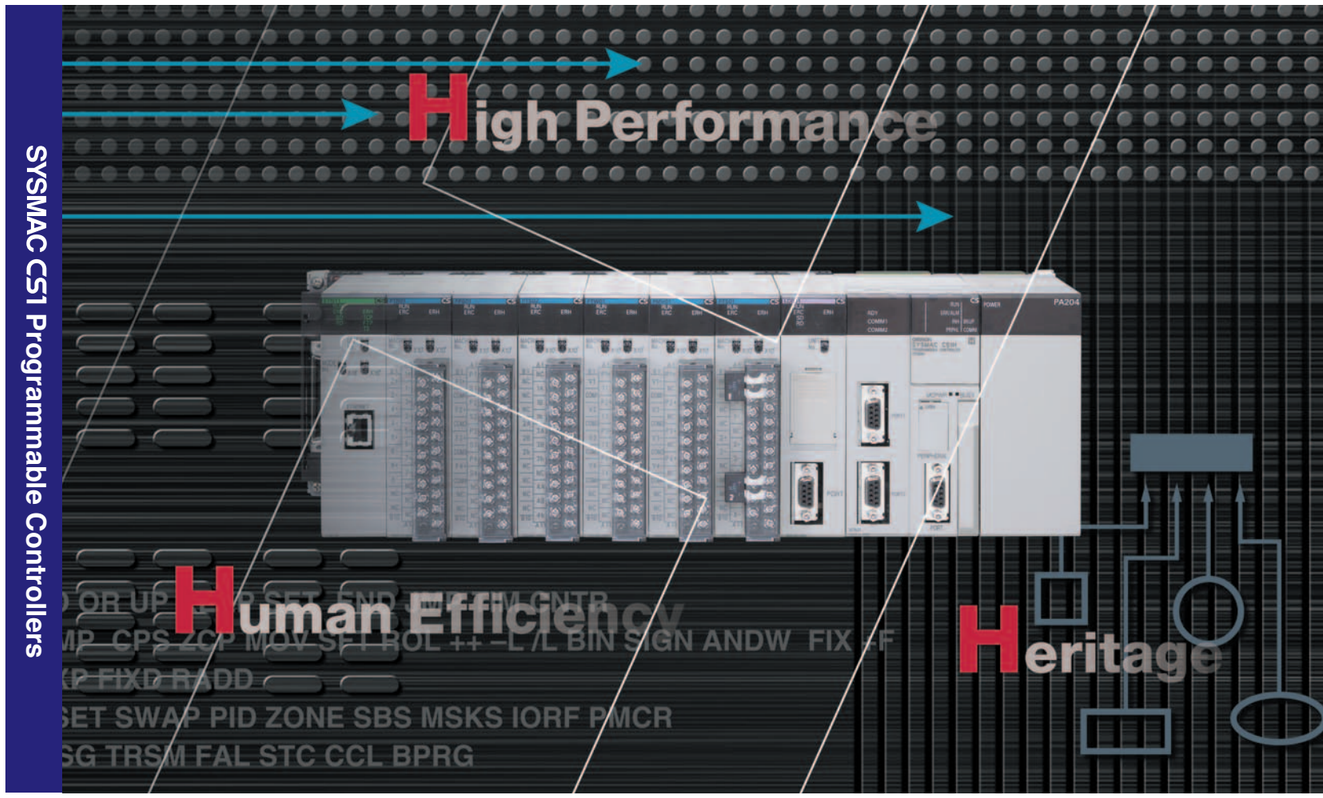
OMRON

SYSMAC CS1

Programmable Controllers

From Machine Control to Information Management –
Multiple-application Controllers with a Wide Range of Functions



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

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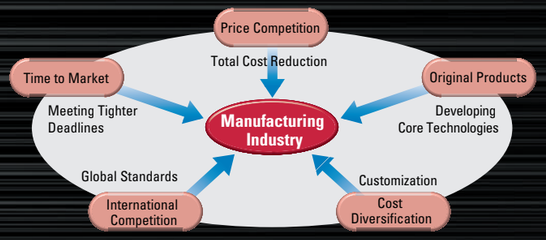
The popular SYSMAC CS1 is better than ev er – finely tuned to allow new levels of control.



The current climate of ever-intensifying competition has created a large number of different needs for manufacturing industries around the world. To meet these needs, OMRON has made further improvements to its SYSMAC CS1 PLCs, which have been used successfully in thousands of systems, to deliver even greater performance. With an "H" for Hyper Controller, the new PLCs boast the highest standards in performance, functionality, and expandability.

High Performance

In order to create facilites that have the production capability to withstand sudden changes in demand, or to create machinery that is easily distinguished from that created by market competitors, a top-speed controller that can deliver the performance required to support these needs is required. The SYSMAC CS1 PLCs have been equipped with the highest I/O responsiveness and data control functionality to significantly reduce processing time and to control machinery movement with greater precision.

Human Efficiency

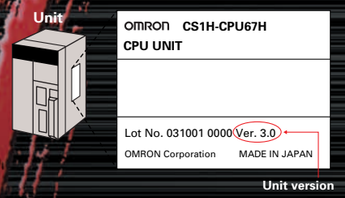
In order to allow easier development of complex programs, in addition to an integrated Windows-based development environment, the new PLCs are equipped with a variety of instructions. Structured programming functionality has been improved to allow programs to be reused with greater efficiency and thereby reduce labor requirements and cut costs.

Heritage

The know-how that our customers have accumulated through the years forms the core of their competitive strength. At OMRON, we believe in enhancing this know-how to the utmost. The key to doing this is 100% upward compatibility. CS1 PLCs allow existing Units and programs to be used without any changes.

● Unit Versions

Unit versions have been introduced to control differences in functions featured by CPU Units that are the result of version upgrades. The unit version is marked on the nameplates of products subject to version control, as shown in the diagram.



This catalog contains information required to select products and is not intended to provide precautionary information. Refer to relevant operation manuals for all precautionary information.

Programmable Controllers are abbreviated as "PLC" in this catalog. The term "personal computers" is fully written out, and not abbreviated.

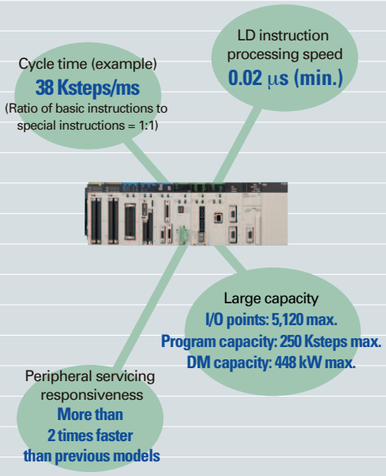
Contents

The evolution of the SYSMAC CS1 is accelera ting advances in the production site.

P6-7

1 Ultimate Performance

Further improvements to instruction execution efficiency, the core of overall PLC performance, enable the highest speeds in the industry. This allows the optimization of processing time and accuracy.



P8-9

2 Instructions That Fit the Application

These PLCs have a variety of special instructions that allow their operation to suit the application. High-precision control can be achieved without complex programs.

- High-precision Positioning
  Double-precision floating-point instructions
- Automatic Adjustment of PID Constants
  PID instructions with autotuning
- Program Simplification
  Set and reset instructions for DM/EM Area bits

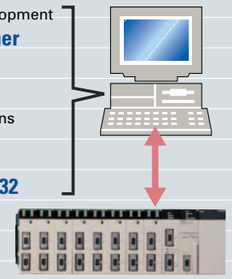
- Error Generation for Debugging
  Failure diagnosis instructions
- High-resolution Approximation
  APR instruction
- Workpiece Information Control for Conveyor Systems
  Table data processing instructions for stacks

P10-11

3 Integrated Development Environment and Middleware

Powerful software packages are available for program development, simulation, and communications. Develop more efficient value-added systems in the time allowed.

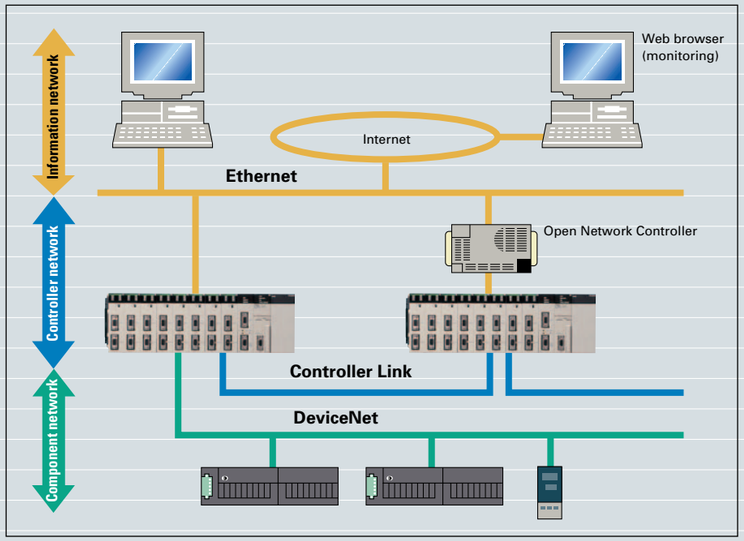
- Program development
  CX-Programmer
- Simulation
  CX-Simulator
- Communications middleware
  Compolet, PLC Reporter 32



P12-13

4 Seamless Networking

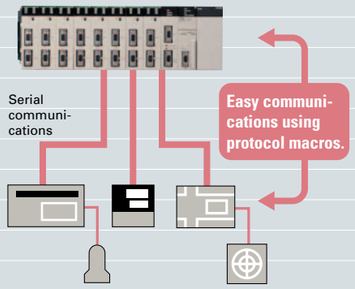
The CS1 supports message communications across three network levels, from information networks down to component networks, allowing greater on-site information management. Remote monitoring of installations is also possible using Web functions via the Internet.



P14-15

5 Easier Connection to Peripheral Devices

Up to 35 peripheral devices can be connected to a CS1 PLC via serial communications. Data can be exchanged with peripheral devices easily using the protocol macro function, eliminating the need for time-consuming communications programs.



P16-19

6 Inheritance and Maintenance

The new PLCs have complete upward compatibility with existing CS1 systems. Facilities performance can be upgraded simply by replacing the CPU Unit (see note). Also, features such as battery-free operation ensure greater convenience for maintenance and operation.

100% Upward Compatibility with Existing CS1 Systems
Battery-free Operation
Memory Cards
Remote Maintenance
Conformance to Global Standards
Etc.

Note: When replacing a CPU Unit with a different model, always test the system to confirm that it has not been adversely affected.

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7 PLC-based System Expansion

A variety of system expansions based on CS1 PLCs, such as PLC-based process automation systems, high-precision positioning systems, and remote monitoring systems are possible.

PLC base

PLC-based process automation systems
High-precision positioning systems
Remote monitoring systems
Field network systems
Onsite information terminals

Use the improved SYSMAC CS1 PLCs to scal e advanced systems to the optimum size.

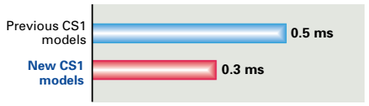
The evolution of the SYSMAC CS1 is accelerating advances in the production site.

1

Faster Instruction Execution and Faster Overall Performance

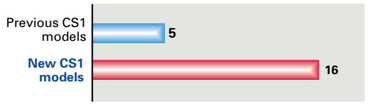
In addition to further improvements to the instruction execution engine, which is the core of overall PLC performance, the high-speed RISC chip has been upgraded to **realize the fastest instruction execution performance in the industry**. Also, the new models have a mode where instruction execution and peripheral processing are processed in parallel, enabling balanced improvements in overall speed.

● **Common Processing: 1.6 Times Faster**



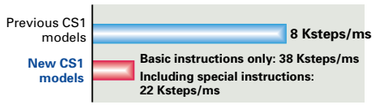
The figures above are for high-speed, general-purpose PLCs with interchangeable boards.

● **PCMIX Value: 3 Times Higher**



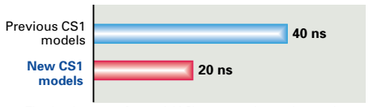
The PCMIX is the average number of instructions that can be executed in 1 μs and expresses the over execution performance of the ladder program. This unit was conceived to allow comparing the performance of PLCs from different manufacturers using a common metric.

● **Cycle Time: 2.5 to 4.8 Times Shorter**
(Cycle time for 128 inputs and 128 outputs)



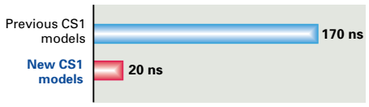
With normal I/O refresh, 1-ms pulses are not lost even for large-capacity (e.g., 30-Kstep) programs. This allows use in applications requiring a high working accuracy, such as molding equipment.

● **LD Instruction Processing Speed: 2 Times Faster**



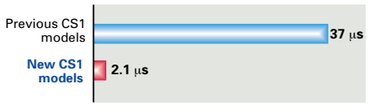
The development of a special LSI to execute instructions and use of a high-speed RISC chip enable high-speed processing at the CPU.

● **OUT Instruction Processing Speed: 8 Times Faster**



Programs consisting mainly of basic instructions are processed at ultrahigh speed.

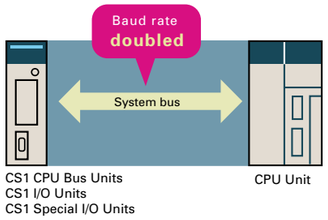
● **Subroutine Processing Speed: 17.6 Times Faster**



Cycle time overhead due to program structuring is minimized.

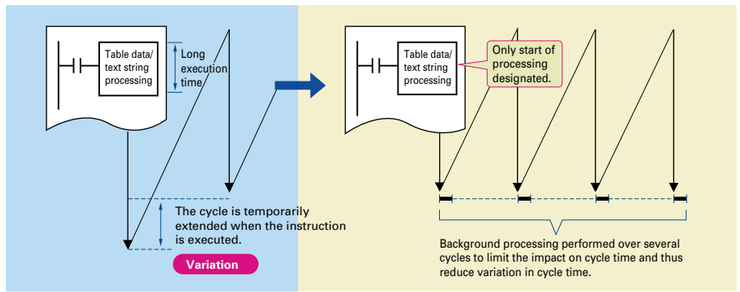
System Bus Baud Rate Doubled

The data transfer rate between the CPU Unit and certain Units has been doubled to further improve total system performance.



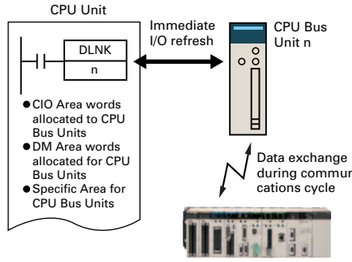
Reduced Variation in Cycle Time During Data Processing

Instructions that require long execution time, such as table data processing instructions and text string processing instructions, are processed over multiple cycles to minimize variations in cycle time and maintain stable I/O response.



Improved Refresh Performance for Data Links, Remote I/O Communications, and Protocol Macros

In the past, I/O refresh processing with the CPU Bus Unit only occurred during I/O refresh after instructions were executed. With the new CS1, however, I/O can be refreshed immediately by using the DLNK instruction. Immediate refreshing for processes peculiar to the CPU Bus Unit, such as for data links and DeviceNet remote I/O communications, and for allocated CIO Area/DM Area words when instructions are executed, means greater refresh responsiveness for CPU Bus Units.



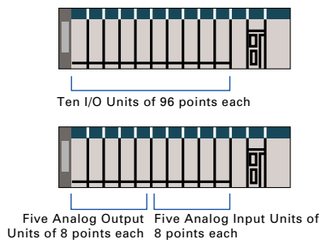
Unit name	Refresh function
Controller Link Unit	Data links
DeviceNet Unit	Remote I/O
Serial Communications Unit	Protocol macros
Ethernet Unit	Socket service based on manipulation of specific bits.

Large Capacity CPU Units for Greater Component Control Power

The CS1 CPU Units boast amazing capacity with up to 5,120 I/O points, 250 Ksteps of programming, 448 Kwords of data memory (including expanded data memory) and 4,096 timers/counters each. With a large programming capacity, CS1 PLCs are not only ideal for large-scale systems but easily handle value-added applications and other advanced data processing.

Control Up to 960 Points with Units Mounted to the CPU Rack

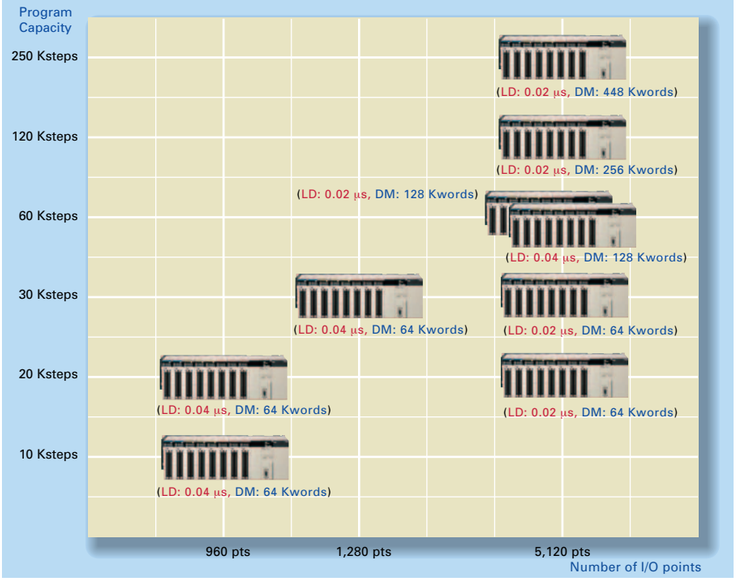
The CS1 provides a high level of space efficiency. As many as 960 I/O points can be controlled by simply mounting ten Basic I/O Units, with 96 I/O points each, to the CPU Rack. Alternatively, as many as 80 analog I/O points can be used by mounting five Analog Input Units and five Analog Output Units.



Wide Lineup Makes It Easy to Build the Optimum System

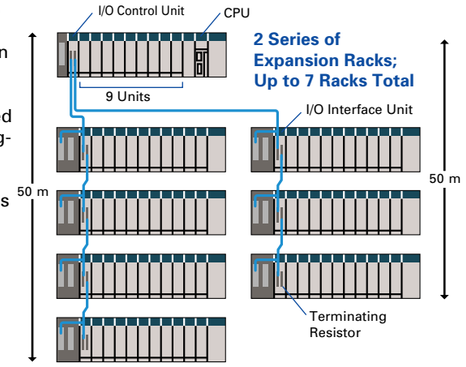
A total of nine CPU Unit models provide for a wide range of applications, from small-scale systems to large. The lineup also includes Memory Cards, Serial Communications Boards, and a wide selection of Special I/O Units that can be used with any CPU Units to flexibly build the system that meets the requirements.

Product lineup (Example: LD instruction processing speed, DM capacity)



Two Series of Expansion Racks Up to 50 m Long for Long-distance Expansion with Up to 72 Units and 7 Racks

With an expansion capacity of up to 80 Units and 7 Racks over a distance of 12 meters, the CS1 can meet large-scale control needs. Alternatively, an I/O Control Unit and I/O Interface Units can be used to connect two series of CS1 Long-distance Expansion Racks extending up to 50 m each and containing a total of up to 72 Units and 7 Racks. CS1 Basic I/O Units, CS1 Special I/O Units, and CS1 CPU Bus Units can be mounted anywhere on the Racks and programmed without being concerned about special remote programming requirements.



Note: C200H Units cannot be mounted on the Long-distance Expansion Racks.

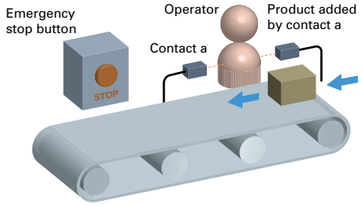
Equipped with functions demanded by the production site to suit a variety of applications.

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

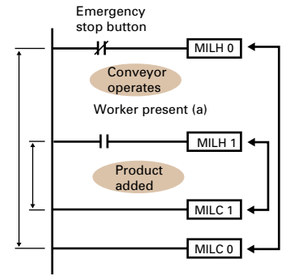
2

Nested Interlocks (for CPU Unit Ver. 2.0 or Later)

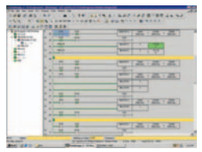
Although strictly speaking the present interlock instructions do not allow nesting, applications can be created to include combination of complete and partial interlock conditions that achieve nested interlocks.



(1) Conveyor operates
(2) Contact "a" turns ON when operator is present and products are supplied.
(3) When the emergency stop button is pressed, the conveyor and product addition both stop.



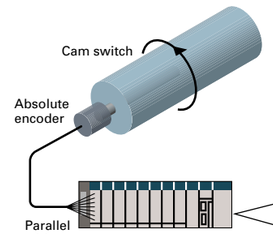
CX-Programmer Screen

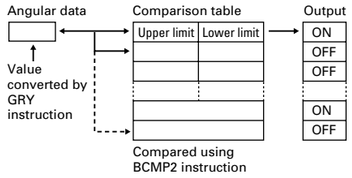


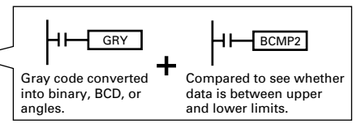
Support Software clearly shows the interlock status.

Easy Cam Switch Control with Ladder Instructions

(for CPU Unit Ver. 2.0 or Later)







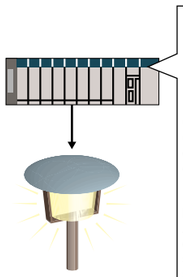
Gray code converted into binary, BCD, or angles.

Compared to see whether data is between upper and lower limits.

The time interval for execution by the GRY instruction is determined by the response speed for reading data from the absolute encoder.

Easy Calendar Timer Function

(for CPU Unit Ver. 2.0 or Later)

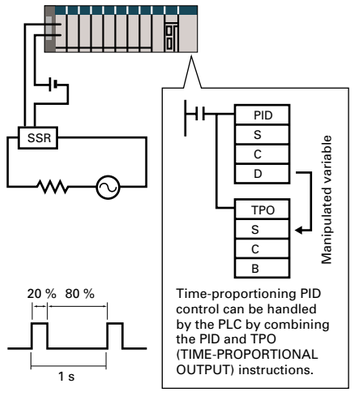


Turn ON at 5:00 every evening

Compares two dates/times Comparison can be limited to any combination of years, months, days, hours, minutes, or seconds.
Example:
A calendar timer function can be easily set up to start a process at exactly 5:00 every evening.

TIME-PROPORTIONAL OUTPUT (TPO) Instruction

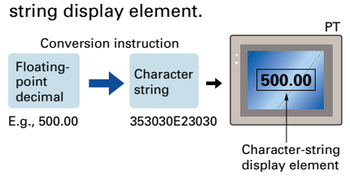
(for CPU Unit Ver. 2.0 or Later)



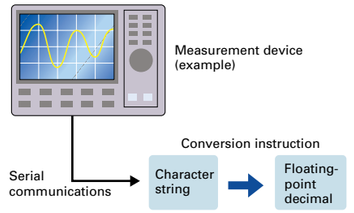
Time-proportioning PID control can be handled by the PLC by combining the PID and TPO (TIME-PROPORTIONAL OUTPUT) instructions.

Convert Between Floating-point Decimal and Character Strings

The new CS1 can convert floating-point decimal (real numbers) to character strings (ASCII) for display on a PT (operator interface). The data can be displayed on the PT as a character-string display element.

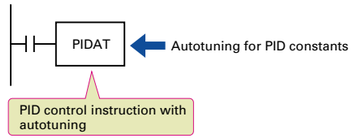


The new CS1 can convert ASCII character strings read from measurement devices by serial communications to floating-point decimal data for use in data processing.



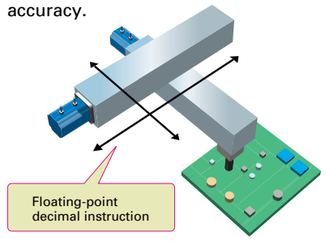
PID Autotuning

The new CS1 can autotune PID constants with a PID control instruction. The limit cycle method is used for autotuning, so the tuning is completed quickly. This is particularly effective for multiple-loop PID control.



Highly Accurate Positioning with XY Tables

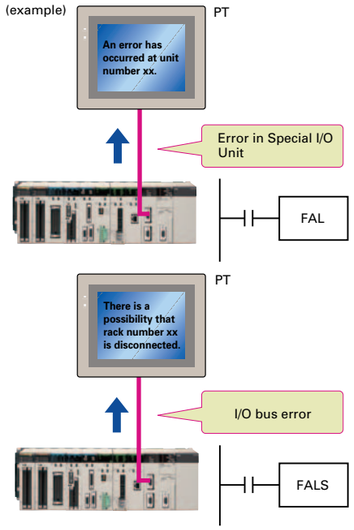
The new CS1 has many double-precision processing instructions for floating-point decimal operations, enabling positioning with greater accuracy.



High-precision positioning

Error Status Generation for Debugging

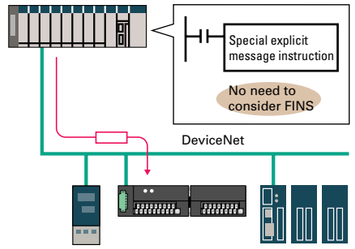
A specified error status can be simulated by executing the diagnostic instructions (FAL/FALS). With the new CS1, debugging is simple for applications that display messages on a PT or other display device based on the error status of the CPU Unit.



Easy Reading of Maintenance Data via DeviceNet

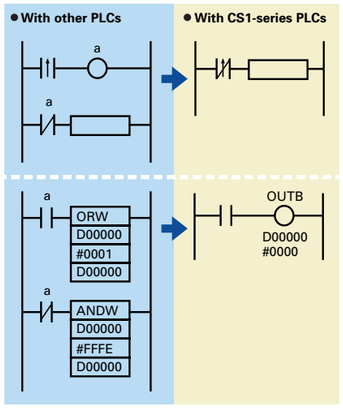
(for CPU Unit Ver. 2.0 or Later)

The addition of special explicit message instructions makes it easy to send explicit messages without having to consider FINS commands. Transferring data among PLCs with explicit messages is also simplified.



Simpler Ladder Programs

Ladder programs that use a lot of basic instructions can be simplified using differentiation instructions LD NOT, AND NOT, and OR NOT, and instructions that access bits in the DM and EM Areas.



Binary Set Values for Timer/Counter Instructions

The SV for a timer or counter instruction can be specified using either BCD or binary. Using binary SV enables longer timers and higher-value counters.

Examples: Timer/Counter Instructions
TIM (BCD): 0 to 999.0 s
TIMX(550) (binary) 0 to 6553.5 s
CNT (BCD): 0 to 999 counts
CNTX(546) (binary) 0 to 65,535 counts

Applicable Timer/Counter Instructions
TIMER: TIMX(550)
COUNTER: CNTX(546)
HIGH-SPEED TIMER: TIMHX(551)
ONE-MS TIMER: TMHHX(552)
ACCUMULATIVE TIMER: TTIMX(555)
LONG TIMER: TIMLX(553)
MULTI-OUTPUT TIMER: MTIMX(554)
REVERSIBLE COUNTER: CNTRX(548)
RESET TIMER/COUNTER: CNRX(547)

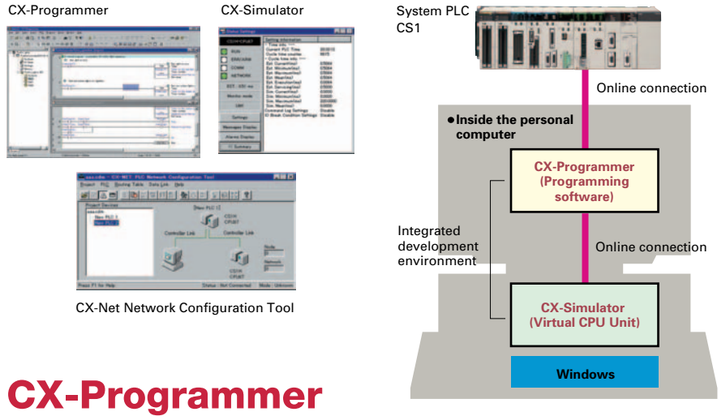
Easier and more efficient design, developmen t, and maintenance with Windows-based software and middleware.

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

3

Improved Support Software for an Integrated Windows-based Development Environment

More efficient design and development using the CX-Programmer for programming and network configuration, and CX-Simulator for operation simulation.



CX-Programmer

OMRON FB Library NEW

(Unit Ver. 3.0 or later)

The OMRON FB library provides function blocks for setting SPs, reading PVs, and reading/writing RUN/STOP status and other Temperature Controller parameters. The programmer simply pastes function blocks from the OMRON FB Library into the ladder program. The desired functions can be utilized simply by inputting the Temperature Controller unit number and address.

●What is the OMRON FB Library?
The OMRON FB Library is a set of functional objects for ladder programming for OMRON CS/CJ-series PLCs. By incorporating the OMRON function blocks provided by OMRON into a ladder program, the program interface for different control devices is easily completed. This reduces the number of working hours required for program development and, at the same time, improves product quality through standardization.

Example: Function Block for Writing Temperature Controller SPs

The Structured Text (ST) Language Enables Trigonometric Functions and other Arithmetic Processes NEW

(Unit Ver. 3.0 or later)

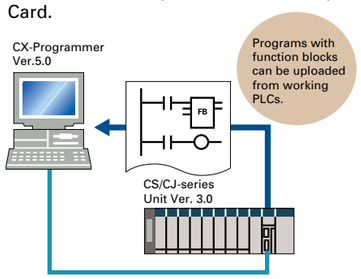
In addition to ladder programming, function block logic can be written in ST, which conforms to IEC61131-3. With ST, arithmetic processing is also possible, including processing of absolute values, square roots, logarithms, and trigonometric functions (SIN, COS, and TAN). Processing difficult to achieve in ladder programs becomes easy to write.

NEW
CX-Programmer Ver. 5.0 or higher is required.

Recovery Possible by Uploading Function Blocks from Working PLC NEW

(Unit Ver. 3.0 or later)

Programs with function blocks can be uploaded from CPU Units, just like normal programs, without the need for additional memory, such as a Memory Card.

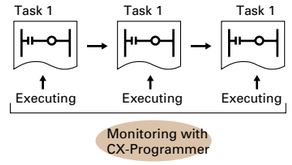


Enhanced Efficiency for Program Development Teams

(for CPU Unit Ver. 2.0 or Later)

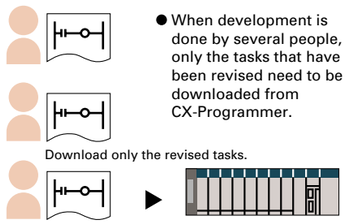
Multiple programmers will enjoy better efficiency when working on task-based programs, thanks to automatic checking for address duplication among tasks, downloading and uploading in task units, and easy monitoring of task operating status.

● The execution status of each task can be monitored with CX-Programmer to improve debugging efficiency.



● Checking for address duplication among tasks developed by multiple programmers is automatically executed with the cross reference report of CX-Programmer.

● When development is done by several people, only the tasks that have been revised need to be downloaded from CX-Programmer.



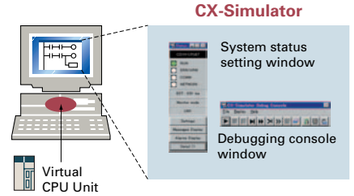
Copy and Paste between Spreadsheets and Symbol Tables

You can use your favorite spreadsheet application to prepare an allocation table with symbol names, addresses, and I/O comments, then copy and paste it into a symbol table, and also do the reverse. This greatly improves programming productivity.

CX-Simulator

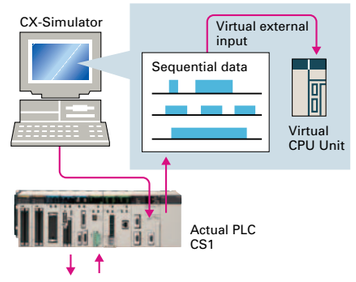
Programs Can Be Executed, Monitored, and Debugged without an Actual PLC

The CX-Simulator Software simulates ladder execution of the new CS1 CPU Unit on a computer. Online functions, such as monitoring of I/O bit status, monitoring of I/O memory present values, forced set/reset, differential monitoring, data tracing, and online editing, can be performed by connecting to the virtual CPU unit on the computer from the CX-Programmer using the CX-Simulator. This reduces the total lead time to machine or system startup.



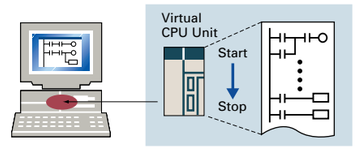
Data Logging On-site and Operation Verification in the Office

Sequential data from I/O memory in the actual PLC can be obtained and saved as a data recreation file (CSV format). On-site PLC ladder execution can be recreated on a computer by inputting this data to the CX-Simulator as virtual external input data.



Comprehensive Debugging Functions Including Ladder Step Execution and Break Points

The new CS1 has comprehensive debugging functions, including ladder step execution (execution by instruction), start point settings, break point setting, I/O break conditions, and scan execution. This enables more detailed debugging without using an actual PLC. Interrupt tasks can be simulated, enabling more realistic debugging.

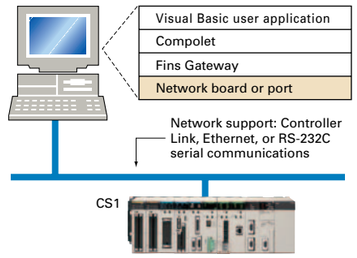


Middleware to Support PLC-centered System Construction

Easy development of user applications for communications with the new CS1.

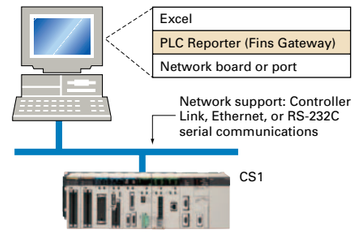
SYSMAC Compolet: Accessing the CS1 with Visual Basic

Use SYSMAC Compolet for communications with OMRON PLCs to greatly reduce development time of user applications for CS1 I/O memory read and write, forced set/reset, and FINS message communications using Visual Basic.



PLC Reporter 32: Add-on Software for Accessing the New CS1 Using Excel

Use PLC Reporter 32 to automatically collect specific CS1 I/O memory data into Excel 97 or Excel 2000 cells without special programming. Basically, a system can be constructed with a computer, PLC Reporter 32, Excel, and a host link cable. The cost of constructing a monitoring system can thus be greatly reduced.



Further improvements to communications f unctions. Seamless networks increase production site transparency.

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

4

The Solution for Communicating across Network Levels

The SYSMAC CS1 enables FINS message communications across a maximum of eight levels (See note) (using CX-Programmer Ver. 4.0 or higher) in comparison with three levels in previous OMRON systems Expansion up to eight levels lets you build a seamless communications system for sending FINS messages across multiple levels of Ethernet and Controller Link networks.

Note: For CPU Unit Ver. 2.0 or later.

A Wide Range of Systems, from Small-scale to Large

OMRON offers a full lineup of reliable PLCs including the "flagship" CS1 Series, and ranging from the small-scale CQM1H to the large-scale CV Series. The CS1 Series meets the needs not only of small-scale to large-scale systems, but of distributed systems as well. This allows the construction of the optimum system for the scale and applications of the production site.

Flexible System Building Based on the DeviceNet

The CS1 Series supports the worldwide multivendor bus standard, DeviceNet. Component connections in a multivendor environment are greatly enhanced by connecting to up to 64 nodes for a wide range of FA applications, and by device profiles and configurator tools that ensure high reliability and easy maintenance. Production systems can be configured even more flexibly by incorporating products such as the MULTIPLE I/O TERMINAL.

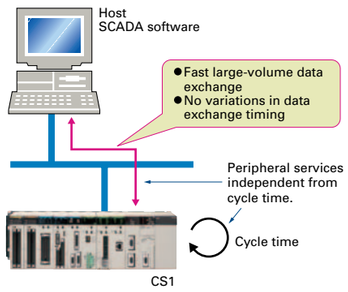
Functions for Better Ethernet Support

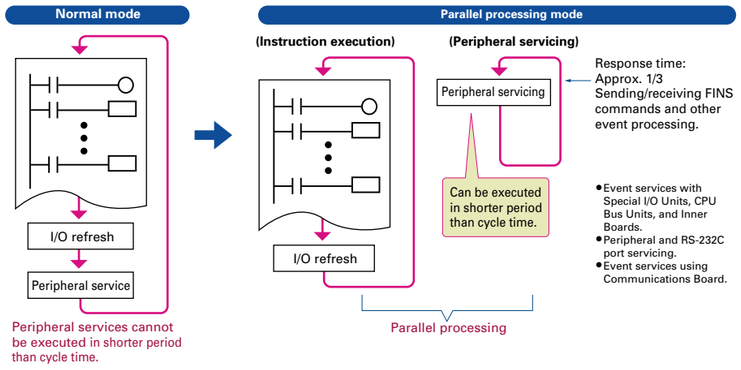
Ethernet is becoming an increasingly important standard for information networks. Up to eight socket interfaces for TCP/IP and UDP/IP are supported, in addition to FINS messages, FTP file transfers, and mail notification, so that production management can now be organically linked with the production site.

High Event Responsiveness and High-speed Instruction Execution

The new CS1 has an operating mode that allows parallel processing for program execution and peripheral services. This has the following benefits.

- Fast exchange with host computers of large amounts of data, without dependence on the program capacity of the new CS1.
- Smooth refreshing of data exchanged with SCADA software without variations in timing.
- Cycle time not affected if communications traffic or networks increase when expanding facilities in the future.



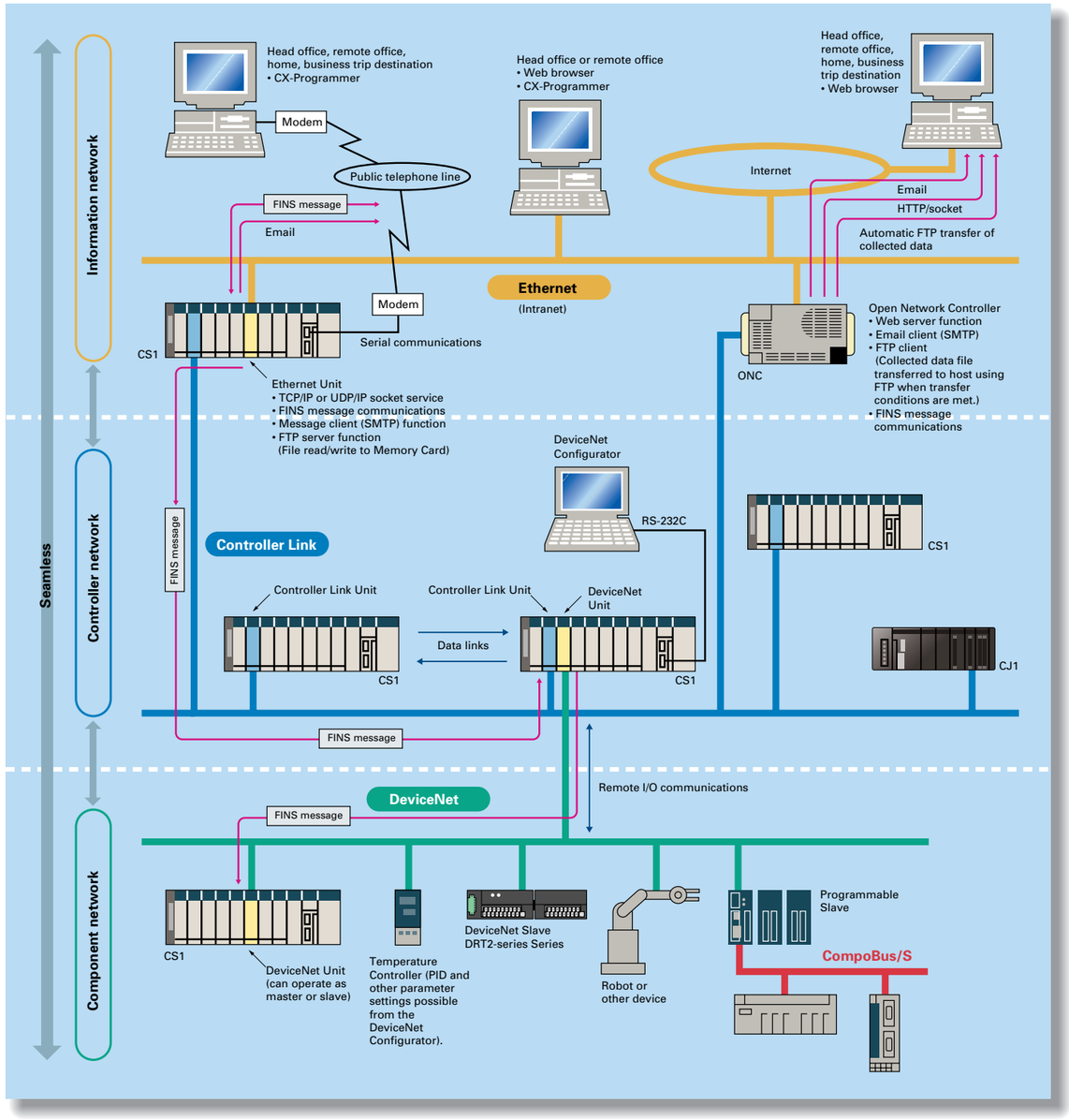


Add a Redundant Optical Ring to Your Controller Link Communications

A redundant network configuration will keep communications flowing over the duplicate ring-shaped path in the event of a broken optical fiber, preventing system malfunction.

Remote Monitoring via the Web

Connecting via an ONC enables remote monitoring from a Web browser with a user-defined Web application (using Web Tool Kit). It is also possible to automatically collect data on a Memory Card mounted to an ONC and automatically transfer data to the host PLC (using Data Collection/Distribution Software).



Construction of systems in multivendor env ironments simplified with protocol macros.

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

5

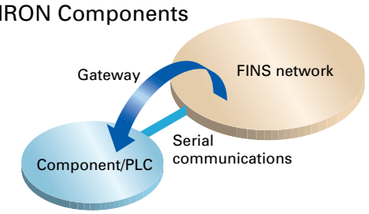
NEW Serial Gateway

(CPU Unit Ver. 3.0 or later)
(Serial Communications Units/Boards with Ver. 1.2 or later)

Truly Seamless Incorporation of OMRON Components and Other Devices into Networks

When the CPU Unit (Ver. 3.0 or later) or Serial Communications Board or Serial Communications Unit (Ver. 1.2 or later) receive a FINS command containing a CompoWay/F command (see note 1) via network or serial communications, the command is automatically converted to a protocol suitable for the message and forwarded using serial communications.

- CompoWay/F (See note 2.)
- Host Link FINS
  (Possible only with Serial Communications Boards or Serial Communications Units Ver. 1.2 or later)

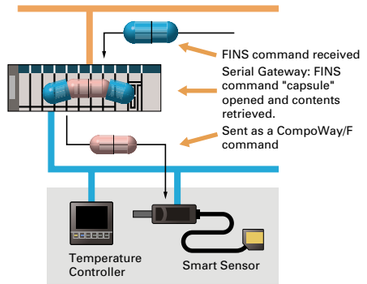


Note 1: FINS
Abbreviation for Factory Interface Network Service. A command system for message services common to OMRON networks. FINS commands can be sent across up to 8 network levels, including serial communications paths using a serial gateway. (Possible only with CS/CJ-series CPU Unit Ver. 2.0 or later.)

Note 2: CompoWay/F
CompoWay/F is an integrated communications protocol used for OMRON general-purpose serial communications. It is used by Temperature Controllers, Digital Panel Meters, Timer/Counters, Smart Sensors, Cam Positioners, Safety Controllers, etc. (as of July 2004).

- **Serial Gateway System (Reference)**

When CompoWay/F commands are enclosed in FINS commands and sent to Serial Communications Boards or Serial Communications Units (Ver. 1.2) or serial ports on CPU Unit Ver. 3.0, the enclosed CompoWay/F command is retrieved using a Serial Gateway Function and sent as a CompoWay/F command.

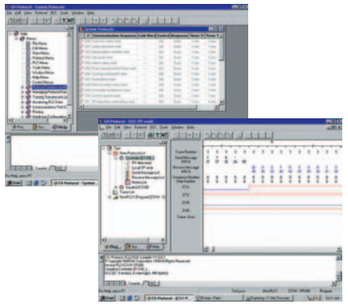


More Ports for Even More Serial Device Connections

Protocol macros make it easy to create serial communications protocols (communications frames, error checks, retries, error processing, etc.) to match those of remote communications devices. Multiple ports are provided for this function. Each PLC supports up to 16 Serial Communications Units (32 ports total) and one Serial Communications Board (with 2 ports). This makes it possible to connect up to 34 devices with serial communications at a speed of 38.4 Kbps. Message length has been increased from 256 to 1,000 bytes to give communications more power than ever before.

Windows-based Software Simplifies Serial Device Connections

Protocol macros for Serial Communications Units and Boards can be created using the CX-Protocol, thus enabling message tracing and greatly reducing the time involved in connecting various serial devices.



Enhanced Protocol Macro Functionality NEW

(Serial Communications Units/Boards with Ver. 1.2 or later)

- Baud rate increased from 38,400 bps to 57,600 bps for faster communications.
- Standard system protocol added for greater connectability with components and PLCs.
  - •CompoWay/F Master
  - •Host Link Master functions
  - •Mitsubishi Computer Link Master

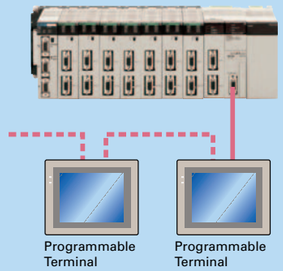
Wide Range of Applicable Protocols Allows for High Value-added Programs

The CS1 Series supports a wide range of serial communications protocols, such as Host Link, no-protocol, NT Link, peripheral bus, and more. These allow for high value-added programs such as MMI, communications, and data processing.

The Fastest Communications in the Industry with High-speed NT Links

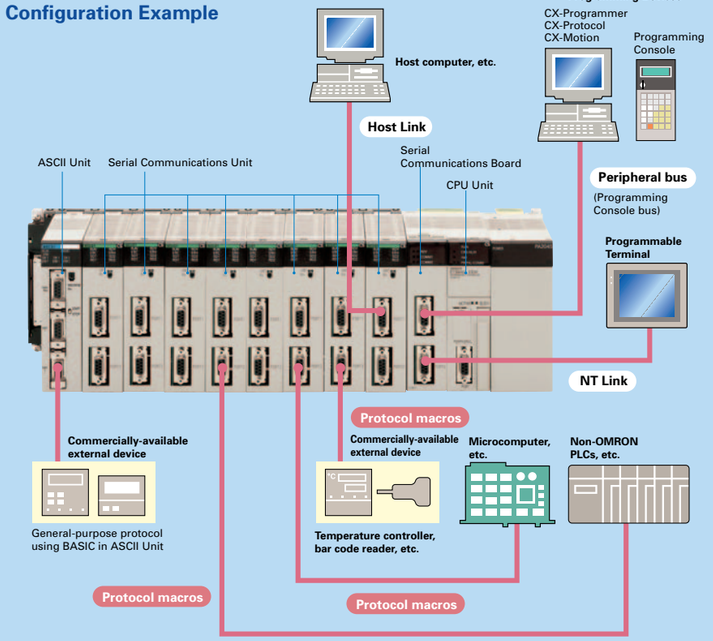
Combine with one of the NS Series Programmable Terminals (NS8, NS10, or NS12) to enable connecting High-speed NT Links. Using NT Link terminology together with a communications speed of 115 Kbps provides high-speed response.

NT Links (1:N Mode)

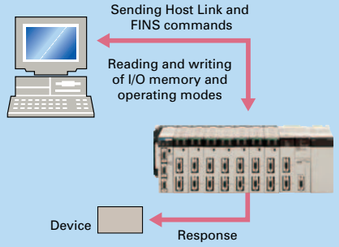


PLC-to-PT connection in NT Link (1:N mode) communications can be either one-to-one or one-to-many.

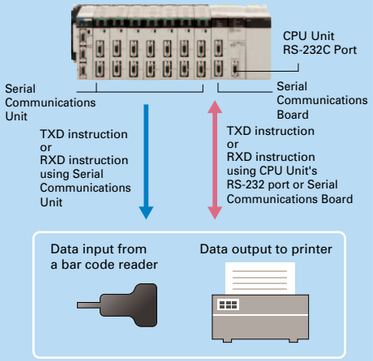
Serial Communications Configuration Example



Host Links



No-protocol



Supports No-protocol Communications NEW
(Serial Communications Units/Boards with Ver. 1.2 or later)

- No-protocol communications supported for Serial Communications Units and Serial Communications Boards
- This mode enables components to be connected to multiple communications ports using no-protocol communications.
- Serial port I/O instructions executable using no-protocol communications from Serial Communications Units and Serial Communications Boards (TXDU, RXDU, TXD, and RXD) are supported for CPU Units with Ver. 3.0 or later.

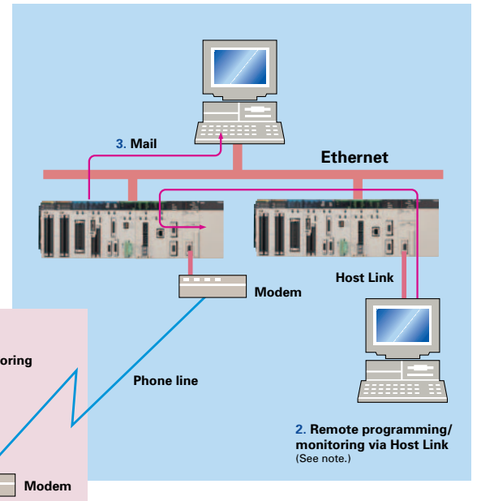
Advanced management and resource inheri tance providing powerful support for maintenance and operation.

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

6

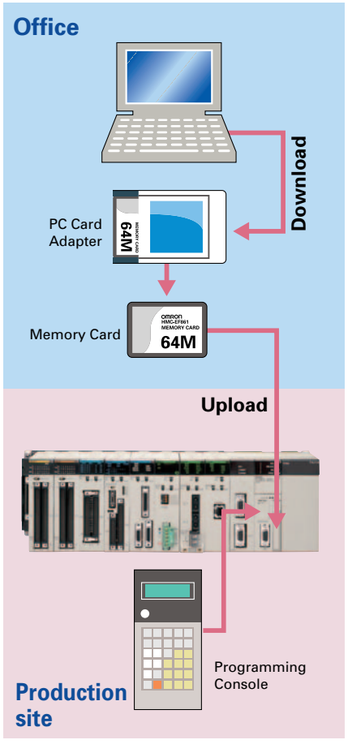
Remote Maintenance

1. Program or monitor a remote PLC via a modem connection.
2. Program or monitor a network PLC via a Host Link connection.
3. Send e-mail for errors from PLCs connected to Ethernet.



Memory Cards for Data File Management

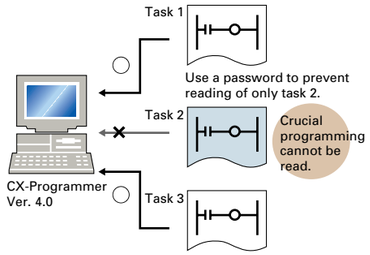
User programs, I/O memory, or system parameters can be converted to Windows-based files and stored in Memory Cards or in EM file memory in the CPU Unit. It is also possible to automatically read the user program and other data from the Memory Card to the CPU Unit at startup, replacing ROM operation. Change programs on-site using only a Memory Card and Programming Console, or use Memory Cards to store symbol tables or I/O comments. Connecting a Programming Device allows monitoring operations with ladder programs with comments. It is also possible to save and read data such as DM data to a Memory Card during operation, and the Memory Cards are ideal for operations such as saving quality data and reading recipes.



Boost Program Security by Keeping Part of It Hidden

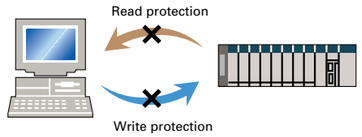
(for CPU Unit Ver. 2.0 or Later)

You can prevent access to special tasks by requiring the user to have a password to read them.



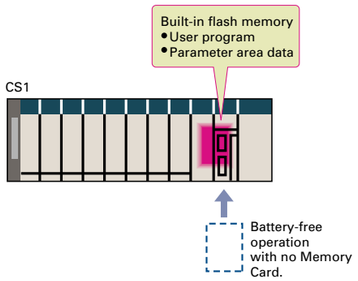
This allows you to hide crucial parts of the program.

By applying write protection, you can also prevent a user from inadvertently writing over the hidden part of the program. This provides additional protection for your program.



Internal Flash Memory-based Battery-free Operation

Flash memory (non-volatile memory) is built into the new CS1's CPU Unit. User programs and system parameters (e.g., PC Setup and data link tables) are automatically saved to this flash memory. This means that the new CS1 can operate without a Memory Card and battery.

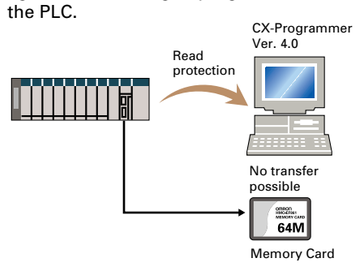


NEW CX-Programmer Ver. 5.0 or higher required.

Prevent Information Leaks from PLCs

(for CPU Unit Ver. 2.0 or Later)

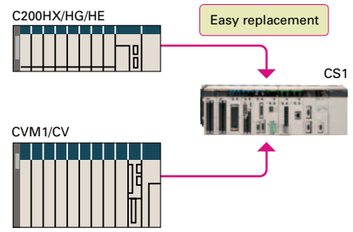
In addition to applying read protection functions to the user program area and tasks, you can also protect against the transfer of user programs to a Memory Card.This prevents leaks of proprietary information by completely protecting against the reading of programs inside the PLC.



Easy Replacement of Existing Models

Programs designed for existing models (C200HX/HG/HE, CVM1, or CV-series PLCs) using the CX-Programmer can be converted for use with the new CS1. The following functions are available to make the conversion to the new CS1 even easier.

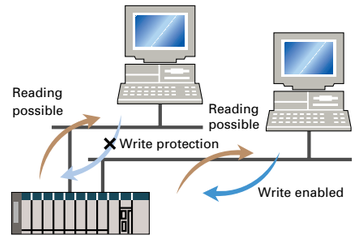
- CV-CS address conversion instruction to convert programs designed for the CVM1/CV that include internal I/O memory addresses.
- C200HX/HG/HE: Region comparison (ZCP and ZCPL) instructions.



Write Protection from a Specific Node over the Network

(for CPU Unit Ver. 2.0 or Later)

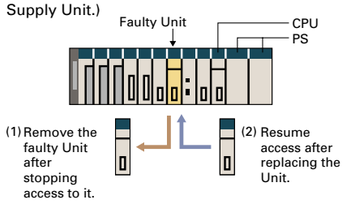
You can now stop specific nodes from writing over the network.By preventing unintentionally writes to the PLC while monitoring data over the network, you can prevent potential problems.



Replace Malfunctioning Units without Turning OFF the Power (Online Unit Replacement)

When an I/O Unit, a Special I/O Unit, or a CPU Bus Unit is malfunctioning, it is now possible to replace the faulty Unit while the system continues operating. This is particularly effective for systems that cannot be stopped when a problem has occurred in another part of the system.

(This function requires a CS1D-CPU□□S CPU Unit, a CS1D-BC082 or CS1D-BI092 Backplane, and a CS1D-PA207R or CS1D-PD024 Power Supply Unit.)



Store All I/O Comments, Symbol Names, Rung Comments, and Other Information in CPU Unit Comment Memory *NEW*

(Unit Ver. 3.0 or later)

When downloading projects, the Memory Card, EM file memory, or comment memory (in the CPU Unit's flash memory) can be selected as the transfer destination for I/O comments, symbol names, rung comments, and other data. This enables data such as I/O comments, symbol names, and rung comments to be stored in the CPU Unit's internal comment memory when a Memory Card or EM file memory are both not available. (PLC models: CS/CJ-series with unit version 3.0 or later only.)

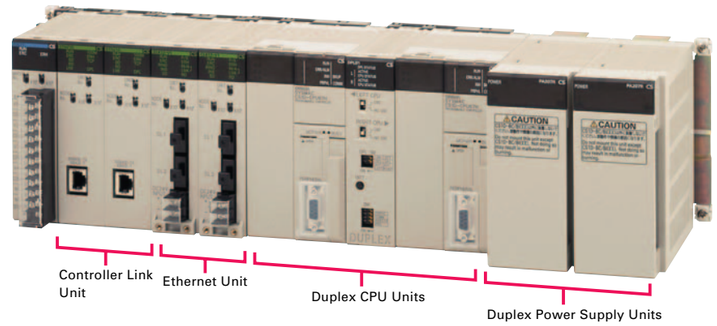
SYSMAC CS1D Programmable Controllers Duplex System

The CS1 Duplex System Boosts the Reliability of Facilities and Equipment

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

6

Duplex-CPU System



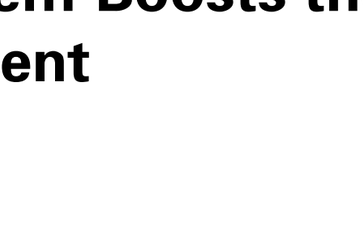
Hot Standby System Adopted for CPU Unit Duplexing

- When a problem occurs in the CPU Unit, the system instantly switches control to the other CPU Unit, enabling continuous operation with minimal effect on the system.
- Because there is no need for special duplex programming, the design process is simple and design steps are reduced.

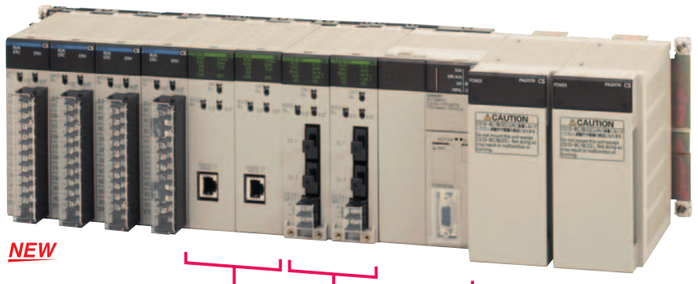
The system can also be configured with only one each of the CPU, Power Supply, and Communications Units. This lets you optimize the system cost by selecting the Units that you need. (The Duplex Unit must be used even when using only one each of the CPU, Power Supply, and Communications Units.)

Online Unit Replacement

With either a Duplex-CPU or Single-CPU CS1D System, Basic I/O Units, Special I/O Units, and CPU Bus Units can be replaced online while the system continues operation.
Although operation will stop for the Unit being replaced, all other Units will continue operation.



Single-CPU System



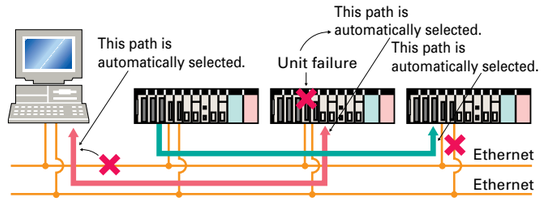
Duplex operation is possible for any or all of the following: CPU Units, Power Supply Units, and Communications Units.

Use duplex operation for the CPU Unit, power supply, or communications depending on system requirements for reliability, costs, and functionality. For example, use duplex operation for all of these for systems that must never go down or use duplex operation for only the power supply (which has a relatively short service life). Just build in the redundancy required by the system.

Increase the Reliability of Information with Duplex Networks

Duplex Ethernet for Greater Information Network Reliability NEW

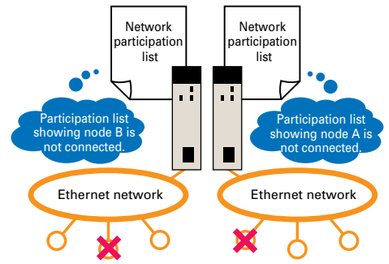
With redundant networks and Communications Units, communications will continue even if a network line is broken or one of the Communications Units fails. The communications path is automatically selected for each communications process (as opposed to switching the entire line), to enable creating a highly reliable network even against a network line broken in more than one location.



The CS1D-ETN21D and CS1D CPU Unit version 1.1 or higher are required for a duplex Ethernet network.

Monitor Connection Status to an Ethernet Network NEW

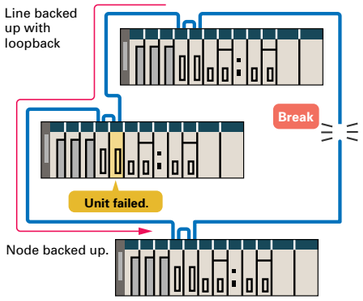
The connection status for each line is stored in the CIO Area words allocated in the CPU Unit. This enables the ladder program or host to quickly detect faulty nodes or lines to make maintenance easier.



Duplex Networks between PLCs with Controller Link

Even if one Unit fails, the other Unit will back it up and continue communications. Even if a line breaks, a loopback will be used to maintain the network.

Either the CS1W-CLK12-V1 or CS1W-CLK52-V1 is required for a Duplex Controller Link network.



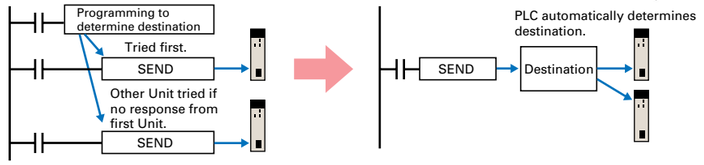
Program without Being Concerned with Duplex Operation

No special programming is required to use duplex communications with the CS1D, making it simple to design programs for duplex systems.

- **The complex programming required in previous applications for duplex communications with Ethernet is eliminated.** NEW

Previously it was necessary to program operation for both Ethernet Units.

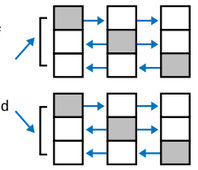
Just program the operation as if for one Ethernet Unit, and the PLC will determine the destination and send the message.



- **Controller Link networks enable allocating data link areas without wasting memory.**

Previously, twice the memory was required to implement data links for two Controller Link Units, and it was necessary to determine which data could be used.

Two sets of the same data link areas were required and programming was required to select the areas.



Just create the data links for one Controller Link Unit to eliminated wasted data memory. The Duplex Controller Link Units share the data links.

Initial and maintenance costs are reduced.

Allows effective use of software assets.

The same support software can be used in systems combining the CS1 and CJ1 Series, and all software programs and data are compatible.Their application and reuse are extremely easy.There is also no need for ladder programs for duplexing. This means that when converting an existing system to a Duplex System, there is almost no need to revise ladder programs.

Complete compatibility among Units.

The CS1D Duplex System is fully compatible with the I/O Units of the entire CS Series. Accordingly, the same Units and materials can be used for restoring the system and conducting maintenance. There is no need to purchase different Units and materials for each system, making the CS1D Duplex System highly economical. (C200H Units, however, cannot be used with CS1D PLCs. Refer to user documentation for details.)

Machine performance improved with high-spe ed, high-precision, flexible motion control.

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

7

● Position Control Units

Two Types of Outputs and Control of 1, 2, or 4 Axes

Select from 1-axis, 2-axis, and 4-axis models with either open-collector output or line-driver output to suit a number of different applications.

A Variety of Positioning Functions

There are 2 operating modes: direct operation (position, speed, acceleration, and deceleration data specified from the ladder program), which is effective for setting target positions, speeds, and acceleration rates immediately or during operation, and memory operation, where fixed patterns are stored beforehand in the Unit and used for operation. There are also a variety of positioning functions, such as interrupt feeding, which is effective for feeder control, and forced interrupt, which is useful in emergencies.

● Advanced Motion Control Units

Easy System Construction

Up to 30 physical axes and two virtual axes, making a total of 32, can be controlled, and the servo interface is handled by high-speed servo communications (MECHATROLINK-II, a registered trademark of Yaskawa Electric Corporation). This makes it possible to control multiple axes with less wiring.

Easy Data Control

High-speed servo communications lets you read programs and parameter settings from CX-Programmer on a PC. You can also read and track the operating status of parameter settings inside the Servo Driver.

Easy Motion Control

Motion control, including positioning, synchronizing (electronic gears, electronic cams, tracking), speed, and torque control, can all be handled by the CS1.
Eight motion tasks can be used for simultaneous motion program execution.

● Motion Control Units

Easy Programming with G Language and Multitasking

The Motion Control Units use G language to ensure easy programming. The Units have a large programming capacity of up to 100 programs and 2,000 program blocks, and allow independent operation of 4 tasks.

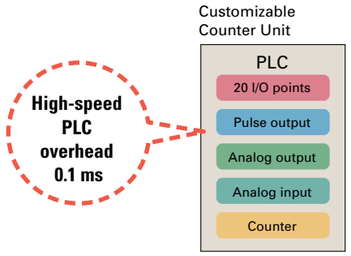
High-speed Interlocks

Interrupt programs can be executed from the motion control program using D codes (interrupt codes). Easy, fast interlocks ensure greater production efficiency.
Synchronous control (electronic gears, electronic cams) is also possible.

● Customizable Counter Units

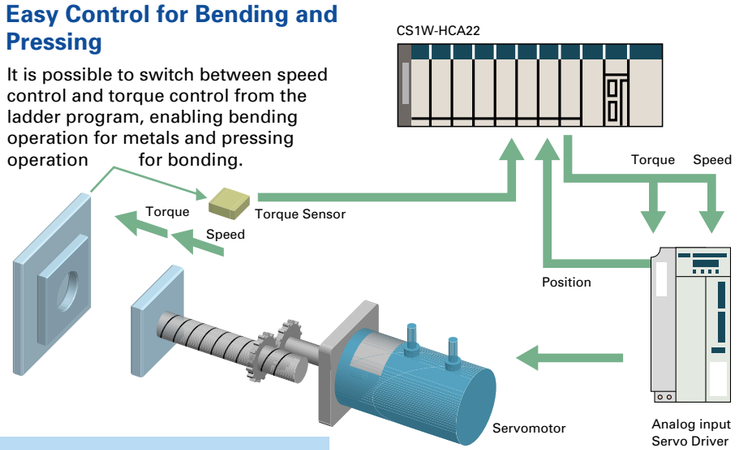
A Whole New Concept

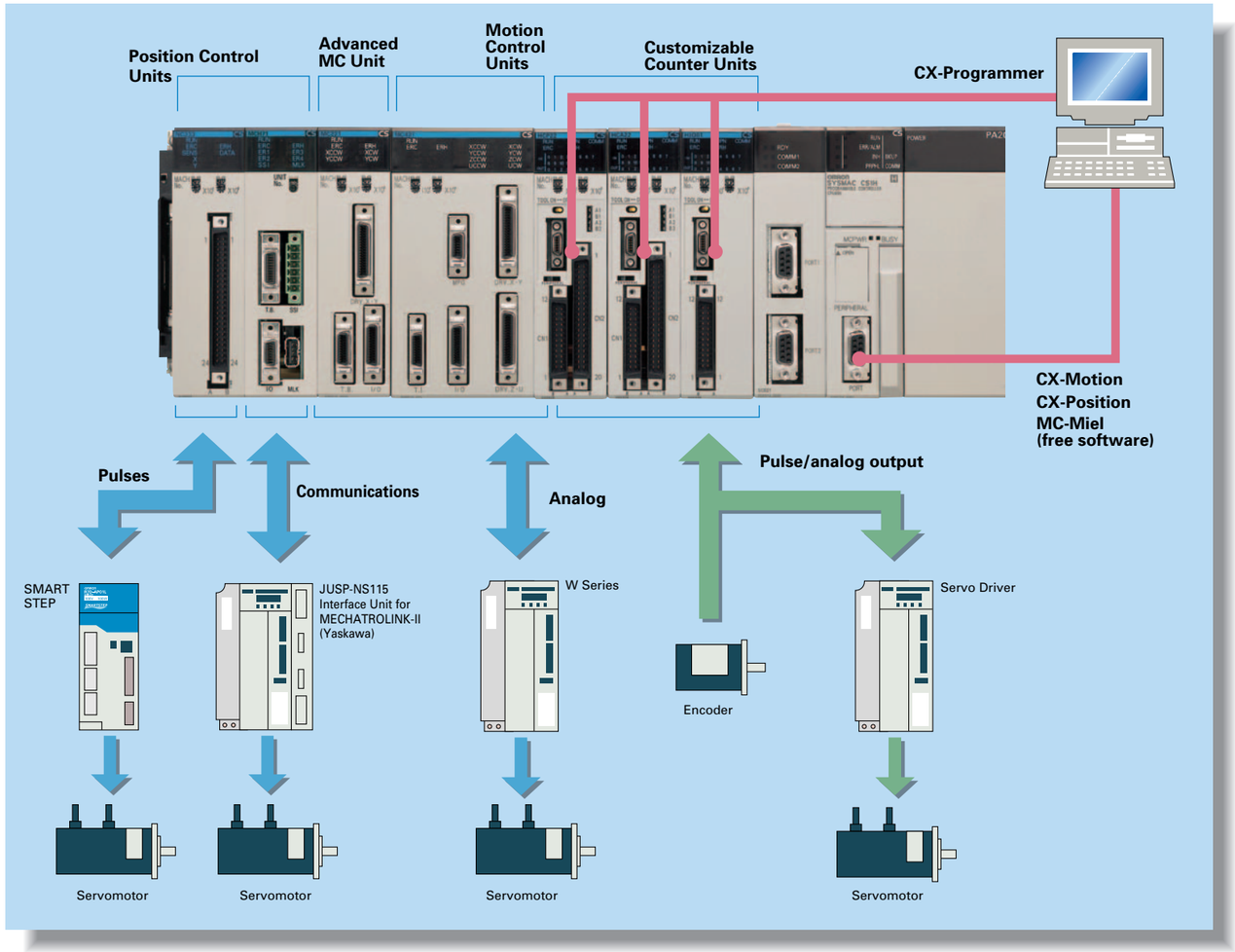
A high-speed PLC with 20 I/O points, a 2-axis high-speed counter, and 2 pulse or analog outputs have all been combined into 1 Unit. The Customizable Counter Units allow easy execution of complicated applications.



Easy Control for Bending and Pressing

It is possible to switch between speed control and torque control from the ladder program, enabling bending operation for metals and pressing operation for bonding.





Synchronous Control with Electronic Cam

Counter input and pulse output that previously could only be connected via a CPU Unit can now both be handled by the same Unit. The built-in high-speed PLC enables synchronous control of, for example, electronic cams. The cam curve that determines the relationship between counter input and pulse output can be defined freely using the line-segment approximation function from the ladder program.

Design Costs Reduced by Modularization

Ladder programs and I/O instructions to be re-used or shared by designers can be transferred from the main CPU Unit to the Units, allowing "modularization" that helps to reduce design costs. Up to 96 Units can be used, enabling easy system expansion in the future.

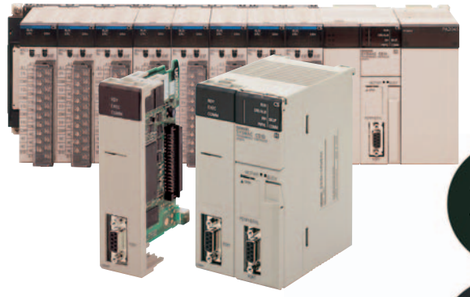
Motion Applications with High-speed Response

A wide range of interrupt functions and superior response performance enable motion applications requiring high-speed response using pulse I/O.

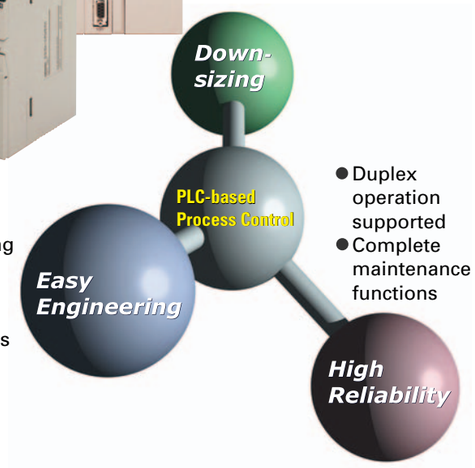
Smart Process Control
OMRON PLC-based Process Control brings Major Innovations to Process Automation

The evolution of the SYSMAC CS1 accelerates DCS downsizing.

7



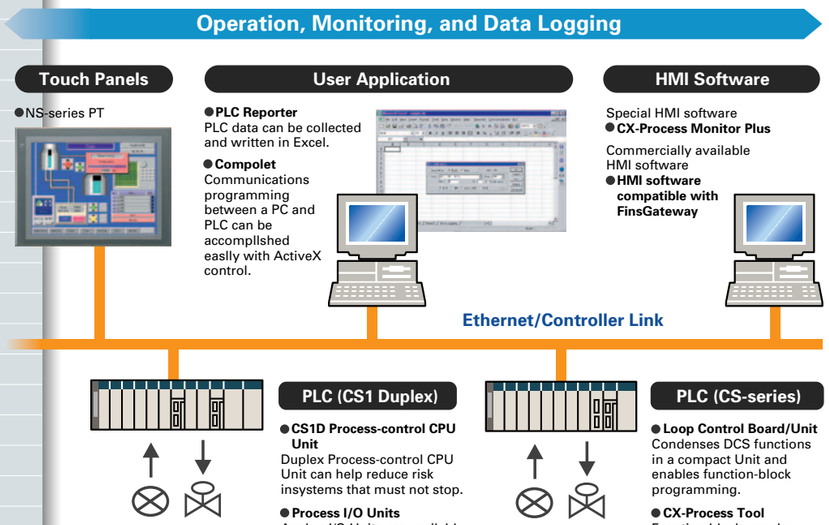
- DCS functionality in a PLC
- Analog Units with signal conversion functions
- A scaleable system configuration



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

- Duplex operation supported
- Complete maintenance functions

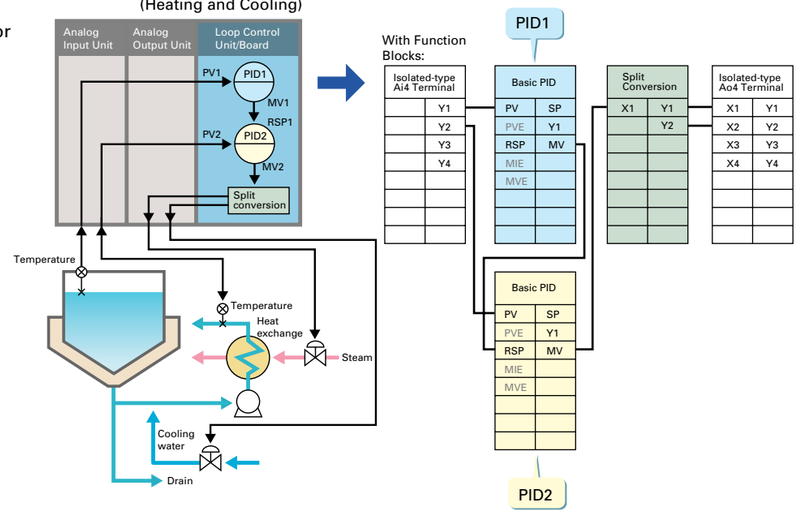
Provides an exceptionally open environment with PLC-based process control to advance standardization and IT integration of the process control system.



Diversified Loop Control is even easier to use. Programming becomes even easier with function-block programming.

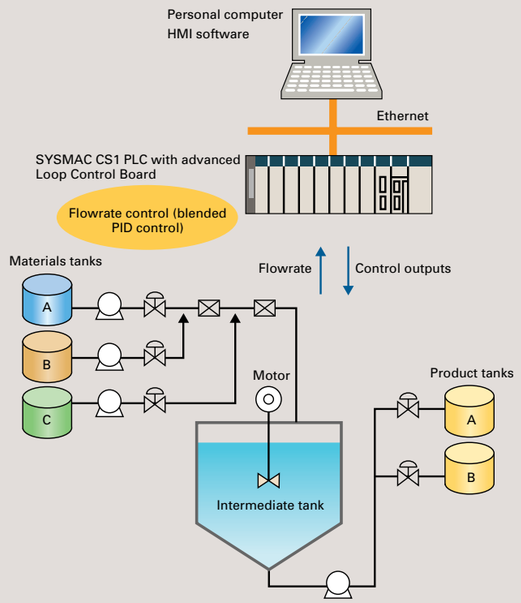
Packed with complete DCS functionality, the LCBs/LCUs are programmed with function blocks designed specifically for process control. Similar to preparing a flow sheet, function blocks are pasted and connections made using a graphic interface. A wide array of control methods, from basic PID control to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

- Example: Cascade Control (Heating and Cooling)

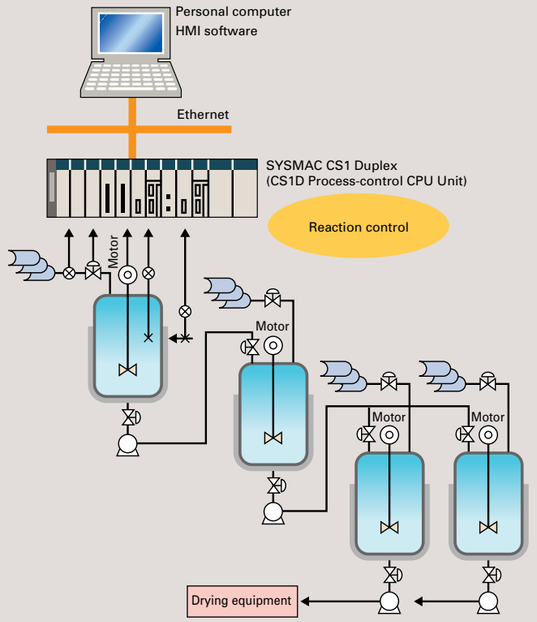


PLC-based Process Control Application Examples

In-line Blending in a Food Plant



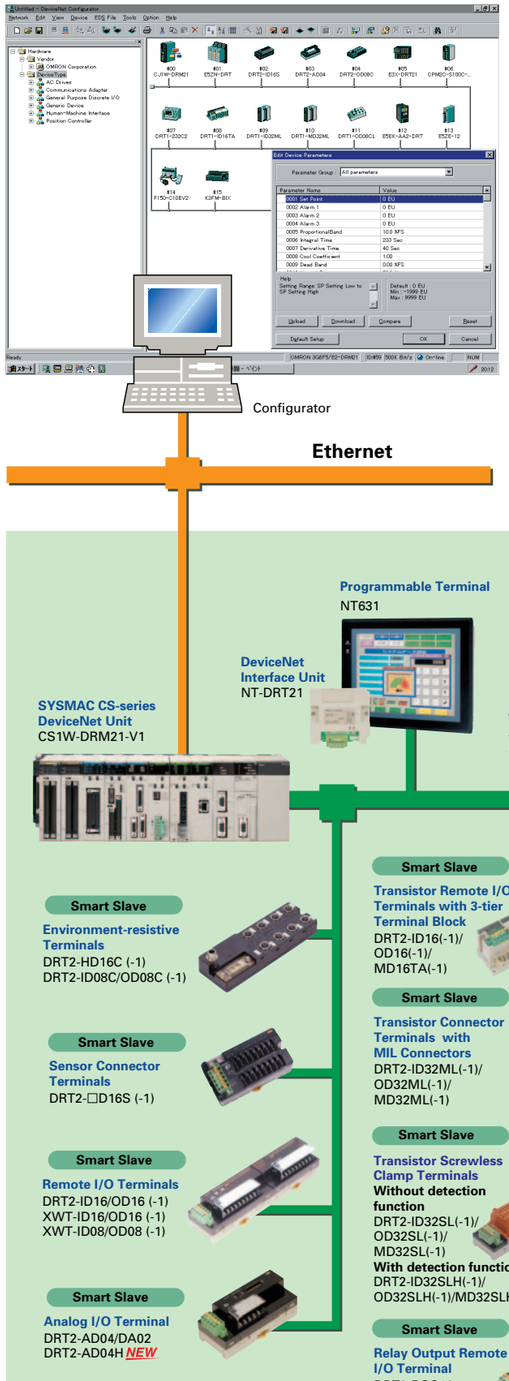
Batch Control in a Chemical Plant



DeviceNet Creates Many Advantages for D evelopment and Design, for Production and Startup, and for Operat ion and Maintenance.

The SYSMAC CS1 with DeviceNet capabilities get you even closer to the production site.

7



Advantages in Development and Design

Hardware Advantages

- Many compatible components for more options and easier system construction.
- No restrictions on Master, enabling equipment modularization at the Slaves.

Software Advantages

- Simple software standardization with profile specified for each component.
- Open network construction eliminates the need to consider communications protocols, allowing program development using ladder diagrams only.

Advantages in Production and Startup

Hardware Advantages

- Assembly time shortened by standardization and modularization.
- Number of work hours reduced by less wiring.
- Simple wiring checking process to help prevent wiring mistakes.
- Simple implementation of distributed equipment manufacturing.
- Distributed I/O for more compact control panels and equipment.

Startup Advantages

- Simple re-assembly at delivery site.
- Simple settings and communications work, shortening startup time.
- Establishing communications with components with plug-and-play simplicity.
- Simple identification of faults with complete monitoring tools.

Advantages in Operation and Maintenance

Operation Advantages

- Recipe control quickly improves yields.
- Preventative maintenance to avoid system shutdowns and increase operating rates.
- Simple layout changes.
- Lines can be constructed for modular replacement.

Maintenance Advantages

- Easy identification of fault locations reduces time to restore operation.
- A wide variety of data can be collected from components, aiding preventative maintenance.
- Simple plug-and-play replacement using connectors.
- Online replacement for maintenance without stopping the system.

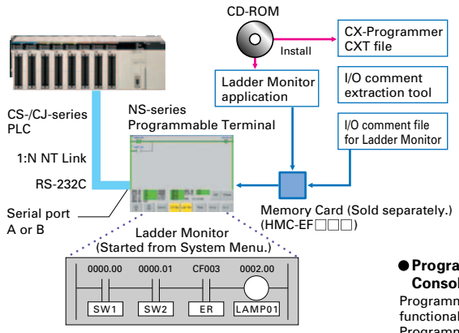
Greater Compatibility with PLCs
Multilingual Globalization for Greater Mach ine Flexibility

Faster Networking on the Factory Floor with the SYSMAC CS1 and NS-series Programmable Terminals

7

Ladder Monitor Function

Save the NS-EXT01 Ladder Monitor system program on a Memory Card (the NS-EXT01 is sold separately) and install the Memory Card to enable monitoring of a ladder program (I/O bit status monitor, address/instruction search, multiple I/O bit monitor, etc.) being executed in a CS/CJ-series PLC connected by a serial connection. It is also possible to display I/O comments created with the CX-Programmer.



Note: CS- and CJ-series PLCs connected via a 1:N NT Link to serial port A or B on an NS-series Programmable Terminal can be monitored.

Programming Console Function (Using NS-EXT01-V2□□□ Ladder Monitor)

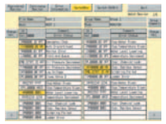
If a Programming Console is selected as the operating mode, a Programming Console is displayed on the Ladder Monitor screen. Operating methods are exactly the same as for a CS-/CJ-series Programming Console. Timer set values can be changed, bit addresses can be added or changed, and many other operations can be performed on-site, all from the screen of the NS-series PT. The functionality of the Ladder Monitor and Programming Console can be used for primary on-site response without a personal computer.

● **Programming Console Function**

Programming Console functionality is displayed when Programming Console is selected as the operating mode.

Switch Box Function

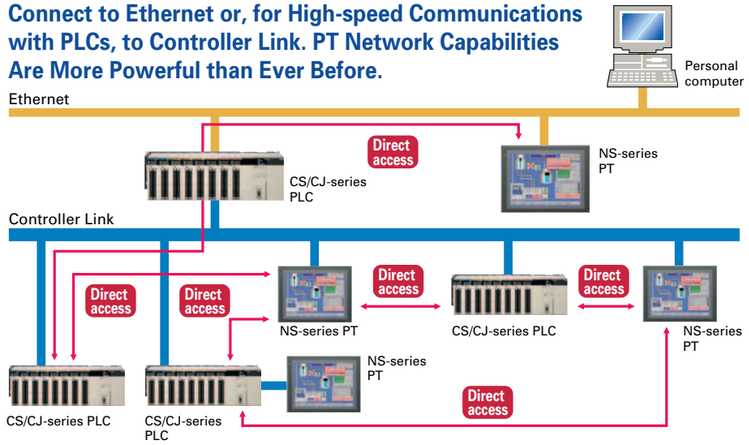
The Switch Box Function has been added to the NS-series Programmable Terminals. The Switch Box Function can be used to monitor the status of each bit in a word or a combination of user-selected bits organized like a ladder program section. The Switch Box Function makes it possible to perform basic troubleshooting on the factory floor even without a computer.



The Switch Box provides the following functions:

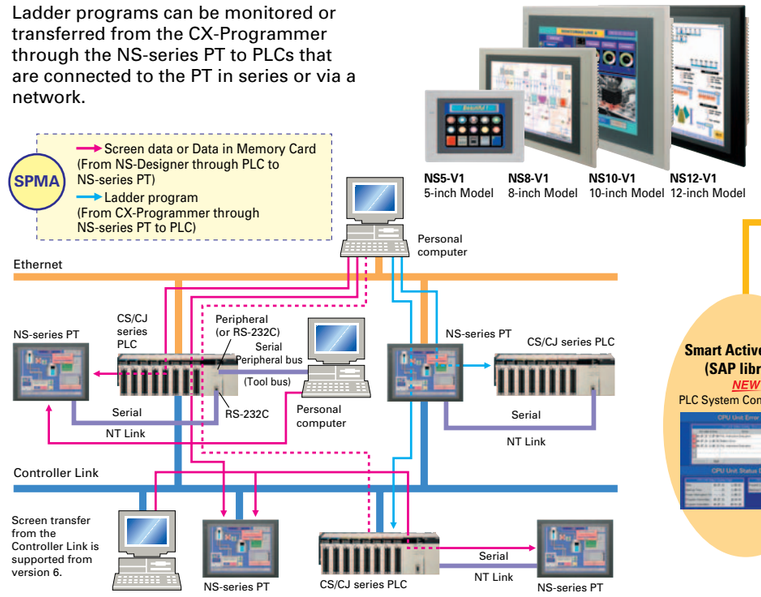
- Switching between Monitoring Contiguous or Noncontiguous Bits and Contiguous Words
  The I/O memory monitor function monitor words or combinations of specified bits. Bit/word comments are imported from the CX-Programmer.
- Register the Words or Bit Combinations To Be Monitored by Group
  Comments can be input for individual groups, e.g., so that the operating conditions of words or bits can be described in text.
- Same User Interface as the Switch Box Utility for Personal Computers
  The same displays can be monitors in the office on a personal computer and onsite at the NS-series PT, making discussions clearer.

Connect to Ethernet or, for High-speed Communications with PLCs, to Controller Link. PT Network Capabilities Are More Powerful than Ever Before.

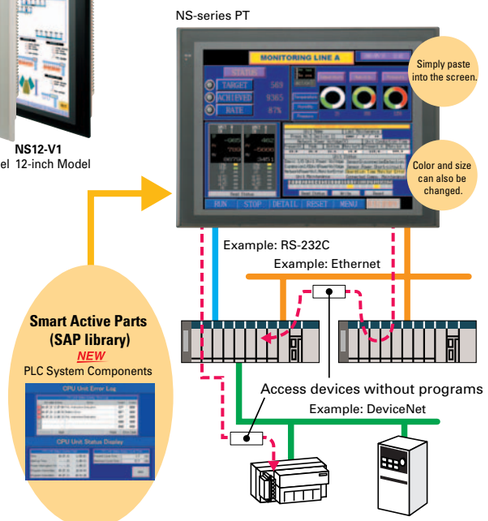


You may want to transfer screens to a PT through the PLC without changing computer connections or transfer a ladder program to the PLC through the PT by using the Ethernet or Controller Link.

Ladder programs can be monitored or transferred from the CX-Programmer through the NS-series PT to PLCs that are connected to the PT in series or via a network.



NS-series PTs provide Smart Active Parts (SAP library) enabling direct access to data in various devices.



Multilingual Version to Develop for Various Demands

- Create Chinese or Korean screens on your Windows system.
- Support multiple languages with the same screen data.
- Create the source language labels and let suppliers handle the other languages.

NS Series: Easily Create Multilingual Screens on Your Windows System

Multi-language Input with Japanese Windows

When Windows 2000 or XP is being used, Simplified Chinese, Traditional Chinese, Korean, and other language text can be input in NS-Designer. Select the desired language with Global IME to input a different language. You can also use this program together with RAKURAKU CHUUGOKUGO and RAKURAKU KANKOKUGO (Chinese and Korean input systems) to convert Japanese to Chinese and Korean.

For more information on this software, refer to the following site or send email to the following address.
URL: http://www.omronsoft.co.jp/SP/
E-mail: rakuraku@omuronsoft.co.jp

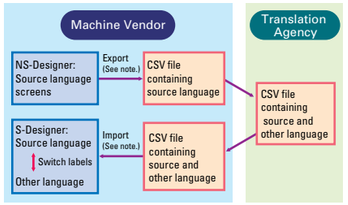
Label Switching to Select from Multiple Languages

Up to 16 groups of labels (labels 0 to 15) can be registered for functional objects such as buttons, lamps, labels, and alarm settings. (Each label can correspond to a different language, for example, label 0 = Japanese, label 1 = Simplified Chinese, label 2 = Korean, label 3 = English, etc.)
Once all of the labels have been input in each language with the multilingual input function, all of the labels can be switched to a different language at once just by specifying the corresponding label number from the PLC.

Example: The label switch function can be used to switch between English and Simplified Chinese.

Use Screen Import/Export Functions to Separate Translation Work

Property information for labels and other objects in screen data created using the NS-Designer can be exported to CSV files. These files can be edited in Excel and other programs. The screens can be created in the source language and then labels and other text exported to CSV files, which can be sent to translators for conversion to other languages. The translated CSV files can then be imported to automatically input the desired languages into labels.



Note: Refer to the operation manual for NS-Designer for information on importing and exporting.

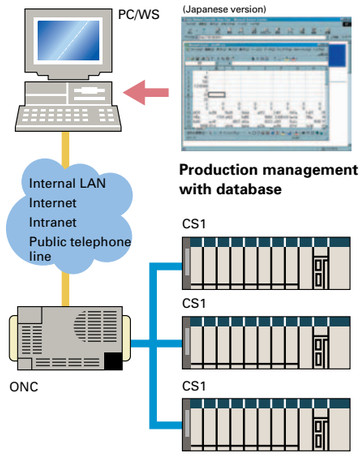
Dramatic improvements in on-site informati on management achieved with data collection functions.

The SYSMAC CS1 and ONC are accelerating advances in the production site.

7

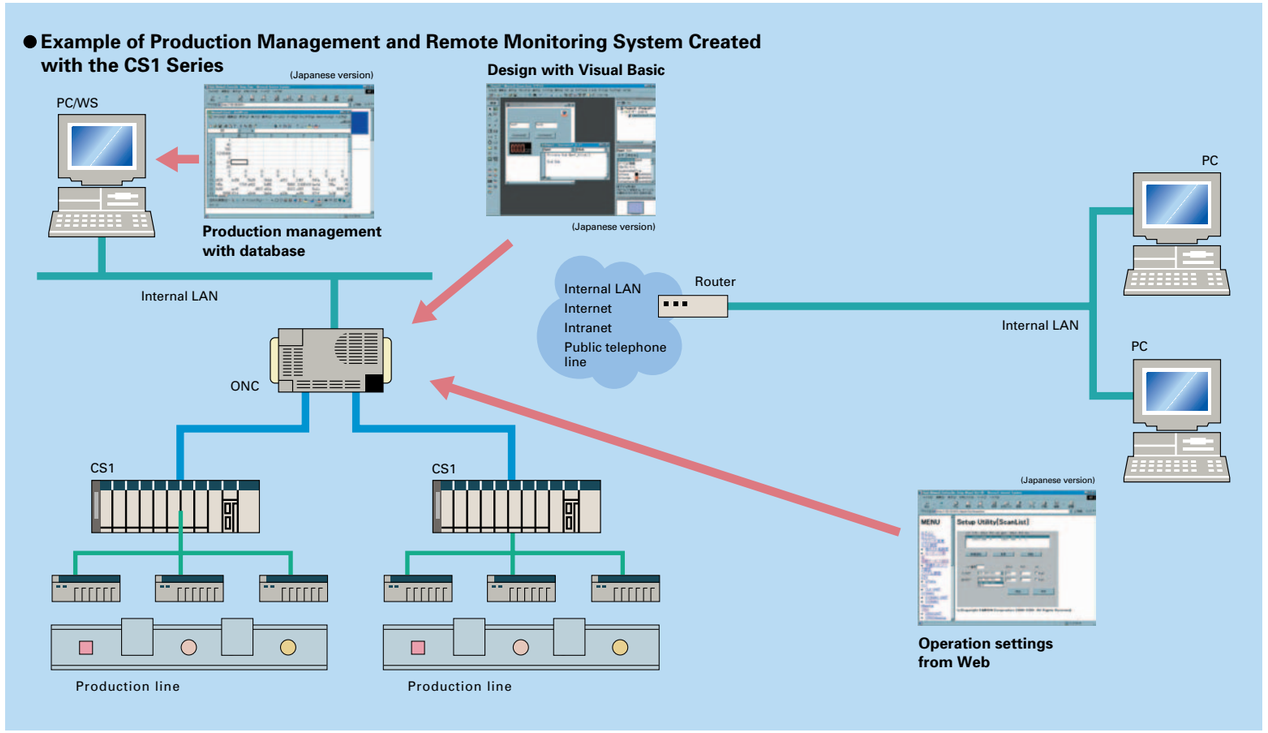
A High Level of Support for On-site Information Management

The Open Network Controller's (ONC) high-level information processing functions, such as Web server functions and functions for data collection, file management, automatic distribution, and automatic delivery of mail attachments, enable significant reductions in design costs. Also, using NX-Server for DeviceNet ONC Edition allows data on the DeviceNet network to be collected independently of I/O control at the CS1-series PLC. The ONC is capable of a high-level of interaction with the CS1 Series.



