

New!

OMRON

PLC-based Process Control

SYSMAC CS Series

Programmable Controllers

CS1W-LCB01/LCB05 Loop Control Board [NEW]

CS1D-LCB05D Duplex Loop Control Board [AVAILABLE SOON]

CS1W-LC001 Loop Control Unit

CS1W-P□□□□ Process I/O Units

Fully Integrated Sequence and Process Control
for the Ideal Control System for Every Application



***Innovation
in the Solution Age***

OMRON INDUSTRIAL AUTOMATION

OMRON's PLC-based Process Control = Smart Monitoring

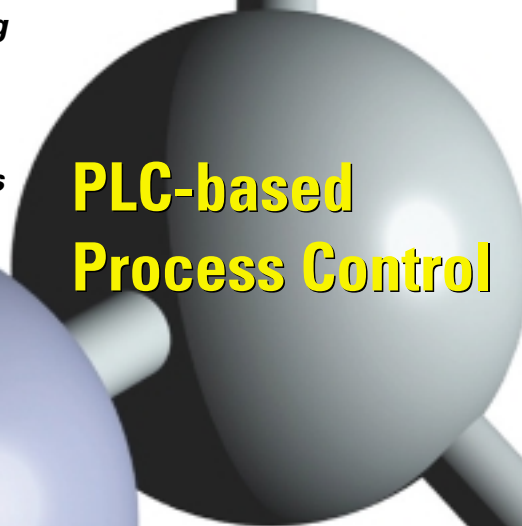
General-purpose PLCs provide everything from simple loop control to advanced process control to

A Breakthrough

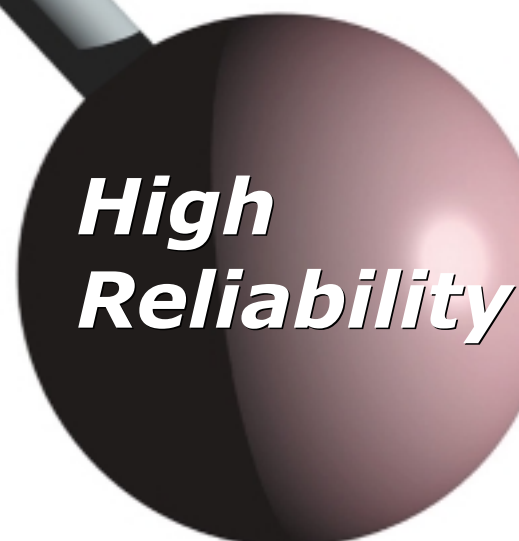
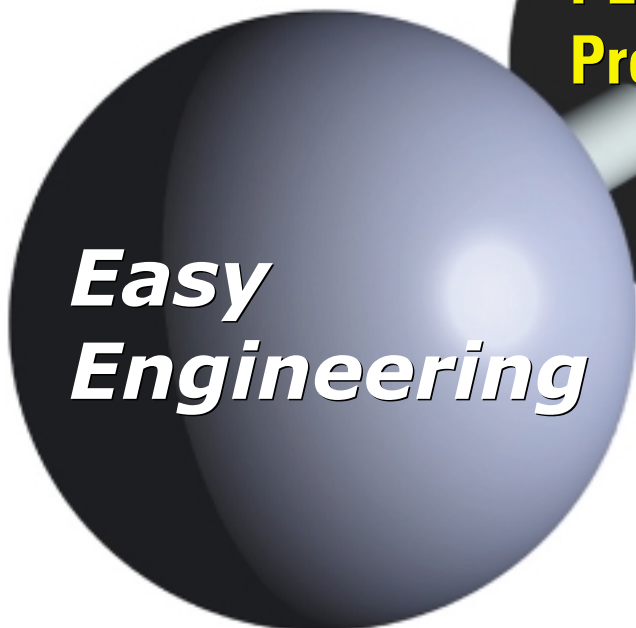
The accelerating wave of globalization calls for rebuilding systems to cope with changes in demand. And now OMRON has taken its wealth of technical know-how in factory automation and process control technology to create a PLC-based process control system.



- *DCS functionality in a PLC*
- *Analog Units with signal conversion functions*
- *A scalable system configuration*



- *Function block programming*
- *Sequence programming using either step ladders or sequence tables*
- *A direct link to HMI products*



- *Duplex operation supported*
- *Complete maintenance functions*

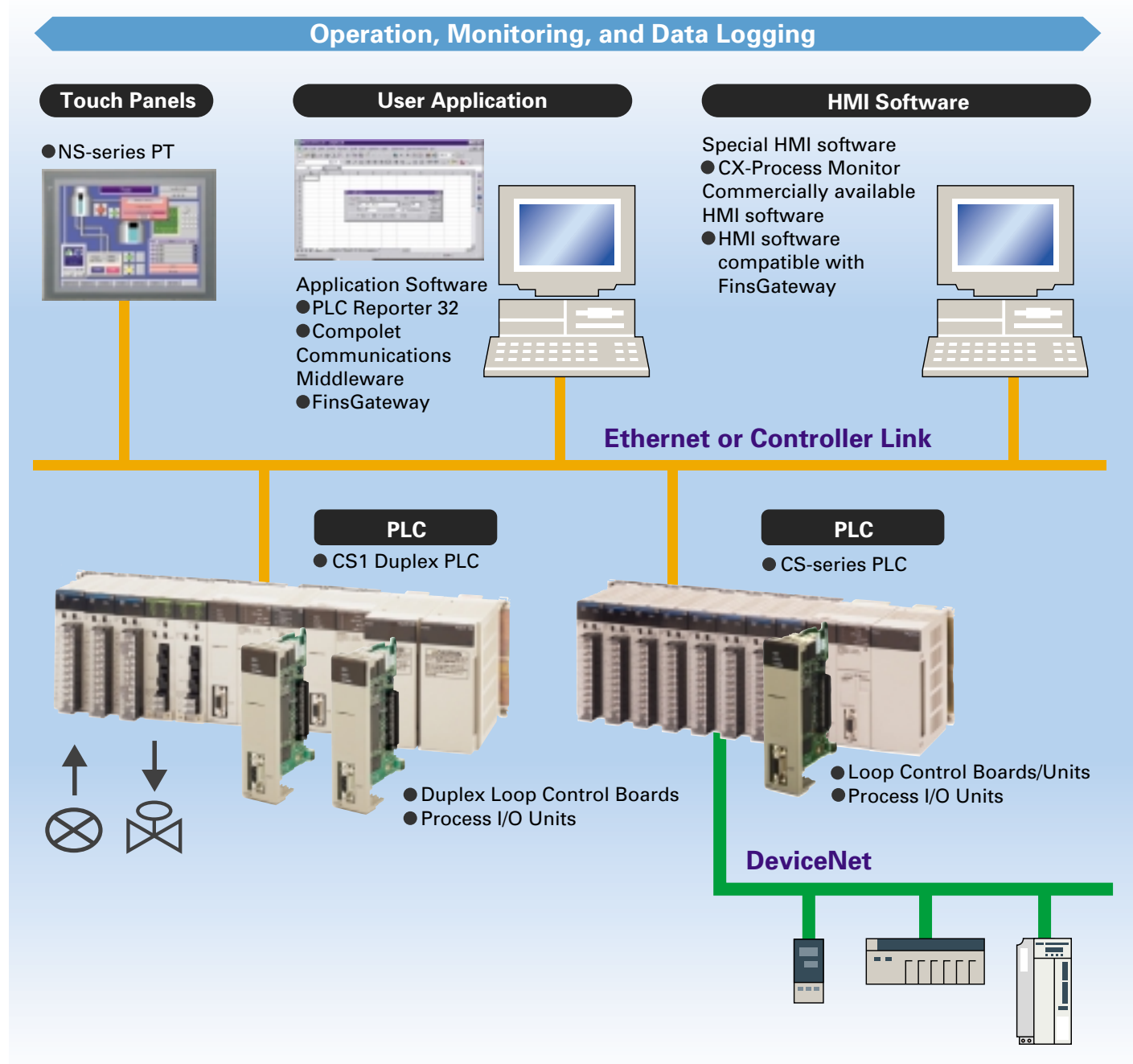
tor and Control

meet customer needs.

The open nature of the PLCs is joined by integrating hardware, software, and networking to meet your needs.

Increasing amounts of information, standardization, and open standards form the basis for achieving hardware and networking capabilities for process control.

A wide range of software that can be easily used by design, development, and maintenance personnel makes operating and maintaining the system far easier.



Going Beyond the Traditional Limits of PLCs with PLC-based Process Control

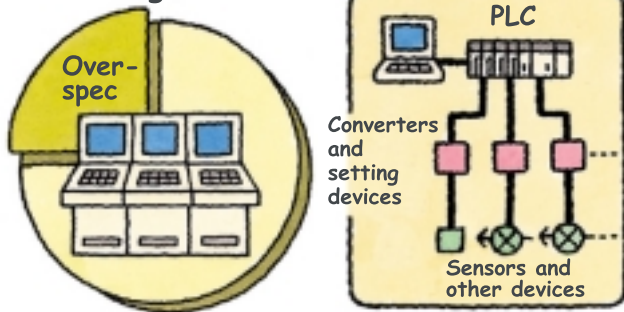
Reducing the Total Cost of Ownership from Initial Costs through Running Costs. PLC-based Process Control Meets Customer Needs

Existing System Problems

Systems are large, meaning high initial costs.

The over-spec nature of a distributed control system (DCS) increased costs. PLCs, however, could not provide the required process control capabilities, and signal conversion with isolators and other devices was required for I/O. It was just not possible to achieve the ideal system for a specific application.

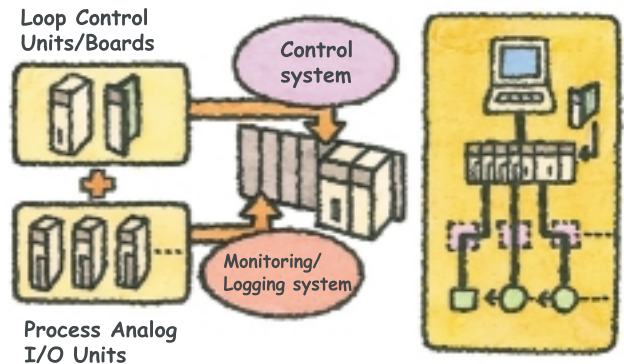
Existing DCS



PLC-based Process Control

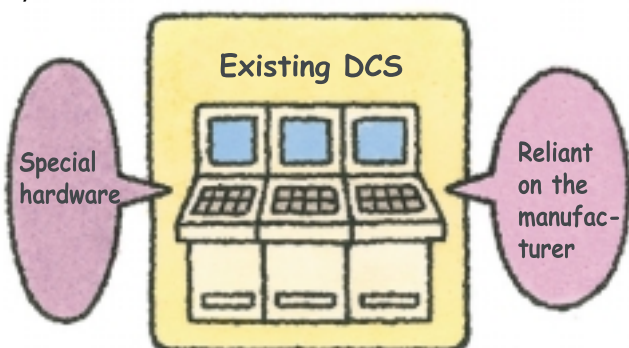
Down Sizing
Cut costs, Save space, Reduce labor

PLCs provide the same functionality and performance as DCS while also providing the traditional features of PLCs: Open specs, easy maintenance, and cost performance. A wide range of Isolated-type Analog Units helps to save space and greatly reduces system costs.



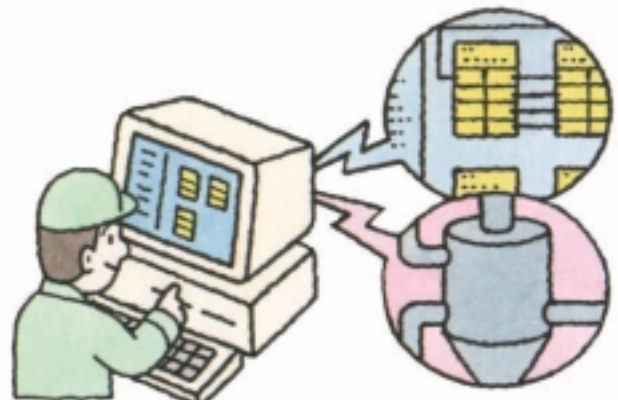
Running costs are high because maintenance and modifications require specialists.

The manufacturer must be relied upon for everything from system construction to maintenance. Even simple changes to parameters cannot be performed in-house. And, it's nearly impossible to use general-purpose devices and software (such as HMI devices or Windows-based software) when modifying the system.



Easy Engineering
Engineering is simple when you can program with function blocks.

Paste function blocks in a window just like you were creating a flow sheet, and then connect the blocks with the mouse to graphically program a wide range of process control. And with a PLC, it's easy to incorporate general-purpose HMI devices and software (such as touch panels and SCADA software).



