

# Programmable Controller

## CS1D Duplex System

The image features a futuristic tunnel with glowing yellow light trails on the floor. Floating within the tunnel are various PLC programming elements:

- Ladder Logic:** A sequence starting with 'Initial', followed by 'Condition1 - TRUE', 'Step2', 'Condition2 - FALSE', 'Step3', 'Condition3 - TRUE', and 'Step4.1'.
- Code Snippets:**

```

IF (P_DoRecvData = TRUE) AND (Process = 0) THEN
  Process := 1;
  P_DoRecvData := FALSE;
END_IF;

CASE paramt OF
  1: val := INT#10;
  2: val := INT#20;
  3: val := INT#30;
  ELSE: val := Def;
END_CASE;

SendData
CPU010_SendData (BOOL) ENO
(BOOL) ENO
(BOOL) BUSY
(BOOL) OK
(BOOL) NG
(WORD) SendDataID
(INT) SendAreaNo
(WORD) RecvDataID
(INT) RecvAreaNo
(INT) DataSize

```

At the bottom, a row of OMRON CS1D Duplex PLC units is shown. The units are labeled 'PA207R CS' and 'POWER'. The 'DUPLEX' label is visible on the front panel of the units.

Easily create redundant systems

Improve development productivity with FB, ST, and SFC

# CS1D brings greater development productivity and reliability to various redun



Monitoring and control at water and sewage plants

## Minimize effects of inevitable failures

- The system cannot be stopped during 24 h/day operation.
  - Recovery costs are very high if the system goes down.
  - An unexpected system stop can lead to a disastrous incident, such as the leakage of a toxic substance.
- In systems like these that demand high reliability, it is important to implement risk management to prepare for possible problems.

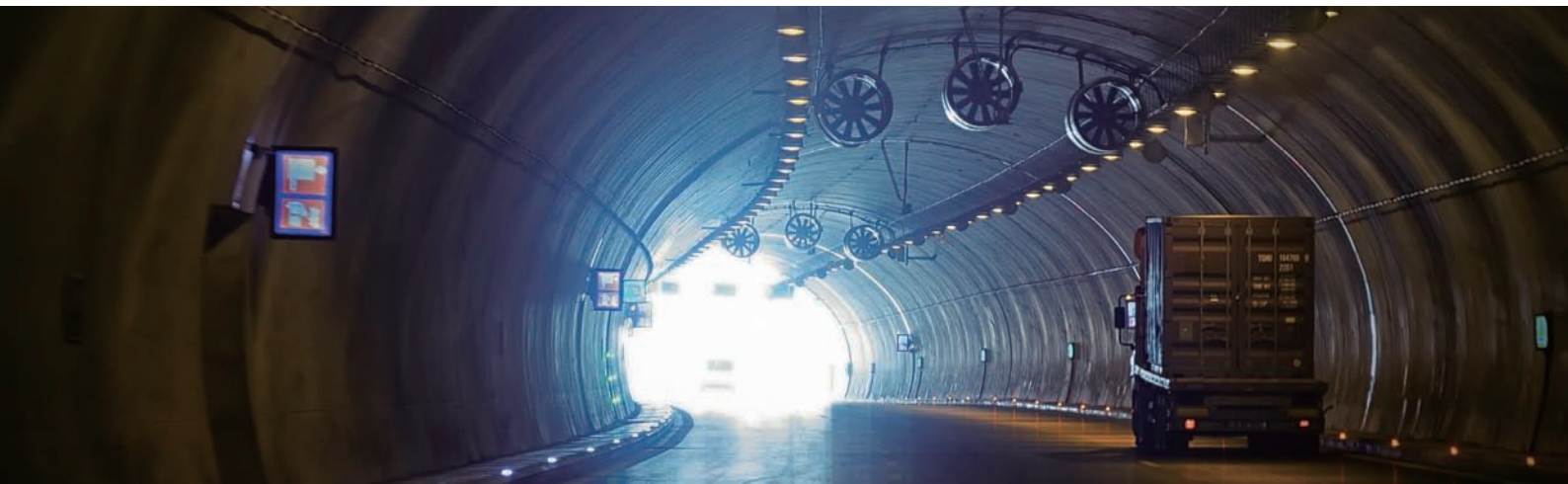
## Omron offers advanced duplex PLC for risk management in your system

Adding redundancy in the system is an effective step to reduce risk. In order to meet customers' needs for system reliability, Omron has packed its proven duplex PLC technology into the CS Series, providing highly reliable PLC systems.

The advanced CS1D Duplex System supports the IEC 61131-3 programming languages, ST and SFC. You can flexibly combine different languages. FBs allow you to reuse and share programs, which will help improve development productivity.

In addition, the high-capacity CPU unit provides sufficient program capacity (400K steps) and data memory (832K words) and offers a flexible environment that supports structured and modular programming.

# dant systems

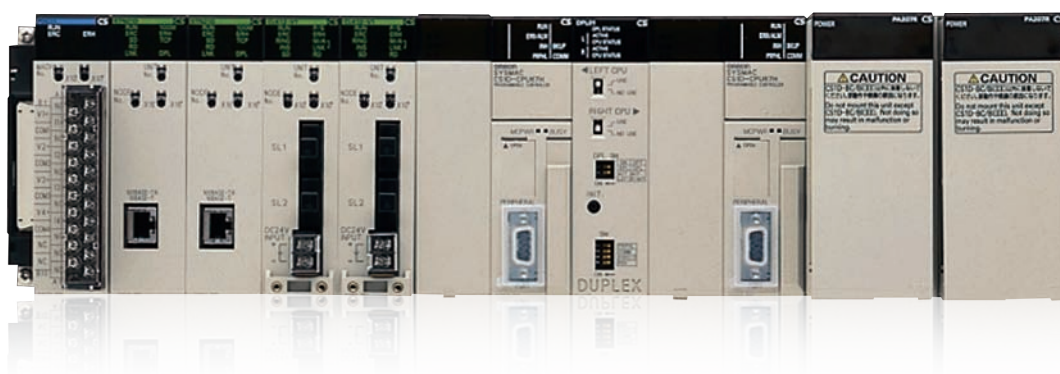


Monitoring and control of air conditioning and lighting in tunnels



Monitoring and control of air conditioning and lighting in underground utility tunnels

Programmable Controller  
**CS1D** **DUPLEX SYSTEM**

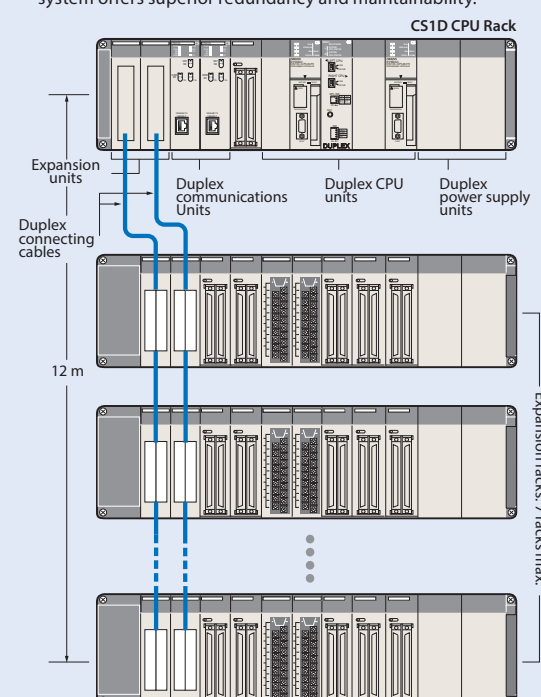


# Flexible configuration to suit your system requirements

## Choose the level of redundancy needed

Omron offers a diverse range of duplex system configurations to match your system requirements. In addition to dual CPU units and power supply units, you can use dual communications units (Controller Link or Ethernet) and expansion cables.

| System name                                  |                          |                                            |
|----------------------------------------------|--------------------------|--------------------------------------------|
|                                              |                          |                                            |
| Configuration                                |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
|                                              |                          |                                            |
| Unit that can be duplexed                    | CPU unit                 |                                            |
|                                              | Power supply unit        |                                            |
|                                              | Communications unit      | Controller Link (Optical ring)<br>Ethernet |
|                                              | Expansion cable          |                                            |
| Replacing or adding unit during power supply | Replacing unit           | CPU unit                                   |
|                                              |                          | Power supply unit                          |
|                                              |                          | Duplex unit                                |
|                                              |                          | I/O expansion unit                         |
|                                              |                          | Basic I/O unit                             |
|                                              |                          | Special I/O unit                           |
|                                              |                          | CPU bus unit                               |
|                                              | Adding unit or backplane | Basic I/O unit                             |
|                                              |                          | Special I/O unit                           |
|                                              |                          | Expansion backplane                        |
| Long-distance expansion system               |                          |                                            |
| Details                                      |                          |                                            |

| SYSTEM1 Duplex CPU, Dual I/O Expansion System                                                                                                                                                                                                                                                                        |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>Cables connecting between a duplex CPU system and expansion systems are also duplexed. This fully duplexed system offers superior redundancy and maintainability.</p>  <p>*The CS1D CPU Unit must be version 1.3 or later.</p> |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes (Can be replaced without a programming device)                                                                                                                                                                                                                                                                   |  |
| Yes (Can be replaced without a programming device)                                                                                                                                                                                                                                                                   |  |
| Yes (Can be replaced without a programming device)                                                                                                                                                                                                                                                                   |  |
| Yes (Can be replaced without a programming device)                                                                                                                                                                                                                                                                   |  |
| Yes (Can be replaced without a programming device)*1                                                                                                                                                                                                                                                                 |  |
| Yes (Can be replaced without a programming device)*1                                                                                                                                                                                                                                                                 |  |
| Yes (Can be replaced without a programming device)*1                                                                                                                                                                                                                                                                 |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| Yes                                                                                                                                                                                                                                                                                                                  |  |
| No                                                                                                                                                                                                                                                                                                                   |  |
| Page 14                                                                                                                                                                                                                                                                                                              |  |

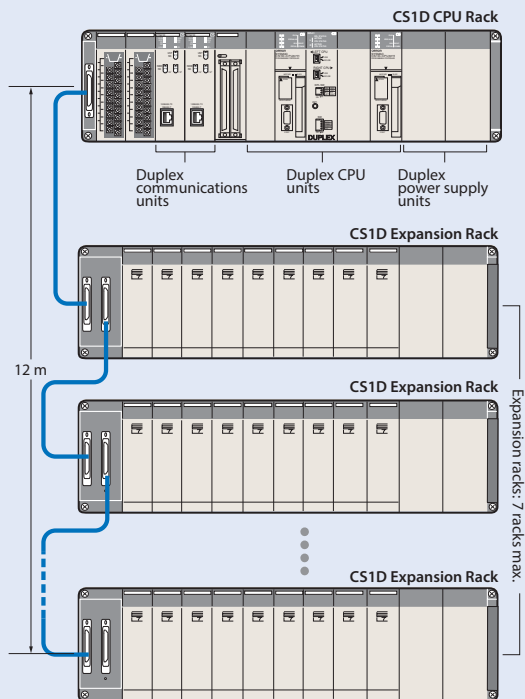
\*1. Enable the *Removal/Addition of Units without a Programming Device* function in the PLC Setup.

\*2. The unit must be version 1.2 or later.

\*3. Enable the *Unit Removal without a Programming Device* function in the PLC Setup to remove the unit without a programming device.

## SYSTEM2 Duplex CPU, Single I/O Expansion System

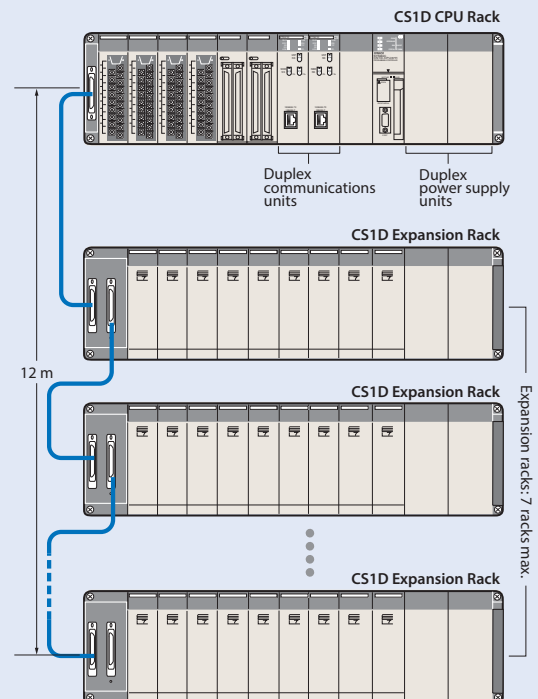
The main system components (CPU units, power supply units, and communications units) can be duplexed. Units can be replaced during operation using a programming device.



|                                                       |
|-------------------------------------------------------|
| Yes                                                   |
| Yes                                                   |
| Yes                                                   |
| Yes                                                   |
| No                                                    |
| Yes (Can be replaced without a programming device)    |
| Yes (Can be replaced without a programming device)    |
| No                                                    |
| No                                                    |
| Yes (Can be replaced using a programming device)*2,*3 |
| Yes (Can be replaced using a programming device)*2,*3 |
| Yes (Can be replaced using a programming device)*2,*3 |
| Yes                                                   |
| Yes                                                   |
| No                                                    |
| Yes                                                   |

## SYSTEM3 Single CPU System

This system is ideal when you want to improve network redundancy and replace a power supply unit or other units online. The CPU unit cannot be duplexed.