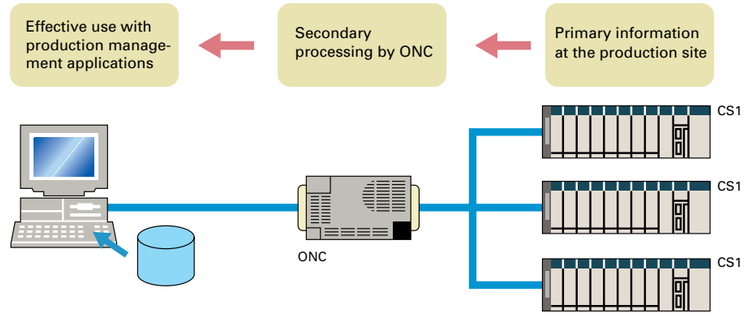
Ethernet – Creation of a Remote Monitoring Environment

The ONC's dial-up connection and PPP connection functions allow maintenance and monitoring of production site information from a computer in a remote location via an ordinary telephone line with, for example, a TA, modem, or dial-up router. The ONC, in combination with the CS1 Series, can be used for a variety of applications.



Use High-level Languages with Primary Production Information

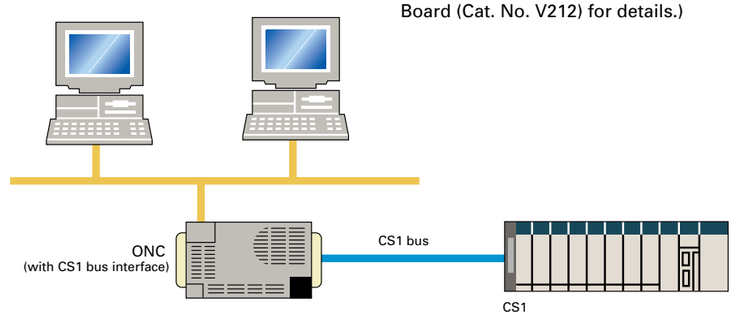
Using the ONC in combination with optional software (purchased separately), such as the Data Collection/Distribution Software or the RemoteKit Software, enables the processing, accumulation, and distribution of primary production site information. If a higher level of information processing is required, user applications can be created using high-level languages, such as Visual Basic, Java, C, or Perl (available soon). By transferring information after secondary processing at the production site end, distribution of the workload between the CS1 and production management system and links to the production management database enable a smooth flow of information.

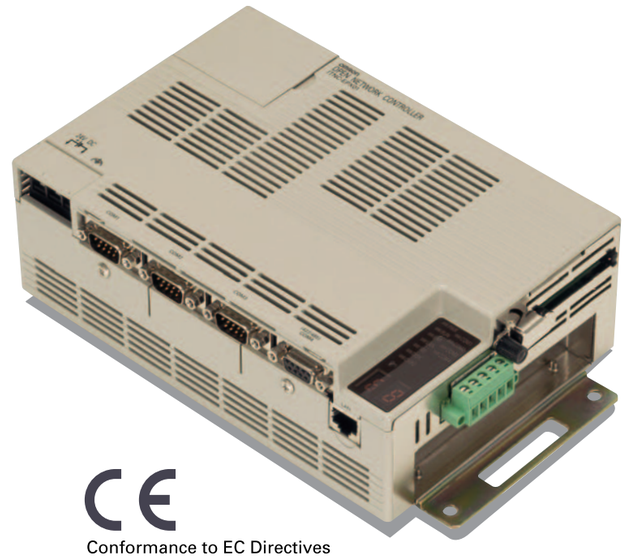


Expanded Role as CS1 Computer Unit

Using an expandable ONC model with a CS1 bus interface (ITNC-EIS01-CST and ITNC-EIX01-CST) allows connection to the CS1 via a high-speed CS1 bus.

The ONC acts as a CS1 Computer Unit allowing the CS1 to be used in applications not possible with a CS1 PLC alone. (Refer to CS1 Bus Interface Board (Cat. No. V212) for details.)

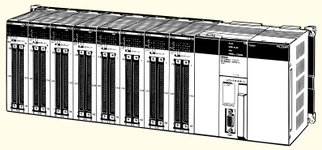




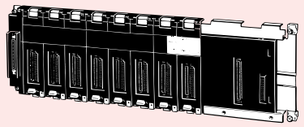
Conformance to EC Directives

A Complete Lineup of Units for Optimum C ontrol.

CPU Rack



CPU Backplanes



CS1W-BC□□2
(2, 3, 5, 8, or 10 slots)
Note: Expansion is not possible for 2-slot Backplanes. These Backplanes are for CS1 Units only.
Use a CS1W-BC□□3 Backplane for C200H Units.
CS1D-BC052
Note: For CS1D only
CS1D-BC082S
Note: For CS1D only

I/O Control Unit

CS1W-IC102

Note: C200H Units cannot be mounted on the Long-distance Expansion Racks.

Long-distance Expansion Connecting Cables

CV500-CN□□2

I/O Interface Unit

CS1W-II102

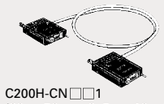
CS1 I/O Connecting Cables

CS1W-C□□3
(30 or 70 cm; 2, 3, 5, 10, or 12 m)

CS1 to C200H I/O Connecting Cables

CS1W-CN□□1
(30 or 70 cm; 2, 3, 5, 10, or 12 m)

C200H I/O Connecting Cables



C200H-CN□□1
(30 or 70 cm; 2, 5, or 10 m)

Serial Communications Board

CS1W-SCB21-V1
CS1W-SCB41-V1

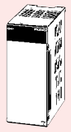
Loop Control Board

CS1W-LCB01/05

CPU Units

CS1H-CPU□□H
CS1G-CPU□□H
CS1D-CPU□□H
CS1D-CPU□□S

Power Supply Units



C200HW-PA204/PA204R/PA204S/PA209R/PD024/PD106R
CS1D-PA207R/PD024

Terminating Resistor

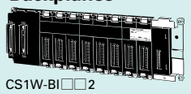
CV500-TER01
(Two provided with CS1W-IC102.)

Memory Card

HMC-EF372/672

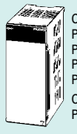
CS1 Expansion Rack

CS1 Expansion Backplanes



CS1W-BI□□2
(3, 5, 8, or 10 slots)
Note: These Expansion Backplanes are for CS1 Units only. Use a CS1W-BI□□3 Backplane (currently available) for C200H Units.
Use the CS1D-BI092 for CS1D PLCs.
The CS1D-BI092 and CS1W-BI□□ cannot be used together.

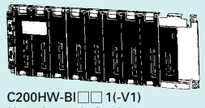
Power Supply Units



C200HW-PA204/PA204S/PA209R/PD024/PD106R
CS1D-PA207R/PD024

C200H Expansion I/O Rack

C200HX/HG/HE Expansion I/O Backplanes



C200HW-BI□□1(-V1)
(3, 5, 8, or 10 slots)

Power Supply Units

C200HW-PA204/PA204S/PA204R/PA209R/PD024

C200H Expansion I/O Rack

CS1 CPU Bus Units

Loop Control Unit

CS1W-LC001

Motion Control Unit

CS1W-MCH71

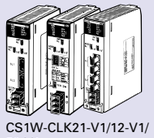
Serial Communications Unit

CS1W-SCU21-V1

Ethernet Units

CS1W-ETN21
CS1D-ETN21D

Controller Link Units



CS1W-CLK21-V1/12-V1/52-V1

SYSMAC Link Units (coaxial, optical)

CS1W-SLK21/SLK11

FL-net Unit

CS1W-FLN22

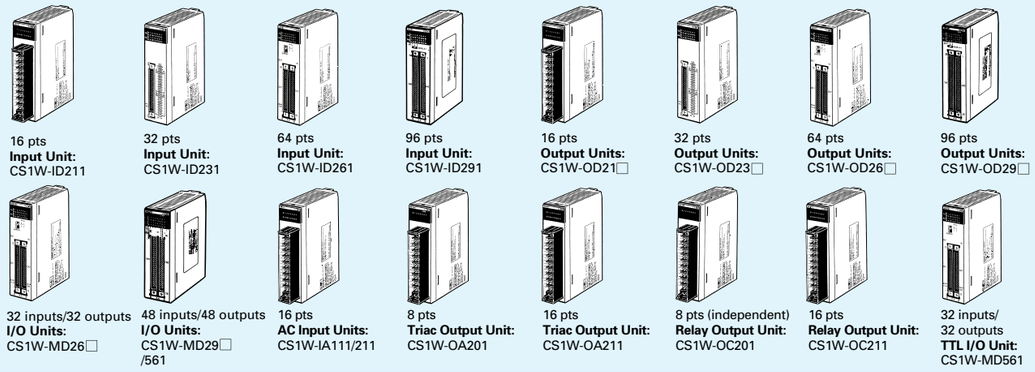
DeviceNet Unit

CS1W-DRM21-V1

Basic I/O Units

C200H Basic I/O Unit

C200H Basic I/O Units and C200H Group-2 High-density Units can slso be used.



16 pts
Input Unit:
CS1W-ID211

32 pts
Input Unit:
CS1W-ID231

64 pts
Input Unit:
CS1W-ID261

96 pts
Input Unit:
CS1W-ID291

16 pts
Output Units:
CS1W-OD21□

32 pts
Output Units:
CS1W-OD23□

64 pts
Output Units:
CS1W-OD26□

96 pts
Output Units:
CS1W-OD29□

32 inputs/32 outputs
I/O Units:
CS1W-MD26□

48 inputs/48 outputs
I/O Units:
CS1W-MD29□
/561

16 pts
AC Input Units:
CS1W-IA111/211

8 pts
Triac Output Unit:
CS1W-OA201

16 pts
Triac Output Unit:
CS1W-OA211

8 pts (independent)
Relay Output Unit:
CS1W-OC201

16 pts
Relay Output Unit:
CS1W-OC211

32 inputs/
32 outputs
TTL I/O Unit:
CS1W-MD561

Interrupt Input Unit

Interrupt function supported on CPU Rack only.
(Two Units mountable on CPU Rack.)

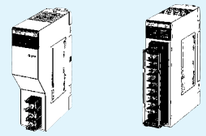
16 pts
CS1W-INT01

C200H Interrupt Input Unit can also be used.

Analog Timer Unit

C200H-TM001

B7A Interface Units



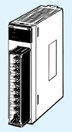
16 pts
C200H-B7A11/O1

Group-2 Unit
C200H-B7A02/12/21/22

High-speed Input Unit

16 pts
CS1W-IDP01

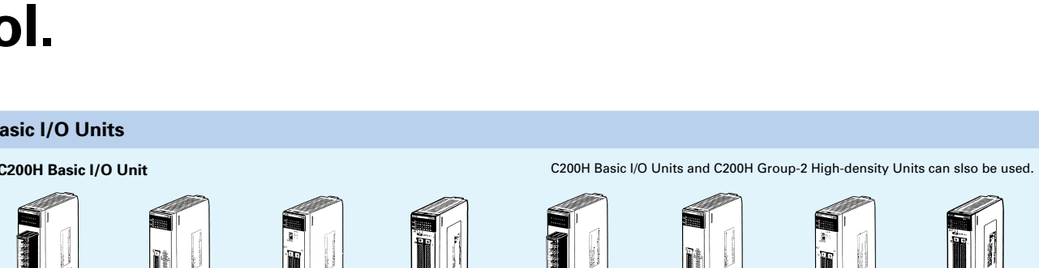
Safety Relay Unit



CS1W-SF200

Special I/O Units

CS1 Special I/O Unit



Analog Input Units
CS1W-AD041-V1
/AD081-V1

Analog Input Units
CS1W-AD161

Analog Output Units
CS1W-DA041/
DA08V/DA08C

Analog I/O Unit
CS1W-MAD44

Process I/O Units
CS1W-P□□□□(-V1)

Position Control Units
CS1W-NC□□3

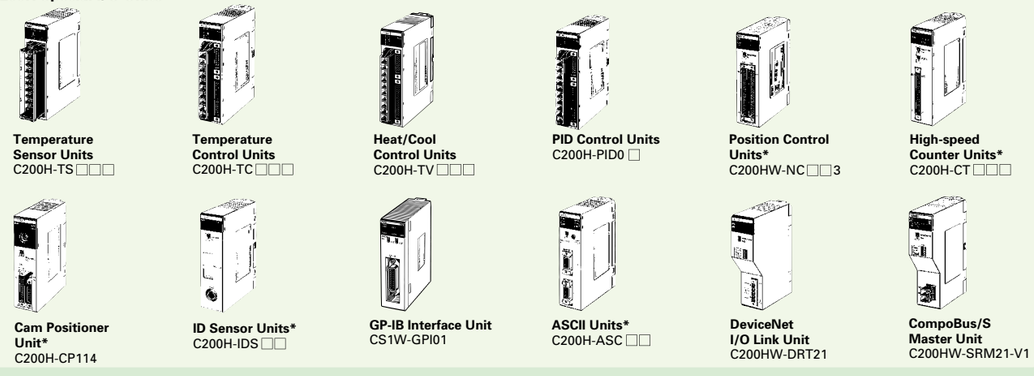
Motion Control Units
CS1W-MC221-V1/
MC421-V1

Customizable Counter Units
CS1W-HCP22-V1/
HCA22-V1/HCA12-V1
/HIO01-V1

High-speed Counter Units
CS1W-CT021/041

ID Sensor Units
CS1W-V600C11
CS1W-V600C12

C200H Special I/O Units



Temperature Sensor Units
C200H-TS□□□

Temperature Control Units
C200H-TC□□□

Heat/Cool Control Units
C200H-TV□□□

PID Control Units
C200H-PID0 □

Position Control Units*
C200HW-NC□□3

High-speed Counter Units*
C200H-CT□□□

Cam Positioner Unit*
C200H-CP114

ID Sensor Units*
C200H-IDS□□

GP-IB Interface Unit
CS1W-GPI01

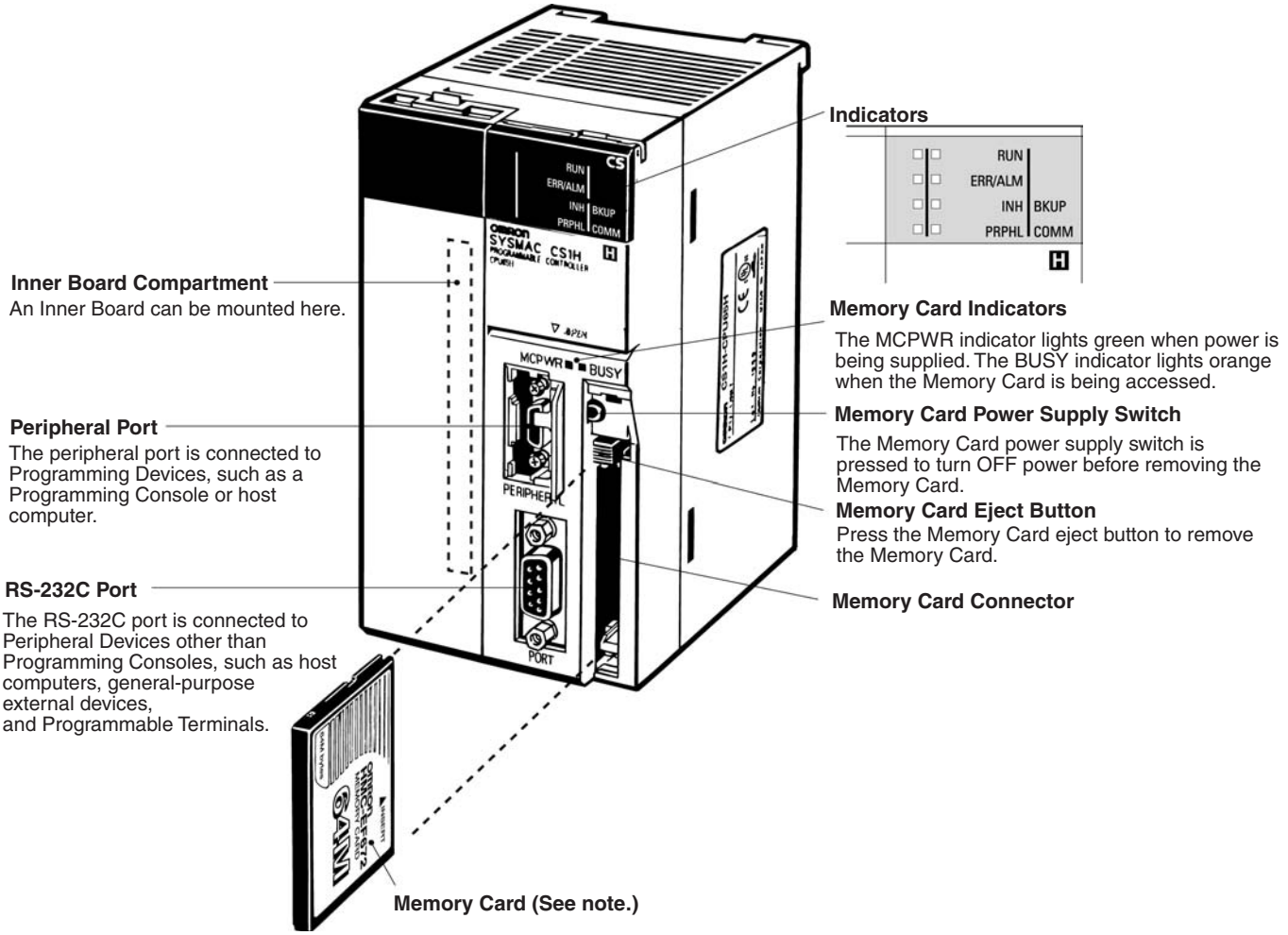
ASCII Units*
C200H-ASC□□

DeviceNet I/O Link Unit
C200HW-DRT21

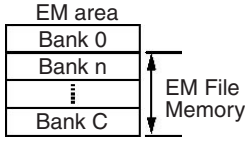
CompoBus/S Master Unit
C200HW-SRM21-V1

Note 1. Only CS1-series Units (i.e., with model numbers starting "CS1W") can be used with CS1D PLCs.
2. The HMC-EF372/EF672 cannot be used with CS1G-CPU□□H, CS1H-CPU□□H, CJ1G-CPU□□H, and CJ1H-CPU□□H CPU Units with lot numbers of 02108 or earlier (i.e., CPU Units manufactured before 8 January 2002) or with NS7-series PTs with lot numbers of 0852 or earlier (i.e., PTs manufactured before 8 May 2002). Be careful when ordering.
3. There are restrictions in data transfers with the CPU Unit for bit and DM Area specifications for the C200H Special I/O Units marked with asterisks, as well as in data transfers programmed from these Units. Refer to CS-series PLC Operation manuals for details.

CPU Unit Overview



With the CS1 PLCs, Memory Cards and specified ranges of the EM Area can be used as file memory. File memory can be used to store the entire user program, I/O memory contents, and/or parameter area contents.

File memory	Memory type	Capacity	Model
Memory Cards 	Flash memory	30 MB	HMC-EF372
		64 MB	HMC-EF672
EM File Memory 	RAM	EM Area capacity of CPU Unit (Max. capacity for CS1H-CPU67: 832 KB).	From the specified bank in the EM area of I/O memory to the last bank (specified in PC Setup).

Note: Memory Card Adapter: HMC-AP001 (The Memory Card Adapter can be used to mount Memory Cards in PC card slots to use the Cards on a personal computer.)

Specifications

■ CPU Units

Model	I/O bits	Program capacity	Data memory capacity (See Note.)	Instruction processing speed	Built-in ports	Options
CS1H-CPU67H/CS1D-CPU67S	5,120 bits (Up to 7 Expansion Racks)	250K steps	448K words	LD: 0.02 μs	Peripheral port and RS-232C port.	Memory Cards Inner Boards, such as Serial Communications Board Only a Loop Control Board (CS1D-LCB05D) can be mounted in a CS1D CPU Unit. No other Inner Boards can be used.
CS1H-CPU66H		120K steps	256K words			
CS1H-CPU65H/CS1D-CPU65S		60K steps	128K words			
CS1H-CPU64H		30K steps	64K words			
CS1H-CPU63H		20K steps				
CS1G-CPU45H	5,120 bits (Up to 7 Expansion Racks)	60K steps	128K words	LD: 0.04 μs		
CS1G-CPU44H/CS1D-CPU44S	1,280 bits (Up to 3 Expansion Racks)	30K steps	64K words			
CS1G-CPU43H	960 bits (Up to 2 Expansion Racks)	20K steps				
CS1G-CPU42H/CS1D-CPU42S		10K steps				
CS1D-CPU65H	5,120 bits (Up to 7 Expansion Racks)	60K steps	128K words	Basic instructions: 0.02 μs min. Special instructions: 0.04 μs		
CS1D-CPU67H		250K steps	448K words			

Note: The available data memory capacity is the sum of the Data Memory (DM) and the Extended Data Memory (EM).

CS1 CPU Unit Descriptions

■ Common Specifications

Item			Specification
Control method			Stored program
I/O control method			Cyclic scan and immediate processing are both possible.
Programming			Ladder diagram
Instruction length			1 to 7 steps per instruction
Ladder instructions			Approx. 400 (3-digit function codes)
Execution time			Basic instructions: 0.02 μs min., Special instructions: 0.04 μs min.
Number of tasks			288 (256 of which are also used as interrupt tasks) Cyclic tasks are executed each cycle and are controlled with TKON(820) and TKOF(821) instructions. The following 4 types of interrupt tasks are supported: Power OFF tasks:1 max., Scheduled interrupt tasks: 2 max., I/O interrupt tasks: 32 max., External interrupt tasks: 256 max.
Interrupt types			Scheduled Interrupts: Interrupts generated at a time scheduled by CPU Unit's built-in timer. I/O Interrupts: Interrupts from Interrupt Input Units. Power OFF Interrupts: Interrupts executed when CPU Unit's power is turned OFF. External I/O Interrupts: Interrupts from Special I/O Units, CS1 Special Units, or Inner Board. **Note:** Interrupts cannot be used with a CS1D CPU Unit.
Function Blocks (See note 1.)			Languages supported for use in function block definitions: Ladder programming language and structured text
CIO (Core I/O) Area (The CIO Area can be used as work bits if not used as shown here.)	I/O Area		5,120 : CIO 000000 to CIO 031915 (320 words from CIO 0000 to CIO 0319) Setting of first rack words can be changed from default (CIO 0000) so that CIO 0000 to CIO 0999 can be used. I/O bits are allocated to Basic I/O Units, such as CS1 Basic I/O Units, C200H Basic I/O Units, and C200H Group-2 High-density I/O Units.
	Link Area		3,200 (200 words): CIO 10000 to CIO 119915 (words CIO 1000 to CIO 1199) Link bits are used for data links and are allocated to Units in Controller Link Systems and PC Link Systems.
	CS1 CPU Bus Unit Area		6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899) CS1 CPU Bus Unit bits store operating status of CS1 CPU Bus Units. (25 words per Unit, 16 Units max.)
	Special I/O Unit Area		15,360 (960 words): CIO 200000 to CIO 295915 (words CIO 2000 to CIO 2959) Special I/O Unit bits are allocated to CS1 Special I/O Units and C200H Special I/O Units. (See note 2.) (10 words per Unit, 96 Units max. The maximum number of slots, however, is limited to 80 including expansion slots, so maximum number of Units is actually 80.)
	Inner Board Area		1,600 (100 words): CIO 190000 to CIO 199915 (words CIO 1900 to CIO 1999) Inner Board bits are allocated to Inner Boards. (100 I/O words max.)
	SYSMAC BUS Area		800 (50 words): CIO 300000 to CIO 304915 (words CIO 3000 to CIO 3049) SYSMAC BUS bits are allocated to Slave Racks connected to SYSMAC BUS Remote I/O Master Units. (10 words per Rack, 5 Racks max.)
	I/O Terminal Area		512 (32 words): CIO 310000 to CIO 313115 (words CIO 3100 to CIO 3131) I/O Terminal bits are allocated to I/O Terminal Units (but not to Slave Racks) connected to SYSMAC BUS Remote I/O Master Units. (1 word per Terminal, 32 Terminals max.)
	C200H Special I/O Unit Area		8,196 (512 words): CIO 000000 to CIO 051115 (words CIO 0000 to CIO 0511) C200H Special I/O Unit bits are allocated to C200H Special I/O Units and allow access separate from I/O refreshing.
		DeviceNet Area	1,600 (100 words): Outputs: CIO 005000 to CIO 009915 (words CIO 0050 to CIO 0099) Inputs: CIO 035000 to CIO 039915 (words CIO 0350 to CIO 0399) DeviceNet bits are allocated to Slaves according to DeviceNet remote I/O communications.
		PC Link Area	64 bits (4 words): CIO 027400 to CIO 025015 (words CIO 0247 to CIO 0250) When a PC Link Unit is used in a PC Link, use these bits to monitor PC Link errors and operating status of other CPU Units in PC Link.
Internal I/O Area			4,800 (300 words): CIO 120000 to CIO 149915 (words CIO 1200 to CIO 1499) 37,504 (2,344 words): CIO 380000 to CIO 614315 (words CIO 3800 to CIO 6143) These bits in CIO Area are used as work bits in programming to control program execution. They cannot be used for external I/O.
Work Area			8,192 bits (512 words): W00000 to W51115 (words W000 to W511) Control programs only. (I/O from external I/O terminals is not possible.) **Note:** When using work bits in programming, use bits in Work Area first before using bits from other areas.

Item	Specification
Holding Area	8,192 bits (512 words): H00000 to H51115 (words H000 to H511) Holding bits are used to control execution of program, and maintain their ON/OFF status when the PLC is turned OFF or operating mode is changed. **Note:** Words H512 to H1535 are allocated to the Function Block Holding Area and are used only for the function block instance area (internally allocated variable area).
Auxiliary Area	Read only: 7,168 bits (448 words): A00000 to A44715 (words A000 to A447) Read/write: 8,192 bits (512 words): A44800 to A95915 (words A448 to A959) Auxiliary bits are allocated specific functions.
Temporary Area	16 bits (TR00 to TR15) Temporary bits are used to store ON/OFF execution conditions at program branches.
Timer Area	4,096: T0000 to T4095 (used for timers only)
Counter Area	4,096: C0000 to C4095 (used for counters only)
DM Area	32K words: D00000 to D32767 Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in DM Area maintain their status when PLC is turned OFF or operating mode is changed. Internal Special I/O Unit DM Area: D20000 to D29599 (100 words × 96 Units). Used to set parameters. CS1 CPU Bus Unit DM Area: D30000 to D31599 (100 words × 16 Units). Used to set parameters. Inner Board DM Area: D32000 to D32099. Used to set parameters for Inner Boards. The DM Area is a general-purpose data area that is read and written by word (16 bits). The contents of the DM Area is maintained when the PLC is turned OFF or operating mode is changed.
EM Area	32K words per bank, 13 banks max.: E0_00000 to EC_32767 max. (Not available on some CPU Units.) Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in EM Area maintain their status when PLC is turned OFF or operating mode is changed. The EM Area is divided into banks, and addresses can be set by either of following methods. Changing current bank using EMBC(281) instruction and setting addresses for current bank. Setting bank numbers and addresses directly. EM data can be stored in files by specifying number of first bank. (EM file memory)
Data Registers	DR0 to DR15. Store offset values for indirect addressing. Data registers can be used independently in each task. One register is 16 bits (1 word).
Index Registers	IR0 to IR15. Store PLC memory addresses for indirect addressing. Index registers can be used independently in each task. One register is 32 bits (2 words).
Task Flag Area	32 (TK0000 to TK0031). Task Flags are read-only flags that are ON when corresponding cyclic task is executable and OFF when corresponding task is not executable or in standby status.
Trace Memory	4,000 words (500 data trace samples at the maximum sample size of 31 bits and 6 words)
File Memory	Memory Cards: Compact flash memory cards can be used (MS-DOS format). EM file memory: Part of EM Area can be converted to file memory (MS-DOS format). OMRON Memory Cards with 15-MB, 30-MB, or 48-MB capacities can be used.

Note: 1. Supported for CPU Unit Ver. 3.0 or later only.

2. Up to 16 C200H Special I/O Units can be used in one PLC, and with some C200H Special I/O Units, the limit is 10 Units. There are some I/O Units that are classified as Special I/O Units.

■ Function Specifications

Item	Specification
Parallel processing modes	The CS1G and CS1H CPU Units support processing modes in which the program is executed in parallel with peripheral processing
Battery-free operation	The user program and system program can be automatically backed up flash memory is mounted.
Constant cycle time	1 to 32,000 ms (Unit: 1 ms)
Cycle time monitoring	Possible (Unit stops operating if cycle is too long): 1 to 40,000 ms (Unit: 10 ms)
I/O refreshing	Cyclic refreshing, immediate refreshing, refreshing by IORF(097).
I/O memory holding when changing operating modes	Possible (Depends on ON/OFF status of IOM Hold Bit in Auxiliary Area.)
Load OFF	All outputs on Output Units can be turned OFF.
Input time constant setting	Time constants can be set for inputs from CS1 Basic I/O Units. The time constant can be increased to reduce influence of noise and chattering or it can be decreased to detect shorter pulses on inputs. (CS1 Basic I/O Units only)
Mode setting at power-up	Possible
Memory Card functions	Automatic reading programs from Memory Card (autoboot).
	Memory Card Storage Data — User program: Program file format (binary); PC System Setup: Data file format (binary); I/O Memory: Data file format (binary), text format, CSV format
	Memory Card Read/Write User program instructions , Peripheral Devices (such as Programming Console), Host Link computer.
Filing	Memory Card data and EM (Extended Data Memory) Area can be handled as files.
Debugging	Force-set/reset, differential monitoring, data tracing (scheduled, each cycle, or when instruction is executed), instruction error tracing.
Online editing	One or more program blocks in user programs can be overwritten when CPU Unit is in PROGRAM or MONITOR mode. This function is not available for block programming areas.
Program protection	Overwrite protection: Set using DIP switch. Copy protection: Password set using Peripheral Device.
Error check	User-defined errors (i.e., user can define fatal errors and non-fatal errors) The FPD(269) instruction can be used to check execution time and logic of each programming block.
Error log	Up to 20 errors are stored in error log. Information includes error code, error details, and time error occurred.
Serial communications	Built-in peripheral port: Peripheral Device (including Programming Console), Host Links, NT Links Built-in RS-232C port: Peripheral Device (excluding Programming Console), Host Links, no-protocol communications, NT Links
	Communications Board (sold separately): Protocol macros, Host Links, NT Links
Clock	Provided on all models. **Note:** Used to store time when power is turned ON and when errors occur.
Power OFF detection time	10 to 25 ms (not fixed)
Power OFF detection delay time	0 to 10 ms (user-defined, default: 0 ms)
Memory protection	Held Areas: Holding bits, contents of Data Memory and Extended Data Memory, and status of counter Completion Flags and present values. **Note:** If IOM Hold Bit in Auxiliary Area is turned ON, and PC Setup is set to maintain IOM Hold Bit status when power to PLC is turned ON, contents of CIO Area, Work Area, part of Auxiliary Area, timer Completion Flag and PVs, Index Registers, and Data Registers will be saved.
Sending commands to a Host Link computer	FINS commands can be sent to a computer connected via Host Link System by executing Network Communications Instructions from PLC.
Remote programming and monitoring	Host Link communications can be used for remote programming and remote monitoring through a Controller Link System or Ethernet network.
Eight-level communications (See note 2.)	Host Link communications can be used for remote programming and remote monitoring from devices on networks up to seven levels away (Controller Link Network, Ethernet Network, or other network).
Storing comments in CPU Unit	I/O comments can be stored in Memory Cards, EM file memory, or in the Comment MemoryÅiSee note 1.) contained in the CPU Unit's flash memory.
Program check	Program checks are performed at beginning of operation for items such as no END instruction and instruction errors. The CX-Programmer can also be used to check programs.
Control output signals	RUN output: The contacts will turn ON (close) while CPU Unit is operating. These terminals are provided only on C200HW-PA204R and C200HW-PA209R Power Supply Units.
Battery life	5 years at 25°C (Depending on the ambient operating temperature and communications conditions, 1.1 years min. Battery Set: CS1W-BAT01) (See note 3.)
Self-diagnostics	CPU errors (watchdog timer), I/O verification errors, I/O bus errors, memory errors, and battery errors.
Other functions	Storage of number of times power has been interrupted, the times of the interrupts, and system operation time (in Auxiliary Area).

Note: 1. Supported for CPU Unit Ver. 3.0 or later only.

2. Supported for CPU Unit Ver. 2.0 or later only. (Three-level communications are supported for Pre-Ver. 2.0 CPU Units.)

3. Use a Replacement Battery that is within two years of its date of manufacture.

■ General Specifications

Item	Specifications					
Power Supply Unit	C200HW-PA204	C200HW-PA204S	C200HW-PA204R	C200HW-PA209R	C200HW-PD024	C200HW-PD106R
Supply voltage	100 to 120 VAC or 200 to 240 VAC, 50/60 Hz				24 VDC	100 VDC
Operating voltage range	85 to 132 VAC or 170 to 264 VAC				19.2 to 28.8 VDC	85 to 143 VDC
Power consumption	120 VA max.			180 VA max.	40 W max.	50 W max.
Inrush current	30 A max.			30 A max./100 to 120 VAC 40 A max./200 to 240 VAC	30 A max.	
Output capacity	4.6 A, 5 VDC (including CPU Unit power)			9 A, 5 VDC (including CPU Unit power)	4.6 A, 5 VDC (including CPU Unit power)	6 A, 5 VDC (including CPU Unit power)
	0.625 A, 26 VDC Total: 30 W	0.625 A, 26 VDC or 0.8 A, 24 VDC Total: 30 W	0.625 A, 26 VDC Total: 30 W	1.3 A, 26 VDC Total: 45 W	0.625 A, 26 VDC Total: 30 W	1 A, 26 VDC Total: 30 W
Output terminal	Not provided	24 VDC load current consumption Less than 0.3 A: +17%/–11% 0.3 A or greater: +10%/–11% (Lot No. 0197 or higher)	Not provided		Not provided	
RUN output (See Note 1.)	Not provided		Contact configuration: SPST-NO Switch capacity: 250 VAC, 2 A (resistive load) 250 VAC, 0.5 A (induction load), 24 VDC, 2 A	Contact configuration: SPST-NO Switch capacity: 240 VAC, 2 A (resistive load) 120 VAC, 0.5 A (inductive load) 24 VDC, 2 A (resistive load) 24 VDC, 2 A (inductive load)	Not provided	Contact configuration: SPST-NO Switch capacity: 250 VAC, 2 A (resistive load) 250 VAC, 0.5 A (inductive load) 24 VDC, 2 A
Insulation resistance	20 MΩ min. (at 500 VDC) between AC external and GR terminals (See Note 1.)				20 MΩ min. (at 500 VDC) between DC external and GR terminals (See Note 1.)	
Dielectric strength	2,300 VAC 50/60 Hz for 1 min between AC external and GR terminals (See Note 1.), leakage current: 10 mA max.				1,000 VAC 50/60 Hz for 1 min between DC external and GR terminals, leakage current: 10 mA max. (See Note 1.)	2,300 VAC 50/60 Hz for 1 min between DC external and GR terminals, leakage current: 10 mA max. (See Note 1.)
	1,000 VAC 50/60 Hz for 1 min between AC external and GR terminals (See Note 1.), leakage current: 10 mA max.					
Noise immunity	Conforms to IEC61000-4-4, 2 kV (power lines)					
Vibration resistance	10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s^2 in X, Y, and Z directions for 80 minutes (Sweep time 8 min ×10 = total time 80 min.) CPU Unit mounted to a DIN track: 2 to 55 Hz, 2.9 m/s^2 in X, Y, and Z directions for 20 minutes					
Shock resistance	147 m/s^2, 3 times each in X, Y, and Z directions					
Ambient operating temperature	0 to 55°C					
Ambient operating humidity	10% to 90% (with no condensation)					
Atmosphere	Must be free from corrosive gases.					
Ambient storage temperature	–20 to 75°C (excluding battery)					
Grounding	Less than 100 Ω					
Enclosure	Mounted in a panel.					

Item	Specifications	
Weight	All models are each 6 kg max.	
CPU Rack Dimensions (mm) (See note 3.)	2 slots: 198.5 × 157 × 123 (W x H x D) 3 slots: 260 × 130 × 123 (W x H x D) 5 slots: 330 × 130 × 123 (W x H x D) 8 slots: 435 × 130 × 123 (W x H x D) 10 slots: 505 × 130 × 123 (W x H x D)	
Safety measures	Conforms to UL, CSA, cULus, cUL, NK, Lloyd's, and EC directives.	Conforms to cULus

Note: 1. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Internal components will be damages if testing is performed with these terminals connected.

2. Only when mounted to a Backplane.

3. Depth is 153 mm for C200HW-PA209R.

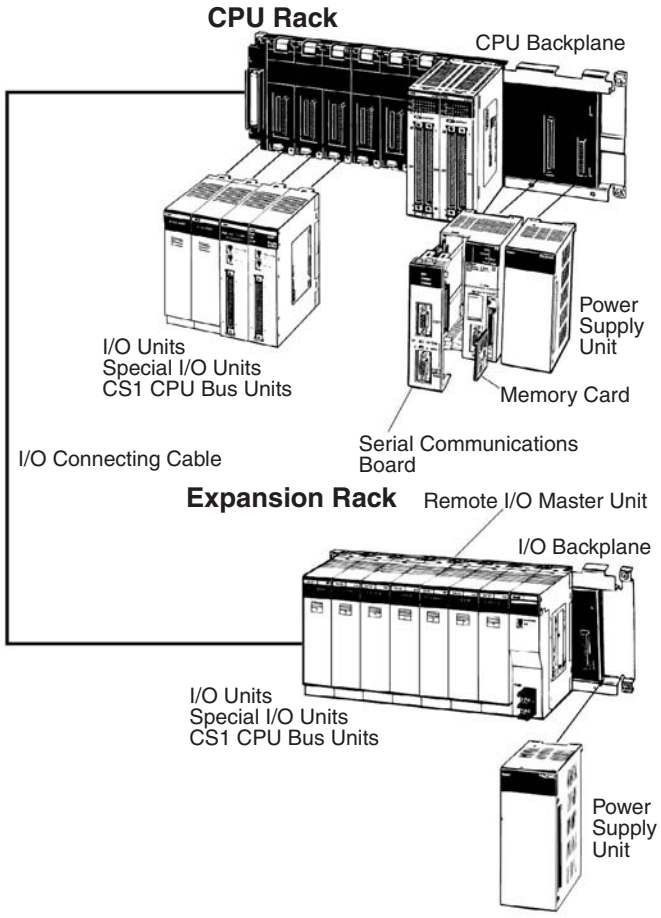
4. Enquire separately for general specifications of Process I/O Units.

Item	Specifications	
Power Supply Unit	CS1D-PA207R	CS1D-PD024
Supply voltage	100 to 120 VAC or 200 to 240 VAC, 50/60 Hz	24 VDC
Operating voltage range	85 to 132 VAC or 170 to 264 VAC	19.2 to 28.8 VDC
Power consumption	150 VA max.	40 W max.
Inrush current	30 A max. at100 to 120 VAC, 40 A max. at 200 to 240 VAC	30 A max.
Output capacity	7 A, 5 VDC (including CPU Unit power)	4.3 A, 5 VDC (including CPU Unit power)
	1.3 A, 26 VDC Total: 35 W	0.56 A, 26 VDC Total: 28 W
Output terminal	Not provided	
RUN output (See Note 2.)	Contact configuration: SPST-NO Switch capacity: 240 VAC, 2 A (resistive load) 120 VAC, 0.5 A (inductive load) 24 VDC, 2 A (resistive load) 24 VDC, 2 A (inductive load)	Not provided
Insulation resistance	20 MΩ min. (at 500 VDC) between AC external and GR terminals (See Note 2.)	20 MΩ min. (at 500 VDC) between DC external and GR terminals (See Note 2.)
Dielectric strength	2,300 VAC 50/60 Hz for 1 min between AC external and GR terminals (See Note 2.) Leakage current: 10 mA max.	1,000 VAC 50/60 Hz for 1 min between DC external and GR terminals, leakage current: 10 mA max. (See Note 2.)
	1,000 VAC 50/60 Hz for 1 min between AC external and GR terminals (See Note 2.) Leakage current: 10 mA max.	
Noise immunity	Conforms to IEC61000-4-4, 2 kV (power lines)	
Vibration resistance	10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s^2 in X, Y, and Z directions for 80 minutes (Sweep time 8 min ×10 = total time 80 min.)	
Shock resistance	147 m/s^2, 3 times each in X, Y, and Z directions	
Ambient operating temperature	0 to 55°C	
Ambient operating humidity	10% to 90% (with no condensation)	
Atmosphere	Must be free from corrosive gases.	
Ambient storage temperature	–20 to 75°C (excluding battery)	
Grounding	Less than 100 Ω	
Enclosure	Mounted in a panel.	
Weight	All models are each 6 kg max.	

Note: 1. Only when mounted to a CPU Backplane.

2. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Internal components will be damages if testing is performed with these terminals connected.

CS1G/CS1H Basic System Configuration



■ CPU Rack

A CPU Rack consists of a CPU Unit, Power Supply Unit, CPU Backplane, Basic I/O Units, Special I/O Units, and CPU Bus Units. The Serial Communications Board and Memory Cards are optional.

Note: The Backplane depends on the type of CPU Rack, Expansion I/O Racks, and Slave Racks that are used.

■ Expansion Racks

Both C200H and CS1 Expansion Racks can be used.

- C200H Expansion I/O Racks can be connected to CPU Racks, CS1 Expansion Racks, or other C200H Expansion I/O Racks.
- CS1 Expansion Racks can be connected to CPU Racks or other CS1 Expansion Racks.

An Expansion Rack consists of a Power Supply Unit, a CS1 or C200H Expansion I/O Backplane, Basic I/O Units, Special I/O Units, and a CS1 CPU Bus Units.

■ Long-distance Expansion Racks

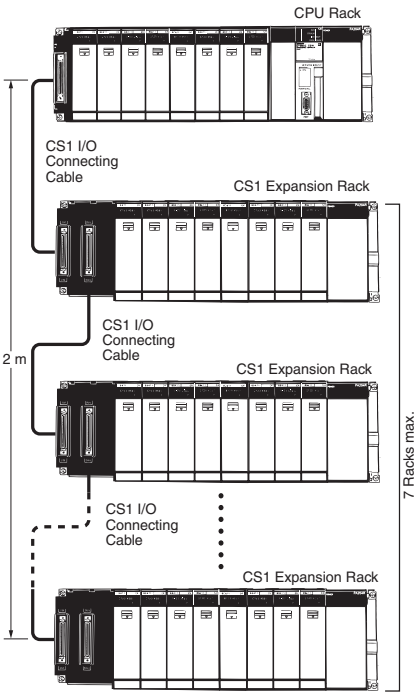
An I/O Control Unit and I/O Interface Units can be used to extend the normal limit of 12 m to 50 m for each of two series of CS1 Expansion Racks. The following Units can be mounted to Long-distance Expansion Racks: CS1 Basic I/O Units, CS1 Special I/O Units, and CS1 CPU Bus Units. (C200H Units cannot be mounted to Long-distance Expansion Racks.)

CS1G/CS1H Expansion Racks

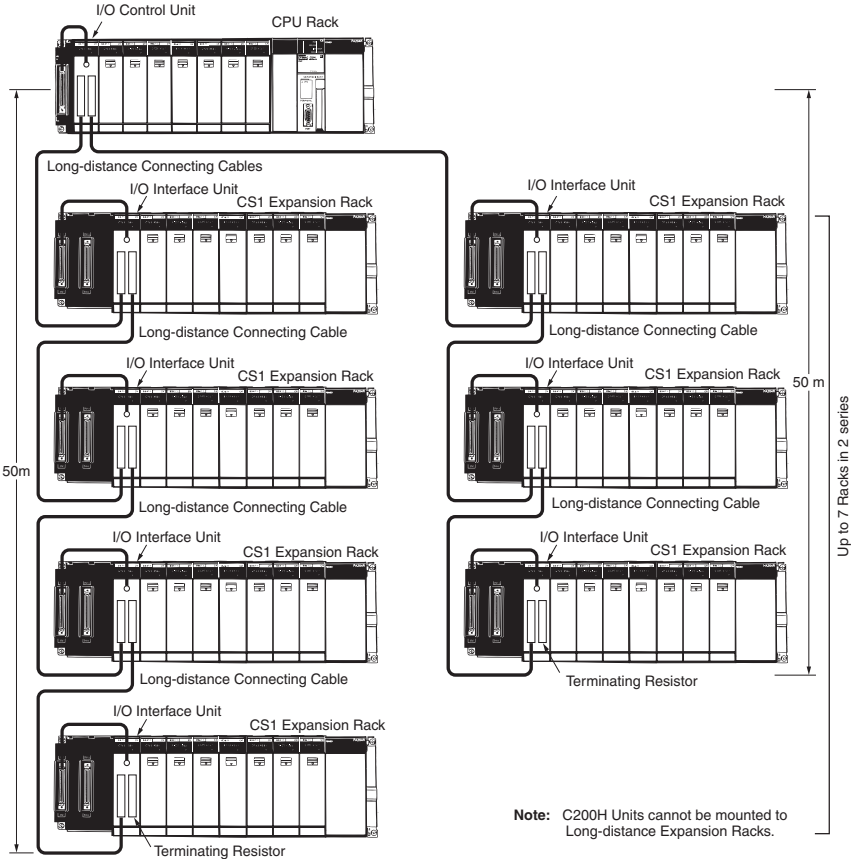
■ Expansion Rack Patterns

The following diagrams show the 5 possible patterns of Expansion Racks.

CPU Rack with CS1 Expansion Racks

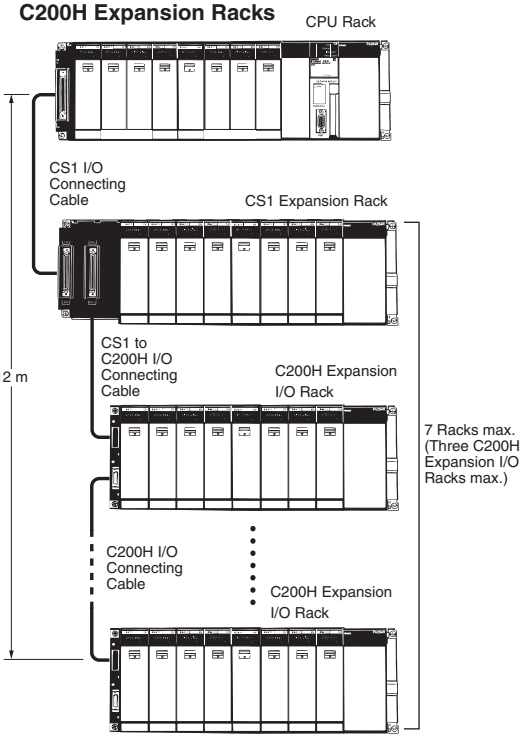


CPU Rack with CS1 Long-Distance Expansion Racks

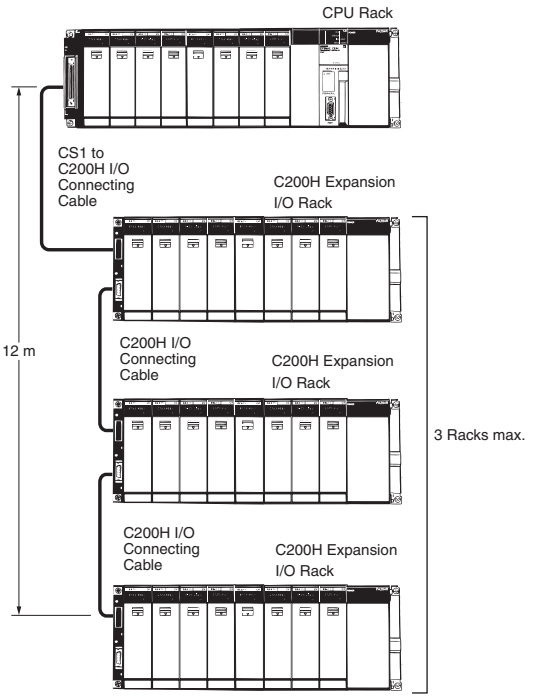


Note: C200H Units cannot be mounted to Long-distance Expansion Racks.

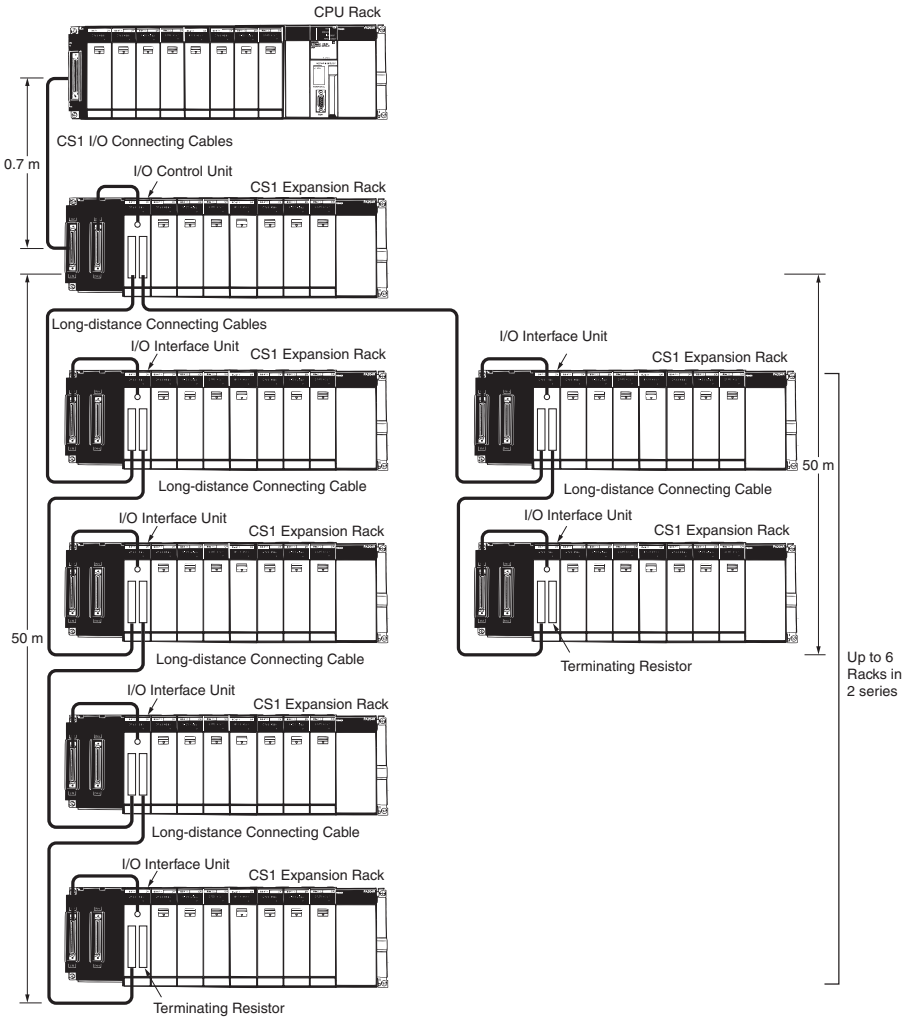
CPU Rack + CS1 Expansion Rack + C200H Expansion Racks



CPU Rack + C200H Expansion Racks



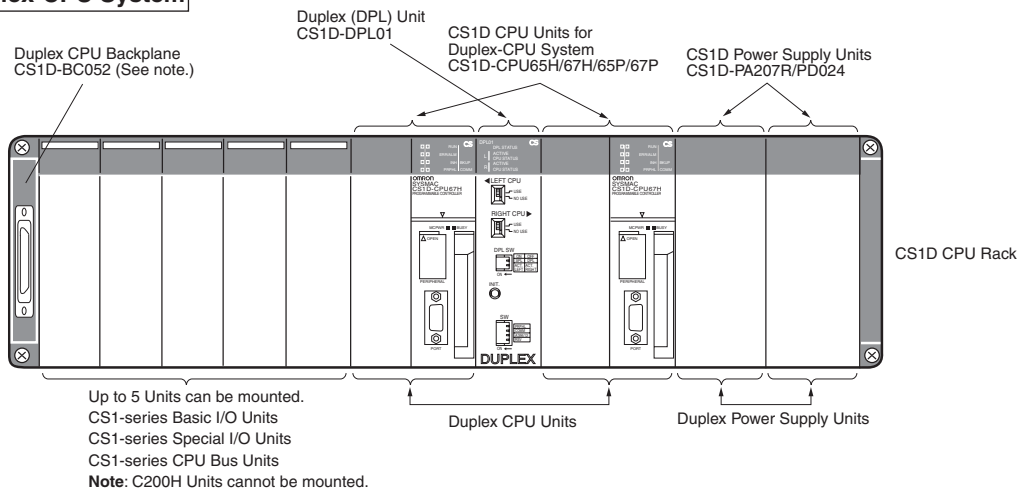
CPU Rack with CS1 Expansion Rack and CS1 Long-Distance Expansion Racks



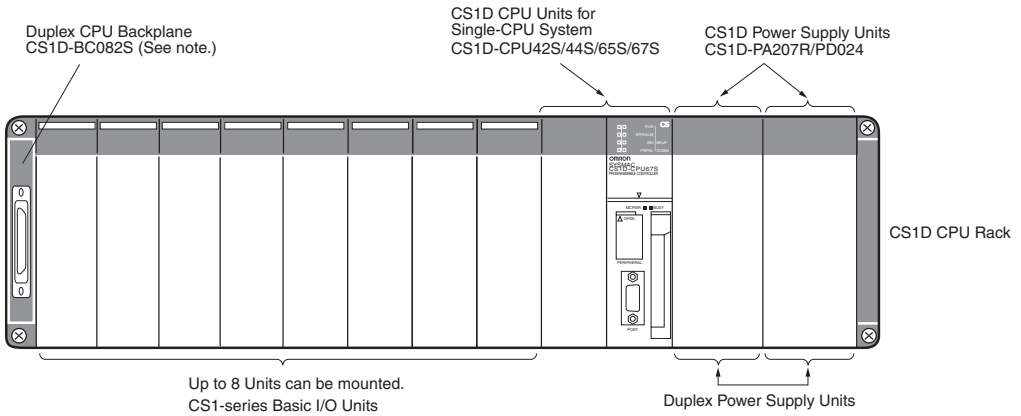
Note: C200H Units cannot be mounted to Long-distance Expansion Racks. (They can be mounted to the CS1 Expansion Rack with the I/O Control Unit mounted.)

CS1D System Configuration

Duplex-CPU System



Single-CPU System



CPU Rack

A CPU Rack consists of a Duplex CPU Backplane to which CPU Units, Power Supply Units, a Duplex Unit, CS1-series Basic I/O Units, CS1-series Special I/O Units, and CS1-series CPU Bus Units are mounted.

Memory Cards and Inner Boards to mount in the CPU Units are optional. (Inner Board cannot be mounted to the CS1D-CPU□□H/P)

The CPU Units, Power Supply Units, Duplex CPU Backplane, and Duplex Unit are all designed specifically for CS1D PLCs.

Note: Different Backplanes are used for the CPU Rack and Expansion Racks. Be sure to use the correct Backplane.

Expansion Racks

An Expansion Rack consists of an Expansion Backplane to which Power Supply Units, CS1-series Basic I/O Units, CS1-series Special I/O Units, and CS1-series CPU Bus Units are mounted.

The Power Supply Units and Expansion Backplane are designed specifically for CS1D PLCs.

CS1-series Expansion Backplanes and C200H Backplanes cannot be connected.

Long-distance Expansion Racks

A Long-distance Expansion Rack consists of an Expansion Backplane to which an I/O Interface Unit, CS1-series Basic I/O Units, CS1-series Special I/O Units, and CS1-series CPU Bus Units are mounted. An I/O Control Unit is used to connect to the Long-distance Expansion Racks.

Using Long-distance Expansion Rack increases the normal limit of 12 m for the Rack to 50 m.

CS1D PLCs

With a CS1D Duplex-CPU System, two CPU Units can be mounted to the CPU Rack for Duplex Mode operation (Duplex Mode), or just one CPU Unit can be mounted for Simplex Mode operation. In either case, a Duplex Unit is required.

With a CS1D Single-CPU System, just one CPU Unit is mounted and a Duplex Unit is not required.

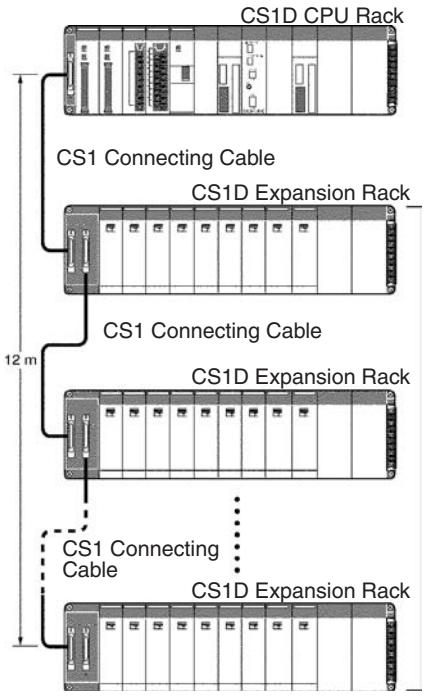
Also, two Power Supply Units can be mounted to any Rack to increase redundancy. (Racks can also be operated with only one Power Supply Unit.) With any of these combinations, there are no further restrictions if the system configuration, e.g., the same number of Expansion Racks can be used as with the other CS1-series PLCs.

Note: C200H Basic I/O Units, C200H Special I/O Units, and C200H CPU Bus Units cannot be mounted on any Rack.

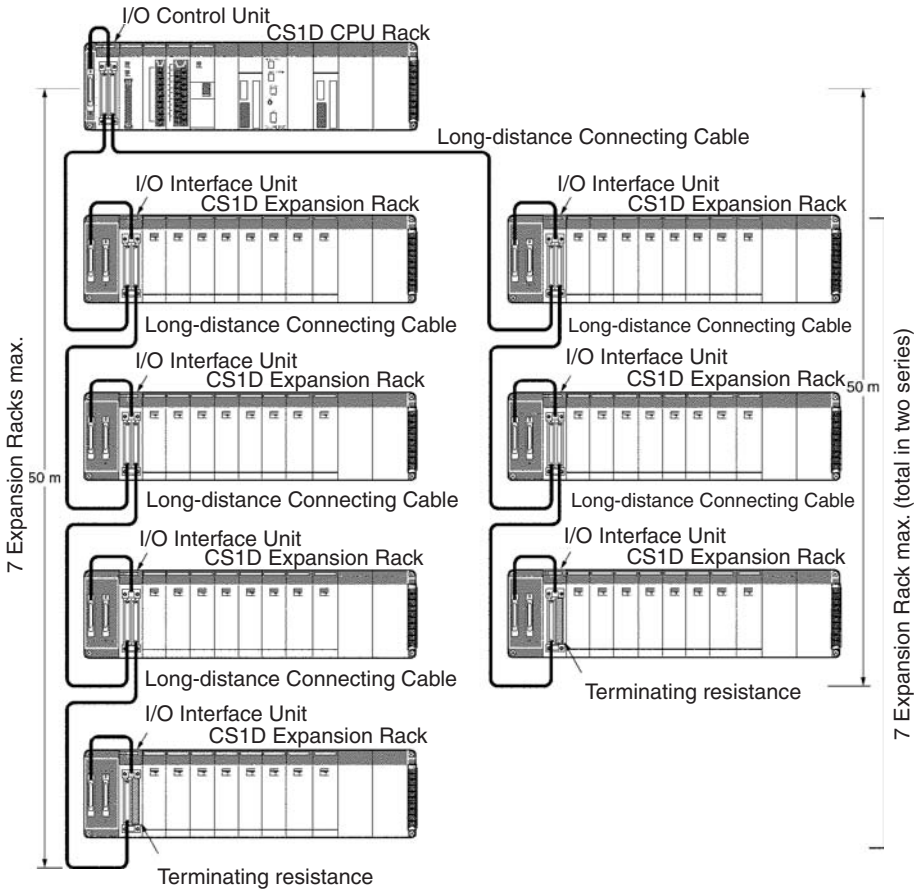
CS1D Expansion Rack Patterns

There are two patterns that can be used.

CPU Rack + Expansion I/O Racks

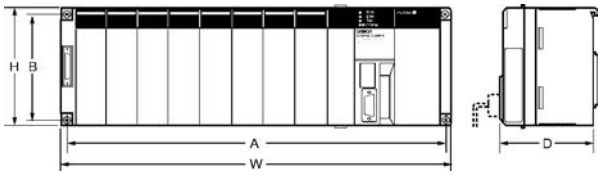


CPU Rack + Long-distance Expansion Racks



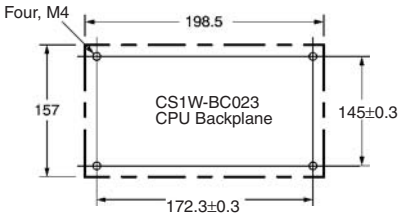
Mounting Dimensions

■ Dimensions



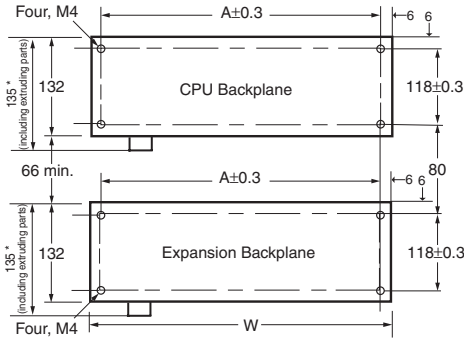
■ Backplanes

CPU Backplane with 2 Slots



Note: Expansion Backplanes cannot be connected to 2-slot CPU Backplanes.

CPU Backplane with 3, 5, 8, or 10 Slots



* The CS1D Backplane does not have any extruding parts.

Unit: mm

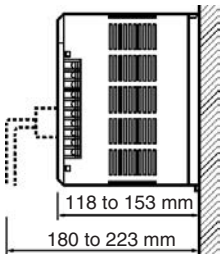
Backplane	Model	A	W
CPU Backplanes	CS1W-BC022/023 (2 slots)	172.3	198.5
	CS1W-BC032/033 (3 slots)	246	260
	CS1W-BC052/053 (5 slots)	316	330
	CS1W-BC082/083 (8 slots)	421	435
	CS1W-BC102/103 (10 slots)	491	505
	CS1D-BC052 (for Duplex-CPU Systems)		
	CS1D-BC082S (for Single-CPU System)		
CS1 Expansion Backplanes	CS1W-BI032/033 (3 slots)	246	260
	CS1W-BI052/053 (5 slots)	316	330
	CS1W-BI082/83 (8 slots)	421	435
	CS1W-BI102/103 (10 slots)	491	505
	CS1D-BI092 (for CS1D PLC)		
C200H Expansion I/O Backplanes	C200HW-BI031 (3 slots)	175	189
	C200HW-BI051 (5 slots)	245	259
	C200HW-BI081-V1 (8 slots)	350	364
	C200HW-BI101-V1 (10 slots)	420	434

Unit: mm

Backplane	A	B	W	H	D
CS1W-BC022/023 (2 slots)	172.3	145	198.5	157	123
CS1W-BC032/033 (3 slots)	246	118	260	132	
CS1W-BC052/053 (5 slots)	316		330		
CS1W-BC082/083 (8 slots)	421		435		
CS1W-BC102/103 (10 slots)	491		505		
CS1D-BC052 (for Duplex-CPU System)					
CS1D-BC082S (for Single-CPU System)					

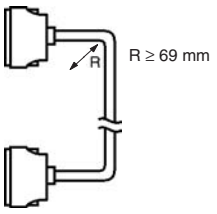
■ Mounting Height

The height of all Racks is from 118 to 153 mm depending on the Units that are mounted. Additional height is required to connect Peripheral Devices and Cables. Be sure to allow sufficient mounting height in the control panel containing the PLC.

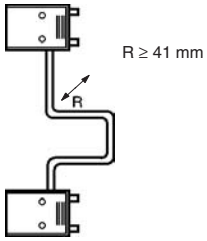


Note: I/O Connecting Cables are 12 m long max. and require sufficient space to maintain the min. bending radius.

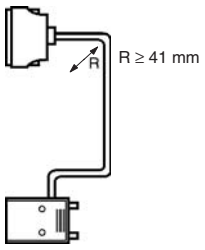
CS1 I/O Connecting Cable
(Cable diameter: 8.6 mm)



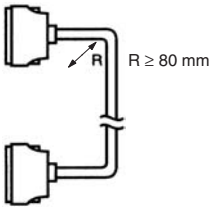
C200H I/O Connecting Cable
(Cable diameter: 5.1 mm)



CS1 to C200H I/O Connecting Cable
(Cable diameter: 5.1 mm)



Long-distance Connecting Cable
(Cable diameter: 10 mm)



CS1-series Features

Better Basic Performance

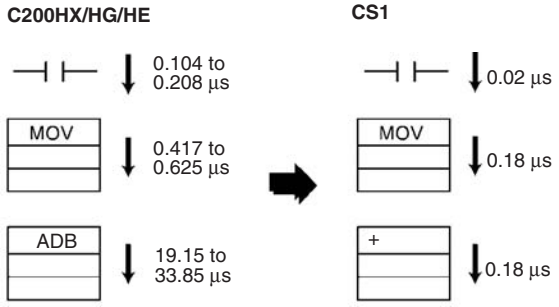
Large Program, Memory, and I/O Capacity; High-speed Instructions and Peripheral Servicing

■ Better Machine Performance with High-speed Processing

CS1 PLCs provide ample speed for advanced machine interfaces, communications, and data processing.

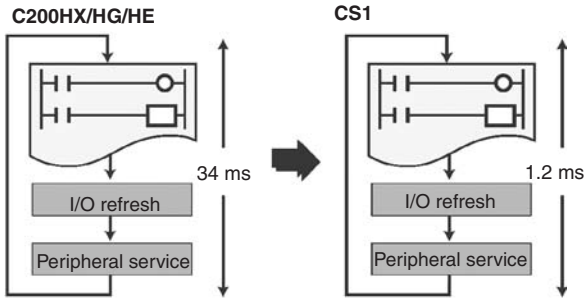
Execution Times from 20 ns

Faster instruction processing includes 0.02 μs for LD and 0.18 μs for MOV. And special instructions are processed almost as fast as basic ones (e.g., as fast as 0.18 μs for some instructions).



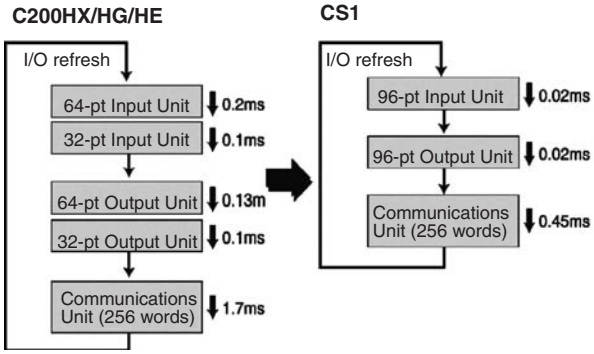
30 Times the Overall Cycle Speed

The following examples are for 30K-step programs (basic instructions: 50%; MOV instructions: 30%; arithmetic operation instructions: 20%).



4 Times the Peripheral Servicing and I/O Refresh Speed

CS1 refresh time for 96 input points: 0.02 ms (15 times faster)
For 96 output points: 0.02 ms (10 times faster)
For 256 words for Communications Unit: 0.45 ms (4 times faster)

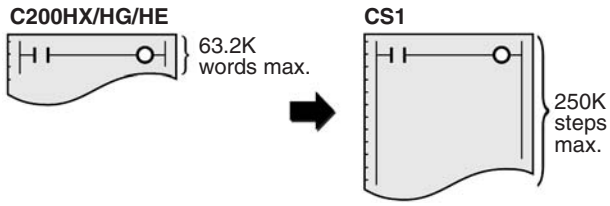


■ Large Capacities to Do the Job

CS1 PLCs also provide ample capacity for advanced machine interfaces, communications, and data processing.

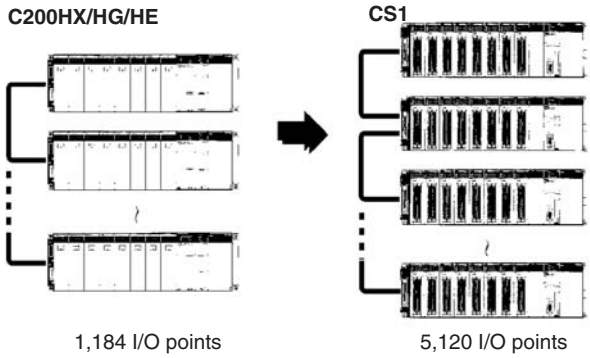
4 Times the Program Capacity

Create programs with up to 250K steps.



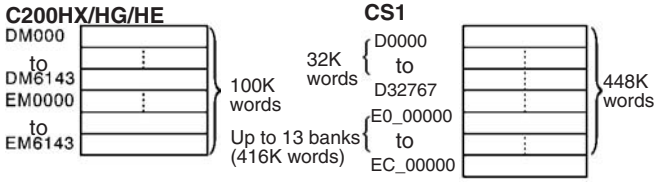
4.3 Times the I/O Capacity

Handle up to 5,120 I/O points.



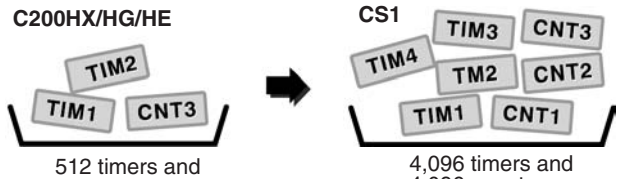
4.5 Times the Data Memory

Use up to 448K words of data memory (word data).



16 Times the Number of Timers/Counters

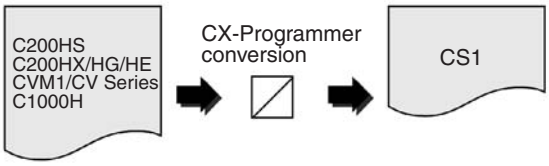
Program up to 4,096 timers and 4,096 counters.



CS1-series Features

■ Use Legacy Programs

The CX-Programmer can be used to convert programs from other OMRON PLCs.



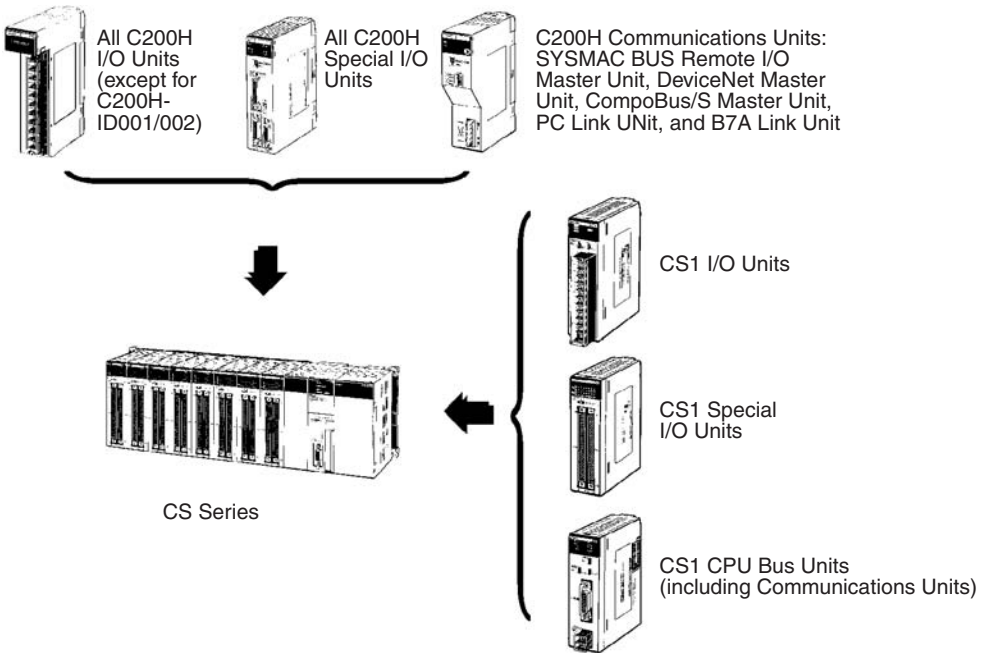
■ Large Capacity Data Handling with Each Instruction

The basic operand specifications have been converted from BCD to binary to increase data handling capacity.

Item	C200HX/HG/HE	CS1
Block transfers	0 to 6655 words	0 to 65535 words
Indirect addressing range	DM 00000 to DM 9999	D00000 to D32767

■ Use C200H Units with CS1G/CS1H PLCs

All of the I/O Units and Special I/O Units and a portion of the Communications Units used for the C200H, C200HS, and C200HX/HG/HE can be used, as can C200HX/HG/HE Expansion I/O Racks. (Only CS1 Units can be used on long-distance Expansion I/O Racks using I/O Control Units or I/O Interface Units.)



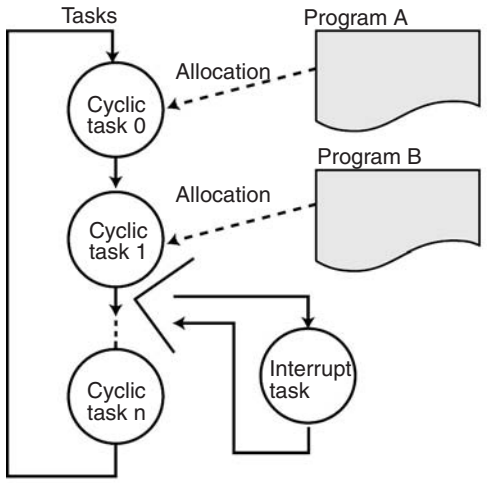
Note: There are restrictions in data transfers with the CPU Unit for CIO and DM Area specifications (e.g., addresses of transfer source or transfer destination) for the C200H Special I/O Units, as well as in data transfers programmed from these Units (e.g., using PC READ or PC WRITE instructions). Refer to CS1 PLC manuals (in particular, information on restrictions in using C200H Special I/O Units) for details, including the following.

Better Design/Development Efficiency

Structured Programming and Team Program Development with Tasks

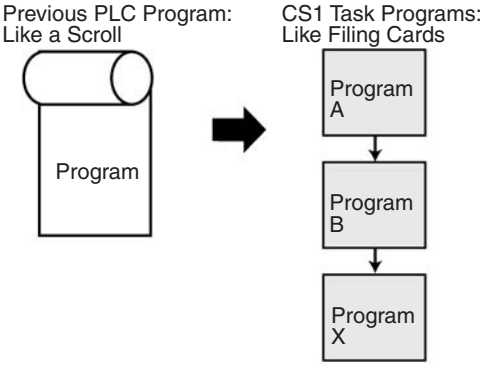
■ Task Programming

With CS1 PLCs, programs can be divided into programming units called tasks. There are both cyclic tasks, which are executed each cycle in a specified order, and interrupt tasks, which are executed when an interrupt occurs.



Comparison to Previous PLCs

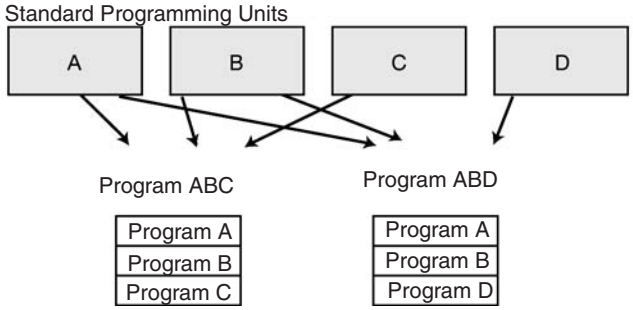
Although previously a PLC program was something like one long scroll, task programs more like separate cards arranged in order of execution.



Advantages

Program Standardization

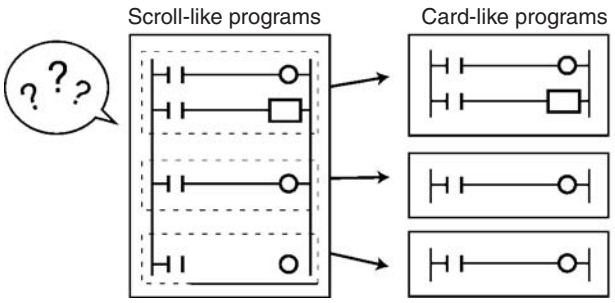
Task programs are created in units divided by functionally by purpose. These functional units can be easily reused when programming new PLCs or systems with the same functionality.



Easier-to-understand Programs

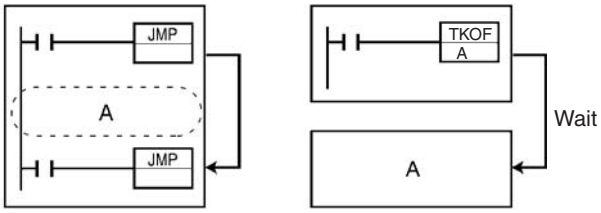
With scroll-like programs, individual functional units are extremely difficult to find just by looking at the program.

Tasks are used to separate a program functionally and make the program much easier to understand.



Shorter Cycle Times

With a scroll-like program, many jump and similar instructions had to be used to avoid executing specific parts of the program. This not only slows down the programs, but makes them more difficult to understand. With task programming, special instructions enable controlling the execution of tasks so that only the require tasks are executed during any particular cycle.

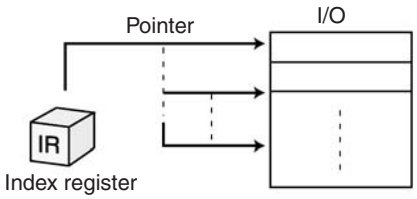


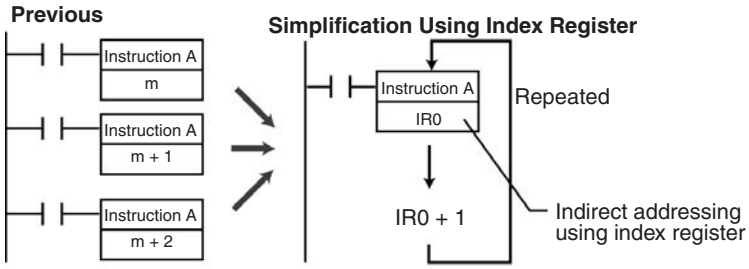
Simple, Easy-to-Understand Programs

Index Registers, Table Data, Repeat Instructions, Block Programs, Text Strings, and More.

■ Simplify Programs with Index Registers

Index registers can be used as memory pointers to enable easily changing the addresses specified for instructions. Using an index register can often enable one instruction to preform the processing previously performed by many instructions.



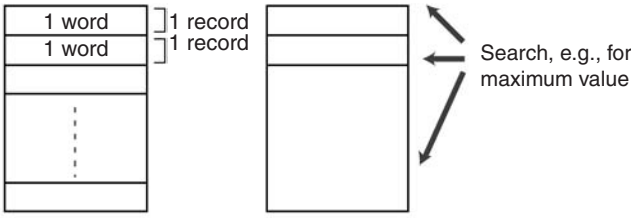


■ Easily Handle Table Data

Table Data Instructions

One-word Records

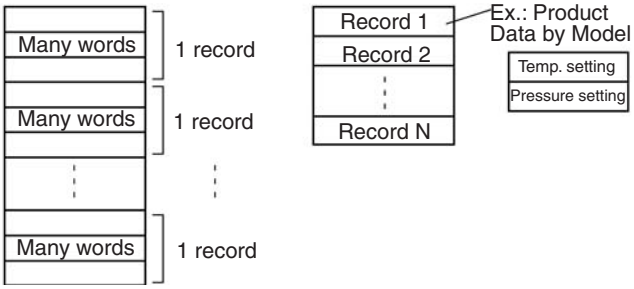
Instructions are provided to find the maximum value, minimum value, and search values.



Multi-word Records

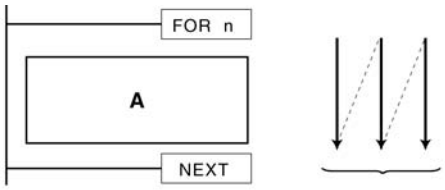
Areas of memory can be defined as tables with the specified record size (words). Index registers can be used with such tables to easily sort records, search for values, or otherwise process the records in the table.

For example, the temperature, pressure, and other settings for each model of a product can be set in separate records and the data handled by record.



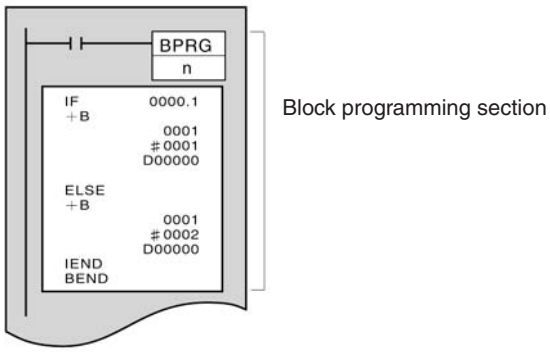
■ Easily Repeat Processing

Instructions are provided that let you easily repeat sections of the program. Repeat execution can also be ended for a specified condition.



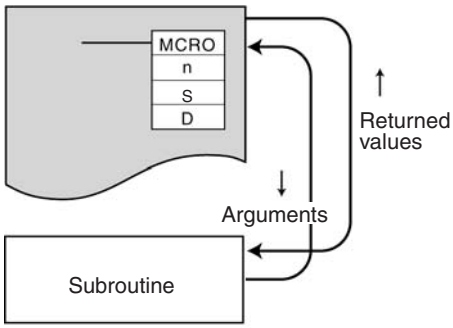
■ Easily Program Logic Flow Control with Block Programming Sections

A block of mnemonic programming instructions can be executed as a group based on a single execution condition. IF/THEN, WAIT, TIMER WAIT, and other instructions can be used inside the block programming section to easily program logic flow control that is difficult to program with ladder diagrams.



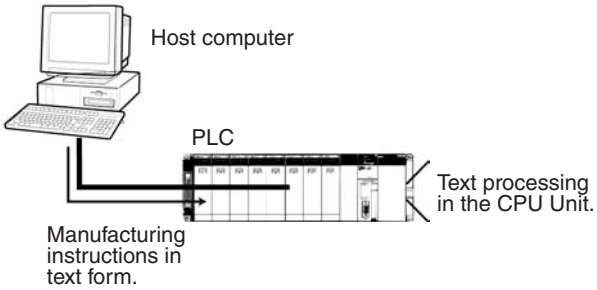
■ Macro (MCRO) Instruction

Macro instructions can be used to execute the same subroutine program with different operands from different locations in the programs (subroutine instruction with argument).



■ Easily Handle Text Strings

Manufacturing instruction can be obtained from a host computer or other external source, stored in memory, and then manipulated as text strings as required by the applications. The text strings can be searched, fetched, reordered, or other processed in the CPU Unit of the PLC.



Maintenance and Management

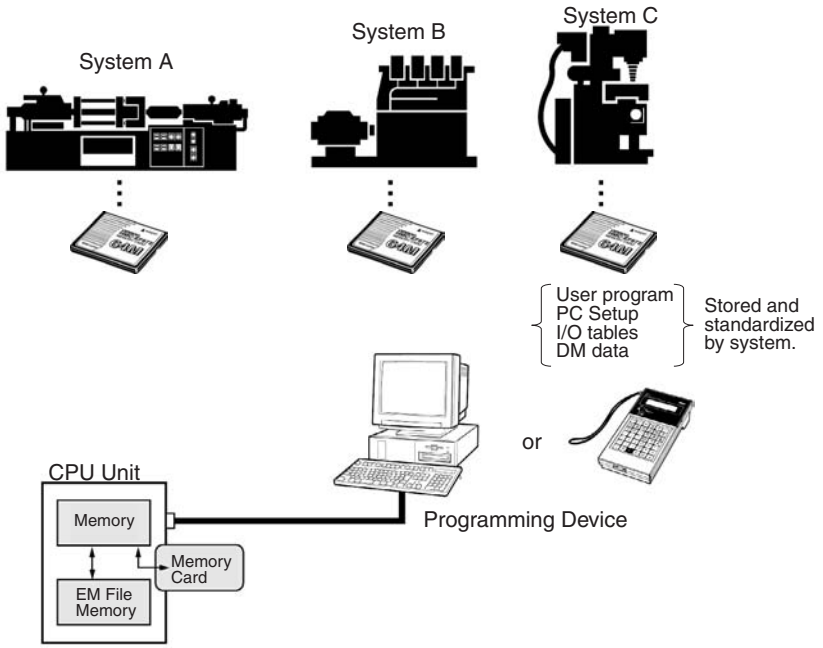
Use Memory Cards to Handle Files Containing Various Types of Data

■ File Applications

Manipulate PLC File Data Using Windows Files

- The user program, parameters, I/O memory, names, I/O comments, and block comments can all be handled as file data. File data can be used to standardize programs and initialization data for each system, and comments can be stored as file data on Memory Cards.
- The CX-Programmer or a Programming Console can be connected to a CS1 PLC to transfer files between the CPU Unit's memory and Memory Cards (or EM File Memory).
- As Windows files, file icons can be dragged and dropped to a Memory Card or computer storage device to easily copy the files.

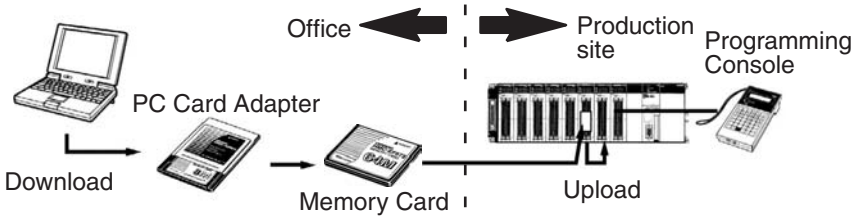
Note: A Memory Card Adapter can be used to mount Memory Cards into a PC card slot on a computer to use them as computer storage devices.



Handle File Data Onsite with Programming Consoles

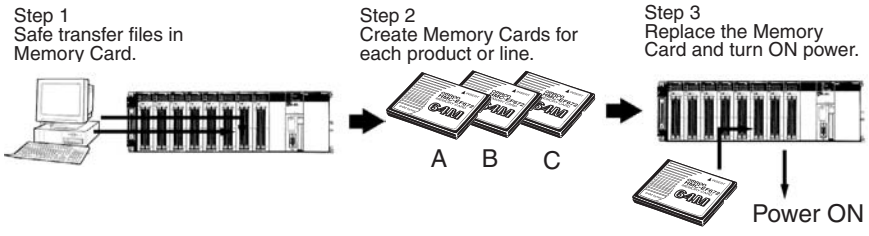
- A Programming Console can be connected to the PLC to transfer files between the CPU Unit's memory and Memory Cards (or EM File Memory).
  A Programming Console and Memory Cards are all you need to change data onsite.

Note: Program and setup data can be easily backed up onsite using only the CPU Unit, without a Programming Device. Also, programmed replacement of programs designated in Memory Cards is also possible without a Programming Device.



Change Program Simply by Changing Cards

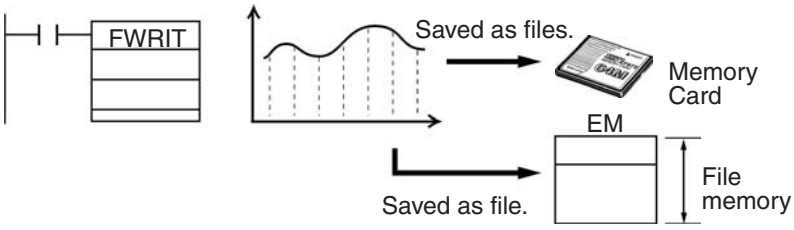
- File data can be automatically transferred from Memory Card to the CPU Unit when power is turned ON, enabling Memory Cards to be used for operation in the same way as is possible with ROM.



Manipulate Files During Operation

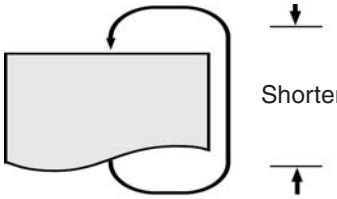
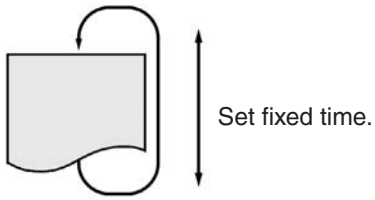
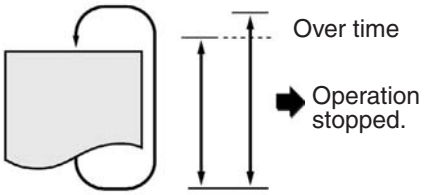
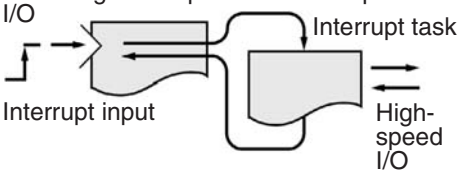
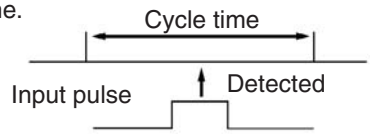
- File read and write instructions can be used during operation to transfer files between the CPU Unit's memory and Memory Cards (or EM File Memory). Trend data, quality control data, other data from memory can be stored during operation in Memory Cards or EM File Memory.

Note: With EV1-version CPU Units, CSV and text files can be saved, and programmed file operations, such as file name changes and deletions, are also possible.