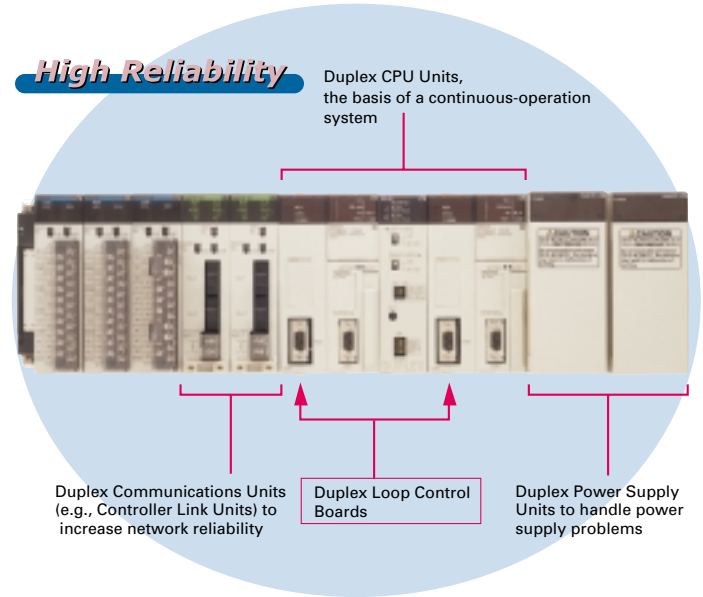
Avoid Problems and Minimize Risks with a Duplex System

Increase the reliability of the facilities and devices with a Duplex PLC-based Process Control System.

If an error occurs in the active CPU Unit, the standby CPU Unit takes over in an instant so that system operation continues essentially unaffected.

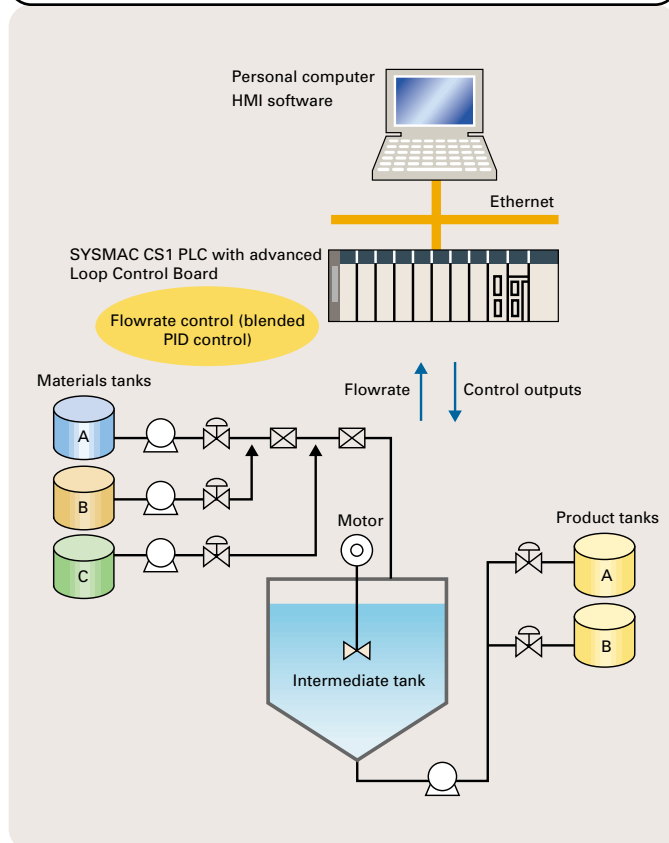
Duplex operation means rapid recovery for errors without stopping system operation.

Replace Units with power supplied or even while the system is running, including CPU Units, Power Supply Units, Communications Units, Special I/O Units, and Basic I/O Units.

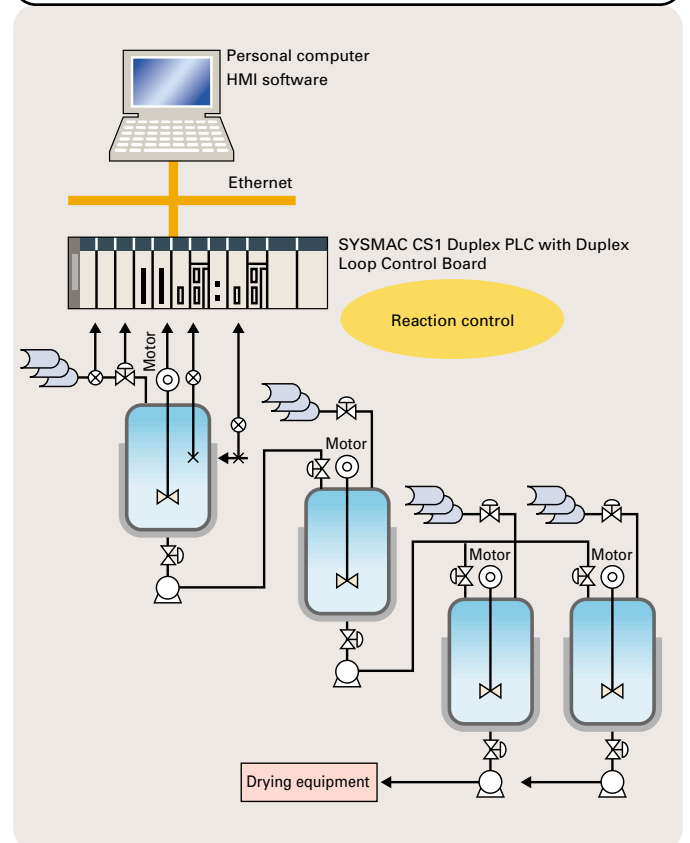


PLC-based Process Control Application Examples

In-line Blending in a Food Plant



Batch Control in a Chemical Factory



A Revolutionary Solution to Process Control

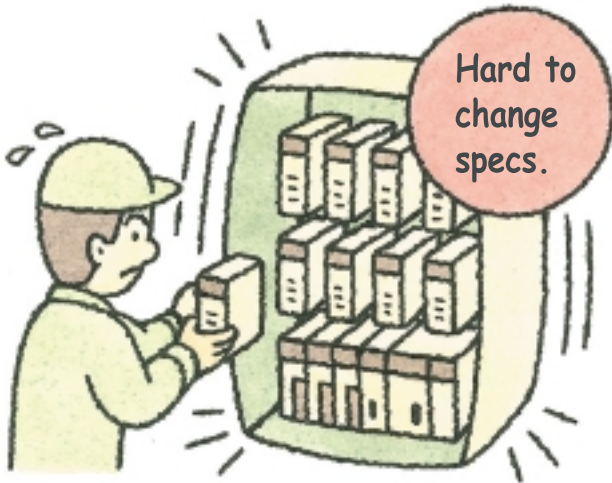
Advanced Controller Functions in a PLC

For easier loop control, for advanced PLC-based analog control:
The New SYSMAC CS1-based Solution

Existing System Problems

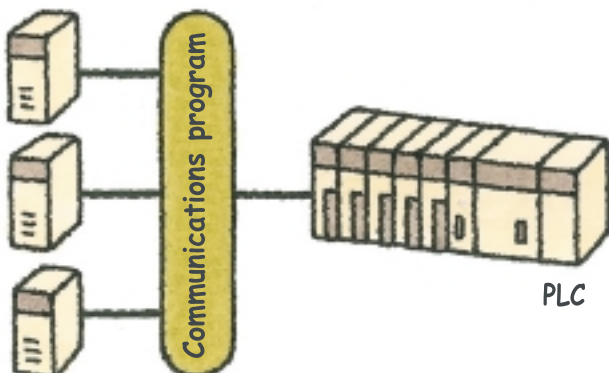
Excessive installation space is required.

When using more than one controller for multi-loop control, the control panel is just too big. And specification changes required altering the control panel, making changes difficult.



Programming communications with the controllers is extremely difficult.

Communications must be programmed to input data to the PLC. And communications time can restrict control performance. The more controllers that are used, the more difficult maintenance becomes.

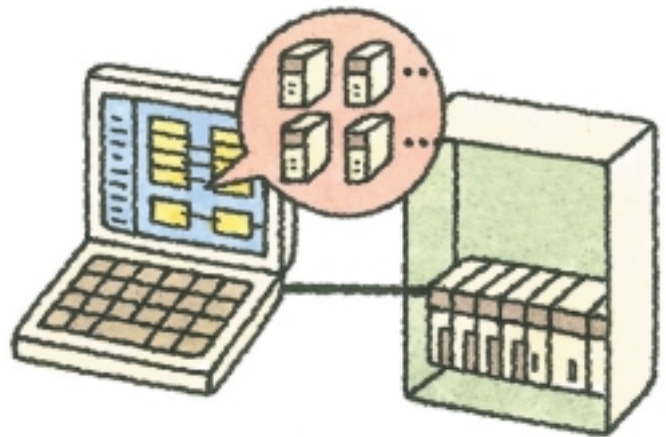


PLC-based Process Control

Down Sizing

Consolidate the functions of many controllers

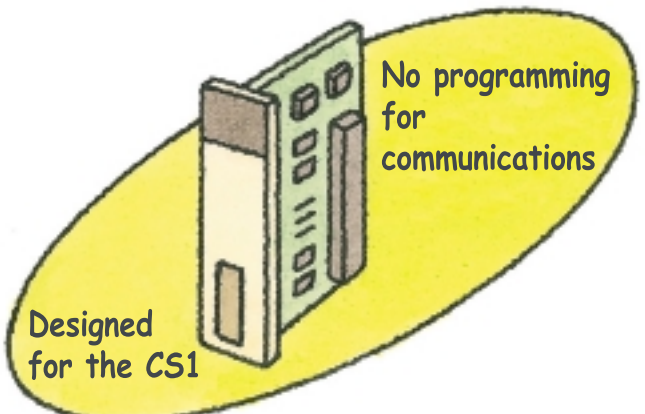
Programming is as simple as combining the function blocks required by the application. To increase the number of controlled loops, just add them to the program. HMI windows can also be created easily using a wide range of utility software.



Easy Engineering

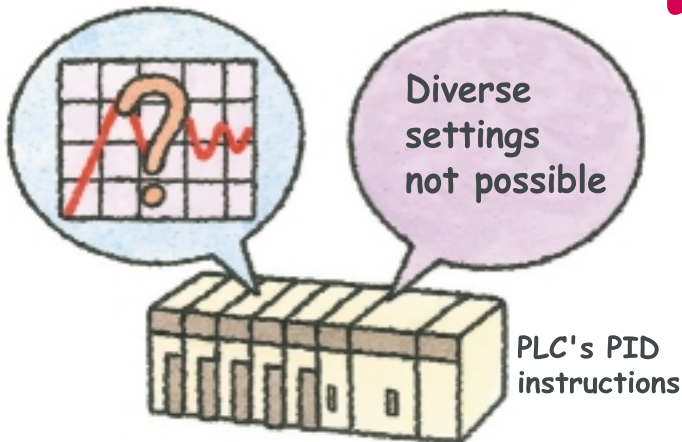
Advanced controller functions are built into the CS1 PLCs. No programming is required for communications.

The Loop Control Boards and Units were designed for the CS1 PLCs and require no communications programming. High-speed, flexible data links can be created with the PLC to increase control performance.



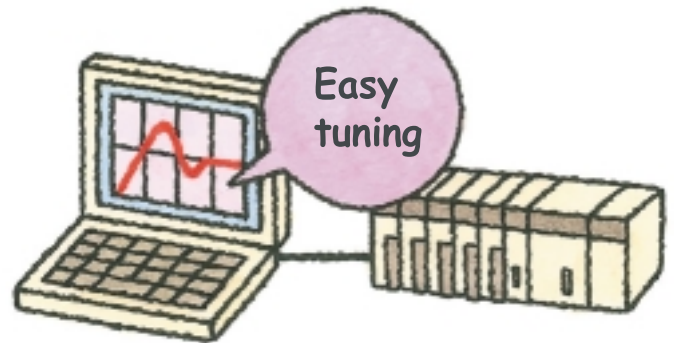
The desired control characteristics cannot be achieved.

Tuning PID control often takes time, slowing down system startup. The PID instructions of the PLC cannot handle the many settings of a loop controller.



