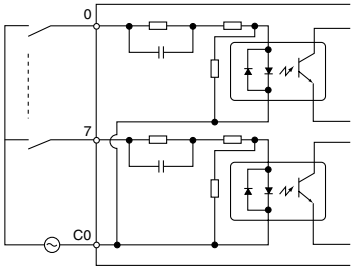
NP1X3206-W, NP1X3202-W



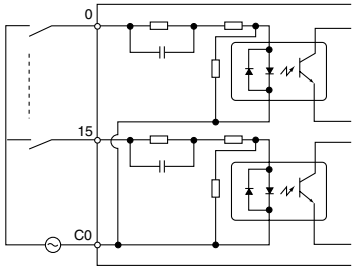
NP1X6406-W



NP1X0810, NP1X0811



NP1X1610



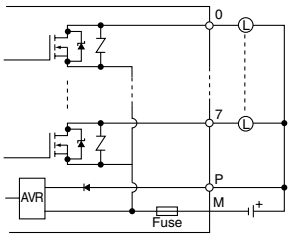
Digital Output Module: NP1Y □

■ Performance specifications

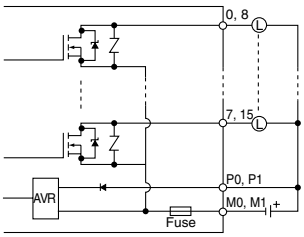
Type	Output	No. of output points	Rated voltage	Max. load current		Response time		Isolation method	Status indication	No. of points / common	Surge protection	External wire connection	Internal current consumption (24V DC)	Mass
				Per point	Common	OFF to ON	ON to OFF							
NP1Y08T0902	Transistor output sink	8	12 to 24V DC	2.4A	8A	1ms or less	1ms or less	Photocoupler	LED indication	8 (x 1)	Varistor	Terminal block	20mA or less	Approx. 150g
NP1Y16T09P6		16		0.6A	4A					8 (x 2)			42mA or less	Approx. 160g
NP1Y16T10P2			48V DC	0.2A	1.6A								42mA or less	Approx. 160g
NP1Y32T09P1		32	12 to 24V DC	0.12A	3.2A					32 (x 1)	Zener diode	Connector	45mA or less	Approx. 130g
NP1Y64T09P1		64								32 (x 2)			90mA or less	Approx. 180g
NP1Y08U0902	Transistor output source	8		2.4A	8A					8 (x 1)	Varistor	Terminal block	20mA or less	Approx. 150g
NP1Y16U09P6		16		0.6A	4A					8 (x 2)			30mA or less	Approx. 160g
NP1Y32U09P1		32		0.12A	3.2A					32 (x 1)	Zener diode	Connector	45mA or less	Approx. 140g
NP1Y64U09P1		64								32 (x 2)			90mA or less	Approx. 180g
NP1Y06S	SSR output	6	100 to 240V AC	2.2A	4.4A	10ms or less	10ms or less			2 (x 3)	CR absorber and varistor	Terminal block	60mA or less	Approx. 190g
NP1Y08S		8			2.2A					All points are independent			80mA or less	Approx. 200g
NP1Y08R-04	Relay output	8	110V DC/ 240V AC	30V DC/ 264V AC: 2.2A 110V DC: 0.2A	30V DC/ 264V AC: 4A 110V DC: 0.8A	Approx. 10ms	Approx. 10ms	Relay		4 (x 2)	Varistor		80mA or less	Approx. 150g
NP1Y16R-08		16		30V DC/ 264V AC: 2.2A 110V DC: 0.2A	30V DC/ 264V AC: 8A 110V DC: 1.6A					8 (x 2)			176mA or less	Approx. 190g

■ Internal circuit diagram

NP1Y08T0902



NP1Y16T09P6, NP1Y16T10P2



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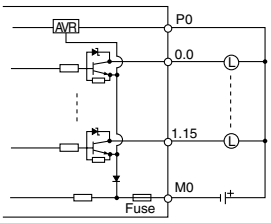

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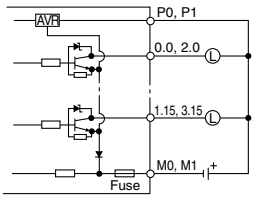

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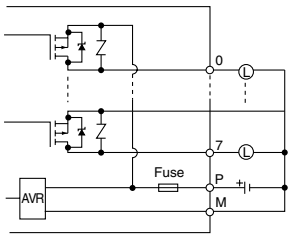

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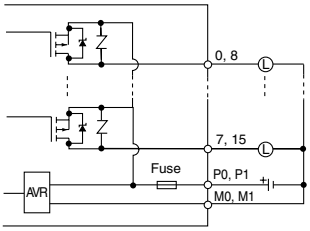

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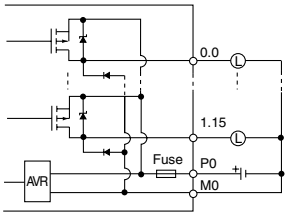

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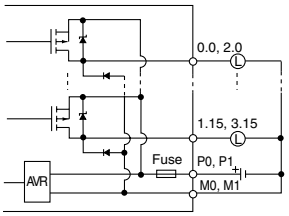
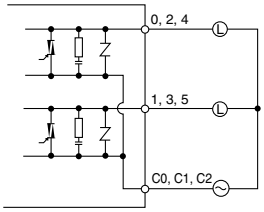
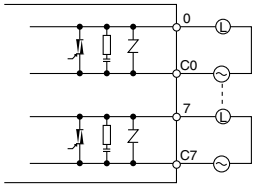


NP1Y06S



NP1Y08S



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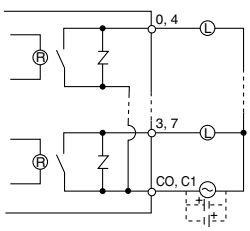
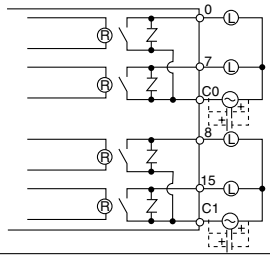


NP1Y16R-08



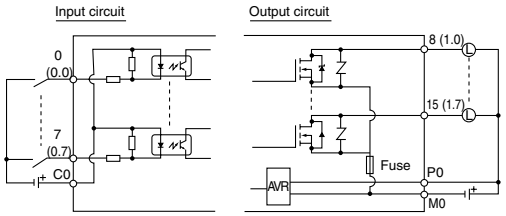
Digital Input/Output Module: NP1W □

■ Performance specifications

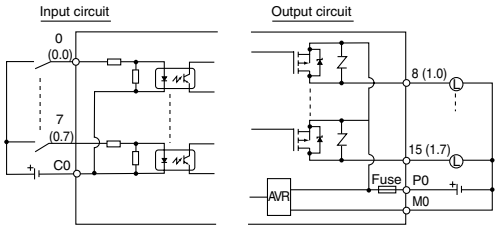
Type	Input					Output						Common				
	Input	No. of input points	Rated voltage	Rated current	No. of points / common	Output	No. of output points	Rated voltage	Max. load current Per point	Max. load current Common	No.of points/ common	Isolation method	Status indication	External wire connection	Internal current consumption (24V DC)	Mass
NP1W1606T	DC input, source	8	24V DC	7mA	8 (x 1)	Transistor output, sink	8	12 to	0.6A	4A	8 (x 1)	Photocoupler	LED indication	Terminal block	35mA or less	Approx. 150g
NP1W3206T		16		4mA	16 (x 1)		16	24V DC	0.12A	1.6A	16 (x 1)			Connector	50mA or less	Approx. 140g
NP1W1606U	DC input, sink	8		7mA	8 (x 1)	Transistor output, source	8		0.6A	4A	8 (x 1)			Terminal block	35mA or less	Approx. 150g
NP1W3206U		16		4mA	16(x 1)		16		0.12A	1.6A	16 (x 1)			Connector	50mA or less	Approx. 140g
NP1W6406T	DC bidirectional input	32		4mA	32(x 1)	Transistor output, sink	32		0.12A	3.2A	32 (x 1)			Connector	90mA or less	Approx. 180g
NP1W6406U	DC bidirectional input	32		4mA	32(x 1)	Transistor output, source	32		0.12A	3.2A	32 (x 1)			Connector	90mA or less	Approx. 180g

■ Internal circuit diagram

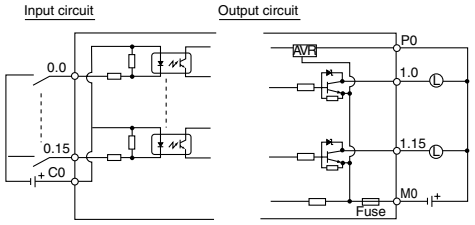
NP1W1606T



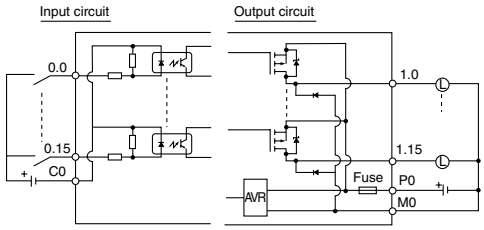
NP1W1606U



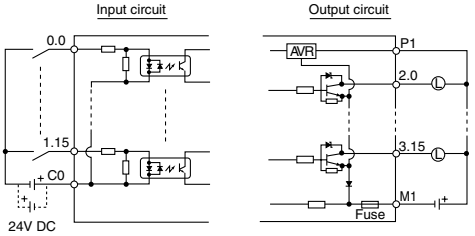
NP1W3206T



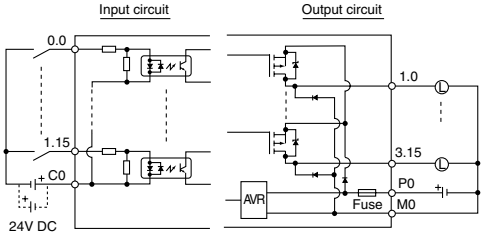
NP1W3206U



NP1W6406T



NP1W6406U



High-speed Digital Input Module: NP1X3206-A

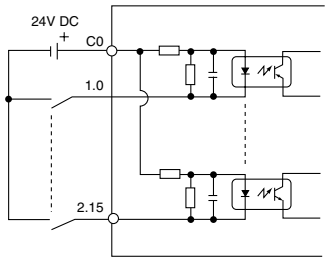
- Digital input module with pulse catch input
- Pulse catch input of minimum 20μs or normal input
- Pulse counter input function of maximum 20kHz, 4 ch. (two-phase)

■ Specifications

Type	Input	No. of input points	Rated voltage	Rated current	Operating voltage		Input delay time		Isolation method	Status indication	No. of points /common	External wire connection	Internal current consumption (24V DC)	Mass
					OFF to ON	ON to OFF	OFF to ON	ON to OFF						
NP1X3206-A	24V DC, source	32	24V DC	4mA	15 to 30V	0 to 5V	0.1 to 100ms Variable by parameter setting		Photocoupler	LED indication	32 (x 1)	Connector	50mA or less	Approx. 130g

■ Internal circuit diagram

NP1X3206-A



Pulse Train Output Built-in Digital Output Module: NP1Y32T09P1-A

- Module with transistor output and pulse train output built-in
- Pulse train output (20kHz) can be selected up to maximum 4 ch. x 2 phases

■ Specifications

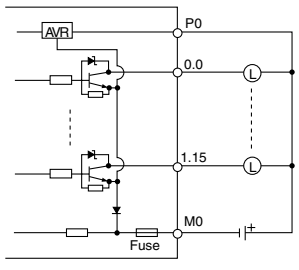
Type	Ouput	No. of output points	Rated voltage	Max. load current		Respose time		Isolation method	Status indication	No. of points /common	Surge protection	External wire connection	Internal current consumption (24V DC)	Mass
				Per point	Commom	OFF to ON	ON to OFF							
NP1Y32T09P1-A	Transistor output, sink	32	12 to 24V DC	0.12A	3.2A	20μs or less, 1μs or less at port sections	20μs or less, 1μs or less at port sections	Photocoupler	LED indication	32 (x 1)	Zener diode	Connector	50mA or less	Approx. 200g

■ Built-in pulse train output specifications

Item	Specification
No. of pulse train output channels	Max. 4 ch. x 2 phases (only when pulse train output mode is selected)
Max. output frequency	20kHz
Pulse output mode	(1) Forward pulse, reverse pulse (2) Pulse train + Sign
Output pulse counting method	Built-in 16-bit up-down counter
Operation mode	Start, stop, and clear operations, Ring operation
No. of general-purpose output points	Frequency/rotation direction/output mode settings 32 points (min. 24 points in pulse train output mode)

■ Internal circuit diagram

NP1Y32T09P1-A



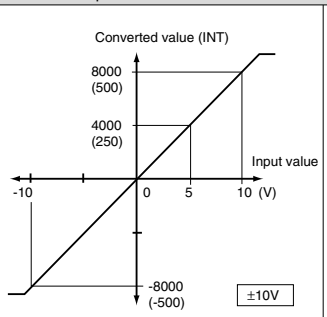
Analog Input Module: NP1AX □

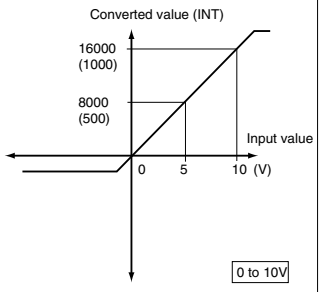
■ Performance specifications

Type	Input	No. of channels	Signal range	Digital output value	Digital resolution	Total accuracy	Converting speed	Occupied word	External wire connection	Internal current consumption (24V DC)	Mass
NP1AXH8V-MR	Multi-range input	8 ch	0 to 5V DC 0 to 10V DC 1 to 5V DC -10 to +10V DC	-8000 to +8000 or 0 to 16000	14 bits	±0.1% or less (at 18 to 28°C) ±0.2% or less (at 0 to 55°C) ±0.3% or less (at 0 to 55°C, 1-5V range)	2.5ms or less /8 ch	8 words + 4 words	Terminal block	200mA or less	Approx. 240g
NP1AXH8I-MR			0 to 20mA DC 4 to 20mA DC -20 to +20mA DC			±0.1% or less (at 18 to 28°C) ±0.4% or less (at 0 to 55°C)					
NP1AXH4-MR		4 ch	0 to 5V DC 0 to 10V DC 1 to 5V DC -10 to +10V DC	-8000 to +8000 or 0 to 16000	14 bits	±0.1% or less (at 25°C) ±1.0% or less (at 0 to 50°C)	1ms/4 ch	8 words + 2 words		120mA or less	Approx. 200g
NP1AX04-MR			-5 to +5V DC 0 to 20mA DC 4 to 20mA DC -20 to +20mA DC	-500 to +500 or 0 to 1000	10 bits	±0.5% or less (at 25°C) ±1.0% or less (at 0 to 55°C)	4ms/4 ch				
NP1AX08V-MR		8 ch	0 to 5V DC 0 to 10V DC 1 to 5V DC -10 to +10V DC		10 bits	±0.5% or less (at 25°C) ±1.0% or less (at 0 to 50°C)	5ms/8 ch	16 words + 2 words			
NP1AX08I-MR			-5 to +5V DC 0 to 20mA DC 4 to 20mA DC -20 to +20mA DC								

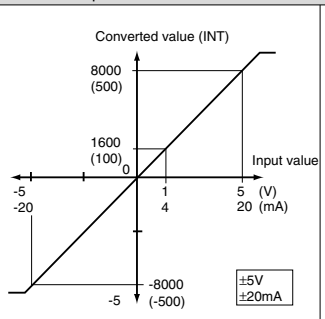
■ Characteristic diagram

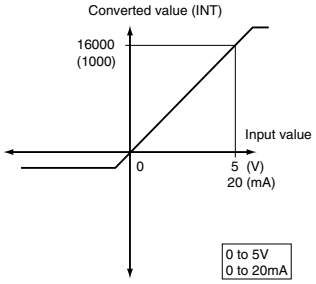
Characteristic pattern 1



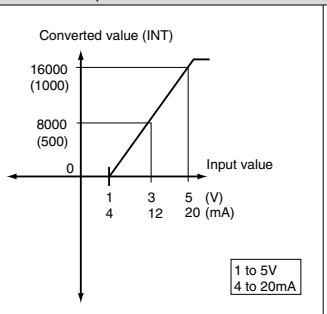


Characteristic pattern 2





Characteristic pattern 3



■ Input value and converted value

Characteristic pattern / Range of input	1	2	3
± 5V		± 8000 (± 500)	
0 to 5V		16000 (1000)	
1 to 5V			16000 (1000)
0 to 10V	16000 (1000)		
± 10V	± 8000 (± 500)		
0 to 20mA		16000 (1000)	
4 to 20mA			16000 (1000)
± 20mA		± 8000 (± 500)	

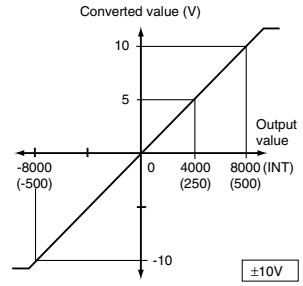
Analog Output Module: NP1AY □

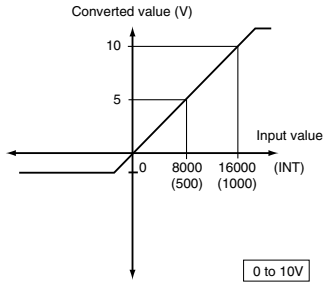
■ Performance specifications

Type	Input	No. of channels	Signal range	Digital output value	Digital resolution	Total accuracy	Converting speed	Occupied word	External wire connection	Internal current consumption (24V DC)	Mass
NP1AYH8V-MR	Multi-range output	8 ch	0 to 5V DC 0 to 10V DC 1 to 5V DC, -10 to +10V DC	-8000 to +8000 or 0 to 16000	14 bits	±0.1% or less (at 18 to 28°C) ±0.2% or less (at 0 to 55°C) ±0.3% or less (at 0 to 55°C, 1 to 5V range)	2ms/8 ch	4 words + 8 words	Terminal block	240mA or less	Approx. 240g
NP1AYH8I-MR			0 to 20mA DC 4 to 20mA DC	0 to 16000		±0.1% or less (at 18 to 28°C) ±0.4% or less (at 0 to 55°C)				300mA or less	
NP1AYH4V-MR		4 ch	0 to 5V DC 0 to 10V DC 1 to 5V DC, -10 to +10V DC	-8000 to +8000 or 0 to 16000		±0.1% or less (at 18 to 28°C) ±0.2% or less (at 0 to 55°C) ±0.3% or less (at 0 to 55°C, 1 to 5V range)	1ms/4 ch	4 words + 4 words		200mA or less	
NP1AYH4I-MR			0 to 20mA DC 4 to 20mA DC	0 to 16000		±0.1% or less (at 18 to 28°C) ±0.4% or less (at 0 to 55°C)					
NP1AYH2-MR		2 ch	0 to 5V DC 0 to 10V DC 1 to 5V DC, -10 to +10V DC	-8000 to +8000 or 0 to 16000		±0.1% or less (at 25°C) ±1.0% or less (at 0 to 50°C)	1ms/2 ch	2 words + 4 words		120mA or less	Approx. 200g
NP1AY02-MR			-5 to +5V DC 0 to 20mA DC 4 to 20mA DC	-500 to +500 or 0 to 1000	10 bits	±0.5% or less (at 25°C) ±1.0% or less (at 0 to 50°C)	2ms/2 ch				

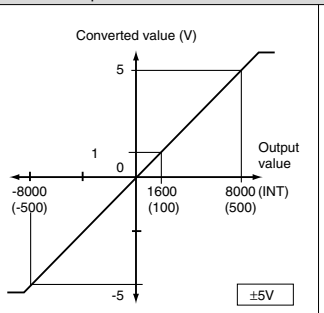
■ Characteristic diagram

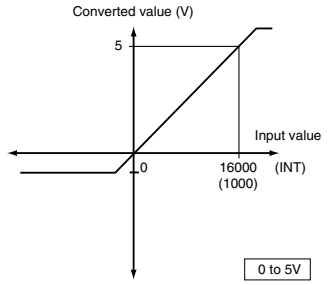
Characteristic pattern 1



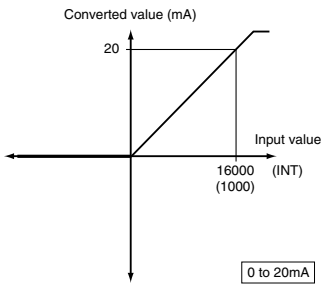


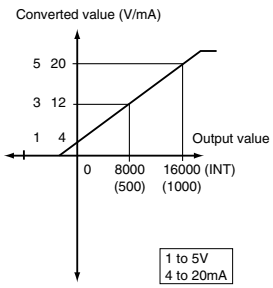
Characteristic pattern 2





Characteristic pattern 3





■ Input value and converted value

Characteristic pattern / Range of input	1	2	3
± 5V		±8000 (± 500)	
0 to 5V		16000 (1000)	
1 to 5V			16000 (1000)
0 to 10V	16000 (1000)		
± 10V	± 8000 (± 500)		
0 to 20mA		16000 (1000)	
4 to 20mA			16000 (1000)

Resistance Bulb Input Module: NP1AXH4-PT

- IEC Standards conformed sensors (platinum resistance thermometer bulb) can be connected. Batch setting is possible for all channels.
- Error detection (the detection of sensor wire breakage or short-circuit) is possible.
- Temperature scale is selectable between Celsius and Fahrenheit.

■ Specifications

Item	Specification
Measurement accuracy	± 0.3% (ambient temperature 18 to 28°C) ± 0.7% (ambient temperature 0 to 55°C) With the 0.0 to 100.0°C and -20.0 to 80.0°C ranges ± 0.4% (ambient temperature 18 to 28°C) ± 0.8% (ambient temperature 0 to 55°C)
Allowable input wiring resistance	10Ω or less
Sampling interval	500ms/4ch
Input filtering time	Hardware (time constant): 50ms Software filter: 1s (variable from 1 to 100s by program)
No. of input channels	4 ch (insulation between channels)
No. of occupied I/O points	Input 8 words, output 8 words
Internal current consumption	150mA or less
External connection	Removable terminal block M3, 20 pins
Mass	Approx. 240g

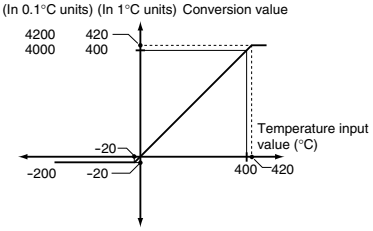
■ Type of resistance thermometer element and Resolutions

Type of resistance thermometer element	Celsius (°C)	Fahrenheit (°F)	
	Measuring temperature range	Measuring temperature range	Resolution of data
Pt	0 to 200	32 to 392	1
	-20 to 80	-4 to 176	
	0 to 100	32 to 212	
	0 to 400	32 to 752	
	-200 to 200	-328 to 392	
	-200 to 600	-328 to 1112	
	0.0 to 200.0	32.0 to 392.0	0.1
	-20.0 to 80.0	-4.0 to 176.0	
	0.0 to 100.0	32.0 to 212.0	
	0.0 to 400.0	32.0 to 752.0	
	-200.0 to 200.0	-328.0 to 392.0	
	-200.0 to 400.0	-328.0 to 1112.0	
JPt	0 to 200	32 to 392	1
	-20 to 80	-4 to 176	
	0 to 100	32 to 212	
	0 to 400	32 to 752	
	-200 to 200	-328 to 392	
	-200 to 500	328 to 932	
	0.0 to 200.0	32.0 to 392.0	0.1
	-20.0 to 80.0	-4.0 to 176.0	
	0.0 to 100.0	32.0 to 212.0	
	0.0 to 400.0	32.0 to 752.0	
	-200.0 to 200.0	-328.0 to 392.0	
	-200.0 to 500.0	-328.0 to 932.0	

Note: The measuring range of temperature is ± 5% of the input range span.

■ Characteristic diagram

In case of PT0.0 to 400.0°C



Thermo-couple Input Module: NP1AXH4-TC

- The following thermocouples that conform to IEC, ASTN and DIN Standards can be connected. Batch setting is possible for all channels.
  IEC: R, K, J, S, B, E, T, N ASTN: W5Re, W26Re, PLII
  DIN: U, L
- Error detection (the detection of sensor wire breakage or short-circuit) is possible.
- Temperature scale is selectable between Celsius and Fahrenheit.

■ Specifications

Item	Specification
Measurement accuracy	± 0.3% (ambient temperature 18 to 28°C) ± 0.7% (ambient temperature 0 to 55°C) With K (0.0 to 400.0°C, 0.0 to 500.0°C, 0.0 to 800.0°C) and T (0.0 to 400.0°C) ranges ± 0.4% (ambient temperature 18 to 28°C), ± 0.8% (ambient temperature 0 to 55°C)
Cold contact compensation accuracy	± 1°C (ambient temperature 18 to 28°C)
Allowable input wiring resistance	100Ω or less
Sampling interval	500ms/4ch
Input filtering time	Hardware (time constant): 50ms Software filter: 1s (variable from 1 to 100s by program)
No. of input channels	4 ch (insulation between channels)
No. of occupied words	Input 8 words, output 8 words
Internal current consumption	150mA or less
External connection	Removable terminal block M3, 20 pins
Mass	Approx. 240g

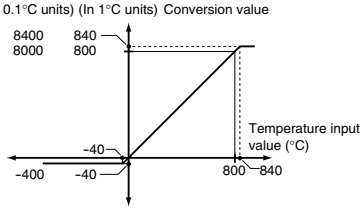
■ Thermocouple Types and Resolutions

Thermocouple type	Celsius (°C)	Fahrenheit (°F)	
	Measuring temperature range	Measuring temperature range	Resolution of data
K	0 to 1300	32 to 2372	1
	0 to 500	32 to 932	
	0 to 800	32 to 1472	
	0.0 to 400.0	32.0 to 752.0	0.1
	0.0 to 500.0	32.0 to 932.0	
	0.0 to 800.0	32.0 to 1472.0	
B	0 to 1800	32 to 3272	1
R	0 to 1700	32 to 3092	1
S	0 to 1700	32 to 3092	1
E	0 to 400	32 to 752	1
	0 to 700	32 to 1292	
	0.0 to 700.0	32.0 to 1292.0	0.1
J	0 to 500	32 to 932	1
	0 to 800	32 to 1472	
	0.0 to 400.0	32.0 to 752.0	0.1
	0.0 to 500.0	32.0 to 932.0	
	0.0 to 800.0	32.0 to 1472.0	
T	0 to 400	32 to 752	1
	0.0 to 400.0	32.0 to 752.0	0.1
N	0 to 1300	32 to 2372	1
U	0 to 400	32 to 752	1
	0 to 600	32 to 1112	
	0.0 to 600.0	32.0 to 1112.0	0.1
L	0 to 400	32 to 752	1
	0 to 900	32 to 1652	
	0.0 to 400.0	32.0 to 752.0	0.1
	0.0 to 900.0	32.0 to 1652.0	
PL II	0 to 1200	32 to 2372	1
W5Re, W26Re	0 to 2300	32 to 4172	1

Note: The measuring range of temperature is ± 5% of the input range span.

■ Characteristic diagram

In case of K0.0 to 800.0°C



I/O Connection of Connector-type Modules

The following types of modules are connected using connectors and recommended for the I/O connection use.

■ Connector type module list

Item	Type	Specification
Digital input module	**NP1X3206-A**	24V DC, 32 points, 4mA 0ms to 100ms variable, with 20kHz x 4 ch. built-in pulse counter
	NP1X3206-W	24V DC, 32 points, 4mA 1ms to 100ms variable
	NP1X3202-W	5/12V DC, 32 points, 3/9mA 1ms to 100ms variable
	NP1X6406-W	24V DC, 64 points, 4mA 1ms to 100ms variable
Digital output module	**NP1Y32T09P1-A**	Tr. Sink, 24V DC, 32 points, 0.12A/point, 3.2A/common, with 20kHz x 4 ch. built-in pulse train output
	NP1Y32T09P1	Transistor sink, 12 to 24V DC, 32 points, 0.12A/point, 3.2A/common
	NP1Y64T09P1	Transistor sink, 12 to 24V DC, 64 points, 0.12A/point, 3.2A/common
	NP1Y32U09P1	Transistor source, 12 to 24V DC, 32 points, 0.12A/point, 3.2A/common
	NP1Y64U09P1	Transistor source, 12 to 24V DC, 64 points, 0.12A/point, 3.2A/common
Digital input /output module	**NP1W3206T**	24V DC, 16 points, Source input, 12 to 24V DC, Tr sink 16-point output
	NP1W3206U	24V DC, 16 points, Sink input, 12 to 24V DC, Tr source 16-point output
	NP1W6406T	24V DC, 32 points, Bidirectional input, 12 to 24V DC, Tr sink 32-point output
High-speed counter module	**NP1F-HC2**	500kHz x 2 ch, 90-degree phase difference 2-phase signal, pulse + directional signal, others
Multi-channel high-speed counter module	**NP1F-HC8**	50kHz x 8 ch, , 90-degree phase difference 2-phase signal, pulse + directional signal, others
Pulse train output positionig control module	**NP1F-HP2**	Pulse train command 250kHz x 2 ch.
Pulse train positioning control combined module	**NP1F-MP2**	2-axis pulse train command positioning control combined module output pulse: 250kHz, Feedback pulse: 500kHz
Analog command positioning control combined module	**NP1F-MA2**	2-axis analog command positioning control combined module feedback pulse: 500kHz

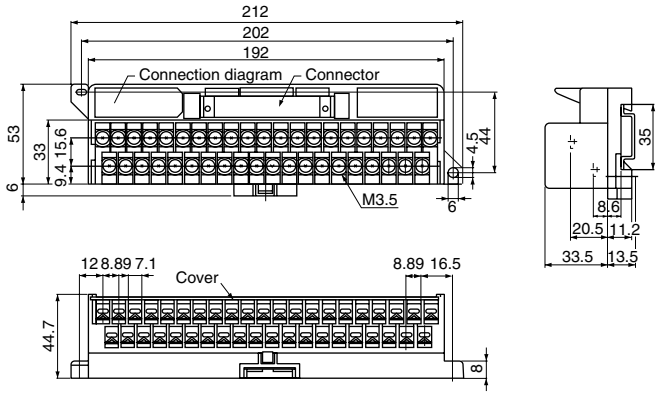
Note: Refer to each manual for the wiring for the connector.

■ Recommended relay terminal blocks and connection cables

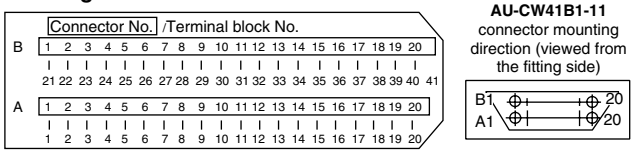
- Type, model, and product cod
- Unit

Model	No. of terminal block pins	No. of connector pins	Rating (connector)	Performance	Product code
AU-CW41B1-11	41	40	Insulation voltage: 60V (AC,DC) Conductive current: 1A (40°C)	Insulation resistance: 100MΩ or more Withstand voltage: 500V, 1 minute Allowable ambient temperature: -5 to +40°C Allowable ambient humidity: 45 to 85%RH Flame resistance: UL94-V1	LP1W-41BA5

- Dimensions, mm (**AU-CW41B1-11** type)



Connection diagram



AU-CW41B1-11
connector mounting direction (viewed from the fitting side)

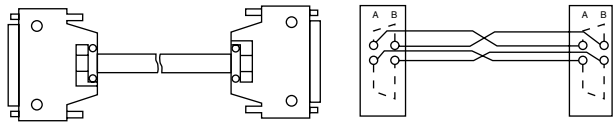
- Connection cable

Applicable terminal block model	No. of pins	Cable type	Connection cable model	Product code
AU-CW41B1-11	40	Multi-core cable	**AUX011-40**□	LP911-40 □
		Flat cable	**AUX021-40**□	LP921-40 □

* □ indicates the length of the multi-core cable and flat cable.
1:1m (standard), 2:2m, 3:3m

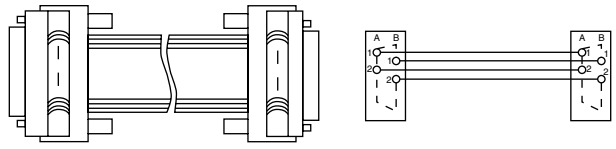
- Recommended cables
- Cable with connectors

AUX011-40 □ type



- Flat cable with connectors

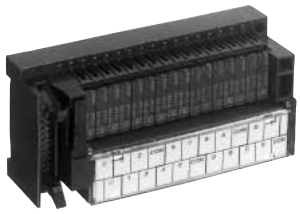
AUX021-40 □ type



Terminal Relay

■ Features

- Minimum width of 110mm has been achieved.
  The external dimension is as compact as 110mm (W) x 52mm (D) x 37mm (H).
- Push-set terminal facilitates tightening screws.
  Push-set terminal is used in the terminal section, eliminating the screw tightening time and preventing screws from being lost.
- LED operation indication facilitates I/O ON/OFF operation check.
  Operation indication LED is arranged in 1:1 correspondence with the relay. This makes the ON/OFF relay operation status clear at a glance.
- Two types of relays available for output and input.
- With surge protection diode provided.



AF96-82

- Terminal cover is installed as standard allowing device No. indication.
- With the built-in relay remover.
- Used for both DIN rail installation and rear-side screw mounting.

■ Performance specifications

Item		Performance
Operating duration		10ms or less
Recovery duration		10ms or less
Vibration resistance	Malfunction	10 to 55Hz, Duplex amplitude 1.0mm
	Durability	10 to 55Hz, Duplex amplitude 1.0mm 3 times each in X, Y, and Z directions to total 18 times
Impact resistance	Malfunction	100 m/s^2
	Durability	200 m/s^2 2 hours each in X, Y, and Z directions to total 6 hours
Operating ambient temperature		-25 to +55 °C (no condensation)
Operating ambient humidity		35 to 85% RH
Terminal screw size		M3
External connection tightening torque		0.5 to 0.7 N·m
Mounting method		Rail mounting (screw mounting also possible)
Applicable round-type crimp-style terminal		R1.25 to 3 (max.6mm wide)
Connection wire		max. ø1.4
LED indication color		Operating indication: Red, Power indication: Green
Coil surge protection element		Diode
Relay removal count		50 times
Insulation resistance (initial)		100 MΩ or more (with 500V DC megger)
Voltage resistance	Between contact coils	For 1 min. at 2000V DC
	Between contacts with same polarity	For 1 min. at 1000V DC
	Between contacts with different polarity	For 1 min. at 2000V DC
Mass		200g

■ Type/Model/Ordering code

Model (Ordering code)	I/O type	No. of points	Rated voltage	Common line handling on Connector side
RS16-□04	Output	16 points	5V DC [DY]	NPN compatible (+ common)
RS16-□04P		(1a x 16)	24V DC [DE]	PNP compatible (- common)
RS16E-□04	Input	16 points		NPN compatible (+ common)

■ Rating

Opening section, connector side (per RB105 1 point)

Item \ Load	RS16 (output)				RS16E (input)	
	Resistance load (cosø =1, L/R=0ms)		Inductive load (cosø =0.4, L/R=7ms)		Resistance load (cosø =1, L/R=0ms)	Inductive load (cosø =0.4, L/R=7ms)
Rated load, rated voltage/current	220V AC 2A		220V AC 2A		24V DC 1A	24V DC 1A
Rated conducting current	2A *1				1A *2	
Contact resistance	30mΩ or less				30mΩ or less	
Voltage/current applicable to min. applicable load (P standard reference value)	0.1V 0.1mA				0.1V 0.1mA	
Mechanical lifetime	20 mil. times				–	
Electrical lifetime	0.2 mil. times	0.3 mil. times	0.1 mil. times	0.06 mil. times		

*1 The relay (RB105) is a 5A rated conducting current product. However, the main unit rated conducting current is restricted to 2A due to the structural characteristics of the terminal relay.
*2 The relay (RB105) is a 5A rated conducting current product. However, the main unit rated conducting current is restricted to 1A due to the structural characteristics of the terminal relay.

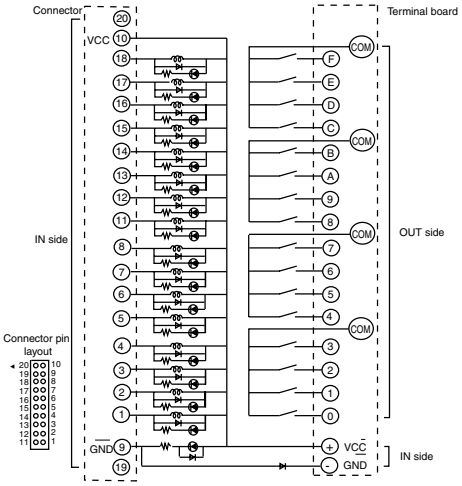
Operating coil I/O specification (per RB105 1 point) (at 20°C)

Rated voltage	Rated current	Coil resistance ±10%	Operating voltage	Recovery voltage	Max. allowable voltage	Power consumption	
						Per 1 point	Per 16 points
5V DC	40mA	125Ω	70% or less of rated voltage	10% or more of rated voltage	110% of rated voltage	0.2W	3.2W
24V DC	8.3mA	2,880Ω	70% or less of rated voltage	10% or more of rated voltage	110% of rated voltage	0.2W	3.2W

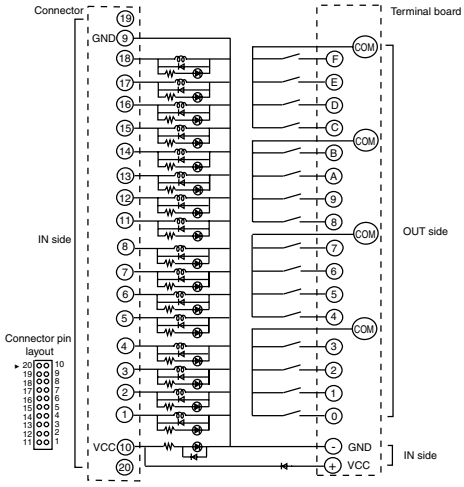
Note: Current supplied to LED is approximately 1mA. To calculate the power supply capacity, add the current value.