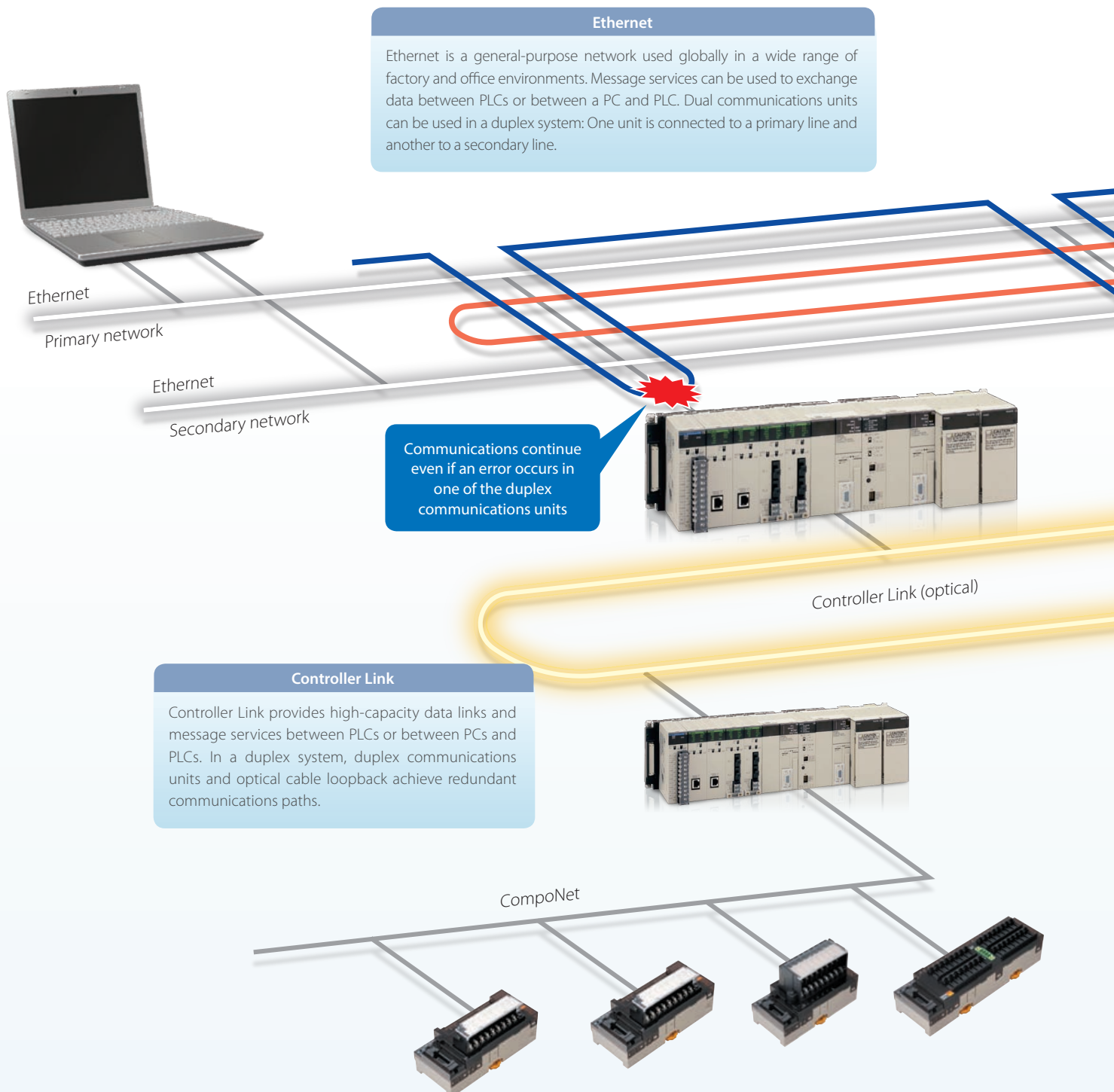


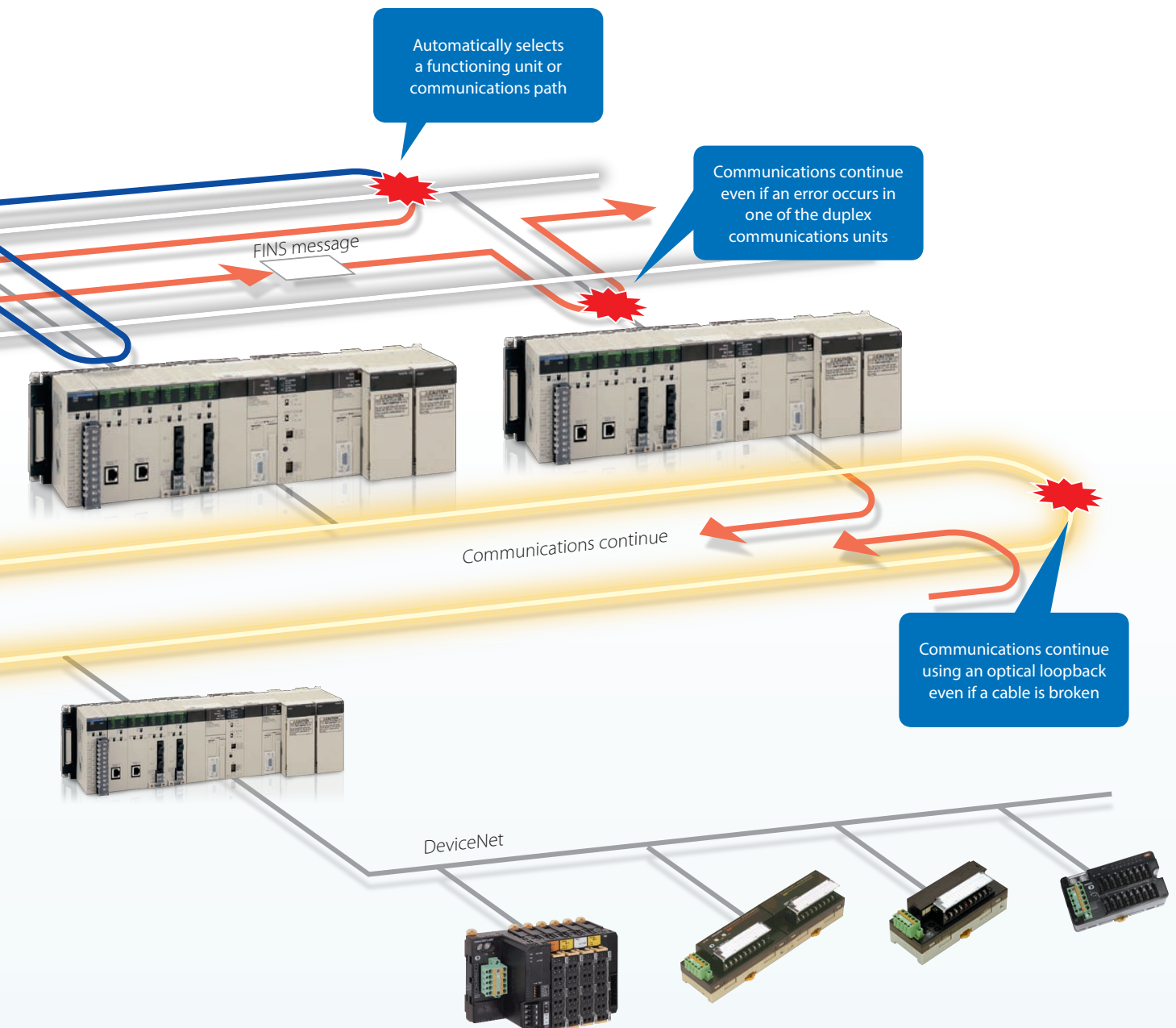
|                                                    |
|----------------------------------------------------|
| No                                                 |
| Yes                                                |
| Yes                                                |
| Yes                                                |
| No                                                 |
| No                                                 |
| Yes (Can be replaced without a programming device) |
| No                                                 |
| No                                                 |
| Yes (Can be replaced using a programming device)   |
| Yes (Can be replaced using a programming device)   |
| Yes (Can be replaced using a programming device)   |
| No                                                 |
| No                                                 |
| No                                                 |
| Yes                                                |

## Supports a variety of network configurations

Redundant communications can be created via Ethernet and Controller Link which is widely used in FA applications.

A variety of networks are available at the I/O level, including open networks DeviceNet and CompoNet with a proven track record in the CS1 Series.





# Easy installation and operation of reliable systems

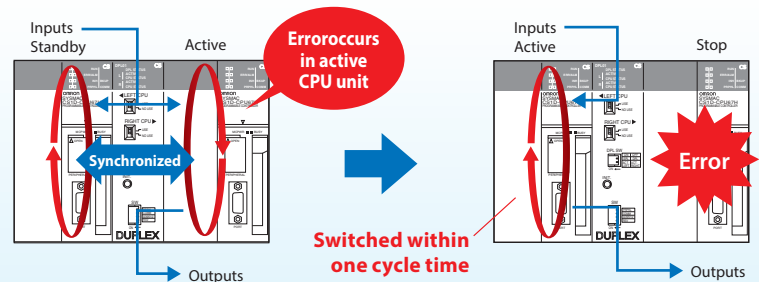
## Easy duplexing of CPU units

All programs and data in the active CPU unit are automatically transferred to the standby CPU unit to synchronize them between CPU units.

This eliminates the need to select synchronized data or transfer individually.

When an error occurs in the active CPU unit, the standby CPU unit takes over control immediately (within one cycle time).

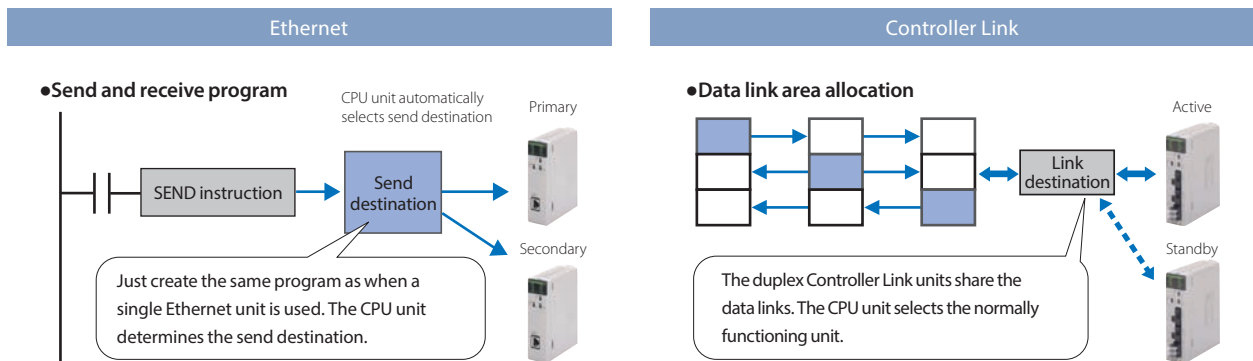
The active and standby CPU units always operate synchronously. If an error occurs in the active CPU unit, the standby CPU unit continues control automatically and continuously.



## Easy duplexing of communications units

The CPU unit automatically selects the normally functioning communications unit.

There is no need for complex programming to switch when an error occurs or special data link area for duplexing.



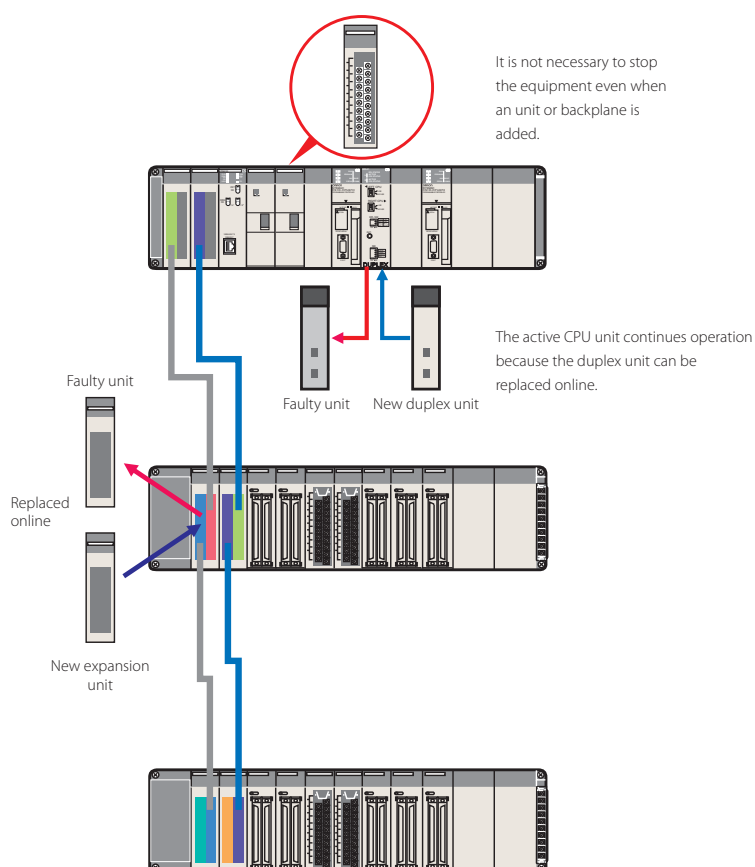
## Easy duplexing of power supply units

A duplex power supply system can be configured with two power supply units connected to a CPU rack, expansion rack, or long-distance expansion rack, which prevents the system from going down due to a power supply unit error.

A power supply unit that malfunctions can be identified by flags in the AR Area of the CPU unit.

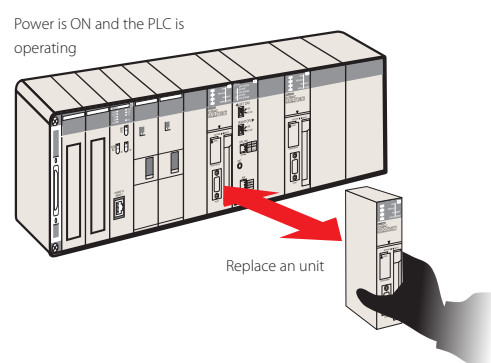
## Replace units during power supply

The CPU unit, power supply unit, duplex unit, basic I/O unit, and special I/O unit can be replaced during power supply or operation. In addition, cable disconnections are monitored, so failures can be located easily.



## Remove or add units without using a programming device

The duplex CPU, dual I/O expansion system does not require special software or an HMI to replace units online.



## Automatic recovery to duplex operation

After the standby CPU unit becomes active due to accidental errors caused by noise or other factors, the stopped CPU unit can be restarted without the need for manipulation by operators and automatically returned to duplex operation.

The period during which only a single CPU unit operates is shortened, maintaining duplex operation to prepare for errors.