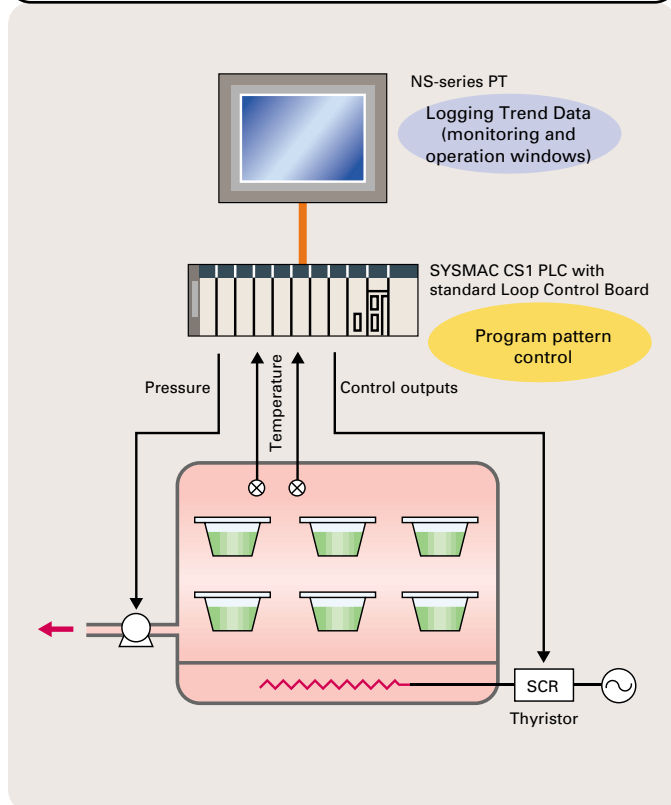
Easy Engineering Control can be tuned as required.

The CX-Process Tool software provides easy tuning. Both autotuning and fine tuning functions can be used to quickly adjust PID constants to the specific application. And function blocks can be set to a control cycle of as short as 10 ms for efficient control of flowrates, pressures, and similar applications.

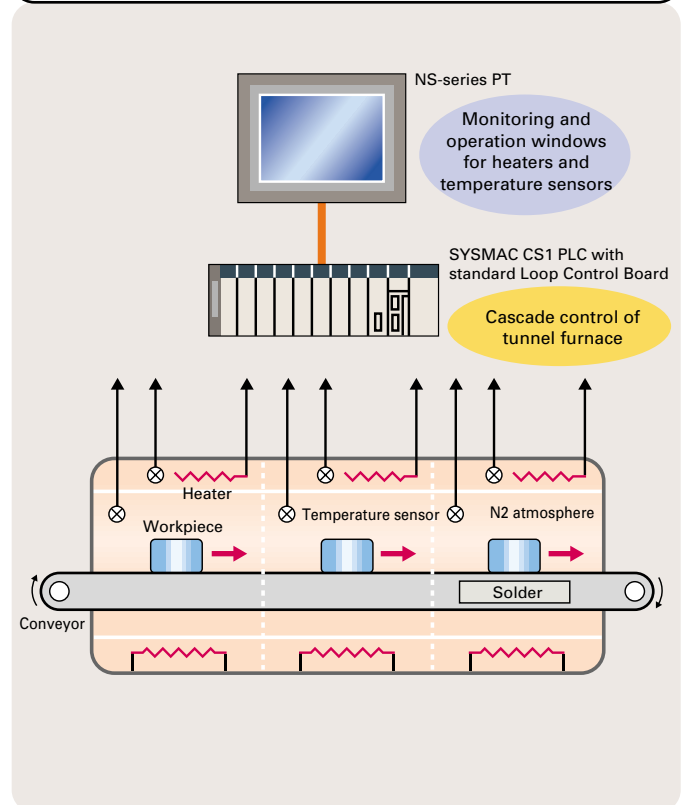


PLC-based Process Control Application Examples

Sterilization and Disinfection of Pharmaceuticals, Food and Beverages



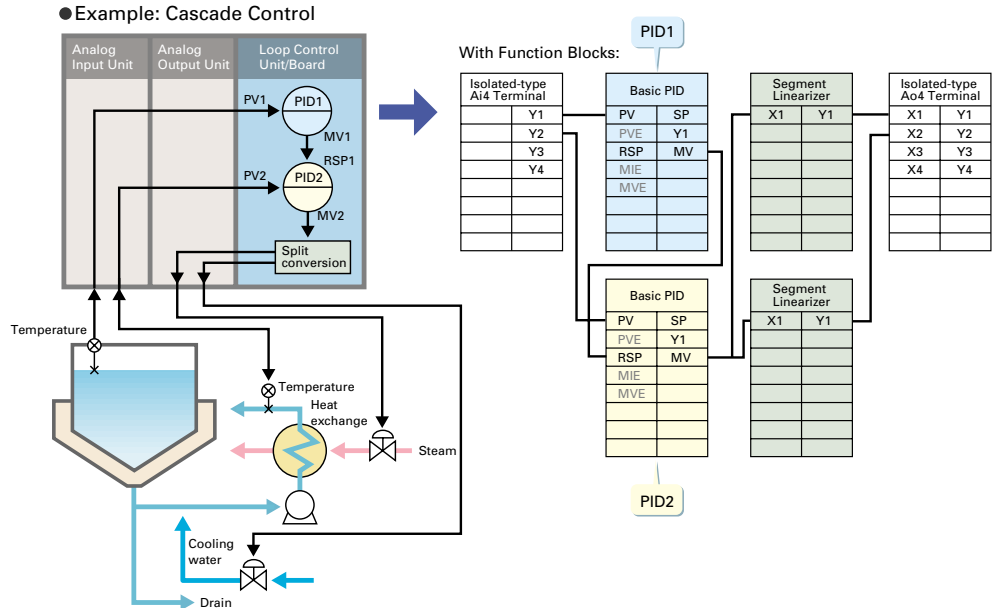
Industrial Furnace



The Smart Products that Configure OMRON P

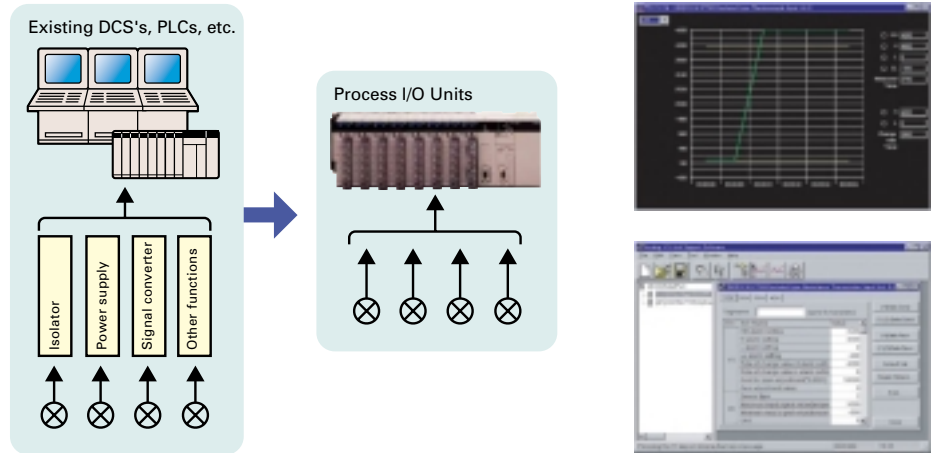
Loop Control Boards (LCBs) and Loop Control Units (LCUs)

Packed with complete DCS functionality, the LCBs/LCUs are programmed with function blocks designed specifically for process control. Similar to preparing a flow sheet, function blocks are pasted and connections made using a graphic interface. A wide array of control methods, from basic PID control to cascade and feed-forward control, are possible.



Process I/O Units

These Analog I/O Units provide the functionality of isolators, power supplies, signal converters, and other devices. Built-in functions, such as measurement value alarms, conversion rate calculations, and square roots, can be used to construct logging/monitoring systems or can be combined with LCBs/LCUs to construct complete process control systems. Parameters are set using Windows-based software that provides either tabular or conversational input methods.

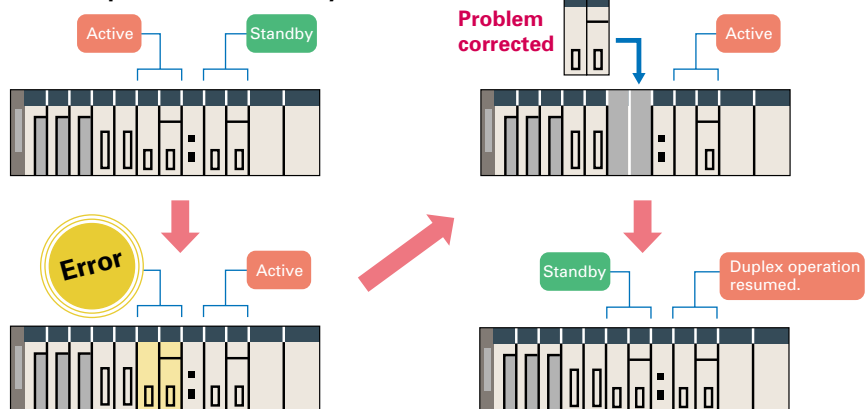


SYSMAC CS1D-series Duplex PLCs

Process control system redundancy is easily achieved by mounted Duplex CPU Units, each with a Duplex Loop Control Board. A duplex system can greatly reduce risk in chemical plants, ship boiler systems, semiconductor utilities, or anywhere reliability is demanded.



● Unit Replacement on Live System



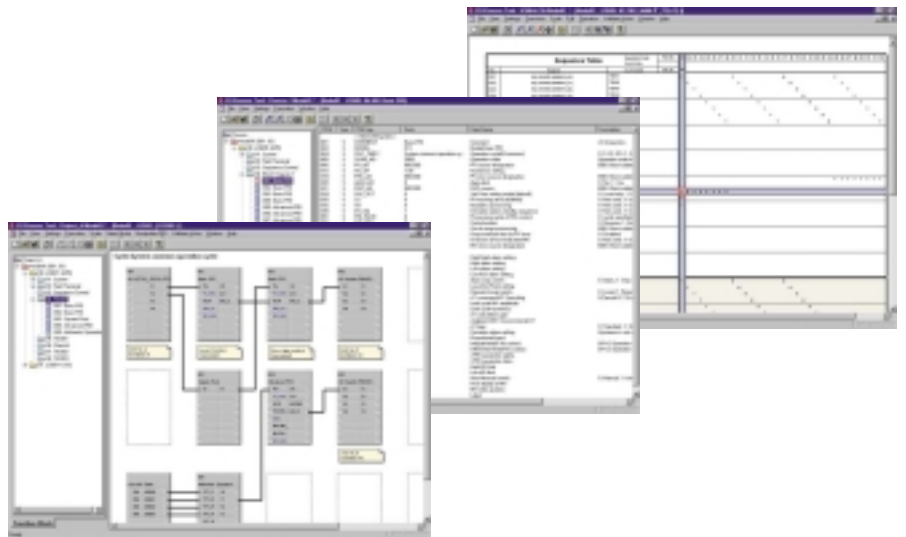
Process Control

The required number of engineering steps is reduced by software that enables analog control programming by combining function blocks and easy connection to HMI devices.

CX-Process

Programming

Paste function blocks in a window just like you were creating a flow sheet, and then connect the blocks with the mouse to program graphically. A total of 70 different types of function block are provided for loop control, such as PID control, segment programming, and square roots.

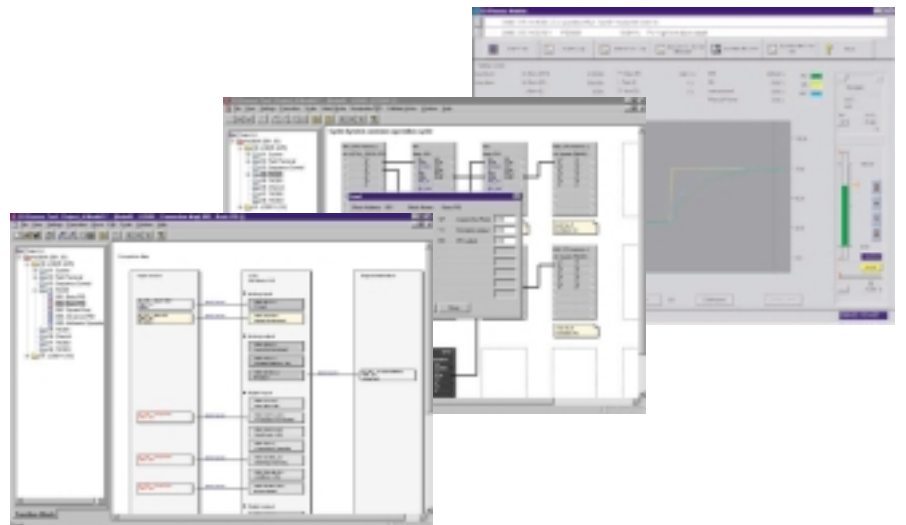


Operation, Debugging, and Monitoring

On operation monitoring windows for function block diagrams, the values of analog signals can be displayed and analog output signals can be changed as desired. ITEM lists for individual function blocks can be monitored or settings can be changed, and parameters can be easily set on tuning windows.

Special monitoring software called the CX-Process Monitor can be used for simple monitoring by creating control windows, trend windows, annunciator windows, and more.