■ Internal connection diagram

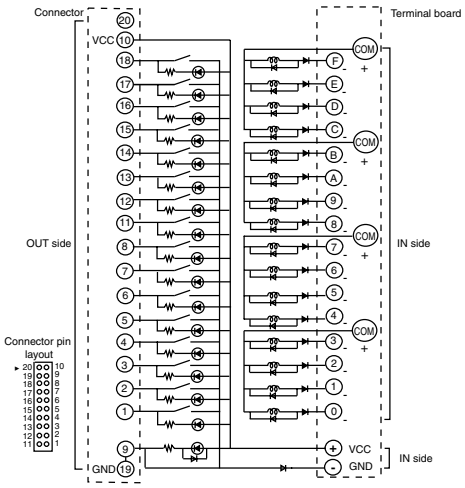
● **RS16-DE04** (output, applicable to NPN)



● **RS16-DE04P** (output, applicable to PNP)

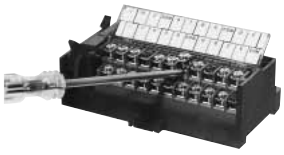


● **RS16E-DE04** (input, applicable to NPN)



■ Using the push-set terminal

(1) Push up the terminal screw with a screwdriver, etc.



AF95-388

(2) When the terminal screw is pushed up, insert the solderless terminal.

AF95-389

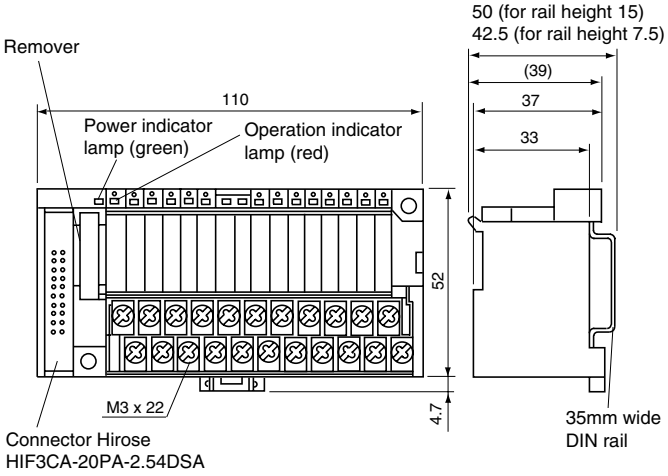
(3) When the solderless terminal is inserted, push down the terminal screw with a screwdriver and then fasten screws.

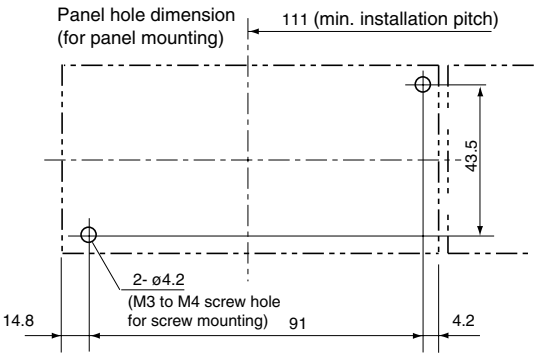
AF95-390

(Note) Fasten the screw of unused terminals.

■ Dimensions

Units: mm





■ Terminal relay cable

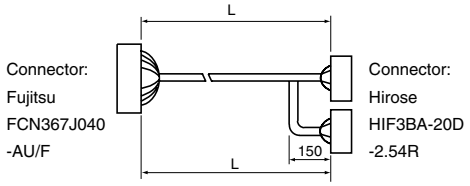
● Type/Model/Ordering code

Type	Cable Length	Model (ordering code)
Cable with connectors (1:2)	1,000mm	**RS910M2-0104**
For MICREX-SX	2,000mm	**RS910M2-0204**
(for input, output)	3,000mm	**RS910M2-0304**

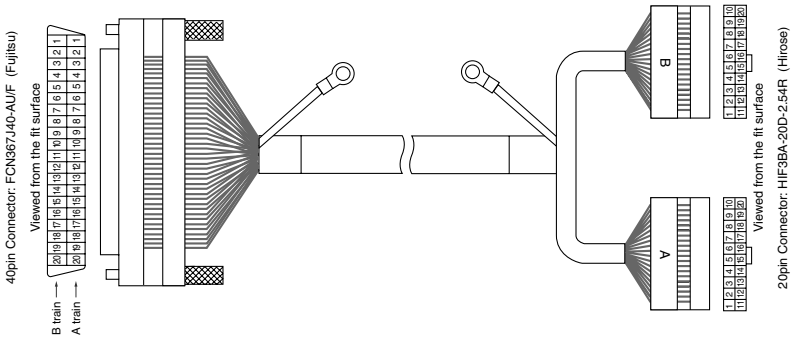
● Dimension specification

Model (ordering code)	I/O type	Compatible PLC
RS910M2-□□04	Output	MICREX-SX series Tr output module **NP1Y32□** *1 **NP1Y64□**
Numeric in □□ indicates a cable length. 01: 1m 02: 2m 03: 3m	Input	MICREX-SX series Input module **NP1X32□** **NP1X64□** **NP1W3206T□**

*1 **NP1Y32T09P1-A** (with the pulse train output function) is not applicable.

	External specification	
Controller side	 Straight length (without bending)	Terminal relay side

■ Terminal relay cable



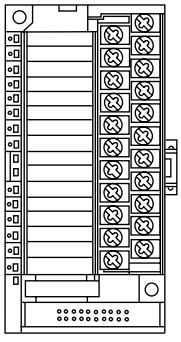
<Connection>

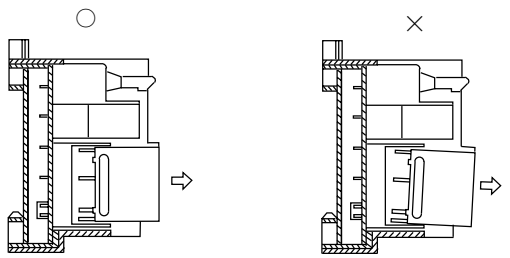
20pin(A)	40pin		20pin(B)	40pin
1	A20	I/O signal	1	B20
2	A19		2	B19
3	A18		3	B18
4	A17		4	B17
5	A16		5	B16
6	A15		6	B15
7	A14		7	B14
8	A13		8	B13
9	A 1	power supply(-)	9	A 2
10	B 1	power supply(+)	10	B 2
11	A12	I/O signal	11	B12
12	A11		12	B11
13	A10		13	B10
14	A 9		14	B 9
15	A 8		15	B 8
16	A 7		16	B 7
17	A 6		17	B 6
18	A 5		18	B 5
19	A 3	power supply(-)	19	A 4
20	B 3	power supply(+)	20	B 4

⚠ Notes on use

(1) Attachment direction
Although there is especially no limitation on the attachment direction, when the relay can be attached horizontally with respect to the floor surface, the direction where the connector comes to the lower side, as shown at right, is recommended. This direction makes the moving section of the relay come to the lower side, thus improving the resistance to vibration. In this case, use retainer fitting TS-XT to prevent the section from dropping downward.

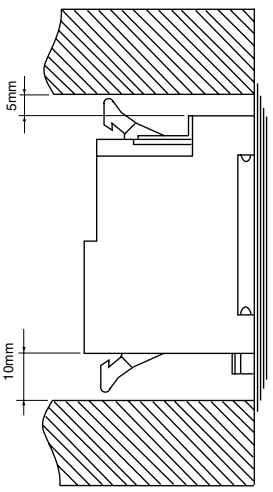
(2) Attach the relay to or remove it from the socket so that it be perpendicular to the surface of the socket. Attaching or removing the relay slantly may cause bend of the relay terminal or damage to the socket. Use the provided pull-out tool when attaching or removing the relay.


(Connector side)



(3) The type of the relay corresponding to the card relay terminal relay applicable to the terminal relay is RB105. As the replacement relay, use a relay of the same type and with the same voltage specification as the one supplied at the time of delivery.

(4) When attaching the PLC terminal to the control panel, etc., leave a space between the adjacent equipment or duct and the PLC terminal to secure a space for connector removal handle operation, as shown at right.



(5) As for connector selection, use connectors prepared as an option. When using commercial products, use products from Hirose Electric. Using a connector from other manufacturers may cause inferior connection or other failures.

Computer-level Communication Module
Web Module: NP1L-WE1

■ Features
Through the Internet and Intranet, this module realizes equipment supervision by Web browser, E-mail sending at failure occurrence, and remote control and remote maintenance (monitoring/program modification) by the programming support tool.

NP1L-WE1
KD02-041A

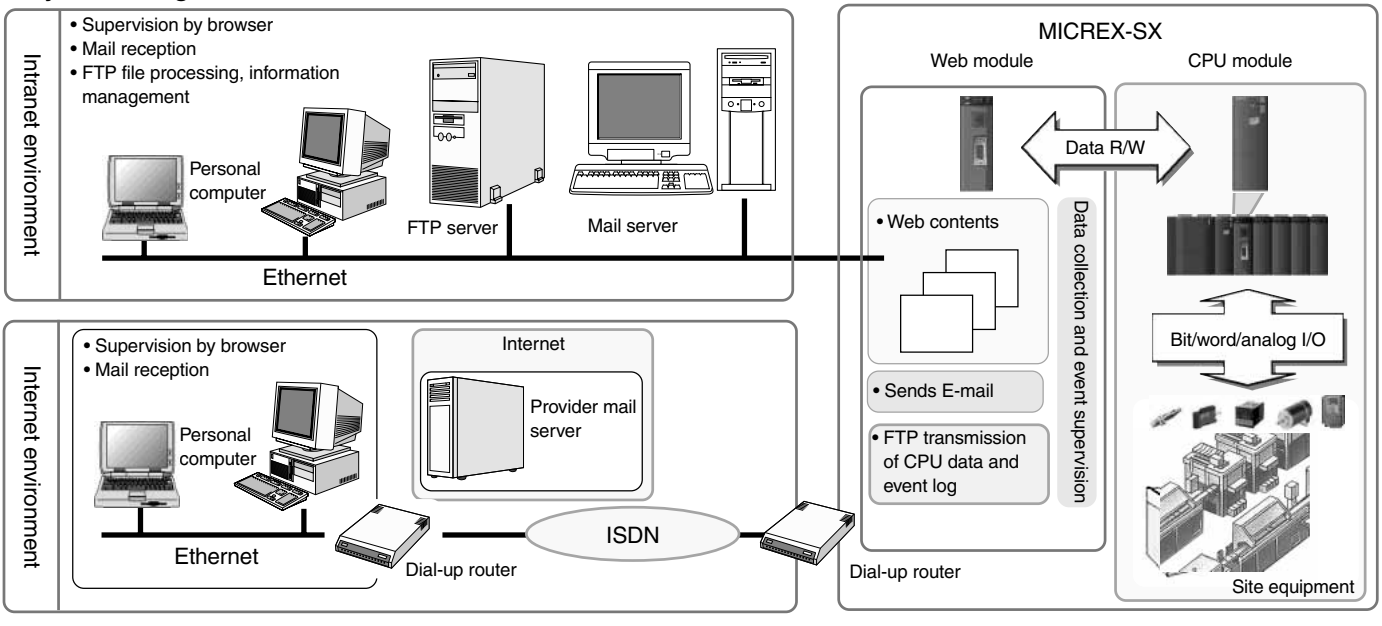
■ Functional specifications

Item	Specification
Web server functions	Controller data can be monitored and set using a browser (Internet Explorer) on a remote personal computer. Mounts the tabular form data display and trend graph display functions as standard. Initial setup items for the Web modules are all set in the browser screen.
E-main send function	Sends E-mail (contain the attached file) to the specified destination address at occurrence of a set event (failure alarm notification, etc.).
FTP function	Saves trend data and CPU data (binary file) in external FTP server at occurrence of a set event. Saved data can be processed to generate a daily/monthly report or trend graph.
Security function	Limits users and setup operations by user name and password.
Remote loader function	Remote operation of SX support tool (D300win), such as monitoring of SPH sequence, from a personal computer
PPP function	Realizes the above functions through the modem (telephone and PHS circuit connection service) and mobile arc (Dopa network) on the RS-232C interface.
User contents creation function	Incorporates user-created contents in the Web module.
SNTP function	Controller data can be calibrating the date data (calendar) of the CPU module.

■ Functional specifications

Item	Specification
Ethernet interface	10BASE-T/100BASE-TX, RJ45 modular jack x1 Auto negotiation
RS-232C interface (For PPP connection)	115.2kbps max. Dsub 9-pin (male) connector x1 Character format Data length: 7/8 bits Parity: Even/odd parity Stop bits: 1/2 bits Hardware flow control: Provided
No. of units mounted	4 or less recommended (in the same configuration)
Internal current consumption	24V DC, 140mA or less
Mass	Approx. 140g

■ System configuration



Ethernet Interface Module: NP1L-ET1

■ Features

- Supports the 10BASE5 interface as well as 100BASE-T/100BASE-TX interface.
- Supports three different communication modes.
- Genera-purpose communication mode (TCP/IP or UDP/IP protocol communication)
- Fixed buffer communication mode (Handshake communication between PC and specific node)
- Loader command communication mode (MICREX-SX loader command function)

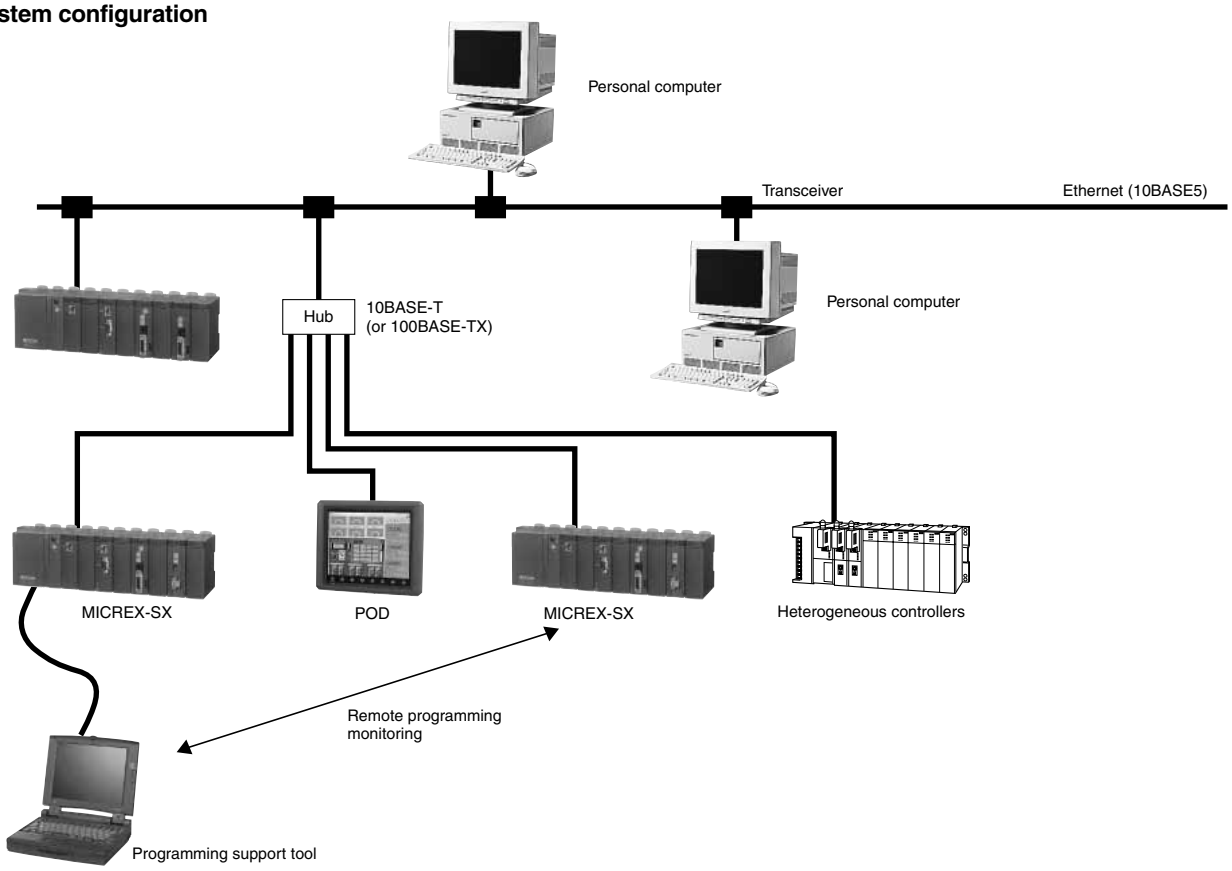
NP1L-ET1
KD02-040A

NP1L-ET2
KD03-016

■ Performance specifications

Item		Specification	
Type		**NP1L-ET1**	**NP1L-ET2**
Communication function	Application communication mode	General-purpose communication Fixed buffer communication	
	Loader command automatic reception mode	Automatic transmission communication	
Interface		10BASE-T/100BASE-TX Automatic selection by the auto negotiation function	10BASE5
Media control		IEEE 802.3/IEEE 802.3u	IEEE 802.3
Transmission rate		10Mbps/100Mbps	10Mbps
Transmission medium		Twist pair cable (UTP)	AUI cable
Protocol		TCP/IP, UDP/IP	
Max. number of nodes for simultaneous communication		16 stations (ports)	
Max. number of transmit words		1017 words	
Max. number of loader connections simultaneously		8 units	
No. of units mounted		4 or less recommended (in the same configuration)	
Internal current consumption		24V DC, 140mA or less	
Mass		Approx. 140g	

■ System configuration



Online Adapter: FOA-ALFA2

■ Features

This module allows easy remote maintenance system configuration simply by connecting the online adapter to the loader port without changing any program on the PLC (MICREX-SX SPH/SPB) side.
The SPB is available on the SX mode.

- Bidirectional communication between the master station (personal computer) and slave station (SPH/SPB SX mode)
- Diverse functions
  - Failure monitor function • Data accumulation function
  - Integrated time monitor function
  - Communication function between the PLCs
- Calendar function (year, month, day, hour, minute, second), Data backup function (data memory, calendar IC memory) are usually available.

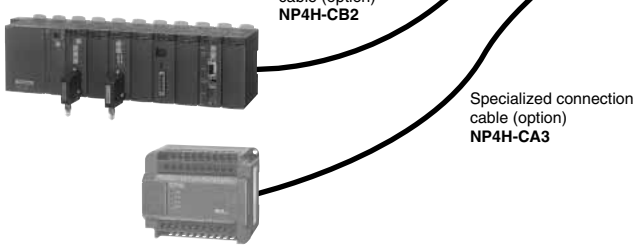
■ Specifications

- General specifications

Item		Specification
Physical environment	Operating ambient temperature	0 to ± 55°C (without condensation)
	Storage temperature	-20 to ± 70°C (without condensation)
	Relative humidity	20 to -90%RH (without condensation)
	Contamination	Contamination level 2
	Corrosion resistance	No corrosive gas is present, no organic solvent adhesion
	Operating altitude/air pressure	Altitude of 2000m or less (air pressure of 70kPa or higher during transportation)
Mechanical operating condition	Resistance to vibration	One amplitude: 0.15mm, constant acceleration: 9.8m/s², 2 hours for each direction, 6 hours total
	Resistance to shock	Peak acceleration: 294m/s², 3 times for each direction
Electrical operating condition	Resistance to noise	Noise simulator method, rise time of 1ns, pulse width of 1us, 1kV
	Resistance to electrostatic discharge	Contact discharge method: ± 6kV, air discharge method: ± 8kV
	Resistance to radiation electromagnetic field	10V/m (80 to 1000MHz)
Cooling system		Natural cooling
Insulation characteristic	Insulation resistance	10MΩ or more (between connectors and ground) with a 500V DC megger
Power supply method		Supplies 24V DC from PLC or 12V DC from AC adapter.
Current consumption		24V: 60mA or less (SPH) / 288mA or less (SPB) 12V: 120mA or less
Mass		Approx. 320g
Calendar accuracy		± 90 seconds/month (25°C, conduction)
Battery type/operating life		Lithium primary battery 3.6V **NP8P-BT** / 5 years (ambient temperature of 25°C)

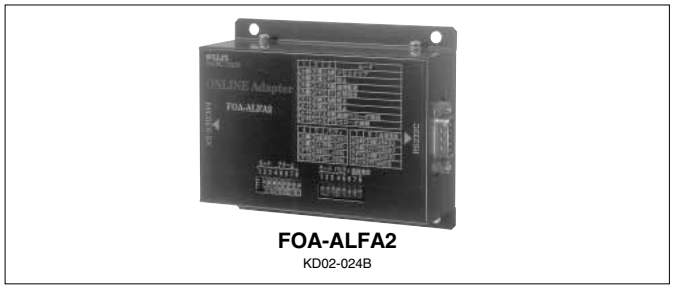
Note: For operating environment, take into consideration the specifications of the communication devices used.
* 1 Use the AC adapter only at the time of initial setup data transmission. Do not use it for connection with SPH.

■ System configuration



■ Initial setup loader (Model: FOA-LOADER2-CD) <Japanese version>

- Creates initial setup data (each function setup). Sets the failure monitor, data accumulation, integrated time monitor functions and registers AT commands for communication.
- Writes the initial setup data to the online adapter.
- Reads the initial setup data from the online adapter.



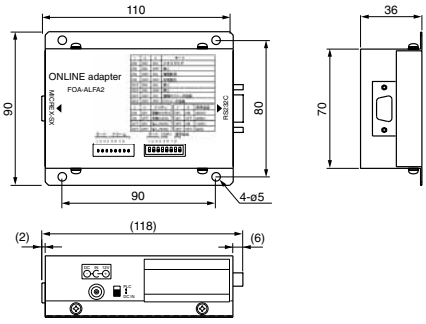
FOA-ALFA2
KD02-024B

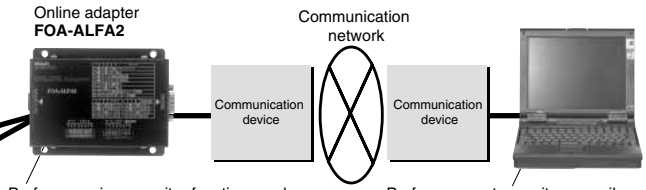
- Functional specifications

Mode	Contents
Online adapter mode	Execution mode of various monitor functions
Loader mode	Monitors SPH/SPB (SX mode) programming monitor locally.
Remote mode Initial setup mode	Monitors SPH/SPB (SX mode) programming monitor from a remote site.
Memory clear mode	Writes setup data necessary for various monitor functions using the initial setup loader.
	Backup memory initialization (clear) mode

■ Outside dimensional drawing

Unit; mm





■ Master station monitoring software (Model: FOA-CENTER2-CD) <Japanese version>

- Slave station monitor function (reception of notification from slave station)
  - Failure monitor function • Data accumulation function
  - Integrated time monitor function
- Access from the master monitor software (personal computer) to slave station.
  - Reads data accumulated in the online adapter.
  - Automatically collects data by time specification (with circuit connection each time).
  - Updates the initial setup data from a remote site. (Remote update function)
  - Uses the personal computer loader software from a remote site.
- Other functions
  - Saves receive data as CSV files.
  - Monitors accumulated data in bar graph form.
  - Upon reception of failure information, automatically transfers the E-mail.

Controller-level Communication Module

OPCN-2 (FL-net) Ver. 2.0 Module: NP1L-FL2
OPCN-2 (FL-net) Ver. 2.0 (100Mbps adaption) Module: NP1L-FL3

NP1L-FL2
AF99-339

NP1L-FL3
KDD05-017

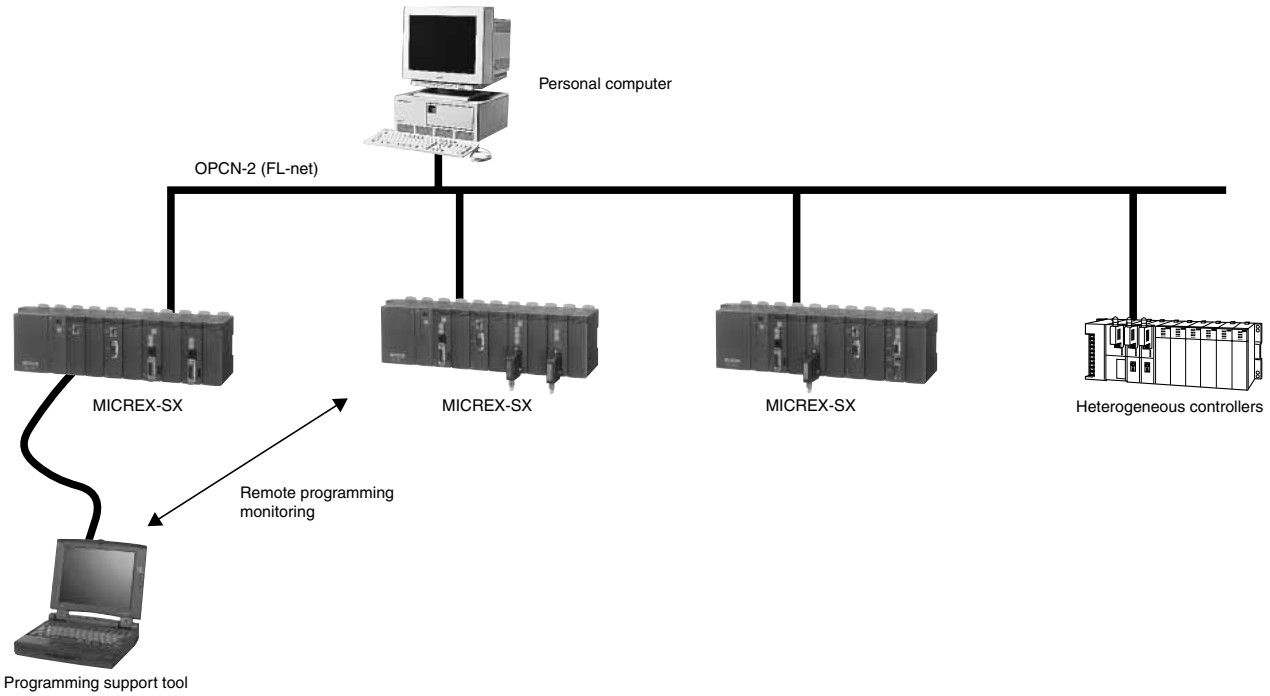
■ Features

- Up to 2 communication modules including P/PE-link can be installed on the base board equipped with CPU.
- Data exchange between processors
  Cyclic data communication, message communication
- OPCN-2 (FL-net) loader commands supported
- SX system loader functions via network are supported.

■ Performance specifications

Item	Specification		
Type	**NP1L-FL2**		**NP1L-FL3**
Transmission specification	10BASE 5	10BASE-T	10BASE-T / 100BASE-TX
No. of SX bus connectable modules	Max. 8 / configuration (including P/PE-link)		
Max. number of system nodes	254 units (100 units / segment)	254 units (2 units / segment)	
Transmission line format	Bus configuraiton (multi-drop)		
Transmission line	Ethernet coaxial cable	UTP (unshilded twisted pair cable)	
Framing method	Ethernet II		
Access control	CSMA/CD		
Transmission method (code)	Base band (Manchester coding)		
Transmission speed	10Mbps		10Mbps / 100Mbps
Max. segment length	500m (2500m max. with repeater)	100m (between node and hub) (max. 200m with repeater)	
Min. node interval	2.5m	–	
Protocol	FA link protocol, UDP / IP, ICMP, ARP		
IP address	Class C		
Data exchange method	• Cyclic broadcast transmission method Data size: Max. 8.5 Kword • Message transmission method Data size: Max. 512 word		
Host interface	Common memory cyclic refresh method, block data read / write		
Internal current consumption	24V DC, 105mA or less		24V DC, 160mA or less
Mass	Approx. 220g		Approx. 220g

■ System configuration



ADS-net Module: NP1L-AD1

NP1L-AD1
KD02-039A

■ Features

- Supports the Autonomous Decentralized Protocol (R3.0) * 1 and is provided with the following functions:
  - Multicast communication function
  - Existence signal transmit function
  - Trouble information transmit function
- Supports the test support function.
- Supports input and output of I/O transactions and up to 16 TCDs.
- Supports the 10BASE-T (TPI) and 10BASE5 (AUI) interfaces.

* 1 The Autonomous Decentralized Protocol is a protocol decided by FA Open Systems Promotion Forum (FAOP) of Manufacturing Science and Technology Center (MSTC, Japan), and the protocol is being discussed in ISO.

- Supports the subnet mask function.

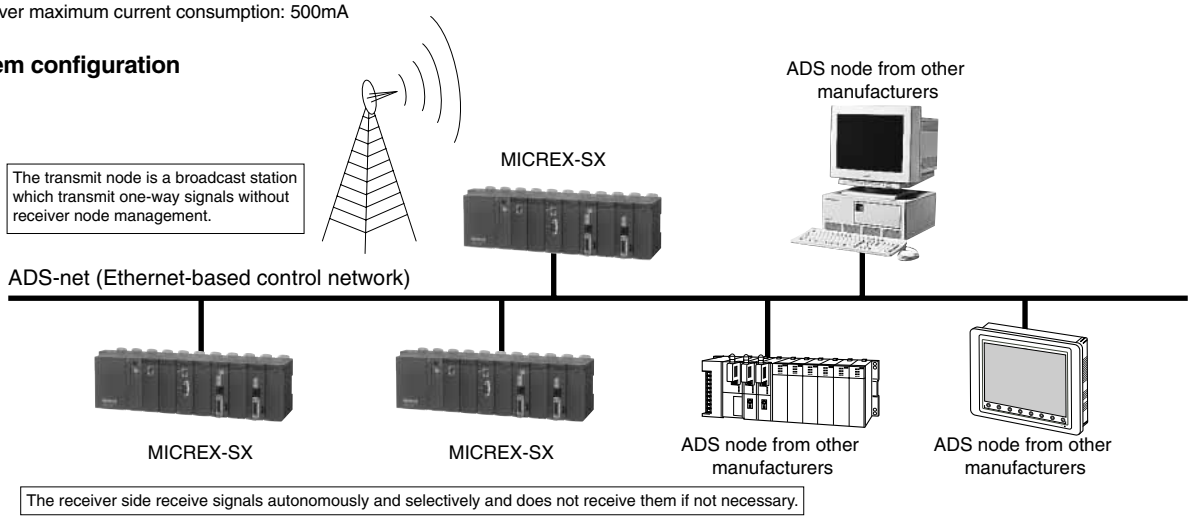
■ Performance specifications

Item	Specification (overview)
Communication function	• Multicast communication (function class: Base-1) * 1 • Existence signal transmission (function class: Base-2) * 2 • Trouble information transmission (function class: Base-3) * 2
Message size	Up to 1024 bytes (user data section)
Message buffer size	Selected from 256/512/1024 bytes.
No. of data fields registered	1 data field
No. of multicast groups registered	Up to 8 groups
No. of output transaction codes	Up to 16 TCD
No. of input transaction codes	Up to 16 TCD
Test node setup	Possible
Interface selector switch	Selected by the switch on the front panel of the module.
Interface	10BASE-T or 10BASE5
Media control	IEEE 802.3
Transmission rate	10Mbps
Max. segment length	10BASE-T: 100m, 10BASE5: 500m (2500m max. with repeaters)
Max. number of nodes	10BASE-T: 1 unit/segment, 10BASE5: 100 units/segment
Protocol	UDP/IP, autonomous distribution protocol (R3.0)
External power supply	12V DC, 500mA * 2
Internal current consumption	24V DC, 140mA or less
Mass	Approx. 220g

* 1 10BASE-T and 10BASE5 cannot be used at the same time.
* 2 When 10BASE5 is used, an external power supply (12V DC) is required.
Use an external power supply (12V DC) which satisfies the specifications of the transceiver and transceiver cable (AUI cable).

[Reference]
IEEE 802.3 defines the following specifications of the transceiver and transceiver cable (AUI cable):
• Transceiver I/O terminal voltage: 12V DC-6% to 15V DC+5%
• Transceiver cable DC resistance: 40 Ω/km or less, maximum total length 50m
• Transceiver maximum current consumption: 500mA

■ System configuration



LONWORKS Network Interface Module: NP1L-LW1

■ Features

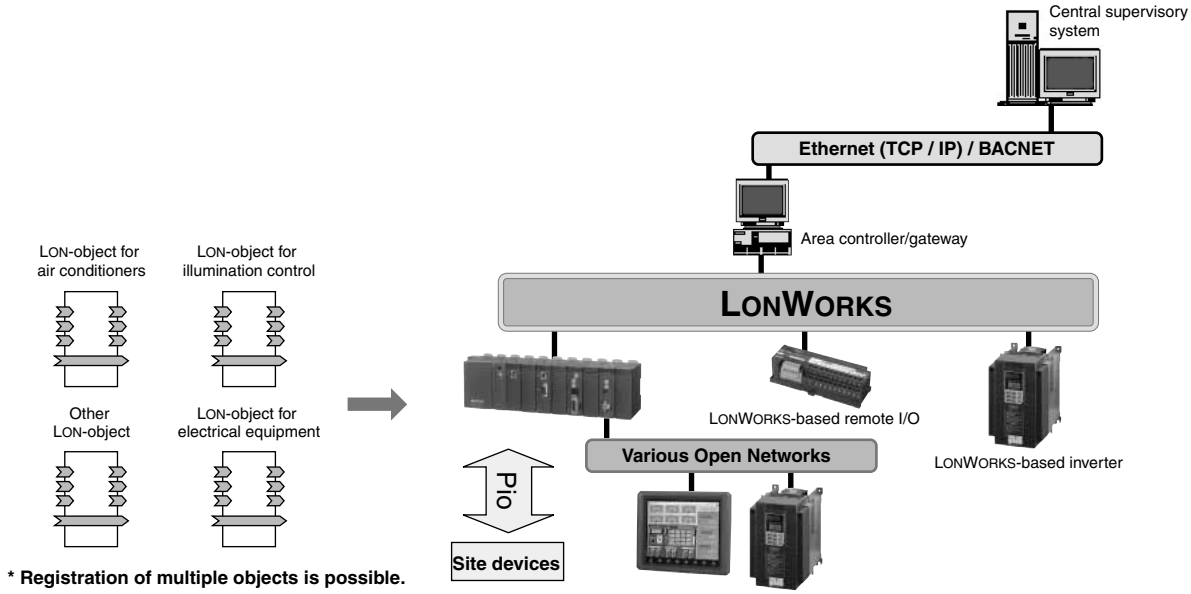
- Uses the communication extension FB compatible with the LONWORKS network, making it easier to transfer and receive MICREX-SX application data to/from other LONWORKS nodes.
- Max. number of NVs: 300, Number of CPs: Up to 200 intelligent nodes can be configured.
- Up to two units can be mounted in one system (configuration).

NP1L-LW1
AF00-197A

■ Specifications

Item	Specification	Remarks
Applicable standards	LONTALK (EIA-709.1), LONMARK	
Transmission rate	78 Kbit/sec	
Transmission distance	2200m (Bus connection) 500m (Free-topology connection)	
No. of node connections	64 units	No. of node connections in the same segment
Transceiver	FTT-10A	
Control LSI	TMPN3120	Application programs operate on SPH.
No. of SX bus mounted	Up to 2 modules / Configuration	Can be used through connection to two LONWORKS networks.
Max. number of NVs	300	Depends on the definition.
Max. number of CPs	200	Depends on the definition.
Total data size of NV+CP	8 Kwords + 128 words	
I/O area size	128 words	Used for NV and CP.
Memory area size	Size x 4 blocks, a total of 8 Kwords or less	Used for NV and CP.
No. of address entries	Fixed to 15	No. of nodes for NVo variable binding
No. of domain table entries	Fixed to 2	
Internal current consumption	24V DC, 140mA or less	
Mass	Approx. 200g	

■ System configuration



LONWORKS Network Interface Module Support Tool: NP4N-LNDF [Japanese Version]

■ SLDEF (Model: NP4N-LNDF)

- To perform communication with the LONWORKS network, it is necessary to define network variables using the specialized tool compatible with the LONWORKS network (neuron C language programming).
- SLDEF makes it possible to define these variables with an ACCESS file without knowledge of the neuron C language.
- The information (SXD files) defined by SLDEF are downloaded from programming support tool Expert (D300win) to the LONWORKS module.
- Since the node object definition specified by LonMark is offered as FB, LONWORKS control can be defined by PLC programming.

P-link/PE-link Module: NP1L-PL1 (P-link) NP1L-PE1 (PE-link)

■ Features

- Up to 2 P/PE-link modules can be installed in a single system configuration.
- N-to-N communications in the token passing method
- Data exchange between processors
  Broadcast communication, message communication
- User program upload/download and processor start/stop are possible from the host computer.
- Remote programming for other processor is possible via the P/PE-link.