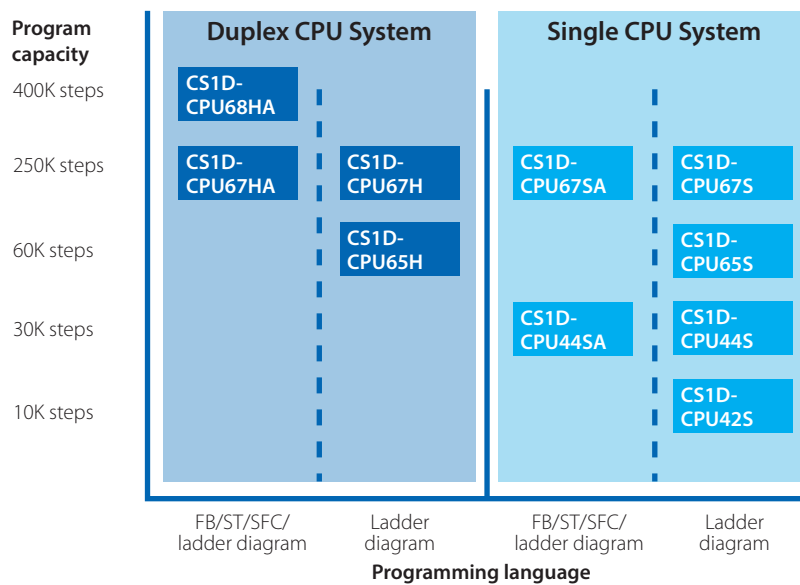
(Setting in PLC Setup is required. When hardware breaks down, the CPU unit is not returned to duplex operation after restart. The unit needs to be replaced.)

# Improve development productivity

## CPU unit with a large program capacity of 400K steps for structured and modular programming

Omron offers 10 models of CPU units to suit a variety of purposes and applications, from small- to large-scale systems. By combining I/O units and special units with any CPU unit, you can configure a lean and efficient system.

The CS1D-CPU68HA has a user memory capacity of 400K steps and 25 Extended Data Memory banks. The total memory capacity is 5 MB including user program, data memory, and comment memory. It has sufficient capacity to provide flexibility in structured and modular programming and to be used for larger systems.

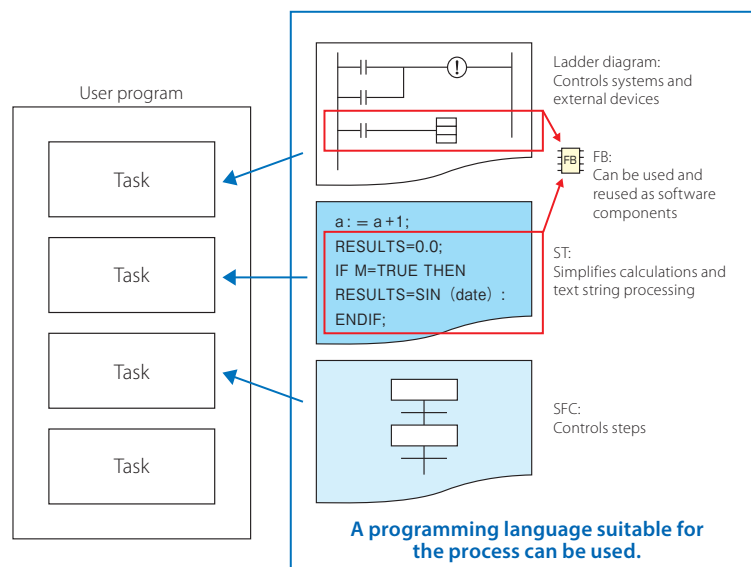


## Improve development productivity by reusing and sharing programs

The CPU unit supports the IEC 61131-3 programming languages: ladder diagram, ST, and SFC. FBs allow you to reuse and share programs, which will improve programming efficiency.

The programs in these languages and using FBs have a higher visibility than conventional ladder programs, making modification and maintenance quicker and easier. FBs, ST, and SFC can be used with the CS1D-CPU□□HA Duplex CPU System CPU Unit and CS1D-CPU□□SA Single CPU System CPU Unit.

(ST: Structured Text, FB: Function Block, SFC: Sequential Function Chart)



## Reuse software assets

The CX-One software can be used even when the CS Series is used together with the CJ Series. Programs and data are compatible with each other, making reuse easier. The specifications of FB and ST supported by the CS1D-CPU□□HA and CS1D-CPU□□SA are compatible with those supported by the CS1H/G and CJ2 Series.

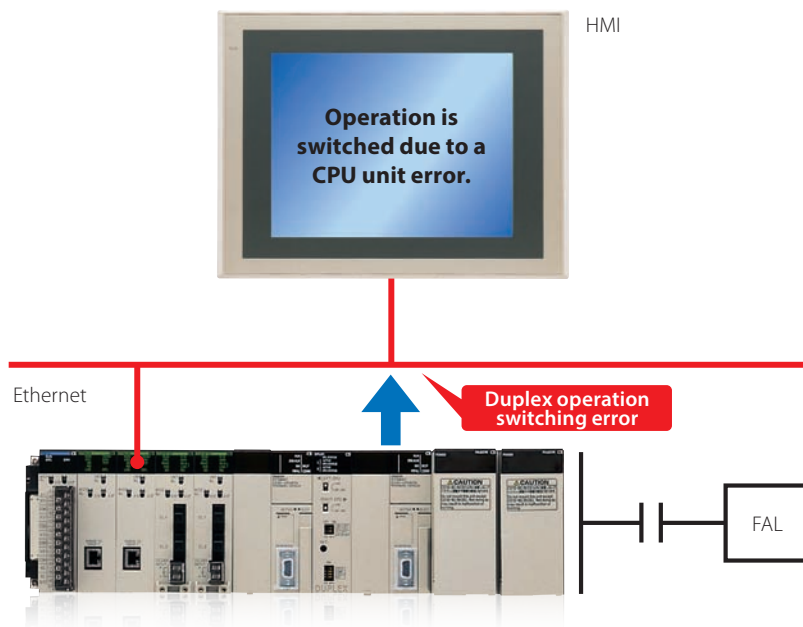


## Units common to all CS Series

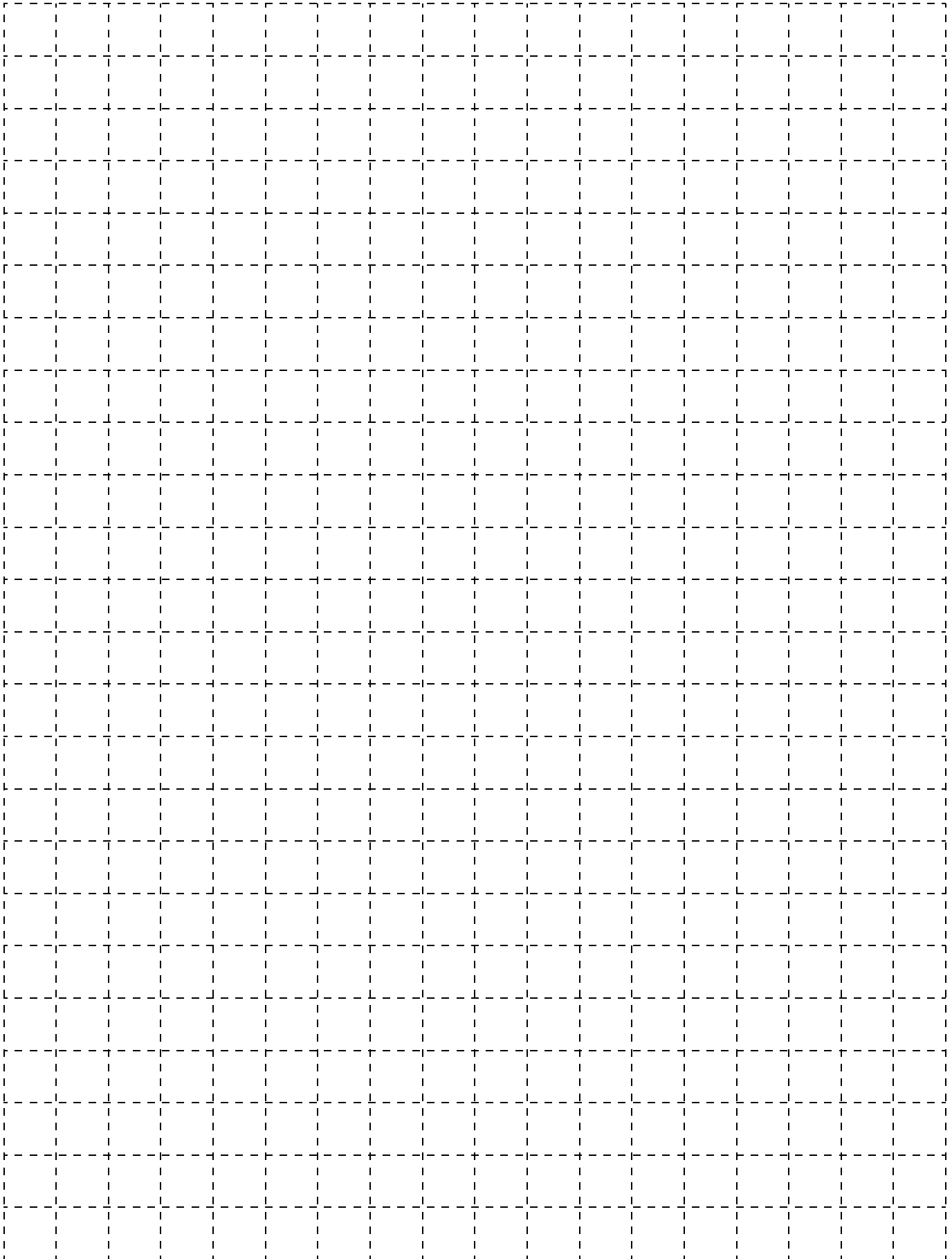
The same I/O units and special units can be used in both the CS1D Duplex System and CS1H/G. This enables parts required for repair and maintenance to be shared between systems, reducing the number of spare parts.

## Verify errors on physical devices

The error check (FAL and FALS) instructions can be used to simulate errors. You can verify the behavior of the HMI and other devices for each error state of the duplex CPU units.



## MEMO



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# System Design Guide

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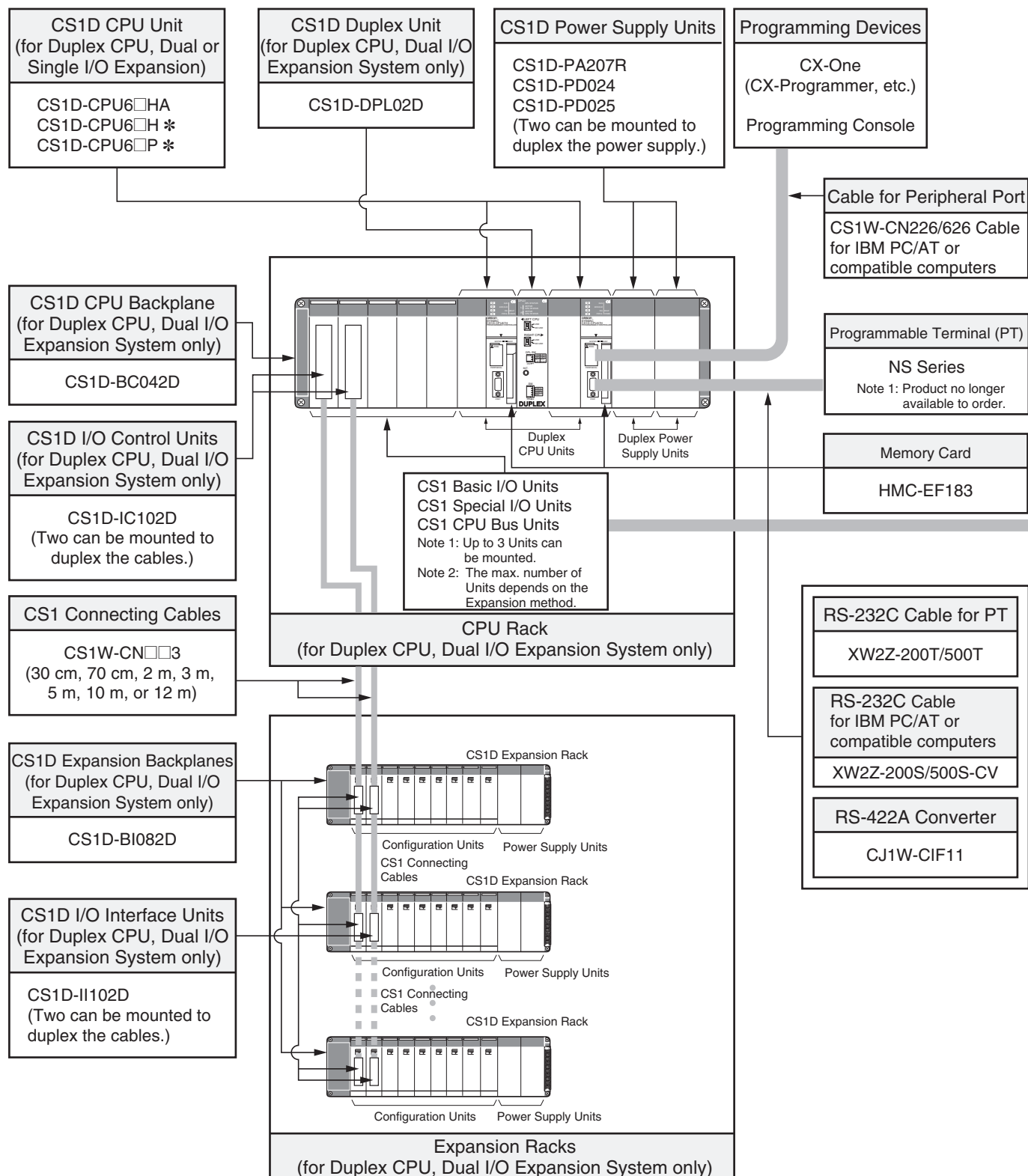
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# System Configuration

## Basic System

### SYSTEM 1 CS1D Duplex CPU, Dual I/O Expansion System



\* The CS1D-CPU6□H/CS1D-CPU6□P CPU Unit version 1.3 or later is required.

