PLC-based Process Control

SYSMAC CS Series
Programmable Controllers

CS1W-LC Loop Control Boards/Units Ver. 3.5
CS1D-CPU CS1D Process CPU Units (for Duplex-CPU Systems)

Fully Integrated Sequence and Process Control for the Ideal Control System for Every Application
OMRON’s PLC-based Process Control = Smart Proc

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.

Down-sizing

- Function block programming
- Sequence programming using either step ladders or sequence tables
- A direct link to HMI products
- DCS functionality in a PLC
- Analog Units with signal conversion functions
- A scaleable system configuration

Easy Engineering

- Duplex operation supported
- Complete maintenance functions

High Reliability
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.

*For details on the CJ Series, refer to the Loop-control CPU Units Catalog (R128-E1-01).
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.

**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.

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**PLC-based Process Control**

**Cut costs, Save space, Reduce labor**

PLCs provide the same functionality and performance as DCS while also providing the advanced 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.

**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).**

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Existing DCS

- Over-spec
- Converters and setting devices
- Sensors and other devices

PLC

- Control system
- Monitoring/Logging system
- Process Analog I/O Units

PLC-based Process Control

- Easy Engineering
- Engineering is simple when you can program with function blocks.
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 (using the hot standby method) so that system operation continues essentially unaffected. Other duplex variations are also possible. For example, instead of duplexing the CPU Unit, Power Supply Unit, and Controller Link Unit, a system can be constructed with a Single-CPU Unit and only a duplex Power Supply Unit or only a duplex Controller Link Unit.

A duplex system means rapid recovery for errors without stopping system operation.

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

PLC-based Process Control Application Examples

**In-line Blending in a Food Plant**

![Diagram of in-line blending process](image1)

**Batch Control in a Chemical Plant**

![Diagram of batch control process](image2)
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.
Gradient Temperature Control for Planar Temperature Control Across Multiple Points

Note: CS1W-LCB05-GTC only.

Gradient temperature control equalizes the temperatures at multiple points, providing high-quality heat processing, reducing energy loss until temperatures stabilize, and saving labor in adjustments due to interference between heaters.

Example: Planar Temperature Control of Multi-stage Furnaces, Wafer and Glass Surface Temperatures, and Other Applications.

Average temperature controlled.
Temperature differences controlled.
Interference at other control output points suppressed.

For details, refer to the SYSMAC CS/CJ Series Controllers for Gradient Temperature Control Catalog (R141).

Compact CJ-series Loop-control CPU Units ideal for equipment built-in controller applications have been added to the series, further expanding the selection to suit the application.

For details on the CJ Series, refer to the Loop-control CPU Units Catalog (R128).
The Smart Products that Configure OMRON Process Control Systems

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. By combining function blocks, a wide array of control methods, from basic PID control to cascade and feed-forward control can be easily configured. The LCB/LCU is used in combination with I/O Units to perform I/O operations.

Process Analog I/O Units
These Analog I/O Units provide the functionality of isolators, power supplies, signal converters, and other devices. The built-in functions, such as measurement value alarms, rate-of-change calculations, and square roots, have enabled major savings in cost and space compared with previous systems. High-resolution Models and 8-point Input Models are also available. By combining the Units, logging/monitoring systems can be constructed, or the Units can be used together with LCBs/LCUs to construct complete process control systems. Parameters can be easily displayed and set in an easy-to-understand form without special tools.

SYSMAC CS1D-series Duplex PLCs
Process control system redundancy is easily achieved by mounting Process-control CPU Units to the SYSMAC CS1D system. A duplex system can greatly reduce risk in chemical plants, ship boiler systems, semiconductor utilities, or anywhere reliability is demanded.
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-One**

Integrated Package Tool

The CX-One is an integrated software package that includes the CX-Programmer PLC Support Software and CX-Process Loop Controller Support Software, as well as the CX-Designer PT Support Software. The CX-One provides inter-software information and settings inheritance for complete system-level support. Even advanced parameters from CPU Unit to CPU Bus Unit parameters through FA network startup can be easily set without relying on user manuals.

CX-Process Tool

Programming

Program graphically by pasting function blocks for PID control, square root calculations, or other functions in a window and then connect them with the mouse. Multiple function blocks can be grouped together to define a single user-defined function block. Function blocks can also be used in sequence tables and step ladders for sequence control programming.

Operation and Debugging

Engineering is simplified by a host of debugging functions that help in setting up the program.

- ITEM lists for individual function blocks can be monitored or settings can be changed.
- Parameters can be easily monitored or changed on tuning windows (up to 4 windows can be started simultaneously).
- Tuning data can be saved in CSV format.
- Individual function blocks can be added or deleted during operation.
- Connection, tag, and comment data can be downloaded to or uploaded from a Memory Card in a Loop Control Board (see note) or CPU Unit.

*Note:* Except for CS1D Process-control CPU Units.

CX-Process Monitor Plus

Monitoring

This Windows-based utility is used to download function block data from Loop Controllers and to monitor the system with control windows (images of the on-site functions), trend windows, graphic windows, annunciator windows, and more. Window configurations can be easily produced by simply selecting the desired tags.
Progressively Easier Handling
New Functions for the LCB01/05 Unit Ver. 3.5 with CX-Process Tool Ver. 5.2

Even Easier to Use
Display Values in Engineering Units

With a simple setting, analog data in the PLC can easily be converted to any engineering unit for display. There is no longer any need for a program to convert from normalized data (0% to 100%) to engineering data.

Even Easier to Use
Segment Program 3

The maximum number of steps has been increased from 30 to 100 to support a wider range of temperature control applications.

Even Easier to Use
Segment Program Edit Window

The display format of the Segment Program Setting Window has been changed to the table format, making it easier to understand intuitively and thus saving time.

Up to 100 Steps for Program Operation
Set the set point, time width, and PID bank (PID set) for up to 100 steps in the Loop Controller to automatically switch these parameters at the specified times. Setting up to 100 steps makes program control ideal for controlling complex batch processing. And uploading and downloading program data makes it easy to save and update parameter settings.
Utility Software

Face Plate Auto-Builder for NS

Engineering steps can be drastically reduced by combining a Loop Controller 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 CX-Designer (NS screen creation software) as required. (Some screens cannot be edited.)

CX-Process Monitor Plus

Lower Costs for the Screens Required in Process Monitoring and Control.

- CX-Process Monitor Plus is Windows-based Support Software that monitors process control systems based on OMRON CS/CJ-series PLCs.
- Tag information allocated in the monitor and control programs in the Loop Controller can be allocated to dynamic objects in a Control Screen.
- Flexible screens can be created inexpensively and easily to achieve Easy Monitoring of PLC-based process control.
- Various functions of the Graphic and Trend Screens have been improved in the version 2.0 upgrade.

CX-Process Monitor Plus Functions

- Monitor and control the operating status of function blocks in the Loop Controller.
- Monitor the alarm status of function blocks in the Loop Controller.
- Configure screens.

Support Software: CX-Process Tool

Create a monitor/control program.
System Configuration

Mounting Position

Loop Control Boards/Units

**CS1W-LCB01/05(-GTC)**
The CS1W-LCB01/05(-GTC) Loop Control Board is an Inner Board for CS-series CPU Units. Only one Loop Control Board can be mounted to a CS1-H CPU Unit or CS1D-CPU Unit.

**CS1D-CPU6**
The LCB05D Duplex Loop Control Board is mounted in the Inner Board slot of the CS1D-CPU6 and cannot be removed.

**CS1W-LC001**
The CS1W-LC001 Loop Control Unit is a CS-series CPU Bus Unit. Up to three Loop Control Units can be mounted to the CPU Rack of a CS-series or CS1D CPU Unit.

Process Analog I/O Units

Process Analog I/O Units are classified as CS-series Special I/O Units and are mounted to the CPU Rack or a CS-series Expansion Rack. The number of Units that can be mounted to a single Rack (CPU Rack or Expansion Rack) depends on the maximum supply current of the Power Supply Unit and the current consumption of other Units mounted to the Rack. Process Analog I/O Units can be mounted in any position on the Racks.

PLC-based Process Control Configuration Example

The process control system is configured using Loop Control Boards/Units, Process Analog I/O Units, and Analog I/O Units to control the functions of the peripheral instruments.
## Loop Control Boards and Units

### General Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Loop Control Boards</td>
</tr>
<tr>
<td>Unit classification</td>
<td>CS-series Inner Boards</td>
</tr>
<tr>
<td>Model number</td>
<td>CS1W-LCB01: Standard Inner Board</td>
</tr>
<tr>
<td></td>
<td>CS1W-LCB05(-GTC): Special Inner Board</td>
</tr>
<tr>
<td></td>
<td>LCB05D: Duplex Inner Board</td>
</tr>
<tr>
<td>Applicable CPU Units</td>
<td>CS1G/H-CPU Unit</td>
</tr>
<tr>
<td></td>
<td>CS1D-CPU Unit</td>
</tr>
<tr>
<td></td>
<td>(See note 2.)</td>
</tr>
<tr>
<td></td>
<td>LCB05D</td>
</tr>
<tr>
<td></td>
<td>CS1W-LC001</td>
</tr>
<tr>
<td>Mounting location</td>
<td>Inner Board slot in CPU Unit</td>
</tr>
<tr>
<td>Number of Boards/Units</td>
<td>1 Board max. per CPU Unit</td>
</tr>
<tr>
<td></td>
<td>3 Units max. per CPU Unit</td>
</tr>
<tr>
<td>Data exchange with CPU Unit</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>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.)</td>
</tr>
<tr>
<td>Setting switches</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Rotary switch on front panel: Unit number (0 to F)</td>
</tr>
<tr>
<td>Indicators</td>
<td>3 LEDs: RUN, ready, and communications port send/receive</td>
</tr>
<tr>
<td></td>
<td>5 LEDs: RUN operation, communications port send, communications port receive, CPU Unit error, and Unit error</td>
</tr>
<tr>
<td>Front panel connections</td>
<td>RS-232C port x 1 (The CS1D-LCB05D cannot be used to connect to the ES100X Controller.)</td>
</tr>
<tr>
<td>Data backup</td>
<td>By super capacitor: All function block data (including sequence tables and step ladder instructions)</td>
</tr>
<tr>
<td></td>
<td>By battery: All function block data (including step ladder instructions) and error log data</td>
</tr>
<tr>
<td>Battery/capacitor life</td>
<td>24 hours at 25°C (life shortened by use at higher temperatures)</td>
</tr>
<tr>
<td></td>
<td>5 years at 25°C (life shortened by use at higher temperatures)</td>
</tr>
<tr>
<td>Data storage in flash memory</td>
<td>Function block data (RAM data backup and recovery can be performed whenever necessary.) Error log data</td>
</tr>
<tr>
<td></td>
<td>Function block data (RAM data backup and recovery can be performed whenever necessary.)</td>
</tr>
<tr>
<td>Effect on CPU Unit cycle</td>
<td>0.8 ms max.</td>
</tr>
<tr>
<td></td>
<td>25 ms max.</td>
</tr>
<tr>
<td></td>
<td>0.2 ms</td>
</tr>
<tr>
<td>Current consumption</td>
<td>220 mA at 5 V DC (Increased by 150 mA when NT-AL001-E Link Adapter is used.)</td>
</tr>
<tr>
<td></td>
<td>360 mA max. at 5 V DC Note: Increased by 150 mA when NT-AL001-E Link Adapter is used.</td>
</tr>
<tr>
<td>Dimensions</td>
<td>34.5 x 130 x 100.5 mm (W x H x D)</td>
</tr>
<tr>
<td>Weight</td>
<td>100g max.</td>
</tr>
<tr>
<td></td>
<td>220 g max.</td>
</tr>
<tr>
<td>Standard accessories</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>C200H-BAT09 Battery (mounted at time of shipment)</td>
</tr>
</tbody>
</table>

**Note:**

1. The functions described here are for the Loop Control Board Ver. 2.5.
2. A Loop Control Board Unit Ver. 1.5 or later is required for use. Do not use a Loop Control Board with a unit version earlier than 1.5.
3. During duplex initialization: 2.1 s max.
# Loop Control Boards and Units