NP1L-PL1
AF98-133

■ Performance specifications

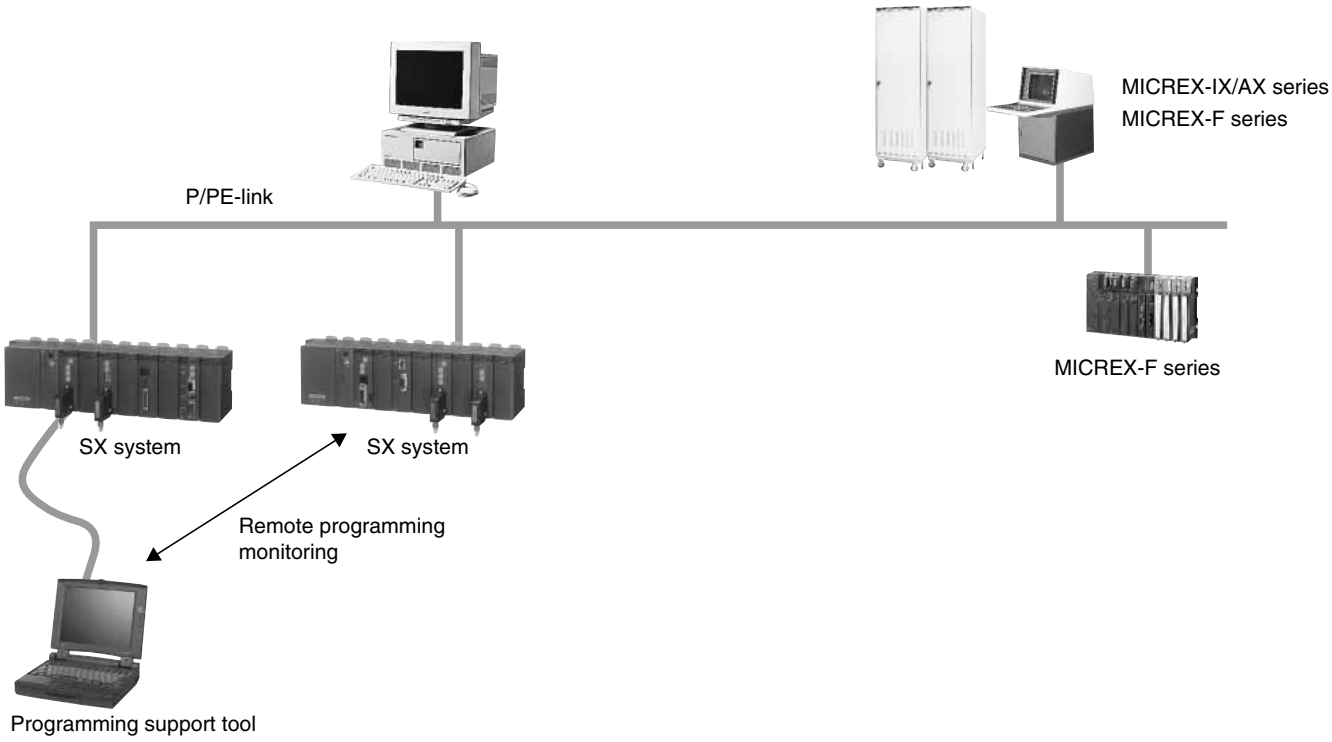
Item	Specification	
Type	**NP1L-PL1** (P-link)	**NP1L-PE1** (PE-link)
No. of SX bus connetable modules	Max.2 /configuration	
No. of P/PE links	Max. 16	Max. 64
Transmission line format	Bus configuration (multi-drop)	
Transmission line	Coaxial cable Total length: Max.250m	Coaxial cable Total length: Max.500m
Transmission method	Half-duplex, serial transmission	
Data exchange method	N: N (token passing) method, memory refresh method	
Transmission speed	5Mbps	
Data transfer	Broadcast communication, message transmission	
Cable	Coaxial cable /5C-2V (conforming to JIS C 3501)	
Internal current consumption	24V DC, 160mA or less	
Mass	Approx. 235g (module), approx. 40g (P/PE-link connector)	

■ P/PE-link connection equipment

Classification	Series		Type	Link	Remarks
PLC	MICREX-F70S		**NC1H-PL1**	P-link	
	MICREX-F120S to 150S		**FPC220P**	P-link	
			FPC420P	PE-link	
FA personal computer	FMV Series		**CNVAD120-01**	P-link	
	Fujitsu		**CNVAD190-01**	PE-link	
Optional	MICREX-F	(Optical converter)	**FNC200B-□**	P-link	
			FNC302A-□	PE-link	
			FNC320A-□	PE-link	Long-distance type
		(Electrical repeater)	**FRP200A-C10**	P-link	

□ indicates the power supply type.
C10: 100 to 110V AC, 110V DC
A20: 200 to 240V AC

■ System configuration



LE-net Module: NP1L-LE1
LE-net Loop Module: NP1L-LL1
LE-net Loop 2 Module: NP1L-LL2

NP1L-LL1
NP1L-LL2
KD04-015

NP1L-LE1
KD04-016

■ Features

- LE-net is an original network of Fuji Electric. It is a low-priced link module between processors to conduct communication with other nodes connected to the LE-net.
- Using the LE-net, broadcast communication and message communication can be conducted.
- The LE-net can be connected either as a multi-drop network or a single loop redundant wiring network. The loop network includes a loop-2 network in which the user data send/receive area is extended.
- If the transmission line is broken, a transmission error occurs in a multi-drop network, but in a loop network, data communication between nodes can continue. This enables construction of a highly reliable system at a relatively low cost.
- It is possible for the loop-2 module to make the LE-net modules redundant by using the redundancy maintenance FB (provided free of charge). The single configuration and the redundant configuration can coexist within a loop.

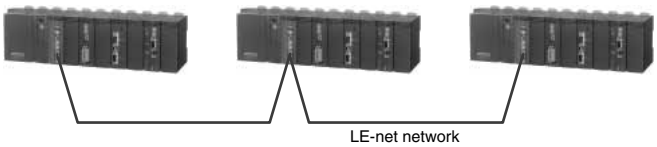
Note: Multi-drop networks, loop networks, and loop-2 networks cannot be connected with each other because each network uses a different transmission protocol. To connect them together, the transmission method must be unified.

■ Performance specifications

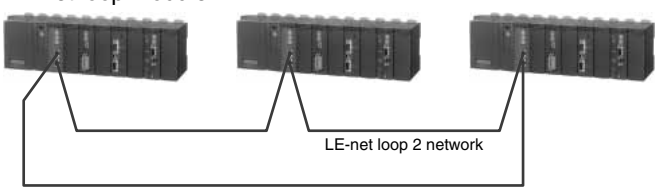
Item	LE-net module	Loop module	Loop 2 module
Type	**NP1L-LE1**	**NP1L-LL1**	**NP1L-LL2**
Connection node quantity	Up to 64 units		
Node number setting range	0 to 63		
Connection distance/ communication speed	800m/62.5kbps, 500m/125kbps, 250m/250kbps, 100m/500kbps, 40m/1Mbps	Total extension: 500m, Between nodes: 100m 5Mbps	
Transmission line	Shielded twisted pair cable (T link cable recommended)	Shielded twisted pair cable, category-5 cross cable	
Transmission line format	Multi drop,	Single loop redundant wiring	
Transmission method	Semi-duplex, Half-duplex, destination arrival receiving method on both sides		
Communication protocol	N: N time slot data exchange communication (broadcast) 1: 1 message communication		
User data frame size	Time slot frame: up to 96 bytes/node Message frame: up to 122 bytes		Time slot frame: up to 1536 bytes/node Message frame: up to 490 bytes
No. of connectable support units	Up to two units simultaneously, including those connected directly or remotely		
Hardware redundancy	–	–	O

■ System configuration

- LE-net module

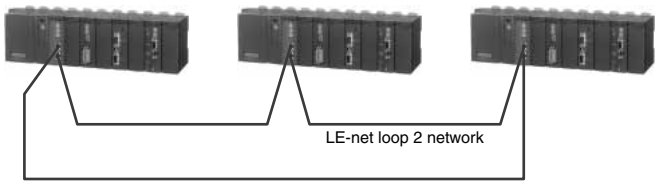


- LE-net loop module



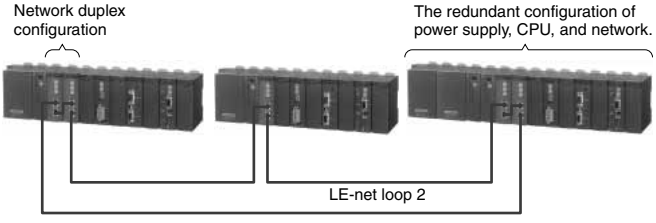
- LE-net loop 2 module

1) Basic system



2) Redundant system

LE-net modules within the same baseboard can be made redundant by using the redundancy maintenance FB (provided free of charge). The single configuration and the redundant configuration can coexist within a loop.



General Purpose Communication Module: NP1L-RS□

■ Features

- Can be combined with an expansion FB (Function Block) for communications with diverse equipment without creating any communication control program.
- Communication port can be used as the loader connection port, which is effective in debugging from the SX bus expansion side installed at a distance.

NP1L-RS1
AF01-93

■ Performance specifications

- Commnication port type by module types

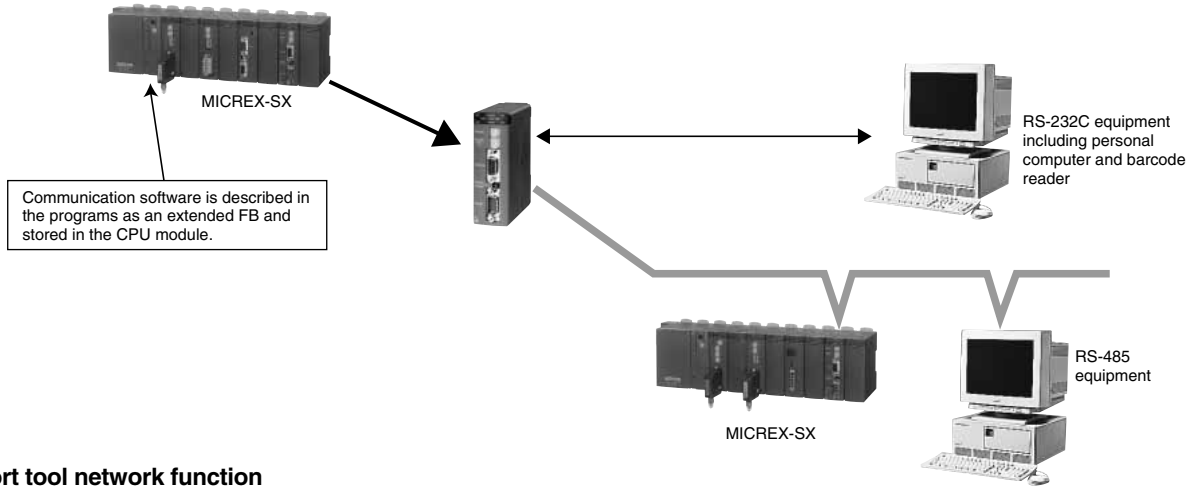
Type	NP1L-RS1	NP1L-RS2	NP1L-RS3	NP1L-RS4
Communication port	RS-232C x 1 channel RS-485 x 1 channel	RS-232C x 1 channel	RS-232C x 2 channels	RS-485 x 1 channel

- Commnication port specifications

Item	Specification	
Port	RS-232C	RS-485
No. of SX bus connectable modules	Max. 16 /configuration	
Communication method	Semi-duplex / serial communication *1	
Synchronization method	Start-stop synchronous transmission	
Transmission speed	1200/2400/4800/9600/19200/38400/57600/76800/115200bps (115200bps or less in total of 2-ch.) *2	
Transmission distance	15m or less	1km or less (transmission speed : 19200bps or less)
No. of connectable modules	1: 1 (One external device)	1: N (Max. 31)
Connection method	D-sub, 9-pin connector (female)	D-sub, 9-pin connector (male)
Transmission protocol	Depends on the application program(Expansion FB) in the CPU module	
Internal current consumption	**NP1L-RS1**: 24V DC, 110mA or less / **NP1L-RS2**: 24V DC, 90mA or less / **NP1L-RS3**: 24V DC, 110mA or less / **NP1L-RS4**: 24V DC, 80mA or less	
Mass	**NP1L-RS1**: Approx. 170g, **NP1L-RS2**: Approx. 160g, **NP1L-RS3**: Approx. 140g, **NP1L-RS4**: Approx. 160g	

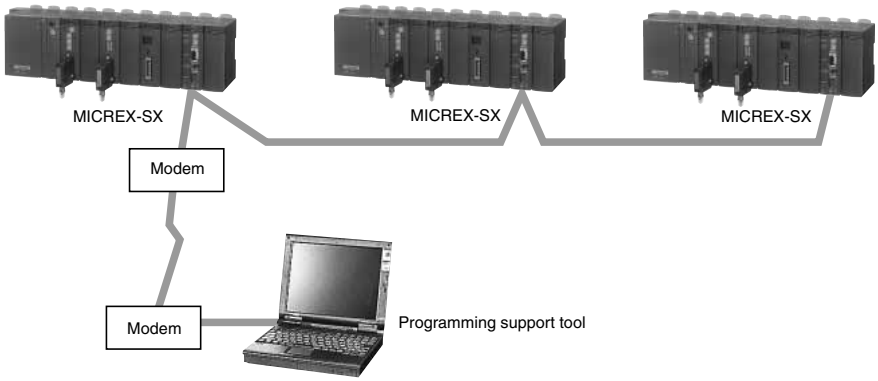
*1 : The use of the non-procedure FB allows full-duplex communication on applications.
*2 : For transmission rates 300, 600, 76800, and 115200 bps, use FBs corresponding to the transmission rate.

■ System configuration



■ Support tool network function

Use of general-purpose communication modules enables supporting multiple systems with one unit of personal computer loader or remotely supporting the system via modem.



General Purpose Communication Package for Factory Automation Machine: NP4N-COMFV3

NP4N-COMF is an expansion FB software package that is used in combination with general-purpose communication modules to implement the target communication functions. The expansion FB is stored in the CPU module to implement various communication protocols.

■ Communication expansion FB list

Package classification	Extended FB type	Applicable equipment	Extended FB name
Standard general-purpose communication FB (Expert (D300win) included as standard))	Start-stop protocol	FB for implementing the start-stop communication protocol using application programs	_C_free _Cfr252 _Cfr128 _Cfr64 _Cfr32 _Cfrpr (Built-in protocol) _Cfrp2 (Built-in protocol)
	Temperature controller communication protocol	Fuji Electric Systemes: PYX, PYH	_CfdPYX
	Inverter communication protocol	Fuji Electric FA Commponents & Systemes: FRENIC5000 For FVR-C11 (FGI-BUS) For FVR-C11 (FGI-BUS) (Reduces the capacity of communication programs.)	_CfdFRN _CfdFVR _Cfvrpr
	MODBUS	The MICREX-SX functions as a master station to communicate with MODBUS slave stations.	_C_modm
	ADS-net communication protocol	FB for ADS-net module (NP1L-AD1)	_ACHG_SYSINF, _ACHG_SUBNET, _ASEND_DATA □□□ , _ARECEIVE_DATA □□□
FA equipment general-purpose communication package **NP4N-COMFV3**	Temperature controller protocol	RKC INSTRUMENT INC.: REX-F, REX-D, FAREX-SR series	_CrkREX
		OMRON: Digital temperature controller E5AX, E5XJ series	_Com AX
		OMRON: Digital temperature controller E5CK series	_ComCK
		Yamatake: Digitronics temperature controller SDC40A/40G series	_CymSDC
	ID system protocol	OMRON: V600 series, V700 series	_ComV6, _ComV7
		SHARP MANUFACTURING SYSTEM: Microwave ID plate system DS series	_CshDS
		Yamatake: Code recognition ID system WAM120 series	_CymWAM
		IDEC IZUMI: Data carrier system FP1A serie	_CizFP
	Barcode reader protocol	Token: TCD8200/8500, TLMS-3200RV series	_Ctk TCD
		NIPPON ELECTRIC INDUSTRY: BCC2600 series	_CndBCC
		KEYENCE: BL180, BL500, BL700 series	_CkyBL
		IZUMI DATA LOGIC: Barcode reader DS series	_CizDS
	SECS protocol	SECS procedure semiconductor manufacturing system (only SECS-I supported)	_C_SECS
	NC protocol	FANUC: FANUC series 18i	_CDNC2
	Serial printer protocol	NEC: PC-PR201 series	_C_print

Device-level Communication Module

OPCN-1 Master Module: NP1L-JP1
OPCN-1 Slave Module: NP1L-JS1
OPCN-1 Interface Module: NP1L-RJ1

NP1L-JP1
AF97-522

■ Features

NP1L-JP1

- Up to 8 units can be connected in a single system configuration.
- Up to 31 units of slave equipment can be connected to a single master unit.
- Number of I/O points is maximum 8192 points (512 words).
- Line speed can be changed to 1Mbps, 500kbps, 250kbps, or 125kbps.

NP1L-JS1

- I/O data link through the OPCN-1 is possible between CPUs.
- Number of I/O points is maximum 2048 points (128 words)

NP1L-RJ1

- Slave station configuration, conforming to the OPCN-1 Standard, implements compact, economical, centralized remote I/O as a multi-vendor network.
- Input fitering time of the input module can be set with DIP switch on the front.

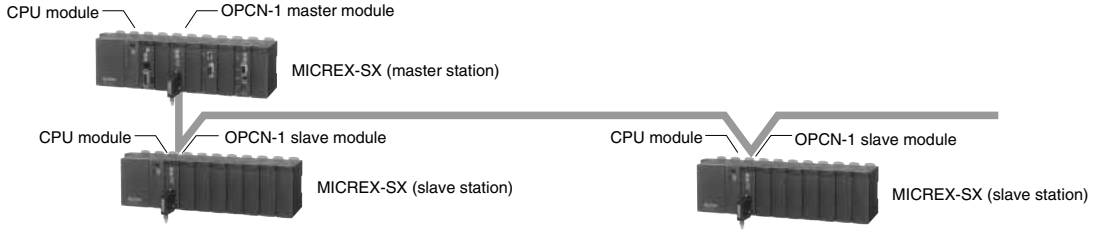
■ Communication specifications

Item	Specification		
Type	**NP1L-JP1**	**NP1L-JS1**	**NP1L-RJ1**
Applicable class	TYPE-M51 I		TYPE-S51 I
No. of SX bus connectable modules	Max. 8 /configuration		–
No. of connectable slaves	31/master module	–	
Station No. setting range	00 fixed	01 to 7F	
Transmission line format	Bus configuration (multi-drop)		
Transmission line	Shielded twisted pair cable		
Transmission method	Half-duplex, serial transmission, based on EIA RS-485		
Transmission speed (Max. total length) *1	125kbps (1000m), 250kbps (800m), 500kbps (480m), 1Mbps (240m)		
Encoding method	NRZI (Non Return to Zero Inverted)		
Error check	ECS ($X^{16}+X^{12}+X^5+1$) and retry		
Communication function	• Initial setting service • I/O service • Reset service • JEM-TR192 service (data read/write service)	• Initial setting service • I/O service • Reset service • Simultaneous broadcast service	
No. of I/O points	Normal mode: Max. 2032 points (127 words) Extension mode or I/O Extension mode: Max. 8192 points (512 words)	Max. 2048 points (128 words) /1 slave	
No. of message points	Max. length of single transmission: 250 bytes (data section for the data read/write service)	–	
Internal current consumption	24V DC, 130mA or less		
Mass	Approx. 230g (module), Approx. 40g (OPCN-1 connector)		

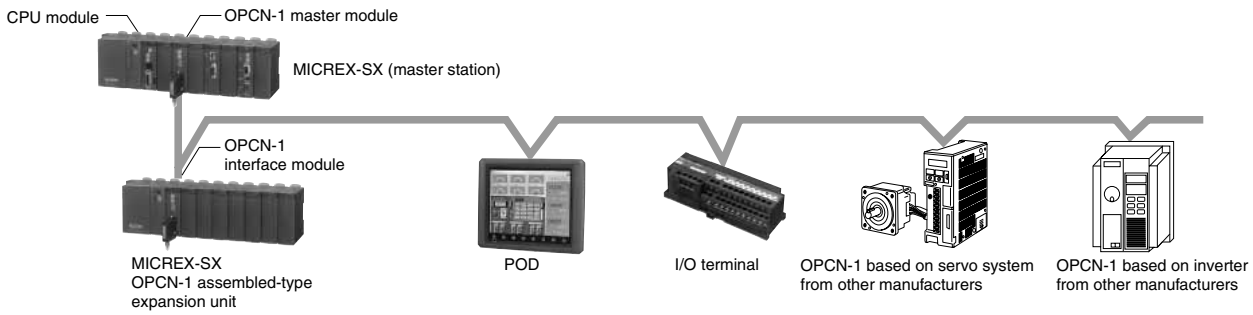
*1 The transmission distance applies to T-KPEV-SB 1.25mm² from Furukawa Electric Co. Note that the distance may vary with the cable characteristics.

■ System configuration

●OPCN-1 slave system



●OPCN-1 remote I/O system



DeviceNet Master Module: NP1L-DN1
DeviceNet Interface Module: NP1L-RD1

NP1L-DN1
AF99-340

■ Features

NP1L-DN1

- Up to 8 units can be connected in a single system configuration.
- Up to 63 units of remote I/O equipment can be connected to a single master unit.
- Number of I/O points is maximum 8192 points (512 words).
- Line speed can be changed to 125kbps (500m), 250kbps (250m), or 500kbps (100m).

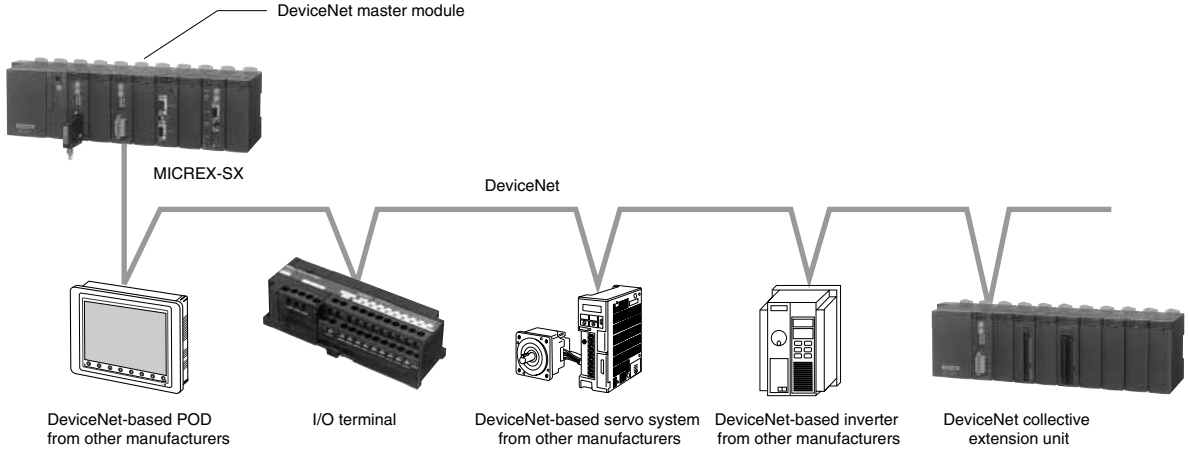
NP1L-RD1

- Realizes small economic collective remote I/O as a DeviceNet slave station.

■ Communication specifications

Item	Specification	
Type	**NP1L-DN1**	**NP1L-RD1**
No. of SX bus connectable modules	Max. 8/configuration	–
No. of remote I/O stations	63 units/master module	–
MAC ID setting range	00 to 63	
Transmission line format	Bus configuration (multi-drop), tree-structure, branch-structure	
Transmission line	Trunk (thick cable), drop (thin cable)	
Transmission method	Half duplex serial communication method	
Data rate (distance)	125kbps (500m), 250kbps (250m), 500kbps (100m)	
Media access control	CSMA/NBA	
Modulation	Base band	
Media linking	DC coupling-type differential Tx/Rx	
Encoding method	Non-zero recovery using the bit stuff function NRZ (Non Return to Zero)	
Error check	FCS (Frame Check Sequence CRC-16)	
Communication function	I/O message Poll command/response Bit-Strobe command/response Change of state/Cyclic ACK not provided Change of state/Cyclic ACK provided Explicit message (implements the client/server function to set and diagnose the remote I/O stations Low priority communication traffic)	Poll command/response Explicit message
Vendor ID	319 (Fuji Electric FA Components & Systems Co,. Ltd.)	
Device type	Communication Adapter (Code: 0x0C)	
No. of I/O points	Normal mode: Max. 2048 points (128 words) Extension mode or I/O Extension mode: Max. 8192 points (512 words)	Max. 2048 points (128 words) /1 slave
No. of message points	Max. length 492 bytes per transmission (Explicit message)	
Network current consumption	24V DC, 45mA or less (supplied from DeviceNet power supply)	
Internal current consumption	24V DC, 90mA or less	
Mass	Approx. 170g	

■ System configuration



T-link Master Module: NP1L-TL1
T-link Slave Module: NP1L-TS1
T-link Interface Module: NP1L-RT1

■ Features

NP1L-TL1

- Up to 8 units can be connected in a single system configuration.
- Up to 32 units of slave equipment can be connected to a single master unit.
- Number of I/O points is maximum 8192 points (512 words).
- T-link equipment for such as MICREX-F and FLEX-PC can be used. (Some types excluded.)

NP1L-TS1

- Data link by I/O data between CPUs through T-link is possible.
- Five different number of I/O points (1 word/1 word, 2 words/2 words, 4 words/4 words, 8 words/8 words, 32 words/32 words) can be selected according to application.

NP1L-TL1
AF98-132

NP1L-RT1

- Realizes small economic collective remote I/O as a T-link slave station.

■ Communication specifications

Item	Specification		
Type	**NP1L-TL1**	**NP1L-TS1**	**NP1L-RT1**
No. of SX bus connectable modules	Max. 8 /configuration		–
No. of connectable T-link slaves	32 /master module * 2	–	
Transmission line format	Bus configuration (multi-drop)		
Transmission line (Max. total length) * 1	Bus transmission line: Shielded twisted pair cable Total length: Max. 1000m Optical transmission line: SI/GI quarts cable, multicomponet cable (Optical connector FNC120/130 is needed for the optical transmission line)		
Transmission method	Half-duplex, serial transmission		
Data exchange method	1:N (polling / selecting) method		
Transmission speed	500kbps		
Error check	FCS ($X^{16}+X^{12}+X^5+1$)		
No. of I/O points	Normal mode: Max. 2048 points (128 words) Extension mode or I/O Extension mode: Max. 8192 points (512 words)		
No. of message points	Max. length per transmission: 220 bytes		
Internal current consumption	24V DC, 140mA or less		
Weight	About 200g (module), about 40g (T-link connector)		

* 1 Transmission distance is the length when using the T-KPEV-SB 1.25mm^2 cable manufactured by Furukawa Electric Co. However, note that the distance may occasionally vary due to the cable characteristics.

* 2 Up to 64 units can be connected as slaves when using the 2T link electric repeater.

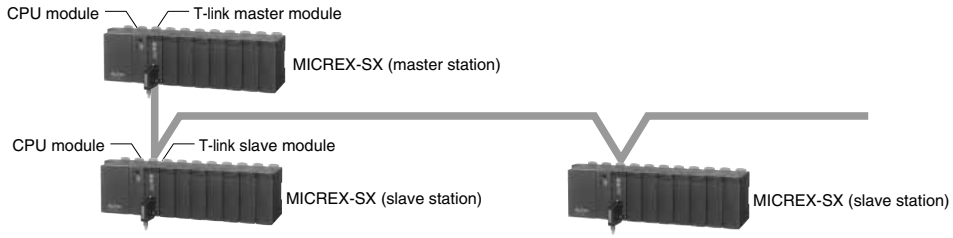
■ Optional

Category	Series name			Remarks
Option	MICREX-F	Optical converter	**FNC120A-A10**	Simplified type
			FNC130A-C10	Advanced type
		Electrical repeater	**FRC200A-C10**	

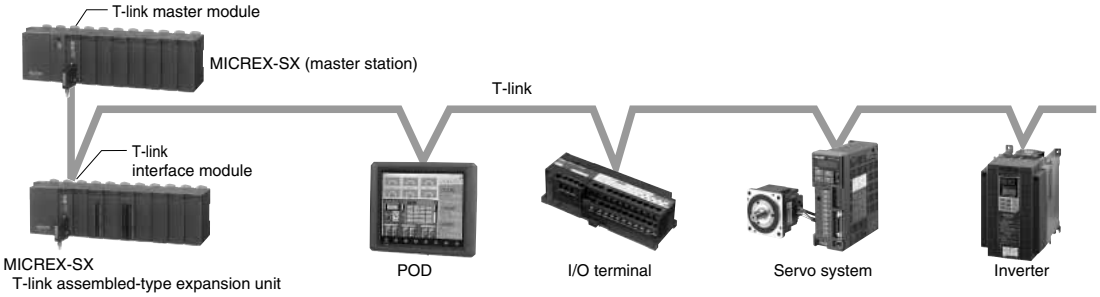
A10 and C10 indicate power supply types.
A10: 100–240V AC
C10: 100–110V AC, 110V DC

■ System configuration

●T-link slave system



●T-link remote I/O system



PROFIBUS-DP Master Module: NP1L-PD1
PROFIBUS-DP Slave Module: NP1L-PS1

■ Features

NP1L-PD1

- Open system
  Diverse slave products of PROFIBUS-DP can be connected (from more than 300 vendors). As for the DP slave, the compatibility authenticated by the PROFIBUS association has been confirmed.
- Flexible system configuration
  In addition to the basic configuration consisting of one DP master and multiple DP slaves, combination with multiple DP masters and multiple DP slaves are possible, making it easier to distribute master functions.
  The maximum number of unit connections (including master stations) is 126. With 33 units or more, repeaters are required.
- Transmission rate
  Can be selected from nine options: 9.6/19.2/93.75/187.5/500/1500/3000/6000/12000kbps. (The upper limit depends on the type of the DP slave.)

NP1L-PS1

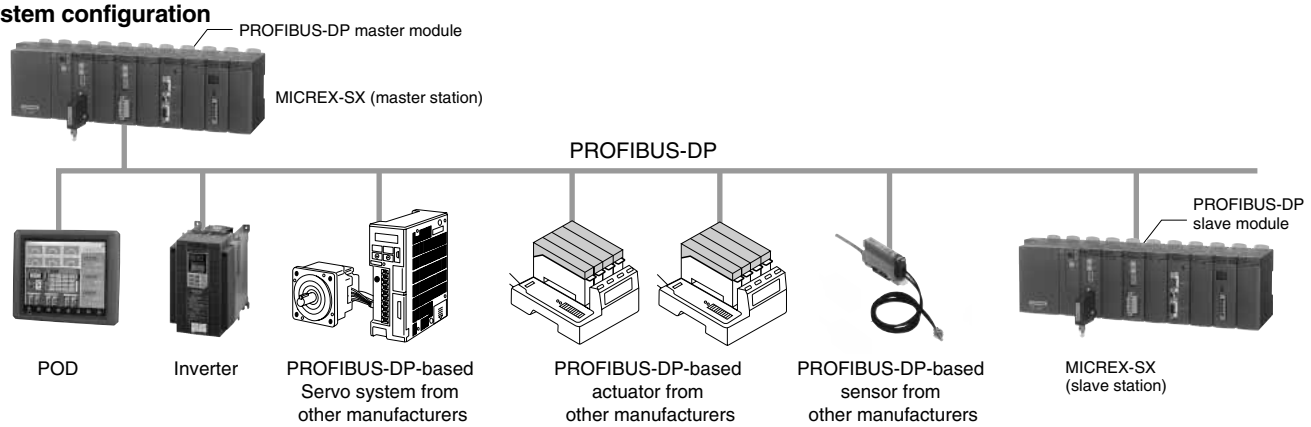
- A data link of input/output data can be established between CPUs via PROFIBUS-DP.
- A maximum of 128 words can be controlled as an input/output total of I/O points.

■ Performance specifications

Item	Specification	
Type	**NP1L-PD1**	**NP1L-PS1**
Applicable standards	IEC 66158, EN 50170, DIN 19245	
Communication function	PROFIBUS-DP master (DPM1) function	PROFIBUS-DP slave function
No. of slave station connections	Up to 32 units (up to 126 units with repeaters)	
Station No. (station address) setup range	0 to 125	
Transmission line form	Bus configuration (multi-drop)	
Communication standard	Applicable to EN 50170 and DIN 19245.	
Data exchange system	1:N (polling/selecting)	
Transmission rate	Nine options (set by configuration of the programming loader) 9.6/19.2/93.75/187.5/500/1500/3000/6000/12000 kbps	
Transmission distance	1200m with a transmission rate of 9.6kbps, 100m with a transmission rate of 12Mbps (Refer to the table below.)	
Cable	PROFIBUS-DP cable (Shielded twist pair cable)	
No. of I/O points	Normal mode: Max. 2048 points (128 words) Extension mode or I/O Extension mode: Max. 8160 points (510 words)	In total I/O: Max. 128 words (Each I/O: Max. 122 words)
Internal current consumption	24V DC, 200mA or less	24V DC, 150mA or less
Mass	Approx. 250g	Approx. 180g

Baud rate (kbps)	9.6	19.2	93.75	187.5	500	1500	3000	6000	12000
Distance/segment	1200m	1200m	1200m	1000m	400m	200m	100m	100m	100m

■ System configuration



■ Configurator Software: KONF-PDP

Used to download the system configuration information to the PROFIBUS-DP master module. Required to update the initial setup or system configuration.

• Please purchase from
HMS INDUSTRIAL NETWORKS

I/O Terminal: NR1 □ Series
: NR2 □ Series

Compact type I/O terminal applicable to diverse field networks with a common frame size.

■ Features

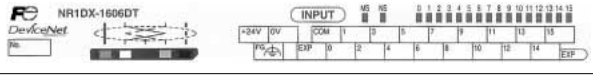
- Compatible with diverse device level networks
  Device level network which performs high-speed communication of I/O information and messages between a programmable controller, a personal computer, and other controllers and an inverter, a servo, an MMI device, and other FA devices, among diverse networks consisting of an FA system, ranging from the computer level to the bit level.
  The I/O terminal corresponds to open device level networks: OPCN-1, DeviceNet, T-link, LONWORKS, and SX bus.
- Easy maintenance
  Since removable terminal blocks are used as the terminal blocks for the communication section, power supply, and I/O, the main unit can be attached and removed easily.

NR1 series

NR2 series

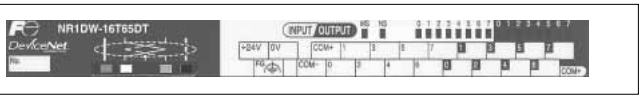
- Preventing mis-wiring
  Uses different colors for the surface sheets of the main unit: input (white), output (black), and I/O mixture (zebra). Applicable networks are also displayed, enabling determination of the unit type at a glance.

• NR1 series
Input unit (white)

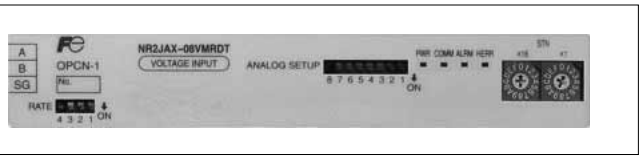


Output unit (black)

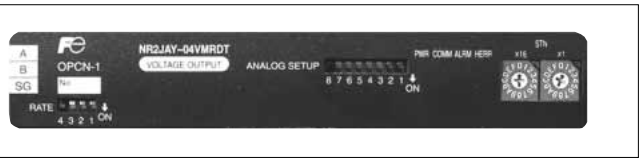
I/O mixture unit (zebra)



• NR2 series
Input unit (white)



Output unit (black)

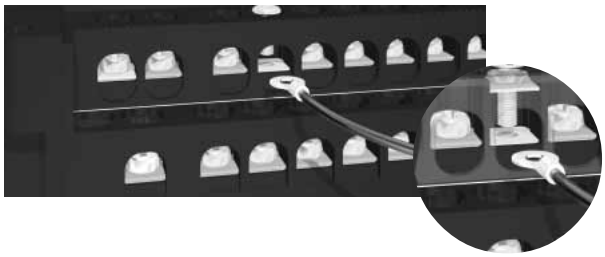


- Enabling DIN rail attachment
  Not only usual screw attachment but also DIN rail attachment is possible.

■ Features of the NR1 Series

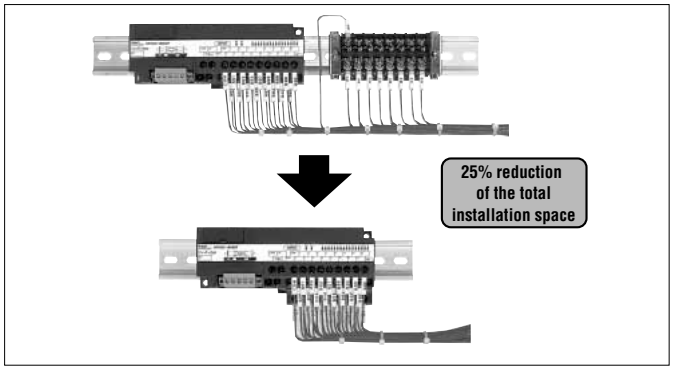
- Efficient safe terminal block structure
  This terminal block has terminal screws which are self-lifting by themselves after loosening, thus preventing screws from being lost at the time of wiring to the round amplifier terminal, increasing the wiring work efficiency.
  The use of power supply and I/O terminal blocks with the finger protection fitting (IP20) contributes to the safety of machines and equipment.