*The CX-Process Monitor is used only for Loop Control Units and requires a license key (sold separately).



Program Changes and Corrections

The function block editor can be used to upload and download function block diagrams with connection information. ITEM data (PID parameters, high/low limits, etc.) for function blocks can also be uploaded and downloaded so that individual function blocks can be changed, added, or deleted without stopping operation.



New CX-Process Tool Functions

Easily Set Data Exchange with SYSMAC CS1 CPU Units

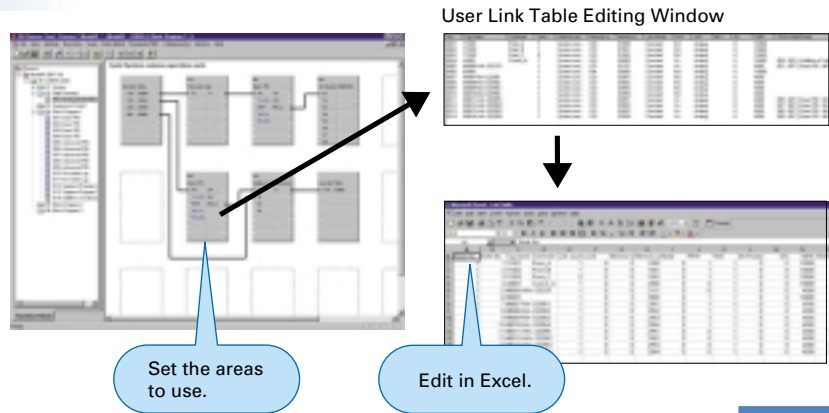
NEW

User Link Tables

- Use user link tables to easily set data exchange with SYSMAC CS1 CPU Units.
- Display CPU memory connection to function blocks.
- Add or edit allocations in tabular form.
- Edit tables on Excel spreadsheets.

Applicable Units/Boards

CS1W-LCB01/LCB05
CS1W-LCB05D



Improve Debugging Performance by Searching Connection Information

NEW

Connection Maps

- Display function block connections on connection maps.
- Jump to a destination merely by double-clicking.
- All connection information, including digital and analog signals, is displayed.

Applicable Units/Boards

CS1W-LCB01/LCB05
CS1D-LCB05D
CS1W-LC001



Program Sequence Control with a Popular Language

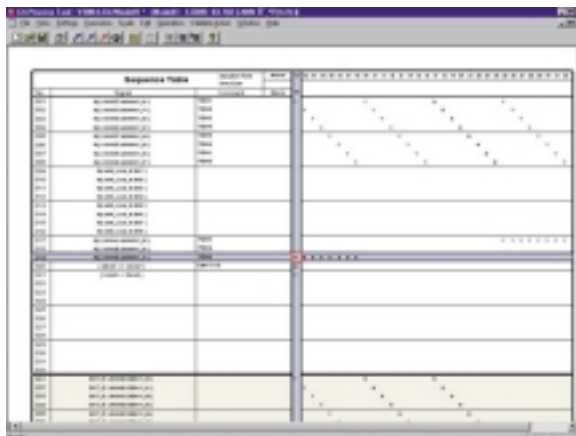
NEW

Sequence Tables

- Sequence tables can be used to program sequence control. (Either sequence tables or step ladder programs must be selected.)
- Step progression by setting the next steps, timer/counter operation, and comparisons via equations are all supported.
- Up to 200 tables can be used for each LCB.

Applicable Units/Boards

CS1W-LCB05
CS1D-LCB05D



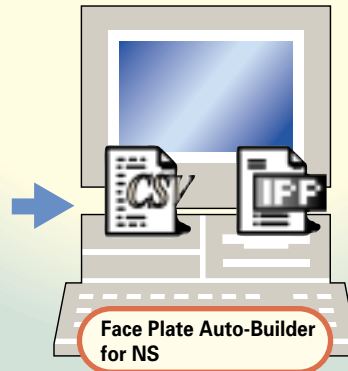
Utility Software

Face Plate Auto-Builder for NS

Engineering steps can be drastically reduced by combining an LCU/LCB with an NS-series Programmable Terminal (PT).

- Automatically Generate Control and Tuning Windows The software generates NS touch panel screen data from tag information created on the CX-Process Tool (tag names, tag comments, scaling, I/O allocations, etc.).
- There is no need for troublesome communications address settings on the PT or ladder programming.
- The generated data can be edited on the NS-Designer (NS screen creation software) as required.

CX-Process Tool
(function block programming software)
● Programming LCUs and LCBs
● CSV tag file output



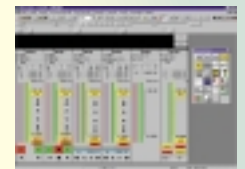
CS1 + LCB/LCU



NS-series PT



Created screens are easily transferred to the PT using a Memory Card or network connection.



NS-Designer
(NS screen creation software)
● Editing of created data.
● Creating other screens as required.

Loop Control Boards and Units

General Specifications

Item		Specification			
Name		Loop Control Boards		Loop Control Unit (See note.)	
Unit classification		CS-series INNER Boards		CS-series CPU Bus Unit	
Model number		CS1W-LCB01: Standard INNER Board	CS1W-LCB05: Special INNER Board	CS1D-LCB05D: Duplex INNER Board (to be released soon)	CS1W-LC001
Applicable CPU Units		CS1G/H-CPU□□H	CS1G/H-CPU□□H	CS1D-CPU□□H (Duplex CPU Unit)	CS-series CPU Units
Mounting location		Inner Board slot in CPU Unit			CPU Rack only
Number of Boards/ Units		1 Board max. per CPU Unit			3 Units max. per CPU Unit
Data ex- change with CPU Unit	I/O memory	User Link Tables: ITEM data for function blocks can be allocated in any part of I/O memory (CIO, WR, HR, or DM Areas, or EM Area bank 0).			CPU Terminal Blocks: ITEM data for function blocks can be allocated in any part of I/O memory in the CPU Unit (CIO, WR, HR, or DM Areas, or EM Area bank 0).
	All data	HMI function used to allocate function block ITEM data for Control, Operation, and External Controller blocks in the specified bank of the EM Area in the CPU Unit. (Default: Bank 0)			Send/Receive All Blocks: Can be allocated in any part of I/O memory (CIO, WR, HR, or DM Areas, or EM Area bank 0). (Default: No data allocated.)
Setting switches		None			Rotary switch on front panel: Unit number (0 to F)
Indicators		3 LEDs: RUN, ready, and communications port send/receive			5 LEDs: RUN operation, communications port send, communications port receive, CPU Unit error, and Unit error
Front panel connections		RS-232C port x 1 (Used for connection to ES100X Controller.)			
Data backup		By super capacitor: All function block data (including sequence tables and step ladder instructions)			By battery: All function block data (including step ladder instructions) and error log data
Battery/capacitor life		24 hours at 25°C (life shortened by use at higher temperatures)			5 years at 25°C (life shortened by use at higher temperatures)
Data storage in flash memory		Function block data (RAM data backup and recovery can be performed whenever necessary.) Error log data			Function block data (RAM data backup and recovery can be performed whenever necessary.)
Effect on CPU Unit cycle time		0.3 to 0.8 ms			0.2 ms
Current consumption (supplied from Power Supply Unit)		220 mA at 5 V DC (Increased by 150 mA when NT-AL001-E Link Adapter is used.)			360 mA max. at 5 V DC (Increased by 150 mA when NT-AL001-E Link Adapter is used.)
Dimensions		34.5 × 130 × 100.5 mm (WxHxD)			
Weight		100g max.			220 g max.
Standard accessories		None			C200H-BAT09 Battery (mounted at time of shipment)

Note: Functions given for the Loop Control Unit are for version 2.5.

Function Specifications

Item		Specifications	Specifications	Specifications	
Model numbers		CS1W-LCB01	CS1W-LCB05 and CS1D-LCB05D	CS1W-LC001	
Operation method		Function block method			
Operation cycle		Settable cycles: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block. (See note 1.)		Settable cycles: 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.	
Number of function blocks	Analog operation	Control blocks (See note 2.)	50 blocks max.	500 blocks max.	32 blocks max.
		Operation blocks (See note 3.)			249 blocks max.
	External controller blocks	32 blocks max.			
Sequence control	Sequence tables	None	200 tables max. 32 conditions and 32 actions per table max. (expandable to 64 conditions and 64 actions per table) 6,400 rules total max.	None	
	Step ladder program blocks	20 blocks max. 2,000 commands total 100 commands max. per block Separable into a 100 steps max.	200 blocks max. 4,000 commands total 100 commands max. per block Separable into a 100 steps max.		
I/O blocks	Field terminal blocks	80 blocks max			
	User link tables	2,400 data items max.		None	
	All data	HMI functions 2,040 words max. Allocated 1 EM Area bank	HMI functions 20,040 words max. Allocated 1 EM Area bank	Send/Receive All Blocks: 1 block each max.	
	CPU terminal blocks	None		16 blocks max.	
	Node terminal blocks	None		100 blocks max.	
System common blocks		1 block max.			
Method for creating and transferring function blocks		Created and transferred using CX-Process Tool (purchased separately).			
Control methods	PID control method	PID with 2 degrees of freedom (with auto-tuning)			
	Control combinations	Any of the following function blocks can be combined: Basic PID control, cascade control, feed-forward control, sample PI control, Smith dead time compensation control, PID control with differential gap, override control, program control, time-proportional control, etc.			
Alarms	PID block internal alarms	4 PV alarms (upper upper-limit, upper limit, lower limit, lower lower-limit) and 1 deviation alarm per PID block			
	Alarm blocks	High/low alarm blocks, deviation alarm blocks			

- Note:**
1. Operation cycles of 0.01, 0.02, and 0.05 s cannot be set for the CS1D-LCB05D.
 2. Control blocks such as those for PID control.
 3. Operation blocks for process control such as those for alarms, square roots, time/date calculations, and pulse-train computations.

CX-Process Tool and Monitor

Software Specifications

Item	Specifications		
	CX-Process Tool	CX-Process Monitor	
Name	CX-Process		
Model number	WS02-LCTC1-EV3		
Applicable PLCs	CS-series PLCs		
Applicable Unit	Loop Control Unit (LCU) Loop Control Boards (LCBs)	Loop Control Unit (LCU)	
Compatible computers	Computer	IBM PC/AT or compatible	
	CPU	Minimum: Pentium 133 MHz min. Recommended: Celeron 400 MHz min.	
	OS	Microsoft Windows 2000, NT4.0, 95*1, 98, Me*2, or XP	Microsoft Windows 2000, NT4.0 or XP
	Memory	Minimum: 32 Mbytes Recommended: 64 Mbytes min.	Minimum: 64 Mbytes Recommended: 96 Mbytes min.
	Hard disk storage	Minimum: 20 Mbytes free space Recommended: 30 Mbytes min. free space	Minimum: 150 Mbytes free space Recommended: 200 Mbytes min. free space
	Monitor	Minimum: XGA Recommended: XGA or higher	Minimum: XGA, 256 color
	CD-ROM drive	1 drive min.	
	Sound board	---	1
	Mouse	Recommended: Microsoft mouse or compatible pointing device	
Communications method	Connection with CPU Unit (or Serial Communications Board/Unit)	When FinsGateway Serial Unit driver is used: Communications protocol with PLC: Host Link (Peripheral Bus is not supported.) Connect the computer to the peripheral port or built-in RS-232C port of the CPU Unit, or to the RS-232C port of the Serial Communications Board/Unit. Connecting cable: For connecting to peripheral port of CPU Unit: CS1W-CN□□□□ (2 m or 6 m) For connecting to RS-232C port of CPU Unit: XW2Z-□□□□□ (2 m or 5 m)	
	Connection via Controller Link	When FinsGateway Controller Link driver or CX-Server is used: Install the software in a computer with a Controller Link Support Board to communicate with a PLC with a Controller Link Unit mounted.	
	Connection via Ethernet	When FinsGateway ETN_UNIT driver or CX-Server is used: Install the software in a computer with an Ethernet Board to communicate with a PLC with an Ethernet Unit mounted.	