## Configuration Units

| Basic I/O Units                                                                                                                              |                                                                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                             |                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 8 I/O points                                                                                                                                 | 16 I/O points                                                                                                                                                      | 32 I/O points                                                                                                                                                             | 64 I/O points                                                                                                                                               | 96 I/O points                                                                                                             |
| Input Units                                                                                                                                  |                                                                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                             |                                                                                                                           |
| ---                                                                                                                                          | <ul style="list-style-type: none"> <li>DC Input Units CS1W-ID211</li> <li>AC Input Units CS1W-IA111 CS1W-IA211</li> </ul>                                          | <ul style="list-style-type: none"> <li>DC Input Units CS1W-ID231</li> </ul>                                                                                               | <ul style="list-style-type: none"> <li>DC Input Units CS1W-ID261</li> </ul>                                                                                 | <ul style="list-style-type: none"> <li>DC Input Units CS1W-ID291</li> </ul>                                               |
| Output Units                                                                                                                                 |                                                                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                             |                                                                                                                           |
| <ul style="list-style-type: none"> <li>Triac Output Units CS1W-OA201</li> <li>Relay Output Units (independent commons) CS1W-OC201</li> </ul> | <ul style="list-style-type: none"> <li>Transistor Output Units CS1W-OD21□</li> <li>Triac Output Units CS1W-OA211</li> <li>Relay Output Units CS1W-OC211</li> </ul> | <ul style="list-style-type: none"> <li>Transistor Output Units CS1W-OD23□</li> </ul>                                                                                      | <ul style="list-style-type: none"> <li>Transistor Output Units CS1W-OD26□</li> </ul>                                                                        | <ul style="list-style-type: none"> <li>Transistor Output Units CS1W-OD29□</li> </ul>                                      |
| I/O Units                                                                                                                                    |                                                                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                             |                                                                                                                           |
| ---                                                                                                                                          | ---                                                                                                                                                                | ---                                                                                                                                                                       | 32 inputs and 32 outputs<br><ul style="list-style-type: none"> <li>DC Input/Transistor Output Units CS1W-MD26□</li> <li>TTL I/O Units CS1W-MD561</li> </ul> | 48 inputs and 48 outputs<br><ul style="list-style-type: none"> <li>DC Input/Transistor Output Units CS1W-MD29□</li> </ul> |
| Other Units                                                                                                                                  |                                                                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                             |                                                                                                                           |
| ---                                                                                                                                          | <ul style="list-style-type: none"> <li>Interrupt Input Units CS1W-INT01</li> <li>High-speed Input Units CS1W-IDP01</li> </ul>                                      | B7A Interface Units<br><ul style="list-style-type: none"> <li>32 inputs CS1W-B7A12</li> <li>32 outputs CS1W-B7A02</li> <li>16 inputs and 16 outputs CS1W-B7A21</li> </ul> | B7A Interface Units<br><ul style="list-style-type: none"> <li>32 inputs and 32 outputs CS1W-B7A22</li> </ul>                                                | ---                                                                                                                       |

| Special I/O Units and CPU Bus Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Sensor Input Units (Process Analog I/O Units)<br><ul style="list-style-type: none"> <li>CS1W-PTS□□</li> </ul> Analog Input Units<br><ul style="list-style-type: none"> <li>Analog Input Units CS1W-AD041-V1 CS1W-AD081-V1 CS1W-AD161</li> <li>Process Analog Input Units such as Isolated-type DC Input Units CS1W-PDC□□ CS1W-PTW01 CS1W-PTR0□</li> <li>Analog Output Units<br/> <ul style="list-style-type: none"> <li>Analog Output Units CS1W-DA041 CS1W-DA08V CS1W-DA08C</li> <li>Isolated-type Analog Output Units (Process Analog I/O Units) CS1W-PMV01 CS1W-PMV02</li> </ul> </li> <li>Analog I/O Units<br/> <ul style="list-style-type: none"> <li>CS1W-MAD44</li> </ul> </li> <li>Isolated-type Pulse Input Unit (Process Analog I/O Unit)<br/> <ul style="list-style-type: none"> <li>CS1W-PPS01</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>High-speed Counter Units CS1W-CT021 CS1W-CT041</li> <li>Customizable Counter Units CS1W-HCP22-V1 CS1W-HCA□2-V1 CS1W-HIO01-V1</li> <li>Position Control Units CS1W-NC1□3 CS1W-NC2□3 CS1W-NC4□3</li> <li>MECHATROLINK-II-compatible Position Control Units CS1W-NC271 CS1W-NC471 CS1W-NCF71</li> <li>Motion Control Units CS1W-MC221-V1 CS1W-MC421-V1</li> </ul> | <ul style="list-style-type: none"> <li>Serial Communications Units CS1W-SCU21-V1 CS1W-SCU31-V1</li> <li>EtherNet/IP Units CS1W-EIP21 CS1W-EIP21S</li> <li>Ethernet Units CS1W-ETN21 CS1D-ETN21D</li> <li>Controller Link Units CS1W-CLK23 CS1W-CLK13 CS1W-CLK53</li> <li>SYSMAC LINK Units CS1W-SLK11 CS1W-SLK21</li> <li>FL-Net Units CS1W-FLN22</li> <li>DeviceNet Units CS1W-DRM21-V1</li> <li>CompoNet Master Units CS1W-CRM21</li> </ul> | <ul style="list-style-type: none"> <li>ID Sensor U Units CS1W-V680C11 CS1W-V680C12 CS1W-V600C11 CS1W-V600C12</li> <li>           GPIB Interface Units CS1W-GPI01         </li> <li>           High-speed Data Storage Units CS1W-SPU01-V2 CS1W-SPU02-V2         </li> </ul> |

**Note:** Including models no longer available to order.

## Basic System

### SYSTEM 1 CS1D Duplex CPU, Dual I/O Expansion System

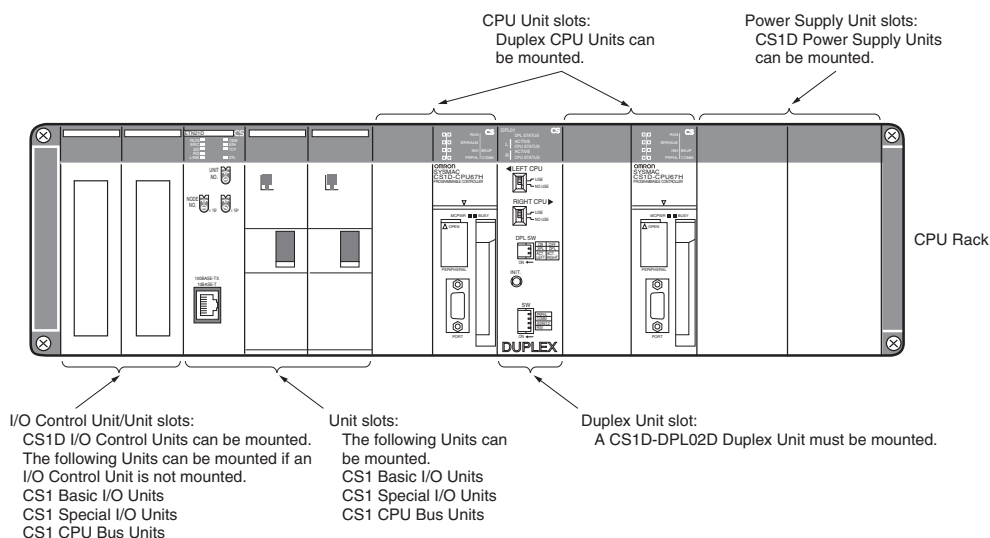
The entire system, including the expansion cables, can be duplexed for the most advanced redundancy and maintenance functions.

The CS1D-CPU6□HA CPU Unit supports FB, ST and SFC programming.

The CS1D-CPU6□H CPU Unit must be version 1.3 or later.

## CPU Rack

### System Configuration



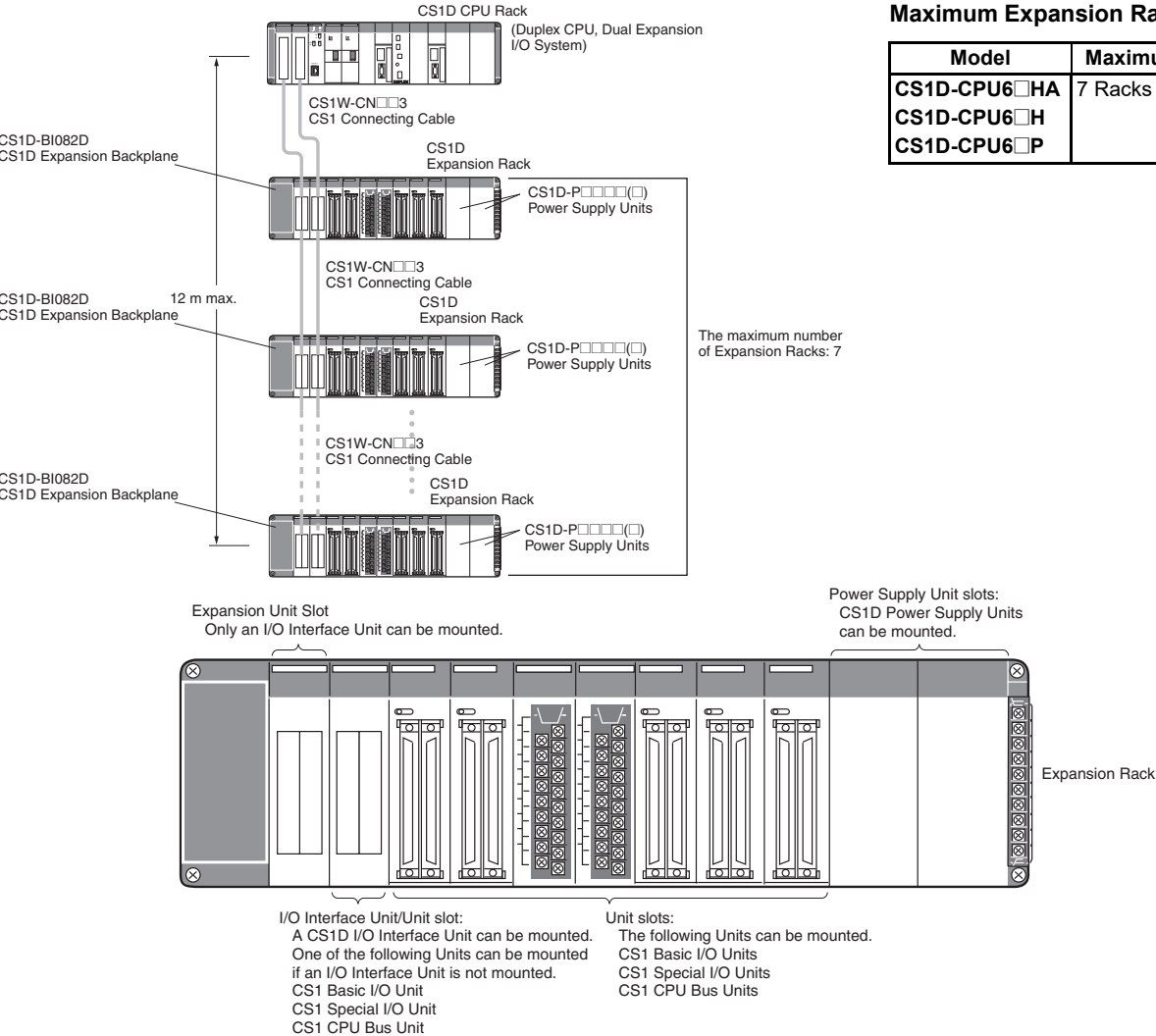
### List of Required Devices

| Rack     | Unit name                                                                |                             | Number required                                                                                                                                                               |
|----------|--------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Rack | CS1D-BC042D CPU Backplane (for Duplex CPU Dual I/O Expansion Systems)    |                             | 1 Backplane                                                                                                                                                                   |
|          | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                                 |                             | 2 Units (Just 1 Unit can also be used.)                                                                                                                                       |
|          | CS1D-CPU6□HA/CS1D-CPU6□H/CS1D-CPU6□P CPU Unit                            |                             | 2 Units                                                                                                                                                                       |
|          | CS1D-DPL02D Duplex Unit (for Duplex CPU Dual I/O Expansion Systems)      |                             | 1 Unit                                                                                                                                                                        |
|          | CS1D-IC102D I/O Control Unit (for Duplex CPU Dual I/O Expansion Systems) |                             | Required only when there is an I/O Expansion System. Two Units are required for a Dual I/O Expansion System, and just one Unit is required for a Single I/O Expansion System. |
|          | Maximum number of I/O Units                                              | Dual I/O Expansion System   | 3 Units                                                                                                                                                                       |
|          |                                                                          | Single I/O Expansion System | 4 Units                                                                                                                                                                       |
|          |                                                                          | No I/O Expansion            | 5 Units                                                                                                                                                                       |

Dual I/O Expansion Racks

The Dual I/O Expansion System has a duplexed expansion bus and supports online replacement of a Duplex Unit, online replacement of Units without a Programming Device, and online addition of I/O Units and Expansion Backplanes. (These functions are supported by the Duplex CPU Dual I/O Expansion System only.) Special I/O Control Units and I/O Interface Units are used in the Dual I/O Expansion System. The expansion bus can be set to either single or dual operation.