## Function Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model numbers</strong></td>
<td>CS1W-LCB01 CS1W-LCB05(-GTC) LCB05D (Built into the CS1D-CPU6@P.) CS1W-LC001</td>
</tr>
<tr>
<td><strong>Operation method</strong></td>
<td>Function block method</td>
</tr>
<tr>
<td><strong>Operation cycle</strong></td>
<td>Settable cycles: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) (See note 1.) Can be set for each function block. Settable cycles: 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.</td>
</tr>
<tr>
<td><strong>Number of function blocks</strong></td>
<td><strong>Analog operation</strong></td>
</tr>
<tr>
<td>Analog operation blocks</td>
<td>50 blocks max.</td>
</tr>
<tr>
<td>Operation blocks (See note 2.)</td>
<td>500 blocks max.</td>
</tr>
<tr>
<td>External controller blocks</td>
<td>32 blocks max. (LCB05D not included)</td>
</tr>
<tr>
<td><strong>Sequence control</strong></td>
<td><strong>Sequence tables</strong></td>
</tr>
<tr>
<td>Sequence tables</td>
<td>None</td>
</tr>
<tr>
<td>Step ladder program blocks</td>
<td>20 blocks max.</td>
</tr>
<tr>
<td>Separable into a 100 steps max.</td>
<td>200 blocks max.</td>
</tr>
<tr>
<td>Separable into a 100 steps max.</td>
<td>200 blocks max.</td>
</tr>
<tr>
<td><strong>I/O blocks</strong></td>
<td><strong>Field terminal blocks</strong></td>
</tr>
<tr>
<td>Field terminal blocks</td>
<td>80 blocks max.</td>
</tr>
<tr>
<td>User link tables</td>
<td>2,400 data items max.</td>
</tr>
<tr>
<td>All data</td>
<td>HMI functions Allocated 1 EM Area bank</td>
</tr>
<tr>
<td>CPU terminal blocks</td>
<td>None</td>
</tr>
<tr>
<td>Node terminal blocks</td>
<td>None</td>
</tr>
<tr>
<td>System common blocks</td>
<td>1 block max.</td>
</tr>
<tr>
<td><strong>Method for creating and transferring function blocks</strong></td>
<td>Created and transferred using CX-Process Tool (purchased separately).</td>
</tr>
<tr>
<td><strong>Control methods</strong></td>
<td><strong>PID control method</strong></td>
</tr>
<tr>
<td>PID control method</td>
<td>PID with 2 degrees of freedom (with auto-tuning)</td>
</tr>
<tr>
<td>Control combinations</td>
<td>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.</td>
</tr>
<tr>
<td>Alarms</td>
<td><strong>PID block internal alarms</strong></td>
</tr>
<tr>
<td>Alarm blocks</td>
<td>4 PV alarms (upper upper-limit, upper limit, lower limit, lower lower-limit) and 1 deviation alarm per PID block</td>
</tr>
<tr>
<td>Alarm blocks</td>
<td>High/low alarm blocks, deviation alarm blocks</td>
</tr>
</tbody>
</table>

**Note:**
1. Operation cycles of 0.01, 0.02, and 0.05 s cannot be set for the 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.
## Software Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>CX-Process Tool</td>
</tr>
<tr>
<td><strong>Model number</strong></td>
<td>WS02-LCTC1-EV5</td>
</tr>
<tr>
<td><strong>Applicable PLCs</strong></td>
<td>CS-series PLCs</td>
</tr>
<tr>
<td><strong>Applicable Units</strong></td>
<td>CJ-series Loop-control CPU Units CS-series Loop Control Units/Boards</td>
</tr>
<tr>
<td><strong>Compatible computers</strong></td>
<td>Computer: IBM PC/AT or compatible</td>
</tr>
<tr>
<td><strong>CPU</strong></td>
<td>Intel CPU (Core, Pentium, or Celeron family)</td>
</tr>
<tr>
<td></td>
<td>For Windows Vista: 1 GHz min. For any other OS: 333 MHz min. required, 1 GHz min. recommended</td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>Microsoft Windows Vista Ultimate or Business, XP</td>
</tr>
<tr>
<td></td>
<td>Professional (up to Service Pack 2), 2000 Professional (Service Pack 3 or higher), ME, NT Workstation (Service Pack 6a or higher), 98 SE (See note 2.)</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>For Windows Vista: 1 GB min. For any other OS: 256 MB min. required, 512 MB min. recommended</td>
</tr>
<tr>
<td><strong>Hard disk storage</strong></td>
<td>Minimum: 350 Mbytes free space (Including approximately 280 Mbytes used for communications middleware and other purposes)</td>
</tr>
<tr>
<td><strong>Monitor</strong></td>
<td>Minimum: XGA Recommended: SXGA 65,536 colors or more</td>
</tr>
<tr>
<td><strong>CD-ROM drive</strong></td>
<td>1 drive min.</td>
</tr>
<tr>
<td><strong>Sound board</strong></td>
<td>---</td>
</tr>
<tr>
<td><strong>Mouse</strong></td>
<td>Recommended: Microsoft mouse or compatible pointing device</td>
</tr>
<tr>
<td><strong>Communications method</strong></td>
<td>Connection with CPU Unit (or Serial Communications Board/Unit)</td>
</tr>
<tr>
<td></td>
<td>When FinsGateway Serial Unit driver is used:</td>
</tr>
<tr>
<td></td>
<td>Communications protocol with PLC: Host Link or Peripheral Bus (See note 3.)</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• Connecting cable:</td>
</tr>
<tr>
<td></td>
<td>• For connecting to peripheral port of CPU Unit: CS1W-CN□□□□ (2 m or 6 m)</td>
</tr>
<tr>
<td></td>
<td>• For connecting to RS-232C port of CPU Unit: XW2Z□□□□□□□□ (2 m or 5 m)</td>
</tr>
<tr>
<td></td>
<td>When CX-Server is used:</td>
</tr>
<tr>
<td></td>
<td>Communications protocol with PLC: Host Link or Peripheral Bus</td>
</tr>
<tr>
<td></td>
<td>Connecting cable:</td>
</tr>
<tr>
<td></td>
<td>• For connecting to peripheral port of CPU Unit: CS1W-CN□□□□ (2 m or 6 m)</td>
</tr>
<tr>
<td></td>
<td>• For connecting to RS-232C port of CPU Unit: XW2Z□□□□□□□□ (2 m or 5 m)</td>
</tr>
<tr>
<td></td>
<td>CX-Server is not supported.</td>
</tr>
<tr>
<td><strong>Connection via Controller Link</strong></td>
<td>When FinsGateway Controller Link driver or CX-Server is used:</td>
</tr>
<tr>
<td></td>
<td>Install the software in a computer with a Controller Link Support Board to communicate with a PLC with a Controller Link Unit mounted.</td>
</tr>
<tr>
<td><strong>Connection via Ethernet</strong></td>
<td>When FinsGateway ETN_UNIT driver or CX-Server is used:</td>
</tr>
<tr>
<td></td>
<td>Install the software in a computer with an Ethernet Board to communicate with a PLC with an Ethernet Unit mounted.</td>
</tr>
</tbody>
</table>
## CX-Process Tool and Monitor

### Connections to PLC

<table>
<thead>
<tr>
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<th>Specifications</th>
<th>CX-Process Tool</th>
<th>CX-Process Monitor Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offline functions</td>
<td>ITEM data settings for function blocks</td>
<td>Construction of user screens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Software connections for analog signals</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Displaying and printing text strings (annotation) pasted on function block</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>diagrams and ladder diagrams.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Instructions for step ladder blocks and commands for sequence table blocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tag settings for CX-Process Monitor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Engineering unit display setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Segment Program parameter setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online functions</td>
<td>• Transfer of function block data (Downloading/Uploading for Loop Control</td>
<td>User screens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boards/Units.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Starting/stopping all function blocks (LCU/LCB)</td>
<td>• Overview screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Monitoring system operation: Monitoring and controlling the System Common</td>
<td>• Control screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>block (including LCB/LCU load rates)</td>
<td>• Tuning screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Validating LCB/LCU operation: Checking function block connections (including</td>
<td>• Trend screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>starting and starting individual function blocks), validating ladder</td>
<td>• Graphic screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>diagrams and sequence tables, and monitoring ITEMs</td>
<td>• Operating guide message screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tuning PID constants and other parameters</td>
<td>• System screens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(fine tuning and autotuning)</td>
<td>• Alarm history screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Initialization of Loop Control Unit memory (RAM)</td>
<td>• System monitor screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• External backup specifications</td>
<td>• Operation log screen</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. The CX-Process functions that can be used depend on the version. For details, refer to the operation manuals (Cat. No.: W372-E1- and W373-E1-).
2. The Windows Vista 64-bit version and Windows XP x64 Edition are not supported.
3. Peripheral Bus cannot be used when FinsGateway V3 is used.

## Connections to PLC

The following 4 methods can be used to connect to a PLC:

<table>
<thead>
<tr>
<th>Communications network</th>
<th>Communication driver</th>
<th>FinsGateway V3</th>
<th>FinsGateway Version2003 (See note 1.)</th>
<th>CX-Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Link</td>
<td></td>
<td>Supported. (Serial Unit version is used.)</td>
<td>Supported.</td>
<td>Supported.</td>
</tr>
<tr>
<td>Peripheral Bus</td>
<td></td>
<td>Not supported.</td>
<td>Supported.</td>
<td>Supported.</td>
</tr>
<tr>
<td>Controller Link</td>
<td></td>
<td>Supported. (See note 2.) (CLK (PCI) version is used.)</td>
<td>Supported.</td>
<td>Supported.</td>
</tr>
<tr>
<td>Ethernet</td>
<td></td>
<td>Supported. (CLK (ISA) version is used.)</td>
<td>Supported.</td>
<td>Supported.</td>
</tr>
</tbody>
</table>

**Note:**
1. Windows 2000 and XP are supported. (Windows 95, 98, and Me are not supported.)
2. The Windows 95 operating system cannot be used.
Function Blocks (Unit Ver. 3.5)

System Common Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>System Common</td>
<td>Makes settings common to all function blocks and outputs signals for the system.</td>
</tr>
</tbody>
</table>

Control Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller</td>
<td>2-position ON/OFF (See note 1.)</td>
<td>2-position type ON/OFF controller</td>
</tr>
<tr>
<td></td>
<td>3-position ON/OFF (See note 1.)</td>
<td>3-position type ON/OFF controller for heating/cooling ON/OFF control</td>
</tr>
<tr>
<td></td>
<td>Basic PID (See note 1.)</td>
<td>Performs basic PID control</td>
</tr>
<tr>
<td></td>
<td>Advanced PID (See note 1.)</td>
<td>Performs PID with two degrees of freedom control for enabling deviation/MV compensation, MV tracking, etc.</td>
</tr>
<tr>
<td></td>
<td>Blended PID (See note 2.)</td>
<td>Performs PID control on the cumulative value (cumulative deviation) between the accumulated value PV and accumulated value Remote Set Point.</td>
</tr>
<tr>
<td></td>
<td>Batch Flowrate Capture (See note 2.)</td>
<td>Functions to open the valve at a fixed opening until a fixed batch accumulated value is reached.</td>
</tr>
<tr>
<td></td>
<td>Fuzzy Logic (See note 2.)</td>
<td>Outputs up to two analog outputs based on fuzzy logic performed on up to 8 analog inputs.</td>
</tr>
<tr>
<td></td>
<td>Indication and Setting (See note 1.)</td>
<td>Manual setter with PV indication and SP setting functions</td>
</tr>
<tr>
<td></td>
<td>Indication and Operation (See note 1.)</td>
<td>Manual setter with PV indication and MV setting functions</td>
</tr>
<tr>
<td></td>
<td>Ratio Setting (See note 1.)</td>
<td>Ratio and bias setter with PV indication and ratio setting function</td>
</tr>
<tr>
<td></td>
<td>Indicator (See note 1.)</td>
<td>PV indicator with PV alarm</td>
</tr>
</tbody>
</table>

Note: 1. High-speed control of function blocks is supported (the operation cycle can be set to 0.01 s, 0.02 s, or 0.05 s), except when using the LCB05D.
2. Cannot be used with the CS1W-LCB05-GTC.

External Controller Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Controller Block</td>
<td>ES100X Controller Terminal (See note.)</td>
<td>Performs monitoring and setting for an ES100X Controller connected directly to the RS-232C port on the Loop Control Unit.</td>
</tr>
</tbody>
</table>

Note: LCB05D not supported.
## Function Blocks (Unit Ver. 3.5)