(Self-lifting screw terminals/Finger protection fitting)



- Contributing to panel design standardization
  The unit frame is unified to a compact size of 148x50x40 (WxHxD: mm), allowing design standardization without worrying about external view modifications by I/O specifications and network specifications. Network modifications can be dealt only with unit replacement.

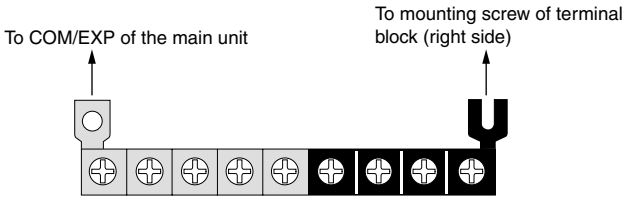
- 25% reduction of total installation space
  "Common extension terminal block" which extends the number of common terminals with one-touch operation is optionally available.
  The use of "common extension terminal block" eliminates the necessity of the separate relay terminal block for common extension, reducing the total installation space by 25%.



■ Common extension bar

Used to extend the common terminal block that is mounted on the lower side of the main unit.
Type: **NR1XV-CB1**

The terminals are divided into two groups for electrical connection: □ and ■ as shown below.



■ Models

NR1 □ series

Product name		Model (= Product code)	Specification
OPCN-1	16-point input	**NR1□X-1606DT**	24V DC, 16-point bi-directional input, removable terminal block
SX bus	8-point Ry output	**NR1□Y-08R07DT**	240V AC/110V DC, 8-point Ry output, removable terminal block
T-link	16-point Tr output * 2	**NR1□Y-16T05DT**	24V DC, 16-point Tr sink output, removable terminal block
DeviceNet * 1	8/8-point mixture	**NR1□W-16T65DT**	24V DC, 8-point source input, 12-24V DC, 8-point Tr sink output, removable terminal block
	4-axis pulse train output * 3	**NR1SF-HP4DT**	Pulse train output comand, 250kHz, 4-axis (2 points / 1-axis)
LonWorks	16-point input	**NR1LX-1606DT**	24V DC, 16-point bi-directional input (4 points can be used as pulse inputs), removable terminal block
	8-point Ry output	**NR1LY-08R07DT**	240V AC/110V DC, 8-point Ry output, removable terminal block
	9-point input/2-point output	**NR1LW-11R80DT**	24V DC, 9-point source input (4 points can be used as pulse inputs), 2-point Ry output, removable terminal block
Option		**NR1XV-CB1**	Common extension terminal block (9 pins)

* 1: □ specification (applicable network specification): J=OPCN-1, S=SX bus, T=T-link, D=DeviceNet
* 2: Tr output products without a fly-wheel diode are also offered. (Model: **NR1□Y-16T05DTZ701**)
* 3: Four-axis pulse train output is supported only by the SX bus.

NR2 □ series

Product name	Model (= Product code)	Specification
Digital input 32-points	**NR2DX-3206DT**	DeviceNet based on, digital input 32 points, removable terminal block
Digital Tr output 32-points	**NR2DY-32T05DT**	DeviceNet based on, digital transistor sink output 32 points, removable terminal block
Digital I/O 32-points	**NR2DW-32T65DT**	DeviceNet based on, digital input 16 points/transistor sink output 16 points, removable terminal block
Digital Ry output 16-points	**NR2DY-16R07DT**	DeviceNet based on, digital relay output 16 points, removable terminal block
Analogue 8-ch voltage input type	**NR2JAX-08VMRDT**	OPCN-1 based on, multi range input 8 ch, resolition 13 bits (voltage type), removable terminal block
Analogue 8-ch current input type	**NR2JAX-08IMRDT**	OPCN-1 based on, multi range input 8 ch, resolition 13 bits (current type), removable terminal block
Analogue 4-ch voltage output type	**NR2JAY-04VMRDT**	OPCN-1 based on, multi range output 4 ch, resolition 13 bits (voltage type), removable terminal block
Analogue 4-ch current output type	**NR2JAY-04IMRDT**	OPCN-1 based on, multi range output 4 ch, resolition 13 bits (current type), removable terminal block

■ Specifications

- General specifications

Item		Specification
Applicable standards		IEC 61131-2/Ed2, EN 50081-2, UL508 *
Physical environment	Operating ambient temperature	0 to ± 55°C (Lon Works-based product: -10 to +55°C)
	Storage temperature	-20 to +70°C
	Relative humidity	20 to 95%RH (without condensation)
	Dust	No dust present
	Contamination	Contamination level 2
	Corrosion resistance	No corrosive gas is present, no organic solvent adhesion
	Operating altitude/air pressure	Altitude of 2000m or less (air pressure of 70kPa or higher during transportation)
Mechanical operating condition	Resistance to vibration	One amplitude: 0.15mm, constant acceleration: 19.6m/s^2, 1.5 hours for each direction, 4.5 hours total
	Resistance to shock	Peak acceleration: 147m/s^2, 3 times for each direction
Electrical operating condition	Electrostatic discharge	Contact discharge: ± 6kV, air discharge: ± 8kV
	Radiative radio frequency electromagnetic field	80 to 1,000MHz: 10V/m
	Fast transient burst wave	Power supply: ± 2kV
	Conductive radio frequency interference	0.15 to 80MHz, 10Vrms
	Square wave noise	Noise power supply 1.5kV, pulse width 1us, Rising time 1ns
Installation and wiring conditions	Structure	IP20 Panel-mount type
	Screw fastening torque	Terminal screw, terminal block mounting screw: 0.5-0.6N·m, Unit mounting screw: 1 to 1.5N·m
	Cooling system	Natural cooling

* Acquisition of UL508 is scheduled for the NR2 series.

● Power supply specifications

Item	Specification			
Unit type	**NR1**□ □		**NR2D**□ (digital I/O)	**NR2JA**□ (analog I/O)
Power supply method	External power supply		DeviceNet communication cable	External power supply
Rated input voltage	24V DC		24V DC	24V DC (Three phase full-wave rectification can not be used.)
Input voltage range	21.6 to 26.4V DC, (LONWORKS-based product: 20.4 to 27.6V DC)		11 to 25V DC	20.4 to 26.4V DC
Dropout tolerance	1ms (at 21.6V), LONWORKS-based product (at 20.4V)		1ms (at 20.4V)	1ms (at 20.4V)
Inrush current	5A, 1ms or less (LONWORKS-based product: 3A, 5ms or less, 25A, 5ms or less for the **NR1LY-08R07DT**)		7A, 0.4ms or less	5A, 1ms or less
Dielectric strength	1500V AC, 1 minute (Between power supply input terminal and frame ground)		500V AC, 1 minute (Between power supply input terminal and I/O terminal)	500V AC, 1 minute (Between analog I/O terminal and frame ground)
Insulation resistance	10MΩ or more (500V DC megger) (Between input terminal and frame ground)		10MΩ or more (500V DC megger) (Between power supply input terminal and I/O terminal)	10MΩ or more (500V DC megger) (Between analog I/O terminal and frame ground)
Power consumption	OPCN-1 SX bus T-link DeviceNet	**NR1**□**X-1606DT**: 1.4W or less **NR1**□**Y-08R07DT**: 3W or less **NR1**□**X-16T05DT**: 1.4W or less **NR1**□**X-16T65DT**: 1.4W or less **NR1SF-HP4DT**: 3.5W or less	**NR2DX-3206DT**: 2.5W or less **NR2DY-32T05DT**: 2.5W or less **NR2DW-32T65DT**: 2.5W or less **NR2DY-16R07DT**: 4.5W or less	**NR2JAX-08VMRDT**: 4.8W or less **NR2JAX-08IMRDT**: 4.8W or less **NR2JAX-04VMRDT**: 5.6W or less **NR2JAX-04IMRDT**: 6.3W or less
	LONWORKS	**NR1LX-1606DT**: 1.6W or less **NR1LY-08R07DT**: 3W or less **NR1LW-11R80DT**: 1.6W or less		

● I/O specifications

(1) NR1 type: I/O specifications of OPCN-1/SX bus/T-link/ DeviceNet-based products

• Input specifications

Item	Specification
Rated input voltage	24V DC
Max. input voltage	26.4V DC
Ripple percentage	5% or less
Rated input current	7mA
Input type	No polarity
Input impedance	3.3kΩ
Operating voltage	ON voltage range: 15 to 26.4V OFF voltage range: 0 to 5V
Input delay time ON/OFF filtering time	OPCN-1, DeviceNet: 3ms/3ms SX bus: Can be changed collectively through parameter setup. * T-link: 5ms/5ms
No. of points per common	16 points/common (Mixture model: 8 points/common)
Isolation	Photocoupler
Dielectric strength	1500V AC, 1 minute (Between input terminals and frame ground)
Insulation resistance	10MΩ or more (500V DC megger) (Between input terminals and frame ground)

* [OFF to ON] - [ON to OFF]: 1-1, 3-3 (default), 3-10, 10-10, 30-30, 100-100ms

• Transistor output specifications

Item	Specification
Rated output voltage	24V DC
Allowable output voltage range	19.2-30V DC
Output format	Sink
Rated load current	0.5A/point (30V DC), 4A/common
Max. load current	0.6A/point (30V DC), 4.8A/common
Output voltage drop	1.5V or less (0.5A)
Output delay time	OFF to ON: 1ms or less ON to OFF: 1ms or less
Leakage current when OFF	0.1mA max.
Surge current	2A, 10ms
Surge suppresser circuit	Clamp diode
Common configuration	16 points/common (8 points/common only for mixture products)
Insulation method	Photocoupler insulation
Dielectric strength	1500V AC, one minute, between input terminals and FG
Insulation resistance	10MΩ or more with a 500V DC megger Between input terminals and FG

• Relay output specifications

Item	Specification
Rated output voltage	240V AC, 110V DC
Max. allowable output voltage	264V AC or less, 110V DC or less
Max. load current	30/250V DC: 2A/point, 110V DC: 0.2A/point
Output delay time	OFF to ON: 10ms or less ON to OFF: 10ms or less
Leakage current when OFF	None
Surge suppresser circuit	None
Min. load voltage, current	5V DC, 1mA
Max. open/close frequency	1800 times/hour
Common configuration	1 point/common
Insulation method	Relay insulation + photocoupler insulation
Dielectric strength	1500V AC, one minute, between output terminals and FG
Insulation resistance	10MΩ or more with a 500V DC megger Between output terminals and FG

(2) Four-axis pulse train output of SX bus compatible products

SX bus compatible products can output four-axis pulse trains. A high-precision positioning system can be built by combining with the servo amplifier/motor of the pulse train command input type or the stepping motor driver.

• Specifications

Item		Specification
Type		**NR1SF-HP4DT**
No. of control axes		4 axes
Speed command	Command signal	Pulse train command
	Max. command frequency	250kHz (Conditions: Shielding twist pair cable: 2m or less)
	Output type	Open collector, sink output
	Max. load current	50mA (24V DC)
	Insulation method	Photocoupler
	Signal type	forward pulse (CW) + reverse pulse (CCW)
Feedback pulse input		None
External pulse input		None
DI signal	No. of points	8 points (2 points / axis) Original point LS (x 4 ch) timing signal / Z phase (x 4 ch)
	Input type	Source input (Non voltage contactor input)
	Input model	DC (IEC 61131-2 type 2)
	Rated current	Approx. 4mA (24V DC)
	Input impedance	Approx. 5.6kΩ
	Insulation method	Photocoupler
	Common configuration	2 points (Extension can be used to the Common extension bar)
Occuipied words		Up to 40 words in total (input: 16words / output: 24words)

(3) I/O specification of LONWORKS-based product

• Input specification

Item	Specification	
	NR1LX-1606DT	**NR1LW-11R80DT**
No. of input points	DI: 12 points, PI (Pulse input): 4 points *1	DI: 5 points, PI (Pulse input): 4 points *1
Input common composition	16 points/common	9 points/common
Input type	None polarity	Source input
Rated voltage	24V DC	
Max. voltage	26.4V DC	
Rated current	7mA	
Input inpedance	3.3kΩ	
Max. pulse input frequency	20Hz	
Pulse input measurement range	0-2147483648 (31 bits, incremental method)	
Standard operation range	OFF to ON 15 to 26.4V, ON to OFF 0 to 5V	
Input delay time	OFF to ON 10ms or less, ON to OFF 10ms or less	
Input type	DC (EN 61131 Type 2)	
Insulation	Photo coupler	
Delating condition	None	

* 1 PI can be used also as DI.

• Output specification

Item	Specification	
	NR1LY-08R07DT	**NR1LW-11R80DT**
No. of output points	DO: 8 points	DO: 2 points
Output common composition	1 point/common	
Rated voltage	240V AC 110V DC	
Max. load current	Relay output 30V DC/240V AC: 2A, 110V DC: 0.2A	
		Voltage output 24V DC: 50mA/point
Min. load current	5V DC: 1mA	
Output delay time	OFF to ON 10ms or less	
	ON to OFF 10ms or less	
Leakage current at the time of OFF	0.1mA or less (200V AC 60Hz)	
Surge protection	None	Varistor
Output protection	None	
Max. operating frequency	1800 times/hour	
Insulation	Photo coupler+Relay	Relay
Output type	Relay output	Relay output or 24V DC voltage output
Delating condition	None	

(4) NR2 type: I/O specifications of the DeviceNet-based products

• Input specifications

Item	Specification
Rated input voltage	24V DC
Max. input voltage	26.4V DC
Ripple percentage	5% or less
Rated input current	5mA
Input type	No polarity
Input impedance	4.7kΩ
Operating voltage	ON voltage range: 15 to 26.4V OFF voltage range: 0 to 5V
Input delay time ON/OFF filtering time	3ms/3ms
No. of points per common	16 points/common (Mixture model: 8 points/common) x 2 circuits
Isolation	Photocoupler
Dielectric strength	1500V AC, 1 minute (Between input terminals and communication terminals)
Insulation resistance	10MΩ or more (500V DC megger) (Between input terminals and communication terminals)
Delating condition	0 to 40˚C: None, 40 to 55˚C: 75%

• Transistor output specifications

Item	Specification
Rated output voltage	24V DC
Allowable output voltage range	19.2-30V DC
Output format	Sink
Rated load current	0.5A/point (30V DC), 2A/common
Max. load current	0.6A/point (30V DC), 2A/common
Output voltage drop	0.1V or less (at 0.5A)
Output delay time	OFF to ON: 1ms or less ON to OFF: 1ms or less
Leakage current when OFF	0.1mA max.
Surge current	4A, 10ms
Surge suppresser circuit	Zener diode
Common configuration	32 points/common (16 points/common only for mixture products)
Insulation method	Photocoupler insulation
Dielectric strength	1500V AC, 1 minute Between output terminals and communication terminals
Insulation resistance	10MΩ or more with a 500V DC megger Between output terminals and communication terminals

• Relay output specifications

Item	Specification
Rated output voltage	240V AC, 120V DC
Max. allowable output voltage	264V AC or less, 120V DC or less
Max. load current	30/250V DC: 2A/point, 110V DC: 0.2A/point
Output delay time	OFF to ON: 10ms or less ON to OFF: 5ms or less
Leakage current when OFF	None
Surge suppresser circuit	None
Min. load voltage, current	5V DC, 1mA
Max. open/close frequency	1800 times/hour
Common configuration	1 point/common
Insulation method	Relay insulation
Dielectric strength	1500V AC, 1 minute Between output terminals and communicatioin terminals
Insulation resistance	10MΩ or more with a 500V DC megger Between output terminals and communicatioin terminals

(5) Analog I/O specification

• Analog voltage input type

Item	Specification			
Type	**NR2JAX-08VMRDT**			
No. of input points	8 points			
Analog input range	0 to 5V	1 to 5V	0 to 10V	-10 to +10V
Input impedance	1MΩ			
Max. input voltage	± 15V			
Input filter	Approx. 100μs or less (Hardware: Primary delay time constant)			
Resolution	1.25mV	1.25mV	1.25mV	1.25mV
Digital value (INT type)	0 to 4000		0 to 8000	-8000 to 8000
Measurement accuracy	± 0.1% of F.S.R (Ta=23˚C ± 5˚C) ± 0.3% of F.S.R (Ta=0 to 55˚C)			
Sampling period	4ms or less / 8 points			
Response time	4ms or less / 8 points + transmission periods (ms)			
Occupied words	Input: 8 words			
Isolation method	Between analog input terminals and FG: Isolation Between analog input terminals and communication terminals: Isolation Between analog input terminals and channels: Not isolation			
Dielectric strength	500V AC, 1 minute, (Between analog input terminals and FG (Shorted current: 5mA))			
Insulation resistance	10MΩ or more (500V DC megger) (Between analog input terminals and FG)			
External connections	External power supply, analog input connection: Detachable screw terminals (M3) 38 poles Communication connection: Detachable screw terminals (M3) 3 poles			

• Analog current input type

Item	Specification		
Type	**NR2JAX-08IMRDT**		
No. of input points	8 points		
Analog input range	± 20mA	0 to 20mA	4 to 20mA
Input impedance	250Ω		
Max. input voltage	± 30mA		
Input filter	Approx. 100μs or less (Hardware: Primary delay time constant)		
Resolution	2.5μA		
Digital value (INT type)	± 8000	0 to 8000	
Measurement accuracy	± 0.1% of F.S.R (Ta=23˚C ± 5˚C) ± 0.4% of F.S.R (Ta=0 to 55˚C)		
Sampling period	4ms or less / 8 points		
Response time	4ms or less / 8 points + transmission periods (ms)		
Occupied words	Input: 8 words		
Isolation method	Between analog input terminals and FG: Isolation Between analog input terminals and communication terminals: Isolation Between analog input terminals and channels: Not isolation		
Dielectric strength	500V AC, 1 minute, (Between analog input terminals and FG (Shorted current: 5mA))		
Insulation resistance	10MΩ or more (500V DC megger) (Between analog input terminals and FG)		
External connections	External power supply, analog input connection: Detachable screw terminals (M3) 38 poles Communication connection: Detachable screw terminals (M3) 3 poles		

• Analog voltage output type

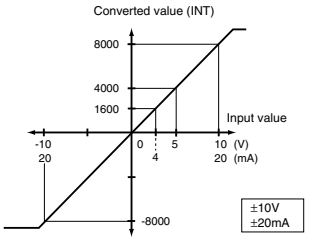
Item	Specification			
Type	**NR2JAY-04VMRDT**			
No. of input points	4 points			
Analog output range	0 to 5V	1 to 5V	0 to 10V	-10 to +10V
Load impedance	1kΩ or more	1kΩ or more	2kΩ or more	2kΩ or more
Resolution	1.25mV	1.25mV	1.25mV	1.25mV
Digital value (INT type)	0 to 4000		0 to 8000	-8000 to 8000
Measurement accuracy	± 0.1% of F.S.R (Ta=23˚C ± 5˚C) ± 0.3% of F.S.R (Ta=0 to 55˚C)			
Sampling period	2ms or less / 4 points			
Response time	2ms or less / 4 points + transmission periods (ms)			
Load short protection	Provided			
High frequency noise (100kHz or more)	150mVp-p or less			
Output ripple	50mVp-p or less			
Occupied words	Output: 4 words			
Isolation method	Between analog input terminals and FG: Isolation Between analog input terminals and communication terminals: Isolation Between analog input terminals and channels: Not isolation			
Dielectric strength	500V AC, 1 minute, (Between analog input terminals and FG (Shorted current: 5mA))			
Insulation resistance	10MΩ or more (500V DC megger) (Between analog input terminals and FG)			
External connections	External power supply, analog input connection: Detachable screw terminals (M3) 38 poles Communication connection: Detachable screw terminals (M3) 3 poles			

• Analog current output type

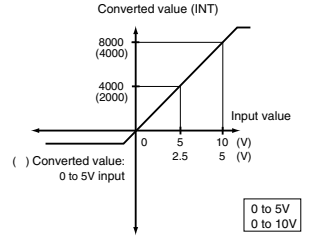
Item	Specification	
Type	**NR2JAY-04IMRDT**	
No. of input points	4 points	
Analog output range	0 to 20mA	4 to 20mA
Load impedance	500Ω or less	
Resolution	2.5μA	
Digital value (INT type)	0 to 8000	
Measurement accuracy	± 0.2% of F.S.R (Ta=23˚C ± 5˚C) ± 0.4% of F.S.R (Ta=0 to 55˚C)	
Sampling period	2ms / 4 points	
Response time	2ms or less / 4 points + transmission periods (ms)	
High frequency noise (100kHz or more)	300μAp-p or less	
Output ripple	100μAp-p or less	
Occupied words	Output: 4 words	
Isolation method	Between analog input terminals and FG: Isolation Between analog input terminals and communication terminals: Isolation Between analog input terminals and channels: Not isolation	
Dielectric strength	500V AC, 1 minute, (Between analog input terminals and FG (Shorted current: 5mA))	
Insulation resistance	10MΩ or more (500V DC megger) (Between analog input terminals and FG)	
External connections	External power supply, analog input connection: Detachable screw terminals (M3) 38 poles Communication connection: Detachable screw terminals (M3) 3 poles	

• Characteristec of the analog voltage/current input type

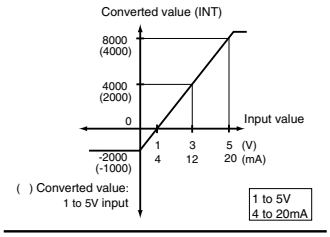
Characteristic pattern



Characteristic pattern

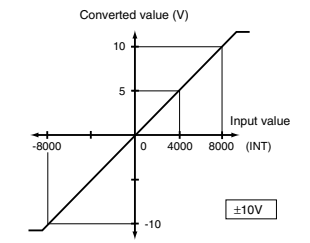


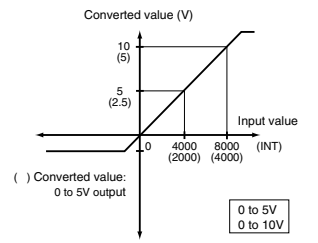
Characteristic pattern



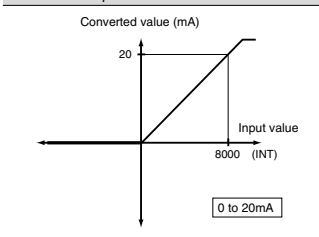
• Characteristec of the analog voltage/current output type

Characteristic pattern

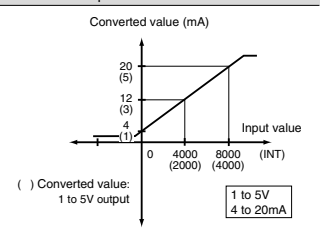




Characteristic pattern



Characteristic pattern



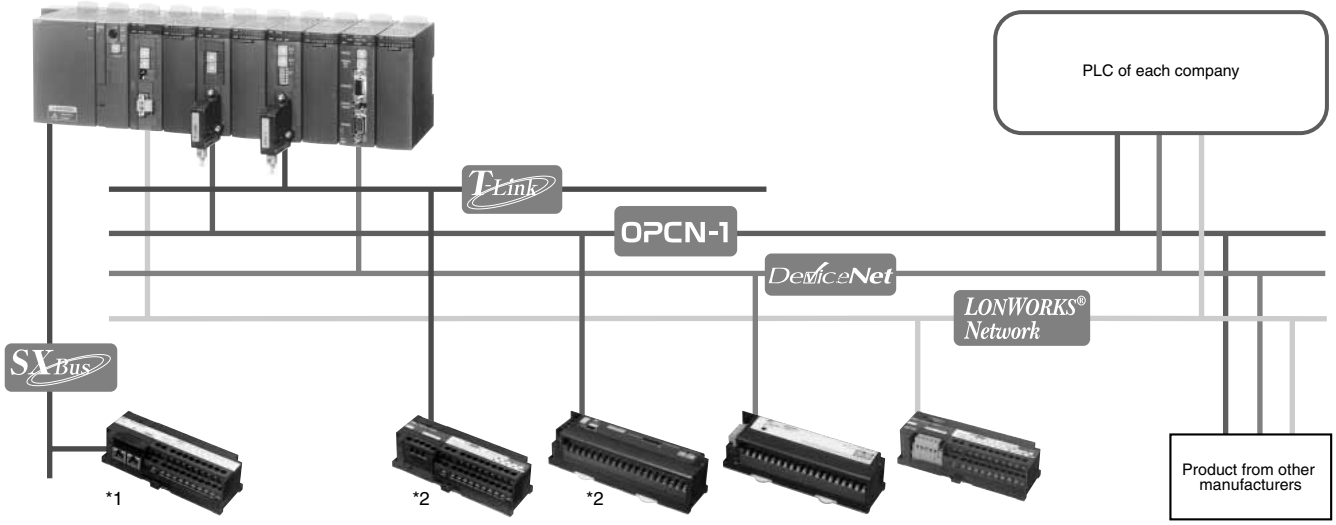
● Communication specifications

Item	Specification				
	OPCN-1	DeviceNet	T-link	SX bus	LONWORKS
Transmission line format	Bus configuration (multi-drop)	Bus configuration (multi-drop, T-branching)	Bus configuration (multi-drop)	Bus configuration (ring)	Free topology (bus-structure/star-structure)
Max. signal point	127 words (2032 /master)	127 words (2032 points)/master (When configurator is not used)	128 words (2048 points)	512 words (8192 points)	228 bytes
Transmission speed/distance	125kbps/1km 250kbps/800m 500kbps/480m 1Mbps/240m (Changes with the switch)	125kbps/500m 250kbps/250m 500kbps/100m (Changes with the switch)	500kbps/1km	25Mbps/25m	78kbps/500 to 2700m
No. of connected stations	31 stations	64 node	32 stations	254 stations (including CPU module) *2	64 units/segment
Electric characteristics	EIA RS-485	–	Pulse transfer method	EIA RS-422	–
Transmission line	Shielded twist pair cable	DeviceNet cable	Shielded twist pair cable	SX bus expansion cable	Twist pair (1P-S)
No. of occupied words *1	8 points: 1 word, 16 points: 1 word, 32 points: 2 word, 8/8 (Mixture): 2 words, 16/16 (Mixture): 2 words, analog input: : 8 words, analog output: 4 words, NR1SF-HP4DT: 40 words				

*1 When the master module of MICREX-SX series is used
*2 The maximum number of the I/O terminal connections are 10 units per base. Up to 22 units can be connected by extending the number of base boards between I/O terminals.

■ System configuration

<MICREX-SX: SPH>



*1 The maximum number of the I/O terminal for the SX bus connections are 10 units per base. Up to 22 units can be connected by extending the number of base boards between I/O terminals.
*2 Please mounting the terminating resistor with accessory of the master module (2 pieces provided on the SX), in case if the I/O terminals for OPCN-1 or for T-link are terminating station.

Bit-level Communication Module
AS-i Master Module: NP1L-AS2

NP1L-AS2
AF00-196

■ Features

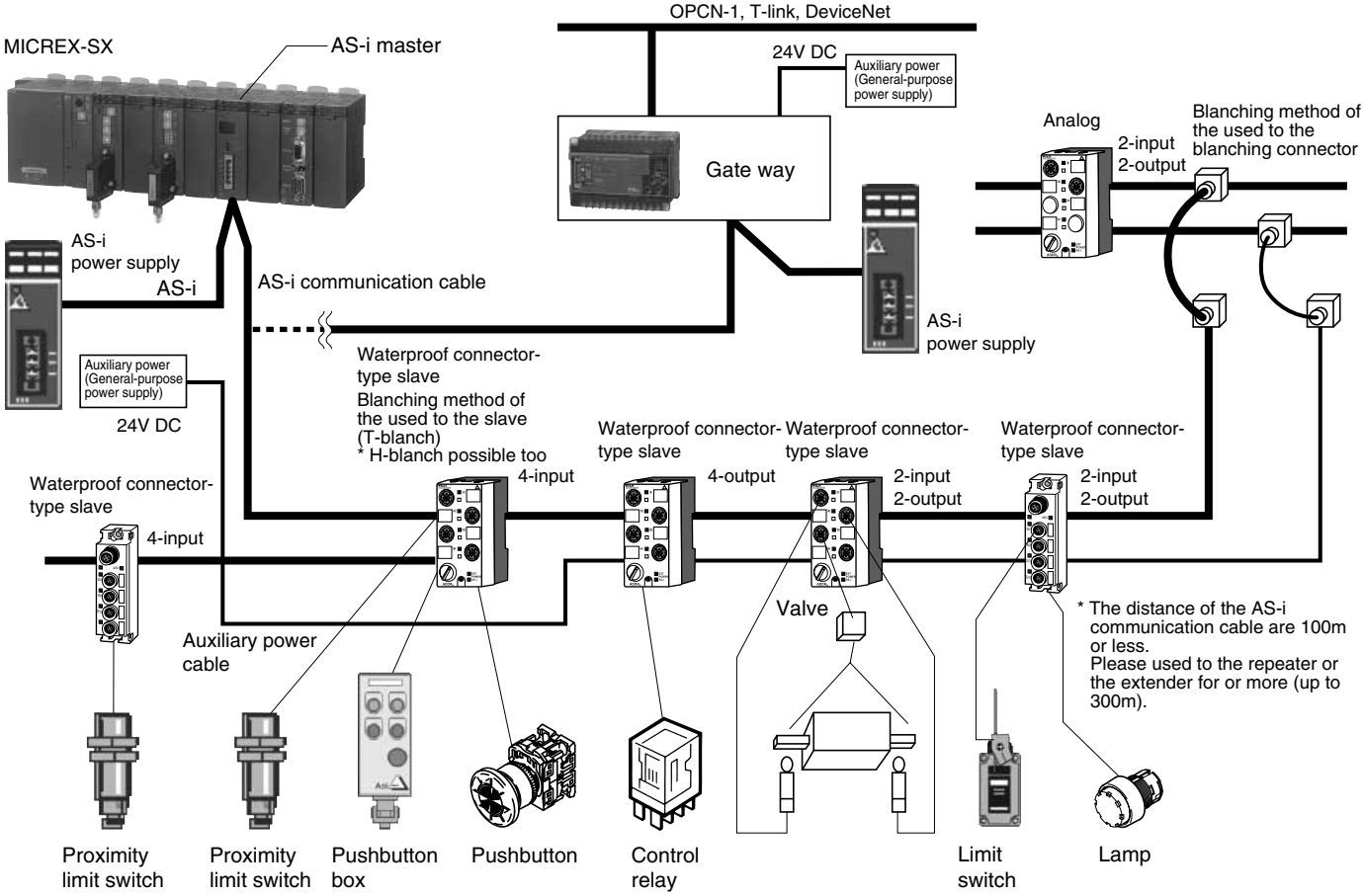
- The **NP1L-AS2** is based on the AS-i communication protocol Version 2.1.
- Up to 12 units can be connected in a single system configuration. configuration.
- Can be connected to diverse types of actuators and sensors conforming to the AS-i Standards.
- Line length: Total 100m
- Up to 62 slave stations can be connected to a single master station.
- Up to 434 I/O points can be controlled.
- The AS-i master module is communicate to between the analog slave station automatically.

■ Communication specifications

Item	Specification
No. of SX bus connectable modules	Max. 12 /configuration
No. of connectable slaves	Max. 62 /master module
Transmission line format	Tree-structure, line-structure, star-structure, ring-structure
Transmission distance	100m (Max.300m at using a repeater)
Transmission method	Half-duplex, serial transmission
Transmission speed	167kbps
Applicable cable	AS-i cable
Refresh time	Approx. 10ms (when 62 units connected) Approx. 5ms (when 31 units connected)
No. of I/O points	Input points: Max. 248 Output points: Max. 186 (Input / Output: 21 words / 21 words)
Current consumption of AS-i master section	30V DC, 100mA or less (supplied from the AS-i power supply, and insulated from the SX bus.)
Internal current consumption	24V DC, 100mA or less
Mass	Approx. 180g

■ System configuration

- System configuration example with the AS-i master
- System configuration example via the gate way



S-LINK Master Module: NP1L-SL1

■ Features

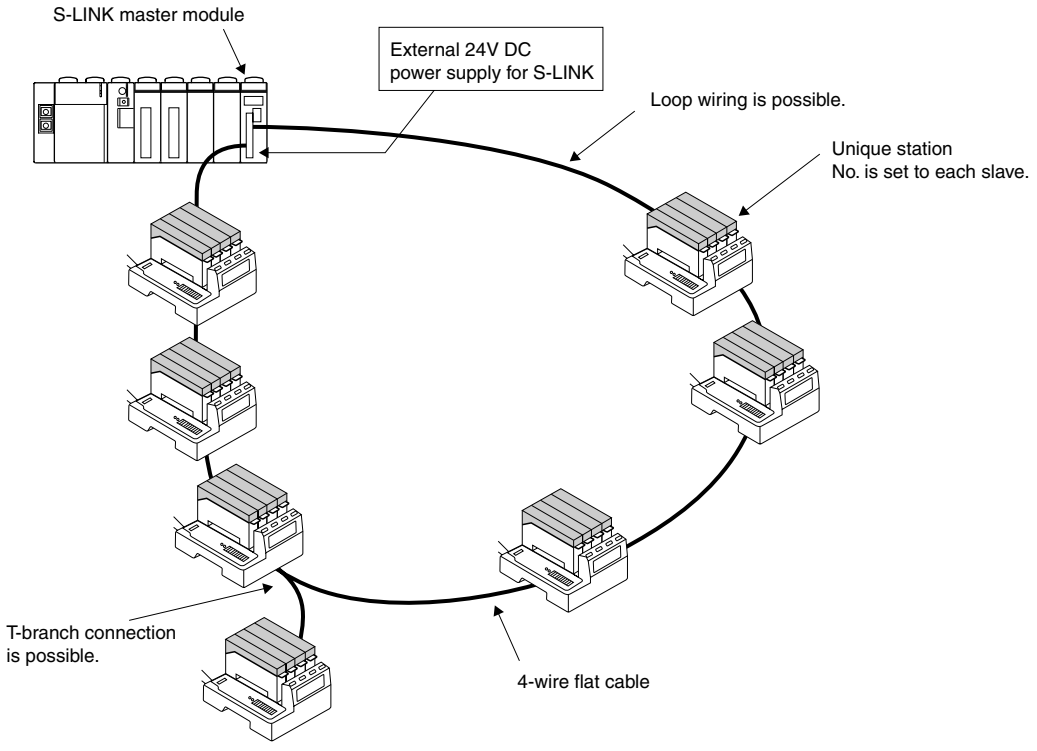
- Connected to the S-LINK (bit) level serial transmission provided by SUNX.
- 128-point I/O control can be performed for each master station. There is no limitation on the number of master connections.

NP1L-SL1
AF01-102

■ Communication specifications

Item	Specification
No. of SX bus connections	No limitation (within the limit of the maximum number of SX bus connections of 8192 points)
No. of slave connections	No limitation
Transmission system	Bi-directional time-division multiplex transmission system
Synchronization system	Bit synchronization, frame synchronization
Protocol	2-wire protocol
Transmission rate	28.5kbps
	Signal trunk line: Total length 200m
Connection method	Multi-drop connection
No. of I/O points	Up to 128 points
Cable	Cable from SUNX: 4-wire flat cable
Refresh time	32 points: 1.4 to 2.9ms
	64 points: 2.5 to 5.2ms
	96 points: 3.6 to 7.4ms
	128 points: 4.7 to 9.6ms
S-LINK master section current consumption	24V DC, 1.6mA or less (supplied from an external power supply, and insulated from the SX bus.)
Internal current consumption	Inside of module (supplied from the SX bus): 24V DC, 80mA or less, S-LINK communication section (supplied from an external power supply): 24V DC, 1.6A or less
Mass	Approx. 200g

■ System configuration



SX Bus Optical Link Module: NP1L-OL1
SX Bus Optical Converter Unit: NP2L-OE1

■ Features

NP1L-OL1

- Mounted on the base board to transmit the SX bus signal as an optical signal.
- Available optical fiber is the PCF, and maximum transmission distance is 25.6km (25°C).

NP2L-OE1

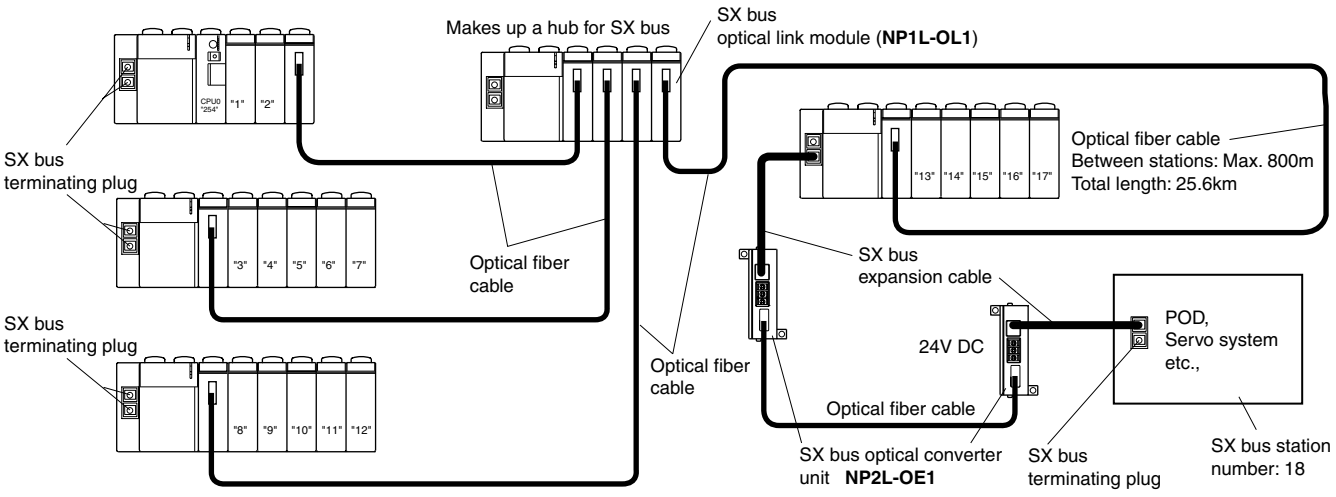
- This unit connects between the SX bus cable and optical fiber cable to transmit the SX bus signal as an optical signal.
- Available optical fiber is the PCF, and maximum transmission distance is 25.6km (25°C).