System Configuration



List of Required Devices

| Rack     | Unit name                                                                |                             | Number required                                                                                                          |
|----------|--------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| CPU Rack | CS1D-IC102D I/O Control Unit (for Duplex CPU Dual I/O Expansion Systems) |                             | Two Units are required for a Dual I/O Expansion System, and just one Unit is required for a Single I/O Expansion System. |
|          | Maximum number of I/O Units                                              | Dual I/O Expansion System   | 3 Units                                                                                                                  |
|          |                                                                          | Single I/O Expansion System | 4 Units                                                                                                                  |

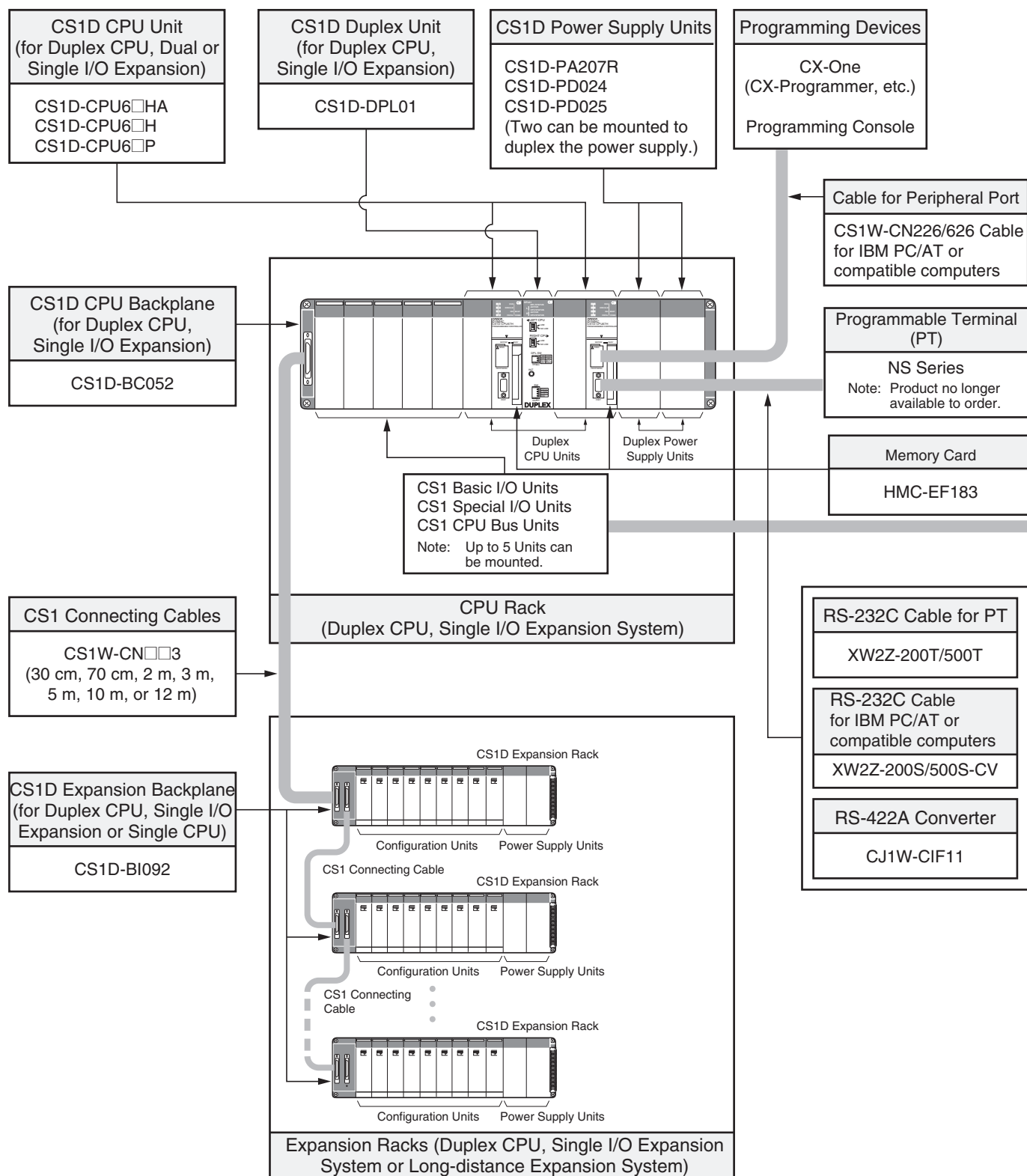
| Rack           | Unit name                                                                   |                             | Number required                                                                                                          |
|----------------|-----------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Expansion Rack | CS1D-BI082D Expansion Backplane (for Duplex CPU Dual I/O Expansion Systems) |                             | 1 Backplane                                                                                                              |
|                | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                                    |                             | 2 Units (Just 1 Unit can also be used.)                                                                                  |
|                | CS1D-II102D I/O Interface Unit (for Duplex CPU Dual I/O Expansion Systems)  |                             | Two Units are required for a Dual I/O Expansion System, and just one Unit is required for a Single I/O Expansion System. |
|                | Maximum number of I/O Units                                                 | Dual I/O Expansion System   | 7 Units                                                                                                                  |
|                |                                                                             | Single I/O Expansion System | 8 Units                                                                                                                  |

Limitations on the System Configuration

- Note:**
- Dual I/O Expansion cannot be used in a Duplex CPU Single I/O Expansion System or Single CPU System.
  - The number of I/O Units that can be mounted in the Backplanes depends on the expansion method being used.
  - CS1W-PNT21 units can be used in the configuration with CS1D (duplex system) but do NOT support HOT SWAPPING function. (CS1W-PNT21 is a specific product released in a specific area.)

## Basic System

### SYSTEM 2 CS1D Duplex CPU, Single I/O Expansion System



| Special I/O Units and CPU Bus Units                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Sensor Input Units<br>(Process Analog I/O Units) <ul style="list-style-type: none"> <li>CS1W-PTS□□</li> </ul>                                                                                                                                            | <ul style="list-style-type: none"> <li>High-speed Counter Units<br/>CS1W-CT021<br/>CS1W-CT041</li> <li>Customizable Counter Units<br/>CS1W-HCP22-V1<br/>CS1W-HCA□2-V1<br/>CS1W-HIO01-V1</li> <li>Position Control Units<br/>CS1W-NC1□3<br/>CS1W-NC2□3<br/>CS1W-NC4□3</li> <li>MECHATROLINK-II-compatible<br/>Position Control Units<br/>CS1W-NC271<br/>CS1W-NC471<br/>CS1W-NCF71</li> <li>Motion Control Units<br/>CS1W-MC221-V1<br/>CS1W-MC421-V1</li> </ul> | <ul style="list-style-type: none"> <li>Serial Communications Units<br/>CS1W-SCU21-V1<br/>CS1W-SCU31-V1</li> <li>EtherNet/IP Units<br/>CS1W-EIP21<br/>CS1W-EIP21S</li> <li>Ethernet Units<br/>CS1W-ETN21<br/>CS1D-ETN21D</li> <li>Controller Link Units<br/>CS1W-CLK23<br/>CS1W-CLK13<br/>CS1W-CLK53</li> <li>SYSMAC LINK Units<br/>CS1W-SLK11<br/>CS1W-SLK21</li> <li>FL-Net Units<br/>CS1W-FLN22</li> <li>DeviceNet Units<br/>CS1W-DRM21-V1</li> <li>CompoNet Master Units<br/>CS1W-CRM21</li> </ul> | <ul style="list-style-type: none"> <li>ID Sensor U Units<br/>CS1W-V680C11<br/>CS1W-V680C12<br/>CS1W-V600C11<br/>CS1W-V600C12</li> </ul> |
| Analog Input Units <ul style="list-style-type: none"> <li>Analog Input Units<br/>CS1W-AD041-V1<br/>CS1W-AD081-V1<br/>CS1W-AD161</li> <li>Process Analog Input Units such as<br/>Isolated-type DC Input Units<br/>CS1W-PDC□□<br/>CS1W-PTW01<br/>CS1W-PTRO□</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>GPIO Interface Units<br/>CS1W-GPIO1</li> </ul>                                                   |
| Analog Output Units <ul style="list-style-type: none"> <li>Analog Output Units<br/>CS1W-DA041<br/>CS1W-DA08V<br/>CS1W-DA08C</li> <li>Isolated-type Analog Output Units<br/>(Process Analog I/O Units)<br/>CS1W-PMV01<br/>CS1W-PMV02</li> </ul>                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                         |
| Analog I/O Units <ul style="list-style-type: none"> <li>CS1W-MAD44</li> </ul> Isolated-type Pulse Input Unit<br>(Process Analog I/O Unit) <ul style="list-style-type: none"> <li>CS1W-PPS01</li> </ul>                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>High-speed Data Storage Units<br/>CS1W-SPU01-V2<br/>CS1W-SPU02-V2</li> </ul>                     |

## Programmable Controllers **CS1D**

## Basic System

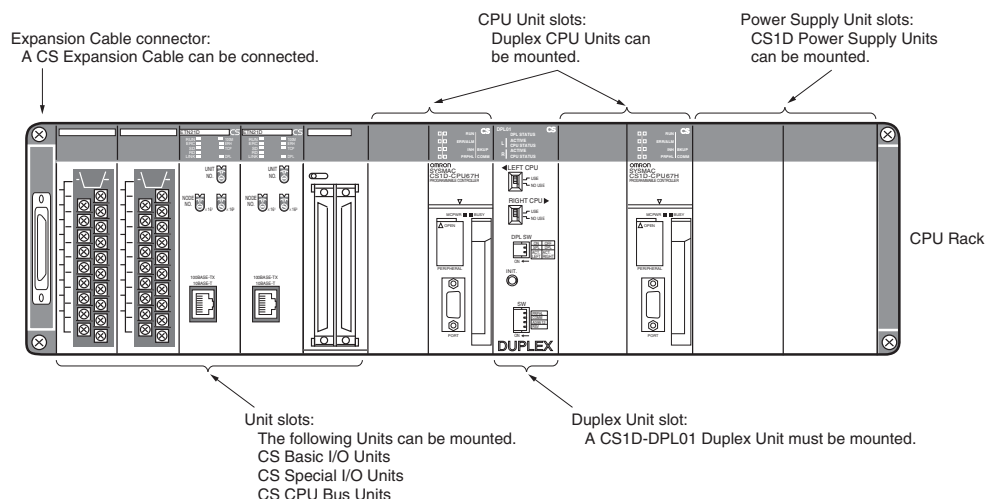
### SYSTEM 2 CS1D Duplex CPU, Single I/O Expansion System

The main system components can be duplexed, such as the CPU Unit, Power Supply Unit, and Communications Unit. Units can be replaced online using a Programming Device.

The CS1D-CPU6□HA CPU Unit supports FB, ST and SFC programming.

## CPU Rack

### System Configuration



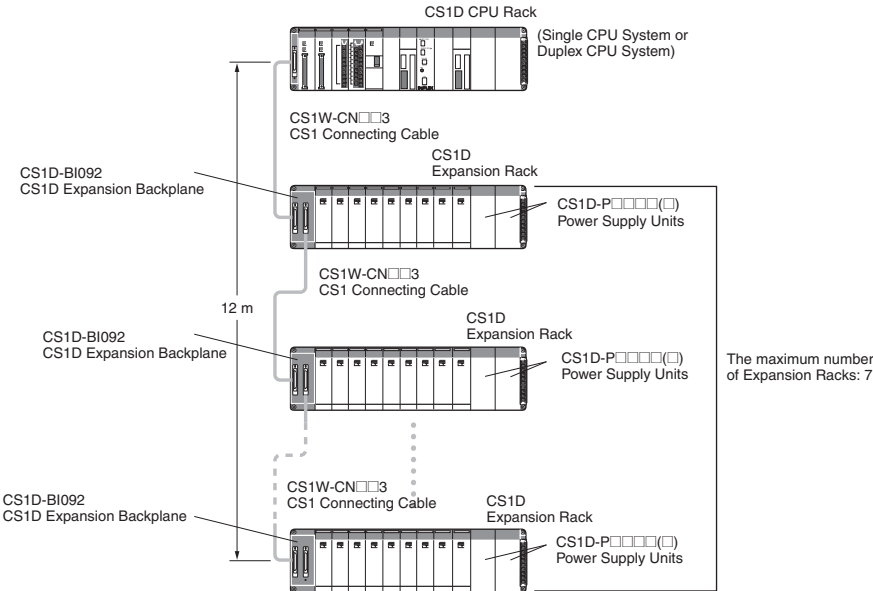
### List of Required Devices

| Rack     | Unit name                                                              | Number required                         |
|----------|------------------------------------------------------------------------|-----------------------------------------|
| CPU Rack | CS1D-BC052 CPU Backplane (for Duplex CPU Single I/O Expansion Systems) | 1 Backplane                             |
|          | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                               | 2 Units (Just 1 Unit can also be used.) |
|          | CS1D-CPU6□HA/CS1D-CPU6□H/CS1D-CPU6□P CPU Unit                          | 2 Units                                 |
|          | CS1D-DPL01 Duplex Unit (for Duplex CPU Single I/O Expansion Systems)   | 1 Unit                                  |
|          | Maximum number of Configuration Units                                  | 5 Units                                 |

Single I/O Expansion Racks

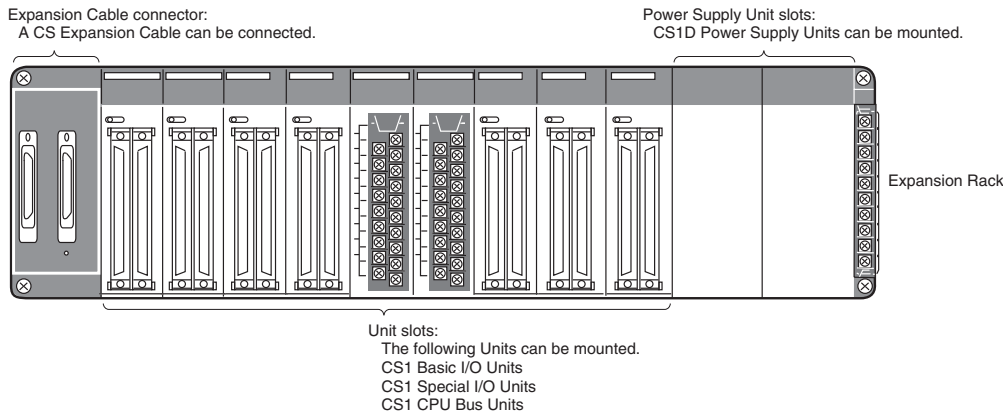
Like the CS1-series PLCs, it is possible to connect Expansion Racks and expand the PLC system just by connecting Expansion Cables. The Duplex CPU Single I/O Expansion System supports the same functions as Single CPU System. Special I/O Control Units and I/O Interface Units are not required.