### Operation Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alarm/ Signal restrictions/Hold</strong></td>
<td>4-Point Warning Indicator (See note 4.)</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>High/Low Alarm (See note 1.)</td>
<td>Provides the alarm contact outputs for the high and low limits of single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Deviation Alarm (See note 1.)</td>
<td>Provides the alarm contact outputs for the deviation of two analog signals.</td>
</tr>
<tr>
<td></td>
<td>Rate-of-change Operation and Alarm (See note 1.)</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>High/Low Limit (See note 1.)</td>
<td>Limits the high and low limits of single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Deviation Limit (See note 1.)</td>
<td>Calculates the deviation between two analog signals, and limits the deviation within that range.</td>
</tr>
<tr>
<td></td>
<td>Analog Signal Hold (See note 1.)</td>
<td>Holds the maximum, minimum or instantaneous value of single analog signals.</td>
</tr>
<tr>
<td><strong>Arithmetic</strong></td>
<td>Addition or Subtraction (See note 1.)</td>
<td>Performs addition/subtraction with gain and bias on up to 4 analog signals.</td>
</tr>
<tr>
<td></td>
<td>Multiplication (See note 1.)</td>
<td>Performs multiplication with gain and bias on up to 2 analog signals.</td>
</tr>
<tr>
<td></td>
<td>Division (See note 1.)</td>
<td>Performs division with gain and bias on up to 2 analog signals.</td>
</tr>
<tr>
<td></td>
<td>Range Conversion (See note 1.)</td>
<td>Easily converts up to 8 analog signals simply by inputting the 0% and 100% input values and 0% and 100% output values.</td>
</tr>
<tr>
<td></td>
<td>Arithmetic Operation (See note 1.)</td>
<td>Performs various math operation (trigonometric, logarithmic, etc.) on floating-point decimal values converted (to industrial units) from up to 8 analog inputs.</td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td>Square Root (See note 1.)</td>
<td>Performs square root extraction (with low-end cutout) on single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Absolute Value (See note 1.)</td>
<td>Outputs the absolute value of single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Non-linear Gain (Dead Band) (See note 1.)</td>
<td>Performs non-linear (3 gain values) operation on single analog signals. Analog signals can also set as a dead band (with different gap).</td>
</tr>
<tr>
<td></td>
<td>Low-end Cutout (See note 1.)</td>
<td>Sets output to zero close to the zero point of single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Segment Linearizer (See note 1.)</td>
<td>Converts single analog signals to 15 segments before the signals is output.</td>
</tr>
<tr>
<td></td>
<td>Temperature And Pressure Correction (See note 1.)</td>
<td>Performs temperature and pressure correction.</td>
</tr>
<tr>
<td><strong>Time Function</strong></td>
<td>First-order Lag (See note 1.)</td>
<td>Performs first-order lag operation on single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Rate-of-change Limit (See note 1.)</td>
<td>Performs rate-of-change restriction on single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Moving Average (See note 1.)</td>
<td>Performs moving average operation on single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Lead/Delay (See note 1.)</td>
<td>Performs lead/delay operation on single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Dead Time (See note 1.)</td>
<td>Performs dead time and first-order lag operations on single analog signals.</td>
</tr>
<tr>
<td></td>
<td>Dead Time Compensation</td>
<td>Used for Smith’s dead time compensation PID control.</td>
</tr>
<tr>
<td></td>
<td>Accumulator for Instantaneous Value Input</td>
<td>Accumulates analog signals, and outputs 8-digit accumulated value signals.</td>
</tr>
<tr>
<td></td>
<td>Run Time Accumulator</td>
<td>Accumulates the operating time, and outputs the pulse signal per specified time.</td>
</tr>
<tr>
<td></td>
<td>Time Sequence Data Statistics (See note 1.)</td>
<td>Records time sequence data from analog signals and calculates statistics, such as averages and standard deviations.</td>
</tr>
<tr>
<td></td>
<td>Ramp Program</td>
<td>Ramp program setter for combining ramps for time and hold values.</td>
</tr>
<tr>
<td></td>
<td>Segment Program</td>
<td>Segment program setter setting the output values with respect to time.</td>
</tr>
<tr>
<td></td>
<td>Segment Program 2</td>
<td>Segment program setting with wait function for setting the output values with respect to time.</td>
</tr>
<tr>
<td></td>
<td>Segment Program 3 (See note 5.)</td>
<td></td>
</tr>
<tr>
<td><strong>Signal Selection/ Switching</strong></td>
<td>Rank Selector (See note 1.)</td>
<td>Selects the rank of up to 8 analog signals.</td>
</tr>
<tr>
<td></td>
<td>Input Selector (See note 1.)</td>
<td>Selects the specified analog signals specified by the contact signal from up to 8 analog signals.</td>
</tr>
<tr>
<td></td>
<td>3-input Selector (See note 1.)</td>
<td>Selects and outputs one of three analog input signals.</td>
</tr>
</tbody>
</table>
### Function Blocks (Unit Ver. 3.5)

#### Operation Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Selection/ Switching</strong></td>
<td>3-output Selector</td>
<td>Outputs one analog input signal in one of three switched directions.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant Selector</td>
<td>Selects 8 preset constants by the contact signal.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant Generator</td>
<td>Outputs 8 independent constants.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ramped Switch</td>
<td>Switches two analog inputs (or constants) with a ramp.</td>
</tr>
<tr>
<td></td>
<td>(See note 3.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bank Selector</td>
<td>Stores a maximum of eight sets of PID parameters (SP, P, I, D, MH, ML) in advance, and switches them to basic PID, advanced PID, or blended PID parameters in response to the analog input zone or input bit.</td>
</tr>
<tr>
<td></td>
<td>(See note 3.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Split Converter</td>
<td>Takes an operating amount input from a basic PID or advanced PID block and converts the V characteristics or parallel characteristics into two analog outputs (e.g., heating and cooling operating amounts).</td>
</tr>
<tr>
<td></td>
<td>(See note 3.)</td>
<td></td>
</tr>
<tr>
<td><strong>ITEM Settings</strong></td>
<td>Constant ITEM Setting</td>
<td>Writes the constant to the specified ITEM at the rising edge of the send command contact.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variable ITEM Setting</td>
<td>Writes the analog signal to the specified ITEM at the rising edge of the send command contact.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Batch Data Collector</td>
<td>Stores each of max. 8 analog inputs to buffer by a certain timing within sequential processing.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td><strong>Pulse Train Operation</strong></td>
<td>Accumulated Value Input Adder</td>
<td>Adds up to four accumulated value signals.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accumulated Value Analog Multiplier</td>
<td>Multiplies analog signals by the accumulated value signals.</td>
</tr>
<tr>
<td></td>
<td>Contact input/Accumulated Value Output</td>
<td>Converts 4-digit accumulated value signals to 8 digits.</td>
</tr>
<tr>
<td></td>
<td>Contact Distributor</td>
<td>Connect contact signals between function blocks in a 1:1 connection.</td>
</tr>
<tr>
<td></td>
<td>Constant Comparator</td>
<td>Compares up to eight sets of analog signals and constants, and outputs the comparison results as contacts.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variable Comparator</td>
<td>Compares up to eight pairs of analog signals, and outputs the comparison results as contacts.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timer (See note 1.)</td>
<td>2-stage output type addition timer for forecast values and reached values. Can also output the present value.</td>
</tr>
<tr>
<td></td>
<td>ON/OFF Timer (See note 1.)</td>
<td>Timer for performing ON-OFF operation at preset ON and OFF times.</td>
</tr>
<tr>
<td></td>
<td>Clock Pulse (See note 1.)</td>
<td>Manipulates and monitors ON/OFF valves with open/close limit switches.</td>
</tr>
<tr>
<td></td>
<td>Counter (See note 1.)</td>
<td>2-stage output type addition timer for forecast values and arrival values. Can also output the current value.</td>
</tr>
<tr>
<td></td>
<td>Internal Switch (See note 1.)</td>
<td>Temporary storage contact for accepting relays in the Step Ladder Program block.</td>
</tr>
<tr>
<td></td>
<td>Level Check (See note 1.)</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>Analog/Pulse Width Converter</td>
<td>Changes the ON/OFF duration ratio in a constant cycle duration so that it is proportional to the analog value.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td><strong>Sequence Operation</strong></td>
<td>Contact Distributor</td>
<td>Connect contact signals between function blocks in a 1:1 connection.</td>
</tr>
<tr>
<td></td>
<td>Constant Comparator</td>
<td>Compares up to eight sets of analog signals and constants, and outputs the comparison results as contacts.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variable Comparator</td>
<td>Compares up to eight pairs of analog signals, and outputs the comparison results as contacts.</td>
</tr>
<tr>
<td></td>
<td>(See note 1.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timer (See note 1.)</td>
<td>2-stage output type addition timer for forecast values and reached values. Can also output the present value.</td>
</tr>
<tr>
<td></td>
<td>ON/OFF Timer (See note 1.)</td>
<td>Timer for performing ON-OFF operation at preset ON and OFF times.</td>
</tr>
<tr>
<td></td>
<td>Clock Pulse (See note 1.)</td>
<td>Manipulates and monitors ON/OFF valves with open/close limit switches.</td>
</tr>
<tr>
<td></td>
<td>Counter (See note 1.)</td>
<td>2-stage output type addition timer for forecast values and arrival values. Can also output the current value.</td>
</tr>
<tr>
<td></td>
<td>Internal Switch (See note 1.)</td>
<td>Temporary storage contact for accepting relays in the Step Ladder Program block.</td>
</tr>
<tr>
<td></td>
<td>Level Check (See note 1.)</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Contact Type Control Target</strong></td>
<td>ON/OFF Valve Manipulator</td>
<td>Manipulates and monitors ON/OFF valves with open/close limit switches.</td>
</tr>
<tr>
<td></td>
<td>Motor Manipulator</td>
<td>Manipulates and monitors motor operation.</td>
</tr>
<tr>
<td></td>
<td>Reversible Motor Manipulator</td>
<td>Manipulates and monitors reversible motor operation.</td>
</tr>
<tr>
<td></td>
<td>Motor Opening Manipulator</td>
<td>Inputs a target opening, and manipulates an electric positional-proportional motor.</td>
</tr>
<tr>
<td></td>
<td>Switch Meter (See note 2.)</td>
<td>Manipulates and monitors multiple (up to 8) devices such as ON/OFF valves, motors, or pumps.</td>
</tr>
</tbody>
</table>

**Note:**
1. High-speed control of function blocks is supported (the operation cycle can be set to 0.01 s, 0.02 s, or 0.05 s), except when using the LCB05D.
2. Cannot be used with the CS1W-LCB05-GTC.
3. LCB05D not supported.
4. Supported by the CS1W-LE001 only.
5. Supported by the CS1W-LCB01/05 only.
## Sequence Control Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequence Control</td>
<td>Step Ladder Program (See note.)</td>
<td>Performs logic sequence and step progression control.</td>
</tr>
<tr>
<td></td>
<td>Sequence Table (See note.)</td>
<td>Performs logic sequence and step progression control based on conditions and actions listed in tabular form.</td>
</tr>
</tbody>
</table>

**Note:** High-speed control of function blocks is supported (the operation cycle can be set to 0.01 s, 0.02 s, or 0.05 s), except when using the CS1D-LCB05D.

## Field Terminal Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact I/O</td>
<td>DI 8-point Terminal (See note.)</td>
<td>Inputs 8 contacts from 8-point Input Unit.</td>
</tr>
<tr>
<td></td>
<td>DI 16-point Terminal (See note.)</td>
<td>Inputs 16 contacts from 16-point Input Unit.</td>
</tr>
<tr>
<td></td>
<td>DI 32-point Terminal (See note.)</td>
<td>Inputs 32 contacts from 32-point Input Unit.</td>
</tr>
<tr>
<td></td>
<td>DI 64-point Terminal (See note.)</td>
<td>Inputs 64 contacts from 64-point Input Unit.</td>
</tr>
<tr>
<td></td>
<td>DO 5-point Terminal (See note.)</td>
<td>Outputs 5 contacts from 5-point Output Unit.</td>
</tr>
<tr>
<td></td>
<td>DO 8-point Terminal (See note.)</td>
<td>Outputs 8 contacts from 8-point Output Unit.</td>
</tr>
<tr>
<td></td>
<td>DO 12-point Terminal (See note.)</td>
<td>Outputs 12 contacts from 12-point Output Unit.</td>
</tr>
<tr>
<td></td>
<td>DO 16-point Terminal (See note.)</td>
<td>Outputs 16 contacts from 16-point Output Unit.</td>
</tr>
<tr>
<td></td>
<td>DO 32-point Terminal (See note.)</td>
<td>Outputs 32 contacts from 32-point Output Unit.</td>
</tr>
<tr>
<td></td>
<td>DO 64-point Terminal (See note.)</td>
<td>Outputs 64 contacts from 64-point Output Unit.</td>
</tr>
<tr>
<td></td>
<td>DI 16-point/DO 16-point Terminal (See note.)</td>
<td>Inputs and outputs 16 contacts each from 16-point Input/16-point Output Units.</td>
</tr>
<tr>
<td></td>
<td>DI 96-point Terminal (See note.)</td>
<td>Inputs 96 contacts from 96-contact Input Units.</td>
</tr>
<tr>
<td></td>
<td>DO 96-point Terminal (See note.)</td>
<td>Outputs 96 contacts from 96-contact Output Units.</td>
</tr>
<tr>
<td></td>
<td>DI 48-point/DO 48-point Terminal (See note.)</td>
<td>Inputs and outputs 48 contacts each from 48-point Input/48-point Output Units.</td>
</tr>
<tr>
<td>Analog I/O</td>
<td>AI 8-point Terminal (AD003) (See note.)</td>
<td>Inputs 8 analog signals from the C200H-AD003.</td>
</tr>
<tr>
<td></td>
<td>AO 8-point Terminal (DA003/4) (See note.)</td>
<td>Inputs 8 analog signals from the C200H-DA003/DA004.</td>
</tr>
<tr>
<td></td>
<td>AI 2-point/AO 2-point Terminal (MAD01) (See note.)</td>
<td>Inputs and outputs 2 analog signals each from the C200H-MAD01.</td>
</tr>
<tr>
<td></td>
<td>AI 4-point Terminal (PTS01-V1/02/03, PDC01, PTW01) (See note.)</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>PI 4-point Terminal (PPS01) (See note.)</td>
<td>Inputs 4 instantaneous values and accumulated values each from CS1W-PPS01 (Isolated-type Pulse Input Unit).</td>
</tr>
<tr>
<td></td>
<td>AO 4-point Terminal (PMV01) (See note.)</td>
<td>Outputs 4 analog signals from CS1W-PMV01 (Isolated-type Control Output Unit).</td>
</tr>
<tr>
<td></td>
<td>AI 8-point Terminal (PTR01/02) (See note.)</td>
<td>Inputs 8 analog signals from CS1W-PTR01 (Power Transducer Input Unit) or CS1W-PTR02 (Analog Input Unit (100 mV)).</td>
</tr>
<tr>
<td></td>
<td>AO 4-point Terminal (PMV02) (See note.)</td>
<td>Outputs 4 analog signals from CS1W-PMV02 (Isolated-type Control Output Unit).</td>
</tr>
<tr>
<td></td>
<td>AI 4-point Terminal (PTS51) (See note.)</td>
<td>Inputs 4 analog signals from CS1W-PTS51 or CJ1W-PTS51 (isolated-type thermocouple Input Unit).</td>
</tr>
<tr>
<td></td>
<td>AI 4-point Terminal (PTS52) (See note.)</td>
<td>Inputs 4 analog signals from CS1W-PTS52 or CJ1W-PTS52 (isolated-type thermocouple input Unit).</td>
</tr>
</tbody>
</table>
### Node Terminal Blocks