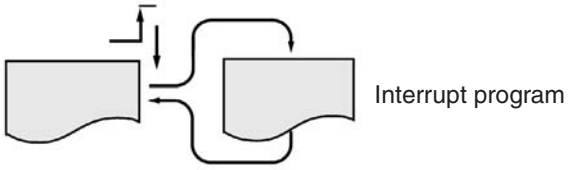
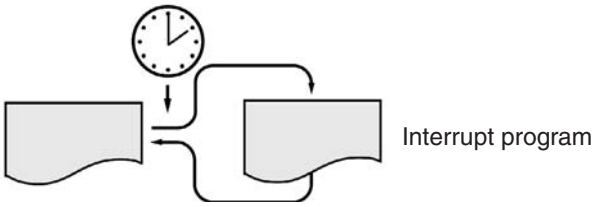
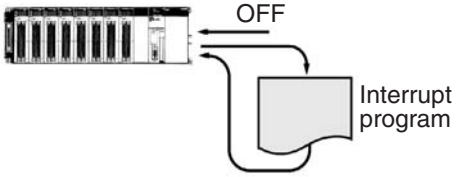
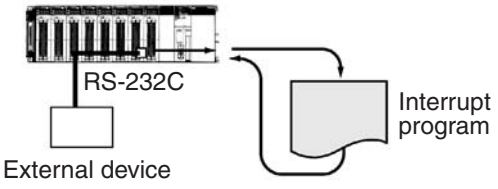


■ A Wide Range of Special Functions

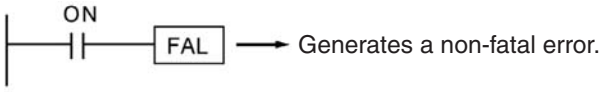
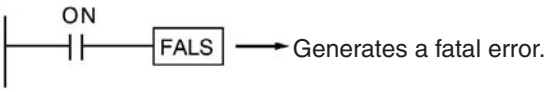
Cycle Time Functions

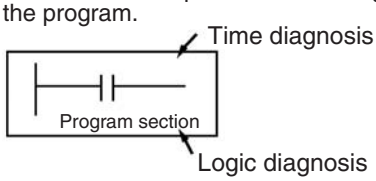
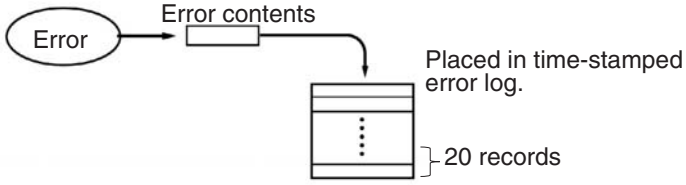
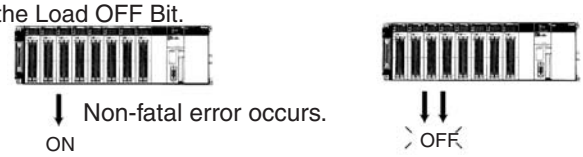
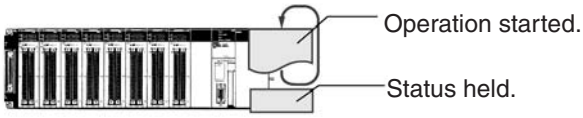
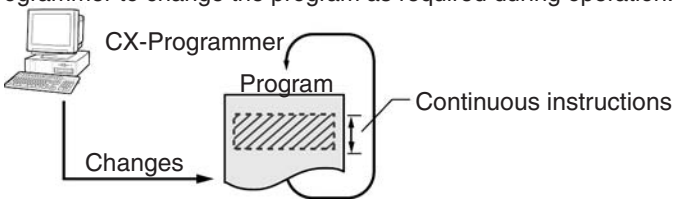
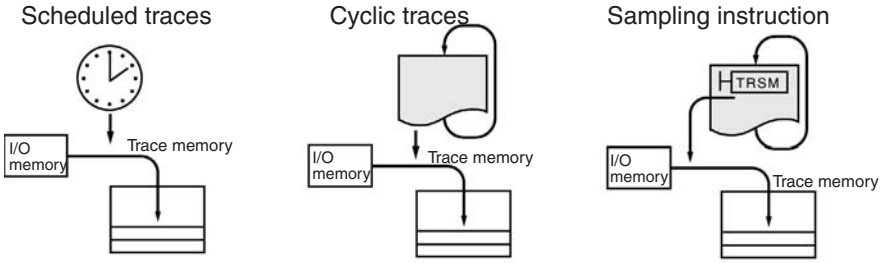
Requirements	Solutions
Reducing the cycle time 	• Place tasks that are not being executed on standby. • Create subroutines for portions of tasks executed only under special conditions. • Disable cyclic refreshing for Special I/O Units when not required each cycle.
Eliminating deviations in I/O response time	• Set the cycle time to a fixed time. 
Stopping operation for long cycle times 	• Use the cycle time monitoring function to stop operation when the cycle time is too long.
Reducing I/O response time for specific I/O 	• Use an I/O interrupt task to execute an interrupt program when a specific input turns ON and then directly refresh external I/O when the appropriate instruction is executed in the interrupt program. External I/O can be directly refreshed either by using immediate refreshing for instruction operands or by using the IORF instruction to refresh all or a specified portion of external I/O.
Inputting signals (e.g., from photomicro-sensors) that are shorter than the cycle time. 	• Use the high-speed pulse input function of the C200H High-density I/O Units (C200H Special I/O Units). These Units can detect 1-ms or 4-ms pulses (except C200H-OD501/OD215.) • Use the IORF instruction to refresh inputs during program execution to further increase processing speed.

Interrupt Functions for CS1G/CS1H PLCs

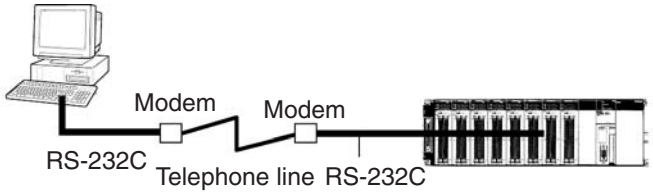
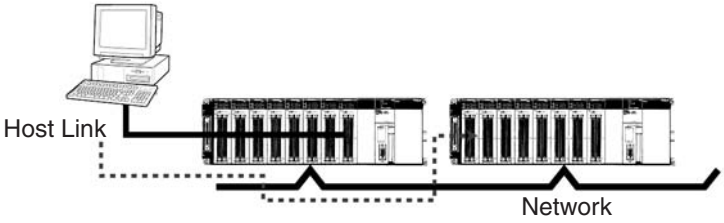
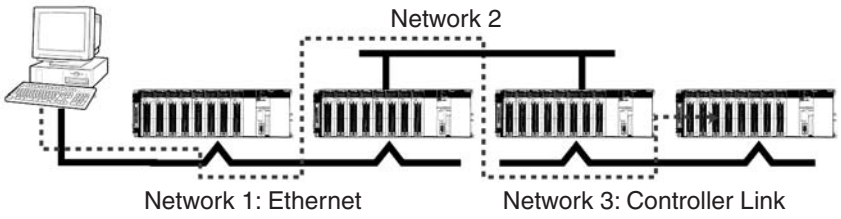
Requirements	Solutions
Executing programming without being affected by the cycle time	• Use I/O interrupt tasks to execute interrupt programs when specific inputs turn ON. 
Monitoring operating conditions at a specific interval	• Use a scheduled interrupt task to execute an interrupt program at a specific interval. 
Executing emergency processing for power interruptions 	• Use the power OFF interrupt task to execute an interrupt program before the CPU stops. Immediate refreshing can be used inside this interrupt program to refresh specified outputs. (CS1G/CS1H only)
Generating CPU Unit interrupts when data is received from a serial port	• Use an interrupt from the Serial Communications Board to execute an interrupt program when a specific messages received by the Board. (CS1G/CS1H only) 

Maintenance and Debugging Functions

Requirements	Solutions
Creating a user-defined error for specific conditions (e.g., errors or specific signals from the controlled system) but allow the CPU Unit to continue running.	• Use the FAL instruction to create a non-fatal user-defined error. An entry can also be left in the error history when the error occurs.  • FAL can also be used just to leave error history records for specific conditions that are not necessarily errors.
Creating a user-defined error for specific conditions (e.g., errors or specific signals from the controlled system) and stop the CPU Unit as a result.	• Use the FALS instruction to create a fatal user-defined error. An entry can also be left in the error history when the error occurs.  • FALS can also be used to automatically stop operation for specific conditions that are not necessarily errors.

Requirements	Solutions
Determining if a specific output turns ON within a specified time after an input turns ON, generating an error if the output does not turn ON, and determining the address in the program responsible for the output not turning ON.	• Use the FPD instruction to perform time or logic diagnosis of a specified portion of the program. 
Creating a history of user-defined and system errors that have occurred.	• Use the error log to record up to 20 time-stamped error records.
Creating an external output when a non-fatal error occurs.	• Use the Non-fatal Error Flag. 
Turning OFF all output from Output Units for specific conditions. Turning OFF all output from Output Units during trial system operation.	• Use the Load OFF Bit. 
Maintaining I/O memory status when starting operation	• Use the I/O memory hold function to start program execution with the same I/O memory status as the last time the program was executed. 
Correcting the program during operation	• Use the CX-Programmer to change the program as required during operation. 
Sampling specified I/O memory bits or word data. • Scheduled sampling • Sampling once per cycle • User-defined sampling	• Use the data tracing function. 

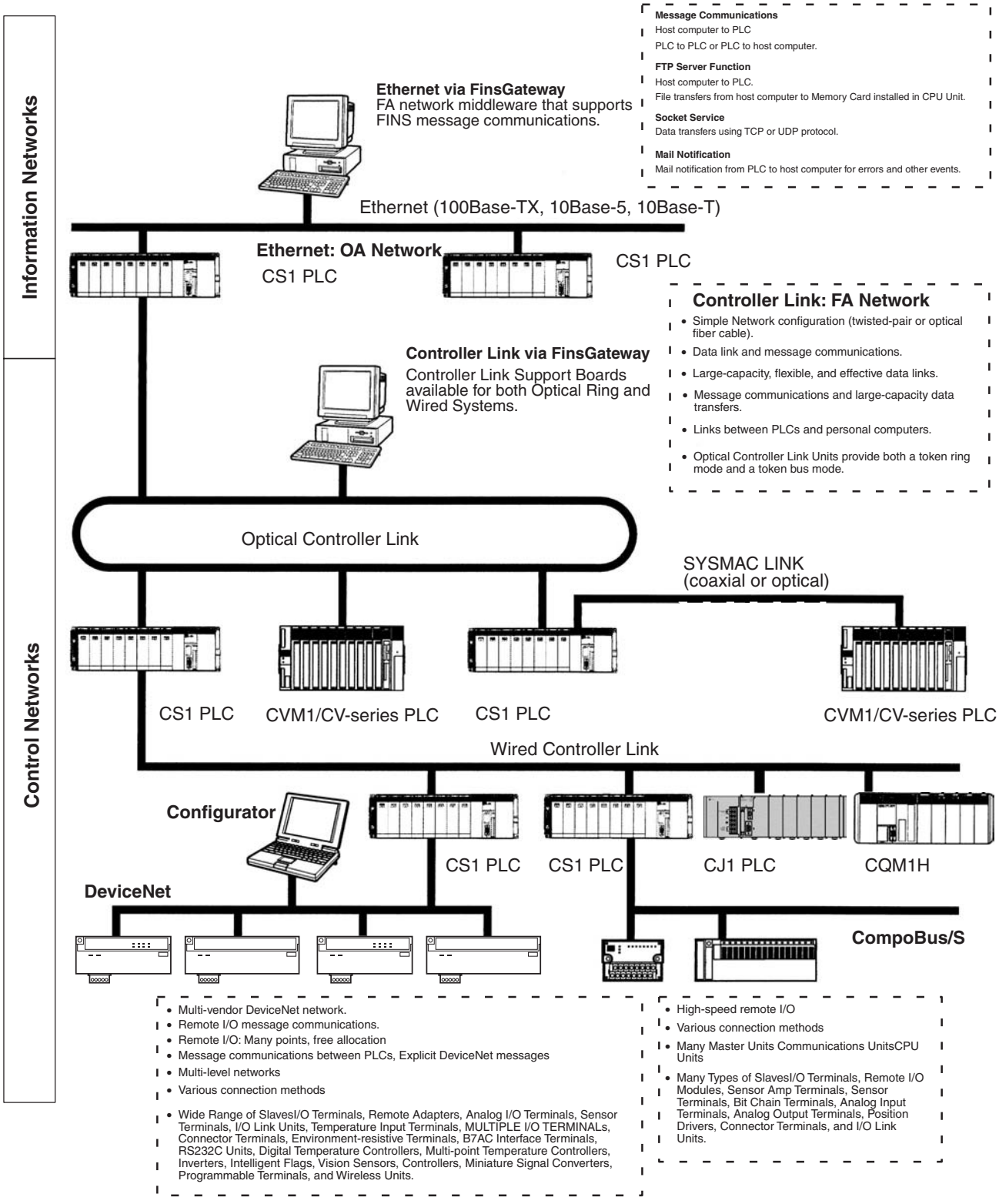
■ Remote Programming and Monitoring

Requirements	Solutions
Monitoring and editing online for remote PLCs using telephone lines	• Perform online programming and monitoring from a CX-Programmer running on a computer connected to the PLC via a modem. 
Monitoring and editing online from the CX-Programmer for a remote PLC connected to a network	• Use a Serial Communications Board or Unit, connect to a PLC via a modem, use an instruction to switch to host link mode, and then program or monitor from the CX-Programmer. (It's not necessary to cut the connection during the procedure.) • Use the host link gateway function to program or monitor any PLC connected to a Controller Link or Ethernet Network to which the PLC connected to the computer running the CX-Programmer is connected (via RS-232C). 
Programming and editing a PLC on a remote network	• Use the gateway function to edit any PLC connect to a network up to two networks away (3 networks including the local network). For example, a PLC on the Controller Link Network shown below can be accessed from the CX-Programmer running on a computer connected to a PLC on the Ethernet Network. 

Seamless Communications between Information and Control Systems

■ Seamless Network Communications

Network hierarchies stretch from component networks through top-level Ethernet networks and, with FINS commands, provide seamless inter-network communications. Multi-vendor support is also now better than ever before.

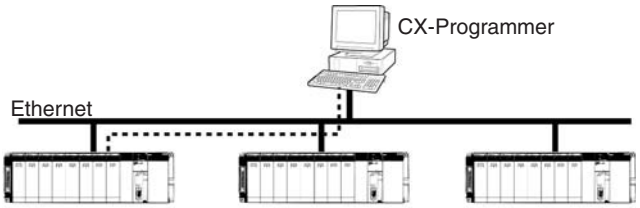


■ Ethernet: Information Network

Use an Ethernet Network to organically link production management with the production site using various communications services.

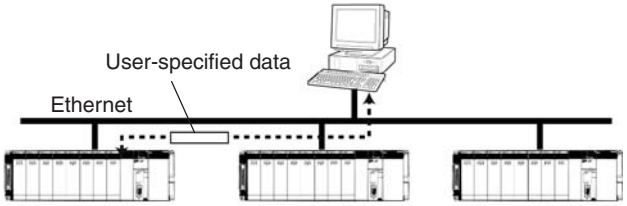
Remote Programming and Monitoring

CX-Programmer running on a computer connected to the Ethernet Network can be used to program and monitor all the PLCs connected to the Ethernet Network.



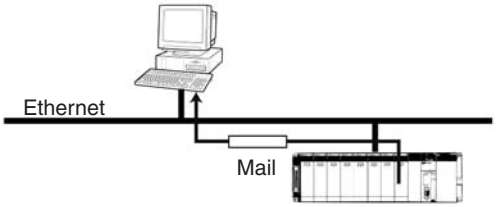
Socket Service

Transfer data using either UDP or TCP protocol.



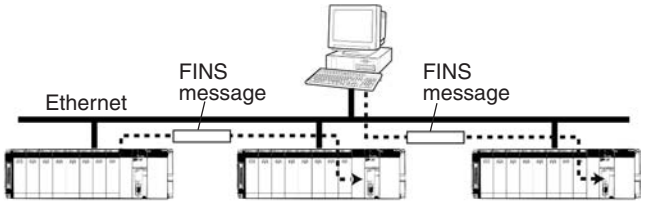
Mail Service

Send electronic mail from the PLC to a host computer when a flag turns ON, when an error occurs, or at scheduled times.



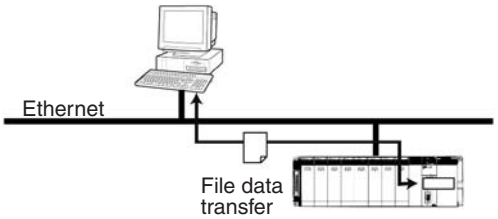
FINS Message Service

Send FINS message between PLCs or between PLCs and host computers. The Ethernet FinsGateway can be used to handle messages from applications without having to program FINS commands directly.



FTP Service

Use the FTP to transfer files between Memory Cards in the CPU Unit and computer memory.



■ Controller Link and SYSMAC LINK: Control Networks

Controller Link or SYSMAC LINK can easily connect PLCs at the factory site in a fully functional FA network.

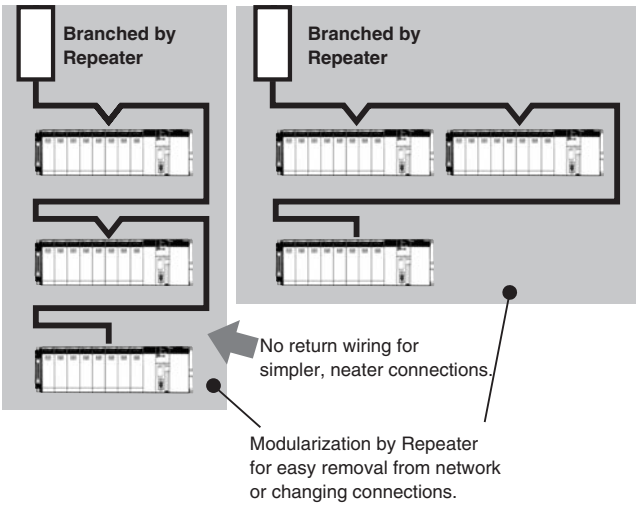
Controller Link:
Easy Network Construction with Twisted-pair or Optical Cables – Use Either H-PCF Cables or GI Cables for Optical Ring Systems

SYSMAC LINK:
Easy Network Construction with Coaxial or Optical Cables

Repeater Units Enable T-branch Wiring, Extension, Expansion, or Optical Sections in Networks

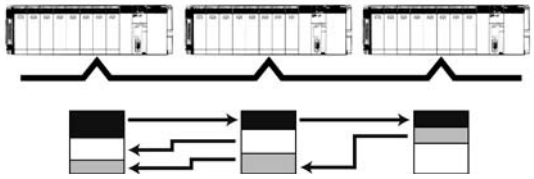
More Flexibility in Wiring for Layout, Construction, and Expansion Using T-branches

Repeater Units can be used for branching, making complicated wiring paths unnecessary. This method reduces wiring labor, and modularization of equipment into Repeater Units.



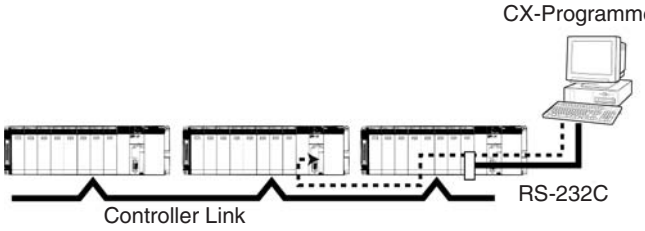
Data Links

Efficient, large-capacity data links can be flexibly created between PLCs and between PLCs and host computers. The Controller Link FinsGateway can be used to handle data links from applications without having to program FINS commands directly.



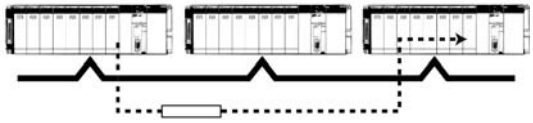
Remote Programming and Monitoring

CX-Programmer connected via RS-232C can be used to program and monitor PLCs on the Controller Link Network.



FINS Message Communications

Large volumes of data can be transferred between PLCs and host computers whenever necessary. The Controller LInk FinsGateway can be used to handle messages from applications without having to program FINS commands directly.

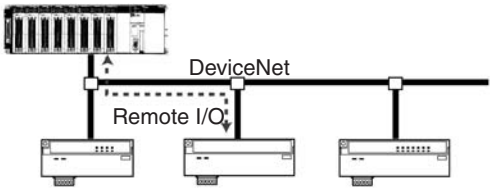


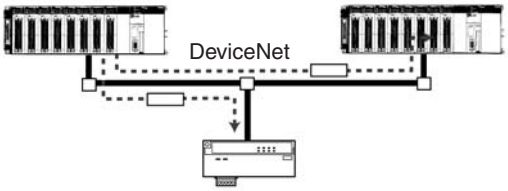
■ DeviceNet: Component Network

Create a multi-vendor network for multibit communications for lower-level PLCs that need to handle both control signals and data.

Remote I/O Communications

Large-capacity remote I/O can be freely allocated according to application needs.





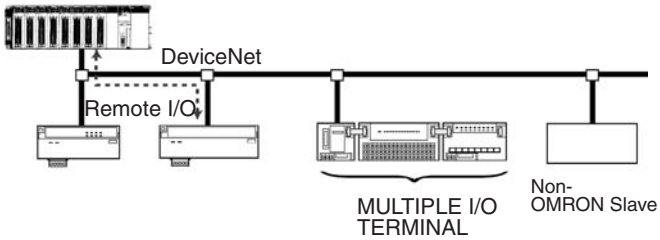
Use MULTIPLE I/O TERMINALs as DeviceNet Slaves

I/O can be expanded through one-step connections. Special I/O and explicit messages are also supported.

Select from a Wide Range of Slaves (Connection Possible to Data-intensive Devices)

Connect contact I/O, analog I/O, temperature inputs, sensor (photoelectric or proximity) inputs, and small PLCs (e.g., CQM1).

Connect to DeviceNet Products from Other Manufacturers



Message Communications

Send FINS messages between OMRON PLCs and Explicit message between OMRON PLCs and devices from other makers.

■ CompoBus/S: High-speed ON/OFF Bus

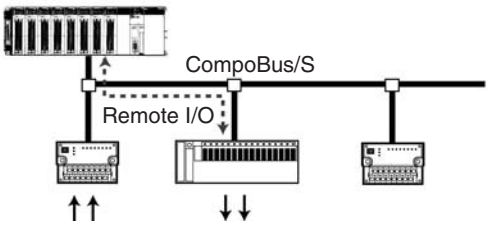
Create a high-speed remote I/O system connected under a PLC to reduce wiring to sensors and actuators in machines.

High-speed or Long-distance Communications (Switchable)

- High-speed Mode (previous mode):
  750 Kbps, 100 m with 2-core VCTF cable
- Long-distance Mode:
  93.75 Kbps, 500 m with 2-core VCTF cable

High-speed Remote I/O Communications: 1 ms Maximum

Link up to 32 slaves with 128 inputs and 128 outputs and a communications cycle time of 1 ms or less. (Cycle time is 0.5 ms for 16 slaves with 64 inputs and 64 outputs.)



Faster Wiring with Special Cables

Connections are easily made with special flat cables or VCTF cables.

Many Slaves Available

Connect contact I/O, contact I/O modules, and sensor (photoelectric or proximity) inputs. Also available are Analog I/O models.

Flexible Branching with Long-distance Communications Mode

By using a special flat cable or 4-core VCTF cable, you can wire up to 200 m total with essentially any required wiring layout.

Better Connectivity and Compatibility

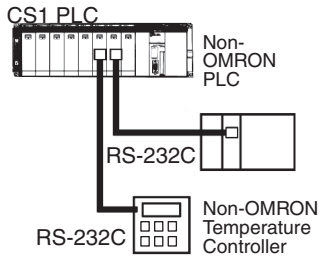
More Serial Communications Ports, More Protocols.
Up to 34 Port Connections with Protocol Setting for Each Port.

■ Protocol Macros

Data transfer protocol for serial communications vary with the manufacturer and with devices. Differences in protocols can make communications between devices by different manufactories very difficult, even when electrical standards are the same.

OMRON's protocol macros solve this problem by enabling easy creation of protocol macros designed to match the protocol of a connected device. Protocol macros will let you communicate with essentially any device with an RS-232C, RS-422, or RS-485 port without having to write a special communications program.

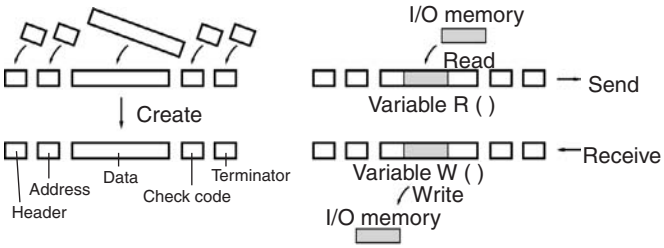
PLCs with Protocol Macros



The Two Main Functions of Protocol Macros

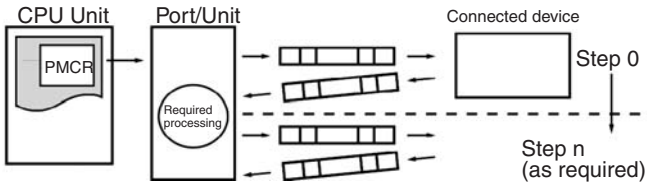
1. Creating Communications Frames

The communications frames can be easily created according to the specifications required by the connected device. Data from I/O memory in the CPU Unit can be easily included as part of a communications frame to read from or write to I/O memory.



2. Creating Frame Send/Receive Procedures

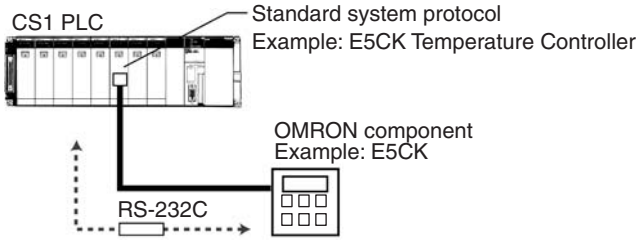
The required processing, including sending and receiving communications frames, can be performed one step at a time according to the results of the previous step, and then CX-Protocol can be used to trace send and receive data.



■ Application Examples

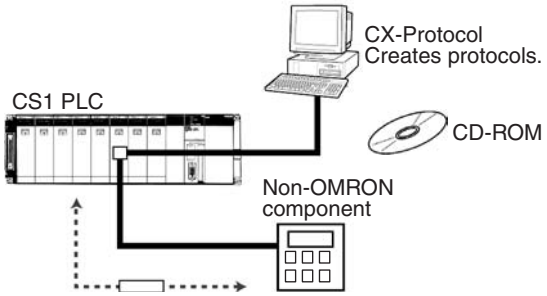
Standard System Protocols

Data transfers with OMRON components can be easily performed using standard system protocols. There is no need to develop your own protocols in this case.



User-created Protocols

Data transfers with non-OMRON components can be easily created just by defining parameters using the CX-Protocol Windows tool.



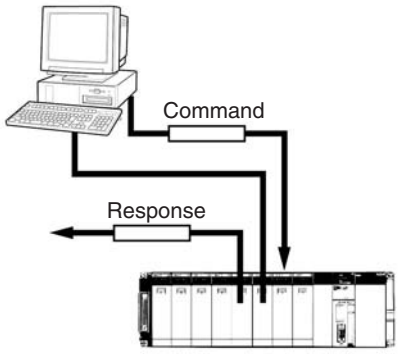
■ Other Protocols

OMRON provides all of the capabilities and capacity you need for the advanced programming required for human-machine interfaces, communications, data processing, and other required applications.

Host Links

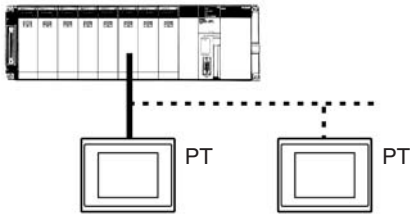
Host Link (C-mode) commands or FINS commands placed within host link headers and terminators can be sent to a host computer to read/write I/O memory, read/control the operating mode, and perform other operations for the PLC.

Unsolicited messages can also be sent from the PLC to the host computer by sending FINS commands from the ladder program using the SEND(090), RECV(098), and CMND(490) instructions.



1:N NT Links

The PLC can be connected to a Programmable Terminal (PT) via RS-232C or RS422A/485 ports, and I/O memory in the PLC can be allocated to various PT functions, including status control areas, status notifications areas, touch switches, lamps, memory tables, and other objects.



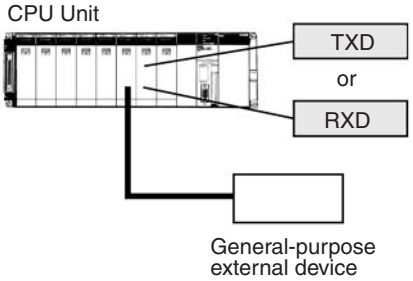
Note: Either one or up to eight PTs can be connected to a PLC in for 1:N NT Links.

High-speed NT Links

High-speed NT Links that are three times faster than standard NT Links are possible with NS-series PTs. This speed is particularly important when connecting to more than one PT.

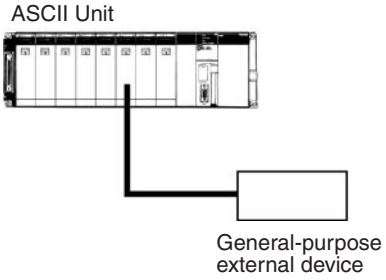
Custom Protocols

I/O instructions for communications ports (TXD(236) and RXD(235)) can be used for simple data transfers (custom protocols), such as to input data from bar code readers or output data to a printer. Start/end codes can be specified, and RS, CS, and other control signals can be handled. (Custom protocols can be used only for the CPU Unit's built-in RS-232C port.)



General-purpose Protocols Using BASIC

An ASCII Unit can be used to create essentially any protocol for an external device using the BASIC language, providing the ability to handle applications for which protocol macros cannot be created.



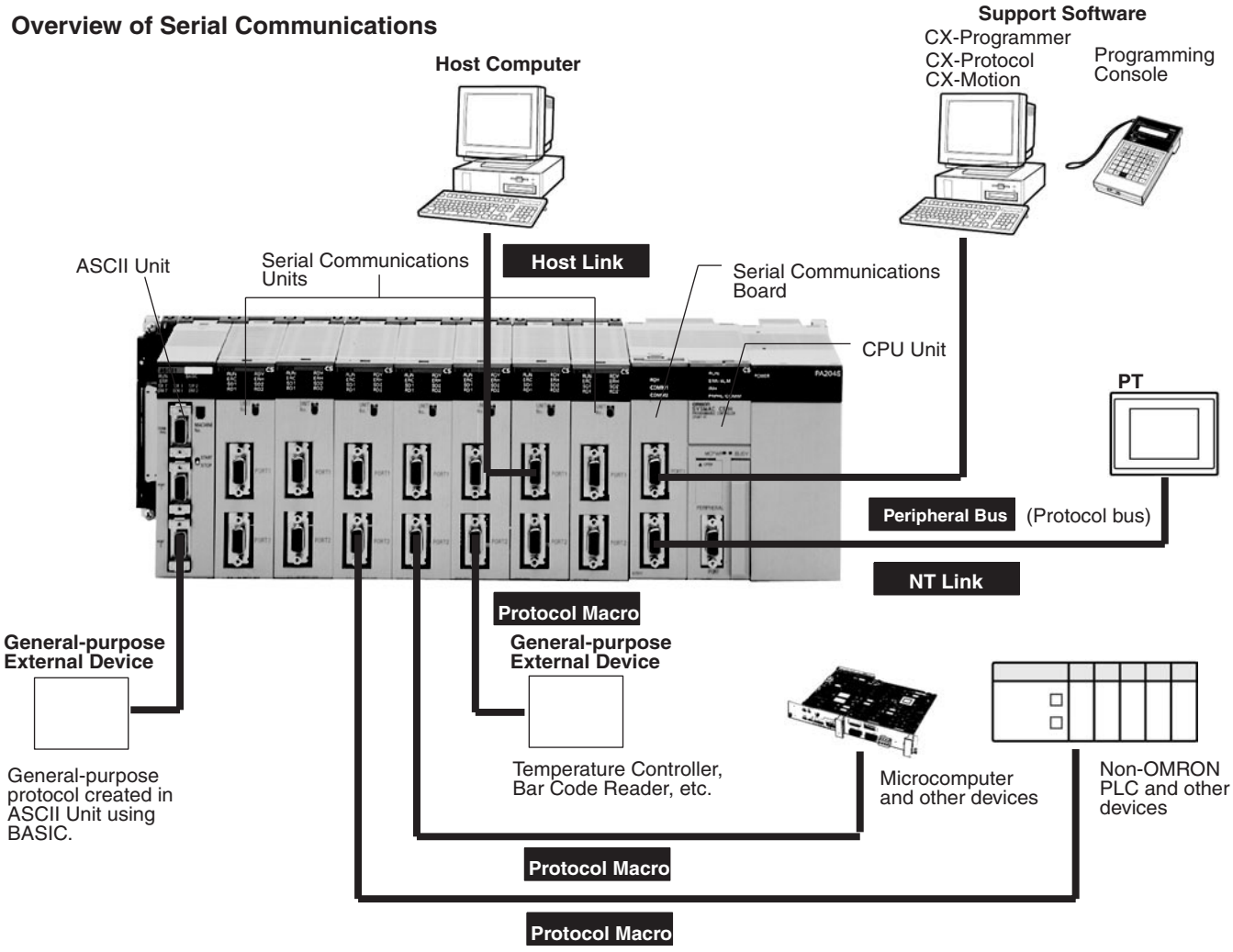
Protocol List

The following protocols are supported for serial communications

Protocol	Main destinations	Outline	Commands/Instructions
Host Link (SYSMAC WAY)	Computers, OMRON Programmable Terminals (PTs)	Communications between host computers and PLCs.	Host Link commands or FINS commands (unsolicited messages supported)
Custom	General-purpose devices	Custom communications with general-purpose external devices.	TXD and RXD instructions
Protocol Macros	General-purpose devices (including OMRON components)	Sending/receiving messages (communications frames) matched to the communications specifications of external devices.	PMCR instruction
1:N NT Links	OMRON Programmable Terminals (PTs)	High-speed communications with Programmable Terminals.	None
Peripheral bus	Support Software	Communications with Support Software tools running on host computers.	None
General (written in BASIC)	General-purpose devices	Unrestricted communications with external devices.	BASIC

Note: Refer to *Serial Communications* on page 138 for the ports that can be used for each protocol.

Overview of Serial Communications



WS02-CXPC1-EV5
CX-Programmer

Reduce application development and testing time and increase machine functionality with CX-Programmer.

Programming software for SYSMAC CS, CJ, C, and CVM1/CV series PLC ladder programs

CX-Programmer provides one common PLC software platform for all types of Omron PLC controllers – from micro PLC's up to Duplex processor systems. It allows easy conversion and re-use of PLC code between different PLC types, and the full re-use of control programs created by older generation PLC programming software.
Many powerful documentation features are available to clearly document the intended use and operation of the control code, are this can be stored inside the PLC. An advanced 'project comparison' function is included to allow in-detail comparison between the PLC project and the PC project.
Easy integration with other Omron software products allows sharing of Tag comments to reduce mistakes, reduce development time and increase ease of use.
Maintenance features allow easy searching of contacts and coils with a single click, thereby allowing fast identification of the cause of machine or line stoppages while monitoring, display, and debugging functions reduce engineering time and implementation costs.
Advanced data trace and time chart monitoring reduces maintenance and troubleshooting time. This can then be used to either fine-tune the performance of the machine, or reduce and optimize the cycle time of the machine.

Powerful, Easy-to-use Functions

Powerful, Easy-to-use Ladder Editor

The ladder create, search, and jump operations can be executed with a single keystroke for efficient programming and debugging. Also, the various comment functions make ladder programs much easier to read and search.

- Program with single key inputs. No mouse required.
- Use the cross reference popup function to check a bit or output's ON/OFF status in real time.
- When the program is input, the software automatically performs a circuit check and output-duplication check to prevent input mistakes.
- With one keystroke, jump to a desired location in the program from the search results or program check results displayed in the output window.
- Input various comments (such as rung comments, I/O comments, and circuit comments) to make the program easier to read and search.

Cross reference popup
Displays the real-time status of the bit or output at the cursor location. It is also possible to jump to the displayed location.

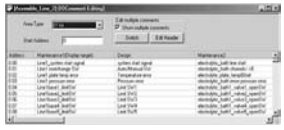
Output duplication check
A output-duplication check is performed automatically when the program is input. Relevant locations are listed and it is pos-sible to jump to those locations.

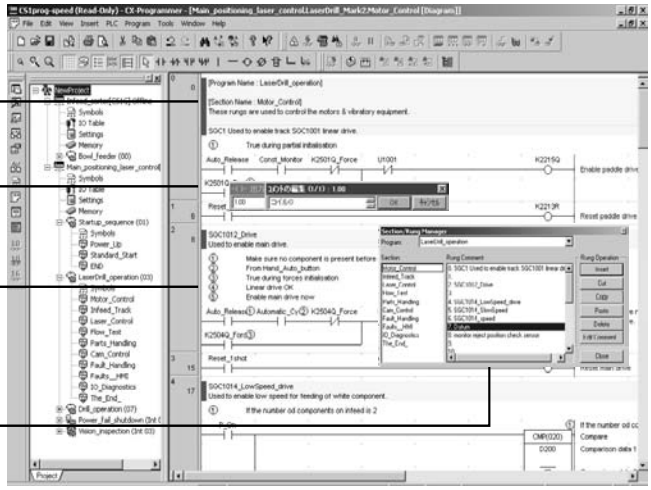
Displaying Comments at the Cursor Position

The symbol comment at the cursor position and corresponding address are displayed at the bottom of Ladder View to improve program legibility.

Switching between Multiple Comments

Multiple symbol comments (up to 16) can be registered for a single address. This function enables different comments for a single program—for designing, factory, each engineer, or each language—and makes the program easier to understand for the corresponding purpose.





Rung comment list
The rung comment jump function makes the program easier to search.

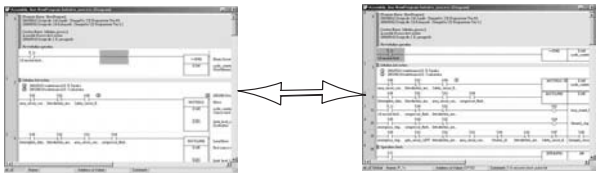
Circuit comment, circuit comment list
Circuit comments can be displayed or hidden. Comments attached as notes can be checked when necessary.

I/O comments
It is possible to display/hide the I/O comments and set attributes such as the number of dis-played lines.

Rung comment list/jump
Program contents can be checked in a list like a table of contents. It is possible to jump to a listed location.

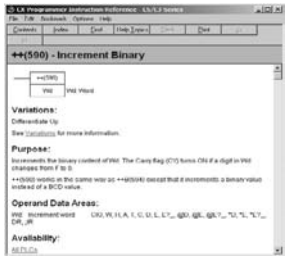
Display Special Instructions Vertically or Horizontally

The user can select whether to display special instructions vertically or horizontally, improving display and printing efficiency.

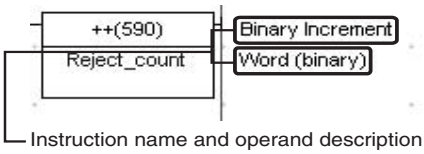


Complete Help and Guidance Functions

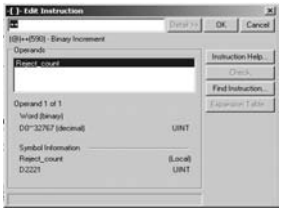
The help and guidance function provides helpful support when inputting or creating a program.



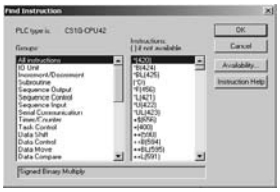
Complete instruction help
The help function can be checked immediately when inputting instructions.



Instruction name and operand description
The instruction name and operand meaning can be displayed in the Ladder Window. (These displays can also be hidden.)



Input help function (Details dialog)
Information on the operand's allowed data areas and setting ranges can be displayed immediately.

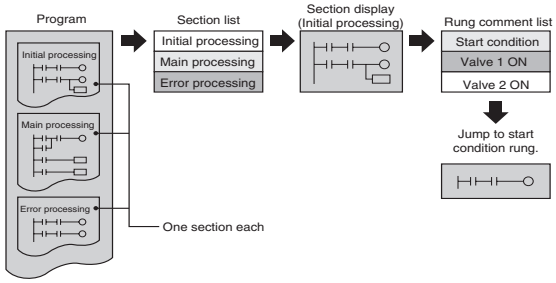


Inputting instructions by instruction group
Instructions can be selected from a list organized by instruction functions.

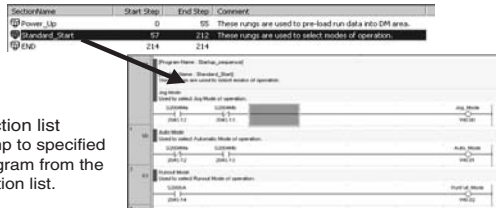
Program Structure

Detailed Debugging can be performedwhile displaying the overall program flow.

Program section displays can be further divided when creating or displaying the program. In the following example, the program is created in sections based on processing and it is possible to jump to a specified processing program (section) from the section list.

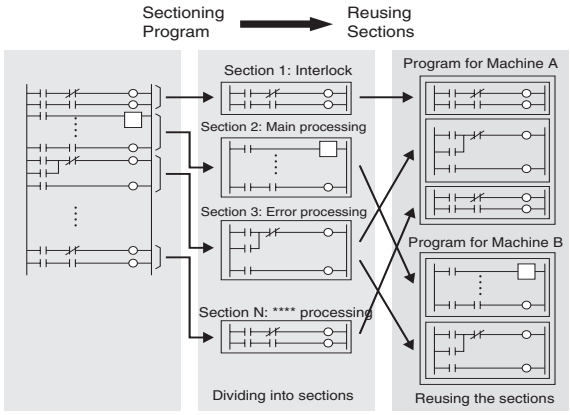


It is possible to jump to a specified section while viewing the overall program in a section list.



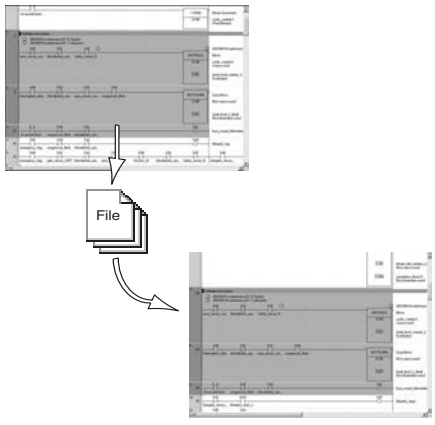
Section list
Jump to specified program from the section list.

Sectioning Program and Reusing Sections



Improved Ladder Program Reusability

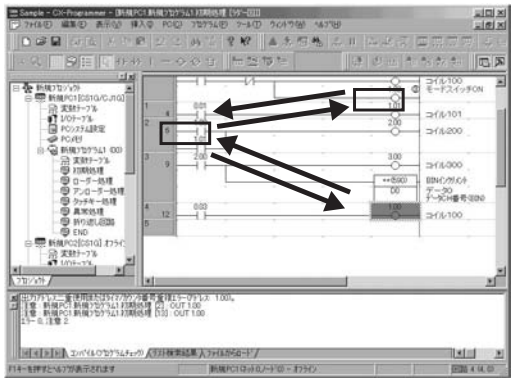
Parts of the program can be saved or additions can be loaded in section, ladder rung, or symbols table units. This allows programs to be easily split into smaller parts, and then integrated, thereby improving reusability of the program.



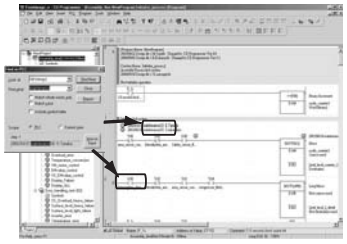
Online Debugging

A Complete Set of Debugging Functions reduces Debugging Time.

- Trace-back searches (searching for bits/outputs with the same address) and consecutive address searches can be performed with a single keystroke.
- Enter the search item by dragging and dropping the item in the ladder window.
- Different parts of the ladder program can be monitored simultaneously with a 2-way or 4-way split screen.
- The I/O monitor function can group locations being monitored, such as steps and processes that are being debugged.

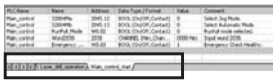


Trace-back Search
Search for the output corresponding to the bit address at the cursor location or search for the bit corresponding to the output at the cursor location.



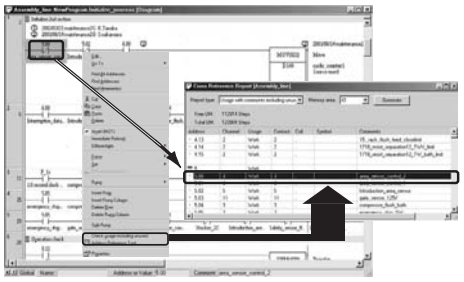
"All" has been added as a target of searching. Any strings can be entered as a keyword for searching.

2-way or 4-way Monitor
Powerful split-screen monitoring function allows simultaneous monitoring of different parts of the ladder program, an overview and detailed view of a ladder program rung, etc.



I/O Monitor Function (Watch Window)

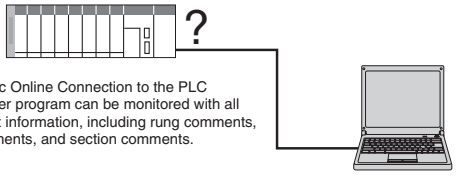
- Group different locations that need to be monitored for each process or piece of machinery being debugged.
- Various data displays are available, such as decimal, hexadecimal, signed, and floating-point.
- Registered addresses can be sorted and monitored.
- Registered addresses are automatically saved to a file. It isn't necessary to register the addresses again the next time debugging is performed.



Easily Search Usages Overview on Ladder Diagrams
The usage overview can be launched from the a popup menu or Ladder View. This enables the user to easily check the usage of addresses at the cursor position and to easily check the usage of contacts/coils.

Automatic Online Connections to PLCs make Online Monitoring Easy

The CX-Programmer automatically detects the PLC model, uploads the PLC program and various parameters, and starts the ladder monitor function.

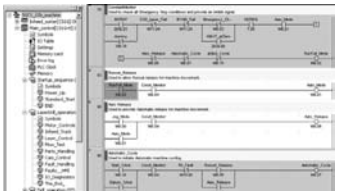


Automatic Online Connection to the PLC
The ladder program can be monitored with all comment information, including rung comments, I/O comments, and section comments.

Online Debugging Functions

- Check continuity efficiently with the ladder wrap-around monitor.
- The online editing function allows several consecutive rungs to be edited at the same time.

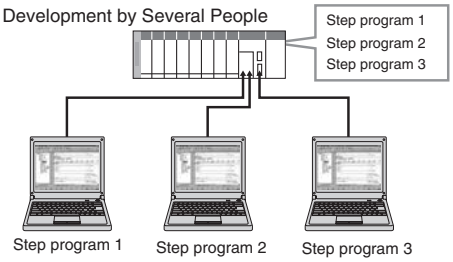
Ladder Wrap-around Monitor
Long ladder rungs are wrapped around to another line before connecting to the right bus bar.



Online Editing
Consecutive ladder rungs can be edited together online. Before edited contents are written to the PLC, a program check is performed automatically and the results are displayed.

Simultaneous Online Debugging by Several People

Program development and online debugging can be performed by two or more people at the same time, so debugging time can be reduced dramatically.



Note: 1. When the WS02-CXPC1-E-V3□ is purchased with only one license and a micro PLC restriction, it can be used only for these PLCs. The Version restricted for only micro PLCs does not support all standard functions.

2. The CX-Programmer does not support SFC.

WS02-SIMC1-E
CX-Simulator

Online debugging of virtual PLCs in the computer

Simulated ladder program execution in a virtual CS/CJ series PLC

WS02-SIMC1-E

Allows program debugging in a single PLC before the actual system has been assembled. Reduces the total lead time required for machine/equipment development and startup.

Key Features

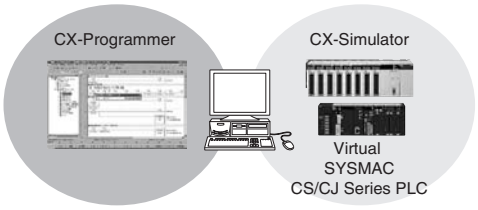
A debugging environment equivalent to the actual PLC system environment can be achieved by simulating the operation of a CS/CJ Series PLC with a virtual PLC in the computer. CX-Simulator makes it possible to evaluate program operation, check the cycle time and reduce debugging time before the actual equipment is assembled.

Ladder program debugging in a computer

Monitor and debug program execution without the actual PLC.

The developed program can be executed in a virtual PLC within the computer and debugged with the CX-Programmer, just like the actual PLC.

- All of the debugging functions can be used, including the ladder monitor, I/O monitor, online editing, force setting/resetting bits, differential monitor, and data tracing.
- The cycle time can be checked without the actual PLC system.
- Interrupt tasks can also be started.



Checking execution times
The virtual cycle time can be checked in advance. Each task can also be started and stopped and each task's cycle time can be checked.

Execute just the required parts of structured/sectional programs and monitor the status of I/O.

Perform efficient debugging operations that cannot be performed in the actual PLC, such as executing single steps, executing single cycles, and inserting break points.

- With the step execution and cycle execution functions, the contents of I/O memory can be monitored in the middle of program execution or after execution of a single cycle.
- Program execution can be stopped when I/O memory data satisfies preset conditions, so that the I/O memory data at that point can be checked.
- A starting point and break point can be specified to execute and debug just that part of the program.

Debug Console
Various execution methods can be selected, such as step execution and cycle execution.

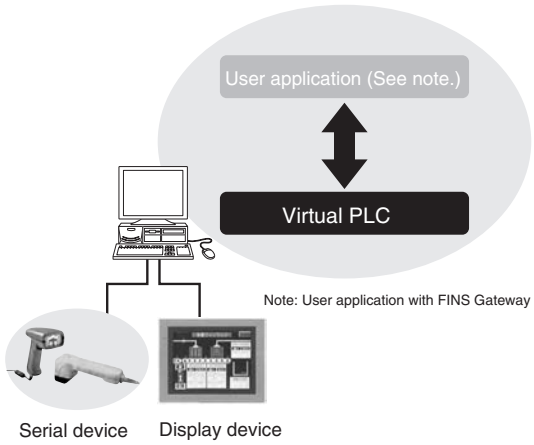
I/O Break Condition Settings
Stop program execution when the specified I/O memory conditions are satisfied, so that the contents of I/O memory at that point can be checked easily.

Virtual External Inputs

Several methods can be used to create and replay virtual external inputs.

The operation of equipment and machinery can be simulated in the PLC as virtual external inputs from several sources.

- Reproducing Virtual External Inputs
  When I/O memory data satisfy preset conditions, specified I/O bits and words can be set to desired values after a set time delay (I/O Condition Tool).
- Reproducing External Inputs
  Virtual external input data from various sources can be reproduced in the virtual PLC. (Some data sources are operation logs of force-set/force-reset bits and changed I/O memory data, data trace data acquired from an actual PLC, and cyclic data files created in spread sheet software.)



I/O Condition settings

Message communications display function

Complete Debugging with Peripheral Devices

Total system debugging can be carried out by performing communications tests with peripheral devices (serial devices, displays, etc.) and user applications that communicate with the PLC.

- Communications can be debugged with external serial devices connected to the computer's COM port.
- Communications can be tested with Programmable Controllers through NT Link.
- Messages sent by the network communications program can be checked. Messages (frames) sent by the TXD (TRANS-MIT), SEND/RECV (NETWORK SEND/RECEIVE), and CMND (DELIVER COMMAND) instructions can be displayed at the computer.

Specifications

Basic Functions	Simulates of a CS/CJ Series CPU Unit's operation in the computer. ●Virtual external inputs can be input and operation of the virtual CPU Unit can be monitored from the CX-Programmer (continuity monitor, PV monitor, online editing, etc.). ●Check the cycle time.
Other Functions	Execute debugging functions that cannot be performed in the actual PLC (such as single step execution). ●Debug network communications and serial communications.
Created files	PC data directory Contents: Various log files such as Virtual PLC and Debug Settings files

Operating Environment

CPU:	Pentium 133 MHz or faster CPU Note: Windows Me requires a 150 MHz or faster CPU. Recommended CPU: Pentium 200 MHz or faster
OS:	Windows 95, 98, Me, 2000, NT 4.0, or XP

Compatible PLCs:

CS Series and CJ Series

WS02-PSTC1-E
CX-Protocol

Create serial communications protocols to communicate with standard serial devices

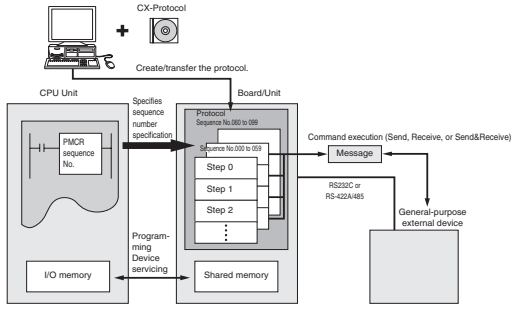
Allows program debugging in a single PLC before the actual system has been assembled. Reduces the total lead time required for machine/equipment development and startup.

Key Features

The CX-Protocol software creates data communications procedures (protocol macros) to exchange data between standard serial devices and the PLC (Serial Communications Unit or Board).

What is a Protocol Macro?

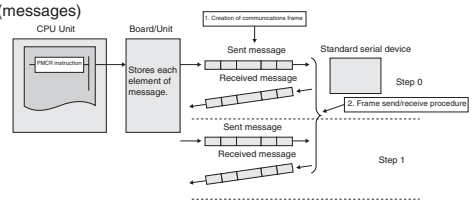
A protocol macro defines the communications protocol for communications between the PLC and any serial device that has an RS-232C port or RS-422A/RS-485 port and uses half-duplex or full-duplex communications with start-stop synchronization. Serial communications can be processed without a ladder program routine once the protocol macro has been written to the Serial Communications Unit or Board (CS/CJ Series Unit/Board, C200HX/C200HG/C200HE Board, or CQM1H Board) and the PMCR instruction has been executed from the CPU Unit's ladder program.



Overview of Protocol Macros

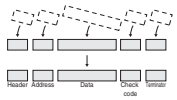
The protocol macro function can be broadly divided into the following two functions.

1. Creation of communications frames (messages)
2. Creation of procedures to send/receive those communications frames (messages)



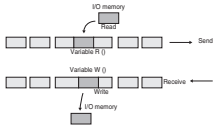
1. Creating communications frames (messages)

1) Communications frames (referred to as "messages" here), which can be understood by general-purpose external devices, can be created according to the communications specifications.



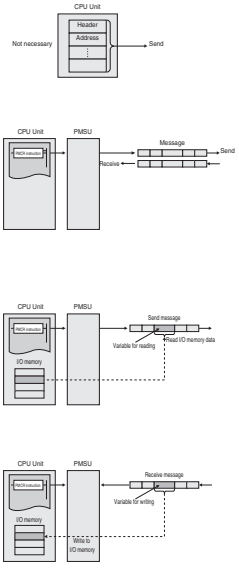
Note: In general, the data area of a send message contains a command code and data. The data area of a receive message contains a response code.

2) Variables for reading data from (or writing data to, if receiving) the I/O memory data areas in the CPU Unit, can be integrated into the messages.



This function has the following advantages:

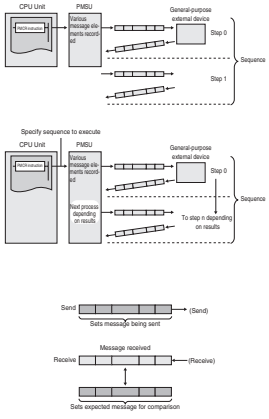
- Ladder program processing will not be necessary at the CPU Unit when, for example, sending messages after arranging them all in data memory.
- The components of the previously created messages are stored in memory at the Unit for Board, not the CPU Unit. When sending or receiving data, the CPU Unit only has to execute the PMCR instruction.
- When handling one part of the I/O memory data, if the variable required for reading that data has been integrated into a send message, the Unit or Board will automatically read the required data from the I/O memory of the CPU Unit when the PMSU sends the message. Similarly, when writing data from one part of a received message into I/O memory, if the variable required to read the data has been integrated into the reception settings message, the Unit or Board will automatically write the data at the designated position in the message into I/O memory when the Unit or Board receives the message.



2. Creating procedures to send/receive the communications frames (messages)

1) This function enables all the processing needed to send or receive a message to be handled as one step, and possesses all the commands (step commands), such as Send, Receive, Send&Receive and Wait, that are needed for each step.

2) This step can be set so that the next process (step/end) depends on the processing result of the previous step. In particular, it is possible to set the sequence so that the next process depends on the contents of one or several set receive messages.



Note 1: A send message created with a protocol macro will perform settings for messages that are actually sent.
Note 2: A receive message created with protocol macro will set an expected message for comparison with messages that are actually received.

CS1 Unit Descriptions

CX-Protocol
WS02-PSTC1-E

Developing Communication Protocols

Supports a Wide Range of Communication Protocols

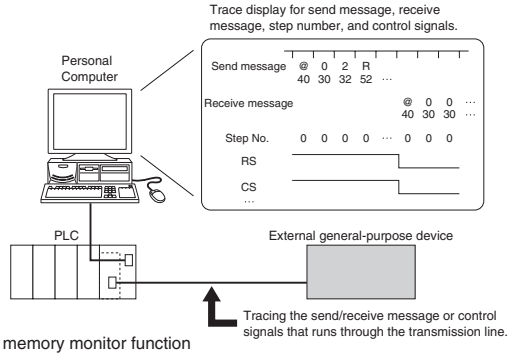
- Send frames and receive frames can be created according to the communications frame (message) specifications of external devices. In addition, variables for exchanging data with the PLC can be incorporated in send and receive frames.
- Supports error check code calculation, frame length calculation during transmission processes, and numeric data conversion between ASCII and hexadecimal.
- Repeat variables can be used, 1:N communications are supported, and write destinations can be switched.
- Supports send and receive time monitoring functions as well as retry processing, so the required communications error processing can be specified easily.
- The interrupt function can send an interrupt to the CPU Unit when receiving data, so high-speed data processing can be performed.
- Expected reception data can be registered and processing can be switched based on the received data.

Complete Set of Debugging Functions

Sequences can be evaluated, saved, and printed with send/receive message tracing.

●Trace function

With a CS/CJ Series PLC, up to 1,700 characters of time-sequential transmission or reception data, which the Board or Unit exchanges with external devices, can be traced. Tracing allows the user to determine which messages were transmitted or received in each step number. The results of tracing can be saved as data in project files or printed.



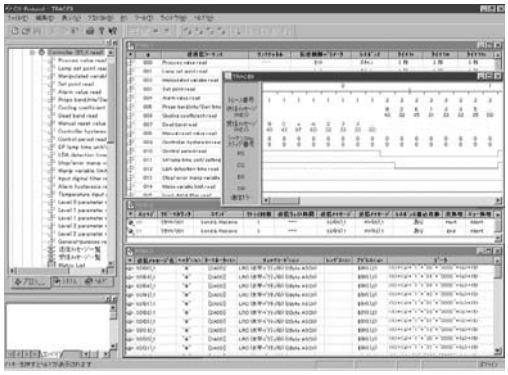
●I/O memory monitor function

Send/receive data stored in the PLC's data areas can be moni-tored.

Standard System Protocols

Protocols to exchange Data with OMRON Control Devices area Standard Feature.

Data exchange protocols for 13 kinds of OMRON control devices, such as Temperature Controllers and Bar Code Readers, are provided. The standard system protocols can be copied easily and customized.



Connected component		Model	Send/receive sequences
CompoWay/F Master		OMRON components equipped with CompoWay/F Slave functions	Sending CompoWay/F commands and receiving responses
Controllers/ Temperature Controllers	Small Digital Controller with Communications Functions (53 × 53 mm)	E5CK	Present value read, set point read, manipulated variable read, etc. Set point write, alarm write, PID parameter write, etc.
	Temperature Controllers with Digital Indications (96 × 96 mm or 48 × 96 mm)	E5□J-A2H0	
	Digital Controllers with Communications Functions (96 × 96 mm)	ES100□	
	High-density Temperature Controller with Communications Functions	E5ZE	
Digital Panel Meters with Communications Output (custom specification)		K3T□	Display value read, comparison value read, write, etc.
Bar Code Readers	Laser Scanner version	V500	Read start, data read, read stop, etc.
	CCD version	V520	
Laser Micrometer		3Z4L	Measurement condition set, continuous measurement start, etc.
Machine Vision Systems	High speed, high precision, low cost version	F200	Measurement, continuous measurement, etc.
	High-precision Inspection/Positioning	F300	
	Character Inspection Software/ Positioning Software	F350	Measurement, positioning, inspection, character inspection, etc.
ID Controllers	Electromagnetic coupling	V600	Carrier data read, autoread, write to carrier, etc.
	Microwave	V620	
Hayes modem AT command		MD24FB10V MD144FB5V ME1414B2	Initialize modem, dial, transfer data, etc.

Specifications

Basic Functions	Create protocols, transfer protocols between the CX-Protocol and the Serial Communications Unit/Board, and save files.
Other Functions	Transmission line trace, standard system protocols, PLC I/O memory monitor, PLC error display, protocol print
Created files	CX-Protocol project file (*.psw) Contents: Protocol list, PLC communications settings, trace list

Operating Environment

CPU:	Pentium 90 MHz or faster CPU Note: Windows Me requires a 150 MHz or faster CPU. Recommended CPU: Pentium 166 MHz or faster
OS:	Windows 95, 98, Me, 2000, NT 4.0, or XP

Compatible PLCs:

CS Series, CJ Series, CQM1H Series, and C200HX/HG/HE Series

Compatible Serial Communications Units/Boards:

CS Series	Serial Communications Units/Boards CS1W-SCB21-V1, CS1W-SCB41-V1, CS1W-SCU21-V1
CJ Series	Serial Communications Units CJ1W-SCU21 and CJ1W-SCU41
C200HX/HG/HE	Communications Boards C200HW-COM04, C200HW-COM04-V1, C200HW-COM05, C200HW-COM05-V1, C200HW-COM06, and C200HW-COM06-V1
CQM1H	Serial Communications Board CQM1H-SCB41

WS02-MCTC1-EV2
CX-Motion

Creates programs to control the motion controller and monitors controller status

Provides the ideal environment for motion control support, from motion controller program development to full system operation.

Key Features

The CX-Motion software can be used to create, edit, and print the various parameters, position data, and motion control programs (G code) required to operate Motion Controllers, transfer the data to the Motion Control Units, and monitor operation of the Motion Control Units. Increase productivity in every step of the motion control process, from development of the motion control program to system operation.

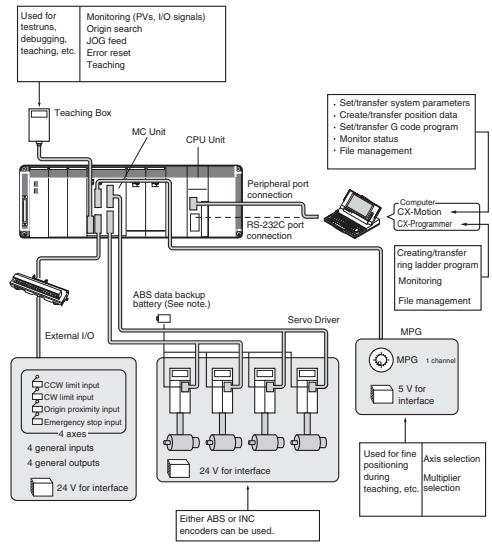
Motion Control Programs

Easily create motion control G Code programs and parameters.

CX-Motion can create all of the data needed in the Motion Control Unit, such as parameters, position data, and the program. The program can be input in either G code or mnemonics.

- When the Unit is connected online, data can be transferred, verified, and saved.
- Data for different Units can be registered and managed as separate projects.

System Configuration with CS1W-MC421/221



Note: A data backup battery is required when an ABS encoder is used.

Operation Monitor

Powerful support during startup and operation

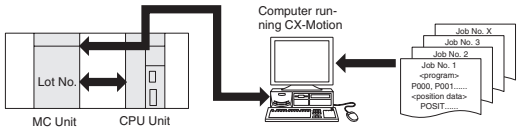
The MC Unit Monitoring function can display vital information at the computer, such as the present position, task being executed, I/O status, error displays, and servo system trace data.

- Up to 20 errors that have occurred in the Motion Control Unit can be stored and displayed (CS1W-MC421/221 and CV500-MC421/221 Motion Control Units only).

Automatic Loading Function

Ideal for flexible, small-lot production lines

Various programs and position data can be stored on disks for the computer running the CX-motion software and the required program/position data can be substituted into the Motion Control Unit when necessary. More than 100 different application programs can be used in this way. A wide variety of programs can be available for execution if the computer is used to store data for the MC Unit.



Specifications

Basic Functions	Create/transfer/print various parameters, position data, and the MC program, transfer data to the MC Unit, and monitor MC Unit's operating status.
Other Functions	Automatic loading, Servo data tracing
Created files	CX-Motion project files (*.mci) Contents: System parameters, position data, program, scripts, etc.

Operating Environment

CPU:	Pentium 100 MHz or faster CPU
OS:	Windows 95, 98, NT4.0, W2000 or XP.

Compatible PLCs:

CS Series, C200HX/HG/HE Series, and CVM1/CV Series

WS02-NCTC1-EV2
CX-Position

Set, transfer, store, and print position control unit data and monitor operation online

Increase productivity in all position control tasks, from design and startup to system maintenance.

Key Features

The CX-Position software simplifies every aspect of position control, from creating/editing the data used in Position Control Units (NC Units) to communicating online and monitoring operation. The software is equipped with functions that can improve productivity, such as automatically generating project data and reusing existing data.

Creating and managing data

Data can be created for various applications

The CX-Position enables data for multiple NC Units on up to 1,000 PLCs to be handled as 1 project. Data is displayed in tree format and the data for an NC Unit can be moved or copied (overwritten) between PLCs in the project tree. This feature allows data to be edited and re-used in other PLCs or NC Units.

- The CX-Position can read information from NC Units connected online and automatically generate project data.
- Data created for a C200HW-NC□□□ using the SYSMAC-NCT can be imported and used as data for the CS1W-NC□□□ or CJS1W-NC□□□.

NC Monitor

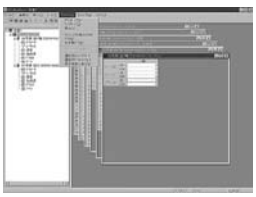
Display the NC units' present positions, error codes, sequence numbers, and I/O status.

The sequence numbers and present positions can be dis-played for up to 4 Units. In addition, the contents of the operating memory area and operating data area can be monitored and the error log can be displayed.

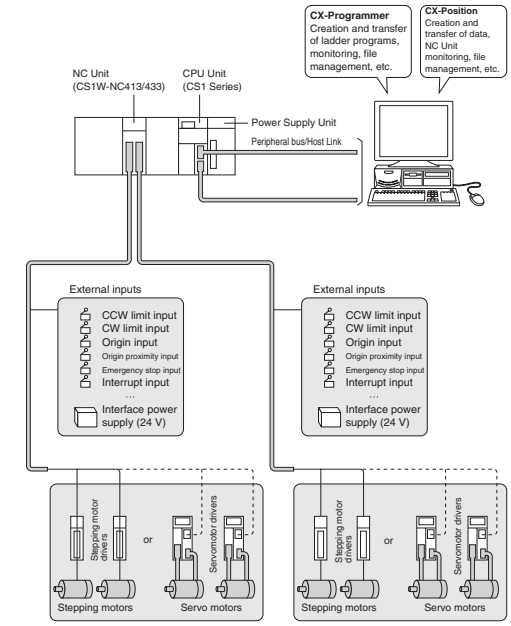
Communications

Communicate with NC units through the network.

It is possible to communicate with NC Units through the Fins-Gateway. Depending on the FinsGateway driver version, HostLink or Ethernet. can be used to perform online operations (monitoring operation or transferring/verifying parameters,sequences, etc.) with the NC Unit.



System Configuration with CS1W-NC413/433



Specifications

Compatible Position Control Units:	CS Series:CS1W-NC113/NC133/NC213/NC413/NC433 CJ Series: CJ1W-NC113/NC133/NC213/NC413/NC433
Basic Functions	Create, edit, and print the Position Control Unit's parameter data,sequence data, speed data, acceleration/deceleration data, dwell times, and zone data. Monitor the Position Control Unit's operating status.
Created files	CX-Position project files (*.nci) Contents: Parameter data, sequence data, speed data, acceleration/deceleration data, dwell times, and zone data

Operating Environment

CPU:	Pentium 100 MHz or faster CPU
OS:	Windows 95, 98, NT4.0, W2000 or XP

Compatible PLCs:

CS Series and CJ Series

WS02-LCTC1-EV4
CX-Process Tool

Creates, transfers, runs, and debugs function blocks for loop control units/boards.

Easy Engineering Solutions for Loop Control Boards (LCB) and Loop Control Units (LCU)

Key Features

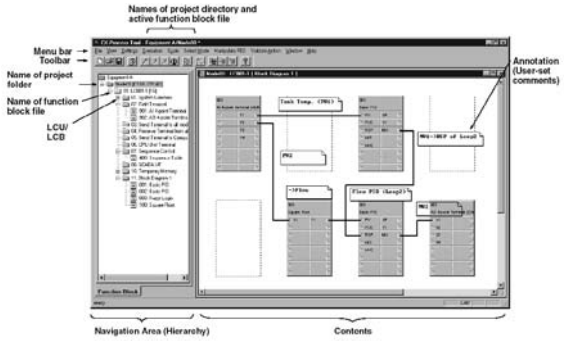
The CX-Process Tool software simplifies every aspect of loop control, from creating/transferring function blocks to running the Boards/Units and debugging (tuning PID parameters, etc.) operation.

Creating Programs

Function Block Diagrams can be created easily.

Function block programs can be created easily by pasting function blocks in the window and making software connections with the mouse.

- Control Blocks, Operation Blocks, and Field Terminal Blocks are available, so all of the required functions can be performed just by arranging the function blocks.
- Comments (user-set character strings) can be pasted in the function block diagrams.

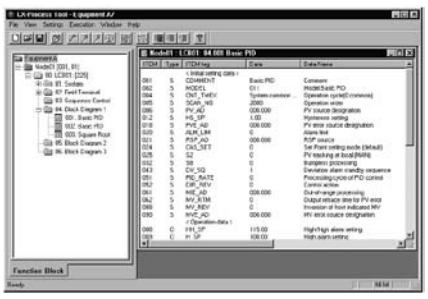


Transferring Programs

Programs can be changed Online.

The entire program, individual blocks, and individual ITEMs can be downloaded from or uploaded to the LCU/LCB.

- When there is a change in an individual block or ITEM, the change can be made while the LCU/LCB continues running.
- Block diagram information can also be downloaded/uploaded (LCU version V2 or higher only).

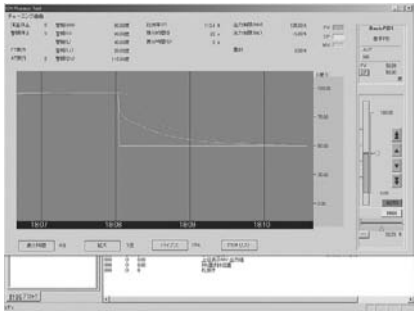


Debugging

Operation can be checked and tuned easily.

All of the ITEM data in a block can be monitored and the operation of a function block's connections can be checked.The PV, SP, and MV trends can be monitored and adjusted in the Tuning Screen.

- A function block's analog signal values can be displayed and forcibly changed and the operation of each function block can be stopped and restarted.
- Run/Stop commands can be executed (Hot or Cold Start).



Specifications

Compatible Loop Control Units/Boards:	CS Series: CS1W-LC001 Loop Control Unit CS1W-LCB01/05 Loop Control Board CS1D-CPU6□P CS1D Process-control CPU Units CJ1G-CPU4□P CJ-series Loop-control CPU Units
Basic Functions	Create, transfer, and debug function block programs.
Created files	CX-Process project files (*.mul) Contents: Function block program, step ladder program, sequence table program, tags, settings, and other information

Operating Environment

CPU:	Pentium 133 MHz or faster CPU Recommended CPU: Celeron 400 MHz or faster CPU
OS:	Windows 95, 98, Me, 2000, XP, or NT 4.0

Compatible PLCs:

CS/CJ Series

WS02-LCTK1-EL01
CX-Process Monitor

Monitors and controls operation of function blocks in loop control units

Monitoring and operation screens can be configured easily with this HMI Software for loop control units,

Key Features

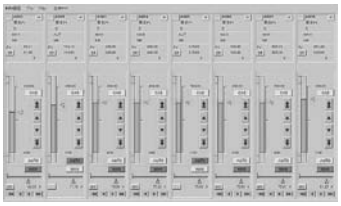
The CX-Process Monitor is HMI (human-machine interface) software that can easily configure standard screens from the tag information created with the CX-Process Tool.

Monitoring the Operating Status

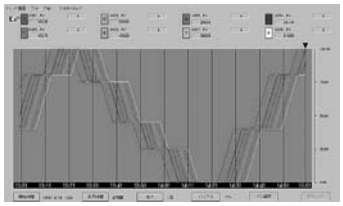
The operating status of function blocks can be monitored.

Bit signals as well as the PV, SP, MV, and other analog signal scan be monitored.
Run and Stop Commands can be sent to the Loop Control Unit.

- Control Screens
- Trend Screens



Group Screen



Trend Screen

Monitoring the Alarm Status

Monitoring alarms in function blocks

Alarms that occur in Control Blocks and Alarm Blocks can be displayed and stored in an alarm log.

- Alarm Log Screens
- Annunciator Screens

Alarm Log Screens

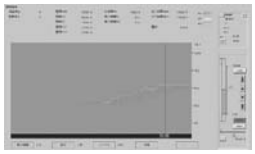
Annunciator Screens

Controlling Operation

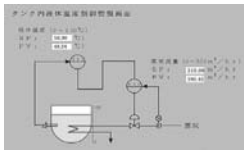
Controlling Operations in Function Blocks

Various adjustments can be made, such as changing a Control Block's settings, switching between Auto and Manual, performing manual operations, and tuning parameters such as PID constants.

- Tuning Screens
- Graphic Screens



Tuning Screens



Graphic Screens

Specifications

Compatible Loop Control Unit:	CS Series: CS1W-LC001 Loop Control Unit CS1W-LCB01/05 Loop Control Board CS1D-CPU65P/67P CS1D Process-control CPU Unit
Basic Functions	Monitor the operating status of Loop Control Units. Control basic function block operation.
Created files	DB folder Contents: Monitor tag settings, screen configuration

Operating Environment

CPU:	Pentium 133 MHz or faster CPU Recommended CPU: Celeron 400 MHz or faster CPU
OS:	Windows 2000, XP, or NT 4.0

Compatible PLCs:

CS Series

WS02-PUTC1-E
CX-Process Analog I/O Unit Software

Sets and monitors operation of process/analog I/O units.

Easily set parameters in 16 models of process I/O units and analog I/O units.

Key Features

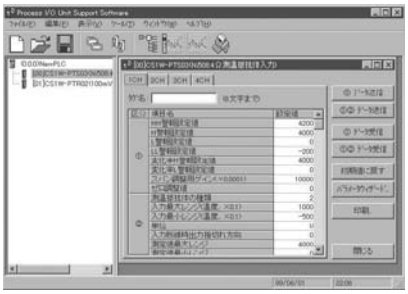
Various parameters in process I/O units and analog I/O units can be input easily in a table format or dialog format

Editing and Transferring Set Values

Edit Settings in the DM Area words allocated to Special I/OUnits.

Settings can be edited in table format or dialog format.

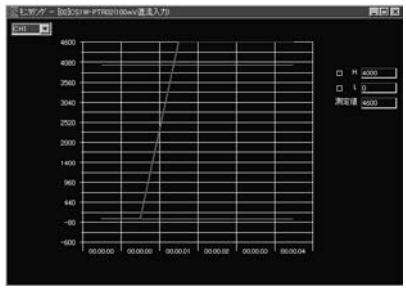
- The settings can be transferred in one-word units or one-Unit units.
- The settings can be saved as a file.



Simple Monitoring

Operation of the Connected Units can be checked.

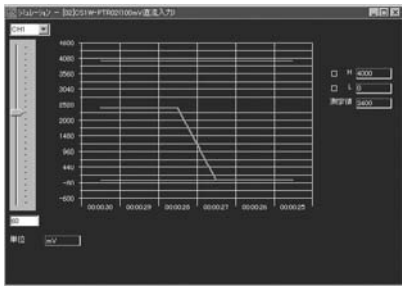
An Input Unit's input data can be monitored.
An output value can be output from an Output Unit.



Simulating Operation

Alarm Operation and Other Functions can be checked.

Input values such as voltages can be entered in the Simulation Window with a sliding bar or numeral entry and operation can be checked in the Analog I/O Unit Support Software.



Specifications

Compatible Units:	Process I/O Units: CS1W-P□□□□ (See note.) Analog I/O Units: CS1W-AD□□□, CS1W-DA□□□, CS1W-MAD□□, CJ1W-AD□□□, CJ1W-DA□□□, and CJ1W-MAD□□ Note: The C□1W-PTS5□ is not supported.
Basic Functions	Edit settings in table format. Input settings in dialog format. Transfer settings. Backup settings. Simulate operation of Process I/O Units and Analog I/O Units. Perform simple monitoring. Print settings.
Created files	Process I/O system file (*.ias) Contents: Settings data, model number information

Operating Environment

CPU:	Pentium 133 MHz or faster
OS:	Windows 95, 98, 2000, or NT 4.0

Compatible PLCs:

CS/CJ Series

NS-NSDC1-V6
NS Designer

Efficient development process for screen creation, simulation and project deployment.

The NS-Designer is used to create screen data for NS-series Programmable Terminals. The NS-Designer can also check the operation of the created screen data on the computer.

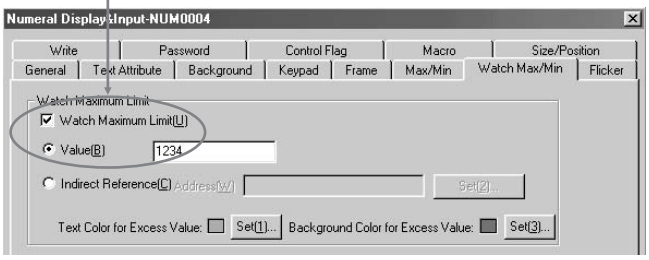
■ Screen Creation

Develop Screens More Efficiently with Easy-to-use Support Software. The NS-Designer has about 1,000 standard functional objects with associated graphics and advanced functions, so even first-time users can create screens easily just by arranging functional objects in a screen.

The NS-Designer is also equipped with a variety of functions that make it easy to create screens for common applications. Screen development is far more efficient with the NS-Designer.

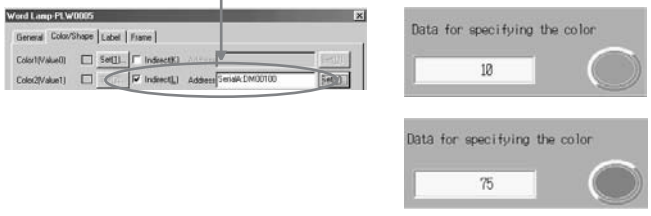
• Color Change when the Upper or Lower Limit Is Exceeded

The upper limit can be monitored just by checking the box and setting the upper limit value.

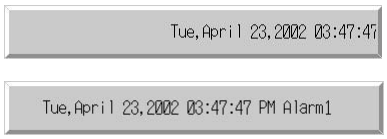


• Indirect Specification of the Display Color (Dynamic Display) with the Color Code (0 to 255)

The color can be specified indirectly by checking the box and setting the address being used for indirect specification.



• Flow Text Display for Alarm/Event Messages

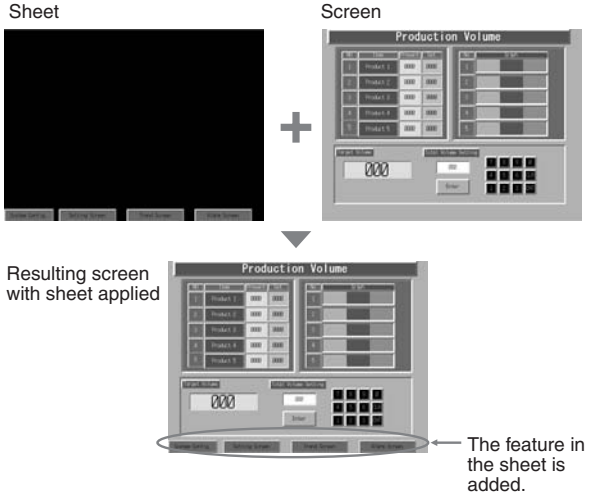


■ Screen templates

Make one common screen (sheet) that overlaps other screens (to save having to recreate the same part, such as a menu, in every screen).

• Sheets

A feature that is common to several screens can be registered as a sheet. The common feature can be added to any screen just by applying the corresponding sheet to the screen. (Up to 10 sheets can be created for one project.)

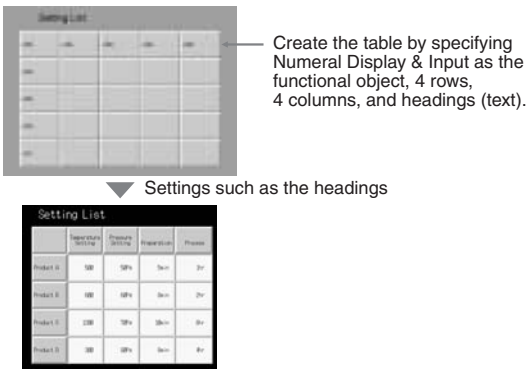


■ Making Table Form Objects

Speed up creating tables containing similar functional objects.

• Tables

The same kind of functional objects (such as Buttons, Text, or Numeral Display & Input objects) can be created together in a table just by specifying the kind of functional object, number of rows, and number of columns in the table. In addition, the properties for functional objects can all be set together and PLC addresses can be allocated automatically.
It is also possible to add headings for each row and column.

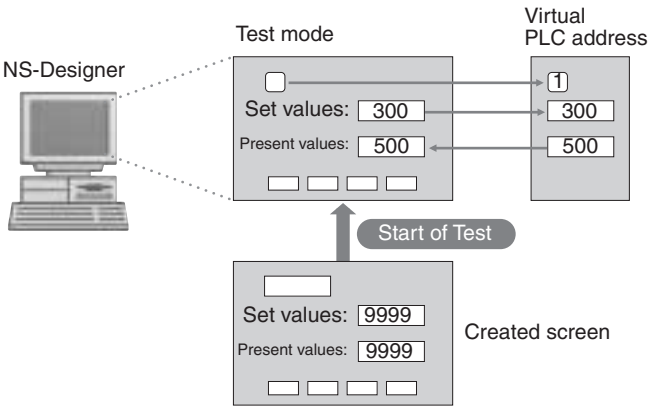


■ The Operation of Screen Data Can Be Confirmed Easily on a Personal Computer

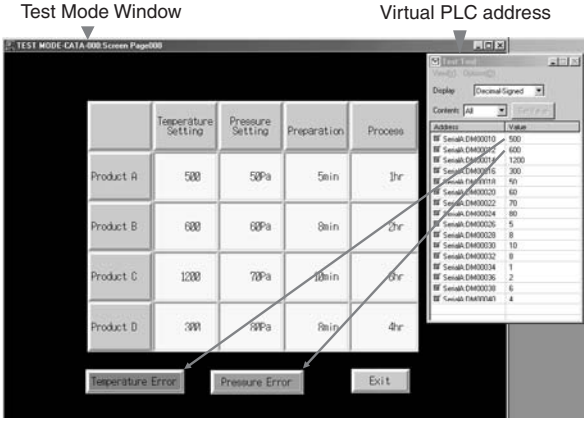
Check the operation of functional objects (buttons, lamps, numeral displays, etc. on a personal computer.

• Simulation via the "Test Function"

When a test is started, a test screen and virtual PLC will be displayed on the computer.



Operating (clicking with the mouse) the functional objects on the test screen will change the corresponding address in the virtual PLC. Conversely, changing the content of a virtual PLC address will change the corresponding functional objects. It is also possible to confirm pop-up screens. This function can be used to confirm the actual operation of a screen during the edition.



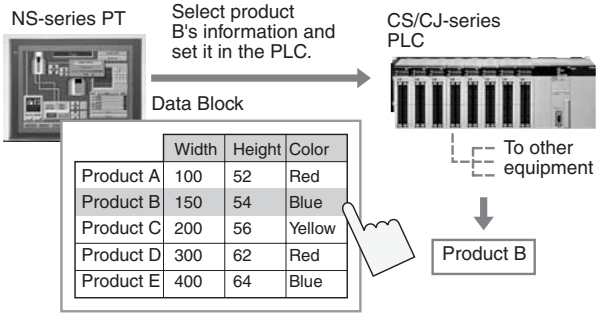
The test function enables debugging screens without NS and PLC Hardware.

• Validation

Validation checks functional objects against checkpoints (such as PLC addresses setting miss), and detected errors are listed. The listed errors can be checked before transferring the screen data to the PT.

■ Built-in Recipe Function for Fast Production Changeovers

Data blocks (recipe function) allow several numeric values and/or character strings to be transferred to/from memory areas, such as PLC data areas. Data blocks can be used to change the system's production setup even faster.



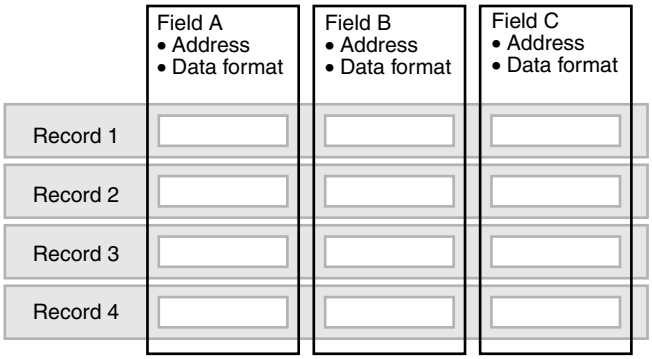
	Width	Height	Color
Product A	100	52	Red
Product B	150	54	Blue
Product C	200	56	Yellow
Product D	300	62	Red
Product E	400	64	Blue

• Register Recipes Easily by Writing Product Information in Data Blocks.

The Data Block (recipe) function consists of records and fields. Set the communications address and data format for each field. The records contain the data for each field.

For example, when production conditions are assigned to the fields, write the values for the product in that record so that the values required for production of the product will be transferred to the PLC.

Using this function can drastically reduce the time required to switch the production arrangement. This function also helps avoid production problems from errors such as recipe transmission mistakes.



WS02-NSFC1-E
Face Plate builder for NS

Automatically create loop control unit/board control and tuning screens for NS-series PTs

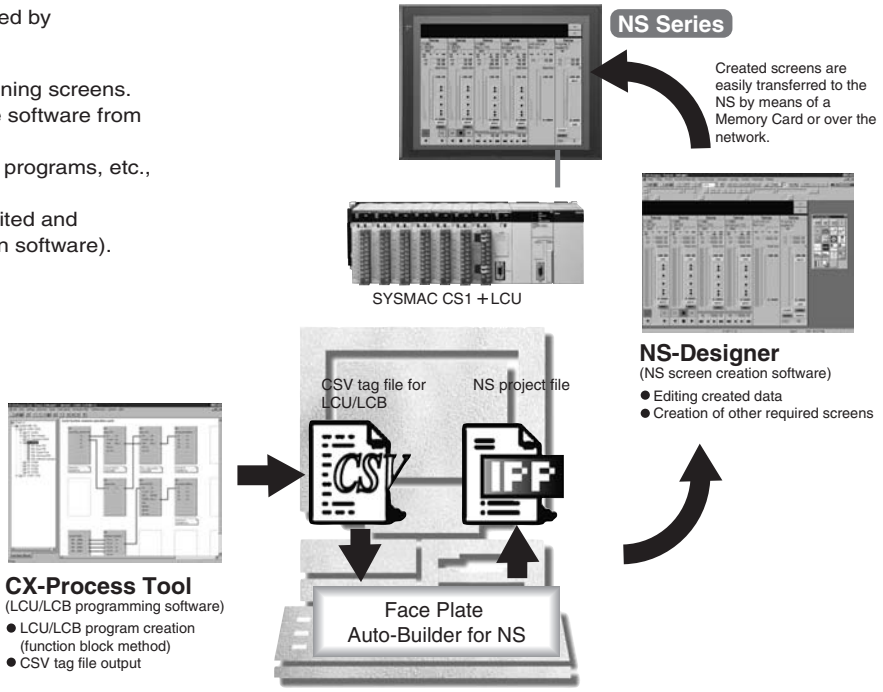
Create touch panel screens with the touch of a button and dramatically reduce development time.

Key Features

The Face Plate Auto-builder automatically creates a NS-series (touch panel) control or tuning screen from the CX-Process Tool's function block information.

Significantly reduces the engineering time required by combining LCB/LCU and the NS Series.

- Automatic generation of control screens and tuning screens. Automatic generation of NS screen data by the software from tag information created with CX-Process Tool.
- NS communications address allocation, ladder programs, etc., are completely unnecessary.
- Data that has been generated can be freely edited and processed by NS-Designer (NS screen creation software).



■ **Specifications**

Product name	Specifications	Model number
Face Plate Auto-Builder for NS	CSV tag files for LCU/LCB used in Face Plate Auto-Builder for NS	WS02-NSFC1-E

WS02-CFDC1-E/3G8E2-DRM21-EV1
DeviceNet Configurator

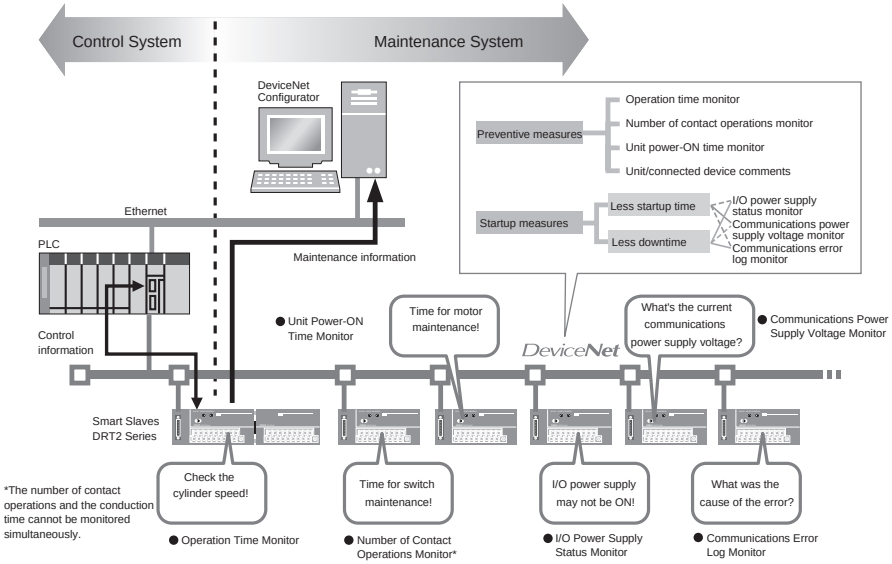
Simplifies system construction and maintenance for DeviceNet multivendor networks.

- Graphical interface to simplify network construction.
- DeviceNet Board for personal computers to enable connection from a serial port.
- Monitor devices through an online connection.
- Use Smart Slaves to build an advanced maintenance system.

Ordering Information

Name	Operating system	Model
DeviceNet Configurator Software	Windows 95, 98, Me, NT4.0, 2000, or XP	WS02-CFDC1-E
DeviceNet Configurator PC Card	Windows 95, 98, Me, 2000, or XP	3G8E2-DRM21-EV1

System Configuration



■ Operating Environment

Operating environment	**Hardware**	Computer: IBM PC/AT or compatible CPU: Pentium 166 MHz or better (Pentium 150 MHz or better for Windows Me) (Recommended: 200 MHz or better) Recommended memory: 32 MB or more Available hardware disk space: 15 MB or more
Network connection method	**Board/Card**	3G8E2-DRM21-EV1 DeviceNet Configurator PC Card (PCMCIA) (DeviceNet Configurator Software included)
	Serial	Peripheral port or RS-232C port on CPU Unit or RS-232C port on Serial Communications Unit/Board mounted to CS/CJ-series PLC.

Note: 1. Windows is a registered trademark of the Microsoft Corporation.
2. Use version 2.1 or later for the CJ1W-DRM21.

■ Outline

The DeviceNet Configurator provides function to aid in constructing and operating DeviceNet multivendor networks. These functions are interfaced through graphical windows for easy operation. Offline, virtual networks can be constructed and device settings can be made. If Smart Slaves are used, an advance maintenance system can be constructed by setting and monitoring maintenance information inside the Smart Slaves.