■ Transmission specifications

Item		Specification	
Type		**NP1L-OL1**	**NP2L-OE1**
No. of connectable modules		Max. 64 /configuration (Total No. of **NP1L-OL1** and **NP2L-OE1**)	
Optical fiber	Type	PCF (Polymer clad fiber), GI type	
	Core/Clad diameter	Core: 200μm Clad: 230μm	
	Min. bending radius * 1	50mm	
	Optical connector	Type: F07	
Transmission distance * 1		Between stations: Max. 800m (Total extension distance 25.6km)	
Internal current consumption		24V DC 54mA or less	
Power supply terminal (External power supply) * 2	Rated input voltage	–	24V DC, 70mA or less
	Rush current	–	165mA or less: When a switching power supply is used * 3 50Ao-p-70μs: When 24V DC is directly turned ON
Mass		Approx. 135g	Approx. 155g

* 1 Minimum bending radius depends on what type of optical-fiber cable is used. Above table shows the values when the HG-20/08 from Sumitomo Electric Industries, Ltd. is used.
* 2 As an external power supply, use a switching power supply (conforming to the UL standard) with “reinforced insulation” of 24V DC 1A or more for each unit.
* 3 When 24V DC is directly turned ON, the rush current is 50Ao-p, 70μs (reference value). This value depends on power conditions.

■ System configuration



SX Bus Electric Repeater Unit: NP2L-RP1

■ Features

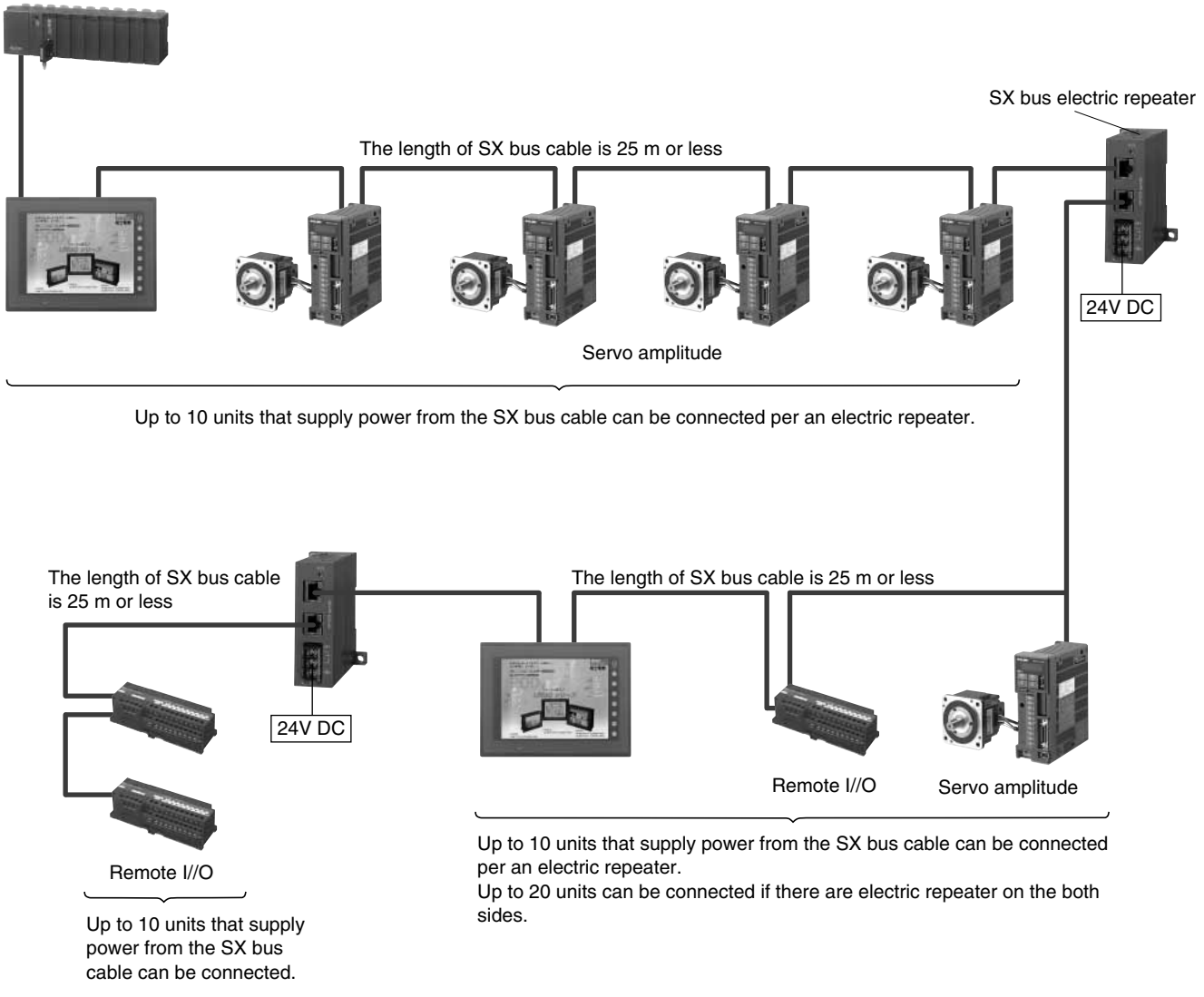
- SX bus connection using another 25m electric cable is enabled by correcting the signal waveforms of the SX bus electric cable.
- Up to three units can be used in one SX system, increasing the total extension length of the SX bus electric cable to a maximum of 100m.

NP2L-RP1
KD03-017

■ Specifications

Item	Specification	Remarks
Rated power supply voltage	24V DC	External power supply specification
Power supply voltage tolerance	22.8 to 26.4V DC	External power supply specification Connection power supply specification with the servo and inverter: 24V to 26.4 V DC
Current consumption	Up to 1470mA	Current consumption: Approx. 70mA 24V power supply to the SX bus cable: Up to two 700mA systems
Dimensions (W x H x D) in mm	50 x 95 x 95	-
SX bus transmission distance	25m	Total extension of the SX bus cable connected to each connector
No. of max. usable units	3 units	The maximum total extension of the SX bus cable is 100m.

■ Example of the system configuration



Memory Card Interface Module: NP1F-MM1

■ Features

- Equipped with 1 slot for PC card interface (PCMCIA) as standard.
- Use of commercially available memory card enables storing data from the CPU modules or reading control and/or management information from the memory card.
- Programs can be uploaded/downloaded from/to CPU module.
- Files can be read/written from the personal computer via the PC card slot.
- Used to back up programs when configuring a redundant (N:1) system for CPU modules.

NP1F-MM1
AF99-14

■ Performance specifications

Item	Specification
No. of SX bus connectable modules	Max. 16 /configuration
Memory card interface	Based on JEIDA Ver. 4.1 /PCMCIA Rel.2.01 Type I, II x 1 slot, 5V
Card type	SRAM card
Internal current consumption	24V DC, 90mA or less
Mass	Approx. 210g (excluding the memory card)

■ Functional specifications

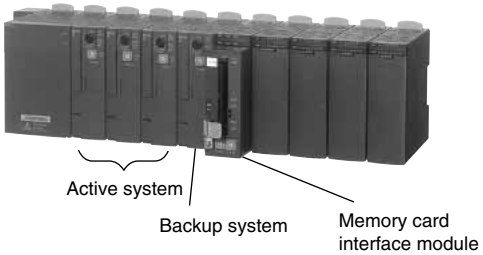
Item	Specification
Data read/write from CPU module	Data read/write between CPU module and memory card by application programs
Program read/write from memory card interface module	Program read/write between CPU module and memory card by the front SW operation of the memory card interface module. Program write to the memory card by the Expert (D300win) operation after memory card installation in the PC card slot of the personal computer.
Self-diagnosis/RAS function	Supervise the current status of the local station for error detection, and notify the error to the CPU module.

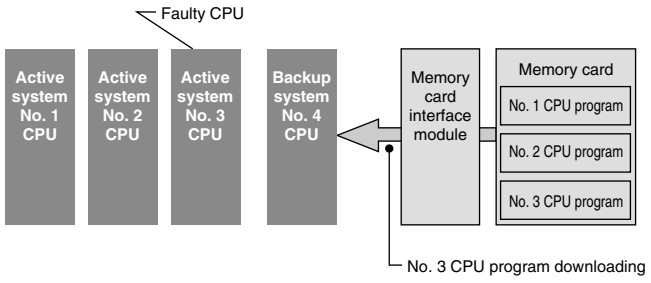
■ Memory card selection reference

Item	Specification (Example)	Application restrictions and conditions	Remarks
Power supply voltage	5 ± 0.25V DC	Available if the product is specified for 5V	
Current consumption	90mA or less at 5V DC	**NP1F-MM1**: Available if the total is 300mA or less.	
Operating temperature range	0 to 60 °C	When a memory card is mounted in the module, heat generation in the module increases the temperature by 10°C. Thus, the max. operating temperature with this memory card used is 50°C.	Give priority to the memory card specification range rather than the operating range of this module.
Operating humidity range	10 to 90% RH, no condensation	No problem because wider than the environment range of this module.	
Storage temperature range	-20 to 70°C	No problem due to the same conditions as the common specification of this module.	
Card removal count	5,000 times or more (outdoor) 10,000 times or more (indoor)	Make sufficient consideration for the removal count.	
Vibration/shock	Vibration: 147m/s²p-p (max.) in operation Shock: 490m/s² (max.) in operation	Module's vibration/shock resistance performance can be met by securing the memory card with the metal bracket, included in this module.	

Note: Be sure to purchase the memory card for which "electrostatic countermeasure" has been taken as well as having the items specified above.

■ System configuration





Dummy Module: NP1F-DMY

■ Features

- When your system will be expanded in the future, the dummy module can be used as a substitute for the extension module.
- If an active module has failed during operation of the system, the system can be restarted when you replace the failed module with the dummy module (which, however, cannot perform the functions of the failed module).

NP1F-DMY
AF00-44

■ Specifications

Item	Specification
Type	**NP1F-DMY**
Substituted module	All modules except power module and CPU module
Mounting place	On a base board directly connected to SX bus Cannot be mounted on a T-link base board or other remote I/O module.
Occupied words	0 word
Internal current consumption	24V DC, 26mA or less
Mass	Approx. 120g

Multiuse Communication Module: NP1F-MU1

■ Features

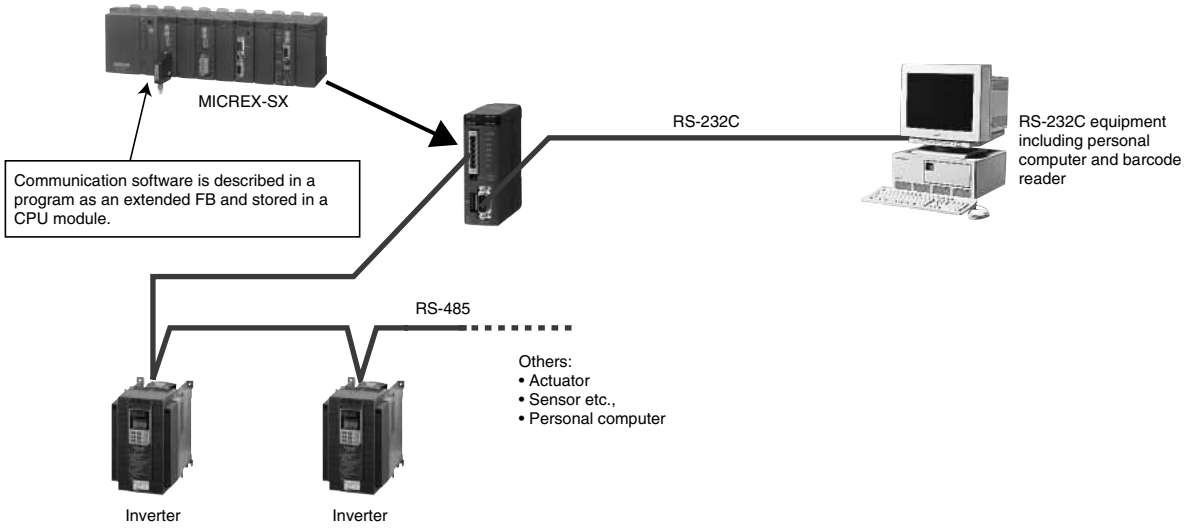
- High-speed communication (RS-485: max. 460.8 kbps) with actuators and sensors can be implemented.
- Optimal communication with devices of various manufacturers can be implemented by freely creating a communication protocol. Protocols can be created by modifying the sample FB.
- Microcomputer circuit boards can be replaced by creating original firmware.

NP1F-MU1
KDD05-018

■ Performance specifications

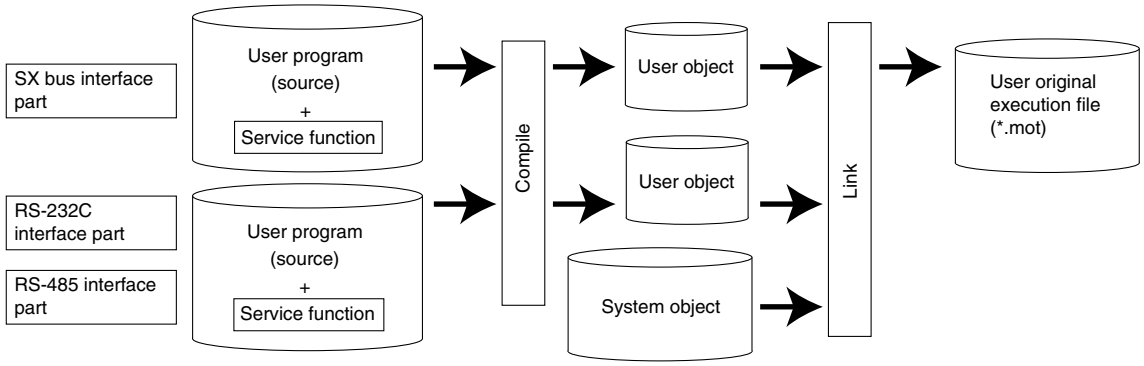
Item	Specification	
Type	**NP1F-MU1**	
Port	RS-232C	RS-485
No. of ports	1 channels	1 channels
Transmission method	Half-duplex communication method	
Synchronisation method	Start-stop synchronous transmission	
Transmission speed	300/600/1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200bps	300/600/1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400/460,800bps
Transmission distance	15m or less	1km or less (transmission speed: 19.2kbps or less)
No. of connectable module	1: 1 (including the external device)	1: 31 (max.)
Connection method	D-sub, 9-pin connector (male)	6 poles terminal block
Transmission method	Transmission protocol by creating program	
Internal current consumption	24V DC, 80mA or less	
Mass	Approx 140g	

■ System configuration



■ Outline of Original Firmware Development

Original high-speed communication modules can be built by combining user programs developed in C language programming, service functions for multiuse communication modules that can be downloaded from homepages, and system objects.



High-speed Counter Module: NP1F-HC □

■ Features

NP1F-HC2 □

- Fast input pulses can be counted up to 2-channels.
- Compatible with 3 types of input signals.
  1) 90° phase-difference pulse
  2) Forward/reverse pulse
  3) Pulse + sign
- 4 types of operation modes
  1) Ring operation
  2) Gating operation
  3) Compare detecting operation
  4) Phase-Z detecting operation
- Since the input voltage for **NP1F-HC2MR** supports DC 5/12/24 V, it becomes possible to standardize the external power supply at DC 24 V and to improve pulse input connectivity.
- The pulse input filter of **NP1F-HC2MR1** is set so that connection with the inverter FRENIC5000 VG7 of Fuji Electric is optimized.

NP1F-HC8

- Fast input pulses can be counted up to 8-channel 50kHz.
- Compatible with 3 types of input signals.
  1) 90° phase-difference pulse
  2) Forward/reverse pulse
  3) Pulse + sign

NP1F-HC2
AF97-520

- 3 types of operation modes
  1) Ring operation
  2) Gating operation
  3) Reset operation

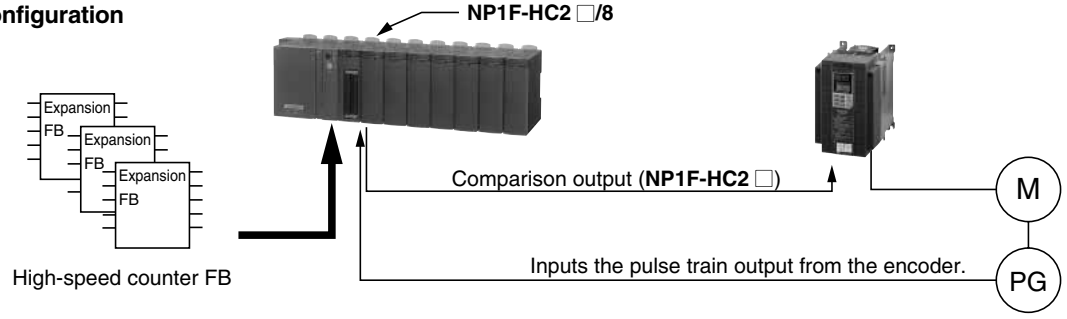
■ Performance specifications

Item		Specification			
Type		**NP1F-HC2**	**NP1F-HC2MR**	**NP1F-HC2MR1**	**NP1F-HC8**
Count input signal	Input signal	2-phase signal (90° phase difference), forward /reverse signal, coded pulse (Selected by the software)			
	Level	Open collector signal or differential signal			
	Input voltage	5V DC	5/12/24V DC		5V DC
Counter	Function	Ring counter function, reset function, gate function, comparison function (**NP1F-HC2**), phase Z detection (**NP1F-HC2**)			
	No. of channels	2 channels (independent)			8 channels (independent)
	Counting speed	500kHz	200kHz	50kHz	50kHz
	Counting range	Signed 32-bit binary (80000000 to 7FFFFFFFH)			Signed 16-bit binary (8000 to 7FFFH)
	Multiplication function	x 4 (2-phase signal, 90° phase difference only)			
	Reset function	Soft command			
	Gate function	External input signal and soft command			
	Comparison function	Hard circuit and soft command			–
	Phase Z detection	External input signal and soft command			–
Comparison	No. of output points	1 point /channel			–
	Comparison range	Same as the counting range			–
	Comparison contents	(Counted value) ≥ (Compared value) to Output ON			–
	Comparison output	Open collector output (sink type) 24V DC			–
Occupied words		Input: 8 words / Output: 8 words (total: 16 words)			Input: 10 words / Output: 2 words (total: 12 words)
Internal current consumption		24V DC 85mA or less			24V DC 100mA or less
Mass		Approx. 120g			Approx. 195g

■ Functions

Function	Description
Linear operation (**NP1F-HC2 □**)	Counting operation for detecting underflow/overflow when the pulse count value is under/over the minimum/maximum value.
Ring operation	Ring-type counting operation to set the minimum value when the pulse count value exceeds the maximum value or to set the maximum value when the count value is less than the minimum value.
Gating operation	Pulse counting operation activated only when the internal or external gate input is in the counting enabled state.
Reset operation	Resetting the counter value to zero (0) by internal command.
Compare detecting operation (**NP1F-HC2 □**)	Comparing the preset compare value and a count value to output the result to the compare output.
Phase-Z detecting operation (**NP1F-HC2 □**)	Reading a count value for each phase-Z detection.

■ System configuration



Two-axis Pulse Train Output Positioning Control Module: NP1F-HP2

NP1F-HP2
AF97-517

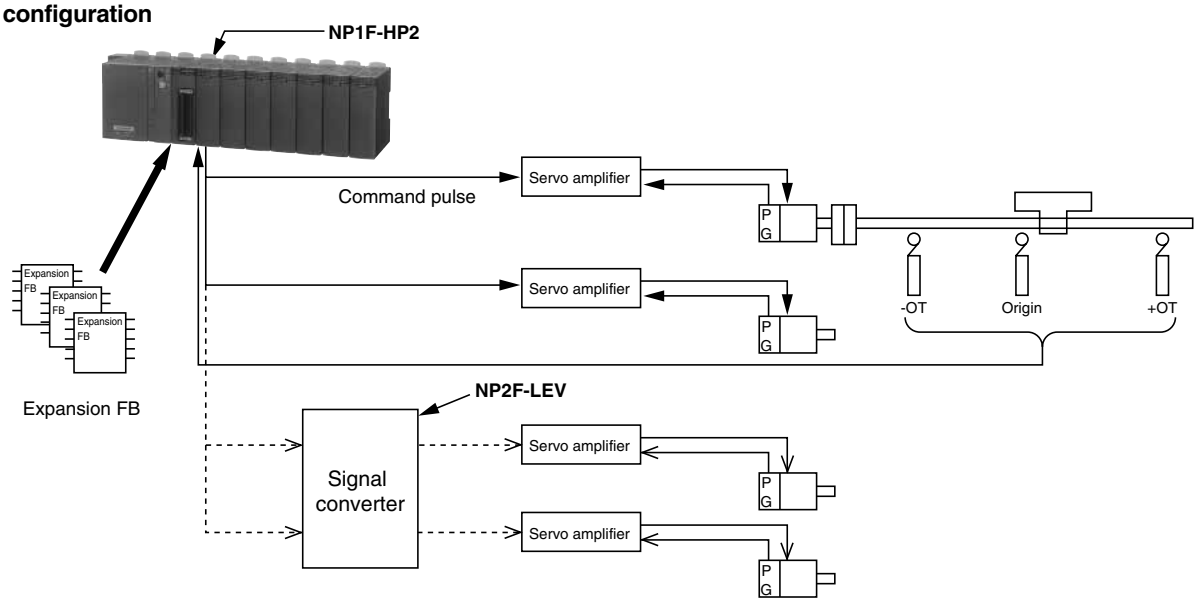
■ Features

- Combined with the servo amplifier motor of the pulse train command input type or the stepping motor driver allows high-precision positioning.
- Use of an expansion FB facilitates embedding necessary functions including axis-independent single-function positioning to multi-axis simultaneous start positioning (pseudo linear interpolation).
- Use of the signal converter (**NP2F-LEV**) enables connecting the differential input type equipment.

■ Performance specifications

Item		Specification
No. of control axes		2 axes
Positioning control		Open loop
Acceleration /deceleration characteristics		Trapezoidal (at pulse generation mode)
Position data		Max. 2^{32}-1 pulse /command
Command pulse	Command frequency	250kHz
	Frequency resolution	16 bits /20 bits
	Output type	Open collector output (forward pulse + reverse pulse)
Control function		Pulse generation mode
Combination actuator		Servo system prepared pulse train command input or stepping motor
Occupied word		Input: 8 words/Output: 8 words (total: 16 words)
Internal current consumption		24V DC 95mA or less
External power supply		24V DC 35mA or less
Mass		Approx. 180g

■ System configuration



■ Signal converter (NP2F-LEV) specifications

Item		Specification
No. of control axes		2 axes (4 channels)
Input signal	Input frequency	Max. 1MHz
	Input type	Open collector input
Output signal	Output frequency	Max. 1MHz
	Output type	Differential signal
External power supply		24V DC, 35mA
Mass		Approx. 130g

Two-axis Pulse Train Multiple Positioning Control Module: NP1F-MP2

NP1F-MP2
AF97-518

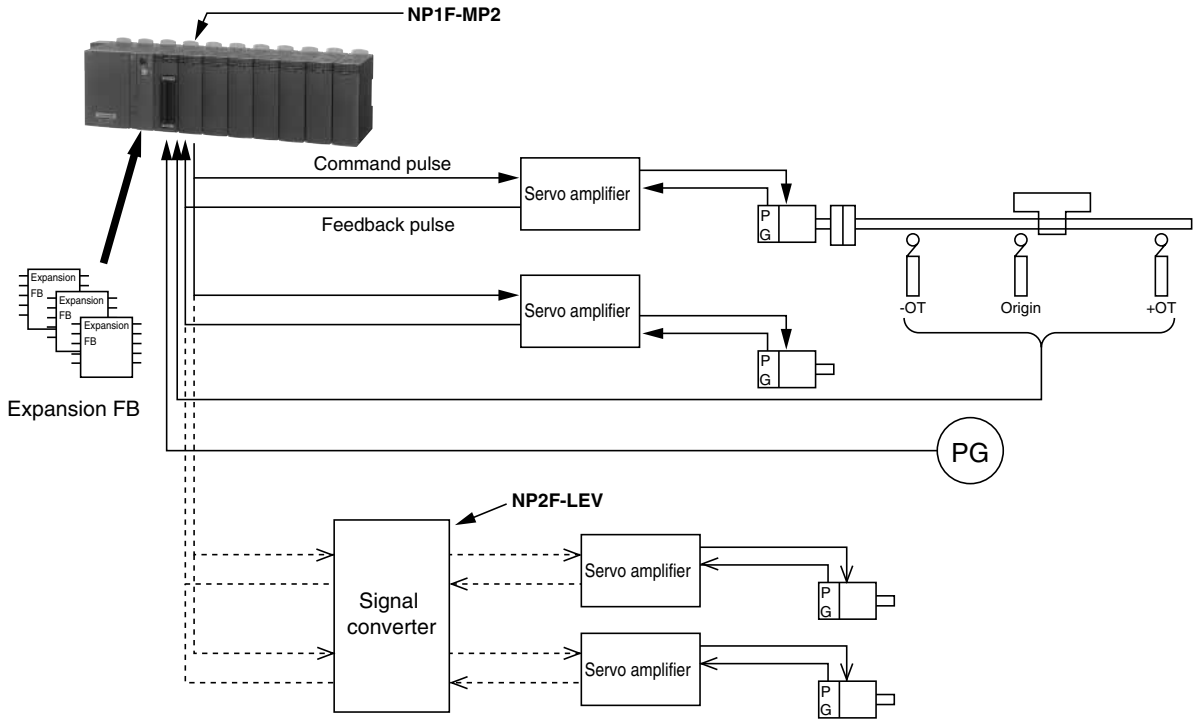
■ Features

- Combined with the servo amplifier motor of the pulse train command input type or the stepping motor driver allows high-precision positioning.
- Use of an expansion FB facilitates embedding necessary functions including axis-independent single-function positioning to multi-axis simultaneous start positioning (pseudo linear interpolation), interpolation, and cam/running cut.
- Current position (current feedback value) can be detected with the feedback pulse. 2 types of operation modes are available: pulse generation mode and position command mode.
- Use of the signal converter (**NP2F-LEV**) enables connecting differential input type equipment.

■ Performance specifications

Item		Specification
No. of control axes		2 axes
Positioning control		Open loop
Acceleration /decelerations characteristics		Trapezoidal (at pulse generation mode)
Position data		Max. 2^{32}-1 pulse /command
Command pulse	Command frequency	250kHz
	Frequency resolution	16 bits /20 bits
	Output type	Open collector output (forward pulse + reverse pulse)
Feedback pulse	Input frequency	500kHz
	Input type	Open collector input or differential signal (90° phase difference, phase A, B and phase Z)
Manual pulse unit	Input frequency	500kHz
	Input type	Open collector input or differential signal (90° phase difference, phase A, B or forward pulse + reverse pulse)
Control function		Pulse generation mode, positioning command mode
Combination actuator		Servo system prepared pulse train command input or stepping mode
Occupied word		Input: 14 words / Output: 8 words (total: 22 words)
Internal current consumption		24V DC 95mA or less
External power supply		24V DC 35mA or less
Mass		Approx. 200g

■ System configuration



Two-axis Analog Multiple Positioning Control Module: NP1F-MA2

NP1F-MA2
AF97-519

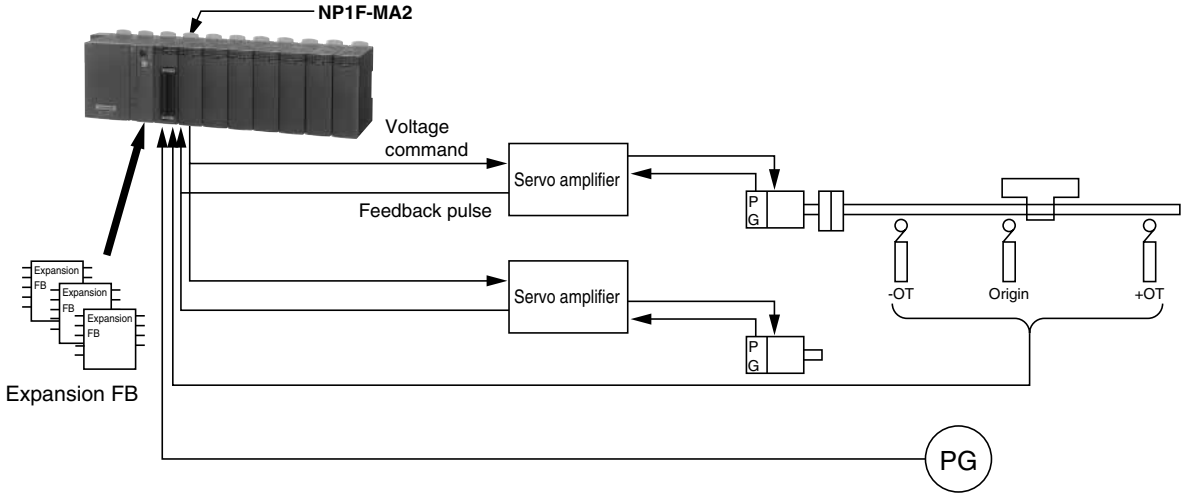
■ Features

- Combined with the servo amplifier motor of the pulse train command input type or the stepping motor driver allows high-precision positioning.
- Use of an expansion FB facilitates embedding necessary functions including axis-independent single-function positioning to multi-axis simultaneous start positioning (pseudo linear interpolation), interpolation, and cam/running cut.
- 3 types of operation modes are available: pulse generation mode, position control mode, and position command mode.

■ Performance specifications

Item		Specification
No. of control axes		2 axes
Positioning control		Semi-closed loop
Acceleration /deceleration characteristics		Trapezoidal (at pulse generation mode)
Position data		Max. 2^{32}-1 pulse /command (at pulse generation mode)
Speed command	Command voltage	Analog speed command (0 to ±10.24V)
	Signal type	Analog voltage command
Feedback pulse	Input frequency	500kHz
	Input type	Open collector input or differential signal (90° phase difference, phase A, phase B and phase Z)
Manual pulse unit	Input frequency	500kHz
	Input type	Open collector input or differential signal (90° phase difference, phase A, phase B, or forward pulse + reverse pulse)
Control functions		Pulse occurrence mode, positioning command mode, positioning control mode
Combination actuator		Servo system prepared analog speed command input
Occupied words		Input: 14 words / Output: 8 words (total: 22 words)
Internal current consumption		24V DC 150mA or less
Mass		Approx. 200g

■ System configuration



MC Module: NP1F-MC8P1

■ Features

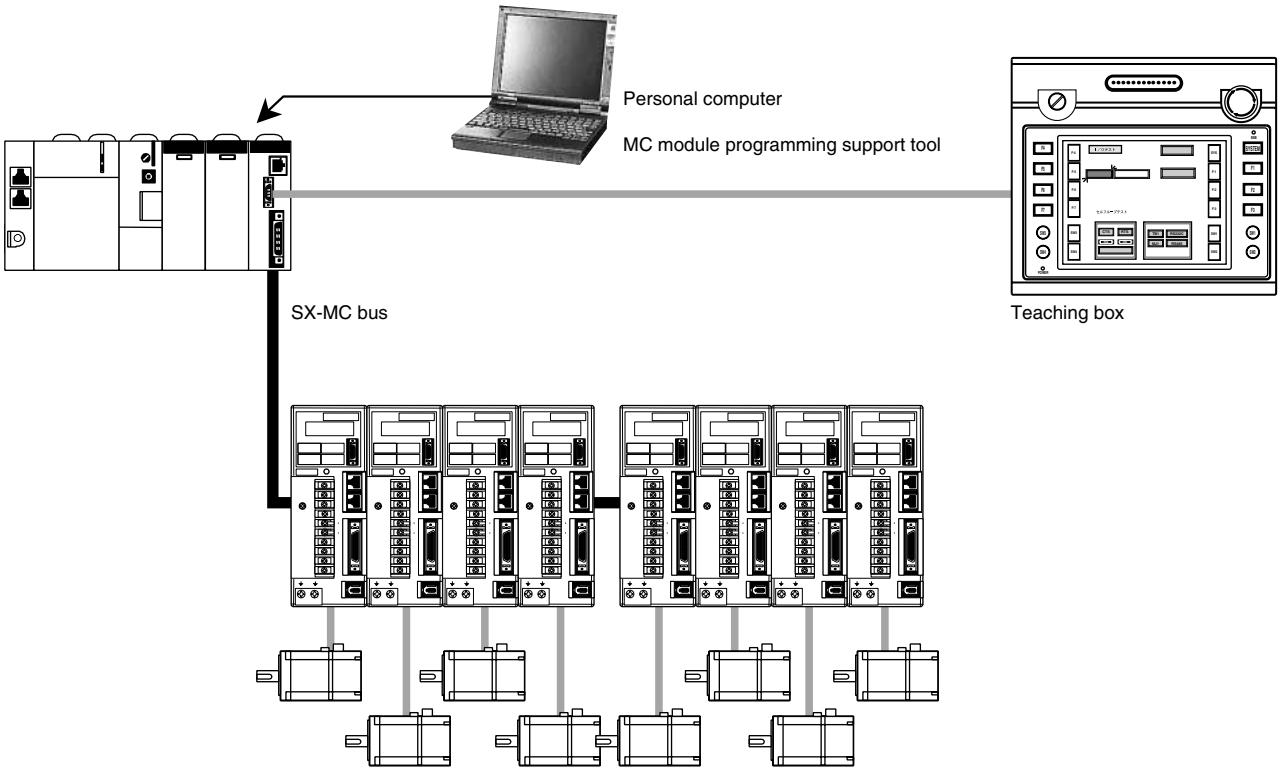
- 8-axis 8-task motion control can be performed with a single module. Axis control can be interpolated with any combination.
- A tabular form programming language is used, allowing conversion the spreadsheet (Excel).
- Sequence control is performed by the CPU and motion control by this module, realizing multi-axis control without loading the CPU.
- Motion control programs are created with the optional MC module programming support tool.

NP1F-MC8P1
AF01-96

■ Performance specifications

Item	Specification
No. of control axes	8-axis/module
Max. position data	-2147483647 to 2147483647 pulses (in 1-pulse steps)
Control operation interval	2ms (4-axis control) or more
Control function	PTP, interpolation, Calculation (Addition, Subtraction, Multiplication, Division), Branch, Subprogram
Interpolation function	Straight line interpolation for up to 4 axes, 2-axis arc interpolation
Program form	Tabular form
Simultaneous execution program	Up to 8 tasks
No. of program stored	Up to 500
Program size	Up to 2500 steps/program, total number of steps: 12500 steps
Combination actuator	Servo system model **RYS** □□□ **S3-VSS**, model **RYS** □□□ **M3-VSK**, (Fuji Electric FA Components & Systems Co., Ltd.)
Actuator interface	SX-MC bus (25MHz)
No. of occupied words	Input 28 words/output 28 words
External power supply current consumption	Input power supply (for external interrupt signal): 24V DC ± 5%, 5mA or less SX-MC bus drive power supply: 24V DC ± 5%, 500mA or less
Internal current consumption	24V DC, 150mA or less
Mass	Approx. 186g

■ System configuration



Note: Use the SX bus extension cable (format: NC1P-□□) to connect the SX-MC bus. The total length of the SX-MC bus is 25m.