CX-Process Tool and Monitor

Item	Specifications		
	CX-Process Tool	CX-Process Monitor	
Offline functions	ITEM data settings for function blocks <ul style="list-style-type: none"> • Software connections for analog signals • Displaying and printing text strings (annotation) pasted on function block diagrams and ladder diagrams. • Instructions for step ladder blocks and commands for sequence table blocks • Tag settings for CX-Process Monitor 	Construction of user screens	
Online functions	<ul style="list-style-type: none"> • Transfer of function block data (Downloading/Uploading for Loop Control Boards/Units.) • Starting/stopping all function blocks (LCU/LCB) • Monitoring system operation: Monitoring and controlling the System Common block (including LCB/LCU load rates) • Validating LCB/LCU operation: Checking function block connections (including starting and starting individual function blocks), validating ladder diagrams and sequence tables, and monitoring ITEMS • Tuning PID constants and other parameters (fine tuning and autotuning) • Initialization of Loop Control Unit memory (RAM) 	User screens <ul style="list-style-type: none"> • Overview screen • Control screen • Tuning screen 	<ul style="list-style-type: none"> • Trend screen • Graphic screen • Operating guide message screen
		System screens <ul style="list-style-type: none"> • Alarm history screen • System monitor screen 	<ul style="list-style-type: none"> • Operation log screen

- Note:**
1. Windows 95 cannot be used when a Controller Link Support Board (PCI bus) is used for connection.
 2. When using Windows Me, the CPU must be a Pentium 150 MHz or higher.
 3. FinsGateway V3 is included in CX-Process. (70 Mbytes of free space required on hard disk.)
 4. The CX-Process functions that can be used vary with the version. For details, refer to the operation manuals (Cat. No.: W372-E1-□ and W373-E1-□).

■ Connections to PLC

The following 3 methods can be used to connect to a PLC. Use the FinsGateway V3 as the communications driver for all methods.

Communications network		Communication driver	
		FinsGateway V3	CX-Server V1.7
Host Link	Connection via PLC's peripheral port or RS-232C port	Supported (Serial Unit version is used.)	Supported*1
Peripheral Bus		Not supported	Supported*1
Controller Link	Connection to PLC with Controller Link Unit via Controller Link Support Board (PCI board).	Supported*2 (CLK (PCI) version is used.)	Supported
	Connection to PLC with Controller Link Unit via Controller Link Support Board (ISA board).	Supported (CLK (ISA) version is used.)	Supported
Ethernet	Connection to PLC with Ethernet Unit via Ethernet Board.	Supported (Ethernet version is used.)	Supported

- Note:**
1. When CX-Server is used for communications, CX-Programmer can be simultaneously connected via the same COM port.
 2. The Windows 95 operating system cannot be used.

Function Blocks

System Common Blocks

Type	Block Name	Function
System	System Common	Makes settings common to all function blocks and outputs signals for the system.

Control Blocks

Type	Block Name	Function
Controller	2-position ON/OFF	2-position type ON/OFF controller
	3-position ON/OFF	3-position type ON/OFF controller for heating/cooling ON/OFF control
	Basic PID	Performs basic PID control.
	Advanced PID	Performs PID with two degrees of freedom control for enabling deviation/MV compensation, MV tracking, etc.
	Blended PID	Performs PID control on the cumulative value (cumulative deviation) between the accumulated value PV and accumulated value Remote Set Point.
	Batch Flowrate Capture	Functions to open the valve at a fixed opening until a fixed batch accumulated value is reached.
	Fuzzy Logic	Outputs up to two analog outputs based on fuzzy logic performed on up to 8 analog inputs.
	Indication and Setting	Manual setter with PV indication and SP setting functions
	Indication and Operation	Manual setter with PV indication and MV setting functions
	Ratio Setting	Ratio and bias setter with PV indication and ratio setting function
Indicator	PV indicator with PV alarm	

External Controller Blocks

Type	Block Name	Function
External Controller Block	ES100X Controller Terminal	Performs monitoring and setting for an ES100X Controller connected directly to the RS-232C port on the Loop Control Unit.

Operation Blocks

Type	Block Name	Function
Alarm/ Signal restrictions/Hold	4-Point Warning Indicator	Provides the alarm contact outputs for the high/high, high, low, and low/low limits of single analog signals. This function block provides the same function as the Indicator block (model 034).
	High/Low Alarm	Provides the alarm contact outputs for the high and low limits of single analog signals.
	Deviation Alarm	Provides the alarm contact outputs for the deviation of two analog signals.
	Rate-of-change Operation and Alarm	Provides the alarm contact outputs for the high and low limits of rate-of-change operation when the analog signal rate-of-change is output.
	High/Low Limit	Limits the high and low limits of single analog signals.
	Deviation Limit	Calculates the deviation between two analog signals, and limits the deviation within that range.
	Analog Signal Hold	Holds the maximum, minimum or instantaneous value of single analog signals.
Arithmetic	Addition or Subtraction	Performs addition/subtraction with gain and bias on up to 4 analog signals.
	Multiplication	Performs multiplication with gain and bias on up to 2 analog signals.
	Division	Performs division with gain and bias on up to 2 analog signals.
	Range Conversion	Easily converts up to 8 analog signals simply by inputting the 0% and 100% input values and 0% and 100% output values.
	Arithmetic Operation	Performs various math operation (trigonometric, logarithmic, etc.) on floating-point decimal values converted (to industrial units) from up to 8 analog inputs.

Function Blocks

Type	Block Name	Function
Functions	Square Root	Performs square root extraction (with low-end cutout) on single analog signals.
	Absolute Value	Outputs the absolute value of single analog signals.
	Non-linear Gain (Dead Band)	Performs non-linear (3 gain values) operation on single analog signals. Analog signals can also set as a dead band (with different gap).
	Low-end Cutout	Sets output to zero close to the zero point of single analog signals.
	Segment Linearizer	Converts single analog signals to 15 segments before the signals is output.
	Temperature And Pressure Correction	Performs temperature and pressure correction.
Time Function	First-order Lag	Performs first-order lag operation on single analog signals.
	Rate-of-change Limit	Performs rate-of-change restriction on single analog signals.
	Moving Average	Performs moving average operation on single analog signals.
	Lead/Delay	Performs lead/delay operation on single analog signals.
	Dead Time	Performs dead time and first-order lag operations on single analog signals.
	Dead Time Compensation	Used for Smith's dead time compensation PID control
	Accumulator for Instantaneous Value Input	Accumulates analog signals, and outputs 8-digit accumulated value signals.
	Run Time Accumulator	Accumulates the operating time, and outputs the pulse signal per specified time.
	Time Sequence Data Statistics	Records time sequence data from analog signals and calculates statistics, such as averages and standard deviations.
	Ramp Program	Ramp program setter for combining ramps for time and hold values.
	Segment Program	Segment program setter setting the output values with respect to time.
	Segment Program 2	Segment program setting with wait function for setting the output values with respect to time
Signal Selection/ Switching	Rank Selector	Selects the rank of up to 8 analog signals.
	Input Selector	Selects the specified analog signals specified by the contact signal from up to 8 analog signals.
	3-input Selector	Selects and outputs one of three analog input signals.
	3-output Selector	Outputs one analog input signal in one of three switched directions.
	Constant Selector	Selects 8 preset constants by the contact signal.
	Constant Generator	Outputs 8 independent constants.
ITEM Settings	Ramped Switch	Switches two analog inputs (or constants) with a ramp.
	Constant ITEM Setting	Writes the constant to the specified ITEM at the rising edge of the send command contact.
	Variable ITEM Setting	Writes the analog signal to the specified ITEM at the rising edge of the send command contact.
Pulse Train Operation	Batch Data Collector	Stores each of max. 8 analog inputs to buffer by a certain timing within sequential processing.
	Accumulated Value Input Adder	Adds up to four accumulated value signals.
	Accumulated Value Analog Multiplier	Multiplies analog signals by the accumulated value signals.
	Accumulator for Accumulated Value Input	Converts 4-digit accumulated value signals to 8 digits.
	Contact input/Accumulated Value Output	Counts low-speed contact pulses, and outputs 8-digit accumulated signals.
Others	Accumulated Value Input/Contact Output	Converts 4-digit accumulated value signals to low-speed contact pulses before they are output.
	Analog/Pulse Width Converter	Changes the ON/OFF duration ratio in a constant cycle duration so that it is proportional to the analog signal.
Sequence Operation	Contact Distributor	Connect contact signals between function blocks in a 1:1 connection.
	Constant Comparator	Compares up to eight sets of analog signals and constants, and outputs the comparison results as contacts.
	Variable Comparator	Compares up to eight pairs of analog signals, and outputs the comparison results as contacts.
	Timer	2-stage output type addition timer for forecast values and reached values. Can also output the present value.

Function Blocks

Sequence Control Blocks

Type	Block Name	Function
Sequence Operation (continued)	ON/OFF Timer	Timer for performing ON-OFF operation at preset ON and OFF times.
	Clock Pulse	Manipulates and monitors ON/OFF valves with open/close limit switches.
	Counter	2-stage output type addition timer for forecast values and arrival values. Can also output the current value.
	Internal Switch	Temporary storage contact for accepting relays in the Step Ladder Program block. (Note: One internal switch is already allocated as "temporary storage" in CX-Process Tool.)
	Level Check	Checks an analog input for 8 levels and outputs a contact corresponding to the level. The level number is also output as an analog value.
Contact Type Control Target	ON/OFF Valve Manipulator	Manipulates and monitors ON/OFF valves with open/close limit switches.
	Motor Manipulator	Manipulates and monitors motor operation.
	Reversible Motor Manipulator	Manipulates and monitors reversible motor operation.
	Motor Opening Manipulator	Inputs a target opening, and manipulates an electric positional-proportional motor.

Sequence Control Blocks

Type	Block Name	Function
Sequence Control	Step Ladder Program	Performs logic sequence and step progression control.
	Sequence Table	Performs logic sequence and step progression control based on conditions and actions listed in tabular form.

Field Terminal Blocks

Type	Block Name	Function
Contact I/O	DI 8-point Terminal	Inputs 8 contacts from 8-point Input Unit.
	DI 16-point Terminal	Inputs 16 contacts from 16-point Input Unit.
	DI 32-point Terminal	Inputs 32 contacts from 32-point Input Unit.
	DI 64-point Terminal	Inputs 64 contacts from 64-point Input Unit.
	DO 5-point Terminal	Outputs 5 contacts from 5-point Output Unit.
	DO 8-point Terminal	Outputs 8 contacts from 8-point Output Unit.
	DO12-point Terminal	Outputs 12 contacts from 12-point Output Unit.
	DO16-point Terminal	Outputs 16 contacts from 16-point Output Unit.
	DO32-point Terminal	Outputs 32 contacts from 32-point Output Unit.
	DO64-point Terminal	Outputs 64 contacts from 64-point Output Unit.
	DI 16-point/DO 16-point Terminal	Inputs and outputs 16 contacts each from 16-point Input/16-point Output Units.
	DI 96-point Terminal	Inputs 96 contacts from 96-contact Input Units.
	DO 96-point Terminal	Outputs 96 contacts from 96-contact Output Units.
	DI 48-point/DO 48-point Terminal	Inputs and outputs 48 contacts each from 48-point Input/48-point Output Units.

Function Blocks

Node Terminal Blocks

Type	Block Name	Function
Analog I/O	AI 8-point Terminal (AD003)	Inputs 8 analog signals from the C200H-AD003.
	AO 8-point Terminal (DA003/4)	Inputs 8 analog signals from the C200H-DA003/DA004.
	AI 2-point/AO 2-point Terminal (MAD01)	Inputs and outputs 2 analog signals each from the C200H-MAD01.
	AI 4-point Terminal (PTS01-V1/02/03,PDC01, PTW01)	Inputs 4 analog signals from one of CS1W-PTS01-V1 (Isolated-type Thermocouple Input Unit), CS1W-PTS02/03 (Isolated-type Temperature-resistance Thermometer Input Unit), CS1W-PDC01 (Isolated-type Analog Input Unit) or CS1W-PTW01 (2-lead Transmitter Input Unit).
	PI 4-point Terminal (PPS01)	Inputs 4 instantaneous values and accumulated values each from CS1W-PPS01 (Isolated-type Pulse Input Unit).
	AO 4-point Terminal (PMV01)	Outputs 4 analog signals from CS1W-PMV01 (Isolated-type Control Output Unit).
	AI 8-point Terminal (PTR01/02/03)	Inputs 8 analog signals from CS1W-PTR01 (Power Transducer Input Unit) or CS1W-PTR02/PTR03 (Analog Input Unit (100 mV)).
	AI 4-point/AO 4-point Terminal (MAD44)	Inputs and outputs 4 analog signals each from the CS1W-MAD44.
	AI 8-point Terminal (AD081)	Inputs 8 analog signals from the CS1W-AD081.
	AO 8-point Terminal (DA08V/C)	Outputs 8 analog signals from the CS1W-DA08V/C.
	AI 4-point Terminal (AD041)	Inputs 4 analog signals from the CS1W-AD041.
	AO 4-point Terminal (DA041)	Outputs 4 analog signals from the CS1W-DA041.
	AI 4-point Terminal (DRT1-AD04)	Inputs four analog signals from a DRT1-AD04 DeviceNet Slave Analog Input Unit.
	AO 2-point Terminal (DRT1-DA02)	Outputs two analog signals from a DRT1-DA02 DeviceNet Slave Analog Output Unit.