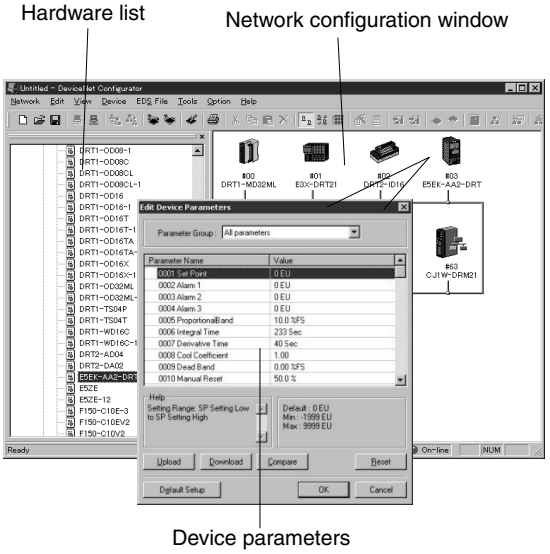
■ Network Construction and Settings

Easy Network Construction with Graphical Interface

A virtual network construction window provided by the Configurator enables dragging and dropping devices from hardware lists to build a network and make the required settings on the personal computer. The resulting information can be saved in files for downloading to the devices online.

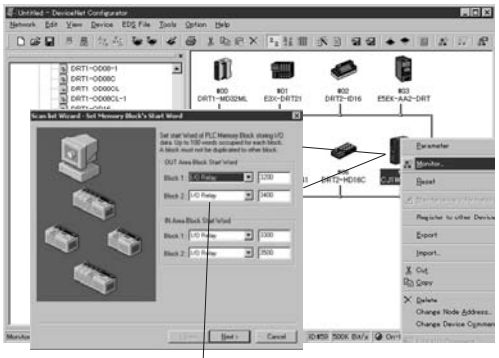
Setting DeviceNet Parameters

Offline, device files can be drug and dropped on a virtual network inside the Configurator to build a network and the parameters for each device can be edited, greatly increasing system design efficiency.



Create Scan Lists Using a Wizard

I/O allocations and slave registrations can be easily performed in the master by using a wizard to create scan lists. The currently registered slaves and allocations can also be easily confirmed.



■ Online Connections

Connect Using a PC Card or Board, or a Serial Port

Software connections from the Configurator are possible using either a DeviceNet Board or Card installed in the personal computer, or though a serial port on an OMRON CS- or CJ-series PLC.

DeviceNet Board or Card

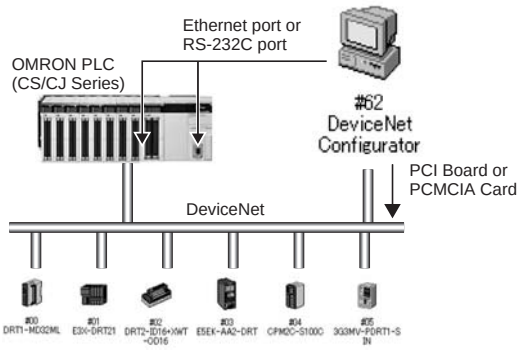
OMRON provides both a PCI Board and a PCMCIA Card to enable direct connection as a node on the DeviceNet network (one node address is allocated).

RS-232C COM Port on Computer

Connection is also possible from the COM port on the computer to the Peripheral port or RS-232C port on CPU Unit or RS-232C port on Serial Communications Unit/Board mounted to a CS/CJ-series PLC that has a DeviceNet Unit mounted to it.

Ethernet Port on Computer

Furthermore, connection is also possible from an Ethernet port on the computer to an Ethernet Unit mounted to a CS/CJ-series PLC that has a DeviceNet Unit mounted to it.



■ Device Management and Monitoring

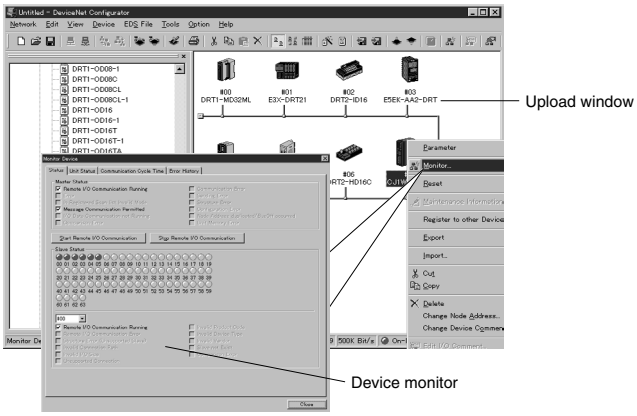
Online Device Monitoring

Use Network Uploads to Monitor Devices (See note.)

The following items can be monitored from the CPU Unit of an OMRON CS- or CJ-series PLC.

- Overall network communications status
- Master and slave status
- Unit status
- Communications cycle time
- Error log

Note: Supported only by devices with a monitor function.

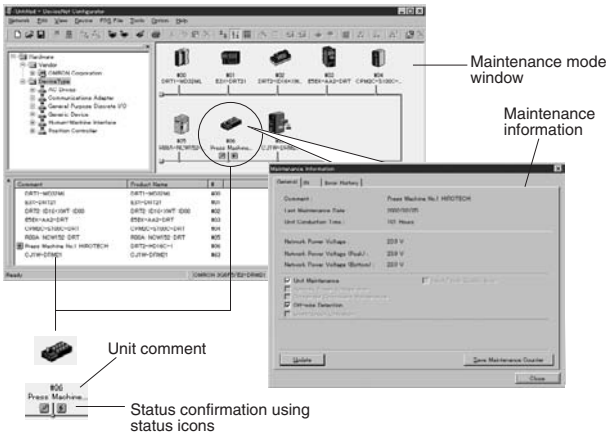


■ Maintenance System Construction

Use Smart Slaves for an Advance Maintenance System

Smart Slave Maintenance Information

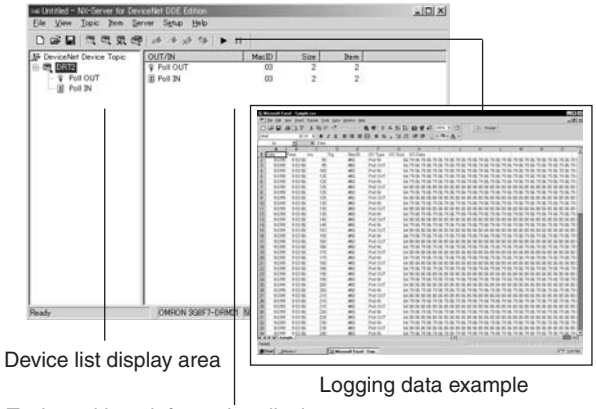
Maintenance information stored in Smart Slaves can be read and use to build a maintenance system that functions separately from the control system.



WS02-NXD1-E
NX-Server

Easily monitor and record all kinds of I/O data in the DeviceNet Network.

- I/O data being transferred through DeviceNet can be monitored.
- The advanced trigger function allows a specific device's data to be recorded.
- Nodes are not used because the Server is equipped with an original frame analysis engine.
- Data can be accessed without increasing network traffic.
- A development kit for developing applications with the DDE Server and software for operating existing user applications are also available.



■ NX-Server Functions

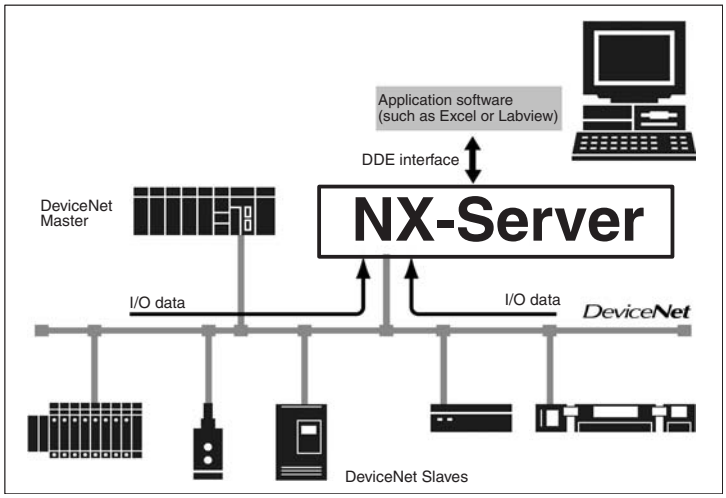
- Topic names and data areas can be set freely for each device that you want to monitor or record.
- DDE interface's server name as a public user interface: NETXDNET
- The data size and format (bit, byte, word) can be specified.
- Data logging can be set independently for each device and their trigger conditions can also be set.
- The recorded data can be checked in standard CSV format.
- Nodes are not used because the Server is equipped with an original frame analysis engine.
- Data can be accessed without increasing network traffic.

Ordering Information

Name	Model
NX-Server for DeviceNet DDE Edition	WS02-NXD1-E

Note: 1. NX-Server is a DDE (Dynamic Data Exchange) Server that collects I/O data and provides that data to higher-level monitoring software.
2. The 3G8E2-DRM21-EV1 PC Card can be used.

System Configuration



Specifications

■ Operating Environment

Hardware	OMRON DeviceNet Configurator PC Cards: 3G8E2-DRM21-EV1 PC Card (included with DeviceNet Configurator) National Instruments DeviceNet boards: Any board that supports NI-DNET Software
Computer	IBM PC/AT compatible
OS	When using the 3G8E2-DRM21-EV1: Windows 95, 98
CPU	Pentium 166 MHz or higher
Hard disk space	5 Mbytes min.
Memory	32 Mbytes min.
Floppy disk drive	Drive that can read 1.44-Mbyte, 3.5-inch, 2HD floppy disks
Display	VGA or higher

Note: Windows is a registered trademark of Microsoft Corporation.

Communications Middleware

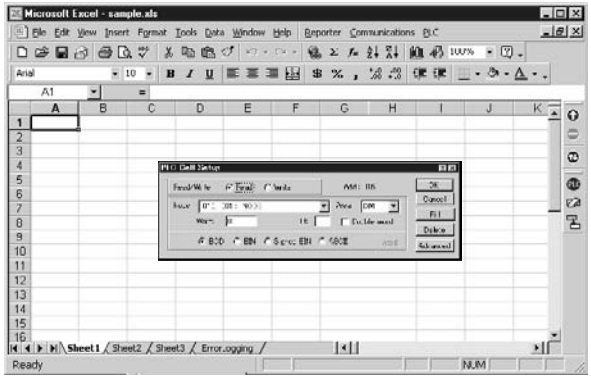
■ PLC Reporter 32 – Simple Data Collection Software

Write PLC data to Excel without programming.

Main Features

Easy Operation

Time-consuming computer programming is completely unnecessary. After installation, PLC data can soon be collected at the computer simply using screen settings. No specialist knowledge is required.

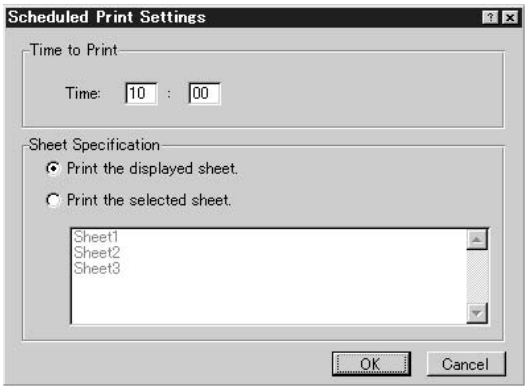


Large Reductions in Construction Costs

Basically, the system can be constructed with just a computer, PLC Reporter, Excel and a Host Link cable. This means that construction time and cost can be greatly reduced.

Automatic Saving/Printing Function

By setting the times at which data is to be saved or printed, or communications started, PLC Reporter will automatically perform all the required tasks. Also, simultaneous time and condition specification is now possible. The maximum number of items that can be set for either specification has been increased to 32. With automatic printing, it is possible to specify different printout sheets for each setting.



Modem Module

A modem module that has the functionality required for modem connections is available as a standard product. By using PLC Reporter in combination with the modem module, data can be obtained from a remote PLC.

Log Function

An easy-to-use log function that helps in the creation of daily reports is available. There are 3 log modes: Fixed time-intervals; when a specified bit turns ON; and one-shot logging to log data only once a day. The logging function can be selected to suit the application, and specified contents of PLC memory can be written to the Excel cells automatically.

Consecutive Reading and Writing for Cells

Data in consecutive areas in PLC memory can be read/written to consecutive cells in the spreadsheet. It is also possible to set cells in the same column simultaneously, and using the batch-setting function that has been added, communications cells can be specified out of a selected range.

Multi-network Version Available

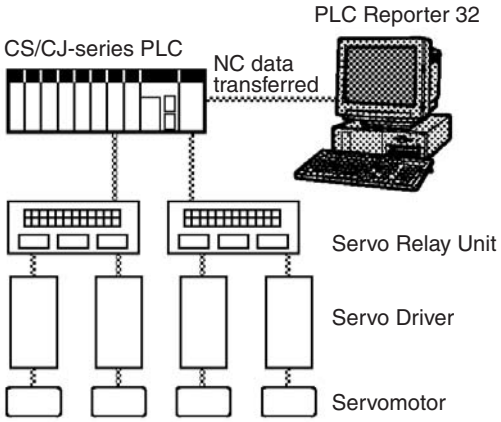
All types of FA network can be handled with this software package. In addition to Host Link communications, a multi-network version that is compatible with SYSMAC LINK, Controller Link, and Ethernet Networks is available.

System Configuration Examples

Changing Production Data in One Operation

Changing Position Data for an NC Unit

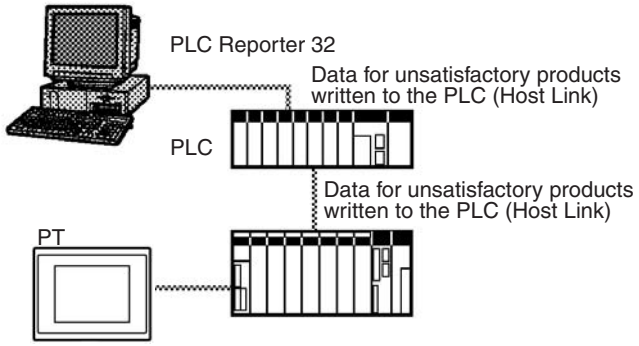
First create the files containing NC Unit data for the different applications. Then, when changing applications, use the PLC Reporter to read the file for the next application from computer memory, and then send it in one operation to the PLC's memory. This functionality means that applications can be switched quickly.



Collection of Data for Quality Checks

Data for Unacceptable Products Displayed in Words

Data for unsatisfactory products sent to the PLC can be collected with the PLC Reporter. Excel's user definitions can be used to define the meanings of codes and thus display messages instead of actual data.



Models/Specifications

Product name	PLC Reporter 32 Host Link Version	PLC Reporter 32 Multi-network Version
Model	SDKY-95HLK-E97	SDKY-95MLT-E97
Compatible networks	Host Link	Host Link, Controller Link, SYSMAC LINK, Ethernet, SYSMAC Board
Connectable PLCs	CS Series, CJ Series, C Series, CV Series	
OS	Microsoft Windows 98, Me, 2000, or XP	
Compatible Excel version	Microsoft Excel 97, 2000, or 2002	
Computer	IBM PC/AT or compatible	
Recommended specifications	CPU: Pentium 300 MHz min. Memory:128 MB min. Free disk space: 20 MB min. CD-ROM drive required for installation	

Note: Product specifications and configurations are current as of July 2003.

■ Compolet™– ActiveX Control for PLC Communications

Development Work for PLC Communications Simpler and Faster with ActiveX Control

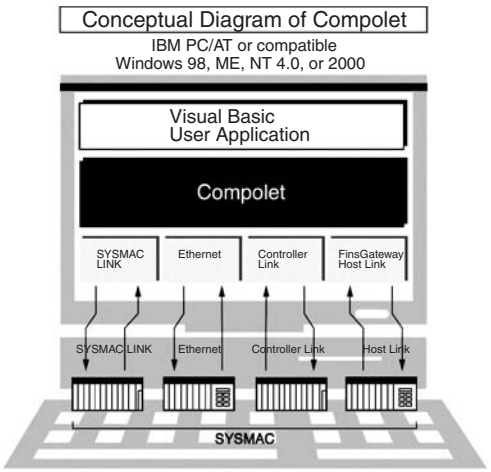
Main Features

Significant Reduction in Development Time

Compolet significantly reduces the time and effort required for difficult, time-consuming communications programming. Using ActiveX control for direct operation of Programmable Controllers (e.g., SYSMAC), eliminates the need for knowledge of PLC communications commands (FINS commands). The application uses an easy-to-read format, allowing simple reading of 100 words of DM Area data. This enables users to concentrate on creating application logics and to configure efficient applications.

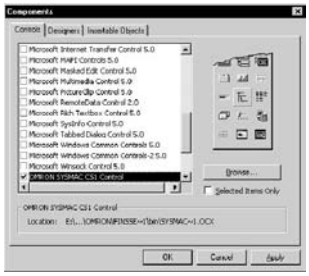
FinsGateway

More than two field networks can be unified into one platform. Users can create various applications without being concerned about types of networks. With the FinsGateway, new networks can be easily added.



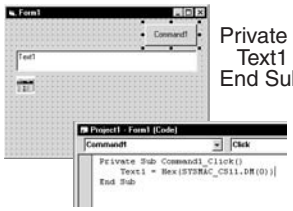
Application

Start Visual Basic and select **Components**.
Select **OMRON SYSMAC CS1 Control.**



On the Form Window, double-click **Command1**, and a window describing codes will be displayed.

Enter the following text in the **Click** column next to the **Command1** column.



```
Private Sub Command1_Click
  Text1 = Hex (SYSMAC_CS11.DM(0))
End Sub
```

Complete

Main Functions

Interface	Function	Description
Property	Communications with SYSMAC PLCs	Specifying the SYSMAC to communicate with, and reading network information
	Reading/writing variables and I/O Area memory data	Reading and writing to memory areas such as DM and CIO words E.g. DM word 100: DM (100)
	Operating state	Reading or changing the operation mode
	Area information	Reading the size of the program area or the number of DM words
	Error information	Reading the value of an error as a message.
	Other SYSMAC information	Reading the format, changing or reading the time
Method	Reading/writing variables and I/O Area memory data	Reading and writing of memory area data such as consecutive DM or I/O words
	I/O table creation	Creating an I/O table for the current configuration
	Forced set/reset/cancel of input bits (contacts)	Forced set/reset/cancel of individual input bits (contacts)
	Execution of FINS services	Sending FINS commands, and acquisition of FINS responses received

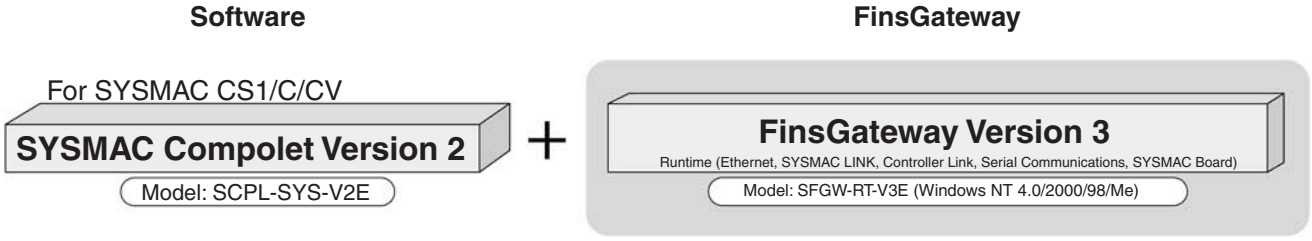
Operating Environment/Specifications

Computer	IBM PC/AT or compatible An environment where the OS can run properly 10MB of free disk space for installation
CPU (memory)	Intel Celeron 400 MHz min. or better recommended (Memory: 32 MB min.)
OS	Windows 98, Me, NT 4.0 SP3 or later, 2000, or XP
Required development software	Microsoft Visual Basic 5.0/6.0
Compatible networks	SYSMAC LINK Controller Link Ethernet Serial communications (RS-232C) SYSMAC Board

Note: A suitable board for each network is required.

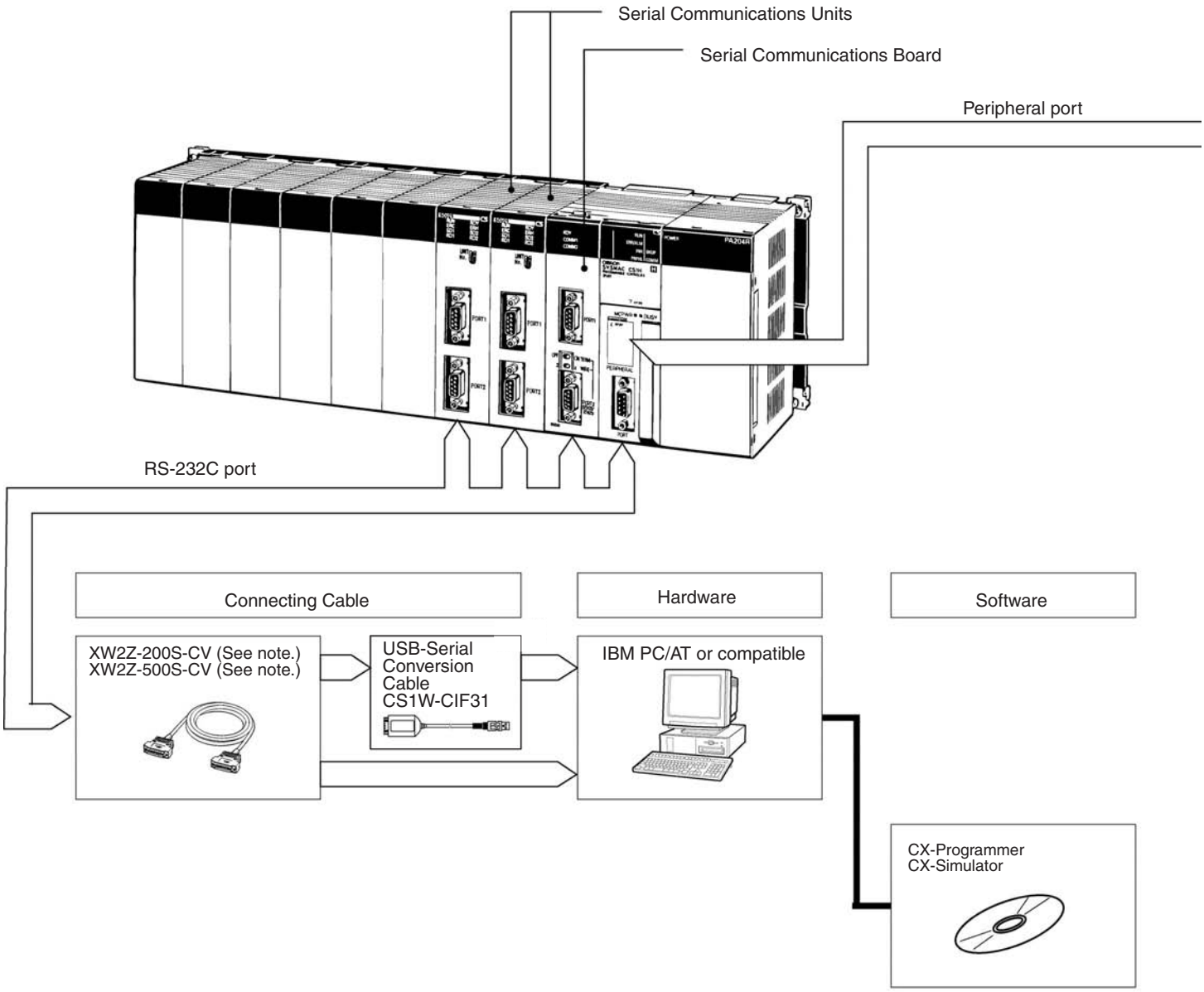
Models

Choose one from the following products according to specification requirements.



Note: Product specifications and configurations are current as of July 2003.

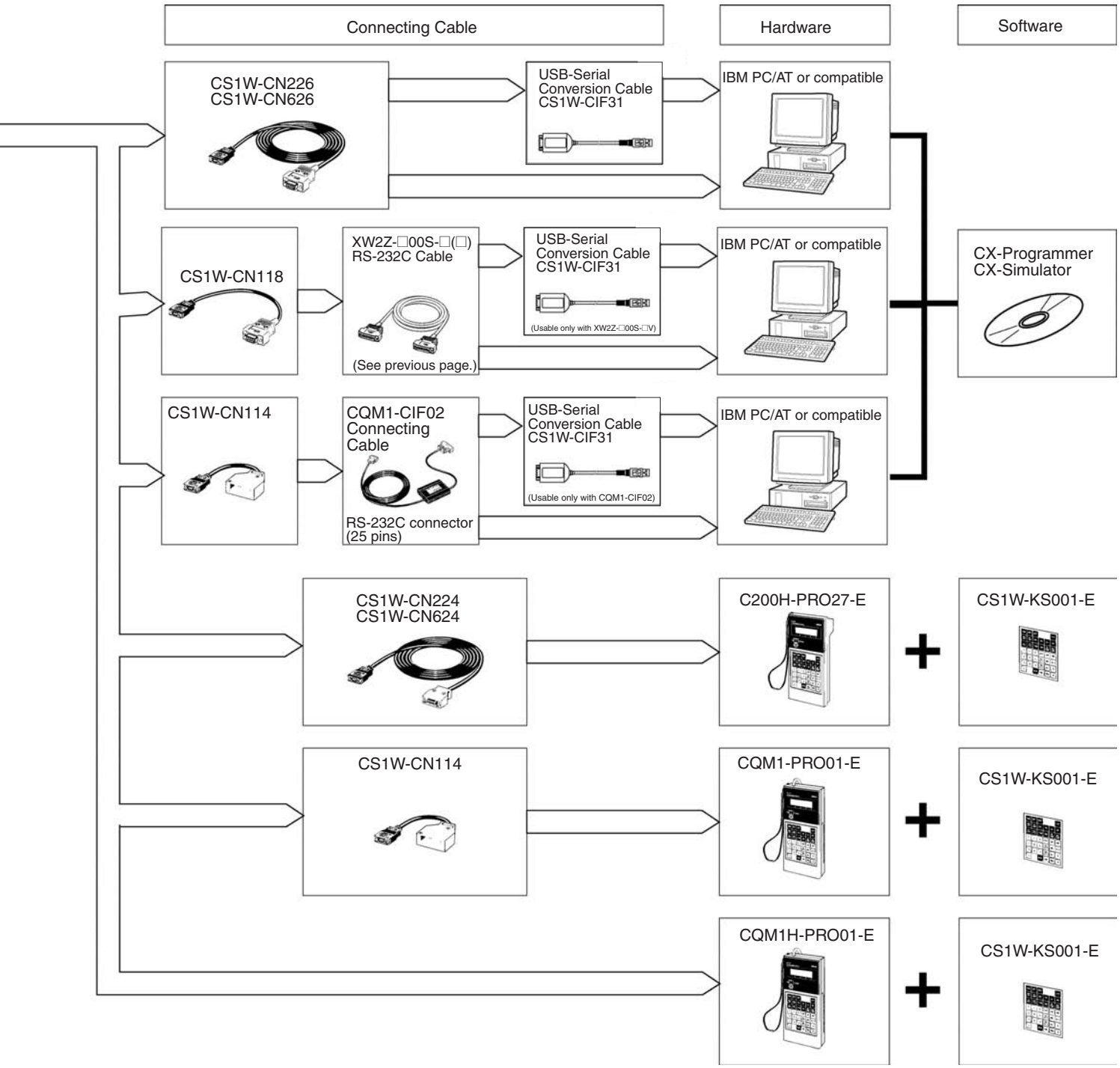
Programming Devices



Note: 1. Refer to the next page for details of cables for connecting to computers. Choose the appropriate cable for the communications mode.

2. The following cables can be used for a Host Link connection (but not a peripheral bus connection):
XW2Z-200S-V
XW2Z-500S-V

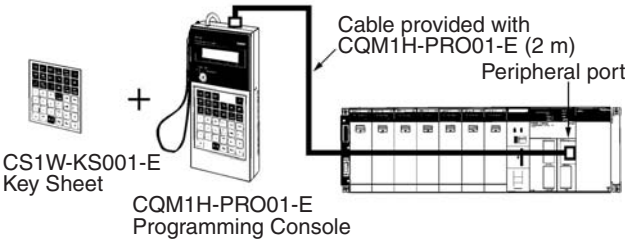
CS1 CPU Unit Descriptions



Programming Devices

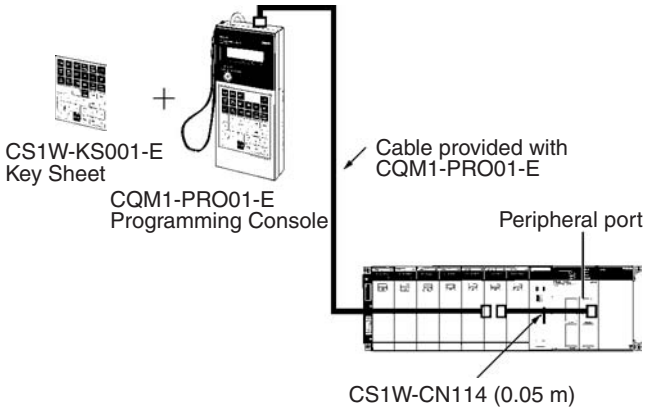
■ Programming Consoles

CQM1H-PRO01-E



Model	Cable	Cable length
CQM1H-PRO01-E	Not required.	---

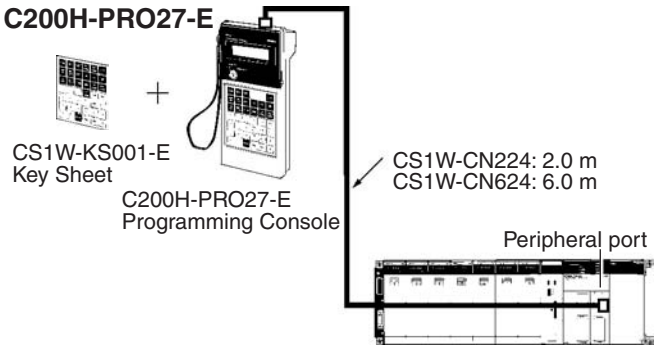
CQM1-PRO01-E (See note.)



Note: The above configuration is also possible for the C200H-PRO27-E with a Programming Console Cable, such as the C200H-CN222.

Model	Cable	Cable length
CQM1-PRO01-E	CS1W-CN114	0.05 m

C200H-PRO27-E



Model	Cable	Cable length
C200H-PR027-E	CS1W-CN224	2.0 m
	CS1W-CN624	6.0 m

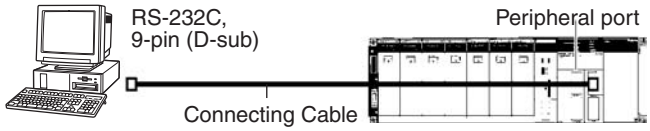
■ Windows-based Programming Software: CX-Programmer

Name	Model	Specifications
CX-Programmer	WS02-CXPC1-E-V5□	OS: Windows 95/98 or Windows NT/Me/2000/XP

The following serial communications modes can be used to connect a computer with the CX-Programmer to a CS1 PLC.

Mode	Features
Peripheral bus	The faster mode, peripheral bus is generally used for CX-Programmer connections. Only 1:1 connections are possible. The baud rate is automatically detected with the CS1.
Host Link	A standard protocol for host computers. Slower than peripheral bus, but allows modem or optical adapter connections, or long-distance or 1:N connections via RS422A/485.

Connecting to the Peripheral Port

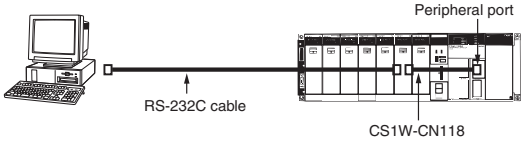


Peripheral Port Connecting Cables

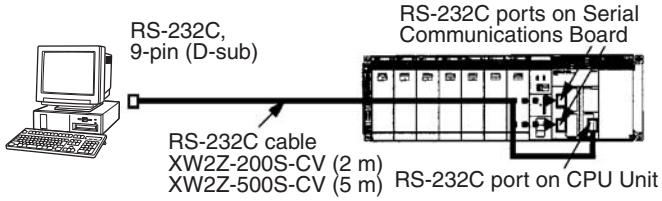
Cable	Length	Computer connector
CS1W-CN226	2.0 m	D-sub, 9-pin, male
CS1W-CN626	6.0 m	

The following cables can be used for an RS-232C connection from the computer to the peripheral port.

Mode	Connecting cables		Length	Computer connector
Peripheral bus or Host Link	XW2Z-200S-CV or XW2Z-500S-CV	CS1W-CN118	2 or 5 m + 0.1 m	D-sub, 9-pin, male
Host Link	XW2Z-200S-V or XW2Z-500S-V			



Connecting to the RS-232C Port



RS-232C Port Connecting Cables

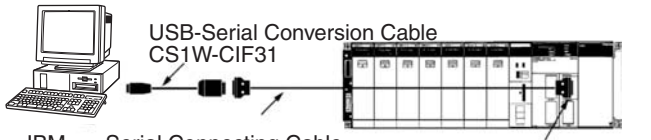
Mode	Cable	Length	Computer connector
Peripheral bus or Host Link	XW2Z-200S-CV	2.0 m	D-sub, 9-pin, male
	XW2Z-500S-CV	5.0 m	

Note: Cables with model numbers ending in "CV" are antistatic.

The following cables can be used for an RS-232C connection from the computer to an RS-232C port. (Unlike cables with model numbers ending in "-CV," however, these cables do not support peripheral bus connection and do not have anti-static specifications.)

Mode	Cable	Length	Computer connector
Host Link	XW2Z-200S-V	2.0 m	D-sub, 9-pin, male
	XW2Z-500S-V	5.0 m	

Using the USB-Serial Conversion Cable



USB–Serial Conversion Cable General Specifications

USB interface standard		Conforms to USB Specification 1.1
DTE speed		115.2 kbps
Connector specifications	Computer end	USB (type A plug, male)
	PLC end	RS-232C (D-sub, 9-pin, male)
Power supply		Bus power (supplied from upstream, 5 VDC)
Current consumption		35 mA
Operating environment	Ambient temperature	0 to 55°C
	Ambient humidity	10% to 90% (with no condensation)
	Atmosphere	No corrosive gas
Weight		50 g

OS Supporting Drivers for the USB–Serial Conversion Cable

Windows 98, Me, 2000, and XP

- **Applicable Software**
- CX-Programmer, CX-Simulator, CX-Protocol, CX-Motion
- CX-Position, CX-Process, DeviceNet Configurator, PLC Reporter 32
- NS-Designer, NT Support Tool for Windows (NTST)

Note: There are restrictions in the COM port that can be used for the NTST.

- **Applicable Communications Middleware**

FinsGateway, CX-Server

Models

The applicable software supports the following PLCs and PTs.

- **PLCs**

CS Series, CJ Series, C Series (C200HS, C200HX/HG/HE, C200H, C1000H, C2000H, CQM1, CPM1, CPM1A, CPM2A, SRM1, CQM1H, CPM2C), CVM1, CV Series

- **PTs**

NS Series, NT Series

Connecting Cables for Peripheral Port

Computer	Serial Communications Mode	Connecting Cable model numbers			Lengths	Computer end
IBM PC/AT or compatible	Tool bus or Host Link (SYSWAY)	CS1W-CIF31	CS1W-CN226		0.5 m + 2.0 m	USB (type A plug)
			CS1W-CN626		0.5 m + 6.0 m	
		CS1W-CIF31	XW2Z-200S-CV/ 500S-CV	CS1W-CN118	0.5 m + (2.0 m or 5.0 m) + 0.1 m	
	Host Link (SYSWAY)	CS1W-CIF31	XW2Z-200S-V/ 500S-V		0.5 m + (2.0 m or 5.0 m) + 0.1 m	

Connecting Cables for RS-232C Port

Computer	Serial Communications Mode	Connecting Cable model numbers		Lengths	Computer end
IBM PC/AT or compatible	Tool bus or Host Link (SYSWAY)	CS1W-CIF31	XW2Z-200S-CV	0.5 m + 2.0 m	USB (type A plug)
			XW2Z-500S-CV	0.5 m + 5.0 m	
	Host Link (SYSWAY)	CS1W-CIF31	XW2Z-200S-V (See note.)	0.5 m + 2.0 m	
			XW2Z-500S-V (See note.)	0.5 m + 5.0 m	

Note: Tool bus connections are not possible and connectors without ESD measures are used.

CS1 Unit Descriptions

Unit Index

Unit		Classification	Model	Use with CS1D	Page
I/O Units	Input Units	CS1 Basic I/O Unit	CS1W-ID211/231/261/291	Yes	93
			CS1W-IA111/211	Yes	94
		C200H Basic I/O Unit	C200H-ID211/212	No	93
			C200H-IA□□□(V)	No	94
			C200H-IM211/212	No	94
		C200H Group-2 High Density Units	C200H-ID216/217/218/219/111	No	93
		C200H Special I/O Unit	C200H-ID215/501	No	93
	Output Units	CS1 Basic I/O Unit	CS1W-OC201/211	Yes	94
			CS1W-OD21□/23□/26□/29□	Yes	94
			CS1W-OA201/211	Yes	95
		C200H Basic I/O Unit	C200H-OC22□(N)	No	94
			C200H-OD□□□	No	94
			C200H-OA223/222V/224	No	95
		C200H Group-2 High-density Units	C200H-OD218/219	No	94
		C200H Special I/O Unit	C200H-OD215/501	No	94
	I/O Units	CS1 Basic I/O Unit	CS1W-MD261/262/291/292/561	Yes	95
		C200H Special I/O Unit	C200H-MD215/115/501	No	95
High-speed Input Unit		CS1 Basic I/O Unit	CS1W-IDP01	Yes	95
Interrupt Input Unit		CS1 Basic I/O Unit	CS1W-INT01	Yes	96
		C200H Basic I/O Unit	C200H-INT01	No	
Analog Timer Unit		C200H Special I/O Unit	C200H-TM001	No	97
B7A Interface Units	Input Units	C200H Basic I/O Unit	C200H-B7AI1/12	No	98
	Output Units	C200H Basic I/O Unit	C200H-B7AO1/02	No	
	I/O Units	C200H Basic I/O Unit	C200H-B7A21/22	No	
Safety Relay Unit		CS1 Basic I/O Unit	CS1W-SF200	Yes	100
Analog I/O Units	Input Units	CS1 Special I/O Unit	CS1W-AD041/081 (-V1)	Yes	103
		C200H Special I/O Unit	C200H-AD03	No	
	Output Units	CS1 Special I/O Unit	CS1W-DA041/08V/08C	Yes	105
		C200H Special I/O Unit	C200H-DA001/002/003/004	No	
	I/O Units	CS1 Basic I/O Unit	CS1W-MAD44	Yes	107
		C200H Special I/O Unit	C200H-MAD01	No	
Loop Control Unit		CS1 CPU Bus Unit	CS1W-LC001	Yes	109
Loop Control Board		Inner Board	CS1W-LCB01/05	Yes (See note 1.)	
		CS1D Process Control CPU Unit (with built-in Inner Board)	CS1D-CPU65P/67P (CS1D-LCB05D built in)	Yes	113
Process I/O Units		CS1 Special I/O Unit	CS1W-P□□□□(-V1)	Yes	113
Temperature Sensor Units		CS1 Special I/O Unit	CS1W-PTS01-V1/02/03/11/12/51/52	Yes	116
		C200H Special I/O Unit	C200H-TS001/002/101/102	No	
Temperature Control Units		C200H Special I/O Unit	C200H-TC□□□	No	118
Heat/Cool Control Units		C200H Special I/O Unit	C200H-TV□□□	No	120
PID Control Units		C200H Special I/O Unit	C200H-PID01/02/03	No	122
Position Control Units		CS1 Special I/O Unit	CS1W-NC□□3	Yes	124
		C200H Special I/O Unit	C200HW-NC□□3	No	

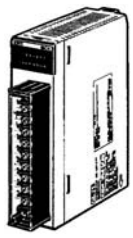
CS1 Unit Descriptions

Unit		Classification	Model	Use with CS1D	Page
Motion Control Unit		CS1 Special I/O Unit	CS1W-MC421-V1/221-V1	Yes	126
		CS1 CPU Bus Unit	CS1W-MCH71	Yes (See note 2.)	128
Customizable Counter Units		CS1 Special I/O Unit	CS1W-HCP22-V1/HCA22-V1/ HCA12-V1/HIO01-V1	Yes	131
High-speed Counter Units		CS1 Special I/O Unit	CS1W-CT021/041	Yes	133
		C200H Special I/O Unit	C200H-CT001-V1/002/021	No	
Cam Positioner Unit		C200H Special I/O Unit	C200H-CP114	No	135
ID Sensor Units		CS1 Special I/O Unit	CS1W-V600C11/V600C12	Yes	137
		C200H Special I/O Unit	C200H-IDS01-V1	No	
Serial Communications Boards/ Unit	Serial Communications Boards	Inner Board	CS1W-SCB21-V1/41-V1	Yes (See note 1.)	139
	Serial Communications Unit	CS1 CPU Bus Unit	CS1W-SCU21-V1	Yes	
GP-IB Interface Unit		CS1 Special I/O Unit	CS1W-GPI01	Yes	140
ASCII Units		C200H Special I/O Unit	C200H-ASC11/21/31	No	141
RS-232C/RS-422 Conversion Unit		---	NT-AL001	Yes	145
Ethernet Unit (100Base-TX/10Base-T)		CS1 CPU Bus Unit	CS1W-ETN21/CS1D-ETN21D	Yes	147
Controller Link Boards/Unit	Controller Link Unit	CS1 CPU Bus Unit	CS1W-CLK21-V1/12-V1/52-V1	Yes	149
	Controller Link Boards	Personal computer ISA board	3G8F7-CLK21-EV1/CLK12-EV1/ CLK52-EV1	Yes	
SYSMAC LINK Boards/Unit	SYSMAC LINK Unit	CS1 CPU Bus Unit	CS1W-SLK21/11	Yes	153
	SYSMAC LINK Boards	Personal computer ISA board	3G8F7-SLK21/11-E	Yes	
FL-net Unit		CS1 CPU Bus Unit	CS1W-FLN22	---	155
DeviceNet Units	DeviceNet Unit (Master/Slave)	CS1 CPU Bus Unit	CS1W-DRM21-V1	Yes	158
	Master Unit	C200H Special I/O Unit	C200HW-DRM21-V1	No	
	Slave	C200H Special I/O Unit	C200HW-DRT21	No	
CompoBus/S Units	Master Unit	C200H Special I/O Unit	C200HW-SRM21-V1	No	160

Note: 1. Inner Boards cannot be used with the CS1D-CPU□□H.

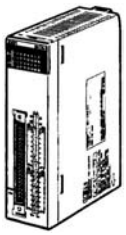
2. There are restrictions when using the CS1W-MCH71 Motion Control Unit with the CS1D-CPU□□H. Refer to the *CS1D Duplex System Operation Manual* (Cat. No.: W405).

I/O Units
CS1W-ID/IA/OC/OD/OA/MD



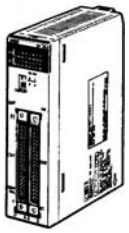
Input Unit
CS1W-ID211
16 points

Output Units
CS1W-OD21□
16 points



Input Unit
CS1W-ID231
32 points

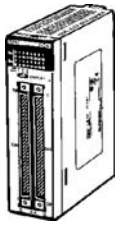
Output Units
CS1W-OD23□
32 points



Input Unit
CS1W-ID261
64 points

Output Units
CS1W-OD26□
64 points

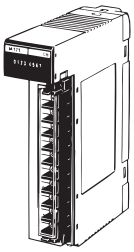
I/O Units
CS1W-MD26□/561
32/32 points



Input Unit
CS1W-ID291
96 points

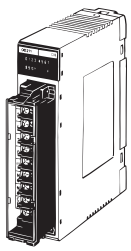
Output Units
CS1W-OD29□
96 points

I/O Units
CS1W-MD29□
48/48 points



Input Unit
C200H-I□□□□
8 points

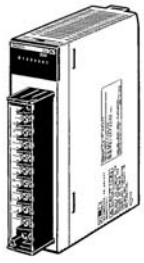
Output Units
C200H-O□□□□
5/8 points



Input Unit
C200H-I□□□□
16 points

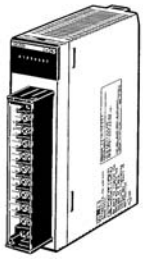
Output Units
C200H-O□□□□
16 points

AC Input Units
CS1W-IA□11
16 points



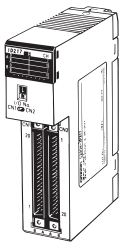
Triac Output Unit
CS1W-OA201
8 points

Triac Output Unit
CS1W-OA211
16 points



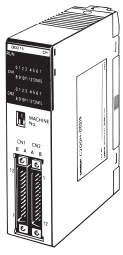
Relay Output Unit
CS1W-OC201
8 independent

Relay Output Unit
CS1W-OC211
16 points



Input Unit
C200H-ID□□□
32/64 points

Output Units
C200H-OD□□□□
32/64 points



Input Unit
C200H-ID□□□
32 points

Output Units
C200H-OD□□□□
32 points

I/O Units
C200H-MD□□□□
16/16 points

■ DC Input Units

Classification	Input voltage	Inputs	Connections	Model	Remarks
CS1 Basic I/O Unit	24 VDC	16 pts	Removable terminal block	CS1W-ID211	Input current: 7 mA
	24 VDC	32 pts	Connector	CS1W-ID231	Input current: 6 mA
	24 VDC	64 pts		CS1W-ID261	
	24 VDC	96 pts		CS1W-ID291	Input current: approx. 5 mA
C200H Basic I/O Unit	12 to 24 VDC	8 pts	Removable terminal block	C200H-ID211	Input current: 10 mA
	12 VDC	16 pts	Removable terminal block	C200H-ID212	Input current: 7 mA
C200H Group-2 I/O Units	24 VDC	32 pts	Connector	C200H-ID216	Input current: 4.1 mA
	24 VDC	64 pts		C200H-ID217	
	24 VDC	32 pts		C200H-ID218	Input current: 6 mA
	24 VDC	64 pts		C200H-ID219	
	12 VDC	64 pts		C200H-ID111	Input current: 4.1 mA
C200H Special I/O Unit	24 VDC	32 pts		C200H-ID215	

■ TTL Input Units

Classification	Input voltage	Inputs	Connections	Model	Remarks
C200H Special I/O Unit	5 VDC	32 pts	Connector	C200H-ID501	Supports high-speed inputs.

■ AC Input Units (and 100 VDC)

Classification	Input voltage	Inputs	Connections	Model
CS1 Basic I/O Units	100 to 120 VAC, or 100 to 120 VDC	16 pts	Removable terminal block	CS1W-IA111
	200 to 240 VAC	16 pts		CS1W-IA211
C200H Basic I/O Units	100 to 120 VAC	8 pts		C200H-IA121
		16 pts		C200H-IA122
				C200H-IA122V
	200 to 240 VAC	8 pts		C200H-IA221
		16 pts		C200H-IA222
				C200H-IA222V

■ AC/DC Input Units

Classification	Input voltage	Inputs	Connections	Model
C200H Basic I/O Units	12 to 24 VAC/VDC	8 pts	Removable terminal block	C200H-IM211
	24 VAC/VDC	16 pts		C200H-IM212

■ Relay Output Units

Classification	Outputs	Connections	Model
CS1 Basic I/O Units	8 pts (independent)	Removable terminal block	CS1W-OC201
	16 pts		CS1W-PC211
C200H Basic I/O Units	8 pts		C200H-PC221
	12 pts		C200H-OC222
	12 pts		C200H-OC222N
	16 pts		C200H-OC225
	16 pts		C200H-OC226N
	5 pts		C200H-OC223
	8 pts		C200H-OC224
	8 pts		C200H-OC224N

■ Transistor Output Units

Classification	Outputs	Max. switching capacity	Connections	Model	Remarks
CS1 Basic I/O Units	16 pts	12 to 24 VDC, 0.5 A/pt, 8 A/Unit sinking	Removable terminal block	CS1W-OD211	---
		24 VDC, 0.5 A/pt, 5 A/Unit, sourcing, load short protection, alarm		CS1W-OD212	---
	32 pts	12 to 24 VDC, 0.5 A/pt, 5 A/Unit, sinking	Connector	CS1W-OD231	---
		24 VDC, 0.5 A/pt, 5 A/Unit, sourcing, load short protection, alarm		CS1W-OD232	---
	64 pts	12 to 24 VDC, 0.3 A/pt, 6.4 A/Unit, sinking		CS1W-OD261	---
		24 VDC, 0.3 A/pt, 6.4 A/Unit, sourcing, load short protection, alarm		CS1W-OD262	---
	96 pts	12 to 24 VDC, 0.1 A sinking, 7.2 A/Unit		CS1W-OD291	---
		12 to 24 VDC, 0.1 A sourcing, 7.2 A/Unit		CS1W-OD292	---
C200H Basic I/O Units	8 pts	12 to 48 VDC, 1 A sinking	Removable terminal block	C200H-OD411	---
	8 pts	24 VDC, 2.1 A, sinking		C200H-OD213	---
	8 pts	24 VDC, 0.8 A, sourcing, load short protection		C200H-OD214	---
	8 pts	5 to 24 VDC, 0.3 A, sourcing		C200H-OD216	---
	12 pts	24 VDC, 0.3 A, sinking		C200H-OD211	---
	16 pts	24 VDC, 0.3 A, sinking		C200H-OD212	---
	12 pts	5 to 24 VDC, 0.3 A, sourcing		C200H-OD217	---
	16 pts	24 VDC, 1.0 A, sourcing, load short protection		C200H-OD21A	---
C200H Group-2 I/O Units	32 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking	Connector	C200H-OD218	---
	64 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking		C200H-OD219	---
C200H Special I/O Unit	32 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking		C200H-OD215	128-pt dynamic outputs possible

Note: C200H-OD212/21B Units can also be used with CS1 PLCs.

■ TTL Output Unit

Classification	Outputs	Max. switching capacity	Connections	Model	Remarks
C200H Special I/O Unit	32 pts	5 VDC, 35 mA	Connector	C200H-OD501	128-pt dynamic outputs possible

■ Triac Output Units

Classification	Outputs	Max. switching capacity	Connections	Model
CS1 Basic I/O Units	8 pts	250 VAC, 1.2 A, 50/60 Hz	Removable terminal block	CS1W-OA201
	16 pts	250 VAC, 0.5 A, 50/60 Hz		CS1W-OA211
C200H Basic I/O Units	8 pts	250 VAC, 1.2 A, 50/60 Hz	Removable terminal block	C200H-OA223
	12 pts	250 VAC, 0.3 A, 50/60 Hz		C200H-OA222V
	12 pts	250 VAC, 0.5 A, 50/60 Hz		C200H-OA224

■ I/O Units

Name	Classification	Inputs/ Outputs	Input voltage	Max. switching capacity	Connections	Model	Remarks
DC Input/ Transistor Output Units	CS1 Basic I/O Units	32 inputs/ 32 outputs	24 VDC	12 to 24 VDC, 0.3 A, sinking	Connector	CS1W-MD261	---
		32 inputs/ 32 outputs		24 VDC, 0.3 A, sourcing, load short protection, alarm		CS1W-MD262	---
		48 inputs/ 48 outputs	24 VDC	12 to 24 VDC, 0.1 A, sinking		CS1W-MD291	---
		48 inputs/ 48 outputs		12 to 24 VDC, 0.1 A, sourcing		CS1W-MD292	---
	C200H Special I/O Units	16 inputs/ 16 outputs	24 VDC	16 mA at 4.5 V to 100 mA at 26.4 VDC, sinking		C200H-MD215	High-speed inputs, 128-pt dynamic outputs possible
		16 inputs/ 16 outputs	12 VDC	24 VDC, 50 mA, sinking		C200H-MD115	

Note: In addition to the normal I/O functions, C200H High-density I/O Units (Special I/O Units) provide the following functions.

- Dynamic I/O (except for OD501/OD215): In stead of normal static inputs and normal static outputs, dynamic outputs and dynamic inputs are used to increase I/O capacity to 128 inputs and 128 outputs through the use of strobe signal outputs. These functions can be used to reduce wiring to devices with more digits, such as displays and keyboards.
- High-speed Inputs (except OD501/OD215): Eight of the inputs can be set as high-speed inputs to accurately input short pulses from devices like photomicroswitches.

■ TTL I/O Unit

Name	Classification	Inputs/ Outputs	Input voltage	Max. switching capacity	Connections	Model	Remarks
TTL I/O Unit	CS1 Basic I/O Units	16 inputs/ 16 outputs	5 VDC	5 VDC, 35 mA	Connector	CS1W-MD561	---
	C200H Special I/O Units					C200H-MD501	High-speed inputs, 128-pt dynamic outputs possible

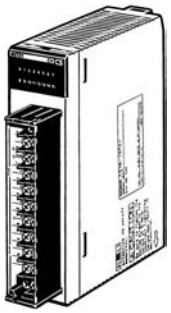
■ High-speed Input Unit

Name	Classification	Inputs	Max. switching capacity	Model
High-speed Input Unit	CS1 Basic I/O Units	16 pts	24 VDC, 7 mA	CS1W-IDP01

Interrupt Input Unit
CS1W-INT01/C200HS-INT01

High-speed Response of 1.0 ms

- Mounted to CPU Rack.
- Use up to two CS1W-INT01 Units or up to four C200HS-INT01 Units.



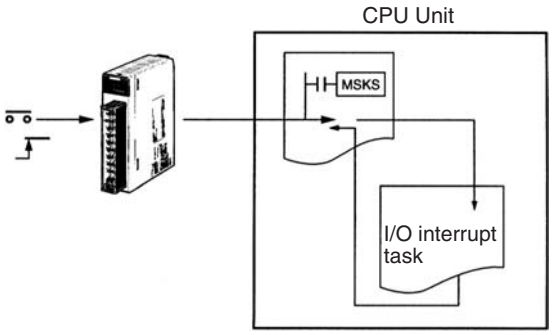
CS1W-INT01
C200HS-INT01

Function

When the input on the Interrupt Input Unit turns ON, the CPU Unit is notified immediately, cyclic task execution (normal programming) is interrupted, and an I/O interrupt task is executed.

The interrupt input function is supported only by CS1G/CS1H CPU Units. The Interrupt Input Units can be used only as normal Input Units with CS1D CPU Units.

System Configuration

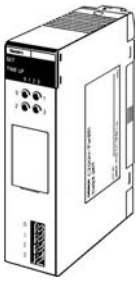


Specifications

Classification	Input voltage	Inputs	Input pulse width	Connections	Allocations	Model
CS1W Basic I/O Unit	24 VDC	16 pts	ON: 0.1 ms min. OFF: 0.5 ms min.	Removable terminal block	16 bits (CIO 0319 to CIO 2000)	CS1W-INT01
C200H Basic I/O Unit	12 to 24 VDC	8 pts	ON: 0.2 ms min. OFF: 0.5 ms min.		8 bits	C200HS-INT01

Analog Timer Unit (Interrupt Input Unit)
C200H-TM001

Easy On-site Time Adjustments

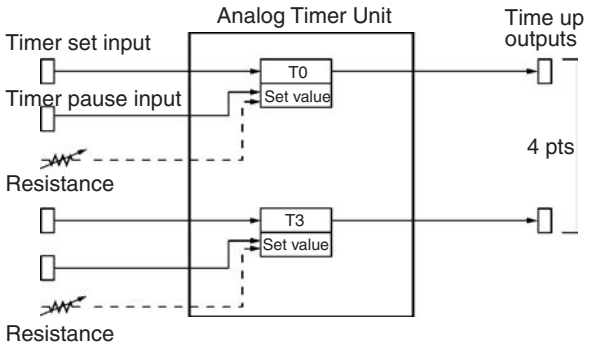


C200H-TM001

Function

Provides four timers, timer numbers 0 to 3, that are easily adjusted onsite via front-panel adjustments or external variable resistors: No Programming Device required. Using timer pause inputs enables applications as a accumulative timer.

System Configuration

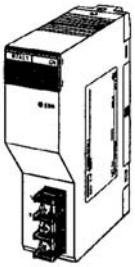


Specifications

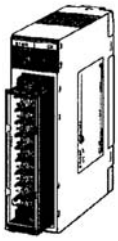
Classification	Timers	Setting range	Time setting method	CPU Unit bits	Allocations (CIO 0319 to CIO 2000)	Model
C200H Basic I/O Unit	4 pts	0.1 to 1.0 s, 1 to 10 s, 2 to 60 s, 1 to 10 min	Internal or external variable resistor	Timer set input, timer pause input, and time up output	16 bits (I/O Bit Area: CIO 2000 to CIO 0319)	C200H-TM001

B7A Interface Units
C200H-B7A

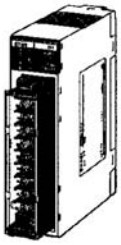
Wire-reduction Units that Transfer 16 Points of I/O Information on Two Signal Wires



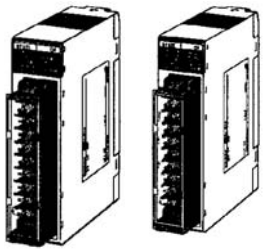
C200H-B7AI1 (16 inputs)
C200H-B7AO1 (16 outputs)



C200H-B7A02
(32 outputs)

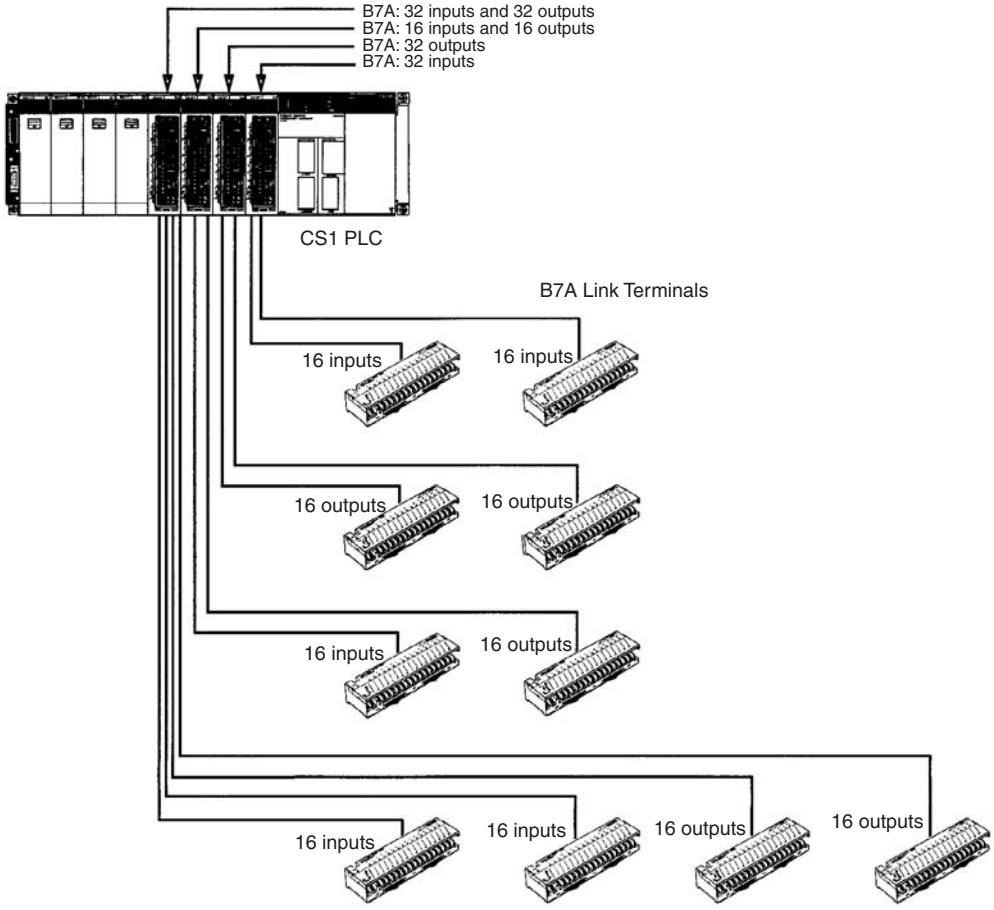


C200H-B7A12
(32 inputs)



C200H-B7A21
(16 inputs/16 outputs)
C200H-B7A22
(32 inputs/32 outputs)

Connection Example



Note: Refer to the B7A Link Terminal catalog (Q101) for details on B7A Link Terminals.

Specifications

Item		B7A Interface Units		B7A Group-2 Interface Units			
		C200H-B7AI1	C200H-B7AO1	C200H-B7A12	C200H-B7A02	C200H-B7A21	C200H-B7A22
I/O capacity	Inputs	16 inputs or 15 + 1 error input	---	32 inputs (See note 1.)	---	16 inputs (See note 2.)	32 inputs (See note 1.)
	Outputs	---	16 outputs	---	32 outputs	16 outputs	32 outputs
Transmission distance		500 m max. if separate power supplies are used for Unit and Link Terminals. 100 m max. if same power supply is used for Unit and Link Terminals.		Normal operation: 500 m max. if separate power supplies are used for Unit Link Terminals. 100 m max. if same power supply is used for Unit Link Terminals. High-speed operation: 100 m max. with shield connected and 10 m max. without shield connected if separate power supplies are used for Unit Link Terminals. 50 m max. with shield connected and 10 m max. without shield connected if same power supply is used for Unit and Link Terminals.			
Transmission delay		19.2 ms typical, 31 ms max.		Normal operation: 19.2 ms typical, 31 ms max. HIgh-speed operation: 3 ms typical, 5 ms max. (See note 3.)			
Internal current consumption		100 mA max. at 5 VDC					
External power supply (See note 4.)		10 mA max. at 12 to 24 VDC ±10%	30 mA max. at 12 to 24 VDC ±10%	50 mA max. at 12 to 24 VDC ±10%	60 mA max. at 12 to 24 VDC ±10%	50 mA max. at 12 to 24 VDC ±10%	80 mA max. at 12 to 24 VDC ±10%
Weight		200 g max.		300 g max.			
I/O word allocations (See note 5.)		I/O words are allocated consecutively according to the mounting position.		I/O words are allocated consecutively according to the mounting position. Two words are allocated to 32-point Units and four words are allocated to 64-point Units.			

Note: 1. Can also be used for 32 inputs or 30 inputs + 2 error inputs by changing input mode.
2. Can also be used for 16 inputs or 15 inputs + 1 error input by changing input mode.
3. Normal and high-speed operation set via switch.
4. Not including power supply to B7A Link Terminals
5. With the C200HX/HG/HE, words from IR 030 to IR 049 are allocated to B7A Interface Units (Group-2 Units) according to the I/O number setting.

Applicable B7A Link Terminals

■ Input Terminals

Type	Model	Transmission delay
Screw terminals	B7A-T6□1	Normal (19.2 ms)
	B7AS-T6□1	
	B7A-T6□6	High-speed (3 ms)
	B7AS-T6□6	
Modules	B7A-T6D2	Normal (19.2 ms)
	B7A-T6D7	High-speed (3 ms)
PC connectors	B7A-T□E3	Normal (19.2 ms)
	B7A-T□E8	High-speed (3 ms)

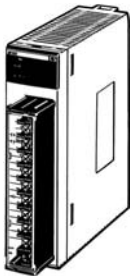
■ Output Terminals

Type	Model	Transmission delay
Screw terminal	B7A-R6□□1	Normal (19.2 ms)
	B7AS-R6□□1	
	B7A-R6□□6	High-speed (3 ms)
	B7AS-R6□□6	
Modules	B7A-R6A52	Normal (19.2 ms)
	B7A-RA57	High-speed (3 ms)
OC connectors	B7A-R□A□3	Normal (19.2 ms)
	B7A-R□A□8	High-speed (3 ms)

Safety Relay Unit
CS1W-SF200

Reduced Wiring and Space for Safety Circuits

- Safety relays and monitor inputs in 1 Unit to reduce wiring and space.
- Safety relays operate with separate power supply from PLC.
- Monitor safety circuit output, K1/K2 relay, or power status from PLC.
- Four general-purpose inputs provided.
- Safety standards: EN954-1 and EN60204-1

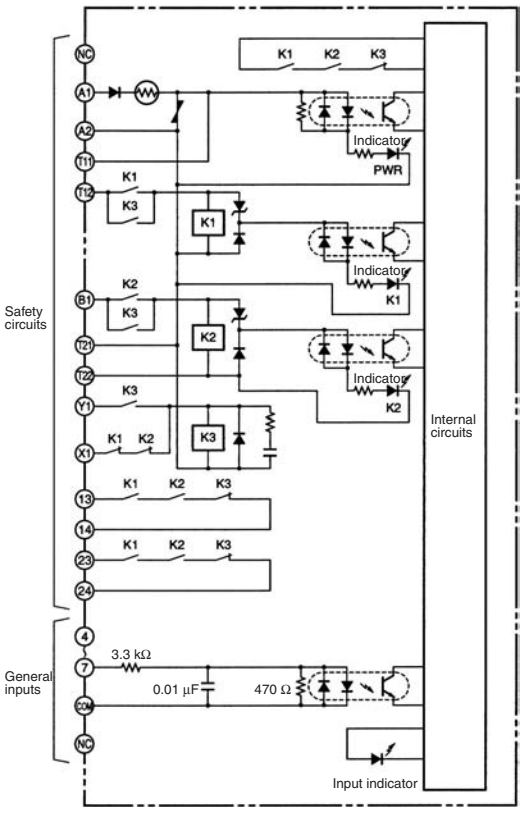


CS1W-SF200

Function

This Safety Relay Unit mounts as an I/O Unit and provides both safety relays and inputs for monitoring.

Internal Connections



Specifications

Item	Specifications
Contact resistance	100 mΩ (5 VDC, 1 A, voltage drop method)
Operating time	300 ms max. (not including bounce)
Response time	10 ms max. (time from input OFF to main contact OFF, not including bounce)
Insulation resistance (See note.)	20 MΩ min. (at 500 VDC) for following: Safety circuits-safety outputs, General inputs-safety outputs, Different poles of safety outputs, and safety circuits-general inputs
Withstand voltage (See note.)	2,500 VAC, 50/60 Hz for 1 min for following: Safety circuits-safety outputs, General inputs-safety outputs, Different poles of safety outputs 500 VAC, 50/60 Hz for 1 min for Safety circuits-general inputs
Durability	Mechanical: 5,000,000 min. (7,200 time/hr) Electrical: 100,000 min. (1,800 time/hr)
Weight	300 g

Note: Measured while mounted to PLC.

Ratings of Safety Circuits

Item		Specification
Power	Supply voltage	24 VDC
	Fluctuation	$^{-15\%}/_{+10\%}$ of supply voltage
	Consumption	24 VDC: 1.7 W max.
Inputs	Current	75 mA max.
Switching	Rated load	250 VAC, 5 A
	Rated ON current	5 A

Ratings of General Inputs

Item	Specifications
Power voltage	24 VDC
Fluctuation	$^{-15\%}/_{+10\%}$ of supply voltage
Input impedance	3.3 kΩ
Input current	7 mA typ. (24 VDC)
ON voltage/current	14.4 VDC min./3 mA min.
OFF voltage/current	5 VDC max./1 mA max.
ON/OFF response	8 ms max. (Set to 1 to 32 in PC Setup)
Circuits	4 points, 1 common
ON points	100% simultaneously ON

Analog Product Selection Guide

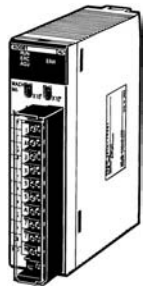
Classification	Model	I/O capacity	I/O isolation*	I/O ranges/types	Conversion time	Remarks	Page
Analog Input Units	CS1W-AD041-V1	4 inputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	0.25 ms/pt	---	103
	CS1W-AD081-V1	8 inputs	No	1 to 5 V, 0 to 5 V, 0 to10 V, ±10 V, 4 to 20 mA		---	
	CS1W-PTW01	4 inputs	Yes	1 to 5 V, 4 to 20 mA	100 ms/4 pts	Built-in power supply for 2-wire transmission device, measured value alarms (HH, H, L, LL), other features	113
	CS1W-PDC11		Yes	4 to 20 mA, 0 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	20 ms/4 pts, 10 ms/2 pts	Measured value alarms (HH, H, L, LL), top/bottom/valley hold, other features.	
	CS1W-PDC55	8 inputs	Yes	4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V	250 ms/8 pts	Measured value alarms (H, L), other features	
	CS1W-PDC01	4 inputs	Yes	1 to 5 V, 0 to 5 V, 0 to10 V, ±10 V, 4 to 20 mA, 0 to 20 mA	100 ms/4 pts	Measured value alarms (HH, H, L, LL), other features	
	CS1W-PTR01	8 inputs	No	–1 mA to 1 mA, 0 to 1 mA	200 ms/8 pts	Motor overdrive prevention, measured value alarms (H, L), other features	
	CS1W-PTR02		No	–100 mA to 100 mA, 0 to 100 mV	200 ms/8 pts	Measured value alarms (H, L), other features	
	C200H-AD003		No	1 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA	1 ms/pt	---	103
Analog Output Units	CS1W-DA041	4 outputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	1 ms/pt	---	105
	CS1W-DA08V	8 outputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V			
	CS1W-DA08C		No	4 to 20 mA			
	CS1W-PMV01	4 outputs	Yes	1 to 5 V, 4 to 20 mA	100 ms/4 pts	Output disconnection alarm, control output answerback input, other features	113
	CS1W-PMV02		Yes	0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	40 ms/4 pts	---	
	C200H-DA001	2 outputs	No	0 to 10 V, 1 to 5 V, 4 to 20 mA	2.5 ms/pt		105
	C200H-DA002	4 outputs	No	–10 to 10 V, 4 to 20 mA			
	C200H-DA003	8 outputs	No	1 to 5 V, 0 to 10 V, –10 to 10 V	1 ms/pt		
	C200H-DA004		No	4 to 20 mA			
Analog I/O Unit	CS1W-MAD44	2 inputs and 2 outputs	No	1 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA	1 ms/pt	---	107
	C200H-MAD01	4 inputs and 4 outputs	No	Inputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA Outputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V	1 ms/pt		
Temperature Sensor Input Units	CS1W-PTS11	4 inputs	Yes	B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII, ±100 mV	20 ms/4 pts, 10 ms/2 pts	Measured value alarms (HH, H, L, LL), input disconnection alarm, top/bottom/valley hold, user-set zero span adjustment, other features.	116
	CS1W-PTS12		Yes	Pt100 Ω (JIS, IEC), Jpt100 Ω, Pt50 Ω, Ni508.4 Ω			
	CS1W-PTS51		Yes	B, J, K, R, S, T, L	250 ms/4 pts	Measured value alarms (H, L), measured value alarm DO output, input disconnection alarm, other features.	
	CS1W-PTS55	8 inputs	Yes		250 ms/8 pts		
	CS1W-PTS52	4 inputs	Yes	Pt100 Ω (JIS, IEC), Jpt100 Ω,	250 ms/4 pts		
	CS1W-PTS56	8 inputs	Yes		250 ms/8 pts		
	CS1W-PTS01-V1	4 inputs	Yes	B, E, J, K, N, R, S, T, ±80 m VDC auto range	150 ms/4 pts	Automatic range setting, measured value alarms (HH, H, L, LL), other features.	
	CS1W-PTS02		Yes	Pt100 (JIS, DIN, ISO) JPt100	100 ms/4 pts		
	CS1W-PTS03		Yes	Ni508 Ω	100 ms/4 pts		
	C200H-TS001		No	K, J	4.8 s max.	---	
	C200H-TS002		No	K, L			
	C200H-TS101		No	JPt100			
	C200H-TS102		No	Pt100			

Note: Inputs are isolated from PLC signals for all Units.

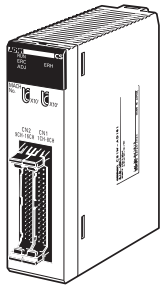
Analog Input Units
CS1W-AD□□□-V1/C200H-AD003

Convert Analog Signals to Binary Data

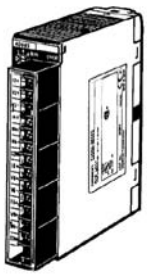
- Wire burnout detection
- Peak-hold function
- Mean function
- Offset gain setting



CS1W-AD041-V1/AD081-V1



CS1W-AD161

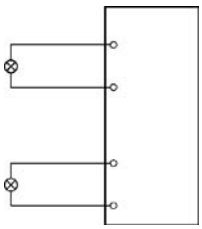


C200H-AD003

Function

Convert input signals such as 1 to 5 V or 4 to 20 mA to binary values between 0000 and 0FA0 Hex and store the results in the allocated words each cycle. The ladder diagram can be used to transfer the data to the DM Area or the SCALING instructions (e.g., SCL(194)) can be sued to scale the data to the desired ranged.

Circuit Configuration



Specifications

Model			CS1W-AD041-V1	CS1W-AD081-V1	CS1W-AD161	C200H-AD003	DRT2-AD04	DRT2-AD04H	GT1-AD08MX
Classification			CS1 Special I/O Units (See note 3.)			C200H Special I/O Unit	DeviceNet Slaves		MULTIPLE I/O TERMINAL of DeviceNet Slaves
Unit number			0 to 95	0 to 95	0 to 94	0 to F	---	---	---
Inputs			4 pts	8 pts	16 pts	8 pts	4 pts	4 pts	4 or 8 pts
Signal range	Voltages	1 to 5 V	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		0 to 10 V	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		0 to 5 V	Yes	Yes	Yes	---	Yes	Yes	Yes
		–10 to 10 V	Yes	Yes	Yes	Yes	Yes	---	Yes
	Currents	4 to 20 mA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		0 to 20 mA	---	---	---	---	Yes	Yes	Yes
Signal range settings			4 settings (one for each point)	8 settings (one for each point)	16 settings (one for each point)	8 settings (one for each point)	4 pts at a time	4 pts at a time	2 pts at a time
Resolution			1/8000	1/8000	1/8000	1/4000	1/6000	1/30000	1/6000
Conversion speed			1 ms/pt max. (0.25 ms/pt max.)	1 ms/pt max. (0.25 ms/pt max.)	1 ms/pt max. (0.25 ms/pt max.)	1 ms/pt max. (1 ms/pt max.)	4 ms/4 pts	250 ms/4 pts	8 ms/8 pts
Overall accuracy (at 25 °C)			Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.2%	Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.3% Current: ±0.4%	Voltage: ±0.3% Current: ±0.4%	Voltage: ±0.3% Current: ±0.4%
Connections			Terminal block	Terminal block	Connector (See note4.)	Terminal block	Terminal block	Terminal block	Connector
Features	Wire burnout detection		Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Peak-hold function		Yes	Yes	Yes	Yes	Yes	Yes	---
	Mean function		Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Scaling		---	---	Yes	---	Yes	Yes	---
	Square root extraction		---	---	---	---	---	---	---

Note: 1. Process I/O Units are also available for analog I/O. Refer to page 113.

2. Analog I/O Terminals are also available as DeviceNet Slaves and in MULTIPLE I/O TERMINALs. Refer to pages 212 to 216.

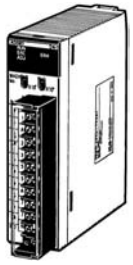
3. System settings also can be used to enable operation with the specifications of the previous Units (CS1W-AD041/081) (resolution: 1/4000, conversion speed: 1 ms per point max.).

4. Use OMRON's XW2D-34G6 Connector-Terminal Block Conversion Unit and special connection cable for input wiring.

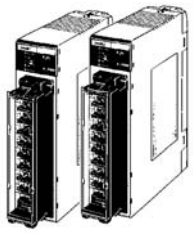
Analog Output Units
CS1W-DA□□□/C200H-DA□□□

Convert Binary Data to Analog Signals

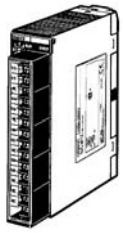
- Output hold function
- Offset gain adjustment (actual function depends on Unit)



CS1W-DA041/
CS1W-DA08V
CS1W-DA08C



C200H-DA001/
C200H-DA002

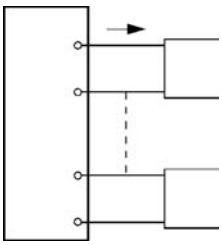


C200H-DA003
(voltage outputs)
C200H-DA004
(current outputs)

Function

Binary data between 0000 to 0FA0 Hex in the allocated words can be convert to analog signals such as 1 to 5 V or 4 to 20 mA for output. All that is required in the ladder diagram is to place the data in the allocated words.

Circuit Configuration



Specifications

Model			CS1W-DA041	CS1W-DA08V	CS1W-DA08C	C200H-DA001	C200H-DA002	C200H-DA003	C200H-DA004	DRT2-DA02	GT1-DA04MX
Classification			CS1 Special I/O Units			C200H Special I/O Units				DeviceNet Slaves	MULTIPLE I/O TERMINAL or DeviceNet Slaves
Unit numbers			0 to 95	0 to 95	0 to 95	0 to 9	0 to F	0 to F	0 to F	---	---
Outputs			4 pts	8 pts	8 pts	2 pts	4 pts	8 pts	8 pts	2 pts	4 pts
Signal range	**Voltages**	**1 to 5 V**	Yes	Yes	---	Yes	---	Yes	---	Yes	Yes
		0 to 10 V	Yes	Yes	---	Yes	---	Yes	---	Yes	Yes
		0 to 5 V	Yes	Yes	---	---	---	---	---	---	Yes
		–10 to 10 V	Yes	Yes	---	---	Yes	Yes	---	Yes	Yes
	Currents	**4 to 20 mA**	Yes	---	Yes	Yes		---	Yes	Yes	---
		0 to 20 mA	---	---	---	---	---	---	---	Yes	---
Signal range settings			4 settings (one for each point)	8 settings (one for each point)	8 settings (one for each point)	2 setting (for both points)	4 settings (one for each point)	8 settings (one for each point)	8 settings (one for each point)	2 settings (one for each point)	2 pts at a time
Resolution			1/4000	1/4000	1/4000	1/4095	Voltages: 1/8190 Currents: 1/4095	1/4000	1/4000	1/6000	1/6000
Conversion speed			1.0 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.	2.5 ms/pt max.	2.5 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.	4 ms/pt	4 ms/4 pts
Overall accuracy (at 25 °C)			Voltages: ±0.3%FS Currents: ±0.5%FS	±0.3% FS	±0.5% FS	±0.5% FS	Voltages: ±0.3%FS Currents: ±0.5%FS	±0.3% FS	±0.5% FS	±0.4% FS	±0.4% FS
Connections			Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Connector
Features	**Output limit**		---	---	---	Yes	---	---	---	---	---
	Upper/lower limit alarm		---	---	---	Yes	---	---	---	---	---
	Pulse outputs		---	---	---	Yes	---	---	---	---	---
	Output hold function		---	Yes	Yes	---	---	Yes	Yes	Yes	Yes

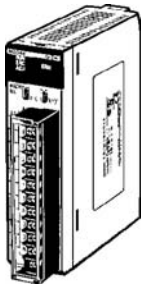
Note: 1. Process I/O Units are also available for analog I/O. Refer to page 113.

2. Analog I/O Terminals are also available as DeviceNet Slaves and in MULTIPLE I/O TERMINALs. Refer to pages 213 to 217.

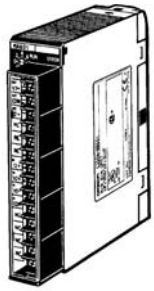
Analog I/O Units
C200H-MAD01/CS1W-MAD44

Analog Inputs and Outputs with One Unit

- Mean function
- Peak hold function
- Wire burnout detection
- Output hold function
- Ratio conversions



CS1W-MAD44

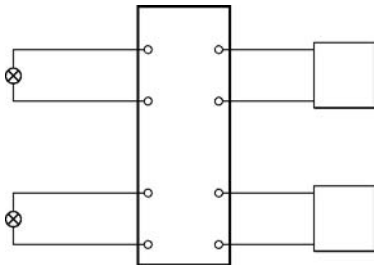


C200H-MAD01

Function

One Unit performs both analog input and analog output operations. The Unit can also be used for ratio and bias processing, which can be performed on analog inputs to output the results as analog outputs.

Circuit Configuration



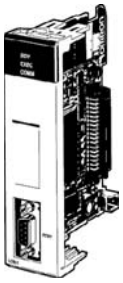
Specifications

Model			CS1W-MAD44	C200H-MAD01
Classification			CS1 Special I/O Unit	C200H Special I/O Unit
Unit numbers			0 to 95	0 to F
Inputs			4 pts	2 pts
Outputs			4 pts	2 pts
Input signal ranges	Voltages	1 to 5 V	Yes	Yes
		0 to 5 V	Yes	---
		0 to 10 V	Yes	Yes
		–10 to 10 V	Yes	Yes
		4 to 20 mA	Yes	Yes
Output signal ranges	Currents	1 to 5 V	Yes	Yes
		0 to 5 V	Yes	---
		0 to 10 V	Yes	Yes
		–10 to 10 V	Yes	Yes
		4 to 20 mA	---	Yes
Resolution			1/4000 (inputs/outputs)	1/4000 (inputs/outputs)
Conversion speed			1.0 ms/pt max (inputs/outputs)	1.0 ms/pt max (inputs/outputs)
Overall accuracy	Inputs		Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.4%
	Outputs		Voltage: ±0.3% Current: ±0.5%	Voltage: ±0.3% Current: ±0.5%
Connections			Terminal block	Terminal block
Features	Mean function		Yes	Yes
	Peak hold		Yes	Yes
	Wire burnout detection		Yes	Yes
	Output hold		Yes	Yes
	Ratio conversion		Yes	Yes

Loop Control Board/Unit
CS1W-LCB□□/CS1D-CPU□□P/CS1W-LC001

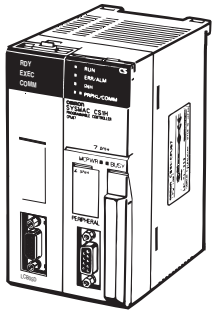
Perform Loop Control for Temperatures, Flow Rates, Pressures, and Other Analog Values; Create Monitoring and Data Logging Systems

- Systems can be designed according to the scale of the applications, from several loops of instrumentation to large-scale systems with hundreds of loops.
- A total of 70 different types of function block are provided for loop control, such as PID control, segment programming, and square roots.
- Programming and setup are easy with the CX-Process Tool Support Software.
- You can also change parameters from the CX-Process Tool while monitoring on tuning screens.
- Process control system redundancy is easily achieved by mounted CS1D Process-control CPU Units, which contain Duplex Loop Control Boards.
- Faceplate Auto Builder for NS-series PTs can also be used to easily create touch-panel screens to monitor operating status.



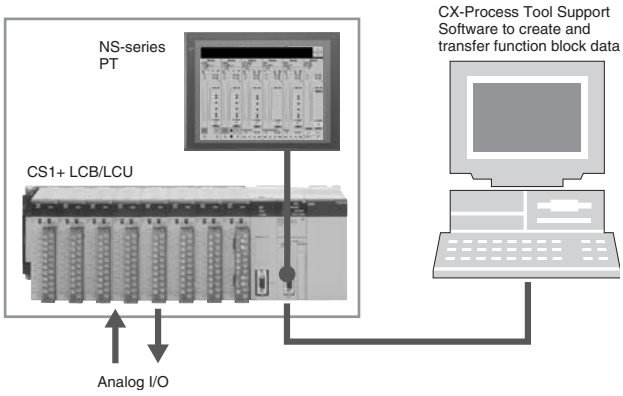
CS1W-LCB01/05

CS1W-LC001



CS1D-CPU65P/67P CPU Unit with Built-in CS1D-LCB05D

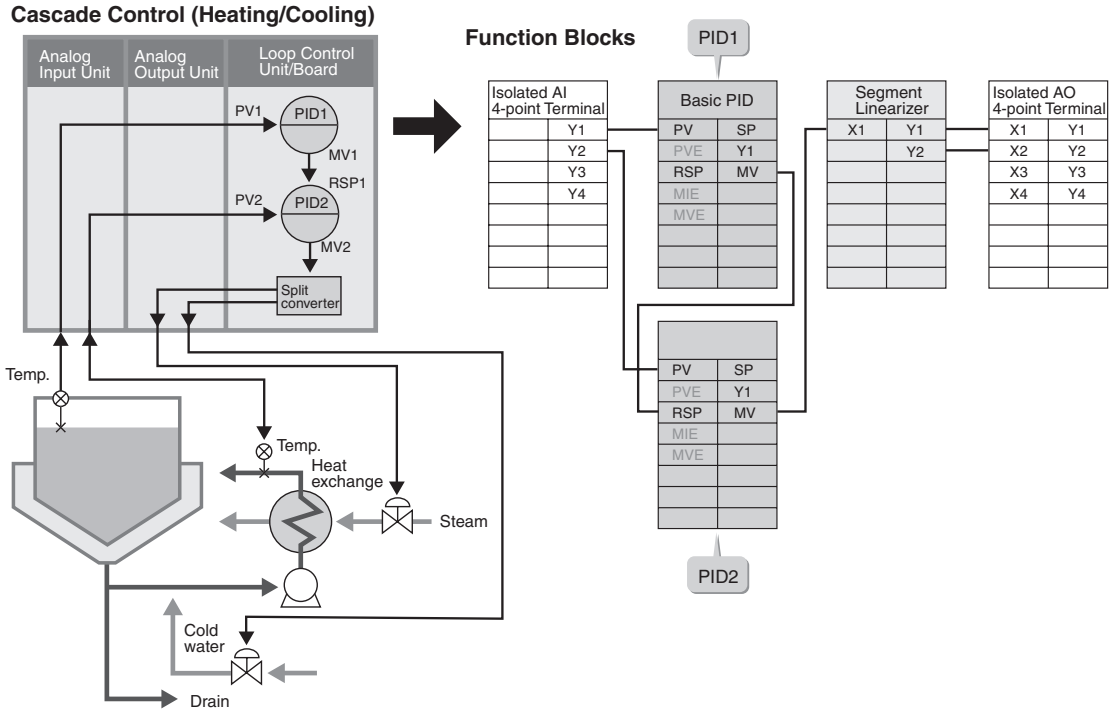
System Configuration Example



Function

Packed with complete DCS functionality, the LCBs/LCUs are programmed with function blocks designed specifically for process control. Paste function blocks in a window, and then connect the blocks with the mouse to program graphically. A wide array of control methods, from basic PID control to cascade and feed-forward control, are possible.

Function Block Example



Note: Refer to the *PLC-based Process Control Catalog* (Cat. No. P051) for details on the Loop Control Board/Unit.

Specifications

Item		Specifications			
Name		Loop Control Board			Loop Control Unit (See note 1.)
Unit classification		CS-series Inner Board			CS-series CPU Bus Unit
Model number		CS1W-LCB01 (Standard model)	CS1W-LCB05 (Standard model)	CS1W-LCB05D (Duplex model, see note 2.)	CS1W-LC001
Applicable PLCs		CS1G/H-CPU□□H	CS1G/H-CPU□□H	Built into CS1G/H-CPU□□P	CS-series PLCs
Mounting location		Inner Board slot in CPU Unit			CPU Rack only
Number of Units		1 max. per CPU Unit			3 max. per PLC
Data exchange with CPU Unit	User allocations in I/O memory	User memory tables used to allocate function block ITEM data for user-specified memory in CPU Unit (CIO, Work, HR, DM, or EM (bank 0) Area).			CPU Unit Terminal Blocks used to allocate function block ITEM data in specified words in CPU Unit memory.
	Batch allocation of all data	HMI function used allocate function block ITEM data for Control, Operation, External Controller, and System Common blocks in the specified bank of the EM Area in the CPU Unit. (Default EM Area bank: Bank 0)			Send/Receive All Blocks is used to allocate data in specified CPU Unit memory (no default settings).
Setting switches		None			Rotary switch on front panel: Unit number (0 to F)
Indicators		3 LEDs:RUN, ready, and communications port send/receive			5 LED indicators: RUN operation, CPU Unit errors, and Unit errors
Front panel connections		One RS-232C port (for connection to ES100X Digital Temperature Controller)			
Data backup		Super capacitor: All function block data (including Step Ladder Program commands), stored error log data			Battery: All function block data (including step ladder instructions) and error log data
Backup super capacitor/Battery life		24 hours at 25°C (life shortened by use at higher temperatures)			5 years at 25°C (Lifetime will be shorter if used at higher temperatures.)
Data storage in flash memory		Function block data backed up from or restored to RAM for user operation, Error log data			Function block data backed up from or restored to RAM for user operation, Error log data
Effect on CPU Unit cycle time		0.8 ms max.		25 ms max. (See note 3.)	0.2 ms
Current consumption (supplied from the Power Supply Unit)		220 mA max. at 5 VDC (When the NT-AL001 Link Adapter is used, the current consumption increases by 1.5 A.)			360 mA max. at 5 VDC (When the NT-AL001 Link Adapter is used, the current consumption increases by 1.5 A.)
External dimensions		34.5 × 130 × 100.5 mm (WxHxD)			
Weight		100 g max.			220 g max.
Standard accessories		None			C200H-BAT09 Battery (mounted at time of shipment)

Note: 1. The functions listed are for Loop Control Unit version 2.5.

2. This is the Inner Board that is built into a CPU Unit and sold as the CS1D-CPU6□P Process-control CPU Unit.

3. The duplex initialization time is 2.1 s max.

Function Specifications

Item			Specifications	Specifications	Specifications
Model numbers			**CS1W-LCB01**	**CS1W-LCB05** **CS1D-LCB05D**	**CS1W-LC001**
Operation method			Function block method		
Operation cycle			Settable cycles: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block. (See note 1.)		Settable cycles: 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.
Number of function blocks	Analog operation	Control blocks (See note 2.)	50 blocks max.	500 blocks max.	32 blocks max.
		Operation blocks (See note 3.)			249 blocks max.
		External controller blocks	32 blocks max. (CS1D-LCB05D not included).		
	Sequence control	Sequence tables	None	200 tables max. 32 conditions and 32 actions per table max. (expandable to 64 conditions and 64 actions per table) 6,400 rules total max.	None
		Step ladder program blocks	20 blocks max. 2,000 commands total 100 commands max. per block Separable into a 100 steps max.	200 blocks max. 4,000 commands total 100 commands max. per block Separable into a 100 steps max.	
	I/O blocks	Field terminal blocks	80 blocks max		
		User link tables	2,400 data items max.		None
		All data	HMI functions 2,040 words max. Allocated 1 EM Area bank	HMI functions 20,040 words max. Allocated 1 EM Area bank	Send/Receive All Blocks: 1 block each max.
		CPU terminal blocks	None		16 blocks max.
		Node terminal blocks	None		100 blocks max.
	System common blocks		1 block max.		
Method for creating and transferring function blocks			Created and transferred using CX-Process Tool (purchased separately).		
Control methods	PID control method		PID with 2 degrees of freedom (with auto-tuning)		
	Control combinations		Any of the following function blocks can be combined: Basic PID control, cascade control, feed-forward control, sample PI control, Smith dead time compensation control, PID control with differential gap, override control, program control, time-proportional control, etc.		
Alarms	PID block internal alarms		4 PV alarms (upper upper-limit, upper limit, lower limit, lower lower-limit) and 1 deviation alarm per PID block		
	Alarm blocks		High/low alarm blocks, deviation alarm blocks		

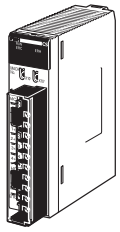
Note: 1. Operation cycles of 0.01, 0.02, and 0.05 s cannot be set for the CS1D-LCB05D.

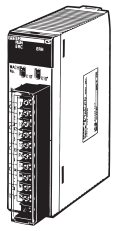
2. Control blocks such as those for PID control.

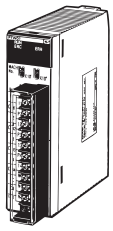
3. Operation blocks for process control such as those for alarms, square roots, time/date calculations, and pulse-train computations.

Process I/O Units
CS1W-P□□□□

- Major savings in installation expenses, space, and labor, because setting devices and conversion devices are no longer required.
- Reads temperature and other analog inputs, enabling process value alarms and rate-of-change calculations and alarms.
- The control output enables the setting output rate-of-change limits and high/low limits.
- Peak/bottom hold and top/valley hold functions can be used for process values (CS1W-P□□1□ only).
- Zero-span adjustment can be performed for the process value within any range, and the time and date of implementation can be automatically saved. The valid and invalid dates can also be set, and notification on the set time and date is also possible (CS1W-P□□1□ only).
- Counts the number of times changes occur that exceed the set threshold and accumulates the analog input values (CS1W-P□□1□ only).