#### Analog I/O

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog I/O</td>
<td>AI 8-point Terminal (PTSS5)</td>
<td>Inputs 8 analog signals from CS1W-PTSS5 (isolated-type thermocouple Input Unit).</td>
</tr>
<tr>
<td></td>
<td>AI 8-point Terminal (PTSS6)</td>
<td>Inputs 8 analog signals from CS1W-PTSS6 (isolated-type thermocouple Input Unit).</td>
</tr>
<tr>
<td></td>
<td>AI 8-point Terminal (PDC55)</td>
<td>Inputs 8 analog signals from CS1W-PDC55 (Direct current Input Unit).</td>
</tr>
<tr>
<td></td>
<td>AI 4-point/AO 4-point Terminal (MAD44) (See note.)</td>
<td>Inputs and outputs 4 analog signals each from the CS1W-MAD44.</td>
</tr>
<tr>
<td></td>
<td>AI 16-point Terminal (AD161)</td>
<td>Inputs 16 analog signals from CS1W-AD161.</td>
</tr>
<tr>
<td></td>
<td>AI 8-point Terminal (AD081)</td>
<td>Inputs 8 analog signals from the CS1W-AD081(-V1) or CJ1W-AD081(-V1).</td>
</tr>
<tr>
<td></td>
<td>AO 8-point Terminal (DA08V/C)</td>
<td>Outputs 8 analog signals from the CS1W-DA08V/C or CJ1W-DA08V/C.</td>
</tr>
<tr>
<td></td>
<td>AI 4-point Terminal (AD041)</td>
<td>Inputs 4 analog signals from the CS1W-AD041(-V1) or CJ1W-AD041(-V1).</td>
</tr>
<tr>
<td></td>
<td>AO 4-point Terminal (DA041)</td>
<td>Outputs 4 analog signals from the CS1W-DA041 or CJ1W-DA041.</td>
</tr>
<tr>
<td></td>
<td>AI 4-point Terminal (DRT1-AD04)</td>
<td>Inputs four analog signals from a DRT1-AD04 DeviceNet Slave Analog Input Unit.</td>
</tr>
<tr>
<td></td>
<td>AO 2-point Terminal (DRT1-DA02)</td>
<td>Outputs two analog signals from a DRT1-DA02 DeviceNet Slave Analog Output Unit.</td>
</tr>
</tbody>
</table>

Note: High-speed control of function blocks is supported (the operation cycle can be set to 0.01 s, 0.02 s, or 0.05 s), except when using the LCB05D.

#### CPU Unit Terminal Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Unit Terminals</td>
<td>DI Terminal from CPU Unit</td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>DO Terminal to CPU Unit</td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>AI Terminal from CPU Unit</td>
<td>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)</td>
</tr>
<tr>
<td></td>
<td>AO Terminal to CPU Unit</td>
<td>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)</td>
</tr>
</tbody>
</table>
Function Blocks (Unit Ver. 3.5)

SCADA Interface Blocks

<table>
<thead>
<tr>
<th>Type</th>
<th>Block Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expanded CPU Unit</td>
<td>Expanded DI Terminal from CPU Unit</td>
<td>Inputs any contact data in CPU Unit I/O Memory, and writes max. 64 points on another function block.</td>
</tr>
<tr>
<td>Terminals</td>
<td>Expanded DO Terminal from CPU Unit</td>
<td>Inputs the contact data of another function block, and writes max. 64 points on any I/O Memory in the CPU Unit.</td>
</tr>
<tr>
<td></td>
<td>Expanded AI Terminal from CPU Unit</td>
<td>Inputs any analog data in CPU Unit I/O Memory, and writes max. 64 words on another function block.</td>
</tr>
<tr>
<td></td>
<td>Expanded AO Terminal from CPU Unit</td>
<td>Inputs the analog data of another function block, and writes max. 64 words on any CPU Unit I/O Memory.</td>
</tr>
<tr>
<td>Send/Receive All Blocks</td>
<td>Receive All Blocks</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Send All Blocks</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Note:**
1. Node Terminal Blocks, CPU Unit Terminal Blocks, and SCADA Interface Blocks are supported by the CS1W-LC001 only.
2. The CS1-W-LCB supports User Link Tables and an HMI instead.
Overview of Process and Analog I/O Units

**Overview**

A wide range of 25 I/O Units, including 16 isolated-type Units, covers almost all typical applications. Also, featuring high-speed (10 ms) and high-resolution (1/64,000) types, this line-up meets a diverse array of potential uses, from data logging to high-speed measurement control.

**Features**

- Dramatic reductions in installation cost, space, and set-up steps are attained by eliminating the need for external setters and converters.
- Process value alarms and rate-of-change calculations can be executed from temperature and analog inputs.
- Rate-of-change limits and high/low output limits calculated for analog output.
- Peak/bottom hold and top/valley hold functions can be used for process values (CS1W-PTS11 only).
- Zero point and span can be adjusted for any specified range, and adjustment days and times can be automatically saved. The adjustment deadline and adjustment deadline expiration notice can also be set and notification given (CS1W-PTS02 only).
- Changes exceeding a set threshold can be counted, and analog input values can be integrated (CS1W-PTS02 only).
- Reduced wiring with MIL connectors (CS1W-AD161 only). XW2D-34G6 Connector-Terminal Block Conversion Unit can be used.

---

**Overview of Process Analog I/O Units**

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>Number of I/O</th>
<th>Field I/O isolation</th>
<th>I/O type</th>
<th>Main specifications (See note.)</th>
<th>Main functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated-type Thermocouple Input Unit (high-resolution)</td>
<td>CS1W-PTS11</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>B, E, J, K, L, N, R, S, T, U, W</td>
<td>Standard accuracy: ±0.05% of F.S. Temperature coefficient: ±0.01%/°C Resolution: 1/64,000 Conversion period: 20 ms/4 pts, 10 ms/2 pts</td>
<td>Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm input disconnection alarm. Top/bottom/valley hold Zero/span adjustment for any specified range</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (high-resolution)</td>
<td>CS1W-PTS12</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>Pt100Ω (JIS, IEC), JPt100, Pt50Ω N508.4Ω</td>
<td>Standard accuracy: ±0.05% of F.S. or ±0.1°C , whichever is larger. Temperature coefficient: ±0.009%/°C Resolution: 1/64,000 Conversion period: 20 ms/4 pts, 10 ms/2 pts</td>
<td>Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm input disconnection alarm Top/bottom/valley hold Zero/span adjustment for any specified range</td>
</tr>
<tr>
<td>Isolated-type DC Input Unit (high-resolution)</td>
<td>CS1W-PDC11</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>4 to 20 mA, 0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 1 to 5 V, 0 to 1.25 V, ±1.25 V</td>
<td>Standard accuracy: ±0.05% of F.S. Temperature coefficient: ±0.008%/°C Resolution: 1/64,000 Conversion period: 20 ms/4 pts, 10 ms/2 pts</td>
<td>Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm input disconnection alarm Top/bottom/valley hold Zero/span adjustment for any specified range</td>
</tr>
<tr>
<td>Isolated-type Thermocouple Input Unit (economic type)</td>
<td>CS1W-PTS51</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>R, S, K, J, T, L, B</td>
<td>Centigrade Selected Total accuracy: ±0.3% of PV or ±1°C whichever is larger. ±1 digit max. Conversion period: 250 ms/Unit</td>
<td>Process value alarms (H, L) Input disconnection detection</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (economic type)</td>
<td>CS1W-PTS52</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>JPt100, Pt100 (JIS, IEC)</td>
<td>Centigrade Selected Total accuracy: ±0.3% of PV or ±0.8°C whichever is larger. ±1 digit max. Conversion period: 250 ms/Unit</td>
<td>Process value alarms (H, L) Input disconnection detection</td>
</tr>
<tr>
<td>Isolated-type DC Input Unit (economic type)</td>
<td>CS1W-PDC55</td>
<td>8 inputs</td>
<td>All inputs are isolated.</td>
<td>4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V</td>
<td>Standard accuracy: ±0.3% of F.S. Resolution: 1/16,000 Conversion period: 250 ms/8 inputs</td>
<td>Process value alarms (H, L) Input disconnection alarm</td>
</tr>
<tr>
<td>Isolated-type Thermocouple Input Unit</td>
<td>CS1W-PTS01-V1</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>B, E, J, K, N, R, S, T</td>
<td>Variable range: ±80 mV DC</td>
<td>Variable range setting Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm input disconnection detection</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit</td>
<td>CS1W-PTS02</td>
<td>4 inputs</td>
<td>All inputs are isolated.</td>
<td>Pt100 (JIS, IEC), JPt100</td>
<td>Standard accuracy: ±0.1% or ±0.1°C, whichever is larger Temperature coefficient: ±0.05%/°C Resolution: 1/4,096 Conversion period: 100 ms/4 pts</td>
<td>Variable range setting Output scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm input disconnection alarm</td>
</tr>
</tbody>
</table>

---

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# Process and Analog I/O Units

**Overview of Process Analog I/O Units**

- **Isolated-type Resistance Thermometer Input Unit (Ni508.4 Ω)**
  - Model: CS1W-PTS03
  - Number of I/O: 4 inputs
  - Field I/O isolation: All inputs are isolated.
  - I/O type: N508.4 Ω
  - Main specifications:
    - Standard accuracy: ±0.2% or ±0.2°C whichever is larger
    - Temperature coefficient: ±0.015%/°C
    - Resolution: 1/4,096
    - Conversion period: 100 ms/4 pts
  - Main functions:
    - Variable range setting
    - Output scaling (±32,000)
    - Process value alarms (HH, H, L, LL)
    - Rate-of-change calculation and alarm input disconnection detection
    - Built-in power supply for 2-wire transmitter

- **Isolated-type 2-Wire Transmitter Input Unit**
  - Model: CS1W-PTW01
  - Number of I/O: 4 inputs
  - Field I/O isolation: All inputs are isolated.
  - I/O type: 4 to 20 mA, 1 to 5 V
  - Main specifications:
    - Standard accuracy: ±0.2%
    - Temp. coefficient: ±0.015%/°C
    - Resolution: 1/4,096
    - Conversion period: 100 ms/4 pts
    - Built-in power supply for 2-wire transmitter
    - Process value alarms (HH, H, L, LL)
    - Rate-of-change calculation and alarm input error detection
    - Square root

- **Isolated-type Analog Input Unit**
  - Model: CS1W-PDC01
  - Number of I/O: 4 inputs
  - Field I/O isolation: All inputs are isolated.
  - I/O type: –10 to 10 V, 0 to 5 V, ±10 V
  - Main specifications:
    - 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 period: 100 ms/4 pts
    - Output scaling (±32,000)
    - Square root
    - Rate-of-change calculation and alarm input error detection

- **Isolated-type Pulse Input Unit**
  - Model: CS1W-PPS01
  - Number of I/O: 4 inputs
  - Field I/O isolation: All inputs are isolated.
  - I/O type: Max. counting speed 20 k pulses/s (voltage input or no-voltage semiconductor input), 20 pulses/s (contact input)
  - Main specifications:
    - Standard accuracy: ±0.1%
    - Temp. coefficient: ±0.015%/°C
    - Resolution: 1/4,096
    - Conversion cycle: 100 ms/4 pts
    - Output disconnection alarm
    - Control output answer input
    - Output rate-of-change limit
    - Output high/low limits
    - Built-in sensor power supply
    - Contact bounce filter
    - Accumulated value output
    - Instantaneous value output and 4 instantaneous value alarms

- **Isolated-type Analog Output Unit**
  - Model: CS1W-PMV01
  - Number of I/O: 4 outputs
  - Field I/O isolation: All outputs are isolated.
  - I/O type: 4 to 20 mA, 1 to 5 V
  - Main specifications:
    - Standard accuracy: ±0.1% (4 to 20 mA)
    - Standard accuracy: ±0.2% (1 to 5 V)
    - Temp. coefficient: ±0.015%/°C
    - Resolution (full scale): 4,000 (output)
    - Conversion period: 100 ms/4 pts
    - Output disconnection alarm
    - Control output answer input
    - Output rate-of-change limit
    - Output high/low limits
    - Output scaling (±32,000)