System Configuration



Maximum Expansion Racks

| Model        | Maximum No. of Racks |
|--------------|----------------------|
| CS1D-CPU6□HA | 7 Racks              |
| CS1D-CPU6□H  |                      |
| CS1D-CPU6□P  |                      |



List of Required Devices

| Rack           | Unit name                                                                                          |                                         | Number required                         |
|----------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| CPU Rack       | Maximum number of Configuration Units                                                              | Duplex CPU, Single I/O Expansion System | 5 Units                                 |
|                |                                                                                                    | Single CPU System                       | 8 Units                                 |
| Expansion Rack | CS1D-BI092 Expansion Backplane (for Duplex CPU Single I/O Expansion Systems or Single CPU Systems) |                                         | 1 Backplane                             |
|                | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                                                           |                                         | 2 Units (Just 1 Unit can also be used.) |
|                | Maximum number of I/O Units (Duplex CPU Single I/O Expansion System or Single CPU System)          |                                         | 9 Units                                 |

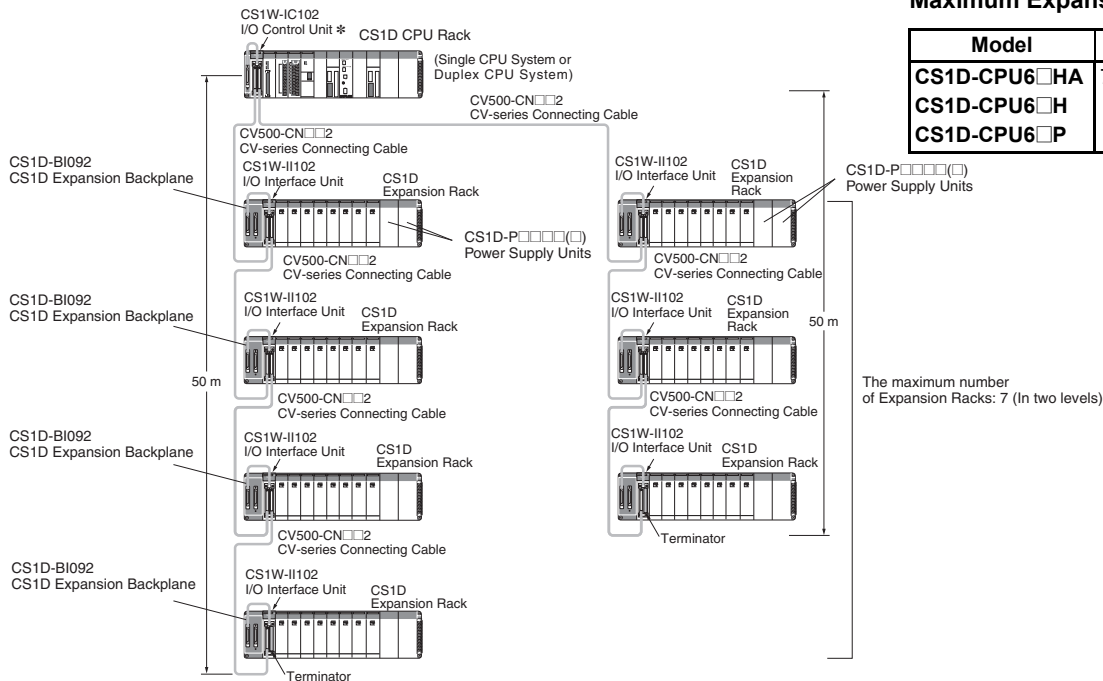
Limitations on the System Configuration

- Note:**
- These Racks cannot be used in a Duplex CPU Dual I/O Expansion System.
  - The following functions cannot be used: Duplex Expansion Cables, Online replacement of a Duplex Unit, Online replacement of Units without a Programming Device, and Online addition of I/O Units and Expansion Backplanes. If any of these functions are required, a Duplex CPU, Dual I/O Expansion System must be used.
  - CS1W-PNT21 units can be used in the configuration with CS1D (duplex system) but do NOT support HOT SWAPPING function. (CS1W-PNT21 is a spcific product released in a specific area.)

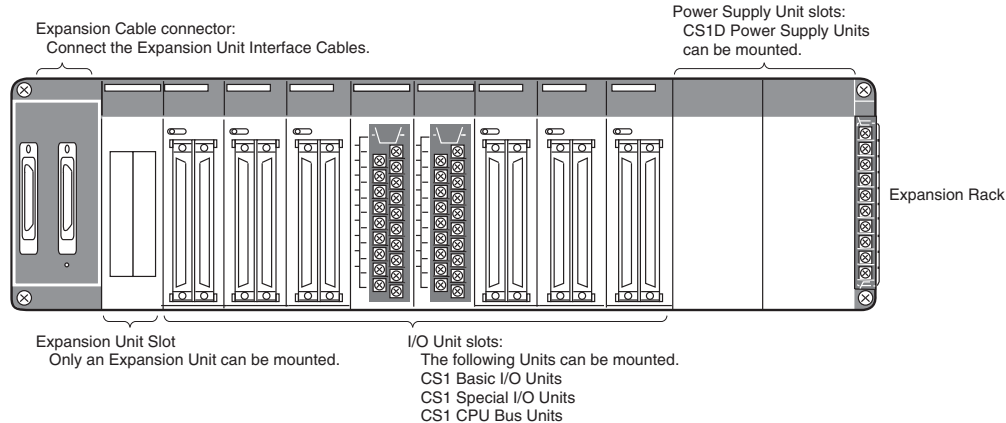
## ■ CS1D Long-distance Expansion Racks

A Long-distance Expansion System can connect a Rack at a distance of up to 50 m. The Long-distance Expansion System functions can be used in the Duplex CPU Single I/O Expansion System and Single CPU System. Special I/O Control Units and I/O Interface Units are used.

### System Configuration



\* If even one CV500-CN□□2 Cable for Long-distance Expansion is used in the PLC system, an I/O Control Unit is required in the source CS1 Rack.



### List of Required Devices

| Rack           | Unit name                                                                                          | Number required                                   |
|----------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------|
| CPU Rack       | CS1D-IC102 I/O Control Unit (for Duplex CPU Single I/O Expansion Systems and Single CPU Systems)   | 1 Unit                                            |
|                | Maximum number of Configuration Units                                                              | Duplex CPU Single I/O Expansion System<br>4 Units |
|                |                                                                                                    | Single CPU System<br>7 Units                      |
| Rack           | Unit name                                                                                          | Number required                                   |
| Expansion Rack | CS1D-BI092 Expansion Backplane (for Duplex CPU Single I/O Expansion Systems or Single CPU Systems) | 1 Backplane                                       |
|                | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                                                           | 2 Units (Just 1 Unit can also be used.)           |
|                | CS1W-II102 I/O Interface Unit (for Duplex CPU Single I/O Expansion Systems or Single CPU Systems)  | 1 Unit                                            |
|                | Maximum number of Configuration Units                                                              | 8 Units                                           |

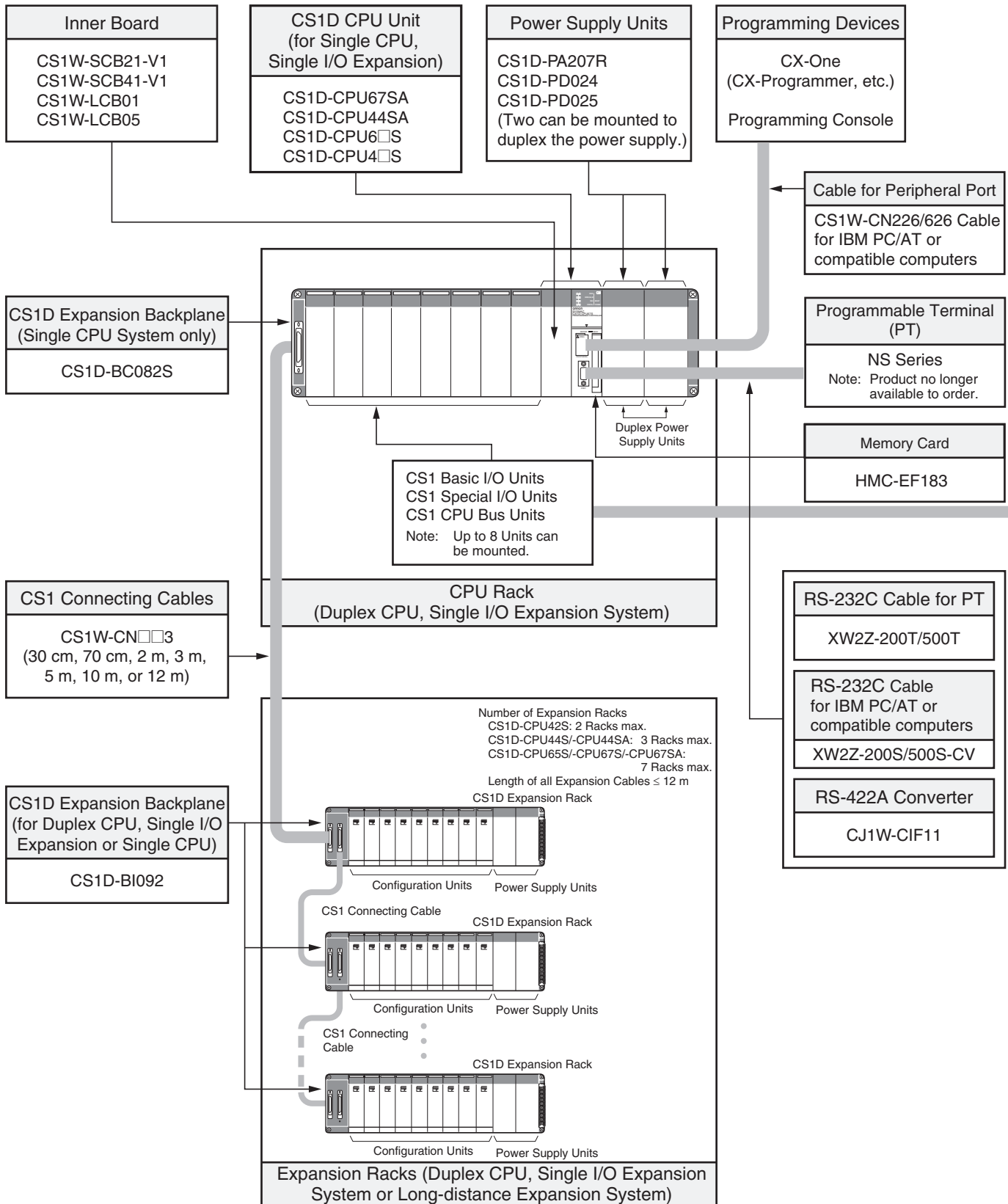
### Limitations on the System Configuration

- Note:**
- These Racks cannot be used in a Duplex CPU Dual I/O Expansion System.
  - The following functions cannot be used: Duplex Expansion Cables, Online replacement of a Duplex Unit, Online replacement of Units without a Programming Device, and Online addition of I/O Units and Expansion Backplanes. If any of these functions are required, a Duplex CPU, Dual I/O Expansion System must be used.
  - CS1W-PNT21 units can be used in the configuration with CS1D (duplex system) but do NOT support HOT SWAPPING function. (CS1W-PNT21 is a specific product released in a specific area.)



## Basic System

### SYSTEM 3 CS1D Single CPU System



## Configuration Units

| Basic I/O Units                                                                                                                                          |                                                                                                                                                                                |                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 8 I/O points                                                                                                                                             | 16 I/O points                                                                                                                                                                  | 32 I/O points                                                                                                                                                                               | 64 I/O points                                                                                                                                                        | 96 I/O points                                                                                                                  |
| Input Units                                                                                                                                              |                                                                                                                                                                                |                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                |
| ---                                                                                                                                                      | <ul style="list-style-type: none"> <li>DC Input Units<br/>CS1W-ID211</li> <li>AC Input Units<br/>CS1W-IA111<br/>CS1W-IA211</li> </ul>                                          | <ul style="list-style-type: none"> <li>DC Input Units<br/>CS1W-ID231</li> </ul>                                                                                                             | <ul style="list-style-type: none"> <li>DC Input Units<br/>CS1W-ID261</li> </ul>                                                                                      | <ul style="list-style-type: none"> <li>DC Input Units<br/>CS1W-ID291</li> </ul>                                                |
| Output Units                                                                                                                                             |                                                                                                                                                                                |                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                |
| <ul style="list-style-type: none"> <li>Triac Output Units<br/>CS1W-OA201</li> <li>Relay Output Units<br/>(independent commons)<br/>CS1W-OC201</li> </ul> | <ul style="list-style-type: none"> <li>Transistor Output Units<br/>CS1W-OD21□</li> <li>Triac Output Units<br/>CS1W-OA211</li> <li>Relay Output Units<br/>CS1W-OC211</li> </ul> | <ul style="list-style-type: none"> <li>Transistor Output Units<br/>CS1W-OD23□</li> </ul>                                                                                                    | <ul style="list-style-type: none"> <li>Transistor Output Units<br/>CS1W-OD26□</li> </ul>                                                                             | <ul style="list-style-type: none"> <li>Transistor Output Units<br/>CS1W-OD29□</li> </ul>                                       |
| I/O Units                                                                                                                                                |                                                                                                                                                                                |                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                |
| ---                                                                                                                                                      | ---                                                                                                                                                                            | ---                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>32 inputs and 32 outputs<br/>DC Input/Transistor Output Units<br/>CS1W-MD26□</li> <li>TTL I/O Units<br/>CS1W-MD561</li> </ul> | <ul style="list-style-type: none"> <li>48 inputs and 48 outputs<br/>DC Input/Transistor Output Units<br/>CS1W-MD29□</li> </ul> |
| Other Units                                                                                                                                              |                                                                                                                                                                                |                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                |
| ---                                                                                                                                                      | <ul style="list-style-type: none"> <li>Interrupt Input Units<br/>CS1W-INT01</li> <li>High-speed Input Units<br/>CS1W-IDP01</li> </ul>                                          | <ul style="list-style-type: none"> <li>B7A Interface Units</li> <li>32 inputs<br/>CS1W-B7A12</li> <li>32 outputs<br/>CS1W-B7A02</li> <li>16 inputs and 16 outputs<br/>CS1W-B7A21</li> </ul> | <ul style="list-style-type: none"> <li>B7A Interface Units</li> <li>32 inputs and 32 outputs<br/>CS1W-B7A22</li> </ul>                                               | ---                                                                                                                            |