CS1W-PTS11


CS1W-PTS12


CS1W-PTW01

Overview

A total of 24 models of Analog I/O Unit are available, including 16 with isolated-type I/O. Using the Analog I/O Units, essentially any type of processing application can be performed.

High-speed (10-ms) and high-resolution (1/64,000) models are also included in the series, and a wide range of applications are supported, from data logging to high-speed temperature control.

Process I/O Units

Name	Model	Number of I/O	Field I/O isolation	I/O type	Main specifications (See note 1.)	Main functions
Isolated-type Thermocouple Input Unit (high-resolution)	CS1W-PTS11	4 inputs	All inputs are isolated.	B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII, ±100 mV	Standard accuracy: ±0.05% full scale Temp. coefficient: ±0.01%/°C (See note 1.) Resolution: 1/64,000 Conversion cycle:20 ms/4 pts, 10 ms/2 pts	Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection Top, bottom, valley hold Variable range zero-span adjustment
Isolated-type Resistance Thermometer Input Unit (high-resolution)	CS1W-PTS12	4 inputs	All inputs are isolated.	Pt100 Ω (JIS, IEC), JPt100 Ω, Pt50 Ω, Ni508.4 Ω	Standard accuracy: The larger of ±0.05% full scale or ±0.01°C Temp. coefficient: ±0.009%/°C (See note 1.) Resolution: 1/64,000 Conversion cycle:20 ms/4 pts, 10 ms/2 pts	Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection Top, bottom, valley hold Variable range zero-span adjustment
Isolated-type DC Input Unit (high-resolution)	CS1W-PDC11	4 inputs	All inputs are isolated.	4 to 20 mA, 0 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	Standard accuracy: ±0.05% full scale Temp. coefficient: ±0.008%/°C Resolution: 1/64,000 Conversion cycle:20 ms/4 pts, 10 ms/2 pts	Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection Top, bottom, valley hold Accumulated value output Variable range zero-span adjustment

CS1 Unit Descriptions

Name	Model	Number of I/O	Field I/O isolation	I/O type	Main specifications (See note 1.)	Main functions
NEW Isolated-type Thermocouple Input Units (Economical type)	CS1W-PTS51	4 inputs	All inputs are isolated.	B, J, K, R, S, T, L	Overall accuracy: ±0.3% of PV or ±1°C, whichever is larger, ± 1 digit max. Conversion cycle: 250 ms/4 pts	Process value alarms (H, L) Process value alarm DO output Input disconnection detection
	CS1W-PTS55	8 inputs				
NEW Isolated-type Resistance Thermometer Input Unit (Economical type)	CS1W-PTS52	4 inputs	All inputs are isolated.	Pt100 (JIS, IEC), JPt100	Overall accuracy: ±0.3% of PV or ±0.8°C, whichever is larger, ± 1 digit max. Conversion cycle: 250 ms/4 pts	Process value alarms (H, L) Process value alarm DO output Input disconnection detection
	CS1W-PTS56	8 inputs				
NEW Isolated-type DC Input Unit (Economical type)	CS1W-PDC55	8 inputs	All inputs are isolated.	4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V	Standard accuracy: ±0.3% full scale Resolution: 1/16,000 Conversion cycle:250 ms/8 pts,	Process value alarms (H, L) Input disconnection detection
Isolated-type Thermocouple Input Unit	CS1W-PTS01-V1	4 inputs	All inputs are isolated.	B, E, J, K, N, R, S, T Variable range: ±80 mV DC	Standard accuracy: ±0.1% Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 150 ms/4 pts	Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection
Isolated-type Resistance Thermometer Input Unit	CS1W-PTS02	4 inputs	All inputs are isolated.	Pt100 (JIS, IEC), JPt100	Standard accuracy: The larger of ±0.1% or ±0.1°C Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection
Isolated-type Resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	4 inputs	All inputs are isolated.	Ni508.4 Ω	Standard accuracy: The larger of ±0.2% or ±0.2°C Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Input disconnection detection
Isolated-type 2-Wire Transmitter Input Unit	CS1W-PTW01	4 inputs	All inputs are isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: ±0.2% Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Built-in power supply for 2-wire transmitter Scaling (±32,000) Process value alarms (HH, H, L, LL) Rate-of-change calculation and alarm Square root Input error detection
Isolated-type Analog Input Unit	CS1W-PDC01	4 inputs	All inputs are isolated.	–10 to 10 V, 0 to 10 V, –5 to 5 V, 0 to 5 V, 1 to 5 V, ±10 V DC variable range, 4 to 20 mA, 0 to 20 mA	Standard accuracy: ±0.1% Temp. coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Process value alarms (HH, H, L, LL) Scaling (±32,000) Square root Rate-of-change calculation and alarm Input error detection
Isolated-type Pulse Input Unit	CS1W-PPS01	4 inputs	All inputs are isolated.	No-voltage semiconductor; voltage input: 0 to 20,000 pulses/s Contact input: 0 to 20 pulses/s	---	Built-in sensor power supply Contact bounce filter Unit pulse conversion Accumulated value output Instantaneous value output and four alarms

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

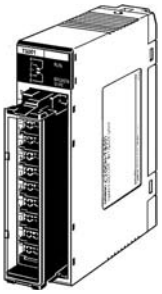
Note: 1. The temperature coefficient depends on the application conditions. Refer to the *SYSMAC CS Series Analog I/O Units Operation Manual* (W368) for details.

2. Refer to pages 103 to 108 for an overview of CS1W-AD0□□, CS1W-DA0□□, and CS1W-MAD44 Analog I/O Unit functions.

Temperature Sensor Units
CS1W-PTS/C200H-TS

Directly Input from Eight Temperature Sensors

- Input directly from up to eight temperature sensors with one Unit. (The types of temperature sensor and temperature ranges can be set separately for each input for the CS1W-PTS5□.)
- Models available with isolated inputs to prevent unwanted current flow between temperature sensor inputs (CS1W-PTS□□ only).
- Provided with measured value alarms (4 points each) (CS1W-PTS□□ only).
- Line disconnection detection provided.

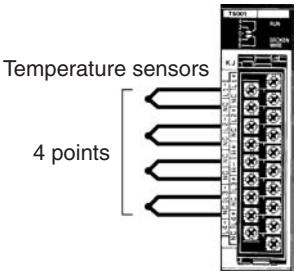


CS1W-PTS11
CS1W-PTS12
CS1W-PTS51
CS1W-PTS55
CS1W-PTS52
CS1W-PTS56
CS1W-PTS01-V1
CS1W-PTS02
CS1W-PTS03
C200H-TS001
C200H-TS002
C200H-TS101
C200H-TS102

Function

Using input from thermocouples or resistance thermometers (up to 4 or 8 inputs), the Unit converts the measured temperatures into BCD or binary data and stores them in the allocated relay area every cycle. The data can be transferred to the DM Area or other memory locations using the ladder program.

Circuit Configuration



Specifications

Model			CS1W-PTS11	CS1W-PTS12	CS1W-PTS51 /55	CS1W-PTS52 /56	CS1W-PTS01-V1	CS1W-PTS02	CS1W-PTS03	C200H-TS001	C200H-TS002	C200H-TS101	C200H-TS102
Classification			CS1 Special I/O Units							C200H Special I/O Units			
Unit numbers			0 to 95	0 to 95	0 to 95	0 to 95	0 to 95	0 to 95	0 to 95	0 to 9	0 to 9	0 to 9	0 to 9
Inputs			4 pts (CS1W-PTS5□: 8 pts)							4 pts			
Input signal	**Thermocouples**	**K**	Yes	---	Yes	---	Yes	---	---	Yes	Yes	---	---
		J	Yes	---	Yes	---	Yes	---	---	Yes	---	---	---
		L	Yes	---	Yes	---	---	---	---	---	Yes	---	---
		R	Yes	---	Yes	---	Yes	---	---	---	---	---	---
		S	Yes	---	Yes	---	Yes	---	---	---	---	---	---
		T	Yes	---	Yes	---	Yes	---	---	---	---	---	---
		E	Yes	---	---	---	Yes	---	---	---	---	---	---
		B	Yes	---	Yes	---	Yes	---	---	---	---	---	---
		N	Yes	---	---	---	Yes	---	---	---	---	---	---
		W	Yes (WRe5–26)	---	---	---	---	---	---	---	---	---	---
		U	Yes	---	---	---	---	---	---	---	---	---	---
		PLII	Yes	---	---	---	---	---	---	---	---	---	---
		± mV	±100 mV	---	---	---	±80 mV	---	---	---	---	---	---
	Resistance thermometers	**JPt100**	---	Yes	Yes	---	---	Yes	---	---	---	Yes	---
		PT50	---	Yes	---	---	---	---	---	---	---	---	---
		PT100	---	Yes	Yes	---	---	Yes	---	---	---	---	Yes
		Ni508.4 Ω	---	Yes	---	Yes	---	---	Yes	---	---	---	---
Input signal range settings			4 pts set individually							One setting for all 4 pts			
A/D conversion output data			4-digit binary		4-digit binary or BCD		4-digit binary			4-digit BCD			
Conversion speed			20 ms/4 pts 10 ms/2 pts		250 ms/Unit		150 ms/4 pts	100 ms/4 points		4.8 s max. (when 4 pts are set for Unit)			
Overall accuracy (See note 2.)			Standard accuracy: ±0.05% of FS Temp coefficient: ±0.01%/°C	Standard accuracy: Larger of ±0.05% of FS or ±0.1°C Temp coefficient: ±0.001%/°C	±0.3% of PV or ±1°C, whichever is larger, ± 1 digit max.	±0.3% of PV or ±0.8°C, whichever is larger, ± 1 digit max.	Standard accuracy: ±0.1% Temp coefficient: ±0.015%/°C (not including cold contact compensation error)	Standard accuracy: Larger of ±0.1% or ±0.1°C Temp coefficient: ±0.015%/°C		±1% + 1°C			
Connections			Terminal block							Terminal block			

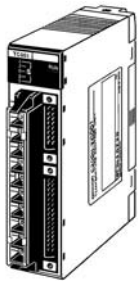
Note: 1. Refer to page 113 for information on CS1W-PTS□□ Process I/O Units.

2. Accuracy depends on application conditions. Refer to the *Analog I/O Unit Operation Manual* (Cat. No. W368) for details.

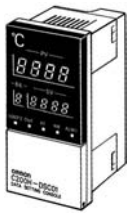
Temperature Control Units
C200H-TC□□

One Unit Functions as Two Temperature Controllers

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Input directly from two temperature sensors (thermocouples: R, S, K, J, T, E, B, N, L, or U) or platinum resistance thermometers (JPt00, Pt100).
- Open-collector, voltage, or current outputs
- Sampling period: 500 ms
- Run/start control.
- Two internal alarms per loop.
- Detects heater burnout though current detectors for both loops.
- Record up to eight sets of target values, alarm values, and PID parameters.
- Connects to Data Setting Console.



C200H-TC□□□

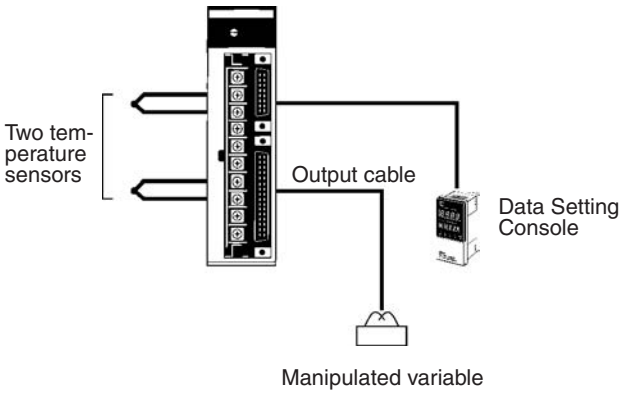


C200H-DSC01
Data Setting Console

Function

Perform 2-loop PID control (two degrees of freedom) based on inputs from thermocouples or platinum resistance thermometers to control a transistor, voltage, or current output. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the target value, read the process value, or perform other operations.

System Configuration



Specifications

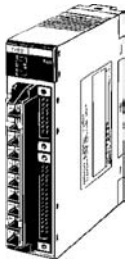
Classification	Temperature sensor inputs	Control outputs	Unit numbers	Model
C200H Special I/O Unit	Thermocouples (R, S, K, J, T, E, B, N, L, or U)	Open-collector (pulse)	0 to 9	C200H-TC001
		Voltage (pulse)		C200H-TC002
		Current (linear)		C200H-TC003
	Platinum resistance thermometers (JPt00, Pt100)	Open-collector (pulse)		C200H-TC101
		Voltage (pulse)		C200H-TC102
		Current (linear)		C200H-TC103

■ Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

Heat/Cool Control Units
C200H-TV□□□

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Input directly from two temperature sensors (thermocouples: R, S, K, J, T, E, B, N, L, or U) or platinum resistance thermometers (JPt00, Pt100).
- Open-collector, voltage, or current outputs
- Sampling period: 500 ms
- Run/start control.
- Two internal alarms per loop.
- Detects heater burnout though current detectors for both loops.
- Record up to eight sets of set points, alarm values, and PID parameters.
- Connects to Data Setting Console.



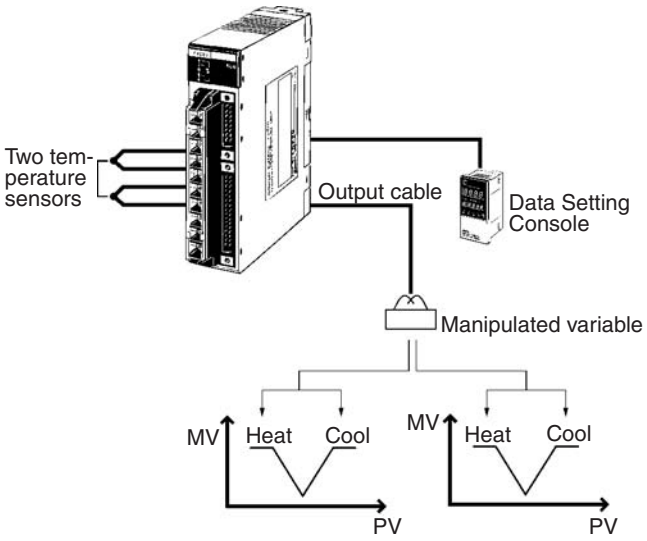
C200H-TV□□□

C200H-DSC01
Data Setting Console

Function

Perform 2-loop PID control (two degrees of freedom) based on inputs from thermocouples or platinum resistance thermometers to control heating and cooling through transistor, voltage, or current outputs. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the set point, read the process value, or perform other operations.

System Configuration



Specifications

Classification	Temperature sensor inputs	Heating control output	Cooling control output	Unit numbers	Model
C200H Special I/O Unit	Thermocouples (R, S, K, J, T, E, B, N, L, or U)	Open-collector (pulse)	Open-collector (pulse)	0 to 9	C200H-TV001
		Voltage (pulse)			C200H-TV002
		Current (linear)			C200H-TV003
	Platinum resistance thermometers (JPt00, Pt100)	Open-collector (pulse)			C200H-TV101
		Voltage (pulse)			C200H-TV102
		Current (linear)			C200H-TV103

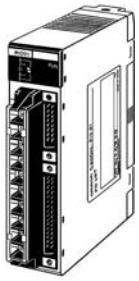
■ Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

PID Control Units
C200H-PID□□

Ideal for Analog Control of Pressures, Flows, and other Variables

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Directly input analog signal.
- Open-collector, voltage, or current outputs
- Sampling period: 100 ms
- Run/start control.
- Manual outputs supported.
- Set two internal alarms for each loop.
- Record up to eight sets of set points, alarm values, and PID parameters.
- Digital filters can be set to dampen rapid changes in inputs.
- Connects to Data Setting Console.



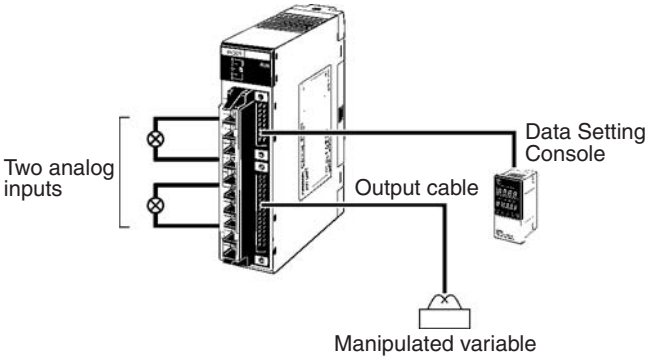
C200H-PID01/PID02/PID03

C200H-DSC01
Data Setting Console

Function

Perform 2-loop PID control (two degrees of freedom) based on input ranges such as 4 to 20 mA or 1 to 5 V to control transistor, voltage, or current outputs. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the set point, read the process value, or perform other operations.

System Configuration



Specification

Classifications	Temperature sensor input	Control output	Unit numbers	Model
C200H Special I/O Unit	4 to 20 mA, 1 to 5 V, 0 to 5 V or 0 to 10 V	Open-collector (pulse)	0 to 9	C200H-PID01
		Voltage (pulse)		C200H-PID02
		Current (linear)		C200H-PID03

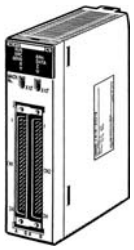
■ Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

Position Control Units
CS1W-NC/C200HW-NC

High-speed, High-precision Positioning with 1, 2, or 4 Axes

- Simple positioning systems can be created by directly specifying operation from the CPU Unit when required.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based Support Software to easily create positioning data and store data and parameters in files. (Use WS01-NCTF1-E with C200HW-NC□ models and WS02-NCTC1-E with CS1W-NC□□ models.)
- Interrupt feeding, forced starting, and other features also supported.
- The following functions are supported for CS1W-NC113, CS1W-NC213, CS1W-NC413, CS1W-NC133, CS1W-NC233, and CS1W-NC433.
  - Speed and acceleration can be changed during direct operation.
  - Speed and acceleration can be changed during JOG operation.
  - Parameters and data can be backed up at once to the Memory Card in the CPU Unit using the CPU Unit's simple backup operation.

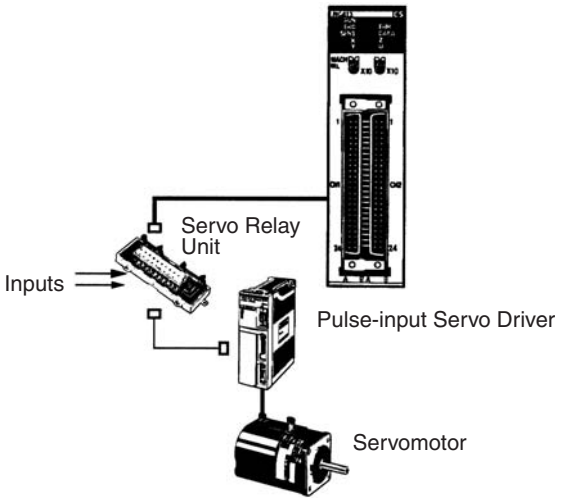


CS1W-NC113/213/413/133/233/433
C200HW-NC113/213/413

Function

These Position Control Units support open-loop control with pulse-train outputs. Position using automatic trapezoid or S-curve acceleration and deceleration. Models available with 1, 2, or 4 axes. Use in combination with servomotors or stepping motors that accept pulse-train inputs.

System Configuration



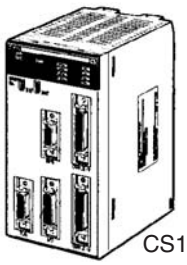
Specifications

Model	CS1W-NC113 CS1W-NC133	CS1W-NC213 CS1W-NC233	CS1W-NC413 CS1W-NC433	C200HW-NC113	C200HW-NC213	C200HW-NC413
Unit name	Position Control Unit					
Classification	CS1 Special I/O Units			C200H Special I/O Units		
Unit numbers	0 to 95		0 to 94	0 to 15 (0 to F)		
Control method	Open-loop, automatic trapezoid acceleration/deceleration					
Control output signals	CS1W-NC□13: Open-collector outputs CS1W-NC□33: Line-driver outputs			Open-collector		
Controlled axes	1	2	4	1	2	4
Operating modes	Direct operation or memory operation					
Data format	Binary (hexadecimal)			BCD		
Affect on scan time for end refresh	0.29 to 0.41 ms max./unit			2.6 to 4.5 ms max./unit		
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instructions			2.6 to 5.5 ms max./instructions		
Startup time	2 ms min. (Refer to operation manual for conditions.)			7.51 ms min. (Refer to operation manual for conditions.)		
Position data	–1,073,741,823 to +1,073,741,823 pulses			–9,999,999 to +9,999,999 pulses		
No. of positions	100 per axis (transferable from CPU Unit)					
Speed data	1 to 500 kpps (in 1-pps units)			1 to 500 kpps (specified as factor)		
No. of speeds	100 per axis (transferable from CPU Unit)					
Acceleration/ deceleration times	0 to 250 s (time to max. speed)					
Acceleration/ deceleration curves	Trapezoidal or S-curve					
Saving data in CPU	Flash memory					
Windows-based Support Software	CX-Position (WS02-NCTC1-E)			SYSMAC-NCT (WS01-NCTF1-E)		

Motion Control Units
CS1W-MC421/-MC221

High-precision, Two-axis Motion Control with Multi-tasking G-language Programming

- High-speed control of up to 4 axes with one Unit and up to 76 axes with one PLC (19 Units x 4 axes) (assumes that Power Supply Unit capacity is not exceeded).
- Winding operations easily controlled at high-speed using traverse positioning control.
- High-speed response to commands from CPU Unit (8 ms for 2 axes, 13 ms for 4 axes).
- Encoder response of 2 Mpps possible with 4x frequency multiplication for applications with high-speed, high-precision servomotors.
- D interrupt code outputs to CPU Unit at end of positioning or at specified positions (D code output time: 3.3 ms max.).
- CX-Motion Windows-based Support Software
  Define user mnemonics to use in place of G codes to simplify MC program development and analysis.
- Servo trace function from CX-Motion to trace error counter changes or motor speeds.
- Automatic Loading Function
  MC programs and positioning data can be automatically downloaded from computer memory when required by the MC Unit.
- Synchronous Control
  Synchronous control can be performed easily using the electronic shaft (electronic gear), electronic cam, virtual axis, resist, and add axis travel functions.

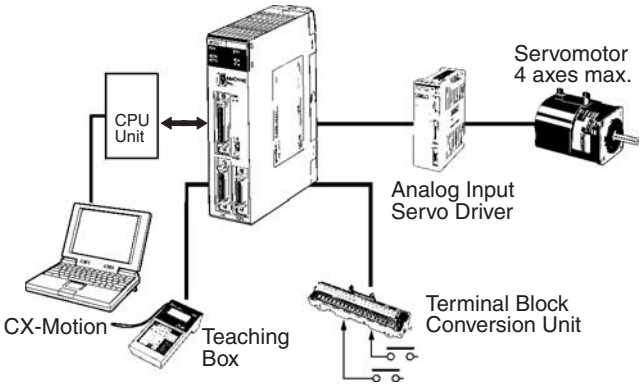

CS1W-MC421-V1


CS1W-MC221-V1

Function

The Motion Controller provides semiclosed-loop control with analog outputs for up to 2 or 4 axes, and supports the G language for advanced, high-speed, high-precision position control, such as traverse operation. Multi-tasking allows you to run the two axes independently for a wider range of application.

System Configuration



Specifications

Model		CS1W-MC421-V1	CS1W-MC221-V1
Classification		CS1 Special I/O Unit	
Control method		Semiclosed loop with automatic trapezoid or S-curve acceleration/deceleration	
Control output signals		Analog	
Internal programming language		G language (Program started by command sent from CPU Unit's ladder program.)	
Controlled axes		4 axes max.	2 axes max.
Maximum position value		–39,999,999 to 39,999,999 (for minimum setting unit of 1)	
Synchronous axis control		4 axes max.	2 axes max.
Positioning	Linear interpolation	4 axes max.	2 axes max.
	Arc interpolation	2 axes max. in a plane	
	Helical interpolation	2-axis arc interpolation in a plane + feed axis	---
	Traverse	2-axis traverse feeding	
	Infinite feed	Infinite feeding of one or more axes	
	Interrupt feed	Interrupt feeding for specified axes (Positioning can be specified for when there is no interrupt.)	
Task programming capacity	Number of tasks	4 tasks max.	2 tasks max.
	Number of programs	25 programs when using 4 tasks	50 programs when using 2 tasks
	Program capacity	500 blocks per task when using 4 tasks	1,000 blocks per task when using 2 tasks

■ CX-Motion: Windows-based Support Software

Model	WS02-MCTC1-EV2
Supported MC Units	CS1W-MC221-V1/421-V1, C200H-MC221, and CV500-MC221/421
Applicable computer	DOS, OS: Windows 95/98 or Windows NT Version 4.0
Functions	Functions required for MC Unit control: Creating/editing/saving/printing system parameters, positioning data, and MC programs; monitoring MC Unit operation

Motion Control Unit
CS1W-MCH71

Achieves a Wide Range of Motion Control Using Internal Motion Programming

Easy System Construction

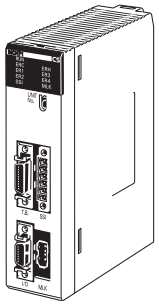
- Easily control multiple axes in flexible combinations. Control up to 30 physical axes, or 32 axes including virtual axes. Physical and virtual axes can be set for individual axes. Achieve various forms of motion control from individual axis control to interpolation and simultaneous axis operation.
- MECHATROLINK-II high-speed servo communications from Yaskawa used with the servo driver and distributed modules. (MECHATROLINK-II is a registered trademark of Yaskawa Electric.) Construct a multi-axis control system with less wiring. Limit switch, origin sensor, and other signals required for control are input to the servo driver, greatly aiding multi-axis system distribution.

Easy Information Management

- High-speed servo communications enable setting and reading motion program and system parameters and data, as well as servo driver parameters all from the support software running on a personal computer.
- All parameters and variables can be read from the Motion Control Unit, including system parameters, global variables, and local variables.
- The device control status and servo system operating status can be monitored.
- Programs and data can be backed up in Memory Cards in the CPU Unit.

Easy Motion Control

- Position, synced, speed, and torque control are all supported, including electronic gear/cam and follow-up synced control.
- The servo communications cycle can be as short as 1 ms.
- Scheduled processing between the Motion Control Unit, servo driver, and distributed modules to achieve exceptionally high-precision control.
- The motion programs in up to eight motion tasks can be executed simultaneously. Also, branching is possible within programs so that independent control, synced control, interpolation, and other interaxis operations can be implemented in the same group of programs.
- Global variables enable easily sharing data between tasks. System variables enable monitoring and utilizing servo status in programming.

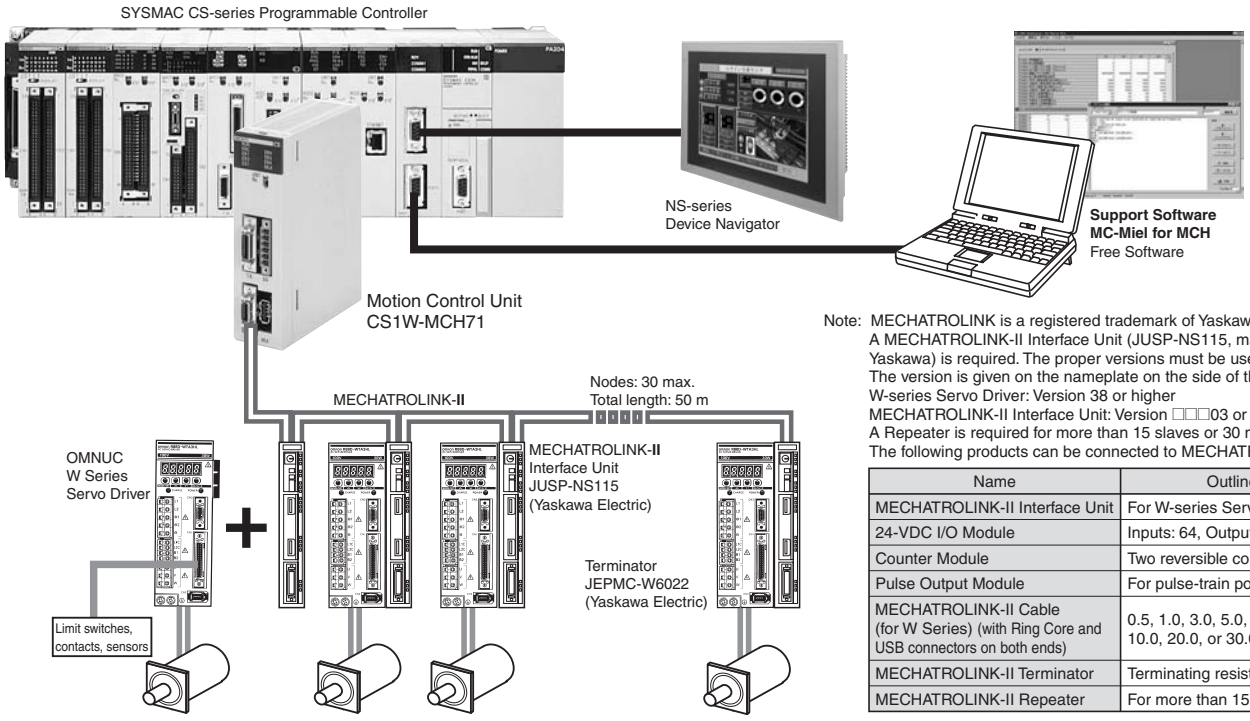


CS1W-MCH71

Function

This Motion Control Unit can control up to 30 axes with internal motion programs. It can be used to achieve a wide range of motion control.

System Configuration



Note: MECHATROLINK is a registered trademark of Yaskawa Electric.
A MECHATROLINK-II Interface Unit (JUSP-NS115, made by Yaskawa) is required. The proper versions must be used together.
The version is given on the nameplate on the side of the Unit.
W-series Servo Driver: Version 38 or higher
MECHATROLINK-II Interface Unit: Version □□□03 or higher
A Repeater is required for more than 15 slaves or 30 m.
The following products can be connected to MECHATROLINK.

Name	Outline
MECHATROLINK-II Interface Unit	For W-series Servo Driver
24-VDC I/O Module	Inputs: 64, Outputs: 64
Counter Module	Two reversible counters
Pulse Output Module	For pulse-train positioning
MECHATROLINK-II Cable (for W Series) (with Ring Core and USB connectors on both ends)	0.5, 1.0, 3.0, 5.0, 10.0, 20.0, or 30.0 m
MECHATROLINK-II Terminator	Terminating resistance
MECHATROLINK-II Repeater	For more than 15 slaves/30 m

Specifications

Item		Specification
Applicable PLCs		SYSMAC CS-series PLCs (CPU Unit: CS1□-CPU□□H)
Classification		CS1 CPU Bus Unit
Data transfers with CPU Unit	CIO Area words allocated to Unit	Allocated words for one unit number (25 words).
		Allocated 11 to 25 words for Unit and tasks (depends on number of motion tasks).
	DM Area words allocated to Unit	Allocated words for one unit number (100 words).
		Allocated 32 to 74 words for Unit and tasks (depends on number of motion tasks).
	User-allocated bits	Allocated 0 to 64 words for axes (depends on highest axis number used).
	User-allocated words	Allocated 0 to 128 words for axes (depends on highest axis number used).
		Allocated 0 to 1,280 words for general I/O (depends on parameter setting).
Applicable servo drivers		W-series Servo Driver (from OMRON) with MECHATROLINK-II Interface Unit (from Yaskawa)
Internal programming language		Special motion control language
Control	Control modes	Position, speed, or torque control via MECHATROLINK-II
	Control axes	32 axes max. (30 physical/virtual axes (physical or virtual selected by axis) and 2 virtual axes)
Operating modes		RUN Mode, CPU Mode, Tool Mode/System (set from Support Software)
Control unit	Minimum command unit	1, 0.1, 0.01, 0.001, or 0.001 (unit: millimeters, inches, degrees, or pulses)
Maximum position value		–2147483648 to 2147483647 pulses (36 bits with sign bit), Infinite feed mode also supported.
Motion program control functions		Positioning (simultaneous: 8 axes/block max., 32 blocks/Unit max.), linear interpolation (simultaneous: 8 axes/block max., 32 blocks/system max.), circular interpolation (simultaneous: 2 or 3 axes/block max., 16 blocks/system max.), positioning (simultaneous: 8 axis/block max., 32 blocks/Unit max.), origin searches, interrupt feeding, time-specified feeding, transverse feeding, independent electronic cams, simultaneously electronic cams, linked operation, follow-up synchronization, speed references, and torque references
Feed speeds	High-speed feeding	1 to 2147483647 command units/min
	Interpolation feeding	1 to 2147483647 command units/min
	Overrides	0.00% to 327.67% (Setting unit: 0.01%, specified by axis or by task.)

Item		Specification
Acceleration/deceleration control		Acceleration/deceleration times: 60,000 ms max (trapezoid or S-curve), S-curve constant: 30,000 ms max.
Programming	Number of tasks	8 max. (number of parallel branches inside task: 8 max.)
	Number of programs	256 programs/Unit max.
	Program capacity	8,000 blocks/Unit (2 MB) max. figured as motion programming
	Number of blocks	800 blocks/program
	Data capacity	Position data: 10,240 points/Unit, Cam data: 32 sheets, 16,000 points/Unit
	Subroutine nesting	Up to 5 levels

Peripheral Device Module Numbers and Specifications

■ Support Software

Name	Model	Remarks
MC-Miel for MCH	---	Support Software for the CS1W-MCH71

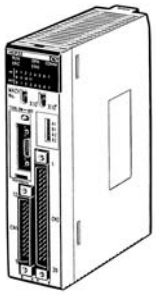
■ MECHATROLINK Devices and Cables (Made by Yaskawa)

Name	Yaskawa model	OMRON model	Remarks
MECHATROLINK-II Interface Unit	JUSP-NS115	FNY-NS115	For W-series Servo Driver
24-VDC I/O Module	JEPMC-IO2310	FNY-IO2310	Inputs: 64, Outputs: 64
Counter Module	JEPMC-PL2900	FNY-PL2900	Two reversible counters
Pulse Output Module	JEPMC-PL2910	FNY-PL2910	Pulse-train positioning, 2 channels
MECHATROLINK-II Cables for W-series Servo Drivers (Ring cores and USB connectors attached to both ends.)	JEPMC-W6003-A5	FNY-W6003-A5	0.5 m
	JEPMC-W6003-01	FNY-W6003-01	1.0 m
	JEPMC-W6003-03	FNY-W6003-03	3.0 m
	JEPMC-W6003-05	FNY-W6003-05	5.0 m
	JEPMC-W6003-10	FNY-W6003-10	10.0 m
	JEPMC-W6003-20	FNY-W6003-20	20.0 m
	JEPMC-W6003-30	FNY-W6003-30	30.0 m
MECHATROLINK-II Terminator	JEPMC-W6022	FNY-W6022	Terminating resistance
MECHATROLINK-II Repeater	JEPMC-REP2000	FNY-REP2000	Required for more than 15 slaves or 30 m.

Note: MECHATROLINK Devices and Cables are made by Yaskawa Electric. These can be order from OMRON using the OMRON model numbers given above. OMRON will deliver the Yaskawa-brand products in response to orders for these products.

Customizable Counter Units
CS1W-H□□□□

Programming Functions and Various I/O Capabilities in a Single Unit. Programmable High-speed Feedback, including Electronic Cams.



CS1W-HCP22-V1
CS1W-HCA12-V1
CS1W-HCA22-V1
CS1W-HIO01-V1

- Ladder programming and various types of I/O in one Unit. Programmable I/O control without going through the CPU Unit.

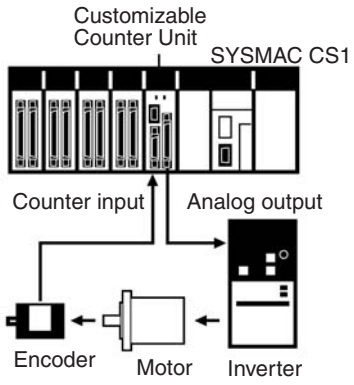
Applications

- Electronic cams (CS1W-HCP22-V1): Wrapping machines
- Feedback control (CS1W-HCA12-V1): Forming machines and presses
- Tension control (CS1W-HCA12-V1): Winding machines

Other Features

- High-speed counters (0.1 ms from set value match)
- Ladder libraries to make program contents inaccessible from unauthorized persons.
- Backing up of programs and data in Memory Cards in CPU Unit.

System Configuration



Specifications

Model number		CS1W-HCP22-V1	CS1W-HCA12-V1	CS1W-HCA22-V1	CS1W-HIO01-V1
Type		Counter inputs, pulse outputs	Analog inputs, counter inputs, analog outputs	Counter inputs, pulse outputs	Basic type
Inputs	**12 DC inputs**	Yes	Yes	Yes	Yes
	Counter inputs	2	1	2	None
	Analog inputs	None	1	None	None
Outputs	**8 transistor outputs**	Yes	Yes	Yes	Yes
	2 pulse outputs	Yes	No	No	No
	2 analog outputs	No	Yes	Yes	No

Programming Functions

Programming language	Ladder programming
Basic instruction execution speed	200 ns (1 Kword) or 400 ns (4 Kwords), switchable
Program capacity	1 Kword or 4 Kwords, switchable
Data memory capacity	6 Kwords + 2 Kwords of expanded data memory
Backup functions	10-day capacitor backup and flash memory storage
CS1 CPU Unit data exchange	132-channel data link (maximum)
Programming Device	CX-Programmer (versions 1.2. or later) or Programming Console
Programming Device Connecting Cable	CS1 Connecting Cable or Programming Console Cable

Counter Inputs (CS1W-HCP22-V1/CS1W-HCA12-V1/HCA22-V1)

Operating modes	Linear and ring
Signal level	5, 12, or 24 V, or line driver (only one input each for 5 and 12 V)
Input method	Phase difference (×1, ×2, or ×4), up/down, or pulse with direction
Counting speed	Voltage: 50 kcps Line driver: 50/200 kcps
Other functions	Compatible with servo drivers for absolute encoders (e.g., OMRON's OMNUC W-series Servo Drivers). Virtual axes are supported.

Pulse Outputs (CS1W-HCP22-V1)

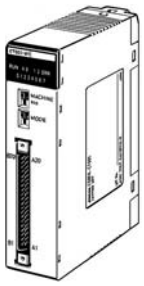
Output signal	Clockwise/counterclockwise
Signal level	5 to 24 V
Output speed	200 kpps

Analog Outputs (CS1W-HCA21-V1/HCA22-V1)

Output signal	–10 to 10 V, 0 to 10 V, 1 to 5 V, 0 to 5 V
Resolution	1/4,000, 1/10,000 (for –10 to 10 V only)
Accuracy	±0.3% of FS (23±2°C), ±0.5% of FS (0 to 55°C)
Conversion speed	0.5 ms max.

High-speed Counter Units
CS1W-CT/C200H-CT

Two External Inputs and Eight External Outputs with Many Operating Modes



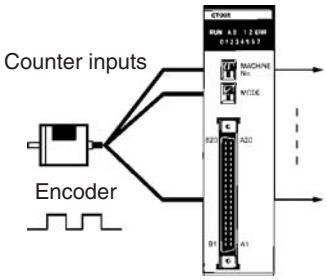
CS1W-CT041
CS1W-CT021
C200H-CT021
C200H-CT001-V1
C200H-CT002

- Max. input frequency = 500 kHz for line-driver input.
- 32-bit counting range.
- 2- and 4-axis operation available.
- Digital variable noise filter provided.
- 5-, 12-, and 24-V line driver inputs available. (5- and 12-V line driver input is only available, however, for 1 axis with the CS1W-CT021 and 2 axes with the CS1W-CT041.)
- Supports simple, ring, and linear counting modes.
- Supports offset phase input, up and down pulse input, and pulse+direction input.
- Supports 4 external control inputs, and a total of 16 functions can be set including open gate, close gate, preset, reset, capture, stop/capture/reset combinations, and reset enable.
- One Unit supports 4 external outputs and 28 internal outputs with counter value zone comparisons, target comparisons, delays, holds, programmable outputs, and hysteresis settings.
- Pulse rate measurement function and data logging.
- Counter outputs and external control inputs can be used to trigger interrupt tasks in the CPU Unit.
- Settings can be changed during Unit operation.

Function

The High-speed Counter Units count pulse signal inputs that are too fast to be detected by normal Input Units. The Units can be programmed to produce outputs according to counter values for specified conditions, and many other functions are supported.

System Configuration



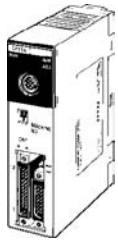
Specifications

Classification	Number of counters	Encoder A and B input, pulse input, Z signal	Maximum counting speed	Unit numbers	Model
CS1 Special I/O Unit	2	Open-collector Input voltage: 5 VDC, 12 VDC, or 24 VDC (5- and 12-VDC input only possible for 1 axis.)	50 kcps	0 to 92 (4 unit numbers per Unit)	CS1W-CT021
		RS-422 line driver	500 kcps		
	4	Open-collector Input voltage: 5 VDC, 12 VDC, or 24 VDC (5- and 12-VDC input only possible up to 2 axes.)	50 kcps		CS1W-CT041
		RS-422 line driver	500 kcps		
C200H Special I/O Unit	1	Open-collector Input voltage: 5 VDC, 12 VDC, or 24 VDC	50 kcps	0 to 9	C200H-CT001-V1
		RS-422 line driver	75 kcps		C200H-CT002
	2	Open-collector Input voltage: 12 VDC or 24 VDC	50 kcps	0 to F	C200H-CT021
		RS-422 line driver	75 kcps		

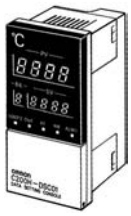
Cam Positioner Unit
C200H-CP114

One Unit Functions as 48 Mechanical Cams

- Supports16 external outputs and 32 internal outputs for a total of 48 cam outputs.
- Set up to seven ON/OFF data for each cam.
- The Data Setting Console allows easy monitoring of cam data settings, present cam angles, or etc.
- An Adjustment Operation function enables setting cam outputs while actually operating the controlled machine.



C200H-CP114

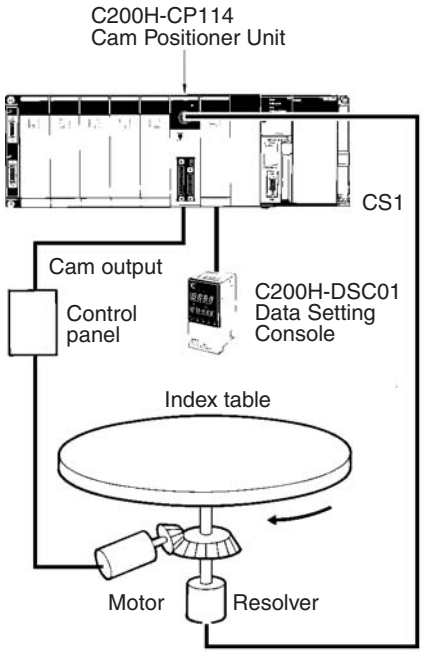


C200H-DSC01
Data Setting Console

Function

Angles are detected though an externally connected resolver (3F88L-RS□□ angle detector) and cam outputs are produced for preset ON/OFF angle data.

System Configuration



Specifications

Classification	Model	No. of cam outputs	Control unit	Resolver response speed	Unit numbers	Resolver response time
Cam Positioner Unit	C200H-CP114	48 (external outputs: 16, internal outputs: 32)	360 division per rotation	800 r/min max.	0 to 9	200 μs (sampling frequency: 5 KHz)

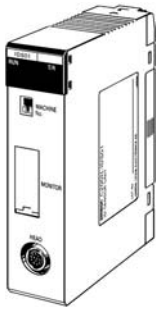
■ Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

ID Sensor Units
CS1W-V600□□□/C200H-IDS01-V1

Connect an ID System to the PLC. Easily Started with a Programming Console.

- Connects and ID System to the Programmable Controller.
- Read data from Data Carriers simply by sending a read command.
- Read/write up to 1,024 bytes for the C200H-IDS01-V1 and up to 2,048 bytes for the CS1W-V600C11/12.

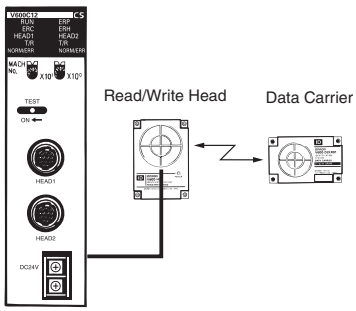


CS1W-V600C11
CS1W-V600C12
C200H-IDS01-V1

Function

Read/write data in Data Carrier memory by sending read/write commands from the CPU Unit to the Read/Write Head. The CS1W-V600C11 connects to one Read/Write Head; the CS1W-V600C12 connects to two. Data transmission speed has also been increased.

System Configuration



Specifications

Classification	Connectable ID System	Read/Write Heads	External power supply	Unit numbers	Model
CS1 Special I/O Unit	V600 Series (electromagnetic, for short distances)	1 max.	Not required.	0 to 95	CS1W-V600C11
		2 max.	24 VDC	0 to 94	CS1W-V600C12
C200H Special I/O Unit		---	Not required.	0 to 9	C200H-IDS01-V1

Serial Communications Features

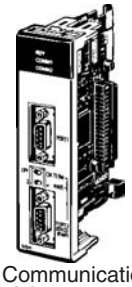
Unit	Model	Ports	Serial communications mode							BASIC programming	Message communications
			Protocol macros	Host Link	NT Links	No-protocol	Peripheral bus	Programming Console bus	NEW Serial Gateway (See note.)		
			General-purpose external devices	Host computers	OMRON PTs	General-purpose external devices	Programming Devices	Programming Console	CompoWay/F-compatible models	General-purpose external device	
CPU Units	All models	Port 1: Peripheral	No	Yes	Yes	No	Yes	Yes	No	No	No
		Port 2: RS-232C	No	Yes	Yes	Yes	Yes	No	Yes	No	No
Serial Communications Boards/ Units	CS1W-SCB21-V1	Port 1: RS-232C	Yes	Yes	Yes	Yes (See note.)	No	No	Yes	No	No
		Port 2: RS-232C	Yes	Yes	Yes	Yes (See note.)	No	No	Yes	No	No
	CS1W-SCB41-V1	Port 1: RS-232C	Yes	Yes	Yes	Yes (See note.)	No	No	Yes	No	No
		Port 2: RS-422A/485	Yes	Yes	Yes	Yes (See note.)	No	No	Yes	No	No
	CS1W-SCU21-V1	Port 1: RS-232C	Yes	Yes	Yes	Yes (See note.)	No	No	Yes	No	No
		Port 2: RS-232C	Yes	Yes	Yes	Yes (See note.)	No	No	Yes	No	No
ASCII Units	C200H-ASC02	Port 1: RS-232C	No	No	No	No	No	No	No	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	No	Yes	No
	C200H-ASC11	Port 1: RS-232C	No	No	No	No	No	No	No	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	No	Yes	No
	C200H-ASC21	Port 1: RS-232C	No	No	No	No	No	No	No	Yes	No
		Port 2: RS-422A/485	No	No	No	No	No	No	No	Yes	No
	C200H-ASC31	Port 1: RS-232C	No	No	No	No	No	No	No	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	No	Yes	No
DeviceNet RS-232C Unit	DRT1-232C2	Port 1: RS-232C Port 2: RS-232C	No	No	No	No	No	No	No	No	Yes

Note: CPU Unit Ver. 3.0 and Serial Communications Board/Unit Ver. 1.2 or later only.

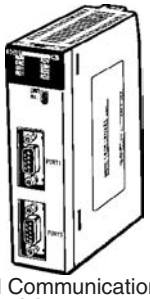
Serial Communications Units/Boards
CS1W-SCU/SCB

Support Protocol Macros, Host Link Communications, 1:N NT Links, Serial Gateway, and No-protocol Mode

- Serial Communications Board
  - Increase the number of serial ports without using I/O slots.
  - Connect general-purpose external devices 1:N using RS-422A/485.
  - Generate interrupts in CPU Unit when data is received.
- Serial Communications Unit
  - Mount up to 16 Unit (including all other CPU Bus Units) on CPU or Expansion Racks. Ideal for systems that required many serial ports.



Serial Communications Boards
CS1W-SCB21-V1
CS1W-SCB41-V1



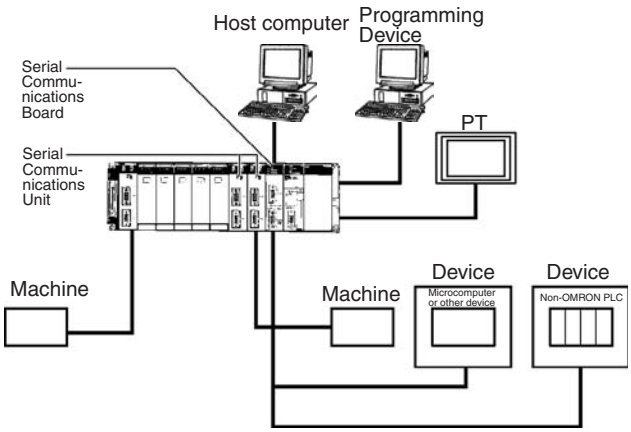
Serial Communications Unit
CS1W-SCU21-V1

Function

Either an Inner Board or CPU Bus Unit can be used to increase the number of serial ports (RS-232C or RS-422A/485) two at a time. Specify Protocol Macros, Host Link Communications, 1:N NT Links, Serial Gateway (see note), or no-protocol serial communications (see note) separately for each port. With the CS1 Series, you can easily provide the right number of serial ports for your system.

Note: Unit Ver. 1.2 or later only.

System Configuration

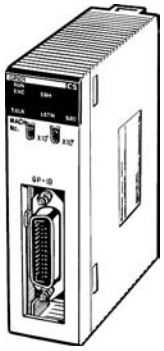


Specifications

Unit	Classification	Serial communications modes	Serial	Unit numbers	Model
Serial Communications Board	Inner Board	Set separately for each port: Protocol Macro, Host Link, 1:N NT Links, Serial Gateway, or no-protocol communications	RS-232C x 2	---	CS1W-SCB21-V1
			RS-232C x 1, RS-422A/485 x 1		CS1W-SCB41-V1
Serial Communications Unit	CS1 CPU Bus Unit		RS-232C x 2	0 to F	CS1W-SCU21-V1

GP-IB Interface Unit
CS1W-GPI01

- Enables communications between SYSMAC CS-series PLCs and GP-IB instruments.
- Conforms to the standard interface IEEE-488-1978 (GP-IB).
- Usable in either Master Mode (controller) or Slave Mode (talker, listener).
- Communications with GP-IB instruments are easily implemented simply by using the INTELLIGENT I/O READ and INTELLIGENT I/O WRITE (IORD/IOWR) instruction in the ladder program in the CPU Unit to read and write buffer memory in the GP-IB Interface Unit.



CS1W-GPI01

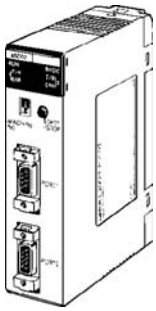
Specifications

Item	Specification
Name	SYSMAC CS-series GP-IB Interface Unit
Model number	CS1W-GPI01
Unit type	CS1 Special I/O Unit
Mounting location	CS1 CPU Rack or CS1 Expansion Rack
Max. number of GP-IB Interface Units	Up to 4 GP-IB Interface Units per CPU Unit
Unit number setting range	0 to 95
GP-IB Interface Unit settings when editing the I/O tables offline with the CX-Programmer	Number of unit numbers used: 1 Number of input words allocated: 5 Number of output words allocated: 5
Transmission method	8-bit parallel data transfer
Communications method	Half duplex
Interface	Conforms to IEEE-489-1978 (24-pin) standards
Handshaking method	Three-line handshaking
Functional specifications (GP-IB interface functions)	Master mode: SH1, AH1, T6, TE0, LE0, C1 to C4, and C28 Slave mode: SH1, AH1, T6, TE0, L4. LE0, SR1, RL0, PP0, DC1, and DT0
Connection configurations	Star configuration or daisy-chain configuration
Transmission distance	Limits on the length of cables in the system (All three of these conditions must be satisfied simultaneously.) Total cable length≤Number of devices in the system×2 m Total cable length≤20 m Length of a single cable≤4 m (for a 1:1 connection)
Max. number of connected devices	15 devices max. including the GP-IB Interface Unit
GP-IB device address	0 to 30
Delimiters	Select from the following: CR + LR, CR, LF, EOI, or user-set code.
Max. data transfer size	512 bytes max. in a single reception or transmission
Max. number of connectors	2 (connectors can be stacked)
Current consumption	5 VDC, 330 mA
Dimensions	35×130×101 mm (W×H×D)
Weight	258 g max.

ASCII Units
C200H-ASC□□

Easily Perform ASCII Data Communications with All Types of General-purpose External Devices. An ASCII Unit Can Also Be Used as a Special Processing Unit.

- Perform ASCII communications with a wide range of external devices.
- The C200H-ASC11/ASC21/ASC31 function as special processing units with BASIC programming.
- Large-capacity user memory: 200 Kbytes
- Model available with RS422A/485 port.
- Various forms of data exchanges with CPU Unit: Select the best method for the read/write trigger and timing.
- High-speed data exchanges possible with shared memory (not dependant on I/O refresh).
- A wide range of interrupt processes: Interrupts fro CPU to ASCII Unit, communications interrupt, key interrupts, timer interrupts, error interrupts, etc.
- Easy control of transmission control signals.
- Calculation instructions for error check codes.
- Many BASIC debugging functions (break points, 1-step execution, execution stop monitoring, etc.)
- Error log supported with up to 30 error records.



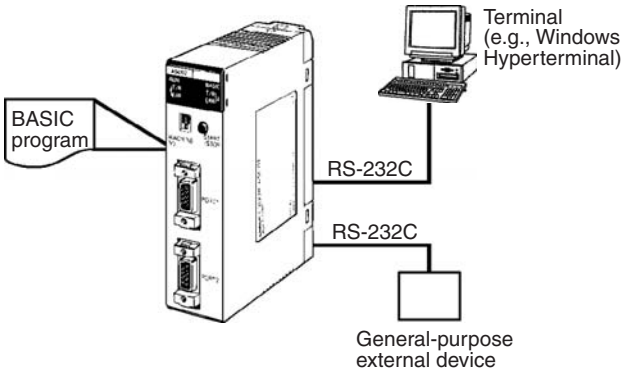
C200H-ASC11
C200H-ASC21
C200H-ASC31

Function

The ASCII Units support BASIC language programming and RS-232C and RS422A/485 serial communications. BASIC programming enables ASCII communications with essential any external device. It can also be used as a special processing unit to aid the CPU Unit without using external communications.

The C200H-ASC21/ASC21/ASC31 provided shared memory with the CPU Unit, and both the ASCII Unit and the CPU Unit can access the shared memory asynchronously, providing for high-speed data exchanges between the two Units without using interrupts.

System Configuration



Specifications

Classification	User memory	Shared memory	Serial communications ports	Unit numbers	Model
C200H Special I/O Unit	200 Kbytes	Provided (90 words in I/O memory)	RS-232C x 2	0 to F	C200H-ASC11
			RS-232C x 1, RS-422A/485 x 1		C200H-ASC21
			RS-232C x 2, RS-232C x 1 for terminal		C200H-ASC31

Note: The C200H-ASC02 can also be used with CS1 PLCs.

Protocol Macros

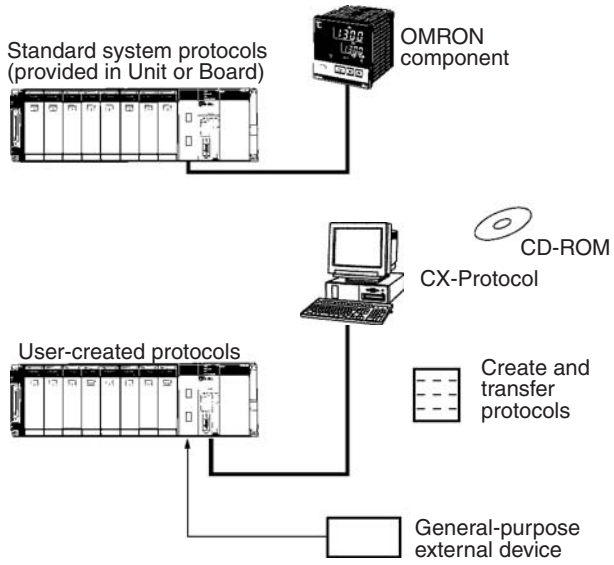
Easily Create Protocols for Data Exchange with External Devices; Execute with One Instruction

Function

Protocols for communications with external devices can be easily created according to the communications standards required by the external device. Protocol macros enable communications with essentially any external device with an RS-232C or RS-422A/485 port without programming communications in the PLC.

Standard system protocols are provided as a standard feature for communications with OMRON components, such as Temperature Controllers, Panel Meters, Bar Code Readers, and Modems. A Windows-based tool called CX-Protocol is also available to enable creation of protocols for most any external device.

System Configuration



Types of Protocol

Protocols	External devices	Required products
Standard system protocols	OMRON components	Serial Communications Board or Unit
User-created protocols	General-purpose external device	Serial Communications Board or Unit + CX-Protocol (Windows-based protocol support software)

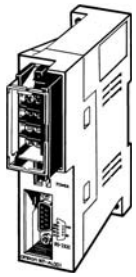
Standard System Protocols

Component		Model	Send/receive sequences
CompoWay/F-compatible components		OMRON CompoWay/F slave components	CompoWay/F command send/response receive
Digital Controllers and Temperature Controllers	Small Digital Controller with Communications (53 x 53 mm)	E5CK	Present value read, set point read, manipulated variable read, etc. Set point write, alarm write, PID parameter write, etc.
	Temperature Controllers with Digital Indications (Thermac J with communications) (96 x 96 mm or 48 x 96 mm)	E5□J-A2H0	
	Digital Controllers with Communications (96 x 96 mm)	ES100□	
	High-density Temperature Controller with communications (8 control points)	E5ZE	
Intelligent Signal Processors (special specifications)		K3T□	Display value read, comparison value read, write, etc.
Bar Code Readers	Laser Scanner type	V500	Read start, data read, read stop, etc.
	CCD type	V520	
Laser Micrometer		3Z4L	Measurement condition set, continuous measurement start, etc.
Visual Inspection Systems	High speed, high precision, low cost	F200	Measurement, continuous measurement, etc.
	High-precision inspection/positioning	F300	
	Character inspection software/positioning software	F350	Measurement, positioning, inspection, character inspection, etc.
ID Controllers	Electromagnetic coupling (for short distances)	V600	Carrier data read, autoread, write, etc.
	Microwave (for long distances)	V620	
Hayes Modem AT Command		---	Modem initialize, dial, send, etc.
C-series PLCs (See note.)		PLC with Host Link (C mode) protocol	---
CS/CJ-series PLCs (See note.) CVM1/CV-series PLCs (See note.)		PLC with Host Link (FINS) protocol	
Mitsubishi PLCs (Sequencer CPU Modules) (See note.)		PLC with Computer Link (A-compatible, 1C frame, model 1) slave functions.	

Note: Serial Communications Board/Unit Ver. 1.2 or later only.

RS-232C/RS-422A Adapter Unit
NT-AL001

- Long-distance transmissions are possible through an RS-422A interface. By converting from RS-232C to RS-422A and then back to RS-232C, a transmission distance of up to 500 m can be achieved.
- No power supply is required. If the 5-V terminal (150 mA max.) is connected from the RS-232C device, a separate power supply is not required to drive the Adapter Unit.
- Duct wiring can be used. The removable terminal block enables wiring not possible with D-sub connectors. (The RS-232C interface is 9-pin D-sub.)



NT-AL001

Function

The NT-AL001 is used to connect a PT or other device with an RS-232C terminal to a device with an RS-422A terminal.

Communications Specifications

■ RS-232C Interface

Item	Specification
Baud rate	64 Kbps max.
Transmission distance	2 m max.
Connector	9-pin, D-sub connector (female)

■ RS-422A Interface

Item	Specification
Baud rate	64 Kbps max. (depends on RS-232C baud rate)
Transmission distance	500 m max.
Terminal block	8 terminals, M3.0; detachable

Communications Networks

Overview

Level	Network	Functions	Communications	Unit/Board
Information networks	Ethernet	Host computer to PLC	FINS messages	Ethernet Unit
		PLC to PLC		
		Host computer to CPU Unit memory card	FTP server	
		UNIX computer or other socket service to PLC	Socket services	
	Controller Link and SYSMAC LINK	Computers connected directly to network and PLC	FINS messages	Controller Link Support Board and Unit SYSMAC LINK Support Board and Unit
			Data links (offsets and automatic setting)	
Control networks	Controller Link and SYSMAC LINK	PLC to PLC	FINS messages	Controller Link Unit SYSMAC LINK Unit
			Data links (offsets and automatic setting)	
	PC Link		Simple data links	PC Link Unit
	DeviceNet		FINS messages on open network	DeviceNet Master Unit and Configurator
	DeviceNet	PLC to components (slaves)	High-capacity remote I/O on open network (fixed or user allocations)	DeviceNet Master Unit and Configurator
	CompoBus/S		High-speed remote I/O with OMRON network (fixed allocations)	CompoBus/S Master Unit

Communications Specifications

Network	Ethernet	Controller Link	SYSMAC LINK	DeviceNet	CompoBus/S
Messages	Yes	Yes	Yes	Yes	---
Data links	---	Yes	Yes	---	---
Remote I/O	---	---	---	Yes	Yes
Maximum speed	100 Mbps	2 Mbps Comm cycle: Approx. 34 ms (Wired: 32 nodes, 2-Kbits + 2-Kword data links)	2 Mbps Comm cycle: Approx. 34 ms (Wired: 32 nodes, 2-Kbits + 2-Kword data links)	500 Kbps Comm cycle: Approx. 5 ms (128 inputs and 128 outputs)	750 Kbps (See note 1.) Comm cycle: Approx. 1 ms (128 inputs and 128 outputs)
Total distance	2.5 km	Twisted-pair: 1 km at 500 Kbps H-PCF cable: 20 km GI cable: 30 km	Coaxial: 1 km Optical: 10 km	500 m at 125 Kbps	Trunk line: 500 m (See note 2.) Communications cycle: 6 ms max.
Maximum nodes	254	32/62	62	63	32
Communications media	Coaxial cable (10Base-5), twisted-pair (100Base-TX), or twisted-pair (10Base-T)	Special twisted-pair cable or optical cable	Coaxial cable or optical cable	DeviceNet cable	2-core or 4-core VCTF cable, special flat cable (See note 3.)
Network data link capacity	---	32,000 words	2,966 words	---	---
Remote I/O capacity	---	---	---	32,000 pts (with Configurator) 16,000 pts (without Configurator)	256 pts
Supporting PLCs	CS, CJ, CVM1, CV, C200HX/HG/HE (See note 4.)	CS, CJ, CVM1, CV, C200HX/HG/HE, CQM1H (Twisted-pair cable only for C200HX/HG/HE and CQM1H.)	CS, CVM1, CV, C200HX/HG/HE, C200HS, C1000H, C2000H	CS, CJ, CVM1, CV, C200HX/HG/HE, CQM1H (with I/O Link)	CS, CJ, C200HX/HG/HE, CQM1H, SRM1; CPM1A/CPM2C (with I/O Link)

Note: 1. For high-speed communications mode. Trunk line length is 100 m (30 m max. for 4-core VCTF or special flat cable).

2. For long-distance communications mode (200 m max. for 4-core VCTF or special flat cable).

3. Different types of cables cannot be mixed.

4. For CVM1, CV, or C200HX/HG/HE: Max. speed: 10 Mbps, Max. nodes: 100, Communications media: Coaxial or twisted-pair cable (10Base-T).

Ethernet Units
CS1W-ETN□□

Immediate Remote Access to PLCs Via Ethernet

Improved FINS Message Communications

- Conforms to TCP/IP.
- Increased number of nodes. (Previously 126 nodes max. increased to 254 nodes max.)
- Communications are still possible even if IP address of host computer changes.
- Multiple FINS applications can be connected online in the personal computer.
- FINS message communications response is up to four times faster than previous models.

Improved Mail

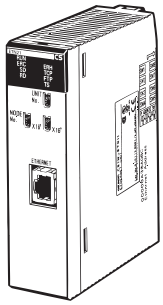
- Mail can be sent containing commands to the PLC (e.g., mail can be used to read I/O memory in the CPU Unit and send commands to backup memory).
- Files can sent as mail attachments (a data file can be automatically generated and sent as an attachment when specified conditions are met).
- More advanced mail send conditions (e.g., sending mail when values in the CPU Unit's I/O memory change to specified values)

Specify Host Name for Server (DNS Client Function)

Automatically Adjusted Built-in Clock (SNTP Client Function)

FTP Server Function, and Socket Services Are Also Supported (Same as Previous 10-Mbps Ethernet Unit)

Mail, DNS client, SNTP client, FTP server, and socket service are not supported for the CS1D-ETN21D.

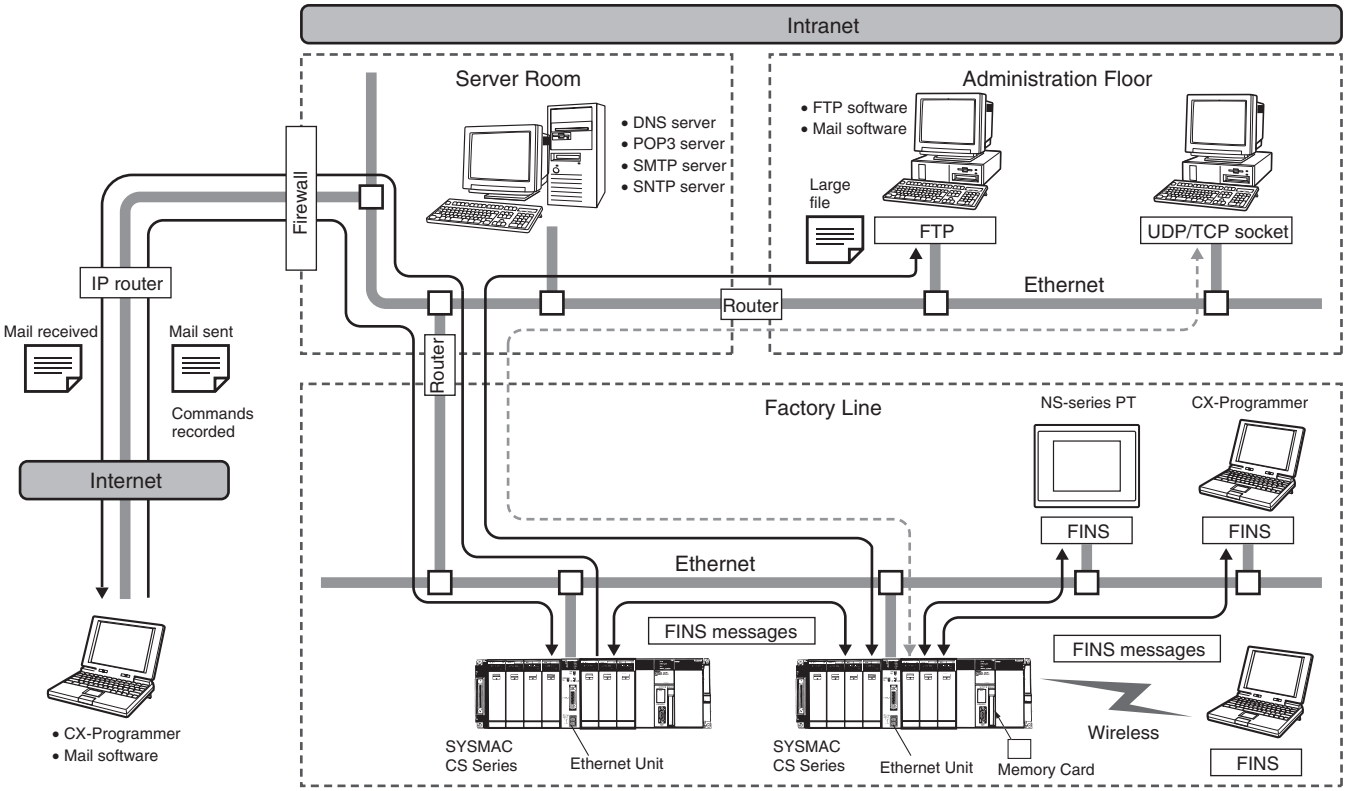


100Base-TX Ethernet Unit
CS1W-ETN21
CS1D-ETN21D

Function

The same functionality and application interfaces as previous CS1W-ETN01 and CJ1W-ETN11 Ethernet Units are provided, while using 100Base-TX as the transmission media. Robust FINS communications enable Ethernet connections using the Intranet. Mail functions have been improved to enable PLC remote access via the Internet.

System Configuration

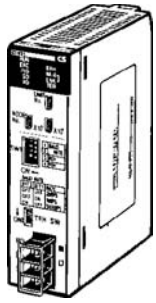


Specifications

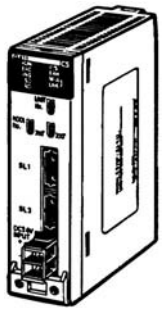
Unit name	Type	Communications service	Connector	Model
Ethernet Unit (100Base-TX)	CS CPU Bus Unit	FINS communications service (TCP/IP, UDP/IP), FTP server functions, socket services, mail transmission service, mail receive (remote command receive), automatically adjusted PLC built-in clock, server/host name specification	100Base-TX (10Base-T)	CS1W-ETN21
				CS1D-ETN21D

Controller Link Units and Controller Link Support Boards
CS1W-CLK/3G8F7-CLK

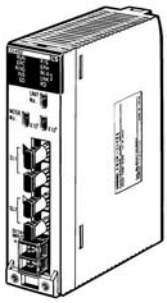
Simpler Controller Link Wiring, Startup, and Construction Provides Larger-capacity Data Links, Greater Flexibility in Area Control, and Supports Multiple Sub-networks



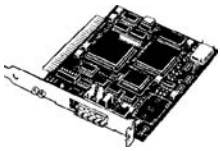
CS1W-CLK21-V1
Wired Controller Link Unit



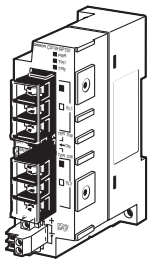
CS1W-CLK12-V1
Optical Controller Link Unit (H-PCF Cable)



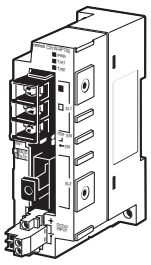
CS1W-CLK52-V1
Optical Controller Link Unit (GI Cable)



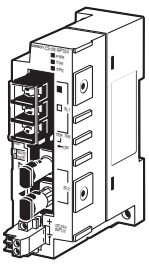
Personal Computer Boards (for PCI bus)
3G8F7-CLK21-EV1
(for wired systems)
3G8F7-CLK12-EV1
(for optical, H-PCF-cable systems)
3G8F7-CLK52-EV1
(for optical, GI-cable systems)



CS1W-RPT01
Wire-to-Wire Repeater Unit



CS1W-RPT02
Wire-to-H-PCF Repeater Unit



CS1W-RPT03
Wire-to-GI Quartz Repeater Unit

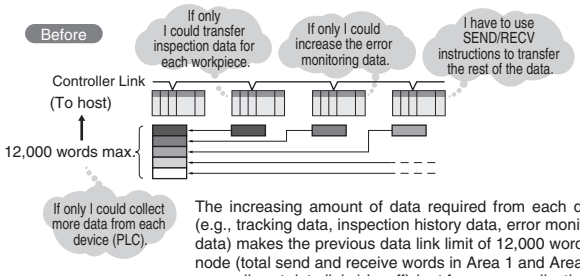
Function

The data link capacity is 20,000 words per node. Allocate both Data Link Area 1 and Area 2 in the same area. Connect up to 8 Units under a single CPU Unit (Unit Ver. 1.2 only).

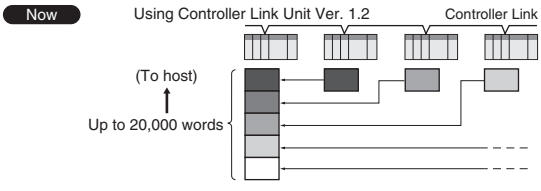
Using Wired Controller Link Units together with Repeater Units allows network configurations for essentially any application, including T-branching, long-distance applications, applications with up to 62 nodes, or applications with optical sections in a wired network. Models are also available that enable changes in configurations and automatic 1:N communications while data links are active.

Huge increase in amount of data that can be collected from devices.

Number of data link send/receive words (total of Area 1 and Area 2) for a single Controller Link Unit increased from 12,000 to 20,000 words.



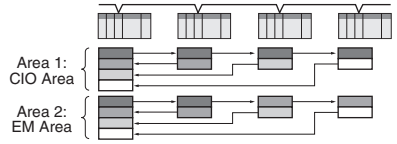
The increasing amount of data required from each device (e.g., tracking data, inspection history data, error monitoring data) makes the previous data link limit of 12,000 words per node (total send and receive words in Area 1 and Area 2 for manually set data links) insufficient for many applications.



New CS/CJ-series Controller Link Units (Wired/Optical Ring) can handle up to 20,000 send/receive data link words (total of Area 1 and Area 2) for a single node. This enables more data to be collected from each device.

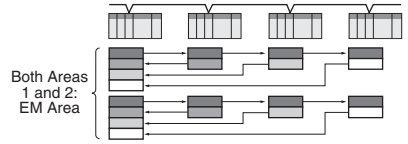
The same Memory Area can be used for the Data Link Areas. For example, Data Link Areas 1 and 2 can be both allocated and managed in EM Bank 0.

Before



Area 1 and Area 2 had to be allocated in separate Memory Areas for user-set data links. Therefore, allocating all data links in the EM Area was not possible.

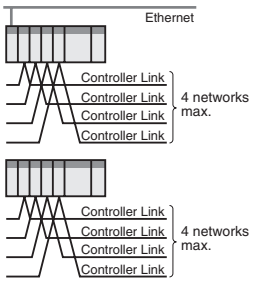
Now



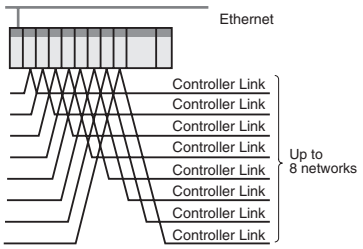
New CS/CJ-series Controller Link Units (Wired/Optical Ring Units) enable both Areas 1 and 2 to be allocated in the same Memory Area when using user-set data links. Provided addresses do not overlap, the same Memory Area can be used, making area control easier.

Control up to 8 Controller Link sub-networks as a group from the host network.

Previous Units supported connection of up to four Controller Link Units to a single CPU Unit. Creating a gateway to the host network to control the Controller Links as a group of sub-networks required dividing the Units between two PLCs with a maximum of four networks for a single PLC.



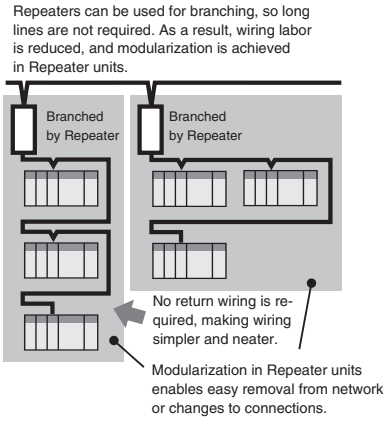
New CS/CJ-series Controller Link Units (Wired/Optical Ring) enable connection of up to 8 Controller Link Units for each CPU Unit. This enables easy centralized control of a group of Controller Link sub-networks from the one PLC.



System Configuration

Use Repeater Units for T-branch Wiring, Extension, Expansion, and Optical Sections

T-branching Enables More Flexible Wiring Solutions for Layout, Building, and Expansion of Networks



Wired Types Support Long-distance Extension

The total extended length that was previously 500 m at 2 Mbps can be extended to up to 1.5 km by using two Repeater Units.

Connect up to 64 Nodes Using Wired Types

Networks can be constructed with up to 62 nodes when Controller Link Units/Support Boards with -V1 suffix are combined with Repeater Units.

WIring with Optical Cables Increases Noise Immunity

Using two Repeater Units for optical ring enables wiring with optical cables in parts of the network subject to noise.

Simpler, More Flexible Data Links

Change Data Link Tables While Data Links Are Active

- When data link tables are changed due to additional nodes or other networking changes, data link tables can be transferred without stopping any data link communications.
- Flexible system configurations can be changed by combining node expansion using Repeater Units.

Specifications

Unit/Board	Classification	Compatible PLC	Media	Model	Connections
Controller Link Units	CPU Bus Unit	CS Series	Wired	CS1W-CLK21-V1	Can be mounted together with previous Controller Link Units/Support Boards.
			Optical ring (H-PCF cable)	CS1W-CLK12-V1 (See note.)	
			Optical ring (GI cable)	CS1W-CLK52-V1 (See note.)	
Controller Link Support Boards	Personal computer board (for PCI bus)	---	Wired	3G8F7-CLK21-EV1	
			Optical ring (H-PCF cable)	3G8F7-CLK12-EV1	
			Optical ring (GI cable)	3G8F7-CLK52-EV1	
Controller Link Repeater Units	---	Not mounted to PLC	Twisted-pair cable	CS1W-RPT01	Unit mounted independently using either DIN Track or screws.
			Optical ring (H-PCF cable)	CS1W-RPT02	
			Optical ring (GI cable)	CS1W-RPT03	

Note: Lot numbers for the CS1W-CLK12-V1 and CS1W-CLK52-V1 are 030602 or later (June 2003 or later).

Main Specifications Related to Version Upgrade for Unit Ver. 1.2

Item		Unit Ver. 1.2 or later	Pre-Ver. 1.2
Number of data link words		Number of send/receive words per Unit Total of Area 1 and Area 2: 20,000 words max.	Number of send/receive words per Unit Total of Area 1 and Area 2: 12,000 words max.
		Number of send words per Unit Total of Area 1 and Area 2: 1,000 words max.	
Data Link Area allocations	User-set allocations	Areas 1 and 2: CIO Area (including data link words), DM Area, and EM Area	
		Both Area 1 and Area 2 can be allocated in the same area (provided there is no address duplication).	Both Area 1 and Area 2 cannot be allocated in the same area.
	Automatically set equal allocations	Area 1: CIO Area (including data link words), Area 2: DM Area and EM Area	
	Automatically set 1:N allocations	Areas 1 and 2: CIO Area (including data link words), DM Area, and EM Area	
Maximum number of Controller Link Units connected to a single CPU Unit		8 Units max.	4 Units max.

Note: CX-Programmer Ver. 5.0 or higher is required to set a data link area with a maximum number of send and receive words of 20,000 words per Controller Unit, or to allocate the same area for Area 1 and Area 2.

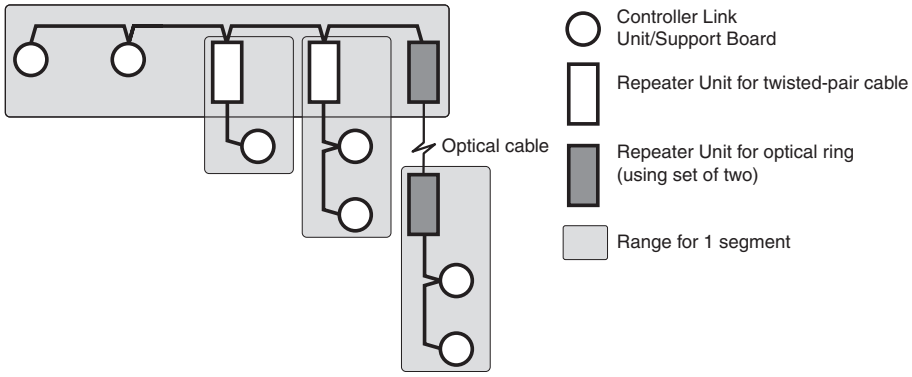
Specifications for Networks Using Repeaters

Item	Segment (See note 1.)	Total network
Transmission path configuration	Multi-drop	Tree (using Repeaters to connect each segment)
Baud rate/maximum transmission distance (See note 2.)	2 Mbps: 500 m 1 Mbps: 800 m 500 kbps: 1 km	2 Mbps: 1.5 km 1 Mbps: 2.4 km 500 kbps: 3.0 km
Maximum number of nodes	Controller Link Unit + Repeater Unit Total number of nodes: 32	Controller Link Unit: 62 nodes (using a Controller Link Unit that supports 62 nodes)
Maximum number of Repeater levels (See note 3.)	---	2 levels

Note: 1. Specifications for each segment are the same as for Wired Controller Link networks.

2. Maximum transmission distance: Total wired cable length between the two nodes separated by the longest total wired cable length.

3. Maximum number of Repeater levels: Maximum number of Repeaters in a path linking any two nodes. For optical ring types, one set of two Units comprises one level.

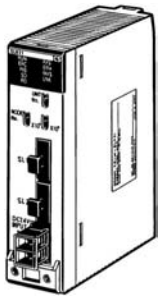


SYSMAC LINK Units and Support Boards
CS1W-SLK/3G8F7-SLK

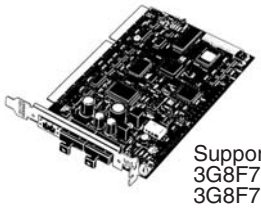
OMRON's Main FA Networks

- Large-capacity, flexible data links.
- Large-capacity data transfers with message service.
- Use coaxial cable or optical fiber to meet system requirements.
- Connect different series of PLCs: CS1, C200HX/HG/HE, CVM1, CV, C200HS and C1000H.
- Complete troubleshooting measures.
- Communications settings with CX-Programmer.

CS1W-SLK21
Coaxial SYSMAC LINK Unit



CS1W-SLK11
Optical SYSMAC LINK Unit



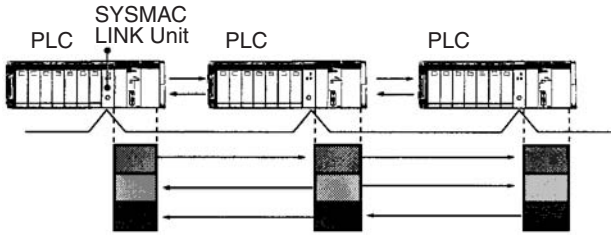
Support Boards (for PCI bus)
3G8F7-SLK21-E (for coaxial systems)
3G8F7-SLK11-E (for optical systems)

Function

The SYSMAC LINK is a core FA network between PLCs. Both automatic data links and as-needed message services can be set up between PLCs or between PLCs and factory computers. You can exchange large volumes of data between up to 62 nodes for large-scale networks, or create a smaller network to suit the application.

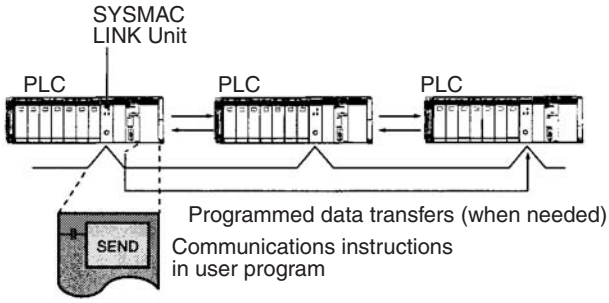
System Configuration

■ Data Links



Cyclic transfer with shared memory data areas
I/O bits, LR Area bits, DM Area words, etc.

■ Message Service



Programmed data transfers (when needed)
Communications instructions
in user program

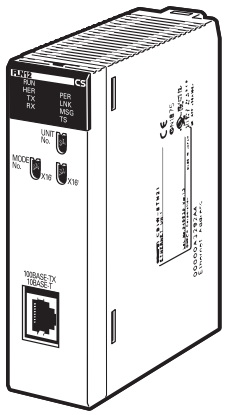
Specifications

Unit	Unit classification	Communications	Transmission media	Specifications	Unit numbers	Model
SYSMAC LINK Unit	CS1 CPU Bus Unit	Data links and message service	Coaxial cable	Up to 4 Units can be mounted to CPU Rack or CS1 Expansion Racks.	0 to F (4 Unit max.)	CS1W-SLK21
			Optical cable			CS1W-SLK11
SYSMAC LINK Support Board	Computer board		Coaxial cable	Computer: Windows-compatible Computer with PCI bus	---	3G8F7-SLK21-E
			Optical cable			3G8F7-SLK11-E

FL-net Unit
CS1W-FLN22

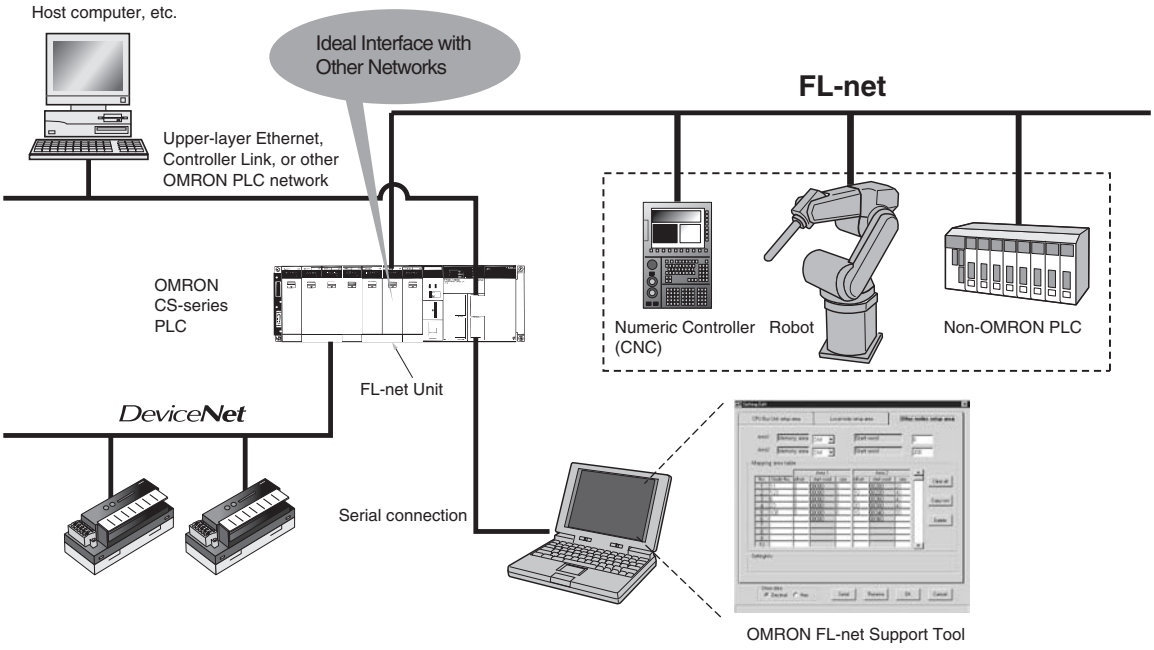
100Base-TX-compatible CS/CJ-series FL-net Unit Easily Enables High-speed Communications with Multi-vendor Controllers

- Functions as Interface with Various Networks
  The CS/CJ Series is compatible with upper-layer Ethernet, OMRON's PLC Controller Link communications protocol, and DeviceNet fieldbus systems, enabling interfacing with each of these networks.
- Supports Baud Rate of 100 Mbps
  A baud rate of 100 Mbps is supported. The baud rate can be automatically selected or a fixed baud rate of 10 Mbps can be set.
- Specify the Order of Data Link Data
  The order of link data bytes can be specified for each node according to the needs of the connected device, eliminating the need for upper/lower byte conversion (SWAP) processing in the ladder program.
- Supports Simple Backup Function
  The setting data (such as the FA Link table) stored in the FL-net Unit can be backed up to the Memory Card in the CPU Unit, making Unit replacement easy.



CS1W-FLN22 *NEW*

System Configuration



What is FL-net?

FL-net is an open FA network that was standardized by the Special Committee for Network Promotion organized by the Japan Electrical Manufacturer's Association (JEMA). FL-net is based on Ethernet and enables interconnection of programmable controllers (PLCs) and other FA devices by different manufacturers. FL-net has the following features.

Ethernet-based FA network.

- Defines a new Ethernet-based FA Link protocol.
- Uses Ethernet's standard UDP/IP communications protocol.
- Cables, hubs, and other networking components are readily available.

Supports cyclic and message transmissions.

- Interlocks between devices, production instructions, and production results collection can all be implemented on the same network.

Uses token passing without a master.

- Prevents data collision and ensures transmission within a fixed period of time.
- Nodes can be automatically added to or removed from the network.
- Communications are maintained between all nodes that are capable of communicating even if a power interruption occurs, or a fault occurs in network devices or cables.

Specifications

■ FL-net Unit

Item \ Model / Type		CJ1W-FLN22	
		100Base-TX	10Base-T
Applicable PLCs		CJ-series PLCs	
Unit classification		CPU Bus Unit	
Mounting location		CPU Rack or Expansion Rack	
Number of Units that can be mounted		4 max. (including Expansion Racks)	
Transfer specifications	**Media access method**	CSMA/CD	
	Modulation	Baseband	
	Transmission paths	Star	
	Baud rate	100 Mbps	10 Mbps
	Transmission media	Unshielded twisted-pair (UTP) cable Categories: 5, 5e Shielded twisted-pair (UTP) cable Categories: 100 Ω at 5, 5e	Unshielded twisted-pair (UTP) cable Categories: 3, 4, 5, 5e Shielded twisted-pair (UTP) cable Categories: 100 Ω at 3, 4, 5, 5e,
	Transmission distance	100 m (distance between hub and node)	
	Number of cascade connections	2	4
Communications	**Cyclic transmission**	• Data link capacity: 8 KB max (512 words) + 8,192 words • Maximum size per node: 8 KB max (512 words) + 8,192 words (**Note:** Earlier CJ1W-FLN01/02/12 versions were restricted to a maximum of 7,677 words.) • Maximum number of data links: 128 • The byte order for data transfer between the Common Memory and CPU Unit's Data Link Area can be selected for each node, according to the needs of the data link-compatible device. **Note:** Earlier CJ1W-FLN01/02/12 versions supported specifying only the order of data allocated data between the Common Memory and Data Link Area, but the direction can now be reversed.	
	Message communications	Supported messages (client function): Read word block, write word block, send transparent message frame (send/read), vendor message (FINS message) Supported instructions: SEND(090)/RECV(098)/CMND(490) (executes sends between OMRON PLCs) or CMND(490) (executes sends between OMRON and non-OMRON PLCs)	

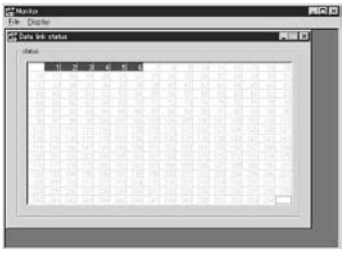
Note: FL-net Support Tool (Ver. 1.60 or higher) is required to make the FL-net settings.
Contact your OMRON sales representative for details on purchasing FL-net Support Tool.

■ FL-net Support Tool

OS	Windows XP, 2000, NT 4.0, Me, 98, or 95
Connection to PLC	Serial connection to CPU Unit's peripheral port or RS-232C port (serial communications mode: Peripheral Bus) Connection cables for IBM PC/AT or compatible: Peripheral port: CS1W-CN226/626 RS-232C port: XW2Z-200S/500S-CV
Function	FL-net Unit initial settings, data link settings, monitor function (Unit status, network status, node status, data link status, participating node status, message sequence status, FA Link network status) With version 1.6 or higher, FL-net Unit settings of other nodes on the FL-net can be made and monitoring of FL-net Units can be performed.

Data Link Status

Displays the data link status of other nodes participating in the FL-net network.



Participating node status

Displays the status of other nodes participating in the FL-net network.

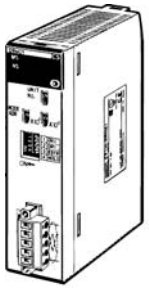
DeviceNet Units
CS1W-DRM21-V1/C200HW-DRM21-V1/C200HW-DRT21

Multivendor, Multibit Network

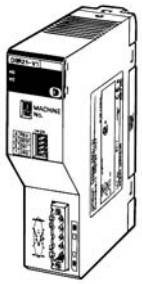
- The following functionality is available without a Configurator (for the CS1-DRM21-V1):
- Remote I/O communications can be allocated in any area using the DM Area settings.
- More than one DeviceNet Unit can be mounted for each CPU Unit (3 max. for fixed allocations).
- More than one DeviceNet Unit can be connected as a master in a single network. When using the Configurator (see note), remote I/O can be allocated in an order independent of node address.