■ Positioning Module Function List

No.	Function	Description	NP1F-HP2	NP1F-MP2		NP1F-MA2		
				Pulse generation	Position command	Pulse generation	Position control	Position command
1	Pulse train command	Outputs the pulse train command signal for forward and reverse pulses.	○	○				
2	Pulse generation mode positioning	References the pulse count and frequency data in the CPU module and carries out positioning by generating the command pulse using the built-in pulse generator.	○	○		○		
3	Position control mode positioning	Directly references position and speed data in the CPU module and carries out positioning.					○	
4	Position command mode positioning	References position data in the CPU module and carries out positioning by generating the command pulse using the built-in pulse generator.			○			○
5	Current value count	Counts the command pulse and detects the current command value (multiplied by 4).	○	○	○	○	○	○
		Counts the feedback pulse and detects the current feedback value (multiplied by 4).		○	○	○	○	○
6	Phase-Z position detect (Origin return operation)	Detects the command position at the phase-Z rising edge (or falling edge).	○	○	○			
		Detects the deviation amount at the phase-Z rising edge (or falling edge).		○	○	○	○	○
		Detects the current feedback position at the phase-Z rising edge (or falling edge).		○	○	○	○	○
7	Interrupt position detect (Interrupt positioning operation)	Detects the command position at the rising edge (or falling edge) of the external interrupt signal.	○	○	○			
		Detects the deviation value at the rising edge (or falling edge) of the external interrupt signal.		○	○	○	○	○
		Detects the current feedback position at the rising edge (or falling edge) of the external interrupt signal.		○	○	○	○	○
8	Automatic-start frequency setting	Allows the user to set the automatic-start frequency.	○	○		○		
9	Trapezoidal acceleration/ deceleration computation	Computes trapezoidal acceleration/deceleration.	○	○		○		
10	Deceleration point automatic computation	Automatically computes the deceleration point.	○	○		○		
11	Continuous frequency change	Continuously updates the command frequency of the pulse generator.	○	○		○		
12	Command pulse count additional setting	Sets the additional command pulse count during pulse generator output.	○	○		○		
13	Pulse output stop processing	Two types of acceleration can be selected for trapezoidal deceleration when the pulse output is interrupted.	○	○		○		
14	Emergency stop processing	Carries out quick stop when an emergency stop error is detected.	○	○				
		Immediately stops the pulse output.			○			
		Immediately clears the speed command voltage to 0V.				○	○	○
15	Over travel (Plus or minus error detection)	Carries out deceleration and stop when a +/-OT error is detected.	○	○		○		
		Immediately stops the pulse output.			○			
		Performs exponential deceleration and stop.					○	○
16	Transmission error monitoring	Monitors a module control program error on the CPU module side, and carries out quick stop when a transmission error is detected.	○	○		○		
		Immediately stops the pulse output.			○			
		Performs exponential deceleration and stop.					○	○
17	External pulse count	Counts the external input pulse for manual pulse unit operation or synchronous operation.		○	○	○	○	○
18	Positioning data first read	Up to four items of positioning data per axis can be registered in the FIFO buffer. The registered positioning data is executed sequentially. It is also possible to make additional settings in the FIFO buffer during operation.		○		○		
19	Positioning data write	Sets additional positioning data during continuous frequency change processing.		○		○		
20	External input signal detect	Detects the input status of all DI signals.	○	○	○	○	○	○
21	External output signal setting	All DO signals can be switched with the CPU module.	○	○	○	○	○	○

Positioning Extension FB Software Package

Product name	Model	Description
Positioning FB package	**NP4N-PTPFV3**	1-axis PTP positioning FB (pseudo linear interpolating function included), highly-functional 1-axis positioning FB, compact 1-axis positioning FB
Electronic cam FB package	**NP4N-CAMFV3**	Cam operation FB (running cut function included), variable cam FB

High-speed counter extended FB, high-speed input counter FB, and simplified positioning expansion FB are included with the programming support tool Expert (D300win) as standard.

■ High-speed counter extended FB

This FB is installed to use the high-speed counter. Multi-functional and simple-functional FBs are available.

■ High-speed input counter FB

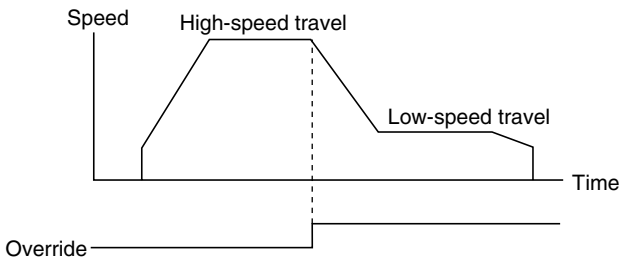
This FB is installed to use the pulse counter input function of the high-speed digital input module (NP1X3206-A).

■ Simplified positioning expansion FB

This is a simplified positioning FB for the digital output module (NP1Y32T09P1-A) with pulse train output built-in. It carries out positioning of 1-axis PTP using the pulse train command.

■ Positioning FB package

- 1-axis PTP positioning FB (pseudo linear interpolating function included) (SPH300)
  This FB is used to accelerate to the set speed, decelerate-and-stop at the specified position, and perform position management. Thus, the specified positioning can be implemented by only setting the target position and speed from the sequence program side. This FB allows speed changeover using a function such as the override function during operation so that the user can easily reduce the conveyance time by fast travel and make high-precision positioning by low-speed travel. The position command and speed command can be set in units of mm or mm/s. The pulse count for the position data is converted by this FB to facilitate the operation. This FB is the most suitable for equipment conveying or assembling basic loaders and unloaders.



In addition, pseudo linear interpolating operation is implemented by 2-axis, 3-axis, or 4-axis simultaneous start. This operation can be applied to control of most types of multi-layer warehouses and assembling equipment, and is also available for conveyor line control. This FB can be applied to the pulse train positioning control combined module, analog positioning control combined module, and pulse train output positioning module.

- Highly-functional 1-axis positioning FB (SPH300)
  This FB has the 1-axis PTP positioning function with S-shape acceleration/deceleration and manual pulse unit operating functions added. This FB is required for electronic cam or running cut operation. It can be applied to the pulse train positioning control combined module and analog positioning control combined module.
- Compact 1-axis FB
  This FB has a compact program size and a reduced memory data count for applying the pulse train positioning control combined module or analog positioning control combined module. It performs 1-axis PTP positioning and is best suited for application to SPH200.

■ Electronic cam FB package (SPH300)

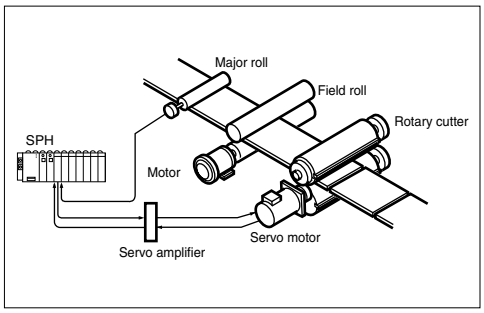
Positioning implemented by cam control operation is very frequently applied in diverse types of machines such as packaging. Use of this FB package allows accommodating various types of cam mechanism operation (cam patterns), eliminating complicated gear changes of the mechanical cam. It also enables implementing operations impossible with the mechanical cam.

- Cam operation FB
  This FB executes 1-axis cam operation positioning. It can implement operations impossible with the mechanical cam as well as operations superseding the conventional mechanical cams. This FB can be applied to the pulse train positioning control combined module and analog positioning control combined module.

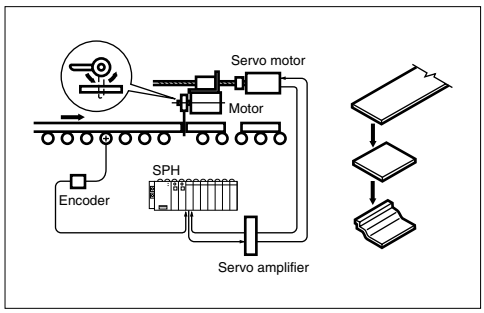
The extended FB with functions necessary for control of a running cut machine is also available. Operation synchronous with the conveyer speed does not need conveyer stop and restart, greatly contributing to machine speed increase. This extended FB is used for various types of machine control as well as for the running cut machine. Use of this FB allows easily implementing synchronous control.
This extended FB can be applied to the pulse train positioning control combined module and analog positioning control combined module.

• Rotary shear control

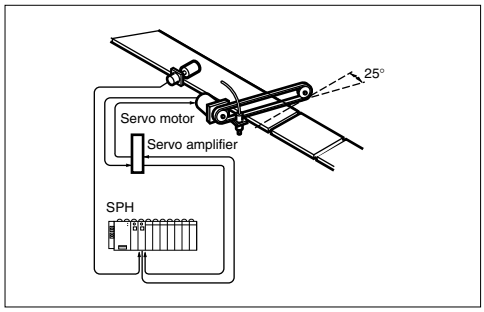
Rotary shear control refers to control of the roll-shaped cutting section (cutter or press) to cut continuously fed material (film, paper, and so on) by feeding at the same speed as the original feed speed. It can be used for such diverse machines as packaging and film manufacture.



• Flying shear control
Flying shear control means controlling so that the cutting section (cutter or press), consisting of ball screw, rack-and-pinion, or equivalent, will cut the continuously fed material (iron plate, external wall material, clay, and so on) by feeding at the same speed as the original feed speed. It can be used for such diverse machines as metal processing, tile manufacturing, and coating.



• Flying cutter control
Flying cutter control is to control so that the cutting section (cutter or water jet), consisting of the ball screw, rack and pinion, chain, and so on, will cut the continuously fed material (film, paper, plastic, etc.) by feeding at a constant ratio to the material's feed speed and at a certain angle to the material. It can be used for such diverse machines as board manufacturing.



- Variable cam FB
  This FB realizes the variable cam function. It detects the machine's main shaft angle (current work value), and turns ON/OFF the output signal of the set main shaft angle (work position). This FB can be applied to the pulse train positioning control combined module, analog positioning control combined module, and pulse train output positioning module.

Functional Extension FB Software Package

■ Easily realizes functional extension by software
External fault diagnostic and adjustment system functions can also be implemented with software (an expansion FB) by using the enhanced processing functions of the CPU module.
The software processing section is placed in the CPU section as an expansion FB and only the external equipment interface processing is separately performed in the I/O section. Thus, an optimum system can be configured according to the function and performance requirements.

■ Diagnostic FB package: NP4N-TRBFV3
Necessary diagnosis can be conducted only by selecting an extended FB for each diagnostic function. If this software is stored in the CPU module for control programs, it is not necessary to add any other special function module. When it is used in the multi-CPU configuration, independence of the control CPU can also be preserved.
For notification of the diagnostic results to the external equipment, Ethernet or a network of general-purpose communication modules or equivalent can also be used.

- Expansion FB packages which implement the fault diagnostic functions
  The following diagnostic and data sampling FBs are available:
  • Sequence/time diagnostic FB
  • Time diagnostic FB
  • Upper/lower limit diagnostic FB
  • Data sampling FB

■ PID FB package: NP4N-PIDFV3
Instrumentation control and sequence control were conventionally separated with respect to both hardware and software. When packaged as an extended FB, this adjustment system computing function is a true linkage between instrumentation control and sequence control.
In addition, the restriction on the control loop count has sufficient expandability in a multi-CPU configuration. (The number of FBs that can be stored in a CPU module is limited by the number of program steps and the sampling rate.)

- Extension FB package realizing the temperature regulation system operation function
  • ON/OFF control FB
  • PID FB with auto-tuning

■ Extension FB package set: NP4N-FSETV3
This set includes the following five different extension FB packages:

FA Device General-Purpose Communication Package:	**NP4N-COMFV3**
Positioning FB Package:	**NP4N-PTPFV3**
Electronic Cam FB Package:	**NP4N-CAMFV3**
Failure Diagnosis FB Package:	**NP4N-TRBFV3**
PID FB Package:	**NP4N-PIDFV3**

Programming Support Tool

Programming Support Tool SX-Programmer Expert (D300win): NP4H-SEDBV3

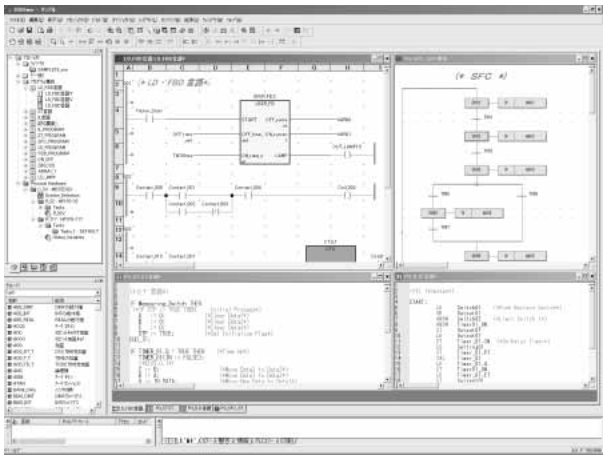
■ **Features**

● **Complete conformity to IEC 61131-3 International Standard**

D300win supports five types of program representations completely conforming to the IEC 61131-3 International Standard. It allows the programmer to code the combination of program representations best suited for the control target.

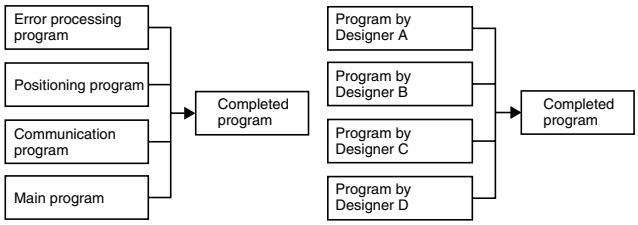
● **Supported representations**

- IL (Instruction List)
- LD (Ladder Diagram)
- FBD (Function Block Diagram)
- ST (Structured Text)
- SFC (Sequential Function Chart)



● **Structured programming**

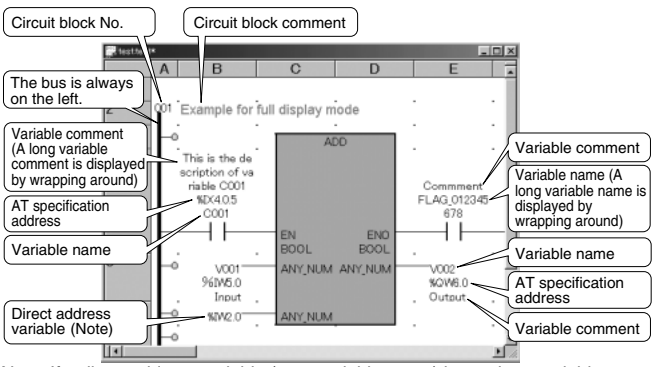
Programming in units of POU or worksheets allows the use of the structured design method by which a program is created by dividing it by functionality or process. This method enables multiple designers to divide the program design among them so that substantial reduction in the program creation time can be achieved.



● **Ladder programming using key operations (grid fixed method)**

Ladder programming can be performed using familiar key operations:

· Standard display mode (variable only)
· Extended display mode (variable + AT specification address)
· All display mode (variable name + AT specification address + variable comment)

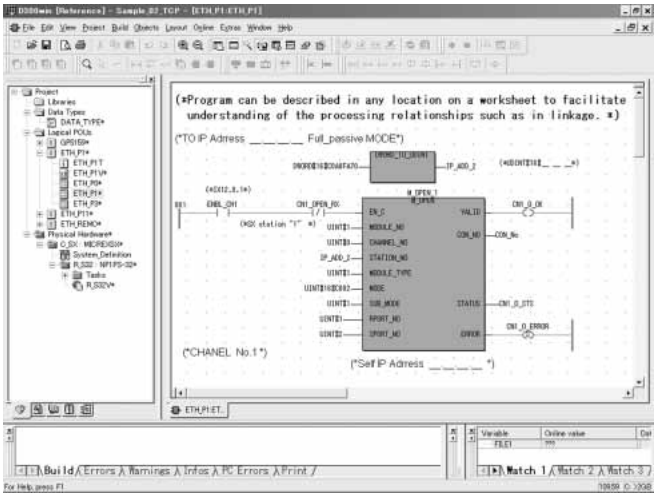


Note: If a direct address variable (= no variable name) is used, no variable comment is displayed, even if it is registered.

● **Free description of programs and comments (Free editing style)**

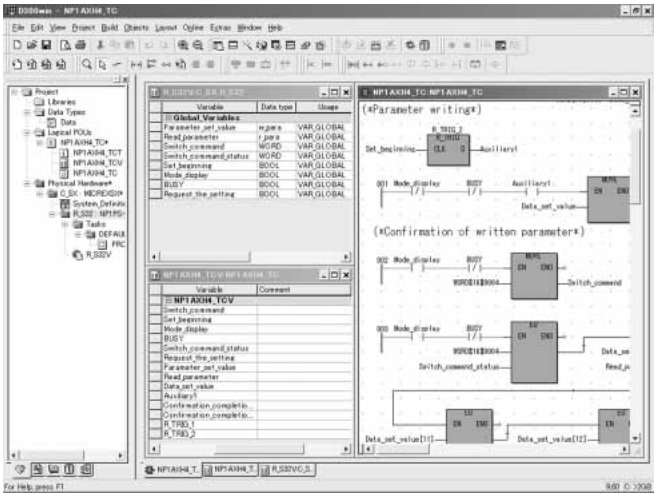
Programs can be described in any location on a worksheet to facilitate understanding of the processing relationships such as in linkage between the interlock condition and the sequence processing section/computing section, allowing efficient programming.

In addition, when a comment is described on a worksheet, the programmer can put a local comment for each circuit block as well as a comment in units of contacts, coils, or circuits, greatly contributing to ease of reading and understanding.



● **Programming with variables (labels)**

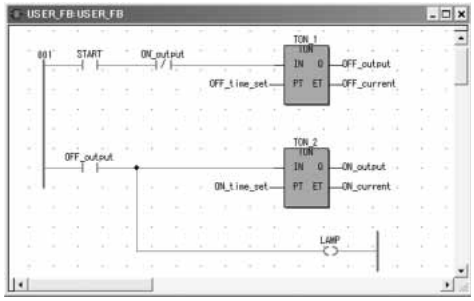
Differing from conventional programming, the Expert (D300win) Programming Support Tool uses label programming (addresses are automatically assigned) in which the address section is described like conventional comments, enabling program coding without being conscious of memory addressing. After the programming, any changes in address assignment can be accommodated by merely changing the corresponding label definition to update the program.



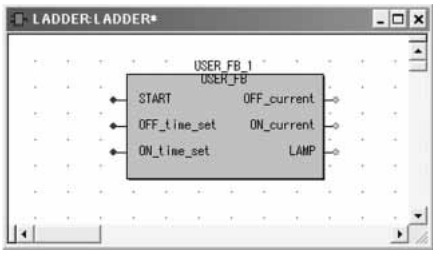
● Integrates user-original circuits into an FB

Frequently used routine programs or circuits can be integrated into an FB so that the programmer can easily reuse them. For FB generation, the user can select a language compatible with IEC 61131-3 supported by Expert (D300win) instead of a special language. If the programs or circuits are stored in library form, the target function can be effectively used without being conscious of debugging.
This is also effective for circuit standardization or structuring if a single control block is integrated into an FB.

• FB internal program (LD/FBD language)

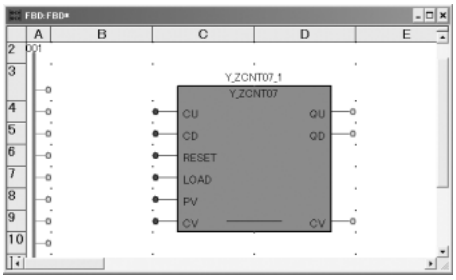


• When FB is used (FBD language)



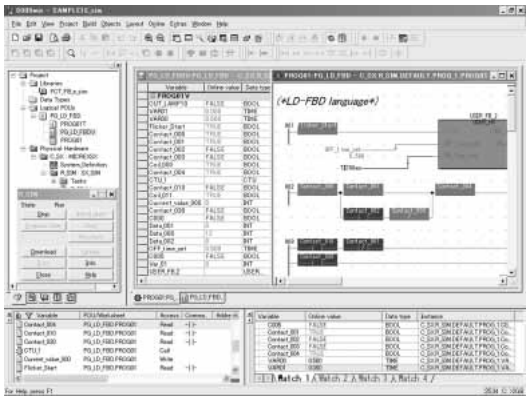
• FB internal program (ST language)

• When FB is used (FBD language)



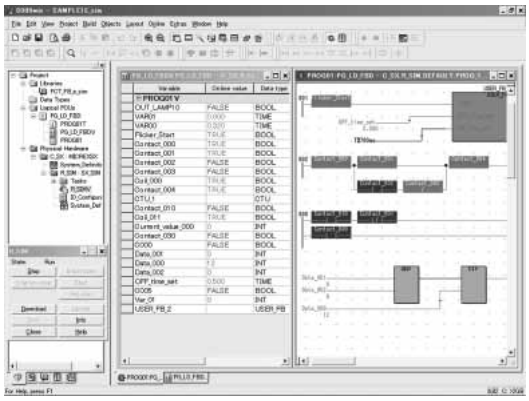
● Simulation function

This tool enables program logic test using the software PLC function for simulation built in Expert (D300win), without using the actual unit.
It performs operating simulation of a program written with a programming language conforming to IEC 61131-3. It enables forced ON/OFF and monitoring of any signal, exhibits its power in remarkable improvement of the programming and debugging efficiency for the SX series.



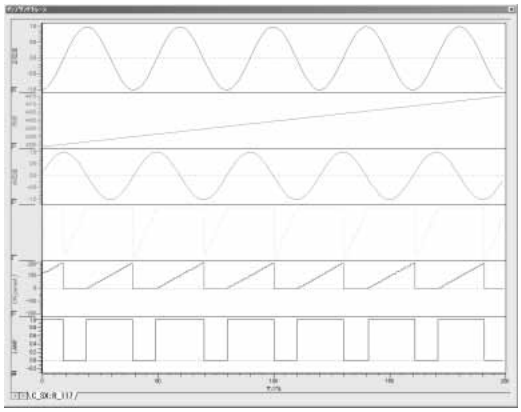
● Error & jump check function

The tool performs program syntax check at the time of program compilation to detect syntax errors. It is possible to jump to an error position by double-clicking an error detection section. This function, together with the cross-reference function and data watch window function, exhibits its power in program correction and testing.



● Sampling trace

Sampling trace function saves variable (memory) data change during PLC is in RUN. It is possible to show sampling data on sampling trace window as graph. Sampling data is automatically saved with project file. This saved sampling data can be exported as csv file (ASCII data).



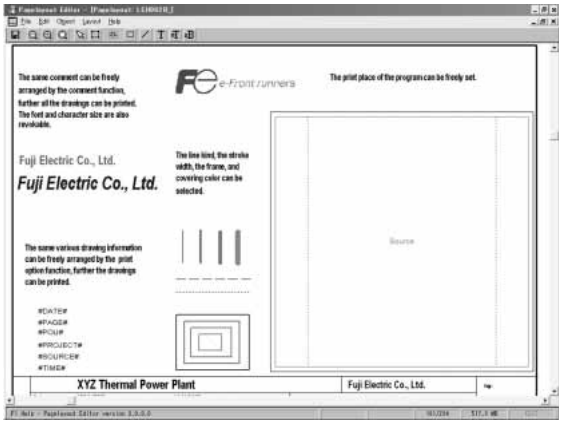
• Documentation function

The documentation preparation function has been substantially improved. Not only can it print drawing numbers, dates, page, and drawing borders, but also company logos and comments. It also augments the print preview function, which allows the user to verify the print state on the screen before beginning printing, and the scaled printing function which eliminates the need to select the paper size.

• Layout function

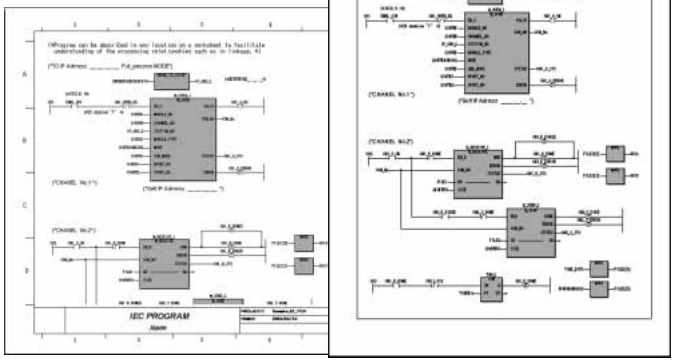
The layout function allows the user to print a program list in a free, user-original format. The created layout can be stored as a layout library, which can be used when necessary.

Frame creation:	Program list can be printed with frames. The frames can be freely designed facilitating reproduction of a conventionally used drawing sheet.
Company logo:	Company logo can be attached to a document. It is created as BMP data and pasted to the frames.
Drawing number:	Drawing number can be placed in a specified position within the frame.
Page:	Page number can be placed in a specified position within the frame.
Comment:	Comments can be placed in a specified position within the frame.



• Preview function

Use of the preview function before printing allows the user to verify the print image.



• Scaled printing

Documents can be printed in enlarged or reduced size. The paper size can be freely selected according to the purpose. The number of programs printed on a single sheet can be freely adjusted to provide united documentation.

• Function module support

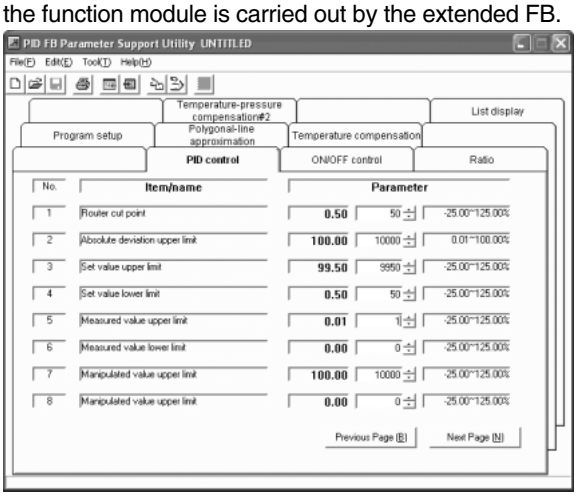
The function module support (built-in each extended FB software package) has been realized as a common support tool. Thus, a dedicated loader is not required.

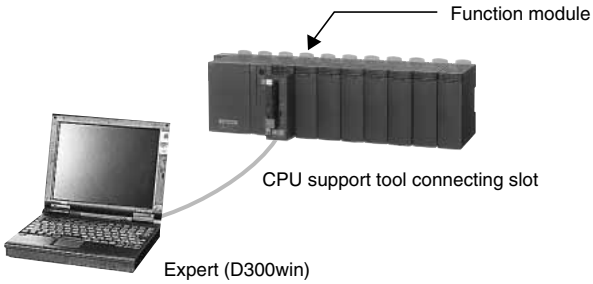
• Sharing program definitions including variable names

Labels and files defined/created with the Expert (D300win) programming support tool can be used as is from the function module support tool. This allows not only reducing the programming workload, but also unifying management of programs.

• Sharing the support tool connection port

The function module support tool can be used even when the IEC programming support tool remains connected to the CPU module. The support function can be used only by starting the function module support tool, thus, it is not necessary to change the connection by replacing the CPU module with the function module. Parameter transmission between the CPU module and the function module is carried out by the extended FB.



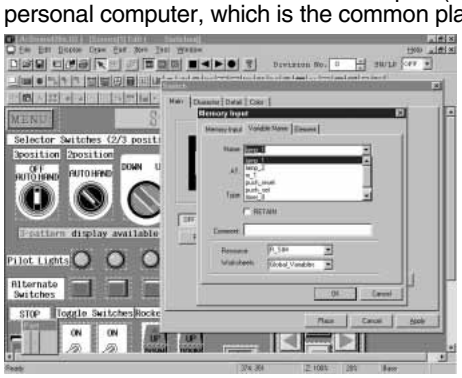


• POD cooperated support

Screen creation for the Programmable Operation Display (POD) can be performed using variable names set with Expert (D300win).

• POD screen creation software

POD screen creation software and Expert (D300win) run on a personal computer, which is the common platform.



● **Multi-user support**
A development environment that allows multiple users to simultaneously access a source project and has a mechanism for exclusive access control is offered. Exclusive control of projects is automatically performed by support tool operations.

- Management, registration, and creation of client projects with respect to a server project
- Check-in/check-out in units of POU

● **USB interface**
The connection method using the full-speed USB (Universal Serial Bus) 1.1 has been added as a loader connection method. Communication with the SPH300 (**NP1PS-□□R**) and SPH2000 can be performed at high speed using a commercial USB cable.

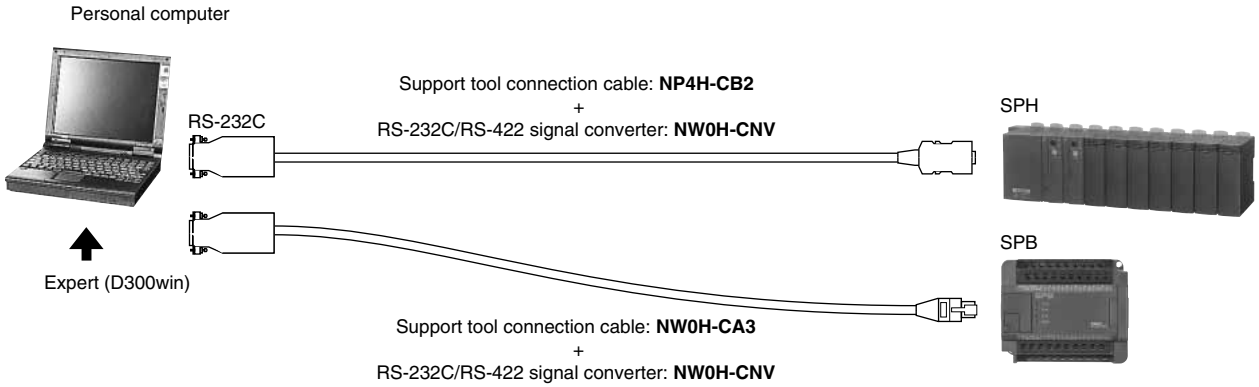
● **Data access to the user ROM**
Projects can be downloaded from/uploaded to the user ROM card (compact flash card) supplied with SPH300 (**NP1PS-□□R**) or SPH2000. Also, data can be written into/read from the user ROM card.

● **SPB SX mode support**
Programming in Expert (D300win) is enabled by rewriting firmware of SPB (small block PLC) using the SPB system software utility attached to the Expert (D300win) software package. For details of the SPB, refer to the chapter of "Related Devices" or the SPB dedicated catalog (No. LEH984).

■ Operating environment

Item		Specification
Hardware		IBM-PC/AT compatible
CPU		Intel Pentium 400MHz or higher (800MHz or higher recommended)
Hard disk		Free space of 140M bytes or more (Expert (D300win) system software: 100MB or more; Standard extension FB software package: 40MB or more)
CD-ROM unit		1 unit (x 4 speed or faster), media: ISO 9660 format
Memory capacity		64M bytes or more (256M bytes or more recommended)
Keyboard		101 keyboard
Mouse		USB mouse, bus mouse, or PS2 mouse
Indicator		800 x 600-dots resolution or higher (1024 x 768-dots resolution or higher recommended)
Communication interface	RS-232C	9600bps-57600kbps (default setup according to resource model selection)
	Ethernet	Possible
	ISDN	Possible (analog port is used)
	USB	Possible with V1.1 (Target CPU: NP1PS-□□R)
	P/PE-link	Possible
	SX bus	Possible
	FL-net	Possible
OS		Windows2000/XP/NT4.0
Portability		Depends on commercial mobile personal computer.
Environmental durability		Depends on environmental conditions of commercial personal computer.

■ System configuration



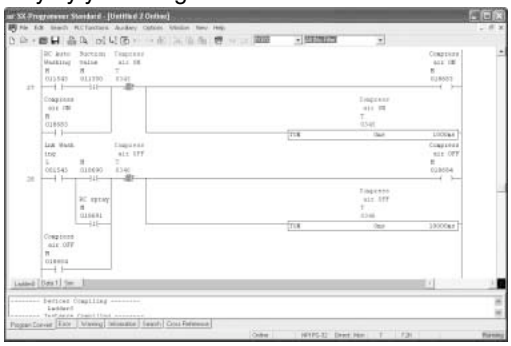
Programming Support Tool

Programming Support Tool SX-Programmer Standard: NP4H-SWN

■ **Features**

• Familiar user interface

The user interface and ladder programming support SPB programming equivalent to a FLEX-PC Windows-compatible PC loader.
Support for full-keyboard operation is also handy for on-site debugging and maintenance. With a whopping 202 different instruction words, the possibilities for your programs are limited only by your imagination.

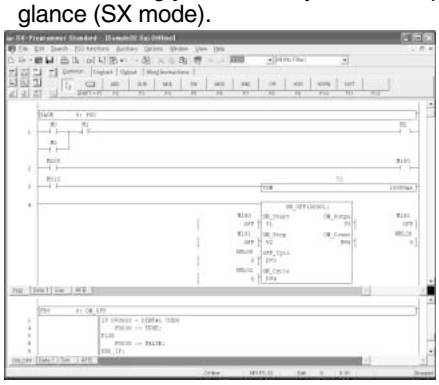


• Compatible with the international standard IEC 61131-3 (JIS B 3503)

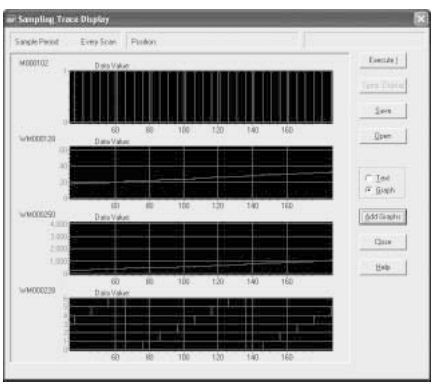
Program representations support the LD language, which is most standard. The ST and FBD programming languages are also supported. Programming in units of POU in which the structured design method is applicable can be performed.

• Full-fledged programming environment

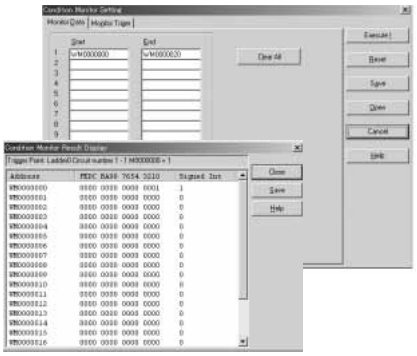
- Programming allows all addresses to be specified, and allows off-line editing (edit and continue).
- Support the Structured design and the parting that used to the FB (Function block).
- Function block (FB) callers are expressed as block-format FBD, enabling you to identify in and out parameters at a glance (SX mode).



- Debugging features
Powerful debugging facilities are provided, including step execution, conditional monitoring, sampling traces, and fault analysis.

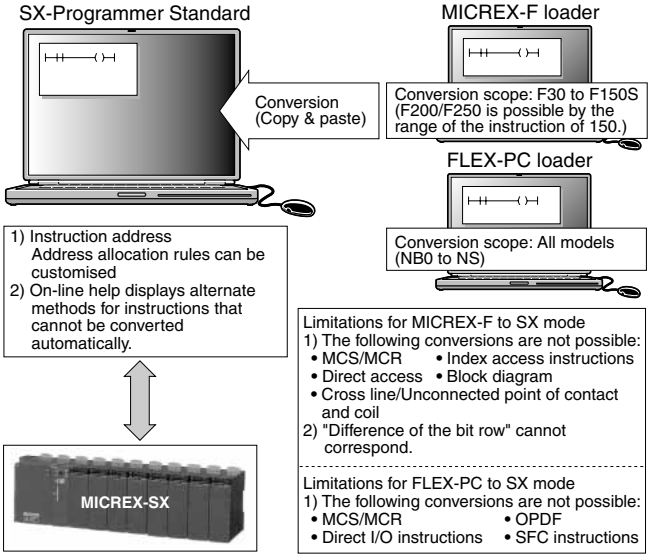


- Conditional monitor function
This is a function to read and display data collected by PLC when conditions are met.
This function enables high-precision analysis.



• Leverage your program assets

In SX mode, you can copy and paste your programs from our FLEX-PC series PLCs. On-line help describes alternate methods for circuits and instructions that cannot be pasted in. In N mode, use your program and comment files as-is.

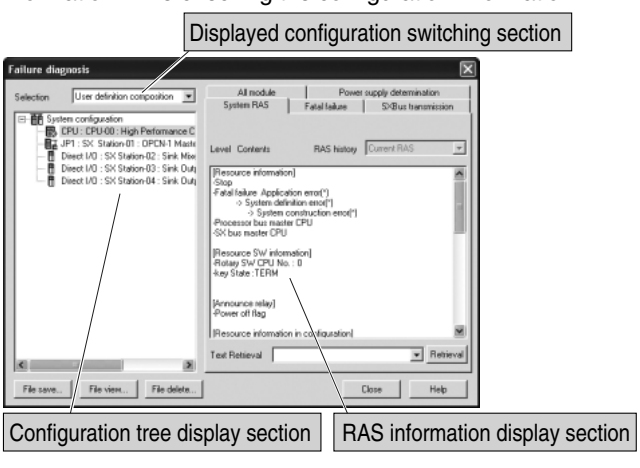


• Resume feature

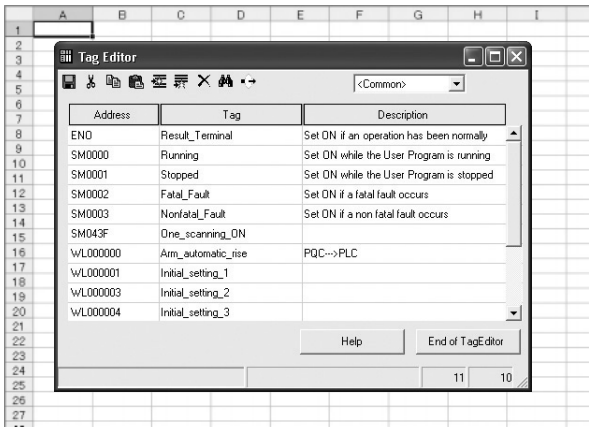
When the software is started, the previous edit/monitor position is automatically displayed.
When you go on-line, monitoring starts at the position you were monitoring last time. When you are off-line, the system transitions to edit mode displaying the point you were editing last time.

• Failure diagnostic function

Failure diagnosis is easy because you can analyze failure information while checking the configuration information.



● **Link with spreadsheet program**
Directly copy comments edited/created in a spreadsheet program (Excel) into your program.



● **USB interface**
The connection method using the full-speed USB (Universal Serial Bus) 1.1 has been added as a loader connection method. Communication with the SPH300 (**NP1PS-□□R**) and SPH2000 can be performed at high speed using a commercial USB cable.