- **Power Transducer Input Unit**
  - Model: CS1W-PTR01
  - Number of I/O: 8 inputs
  - Field I/O isolation: Inputs and PLC signals are isolated.
  - I/O type: ±1 mA, 0 to 1 mA
  - Main specifications:
    - Standard accuracy: ±0.2%
    - Temp. coefficient: ±0.015%/°C
    - Resolution: 1/4,096
    - Conversion cycle: 200 ms/8 pts
    - Anti-overshooting at motor startup
    - Output scaling (±32,000)

- **Analog Input Unit (100 mV)**
  - Model: CS1W-PTR02
  - Number of I/O: 8 inputs
  - Field I/O isolation: Inputs and PLC signals are isolated.
  - I/O type: ±100 mV, 0 to 100 mV
  - Main specifications:
    - Standard accuracy: ±0.2%
    - Temp. coefficient: ±0.015%/°C
    - Resolution: 1/4,096
    - Conversion period: 200 ms/8 pts
    - Process value alarms (H, L)
    - Output scaling (±32,000)

---

**Note:** Varies depending on usage conditions. Refer to the *Analog I/O Units User’s Manual (W368)* for details.
# Overview of Analog I/O Units

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>Number of I/O</th>
<th>Field I/O isolation</th>
<th>I/O signal ranges</th>
<th>Overall accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input Unit</td>
<td>CS1W-AD041-V1</td>
<td>4 inputs</td>
<td>Isolated between inputs and PLC signals. No isolation between inputs.</td>
<td>1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA</td>
<td>Voltage input: ±0.2% of F.S.: current input ±0.4% of F.S. (23±2°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voltage input: ±0.4% of F.S.: current input ±0.6% of F.S. (0 to 55°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resolution: 1/8,000 (See note 1.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Conversion speed: 250 µs/point max. (See note 1.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Can be used with a resolution of 1/4,000 and conversion speed of 1 ms.)</td>
</tr>
<tr>
<td>Analog Output Unit</td>
<td>CS1W-DA041</td>
<td>4 outputs</td>
<td>Isolated between inputs and PLC signals. No isolation between inputs.</td>
<td>1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA</td>
<td>Voltage output: ±0.3% of F.S.: current output ±0.5% of F.S. (23±2°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voltage output: ±0.5% of F.S.: current output ±0.8% of F.S. (0 to 55°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resolution: 1/4,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Conversion speed: 1 ms/point max.</td>
</tr>
<tr>
<td>Analog I/O Unit</td>
<td>CS1W-MAD44</td>
<td>4 inputs</td>
<td>Isolated between inputs and PLC signals. No isolation between inputs.</td>
<td>1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA</td>
<td>Voltage input: ±0.2% of F.S.: current input ±0.4% of F.S. (23±2°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voltage input: ±0.4% of F.S.: current input ±0.6% of F.S. (0 to 55°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Output: ±0.3% of F.S. (23±2°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Output: ±0.5% of F.S. (0 to 55°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I/O resolution: 1/4,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Conversion speed: 1 ms/point max.</td>
</tr>
</tbody>
</table>

**Note:**

1. The resolution and conversion speed can be switched with a DM setting.
   If it isn’t necessary to change the setting, the Unit can be used with the earlier model’s mode (resolution of 1/4,000 and conversion speed of 1 ms) just like the conventional model.

2. Use the OMRON XW2D-34G6 Connector-Terminal Block Conversion Unit and XW2Z-200C Connecting Cable to wire inputs.
## Common Specifications for Process and Analog I/O Units

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit classification</td>
<td>CS-series Special I/O Unit</td>
</tr>
<tr>
<td>Dimensions</td>
<td>$35 \times 130 \times 126$ mm ($W \times H \times D$)</td>
</tr>
<tr>
<td>Weight</td>
<td>450 g max.</td>
</tr>
</tbody>
</table>
| External connection terminals | CS1W-PTS55/56, PDC55: 24-point detachable terminal block (lever type)  
CS1W-AD161: MIL connectors (34-pin × 2)  
Other models: 21-point detachable terminal block (M3 screws, with tightening torque of 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. |

### Item Specifications

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>Current consumption (power)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5 V</td>
</tr>
<tr>
<td>Isolated-type Thermocouple Input Unit</td>
<td>CS1W-PTS01-V1</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTS11</td>
<td>0.12 A (0.6 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTS51</td>
<td>0.25 A (1.25 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTS55</td>
<td>0.18 A (0.9 W)</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (Pt100, JPt100)</td>
<td>CS1W-PTS02</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTS03</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (Ni50 8.4 Ω)</td>
<td>CS1W-PTS03</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTS12</td>
<td>0.12 A (0.6 W)</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (Pt100, JPt100)</td>
<td>CS1W-PTS02</td>
<td>0.25 A (1.25 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTS55</td>
<td>0.18 A (0.9 W)</td>
</tr>
<tr>
<td>Isolated-type 2-Wire Transmitter Input Unit</td>
<td>CS1W-PTW01</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td>Isolated-type DC Input Unit</td>
<td>CS1W-PDC01</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PDC11</td>
<td>0.12 A (0.6 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PDC55</td>
<td>0.18 A (0.9 W)</td>
</tr>
<tr>
<td>Power Transducer Input Unit</td>
<td>CS1W-PTR01</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PTR02</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td>Isolated-type Pulse Input Unit</td>
<td>CS1W-PPS01</td>
<td>0.20 A (1.0 W)</td>
</tr>
<tr>
<td>Isolated-type Analog Output Units</td>
<td>CS1W-PMV01</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-PMV02</td>
<td>0.12 A (0.6 W)</td>
</tr>
<tr>
<td>Analog Input Units</td>
<td>CS1W-AD041-V1</td>
<td>0.12 A (0.6 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-AD081-V1</td>
<td>0.15 A (0.75 W)</td>
</tr>
<tr>
<td>Analog Output Units</td>
<td>CS1W-DA041</td>
<td>0.13 A (0.65 W)</td>
</tr>
<tr>
<td></td>
<td>CS1W-DA08V</td>
<td>0.25 A (6.5 W)</td>
</tr>
<tr>
<td>Analog I/O Unit</td>
<td>CS1W-MAD44</td>
<td>0.2 A (1.0 W)</td>
</tr>
</tbody>
</table>

(Reference) Maximum current and total power supplied

<table>
<thead>
<tr>
<th>Power Supply Unit</th>
<th>Maximum current supplied (power)</th>
<th>Maximum total power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 V</td>
<td>26 V</td>
</tr>
<tr>
<td>C200HW-PA204</td>
<td>4.6 A (23 W)</td>
<td>0.6 A (15.6 W)</td>
</tr>
<tr>
<td>C200HW-PA204S</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>C200HW-PA204R</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>C200HW-PD024</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>C200HW-PD025</td>
<td>5.3 A (26.5 W)</td>
<td>1.3 A (33.8 W)</td>
</tr>
<tr>
<td>C200HW-PA209R</td>
<td>9 A (45 W)</td>
<td>1.3 A (33.8 W)</td>
</tr>
<tr>
<td>CS1D-PA207R</td>
<td>7 A (35 W)</td>
<td>1.3 A (33.8 W)</td>
</tr>
<tr>
<td>CS1D-PD024</td>
<td>4.3 A (21.5 W)</td>
<td>0.56 A (14.6 W)</td>
</tr>
<tr>
<td>CS1D-PD025</td>
<td>5.3 A (26.5 W)</td>
<td>1.3 A (33.8 W)</td>
</tr>
</tbody>
</table>

Ambient operating temperature: 0 to 55°C

Ambient operating humidity: 10% to 90% (no condensation)

Isolation: Between I/O, and between inputs and the Backplane. There is no isolation, however, between inputs for Power Supply Transducer Input Units, Current Input Units (100 mV), Analog Input Units, Analog Output Units, and I/O Units.

Insulation resistance: 20 MΩ min. (at 500 V DC) between isolated sections

Dielectric strength: 1,000 V AC between isolated sections

**Note:** Process Analog I/O Units can be used even if a Loop Control Board or Loop Control Unit is not used.
Face Plate Auto-Builder for NS

Simply specify the CSV tag file created using the CX-Process Tool to automatically create a project constructed with a Face Plate for Loop-control CPU Units for use with OMRON's NS-series Programmable Terminals.

Function Overview

- Create windows for monitoring and tuning PID and other function blocks for up to 100 loops (NS System version 4 or higher).
- NS project files for monitoring multiple Loop-control CPU Units from a single NS-series PT can be generated from CX-Process projects for up to 32 multiple nodes.
- When a Segment Program 2 or 3 function block is used for program operation, the Detailed Setting Windows (Time Interval vs. Output Value Setting Window, Wait Interval Setting Window) used for the parameter settings are also automatically generated.

Basic Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Face Plate Auto-Builder for NS</td>
</tr>
<tr>
<td>Model number</td>
<td>(Included in CX-One Package)</td>
</tr>
<tr>
<td>Applicable PLC products</td>
<td>CJ-series Loop-control CPU Units</td>
</tr>
<tr>
<td></td>
<td>CS-series Loop Control Boards (unit version 1.0 or later)</td>
</tr>
<tr>
<td></td>
<td>CS-series Loop Control Units (unit version 2.0 or later)</td>
</tr>
<tr>
<td></td>
<td>CS1D Process-control CPU Units</td>
</tr>
<tr>
<td>Applicable PTs</td>
<td>NS-series NS12, NS10, and NS8 (PT version 2.0 or later)</td>
</tr>
<tr>
<td></td>
<td>CX-Designer</td>
</tr>
<tr>
<td>System requirements</td>
<td>Computer: IBM PC/AT or compatible</td>
</tr>
<tr>
<td></td>
<td>CPU: Intel Pentium III 1 GHz or better recommended</td>
</tr>
<tr>
<td></td>
<td>OS: Microsoft Windows 2000 (Service Pack 3 or higher), XP, or Vista</td>
</tr>
<tr>
<td></td>
<td>Memory: Recommended: 512 Mbytes min.</td>
</tr>
<tr>
<td></td>
<td>Hard disk storage: Recommended: 450 Mbytes free space min.</td>
</tr>
<tr>
<td></td>
<td>Monitor: Minimum: XGA 256 colors</td>
</tr>
<tr>
<td>Basic functions</td>
<td>Number of generated loops: 100 max., control windows and tuning windows</td>
</tr>
<tr>
<td></td>
<td>Applicable face plates: 2-position ON/OFF, 3-position ON/OFF, Basic PID, Advanced PID, Indication and Operation, Indicator, Segment Program 2 (includes the parameter setting windows), Segment Program 3 (includes the parameter setting windows)</td>
</tr>
<tr>
<td></td>
<td>Number of loops in control windows: 6 loops per window for NS12, 4 loops per window for NS10/NS8</td>
</tr>
<tr>
<td></td>
<td>Realtime trend in tuning window: 1-second cycle</td>
</tr>
</tbody>
</table>

Example of Automatically Created Windows

[Diagram of tuning window and control window with various elements such as SP numerical value display, PV numerical value display, CAS button, MV indicator, etc.]
Utility Software

RSView 32-related Software

■ SYSMAC OPC Server

The SYSMAC OPC Server is an application that runs on Windows 2000, NT, or XP as a local/remote server for OPC Data Access 2.0. It is required to connect to RSView32.

Basic Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>SYSMAC OPC Server V2</td>
</tr>
<tr>
<td>Model number</td>
<td>WS02-OPCC1-E</td>
</tr>
<tr>
<td>Applicable PLC products</td>
<td>CS, CJ, CV, CMV1, C200HX/HG/HE, CQM1H</td>
</tr>
<tr>
<td>System requirements</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>IBM PC/AT or compatible</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Pentium, Celeron 400 MHz or better recommended</td>
</tr>
<tr>
<td>OS</td>
<td>Microsoft Windows NT4.0, 2000, or XP</td>
</tr>
<tr>
<td>Memory</td>
<td>Recommended: 128 Mbytes min.</td>
</tr>
<tr>
<td>Hard disk storage</td>
<td>Recommended: 100 Mbytes free space min.</td>
</tr>
</tbody>
</table>

Note: FinsGateway version 3 is included with this product, so there is no need to purchase it separately.

■ Faceplate Components for Loop Controllers

Function block control and monitoring is enabled by simply pasting faceplate objects corresponding to Loop Controller function blocks into RSView32. (SYSMAC OPC Server is required to use this function.)