Node Terminal Blocks

Type	Block Name	Function
Send to Computer	DO to Computer	Sends 128 contacts to the send-to-computer area. When CX-Process Monitor is used, the contact signals to be monitored are connected to this function block.
	AO to Computer	Sends 16 analog values to the send-to-computer area. When CX-Process Monitor is used, the analog signals to be monitored are connected to this function block.
	1-Block Send Terminal to Computer	Sends a specified 1 block to the send-to-computer area. When CX-Process Monitor is used, the 1 block to be monitored are connected to this function block.
	4-Block Send Terminal to Computer	Sends a specified 4 block to the send-to-computer area. When CX-Process Monitor is used, the 4 block to be monitored are connected to this function block.
Send to All Nodes	DO Terminal to All Nodes	Sends 32 contacts to nodes on the Controller Link Data Link.
	AO Terminal to All Nodes	Sends 2 analog values to nodes on the Controller Link Data Link.
	DO Terminal Settings from Computer	Receives 32 contacts sent from the computer. (Can also be downloaded to the send-to-all nodes area.)
	AO Terminal Settings from Computer	Receives 2 analog values sent from the computer. (Can also be downloaded to the send-to-all nodes area.)
Receive from All Nodes	DI Terminal from All Nodes	Receives 32 contacts sent from nodes on the Controller Link Data Link.
	AI Terminal from All Nodes	Receives 2 analog values sent from nodes on the Controller Link Data Link.

CPU Unit Terminal Blocks

Type	Block Name	Function
CPU Unit Terminals	DI Terminal from CPU Unit	Inputs max. 128 points from any leading address in CPU Unit I/O memory (one of CIO, WR, HR, DM and EM area types). (read)
	DO Terminal to CPU Unit	Outputs max. 128 points from any leading address in CPU Unit I/O memory (one of CIO, WR, HR, DM and EM area types). (read and write)
	AI Terminal from CPU Unit	Inputs max. 8 words from any leading address in CPU Unit I/O memory (one of CIO, WR, HR, DM and EM area types). (read)
	AO Terminal to CPU Unit	Outputs max. 8 words from any leading address in CPU Unit I/O memory (one of CIO, WR, HR, DM and EM area types). (read and write)

SCADA Interface Blocks

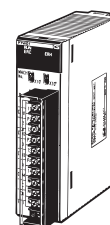
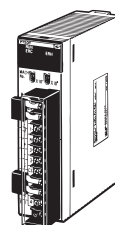
Type	Block Name	Function
Expanded CPU Unit Terminals	Expanded DI Terminal from CPU Unit	Inputs any contact data in CPU Unit I/O Memory, and writes max. 64 points on another function block.
	Expanded DO Terminal from CPU Unit	Inputs the contact data of another function block, and writes max. 64 points on any I/O Memory in the CPU Unit.
	Expanded AI Terminal from CPU Unit	Inputs any analog data in CPU Unit I/O Memory, and writes max. 64 words on another function block.
	Expanded AO Terminal from CPU Unit	Inputs the analog data of another function block, and writes max. 64 words on any CPU Unit I/O Memory.
Send/Receive All Blocks	Receive All Blocks	Reads ITEM data specified for Send/Receive All Blocks for up to 32 Control Blocks, 249 Operation Blocks, and 32 External Controller Blocks starting from a specified address in the I/O memory of the CPU Unit.
	Send All Blocks	Writes ITEM data specified for Send/Receive All Blocks for up to 32 Control Blocks, 249 Operation Blocks, and 32 External Controller Blocks starting to a specified address in the I/O memory of the CPU Unit.

Analog I/O Units

Analog I/O Units

Features

- A total of 16 Analog I/O Unit models are available, including 8 with isolated-type I/O. Using the Analog I/O Units, most types of processing applications can be performed.
- Using a variety of functions such as automatic range setting, process value scaling, and process value alarm, appropriate configurations for a wide range of monitoring needs can be created.



CS1W-PTS01-V1 CS1W-PTW01

Process Analog I/O Units

Name	Model	Number of I/O	Field I/O isolation	I/O type	Main specifications	Main functions
Isolated-type Thermocouple Input Unit	CS1W-PTS01-V1	4 inputs	All inputs are isolated.	B, E, J, K, N, R, S, T Variable range: ±80 mV DC	Standard accuracy: ±0.1% Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 150 ms/4 pts	Variable range setting Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection
Isolated-type Resistance Thermometer Input Unit	CS1W-PTS02	4 inputs	All inputs are isolated.	Pt100 (JIS, IEC), JPt100	Standard accuracy: The larger of ±0.1% or ±0.1°C Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Variable range setting Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection
Isolated-type Resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	4 inputs	All inputs are isolated.	Ni508.4 Ω	Standard accuracy: The larger of ±0.2% or ±0.2°C Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Variable range setting Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection
Isolated-type 2-Wire Transmitter Input Unit	CS1W-PTW01	4 inputs	All inputs are isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: ±0.2% Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Built-in power supply for 2-wire transmitter Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Square root Input error detection
Isolated-type Analog Input Unit	CS1W-PDC01	4 inputs	All inputs are isolated.	-10 to 10 V, 0 to 10 V, -5 to 5 V, 0 to 5 V, 1 to 5 V, ±10 V DC variable range, 4 to 20 mA, 0 to 20 mA	Standard accuracy: ±0.1% Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Process value alarms (HH, H, L, LL) Scaling (±32,000) Square root Rate-of-change calculation and alarm Input error detection
Isolated-type Pulse Input Unit	CS1W-PPS01	4 inputs	All inputs are isolated.	No-voltage semiconductor; voltage input: 0 to 20,000 pulses/s Contact input: 0 to 20 pulses/s	---	Built-in sensor power supply Contact bounce filter Unit pulse conversion Accumulated value output Instantaneous value output and four alarms

Analog I/O Units

Standard Analog I/O Units

Name	Model	Number of I/O	Field I/O isolation	I/O type	Main specifications	Main functions
Isolated-type Analog Output Unit	CS1W-PMV01	4 outputs	All outputs are isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: $\pm 0.1\%$ (4 to 20 mA) $\pm 0.2\%$ (1 to 5 V) Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$ 4,000 (output) Conversion cycle: 100 ms/4 pts	Output disconnection alarm Control output answer input Output rate-of-change limit Output high/low limits
	CS1W-PMV02	4 outputs	All outputs isolated	0 to 10 V, ± 10 V, 0 to 5 V, ± 5 V, 0 to 1 V, ± 1 V	Standard accuracy: $\pm 0.1\%$ Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$ Resolution: ± 10 V, ± 1 V: 1/16,000 (full scale) 0 to 10 V, 0 to 1 V, ± 5 V: 1/8,000 (full scale) 0 to 5 V: 1/4,000 (full scale) Conversion cycle: 40 ms/4 pts	Output rate-of-change limit Output high/low limits Scaling ($\pm 32,000$)
Power Transducer Input Unit	CS1W-PTR01	8 inputs	Inputs and PLC signals isolated.	-1 to 1 mA, 0 to 1 mA	Standard accuracy: $\pm 0.2\%$ Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$ Resolution: 1/4,096 Conversion cycle: 200 ms/8 pts	Anti-overshooting at motor startup Process value alarms (H, L) Scaling ($\pm 32,000$)
Analog Input Unit (100 mV)	CS1W-PTR02	8 inputs	Inputs and PLC signals isolated.	-100 to 100 mV, 0 to 100 mV	Standard accuracy: $\pm 0.2\%$ Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$ Resolution: 1/4,096 Conversion cycle: 200 ms/8 pts	Process value alarms (H, L) Scaling ($\pm 32,000$)

Standard Analog I/O Units

Name	Model	Number of I/O	Field I/O isolation	I/O signal ranges	Overall accuracy
Analog Input Unit	CS1W-AD041-V1	4 inputs	Inputs and PLC signals isolated.	1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA	At $23\pm 2^{\circ}\text{C}$: Voltage input: $\pm 0.2\%$ of F.S. Current input: $\pm 0.4\%$ of F.S. At 0 to 55°C : Voltage input: $\pm 0.4\%$ of F.S. Current input: $\pm 0.6\%$ of F.S. Resolution: 1/8,000 or 1/4,000; Conversion speed: 250 μs or 1 ms (See note.)
	CS1W-AD081-V1	8 inputs	Inputs and PLC signals isolated.	1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA	At $23\pm 2^{\circ}\text{C}$: Voltage input: $\pm 0.2\%$ of F.S. Current input: $\pm 0.4\%$ of F.S. At 0 to 55°C : Voltage input: $\pm 0.4\%$ of F.S. Current input: $\pm 0.6\%$ of F.S. Resolution: 1/8,000 or 1/4,000; Conversion speed: 250 μs or 1 ms (See note.)
Analog Output Unit	CS1W-DA041	4 outputs	Outputs and PLC signals isolated.	1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA	At $23\pm 2^{\circ}\text{C}$: Voltage output: $\pm 0.3\%$ of F.S. Current output: $\pm 0.5\%$ of F.S. At 0 to 55°C : Voltage output: $\pm 0.5\%$ of F.S. Current output: $\pm 0.8\%$ of F.S. Resolution: 1/4,000
	CS1W-DA08V	8 outputs	Outputs and PLC signals isolated.	1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V	At $23\pm 2^{\circ}\text{C}$: $\pm 0.3\%$ of F.S. At 0 to 55°C : $\pm 0.5\%$ of F.S. Resolution: 1/4,000
	CS1W-DA08C	8 outputs	Outputs and PLC signals isolated.	4 to 20 mA	At $23\pm 2^{\circ}\text{C}$: $\pm 0.5\%$ of F.S. At 0 to 55°C : $\pm 0.8\%$ of F.S. Resolution: 1/4,000
Analog I/O Unit	CS1W-MAD44	4 inputs 4 outputs	Inputs/outputs and PLC signals isolated.	Input: 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA Output: 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V	At $23\pm 2^{\circ}\text{C}$: Voltage input: $\pm 0.2\%$ of F.S. Current input: $\pm 0.4\%$ of F.S. Output: $\pm 0.3\%$ of F.S. At 0 to 55°C : Voltage input: $\pm 0.4\%$ of F.S. Current input: $\pm 0.6\%$ of F.S. Output: $\pm 0.5\%$ of F.S. Resolution: 1/4,000

Note: The conversion time and resolution can be selected in the DM Area settings to 1/4,000 and 1 ms (previous values) or 1/8,000 and 250 μs .

Analog I/O Units

Common Specifications for Process and Standard Analog I/O Units

Common Specifications for Process and Standard Analog I/O Units

Item	Specifications				
Unit classification	CS-series Special I/O Unit				
Dimensions	35 × 130 × 126 mm (W × H × D)				
Weight	450 g max.				
External connection terminals	21-terminal detachable terminal block (M3 screws; tightening torque: 0.5 N·m)				
Unit number switch	00 to 95				
Self-diagnostic function	Results shown by LED indicators.				
Mounting position	CS-series CPU Rack or CS-series Expansion Rack				
Internal current consumption	Confirm that the total current consumption of all the Units (including the CPU Unit) mounted to a single CPU Rack or Expansion Rack does not exceed the maximum power supplied by the Power Supply Unit.				
	Name	Model	Current consumption (power)		
			5 V	26 V	
	Isolated-type Thermocouple Input Unit	CS1W-PTS01-V1	0.15 A (0.75 W)	0.15 A (3.9 W)	
	Isolated-type Resistance Thermometer Input Unit	CS1W-PTS02			
	Isolated-type Resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03			
	Isolated-type 2-Wire Transmitter Input Unit	CS1W-PTW01		0.16 A (4.16 W)	
	Isolated-type Analog Input Unit	CS1W-PDC01		0.15 A (3.9 W)	
	Isolated-type Pulse Input Unit	CS1W-PPS01	0.20 A (1.00 W)	0.16 A (4.16 W)	
	Isolated-type Analog Output Units	CS1W-PMV01	0.15 A (0.75 W)	0.16 A (4.16 W)	
		CS1W-PMV02	0.12 A (0.6 W)	0.12 A (3.12 W)	
	Power Transducer Input Unit	CS1W-PTR01	0.15 A (0.75 W)	0.08 A (2.08 W)	
	Analog Input Unit (100 mV)	CS1W-PTR02			
	Analog Input Units	CS1W-AD041-V1	0.12 A (0.6 W)	0.09 A (2.34 W)	
		CS1W-AD081-V1			
	Analog Output Units	CS1W-DA041	0.13 A (0.65 W)	0.18 A (4.68 W)	
		CS1W-DA08V			
		CS1W-DA08C		0.25 A (6.5 W)	
	Analog I/O Unit	CS1W-MAD44	0.20 A (1.00 W)	0.20 A (5.20 W)	
	(Reference) Maximum current and total power supplied				
	Power Supply Unit	Maximum current supplied (power)			Maximum total power
		5 V	26 V	24 V	
	C200HW-PA204	4.6 A (23 W)	0.6 A (15.6 W)	None	30 W
	C200HW-PA204S			0.8 A (19.2 W)	
	C200HW-PA204R			None	
	C200HW-PD024				
	C200HW-PA209R	9 A (45 W)	1.3 A (33.8 W)		45 W
Ambient operating temperature	0 to 55°C				
Ambient operating humidity	10% to 90% (with no condensation)				
Isolation	Between inputs or between outputs; between inputs or outputs and Backplane. (For the Power Transducer Input Unit and the Analog Input Unit (100 mV, there is no isolation between inputs.)				
Insulation resistance	20 MΩ/500 V DC between insulated parts.				
Dielectric strength	1,000 V AC between insulated parts.				