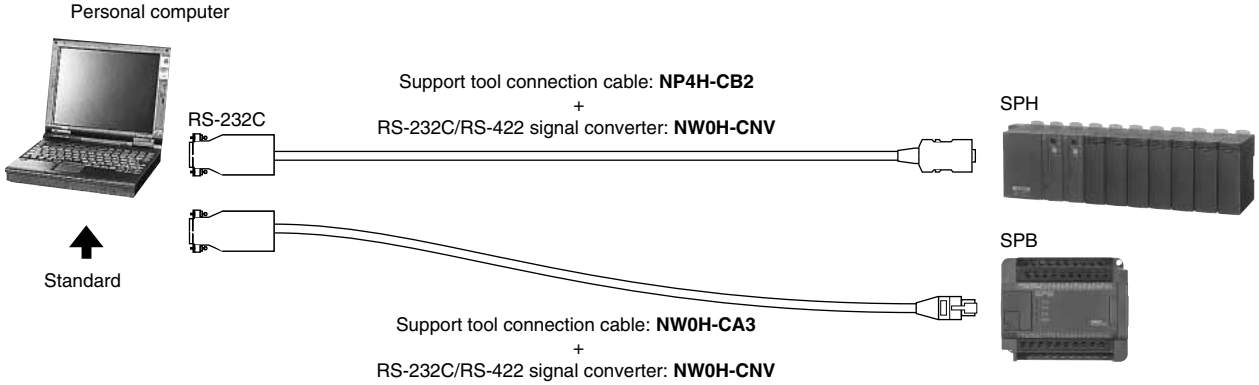
● **Data access to the user ROM**
Projects can be downloaded from/uploaded to the user ROM card (compact flash card) supplied with SPH300 (**NP1PS-□□R**) or SPH2000. Also, data can be written into/read from the user ROM card.

● **Support also of SPB and FLEX-PC programming**
Standard supports three types of programming (SPH, SPB, and FLEX-PC).
However, there is no SPH program compatibility between Standard and Expert (D300win).
Program editing can be performed by selecting SPB (N mode/SX mode), SPH, or FLEX-PC during file selection after activation.

■ Operating environment

Item		Specification
Hardware		IBM-PC/AT compatible
CPU		Intel Pentium 233MHz or higher (350MHz or higher recommended)
Hard disk		Free space of 200M bytes or more
CD-ROM unit		1 unit (x 4 speed or faster), media: ISO 9660 format
Memory capacity		64M bytes or more (256M bytes or more recommended)
Keyboard		101 keyboard
Mouse		USB mouse, bus mouse, PS2 mouse
Indicator		800 x 600-dots resolution or higher (1024 x 768-dots resolution or higher recommended)
Communication interface	RS-232C	9600bps-57600kbps (default setup according to resource model selection)
	Ethernet	Possible
	ISDN	Possible (analog port is used)
	USB	Possible with V1.1 (Target CPU: NP1PS-□□R)
	P/PE-link	Possible
	SX bus	Possible
	FL-net	Possible
OS		Windows95/98/ME/2000/XP/WindowsNT4.0
Portability		Depends on commercial mobile personal computer.
Environmental durability		Depends on environmental conditions of commercial personal computer.

■ System configuration



Programming Automatic Generation Tool SC Matrix: NP4H-SESV2 [Japanese Version]

■ Features

● Suitable for process step control

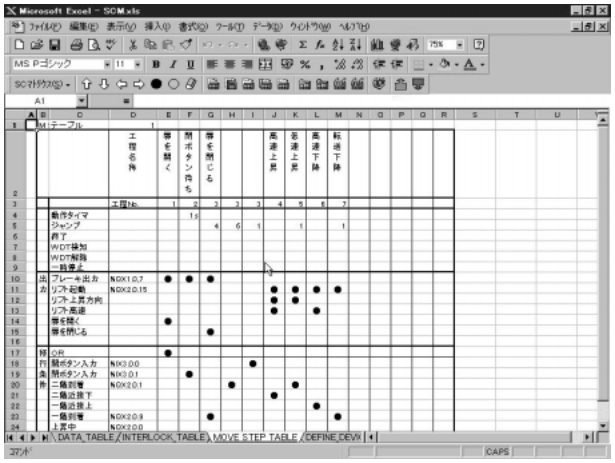
This programming tool is intended to create process step control programs necessary for machine control and line control.

● Matrix programming using Excel

The SC matrix operates on Microsoft Excel. Process step programming is made simply by setting I/O conditions on a matrix basis using Excel worksheets. Program downloading to the PLC is performed by means of Expert (D300win).

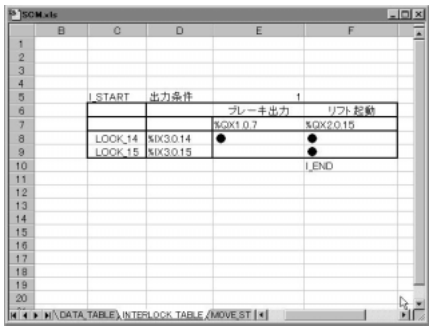
SC matrix table

This table is used to set the process step condition and output conditions for each process. Up to 98 processes and up to 100 transitional conditions can be described in one table. Up to 64 Excel worksheets can be registered, allowing creation of up to 64 tables.



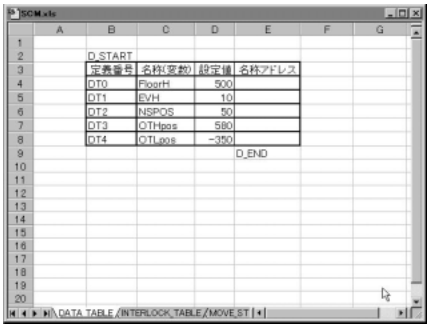
Output condition table

This table defines the devices to be output to a specific input. It corresponds to the SC matrix table and allows setting of interlock condition for each output. The condition is monitored regardless of the process step and, if a condition is met, the specified device is turned ON.



Data table

This table defines the data trains to be transferred to the PLC using the SC matrix table. It relates the definition number starting with “DT” to the setting and target device. Data trains of up to 4000 points can be set as integers or double-precision integers. Multiple data tables can be registered which can be selected during each operation.



● Programming by variable (label)

Like Expert (D300win), since variables can be used for the PLC address, programming can be made without being aware of the memory address.

● Automatic generation programming

PLC programs are generated automatically by compiling programs created on Excel. PLC programs can be created without the knowledge of programming languages specific to the PLC, allowing PLC novices to make programs easily.

● Monitoring

The PLC monitor can also be displayed in the same screen as the Excel worksheet. This makes it easier to grasp the machine process step and perform adjustment and maintenance of machines.

Overall monitor

This screen monitors the entire SC matrix table. It is suitable for overlooking the entire process operation. Other tables can be monitored easily by switching between worksheets.

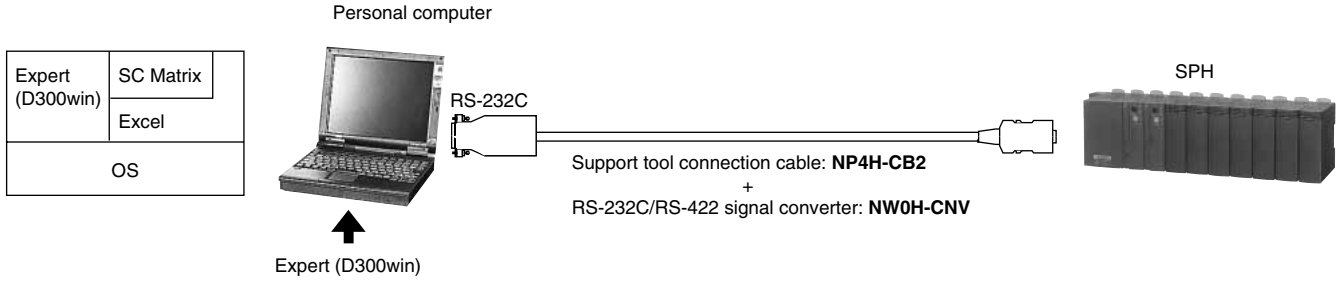
Partial monitor

This screen monitors only the current process being executed. It displays the relationship between the operating output signal and the transitional conditions.

■ Operating environment

Item		Specification
Hardware		IBM-PC/AT compatible
CPU		Intel Pentium 233MHz or higher
Hard disk		Free space of 10M bytes or more (with additional disk space for Expert (D300win) and Excel)
CD-ROM unit		1 unit (x 4 speed or faster), media: ISO 9660 format
Memory capacity		32M bytes or more (64M bytes or more recommended)
Keyboard		101 keyboard
Mouse		USB mouse, bus mouse, PS2 mouse
Indicator		800 x 600-dots resolution or higher (1024 x 768-dots resolution or higher recommended)
Communication interface	RS-232C	9600bps to 57600kbps
	Ethernet	Possible
	ISDN	Possible (analog port is used)
	USB	Possible with V1.1 (Target CPU: **NP1PS-□□R**)
OS		Windows95/98/2000/NT4.0
Excel version		Excel97/2000
Portability		Depends on commercial mobile personal computer.
Environmental durability		Depends on environmental conditions of commercial personal computer.

■ System configuration



MC Module Programming Support Tool: NP4H-MC1 [Japanese Version]

This tool is used to create and support MC module programs. It allows parameter setup, tabular form programming, monitoring, etc.

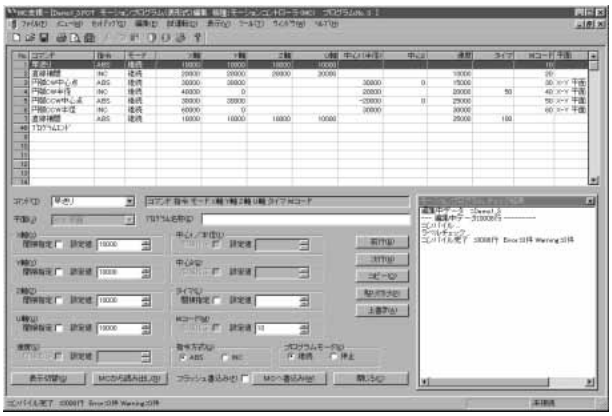
■ Editing positioning parameters

This tool allows diverse parameter setups for performing position control using the MC module.

I/O selection parameters:	I/O area setup, initial value, axis name, etc.
Interpolation operation parameter:	Synthetic high-speed limiter, acceleration/deceleration time, etc.
Axis control standard parameter:	Actuator control information (up to 8 axes)

■ Editing positioning parameters

This tool allows editing of MC module positioning programs in tabular form.
Programming with up to 2500 lines can be performed, allowing execution of a large program.



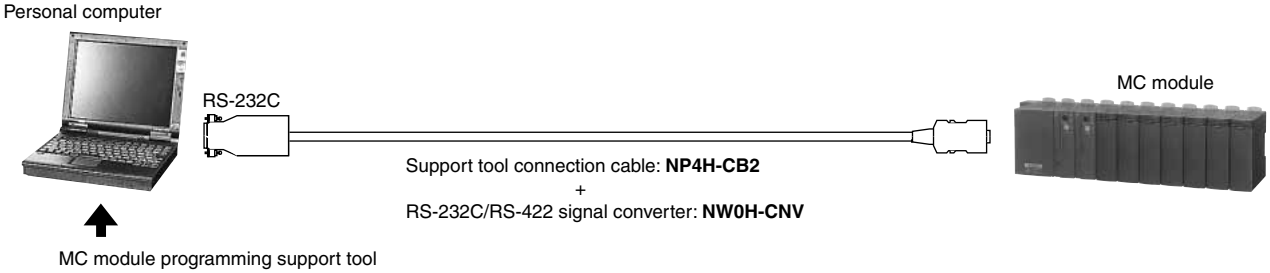
■ Offline operation for parameter setup information check

Machines connected to a motor can be operated without intervention of an SPH application, thus preventing machine failure at the time of debugging and maintenance.
The functions include alarm reset, position preset, return-to-origin, manual feed, deviation reset, etc.

■ Operating environment

Item		Specification
Hardware		IBM-PC/AT compatible
CPU		Intel Pentium 233MHz or higher
Hard disk		Free space of 10M bytes or more
CD-ROM unit		1 unit (x 4 speed or faster), media: ISO 9660 format
Memory capacity		32M bytes or more (64M bytes or more recommended)
Keyboard		101 keyboard
Mouse		USB mouse, bus mouse, PS2 mouse
Indicator		800 x 600-dots resolution or higher (1024 x 768-dots resolution or higher recommended)
Communication interface	RS-232C	38400bps
OS		Windows95/98/XP/NT4.0
Portability		Depends on a commercial mobile personal computer.
Environmental durability		Depends on environmental condition of a commercial personal computer.

■ System configuration

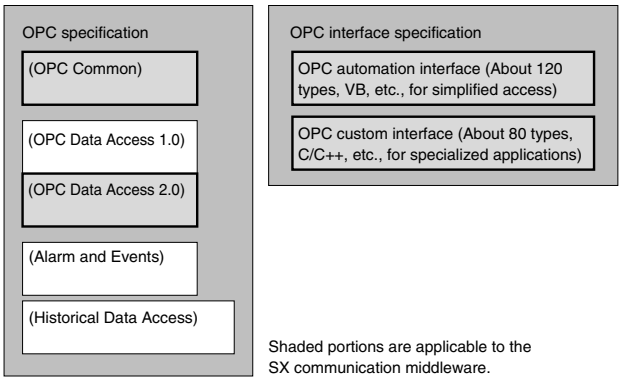


OPC-Coordinated Library SX Communication Middleware: NP4N-MDLW

■ Features

- **OPC-coordinated library**
  Among various specifications established by OPC Foundation, this library is compatible with the OPC common specification and data access specification. The OPC automation interface and OPC custom interface are prepared as programming interfaces.

- In combination with a commercial SCADA software (RSView32 from ROCKWELL AUTOMATION, Intouch from Wonderware, etc.), this library makes it possible to display the SPH-controlled data to the supervisory screen and utilize the data for the SPH setup data from the operation screen.



Shaded portions are applicable to the SX communication middleware.

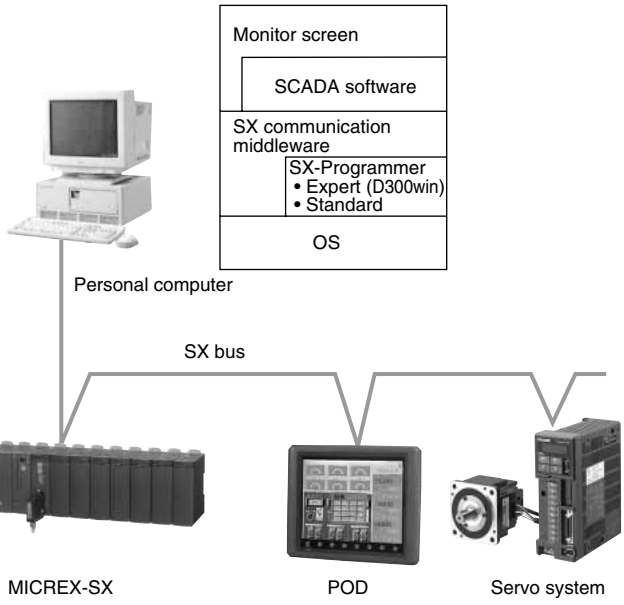
■ Operating environment

Item		Specification
Hardware		IBM-PC/AT compatible
CPU		Intel Pentium 233MHz or higher
Hard disk		Free space of 10M bytes or more (with additional disk space for Programming support tool)
CD-ROM unit		1 unit (x 4 speed or faster), media: ISO 9660 format
Memory capacity		128M bytes or more
Keyboard		101 keyboard
Mouse		USB mouse, bus mouse, or PS2 mouse
Indicator		1024 x 768-dots resolution or higher
Communication interface	Ethernet	Commercial Ethernet board
	RS-232C	Commercial personal computer
	Modem	Commercial personal computer
	FL-net	Commercial Ethernet board
Software (OS)		Windows NT4.0/2000
Environmental durability		Depends on environmental condition of a commercial personal computer.
Models to be connected		MICREX-SX SPH series
Language for user application software development		Microsoft Visual Basic Microsoft Visual C++

■ Sample application system

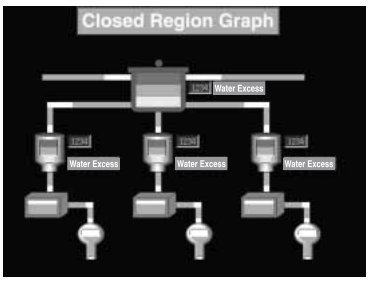
The example at right is a centralized monitor system for line equipment configured using SPH as a controller.

- The monitor screen makes status display and data collection of each I/O device.
- The operation screen sets production command data for each line.



■ Sample application monitor screen

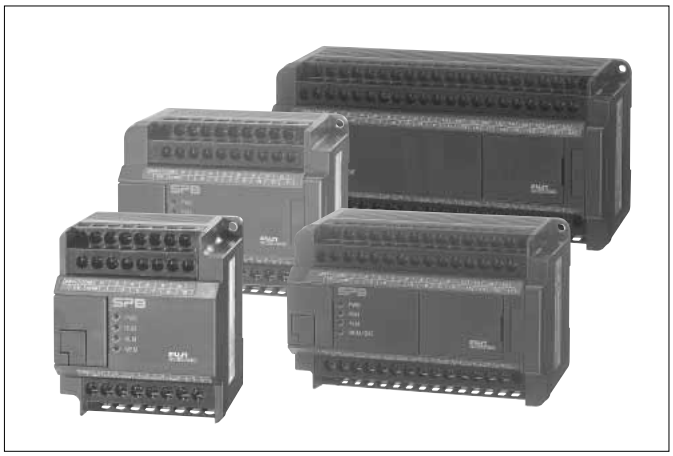
The following is a sample application monitor screen using the SCADA software.



The SX communication middleware accommodates system business talks. For details, please contact our sales section.

Small Block PLC SPB: NW0P-□

High-performance SPB programmable logic controller is packed with many useful function in a compact body.



■ Features

● Compact size

The SPB is a compact size in which the installation place is not chosen.
Ideal for reducing control panel space.

	External Dimensions (mm)		
	Width	Height	Depth
20-points basic unit	80	90	81
30-points basic unit	110	90	81
40-points basic unit	140	90	81
60-points basic unit	180	90	81
16-points expansion unit	64	90	81
32-points expansion unit	110	90	81
60-points expansion unit	180	90	81

● Two programming languages

With one type of hardware, SPB is applicable to two programming languages:
- SX mode: MICREX-SX (language compliant with IEC)
- N mode: FLEX-PC N (language of ladder and instruction words)

● Large-capacity memory

Programming with rich memory

	Memory capacity			
	Program memory		Data memory	
Type	SX mode * 1	N mode	SX mode	N mode
20points basic unit	2 Ksteps	4Ksteps	5 Kwords	9 Kwords
30points basic unit				
40points basic unit	4 Ksteps	8 Ksteps	8.5 Kwords	
60points basic unit				

* 1 There are Included the initiated value of the retain memory.

● High-speed processing

Ideal for small-size machines requiring fast processing.
Fast 0.44 μs. per Sequence instruction and 2.19 μs (N mode). and 1.50 μs (SX mode). for Data instructions.

● Many types of instructions

Many types of instructions allow ease of programming.
The program size can be reduced by effectively using a combination of instruction words.
SX mode: 202 types, N mode: 211 types.

● Online program edit function

Allows program modification without interrupting machine operation.

● International standards conformity

All SPB models conform to the UL/cUL standards as well as the CE mark standard.
Conforms to the CE marking, UL standard and RoHS directive (conforming one after another) as well as IEC standard.

● Two analog timers

Two analog timers are built in for convenient fine-tuning and testing.

● Communication & Networking

Communication adapters are available for RS-232C, RS-485, and simplified personal computer link connections.

● POD direct connection

The SPB can be connected to the POD via the loader port. No special communication unit is required.

● Diversified functions for expanding applications
- Internal high-speed counter function
- Interrupting function
- Pulse train output function
- Pulse catch function
- Constant scan setting
- Pulse width modulation function

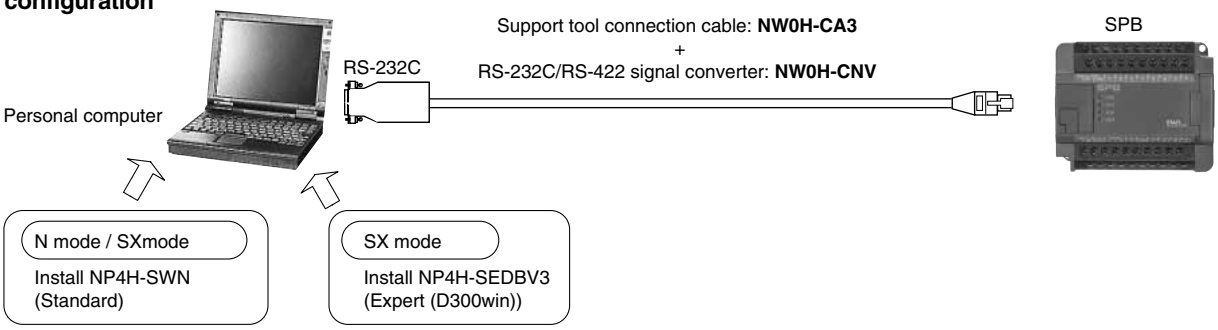
● Adapted to analog control

Multi-range (voltage / current) adapted. 3 types of analog unit with detachable terminal blocks are added to the lineup.
Capable of analog control, such as temperature control by PID instruction.

● Self-lifting terminal block & Finger protection

Use of the self-lifting terminal block - the terminals automatically pop up when unscrewed, reducing the wiring works and preventing less of screws. The finger protection structure ensures safety.

■ System configuration



PCI-Bus-Based SPH300 CPU Board : NP3PS-SX1PCS□□

■ Features

- The board is provided with an extension connector of the SX bus, allowing connection to diverse SX-based devices (indicators, remote I/Os, servo units, etc.) as well as standalone operation on a personal computer.
- When programming supporting tool Expert (D300win) conforming to IEC is installed in a personal computer with this board mounted, programming and maintenance can be performed from the personal computer. Like the SPH300, this board is provided with a loader connector as standard. This makes it possible to perform programming and maintenance also from other personal computers with Expert (D300win).
- This board is connected to the PCI bus through 8K-word dual port memory, allowing high-speed data transmission. It can interface to applications for personal computers.
- A communication driver for data access with this board has been prepared.

NP3PS-SX1PCS32
AF02-79

- Using the high-speed data exchange function, data in the standard memory of PLC can be read at high speed from the personal computer or data can be written into the standard memory.

■ Performance specifications

Performance and specifications of the built-in board type CPU board **NP3PS-SX1PCS32/NP3PS-SX1PCS74** are equivalent to those of the module type **NP1PS-32/NP1PS-74**.

Built-in board type	Module type	Program memory capacity
NP3PS-SX1PCS32	**NP1PS-32**	32768 steps
NP3PS-SX1PCS74	**NP1PS-74**	75776 steps

For details on performance and specifications, refer to “CPU Module: **NP1PS-**□□” on this catalog.

■ Operating environment

Item	Specification
Hardware	IBM-AT compatible * 1
CPU	Intel Pentium 233MHz or higher
Hard disk	Free space of 10M bytes or more (and necessary disk capacity for Expert (D300win) too)
CD-ROM unit	At least 1 unit, (x 4 speed or faster recommended), media: ISO 9660 format
Memory capacity	32M bytes or more (256M bytes or more recommended for Expert (D300win) operation)
Keyboard	101 English keyboard
Mouse	USB mouse, bus mouse, PS2 mouse
Indicator (resolution)	800 x 600-dots resolution or higher
Operating system	Windows2000/XP/NT4.0
Environmental durability	Depends on environmental conditions of commercial personal computer.
Others	TCP/IP protocol

* 1 This board is not applicable to the multi-CPU configuration. Use a personal computer with the single-CPU configuration.

PCI-Bus-Based OPCN-2 (FL-net) Ver. 2.0 Board: NP3L-FL2PCS

■ Features

- Two different communication functions by application
  With cyclic communication, this board supports both the common memory function, which allows each node to share the same data, and the message communication function, which exchanges only necessary information when required.
- Large capacity common memory
  The capacity of the common memory is 8K bits and 8K words.
- High-reliability by the master-less method
  Since no master exists, participation and removal of each node can freely be performed without affecting communication of other nodes. The power of any node can be turned ON or OFF, allowing easy maintenance.

NP3L-FL2PCS
AF02-80

■ Performance specifications

Performance and specifications of the built-in board type FL-net board NP3L-FL2PCS are equivalent to those of the module type NP1L-FL2.

For details on performance and specifications, refer to “OPCN-2 (FL-net) Ver. 2.0 Module: NP1L-FL2” on this catalog.
This board conforms, however, only to the transmission specification 10BASE-T, and not to 10BASE5.

■ Operating environment

Item	Specification
Hardware	IBM-AT compatible
CPU	Intel Pentium 233MHz or higher
Hard disk	Free space of 10M bytes or more (and necessary disk capacity for Expert (D300win) too)
CD-ROM unit	At least 1 unit, (x 4 speed or faster recommended), media: ISO 9660 format
Memory capacity	64M bytes or more (256M bytes or more recommended for Expert (D300win) operation)
Keyboard	101 English keyboard
Mouse	USB mouse, bus mouse, PS2 mouse
Indicator (resolution)	800 x 600-dots resolution or higher
Operating system	Windows2000/XP/NT4.0
Environmental durability	Depends on environmental conditions of commercial personal computer.
User's application development language	Microsoft Visual Basic Microsoft Visual C++
Others	TCP/IP protocol

PCI-Bus-Based LE-net Loop 2 Board: NP3L-LL2PCS

NP3L-LL2PCS
KD04-018

■ Features

- LE-net is an original network of Fuji Electric. It is a low-priced link module between processors to conduct communication with other nodes connected to the LE-net.
- Using the LE-net, broadcast communication and message communication can be conducted.
- The LE-net can be connected either as a multi-drop network or a single loop redundant wiring network. The loop network includes a loop-2 network in which the user data send/receive area is extended.
- If the transmission line is broken, a transmission error occurs in a multi-drop network, but in a loop network, data communication between nodes can continue. This enables construction of a highly reliable system at a relatively low cost.
- It is possible for the loop-2 module to make the LE-net modules redundant by using the redundancy maintenance FB (provided free of charge). The single configuration and the redundant configuration can coexist within a loop.
- Since this board uses the loop 2 mode, LE-net loop 2 modules can be connected to the same system.

■ Performance specifications

Performance and specifications of the built-in board type LE-net loop 2 board NP3L-LL2PCS are equivalent to those of the module type NP1L-LL2.

However, the board cannot be made redundant.
For details on performance and specifications, refer to “LE-net loop 2 Module: NP1L-LL2” on this catalog.

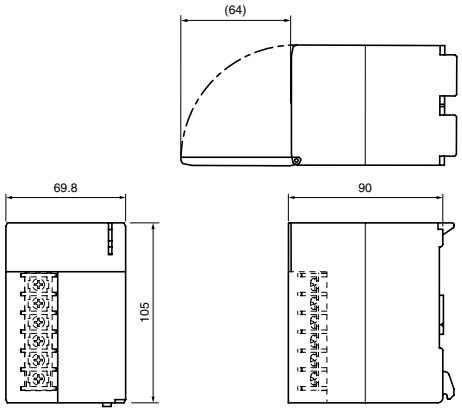
■ Operating environment

Item	Specification
Hardware	IBM-AT compatible
CPU	Intel Pentium 300MHz or higher
Hard disk	Free space of 10M bytes or more
CD-ROM unit	At least 1 unit, (x 4 speed or faster recommended), media: ISO 9660 format
Memory capacity	128M bytes or more recommended
Keyboard	101 English keyboard
Mouse	USB mouse, bus mouse, PS2 mouse
Indicator (resolution)	800 x 600-dots resolution or higher
Operating system	Windows2000/XP/NT4.0
Environmental durability	Depends on environmental conditions of commercial personal computer.
User's application development language	Microsoft Visual Basic Microsoft Visual C++
Others	TCP/IP protocol

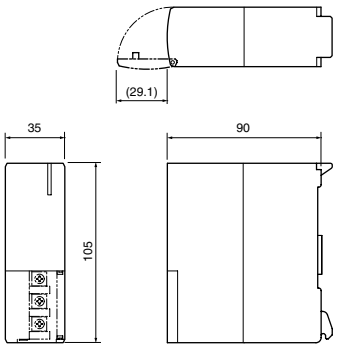
■ Dimensions

(1) Power supply module

1) **NP1S-22**, **NP1S-42**

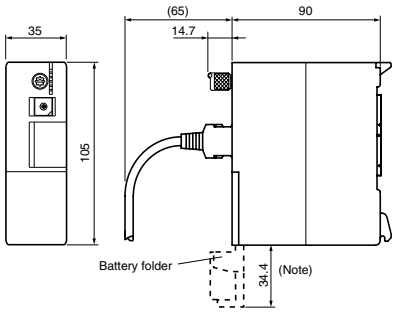


2) **NP1S-91**, **NP1S-81**



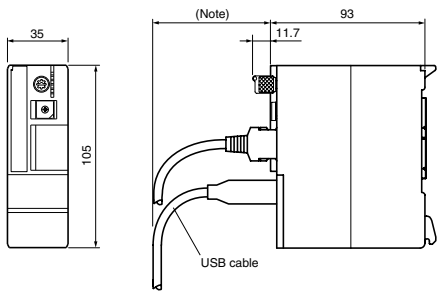
(2) CPU module

1) SPH200 **NP1PH-16**, **NP1PH-08**



Note: For the SPH200, open the battery folder at an angle of 180° when user ROM card is removed.

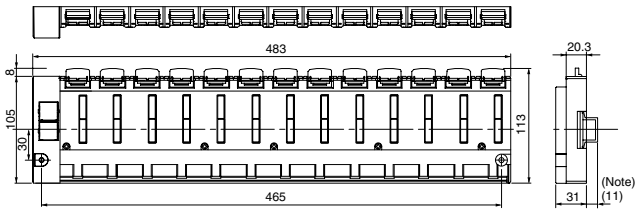
2) SPH300 (User ROM card adapted CPU)
NP1PS-32/32R, NP1PS-74/74R, NP1PS-117/117R, NP1PS-245R, NP1PM-48R/48E, NP1PM-256E



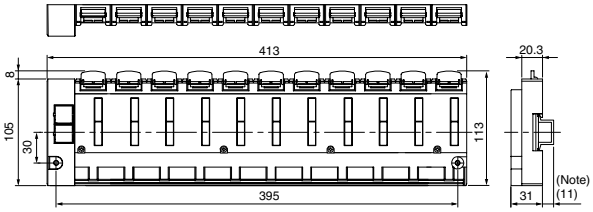
Note: For bend radius, check the specification for the loader cable you use.

(3) Base board

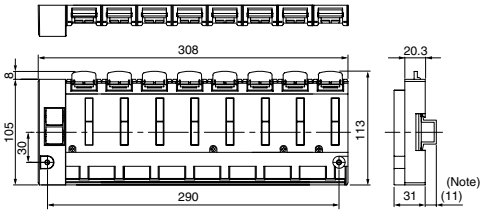
1) **NP1BP-13**, **NP1BS-13, NP1BP-13S, NP1BS-13S, NP1BP-13D**



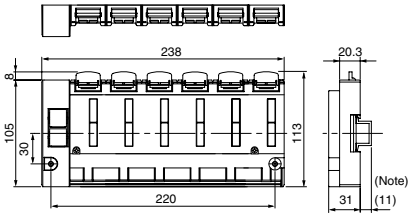
2) **NP1BS-11, NP1BS-11S**



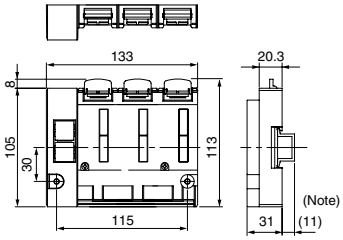
3) **NP1BS-08, NP1BS-08S**



4) **NP1BS-06**



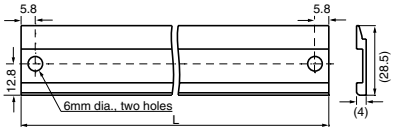
4) **NP1BS-03**



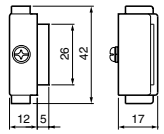
Note: ( ) means to use the rail (TH35-15AL) made by FUJI.

(4) Base board mounting bracket (accessories for base board)

Type	L (mm)
For NP1BP-13/NP1BS-13/NP1BP-13S/NP1BS-13S/NP1BP-13D	476.5
For NP1BS-11/NP1BS-11S	406.5
For NP1BS-08/NP1BS-08S	301.5
For NP1BS-06	231.5
For NP1BS-03	126.5

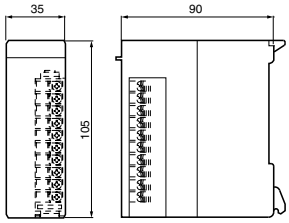


(5) Base board mounting stud **NP8B-ST**



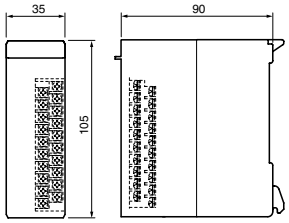
(6) I/O module

1) 6-point/8-point module (digital)

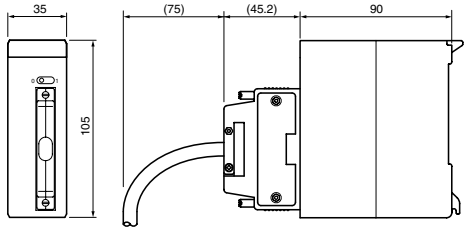


Note: Transistor sink 8-point output type (NP1Y08T0902) and SSR 8-point output type (NP1Y08S) are equivalent to the 16-point module below.

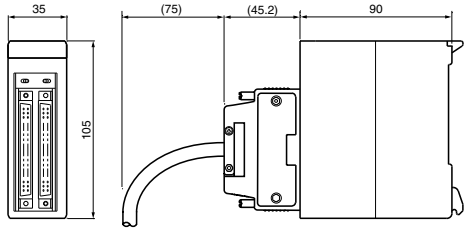
2) 16-point module (digital) / Analog input module / Analog output module
(**NP1AY□2-MR**, **NP1AX□4-MR**, **NP1AX08V-MR, NP1AX08V-MR**)



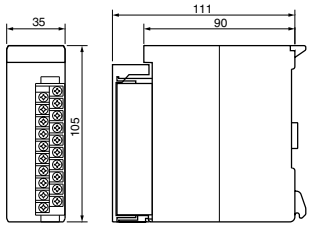
3) 32-point module



4) 64-point module

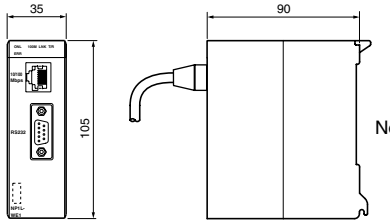


5) Terminal block protrusion module
(Resistance temperature sensor input module **NP1AXH4-PT**,
Thermocouple input module **NP1AXH4-TC**,
Analog I/O module
NP1AXH8□-MR, **NP1AYH8□-MR**, **NP1AYH4□-MR**)



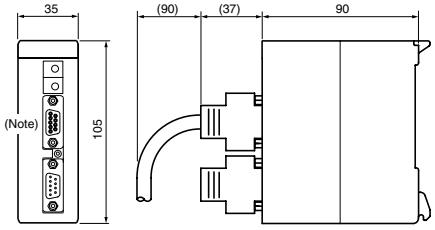
(7) Communication module

1) Web module **NP1L-WE1**, **NP1L-ET1/ET2**

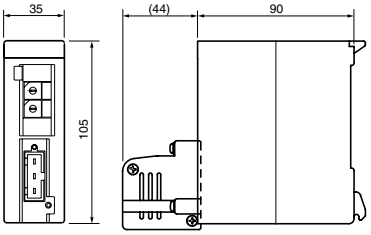


Note: This differs by type, whether or not connectors and switches exist, but outside dimensions are the same for all types.

2) General purpose communication module **NP1L-RS1/2/3/4**,
PROFIBUS-DP master module **NP1L-PD1**,
PROFIBUS-DP slave module **NP1L-PS1**

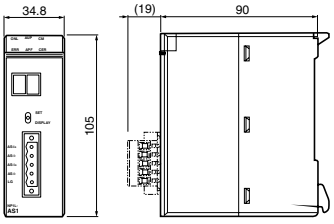


3) T-link master module **NP1L-TL1**,
T-link slave module **NP1L-TS1**,
T-link interface module **NP1L-RT1**,
P-link module **NP1L-PL1**,
PE-link module **NP1L-PE1**,
OPCN-1 master module **NP1L-JP1**,
OPCN-1 slave module **NP1L-JS1**,
OPCN-1 interface module **NP1L-RJ1**

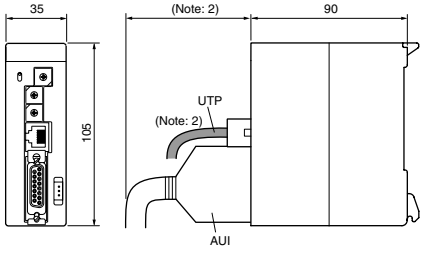


Note: This differs by type, whether or not connectors and switches exist, but outside dimensions are the same for all types.