Basic Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Loop Controller Faceplate Objects (CX-Process 2 Control)</td>
</tr>
<tr>
<td>Model number</td>
<td>WS02-LCFC1-E</td>
</tr>
<tr>
<td>Applicable PLC products</td>
<td>CS-series Loop Control Boards</td>
</tr>
<tr>
<td></td>
<td>CS-series Loop Control Units (unit version 2.0 or later)</td>
</tr>
<tr>
<td></td>
<td>CS10 Process-control CPU Units</td>
</tr>
<tr>
<td></td>
<td>CI-series Loop-control CPU Units</td>
</tr>
<tr>
<td>System requirements</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>IBM PC/AT or compatible</td>
</tr>
<tr>
<td>CPU</td>
<td>SYSMAC OPC Server version 2.6 or later and RSView32 version 7.0 or later</td>
</tr>
<tr>
<td>OS</td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>Recommended: 10 Mbytes min.</td>
</tr>
<tr>
<td>Hard disk storage</td>
<td>Recommended: 10 Mbytes min.</td>
</tr>
<tr>
<td>Basic functions</td>
<td>Applicable face plates: 2-position ON/OFF (See note.), 3-position ON/OFF (See note.), Basic PID (See note.), Advanced PID (See note.), Blended PID (See note.), Batch Flowrate Capture (See note.), Indication and Setting (See note.), Indication and Operation (See note.), Ratio Setting (See note.), Indicator (See note.), ES100X Controller Terminal (See note.), High/Low Alarm, Segment Program 2, Timer, Counter, ON/OFF Valve Manipulator, Motor Manipulator, Reversible Motor Manipulator, Motor Opening Manipulator, User Link Table tags</td>
</tr>
<tr>
<td></td>
<td>Number of loops in control windows: 8 loops per window</td>
</tr>
<tr>
<td></td>
<td>Realtime trend in tuning window: 1-second cycle</td>
</tr>
<tr>
<td></td>
<td>The control log from the faceplate can be recorded in the RSView32 activity log.</td>
</tr>
</tbody>
</table>

Note: Includes the Tuning Parameter Screen. Enabled when using the sample project included with the product.
Dimensions

CPU Units

■ CS1D Process-control CPU Units (Unit: mm)
  CS1D-CPU65P
  CS1D-CPU67P

Inner Boards

■ Loop Control Boards (Unit: mm)
  CS1W-LCB01
  CS1W-LCB05(-GTC)

CPU Bus Units

■ Loop Control Unit (Unit: mm)
  CS1W-LC001
### Special I/O Units

#### Analog I/O Units (Unit: mm)

<table>
<thead>
<tr>
<th>Process Analog I/O Units</th>
<th>Standard Analog I/O Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1W-PTS11</td>
<td>CS1W-AD041-V1</td>
</tr>
<tr>
<td>CS1W-PTS12</td>
<td>CS1W-AD081-V1</td>
</tr>
<tr>
<td>CS1W-PDC11</td>
<td>CS1W-DA041</td>
</tr>
<tr>
<td>CS1W-PTS51</td>
<td>CS1W-DA08V</td>
</tr>
<tr>
<td>CS1W-PTS52</td>
<td>CS1W-DA08C</td>
</tr>
<tr>
<td>CS1W-PTS55</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTS56</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTS01-V1</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTS02</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTS03</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTW01</td>
<td></td>
</tr>
<tr>
<td>CS1W-PDC01</td>
<td></td>
</tr>
<tr>
<td>CS1W-PDC55</td>
<td></td>
</tr>
<tr>
<td>CS1W-PPS01</td>
<td></td>
</tr>
<tr>
<td>CS1W-PMV01</td>
<td></td>
</tr>
<tr>
<td>CS1W-PMV02</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTR01</td>
<td></td>
</tr>
<tr>
<td>CS1W-PTR02</td>
<td></td>
</tr>
</tbody>
</table>

**Analog Input Units**

CS1W-AD161
International Standards

The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives. Contact your OMRON representative for further details and applicable conditions for these standards.

EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives as described below.

EMC Directives

Applicable Standards

- EMI: EN61000-6-4
- EMS: EN61131-2 and EN61000-6-2 (See note.)

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.

EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

Note: The applicable EMI standard depends on the product.

Low Voltage Directive

Applicable Standard

EN61131-2

Devices that operate at voltages from 50 to 1,000 VAC or 75 to 150 VDC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges. These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.
Ordering Information

Selection Guide

■ Process Control

Is a Duplex-CPU system required?

Yes

CS1D Process-control CPU Units: CS1D-CPU6/P (See note.)
CPU Unit with built-in Loop Control Board. Duplex CPU Units, power supplies, and networks are possible.

Note: Cannot be used with CS1D-S (independent CPU Unit system).
Use a CS1W-LCB01/05 for the CS1D-S.

No

How many control loops are required?

Less than 20 loops

20 to 199 loops

More than 200 loops

Loop Control Board (LCB): CS1W-LCB01
Provides advanced controller functions in a PLC.
Function blocks can be set with a control cycle as fast as 10 ms, enabling precision control of high-speed temperature increases and similar applications.

Loop Control Board (LCB): CS1W-LCB05(-GTC)
When mounted in a CS1D-CPU6/S, duplex power supplies and networks are also possible.

Construct a system with the PLC connected to the network.
Use Controller Link to enable high-volume data links between PLCs. Large-scale systems can be configured with up to 62 CS1 nodes (LCBs).

■ Analog Input

Isolation between channels

Temperature input? Pulse signals? Analog signals?

Yes

Is high precision required?

Yes

Isolated-type Thermocouple Input Unit (high-resolution type):
CS1W-PTS11 (thermocouple input)
CS1W-PTS12 (resistance thermometer input)
High-speed, high-definition Temperature Input Units. Suitable for high-speed temperature control in machinery such as semiconductor devices and industrial furnaces.
Resolution: 64,000; Conversion cycle: 20 ms/4 points (10 ms/2 points)

No

Isolated-type Thermocouple Input Unit (economical type):
CS1W-PTS15/55 (thermocouple input)
CS1W-PTS25/56 (resistance thermometer input)
Connect temperature sensors directly to the Unit. A low-cost solution for reading sensor data.

Pulse Input

Is isolation between channels required?

Yes

Is power supply from the Unit required?

Yes

Isolated-type Pulse Input Unit: CS1W-PPS01
Inputs up to 4 inputs from a Capacitive Flow Rate Sensor (oval flow rate sensor)

No

Isolated-type 2-Wire Transmitter Input Unit: CS1W-PTW01
Inputs up to 4 points from the transmitter without requiring an external DC power supply.

Analog Input Unit: CS1W-AD
Reads up to 16 analog signals with a single Unit.

Note: Models with power supply transducer inputs (±1 mA, 0 to 1 mA), for 0 to 100 mV are also available. Refer to "Process and Analog I/O Units" on page 23 for details.

■ Analog Output

Isolation between channels

Isolation between channels required?

Yes

Isolated-type Analog Output Unit:
CS1W-PMV01 (4 to 20 mA, 1 to 5 V)
CS1W-PMV02 (0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V)
Outputs up to 4 analog signals from a single Unit.

Non-isolated between outputs (isolated between outputs and PLC signals)

Analog Output Unit: CS1W-DA
Outputs up to 8 analog signals using a single Unit.
# Ordering Information

## Basic PLC Components

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Units</strong></td>
<td>I/O bits: 5,120, Program capacity: 250K steps, Data memory capacity: 148K words (DM: 32K words, EM: 32K words × 13 banks)</td>
<td>CS1H-CPU67H</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td>CPU Units</td>
<td>I/O bits: 5,120, Program capacity: 120K steps, Data memory capacity: 256K words (DM: 32K words, EM: 32K words × 7 banks)</td>
<td>CS1H-CPU66H</td>
<td>---</td>
</tr>
<tr>
<td>CPU Units</td>
<td>I/O bits: 5,120, Program capacity: 60K steps, Data memory capacity: 128K words (DM: 32K words, EM: 32K words × 3 banks)</td>
<td>CS1H-CPU65H</td>
<td>---</td>
</tr>
<tr>
<td>CPU Units</td>
<td>I/O bits: 5,120, Program capacity: 30K steps, Data memory capacity: 64K words (DM: 32K words, EM: 32K words × 1 bank)</td>
<td>CS1H-CPU64H</td>
<td>---</td>
</tr>
<tr>
<td>CPU Units</td>
<td>I/O bits: 5,120, Program capacity: 20K steps, Data memory capacity: 64K words (DM: 32K words, EM: 32K words × 1 bank)</td>
<td>CS1H-CPU63H</td>
<td>---</td>
</tr>
<tr>
<td>CPU Units</td>
<td>I/O bits: 5,120, Program capacity: 60K steps, Data memory capacity: 128K words (DM: 32K words, EM: 32K words × 3 banks)</td>
<td>CS1G-CPU45H</td>
<td>---</td>
</tr>
<tr>
<td>CPU Backplanes</td>
<td>2 slots (Does not connect to Expansion Rack.)</td>
<td>CS1W-BC023</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>CPU Backplanes</td>
<td>3 slots</td>
<td>CS1W-BC033</td>
<td>---</td>
</tr>
<tr>
<td>CPU Backplanes</td>
<td>5 slots</td>
<td>CS1W-BC053</td>
<td>---</td>
</tr>
<tr>
<td>CPU Backplanes</td>
<td>8 slots</td>
<td>CS1W-BC083</td>
<td>---</td>
</tr>
<tr>
<td>CPU Backplanes</td>
<td>10 slots</td>
<td>CS1W-BC103</td>
<td>---</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, with maintenance forecast function</td>
<td>C200HW-PA204</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, with RUN output</td>
<td>C200HW-PA204S</td>
<td>U, C</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 9 A, 5 VDC, 1.3 A, 26 V DC, Total: 45 W max.</td>
<td>C200HW-PA209R</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 9 A, 5 VDC, 1.3 A, 26 V DC, Total: 45 W max.</td>
<td>C200HW-PA209R</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, 0.625 A, 26 V DC, Total: 30 W max.</td>
<td>C200HW-PA204</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, 0.625 A, 26 V DC, Total: 30 W max.</td>
<td>C200HW-PA204S</td>
<td>U, C</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, 0.625 A, 26 V DC, Total: 45 W max.</td>
<td>C200HW-PA209R</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, 0.625 A, 26 V DC, Total: 45 W max.</td>
<td>C200HW-PA209R</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Output capacity: 4.6 A, 5 VDC, 0.625 A, 26 V DC, Total: 45 W max.</td>
<td>C200HW-PA209R</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Memory Cards</td>
<td>Flash memory, 128 MB</td>
<td>HMC-EF183</td>
<td>N, L, CE</td>
</tr>
<tr>
<td>Memory Cards</td>
<td>Memory Card Adapter (for computer PCMCIA slot)</td>
<td>HMC-AP001</td>
<td>N, L, CE</td>
</tr>
<tr>
<td>Serial Communications</td>
<td>2 × RS-232C ports, protocol macro function</td>
<td>CS1W-SCB21-V1</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Boards</td>
<td>1 × RS-232C port + 1 × RS-422/485 port, protocol macro function</td>
<td>CS1W-SCB41-V1</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>Programming</td>
<td>An English Keyboard Sheet (CS1W-KS001-E) is required.</td>
<td>CQM1-PRO01-E</td>
<td>U, C, CE</td>
</tr>
<tr>
<td>Consoles</td>
<td>Note: Connects to peripheral port on CPU Unit only. (Cannot connect to RS-232C port.)</td>
<td>CQM1-PRO01-E</td>
<td>U, C, N, CE</td>
</tr>
<tr>
<td>Programming</td>
<td>CQMH1-PRO01-E</td>
<td>C200H-PRO27-E</td>
<td>U, C, CE</td>
</tr>
<tr>
<td>Console Key Sheet</td>
<td>For C200H-PRO27 and CQM1-PRO01</td>
<td>CS1W-KS001-E</td>
<td>CE</td>
</tr>
<tr>
<td>Programming</td>
<td>Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)</td>
<td>CS1W-CN114</td>
<td>---</td>
</tr>
<tr>
<td>Console Connecting Cables</td>
<td>Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)</td>
<td>CS1W-CN224</td>
<td>---</td>
</tr>
<tr>
<td>Connector Cover</td>
<td>Protects unused Backplane connectors (Power Supply Unit connectors)</td>
<td>CS500-COV01</td>
<td>---</td>
</tr>
<tr>
<td>Space Unit</td>
<td>For unused I/O slot spaces</td>
<td>CS1W-SP001</td>
<td>---</td>
</tr>
<tr>
<td>Space Unit</td>
<td>For unused power supply slot spaces (same shape as PA207R)</td>
<td>CS1D-SP001</td>
<td>---</td>
</tr>
<tr>
<td>Space Unit</td>
<td>For unused power supply slot spaces (same shape as PA204)</td>
<td>CS1D-SP002</td>
<td>---</td>
</tr>
</tbody>
</table>
# CS1D Duplex Systems

## For Duplex-CPU Systems

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CS1D CPU Units</strong> (For Duplex-CPU Systems)</td>
<td>I/O bits</td>
<td>Program capacity</td>
<td>Data memory capacity</td>
</tr>
<tr>
<td>5,120</td>
<td>60K steps</td>
<td>128K words</td>
<td>CS1D-CPU65H</td>
</tr>
<tr>
<td>256K steps</td>
<td>448K words</td>
<td>CS1D-CPU67H</td>
<td></td>
</tr>
<tr>
<td><strong>CS1D Process-control CPU Units</strong> (For Duplex-CPU Systems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU Unit: CS1D-CPU65H</td>
<td>Loop Control Board: CS1D-LCB05D, 500 function blocks max.</td>
<td>CS1D-CPU65P</td>
<td>UC1, N, CE</td>
</tr>
<tr>
<td>CPU Unit: CS1D-CPU67H</td>
<td>Loop Control Board: CS1D-LCB05D, 500 function blocks max.</td>
<td>CS1D-CPU67P</td>
<td></td>
</tr>
<tr>
<td><strong>Duplex Unit</strong> (For Duplex-CPU Systems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit for Duplex CPU Systems</td>
<td></td>
<td>CS1D-DPL01</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td>Unit for Duplex CPU Systems (Can be replaced online.)</td>
<td></td>
<td>CS1D-DPL02D</td>
<td>UC1, CE</td>
</tr>
<tr>
<td><strong>CPU Backplane</strong> (For Duplex-CPU Systems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 slots</td>
<td></td>
<td>CS1D-BC052</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td><strong>CS1D Power Supply Unit</strong> (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>100 to 120 V AC or 200 to 240 V AC (supports output during operation) Output capacity: 7 A, 5 V DC, 1.3 A, 26 V DC, Total: 35 W max. (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>CS1D-PA207R</td>
<td></td>
</tr>
<tr>
<td>24 V DC, Output capacity: 4.3 A, 5 V DC, 0.56 A, 26 V DC, Total: 28 W max. (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>CS1D-PD024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 V DC, Output capacity: 5.3 A, 5 V DC, 1.3 A, 26 V DC, Total: 40 W max. (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>CS1D-PD025</td>
<td>UC1, N, L, CE</td>
<td></td>
</tr>
</tbody>
</table>