| Special I/O Units, CPU Bus Units, and Inner Boards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                         |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Temperature Sensor Input Units<br/>(Process Analog I/O Units)</li> <li>CS1W-PTS□□</li> </ul> <p>Analog Input Units</p> <ul style="list-style-type: none"> <li>Analog Input Units<br/>CS1W-AD041-V1<br/>CS1W-AD081-V1<br/>CS1W-AD161</li> <li>Process Analog Input Units such as<br/>Isolated-type DC Input Units<br/>CS1W-PDC□□□</li> <li>CS1W-PTW01<br/>CS1W-PTR0□</li> </ul> <p>Analog Output Units</p> <ul style="list-style-type: none"> <li>Analog Output Units<br/>CS1W-DA041<br/>CS1W-DA08V<br/>CS1W-DA08C</li> <li>Isolated-type Analog Output Units<br/>(Process Analog I/O Units)<br/>CS1W-PMV01<br/>CS1W-PMV02</li> </ul> <p>Analog I/O Units</p> <ul style="list-style-type: none"> <li>CS1W-MAD44</li> </ul> <p>Isolated-type Pulse Input Unit<br/>(Process Analog I/O Unit)</p> <ul style="list-style-type: none"> <li>CS1W-PPS01</li> </ul> <p>Loop Control Boards</p> <ul style="list-style-type: none"> <li>CS1W-LCB01<br/>CS1W-LCB05</li> </ul> | <ul style="list-style-type: none"> <li>High-speed Counter Units<br/>CS1W-CT021<br/>CS1W-CT041</li> <li>Customizable Counter Units<br/>CS1W-HCP22-V1<br/>CS1W-HCA□2-V1<br/>CS1W-HIO01-V1</li> <li>Position Control Units<br/>CS1W-NC1□3<br/>CS1W-NC2□3<br/>CS1W-NC4□3</li> <li>MECHATROLINK-II-compatible<br/>Position Control Units<br/>CS1W-NC271<br/>CS1W-NC471<br/>CS1W-NC71</li> <li>Motion Control Units<br/>CS1W-MC221-V1<br/>CS1W-MC421-V1</li> </ul> | <ul style="list-style-type: none"> <li>Serial Communications Boards<br/>CS1W-SCB21-V1<br/>CS1W-SCB41-V1</li> <li>Serial Communications Units<br/>CS1W-SCU21-V1<br/>CS1W-SCU31-V1</li> <li>EtherNet/IP Units<br/>CS1W-EIP21<br/>CS1W-EIP21S</li> <li>Ethernet Units<br/>CS1W-ETN21<br/>CS1D-ETN21D</li> <li>Controller Link Units<br/>CS1W-CLK23<br/>CS1W-CLK13<br/>CS1W-CLK53</li> <li>SYSMAC LINK Units<br/>CS1W-SLK11<br/>CS1W-SLK21</li> <li>FL-Net Units<br/>CS1W-FLN22</li> <li>DeviceNet Units<br/>CS1W-DRM21-V1</li> <li>CompoNet Master Units<br/>CS1W-CRM21</li> </ul> | <ul style="list-style-type: none"> <li>ID Sensor U Units<br/>CS1W-V680C11<br/>CS1W-V680C12<br/>CS1W-V600C11<br/>CS1W-V600C12</li> </ul> | <ul style="list-style-type: none"> <li>GPIO Interface Units<br/>CS1W-GPIO1</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>High-speed Data Storage Units<br/>CS1W-SPU01-V2<br/>CS1W-SPU02-V2</li> </ul>                     |                                                                                       |

**Note:** Including models no longer available to order.

## Basic System

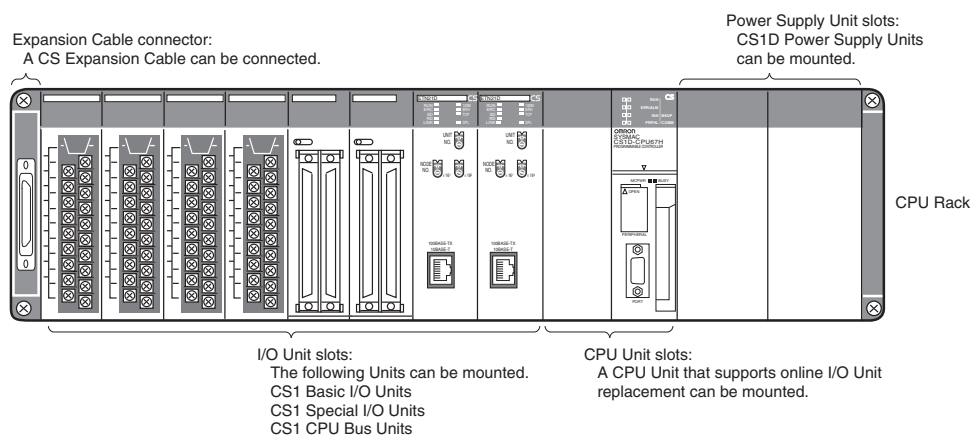
### SYSTEM 3 CS1D Single CPU System

This system configuration is ideal when you want to replace a Power Supply Unit or other Units online or improve redundancy in the Communications section.

The CS1D-CPU□□SA CPU Unit supports FB, ST and SFC programming.

## CPU Rack

### System Configuration



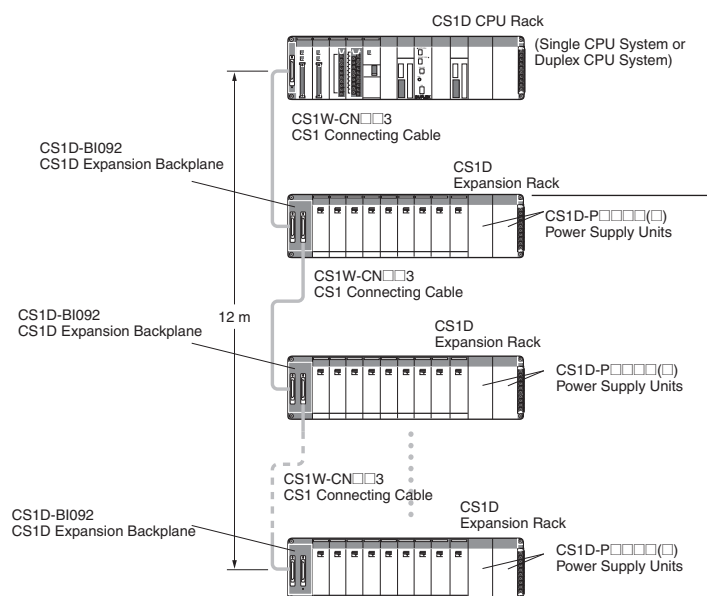
### List of Required Devices

| Rack     | Unit name                                                  | Number required                         |
|----------|------------------------------------------------------------|-----------------------------------------|
| CPU Rack | CS1D-BC082S CPU Backplane (for Single CPU Systems)         | 1 Backplane                             |
|          | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                   | 2 Units (Just 1 Unit can also be used.) |
|          | CS1D-CPU67SA/CS1D-CPU44SA/CS1D-CPU6□S/CS1D-CPU4□S CPU Unit | 1 Unit                                  |
|          | Maximum number of Configuration Units                      | 8 Units                                 |

## Single I/O Expansion Racks

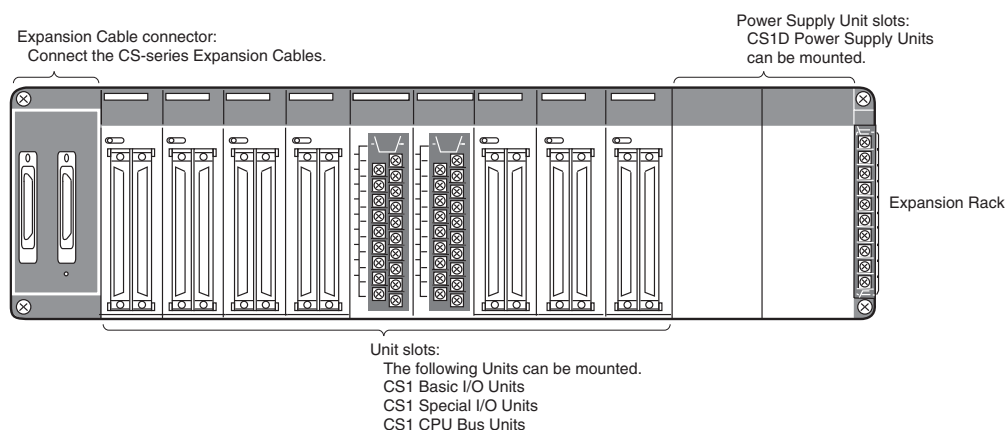
Like the CS1-series PLCs, it is possible to connect Expansion Racks and expand the PLC system just by connecting Expansion Cables. The Single CPU System supports the same functions as Duplex CPU Single I/O Expansion System. Special I/O Control Units and I/O Interface Units are not required.

### System Configuration



### Maximum Expansion Racks

| Model                       | Maximum No. of Racks |
|-----------------------------|----------------------|
| CS1D-CPU67SA<br>CS1D-CPU6□S | 7 Racks              |
| CS1D-CPU44SA<br>CS1D-CPU44S | 3 Racks              |
| CS1D-CPU42S                 | 2 Racks              |



### List of Required Devices

| Rack     | Unit name                                                                        | Number required |
|----------|----------------------------------------------------------------------------------|-----------------|
| CPU Rack | Maximum number of Configuration Units<br>Duplex CPU, Single I/O Expansion System | 5 Units         |
|          | Single CPU System                                                                | 8 Units         |

| Rack           | Unit name                                                                                          | Number required                         |
|----------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|
| Expansion Rack | CS1D-BI092 Expansion Backplane (for Duplex CPU Single I/O Expansion Systems or Single CPU Systems) | 1 Backplane                             |
|                | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                                                           | 2 Units (Just 1 Unit can also be used.) |
|                | Maximum number of I/O Units (Duplex CPU Single I/O Expansion System or Single CPU System)          | 9 Units                                 |

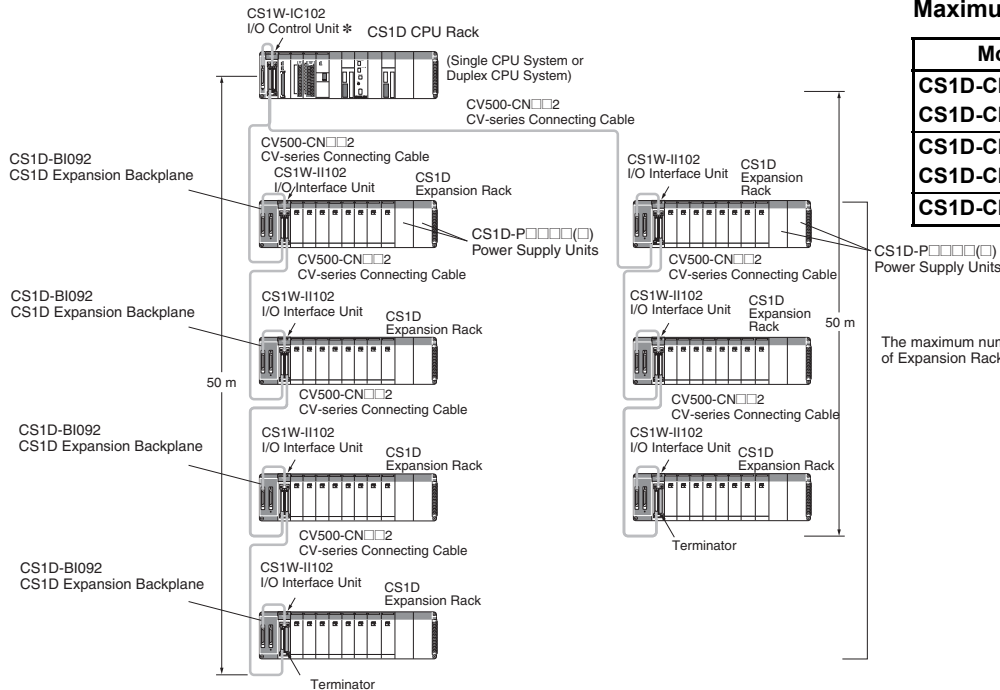
### Limitations on the System Configuration

- Note:**
- These Racks cannot be used in a Duplex CPU Dual I/O Expansion System.
  - The following functions cannot be used: Duplex Expansion Cables, Online replacement of a Duplex Unit, Online replacement of Units without a Programming Device, and Online addition of I/O Units and Expansion Backplanes. If any of these functions are required, a Duplex CPU, Dual I/O Expansion System must be used.
  - CS1W-PNT21 units can be used in the configuration with CS1D (duplex system) but do NOT support HOT SWAPPING function. (CS1W-PNT21 is a specific product released in a specific area.)

## ■ CS1D Long-distance Expansion Racks

A Long-distance Expansion System can connect a Rack at a distance of up to 50 m. The Long-distance Expansion System functions can be used in the Duplex CPU Single I/O Expansion System and Single CPU System. Special I/O Control Units and I/O Interface Units are used.

### System Configuration

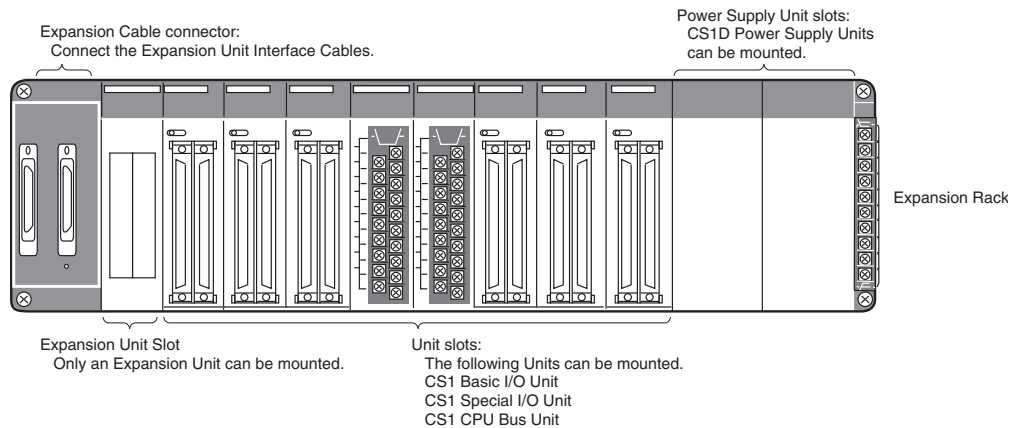


### Maximum Expansion Racks

| Model                       | Maximum No. of Racks |
|-----------------------------|----------------------|
| CS1D-CPU67SA<br>CS1D-CPU6□S | 7 Racks              |
| CS1D-CPU44SA<br>CS1D-CPU44S | 3 Racks              |
| CS1D-CPU42S                 | 2 Racks              |

The maximum number of Expansion Racks: 7 (In two levels)

\* If even one CV500-CN□□2 Cable for Long-distance Expansion is used in the PLC system, an I/O Control Unit is required in the source CS1 Rack.