4) AS-i master module **NP1L-AS2**

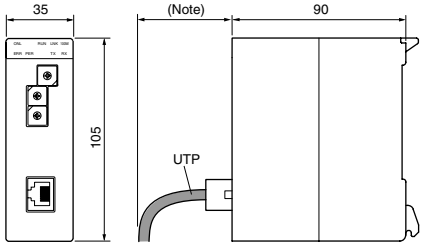


5) FL-net module **NP1L-FL2**,
ADS-net module **NP1L-AD1**



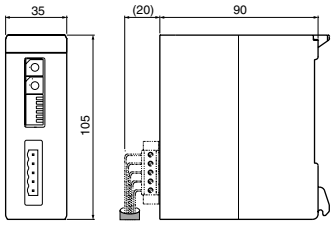
Note: 1) This differs by type, whether or not switches exist, but outside dimensions are the same for all types.
Note: 2) For AUI and UTP cables, you need to take connector dimensions and cable bend into consideration. (For bend radius, check the specification for the cable you use.)

6) FL-net module **NP1L-FL3**

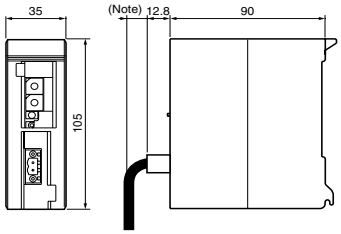


Note: For AUI and UTP cables, you need to take connector dimensions and cable bend into consideration. (For bend radius, check the specification for the cable you use.)

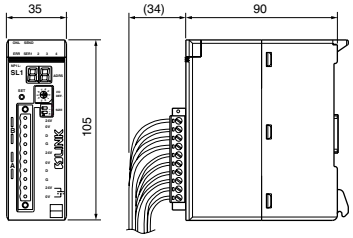
7) DeviceNet master module **NP1L-DN1**,
DeviceNet interface module **NP1L-RD1**



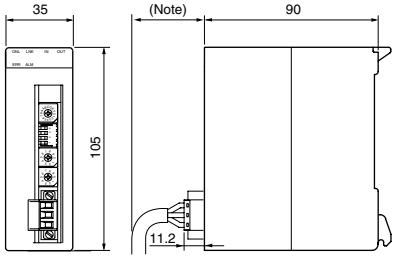
8) LonWorks interface module **NP1L-LW1**



9) S-LINK master module **NP1L-SJ1**

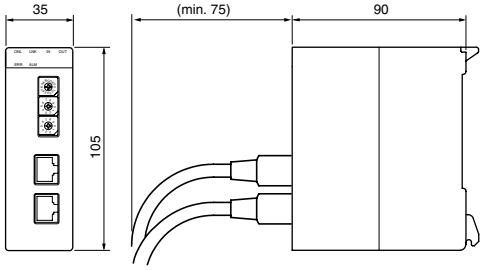


10) LE-net module **NP1L-LE1**

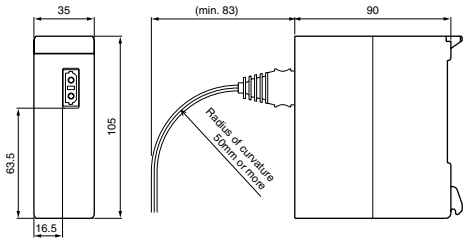


Note: Consider the bend of the cable you use.

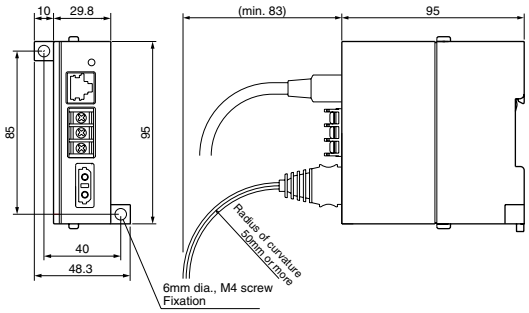
11) LE-net loop module **NP1L-LL1,**
LE-net loop module **NP1L-LL1**



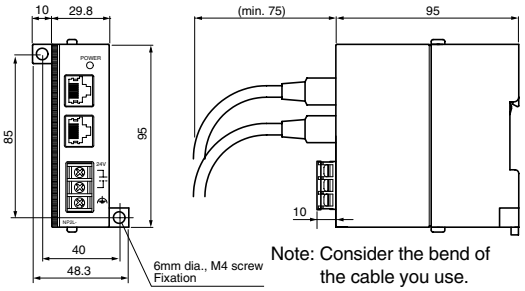
12) SX bus optical link module **NP1L-OL1**



13) SX bus optical link converter **NP2L-OE1**



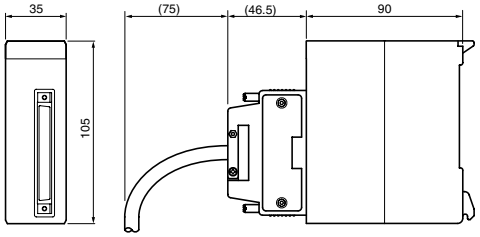
14) SX bus electrical repeater **NP2L-RP1**



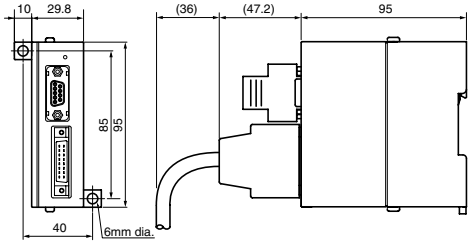
Note: Consider the bend of the cable you use.

(8) Positioning control module / Unit

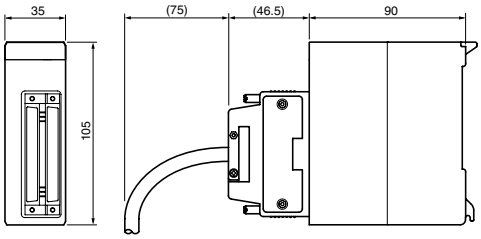
1) High-speed counter modle **NP1F-HC2**, **NP1F-HC2MR**, **NP1F-HC2MR1**,
Multi channel high-speed counter module **NP1F-HC8**



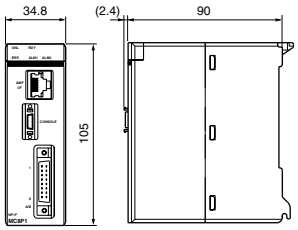
2) Signal converter **NP2F-LEV**



3) Positioning control module **NP1F-MA2**, **NP1F-MP2**, **NP1F-HP2**

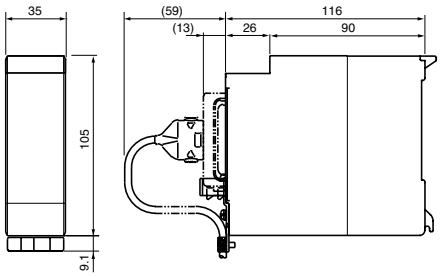


4) Motion control module **NP1F-MC8P1**

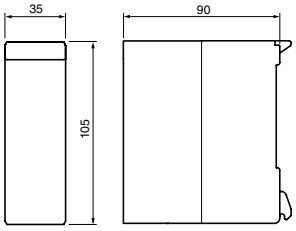


(9) Function module / Unit

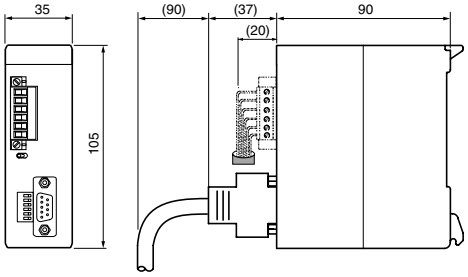
1) Memory card interface module **NP1F-MM1**



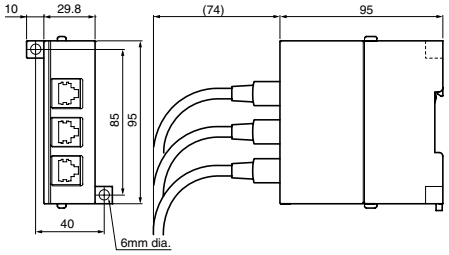
2) Dummy module **NP1F-DMY**



3) Multi-use communication module **NP1F-MU1**

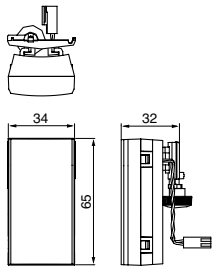


4) SX bus T-branch unit **NP8B-TB**

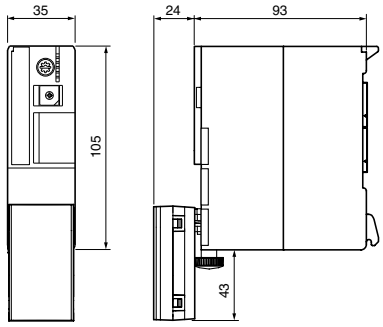


(10) Oputions

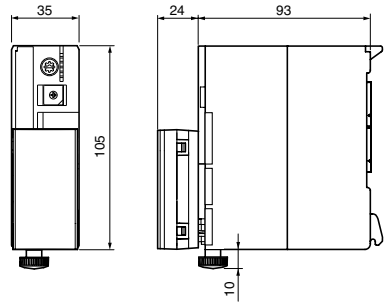
1) Battery box **NP8P-BTS**



• Dimension at lower installation

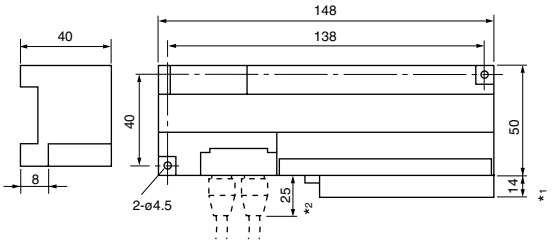


• Dimension at upper installation



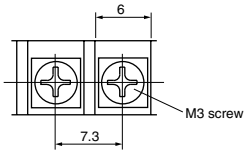
(11) I/O Terminal

1) NR1 series **NR1** □

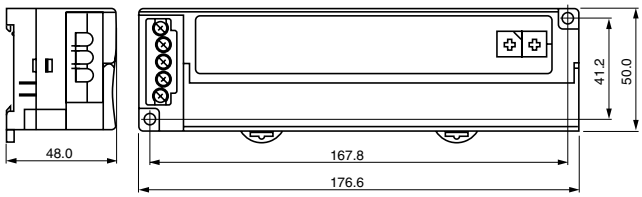


*1) When the extension terminal block is mounted.
*2) When the SX bus-adapted unit is connected.

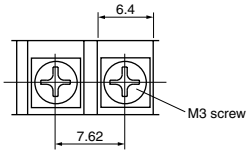
<Terminal dimensions>



2) NR2 series **NR2** □



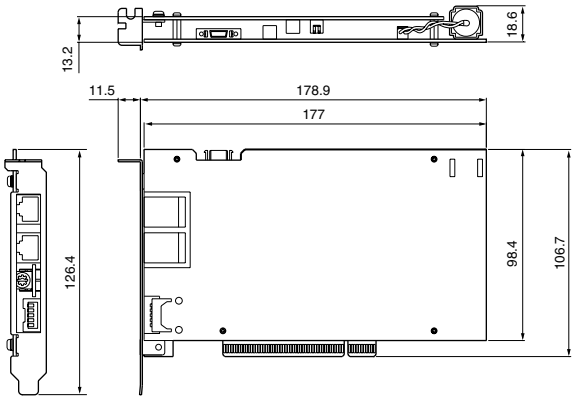
<Terminal dimensions>



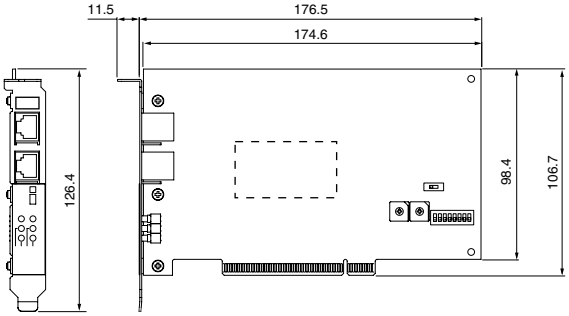
Dimensions

(10) PCI-bus-based board

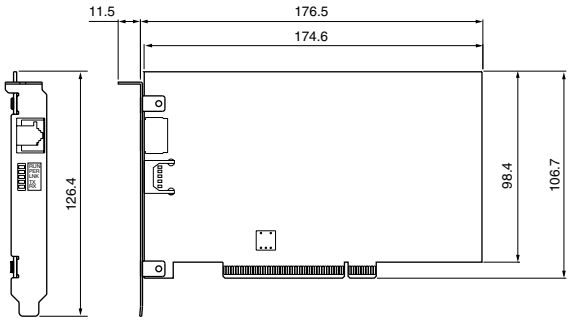
1) SPH300 CPU board **NP3PS-SX1PCS □ □**



2) LE-net loop2 board **NP3L-LL2PCS**



3) OPCN-2 (FL-net) board **NP3L-FL □ PCS**



■ Types/Odering codes

Names		Types (Odering codes)	Specifications, Names			Standards CE *2	UL cUL	LR *3	NK
CPU module	SPH300	**NP1PS-32**	SPH300 Program memory capacity 32K steps Max. No. of I/O points 8192 points	Accessories: Data backup battery (Built-in) SX bus terminating plug 2 pieces CPU mode selection key switch Screwdriver (for the CPU setting)	Basic instruction execution speeds 20ns or more	○	○	○	○
		NP1PS-74	SPH300 Program memory capacity 74K steps Max. No. of I/O points 8192 points			○	○	○	○
		NP1PS-117	SPH300 program memory capacity 117K steps Max. No. of I/O points 8192 points			○	○	○	○
		NP1PS-32R	SPH300 Program memory capacity 32K steps User ROM/USB adapted, Max. No. of I/O points 8192 points			○	○	○	○
		NP1PS-74R	SPH300 Program memory capacity 74K steps User ROM/USB adapted, Max. No. of I/O points 8192 points			○	○	○	○
		NP1PS-117R	SPH300 Program memory capacity 117K steps User ROM/USB adapted, Max. No. of I/O points 8192 points			○	○	○	○
		NP1PS-245R	SPH300 Program memory capacity 245K steps User ROM/USB adapted, Max. No. of I/O points 8192 points						
	SPH200	**NP1PH-08**	SPH200 Program memory capacity 8K steps Max. No. of I/O points 8192 points		Basic instruction execution speeds 70ns or more	○	○	○	○
		NP1PH-16	SPH200 Program memory capacity 16K steps Max. No. of I/O points 8192 points			○	○	○	○
	SPH2000	**NP1PM-48R**	SPH2000 Program memory capacity 48K steps User ROM/USB adapted, Max. No. of I/O points 8192 points		Basic instruction execution speeds 30ns or more				
		NP1PM-48E	SPH2000 Program memory capacity 48K steps User ROM/USB/Ethernet adapted, Max. No. of I/O points 8192 points						
		NP1PM-256E	SPH2000 Program memory capacity 256K steps User ROM/USB/Ethernet adapted, Max. No. of I/O points 8192 points						
Power supply module		**NP1S-22**	100/240V AC Input power supply, output capacity 35W, Accessories: Connector for ALM contact, Voltage selection jumper plate			○	○	○	○
		NP1S-81	200V AC Input power supply 15W (1 slot)			○	○		
		NP1S-91	100V AC Input power supply 15W (1 slot)			○	○		
		NP1S-42	24V DC Input power supply, output capacity 35W, Accessories: Connector for ALM contact			○	○	○	○
Base board		**NP1BS-03**	For 3 slots Processor buses 2 slots	Accessories: Base board mounting bracket		○	○	○	○
		NP1BS-06	For 6 slots Processor buses 3 slots			○	○	○	○
		NP1BS-08	For 8 slots Processor buses 3 slots			○	○	○	○
		NP1BS-11	For 11 slots Processor buses 3 slots			○	○	○	○
		NP1BS-13	For 13 slots Processor buses 3 slots			○	○	○	○
		NP1BP-13	For 13 slots Processor buses 10 slots (High speed type)			○	○	○	○
		NP1BS-08S	Base with station number setup function For 8 slots Processor buses 3 slots			○	○		
		NP1BS-11S	Base with station number setup function For 11 slots Processor buses 3 slots			○	○		
		NP1BS-13S	Base with station number setup function For 13 slots Processor buses 3 slots			○	○		
		NP1BP-13S	Base with station number setup function For 13 slots Processor buses 10 slots			○	○		
		NP1BP-13D	Hot plug base with station number setup function For 13 slots Processor buses 10 slots			○	○	○	○
SX bus expansion cable *4		**NP1C-P3**	300mm cable			—	○	○	○
		NP1C-P6	600mm cable			—	○	○	○
		NP1C-P8	800mm cable			—	○	○	○
		NP1C-02	2000mm cable			—	○	○	○
		NP1C-05	5000mm cable			—	○	○	○
		NP1C-10	10000mm cable			—	○	○	○
		NP1C-15	15000mm cable			—			
		NP1C-25	25000mm cable			—	○	○	○
SX bus T-branch unit		**NP8B-TB**	SX bus T-branch connecting unit, Accessories: SX bus terminating plug 1 piece			○	○	○	○
Digital input module *1		**NP1X1606-W**	24V DC, 16 points, 7mA 1 to 100ms variable		Screw terminal	○	○	○	○
		NP1X3206-W	24V DC, 32 points, 4mA 1 to 100ms variable, Optional Connector		Connector	○	○	○	○
		NP1X3202-W	5V/12V DC, 32 points, 3mA/9mA 1 to 100ms variable, Optional Connector		Connector	○	○	○	○
		NP1X3206-A	24V DC, 32 points, 4mA 0 to 100ms variable, Pulse catch 20kHz, Optional Connector		Connector	○	○		
		NP1X6406-W	24V DC, 64 points, 4mA 1 to 100ms variable, Optional Connector		Connector	○	○	○	○
		NP1X1607-W	48V DC, 16 points, 5mA 1 to 100ms variable		Screw terminal				
		NP1X0810	100/120V AC, 8 points, 10mA 10ms		Screw terminal	○	○	○	○
		NP1X1610	100/120V AC, 16 points, 10mA 10ms		Screw terminal	○	○	○	○
		NP1X0811	200/240V AC, 8 points, 10mA 10ms		Screw terminal	○	○	○	○
Digital output module *1		**NP1Y08T0902**	Tr sink, 12 to 24V DC, 8 points, 2.4A/point, 4A/common		Screw terminal	○	○	○	○
		NP1Y16T09P6	Tr sink, 12 to 24V DC, 16 points, 0.6A/point, 4A/common		Screw terminal	○	○	○	○
		NP1Y32T09P1-A	Tr sink, 24V DC, 32 points, 0.12A/point, 3.2A/common, Pulse train output 20kHz x 4ch (Built-in), Optional Connector		Connector	○	○		
		NP1Y32T09P1	Tr sink, 12 to 24V DC, 32 points, 0.12A/point, 3.2A/common, Optional Connector		Connector	○	○	○	○
		NP1Y64T09P1	Tr sink, 12 to 24V DC, 64 points, 0.12A/point, 3.2A/common, Optional Connector		Connector	○	○	○	○
		NP1Y16T10P2	Tr sink, 48V DC, 16 points, 0.2A/point, 1.6A/common		Screw terminal				
		NP1Y08U0902	Tr source, 12 to 24V DC, 8 points, 2.4A/point, 4A/common		Screw terminal	○	○	○	○

Standards	○	Certificated	—	Exceptions

*1 Connectors (solder type) for digital input, output, I/O-mixed, and positioning modules are separately available (**NP8V-CN**).
*2 Conformance to CE marking is confirmed on individual SX Series models. When exporting the final product with the SX Series built in to the EU, be sure to verify the standard conformance corresponding to the final product.
*3 For vibration countermeasures, the modules must be fixed in units of base board. For further information, contact your Fuji sales representative.
*4 The SX bus cable corresponds to the arbitrariness length. Please contact our sales section.

Odering Information

Names	Types (Odering codes)	Specifications, Names		Standards CE *2	UL cUL	LR *3	NK
Digital output module *1	**NP1Y16U09P6**	Tr source, 12 to 24V DC, 16 points, 0.6A/point, 4A/common	Screw terminal	○	○	○	○
	NP1Y32U09P1	Tr source, 12 to 24V DC, 32 points, 0.12A/point, 3.2A/common, Optional Connector	Connector	○	○	○	○
	NP1Y64U09P1	Tr source, 12 to 24V DC, 64 points, 0.12A/point, 3.2A/common, Optional Connector	Connector	○	○	○	○
	NP1Y06S	SSR, 100 to 240V AC, 6 points, 2.2A/point, 4.4A/common	Screw terminal	○	○	○	○
	NP1Y08S	SSR, 100 to 240V AC, 8 points: all points are independent, 2.2A/points	Screw terminal				○
	NP1Y08R-04	Ry, 110V DC, 240V AC, 8 points, 30V DC/ 264V AC: 2.2A/point, 4A/common	Screw terminal	○	○	○	○
	NP1Y16R-08	Ry, 110V DC, 240V AC, 16 points, 30V DC/ 264V AC: 2.2A/point, 8A/common	Screw terminal	○	○	○	○
Digital I/O mixed module *1	**NP1W1606T**	24V DC 8 points source input, 12 to 24V DC 8 points Tr sink output	Screw terminal	○	○	○	○
	NP1W1606U	24V DC 8 points sink input, 12 to 24V DC 8 points Tr source output	Screw terminal		○	○	○
	NP1W3206T	24V DC 16 points source input, 12 to 24V DC Tr sink 16 points output, Optional Connector	Connector	○	○	○	○
	NP1W3206U	24V DC 16 points sink input, 12 to 24V DC Tr source 16 points output, Optional Connector	Connector	○	○	○	○
	NP1W6406T	24V DC 32 points source input, 12 to 24V DC Tr sink 32 points output, Optional Connector	Connector	○	○	○	○
	NP1W6406U	24V DC 32 points interactive input, 12 to 24V DC Tr source 32 points output, Optional Connector	Connector	○	○		
Terminal Relay	**RS16E-DE04**	24V DC source input					
	RS16-DE04	24V DC sink output		○	○		
	RS16-DE04P	24V DC source output			○		
	RS910M2-0104	Terminal cable for MICREX-SX: 1m					
	RS910M2-0204	Terminal cable for MICREX-SX: 2m					
	RS910M2-0304	Terminal cable for MICREX-SX: 3m					
Analog I/O module	**NP1AXH4-MR**	High speed type multi-range input 4ch, resolution: 14 bits		○	○	○	○
	NP1AXH8V-MR	High speed type multi-range input 8ch, resolution: 14 bits (voltage type)		○	○	○	○
	NP1AXH8I-MR	High speed type multi-range input 8ch, resolution: 14 bits (current type)		○	○	○	○
	NP1AXH4-PT	Resistance thermometer element input (Pt100Ω/JPt100Ω) 8ch, resolution: 14 bits		○	○		
	NP1AXH4-TC	Thermo-couple input module 4ch, resolution: 14 bits		○	○		
	NP1AYH2-MR	High speed type multi-range output 2ch, resolution: 14 bits		○	○	○	○
	NP1AYH4V-MR	High speed type multi-range output 4ch, resolution: 14 bits (voltage type)		○	○		
	NP1AYH4I-MR	High speed type multi-range output 4ch, resolution: 14 bits (current type)		○	○		
	NP1AYH8V-MR	High speed type multi-range output 8ch, resolution: 14 bits (voltage type)		○	○	○	○
	NP1AYH8I-MR	High speed type multi-range output 8ch, resolution: 14 bits (current type)		○	○	○	○
	NP1AX04-MR	Standard type multi-range input 4ch, resolution: 10 bits		○	○	○	○
	NP1AY02-MR	Standard type multi-range output 2ch, resolution: 10 bits		○	○	○	○
	NP1AX08V-MR	Standard type multi-range input 8ch, resolution: 10 bits (voltage type)		○	○	○	○
	NP1AX08I-MR	Standard type multi-range input 8ch, resolution: 10 bits (current type)		○	○	○	○
Communication module	**NP1L-WE1**	Web module 10BASE-T/100BASE-TX Web server function		○	○		
	NP1L-ET1	Ethernet interface module 10BASE-T/100BASE-TX		○	○		
	NP1L-ET2	Ethernet interface module 10BASE5			○		
	NP1L-FL1	FL-net module Ver. 1.0	Accessories: Power supply cable for the 10BASE5	○	○		
	NP1L-FL2	FL-net module Ver. 2.0	Accessories: Power supply cable for the 10BASE5	○	○		
	NP1L-FL3	FL-net module Ver. 2.0 (10/100Mbps)		○	○		
	NP1L-AD1	ADS-net module Self-directed distributed protocol (R3.0) support Accessories: Power supply cable for the 10BASE5		○	○		
	NP1L-LW1	LonWorks interface module (78kbps) Accessories: Connector for cable connected			○		
	NP1L-PL1	P-link module	Accessories: P/PE-link connector		○	○	○
	NP1L-PE1	PE-link module	Accessories: P/PE-link connector		○	○	○
	NP1L-LE1	LE-net module		○	○	○	○
	NP1L-LL1	LE-net loop module		○	○	○	○
	NP1L-LL2	LE-net loop2 module		○	○	○	○
	NP1L-RS1	General purpose communication module RS-232C (connector), RS-485 (connector) each 1ch		○	○	○	○
	NP1L-RS2	General purpose communication module RS-232C (connector) 1ch		○	○	○	○
	NP1L-RS3	General purpose communication module RS-232C (connector) 2ch		○	○		
	NP1L-RS4	General purpose communication module RS-485 (connector) 1ch		○	○	○	○
	NP1L-JP1	OPCN-1 master module	Accessories: OPCN-1 connector, Terminating resistor 2 pieces	○	○	○	○
	NP1L-JS1	OPCN-1 slave module	Accessories: OPCN-1 connector	○	○		
	NP1L-RJ1	OPCN-1 interface module	Accessories: OPCN-1 connector, SX bus terminating plug 2 pieces	○	○	○	○
	NP1L-DN1	DeviceNet master module	Accessories: Screw connector (for cable splicing)	○	○		
	NP1L-RD1	DeviceNet interface module	Accessories: Screw connector (for cable splicing), SX bus terminating plug 2 pieces	○	○		
	NP1L-TL1	T-link master module	Accessories: T-link connector, T-link terminating resistor 2 pieces	○	○	○	○
	NP1L-RT1	T-link interface module	Accessories: T-link connector, SX bus terminating plug 2 pieces	○	○	○	○
	NP1L-TS1	T-link slave module	Accessories: T-link connector	○	○	○	○
	NP1L-PD1	PROFIBUS-DP master module	Communication standard (IEC 66158, EN 50171, DIN 19245)	○	○		
	NP1L-PS1	PROFIBUS-DP slave module	Communication standard (IEC 66158, EN 50171, DIN 19245)	○	○		
	NP1L-AS1	AS-i master module Ver. 2.0	Accessories: Screw connector (for cable splicing)	○	○		
	NP1L-AS2	AS-i master module Ver. 2.1	Accessories: Screw connector (for cable splicing)	○	○		
	NP1L-SL1	S-LINK master module 1ch	Accessories: Screw connector (for cable splicing)				
	NP1L-OL1	SX bus optical link module	Accessories: SX bus terminating plug	○	○		
	NP2L-OE1	SX bus electrical - optical converter	Accessories: SX bus terminating plug	○	○		
	NP2L-RP1	SX bus electrical - electrical repeater	Accessories: SX bus terminating plug	○	○		

Standards	○	Certificated	—	Exceptions

*1 Connectors (solder type) for digital input, output, I/O-mixed, and positioning modules are separately available (**NP8V-CN**).
*2 Conformance to CE marking is confirmed on individual SX Series models. When exporting the final product with the SX Series built in to the EU, be sure to verify the standard conformance corresponding to the final product.
*3 For vibration countermeasures, the modules must be fixed in units of base board. For further information, contact your Fuji sales representative.

Names	Types (Odering codes)	Specifications, Names	Standards CE * 2	UL cUL	LR * 3	NK
Positioning module * 1	**NP1F-HC2**	High speed counter module 500kHz x 2ch Input signal voltage: 5V DC Accessories: Optional Connector	○	○		
	NP1F-HC2MR	High speed counter module 200kHz x 2ch Input signal voltage: 5/12/24 DC Accessories: Optional Connector	○	○		
	NP1F-HC2MR1	High speed counter module 50kHz x 2ch Input signal voltage: 5/12/24 DC Accessories: Optional Connector	○	○		
	NP1F-HC8	Multi-channel high speed counter module 50kHz x 8ch Accessories: Optional Connector	○	○		
	NP1F-HP2	Pulse train output positioning control module Pulse train command 250kHz x 2ch Accessories: Optional Connector	○	○		
	NP1F-MP2	Pulse train positioning control combined module Output pulse: 250kHz x 2ch, Feedback pulse: 500kHz, Accessories: Optional Connector	○	○		
	NP1F-MA2	Analog command positioning control combined module Feedback pulse: 500kHz x 2ch, Accessories: Optional Connector	○	○		
	NP2F-LEV	Signal converter Converts signal level: 4ch, open collector to differential signal, Accessories: I/O connector each 1 piece	○	○		
	NP1F-MC8P1	MC (Motion control) module Table format PTP, Accessories: SX bus terminating plug 1 piece				
Function module	**NP1F-MM1**	Memory card interface module Memory card interface 1ch, Accessories: Memory card mounting bracket, Dummy card	○	○		
	NP1F-DMY	Dummy module	○	○	○	○
	NP1F-MU1	Multi-use communication module RS-232C x 1ch, RS-485 x 1ch Communication by the arbitrary protocol	○	○		
Extended FB software package	**NP4N-TRBFV3**	Fault diagnosis FB software package Version 3	—	—	—	—
	NP4N-PIDFV3	PID FB software package Version 3	—	—	—	—
	NP4N-PTPFV3	Positioning control FB software package Version 3	—	—	—	—
	NP4N-CAMFV3	Electronic cam FB software package Version 3	—	—	—	—
	NP4N-COMFV3	General purpose communication software package for Factory Automation machine Version 3	—	—	—	—
	NP4N-FSETV3	Extension FB software package set Version 3	—	—	—	—
	NP4N-MDLW	SX communication middleware	—	—	—	—
	NP4N-LNDF	LonWorks module definition tool (ACSESS format) (Japanese version)	—	—	—	—
Personal computer loader * 5	**NP4H-SEDBV3**	Programming support tool based on IEC 61131-3 D300win software package Version 3	—	—	—	—
	NP4H-SEDBV2	Programming support tool based on IEC 61131-3 D300win software package Version 2	—	—	—	—
	NP4H-SESV2	Automatic programming generation tool for process step control, SC matrix (Japanese version)	—	—	—	—
	NP4H-MC1	MC module programming support tool (Japanese version)	—	—	—	—
Loader connecting cable	**NP4H-CB2**	Programming support tool connection cable for AT compatible personal computer (Necessary to the signal converter: **NW0H-CNV**)	—	—	—	—
	NW0H-CNV	Programming support tool for AT compatible personal computer. Signal converter for CPU module connecting (It used to with combined the loader connecting cable (**NP4H-CB2**, Optional).	○	—	—	—
Simulative-input switch	**NP8X-SW**	Simulative-input switch for DC input module (16 points)	—	—	—	—
ROM cassette	**NP8PMF-16**	User ROM cassette for the SPH200, Capacity: 16MB	—	—	—	—
	NP8PCF-128	User ROM card compact flash memory for the SPH300, Capacity: 128MB	—	—	—	—
Online adapter and Relational software	**FOA-ALFA2**	Online adapter (Necessary for the **NP4H-CB2** on connection to personal computer)				
	FOA-LOADER2-CD	Initial setting loader software for the online adapter (Japanese version)	—	—	—	—
	FOA-CENTER2-CD	Master station monitoring software for the online adapter (Japanese version)	—	—	—	—
Auxiliaries	**NP8P-BT**	Data backup battery (Battery type: Lithium primary battery)	—	—	—	—
	NP8P-BT1	Data backup for high-capacity battery (Battery type: Lithium primary battery)	—	—	—	—
	NP8P-BTS	Data backup for high-capacity battery box (**NP8P-BT1** + storage box)	—	—	—	—
	NP8B-BP	SX bus terminating plug	—	—	—	—
	NP8B-ST	Base board mounting stud (DIN rail type)	—	—	—	—
	NP8V-CN	I/O, positioning control module connector (solder type)	—	—	—	—
	NP8P-KY	CPU mode selection key switch	—	—	—	—
	FTC120T	T link / OPCN-1 connector	—	—	—	—
	FTC120P	P/PE link connector	—	—	—	—
	FRT120A100	T link / OPCN-1 terminating resistor	—	—	—	—
	FRT220A75	P/PE link terminating resistor	—	—	—	—

Standards	○	Certificated	—	Exceptions

*2 Conformance to CE marking is confirmed on individual SX Series models. When exporting the final product with the SX Series built in to the EU, be sure to verify the standard conformance corresponding to the final product.
*3 For vibration countermeasures, the modules must be fixed in units of base board. For further information, contact your Fuji sales representative.
*5 The OS is not included.

Odering Information

Names			Types (Odering codes)	Specifications, Names		Standards CE * 2	UL cUL	LR	NK
I/O terminals	NR1 type	OPCN-1	**NR1JX-1606DT**	No polarity, input 24V DC, 16 points, detachable terminals		○	○		
			NR1JY-08R07DT	Ry output 240V AC / 110V DC, 8 points, detachable terminals		○	○		
			NR1JY-16T05DT	Tr sink output 24V DC, 16 points, detachable terminals		○	○		
			NR1JW-16T65DT	Source input 24V DC, 8 points, Tr sink output 24V DC, 8 points, detachable terminals		○	○		
		DeviceNet	**NR1DX-1606DT**	No polarity, input 24V DC, 16 points, detachable terminals		○	○		
			NR1DY-08R07DT	Ry output 240V AC / 110V DC, 8 points, detachable terminals		○	○		
			NR1DY-16T05DT	Tr sink output 24V DC, 16 points, detachable terminals		○	○		
			NR1DW-16T65DT	Source input 24V DC, 8 points, Tr sink output 24V DC, 8 points, detachable terminals		○ ○	○ ○		
		T-LINK	**NR1TX-1606DT**	No polarity, input 24V DC, 16 points, detachable terminals		○	○		
			NR1TY-08R07DT	Ry output 240V AC / 110V DC, 8 points, detachable terminals		○	○		
			NR1TY-16T05DT	Tr sink output 24V DC, 16 points, detachable terminals		○	○		
			NR1TW-16T65DT	Source input 24V DC, 8 points, Tr sink output 24V DC, 8 points, detachable terminals		○ ○	○ ○		
		SX bus	**NR1SX-1606DT**	No polarity, input 24V DC, 16 points, detachable terminals		○	○		
			NR1SY-08R07DT	Ry output 240V AC / 110V DC, 8 points, detachable terminals		○	○		
			NR1SY-16T05DT	Tr sink output 24V DC, 16 points, detachable terminals		○	○		
			NR1SW-16T65DT	Source input 24V DC, 8 points, Tr sink output 24V DC, 8 points, detachable terminals		○	○		
			NR1SF-HP4DT	Pulse train output Pulse train command: 250kHz 4 axes (2 points/1 axes)		○			
		LonWorks	**NR1LX-1606DT**	No polarity, input 24V DC, 16 points (included the 4 pulse input points), detachable terminals	Accessories: Neuron ID seal				
			NR1LY-08R07DT	Ry output 240V AC / 110V DC, 8 points, detachable terminals					
			NR1LW-11R80DT	Source input 24V DC, 9 points (included the 4 pulse input points), Ry output 240V AC / 110V DC, 2 points, detachable terminals					
		Optional	**NR1XV-CB1**	Common extension bar (9 pins)		—			
	NR2 type	DeviceNet	**NR2DX-3206DT**	No polarity, input 24V DC, 32 points, detachable terminals					
			NR2DY-32T05DT	Tr sink output 24V DC, 32 points, detachable terminals					
			NR2DY-16R07DT	Ry output 240V AC / 120V DC, 16 points, detachable terminals					
			NR2DW-32T65DT	No polarity, input 24V DC, 8 points, Tr sink output 24V DC, 8 points, detachable terminals					
		OPCN-1	**NR2JAX-08VMRDT**	Multi-range input 8ch, resolution: 13 bits (voltage type), detachable terminals		○			
			NR2JAX-08IMRDT	Multi-range input 8ch, resolution: 13 bits (current type), detachable terminals		○			
			NR2JAY-04VMRDT	Multi-range output 8ch, resolution: 13 bits (voltage type), detachable terminals		○			
			NR2JAY-04IMRDT	Multi-range output 8ch, resolution: 13 bits (current type), detachable terminals		○			

Standards | ○ Certificated | — Exceptions

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Names		Types (Odering codes)	Standards CE	UL cUL	LR	NK
PCI bus based SPH300 CPU board Program memory capacity: 32K steps	Accessories:	**NP3PS-SX1PCS32**				
PCI bus based SPH300 CPU board Program memory capacity: 74K steps	Driver (CD version), Data backup battery, SX bus terminating plug 2 pieces CPU mode selection key switch, Name and use seal	**NP3PS-SX1PCS74**				
PCI bus based LE-net loop2 board	Accessories: Driver (CD version)	**NP3L-LL2PCS**			○	○
PCI bus based FL-net board Ver. 1.0	Accessories:	**NP3L-FL1PCS**				
PCI bus based FL-net board Ver. 2.0	Driver (CD version), Name and use seal	**NP3L-FL2PCS**				

Standards | ○ Certificated | — Exceptions

⚠ Safety Considerations

- For safe operation, before using the product read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult the Fuji sales division.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.

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Printed in Japan 2006-2 (B06c/D01) Sh 30 FIS LEH982c