## For Single-CPU Systems (See note.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CS1D CPU Units</strong> (For Single-CPU Systems)</td>
<td>I/O bits</td>
<td>Program capacity</td>
<td>Data memory capacity</td>
</tr>
<tr>
<td>5,120</td>
<td>60K steps</td>
<td>128K words</td>
<td>CS1D-CPU65S</td>
</tr>
<tr>
<td>256K steps</td>
<td>448K words</td>
<td>CS1D-CPU67S</td>
<td></td>
</tr>
<tr>
<td>1,280</td>
<td>30K steps</td>
<td>64 K words</td>
<td>CS1D-CPU44S</td>
</tr>
<tr>
<td>960</td>
<td>10K steps</td>
<td>64 K words</td>
<td>CS1D-CPU42S</td>
</tr>
<tr>
<td><strong>CPU Backplane</strong> (For Single-CPU Systems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 slots</td>
<td></td>
<td>CS1D-BC082S</td>
<td></td>
</tr>
<tr>
<td><strong>CS1D Power Supply Unit</strong> (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>100 to 120 V AC or 200 to 240 V AC (supports output during operation) Output capacity: 7 A, 5 V DC, 1.3 A, 26 V DC, Total: 35 W max. (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>CS1D-PA207R</td>
<td></td>
</tr>
<tr>
<td>24 V DC, Output capacity: 4.3 A, 5 V DC, 0.56 A, 26 V DC, Total: 28 W max. (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>CS1D-PD024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 V DC, Output capacity: 5.3 A, 5 V DC, 1.3 A, 26 V DC, Total: 40 W max. (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>CS1D-PD025</td>
<td>UC1, N, L, CE</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Loop Control Board Unit Ver. 1.5 or later is required when using the Loop Control Board. Do not use a unit version earlier than Unit Ver. 1.5.

## Expansion Units

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O Control Unit</td>
<td>For distances exceeding 12 m (50 m max.), equipped with two terminating resistors</td>
<td>CS1W-IC102</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>I/O Interface Unit</td>
<td>For distances exceeding 12 m (50 m max.)</td>
<td>CS1W-II102</td>
<td></td>
</tr>
<tr>
<td>Expansion Backplane (supports online replacement) (Used for both Duplex-CPU Systems and Single-CPU Systems)</td>
<td>9 slots</td>
<td>CS1D-BI092</td>
<td>UC1, N, L, CE</td>
</tr>
</tbody>
</table>
Ordering Information

Loop Control Boards and Loop Control Units

<table>
<thead>
<tr>
<th>Unit name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop Control Boards</td>
<td>No. of function blocks: 50 blocks max.</td>
<td>CS1W-LCB01</td>
<td>UC1, N, CE</td>
</tr>
<tr>
<td></td>
<td>No. of function blocks: 500 blocks max.</td>
<td>CS1W-LCB05</td>
<td></td>
</tr>
<tr>
<td>Loop Control Unit</td>
<td>No. of control loops: 32 loops max.</td>
<td>CS1W-LC001</td>
<td>UC1, N, CE</td>
</tr>
<tr>
<td></td>
<td>No. of operations: 249 max.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Use a CS1D-CPU6 P CSID Process-control CPU Unit (for Duplex-CPU System) when duplex operation is required. Use the CS1W-LCB0□ Loop Control Board when using a CS1D CPU Unit for a Single-CPU System

Process Analog I/O Units

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated-type Thermocouple Input Unit (high-resolution type)</td>
<td>4 inputs, B, E, J, K, L, N, R, S, T, U, WRe5-26, PL II, ±100 mV</td>
<td>CS1W-PTS11</td>
<td>UC1, N, CE</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (high-resolution type)</td>
<td>4 inputs, Pt100 Ω (JIS, IEC), JPt100 Ω, Pt50 Ω, Ni508.4 Ω</td>
<td>CS1W-PTS12</td>
<td></td>
</tr>
<tr>
<td>Isolated-type DC Input Unit (high-resolution type)</td>
<td>4 inputs, 4 to 20 mA, 0 to 20 mA, 0 to 10 V, ±5 V, 0 to 5 V, ±5 V, 0 to 1.25 V, ±1.25 V</td>
<td>CS1W-PDC11</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Thermocouple Input Unit (economical type)</td>
<td>4 inputs, R, S, K, T, L, B</td>
<td>CS1W-PTS51</td>
<td>UC1, CE</td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit (economical type)</td>
<td>8 inputs, R, S, K, T, L, B</td>
<td>CS1W-PTS55</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Analog Input Unit (economical type)</td>
<td>8 inputs, Pt100, Pt100 (JIS, IEC)</td>
<td>CS1W-PDC55</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Analog Input Unit</td>
<td>8 inputs, 4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V</td>
<td>CS1W-PDC56</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Thermocouple Input Unit</td>
<td>4 inputs, B, E, J, K, N, R, S, T; ±80 mV</td>
<td>CS1W-PTS01-V1</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit</td>
<td>4 inputs, Pt100, JPt100</td>
<td>CS1W-PTS02</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Resistance Thermometer Input Unit</td>
<td>4 inputs, Ni508.4 Ω</td>
<td>CS1W-PTS03</td>
<td></td>
</tr>
<tr>
<td>Isolated-type 2-Wire Transmitter Input Unit</td>
<td>4 inputs, 4 to 20 mA, 1 to 5 V</td>
<td>CS1W-PTW01</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Analog Input Unit</td>
<td>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</td>
<td>CS1W-PDC01</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Pulse Input Unit</td>
<td>4 inputs</td>
<td>CS1W-PPS01</td>
<td></td>
</tr>
<tr>
<td>Isolated-type Analog Output Unit</td>
<td>4 outputs, 4 to 20 mA, 1 to 5 V</td>
<td>CS1W-PMV01</td>
<td></td>
</tr>
<tr>
<td>Power Transducer Input Unit</td>
<td>4 outputs, 0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V</td>
<td>CS1W-PMV02</td>
<td></td>
</tr>
<tr>
<td>Analog Input Unit (100 mV)</td>
<td>8 inputs, 0 to 1 mA, ±1 mA</td>
<td>CS1W-PTR01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 inputs, 0 to 100 mV, ±100 mV</td>
<td>CS1W-PTR02</td>
<td></td>
</tr>
</tbody>
</table>
Ordering Information

Standard Analog I/O Units

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input Units</td>
<td>4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA),</td>
<td>CS1W-AD041-V1</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1/8,000 (See note.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA),</td>
<td>CS1W-AD081-V1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resolution: 1/8,000 (See note.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA),</td>
<td>CS1W-AD161</td>
<td>UC1, CE</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1/8,000 (See note.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog Output Units</td>
<td>4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA),</td>
<td>CS1W-DA041</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1/4,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V), Resolution: 1/4,000</td>
<td>CS1W-DA08V</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>8 outputs (4 to 20 mA), Resolution: 1/4,000</td>
<td>CS1W-DA08C</td>
<td></td>
</tr>
<tr>
<td>Analog I/O Unit</td>
<td>4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA),</td>
<td>CS1W-MAD44</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1/4,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Resolution: 1/4,000 is also possible.

Connector-Terminal Block Conversion Unit and Connecting Cable for CS1W-AD161

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector-Terminal Block Conversion Unit</td>
<td>34 terminal, dimensions: 128 × 40 × 39 mm</td>
<td>XW2D-34G6</td>
<td>---</td>
</tr>
<tr>
<td>Connector-Terminal Block Conversion Unit Connecting Cable</td>
<td>Length: 2 m</td>
<td>XW2Z-200C</td>
<td>---</td>
</tr>
</tbody>
</table>

SYSMAC SPU Units (Storage and Processing Units)

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSMAC SPU Unit</td>
<td>One Ethernet port, one PC card slot</td>
<td>CS1W-SPU1-V2</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Two Ethernet ports, one PC card slot</td>
<td>CS1W-SPU2-V2</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td>SPU Basic Software</td>
<td>SPU Unit Setting Software</td>
<td>WS02-SPTC1-V2</td>
<td>---</td>
</tr>
<tr>
<td>Memory Cards</td>
<td>128-MB compact flash card</td>
<td>HMC-EF183</td>
<td>L, CE</td>
</tr>
<tr>
<td></td>
<td>256-MB compact flash card</td>
<td>HMC-EF283</td>
<td></td>
</tr>
<tr>
<td></td>
<td>512-MB compact flash card</td>
<td>HMC-EF583</td>
<td>CE</td>
</tr>
<tr>
<td>Memory Card Adapter</td>
<td>For PC card slot</td>
<td>HMC-AP001</td>
<td></td>
</tr>
<tr>
<td>Ethernet Cross Cables</td>
<td>2-m cable (made by corega KK)</td>
<td>CG-UTP02WXA</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>3-m cable (made by corega KK)</td>
<td>CG-UTP03WXA</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. Required for data collection settings.
2. Required to install the Memory Card in the SPU Unit.
## Basic I/O Units

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Units</td>
<td>DC Input Units</td>
<td>24 V DC, 16 inputs, 7 mA</td>
<td>CS1W-ID211</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 32 inputs, 6 mA</td>
<td>CS1W-ID231</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 64 inputs, 6 mA</td>
<td>CS1W-ID261</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 96 inputs, approx. 5 mA</td>
<td>CS1W-ID291</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>AC Input Units</td>
<td>100 to 120 V AC, 100 to 120 V DC, 16 inputs</td>
<td>CS1W-IA111</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 to 240 V AC, 16 inputs</td>
<td>CS1W-IA211</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Interrupt Input Unit</td>
<td>24 V DC, 16 inputs, 7 mA</td>
<td>CS1W-INT01</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>High-speed Input Unit</td>
<td>24 V DC, 16 inputs, 7 mA</td>
<td>CS1W-IDP01</td>
<td></td>
</tr>
<tr>
<td>Output Units</td>
<td>Relay Output Units</td>
<td>250 V AC, 2 A max.; 24 VDC, 2 A max.; 120 V DC, 0.1 A max.; independent contacts, 8 outputs</td>
<td>CS1W-OC201</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 V AC, 2 A max.; 24 VDC, 2 A max.; 120 V DC, 0.1 A max.; 16 outputs</td>
<td>CS1W-OC211</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transistor Output Units</td>
<td>12 to 24 V DC, 0.5 A, 16 sinking outputs</td>
<td>CS1W-OD211</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 0.5 A, 16 sourcing outputs (load short-circuit protection, with alarm)</td>
<td>CS1W-OD212</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 to 24 V DC, 0.5 A, 32 sinking outputs</td>
<td>CS1W-OD231</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 0.5 A, 32 sourcing outputs (load short-circuit protection, with alarm)</td>
<td>CS1W-OD232</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 to 24 V DC, 0.3 A, 64 sinking outputs</td>
<td>CS1W-OD261</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 0.3 A, 64 sourcing outputs (load short-circuit protection, with alarm)</td>
<td>CS1W-OD262</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Triac Output Units</td>
<td>250 V AC, 1.2 A max., 8 outputs</td>
<td>CS1W-OA201</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 V AC, 0.5 A max., 16 outputs</td>
<td>CS1W-OA211</td>
<td></td>
</tr>
<tr>
<td>I/O Units</td>
<td>DC Input/Transistor Output Units</td>
<td>24 V DC, 6 mA, 32 inputs, 12 to 24 V DC, 0.3 A, 32 sinking outputs (load short-circuit protection, with alarm)</td>
<td>CS1W-MD261</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 6 mA, 32 inputs, 24 V DC, 0.3 A, 32 sourcing outputs (load short-circuit protection, with alarm)</td>
<td>CS1W-MD262</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, approx. 5 A, 48 inputs, 12 to 24 V DC, 0.1 A, 48 outputs, sinking inputs/outputs</td>
<td>CS1W-MD291</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC, 5 A, 48 outputs, 12 to 24 V DC, 0.1 A, 48 outputs, sourcing inputs/outputs</td>
<td>CS1W-MD292</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TTL I/O Unit</td>
<td>5 V DC, 32 inputs, 32 outputs</td>
<td>CS1W-MD561</td>
<td>UC1, N, L, CE</td>
</tr>
</tbody>
</table>