Note: The Configurator is allocated 1 node if connected using a special board or card. It is not allocated a node if connected using serial communications.

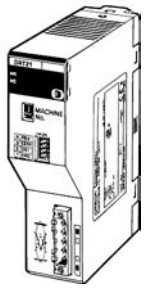
- DeviceNet Units can be used as both masters and slaves, and master and slave functionality can be used simultaneously.
- DeviceNet Units allow DeviceNet networks to be handled with the same seamless transparency as Controller Link, Ethernet, or other networks when using message communications or CX-Programmer remote programming and monitoring.



CS1W-DRM21-V1
DeviceNet Unit



C200HW-DRM21-V1
Master Unit



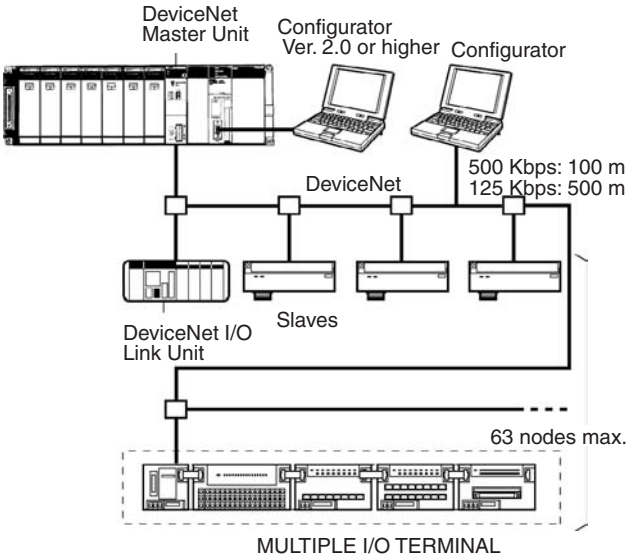
C200HW-DRT21
I/O Link Unit

Function

This is OMRON's implementation of the DeviceNet open field network, a multibit, multivender network for machine/line control and information. The following types of communications are possible.

1. Remote I/O communications for automatic data transfers between the CPU Unit and Slaves (with no programming in the CPU Unit).
2. Message communications that, using specific instructions (IOWR and CMND), can be programmed in a CPU Unit equipped with DeviceNet Unit to send read/write message to slaves or other CPU Units equipped with DeviceNet Units and control operation.

System Configuration



Specifications

■ DeviceNet Unit

Classification		Types of communications	Specifications	Unit numbers	Model
CS1 CPU Bus Unit	Master functions Slave functions	Remote I/O communications master (fixed or user-set allocations) Remote I/O communications slave (fixed or user-set allocations) Message communications	Up to 16 Units can be mounted when a Configurator is used.	0 to F (A Configurator is required to mount 16 Units.)	CS1W-DRM21-V1
C200H Special I/O Unit	Master functions	Remote I/O communications master			C200HW-DRM21-V1
	Slave functions	Remote I/O communications slave			C200HW-DRT21

■ DeviceNet Configurator

Model number	Specifications
WS02-CFDC1-E	Software only (Windows 95, 98, NT 4.0, 2000, or XP)
3G8E2-DRM21-EV1	PC card with software (Windows 95, 98, Me, 2000, or XP)

■ Setting/Monitoring Software

Name	Model number	Specifications
NX-Server	WS02-NXD1-E	DDE edition (Windows 95, 98, NT 4.0, 2000, or XP)

■ DeviceNet Slaves

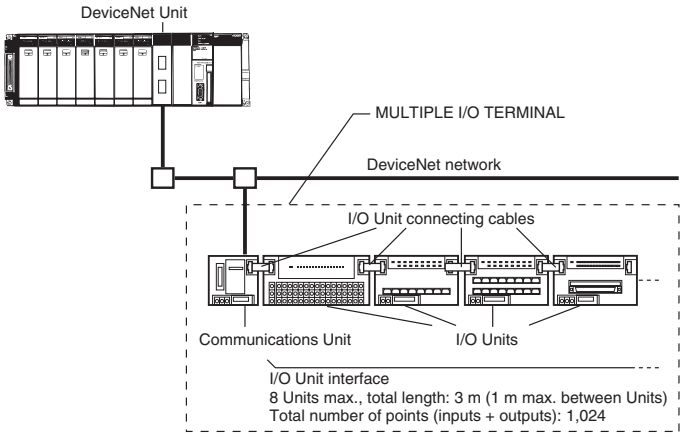
Note: Refer to *Ordering Information* in this manual for details.

MULTIPLE I/O TERMINALs

Multibit Building-block DeviceNet Slaves

- Expand I/O simply by adding I/O Units to the I/O interface.
- Create a low-cost multibit I/O system.
- Connect up to eight Multiple I/O Units to a single Communications Unit.
- Mix Digital and Analog Units.
- Select from a broad range of I/O Units.

System Configuration



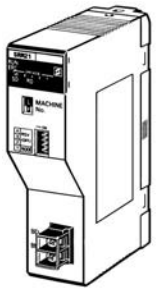
Function

A Communications Unit can be connected to DeviceNet to create an I/O interface for connecting various types of I/O Units. Allocations and address settings are not required for the I/O Units, enabling flexible distributed I/O with ease.

CompoBus/S Master Unit
C200HW-SRM21-V1

High-speed ON/OFF Bus for Distributed Machine Control and Reduced Wiring

- Select either long-distance or high-speed communications.
  High-speed: 750 Kbps, communications distance: 100 m
  (30 m for 4-core VCTF or special flat cable)
  Long-distance: 93.75 Kbps, communications distance: 500 m
  (Total distance is 200 m max. for 4-core VCTF or special flat cable)
- Easy expansions at any location with T-branches.
- Reduce wiring with either VCTF cable or a special flat cable.
- Sensor connectors for easy wiring.

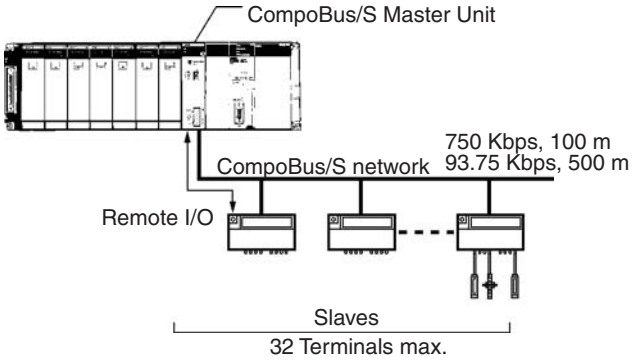


C200HW-SRM21-V1

Function

A high-speed ON/OFF bus that automatically transfers remote I/O status to the CPU Unit without any programming in the CPU Unit. High-speed remote I/O is supported by a communications cycle time of 1 ms maximum for 256 I/O points.

System Configuration



Specifications

■ CompoBus/S Master Unit

Classification	Communications	Specifications	Unit number	Model
C200H Special I/O Unit	Remote I/O	No. of mountable Units: 16	0 to F	C200HW-SRM21-V1

■ CompoBus/S Slave Units

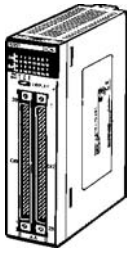
Note: Refer to *Ordering Information* in this manual for details.

I/O Allocations

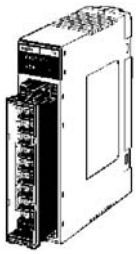
In CS1 PLCs, part of the I/O memory is allocated to each Unit. Units are divided into the following 3 groups for allocations.

- Basic I/O Units
- Special I/O Units
- CS1 CPU Bus Units

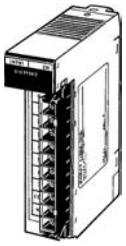
Basic I/O Units



CS1 Basic I/O Units



C200H Basic I/O Units



C200H Group-2 High-density I/O Units (See Note 2.)

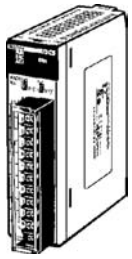
Allocations

CIO Area:
CIO 0000 to CIO 0319 (See Note 1.)
(Memory is allocated in word (16-bit) units in the order Units are mounted on the Rack.)

Note 1. The Rack's first word setting can be changed from the default setting (CIO 0000) to any word from CIO 0000 to CIO 9999. The first word setting can be changed only with a Programming Device other than a Programming Console.

2. The unit number setting on the front of C200H Group-2 High-density I/O Units is ignored. Words are allocated to these Units based on their location in the Rack.

Special I/O Units



CS1 Special I/O Units

C200H Special I/O Units (See Note 2.)

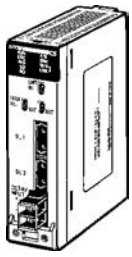
Allocations

Special I/O Unit Area:
CIO 2000 to CIO 2959
(Each Unit is allocated ten words based on its unit number.)

Note 1. Although there are 80 unit number settings, a maximum of 80 Units can actually be mounted to a PLC because that is the maximum number of slots possible.

2. Some Units classified as I/O Units (namely C200H High-density I/O Units) are actually treated as Special I/O Units.

CS1 CPU Bus Units



CS1 CPU Bus Units

Allocations

CS1 CPU Bus Unit Area:
CIO 1500 to CIO 1899
(Each Unit is allocated 25 words based on its unit number.)

■ Allocations to Basic I/O Unit Groups

Basic I/O Units include CS1 Basic I/O Units, C200H Basic I/O Units, and C200H Group-2 High-density I/O Units.

Allocated words in the CIO Area: CIO 0000 to CIO 0319

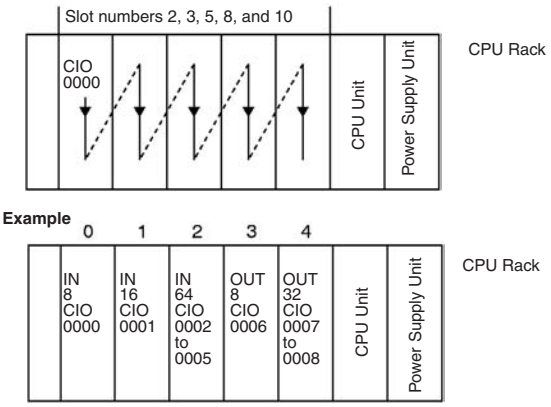
Basic I/O Units can be mounted to the CPU Rack, CS1 Expansion Racks, and C200HX/HG/HE Expansion I/O Racks.

Note: CS1 Basic I/O Units cannot be mounted to C200HX/HG/HE Expansion I/O Racks.

Allocation Methods

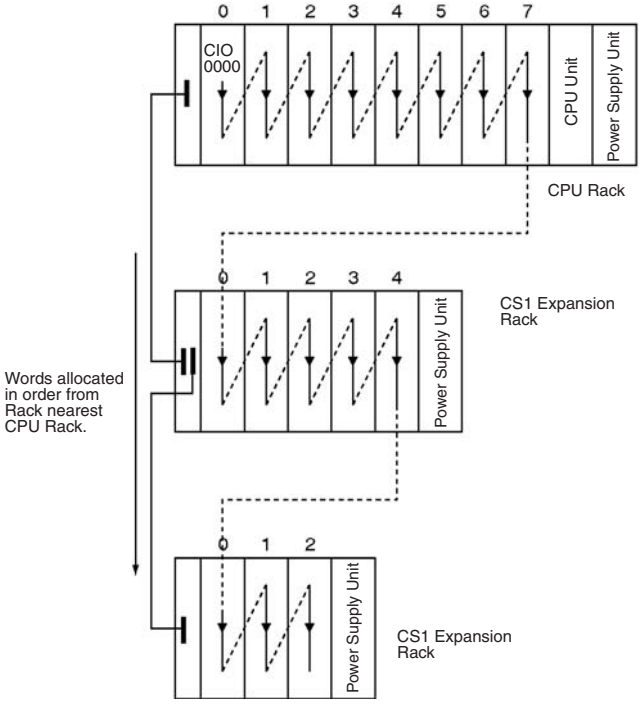
1. CPU Rack

Basic I/O Units on the CPU Rack are allocated words left to right (i.e., from the Unit farthest from the CPU Unit) starting from CIO 0000. Units are allocated as many words as required in word units (16 bits). The CX-Programmer can also be used to specify the first slot words and to reserve words.



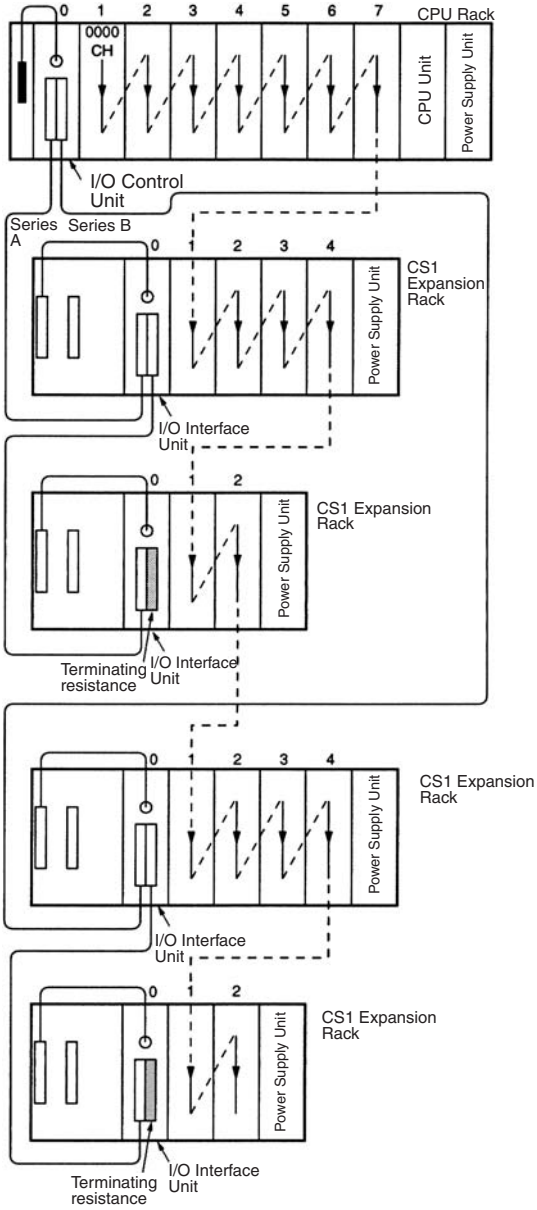
2. Allocations to CS1 Expansion and C200H Expansion I/O Racks

I/O allocation to Basic I/O Units continues from the CPU Rack to the Expansion Racks. Words are allocated from left to right and each Unit is allocated as many words as it requires in word units, just like Units in the CPU Rack. A Rack's first word setting can be changed set to any word from CIO 0000 to CIO 9999 using a Programming Device.



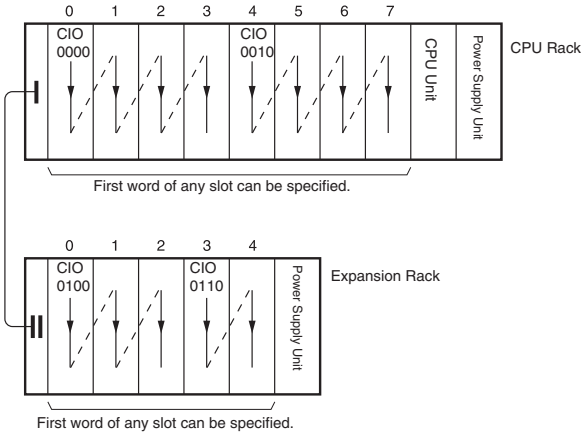
3. CS1 Long-distance Expansion Racks

Words are allocated to series A and then series B. Otherwise, allocations are the same as for other Racks.



Specifying First Slot Words (Unit Ver. 2.0 or Later with CX-Programmer Ver. 4.0 or Higher)

CX-Programmer version 4.0 can be used to specify the first word of specific slots on specific Racks. Up to 64 groups consisting of a corresponding Rack/slot number and first word can be specified, allowing, for example, Input Units and Output Units to be allocated in separate locations or allowing allocations to be specified in user-set groups.



With CX-Programmer version 3.2, up 3 first slot words can be specified.

■ Allocations to Special I/O Units

Special I/O Units include CS1 Special I/O Units and C200H Special I/O Units.

Each of these Units is allocated ten words in the Special I/O Unit Area (CIO 2000 to CIO 2959).

Special I/O Units can be mounted to the CPU Rack, CS1 Expansion Racks, and C200H Expansion I/O Racks*.

Note: *CS1 Special I/O Units cannot be mounted to C200H Expansion I/O Racks.

Each Unit is allocated 10 words in the Special I/O Unit Area, as shown in the following table.

Unit number	Words allocated
0	CIO 2000 to CIO 2009
1	CIO 2010 to CIO 2019
2	CIO 2020 to CIO 2029
⋮	⋮
15	CIO 2150 to CIO 2159
⋮	⋮
95	CIO 2950 to CIO 2959

Note: Special I/O Units are ignored during I/O allocation to Basic I/O Units. Slots containing Special I/O Units are treated as empty slots.

■ Allocations to CS1 CPU Bus Units

Each CS1 CPU Bus Unit is allocated 25 words in the CS1 CPU Bus Unit Area (CIO 1500 to CIO 1899).

CS1 CPU Bus Units can be mounted to the CPU Rack or CS1 Expansion Racks.

Each Unit is allocated 25 words in the CPU Bus Unit Area, as shown in the following table.

Unit number	Words allocated
0	CIO 1500 to CIO 1524
1	CIO 1525 to CIO 1549
2	CIO 1550 to CIO 1574
⋮	⋮
F	CIO 1875 to CIO 1899

Note: CS1 CPU Bus Units are ignored during I/O allocation to Basic I/O Units. Slots containing CS1 CPU Bus Units are treated as empty slots.

Current Consumption

The amount of current/power that can be supplied to the Units mounted in a Rack is limited by the capacity of the Rack's Power Supply Unit. The system must be designed so that the total current consumption of the Units does not exceed the maximum current for each voltage group and the total power consumption does not exceed the maximum for the Power Supply Unit.

■ CPU Racks and Expansion Racks

The following table shows the maximum currents and power that can be supplied by Power Supply Units on CPU Racks and Expansion Racks (both CS1 Expansion Racks and C200H Expansion I/O Racks).

Note: 1. When calculating current/power consumption in a CPU Rack, be sure to include the power required by the CPU Backplane and CPU Unit themselves.

2. Likewise, be sure to include the power required by the Expansion Backplane itself when calculating current/power consumption in an Expansion Rack.

Power Supply Unit	Max. Current Consumption			Max. Total Power Consumption
	5-V group	26-V group	24-V group	
C200HW-PA204	4.6 A	0.6 A	None	30 W
C200HW-PA204S	4.6 A	0.6 A	0.8 A	30 W
C200HW-PA204R	4.6 A	0.6 A	None	30 W
C200HW-PD204	4.6 A	0.6 A	None	30 W
C200HW-PA209R	9 A	1.3 A	None	45 W
C200HW-PD106R	6 A	1.0 A	None	30 W
CS1D-PA207R	7 A	1.3 A	None	35 W
CS1D-PD024	4.3 A	0.56 A	None	28 W

Be sure both Condition 1 and Condition 2 are met.

Condition 1: Maximum Current Supply

1. Current required at 5 VDC by all Units (A) ≤ Max. Current shown in table

2. Current required at 26 VDC by all Units (B) ≤ Max. Current shown in table

3. Current required at 24 VDC by all Units (C) ≤ Max. Current shown in table

Condition 2: Maximum Total Current Supply

1. A × 5 VDC + B × 26 VDC + C × 24 VDC ≤ Max. Power shown in table

■ Example Calculations

Example 1

In this example, the following Units are mounted to a CPU Rack with a C200HW-PA204S Power Supply Unit.

Unit	Model	Quantity	5-VDC	26-VDC	24-VDC
CPU Backplane (8 slots)	CS1W-BC083	1	0.11 A	---	---
CPU Unit	CS1H-CPU67H	1	0.82 A	---	---
Input Units	C200H-ID216	2	0.10 A	---	---
	CS1W-ID291	2	0.20 A	---	---
Output Units	C200H-OC221	2	0.01 A	0.075 A	---
Special I/O Unit	C200H-NC213	1	0.30 A	---	---
CPU Bus Unit	CS1W-CLK21	1	0.50 A	---	---
Service Power Supply Unit		0.3 A used	---	---	0.3 A
Current consumption	Calculation		0.11 A + 0.82 A + 0.10 A x 2 + 0.20 A x 2 + 0.01 A x 2 + 0.30 A + 0.50 A	0.075 A x 2	0.3 A
	Result		2.35 A (≤4.6 A)	0.15 A (≤0.6 A)	0.3 A (≤0.8 A)
Power consumption	Calculation		2.35 A x 5 V = 11.75 W	0.15 A x 26 V = 3.9 W	0.3 A x 24 V = 7.2 W
	Result		11.75 + 3.9 + 7.2 = 22.85 W (≤30 W)		

■ Current Consumption Tables

5-VDC Voltage Group

Name	Model	Consumption (A)
CPU Units (These values include current consumption by a Programming Console.)	CS1H-CPU67H	0.82 (See note.)
	CS1H-CPU66H	0.82 (See note.)
	CS1H-CPU65H	0.82 (See note.)
	CS1H-CPU64H	0.82 (See note.)
	CS1H-CPU63H	0.82 (See note.)
	CS1G-CPU45H	0.78 (See note.)
	CS1G-CPU44H	0.78 (See note.)
	CS1G-CPU43H	0.78 (See note.)
	CS1G-CPU42H	0.78 (See note.)
CS1D CPU Units for Single-CPU Systems supporting Online Unit Replacement	CS1D-CPU67S	0.82 (See note.)
	CS1D-CPU65S	
	CS1D-CPU44S	0.78 (See note.)
	CS1D-CPU42S	
Serial Communication Boards	CS1W-SCB21-V1	0.28 (See note.)
	CS1W-SCB41-V1	0.36 (See note.)
Loop Control Boards	CS1W-LCB01	0.22 (See note.)
	CS1W-LCB05	
CPU Backplanes (for CS1 Units only)	CS1W-BC022	0.11
	CS1W-BC032	0.11
	CS1W-BC052	0.11
	CS1W-BC082	0.11
	CS1W-BC102	0.11
CPU Backplanes	CS1W-BC023	0.11
	CS1W-BC033	0.11
	CS1W-BC053	0.11
	CS1W-BC083	0.11
	CS1W-BC103	0.11
I/O Control Unit	CS1W-IC102	0.92
CS1 Expansion Backplanes (for CS1 Units only)	CS1W-BI032	0.23
	CS1W-BI052	0.23
	CS1W-BI082	0.23
	CS1W-BI102	0.23
CS1 Expansion Backplanes	CS1W-BI033	0.23
	CS1W-BI053	0.23
	CS1W-BI083	0.23
	CS1W-BI103	0.23
I/O Interface Unit	CS1W-II102	0.23
C200H Expansion I/O Backplanes	C200HW-BI031	0.15
	C200HW-BI051	0.15
	C200HW-BI081-V1	0.15
	C200HW-BI101-V1	0.15
CS1D CPU Units (These values include current consumption by a Programming Console.)	CS1D-CPU65H	0.82 (See note.)
	CS1D-CPU67H	
CS1D Process-control CPU Units	CS1D-CPU65P	1.04
	CS1D-CPU67P	
Duplex Backplane	CS1D-BC052	Total: 0.55
Duplex Unit	CS1D-DPL01	
CS1D Backplane for Single-CPU System	CS1D-BC1082S	0.17
CS1D Expansion Backplane with Online Replacement Capability	CS1D-BI092	0.28

Note: Add 0.15 A per port when the NT-AL001-E is connected.

Basic I/O Units

Category	Name	Model	Consumption (A)
C200H Input Units	DC Input Units	C200H-ID211	0.01
		C200H-ID212	0.01
	AC Input Units	C200H-IA121	0.01
		C200H-IA122	0.01
		C200H-IA122V	0.01
		C200H-IA221	0.01
		C200H-IA222	0.01
		C200H-IA222V	0.01
	AC/DC Input Units	C200H-IM211	0.01
		C200H-IM212	0.01
	B7A Interface Units	C200H-B7AI1	0.10
		C200H-B7A12	0.10
	Interrupt Input Unit	C200HS-INT01	0.02
CS1 Input Units	DC Input Units	CS1W-ID211	0.10
		CS1W-ID231	0.15
		CS1W-ID261	0.15
		CS1W-ID291	0.20
	AC Input Units	CS1W-IA111	0.11
		CS1W-IA211	0.11
	Interrupt Input Unit	CS1W-INT01	0.10
	High-speed Input Unit	CS1W-IDP01	0.10
	Safety Relay Unit	CS1W-SF200	0.10
C200H Group-2 High-density Input Units	DC Input Units	C200H-ID216	0.10
		C200H-ID217	0.12
		C200H-ID218	0.10
		C200H-ID219	0.12
		C200H-ID111	0.12

CS1 Unit Descriptions

Category	Name	Model	Consumption (A)
C200H Output Units	Relay Output Units	C200H-OC221	0.01
		C200H-OC222	0.01
		C200H-OC222N	0.008
		C200H-OC225	0.05
		C200H-OC226N	0.03
		C200H-OC223	0.01
		C200H-OC224	0.01
		C200H-OC224N	0.01
	Transistor Output Units	C200H-OD411	0.14
		C200H-OD213	0.14
		C200H-OD214	0.14
		C200H-OD216	0.01
		C200H-OD211	0.16
		C200H-OD217	0.01
		C200H-OD212	0.18
		C200H-OD21A	0.16
C200H Output Units	B7A Interface Units	C200H-B7A01	0.10
		C200H-B7A02	0.10
	Triac Output Units	C200H-OA223	0.18
		C200H-OA222V	0.20
		C200H-OA224	0.27
CS1 Output Units	Relay Output Units	CS1W-OC201	0.10
		CS1W-OC211	0.13
	Transistor Output Units	CS1W-OD211	0.17
		CS1W-OD212	0.17
		CS1W-OD231	0.27
		CS1W-OD232	0.27
		CS1W-OD261	0.39
		CS1W-OD262	0.39
		CS1W-OD291	0.48
		CS1W-OD292	0.48
	Triac Output Units	CS1W-OA201	0.23 max. (0.07 + 0.02 × No. of points ON)
		CS1W-OA211	0.406 max. (0.07 + 0.021 × No. of points ON)
C200H Group-2 High-density Output Units	Transistor Output Units	C200H-OD218	0.27
		C200H-OD21B	0.48
		C200H-OD219	0.48
C200H I/O Units	B7A Interface Units	C200H-B7A21	0.10
		C200H-B7A22	0.10
	Analog Timer Unit	C200H-TM001	0.06
CS1 I/O Units	DC Input/Transistor Output Units	CS1W-MD261	0.27
		CS1W-MD262	0.27
		CS1W-MD291	0.35
		CS1W-MD292	0.35
	TTL Input/TTL Output Unit	CS1W-MD561	0.27

Special I/O Units

Category	Name	Model	Consumption (A)
C200H High-density I/O Units (Special I/O Units)	DC Input Unit	C200H-ID215	0.13
	TTL Input Unit	C200H-ID501	0.13
	Transistor Output Unit	C200H-OD215	0.22
	TTL Output Unit	C200H-OD501	0.22
	TTL I/O Unit	C200H-MD501	0.18
	DC Input Transistor Output Unit	C200H-MD215	0.18
		C200H-MD115	0.18
C200H Special I/O Units	Temperature Control Units	C200H-TC001	0.33
		C200H-TC002	0.33
		C200H-TC003	0.33
		C200H-TC101	0.33
		C200H-TC102	0.33
		C200H-TC103	0.33

CS1 Unit Descriptions

Category	Name	Model	Consumption (A)
C200H Special I/O Units	Heat/Cool Temperature Control Units	C200H-TV001	0.33
		C200H-TV002	0.33
		C200H-TV003	0.33
		C200H-TV101	0.33
		C200H-TV102	0.33
		C200H-TV103	0.33
	Temperature Sensor Units	C200H-TS001	0.45
		C200H-TS002	0.45
		C200H-TS101	0.45
		C200H-TS102	0.45
	PID Control Units	C200H-PID01	0.33
		C200H-PID02	0.33
		C200H-PID03	0.33
	Cam Positioner Unit	C200H-CP114	0.30
	ASCII Units	C200H-ASC02	0.20
	ASCII Units	C200H-ASC11	0.25
		C200H-ASC21	0.30
		C200H-ASC31	0.30
	Analog Input Units	C200H-AD001	0.55
		C200H-AD002	0.45
		C200H-AD003	0.10
	Analog Output Units	C200H-DA001	0.65
		C200H-DA002	0.60
		C200H-DA003	0.10
		C200H-DA004	0.10
	Analog I/O Units	C200H-MAD01	0.10
	High-speed Counter Units	C200H-CT001-V1	0.30
		C200H-CT002	0.30
		C200H-CT021	0.45
	Motion Control Unit	C200H-MC221	0.65 (w/ Teaching Box: 0.85)
	Position Control Units	C200HW- NC113	0.30
		C200HW-NC213	0.30
		C200HW-NC413	0.50
	ID Sensor Units	C200H-IDS01-V1	0.25
		C200H-IDS21	0.25
	Fuzzy Logic Unit	C200H-FZ001	0.30
	Voice Unit	C200H-OV001	0.30
	DeviceNet Master Unit	C200HW-DRM21-V1	0.25
	DeviceNet I/O Link Unit	C200HW-DRT21	0.25
	CompoBus/S Master Unit	C200HW-SRM21-V1	0.15
	PC Link Unit	C200H-LK401	0.35

Category	Name	Model	Consumption (A)
CS1 Special I/O Unit	Analog Input Unit	CS1W-AD□□□-V1	0.13
	Analog Output Unit	CS1W-DA□□□	0.13
	Analog I/O Unit	CS1W-MAD44	0.20
	Isolated Thermocouple Input Unit	CS1W-PTS01-V1	0.15
		CS1W-PTS11	0.12
		CS1W-PTS51	0.25
		CS1W-PTS55	0.18
	Isolated Temperature- resistance Thermometer Input Unit	CS1W-PTS02	0.15
		CS1W-PTS12	0.12
		CS1W-PTS52	0.25
		CS1W-PTS56	0.18
	Isolated Temperature- resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	0.15
	Isolated Two-wire Transmission Device Input Unit	CS1W-PTW01	
	Isolated DC Input Unit	CS1W-PDC01	0.15
		CS1W-PDC11	0.12
		CS1W-PDC55	0.18
	Isolated Pulse Input Unit	CS1W-PPS01	0.20
	Isolated Control Output Unit	CS1W-PMV01	0.15
		CS1W-PMV02	0.12
	Power Transducer Input Unit	CS1W-PTR01	0.15
	100-mV DC Input Unit	CS1W-PTR02	
	Motion Control Units	CS1W-MC221	0.60 (w/ Teaching Box: 0.80 A)
		CS1W-MC421	0.70 (w/ Teaching Box: 1.00 A)
	Position Control Units	CS1W-NC113/ 133	0.25
		CS1W-NC213/ 233	
		CS1W-NC413/ 433	0.36
	High-speed Counter Units	CS1W-CT021	
		CS1W-CT041	0.45
	Customizable Counter Units	CS1W-HCP22-V1	0.80
		CS1W-HCA12-V1	0.75
		CS1W-HCA22-V1	
		CS1W-HIO01-V1	0.60
	GP-IB Interface Unit	CS1W-GPI01	0.33
	ID Sensor Units	CS1W-V600C11	0.26
		CS1W-V600C12	0.32

Note: Depends on the Memory Card being used and can be calculated as follows: 0.7 mA max. at +5 VDC (Unit alone) + PC card output current (I_{card})
I_{5v} (one slot) ≤ 0.5 A, I_{12V} (one slot) ≤ 0.1 A
And,
$I_{card} = I_{5v}$ (two slots) + 3.4 × I_{12V} (two slots) ≤ 1.0 A

CS1 Unit Descriptions

CS1 CPU Bus Units

Category	Name	Model	Consumption (A)
CS1 CPU Bus Units	Motion Control Unit	CS1W-MCH71	0.8
	Loop Control Unit	CS1W-LC001	0.36
	Controller Link Units	CS1W-CLK52-V1	0.65
		CS1W-CLK21-V1	0.33
		CS1W-CLK21-V1	0.33
		CS1W-CLK12-V1	0.52
	SYSMAC LINK Unit	CS1W-SLK21	0.48
		CS1W-SLK11	0.47
	Serial Communications Unit	CS1W-SCU21-V1	0.29 (See Note.)
	Ethernet Unit	CS1W-ETN21	0.40
		CS1W-ETN21D	
		CS1W-ETN01/11	
	DeviceNet Unit	CS1W-DRM21-V1	0.29
	FL-net Unit	CS1W-FLN22	0.38
		CS1W-FLN12	0.40
		CS1W-FLN02	

Note: Add 0.15 A per port when the NT-AL001-E is connected.

26-V Current Consumption

Category	Name	Model	Consumption (A)
C200H Output Units	Relay Output Units	C200H-OC221	0.075 for 8 points ON at the same time
		C200H-OC222	
		C200H-OC223	
		C200H-OC224	
		C200H-OC225	
		C200H-OC222N	0.09 for 8 points ON at the same time
		C200H-OC226N	
		C200H-OC224N	
	Transistor Output Units	C200H-OD216	0.075 for 8 points ON at the same time
		C200H-OD217	
CS1 Output Units	Relay Output Units	CS1W-OC201	0.006 for each point ON at the same time
		CS1W-OC211	
C200H Special I/O Units	Analog Input Unit	C200H-AD003	0.10
	Analog Output Units	C200H-DA003	0.20
		C200H-DA004	0.25
	Analog I/O Unit	C200H-MAD01	0.20
	ID Sensor Units	C200H-IDS01-V1	0.12
		C200H-IDS21	0.12

Category	Name	Model	Consumption (A)
CS1 Special I/O Units	Analog Input Unit	CS1W-AD□□□-V1	0.10
	Analog Output Units	CS1W-DA041	0.18
		CS1W-DA08V	0.18
		CS1W-DA08C	0.25
	Analog I/O Unit	CS1W-MAD44	0.20
	Isolated Thermocouple Input Unit	CS1W-PTS01-V1	0.15
		CS1W-PTS11	0.08
		CS1W-PTS55	0.06
	Isolated Temperature- resistance Thermometer Input Unit	CS1W-PTS02	0.15
		CS1W-PTS12	0.07
		CS1W-PTS56	0.06
	Isolated Temperature- resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	0.15
	Isolated Two-wire Transmission Device Input Unit	CS1W-PTW01	0.16
	Isolated DC Input Unit	CS1W-PDC01	
		CS1W-PDC11	0.12
		CS1W-PDC55	0.06
	Isolated Pulse Input Unit	CS1W-PPS01	0.16
	Isolated Control Output Unit	CS1W-PMV01	
		CS1W-PMV02	0.12
	Power Transducer Input Unit	CS1W-PTR01	0.08
	100-mV DC Input Unit	CS1W-PTR02	
	Customizable Counter Units	CS1W-HCA22	0.15
		CS1W-HCA12-V1	
		CS1W-HCA22-V1	
	ID Sensor Unit	CS1W-V600C11	0.12

Instructions

■ Sequence Input Instructions

Name	Mnemonic	Function code	Function
LOAD	LD	---	Indicates a logical start and creates an ON/OFF execution condition based on the ON/OFF status of the specified operand bit.
LOAD NOT	LD NOT	---	Indicates a logical start and creates an ON/OFF execution condition based on the reverse of the ON/OFF status of the specified operand bit.
AND	AND	---	Takes a logical AND of the status of the specified operand bit and the current execution condition.
AND NOT	AND NOT	---	Reverses the status of the specified operand bit and takes a logical AND with the current execution condition.
OR	OR	---	Takes a logical OR of the ON/OFF status of the specified operand bit and the current execution condition.
OR NOT	OR NOT	---	Reverses the status of the specified bit and takes a logical OR with the current execution condition.
AND LOAD	AND LD	---	Takes a logical AND between logic blocks.
OR LOAD	OR LD	---	Takes a logical OR between logic blocks.
NOT	NOT	520	Reverses the execution condition.
CONDITION ON	UP	521	UP(521) turns ON the execution condition for one cycle when the execution condition goes from OFF to ON.
CONDITION OFF	DOWN	522	DOWN(522) turns ON the execution condition for one cycle when the execution condition goes from ON to OFF.
BIT TEST	LD TST	350	LD TST(350), AND TST(350), and OR TST(350) are used in the program like LD, AND, and OR; the execution condition is ON when the specified bit in the specified word is ON and OFF when the bit is OFF.
BIT TEST NOT	LD TSTN	351	LD TSTN(351), AND TSTN(351), and OR TSTN(351) are used in the program like LD NOT, AND NOT, and OR NOT; the execution condition is OFF when the specified bit in the specified word is ON and ON when the bit is OFF.
BIT TEST	AND TST	350	LD TST(350), AND TST(350), and OR TST(350) are used in the program like LD, AND, and OR; the execution condition is ON when the specified bit in the specified word is ON and OFF when the bit is OFF.
BIT TEST NOT	AND TSTN	351	LD TSTN(351), AND TSTN(351), and OR TSTN(351) are used in the program like LD NOT, AND NOT, and OR NOT; the execution condition is OFF when the specified bit in the specified word is ON and ON when the bit is OFF.
BIT TEST	OR TST	350	LD TST(350), AND TST(350), and OR TST(350) are used in the program like LD, AND, and OR; the execution condition is ON when the specified bit in the specified word is ON and OFF when the bit is OFF.
BIT TEST NOT	OR TSTN	351	LD TSTN(351), AND TSTN(351), and OR TSTN(351) are used in the program like LD NOT, AND NOT, and OR NOT; the execution condition is OFF when the specified bit in the specified word is ON and ON when the bit is OFF.

■ Sequence Output Instructions

Name	Mnemonic	Function code	Function
OUTPUT	OUT	---	Outputs the result (execution condition) of the logical processing to the specified bit.
OUTPUT NOT	OUT NOT	---	Reverses the result (execution condition) of the logical processing, and outputs it to the specified bit.
KEEP	KEEP	011	Operates as a latching relay.
DIFFERENTIATE UP	DIFU	013	DIFU(013) turns the designated bit ON for one cycle when the execution condition goes from OFF to ON (rising edge).
DIFFERENTIATE DOWN	DIFD	014	DIFD(014) turns the designated bit ON for one cycle when the execution condition goes from ON to OFF (falling edge).
SET	SET	---	SET turns the operand bit ON when the execution condition is ON.
RESET	RSET	---	RSET turns the operand bit OFF when the execution condition is ON.
MULTIPLE BIT SET	SETA	530	SETA(530) turns ON the specified number of consecutive bits.

Instructions

Name	Mnemonic	Function code	Function
MULTIPLE BIT RESET	RSTA	531	RSTA(531) turns OFF the specified number of consecutive bits.
SINGLE BIT SET	SETB	532	Turns ON the specified bit in the specified word when the execution condition is ON.
SINGLE BIT RESET	RSTB	533	Turns OFF the specified bit in the specified word when the execution condition is ON.
SINGLE BIT OUTPUT	OUTB	534	Outputs the result (execution condition) of the logical processing to the specified bit.

■ Sequence Control Instructions

Name	Mnemonic	Function code	Function
END	END	001	Indicates the end of a program. END(001) completes the execution of a program for that cycle. No instructions written after END(001) will be executed. Execution proceeds to the program with the next task number. When the program being executed has the highest task number in the program, END(001) marks the end of the overall main program.
NO OPERATION	NOP	000	This instruction has no function. (No processing is performed for NOP(000).)
INTERLOCK	IL	002	Interlocks all outputs between IL(002) and ILC(003) when the execution condition for IL(002) is OFF. IL(002) and ILC(003) are normally used in pairs.
INTERLOCK CLEAR	ILC	003	Interlocks all outputs between IL(002) and ILC(003) when the execution condition for IL(002) is OFF. IL(002) and ILC(003) are normally used in pairs.
MULTI-INTERLOCK DIFFERENTIATION HOLD (Unit Ver. 2.0 or later only)	MILH	517	When the execution condition for MILH(517) is OFF, the outputs for all instructions between that MILH(517) instruction and the next MILC(519) instruction are interlocked. MILH(517) and MILC(519) are used as a pair. MILH(517)/MILC(519) interlocks can be nested (e.g., MILH(517)—MILH(517)—MILC(519)—MILC(519)). If there is a differentiated instruction (DIFU, DIFD, or instruction with a @ or % prefix) between MILH(517) and the corresponding MILC(519), that instruction will be executed after the interlock is cleared if the differentiation condition of the instruction was established.
MULTI-INTERLOCK DIFFERENTIATION RELEASE (Unit Ver. 2.0 or later only)	MILR	518	When the execution condition for MILR(518) is OFF, the outputs for all instructions between that MILR(518) instruction and the next MILC(519) instruction are interlocked.MILR(518) and MILC(519) are used as a pair. MILR(518)/MILC(519) interlocks can be nested (e.g., MILR(518)—MILR(518)—MILC(519)—MILC(519)). If there is a differentiated instruction (DIFU, DIFD, or instruction with a @ or % prefix) between MILR(518) and the corresponding MILC(519), that instruction will not be executed after the interlock is cleared even if the differentiation condition of the instruction was established.
MULTI-INTERLOCK CLEAR (Unit Ver. 2.0 or later only)	MILC	519	Clears an interlock started by an MILH(517) or MILR(518) with the same interlock number.
JUMP	JMP	004	When the execution condition for JMP(004) is OFF, program execution jumps directly to the first JME(005) in the program with the same jump number. When the execution condition is ON, all instructions are executed normally.
JUMP END	JME	005	JME(005) indicates the destination of jumps made for JMP(004), CJP(510), and CJPN(511).
CONDITIONAL JUMP	CJP	510	The operation of CJP(510) is the basically the opposite of JMP(004). When the execution condition for CJP(510) is ON, program execution jumps directly to the first JME(005) in the program with the same jump number. When the execution condition is OFF, all instructions are executed normally.
CONDITIONAL JUMP	CJPN	511	The operation of CJPN(511) is almost identical to JMP(004). When the execution condition for CJP(004) is OFF, program execution jumps directly to the first JME(005) in the program with the same jump number. When the execution condition is ON, all instructions are executed normally.
MULTIPLE JUMP	JMP0	515	When the execution condition for JMP0(515) is OFF, all instructions from JMP0(515) to the next JME0(516) in the program are processed as NOP(000). When the execution condition is ON, all instructions are executed normally. Use JMP0(515) and JME0(516) in pairs. There is no limit on the number of pairs that can be used in the program.
MULTIPLE JUMP END	JME0	516	JME0(516) indicates the destination of jumps made for JMP0(515).

Name	Mnemonic	Function code	Function
START FOR-NEXT LOOP	FOR	512	The instructions between FOR(512) and NEXT(513) are repeated a specified number of times. FOR(512) and NEXT(513) are used in pairs.
BREAK LOOP	BREAK	514	Programmed in a FOR-NEXT loop to cancel the execution of the loop for a given execution condition. The remaining instructions in the loop are processed as NOP(000) instructions.
END FOR-NEXT LOOP	NEXT	513	The instructions between FOR(512) and NEXT(513) are repeated a specified number of times. FOR(512) and NEXT(513) are used in pairs.

■ Timer and Counter Instructions

Name	Mnemonic	Function code	Function
BCD TIMER	TIM	---	TIM operates a decrementing timer with units of 0.1-s. Setting range for Set Value (SV): BCD: 0 to 999.9 s Binary: 0 to 6,553.5 s
BINARY TIMER	TIMX	550	
BCD COUNTER	CNT	---	CNT operates a decrementing counter. Setting range for Set Value (SV): BCD: 0 to 9,999 counts Binary: 0 to 65,535 counts
BINARY COUNTER	CNTX	546	
BCD HIGH-SPEED TIMER	TIMH	015	TIMH(015) operates a decrementing timer with units of 10-ms. Setting range for Set Value (SV): BCD: 0 to 99.99 s Binary: 0 to 655.35 s
BINARY HIGH-SPEED TIMER	TIMHX	551	
BCD ONE-MS TIMER	TMHH	540	TMHH(540) operates a decrementing timer with units of 1-ms. Setting range for Set Value (SV): BCD: 0 to 9.999 s Binary: 0 to 65.535 s
BINARY ONE-MS TIMER	TMHHX	552	
BCD ACCUMULATIVE TIMER	TTIM	087	TTIM(087) operates an incrementing timer with units of 0.1-s. Setting range for Set Value (SV): BCD: 0 to 999.9 s Binary: 0 to 6,553.5 s
BINARY ACCUMULATIVE TIMER	TTIMX	555	
BCD LONG TIMER	TIML	542	TIML(542) operates a decrementing timer with units of 0.1-s. Setting range for Set Value (SV): BCD: 115 days Binary: 49,710 days
BINARY LONG TIMER	TIMLX	553	
BCD MULTI-OUTPUT TIMER	MTIM	543	MTIM(543) operates a 0.1-s incrementing timer with eight independent SVs and Completion Flags. Setting range for Set Value (SV): BCD: 0 to 999.9 s Binary: 0 to 6,553.5 s
BINARY MULTI-OUTPUT TIMER	MTIMX	554	
BCD REVERSIBLE COUNTER	CNTR	012	CNTR(012) operates a reversible counter.
BINARY REVERSIBLE COUNTER	CNTRX	548	
BCD RESET TIMER/ COUNTER	CNR	545	Resets the timers or counters within the specified range of timer or counter numbers. Sets the set value (SV) to the maximum of 9,999 for BCD instructions and FFFF for binary instructions.
BINARY RESET TIMER/ COUNTER	CNRX	547	

■ Symbol Comparison Instructions

Name	Mnemonic	Function code	Function
Symbol Comparison (Unsigned)	LD, AND, OR + =, <>, <, <=, >, >=	300 (=) 305 (<>) 310 (<>) 315 (<=) 320 (>) 325(>=)	Symbol comparison instructions (unsigned) compare two values (constants and/or the contents of specified words) in 16-bit binary data and create an ON execution condition when the comparison condition is true. There are three types of symbol comparison instructions, LD (LOAD), AND, and OR.
Symbol Comparison (Double-word, unsigned)	LD, AND, OR + =, <>, <, <=, >, >= + L	301 (=) 306 (<>) 311 (<>) 316 (<=) 321 (>) 326 (>=)	Symbol comparison instructions (double-word, unsigned) compare two values (constants and/or the contents of specified double-word data) in unsigned 32-bit binary data and create an ON execution condition when the comparison condition is true. There are three types of symbol comparison instructions, LD (LOAD), AND, and OR.
Symbol Comparison (Signed)	LD, AND, OR + =, <>, <, <=, >, >= +S	302 (=) 307 (<>) 312 (<>) 317 (<=) 322 (>) 327 (>=)	Symbol comparison instructions (signed) compare two values (constants and/or the contents of specified words) in signed 16-bit binary (4-digit hexadecimal) and create an ON execution condition when the comparison condition is true. There are three types of symbol comparison instructions, LD (LOAD), AND, and OR.

Instructions

Name	Mnemonic	Function code	Function
Symbol Comparison (Double-word, signed)	LD, AND, OR + =, <>, <, <=, >, >= +SL	303 (=) 308 (<>) 313 (<>) 318 (<=) 323 (>) 328 (>=)	Symbol comparison instructions (double-word, signed) compare two values (constants and/or the contents of specified double-word data) in signed 32-bit binary (8-digit hexadecimal) and create an ON execution condition when the comparison condition is true. There are three types of symbol comparison instructions, LD (LOAD), AND, and OR.
Time comparison (Unit Ver. 2.0 or later only)	LD, AND, OR + = DT <> DT < DT, <= DT > DT >= DT	341 (= DT) 342 (<> DT) 343 (< DT) 344 (<= DT) 345 (> DT) 346 (>= DT)	Time comparison instructions compare two BCD time values and create an ON execution condition when the comparison condition is true. There are three types of time comparison instructions, LD (LOAD), AND, and OR. Time values (year, month, day, hour, minute, and second) can be masked/unmasked in the comparison so it is easy to create calendar timer functions.
COMPARE	CMP	020	Compares two unsigned binary values (constants and/or the contents of specified words) and outputs the result to the Arithmetic Flags in the Auxiliary Area.
DOUBLE COMPARE	CMPL	060	Compares two double unsigned binary values (constants and/or the contents of specified words) and outputs the result to the Arithmetic Flags in the Auxiliary Area.
SIGNED BINARY COMPARE	CPS	114	Compares two signed binary values (constants and/or the contents of specified words) and outputs the result to the Arithmetic Flags in the Auxiliary Area.
DOUBLE SIGNED BINARY COMPARE	CPSL	115	Compares two double signed binary values (constants and/or the contents of specified words) and outputs the result to the Arithmetic Flags in the Auxiliary Area.
TABLE COMPARE	TCMP	085	Compares the source data to the contents of 16 consecutive words and turns ON the corresponding bit in the result word when the contents of the words are equal.
MULTIPLE COMPARE	MCMP	019	Compares 16 consecutive words with another 16 consecutive words and turns ON the corresponding bit in the result word where the contents of the words **are not** equal.
BLOCK COMPARE	BCMP	068	Compares the source data to 16 ranges (defined by 16 lower limits and 16 upper limits) and turns ON the corresponding bit in the result word when the source data is within the range.
EXPANDED BLOCK COMPARE (CJ1G/H CPU Unit Ver. 2.0 or later only)	BCMP2	502	Compares the source data to up to 256 ranges (defined by upper and lower limits) and turns ON the corresponding bit in the result word when the source data is within a range.
AREA RANGE COMPARE	ZCP	088	Compares the 16-bit unsigned binary value in CD (word contents or constant) to the range defined by LL and UL and outputs the results to the Arithmetic Flags in the Auxiliary Area.
DOUBLE AREA RANGE COMPARE	ZCPL	116	Compares the 32-bit unsigned binary value in CD and CD+1 (word contents or constant) to the range defined by LL and UL and outputs the results to the Arithmetic Flags in the Auxiliary Area.

■ Data Movement Instructions

Name	Mnemonic	Function code	Function
MOVE	MOV	021	Transfers a word of data to the specified word.
DOUBLE MOVE	MOVL	498	Transfers two words of data to the specified words.
MOVE NOT	MVN	022	Transfers the complement of a word of data to the specified word.
DOUBLE MOVE NOT	MVNL	499	Transfers the complement of two words of data to the specified words.
MOVE BIT	MOVB	082	Transfers the specified bit.
MOVE DIGIT	MOVD	083	Transfers the specified digit or digits. (Each digit is made up of 4 bits.)
MULTIPLE BIT TRANSFER	XFRB	062	Transfers the specified number of consecutive bits.
BLOCK TRANSFER	XFER	070	Transfers the specified number of consecutive words.
BLOCK SET	BSET	071	Copies the same word to a range of consecutive words.
DATA EXCHANGE	XCHG	073	Exchanges the contents of the two specified words.
DOUBLE DATA EXCHANGE	XCGL	562	Exchanges the contents of a pair of consecutive words with another pair of consecutive words.
SINGLE WORD DISTRIBUTE	DIST	080	Transfers the source word to a destination word calculated by adding an offset value to the base address.

Name	Mnemonic	Function code	Function
DATA COLLECT	COLL	081	Transfers the source word (calculated by adding an offset value to the base address) to the destination word.
MOVE TO REGISTER	MOVR	560	Sets the PLC memory address of the specified word, bit, or timer/counter Completion Flag in the specified Index Register. (Use MOVRW(561) to set the PLC memory address of a timer/counter PV in an Index Register.)
MOVE TIMER/ COUNTER PV TO REGISTER	MOVRW	561	Sets the PLC memory address of the specified timer or counter's PV in the specified Index Register. (Use MOVR(560) to set the PLC memory address of a word, bit, or timer/ counter Completion Flag in an Index Register.)

■ Data Shift Instructions

Name	Mnemonic	Function code	Function
SHIFT REGISTER	SFT	010	Operates a shift register.
REVERSIBLE SHIFT REGISTER	SFTR	084	Creates a shift register that shifts data to either the right or the left.
ASYNCHRONOUS SHIFT REGISTER	ASFT	017	Shifts all non-zero word data within the specified word range either towards St or toward E, replacing 0000Hex word data.
WORD SHIFT	WSFT	016	Shifts data between St and E in word units.
ARITHMETIC SHIFT LEFT	ASL	025	Shifts the contents of Wd one bit to the left.
DOUBLE SHIFT LEFT	ASLL	570	Shifts the contents of Wd and Wd +1 one bit to the left.
ARITHMETIC SHIFT RIGHT	ASR	026	Shifts the contents of Wd one bit to the right.
DOUBLE SHIFT RIGHT	ASRL	571	Shifts the contents of Wd and Wd +1 one bit to the right.
ROTATE LEFT	ROL	027	Shifts all Wd bits one bit to the left including the Carry Flag (CY).
DOUBLE ROTATE LEFT	ROLL	572	Shifts all Wd and Wd +1 bits one bit to the left including the Carry Flag (CY).
ROTATE LEFT WITHOUT CARRY	RLNC	574	Shifts all Wd bits one bit to the left not including the Carry Flag (CY).
DOUBLE ROTATE LEFT WITHOUT CARRY	RLNL	576	Shifts all Wd and Wd +1 bits one bit to the left not including the Carry Flag (CY).
ROTATE RIGHT	ROR	028	Shifts all Wd bits one bit to the right including the Carry Flag (CY).
DOUBLE ROTATE RIGHT	RORL	573	Shifts all Wd and Wd +1 bits one bit to the right including the Carry Flag (CY).
ROTATE RIGHT WITHOUT CARRY	RRNC	575	Shifts all Wd bits one bit to the right not including the Carry Flag (CY). The contents of the rightmost bit of Wd shifts to the leftmost bit and to the Carry Flag (CY).
DOUBLE ROTATE RIGHT WITHOUT CARRY	RRNL	577	Shifts all Wd and Wd +1 bits one bit to the right not including the Carry Flag (CY). The contents of the rightmost bit of Wd +1 is shifted to the leftmost bit of Wd, and to the Carry Flag (CY).
ONE DIGIT SHIFT LEFT	SLD	074	Shifts data by one digit (4 bits) to the left.
ONE DIGIT SHIFT RIGHT	SRD	075	Shifts data by one digit (4 bits) to the right.
SHIFT N-BIT DATA LEFT	NSFL	578	Shifts the specified number of bits to the left.
SHIFT N-BIT DATA RIGHT	NSFR	579	Shifts the specified number of bits to the right.
SHIFT N-BITS LEFT	NASL	580	Shifts the specified 16 bits of word data to the left by the specified number of bits.
DOUBLE SHIFT N-BITS LEFT	NSLL	582	Shifts the specified 32 bits of word data to the left by the specified number of bits.
SHIFT N-BITS RIGHT	NASR	581	Shifts the specified 16 bits of word data to the right by the specified number of bits.
DOUBLE SHIFT N-BITS RIGHT	NSRL	583	Shifts the specified 32 bits of word data to the right by the specified number of bits.

■ Increment/Decrement Instructions

Name	Mnemonic	Function code	Function
INCREMENT BINARY	++	590	Increments the 4-digit hexadecimal content of the specified word by 1.
DOUBLE INCREMENT BINARY	++L	591	Increments the 8-digit hexadecimal content of the specified words by 1.
DECREMENT BINARY	−−	592	Decrements the 4-digit hexadecimal content of the specified word by 1.
DOUBLE DECREMENT BINARY	−−L	593	Decrements the 8-digit hexadecimal content of the specified words by 1.
INCREMENT BCD	++B	594	Increments the 4-digit BCD content of the specified word by 1.
DOUBLE INCREMENT BCD	++BL	595	Increments the 8-digit BCD content of the specified words by 1.
DECREMENT BCD	−−B	596	Decrements the 4-digit BCD content of the specified word by 1.
DOUBLE DECREMENT BCD	−−BL	597	Decrements the 8-digit BCD content of the specified words by 1.

Instructions

■ Symbol Math Instructions

Name	Mnemonic	Function code	Function
SIGNED BINARY ADD WITHOUT CARRY	+	400	Adds 4-digit (single-word) hexadecimal data and/or constants.
DOUBLE SIGNED BINARY ADD WITHOUT CARRY	+L	401	Adds 8-digit (double-word) hexadecimal data and/or constants.
SIGNED BINARY ADD WITH CARRY	+C	402	Adds 4-digit (single-word) hexadecimal data and/or constants with the Carry Flag (CY).
DOUBLE SIGNED BINARY ADD WITH CARRY	+CL	403	Adds 8-digit (double-word) hexadecimal data and/or constants with the Carry Flag (CY).
BCD ADD WITHOUT CARRY	+B	404	Adds 4-digit (single-word) BCD data and/or constants.
DOUBLE BCD ADD WITHOUT CARRY	+BL	405	Adds 8-digit (double-word) BCD data and/or constants.
BCD ADD WITH CARRY	+BC	406	Adds 4-digit (single-word) BCD data and/or constants with the Carry Flag (CY).
DOUBLE BCD ADD WITH CARRY	+BCL	407	Adds 8-digit (double-word) BCD data and/or constants with the Carry Flag (CY).
SIGNED BINARY SUBTRACT WITHOUT CARRY	–	410	Subtracts 4-digit (single-word) hexadecimal data and/or constants.
DOUBLE SIGNED BINARY SUBTRACT WITHOUT CARRY	–L	411	Subtracts 8-digit (double-word) hexadecimal data and/or constants.
SIGNED BINARY SUBTRACT WITH CARRY	–C	412	Subtracts 4-digit (single-word) hexadecimal data and/or constants with the Carry Flag (CY).
DOUBLE SIGNED BINARY WITH CARRY	–CL	413	Subtracts 8-digit (double-word) hexadecimal data and/or constants with the Carry Flag (CY).
BCD SUBTRACT WITHOUT CARRY	–B	414	Subtracts 4-digit (single-word) BCD data and/or constants.
DOUBLE BCD SUBTRACT WITHOUT CARRY	–BL	415	Subtracts 8-digit (double-word) BCD data and/or constants.
BCD SUBTRACT WITH CARRY	–BC	416	Subtracts 4-digit (single-word) BCD data and/or constants with the Carry Flag (CY).
DOUBLE BCD SUBTRACT WITH CARRY	–BCL	417	Subtracts 8-digit (double-word) BCD data and/or constants with the Carry Flag (CY).
SIGNED BINARY MULTIPLY	*	420	Multiplies 4-digit signed hexadecimal data and/or constants.
SIGNED BINARY MULTIPLY	*L	421	Multiplies 8-digit signed hexadecimal data and/or constants.
UNSIGNED BINARY MULTIPLY	*U	422	Multiplies 4-digit unsigned hexadecimal data and/or constants.
DOUBLE UNSIGNED BINARY MULTIPLY	*UL	423	Multiplies 8-digit unsigned hexadecimal data and/or constants.
BCD MULTIPLY	*B	424	Multiplies 4-digit (single-word) BCD data and/or constants.
DOUBLE BCD MULTIPLY	*BL	425	Multiplies 8-digit (double-word) BCD data and/or constants.
SIGNED BINARY DIVIDE	/	430	Divides 4-digit (single-word) signed hexadecimal data and/or constants.
DOUBLE SIGNED BINARY DIVIDE	/L	431	Divides 8-digit (double-word) signed hexadecimal data and/or constants.
UNSIGNED BINARY DIVIDE	/U	432	Divides 4-digit (single-word) unsigned hexadecimal data and/or constants.
DOUBLE UNSIGNED BINARY DIVIDE	/UL	433	Divides 8-digit (double-word) unsigned hexadecimal data and/or constants.
BCD DIVIDE	/B	434	Divides 4-digit (single-word) BCD data and/or constants.
DOUBLE BCD DIVIDE	/BL	435	Divides 8-digit (double-word) BCD data and/or constants.

■ Conversion Instructions

Name	Mnemonic	Function code	Function
BCD-TO BINARY	BIN	023	Converts BCD data to binary data.
DOUBLE BCD-TO-DOUBLE BINARY	BINL	058	Converts 8-digit BCD data to 8-digit hexadecimal (32-bit binary) data.
BINARY-TO-BCD	BCD	024	Converts a word of binary data to a word of BCD data.
DOUBLE BINARY-TO-DOUBLE BCD	BCDL	059	Converts 8-digit hexadecimal (32-bit binary) data to 8-digit BCD data.
2'S COMPLEMENT	NEG	160	Calculates the 2's complement of a word of hexadecimal data.
DOUBLE 2'S COMPLEMENT	NEGL	161	Calculates the 2's complement of two words of hexadecimal data.

Name	Mnemonic	Function code	Function
16-BIT TO 32-BIT SIGNED BINARY	SIGN	600	Expands a 16-bit signed binary value to its 32-bit equivalent.
DATA DECODER	MLPX	076	Reads the numerical value in the specified digit (or byte) in the source word, turns ON the corresponding bit in the result word (or 16-word range), and turns OFF all other bits in the result word (or 16-word range). 4-to-16 bit conversion
DATA ENCODER	DMPX	077	FInds the location of the first or last ON bit within the source word (or 16-word range), and writes that value to the specified digit (or byte) in the result word. 16-to-4 bit conversion
ASCII CONVERT	ASC	086	Converts 4-bit hexadecimal digits in the source word into their 8-bit ASCII equivalents.
ASCII TO HEX	HEX	162	Converts up to 4 bytes of ASCII data in the source word to their hexadecimal equivalents and writes these digits in the specified destination word.
COLUMN TO LINE	LINE	063	Converts a column of bits from a 16-word range (the same bit number in 16 consecutive words) to the 16 bits of the destination word.
LINE TO COLUMN	COLM	064	Converts the 16 bits of the source word to a column of bits in a 16-word range of destination words (the same bit number in 16 consecutive words).
SIGNED BCD-TO-BINARY	BINS	470	Converts one word of signed BCD data to one word of signed binary data.
DOUBLE SIGNED BCD-TO-BINARY	BISL	472	Converts double signed BCD data to double signed binary data.
SIGNED BINARY-TO-BCD	BCDS	471	Converts one word of signed binary data to one word of signed BCD data.
DOUBLE SIGNED BINARY-TO-BCD	BDSL	473	Converts double signed binary data to double signed BCD data.
GRAY CODE CONVERT **(Unit Ver. 2.0 or later only)**	GRY	474	Converts the gray binary code data in the specified word to standard binary, BCD, or angle (°) data at the specified resolution.

■ Logic Instructions

Name	Mnemonic	Function code	Function
LOGICAL AND	ANDW	034	Takes the logical AND of corresponding bits in single words of word data and/or constants.
DOUBLE LOGICAL AND	ANDL	610	Takes the logical AND of corresponding bits in double words of word data and/or constants.
LOGICAL OR	ORW	035	Takes the logical OR of corresponding bits in single words of word data and/or constants.
DOUBLE LOGICAL OR	ORWL	611	Takes the logical OR of corresponding bits in double words of word data and/or constants.
EXCLUSIVE OR	XORW	036	Takes the logical exclusive OR of corresponding bits in single words of word data and/or constants.
DOUBLE EXCLUSIVE OR	XORL	612	Takes the logical exclusive OR of corresponding bits in double words of word data and/or constants.
EXCLUSIVE NOR	XNRW	037	Takes the logical exclusive NOR of corresponding single words of word data and/or constants.
DOUBLE EXCLUSIVE NOR	XNRL	613	Takes the logical exclusive NOR of corresponding bits in double words of word data and/or constants.
COMPLEMENT	COM	029	Turns OFF all ON bits and turns ON all OFF bits in Wd.
DOUBLE COMPLEMENT	COML	614	Turns OFF all ON bits and turns ON all OFF bits in Wd and Wd+1.

■ Special Math Instructions

Name	Mnemonic	Function code	Function
BINARY ROOT	ROTB	620	Computes the square root of the 32-bit binary content of the specified words and outputs the integer portion of the result to the specified result word.
BCD SQUARE ROOT	ROOT	072	Computes the square root of an 8-digit BCD number and outputs the integer portion of the result to the specified result word.

Instructions

Name	Mnemonic	Function code	Function
ARITHMETIC PROCESS	APR	069	Calculates the sine or cosine of the source angle data between 0° and 90° and outputs the result as a 4-digit BCD value below the decimal. The linear extrapolation function allows any relationship between X and Y to be approximated with line segments. The input data can be unsigned 16-bit BCD data, unsigned 16-bit binary data, signed 16-bit binary data, signed 32-bit binary data, or single-precision floating-point decimal data.
FLOATING POINT DIVIDE (BCD)	FDIV	079	Divides a 7-digit floating-point number (mantissa) by a 1-digit floating-point number (exponent).
BIT COUNTER	BCNT	067	Counts the total number of ON bits in the specified word(s).

■ Floating-point Math Instructions

Name	Mnemonic	Function code	Function
FLOATING TO 16-BIT	FIX	450	Converts a 32-bit floating-point value to 16-bit signed binary data and places the result in the specified result word.
FLOATING TO 32-BIT	FIXL	451	Converts a 32-bit floating-point value to 32-bit signed binary data and places the result in the specified result words.
16-BIT TO FLOATING	FLT	452	Converts a 16-bit signed binary value to 32-bit floating-point data and places the result in the specified result words.
32-BIT TO FLOATING	FLTL	453	Converts a 32-bit signed binary value to 32-bit floating-point data and places the result in the specified result words.
FLOATING POINT ADD	+F	454	Adds two 32-bit floating-point numbers and places the result in the specified result words.
FLOATING POINT SUBTRACT	–F	455	Subtracts one 32-bit floating-point number from another and places the result in the specified result words.
FLOATING- POINT DIVIDE	/F	457	Divides one 32-bit floating-point number by another and places the result in the specified result words.
FLOATING- POINT MULTIPLY	*F	456	Multiplies two 32-bit floating-point numbers and places the result in the specified result words.
DEGREES TO RADIANS	RAD	458	Converts a 32-bit floating-point number from degrees to radians and places the result in the specified result words.
RADIANS TO DEGREES	DEG	459	Converts a 32-bit floating-point number from radians to degrees and places the result in the specified result words.
SINE	SIN	460	Calculates the sine of a 32-bit floating-point number (in radians) and places the result in the specified result words.
COSINE	COS	461	Calculates the cosine of a 32-bit floating-point number (in radians) and places the result in the specified result words.
TANGENT	TAN	462	Calculates the tangent of a 32-bit floating-point number (in radians) and places the result in the specified result words.
ARC SINE	ASIN	463	Calculates the arc sine of a 32-bit floating-point number and places the result in the specified result words. (The arc sine function is the inverse of the sine function; it returns the angle that produces a given sine value between –1 and 1.)
ARC COSINE	ACOS	464	Calculates the arc cosine of a 32-bit floating-point number and places the result in the specified result words. (The arc cosine function is the inverse of the cosine function; it returns the angle that produces a given cosine value between –1 and 1.)
ARC TANGENT	ATAN	465	Calculates the arc tangent of a 32-bit floating-point number and places the result in the specified result words. (The arc tangent function is the inverse of the tangent function; it returns the angle that produces a given tangent value.)
SQUARE ROOT	SQRT	466	Calculates the square root of a 32-bit floating-point number and places the result in the specified result words.
EXPONENT	EXP	467	Calculates the natural (base e) exponential of a 32-bit floating-point number and places the result in the specified result words.
LOGARITHM	LOG	468	Calculates the natural (base e) logarithm of a 32-bit floating-point number and places the result in the specified result words.
EXPONENTIAL POWER	PWR	840	Raises a 32-bit floating-point number to the power of another 32-bit floating-point number.

Name	Mnemonic	Function code	Function
FLOATING SYMBOL COMPARISON	LD, AND, OR + =F, <>F, <F, <=F, >F, >=F	329 (=F) 330 (<>F) 331 (<F) 332 (<=F) 333 (>F) 334 (>+F)	Compares the specified single-precision data (32 bits) or constants and creates an ON execution condition if the comparison result is true. Three kinds of symbols can be used with the floating-point symbol comparison instructions: LD (Load), AND, and OR.
FLOATING- POINT TO ASCII	FSTR	448	Converts the specified single-precision floating-point data (32-bit decimal-point or exponential format) to text string data (ASCII) and outputs the result to the destination word.
ASCII TO FLOATING-POINT	FVAL	449	Converts the specified text string (ASCII) representation of single-precision floating-point data (decimal-point or exponential format) to 32-bit single-precision floating-point data and outputs the result to the destination words.

■ Double-precision Floating-point Instructions

Name	Mnemonic	Function code	Function
DOUBLE FLOATING TO 16-BIT BINARY	FIXD	841	Converts the specified double-precision floating-point data (64 bits) to 16-bit signed binary data and outputs the result to the destination word.
DOUBLE FLOATING TO 32-BIT BINARY	FIXLD	842	Converts the specified double-precision floating-point data (64 bits) to 32-bit signed binary data and outputs the result to the destination words.
16-BIT BINARY TO DOUBLE FLOATING	DBL	843	Converts the specified16-bit signed binary data to double-precision floating-point data (64 bits) and outputs the result to the destination words.
32-BIT BINARY TO DOUBLE FLOATING	DBLL	844	Converts the specified 32-bit signed binary data to double-precision floating-point data (64 bits) and outputs the result to the destination words.
DOUBLE FLOATING-POINT ADD	+D	845	Adds the specified double-precision floating-point values (64 bits each) and outputs the result to the result words.
DOUBLE FLOATING-POINT SUBTRACT	–D	846	Subtracts the specified double-precision floating-point values (64 bits each) and outputs the result to the result words.
DOUBLE FLOATING-POINT MULTIPLY	*D	847	Multiplies the specified double-precision floating-point values (64 bits each) and outputs the result to the result words.
DOUBLE FLOATING-POINT DIVIDE	/D	848	Divides the specified double-precision floating-point values (64 bits each) and outputs the result to the result words.
DOUBLE DEGREES TO RADIANS	RADD	849	Converts the specified double-precision floating-point data (64 bits) from degrees to radians and outputs the result to the result words.
DOUBLE RADIANS TO DEGREES	DEGD	850	Converts the specified double-precision floating-point data (64 bits) from radians to degrees and outputs the result to the result words.
DOUBLE SINE	SIND	851	Calculates the sine of the angle (radians) in the specified double-precision floating-point data (64 bits) and outputs the result to the result words.
DOUBLE COSINE	COSD	852	Calculates the cosine of the angle (radians) in the specified double-precision floating-point data (64 bits) and outputs the result to the result words.
DOUBLE TANGENT	TAND	853	Calculates the tangent of the angle (radians) in the specified double-precision floating-point data (64 bits) and outputs the result to the result words.
DOUBLE ARC SINE	ASIND	854	Calculates the angle (in radians) from the sine value in the specified double-precision floating-point data (64 bits) and outputs the result to the result words. (The arc sine function is the inverse of the sine function; it returns the angle that produces a given sine value between –1 and 1.)
DOUBLE ARC COSINE	ACOSD	855	Calculates the angle (in radians) from the cosine value in the specified double-precision floating-point data (64 bits) and outputs the result to the result words. (The arc cosine function is the inverse of the cosine function; it returns the angle that produces a given cosine value between –1 and 1.)
DOUBLE ARC TANGENT	ATAND	856	Calculates the angle (in radians) from the tangent value in the specified double-precision floating-point data (64 bits) and outputs the result to the result words.
DOUBLE SQUARE ROOT	SQRTD	857	Calculates the square root of the specified double-precision floating-point data (64 bits) and outputs the result to the result words.
DOUBLE EXPONENT	EXPD	858	Calculates the natural (base e) exponential of the specified double-precision floating-point data (64 bits) and outputs the result to the result words.

Name	Mnemonic	Function code	Function
DOUBLE LOGARITHM	LOGD	859	Calculates the natural (base e) logarithm of the specified double-precision floating-point data (64 bits) and outputs the result to the result words.
DOUBLE EXPONENTIAL POWER	PWRD	860	Raises a double-precision floating-point number (64 bits) to the power of another double-precision floating-point number and outputs the result to the result words.
DOUBLE SYMBOL COMPARISON	LD, AND, OR + =D, <>D, <D, <=D, >D, >=D	335 (=D) 336 (<>D) 337 (<D) 338 (<=D) 339 (>D) 340 (>=D)	Compares the specified double-precision data (64 bits) and creates an ON execution condition if the comparison result is true. Three kinds of symbols can be used with the floating-point symbol comparison instructions: LD (Load), AND, and OR.

■ Table Data Processing Instructions

Name	Mnemonic	Function code	Function
SET STACK	SSET	630	Defines a stack of the specified length beginning at the specified word and initializes the words in the data region to all zeroes.
PUSH ONTO STACK	PUSH	632	Writes one word of data to the specified stack.
FIRST IN FIRST OUT	FIFO	633	Reads the first word of data written to the specified stack (the oldest data in the stack).
LAST IN FIRST OUT	LIFO	634	Reads the last word of data written to the specified stack (the newest data in the stack).
DIMENSION RECORD TABLE	DIM	631	Defines a record table by declaring the length of each record and the number of records. Up to 16 record tables can be defined.
SET RECORD LOCATION	SETR	635	Writes the location of the specified record (the PLC memory address of the beginning of the record) in the specified Index Register.
GET RECORD NUMBER	GETR	636	Returns the record number of the record at the PLC memory address contained in the specified Index Register.
DATA SEARCH	SRCH	181	Searches for a word of data within a range of words.
SWAP BYTES	SWAP	637	Switches the leftmost and rightmost bytes in all of the words in the range.
FIND MAXIMUM	MAX	182	Finds the maximum value in the range.
FIND MINIMUM	MIN	183	Finds the minimum value in the range.
SUM	SUM	184	Adds the bytes or words in the range and outputs the result to two words.
FRAME CHECKSUM	FCS	180	Calculates the ASCII FCS value for the specified range.
STACK SIZE READ	SNUM	638	Counts the amount of stack data (number of words) in the specified stack.
STACK DATA READ	SREAD	639	Reads the data from the specified data element in the stack. The offset value indicates the location of the desired data element (how many data elements before the current pointer position).
STACK DATA OVERWRITE	SWRIT	640	Writes the source data to the specified data element in the stack (overwriting the existing data). The offset value indicates the location of the desired data element (how many data elements before the current pointer position).
STACK DATA INSERT	SINS	641	Inserts the source data at the specified location in the stack and shifts the rest of the data in the stack downward. The offset value indicates the location of the insertion point (how many data elements before the current pointer position).
STACK DATA DELETE	SDEL	642	Deletes the data element at the specified location in the stack and shifts the rest of the data in the stack upward. The offset value indicates the location of the deletion point (how many data elements before the current pointer position).

■ Data Control Instructions

Name	Mnemonic	Function code	Function
PID CONTROL	PID	190	Executes PID control according to the specified parameters.
PID CONTROL WITH AUTO TUNING	PIDAT	191	Executes PID control according to the specified parameters. The PID constants can be autotuned.
LIMIT CONTROL	LMT	680	Controls output data according to whether or not input data is within upper and lower limits.
DEAD BAND CONTROL	BAND	681	Controls output data according to whether or not input data is within the dead band range.
DEAD ZONE CONTROL	ZONE	682	Adds the specified bias to input data and outputs the result.
TIME-PROPORTIONAL OUTPUT (Unit Ver. 2.0 or later only)	TPO	685	Inputs the duty ratio or manipulated variable from the specified word, converts the duty ratio to a time-proportional output based on the specified parameters, and outputs the result from the specified output.
SCALING	SCL	194	Converts unsigned binary data into unsigned BCD data according to the specified linear function.
SCALING 2	SCL2	486	Converts signed binary data into signed BCD data according to the specified linear function. An offset can be input in defining the linear function.
SCALING 3	SCL3	487	Converts signed BCD data into signed binary data according to the specified linear function. An offset can be input in defining the linear function.
AVERAGE	AVG	195	Calculates the average value of an input word for the specified number of cycles.

Instructions

■ Subroutines Instructions

Name	Mnemonic	Function code	Function
SUBROUTINE CALL	SBS	091	Calls the subroutine with the specified subroutine number and executes that program.
SUBROUTINE ENTRY	SBN	092	Indicates the beginning of the subroutine program with the specified subroutine number.
SUBROUTINE RETURN	RET	093	Indicates the end of a subroutine program.
MACRO	MCRO	099	Calls the subroutine with the specified subroutine number and executes that program using the input parameters in S to S+3 and the output parameters in D to D+3.
GLOBAL SUB-ROUTINE ENTRY	GSBN	751	Indicates the beginning of a global subroutine program with the specified subroutine number.
GLOBAL SUB-ROUTINE RETURN	GRET	752	Indicates the end of a global subroutine program.
GLOBAL SUB-ROUTINE CALL	GSBS	750	Calls the global subroutine with the specified subroutine number and executes that program.

■ Interrupt Control Instructions

Name	Mnemonic	Function code	Function
SET INTERRUPT MASK	MSKS	690	Sets up interrupt processing for scheduled interrupts. Scheduled interrupt tasks are masked (disabled) when the PLC is first turned on. MSKS(690) can be used to set the time intervals for scheduled interrupts.
READ INTERRUPT MASK	MSKR	692	Reads the current interrupt processing settings that were set with MSKS(690).
CLEAR INTERRUPT	CLI	691	Sets the time to the first scheduled interrupt.
DISABLE INTERRUPTS	DI	693	Disables execution of all interrupt tasks except the power OFF interrupt.
ENABLE INTERRUPTS	EI	694	Enables execution of all interrupt tasks that were disabled with DI(693).

■ Step Instructions

Name	Mnemonic	Function code	Function
STEP DEFINE	STEP	008	Functions in following two ways, depending on its position and whether or not a control bit has been specified. (1) Starts a specific step. (2) Ends the step programming area (i.e., step execution). The step programming area is from the first STEP(008) instruction (which always takes a control bit) to the last STEP(008) instruction (which never takes a control bit).
STEP START	SNXT	009	Used in the following three ways, depending on its position: (1) To start step programming execution. (2) To proceed to the next step control bit. (3) To end step programming execution.

■ Basic I/O Unit Instructions

Name	Mnemonic	Function code	Function
I/O REFRESH	IORF	097	Refreshes the specified I/O words between the starting word and end word, inclusively. IORF(097) is used to refresh words allocated to Basic I/O Units or Special I/O Units mounted on the CPU Rack or Expansion Racks.
7-SEGMENT DECODER	SDEC	078	Converts the contents (0 to F) of the 4 bits for the designated digit(s) of word data into 8-bit, 7-segment display code and places it into the upper or lower 8-bits of the specified destination words.
DIGITAL INPUT SWITCH (Unit Ver. 2.0 or later only)	DSW	210	Reads the value set on an external digital switch (or thumbwheel switch) connected to an Input Unit or Output Unit and stores the 4-digit or 8-digit BCD data in the specified words.
TEN KEY INPUT (Unit Ver. 2.0 or later only)	TKY	211	Reads numeric data from a ten-key keypad connected to an Input Unit and stores up to 8 digits of BCD data in the specified words.

Name	Mnemonic	Function code	Function
HEXADECIMAL KEY INPUT (Unit Ver. 2.0 or later only)	HKY	212	Reads numeric data from a hexadecimal keypad connected to an Input Unit or Output Unit and stores up to 8 digits of hexadecimal data in the specified words.
MATRIX INPUT (Unit Ver. 2.0 or later only)	MTR	213	Inputs up to 64 signals from an 8 × 8 matrix connected to an Input Unit or Output Unit (using 8 input points and 8 output points) and stores that 64-bit data in the 4 destination words (64 bits).
7-SEGMENT DISPLAY OUTPUT (Unit Ver. 2.0 or later only)	7SEG	214	Converts the source data (either 4-digit or 8-digit BCD) to 7-segment display data, and outputs that data to the specified output word.
INTELLIGENT I/O READ	IORD	222	Reads the contents of the I/O Unit's memory area.
INTELLIGENT I/O WRITE	IOWR	223	Outputs the contents of the CPU Unit's I/O memory area to the Special I/O Unit.
CPU BUS UNIT I/O REFRESH	DLNK	226	Immediately refreshes the I/O in the CPU Bus Unit with the specified unit number.

■ Serial Communications Instructions

Name	Mnemonic	Function code	Function
PROTOCOL MACRO	PMCR	260	Calls and executes a communications sequence (protocol data) registered in a Serial Communications Unit.
TRANSMIT (Unit Ver. 3.0 or later only)	TXD	236	Converts the specified number of bytes of data into ASCII and sends it from the RS-232C port built into the CPU Unit (no-protocol mode) according to the start code and end code specified for no-protocol mode in the PLC Setup.
RECEIVE (Unit Ver. 3.0 or later only)	RXD	235	Outputs the specified number of bytes of data sent from the RS-232C port built into the CPU Unit (no-protocol mode) according to the start code and end code specified for no-protocol mode in the PLC Setup.
TRANSMIT VIA SERIAL COMMUNICATIONS UNIT (Unit Ver 3.0 or later)	TXDU	256	Outputs the specified number of bytes of data without conversion from the serial port of a Serial Communications Unit (Ver. 1.2 or later). The data is output in no-protocol mode with the start code and end code (if any) specified in the allocated DM Setup Area.
RECEIVE VIA SERIAL COMMUNICATIONS UNIT (Unit Ver. 3.0 or later)	RXDU	255	Reads the specified number of bytes of data starting with the specified start word from the serial port of a Serial Communications Unit (Ver. 1.2 or later). The data is read in no-protocol mode with the start code and end code (if any) specified in the allocated DM Setup Area.
CHANGE SERIAL PORT SETUP (Unit Ver. 3.0 or later only)	STUP	237	Changes the communications parameters of a serial port (including peripheral ports) on the CPU Unit, Serial Communications Unit, or Serial Communications Board.

■ Network Instructions

Name	Mnemonic	Function code	Function
NETWORK SEND	SEND	090	Transmits data to a node in the network.
NETWORK RECEIVE	RECV	098	Requests data to be transmitted from a node in the network and receives the data.
DELIVER COMMAND	CMND	490	Sends FINS commands and receives the response.
EXPLICIT MESSAGE SEND (Unit Ver. 2.0 or later only)	EXPLT	720	Sends an explicit message with any Service Code.
EXPLICIT GET ATTRIBUTE (Unit Ver. 2.0 or later only)	EGATR	721	Reads status information with an explicit message (Get Attribute Single, Service Code: 0E hex).

Instructions

Name	Mnemonic	Function code	Function
EXPLICIT SET ATTRIBUTE (Unit Ver. 2.0 or later only)	ESATR	722	Writes status information with an explicit message (Set Attribute Single, Service Code: 0E hex).
EXPLICIT WORD READ (Unit Ver. 2.0 or later only)	ECHRD	723	Reads data to the local CPU Unit from a remote CPU Unit in the network. (The remote CPU Unit must support explicit messages.)
EXPLICIT WORD WRITE (Unit Ver. 2.0 or later only)	ECHWR	724	Writes data from the local CPU Unit to a remote CPU Unit in the network. (The remote CPU Unit must support explicit messages.)

■ File Memory Instructions

Name	Mnemonic	Function code	Function
READ DATA FILE	FREAD	700	Reads the specified data or amount of data from the specified data file (I/O memory file) in file memory to the specified I/O memory data area in the CPU Unit.
WRITE DATA FILE	FWRIT	701	Writes to the specified data file (I/O memory file) with the specified data from the specified I/O memory area.

■ Display Instructions

Name	Mnemonic	Function code	Function
DISPLAY MESSAGE	MSG	046	Reads the specified sixteen words of extended ASCII and displays the message on a Programming Device such as a Programming Console.

■ Clock Instructions

Name	Mnemonic	Function code	Function
CALENDAR ADD	CADD	730	Adds time to the calendar data in the specified words.
CALENDAR SUBTRACT	CSUB	731	Subtracts time from the calendar data in the specified words.
HOURS TO SECONDS	SEC	065	Converts time data in hours/minutes/seconds format to an equivalent time in seconds only.
SECONDS TO HOURS	HMS	066	Converts seconds data to an equivalent time in hours/minutes/seconds format.
CLOCK ADJUSTMENT	DATE	735	Changes the internal clock setting to the setting in the specified source words.

■ Debugging Instructions

Name	Mnemonic	Function code	Function
TRACE MEMORY SAMPLING	TRSM	045	When TRSM(045) is executed, the status of a preselected bit or word is sampled and stored in Trace Memory. TRSM(045) can be used anywhere in the program, any number of times.

■ Failure Diagnosis Instructions

Name	Mnemonic	Function code	Function
FAILURE ALARM	FAL	006	Generates or clears user-defined non-fatal errors. Non-fatal errors do not stop PLC operation. Can also be used to simulate non-fatal system errors with the CJ-series CPU Units.
SEVERE FAILURE ALARM	FALS	007	Generates user-defined fatal errors. Fatal errors stop PLC operation. Can also be used to simulate fatal system errors with the CJ-series CPU Units.
FAILURE POINT DETECTION	FPD	269	Diagnoses a failure in an instruction block by monitoring the time between execution of FPD(269) and execution of a diagnostic output and finding which input is preventing an output from being turned ON.

■ Other Instructions

Name	Mnemonic	Function code	Function
SET CARRY	STC	040	Sets the Carry Flag (CY).
CLEAR CARRY	CLC	041	Turns OFF the Carry Flag (CY).
SELECT EM BANK	EMBC	281	Changes the current EM bank.
EXTEND MAXIMUM CYCLE TIME	WDT	094	Extends the maximum cycle time, but only for the cycle in which this instruction is executed.
SAVE CONDITION FLAGS	CCS	282	Saves the status of the condition flags.
LOAD CONDITION FLAGS	CCL	283	Reads the status of the condition flags that was saved.
CONVERT ADDRESS FROM CV	FRMCV	284	Converts a CV-series PC memory address to its equivalent CS-series PC memory address.
CONVERT ADDRESS TO CV	TOCV	285	Converts a CS-series PC memory address to its equivalent CV-series PC memory address.
DISABLE PERIPHERAL SERVICING	IOSP	287	Disables peripheral servicing during program execution in Parallel Processing Mode or Peripheral Servicing Priority Mode.
ENABLE PERIPHERAL SERVICING	IORS	288	Enables peripheral servicing that was disabled by IOSP(287) for program execution in Parallel Processing Mode or Peripheral Servicing Priority Mode.

■ Block Programming Instructions

Name	Mnemonic	Function code	Function
BLOCK PROGRAM BEGIN	BPRG	096	Define a block programming area. For every BPRG(096) there must be a corresponding BEND(801).
BLOCK PROGRAM END	BEND	801	Define a block programming area. For every BPRG(096) there must be a corresponding BEND(801).
BLOCK PROGRAM PAUSE	BPPS	811	Pause and restart the specified block program from another block program.
BLOCK PROGRAM RESTART	BPRS	812	Pause and restart the specified block program from another block program.
CONDITIONAL BLOCK EXIT	*input_condition* EXIT	806	EXIT(806) without an operand bit exits the program if the execution condition is ON.
CONDITIONAL BLOCK EXIT	EXIT *bit_address*	806	EXIT(806) without an operand bit exits the program if the execution condition is ON.
CONDITIONAL BLOCK EXIT (NOT)	EXIT NOT *bit_address*	806	EXIT(806) without an operand bit exits the program if the execution condition is ON.
CONDITIONAL BLOCK BRANCHING	*input_condition* IF	802	If the execution condition is ON, the instructions between IF(802) and ELSE(803) will be executed and if the execution condition is OFF, the instructions between ELSE(803) and IEND(804) will be executed.
CONDITIONAL BLOCK BRANCHING	IF *bit_address*	802	If the operand bit is ON, the instructions between IF(802) and ELSE(803) will be executed. If the operand bit is OFF, the instructions between ELSE(803) and IEND(804) will be executed.
CONDITIONAL BLOCK BRANCHING (NOT)	IF NOT *bit_address*	802	The instructions between IF(802) and ELSE(803) will be executed and if the operand bit is ON, the instructions be ELSE(803) and IEND(804) will be executed is the operand bit is OFF.
CONDITIONAL BLOCK BRANCHING (ELSE)	ELSE	803	If the ELSE(803) instruction is omitted and the operand bit is ON, the instructions between IF(802) and IEND(804) will be executed
CONDITIONAL BLOCK BRANCHING END	IEND	804	If the operand bit is OFF, only the instructions after IEND(804) will be executed.
ONE CYCLE AND WAIT	*input_condition* WAIT	805	If the execution condition is ON for WAIT(805), the rest of the instruction in the block program will be skipped.
ONE CYCLE AND WAIT	WAIT *bit_address*	805	If the operand bit is OFF (ON for WAIT NOT(805)), the rest of the instructions in the block program will be skipped. In the next cycle, none of the block program will be executed except for the execution condition for WAIT(805) or WAIT(805) NOT. When the execution condition goes ON (OFF for WAIT(805) NOT), the instruction from WAIT(805) or WAIT(805) NOT to the end of the program will be executed.
ONE CYCLE AND WAIT (NOT)	WAIT NOT *bit_address*	805	If the operand bit is OFF (ON for WAIT NOT(805)), the rest of the instructions in the block program will be skipped. In the next cycle, none of the block program will be executed except for the execution condition for WAIT(805) or WAIT(805) NOT. When the execution condition goes ON (OFF for WAIT(805) NOT), the instruction from WAIT(805) or WAIT(805) NOT to the end of the program will be executed.

Instructions

Name	Mnemonic	Function code	Function
BCD TIMER WAIT	TIMW	813	Delays execution of the rest of the block program until the specified time has elapsed. Execution will be continued from the next instruction after TIMW(813) when the timer times out. Setting range for Set Value (SV): BCD: 0 to 999.9 s Binary: 0 to 6,553.5 s
BINARY TIMER WAIT	TIMWX	816	
BCD COUNTER WAIT	CNTW	814	Delays execution of the rest of the block program until the specified count has been achieved. Execution will be continued from the next instruction after CNTW(814) when the counter counts out. Setting range for Set Value (SV): BCD: 0 to 9999 counts Binary: 0 to 65,535 counts
BINARY COUNTER WAIT	CNTWX	817	
BCD HIGH-SPEED TIMER WAIT	TMHW	815	Delays execution of the rest of the block program until the specified time has elapsed. Execution will be continued from the next instruction after TMHW(815) when the timer times out. Setting range for Set Value (SV): BCD: 0 to 99.99 s Binary: 0 to 655.35 s
BINARY HIGH-SPEED TIMER WAIT	TMHWX	818	
LOOP	LOOP	809	LOOP(809) designates the beginning of the loop program.
LEND	*input_condition* LEND	810	LEND(810) or LEND(810) NOT specifies the end of the loop. When LEND(810) or LEND(810) NOT is reached, program execution will loop back to the next previous LOOP(809) until the operand bit for LEND(810) or LEND(810) NOT turns ON or OFF (respectively) or until the execution condition for LEND(810) turns ON.
LEND	LEND *bit_address*	810	If the operand bit is OFF for LEND(810) (or ON for LEND(810) NOT), execution of the loop is repeated starting with the next instruction after LOOP(809). If the operand bit is ON for LEND(810) (or OFF for LEND(810) NOT), the loop is ended and execution continues to the next instruction after LEND(810) or LEND(810) NOT.
LEND NOT	LEND NOT *bit_address*	810	LEND(810) or LEND(810) NOT specifies the end of the loop. When LEND(810) or LEND(810) NOT is reached, program execution will loop back to the next previous LOOP(809) until the operand bit for LEND(810) or LEND(810) NOT turns ON or OFF (respectively) or until the execution condition for LEND(810) turns ON.