Note: Process Analog I/O Units can be used even if a Loop Control Board or Loop Control Unit is not used.

Utility Software

Face Plate Auto-Builder for NS

Basic Specifications

Item		Specifications
Name		Face Plate Auto-Builder for NS
Model number		WS02-NSFC1-E (available soon)
Applicable PLC products		CS-series Loop Control Boards CS-series Loop Control Units (version 2.0 or later)
Applicable PTs		NS-series NS12, NS10, and NS 7 (PT version 2.0 or later) NS-Designer (version 2.0 or later)
System requirements	Computer	IBM PC/AT or compatible
	CPU	Celeron 400 MHz or better recommended
	OS	Microsoft Windows 95, 98, Me, NT4.0, 2000, or XP
	Memory	Recommended: 32 Mbytes min.
	Hard disk storage	Recommended: 200 Mbytes free space min.
	Monitor	Minimum: 640 x 480 dots
Basic functions		Number of generated loops: 32 max., control windows and tuning windows Applicable face plates: 2-position ON/OFF, 3-position ON/OFF, Basic PID, Advanced PID, Indication and Operation, Indicator, Segment Program 2 Number of loops in control windows: 6 loops per window for NS12, 4 loops per window for NS10/NS7 Realtime trend in tuning window: 1-second cycle

Utility Software

Process Analog I/O Unit Support Software

Analog I/O Support Software is a Windows-based setting tool for Process Analog I/O Units and Analog I/O Units. Various parameters can be set in tabular or conversational form.

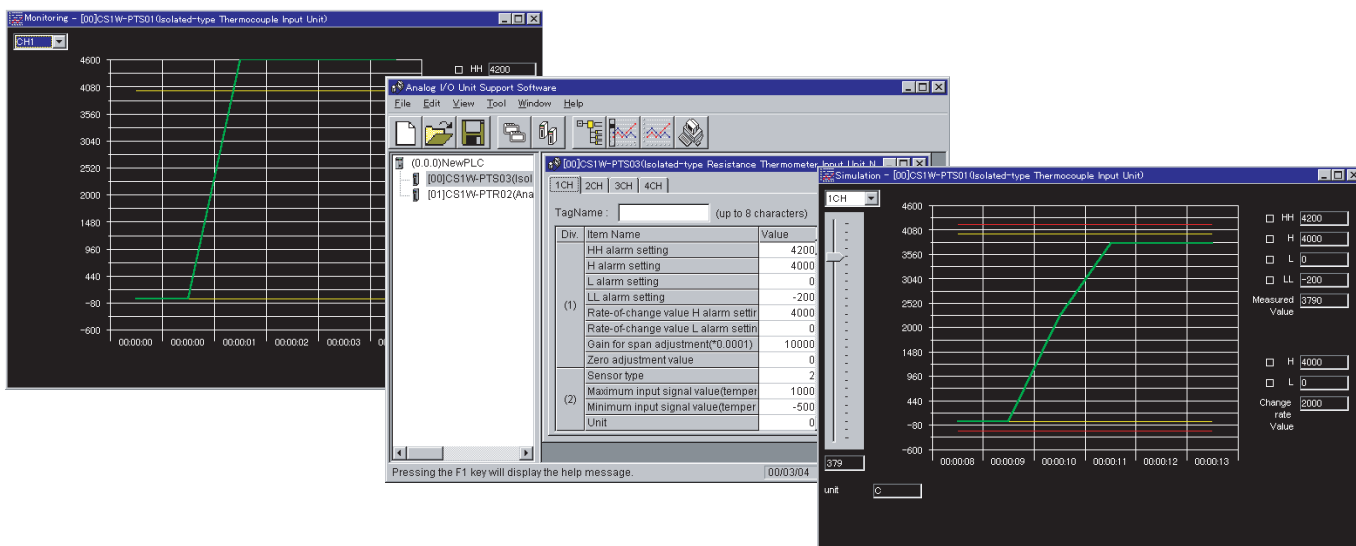
Functions

- Editing set values in Special I/O Unit DM Area of CPU Unit used by Process Analog I/O Units and Standard Analog I/O Units.
 - Set value editing in tabular form
 - Interactive input (Parameter Wizard)
 - Setting values transfer (Upload/Download)
- Setting values backup (File Saving)
- Process Analog I/O Units simulation
- Simple monitoring function for Process Analog I/O Units
- Printing set values

Note: 1. Only Process Analog I/O Units are not supported by the Parameter Wizard.
 2. This Support Software doesn't support adjustment mode functions for Analog I/O Units. Please use a Programming Console in adjustment mode.

System Requirements

Compatible computers	Computer	IBM PC/AT or compatible
	CPU	Minimum: Pentium 75 MHz
	OS	Microsoft Windows 95, 98, or 2000
	Memory	Minimum: 32 Mbytes
	Hard disk storage	Minimum: 10 Mbytes free space
	Monitor	Minimum: SVGA
	Mouse	Microsoft mouse or compatible pointing device
Connection methods	Connection via RS-232C	Only Host Link (Peripheral bus is not acceptable)
	Connection via Controller Link	For a communication driver, FinsGateway Controller Link driver or FinsGateway V.3 CLK (PCI) driver is required.
	Connection via Ethernet	For a communication driver, FinsGateway ETN_UNIT driver is required.



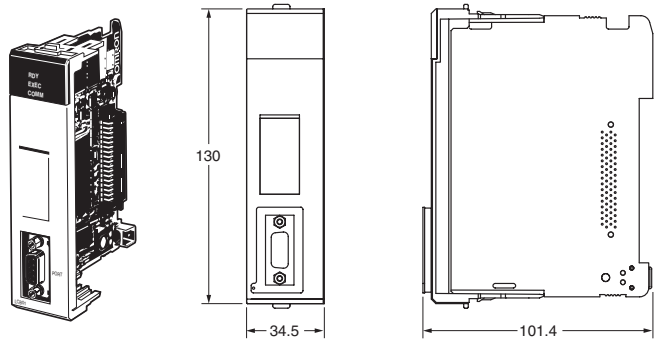
Dimensions

Dimensions

INNER Boards

Loop Control Boards (Unit: mm)

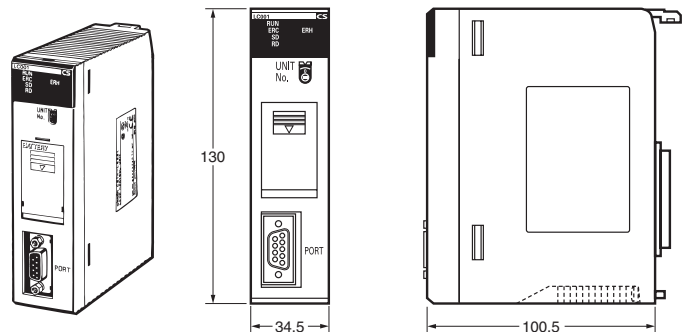
- CS1W-LCB01
- CS1W-LCB05
- CS1D-LCB05D



CPU Bus Units

Loop Control Unit (Unit: mm)

- CS1W-LC001



Special I/O Units

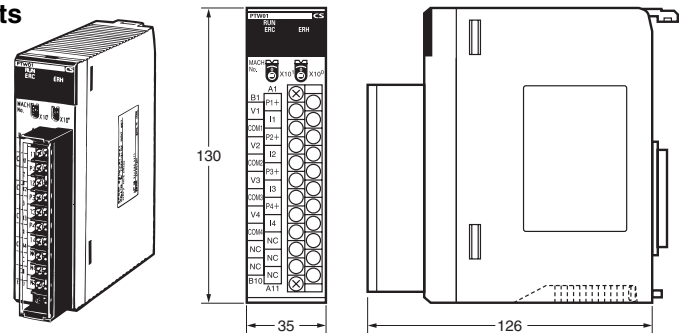
Analog I/O Units (Unit: mm)

Process Analog I/O Units

- CS1W-PTS01-V1
- CS1W-PTS02
- CS1W-PTS03
- CS1W-PTW01
- CS1W-PDC01
- CS1W-PTR01
- CS1W-PTR02
- CS1W-PPS01
- CS1W-PMV01
- CS1W-PMV02

Standard Analog I/O Units

- CS1W-AD041-V1
- CS1W-AD081-V1
- CS1W-DA041
- CS1W-DA08V
- CS1W-DA08C
- CS1W-MAD44



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■ EMC Directives

OMRON devices that comply with EC Directives also conform to the related EMC standards so that they can be more easily built into other devices or the overall machine. The actual products have been checked for conformity to EMC standards (see the following note). Whether the products conform to the standards in the system used by the customer, however, must be confirmed by the customer.

EMC-related performance of the OMRON devices that comply with EC Directives will vary depending on the configuration, wiring, and other conditions of the equipment or control panel on which the OMRON devices are installed. The customer must, therefore, perform the final check to confirm that devices and the overall machine conform to EMC standards.

Applicable EMC Standards

EMS (Electromagnetic Susceptibility): EN61131-2



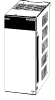



EMI (Electromagnetic Interference): EN50081-2

(Radiated emission: 10-m regulations)

Low Voltage Directive

OMRON Power Supply Units and I/O Units have been determined safe when operating at voltages of 50 to 1,000 V AC and 75 to 1,500 V DC according to the safety standards in EN61131-2.

Basic PLC Components

Name	Specifications			Model	Standards	
CPU Units 	I/O bits Program capacity Data memory capacity	5,120	250K steps	448K words (DM: 32K words, EM: 32K words ×13 banks)	CS1H-CPU67H	UC, N, L, CE
		5,120	120K steps	256K words (DM: 32K words, EM: 32K words ×7 banks)	CS1H-CPU66H	
		5,120	60K steps	128K words (DM: 32K words, EM: 32K words ×3 banks)	CS1H-CPU65H	
		5,120	30K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1H-CPU64H	
		5,120	20K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1H-CPU63H	
		5,120	60K steps	128K words (DM: 32K words, EM: 32K words ×3 banks)	CS1G-CPU45H	
		1,280	30K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1G-CPU44H	
		960	20K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1G-CPU43H	
		960	10K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1G-CPU42H	
CPU Backplanes 	2 slots (Does not connect to Expansion Rack.)			CS1W-BC023		
	3 slots			CS1W-BC033		
	5 slots			CS1W-BC053		
	8 slots			CS1W-BC083		
	10 slots			CS1W-BC103		
Power Supply Units 	100 to 120 V AC or 200 to 240 V AC, Output capacity: 4.6 A, 5 V DC			C200HW-PA204	U, C, N, L, CE	
	100 to 120 V AC or 200 to 240 V AC (with 0.8 A 24 V DC service power supply) Output capacity: 4.6 A, 5 V DC			C200HW-PA204S		
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 4.6 A, 5 V DC			C200HW-PA204R	U, C	
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 9 A, 5 V DC			C200HW-PA209R	U, C, N, L, CE	
	24 V DC, Output capacity: 4.6 A, 5 V DC			C200HW-PD024		
Memory Cards 	Flash memory, 15 MB			HMC-EF172	L, CE	
	Flash memory, 30 MB			HMC-EF372		
	Flash memory, 64 MB			HMC-EF672	---	
	Memory Card Adapter (for computer PCMCIA slot)			HMC-AP001	CE	
Serial Communications Boards	2 × RS-232C ports, protocol macro function			CS1W-SCB21-V1	U, C, N, L, CE	
	1 × RS-232C port + 1 × RS-422/485 port, protocol macro function			CS1W-SCB41-V1		
Programming Consoles 	An English Keyboard Sheet (CS1W-KS001-E) is required. (Connects on peripheral port on CPU Unit only.)			CQM1-PRO01-E	U, C, N, CE	
				C200H-PRO27-E		
Programming Console Key Sheet	For C200H-PRO27 and CQM1-PRO01			CS1W-KS001-E	CE	
Programming Console Connecting Cables 	Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)			CS1W-CN114		
	Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)			CS1W-CN224		
	Connects the C200H-PRO27-E Programming Console. (Length: 6.0 m)			CS1W-CN624		