**Note:** C200H/C200HW Basic I/O Units can also be mounted.
### Ordering Information

**CPU Bus Units (Network Units)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controller Link Units</strong></td>
<td>Wired Unit, shielded twisted-pair cable (See note 1.)</td>
<td>CS1W-CLK23</td>
<td>UC1, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Optical ring for H-PCF cable (See note 2.), supports duplex communications</td>
<td>CS1W-CLK13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Optical ring for GI cable (See note 3.), supports duplex communications</td>
<td>CS1W-CLK53</td>
<td></td>
</tr>
<tr>
<td><strong>SYSMAC LINK Units</strong></td>
<td>Coaxial cable (5C-2V cable)</td>
<td>CS1W-SLK21</td>
<td>U, C, CE</td>
</tr>
<tr>
<td></td>
<td>Optical cable (H-PCF cable)</td>
<td>CS1W-SLK11</td>
<td>U, C, N, CE</td>
</tr>
<tr>
<td><strong>Serial Communications Unit</strong></td>
<td>Two RS-232C Ports</td>
<td>CS1W-SCU21-V1</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>Two RS-422A/485 ports</td>
<td>CS1W-SCU31-V1</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td><strong>Ethernet Unit</strong></td>
<td>100Base-TX (10Base-T), supports duplex communications</td>
<td>CS1W-ETN21</td>
<td>U, C, N, L, CE</td>
</tr>
<tr>
<td></td>
<td>100Base-TX (10Base-T), supports duplex communications (FINS communications (TCP/IP, UDP/IP), socket service, FTP server, mail transmission)</td>
<td>CS1D-ETN21D</td>
<td></td>
</tr>
<tr>
<td><strong>FL-net Unit</strong></td>
<td>FL-net (OPCN-2), 100Base-TX</td>
<td>CS1W-FLN22</td>
<td>U, C, CE</td>
</tr>
<tr>
<td><strong>DeviceNet Unit</strong></td>
<td>Functions as remote I/O master and/or slave.</td>
<td>CS1W-DRM21-V1</td>
<td>U, C, CE</td>
</tr>
<tr>
<td><strong>CompoNet Master Unit</strong></td>
<td>Word Slaves: 2,048 max. (1,024 inputs and 1,024 outputs)</td>
<td>CS1W-CRM21</td>
<td>U, U1, L, CE, UC, UC1 (pending)</td>
</tr>
<tr>
<td></td>
<td>Bit Slaves: 512 max. (256 inputs and 256 outputs)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

1. Use the following special cable for shielded, twisted-pair cable.
   - ESVVC0.5 x 2C-13262 (Bando Electric Wire: Japanese Company)
   - ESVC0.5 x 2C-99-087B (Nihon Electric Wire & Cable Corporation: Japanese Company)
   - ESVC0.5 x 2C-99-087B (Nihon Electric Wire & Cable Corporation: Japanese Company)
   - Li2Y-FCY2 x 0.56qmm (Kromberg & Schubert, Komtec Department: German Company)
   - 1 x 2 x AWG-20PE + Tr.CUSN + PVC (Draka Cables Industrial: Spanish Company)
   - #9207 (Belden: US Company)

2. When using wire-to-optical (H-PCF) cable, use a H-PCF cable (for both Controller Link and SYSMAC LINK) or a H-PCF optical fiber cable with connector.

3. When using wire-to-optical (GI) cable, use a GI optical cable (for Controller Link)
## Support Software and Connecting Cables

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Number of licenses</th>
<th>Media</th>
<th>Model</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX-One FA Integrated Tool Package Ver. 3.1</td>
<td>The CX-One is an integrated tool package that provides programming and monitoring software for OMRON PLCs and components. The CX-One runs on any of the following operating systems: Windows 2000 (Service Pack 3 or higher), XP, or Vista. The following Support Software is included: CX-Protocol version 1.1, CX-Designer version 3.1, CX-Process Tool version 5.1, NS Faceplate Auto-Builder version 3.1.</td>
<td>1 license</td>
<td>CD</td>
<td>CXONE-AL01C-EV3</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CXONE-AL01D-EV3</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CXONE-AL03C-EV3</td>
<td>---</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CXONE-AL03D-EV3</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CXONE-AL10C-EV3</td>
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<td>CXONE-AL10D-EV3</td>
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<td></td>
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<td></td>
<td>CXONE-AL30C-EV3</td>
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<td></td>
<td>CXONE-AL30D-EV3</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td>CXONE-AL50C-EV3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CXONE-AL50D-EV3</td>
<td>---</td>
</tr>
<tr>
<td>CX-Protocol Ver. 1.1</td>
<td>Protocol creation software for Windows 2000 (Service Pack 3 or higher), XP, or Vista. Note: Use with CJ1G/CJ1H CPU Unit version 1.2 or higher, or CJ1M CPU Unit version 1.3 or higher.</td>
<td>1 license</td>
<td>CD</td>
<td>WS02-PSTC1-E</td>
<td>---</td>
</tr>
<tr>
<td>CX-Programmer Ver. 8.1</td>
<td>Windows-based Support Software for ladder programming on Windows 2000 (Service Pack 3 or higher), XP, or Vista.</td>
<td>1 license</td>
<td>CD</td>
<td>WS02-CXPC1-E-V8.1</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WS02-CXPC1-E03-V8.1</td>
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</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>WS02-CXPC1-E10-V8.1</td>
<td>---</td>
</tr>
<tr>
<td>CX-Designer Ver. 3.1</td>
<td>NS-series PT screen creation software for Windows 2000 (Service Pack 3 or higher), XP, or Vista. CX-Designer version 3.1 or higher includes the Ladder Monitor Software. Note: The Ladder Monitor software allows ladder programming in a CS/CJ-series PLC to be monitored on an NS-series PT. To use System Program version 6.6 or earlier with the NS8/10/12-V1 or NS8/10/12-V2, a Memory Card and Memory Card Adapter must be ordered separately.</td>
<td>1 license</td>
<td>CD</td>
<td>NS-CXDC1-V3</td>
<td>---</td>
</tr>
<tr>
<td>CX-Process Monitor Plus Ver. 2.0</td>
<td>Windows-based monitoring software for Loop Controllers for Windows NT 4.0, 2000, or XP.</td>
<td>1 license</td>
<td>CD</td>
<td>WS02-LCMC1-EV2</td>
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<td>WS02-LCMC1-JV2L03</td>
<td>---</td>
</tr>
<tr>
<td>Peripheral Device Connecting Cables (for peripheral port)</td>
<td>Connects DOS computers, D-Sub 9-pin receptacle (Conversion cable to connect RS-232C cable to peripheral port) (Length: 0.1 m)</td>
<td>1 license</td>
<td>CD</td>
<td>CST1W-CN118</td>
<td>CE</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>CST1W-CN226</td>
<td>---</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>CST1W-CN626</td>
<td>---</td>
</tr>
<tr>
<td>Peripheral Device Connecting Cables (for RS-232C port)</td>
<td>Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)</td>
<td>3 licenses</td>
<td>CD</td>
<td>XW2Z-200S-CV</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XW2Z-500S-CV</td>
<td>---</td>
</tr>
<tr>
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<td></td>
<td>XW2Z-200S-V</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XW2Z-500S-V</td>
<td>---</td>
</tr>
<tr>
<td>USB-Serial Conversion Cable</td>
<td>USB-RS-232C Conversion Cable (Length: 0.5 m) and PC driver (on a CD-ROM disc), Complies with USB Specification 1.1. On personal computer side: USB (A plug connector, male) On PLC side: RS-232C (D-Sub 9-pin, male)</td>
<td>1 license</td>
<td>CD</td>
<td>CST1W-CIF31</td>
<td>N</td>
</tr>
</tbody>
</table>

**Note:**
1. Site licenses are available for users who will run CX-One on multiple Computers. Ask your OMRON sales representative for details.
2. When purchasing the DVD format, verify the computer model and DVD drive specifications before purchasing.

This eco label is displayed only on products that satisfy stringent environmental standards established by OMRON.
## NS-series Programmable Terminals

<table>
<thead>
<tr>
<th>Model name</th>
<th>Specifications</th>
<th>Ethernet</th>
<th>Case color</th>
<th>Model number</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS5-V2</td>
<td>5.7-inch STN monochrome, 320 x 240 dots</td>
<td>No</td>
<td>Ivory</td>
<td>NS5-MQ10-V2</td>
<td>U, C, CE, N, L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Black</td>
<td>NS5-MQ10B-V2</td>
<td>UL Type4</td>
</tr>
<tr>
<td></td>
<td>5.7-inch STN, 320 x 240 dots</td>
<td>No</td>
<td>Ivory</td>
<td>NS5-SQ10-V2</td>
<td>NEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Black</td>
<td>NS5-SQ10B-V2</td>
<td>NEW</td>
</tr>
<tr>
<td></td>
<td>5.7-inch TFT, 320 x 240 dots</td>
<td>No</td>
<td>Ivory</td>
<td>NS5-TQ10-V2</td>
<td>NEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Black</td>
<td>NS5-TQ10B-V2</td>
<td>NEW</td>
</tr>
<tr>
<td>NS8-V2</td>
<td>8.4-inch TFT, 640 x 480 dots</td>
<td>No</td>
<td>Ivory</td>
<td>NS8-TV00-V2</td>
<td>U, C, CE, N, L</td>
</tr>
<tr>
<td>NS10-V2</td>
<td>10.4-inch TFT, 640 x 480 dots</td>
<td>No</td>
<td>Ivory</td>
<td>NS10-TV00-V2</td>
<td>U, C, CE, N, L</td>
</tr>
<tr>
<td>NS12-V2</td>
<td>12.1-inch TFT, 800 x 600 dots</td>
<td>No</td>
<td>Black</td>
<td>NS12-TS00-V2</td>
<td>U, C, CE</td>
</tr>
<tr>
<td>NS5-V2 Hand-held</td>
<td>5.7-inch STN, 320 x 240 dots</td>
<td>No</td>
<td>Black (Emergency stop switch: red)</td>
<td>NSH5-SQR10B-V2</td>
<td>NEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Black (Stop switch: gray)</td>
<td>NSH5-SQG10B-V2</td>
<td>NEW</td>
</tr>
<tr>
<td>Cable</td>
<td>Screen transfer cable for DOS/V</td>
<td>XW22-S02</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT-to-PLC Connecting Cable</td>
<td>PT connection: 9 pins</td>
<td>XW22-2001</td>
<td>--</td>
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</tr>
<tr>
<td>NSH5 Cables</td>
<td>RS-422A cable (loose wires)</td>
<td>XW22-5001</td>
<td>--</td>
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</tr>
<tr>
<td></td>
<td>RS-232C cable (loose wires)</td>
<td>NSH5-422CW-10M</td>
<td>--</td>
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</tr>
<tr>
<td></td>
<td>RS-232C cable (loose wires)</td>
<td>NSH5-232CW-3M</td>
<td>--</td>
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<td></td>
</tr>
</tbody>
</table>

## NS-Runtime

<table>
<thead>
<tr>
<th>Model name</th>
<th>Specifications</th>
<th>Media</th>
<th>Model number</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS-Runtime</td>
<td>NS-Runtime Installer, manual PDF, hardware key (See note.)</td>
<td>CD</td>
<td>NS-NSRCL1</td>
<td>NEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS-NSRCL3</td>
<td>NEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS-NSRCL10</td>
<td>NEW</td>
</tr>
</tbody>
</table>

**Note:** A hardware key (USB dongle) is required to run NS-Runtime.
### Utility Software

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model number</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop Controller Faceplate Objects</td>
<td>ActiveX Control Objects (for RSView32) OS: Windows 2000 or XP</td>
<td>WS02-LCFCT-JV2</td>
<td>---</td>
</tr>
<tr>
<td>SYSMAC OPC Server V2</td>
<td>Local/Remote Server for OPC Data Access 2.0 OS: Windows NT4.0, 2000, or XP (FinsGateway version 3 is included.)</td>
<td>WS02-OPCCT1-E</td>
<td>---</td>
</tr>
<tr>
<td>Process Analog I/O Unit Support Software</td>
<td>Setting Tool Software for Process Analog I/O Unit OS: Windows 95, 98, NT4.0, 2000, or XP</td>
<td>WS02-PUTCT1-E</td>
<td>---</td>
</tr>
</tbody>
</table>

### Middleware

<table>
<thead>
<tr>
<th>Name</th>
<th>Specifications</th>
<th>Model number</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC Reporter 32</td>
<td>Host Link version of easy data collection software OS: Windows 98, Me, 2000, or XP</td>
<td>SDKY-95HLK-E97</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Multi-network version of easy data collection software OS: Windows 98, Me, 2000, or XP</td>
<td>SDKY-95MLT-E97</td>
<td>---</td>
</tr>
</tbody>
</table>

**Note:** Refer to the SYSMAC CS1-series PLC Catalog (Cat. No. P047) for common and general specifications for SYSMAC CS-series Special I/O Units and Basic I/O Units. Refer to the NS-series PT Catalog (Cat. No. V078) for more information on NS-series PTs.
# Read and Understand this Catalog

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

# Warranty and Limitations of Liability

## Warranty

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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# Application Considerations

## Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

## Programmable Products

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

# Disclaimers

## Change in Specifications

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased products.

## Dimensions and Weights

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

## Performance Data

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.
Note: Do not use this document to operate the Unit.

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