■ Text String Processing Instructions

Name	Mnemonic	Function code	Function
MOV STRING	MOV$	664	Transfers a text string.
CONCATENATE STRING	+$	656	Links one text string to another text string.
GET STRING LEFT	LEFT$	652	Fetches a designated number of characters from the left (beginning) of a text string.
GET STRING RIGHT	RGHT$	653	Reads a designated number of characters from the right (end) of a text string.
GET STRING MIDDLE	MID$	654	Reads a designated number of characters from any position in the middle of a text string.
FIND IN STRING	FIND$	660	Finds a designated text string from within a text string.
STRING LENGTH	LEN$	650	Calculates the length of a text string.
REPLACE IN STRING	RPLC$	661	Replaces a text string with a designated text string from a designated position.
DELETE STRING	DEL$	658	Deletes a designated text string from the middle of a text string.
EXCHANGE STRING	XCHG$	665	Replaces a designated text string with another designated text string.
CLEAR STRING	CLR$	666	Clears an entire text string with NUL (00 hex).
INSERT INTO STRING	INS$	657	Deletes a designated text string from the middle of a text string.
String Comparison	LD, AND, OR + =$, <>$, <$, <=$, >$, >=$	670 (=$) 671 (<>$) 672 (<$) 673 (<=$) 674 (>$) 675 (>=$	Sting comparison instructions (=$, <>$, <$, <=$, >$, >=$) compare two text strings from the beginning, in terms of value of the ASCII codes. If the result of the comparison is true, an ON execution condition is created for a LOAD, AND, or OR.

■ Task Control Instruction

Name	Mnemonic	Function code	Function
TASK ON	TKON	820	Makes the specified task executable.
TASK OFF	TKOF	821	Puts the specified task into standby status.

Model Conversion Instructions

Name	Mnemonic	Function code	Function
BLOCK TRANSFER (Unit Ver.3.0 or later only)	XFERC	565	Transfers the specified number of consecutive words.
SINGLE WORD DISTRIBUTE (Unit Ver.3.0 or later only)	DISTC	566	Transfers the source word to a destination word calculated by adding an offset value to the base address.
DATA COLLECT (Unit Ver.3.0 or later only)	COLLC	567	Transfers the source word (calculated by adding an offset value to the base address) to the destination word.
MOVE BIT (Unit Ver.3.0 or later only)	MOVBC	568	Transfers the specified bit.
BIT COUNTER (Unit Ver.3.0 or later only)	BCNTC	621	Counts the total number of ON bits in the specified word(s).

Special Function Block Instructions

Name	Mnemonic	Function code	Function
GET VARIABLE ID (Unit Ver.3.0 or later only)	GETID	286	Outputs the FINS command variable type (data area) code and word address for the specified variable or address. This instruction is generally used to get the assigned address of a variable in a function block.

Replacing C200H I/O Units

■ Replacing C200H I/O Units with CS1 I/O Units

This section shows the corresponding CS1 I/O models and notes for replacing C200H I/O Units.

16-point DC Input Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-ID212 ➡	CS1W-ID211
Description	16-point DC Input Units with terminal blocks	
Notes	The terminal arrangement must be changed.	
	The impedance increases (from 3 kΩ to 3.3 kΩ). Check that correct operation is possible in cases where increased impedance may influence operation.	
	The internal 5-V current consumption increases (from 10 mA to 100 mA). Check that the increased current is within the range of the power supply.	

32-point DC Input Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-ID218 ➡	CS1W-ID231
Description	32-point DC Input Units with connectors. The connectors, the pin arrangement, and the input specifications are the same.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The internal 5-V current consumption increases (from 100 mA to 150 mA). Check that the increased current is within the range of the power supply.	

32-point DC Input Units (cntd.)

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-ID216 ➡	CS1W-ID231
Description	32-point DC Input Units with connectors. The connectors and the pin arrangement are the same. The input current increases, allowing use with a wider range of devices.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The input specifications change (e.g., the impedance decreases and the input current increases from 4.1 mA to 6 mA.) Check that correct operation is possible in cases where changes in input specifications may influence operation.	
	The internal 5-V current consumption increases (from 100 mA to 150 mA). Check that the increased current is within the range of the power supply.	

64-point DC Input Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-ID219 ➡	CS1W-ID261
Description	64-point DC Input Units with connectors. The connectors, the pin arrangement, and the input specifications are the same.	
Notes	There are 4 commons instead of 2. Connect where necessary.	
	The internal 5-V current consumption increases (from 120 mA to 150 mA). Check that the increased current is within the range of the power supply.	

64-point DC Input Units (cntd.)

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-ID217 ➡	CS1W-ID261
Description	64-point DC Input Units with connectors. The connectors and the pin arrangement are the same. The input current increases, allowing use with a wider range of devices.	
Notes	There are 4 commons instead of 2. Connect where necessary.	
	The input specifications change (e.g., the impedance decreases and the input current increases from 4.1 mA to 6 mA.) Check that correct operation is possible in cases where changes in input specifications may influence operation.	
	The internal 5-V current consumption increases (from 100 mA to 150 mA). Check that the increased current is within the range of the power supply.	

16-point Sinking Transistor Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OD212 ➡	CS1W-OD211
Description	16-point Transistor Output (sinking) Units with terminal blocks. The output current capacity increases (from 0.3 A per point and 4.8 A per Unit to 0.5 A per point and 8 A per Unit). The rated voltage range also increases (from 24 V to any voltage in the range 12 to 24 V.)	
Notes	The terminal arrangement must be changed.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.3 ms to 1 ms.)	

Replacing C200H I/O Units

16-point Sourcing Transistor Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OD21A	CS1W-OD212
Description	16-point Transistor Output (sourcing) Units with terminal blocks.	
Notes	The terminal arrangement must be changed.	
	The output capacity changes (from 1 A per point and 4 A per Unit to 0.5 A per point and 5 A per Unit). Check that correct operation is possible in cases where changes in output capacity may influence operation.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.3 ms to 1 ms.)	
	The internal 5-V current consumption increases (from 160 mA to 170 mA). The external 24-V power supply current also increases (from 35 mA to 40 mA). Check that the increased current is within the range of the power supply.	
	There are no alarm output contacts. Use the alarm bits in the Auxiliary Area.	

32-point Sinking Transistor Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OD218	CS1W-OD231
Description	32-point Transistor Output (sinking) Units with connectors. The connectors and the pin arrangement are the same. The output current capacity increases (from 100 mA to 0.5 A per point, 2.5 A per common, and 5 A per Unit). The load voltage range changes from 4.5 to 26.4 V to 10.2 to 26.4 V.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.4 ms to 1 ms.)	
	Replacement is not possible for applications with an output load range of 4.5 to 10.2 V.	
	The internal 5-V current consumption increases (from 180 mA to 270 mA). Check that the increased current is within the range of the power supply.	

32-point Sourcing Transistor Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OD21B	CS1W-OD232
Description	32-point Transistor Output (sourcing) Units with connectors. The connectors and the pin arrangement are the same.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.3 ms to 1 ms.)	
	The internal 5-V current consumption increases (from 180 mA to 270 mA). Check that the increased current is within the range of the power supply.	

64-point Sinking Transistor Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OD219	CS1W-OD261
Description	64-point Transistor Output (sinking) Units with connectors. The connectors and the pin arrangement are the same. The output current capacity increases (from 100 mA to 0.3 A per point, 1.6 A per common, and 6.4 A per Unit). The load voltage range changes from 4.5 to 26.4 V to 10.2 to 26.4 V.	
Notes	There are 4 commons instead of 2. Connect where necessary.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.4 ms to 1 ms.)	
	Replacement is not possible for applications with an output load range of 4.5 to 10.2 V.	
	The internal 5-V current consumption increases (from 270 mA to 390 mA). Check that the increased current is within the range of the power supply.	

16-point 100-VAC Input Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-IA122/ 122V	CS1W-IA111
Description	16-point 100-VAC Input Units with terminal blocks. 100-VDC input also possible.	
Notes	The terminal arrangement must be changed.	
	The input specifications change. Check that correct operation is possible in cases where changes in input specifications may influence operation. (ON voltage increases from 60 VAC min. to 65 VAC min. and the input impedance (50 Hz) increases from 9.7 kΩ to 10 kΩ.)	
	The internal 5-V current consumption increases (from 10 mA to 110 mA). Check that the increased current is within the range of the power supply.	

Replacing C200H I/O Units

16-point 200VAC Input Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-IA222/ 222V	CS1W-IA211
Description	16-point 200-VAC Input Units with terminal blocks. The input specifications are the same.	
Notes	The terminal arrangement must be changed.	
	The internal 5-V current consumption increases (from 10 mA to 110 mA). Check that the increased current is within the range of the power supply.	

8-point Triac Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OA223	CS1W-OA201
Description	8-point Triac Output Units with terminal blocks. The output current capacity increases (from 4 A per Unit to 4.8 A per Unit).	
Notes	The terminal arrangement must be changed.	
	The maximum inrush current changes. Check that correct operation is possible in cases where changes in maximum inrush current may influence operation. (Changes from 15 A for a pulse width of 100 ms and 30 A for a pulse width of 10 ms to 10 A for a pulse width of 100 ms and 20 A for a pulse width of 10 ms.)	
	The internal 5-V current consumption increases (from 180 mA to 230 mA). Check that the increased current is within the range of the power supply.	

16-point Triac Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OA224	CS1W-OA211
Description	16-point Triac Output Units with terminal blocks. The number of output points increases (from 12 to 16). The output current capacity also increases (from 2 A per Unit to 4 A per Unit).	
Notes	The terminal arrangement must be changed.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Maximum inrush current decreases from 20 A for a pulse width of 10 ms to 15 A for a pulse width of 10 ms and the residual voltage increases from 1.5 VAC (50 to 500 mA) to 1.6 VAC.)	
	The internal 5-V current consumption increases (from 270 mA to 406 mA). Check that the increased current is within the range of the power supply.	

8-point Independent Relay Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OC224/ OC224N	CS1W-OC201
Description	Relay Output Units with 8 independent output points and terminal blocks. 100-VDC input also possible.	
Notes	The terminal arrangement must be changed.	
	The ON/OFF response time changes (C200H-OC224 only). Check that correct operation is possible in cases where an increased ON/OFF response time may influence operation. (Increases from 10 ms to 15 ms)	
	The internal 5-V current consumption increases (from 10 mA to 100 mA). Check that the increased current is within the range of the power supply.	

16-point Relay Output Units

Item	C200H I/O Unit	Corresponding CS1 I/O Unit
Model number	C200H-OC225/ OC226N	CS1W-OC211
Description	16-point Relay Output Units with terminal blocks. Restrictions on the number of points per current for simultaneous turning ON of more than 1 contact are removed. 100-VDC input also possible.	
Notes	The terminal arrangement must be changed.	
	The ON/OFF response time changes (C200H-OC225 only). Check that correct operation is possible in cases where an increased ON/OFF response time may influence operation. (Increases from 10 ms to 15 ms)	
	The internal 5-V current consumption increases (from the range 30 to 50 mA to 130 mA at 5 V and from the range 75 to 90 mA to 96 mA at 26 V.) Check that the increased current is within the range of the power supply.	

Ordering Information

■ International Standards

- The standards indicated in the "Standards" column are those current for UL, CSA, cULus, NK, and Lloyd standards and EC Directives as of the end of December 2004. 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.
- Ask your OMRON representative for the conditions under which the standards were met.

■ 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 (See note.)

EMI: EN61000-6-4

EMS: EN61131-2 and EN61000-6-2

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 and EMS standards depend on the product.

Low Voltage Directive

Applicable Standard

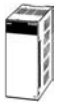
EN61131-2

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

■ CPU Rack

Name	Specifications			Model	Standards
CPU Units (See note.) 	I/O bits	Program capacity	Data memory capacity	---	---
	5,120 (Expansion Racks: 7)	250K steps	448K words (DM: 32K words, EM: 32K words ×13 banks)	CS1H-CPU67H	UC1, N, L, CE
	5,120 (Expansion Racks: 7)	120K steps	256K words (DM: 32K words, EM: 32K words ×7 banks)	CS1H-CPU66H	
	5,120 (Expansion Racks: 7)	60K steps	128K words (DM: 32K words, EM: 32K words ×3 banks)	CS1H-CPU65H	
	5,120 (Expansion Racks: 7)	30K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1H-CPU64H	
	5,120 (Expansion Racks: 7)	20K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1H-CPU63H	
	5,120 (Expansion Racks: 7)	60K steps	128K words (DM: 32K words, EM: 32K words ×3 banks)	CS1G-CPU45H	
	1,280 (Expansion Racks: 3)	30K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1G-CPU44H	
	960 (Expansion Racks: 2)	20K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1G-CPU43H	
	960 (Expansion Racks: 2)	10K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1G-CPU42H	
CPU Units Supporting Online Unit Replacement	5,120 (Expansion Racks: 7)	250K steps	448K words (DM: 32K words, EM: 32K words ×13 banks)	CS1D-CPU67S	
	5,120 (Expansion Racks: 7)	60K steps	128K words (DM: 32K words, EM: 32K words ×3 banks)	CS1D-CPU65S	
	1,280 (Expansion Racks: 3)	30K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1D-CPU44S	
	960 (Expansion Racks: 2)	10K steps	64K words (DM: 32K words, EM: 32K words ×1 bank)	CS1D-CPU42S	
CPU Backplanes (for CS1 Units only)	2 slots (Does not connect to Expansion Rack.)			CS1W-BC022	U, C, N, L, CE
	3 slots			CS1W-BC032	
	5 slots			CS1W-BC052	
	8 slots			CS1W-BC082	
	10 slots			CS1W-BC102	
CPU Backplanes 	2 slots (Does not connect to Expansion Rack.)			CS1W-BC023	U, C, N, L, CE
	3 slots			CS1W-BC033	
	5 slots			CS1W-BC053	
	8 slots			CS1W-BC083	
	10 slots			CS1W-BC103	
CS1D CPU Backplane Supporting Online Unit Replacement	8 slots (Use together with the CS1D-CPU□□S.)			CS1D-BC082S	UC1, N, L, CE
Power Supply Units 	100 to 120 VAC or 200 to 240 VAC; Output capacity: 4.6 A, 5 VDC			C200HW-PA204	U, C, N, L, CE
	100 to 120 VAC or 200 to 240 VAC (with 0.8 A, 24 VDC service power supply) Output capacity: 4.6 A, 5 VDC			C200HW-PA204S	
	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 4.6 A, 5 VDC			C200HW-PA204R	U, C
	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 9 A, 5 VDC			C200HW-PA209R	U, C, N, L, CE
	24 VDC, Output capacity: 4.6 A, 5 VDC			C200HW-PD024	UC1, N, L, CE
	100 VDC, Output capacity: 6 A, 5 VDC			C200HW-PD106R	U, C
I/O Control Unit	For Expansion Racks connected over a distance of more than 12 m (2 terminating resistors included. C200H Units cannot be used on Long-distance Expansion Racks.)			CS1W-IC102	U, C, N, L, CE
Memory Cards 	Flash memory, 30 MB			HMC-EF372 (See note.)	L, CE
	Flash memory, 64 MB			HMC-EF672 (See note.)	
	Memory Card Adapter (for computer PCMIA slot)			HMC-AP001	CE
Serial Communications Boards	2 × RS-232C ports, protocol macro function			CS1W-SCB21-V1	U, C, N, L, CE
	1 × RS-232C port + 1 × RS-422/485 port, protocol macro function			CS1W-SCB41-V1	

Ordering Information

Name	Specifications		Model	Standards
Programming Consoles 	An English Keyboard Sheet (CS1W-KS001-E) is required. (Connects to peripheral port on CPU Unit only. Cannot be connected to RS-232C port.)		CQM1H-PRO01-E	U, C, CE
			CQM1-PRO01-E	U, C, N, CE
			C200H-PRO27-E	
Programming Console Key Sheet	For CQM1H-PRO01-E, C200H-PRO27-E and CQM1-PRO01-E		CS1W-KS001-E	CE
Programming Console Connecting Cables 	Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)		CS1W-CN114	
	Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)		CS1W-CN224	
	Connects the C200H-PRO27-E Programming Console. (Length: 6.0 m)		CS1W-CN624	
CX-Programmer	For 1 license	Windows-based Support Software for ladder programming on Windows 95, 98, Me, NT 4.0, 2000, or XP (Connects to peripheral port on CPU Unit or RS-232C port on CPU Unit or Serial Communications Unit/Board.)	WS02-CXPC1-E-V5□	---
	For 3 licenses		WS02-CXPC1-EL03-V5□	
	For 10 licenses		WS02-CXPC1-EL10-V5□	
Peripheral Device Connecting Cables (for peripheral port)	Connects DOS computers, D-Sub 9-pin receptacle (Length: 0.1 m) (Conversion cable to connect RS-232C cable to peripheral port)		CS1W-CN118	CE
	Peripheral bus or Host Link	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	CS1W-CN226	
		Connects DOS computers, D-Sub 9-pin (Length: 6.0 m)	CS1W-CN626	
Peripheral Device Connecting Cables (for RS-232C port)	Peripheral bus or Host Link, antistatic	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-CV	---
		Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-CV	
	Host Link	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-V	
		Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-V	
USB-Serial Conversion Cable	Includes 0.5-m USB-RS-232C conversion cable, and special PC driver (CD-ROM). Refer to *Using the USB-Serial Conversion Cable* on page 89 for details.		CS1W-CIF31	
CX-Simulator	Windows-based Support Software for simulating ladder program operation on Windows 95, 98, Me, NT 4.0, 2000, or XP		WS02-SIMC1-E	---
CX-Protocol	Windows-based Protocol Creation Software for Windows 95, 98, Me, NT 4.0, 2000, or XP		WS02-PSTC1-E	---
Battery Set	For CS1 Series only. (Install a replacement battery within 2 years of the production date.)		CS1W-BAT01	L, CE

Note: 1. HMC-EF172/EF372/EF672 flash memory cannot be used with CS1G-CPU□□H, CS1H-CPU□□H, CJ1G-CPU□□H, or CJ1H-CPU□□H Units predating lot number 020108 (i.e., manufactured before January 8, 2002) or with NS-7-series products predating lot number 0852 (i.e., manufactured before May 8, 2002) cannot be used together.

2. A commercially available 25-to-9 pin adapter is required if the RS-232C connector on the computer is a D-Sub 9-pin connector.

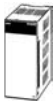
■ SYSMAC CS1D Duplex System

Name	Specifications			Model	Standards
CS1D CPU Units for Duplex-CPU Systems	I/O capacity	Program capacity	Data memory capacity	---	UC1, N, L, CE
	5,120 points (Expansion Racks: 7)	60 Ksteps	128 Kwords (DM: 32 Kwords, EM: 32 Kwords x 3 banks)	CS1D-CPU65H	
		250 Ksteps	448 Kwords (DM: 32 Kwords, EM: 32 Kwords x 13 banks)	CS1D-CPU67H	
CS1D Process-control CPU Units	CPU Unit: CS1D-CPU65H Loop Control Board: CS1D-LCB05D (See note.)			CS1D-CPU65P	UC1, CE
	CPU Unit: CS1D-CPU67H Loop Control Board: CS1D-LCB05D (See note.)			CS1D-CPU67P	
Duplex Unit	---			CS1D-DPL01	UC1, N, L, CE
CS1D Power Supply Units	100 to 120 VAC or 200 to 240 VAC, 50/60 Hz (with RUN output) Output capacity: 7 A, 5 VDC; 1.3 A, 26 VDC, 35 W total max.			CS1D-PA207R	
	24 VDC, Output capacity: 4.3 A, 5 VDC; 0.56 A, 26 VDC, 28 W total max.			CS1D-PD024	
Duplex CPU Backplane	5 slots			CS1D-BC052	
CS1D Expansion Backplane with Online Replacement Capability	9 slots (Used both for CS1D Expansion Racks and CS1D Long-distance Expansion Racks.)			CS1D-BI092	
CPU Backplane for Single-CPU Systems	8 slots			CS1D-BC082S	UC1, N, L, CE

Ordering Information

Name	Specifications		Model	Standards
Controller Link Units	Optical ring type with H-PCF cable		CS1W-CLK12-V1	UC1, N, L, CE
	Optical ring type with GI cable		CS1W-CLK52-V1	
CX-Programmer	Windows-based Support Software for ladder programming on Windows 95, 98, Me, NT 4.0, 2000, or XP	For 1 license	WS02-CXPC1-E-V5□	---
		For 3 licenses	WS02-CXPC1-EL03-V5□	
		For 10 licenses	WS02-CXPC1-EL10-V5□	
Optical Fiber Cable	H-PCF cable for Controller Link Units, cable length: 50 cm		CS1D-CN051	

■ Expansion Racks

Name	Specifications		Model	Standards
CS1 Expansion Backplanes (See note.)	3 slots		CS1W-BI032	U, C, N, L, CE
	5 slots		CS1W-BI052	
	8 slots		CS1W-BI082	
	10 slots		CS1W-BI102	
CS1 Expansion Backplanes 	3 slots		CS1W-BI033	
	5 slots		CS1W-BI053	
	8 slots		CS1W-BI083	
	10 slots		CS1W-BI103	
CS1D Expansion Backplane Supporting Online Unit Replacement	9 slots (Use together with the CS1D-CPU□□.)		CS1D-BI092	UC1, N, L, CE
C200H Expansion I/O Backplanes (See note.) 	3 slots		C200HW-BI031	U, C, N, L, CE
	5 slots		C200HW-BI051	
	8 slots		C200HW-BI081-V1	
	10 slots		C200HW-BI101-V1	
Power Supply Units (See note.) 	100 to 120 VAC or 200 to 240 VAC, Output capacity: 4.6 A, 5 VDC		C200HW-PA204	
	100 to 120 VAC or 200 to 240 VAC (with service supply: 0.8 A, 24 VDC) Output capacity: 4.6 A, 5 VDC		C200HW-PA204S	
	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 4.6 A, 5 VDC		C200HW-PA204R	U, C
	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 9 A, 5 VDC		C200HW-PA209R	U, C, N, L, CE
	24 VDC Output capacity: 4.6 A, 5 VDC		C200HW-PD024	UC1, N, L, CE
	100 VDC Output capacity: 6 A, 5 VDC		C200HW-PD106R	UC
CS1D Power Supply Units Supporting Online Unit Replacement	100 to 120 VAC or 200 to 240 VAC, 50/60 Hz (with RUN output) Output capacity: 7 A, 5 VDC; 1.3 A, 26 VDC; 35 W total		CS1D-PA207R	UC1, N, L, CE
	24 VDC Output capacity: 4.3 A, 5 VDC; 0.56, 26 VDC; 28 W total		CS1D-PD024	UC1, N, L, CE
I/O Interface Unit	For Expansion Racks connected over a distance of more than 12 m. (C200H Units cannot be used on Long-distance Expansion Racks.)		CS1W-II102	U, C, N, L, CE
CS1 I/O Connecting Cables	Connects CS1 Expansion I/O Backplanes to CPU Backplanes or other CS1 Expansion I/O Backplanes. When using a CS1W-CN313/CN713 Cable with a CS1□-CPU□□H CPU Unit, use a Cable with a manufacturing date of 20 September 2001 or later. Do not use Cables without a manufacturing date of Cables manufactured before 20 September 2001.	Length: 0.3 m	CS1W-CN313	N, L, CE
		Length: 0.7 m	CS1W-CN713	
		Length: 2 m	CS1W-CN223	
		Length: 3 m	CS1W-CN323	
		Length: 5 m	CS1W-CN523	
		Length: 10 m	CS1W-CN133	
		Length: 12 m	CS1W-CN133-B2	

Ordering Information

Name	Specifications		Model	Standards
Long-distance Expansion Rack Cables	Connect I/O Control Unit to I/O Interface Unit or connects two I/O Interface Units	Length: 0.3 m	CV500-CN312	N, L, CE
		Length: 0.6 m	CV500-CN612	
		Length: 1 m	CV500-CN122	
		Length: 2 m	CV500-CN222	N, CE
		Length: 3 m	CV500-CN322	
		Length: 5 m	CV500-CN522	
		Length: 10 m	CV500-CN132	N, L, CE
		Length: 20 m	CV500-CN232	N, CE
		Length: 30 m	CV500-CN332	N, L, CE
		Length: 40 m	CV500-CN432	N, CE
		Length: 50 m	CV500-CN532	N, L, CE
CS1 to C200H I/O Connecting Cables (See note.)	Connects C200H Expansion I/O Backplanes to CPU Backplanes or CS1 Expansion I/O Backplanes.	Length: 0.3 m	CS1W-CN311	N, L, CE
		Length: 0.7 m	CS1W-CN711	
		Length: 2 m	CS1W-CN221	
		Length: 3 m	CS1W-CN321	
		Length: 5 m	CS1W-CN521	
		Length: 10 m	CS1W-CN131	
		Length: 12 m	CS1W-CN131-B2	
C200H I/O Connecting Cables (See note.)	Connects C200H Expansion I/O Backplanes to other C200H Expansion I/O Backplanes.	Length: 0.3 m	C200H-CN311	N, L, CE
		Length: 0.7 m	C200H-CN711	
		Length: 2 m	C200H-CN221	
		Length: 5 m	C200H-CN521	L, CE
		Length: 10 m	C200H-CN131	

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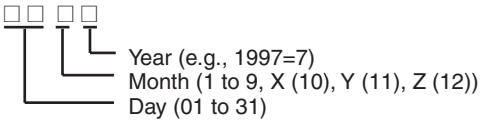


Note: Cannot be used with a CS1D CPU Unit.

Ordering Information

■ CS1 Basic I/O Units

Classification	Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
				CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
CS1 Input Units	DC Input Units	24 VDC, 16 inputs, 7 mA	CS1W-ID211	Yes	No	Yes	Yes	No	1	UC1, N, L, CE
		24 VDC, 32 inputs, 6 mA	CS1W-ID231	Yes	No	Yes	Yes	No	2	
		24 VDC, 64 inputs, 6 mA	CS1W-ID261	Yes	No	Yes	Yes	No	4	
		24 VDC, 96 inputs, approx. 5 mA	CS1W-ID291	Yes	No	Yes	Yes	No	6	U, C, N, L, CE
	AC Input Units	100 to 120 VAC, 100 to 120 VDC, 16 inputs	CS1W-IA111	Yes	No	Yes	Yes	No	1	UC1, N, L, CE
		200 to 240 VAC, 16 inputs	CS1W-IA211	Yes	No	Yes	Yes	No	1	UC, N, L, CE
	Interrupt Input Unit	24 VDC, 16 inputs, 7 mA	CS1W-INT01	Yes	No	Yes (See note.)	Yes (See note.)	No	1	UC1, N, L, CE
	High-speed Input Unit	24 VDC, 16 inputs, 7 mA	CS1W-IDP01	Yes	No	Yes	Yes	No	1	
	Safety Relay Unit	24 VDC, 2 channels with 4 inputs each, 4 pts/common	CS1W-SF200	Yes	No	Yes	Yes	No	1	U, C, CE
CS1 Output Units	Relay Output Units	250 VAC or 120 VDC, independent contacts, 8 outputs, 2 A	CS1W-OC201	Yes	No	Yes	Yes	No	1	UC1, N, L, CE
		250 VAC or 120 VDC, 16 outputs, 2 A	CS1W-OC211	Yes	No	Yes	Yes	No	1	
	Transistor Output Units 	12 to 24 VDC, 0.5A, 16 sinking outputs	CS1W-OD211	Yes	No	Yes	Yes	No	1	
		24 VDC, 0.5A, 16 sourcing outputs	CS1W-OD212	Yes	No	Yes	Yes	No	1	U, C, N, L, CE
		12 to 24 VDC, 0.5A, 32 sinking outputs	CS1W-OD231	Yes	No	Yes	Yes	No	2	UC1, N, L, CE
		24 VDC, 0.5A, 32 sourcing outputs	CS1W-OD232	Yes	No	Yes	Yes	No	2	U, C, N, L, CE
		12 to 24 VDC, 0.3A, 64 sinking outputs	CS1W-OD261	Yes	No	Yes	Yes	No	4	UC1, N, L, CE
		24 VDC, 0.3A, 64 sourcing outputs	CS1W-OD262	Yes	No	Yes	Yes	No	4	
		12 to 24 VDC, 0.1A, 96 sinking outputs	CS1W-OD291	Yes	No	Yes	Yes	No	6	U, C, N, L, CE
		12 to 24 VDC, 0.1A, 96 sourcing outputs	CS1W-OD292	Yes	No	Yes	Yes	No	6	
	Triac Output Units	250 VAC, 1.2 A, 8 outputs	CS1W-OA201	Yes	No	Yes	Yes	No	1	UC, N, L, CE
		250 VAC, 0.5 A, 16 outputs	CS1W-OA211	Yes	No	Yes	Yes	No	1	
CS1 I/O Units	DC Input/ Transistor Output Units 	24 VDC, 6 mA, 32 inputs, 12 to 24 VDC, 0.3 A, 32 sinking outputs	CS1W-MD261	Yes	No	Yes	Yes	No	Inputs: 2 Outputs: 2	UC1, N, L, CE
		24 VDC, 6 mA, 32 inputs, 24 VDC, 0.3 A, 32 sourcing outputs	CS1W-MD262	Yes	No	Yes	Yes	No	Inputs: 2 Outputs: 2	U, C, N, L, CE
		24 VDC, approx. 5 A, 48 inputs, 12 to 24 VDC, 0.1 A, 48 outputs, sinking inputs/outputs	CS1W-MD291	Yes	No	Yes	Yes	No	Inputs: 3 Outputs: 3	
		24 VDC, approx. 5A, 48 inputs, 12 to 24 VDC, 0.1 A, 48 outputs, sourcing inputs/outputs	CS1W-MD292	Yes	No	Yes	Yes	No	Inputs: 3 Outputs: 3	
	TTL I/O Unit	5 VDC, 32 inputs, 32 outputs	CS1W-MD561	Yes	No	Yes	Yes	No	Inputs: 2 Outputs: 2	UC, N, L, CE

Note: Interrupt inputs are not supported on these Racks (i.e., used as normal I/O Unit).

Ordering Information

■ C200H Basic I/O Units

Classification	Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
				CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
C200H Input Units (See note 1.)	DC Input Units 	12 to 24 VDC, 8 inputs	C200H-ID211	Yes	Yes	Yes	No	Yes	1	U, C, N, L, CE
		24 VDC, 16 inputs	C200H-ID212	Yes	Yes	Yes	No	Yes	1	
	AC Input Units 	100 to 120 VAC, 8 inputs	C200H-IA121	Yes	Yes	Yes	No	Yes	1	U, C, N, L
		100 to 120 VAC, 16 inputs	C200H-IA122	Yes	Yes	Yes	No	Yes	1	
		100 to 120 VAC, 16 inputs	C200H-IA122V	Yes	Yes	Yes	No	Yes	1	CE
		200 to 240 VAC, 8 inputs	C200H-IA221	Yes	Yes	Yes	No	Yes	1	U, C, N, L
		200 to 240 VAC, 16 inputs	C200H-IA222	Yes	Yes	Yes	No	Yes	1	
		200 to 240 VAC, 16 inputs	C200H-IA222V	Yes	Yes	Yes	No	Yes	1	CE
	AC/DC Input Units 	12 to 24 VAC/VDC, 8 inputs	C200H-IM211	Yes	Yes	Yes	No	Yes	1	U, C, N, L, CE
		24 VAC/VDC, 16 inputs	C200H-IM212	Yes	Yes	Yes	No	Yes	1	
	B7A Input Units 	16 inputs	C200H-B7AI1	Yes	Yes	Yes	No	Yes	1	U, C, CE
		32 inputs	C200H-B7A12	Yes	Yes	Yes	No	No (See note 3.)	2	U, C
	Interrupt Input Unit 	12 to 24 VDC, 8 inputs	C200HS-INT01	Yes	Yes (See note 2.)	Yes (See note 2.)	No (See note 2.)	No	1	
C200H Output Units (See note 1.)	Relay Bit Output Units 	250 VAC/24 VDC, 2 A, 8 outputs max.	C200H-OC221	Yes	Yes	Yes	No	Yes	1	U, C, N
		250 VAC/24 VDC, 2 A, 12 outputs max.	C200H-OC222	Yes	Yes	Yes	No	Yes	1	
		250 VAC/24 VDC, 2 A, 12 outputs max.	C200H-OC222N	Yes	Yes	Yes	No	Yes	1	CE
		250 VAC/24 VDC, 2 A, 16 outputs max.	C200H-OC225	Yes	Yes	Yes	No	Yes	1	U, C, N, L
		250 VAC/24 VDC, 2 A, 16 outputs max.	C200H-OC226N	Yes	Yes	Yes	No	Yes	1	CE
		250 VAC/24 VDC, 2 A, independent contacts, 5 outputs max.	C200H-OC223	Yes	Yes	Yes	No	Yes	1	U, C, N, L
		250 VAC/24 VDC, 2 A, independent contacts, 8 outputs max.	C200H-OC224	Yes	Yes	Yes	No	Yes	1	
		250 VAC/24 VDC, 2 A, independent contacts, 8 outputs max.	C200H-OC224N	Yes	Yes	Yes	No	Yes	1	CE

Ordering Information

Classification	Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
				CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
C200H Output Units (See note 1.)	Transistor Output Units 	12 to 48 VDC, 1 A, 8 sinking outputs	C200H-OD411	Yes	Yes	Yes	No	Yes	1	U, C, N, L, CE
		24 VDC, 2.1 A, 8 sinking outputs	C200H-OD213	Yes	Yes	Yes	No	Yes	1	
		24 VDC, 0.8 A, 8 sourcing outputs, load short-circuit protection.	C200H-OD214	Yes	Yes	Yes	No	Yes	1	U, C, N, L
		5 to 24 VDC, 0.3 A, 8 sourcing outputs	C200H-OD216	Yes	Yes	Yes	No	Yes	1	
		24 VDC, 0.3 A, 12 sinking outputs	C200H-OD211	Yes	Yes	Yes	No	Yes	1	U, C, N, L, CE
		5 to 24 VDC, 0.3 A, 12 sourcing outputs	C200H-OD217	Yes	Yes	Yes	No	Yes	1	
		24 VDC, 0.3 A, 16 sinking outputs	C200H-OD212	Yes	Yes	Yes	No	Yes	1	
		24 VDC, 1 A, 16 sourcing outputs, load short-circuit protection.	C200H-OD21A	Yes	Yes	Yes	No	Yes	1	CE
	B7A Output Units 	16 outputs	C200H-B7AO1	Yes	Yes	Yes	No	Yes	1	U, C, CE
		32 outputs	C200H-B7A02	Yes	Yes	Yes	No	No (See note 3.)	2	
	Triac Output Units 	250 VAC, 1.2 A, 8 outputs	C200H-OA223	Yes	Yes	Yes	No	Yes	1	CE
		250 VAC, 0.3 A, 12 outputs	C200H-OA222V	Yes	Yes	Yes	No	Yes	1	
		250 VAC, 0.5 A, 12 outputs	C200H-OA224	Yes	Yes	Yes	No	Yes	1	U, C, N, L
C200H I/O Units (See note 1.)	B7A I/O Units	16 inputs, 16 outputs	C200H-B7A21	Yes	Yes	Yes	No	No (See note 3.)	Inputs: 1 Outputs: 1	U, C, CE
		32 inputs, 32 outputs	C200H-B7A22	Yes	Yes	Yes	No	No (See note 3.)	Inputs: 2 Outputs: 2	
	Analog Timer Unit 	4-point timer	C200H-TM001	Yes	Yes	Yes	No	Yes	1	U, C
		External Variable Resistor Connector:	C4K-CN223	---						---

Note: 1. C200H Units cannot be used with CS1D CPU Units.
2. Interrupt inputs are not supported on these Racks (i.e., used as normal I/O Unit).
3. The C200H-B7A12/02/21/22 are C200H Group-2 Units.
4. The C200H-ID001 (no-voltage contacts, 8 inputs, NPN) and C200H-ID002 (no-voltage contacts, 8 inputs, PNP) cannot be used.

■ C200H Group-2 High-density I/O Units

Classification	Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
				CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
C200H Group-2 High-density Input Units (See note.)	DC Input Units 	24 VDC, 32 inputs	C200H-ID216	Yes	Yes	Yes	No	No	2	U, C, N, L, CE
		24 VDC, 64 inputs	C200H-ID217	Yes	Yes	Yes	No	No	4	
		24 VDC, 32 inputs, 6 mA	C200H-ID218	Yes	Yes	Yes	No	No	2	U, C, CE
		24 VDC, 64 inputs, 6 mA	C200H-ID219	Yes	Yes	Yes	No	No	4	
		12 VDC, 64 inputs	C200H-ID111	Yes	Yes	Yes	No	No	4	U, C

Ordering Information

Classification	Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
				CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
C200H Group-2 High-density Output Units (See note.)	Transistor Output Units	16 mA/4.5 V to 100 mA/26.4 V, 32 sinking outputs	C200H-OD218	Yes	Yes	Yes	No	No	2	U, C, N, L, CE
		0.5 A/ 24 VDC, 32 sourcing outputs, load short-circuit protection	C200H-OD21B	Yes	Yes	Yes	No	No	2	U, C, CE
		16 mA/4.5 V to 100mA/26.4 V, 64 sinking outputs	C200H-OD219	Yes	Yes	Yes	No	No	4	U, C, N, L, CE

Note: C200H Units cannot be used with CS1D CPU Units.

Connectors for 32-point and 64-point CS1 I/O Units and C200H Group-2 High-density I/O Units

Part	Connection		Model	Remarks	Standards
Applicable connector	Soldered (included with Unit)		C500-CE404	From Fujitsu Socket: FCN-361J040-AU Connector bar: FCN-360C040-J2	---
	Crimped		C500-CE405	From Fujitsu Socket: FCN-363J040 Connector bar: FCN-360C040-J2 Contacts: FCN-363J-AU	
	Pressure welded		C500-CE403	From Fujitsu: FCN-367J040-AU/F	
Terminal block connection parts	1:1	Special Cable	XW2Z-□□□B (See note.)	For CS1W-ID231/ID261/OD231/ OD232/OD261/OD262/MD261/ MD262 and C200H-ID216/ID217/ID218/ID219/ID111/OD218 /OD21B/OD219	
		Terminal Block Unit	XW2B-40G4		
			XW2B-40G5		
			XW2D-40G6		
	1:2	Special Cable	XW2Z-□□□D (See note.)		
		Terminal Block Unit	XW2B-20G4		
			XW2B-20G5		
			XW2D-20G6		
			XW2C-20G5-IN16		

Note: Refer to the XW2□ Connector-Terminal Block Conversion Unit catalog for details. (Square boxes indicate the cable length.)

Connectors for 96-point CS1 I/O Units

Part	Connection		Model	Remarks	Standards
Applicable connectors	Soldered (included with Unit)		CS1W-CE561	From Fujitsu Socket: FCN-361J056-AU Connector bar: FCN-360C056-J3	---
	Crimped		CS1W-CE562	From Fujitsu Socket: FCN-363J056 Connector bar: FCN-360C056-J3 Contacts: FCN-363J-AU	
	Pressure welded		CS1W-CE563	From Fujitsu: FCN-367J056-AU	
Terminal block	1:1	Special Cable	XW2Z-□□□H-1 (see note.)	For CS1W-ID291/OD291/OD292/ MD291/MD292	
		Terminal Block Unit	XW2B-60G4		
			XW2B-60G5		
	1:2	Special Cable	XW2Z-□□□H-2 (see note.)		
		Terminal Block Unit	XW2B-20G4		
			XW2B-20G5		
			XW2D-20G6		
			XW2B-40G4		
			XW2B-40G5		
			XW2D-40G6		
	1:3	Special Cable	XW2Z-□□□H-3 (see note.)		
		Terminal Block Unit	XW2B-20G4		
			XW2B-20G5		
			XW2D-20G6		

Note: Refer to the XW2□/XW2D Connector-Terminal Block Conversion Unit catalogs for details. (Square boxes indicate the cable length.)

Ordering Information

■ C200H High-density I/O Units Classified as Special I/O Units (See note.)

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
DC Input Units	24 VDC, 32 inputs	C200H-ID215	Yes	Yes	Yes	No	Yes	0 to 9	U, C, N, L, CE
TTL Input Units	5 VDC, 32 inputs	C200H-ID501	Yes	Yes	Yes	No	Yes		
Transistor Output Units	24 VDC, 32 sinking outputs	C200H-OD215	Yes	Yes	Yes	No	Yes		U, C, CE
TTL Output Units	5 VDC, 32 sinking outputs	C200H-OD501	Yes	Yes	Yes	No	Yes		U, C, N, L, CE
TTL I/O Units	5 VDC, 16 inputs, 16 sinking outputs	C200H-MD501	Yes	Yes	Yes	No	Yes		
DC Input/Transistor Output Units	24 VDC, 16 inputs, 16 sinking outputs	C200H-MD215	Yes	Yes	Yes	No	Yes		
	12 VDC, 16 inputs, 16 sinking outputs	C200H-MD115	Yes	Yes	Yes	No	Yes		U, C

Note: The above Units function mainly as I/O Units but are classified as Special I/O Units. They cannot be used with CS1D CPU Units.

Connectors for C200H High-density I/O Units

Part	Connection	Model	Remarks	Standards
Applicable connectors	Soldered (included with Unit)	C500-CE241	From Fujitsu Socket: FCN-361J024-AU Connector bar: FCN-360C024-J2	---
	Crimped	C500-CE242	From Fujitsu Socket: FCN-363J024 Connector bar: FCN-360C024-J2 Contacts: FCN-363J-AU	
	Pressure welded	C500-CE243	From Fujitsu: FCN-367J024-AU/F	
Terminal block connection parts	Special Cable	XW2Z-□□□A (See note.)	For C200H-ID215/ID501/OD215/MD115/MD215 For C200H-ID215/ID501/MD115/MD215/MD501	
	Terminal Block Connector	XW2B-20G4		
		XW2B-20G5		
		XW2D-20G6		
		XW2B-20G5-D		
		XW2B-40G5-T		
	Special Cable	XW2Z-□□□A (see note)		
	Terminal Block Connector	XW2C-20G6-IN16		

Note: The above Units function mainly as I/O Units but are classified as Special I/O Units. They cannot be used with CS1D CPU Units.

Ordering Information

■ C200H Special I/O Units (Cannot Be Used with CS1D)

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Temperature Control Units 	Thermocouple input, time-proportioning PID, or ON/OFF transistor output	C200H-TC001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	Thermocouple input, time-proportioning PID, or ON/OFF voltage output	C200H-TC002	Yes	Yes	Yes	No	Yes		
	Thermocouple input, PID current output	C200H-TC003	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF transistor output	C200H-TC101	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF voltage output	C200H-TC102	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, PID current output	C200H-TC103	Yes	Yes	Yes	No	Yes		
Data Setting Console 	Used with Temperature Control Units. Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01	---					---	---
	Connecting Cable, 2 m	C200H-CN225	---						
	Connecting Cable, 4 m	C200H-CN425	---						
Heat/Cool Temperature Control Units 	Thermocouple input, time-proportioning PID, or ON/OFF transistor output	C200H-TV001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	Thermocouple input, time-proportioning PID, or ON/OFF voltage output	C200H-TV002	Yes	Yes	Yes	No	Yes		
	Thermocouple input, PID current output	C200H-TV003	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF transistor output	C200H-TV101	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF voltage output	C200H-TV102	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, PID current output	C200H-TV103	Yes	Yes	Yes	No	Yes		
Temperature Sensor Units 	Thermocouple input, K/J selectable	C200H-TS001	Yes	Yes	Yes	No	Yes	0 to 9	U, C
	Thermocouple input, K/L selectable	C200H-TS002	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer, JPt 100	C200H-TS101	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer, Pt 100	C200H-TS102	Yes	Yes	Yes	No	Yes		

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
PID Control Units 	Voltage output/current input, time-proportioning PID, or ON/OFF transistor output	C200H-PID01	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	Voltage output/current input, time-proportioning PID, or ON/OFF voltage output	C200H-PID02	Yes	Yes	Yes	No	Yes		
	Voltage output/current input, PID current output	C200H-PID03	Yes	Yes	Yes	No	Yes		
Data Setting Console 	Used with PID Control Units. Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01	---					---	---
	Connecting Cable, 2 m	C200H-CN225	---						
	Connecting Cable, 4 m	C200H-CN425	---						
Cam Positioner Unit 	48 cam outputs (16 external outputs and 32 internal outputs), Resolver speed: 20 μs (5 kHz)	C200H-CP114	Yes	Yes	Yes	No	Yes	0 to 9	U, C
Data Setting Console 	Used with Cam Positioner Unit. Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01	---					---	---
	Connecting Cable, 2 m	C200H-CN225	---						
	Connecting Cable, 4 m	C200H-CN425	---						
ASCII Units 	24-Kbyte RAM, 2 RS-232C ports	C200H-ASC02	Yes	Yes	Yes	No	Yes	0 to F	U, C
	200-Kbyte RAM, 2 RS-232C ports	C200H-ASC11	Yes	Yes	Yes	No	Yes		U, C, CE
	200-Kbyte RAM, RS-232C port, RS-422/485 port	C200H-ASC21	Yes	Yes	Yes	No	Yes		
	200-Kbyte RAM, 3 RS-232C ports (1 terminal only)	C200H-ASC31	Yes	Yes	Yes	No	Yes		
Analog Input Units 	4 to 20 mA, 1 to 5/0 to 10 V (selectable), 4 inputs, 1/4,000 resolution	C200H-AD001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, N, L
	4 to 20 mA, 1 to 5/0 to 10 V/–10 to +10 V (selectable); 8 inputs; 1/4,000 resolution	C200H-AD002	Yes	Yes	Yes	No	Yes	0 to F	U, C, N, L, CE
	4 to 20 mA, 1 to 5/0 to 10 V/–10 to +10 V (selectable); 8 inputs; 1/4,000 resolution	C200H-AD003	Yes	Yes	Yes	No	Yes		

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Analog Output Units 	4 to 20 mA, 1 to 5/0 to 10 V (selectable); 2 outputs; 1/4,075 resolution	C200H-DA001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, N, L
	4 to 20 mA, –10 to +10 V (selectable), 4 outputs; voltage: 1/8,190 current: 1/4,095	C200H-DA002	Yes	Yes	Yes	No	Yes	0 to F	U, C, N, L, CE
	1 to 5 V, –10 to +10 V (selectable), 8 outputs; 1/4,000 resolution	C200H-DA003	Yes	Yes	Yes	No	Yes		
	4 to 20 mA, 8 outputs; 1/4,000 resolution	C200H-DA004	Yes	Yes	Yes	No	Yes		
Analog I/O Units 	2 inputs (4 to 20 mA,1 to 5 V, etc.) 2 outputs (4 to 20 mA, 1 to 5 V, etc.)	C200H-MAD01	Yes	Yes	Yes	No	Yes		
High-speed Counter Units 	One-axis pulse input, counting rate: 50 kcps max.	C200H-CT001-V1	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	One-axis pulse input, counting rate: 75 kcps max., line driver compatible	C200H-CT002	Yes	Yes	Yes	No	Yes		
	Two-axis pulse input, counting rate: 75 kcps max., line driver compatible	C200H-CT021	Yes	Yes	Yes	No	Yes	0 to F	
	Solder terminal; 40p and a Connector Cover	C500-CE401	---					---	---
	Solderless terminal; 40p and a Connector Cover (Crimped)	C500-CE402	---						
	Pressure welded terminal; 40p	C500-CE403	---						
	Solder terminal; 40p and a Connector Cover (Horizontal-type)	C500-CE404	---						
	Crimp-style terminal; 40p and a Connector Cover (Horizontal-type)	C500-CE405	---						
Motion Control Units 	G-language programmable, two-axis analog outputs	C200H-MC221	Yes	Yes	Yes	No	Yes	0 to F	U, C, CE
	CX-Motion (MC Support Software) (Windows 95/98/NT 4.0)	WS02-MCTC1-EV2	---					---	---
	Computer Cable	Same as those for the CX-Programmer. Refer to page 191 for details.							
	Teaching Box	CVM1-PRO01-V1	---						U, C, CE
	Connection cable for Teaching Box: 2 m long	CV500-CN224	---						CE
	Memory Pack	CVM1-MP702-V1	---						U, C, CE
	Terminal Block Conversion Unit Simplifies wiring.	XW2B-20J6-6	---						---
	Connecting Cable for Terminal Block Conversion Unit	XW2Z-100J-F1	---						

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Position Control Units 	One-axis pulse-train open-collector output	C200HW-NC113	Yes	Yes	Yes	No	Yes	0 to F	U, C, CE
	Two-axis pulse-train open-collector output	C200HW-NC213	Yes	Yes	Yes	No	Yes		
	Four-axis pulse-train open-collector output	C200HW-NC413	Yes	Yes	Yes	No	Yes		
	NC Support Software (SYSMAC-NCT)	WS01-NCTF1-E	---					---	---
	Peripheral Port Connecting Cables for computer	Same as those for the CX-Programmer. Refer to page 191 for details.							
	1-axis Relay Unit for C200HW-NC113	XW2B-20J6-1B	---					---	---
	2-axis Relay Unit for C200HW-NC213/NC413	XW2B-40J6-2B	---						
	1-axis W, U-series Connecting Cables for C200HW-NC113	XW2Z-050J-A6 (0.5 m)	---						
		XW2Z-100J-A6 (1 m)	---						
	2-axis W, U-series Connecting Cables for C200HW-NC213/NC413	XW2Z-050J-A7 (0.5 m)	---						
		XW2Z-100J-A7 (1 m)	---						
	1-axis SmartStep Connecting Cables for C200HW-NC113	XW2Z-050J-A8 (0.5 m)	---						
		XW2Z-100J-A8 (1 m)	---						
	2-axis SmartStep Connecting Cables for C200HW-NC213/NC413	XW2Z-050J-A9 (0.5 m)	---						
		XW2Z-100J-A9 (1 m)	---						
ID Sensor Units 	Electromagnetic coupling	C200H-IDS01-V1	Yes	Yes	Yes	No	Yes	0 to 9	U, C
	Microwave type	C200H-IDS21	Yes	Yes	Yes	No	Yes		---
DeviceNet Master Unit (See note 3.) 	DeviceNet Remote I/O Master, 300 bits max.	C200HW-DRM21-V1	Yes	Yes	Yes	No	No	0 to F	U, C, N, L, CE
DeviceNet I/O Link Unit 	DeviceNet Remote I/O Slave, 64 bits max.	C200HW-DRT21	Yes	Yes	Yes	No	No	0 to F	U, C, N, CE
CompoBus/S Master Units 	CompoBus/S Remote I/O, 256 bits max.	C200HW-SRM21-V1	Yes	Yes	Yes	No	No	0 to F	U, C, N, L, CE

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
PLC Link Unit	PLC links 1 level: 32 Units 2 levels: 64 Units	C200H-LK401	Yes	Yes	Yes	No	No	0 to 9	N, L, CE
SYSMAC BUS Remote I/O Master Unit (See note 4.)	Wired	C200H-RM201	Yes	Yes	Yes	No	No	0 to 3	N, L, CE
	Optical	C200H-RM001-PV1	Yes	Yes	Yes	No	No		N, L

Note: 1. A 25-pin to 9-pin adapter is required to connected to a 9-pin, D-sub RS-232C connector on an IBM PC/AT or compatible.

2. C200H Special I/O Units cannot be used with CS1D CPU Units.

3. The DeviceNet Slaves are allocated up to 2,048 I/O bits (100 words) in the DeviceNet Area.

4. Words (10 per unit number) are allocated to Units on Remote I/O Slave Racks in the SYSMAC BUS Area according to unit number. Other Slaves are allocated words (1 per unit number) in the I/O Terminal Area according to unit number.

Ordering Information

■ CS1 Special I/O Units

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
ID Sensor Unit	For V600 RFID System, 1 Head	CS1W-V600C11	Yes	No	Yes	Yes	No	0 to 95	U, CE
	For V600 RFID System, 2 Heads	CS1W-V600C12						0 to 94	
Customizable Counter Units	Pulse input: 1 axis Analog input: 1 Analog output: 1 DC inputs: 12 Transistor outputs: 8	CS1W-HCA12-V1	Yes	No	Yes	Yes	No	0 to 95	U, C, CE
	Pulse input: 2 pts Pulse output: 2 pts Contact input: 12 pts Contact output: 8 pts	CS1W-HCP22-V1							
	Pulse input: 2 pts Analog output: 2 pts Contact input: 12 pts Contact output: 8 pts	CS1W-HCA22-V1							
	Contact input: 12 pts Contact output: 8 pts	CS1W-HIO01-V1							
Analog Input Unit	4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/8,000 Conversion: 250 μs/point (See note 2.)	CS1W-AD041-V1	Yes	No	Yes	Yes	No		UC1, N, CE
	8 inputs (1 to 5 V, 0 to 5 V, 0 to10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/8,000 Conversion: 250 μs/point (See note 2.)	CS1W-AD081-V1							
	16 inputs (1 to 5 V, 0 to 5 V, 0 to10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/8,000 Conversion: 250 μs/point (See note 2.)	CS1W-AD161						0 to 94	UC1, CE
Analog Output Units	4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/4,000	CS1W-DA041						0 to 95	UC1, N, CE
	8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA) Resolution: 1/4,000	CS1W-DA08V							U, C, N, CE
	8 outputs (4 to 20 mA) Resolution: 1/4,000	CS1W-DA08C							
Analog I/O Unit 	4 inputs (4 to 20 mA, 1 to 5 V, etc.) 4 outputs (1 to 5 V, 0 to 10 V, etc.)	CS1W-MAD44							U, C, N, L, CE

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Process I/O Units									
Isolated Thermocouple Input Unit	4 inputs, B, E, J, K, N, R, S, T, U, WRe5-26, PLII, ±100 mV	CS1W-PTS11	Yes	No	Yes	Yes	No	0 to 95	UC1, CE, N
	4 inputs, B, J, K, R, S, T, L	CS1W-PTS51							CE, UC1
	8 inputs, B, J, K, R, S, T, L	CS1W-PTS55 *NEW*							UC1, CE
	4 inputs, B, E, J, K, N, R, S, T ±80 mV	CS1W-PTS01-V1							UC1, CE
Isolated Temperature- resistance Thermometer Input Unit	4 inputs, Pt100Ω (JIS, IEC), JPt100Ω, Pt50Ω, Ni508.4Ω	CS1W-PTS12							UC1, CE, N
	4 inputs, Pt100Ω (JIS, IEC), JPt100Ω	CS1W-PTS52							UC1, CE
	8 inputs, Pt100Ω (JIS, IEC), JPt100Ω	CS1W-PTS56 *NEW*							
	4 inputs, Pt100, JPt	CS1W-PTS02							
Isolated Temperature-resistance Thermometer Input Unit (Ni508.4 Ω)	4 inputs, Ni508.4Ω	CS1W-PTS03							
Isolated Two-wire Transmission Device Input Unit	4 inputs, 4 to 20 mA, 1 to 5 V	CS1W-PTW01							
Isolated DC Input Unit	4 inputs, 4 to 20 mA, 0 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	CS1W-PDC11							UC1, CE, N
	8 inputs, 4 to 20 mA, 0 to 10 V, 1 to 5 V, 0 to 5 V,	CS1W-PDC55 *NEW*							
	4 inputs, 4 to 20 mA, 1 to 5 V, 0 to 5 V, ±5 V, 0 to 10 V, ±10 V	CS1W-PDC01							UC1, CE
Isolated Pulse Input Unit	4 inputs	CS1W-PPS01							
Isolated Control Output Unit	4 outputs, 4 to 20 mA, 1 to 5 V	CS1W-PMV01							
	4 outputs, 0 to 100 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	CS1W-PMV02							
Power Transducer Input Unit	8 inputs, 0 to 1 mA, ±1 mA	CS1W-PTR01							
100-mV DC Input Unit	8 inputs, 0 to 100 mA, ±100 mV	CS1W-PTR02							UC1, CE
Support Software	Setting tool software for the Processing I/O Units, OS: Windows 95, 98, NT 4.0, 2000 (See note 1.)	WS02-PUTC1-E	---					---	---

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
High-speed Counter Units	Pulse input: 2 pts Counting speed: 500 kcps max.	CS1W-CT021	Yes	No	Yes	Yes	No	0 to 92	UC, N, L, CE
	Pulse input: 4 pts Counting speed: 500 kcps max.	CS1W-CT041							
GP-IB Interface Unit	Supports Master mode/Slave mode	CS1W-GPI01						0 to 95	UC, CE
Motion Control Units 	4 axes, analog outputs, G language	CS1W-MC421-V1						0 to 91	U, C, CE
	2 axes, analog outputs, G language	CS1W-MC221-V1						0 to 93	
CX-Motion (MC Support Software)	Windows 95, 98, NT, 2000, Me, or XP	WS02-MCTC1-EV2	---					---	---
Computer Cables	Same as those for the CX-Programmer. Refer to page 191 for details.								
Teaching Box		CVM1-PRO01-V1	---					---	U, C, CE
Connection cable for Teaching Box	Length: 2 m	CV500-CN224	---						CE
Memory Pack	---	CVM1-MP702-V1	---						U, C, CE
Terminal Block Conversion Unit	For 2 axes. Simplifies wiring.	XW2B-20J6-6	---						---
Terminal Block Conversion Unit	For 4 axes. Simplifies wiring.	XW2B-20J6-7	---						
Connecting Cable for Terminal Block Conversion Unit	---	XW2Z-100J-F1	---						

Ordering Information

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Position Control Units	One-axis pulse train open-collector output	CS1W-NC113	Yes	No	Yes	Yes	No	0 to 95	U, C, N, L CE
	Two-axis pulse train open-collector output	CS1W-NC213							
	Four-axis pulse train open-collector output	CS1W-NC413						0 to 94	
	One-axis pulse train line-driver output	CS1W-NC133						0 to 95	
	Two-axis pulse train line-driver output	CS1W-NC233							
	Four-axis pulse train line-driver output	CS1W-NC433						0 to 94	
NC Support Software (CX-Position)	Windows 95, 98, NT 4.0, 2000, Me, or XP	WS02-NCTC1-EV2	---					---	---
Peripheral Port Connecting Cables for computer		Same as those for the CX-Programmer. Refer to page 191 for details.							
1-axis Relay Unit for CS1W-NC1□3		XW2B-20J6-1B	---					---	---
2-axis Relay Unit for CS1W-NC2□3/NC4□3		XW2B-40J6-2B	---						
1-axis W, U-series Connecting Cables for CS1W-NC113		XW2Z-050J-A6 (0.5 m)	---						
		XW2Z-100J-A6 (1 m)	---						
2-axis W, U-series Connecting Cables for CS1W-NC213/NC413		XW2Z-050J-A7 (0.5 m)	---						
		XW2Z-100J-A7 (1 m)	---						
1-axis SmartStep Connecting Cables for CS1W-NC113		XW2Z-050J-A8 (0.5 m)	---						
		XW2Z-100J-A8 (1 m)	---						
2-axis SmartStep Connecting Cables for CS1W-NC213/NC413		XW2Z-050J-A9 (0.5 m)	---						
		XW2Z-100J-A9 (1 m)	---						
1-axis W, U-series Connecting Cables for CS1W-NC133		XW2Z-050J-A10 (0.5 m)	---						
		XW2Z-100J-A10 (1 m)	---						
2-axis W, U-series Connecting Cables for CS1W-NC233/NC433		XW2Z-050J-A11 (0.5 m)	---						
		XW2Z-100J-A11 (1 m)	---						
1-axis SmartStep Connecting Cables for CS1W-NC133		XW2Z-050J-A12 (0.5 m)	---						
		XW2Z-100J-A12 (1 m)	---						
2-axis SmartStep Connecting Cables for CS1W-NC233/NC433		XW2Z-050J-A13 (0.5 m)	---						
		XW2Z-100J-A13 (1 m)	---						

Note: 1. Setting support software for the Processing I/O Units also supports CS1W-AD□□□, CS1WS-DA□□□, and CS1W-MAD44.

2. These Analog Input Units differ from the CS1W-AD41/AD081 in that they have a higher resolution (1/8,000) and faster conversion (250 μs/point). The resolution can also be set to 1/4,000 and the conversion speed can also be set to 1 ms/point.

Ordering Information

■ CS1 CPU Bus Units

Name	Specifications	Model	Mountable Racks					Words allocated (CIO 1500 to CIO 1899)	Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks			
Motion Control Units	MECHATROLINK-II, Real axes: 32, Virtual axes: 2, Special motion control language	CS1W-MCH71	Yes	No	Yes	Yes	No	---	0 to 95	UC1, CE
MC-Miel for MCH	Support Software for CS1W-MCH71 (See note 1.)	---	---						---	---
Controller Link Units	Twisted pair	CS1W-CLK21-V1	Yes	No	Yes	Yes	No	25 words	0 to F	U, C, N, L, CE
	Optical ring (H-PCF cable)	CS1W-CLK12-V1	Yes	No	Yes	Yes	No	25 words		U, C, CE (L to be received soon.)
	Optical ring (GI cable)	CS1W-CLK52-V1	Yes	No	Yes	Yes	No	25 words		U, C, CE (L to be received soon.)
Controller Link Support Boards	For PCI Bus (wire type), with Support Software	3G8F7-CLK21-EV1	---					---	---	CE
	For PCI Bus (H-PCF optical type), with Support Software	3G8F7-CLK12-EV1	---					---		
	For PCI Bus (GI optical type)	3G8F7-CLK52-EV1	---					---	---	
Controller Link Relay Terminals	Wired (a set of 5)	CJ1W-TB101	---					---	---	---
Controller Link Repeater Units	Twisted-pair	CS1W-RPT01	---					---	---	UC1, CE
	Optical ring (H-PCF cable) (See note 2.)	CS1W-RPT02	---					---	---	
	Optical ring (GI cable) (See note 3.)	CS1W-RPT03	---					---	---	
SYSMAC LINK Units	Coaxial cable (5C-2V cable)	CS1W-SLK21	Yes	No	Yes	Yes	No	25 words	0 to F	U, C, CE
	Optical cable (H-PCF cable)	CS1W-SLK11						25 words		U, C, N, CE
SYSMAC LINK Support Boards	For PCI Bus (coaxial type), with Support Software	3G8F7-SLK21-E	---					---	---	CE
	For PCI Bus (H-PCF optical type), with Support Software	3G8F7-SLK11-E	---					---	---	
F-Adapter	---	C1000H-CE001	One each included with Coaxial SYSMAC LINK Unit.							N
F-Cover	---	C1000H-COV01								---
Terminator	---	C1000H-TER01	One required at the node at each end of the network.							N
Serial Communications Units	Two RS-232C Ports	CS1W-SCU21-V1	Yes	No	Yes	Yes	No	25 words	0 to F	U, C, N, L, CE
RS-422A Adapters	Converts RS-232C to RS-422A/RS485.	CJ1W-CIF11	---					25 words	---	UC, N, CE
RS-232C–RS-422A Conversion Units	1 RS-232C port and 1 RS-422A terminal block	NT-AL001	---					---	---	---

Ordering Information

Name	Specifications	Model	Mountable Racks					Words allocated (CIO 1500 to CIO 1899)	Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks			
Ethernet Units	10Base-5	CS1W-ETN01	Yes	No	Yes	Yes	No	25 words	0 to F	U, C, N, L, CE
	10Base-T	CS1W-ETN11								UC1, N, L, CE
	100Base-TX	CS1W-ETN21								
		CS1D-ETN21D								UC1, N, L, CE
FL-net Units	FL-net (OPCN-2) version 2 specifications, 100Base-TX	CS1W-FLN22 *NEW*	Yes	No	Yes	Yes	No	25 words	0 to F	UC1, CE
	FL-net (OPCN-2) version 2 specifications, 10Base-5	CS1W-FLN02	Yes	No	Yes	Yes	No			
	FL-net (OPCN-2) version 2 specifications, 10Base-T	CS1W-FLN12	Yes	No	Yes	Yes	No			
DeviceNet Units (See note 4.)	Functions as master and/or slave; allows control of 2,048 points max. per master.	CS1W-DRM21-V1	Yes	No	Yes	Yes	No	---	0 to F	U, C, N, L, CE
Loop Control Units	Control loops: 32 Processes: 250	CS1W-LC001	Yes	No	No	No	No	---	0 to F	UC1, N, CE
Loop Control Boards	50 blocks maximum including both adjustment and operation blocks	CS1W-LCB01	CPU Unit Inner Board for CS1-H PLCs							UC1, N, CE
	500 blocks maximum including both adjustment and operation blocks	CS1W-LCB05								
CX-Process		WS02-LCTC1-EV4	Programming tool for Loop Control Board/Unit Tool Software: Windows 95, 98, Me, NT 4.0, 2000, or XP					---	---	---
	For 3 licences	WS02-LCTC1-EV4L03								
	For 10 licences	WS02-LCTC1-EV4L10								
CX-Process Monitor Plus		WS02-LCMC1-E	Programming tool for Loop Control Board/Unit Tool Software: Windows 95, 98, Me, NT 4.0, 2000, or XP					---	---	---
	For 3 licences	WS02-LCMC1-EL03								
	For 10 licences	WS02-LCMC1-EL10z								

Note: 1. Order *MC-Miel for MCH Support Software Operation Manual* (Cat. No. I809) to obtain the MC-Miel for MCH Support Software for CS1W-MCH71 CD-ROM.

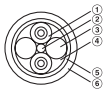
2. Use the H-PCF cables or H-PCF optical fiber cables with connectors listed in the following table for Optical Ring (H-PCF cable) Controller Link Repeater Units.

3. Use the GI optical cables listed on the following page for Optical Ring (GI cable) Controller Link Repeater Units.

4. The DeviceNet Slaves are allocated up to 2,048 I/O bits (100 words) in the DeviceNet Area.

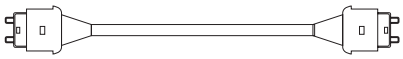
Ordering Information

■ H-PCF Cables

Name	Applicable Units/Construction		Specifications		Model	Standards
Optical Fiber Cables	Controller Link	 1.Optical-fiber single-core cable 2.Tension member (plastic-covered copper wire) 3. Lacing (plastic lacing 4. Inclusion (plastic yarn or fiber) 5. Holding tape (plastic fiber) 6. Heat-resistant PVC sheath	2-core optical cable with tension member	Black: 10 m	S3200-HCCB101	---
				Black: 50 m	S3200-HCCB501	
				Black: 100 m	S3200-HCCB102	
				Black: 500 m	S3200-HCCB502	
				Black: 1,000 m	S3200-HCCB103	
				Orange: 10 m	S3200-HCCO101	
				Orange: 50 m	S3200-HCCO501	
				Orange: 100 m	S3200-HCCO102	
				Orange: 500 m	S3200-HCCO502	
				Orange: 1,000 m	S3200-HCCO103	
Optical Connectors (Crimp-cut) 	SYSMAC BUS: C200H-RM001-(P)V1, C200H-RT001/RT002-(P)V1		Half-lock Remote I/O Master/Slave Unit		S3200-COCH82	
	Controller Link: CS1W-CLK12, 3G8F7-CLK12, CS1W-RPT02 SYSMAC LINK: CS1W-SLK11, 3G8F7-SLK11, C200HW-SLK13/SLK14		Half-lock		S3200-OCCF2571	
	Controller Link: CS1W-CLK12, 3G8F7-CLK12, CS1W-RPT02 SYSMAC LINK: 3G8F7-SLK11		Full-lock		S3200-COCF2071 (See note.)	

Note: The S3200-COCF2071 Crimp-cut Optical Connector cannot be used with the CS1W-SLK11. Use the S3200-OCCF2571 Half-lock Optical Connector or a S3200-CN□□□-□□-□□ H-PCF Fiber Cable with Connectors.

■ H-PCF Optical Fiber Cables with Connectors (Composite Cable with 2 Fibers and 2 Power Supply Lines, Black)

Applicable Units	Appearance	Model	Standards
Controller Link		S3200-CN□□□-20-20	---
		S3200-CN□□□-20-25	
		S3200-CN□□□-25-25	

Note: The optical connectors on the H-PCF Optical Fiber Cables with Connectors are glue-and-polish connectors.

Cable Length

Cables are available in lengths of 2 m, 5 m, 10 m, 15 m, and 20 m. Contact your sales representative for details on cables 21 m or longer.

Model Number Legend

(1) Cable length: 2 m, 5 m, 10 m, 15 m, 20 m

Example: S3200-CN□□□-20-25

(1) (2) (3)

(1) H-PCF optical fiber cable

(2) Cable length

□□□	Length
201	2 m
501	5 m
102	10 m
152	15 m
202	20 m

(2) Cable length: 21 m or longer

Example: S3200-CN-20-20

(1) (3) Specify the cable length (unit: 1 m)

(3) Connectors on both ends

Code	Appearance
20	 Full lock
25	 Half lock

Ordering Information

Optical Connector Assembly Tool

Name	Applicable Units	Model	Manufacturer	Standards
Optical Fiber Assembly Tool	Used for assembling crimp-cut connectors and hard plastic-clad, quartz-fiber for SYSMAC C-series SYSMAC BUS, SYSMAC LINK, and Controller Link optical transmission systems.	CAK-0057	Sumitomo Electric Industries, Ltd	---

Note: 1. Contact your nearest OMRON sales representative for details on the CAK-0057.

2. Optical Fiber Cable (H-PCF) Connector Assembly
Performance may be adversely affected if cable connectors are assembled by the user. Cables with connectors or assembly by a professional is recommended.

■ GI Optical Cables

To handle optical cables, always use a qualified technician with the knowledge required to select, assemble, and lay GI optical cables.

Compatible Optical Cables and Connectors

- Optical fiber category: Graded, index, multi-mode, all quartz crystal, fiber (GI AGF cable)
- Optical fiber construction (core/clad diameter): 62.5/125 μm or 50/125 μm
- Optical fiber optical characteristics: Refer to the following table.
- Optical connector: ST connector (IEC-874-10)

50/125 μm AGF Cable

Item	Minimum	Standard	Maximum	Conditions	
Numerical aperture (N.A.)	---	0.21	---	---	
Transmission loss (dB)	---	---	3.0 Lf	0.5 km ≤ Lf	λ = 0.8 μm
			3.0 Lf + 0.2	0.2 km ≤ Lf < 0.5 km	Ta = 25°C
			3.0 Lf + 0.4	Lf ≤ 0.2 km	
Connection loss (dB)	---	---	1.0	λ = 0.8 μm, one location	
Transmission bandwidth (MHz·km)	500	---	---	λ = 0.85 μm (LD)	

Lf is fiber length in km, Ta is ambient temperature, and λ is the peak wavelength of the test light source.

62.5/125 μm AGF Cable

Item	Minimum	Standard	Maximum	Conditions	
Numerical aperture (N.A.)	---	0.28	---	---	
Transmission loss (dB)	---	---	3.5 Lf	0.5 km ≤ Lf	λ = 0.8 μm
			3.5 Lf + 0.2	0.2 km ≤ Lf < 0.5 km	Ta = 25°C
			3.5 Lf + 0.4	Lf ≤ 0.2 km	
Connection loss (dB)	---	---	1.0	λ = 0.8 μm, one location	
Transmission bandwidth (MHz·km)	200	---		λ = 0.85 μm (LD)	

Lf is fiber length in km, Ta is ambient temperature, and λ is the peak wavelength of the test light source.

■ Configurator

Product	Model	Specifications	Standards
DeviceNet Configurator	WS02-CFDC1-E	DeviceNet Configurator Software (Windows 95, 98, NT4.0, 2000, or XP)	---
	3G8E2-DRM21-EV1	PC Card (provided with software running on Windows 95, 98, Me, 2000, or XP)	

■ Monitor Software

Product	Model	Specifications	Standards
NX-Server	WS02-NXD1-E	DDE Edition	---

Ordering Information

■ DeviceNet Slaves

Smart Slaves

Product		Model	Specifications	Standards
Remote I/O Terminals with Transistors		DRT2-ID16	16 inputs for terminals with NPN, + common	U1, CE
		DRT2-ID16-1	16 inputs for terminals with PNP, – common	
		DRT2-OD16	16 outputs for terminals with NPN, – common	
		DRT2-OD16-1	16 outputs for terminals with PNP, + common	
Remote I/O Terminal Expansion Units with Transistors		XWT-ID08	8 inputs for terminals with NPN, + common	U1, CE
		XWT-ID08-1	8 inputs for terminals with PNP, – common	
		XWT-OD08	8 outputs for terminals with NPN, – common	
		XWT-OD08-1	8 outputs for terminals with PNP, + common	
		XWT-ID16	16 inputs for terminals with NPN, + common	
		XWT-ID16-1	16 inputs for terminals with PNP, – common	
		XWT-OD16	16 outputs for terminals with NPN, – common	
		XWT-OD16-1	16 outputs for terminals with NPN, + common	
Remote I/O Terminal with Relay Outputs		DRT2-ROS16	16 output points	CE, UR
Remote I/O Terminals with 3-tier Terminal Blocks and Transistors		DRT2-ID16TA	NPN with + common	U1, CE
		DRT2-ID16TA-1	PNP with – common	
		DRT2-OD16TA	NPN with + common	
		DRT2-OD16TA-1	PNP with – common	
		DRT2-MD16TA	NPN with + common	
		DRT2-MD16TA-1	PNP with – common	
Remote I/O Terminals with Transistors and MIL Connectors		DRT2-ID32ML	NPN with + common	U1, CE
		DRT2-ID32ML-1	PNP with – common	
		DRT2-OD32ML	NPN with + common	
		DRT2-OD32ML-1	PNP with – common	
		DRT2-MD32ML	NPN with + common	
		DRT2-MD32ML-1	PNP with – common	
Board Terminals with MIL Connectors	Horizontal mounting	DRT2-ID32B	32 inputs for terminals with NPN, + common	U, CE
		DRT2-ID32B-1	32 inputs for terminals with PNP, – common	
		DRT2-OD32B	32 inputs for terminals with NPN, + common	
		DRT2-OD32B-1	32 inputs for terminals with PNP, – common	
		DRT2-MD32B	16 inputs/16 outputs (NPN inputs with + common/NPN outputs with – common)	
		DRT2-MD32B-1	16 inputs/16 outputs (PNP inputs with – common/NPN outputs with + common)	
	Vertical mounting	DRT2-ID32BV	32 inputs for terminals with NPN, + common	
		DRT2-ID32BV-1	32 inputs for terminals with PNP, – common	
		DRT2-OD32BV	32 inputs for terminals with NPN, + common	
		DRT2-OD32BV-1	32 inputs for terminals with PNP, – common	
		DRT2-MD32BV	16 inputs/16 outputs (NPN inputs with + common/NPN outputs with – common)	
		DRT2-MD32BV-1	16 inputs/16 outputs (PNP inputs with – common/NPN outputs with + common)	
Sensor Connector Terminals		DRT2-ID16S	16 inputs for terminals with NPN, + common	U, CE
		DRT2-ID16S-1	16 inputs for terminals with PNP, – common	
		DRT2-MD16S	8 inputs/8 outputs (NPN inputs with + common/NPN outputs with – common)	
		DRT2-MD16S-1	8 inputs/8 outputs (PNP inputs with – common/NPN outputs with + common)	
Analog Input Terminals		DRT2-AD04	4 inputs	U1, CE
		DRT2-AD04H	4 inputs, high-resolution	
Analog Output Terminals		DRT2-DA02	2 outputs	

Ordering Information

Product	Model	Specifications	Standards
Screwless Clamp Terminals with Transistors	DRT2-ID32SLH	32 inputs (NPN with + common) with detection functions	U, CE
	DRT2-ID32SLH-1	32 inputs (PNP with – common) with detection functions	
	DRT2-OD32SLH	32 outputs (NPN with + common) with detection functions	
	DRT2-OD32SLH-1	32 outputs (PNP with – common) with detection functions	
	DRT2-MD32SLH	16 inputs/16 outputs (NPN inputs with + common, NPN outputs with – common) with detection functions	
	DRT2-MD32SLH-1	16 inputs/16 outputs (PNP inputs with – common, NPN outputs with + common) with detection functions	
	DRT2-ID32SL	32 inputs (NPN with + common) without detection functions	
	DRT2-ID32SL-1	32 inputs (PNP with – common) without detection functions	
	DRT2-OD32SL	32 outputs (NPN with + common) without detection functions	
	DRT2-OD32SL-1	32 outputs (PNP with – common) without detection functions	
	DRT2-MD32SL	16 inputs/16 outputs (NPN inputs with + common, NPN outputs with – common) without detection functions	
	DRT2-MD32SL-1	16 inputs/16 outputs (PNP inputs with – common, NPN outputs with + common) without detection functions	
Environment-resistant Terminals with Transistors	DRT2-ID08C	8 inputs for terminals with NPN, + common	U, CE
	DRT2-ID08C-1	8 inputs for terminals with PNP, – common	
	DRT2-OD08C	8 outputs for terminals with NPN, – common	
	DRT2-OD08C-1	8 outputs for terminals with PNP, + common	
	DRT2-HD16C	16 inputs for terminals with NPN, + common	
	DRT2-HD16C-1	16 inputs for terminals with PNP, – common	
Modular Temperature Controller	E5ZN-DRT	E5ZN DeviceNet Communications Unit	U, CE
	E5ZN-SCT24S-500	Terminal Unit	
	E5ZN-SDL	Setting Display Unit	
DeviceNet Communications Units (for Inverters)	3G3MV-PDRT2	3G3MV DeviceNet Communications Unit	U, CE
	3G3RV-PDRT2	3G3RV/3G3FV DeviceNet Communications Unit	

Ordering Information

General-purpose Slaves

Product	Model	Specifications		Standards
Transistor Remote I/O Terminals	DRT1-ID08	8 inputs for terminals with NPN, + common		U, C, CE
	DRT1-ID08-1	8 inputs for terminals with PNP, – common		
	DRT1-ID16	16 inputs for terminals with NPN, + common		
	DRT1-ID16-1	16 inputs for terminals with PNP, – common		
	DRT1-OD08	8 outputs for terminals with PNP, – common		
	DRT1-OD08-1	8 outputs for terminals with NPN, + common		
	DRT1-OD16	16 outputs for terminals with PNP, – common		
	DRT1-OD16-1	16 outputs for terminals with NPN, + common		
	DRT1-MD16	8 inputs/8 outputs for terminals with NPN, + common for inputs, – common for outputs		---
Remote Adapters	DRT1-ID16X	16 inputs with pull-wire connectors, NPN, + common		U, C, CE
	DRT1-ID16X-1	16 inputs with pull-wire connectors, PNP, – common		
	DRT1-OD16X	16 outputs with pull-wire connectors, NPN, – common		
	DRT1-OD16X-1	16 outputs with pull-wire connectors, PNP, + common		
MIL Socket Flat Cable Connectors	XG4A-2031	DIP straight terminal connector plug		---
	XG4A-2034	DIP L terminal connector plug		
Analog Input Terminals	DRT1-AD04	4 or 2 input points (selectable using DIP switch) (Allocated 4 or 2 input words at the master)		U, CE
	DRT1-AD04H	4 input points (Allocated 4 input words at the master)		
Analog Output Terminals	DRT1-DA02	2 output points Current output: 0 to 20 mA, 4 to 20 mA Voltage output: 1 to 5 V, 0 to 10 V, –10 to 10 V		
Temperature Input Terminals	DRT1-TS04T	4 input points (Allocated 4 input words at the master)	Input types: R, S, K1, K2, J1, J2, T, E, B, N, L1, L2, U, W, PLII	
	DRT1-TS04P		Input types: Pt100, JPt100	
Sensor Terminals (2-wire Sensors)	DRT1-HD16S	8 input and 8 output points for sensors (NPN) 2 input points for 1 sensor		---
	DRT1-ND16S	8 input and 8 output points for sensors		
	XS8A-0441 (See note.)	Cable Connector (0.3 to 0.5 mm^2)		
	XS8A-0442 (See note.)	Cable Connector (0.14 to 0.2 mm^2)		
Waterproof Terminals	DRT1-ID04CL	4 transistor inputs, NPN (+ common)		CE, L
	DRT1-ID04CL-1	4 transistor inputs, PNP (– common)		
	DRT1-OD04CL	4 transistor outputs, NPN (– common)		
	DRT1-OD04CL-1	4 transistor outputs, PNP (+ common)		
	DRT1-ID08CL	8 transistor inputs, NPN (+ common)		
	DRT1-ID08CL-1	8 transistor inputs, PNP (– common)		
	DRT1-OD08CL	8 transistor outputs, NPN (– common)		
	DRT1-OD08CL-1	8 transistor outputs, PNP (+ common)		
Environment-resistive Transistor Terminals	DRT1-ID08C	8 inputs, NPN (+ common)		U, C, CE
	DRT1-HD16C	16 inputs, NPN (+ common)		
	DRT1-HD16C-1	16 inputs, PNP (– common)		U, C
	DRT1-OD08C	8 outputs, NPN (– common)		U, C, CE
	DRT1-WD16C	16 outputs, NPN (– common)		
	DRT1-WD16C-1	16 outputs, PNP (+ common)		U, C
	DRT1-MD16C	8 inputs, NPN (+ common) 8 outputs, NPN (– common)		U, C, CE
	DRT1-MD16C-1	8 inputs, PNP (– common) 8 outputs, PNP (+ common)		U, E
B7AC Interface Unit	DRT1-B7AC	10 inputs x 3 Units (i.e., branching for 3 B7AC Units)		U, C, CE

Note: Orders are accepted in units of 10 Connectors.

Ordering Information

Intelligent Slaves Operating as PLC Units

Product	Model	Specifications		Standards
Programmable Slaves	CPM2C-S100C-DRT	Slave equipped with CPM2C CPU Unit functions 1,024 points max. for Remote I/O Links Includes Compo-Bus/S Master.	4 transistor outputs (sinking)	U, C, CE
	CPM2C-S110C-DRT		4 transistor outputs (sourcing)	
I/O Link Units	C200HW-DRT21	For CS1, C200HX/HG/HE 512 input points max. 512 output points max.		U, C, N, CE
	CQM1-DRT21	For CQM1H/CQM1 16 input points 16 output points		U, C, CE
	CPM1A-DRT21	For CPM1A/CPM2A 32 input points 32 output points		

Other Intelligent Slaves

Product	Model	Specifications		Standards
RS-232C Unit	DRT1-232C2	2 RS-232C ports 16 input points (communications status)		U, C, CE
Fiber Amplifier DeviceNet Communications Unit	E3X-DRT21	Up to 16 E3X-DA-N Fiber Amplifiers can be connected.		---
	E3X-DA6-P (See note.)	Fiber Amplifier		
	E3X-CN02 (See note.)	Reduced-wiring Connector		
	E39-TM1	Terminal Block Unit		
Intelligent Flag III	V600-HAM42-DRT	ID system for DeviceNet		CE
Vision Sensor Controller	F150-C10E-3-DRT	Vision Sensor for DeviceNet		CE
Digital Controller	E5EK-AA2-DRT-500	Digital Controller for DeviceNet		---
High-density Temperature Controllers	E5ZE-8AQHD1-TCB-V2	Thermocouple	Heating control, voltage output	---
	E5ZE-8ACAD1-TCB-V2		Heating control, current output	
	E5ZE-8VQHD1-TCB-V2		Heating/cooling control, voltage output	
	E5ZE-8VCAD1-TCB-V2		Heating/cooling control, current output	
	E5ZE-8AQHD1-TPB-V2	Platinum-resistance thermometer	Heating control, voltage output	
	E5ZE-8ACAD1-TPB-V2		Heating control, current output	
	E5ZE-8VQHD1-TPB-V2		Heating/cooling control, voltage output	
	E5ZE-8VCAD1-TPB-V2		Heating/cooling control, current output	
AC Servo Drivers	R88A-NCW152-DRT	DeviceNet Option Unit for OMNUC W-series AC Servo Drivers		CE
	R88A-CNU01R	External I/O Connector		---
	R88A-CCW002P4	Cable for Setup Tool (IBM PC/AT or compatible, 2 m)		
Programmable Terminals	NT-DRT21	DeviceNet Interface Unit for NT31/NT631 Programmable Terminals		U, CE
DeviceNet Wireless Unit	WD30-ME	DeviceNet Wireless Master Station	Pencil antenna	---
	WD30-ME01		Magnetic Base Antenna	
	WD30-SE	DeviceNet Wireless Slave Station	Pencil antenna	
	WD30-SE01		Magnetic Base Antenna	
	WD30-AT001	Magnetic Base Antenna		

Note: Order the Fiber Amplifier and Reduced-wiring Connector together.

Ordering Information

■ DeviceNet MULTIPLE I/O TERMINAL Units

Name		Model number	I/O points	Specifications	Standards
Communications Unit		DRT1-COM	---	Total Slave I/O points: 1,024 max.	U, C, CE
Digital I/O Units	Units with Terminal Blocks	GT1-ID16	16 inputs	NPN (+ common)	
		GT1-ID16-1	16 inputs	PNP (– common)	
		GT1-OD16	16 outputs	NPN (– common)	
		GT1-OD16-1	16 outputs	PNP (+ common)	
	Units with MOLEX Connectors	GT1-ID16MX	16 inputs	NPN (+ common)	
		GT1-ID16MX-1	16 inputs	PNP (– common)	
		GT1-OD16MX	16 outputs	NPN (– common)	
		GT1-OD16MX-1	16 outputs	PNP (+ common)	
	Units with Fujitsu Connectors	GT1-ID16ML	16 inputs	NPN (+ common)	
		GT1-ID16ML-1	16 inputs	PNP (– common)	
		GT1-OD16ML	16 outputs	NPN (– common)	
		GT1-OD16ML-1	16 outputs	PNP (+ common)	
	Units with D-Sub 25-pin Connectors	GT1-ID16DS	16 inputs	NPN (+ common)	
		GT1-ID16DS-1	16 inputs	PNP (– common)	
		GT1-OD16DS	16 outputs	NPN (– common)	
		GT1-OD16DS-1	16 outputs	PNP (+ common)	
	Units with High-density Fujitsu Connectors	GT1-ID32ML	32 inputs	NPN (+ common)	
		GT1-ID32ML-1	32 inputs	PNP (– common)	
		GT1-OD32ML	32 outputs	NPN (– common)	
		GT1-OD32ML-1	32 outputs	PNP (+ common)	
Analog Input Units		GT1-AD08MX	8 inputs	MOLEX connector	
		GT1-AD04	4 inputs	Terminal block	
Analog Output Units		GT1-DA04MX	4 outputs	MOLEX connector	
		GT1-DA04	4 outputs	Terminal block	
Temperature Input Units		GT1-TS04T	4 inputs	Thermocouple	
		GT1-TS04P	4 inputs	Platinum resistance thermometer	
Counter Unit		GT1-CT01	1 input, 2 outputs	1 input, 2 outputs Counter Unit with encoder input	CE
Relay Output Units		GT1-ROP08	8 outputs	8 relay outputs, 2 A, SPST-NO	U, C, CE
		GT1-ROS16	16 outputs	8 relay outputs, 5 A, SPST-NO	
		GT1-FOP08	8 outputs	8 SSR outputs, 1.5 A, SPST-NO	---
I/O Unit Connecting Cable		GCN1-100	---	1 m	---

Note: For details on DeviceNet, refer to the DeviceNet Catalog (Cat. No. Q102).

Ordering Information

■ CompoBus/S Slave Units

Name	Model number	Specifications	Standards (See note.)
I/O Link Units	CPM2C-SRT21	For CPM2C; 8 input points, 8 output points	CE
	CPM1A-SRT21	For CPM1A/CPM2A; 8 input points, 8 output points	U, C, CE
Remote I/O Terminals with Transistors	SRT2-ID04	4 input points, NPN (+ common)	
	SRT2-ID04	4 input points, NPN (+ common)	
	SRT2-ID04-1	4 input points, PNP (– common)	
	SRT2-OD04	4 output points, NPN (– common)	
	SRT2-OD04-1	4 output points, PNP (+ common)	
	SRT2-ID08	8 input points, NPN (+ common)	
	SRT2-ID08-1	8 input points, PNP (– common)	
	SRT2-OD08	8 output points, NPN (– common)	
	SRT2-OD08-1	8 output points, PNP (+ common)	
	SRT2-ID16	16 input points, NPN (+ common)	
	SRT2-ID16-1	16 input points, PNP (– common)	
	SRT2-OD16	16 output points, NPN (– common)	
	SRT2-OD16-1	16 output points, PNP (+ common)	
Remote I/O Terminals with Transistors and 3-tier Terminal Block	SRT2-ID16T	16 input points, NPN (+ common)	
	SRT2-ID16T-1	16 input points, PNP (– common)	
	SRT2-MD16T	16 I/O points, NPN (inputs: + common, outputs: – common)	
	SRT2-MD16T-1	16 I/O points, PNP (inputs: – common, outputs: + common)	
	SRT2-OD16T	16 output points, NPN (– common)	
	SRT2-OD16T-1	16 output points, PNP (+ common)	
Remote Input Terminals with Transistors and Connectors (4/8 points)	SRT2-ID04MX	4 input points, NPN (+ common)	CE
	SRT2-ID08MX	8 input points, PNP (+ common)	
Remote Output Terminals with Relays	SRT2-ROC08	8 relay output points	U, C, CE
	SRT2-ROC16	16 relay output points	
	SRT2-ROF08	8 power MOSFET relay output points	
	SRT2-ROF16	16 power MOSFET relay output points	
Remote I/O Terminals with Transistors and Connectors	SRT2-ID32ML	32 input points, NPN (+ common)	CE
	SRT2-ID32ML-1	32 input points, PNP (– common)	
	SRT2-OD32ML	32 output points, NPN (– common)	
	SRT2-OD32ML-1	32 output points, PNP (+ common)	
	SRT2-MD32ML	32 I/O points, NPN (inputs: + common, outputs: – common)	
	SRT2-MD32ML-1	32 I/O points, PNP (inputs: – common, outputs: + common)	
	SRT2-VID08S	8 input points, NPN (+ common)	U, C, CE
	SRT2-VID08S-1	8 input points, PNP (– common)	
	SRT2-VOD08S	8 output points, NPN (– common)	
	SRT2-VOD08S-1	8 output points, PNP (+ common)	
	SRT2-VID16ML	16 input points, NPN (+ common)	
	SRT2-VID16ML-1	16 input points, PNP (– common)	
	SRT2-VOD16ML	16 output points, NPN (– common)	
	SRT2-VOD16ML-1	16 output points, PNP (+ common)	
	SRT2-ATT01	Mounting Bracket A	
	SRT2-ATT02	Mounting Bracket B	

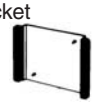
Ordering Information

Name	Model number	Specifications	Standards (See note.)
Waterproof Terminals (with Transistors)	SRT2-ID04CL	4 input points, NPN (+ common)	CE
	SRT2-ID04CL-1	4 input points, PNP (– common)	
	SRT2-OD04CL	4 output points, NPN (– common)	
	SRT2-OD04CL-1	4 output points, PNP (+ common)	
	SRT2-ID08CL	8 input points, NPN (+ common)	
	SRT2-ID08CL-1	8 input points, PNP (– common)	
	SRT2-OD08CL	8 output points, NPN (– common)	
	SRT2-OD08CL-1	8 output points, PNP (+ common)	
CompoBus/S Fiber Amplifier Sensor Communication Unit	E3X-SRT21	Connects to up to 14 Fiber Amplifier Units	
Sensor Terminals	SRT2-ID08S	8 Sensor inputs (NPN)	---
	SRT2-ND08S	4 remote-teaching Sensor inputs, 4 outputs (NPN)	
	SRT2-OD08S	8 Sensor outputs (NPN)	
Analog Input Terminal	SRT2-AD04	1 to 4 inputs (set via DIP switch)	U, C. CE
Analog Output Terminal	SRT2-DA02	1 or 2 outputs (set via DIP switch)	
Remote I/O Modules	SRT2-ID16P	16 input points, NPN (+ common)	---
	SRT2-OD16P	16 output points, NPN (– common)	
Positioner Drivers (Cannot be used in Long-distance Communications Mode.)	FND-X06H-SRT	200-VAC input, 6 A	U, CE, CU
	FND-X12H-SRT	200-VAC input, 12 A	
	FND-X25H-SRT	200-VAC input, 25 A	
	FND-X50H-SRT	200-VAC input, 50 A	
	FND-X06L-SRT	100-VAC input, 6 A	
	FND-X12L-SRT	100-VAC input, 12 A	

Note: 1. OMRON products that comply with EC Directives also comply with the common emission standard of the EMC Directive as individual products. The user must, however, confirm compliance with the EMC Directive for the overall device or machine containing the OMRON product, which can be affected by the configuration of the control panel, wiring conditions, layout, and other factors.