CS1D Duplex Systems

Name	Specifications			Model	Standards
CS1D CPU Units	I/O bits	Program capacity	Data memory capacity	---	---
		5,120	60K steps	128K words (DM: 32K words, EM: 32K words × 3 banks)	
		250K steps	448K words (DM: 32K words, EM: 32K words × 13 banks)	CS1D-CPU67H	UC, N, L, CE
Duplex Unit	---			CS1D-DPL01	
CS1D Power Supply Units	100 to 120 V AC or 200 to 240 V AC, 50/60 Hz, Output capacity: 7 A, 5 V DC; 1.3 A, 26 V DC, Total: 35 W max.			CS1D-PA207R	
Duplex CPU Backplane	5 slots			CS1D-BC052	
CS1D Expansion Backplane (supports online replacement)	9 slots (Used for both CS1D Expansion and Long-distance Expansion Racks)			CS1D-BIO92	
Controller Link Units	Optical ring (H-PCF cable)			CS1W-CLK12-V1	
	Optical ring (GI cable)			CS1W-CLK52-V1	

Loop Control Boards and Loop Control Units

Unit name	Specifications	Model	Standards
Loop Control Boards	No. of function blocks: 50 blocks max.	CS1W-LCB01	UC, CE
	No. of function blocks: 500 blocks max.	CS1W-LCB05	
	No. of function blocks: 500 blocks max. Supports duplex (CS1D) operation (to be released soon)	CS1D-LCB05D	
Loop Control Unit	No. of control loops: 32 loops max. No. of operations: 249 max.	CS1W-LC001	U, C, N, CE

Process Analog I/O Units

Name	Specifications	Model	Standards
Isolated-type Thermocouple Input Unit	4 inputs, B, E, J, K, N, R, S, T; ±80 mV	CS1W-PTS01-V1	U, C, CE
Isolated-type Resistance Thermometer Input Unit	4 inputs, Pt100, JPt100	CS1W-PTS02	
Isolated-type Resistance Thermometer Input Unit (Ni508.4 Ω)	4 inputs, Ni508.4 Ω	CS1W-PTS03	
Isolated-type 2-Wire Transmitter Input Unit	4 inputs, 4 to 20 mA, 1 to 5 V	CS1W-PTW01	
Isolated-type Analog Input Unit	4 inputs, 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V, ±5 V, 0 to 10 V, ±10 V	CS1W-PDC01	
Isolated-type Pulse Input Unit	4 inputs	CS1W-PPS01	
Isolated-type Analog Output Unit	4 outputs, 4 to 20 mA, 1 to 5 V	CS1W-PMV01	UC, CE
	4 outputs, 0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	CS1W-PMV02	
Power Transducer Input Unit	8 inputs, 0 to 1 mA, ±1 mA	CS1W-PTR01	U, C, CE
Analog Input Unit (100 mV)	8 inputs, 0 to 100 mV, ±100 mV	CS1W-PTR02	

Standard Analog I/O Units

Name	Specifications	Model	Standards
Analog Input Units	4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA), Resolution: 1/8,000 or 1/4,000	CS1W-AD041-V1	U, C, N, L, CE
	8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA), Resolution: 1/8,000 or 1/4,000	CS1W-AD081-V1	
Analog Output Units	4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA), Resolution: 1/4,000	CS1W-DA041	U, C, N, CE
	8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V), Resolution: 1/4,000	CS1W-DA08V	
	8 outputs (4 to 20 mA), Resolution: 1/4,000	CS1W-DA08C	
Analog I/O Unit	4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA), Resolution: 1/4,000	CS1W-MAD44	U, C, N, L, CE
	4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V), Resolution: 1/4,000		

Basic I/O Units

Classification	Name	Specifications	Model	Standards	
Input Units	DC Input Units	24 V DC, 16 inputs, 7 mA	CS1W-ID211	UC, N, CE	
		24 V DC, 32 inputs, 6 mA	CS1W-ID231		
		24 V DC, 64 inputs, 6 mA	CS1W-ID261		
		24 V DC, 96 inputs, approx. 5 mA	CS1W-ID291	U, C, N, L, CE	
	AC Input Units	100 to 120 V AC, 100 to 120 V DC, 16 inputs	CS1W-IA111	UC, N, CE	
		200 to 240 V AC, 16 inputs	CS1W-IA211		
	Interrupt Input Unit	24 V DC, 16 inputs, 7 mA	CS1W-INT01	U, C, N, CE	
High-speed Input Unit	24 V DC, 16 inputs, 7 mA	CS1W-IDP01			
Output Units	Relay Output Units	250 V AC, 2 A max.; 24 VDC, 2 A max.; 120 V DC, 0.1 A max.; independent contacts, 8 outputs	CS1W-OC201	UC, N, CE	
		250 V AC, 2 A max.; 24 VDC, 2 A max.; 120 V DC, 0.1 A max.; 16 outputs	CS1W-OC211		
	Transistor Output Units	12 to 24 V DC, 0.5A, 16sinking outputs	CS1W-OD211	U, C, N, CE	
		24 V DC, 0.5A, 16sourcing outputs (load short-circuit protection, with alarm)	CS1W-OD212		
		12 to 24 V DC, 0.5A, 32sinking outputs	CS1W-OD231		
		24 V DC, 0.5A, 32sourcing outputs (load short-circuit protection, with alarm)	CS1W-OD232		
		12 to 24 V DC, 0.3A, 64sinking outputs	CS1W-OD261		
		24 V DC, 0.3A, 64sourcing outputs (load short-circuit protection, with alarm)	CS1W-OD262		
		12 to 24 V DC, 0.1A, 96sinking outputs	CS1W-OD291		U, C, N, L, CE
		12 to 24 V DC, 0.1A, 96sourcing outputs	CS1W-OD292		
	Triac Output Units	250 V AC, 1.2 A, 8outputs	CS1W-OA201	UC, N, CE	
		250 V AC, 0.5 A, 16outputs	CS1W-OA211		
	I/O Units	DC Input/ Transistor Output Units	24 V DC, 6 mA, 32inputs, 12 to 24 V DC, 0.3 A, 32 sinking outputs	CS1W-MD261	U, C, N, CE
24 V DC, 6 mA, 32inputs, 24 V DC, 0.3 A, 32 sourcing outputs			CS1W-MD262		
24 V DC, approx. 5 A, 48inputs, 12 to 24 V DC, 0.1 A, 48 outputs, sinking inputs/outputs			CS1W-MD291	U, C, N, L, CE	
24 V DC, approx. 5 A, 48inputs, 12 to 24 V DC, 0.1 A, 48 outputs, sourcing inputs/outputs			CS1W-MD292		
TTL I/O Unit		5 V DC, 32 inputs, 32 outputs	CS1W-MD561	UC, CE	

Note: C200H Basic I/O Units can also be mounted.

CPU Bus Units

Name	Specifications	Model	Standards
Controller Link Units	Twisted pair	CS1W-CLK21	U, C, N, L, CE
	Optical ring (H-PCF cable)	CS1W-CLK12-V1	
	Optical ring (GI cable)	CS1W-CLK52-V1	
SYSMAC LINK Units	Coaxial cable (5C-2V cable)	CS1W-SLK21	U, C, CE
	Optical cable (H-PCF cable)	CS1W-SLK11	U, C, N, CE
Serial Communications Unit	Two RS-232C Ports	CS1W-SCU21-V1	U, C, N, L, CE
Ethernet Unit	10Base-5 (FINS communications, socket service, FTP server, mail notification)	CS1W-ETN01	U, C, N, L, CE
	10Base-T (FINS communications, socket service, FTP server, mail notification)	CS1W-ETN11	U, C, CE
DeviceNet Unit	Functions as remote I/O master and/or slave.	CS1W-DRM21	

Ordering Information

Support Software and Connecting Cables

Support Software and Connecting Cables

Name	Specifications		Model	Standards
CX-Programmer	For 1 license	Windows-based Support Software for ladder programming on Windows 95, 98, Me, NT 4.0, 2000, or XP	WS02-CXPC1-EV3	---
	For 3 licenses		WS02-CXPC1-EV3L03	
	For 10 licenses		WS02-CXPC1-EV3L10	
CX-Process	For 1 license	Programming tool for Loop Control Board/Unit <u>Operating System</u> Tool Software: Windows 95, 98, Me, NT4.0, 2000, or XP Monitor Software: Windows NT4.0, 2000, or XP	WS02-LCTC1-EV3	
	For 3 licenses		WS02-LCTC1-EV3L03	
	For 10 licenses		WS02-LCTC1-EV3L10	
CX-Process Monitor License Key	Hardware key for licensed CX-Process Monitor operation.		WS02-LCTK1-EL01	
CX-Simulator	Support Software for Windows 95, 98, Me, NT4.0, 2000, or XP Simulates only CS1 CPU Units.		WS02-SIMC1-E	
CX-Protocol	Protocol Creation Software for Windows 95, 98, Me, NT4.0, 2000, or XP		WS02-PSTC1-E	
Peripheral Device Connecting Cables (for peripheral port)	Connects DOS computers, D-Sub 9-pin receptacle (Length: 0.1 m) (Conversion cable to connect RS-232C cable to peripheral port)		CS1W-CN118	CE
	Peripheral bus or Host Link	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	CS1W-CN226	
		Connects DOS computers, D-Sub 9-pin (Length: 6.0 m)	CS1W-CN626	
Peripheral Device Connecting Cables (for RS-232C port)	Peripheral bus or Host Link, antistatic	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-CV	---
		Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-CV	
	Peripheral bus or Host Link	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-V	
		Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-V	

Ordering Information

NS-series Programmable Terminals

NS-series Programmable Terminals

Name	Specifications		Model number		Standards
			Ethernet	Case color	
NS12 PT	12-inch TFT, 800 x 600 dots	No	Ivory	NS12-TS00	UC, CE, NEMA4
			Black	NS12-TS00B	
		Yes	Ivory	NS12-TS01	
			Black	NS12-TS01B	
NS10 PT	10-inch TFT, 640 x 480 dots	No	Ivory	NS10-TV00	
			Black	NS10-TV00B	
		Yes	Ivory	NS10-TV01	
			Black	NS10-TV01B	
NS7 PT	7-inch STN, 640 x 480 dots	No	Ivory	NS7-SV00	
			Black	NS7-SV00B	
		Yes	Ivory	NS7-SV01	
			Black	NS7-SV01B	
NS-Designer screen design software	Windows English Version on CD-ROM		NS-NSDC1-EV2	---	
Cable	Screen transfer cable for IBM PC/AT or compatible		XW2Z-S002		
PT-to-PLC Connecting Cable	PT connection: 9 pins	Length: 2 m	XW2Z-200T		
	PLC connection: 9 pins	Length: 5 m	XW2Z-500T		
Accessories	Ladder Monitor Software	One CD-ROM	NS-EXT01-V2		
		Ladder Monitor application (See note 1.) and I/O Comment File Extraction Tool (See note 2.)	NS-EXT01-V2L03 (3 licenses)		
		A Memory Card (sold separately) is required to use the software in the NS-series PT.	NS-EXT01-V2L10 (10 licenses)		
		An HMC-AP001 Memory Card Adapter is required in order to copy the data from the CD-ROM in the computer to the Memory Card.	NS-EXT01-V2HMC (with 48-Mbyte Memory Card)		

- Note:** 1. NS-series PT application used to monitor a SYSMAC CS/CJ-series PLC's ladder program from the PT.
 2. This tool extracts I/O comment data from the CX-Programmer's CXT file and converts the data to a format that can be used by the Ladder Monitor Software for NS.

Utility Software

Name	Specifications	Model number	Standards
Face Plate Auto-Builder for NS	Automatically generates NS-series screen data from CSV tag files for Loop Control Boards or Loop Control Units	WS02-NSFC1-E (available soon)	---
Analog I/O Unit Support Software	Setting software for Process and Standard Analog I/O Units: OS: Windows 95, 98, 2000, or NT4.0	WS02-PUTC1-E	

Middleware

Name	Specifications	Model number	Standards
Compolet	ActiveX Control (Full Version) C/CV/CS-series compatible Multi-network version of FinsGateway runtime software OS: Windows 98, Me, NT4.0, 2000, or XP	SCPL-SYSFL-V2E	---
	ActiveX Control (Lite Version) Only C-series compatible Host Link version of FinsGateway runtime software OS: Windows 98, Me, NT4.0, 2000, or XP	SCPL-SYSLT-V2E	
PLC Reporter 32	Host Link version of easy data collection software OS: Windows 98, Me, 2000, or XP	SDKY-95HLK-E97	
	Multi-network version of easy data collection software OS: Windows 98, Me, 2000, or XP	SDKY-95MLT-E97	

Note: Do not use this document to operate the Unit.

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