2. For details on CompoBus/S, refer to the CompoBus/S Catalog (Cat. No. Q103).

■ Optional Products

Name	Specifications		Model	Standards
I/O Unit Cover 	Cover for 10-pin terminal block		C200H-COV11	---
Terminal Block Covers 	Short protection for 10-pin terminal block (package of 10 covers); 8 pts		C200H-COV02	
	Short protection for 19-pin terminal block (package of 10 covers); 12 pts		C200H-COV03	
C200H Unit Connector Cover 	Protective cover for unused I/O Connecting Cable connectors		C500-COV01	
CS1 Special I/O Unit Connector Cover	Protective cover for unused I/O Connecting Cable connectors		CV500-COV01	
C200H Expansion I/O Backplane Insulation Plates 	Electrically insulate C200H Expansion I/O Backplanes from the control panel to increase noise resistance.	For 3-slot Backplane	C200HW-ATT32	N, L, CE
		For 5-slot Backplane	C200HW-ATT52	
		For 8-slot Backplane	C200HW-ATT82	
		For 10-slot Backplane	C200HW-ATTA2	
Relay 	24 VDC, for C200H-OC221/OC222/OC223/OC224/OC225		NTKPG6B-1174P-FD-US	---
Programming Console Mounting Bracket 	Used to attach C200H-PRO27-E Hand-held Programming Console to a panel.		C200H-ATT01	

Ordering Information

Name	Specifications	Model	Standards
Space Units	Used for empty I/O slot on the CS1W-BC□□3/BI□□3 or C200HW-BI□□□.	C200H-SP001	---
	Used for empty I/O slot on CS1W-BC□□2/BI□□2 and CS1D-BC□□□(S)/BI□□□	CS1W-SP001	
	Used for empty Power Supply Unit slot on CS1D-BC□□□(S)/BI□□□; same shape as the CS1W-PA207R.	CS1W-SP001	
	Used for empty Power Supply Unit slot on CS1D-BC□□□(S)/BI□□□; same shape as the CS1W-PA207R.	CS1W-SP002	
Battery Set	For CS-series CPU Units. (Use batteries within two years of manufacture.)	CS1W-BAT01	L, CE
Terminating Resistor (See note.)	Mounts to end of CS1 Long-distance Expansion Rack	CV500-TER01	U, C

Note: Two Terminating Resistors are included with the CS1W-IC102 I/O Control Unit.

■ Mounting Rails and Accessories

Name	Specifications	Model number	Standards
DIN Track Mounting Bracket 	1 set (2 included)	C200H-DIN01	---
DIN Tracks 	Length: 50 cm; height: 7.3 cm	PFP-50N	
	Length: 1 m; height: 7.3 cm	PFP-100N	
	Length: 50 cm; height: 16 mm	PFP-100N2	
End Plate 	---	PFP-M	
Spacer 	---	PFP-S	

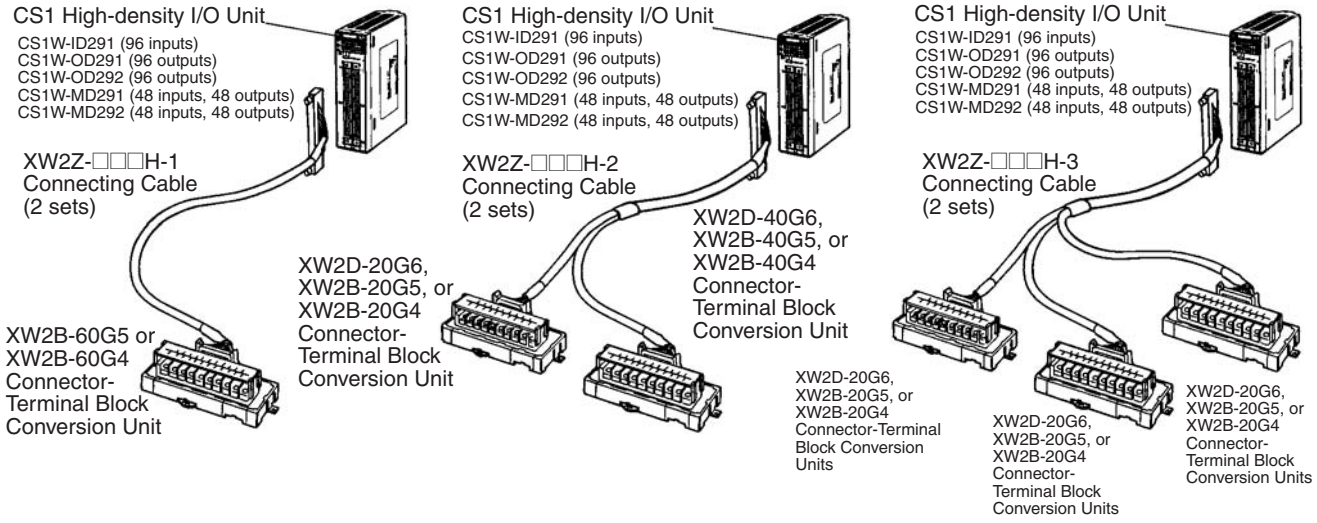
Note: Order PFP products in increments of 10.

Wiring Devices for High-density I/O Units

■ XW2Z Connecting Cables and XW2□ Connector-Terminal Block Conversion Units

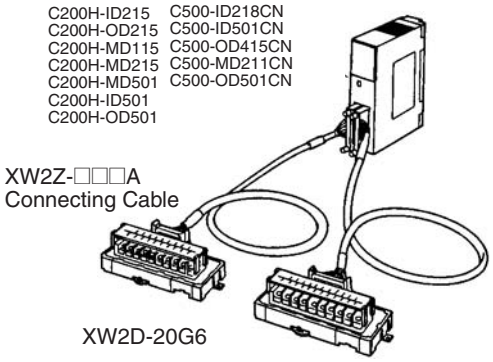
The XW2D Series for Connecting to Various Controllers

CS1-series PLC Basic I/O Units (96 or 48/48 I/O Points)



PLC 32-point I/O Units with Connectors

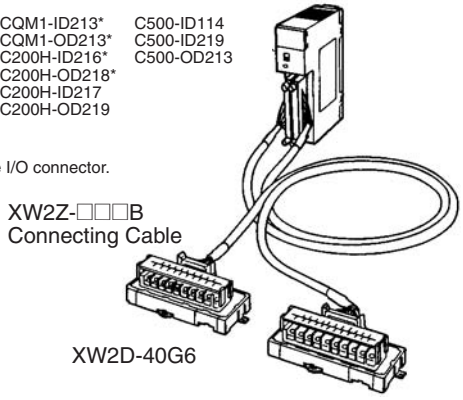
C200H-ID215
C200H-OD215
C200H-MD115
C200H-MD215
C200H-MD501
C200H-ID501
C200H-OD501
C500-ID218CN
C500-ID501CN
C500-OD415CN
C500-MD211CN
C500-OD501CN



PLC 32-point Group-2 I/O Units with Connectors
PLC 64-point I/O Units with Connectors

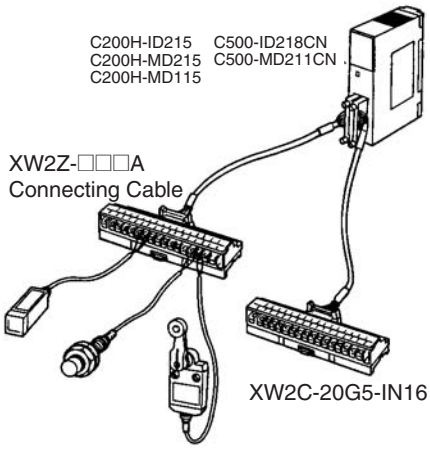
CS1W-ID231*
CS1W-OD231*
CS1W-OD232*
CS1W-ID261
CS1W-OD261
CS1W-OD262
CS1W-MD261
CS1W-MD262
CQM1-ID213*
CQM1-OD213*
C200H-ID216*
C200H-OD218*
C200H-ID217
C200H-OD219
C500-ID114
C500-ID219
C500-OD213

* Only one I/O connector.

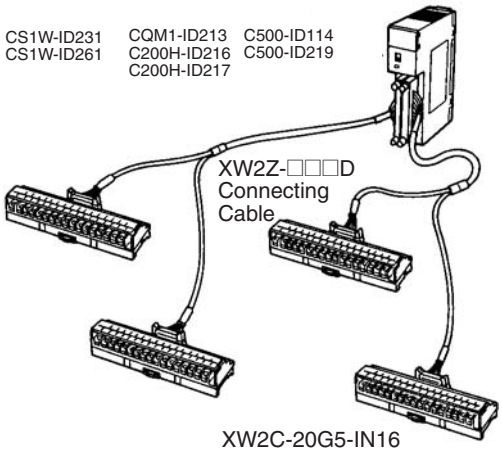


The XW2C-20G5-IN16 for when a Power Supply Common Terminal Is Required

PLC 32-point I/O Units with Connectors



PLC 32-point Group-2 Input Units with Connectors
PLC 64-point Input Units with Connectors

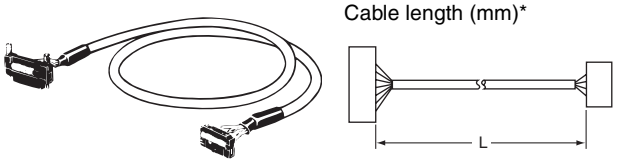


■ XW2Z Connecting Cables for Connector-Terminal Block Conversion Units

Refer to the table of Connecting Cables on page 224 for information on Connecting Cables between PLC I/O Units and Connector-Terminal Block Conversion Units.

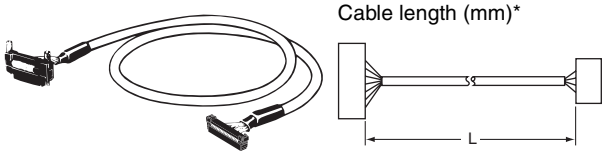
The XW2Z-□□□A for PLC 32-point I/O Units with Connectors

XW2Z-□□□A



*Cable length L (mm)	Model
500	XW2Z-050A
1,000	XW2Z-100A
1,500	XW2Z-150A
2,000	XW2Z-200A
3,000	XW2Z-300A
5,000	XW2Z-500A

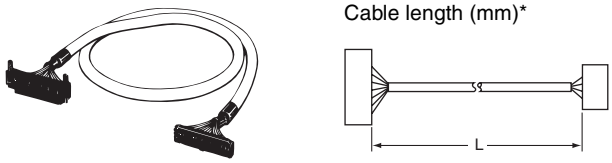
XW2Z-□□□AU



*Cable length L (mm)	Model
500	XW2Z-050AU
1,000	XW2Z-100AU
1,500	XW2Z-150AU
2,000	XW2Z-200AU
3,000	XW2Z-300AU
5,000	XW2Z-500AU

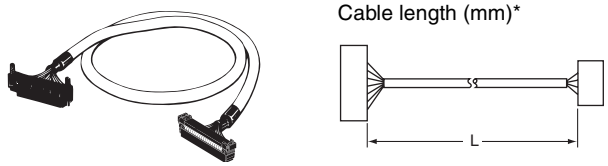
The XW2Z-□□□B for PLC 32-point Group-2 I/O Units with Connectors and PLC 64-point I/O Units with Connectors

XW2Z-□□□B



Type	*Cable length L (mm)	Model
Normal wiring	500	XW2Z-050B
	1,000	XW2Z-100B
	1,500	XW2Z-150B
	2,000	XW2Z-200B
	3,000	XW2Z-300B
	5,000	XW2Z-500B

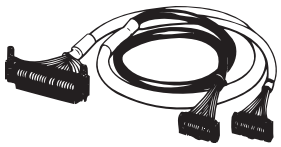
XW2Z-□□□BU



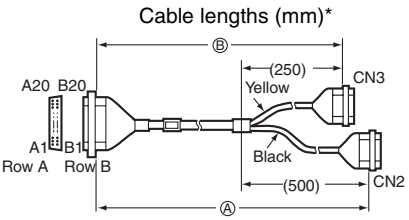
Type	*Cable length L (mm)	Model
Normal wiring	500	XW2Z-050BU
	1,000	XW2Z-100BU
	1,500	XW2Z-150BU
	2,000	XW2Z-200BU
	3,000	XW2Z-300BU
	5,000	XW2Z-500BU

The XW2Z-□□□D for PLC 32-point Group-2 Input Units with Connectors and PLC 64-point Input Units with Connectors

XW2Z-□□□D



Note: The G79-I□C-□ Cable with a Connector for the G7TC cannot be used with the XW2C because the wiring is not the same.

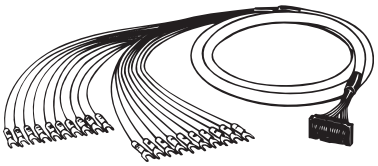


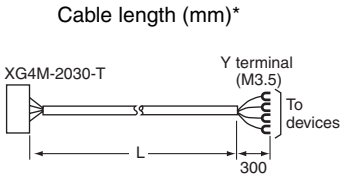
CN2 (on the black branch) corresponds to row A of CN1 and CN3 (on the yellow branch) corresponds to row B of CN1.

*Cable lengths (mm)		Model
A	B	
1,000	750	XW2Z-100D
1,500	1,250	XW2Z-150D
2,000	1,750	XW2Z-200D
3,000	2,750	XW2Z-300D
5,000	4,750	XW2Z-500D

The XW2Z-□□□F Cable with Loose Wires with Crimp Connectors (20 Wires)

XW2Z-□□□F

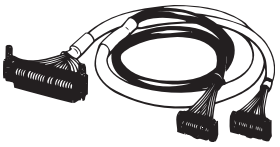


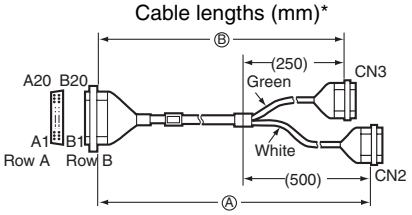


*Cable length L (mm)	Model
1,000	XW2Z-100F
1,500	XW2Z-150F
2,000	XW2Z-200F
3,000	XW2Z-300F
5,000	XW2Z-500F

The XW2Z-□□□L for PLC 32-point Group-2 Output Units with Connectors and PLC 64-point Output Units with Connectors

XW2Z-□□□L

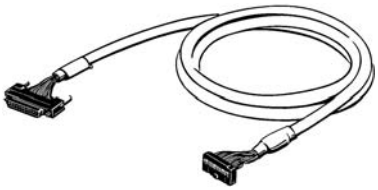


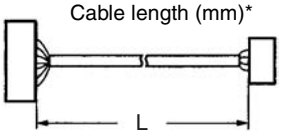


CN2 (on the white branch) corresponds to row A of CN1 and CN3 (on the green branch) corresponds to row B of CN1.

*Cable lengths (mm)		Model
A	B	
1,000	750	XW2Z-100L
1,500	1,250	XW2Z-150L
2,000	1,750	XW2Z-200L
3,000	2,750	XW2Z-300L
5,000	4,750	XW2Z-500L

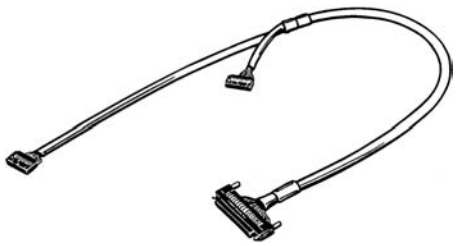
The XW2Z-□□□H-1 for PLC 96-point I/O Units with Connectors

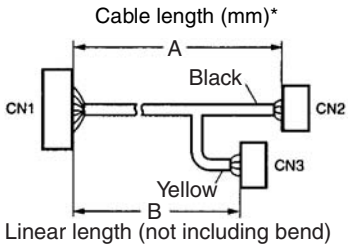




*Cable length L (mm)	Model
500	XW2Z-050H-1
1,000	XW2Z-100H-1
1,500	XW2Z-150H-1
2,000	XW2Z-200H-1
3,000	XW2Z-300H-1
5,000	XW2Z-500H-1
7,000	XW2Z-700H-1
10,000	XW2Z-010H-1

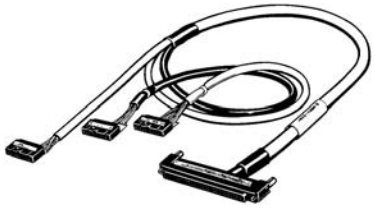
XW2Z-□□□H-2

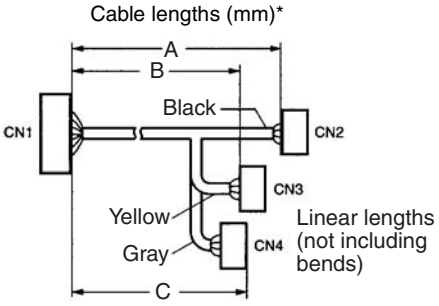




*Cable lengths (mm)		Model
A	B	
1,000	750	XW2Z-100H-2
1,500	1,250	XW2Z-150H-2
2,000	1,750	XW2Z-200H-2
3,000	2,750	XW2Z-300H-2
5,000	4,750	XW2Z-500H-2
10,000	9,750	XW2Z-010H-2

XW2Z-□□□H-3



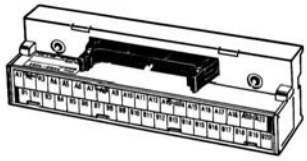


*Cable lengths (mm)			Model
A	B	C	
1,000	750	1,000	XW2Z-100H-3
1,500	1,250	1,500	XW2Z-150H-3
2,000	1,750	2,000	XW2Z-200H-3
3,000	2,750	3,000	XW2Z-300H-3
5,000	4,750	5,000	XW2Z-500H-3
10,000	9,750	10,000	XW2Z-010H-3

■ XW2□ Connector-Terminal Block Conversion Units

XW2D Connector-Terminal Block Conversion Units, Slim Type

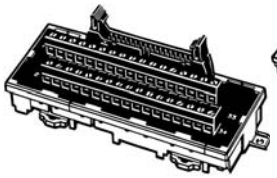
- Mounting area 35% less than 40-point XW2B models enabling down-sizing of control panel and automatic devices.
- Fallout-prevention mechanism used with terminal screws.
- Round crimp terminals and Y-shaped crimp terminals can be used together.
- Units available with built-in bleeder resistance (5.6 kΩ) for each terminal (model numbers ending in -RF or -RM). Applicable to input currents of 8.4 mA (typical).



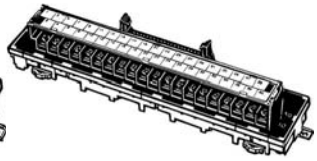
XW2D-□□G6 (M3 screws)

XW2B Connector-Terminal Block Conversion Units, Through Type

- Mount to DIN track or via screws.
- MIL flat cable connectors or multi-pin square connectors available.
- Terminal blocks available with M3 or M3.5 screws.



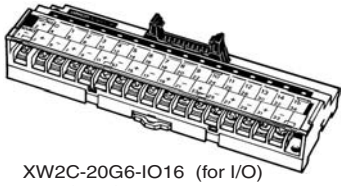
XW2B-□□G4 (M3 screws)



XW2B-□□G5 (M3.5 screws)

XW2C Connector-Terminal Block Conversion Units with Commons

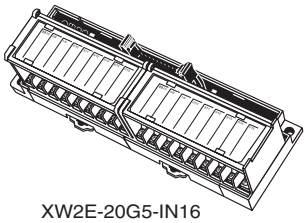
- Equipped with common terminal for I/O device power supply.
- ON/OFF status indicators. (XW2C-20G5-IN16)
- Mount to DIN track or via screws.
- Connectable to either PLC Input or Output Unit by changing a short bar (included). (XW2C-20G6-IO16)



XW2C-20G6-IO16 (for I/O)
XW2C-20G5-IN16 (for inputs)

XW2E Connector-Terminal Block Conversion Units with Commons and 3-tier Terminal Block

- Common terminal block with power supply terminals.
- Three-tier terminal block for easy wiring.



XW2E-20G5-IN16

■ Models

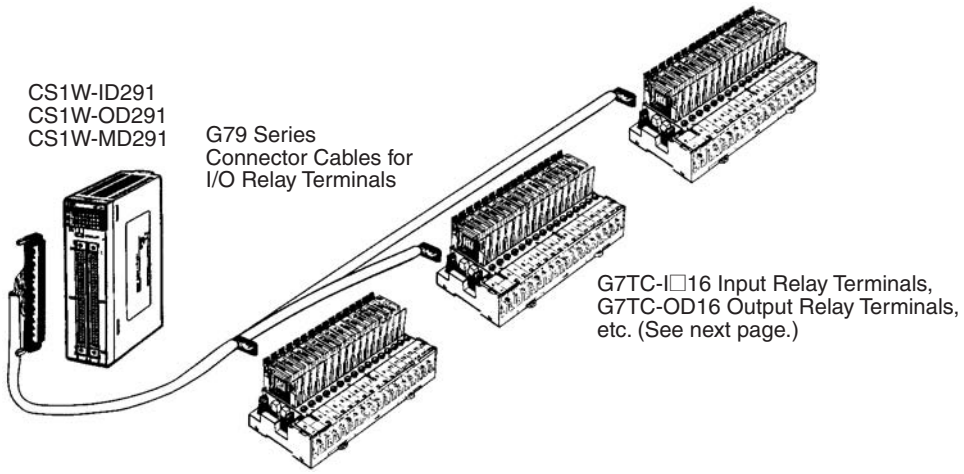
Name		I/O	Model
Connector-Terminal Block Conversion Unit, Slim Type	M3	32	XW2D-40G6
Connector-Terminal Block Conversion Units with Built-in Bleeder Resistance	M3	32	XW2D-40G6-RF
			XW2D-40G6-RM
Connector-Terminal Block Conversion Units, Through Type	M3.5	32	XW2B-40G5
	M3		XW2B-40G4
Connector-Terminal Block Conversion Unit, Slim Type	M3	16	XW2B-20G6
Connector-Terminal Block Conversion Units, Through Type	M3.5	16	XW2B-20G5
	M3		XW2B-20G4
Connector-Terminal Block Conversion Unit with Common	M3	16 inputs/16 outputs	XW2C-20G6-IO16
Connector-Terminal Block Conversion Unit with Common	M3.5	16 inputs	XW2C-20G5-IN16
Connector-Terminal Block Conversion Unit with Common and 3-Tier Terminal Block	M3	16 inputs	XW2E-20G5-IN16

■ G79 I/O Relay Terminal Connector Cables and G7TC, G70A, and G70D I/O Relay Terminals for Connector Cables

Connect High-density I/O Units to Relay Terminals

CS1 High-density I/O Units with 48/48 or 96 I/O Points (Basic I/O Units)

1:3 Connector Cables

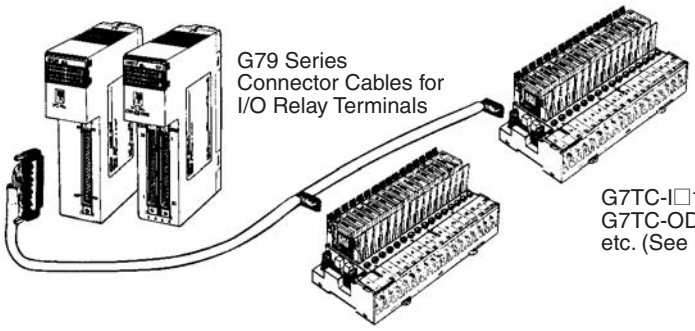


CS1 High-density (32, 64, or 32/32 I/O Points) and C200H Group-2 High-density I/O Units (Basic I/O Units)

1:2 Connector Cables

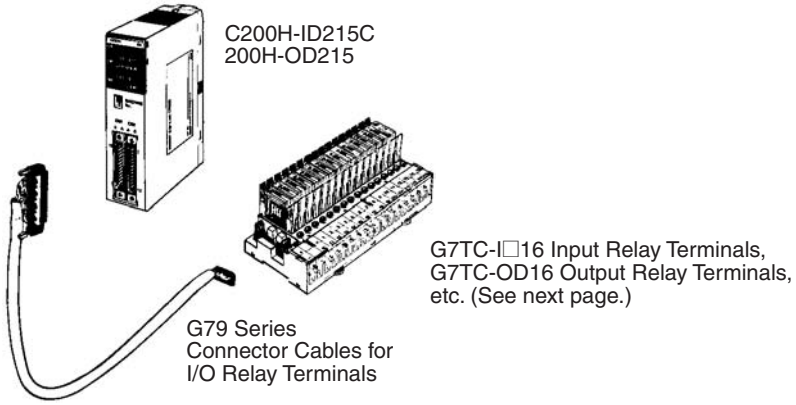
CS1W-ID231
CS1W-ID261
CS1W-OD231
CS1W-OD232
CS1W-OD261
CS1W-OD262
CS1W-MD261
CS1W-MD262

C200H-ID216
C200H-ID217
C200H-ID218
C200H-ID219
C200H-OD218
C200H-OD219
C200H-OD21B



C200H High-density I/O Units (Special I/O Units)

1:1 Connector Cables



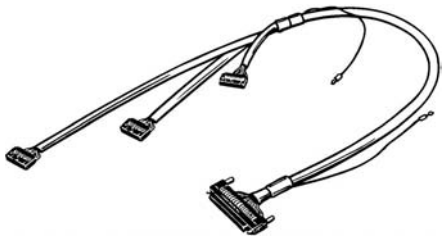
■ G79 I/O Relay Terminal Connector Cables

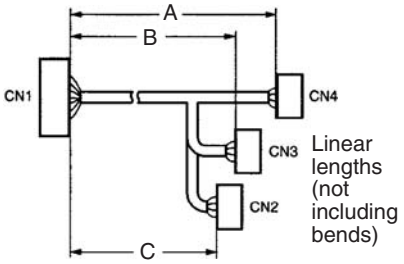
G79-□□□C-□-□

CS1 High-density I/O Units (96, 48/48 points) (Basic I/O Units)		I/O Relay Terminal Connector Cables (See note 1.)				Applicable Relay Terminals (See note 2.)
		Cable lengths (m)			Model numbers	
Model	I/O	A	B	C		Model numbers
CS1W-ID291	96 inputs	1.5 2 3	1.25 1.75 2.75	1 1.5 2.5	G79-150C-125-100 G79-200C-175-150 G79-300C-275-250	G7TC-I□16
CS1W-OD291	96 outputs					G7TC-OC16 G70D-□O□16 G70A-ZOC16-3 (plus relays)
CS1W-MD291	48 inputs					G7TC-I□16
	48 outputs					G7TC-OC16 G70D-□O□16 G70A-ZOC16-3 (plus relays)

Note: 1. One connector required for each I/O Unit connector.

2. Relay Terminals required for number of I/O.



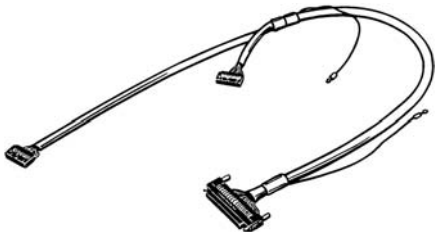


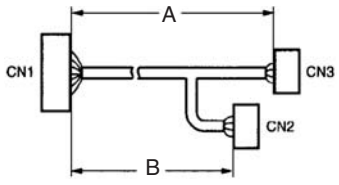
G79-I□□□C-□/G79-O□□□C-□

CS1 High-density (32, 64, 32/32 points) and C200H Group-2 High-density I/O Units (Basic I/O Units)		I/O Relay Terminal Connector Cables (See note 1.)			Applicable Relay Terminals (See note 2.)
		Cable lengths (m)		Model numbers	
Model	I/O	A	B		Model numbers
CS1W-ID231 CS1W-ID261 CS1W-MD261 (Inputs) C200H-ID216 C200H-ID217 C200H-ID218 C200H-ID219	32 inputs 64 inputs	1 1.5 2 3 5	0.75 1.25 1.75 2.75 4.75	G79-I100C-75 G79-I150C-125 G79-I200C-175 G79-I300C-275 G79-I500C-475	G7TC-I□16
CS1W-OD231 CS1W-OD261 CS1W-MD261 (Outputs) C200H-OD218 C200H-OD219	32 outputs 64 outputs	1 1.5 2 3 5	0.75 1.25 1.75 2.75 4.75	G79-O100C-75 G79-O150C-125 G79-O200C-175 G79-P300C-275 G79-O500C-475	G7TC-OC16 G70D-□O□16 G70A-ZOC16-3 (plus relays)
CS1W-OD232 CS1W-OD262 CS1W-MD262 (Outputs) C200H-OD21B	32 outputs 64 outputs	1 1.5 2 3 5	0.75 1.25 1.75 2.75 4.75	G79-O100C-75 G79-O150C-125 G79-O200C-175 G79-O300C-275 G79-O500C-475	G70D-□016-1 G70A-ZOC16-4 (plus relays)

Note: 1. One connector required for each I/O Unit connector.

2. Relay Terminals required for number of I/O.



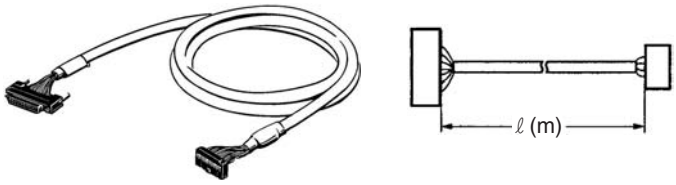


Linear length (not including bend)

■ G79□□□C

C200H High-density I/O Units (Special I/O Units)		I/O Relay Terminal Connector Cables (See note 1.)		Applicable Relay Terminals (See note 2.)
Model	I/O	Cable length ℓ (m)	Model numbers	Model numbers
C200H-ID215	32 inputs	1 1.5 2 3 5	G79-100C G79-150C G79-200C G79-300C G79-500C	G7TC-I□16
C200H-OD215	32 outputs			G7TC-OC16 G70D-□O□16 G70A-ZOC16-3 (plus relays)

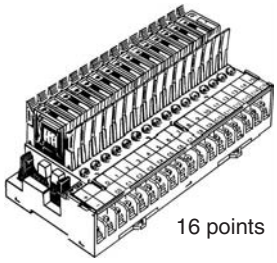
Note: 1. One connector required for each I/O Unit connector.
2. Relay Terminals required for number of I/O.

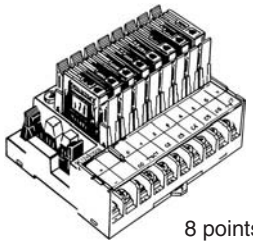


■ G7TC, G70A, and G70D I/O Relay Terminals for Connector Cables

G7TC:
I/O Relay Terminals with High-capacity Relays

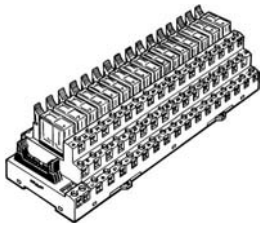
- Models with 8 outputs, 16 outputs, or 16 inputs.
- PNP model with 16 outputs.
- Compact: 182 x 85 x 68 mm (WxDxH) (8-pt: 102 mm W).
- G7T I/O relays (SPST-NO, 5 A/relay) mounted.
- Models available meeting UL and CSA standards.
- Model with 16 independent points.
- G3TA I/O Solid-state Relays can be mounted.


16 points


8 points

G70A-ZOC16:
I/O Relay Terminals with User-selected Relays

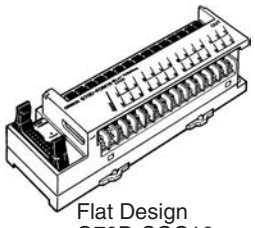
- 16-output relay terminal sockets.
- PNP models available.
- Compact: 234 x 75 x 64 mm (WxDxH).
- Mount G2R Power Relays, G3R Solid-state Relays, G3RZ Power MOS FET Relays, or H3RN Timers as required (Relays/Timers sold separately).
- High-capacity terminal block: 10 A.
- VDE standards met.
- Model with 16 independent points.



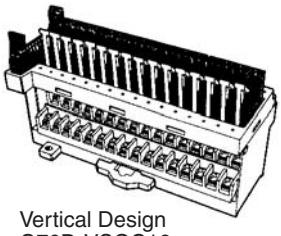
Note: Relays sold separately.

G70D:
16-point I/O Relay Terminals with G6D and G3DZ

- 16-output relay terminal.
- Pick from a flat design (156 x 51 x 39 mm (WxDxH)) or vertical design (135 x 46 x 81 mm (WxDxH))
- G6C Power Relays (SPST-NO, 3 A/relay for flat design and 3 A/common for vertical design) or G3DZ Power MOS FET Relays (SPST-NO, 0.3 A/relay) mounted.
- Flat design: 2 outputs/common, Vertical design: 16 independent outputs.



Flat Design
G70D-SOC16
(Relay outputs)
G70D-FOM16
(MOS FET outputs)



Vertical Design
G70D-VSOC16
(Relay outputs)
G70D-VFOM16
(MOS FET outputs)

■ Models

Model	Rated voltage
G7TC-ID16	24 VDC
G7TC-IA16	100/110 VAC
	200/220 VAC
G7TC-OC16	24 VDC
G70A-ZOC16-3	Relays sold separately.
G70A-ZOC16-4	Relays sold separately.
G70D-SOC16	24 VDC
G70D-VSOC16	24 VDC
G70D-FOM16	24 VDC
G70D-VFOM16	24 VDC

Connecting Cable Tables

■ Connecting to CS1 I/O Units

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
CS1W-ID291 (48 points × 2)	XW2B-60G5 XW2B-60G4	1:1	0.5	XW2Z-050H-1	222
			1	XW2Z-100H-1	
			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1	
			3	XW2Z-300H-1	
			5	XW2Z-500H-1	
			7	XW2Z-700H-1	
			10	XW2Z-010H-1	
	XW2D-20G6 + XW2D-40G6 XW2B-20G5 + XW2B-40G5 XW2B-20G4 + XW2B-40G4	1:2	1	XW2Z-100H-2	
			1.5	XW2Z-150H-2	
			2	XW2Z-200H-2	
			3	XW2Z-300H-2	
			5	XW2Z-500H-2	
			10	XW2Z-010H-2	
	XW2D-20G6 (3 Units) XW2B-20G5 (3 Units) XW2B-20G4 (3 Units)	1:3	1	XW2Z-100H-3	
			1.5	XW2Z-150H-3	
			2	XW2Z-200H-3	
			3	XW2Z-300H-3	
			5	XW2Z-500H-3	
			10	XW2Z-010H-3	
	G7TC-IA16/ID16	1:3	1.5	G79-150C-125-100	226
			2	G79-200C-175-150	
			3	G79-300C-275-250	
CS1W-OD291 (48 points × 2)	XW2B-60G5 XW2B-60G4	1:1	0.5	XW2Z-050H-1	222
			1	XW2Z-100H-1	
			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1	
			3	XW2Z-300H-1	
			5	XW2Z-500H-1	
			7	XW2Z-700H-1	
			10	XW2Z-010H-1	
	XW2D-20G6 + XW2D-40G6 XW2B-20G5 + XW2B-40G5 XW2B-20G4 + XW2B-40G4	1:2	1	XW2Z-100H-2	
			1.5	XW2Z-150H-2	
			2	XW2Z-200H-2	
			3	XW2Z-300H-2	
			5	XW2Z-500H-2	
			10	XW2Z-010H-2	
	XW2D-20G6 (3 Units) XW2B-20G5 (3 Units) XW2B-20G4 (3 Units)	1:3	1	XW2Z-100H-3	
			1.5	XW2Z-150H-3	
			2	XW2Z-200H-3	
			3	XW2Z-300H-3	
			5	XW2Z-500H-3	
			10	XW2Z-010H-3	
	G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:3	1.5	G79-150C-125-100	226
			2	G79-200C-175-150	
			3	G79-300C-275-250	
CS1W-OD292 (48 points × 2)	XW2B-60G5 XW2B-60G4	1:1	0.5	XW2Z-050H-1	222
			1	XW2Z-100H-1	
			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1	
			3	XW2Z-300H-1	
			5	XW2Z-500H-1	
			7	XW2Z-700H-1	
			10	XW2Z-010H-1	
	XW2D-20G6 + XW2D-40G6 XW2B-20G5 + XW2B-40G5 XW2B-20G4 + XW2B-40G4	1:2	1	XW2Z-100H-2	
			1.5	XW2Z-150H-2	
			2	XW2Z-200H-2	
			3	XW2Z-300H-2	
			5	XW2Z-500H-2	
			10	XW2Z-010H-2	
	XW2D-20G6 (3 Units) XW2B-20G5 (3 Units) XW2B-20G4 (3 Units)	1:3	1	XW2Z-100H-3	
			1.5	XW2Z-150H-3	
			2	XW2Z-200H-3	
			3	XW2Z-300H-3	
			5	XW2Z-500H-3	
			10	XW2Z-010H-3	
	G7TC-OC16-1	1:3	1.5	G79-150C-125-100	226
			2	G79-200C-175-150	
			3	G79-300C-275-250	
CS1W-MD291 (48 inputs) (48 outputs)	XW2B-60G5 XW2B-60G4	1:1	0.5	XW2Z-050H-1	222
			1	XW2Z-100H-1	
			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1	
			3	XW2Z-300H-1	
			5	XW2Z-500H-1	
			7	XW2Z-700H-1	
			10	XW2Z-010H-1	
	XW2D-20G6 + XW2D-40G6 XW2B-20G5 + XW2B-40G5 XW2B-20G4 + XW2B-40G4	1:2	1	XW2Z-100H-2	
			1.5	XW2Z-150H-2	
			2	XW2Z-200H-2	
			3	XW2Z-300H-2	
			5	XW2Z-500H-2	
			10	XW2Z-010H-2	
	XW2D-20G6 (3 Units) XW2B-20G5 (3 Units) XW2B-20G4 (3 Units)	1:3	1	XW2Z-100H-3	
			1.5	XW2Z-150H-3	
			2	XW2Z-200H-3	
			3	XW2Z-300H-3	
			5	XW2Z-500H-3	
			10	XW2Z-010H-3	
	G7TC-IA16/ID16 G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:3	1.5	G79-150C-125-100	226
			2	G79-200C-175-150	
			3	G79-300C-275-250	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
CS1W-MD292 (48 inputs) (48 outputs)	XW2B-60G5 XW2B-60G4	1:1	0.5	XW2Z-050H-1	222
			1	XW2Z-100H-1	
			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1	
			3	XW2Z-300H-1	
			5	XW2Z-500H-1	
			7	XW2Z-700H-1	
			10	XW2Z-010H-1	
	XW2D-20G6 + XW2D-40G6 XW2B-20G5 + XW2B-40G5 XW2B-20G4 + XW2B-40G4	1:2	1	XW2Z-100H-2	
			1.5	XW2Z-150H-2	
			2	XW2Z-200H-2	
			3	XW2Z-300H-2	
			5	XW2Z-500H-2	
			10	XW2Z-010H-2	
	XW2D-20G6 (3 Units) XW2B-20G5 (3 Units) XW2B-20G4 (3 Units)	1:3	1	XW2Z-100H-3	
			1.5	XW2Z-150H-3	
			2	XW2Z-200H-3	
			3	XW2Z-300H-3	
			5	XW2Z-500H-3	
			10	XW2Z-010H-3	
	G7TC-IA16/ID16 G7TC-OC16-1	1:3	1.5	G79-150C-125-100	226
			2	G79-200C-175-150	
			3	G79-300C-275-250	
CS1W-ID231 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
CS1W-OD231 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
CS1W-OD232 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	
CS1W-ID261 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
CS1W-OD261 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
CS1W-OD262 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	
CS1W-MD261 (32 inputs)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
CS1W-MD261 (32 outputs)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
CS1W-MD262 (32 inputs)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
CS1W-MD262 (32 outputs)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	

■ Connecting to C200H I/O Units

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
C200H-ID217 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
	G7TC-IA16/ID16	1:2	1	G79-I100C-75	226
			1.5	G79-I150C-125	
			2	G79-I200C-175	
			3	G79-I300C-275	
			5	G79-I500C-475	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
C200H-ID219 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
	G7TC-IA16/ID16	1:2	1	G79-I100C-75	226
			1.5	G79-I150C-125	
			2	G79-I200C-175	
			3	G79-I300C-275	
			5	G79-I500C-475	
C200H-OD219 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	
	G7TC-OC16/08 G70D-SOC16/ VSOC16 G70A-ZOC16-3	1:2	1	G79-O100C-75	226
			1.5	G79-O150C-125	
			2	G79-O200C-175	
			3	G79-O300C-275	
			5	G79-O500C-475	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
C200H-ID216 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
	G7TC-IA16/ID16	1:2	1	G79-I100C-75	226
			1.5	G79-I150C-125	
			2	G79-I200C-175	
			3	G79-I300C-275	
			5	G79-I500C-475	
C200H-ID218 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
C200H-OD218 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units)	1:2	1	XW2Z-100L	221
			1.5	XW2Z-150L	
			2	XW2Z-200L	
			3	XW2Z-300L	
			5	XW2Z-500L	
	G7TC-OC16/08 G70D-SOC16/ VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:2	1	G79-O100C-75	226
			1.5	G79-O150C-125	
			2	G79-O200C-175	
			3	G79-O300C-275	
			5	G79-O500C-475	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
C200H-ID215 (16 points × 2)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2C-20G5-IN16 XW2E-20G5-IN16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-IA16/ID16	1:1	1	G79-100C	226
			1.5	G79-150C	
			2	G79-200C	
			3	G79-300C	
			5	G79-500C	
C200H-OD215 (16 points × 2)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-OC16/08 G70D-SOC16/ VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:1	1	G79-100C	226
			1.5	G79-150C	
			2	G79-200C	
			3	G79-300C	
			5	G79-500C	
C200H-MD215 (16 inputs)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2C-20G5-IN16 XW2E-20G5-IN16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-IA16/ID16	1:1	1	G79-100C	226
			1.5	G79-150C	
			2	G79-200C	
			3	G79-300C	
			5	G79-500C	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
C200H-MD215 (16 outputs)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-OC16/08 G70D-SOC16/ VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:1	1	G79-100C	226
			1.5	G79-150C	
			2	G79-200C	
			3	G79-300C	
			5	G79-500C	
C200H-ID111 (32 points × 2)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units) XW2B-20G4 (2 Units) XW2B-40G5-T XW2C-20G6-IO16 (2 Units) XW2E-20G5-IN16 (2 Units)	1:2	1	XW2Z-100D	
			1.5	XW2Z-150D	
			2	XW2Z-200D	
			3	XW2Z-300D	
			5	XW2Z-500D	
C200H-ID501 (16 points × 2)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2E-20G5-IN16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
C200H-OD501 (16 points × 2)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
C200H-MD501 (16 inputs)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2E-20G5-IN16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
C200H-MD501 (16 outputs)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	

■ Connecting to DeviceNet I/O Terminals

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
GT1-ID32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	G7TC-IA16/ID16	1:1	0.25	G79-I25C	---
			0.5	G79-I50C	
GT1-ID32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
GT1-OD32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:1	0.25	G79-O25C	---
			0.5	G79-O50C	
GT1-OD32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.5	XW2Z-050B	221
			1	XW2Z-100B	
			1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
GT1-ID16ML (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-IA16/ID16	1:1	1	G79-100C	226
			1.5	G79-150C	
			2	G79-200C	
			3	G79-300C	
			5	G79-500C	
GT1-ID16ML-1 (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
GT1-OD16ML (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:1	1	G79-100C	226
			1.5	G79-150C	
			2	G79-200C	
			3	G79-300C	
			5	G79-500C	
GT1-OD16ML-1 (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4	1:1	0.5	XW2Z-050A	221
			1	XW2Z-100A	
			1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
DRT2-ID32ML DRT1-ID32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-IA16/ID16	1:2	0.5	G79-I50-25-D1	
			0.75	G79-I75-50-D1	
DRT2-ID32ML-1 DRT1-ID32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
DRT2-OD32ML DRT1-OD32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-OD16/08 G70D-SOC16/VSOC16 G70A-ZIC16-3 G70D-SOC08 G70R-SOC08	1:2	0.5	G79-O50-25-D1	
			0.75	G79-O75-50-D1	
DRT2-OD32ML-1 DRT1-OD32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G70A-ZOC16-4	1:2	0.5	G79-O50-25-D1	
			0.75	G79-O75-50-D1	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
DRT2-MD32ML DRT1-MD32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-IA16/ID16 G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:2	0.5	G79-M50-25-D1	
			0.75	G79-M75-50-D1	
DRT2-MD32ML-1 DRT1-MD32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G70A-ZOC16-4	1:2	0.5	G79-M50-25-D2	
			0.75	G79-M75-50-D2	

■ Connecting to CompoBus/S I/O Terminals

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
SRT2-VID16ML (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2C-20G5-IN16 XW2E-20G5-IN16	1:1	0.25	G79-O25C	---
			0.5	G79-O50C	
	G7TC-IA16/ID16	1:1	0.25	G79-I25C	
			0.5	G79-I50C	
SRT2-VID16ML-1 (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2C-20G5-IN16 XW2E-20G5-IN16	1:1	0.25	G79-O25C	---
			0.5	G79-O50C	
SRT2-VOD16ML (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2C-20G5-IN16 XW2E-20G5-IN16	1:1	0.25	G79-O25C	---
			0.5	G79-O50C	
	G7TC-OC16/08 G70D-SOC16/ VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:1	0.25	G79-O25C	
			0.5	G79-O50C	
SRT2-VOD16ML-1 (16 points)	XW2D-20G6 XW2B-20G5 XW2B-20G4 XW2C-20G6-IO16 XW2C-20G5-IN16 XW2E-20G5-IN16	1:1	0.25	G79-O25C	---
			0.5	G79-O50C	
	G70A-ZOC16-4	1:1	0.25	G79-O25C	
			0.5	G79-O50C	
SRT2-ID32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-IA16/ID16	1:2	0.5	G79-I50-25-D1	
			0.75	G79-I75-50-D1	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branching	Length (m)	Model	Page
SRT2-ID32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
SRT2-OD32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:2	0.5	G79-O50-25-D1	
			0.75	G79-O75-50-D1	
SRT2-OD32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G70A-ZOC16-4	1:2	0.5	G79-M50-25-D1	
			0.75	G79-M75-50-D1	
SRT2-MD32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-IA16/ID16 G7TC-OC16/08 G70D-SOC16/VSOC16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08	1:2	0.5	G79-M50-25-D1	
			0.75	G79-M75-50-D1	
SRT2-MD32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	---
			0.5	XW2Z-C50K	
			1	XW2Z-100K	
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G70A-ZOC16-4	1:2	0.5	G79-M50-25-D2	
			0.75	G79-M75-50-D2	

Peripheral Devices

Programmable Terminals
NS12-V1/NS10-V1/NS8-V1/NS5-V1

PTs as a Machine Navigator. NS-series PTs Navigate All Areas of Machine Operation, from Daily Operation to Device Error Displays and Error Recovery

The PT is traditionally a terminal that exchanges data in allocated areas with the PLC's CPU Unit. The internal and external control of a PLC with only this type of data exchange is, however, difficult. An NS-series PT, however, uses communications functions and Smart Active Parts to incorporate software computer functions to operate as a Device Navigator.

NS5-V1 5-inch Model | NS8-V1 8-inch Model | NS10-V1 10-inch Model | NS12-V1 12-inch Model

Consider the possibilities in using an NS-series PT with your existing system.

- NS-series PTs support serious networking to enable creating flexible communications systems.
- Simulate PT operations on personal computers without PT hardware.
- Monitor PLC ladder programs from an NS-series PT after system startup. (Applies to SYSMAC CS-series and CJ-series PLCs.)
- Use macro programs. A wide range of processing can be written in an easy-to-understand language.
- Use the many functions that greatly increase screen creation efficiency.
- Use Memory Cards with a wide range of data formats: CSV, RTF, TXT, BMP, and JPEG.

NS-Designer

The new NS-Designer screen creation software provides an easy, comfortable development environment.

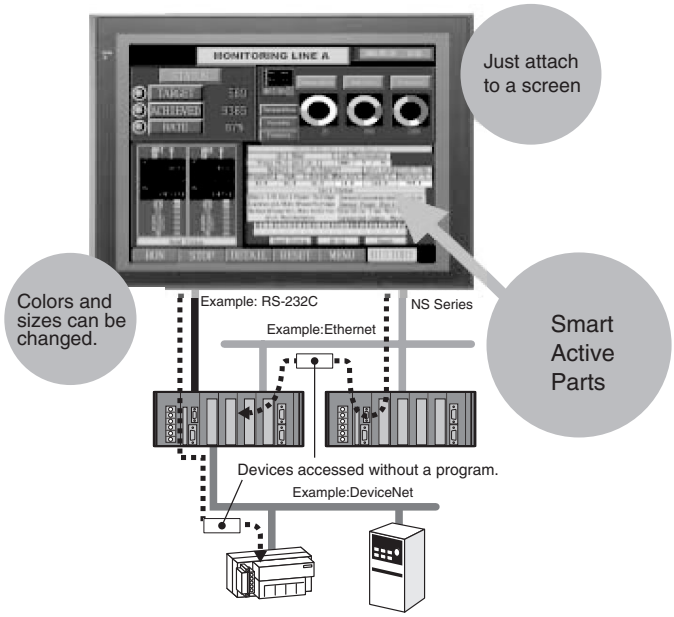
NS-series Lineup

Series		NS12-V1	NS10-V1	NS8-V1	NS5-V1
Appearance					
Dimensions (WxHxD)		315 x 241 x 48.5 mm	315 x 241 x 48.5 mm	232 x 177 x 48.5 mm	195 x142 x54 mm
Effective display area		12.1 inch	10.4 inch	8 inch	5.7 inch
Display device		TFT	TFT	TFT	STN
Number of dots		800 x 600 dots	640 x 480 dots	640 x 480 dots	320 x 240 dots
Display color	Basic colors (objects, background, etc.)	256 colors (See note.)	256 colors (See note.)	256 colors (See note.)	256 colors
	Image data (BMP or JPG images)	32,768 colors	32,768 colors	32,768 colors	4,096 colors
	Images displayed via video input (See note 2.)	260,000 colors	260,000 colors	260,000 colors	---
Screen data capacity		20 Mbytes	20 Mbytes	20 Mbytes (See note 1.)	6 Mbytes
Memory Card		❍	❍	❍	❍
Ladder Monitor function		❍	❍	❍	---
Video Input Unit support		❍	❍	❍	---
Controller Link Interface Unit support		❍	❍	---	---

Note: 1. The screen data capacity of the NS8-V1 depends on the model.
2. The video input is not supported by NS5-V1.

With an NS-series PT, just drag and drop Smart Active Parts to customize the interface for your machine.

NS-series PTs provide Smart Active Parts that allow direct data access to a variety of devices.



A SYSMAC CS/CJ-series PLC's Ladder Program can be monitored from an NS-series Programmable Terminal after the System is started.

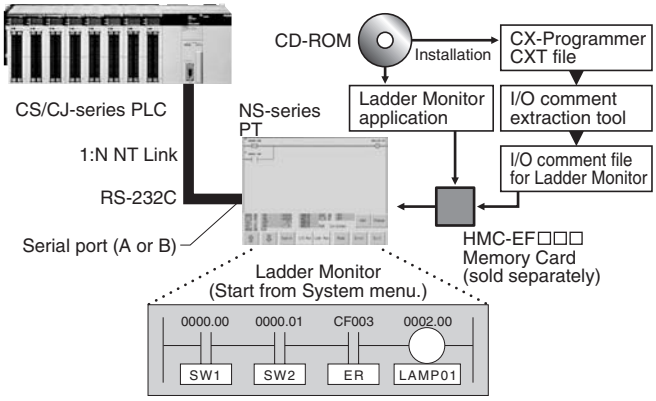
NS Ladder Monitor

■ Monitoring/Editing the Ladder Program

Do You Need to Monitor Execution of the PLC's Ladder Program?

● Ladder Monitor Function

Save the NS-EXT01 Ladder Monitor system program on a Memory Card and install the Memory Card to enable monitoring of a ladder program (I/O bit status monitor, address/instruction search, multiple I/O bit monitor, etc.) being executed in a CS/CJ-series PLC connected by a serial connection. It is also possible to display I/O comments created with the CX-Programmer.



Note: The PLC operation can be monitored only if the PLC is a CS/CJ-series PLC connected to serial port A or serial port B of the Programmable Terminal with 1:N NT Link protocol.

Standard Models

Model name	Specifications	Ethernet	Case color	Model number
NS12 PT	12-inch TFT 800 x 600 dots	No	Ivory	NS12-TS00-V1
			Black	NS12-TS00B-V1
		Yes	Ivory	NS12-TS01-V1
			Black	NS12-TS01B-V1
NS10 PT	10-inch TFT 640 x 480 dots	No	Ivory	NS10-TV00-V1
			Black	NS10-TV00B-V1
		Yes	Ivory	NS10-TV01-V1
			Black	NS10-TV01B-V1
NS8 PT	8-inch TFT 640 x 480 dots	No	Ivory	NS8-TV00-V1
			Black	NS8-TV00B-V1
		Yes	Ivory	NS8-TV01-V1
			Black	NS8-TV01B-V1
NS5 PT	5-inch TFT 320 x 240 dots	No	Ivory	NS5-SQ00-V1
			Black	NS5-SQ00B-V1
		Yes	Ivory	NS5-SQ01-V1
			Black	NS5-SQ01B-V1
NS-Designer Screen design software	Windows version on CD-ROM			NS-NSDC1-V6
Cable (See note 1.)	Screen transfer cable for IBM PC/AT or compatible			XW2Z-S002
	USB Host Cable, cable length: 5 m			NS-US52 (5 m)
	USB Host Cable, cable length: 2 m			NS-US22 (2 m)
PT-to-PLC Connecting Cable	PT connection: 9 pins PLC connection: 9 pins	Length: 2 m		XW2Z-200T
		Length: 5 m		XW2Z-500T
Accessories	Ladder Monitor Software	One CD-ROM Ladder Monitor application (See note 1.) and I/O Comment File Extraction Tool (See note 2.)		NS-EXT01-V2
				NS-EXT01-V2L03 (3 licenses)

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

■ Options

Model name	Specifications		Model number
Video Input Unit	Inputs: 4 channels Signal type: NTSC/PAL		NS-CA001
	Inputs channels: 2 video channels and 1 RGBI channels (See note 5.) Signal model: NTSC/PAL		NS-CA002
Special Cable for the Console			F150-VKP (2m)
			F150-VKP (5m)
Controller Link Interface Unit	For Controller Link Communications		NS-CLK21
RS-422A Adapter	Transmission distance: 500 m total length Note: User this model when connecting PT models without a V1 Suffix. Note: PT models with a suffix of V1 can also be connected.		NS-AL002
	Transmission on distance: 50 m total length Note: Only PT models with a suffix of V1 are connectable. Use the NS-002 to connect models without a V1a suffix.		CJ1W-CIF11
Sheet/Cover (See note 4.)	Anti-reflection Sheets (5 surface sheets)	NS12/10	NS12-KBA04
		NS8	NS7-KBA04
		NS5	NS31C-KBA04
	Anti-reflection Sheets (5 surface sheets) (anti-reflection coating)	NS12/10	NS12-KB0A05
		NS8	NS7-KBA05
		NS5	NS31C-KBA05
	Protective Covers (5 pack) (Transpareant)	NS12/10	NS12-KBA05
		NS8	NS7-KBA05
		NS5	NS31C-KBA05N
Attachment	(NT625C/631/631C Series to NS12 Series)		NS12-ATT01
	(NT625C//631/631C Series to NS12 Series)		NS12-ATT01B
	(NT600M//600G/610G/612G Series to NS8 Series)		NS8-ATT01
	(NT620S//620C/600C Series to NS8 SEries)		NS8-ATT01B
Memory Card		15 MB	HMC-EF172
		30 MB	HMC-EF372
		64 MB	HMC-EF672
Memory Card Adapter			HMC-AP001
Battery			CPM2A-BAT01
Bar Code Reader (Refer to the Catalog for details.)			V520-RH21-6

Note: 1. Be sure to use cables made by OMRON when connecting NS hardware to a printer.
2. NS-series PT application used to monitor a SYSMAC CS/CJ-series PLC's ladder program from the PT.
3. This tool extracts I/O comment data from the CX-Programmer's CXT file and converts the data to a format that can be used by the Ladder Monitor Software for NS.
4. Chemical-resistant Cover NT30-KBA01 is available for only the NS5.
5. One screen cannot display two video inputs simultaneously.

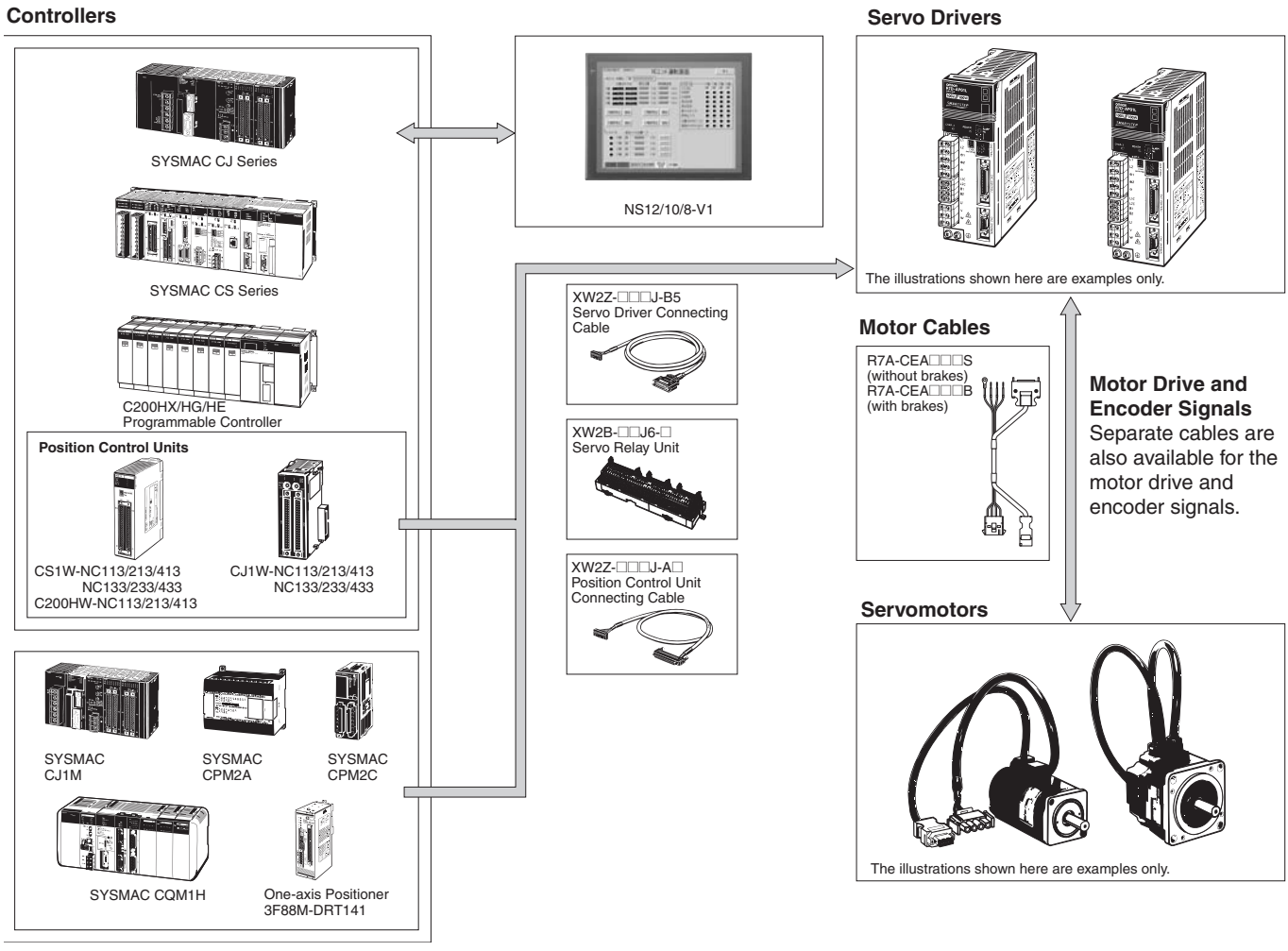
Servo Systems

■ R7M-A/R7D-A AC SMARTSTEP Servomotors/Servo Drivers

SMARTSTEP Provides an Easy-Setup Operation Environment

- A lineup of control cables ensures easy connections between the Driver and a variety of controllers. A single cable is all that is required to connect the motor as well. Special reduction gears are available.
- Easily achieve a monitoring/debugging system by combining NS-series PTs with OMRON SYSMAC CJ- or CS-series PLCs. A complete line of specialized tools, such as Monitoring Software and Parameter Units, is also available.
- Easy system setup is possible from front-panel switches. The system does not require time-consuming parameter settings and the Servomotor can be used as easily as a stepping motor.
- Servomotor Capacities
  30 W, 50 W, 100 W, 200 W, 400 W, 750 W

System Configuration



Note: Refer to the *SMARTSTEP* catalog (Cat. No. I807) for details.

■ R88M-W/R88D-W AC Servomotors/Servo Drivers (OMNUC W Series)

The Performance, Response, Speed, and Control Accuracy Required of Servos Onsite: Greatly Improve Machine Performance and Productivity

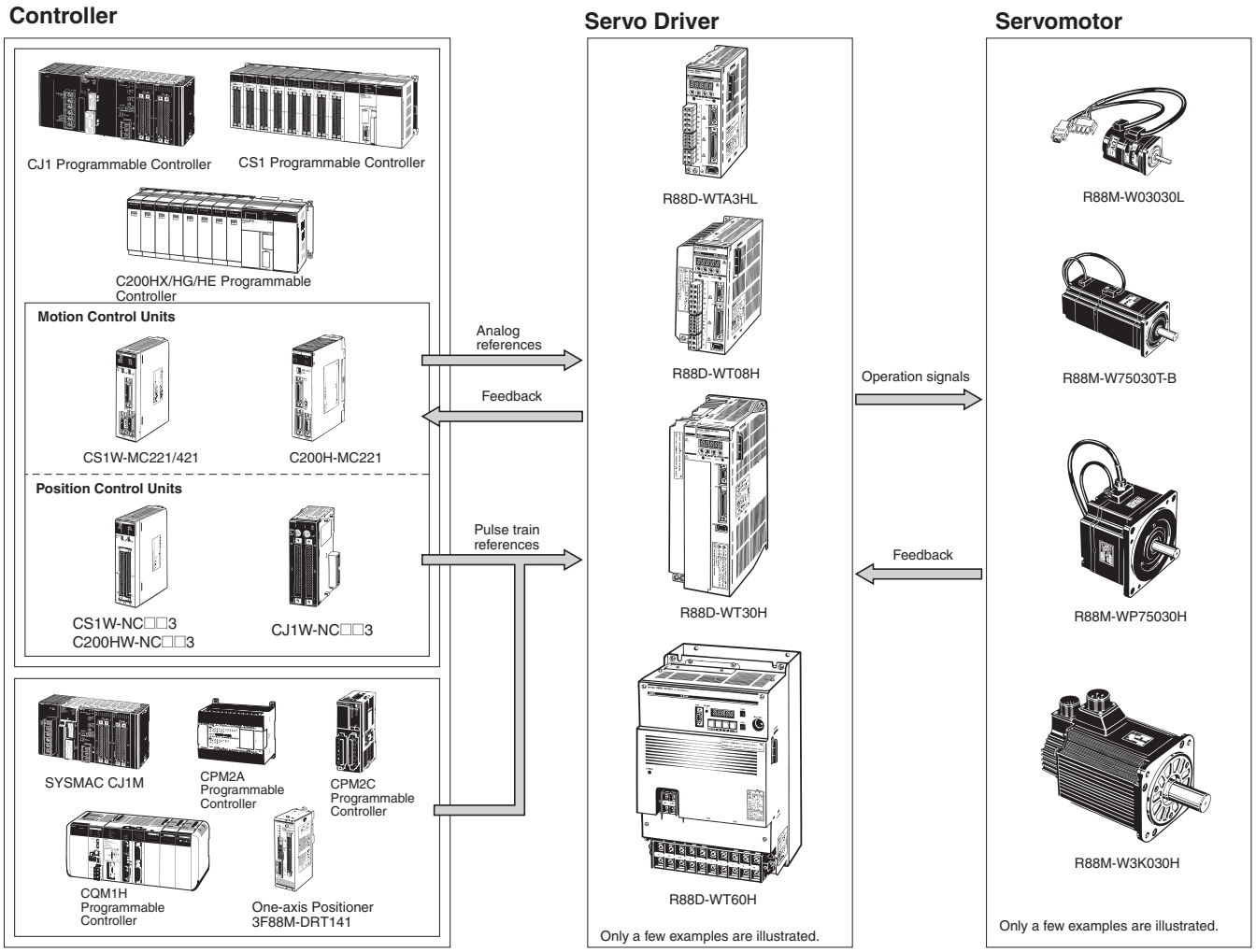
AC Servo Drivers

- Control algorithms greatly reduce positioning time (1/3rd of OMRON U Series).
- Online auto-tuning to automatically measure machine characteristics and easily adjust the servo gain.

AC Servomotors

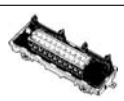
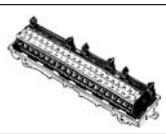
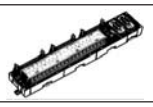
- Comprehensive lineup: Models with brakes, models with gears, 1,000-r/min models (300 W to 5.5 kW), 1,500-r/min models (450 W to 15 kW), and 3,000-r/min models (30 W to 5 kW).
- Greatly reduce motor speed ripple for smoother operation.
- Maximum speeds of 5,000 r/min and high-resolution serial encoder for a fast, accurate drive (not provided on all models).

System Configuration



■ XW2B Servo Relay Units

Combinations of Servo Relay Units, Servo Drivers, and Position Control

Position Control Units	Position Control Unit Connecting Cables	Servo Relay Units	Servo Driver Connecting Cables	Servo Drivers
				
C200H-NC112	XW2Z-□□□J-A1	XW2B-20J6-1B (See note 1.)	(See notes 2 and 3.) 	
	XW2Z-□□□J-A4 (For R7D-AP only)		SMARTSTEP A-series Connecting Cable	SMARTSTEP A-series Servo Driver
C200HW-NC113 CS1W-NC113	XW2Z-□□□J-A6		XW2Z-□□□J-B5 Communications function not supported (XW2B-□□J6-□B only.)	R7D-AP□□□
	XW2Z-□□□J-A8 (For R7D-AP only)			
CS1W-NC133	XW2Z-□□□J-A10			
	XW2Z-□□□J-A12 (For R7D-AP only)			
CJ1W-NC113	XW2Z-□□□J-A14			
	XW2Z-□□□J-A16 (For R7D-AP only)			
CJ1W-NC133	XW2Z-□□□J-A18			
	XW2Z-□□□J-A20 (For R7D-AP only)			
3F88M-DRT141	XW2Z-□□□J-A24			
	XW2Z-□□□J-A25 (For R7D-AP only)			
				
C200H-NC211	XW2Z-□□□J-A2	XW2B-40J6-2B (See note 1.)	(See notes 2 and 3.) 	
	XW2Z-□□□J-A5 (For R7D-AP only)		OMNUC W-series Connecting Cable	OMNUC W-series Servo Driver
C200HW-NC213/413 CS1W-NC213/413	XW2Z-□□□J-A7		XW2Z-□□□J-B4	R88D-WT□□H□
	XW2Z-□□□J-A9 (For R7D-AP only)			
CS1W-NC233/433	XW2Z-□□□J-A11			
	XW2Z-□□□J-A13 (For R7D-AP only)			
CJ1W-NC213/413	XW2Z-□□□J-A15			
	XW2Z-□□□J-A17 (For R7D-AP only)			
CJ1W-NC233/433	XW2Z-□□□J-A19			
	XW2Z-□□□J-A21 (For R7D-AP only)			
	(See note 3.) 	(See note 3.) 	(See notes 2 and 3.)	
CQM1-CPU43-V1 CQM1H-PLB21	XW2Z-□□□J-A3	XW2B-20J6-3B (See note 1.)	SMARTSTEP A-series Connecting Cable	SMARTSTEP A-series Servo Driver
CS1W-HCP222 (for 1 axis)	XW2Z-□□□J-A22		XW2Z-□□□J-B5 Communications function not supported (XW2B-□□J6-□B only.)	R7D-AP□□□
CS1W-HCP22 (for 2 axes)	XW2Z-□□□J-A23			
	(See note 5.) 		(See notes 2 and 3.)	
CS1W-NC113/213/413	XW2Z-□□□J-A9	XW2B-40J6-4A	SMARTSTEP A-series Connecting Cable	SMARTSTEP A-series Servo Driver
CS1W-NC133/233/433	XW2Z-□□□J-A13		XW2Z-□□□J-B7 Communications function supported (XW2B-40J6-4A only).	R7D-AP□□□
CS1W-NC/113/213/413	XW2Z-□□□J-A17			
CS1W-NC133/233/433	XW2Z-□□□J-A21			

Serial Communications Unit/Board	Serial Communications Unit/Board Connecting Cable
(See note 6.) 	
CS1W-SCB41	XW2Z-□□□J-C1
CJ1W-SCU41	

Note: 1. Satisfies the functions of conventional models such as the XW2B-20J6-2, XW2B-40J6-2, and XW2B-20J6-3 and can be connected to the R88D-UEP□□□ or R7D-AP□□□.

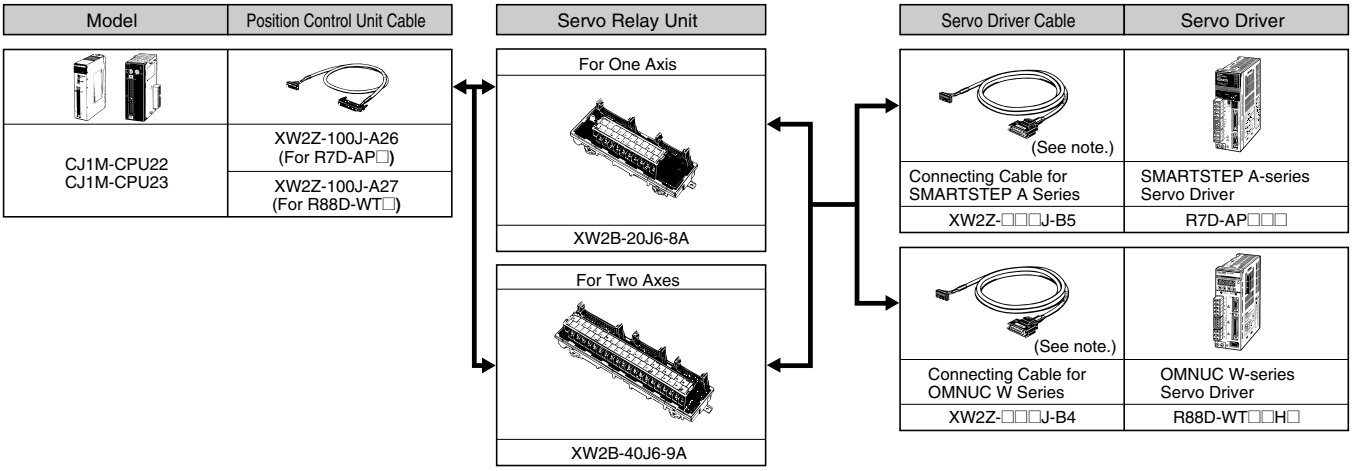
2. When connecting to a C200H-NC211, C200HW-NC213/-413, or CS1W-NC213/-233/-413/-433, two Servo Driver Connecting Cables are required for one Relay Unit.

3. When using the CQM1-CPU43-V1 for two axes, two Position Control Unit Connecting Cables, two Relay Units, and two Servo Driver Connecting Cables are required.

4. Use the following Connecting Cables:
C200H-NC112: XW2Z-□□□J-A4 C200HW-NC113, CS1W-NC113: XW2Z-□□□J-A8
C200H-NC211: XW2Z-□□□J-A5 C200HW-NC213/-413, CS1W-NC213: XW2Z-□□□J-A9

5. Do not wire signals to the Y-axis terminals of the XW2B-40J6-4A when using a One-axis Position Control Unit.

6. Connect these Cables to the communications connector of the XW2B-40J6-4A when using two axes or more.



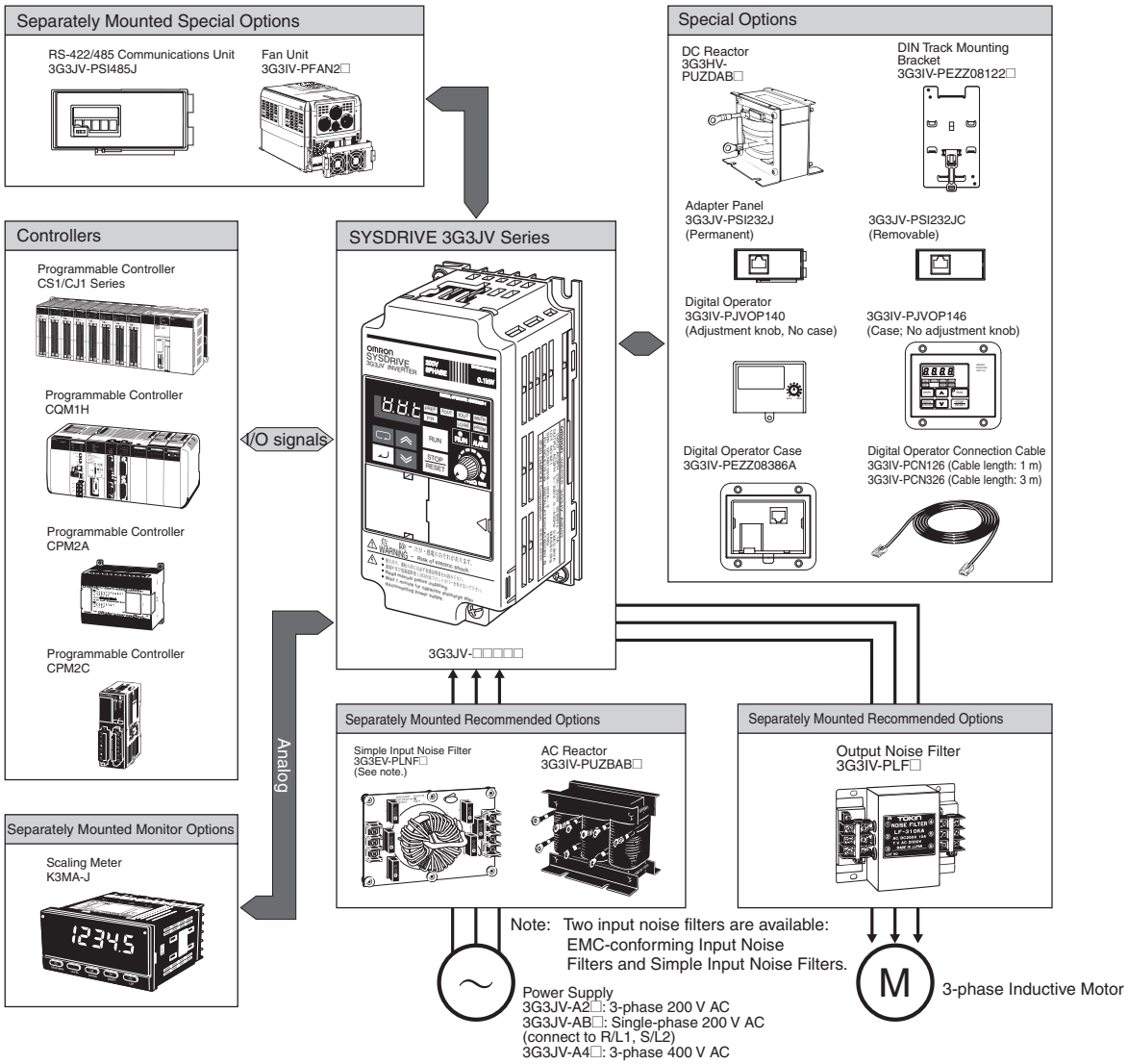
Note: When using the Unit for two axes, two Servo Driver Cables are required for each Servo Relay Unit.

■ SYSDRIVE 3G3JV-series Compact Simplified Inverters

Economic Compact Inverter with Versatile Functions for Easy Application, Maintenance, and Speed Control

- The speed adjuster on the front panel ensures easy speed control.
- Offers versatile speed control operations such as multi-step speed control up to a maximum of eight steps, jog operations, and acceleration and deceleration (UP/DOWN) control.
- Numerous easy-to-use functions including slip compensation, overtorque detection, and speed search functions packed into a compact body.
- A cooling fan can be snapped on in a single action, making mounting and removal easy, and simplifying maintenance.
- Compact size for easily building into panels.
- The main circuit terminals are arranged on the top and bottom of the housing, making it possible to mount the Inverter like a contactor. The optional DIN Track Mounting Bracket enables the Inverter to be easily mounted to a DIN Track in one easy action.
- Conforms to CE and UL/cUL standards.

System Configuration

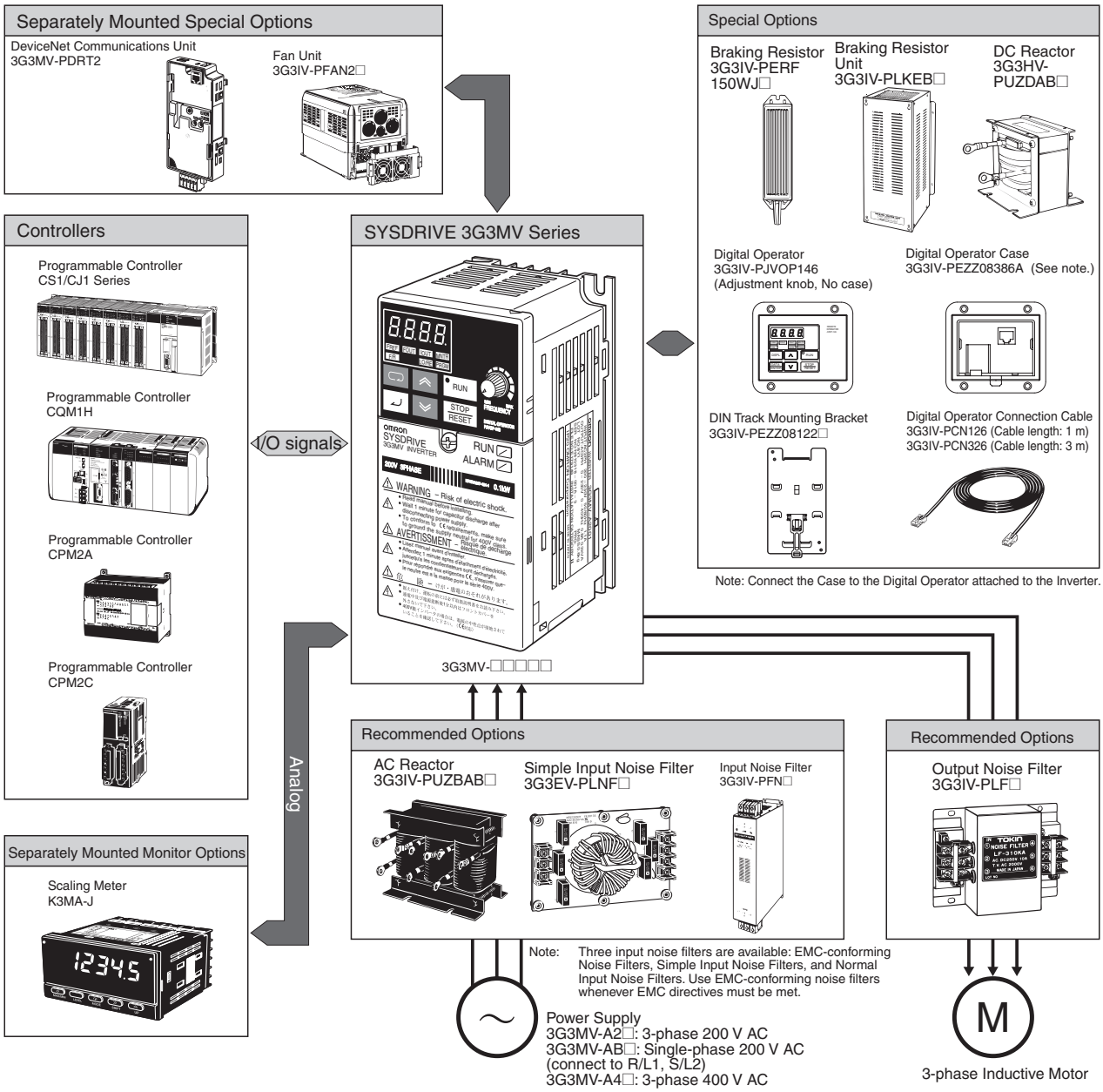


Peripheral Devices

■ SYSDRIVE 3G3MV-series Multi-function Compact Inverters

Powerful with Complete Functions and New Networking Capabilities

- Sensor-free vector control function to deliver high torque at low speeds.
- RS-422/485 communications are provided as a standard feature and an optional DeviceNet Communications Unit is available for complete network compatibility.
- Even easier to use, with frequency control located on the top of the Digital Operator, and parameter constants able to be copied and managed from a standard Digital Operator.
- Standard features include energy-saving control and PID control. The high-speed current limit function further improves tripless operation.
- Incorporates an inrush current preventive circuit for even more robust protection.
- Conforms to CE and UL/cUL standards.



Open Network Controllers

■ ITNC-EI□01 (-DRM/-CST) Open Network Controller

Information Station for Manufacturing Equipment and Production Lines

- Simply put, the ONC is an information station. It provides onsite information to your information system from manufacturing equipment and production lines by sending data collected from PLCs, DeviceNet, Temperature Controllers, Digital Panel Meters, and other FA components via Ethernet, intranet, and Internet connections. It can be used to add advanced information capabilities to equipment and production facilities without changing the PLC system.

Ordering Information

Hardware

Name	Specifications	Model
Version 2	Expansion slot (See note 1.); Three RS-232C ports and one RS-422A/485 port; No DeviceNet interface	ITNC-EPX01
Version 2 with DeviceNet	Expansion slot (See note 1.); Three RS-232C ports and one RS-422A/485 port; DeviceNet interface	ITNC-EPX01-DRM
Version 1 Standard model	No expansion slot; Two RS-232C ports; No DeviceNet interface	ITNC-EIS01
Version 1 Standard model with DeviceNet	No expansion slot; Two RS-232C ports; DeviceNet interface	ITNC-EIS01-DRM
Version 1 Expandable model	Expansion slot (See note 2.); Two RS-232C ports and one RS-422A/485 port; No DeviceNet interface	ITNC-EIX01
Version 1 Expandable model with DeviceNet	Expansion slot (See note 2.); Two RS-232C ports and one RS-422A/485 port; DeviceNet interface	ITNC-EIX01-DRM
Version 1 Standard model with CS1 Bus Interface	No expansion slot; Two RS-232C ports; CS1 bus interface (See note 3.)	ITNC-EIS01-CST
Version 1 Expandable model with CS1 Bus Interface	Expansion slot (See note 2.); Two RS-232C ports and one RS-422A/485 port; CS1 bus interface (See note 3.)	ITNC-EIX01-CST
CS1 Bus Interface Cable	Cable length: 1 m	ITBC-CN001-CST
	Cable length: 5 m	ITBC-CN005-CST
	Cable length: 12 m	ITBC-CN012-CST
Standard model with Mounting Bracket for vertical mounting	For version 1	ITNC-AP001
Expandable model with Mounting Bracket for vertical mounting	For version 1	ITNC-AP002
DIN Track Mounting Bracket	Common to standard and expandable model	ITNC-DIN01

Note: 1. The expansion slot is a PCI bus slot into which either a Controller Link Support Board, SYSMAC Link Support Board, or CS1 Bus Interface Board (PCI bus type) can be mounted. Only one slot is provided.

2. The expansion slot is an ISA bus slot into which either a Controller Link Support Board, SYSMAC Link Support Board, or SYSMAC Board (ISA bus type) can be mounted. Only one slot is provided.

3. Models with CS1 bus interfaces cannot be connected to DeviceNet.

Software (for Both ONC Version 1 and Version 2)

Name	Licensed product	Specifications	Model
Data Collection/Distribution Service Software Ver. 2.00 (See note 2.)	Available (for 1 user, 5 users, or 10 users)	A Memory Card (15 Mbytes min.) must be purchased separately. (See note 1.)	ITNC-DL1Q-ECD-V2
WebToolKit Software Ver. 1.00			ITNC-WK1Q-ECD
RemoteKit Software Ver. 1.11			ITNC-RK1Q-ECD
DataBase ToolKit Software Ver. 1.00			ITNC-DK1Q-ECD
Third-party PLC Connection Unit Ver. 1.00 (Mitsubishi A-series Computer Link Unit)	None	---	ITNC-MD1Q-EF
NX-Server for DeviceNet ONC Edition Ver. 2.00			ITNC-NS1Q-EF

Note: 1. A Memory Card (sold separately) is required for ONC version 1. A Memory Card is not required for ONC version 2 if the available space in the internal disk is sufficient.

2. A Memory Card is also recommended for ONC version 2.

General Specifications

Item		Ver. 1		Ver. 2
		ITNC-EIS01 ITNC-EIS01-DRM ITNC-EIS01-CST	ITNC-EIX01 ITNC-EIX01-DRM ITNC-EIX01-CST	ITNC-EPX01 ITNC-EPX01-DRM
CPU		486 compatible, CPU: 66 MHz, equivalent to 486SX		486 compatible, CPU: 133 MHz, equivalent to 486DX
FPU		None (software emulation)		Provided
Memory		16 Mbytes		32 Mbytes
Internal disk		Flash disk, 8 Mbytes		Flash disk, 32 Mbytes
Interface	LAN	10Base-T		10Base-T/100Base-TX
	Serial ports	Two RS-232C ports	Two RS-232C ports and one RS-422A/485 port	Three RS-232C ports and one RS-422A/485 port
	DeviceNet	Available (ITNC-EIS01-DRM only)	Available (ITNC-EIX01-DRM only)	Available (ITNC-EPX01-DRM only)
	CS1 bus interface	Available (ITNC-EIS01-CST only)	Available (ITNC-EIX01-CST only)	None
CF card slot		None	One ISA bus slot (half size)	One PCI bus slot (half size)
Memory card		One slot		
Power supply		24 VDC, 15 W max.	24 VDC, 20 W max.	24 VDC, 20 W max.
Backup memory		None		Provided
Setup utility		No Setup/Maintenance Utility (use a Dedicated Memory Card)		Setup/Maintenance Utility installed in internal disk

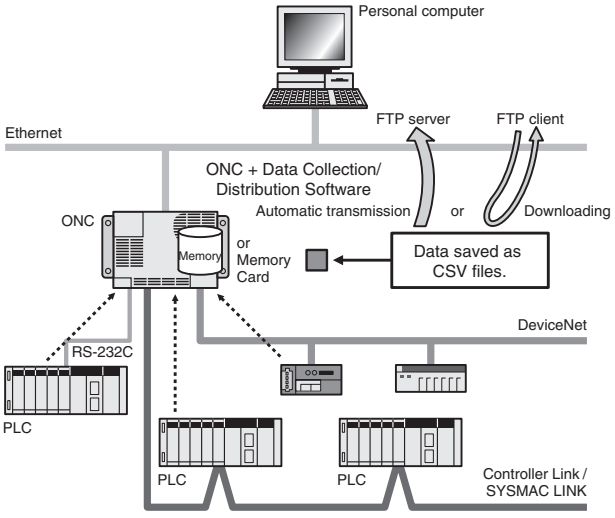
Application as a Data Collection Station

Collect Data and Send It Using FTP

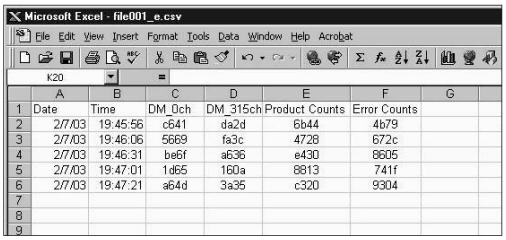
Collect data under the required conditions from PLCs (see note 1) connected via various networks and from DeviceNet slaves (see note 2) and save it in CSV or binary files in the Memory Card in the ONC. Without any changes to the PLC system, the ONC can be used as a collection station for production, error, inspection, and history data.

Note: 1. CIO and DM Area data from the PLC can be collected if it is set for event memory in the ONC or specified for a serial connection.

2. Periodic collection: Collection at a specified time interval, such as 500 ms.
Event collection: Collection when some event occurs, such as a change in I/O status or data contents in the PLC or in DeviceNet devices.
Example: Collecting status information when an error occurs by using the occurrence of an error in processing or inspections on the production line as the event.
Scheduled collection: Collection at specific times, such as each hour.
Example: Collection every hour on the hour, such as 12:00 noon, 1:00 PM, etc. (minimum setting: every minute)



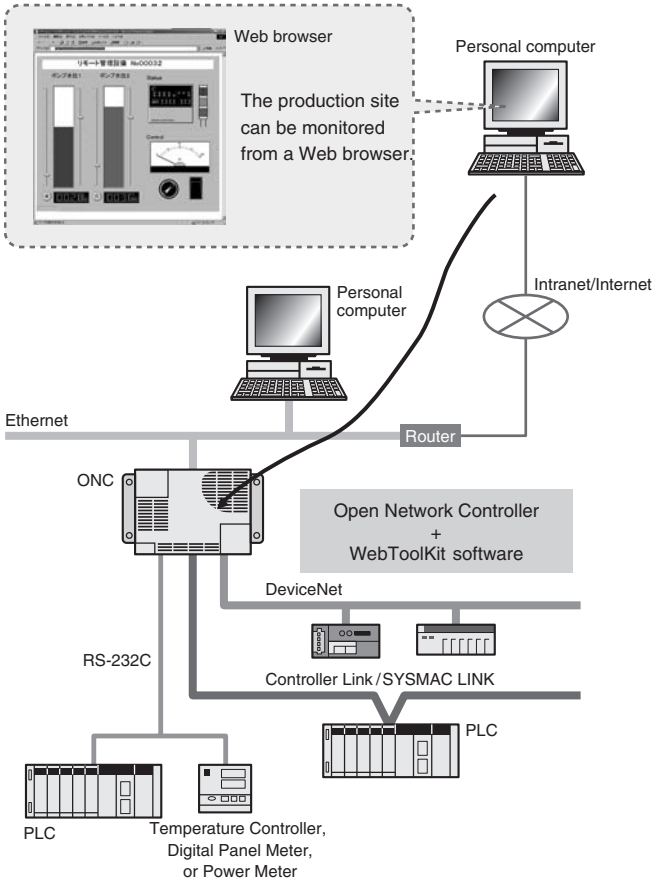
Example: Data collected using the Data Collection/Distribution Software can be displayed in Excel as shown below. A sample CSV file is shown set to collect data when bit 00 in CIO 0000 turns ON. The date can be added each time data is collected, and field names can be attached.



WebToolKit for ONC Application as a Browser Station

Information from FA components connected to the ONC can be viewed from a Web browser running on a personal computer connected to Ethernet, an intranet, or Internet (see note). This enables using Internet Explorer on your computer for monitoring. The WebToolKit is a development kit for building Web applications using Visual Basic or Java. The Web application is built in the ONC, allowing Web browsers running on personal computers to monitor data. (The computer is used as a graphic terminal.)

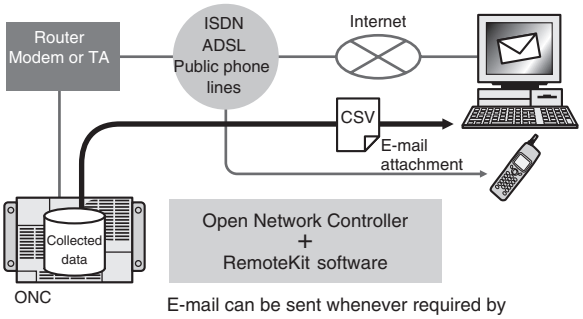
Note: Obtain a fixed IP address from the provider to use Internet.



RemoteKit for ONC Application as an E-mail Station

E-mail can be sent from the ONC to personal computers or cell phones on specified conditions (see note). Files created by the Data Collection/Distribution Software can also be attached to e-mail sent to personal computers. This enables e-mail to be used to provide status reports periodically, when errors occur, or at scheduled times. Dialup connections can be automatically processed through a modem to your ISP.

Note: E-mail can be sent based on a schedule or according to changes in bits or analog data from components connected to the ONC, such as PLCs or DeviceNet slaves.



E-mail can be sent whenever required by installing a single ONC in the facility (e.g., gas turbine power generation plants).

NOTE

Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. 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.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

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

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 this product.

NEVER USE THE PRODUCT 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 PRODUCT IS 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 product.

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.