### List of Required Devices

| Rack           | Unit name                                                                                          | Number required                                   |
|----------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------|
| CPU Rack       | CS1W-IC102 I/O Control Unit (for Duplex CPU Single I/O Expansion Systems and Single CPU Systems)   | 1 Unit                                            |
|                | Maximum number of Configuration Units                                                              | Duplex CPU Single I/O Expansion System<br>4 Units |
|                |                                                                                                    | Single CPU System<br>7 Units                      |
| Expansion Rack | CS1D-BI092 Expansion Backplane (for Duplex CPU Single I/O Expansion Systems or Single CPU Systems) | 1 Backplane                                       |
|                | CS1D-PA207R/CS1D-PD02□ Power Supply Unit                                                           | 2 Units (Just 1 Unit can also be used.)           |
|                | CS1W-II102 I/O Interface Unit (for Duplex CPU Single I/O Expansion Systems or Single CPU Systems)  | 1 Unit                                            |
|                | Maximum number of Configuration Units                                                              | 8 Units                                           |

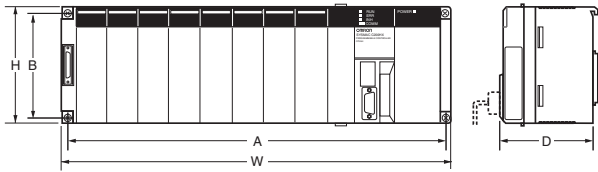
### Limitations on the System Configuration

- Note:**
- These Racks cannot be used in a Duplex CPU Dual I/O Expansion System.
  - The following functions cannot be used: Duplex Expansion Cables, Online replacement of a Duplex Unit, Online replacement of Units without a Programming Device, and Online addition of I/O Units and Expansion Backplanes. If any of these functions are required, a Duplex CPU, Dual I/O Expansion System must be used.
  - CS1W-PNT21 units can be used in the configuration with CS1D (duplex system) but do NOT support HOT SWAPPING function. (CS1W-PNT21 is a specific product released in a specific area.)

# Dimensions

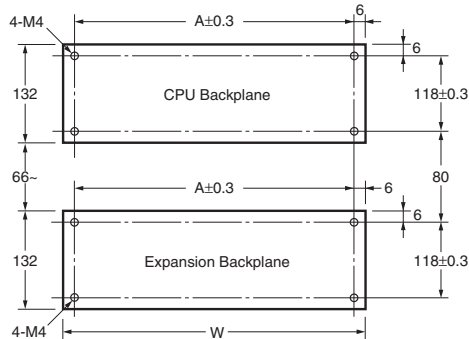
(Unit: mm)

## External Dimensions



| Name                     | Model       | A   | B   | W   | H   | D   |
|--------------------------|-------------|-----|-----|-----|-----|-----|
| CS1D CPU Backplane       | CS1D-BC042D | 491 | 118 | 505 | 132 | 123 |
|                          | CS1D-BC052  |     |     |     |     |     |
|                          | CS1D-BC082S |     |     |     |     |     |
| CS1D Expansion Backplane | CS1D-BI82D  | 491 | 118 | 505 | 132 | 123 |
|                          | CS1D-BI092  |     |     |     |     |     |

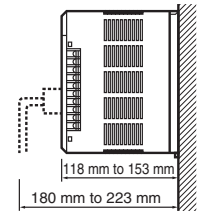
## Backplane Mounting Dimensions



| Name                     | Model       | A   | W   |
|--------------------------|-------------|-----|-----|
| CS1D CPU Backplane       | CS1D-BC042D | 491 | 505 |
|                          | CS1D-BC052  |     |     |
|                          | CS1D-BC082S |     |     |
| CS1D Expansion Backplane | CS1D-BI082D | 491 | 505 |
|                          | CS1D-BI092  |     |     |

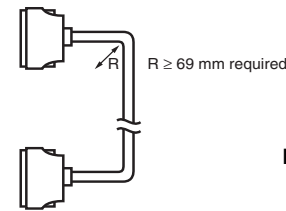
## Mounting Height

The mounting height of CPU Racks and Expansion Racks is 118 to 123 mm, depending on I/O Units mounted. If Programming Devices or connecting cables are attached, the additional dimensions must be taken into account. Allow sufficient clearance in the control panel in which the PLC is mounted.



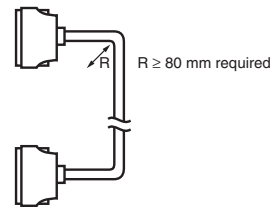
**Note:** When using Expansion Racks, the total length of the I/O Connecting Cables must be less than 12 m. When bending an I/O Connecting Cables, provide at least the minimum bending radius shown in the following diagrams.

## CS1 Connecting Cable



**Note:** Cable thickness: 8.6 mm dia.

## Long-distance Expansion Rack I/O Connecting Cable



**Note:** Cable thickness: 10 mm dia.

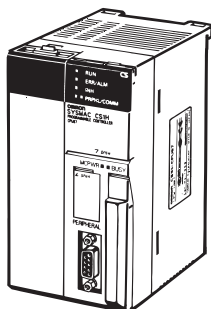
# General Specifications

| Item      Power Supply Unit   |                                                                                                                                                                                                                                                                                                                                                                         | Specifications                                                                                           |                                                                                      |            |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
|                               |                                                                                                                                                                                                                                                                                                                                                                         | CS1D-PA207R                                                                                              | CS1D-PD024                                                                           | CS1D-PD025 |
| Power supply voltage          | 100 to 120 V AC/200 to 240 V, 50/60 Hz                                                                                                                                                                                                                                                                                                                                  | 24 V DC                                                                                                  |                                                                                      |            |
| Operating voltage range       | 85 to 132 V AC/170 to 264 V                                                                                                                                                                                                                                                                                                                                             | 19.2 to 28.8 V DC                                                                                        |                                                                                      |            |
| Power consumption             | 150 VA max.                                                                                                                                                                                                                                                                                                                                                             | 40 W max.                                                                                                | 60 W max.                                                                            |            |
| Inrush current                | 100 to 120 V AC: 30 A max.<br>200 to 240 VAC: 40 A max.                                                                                                                                                                                                                                                                                                                 | 30 A max.                                                                                                |                                                                                      |            |
| Power supply output capacity  | 5 V DC, 7 A (including the CPU Unit power supply)<br>26 V DC, 1.3 A<br>Total: 35 W                                                                                                                                                                                                                                                                                      | 5 V DC, 4.3 A (including the CPU Unit power supply)<br>26 V DC, 0.56 A<br>Total: 28 W                    | 5 V DC, 5.3 A (including the CPU Unit power supply)<br>26 V DC, 1.3 A<br>Total: 40 W |            |
| Power supply output terminal  | Not provided.                                                                                                                                                                                                                                                                                                                                                           |                                                                                                          |                                                                                      |            |
| RUN output *1                 | Contact configuration: SPST-NO<br>Switch capacity:<br>240 V AC, 2 A (resistive load)<br>120 V AC, 0.5 A (induction load)<br>24 V DC, 2 A (resistive load)<br>24 VDC, 2 A (induction load)                                                                                                                                                                               | Not provided.                                                                                            |                                                                                      |            |
| Insulation resistance         | 20 MΩ min. (at 500 V DC) between AC external and GR terminals *2                                                                                                                                                                                                                                                                                                        | 20 MΩ min. (at 500 V DC) between DC external and GR terminals *2                                         |                                                                                      |            |
| Dielectric strength           | Between AC external and GR terminals *2:<br>2,300 V AC 50/60 Hz for 1 min<br>Leakage current: 10 mA max.<br>Between DC external and GR terminals *2:<br>1,000 V AC 50/60 Hz for 1 min<br>Leakage current: 10 mA max.                                                                                                                                                    | Between DC external and GR terminals *2:<br>1,000 V AC 50/60 Hz for 1 min<br>Leakage current: 10 mA max. |                                                                                      |            |
| Noise immunity                | 2 kV on power supply line (conforming to IEC61000-4-4)                                                                                                                                                                                                                                                                                                                  |                                                                                                          |                                                                                      |            |
| Vibration resistance          | 10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s <sup>2</sup> in X, Y, and Z directions for 80 minutes<br>(Time coefficient: 8 minutes × coefficient factor 10 = total time 80 minutes)<br>(When mounted on a DIN Track: 2 to 55 Hz, acceleration of 2.9 m/s <sup>2</sup> in X, Y, and Z directions for 20 minutes)<br>(conforming to IEC60068-2-6) |                                                                                                          |                                                                                      |            |
| Shock resistance              | 147 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (conforming to IEC60068-2-27)                                                                                                                                                                                                                                                                               |                                                                                                          |                                                                                      |            |
| Ambient operating temperature | 0 to 55°C                                                                                                                                                                                                                                                                                                                                                               |                                                                                                          |                                                                                      |            |
| Ambient operating humidity    | 10% to 90% (with no condensation)                                                                                                                                                                                                                                                                                                                                       |                                                                                                          |                                                                                      |            |
| Atmosphere                    | No corrosive gases                                                                                                                                                                                                                                                                                                                                                      |                                                                                                          |                                                                                      |            |
| Ambient storage temperature   | -20 to 75°C (excluding battery)                                                                                                                                                                                                                                                                                                                                         |                                                                                                          |                                                                                      |            |
| Grounding                     | Less than 100 Ω                                                                                                                                                                                                                                                                                                                                                         |                                                                                                          |                                                                                      |            |
| Enclosure                     | Mounted in a panel.                                                                                                                                                                                                                                                                                                                                                     |                                                                                                          |                                                                                      |            |
| Weight                        | Each Rack: 6 kg max.                                                                                                                                                                                                                                                                                                                                                    |                                                                                                          |                                                                                      |            |
| CPU Rack dimensions (mm)      | CS1D-BC052 (5 slots, Duplex CPU System) and CS1D-BI082S (8 slots, Single CPU System):<br>505 × 132 × 123 mm (W × H × D) *2                                                                                                                                                                                                                                              |                                                                                                          |                                                                                      |            |

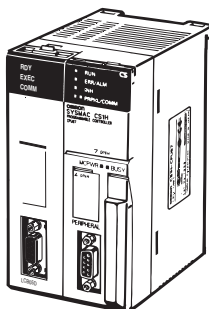
\*1. Supported when mounted to a Backplane.

\*2. Disconnect the CS1D Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Testing the insulation and dielectric strength with the LG terminal and the GR terminals connected will damage internal circuits in the CPU Unit.

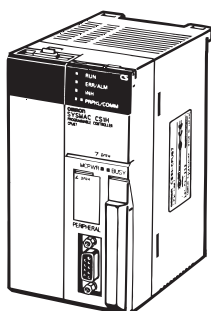
# CPU Units



CS1D CPU Unit  
(For a Duplex CPU System)



Process-control CPU Unit



CS1D CPU Unit  
(For a Single CPU System)

| Item                               |                            | CS1D CPU Unit                               |                            |                           |                            |                             |                                             |                                             |                           |                          |                          |                          |         |
|------------------------------------|----------------------------|---------------------------------------------|----------------------------|---------------------------|----------------------------|-----------------------------|---------------------------------------------|---------------------------------------------|---------------------------|--------------------------|--------------------------|--------------------------|---------|
|                                    |                            | CS1D-H CPU Unit<br>(For Duplex CPU Systems) |                            |                           |                            | Process-control<br>CPU Unit |                                             | CS1D-H CPU Unit<br>(For Single CPU Systems) |                           |                          |                          |                          |         |
| Model                              | CS1D-<br>CPU68HA           | CS1D-<br>CPU67HA                            | CS1D-<br>CPU67H            | CS1D-<br>CPU65H           | CS1D-<br>CPU67P            | CS1D-<br>CPU65P             | CS1D-<br>CPU67SA                            | CS1D-<br>CPU67S                             | CS1D-<br>CPU65S           | CS1D-<br>CPU44SA         | CS1D-<br>CPU44S          | CS1D-<br>CPU42S          |         |
| CPU Unit duplex-<br>ing            | Can be duplexed.           |                                             |                            |                           |                            |                             | Cannot be duplexed.                         |                                             |                           |                          |                          |                          |         |
| Number of I/O<br>points            | 5,120 points               |                                             |                            |                           |                            |                             |                                             |                                             |                           | 1,280<br>points          | 1,280<br>points          | 960 points               |         |
| Number of Expan-<br>sion Racks     | 7 max.                     |                                             |                            |                           |                            |                             |                                             |                                             |                           | 3 max.                   | 3 max.                   | 2 max.                   |         |
| User program ca-<br>pacity         | 400<br>Ksteps              | 250<br>Ksteps                               | 250<br>Ksteps              | 60<br>Ksteps              | 250<br>Ksteps              | 60<br>Ksteps                | 250<br>Ksteps                               | 250<br>Ksteps                               | 60<br>Ksteps              | 30<br>Ksteps             | 30<br>Ksteps             | 10<br>Ksteps             |         |
| Data memory                        | 832<br>Kwords              | 448<br>Kwords                               | 448<br>Kwords              | 128<br>Kwords             | 448<br>Kwords              | 128<br>Kwords               | 448<br>Kwords                               | 448<br>Kwords                               | 128<br>Kwords             | 64<br>Kwords             | 64<br>Kwords             | 64<br>Kwords             |         |
| DM                                 | 32 Kwords                  | 32 Kwords                                   | 32 Kwords                  | 32 Kwords                 | 32 Kwords                  | 32 Kwords                   | 32 Kwords                                   | 32 Kwords                                   | 32 Kwords                 | 32 Kwords                | 32 Kwords                | 32 Kwords                |         |
| EM                                 | 32 Kwords<br>×<br>25 banks | 32 Kwords<br>×<br>13 banks                  | 32 Kwords<br>×<br>13 banks | 32 Kwords<br>×<br>3 banks | 32 Kwords<br>×<br>13 banks | 32 Kwords<br>×<br>3 banks   | 32 Kwords<br>×<br>13 banks                  | 32 Kwords<br>×<br>13 banks                  | 32 Kwords<br>×<br>3 banks | 32 Kwords<br>×<br>1 bank | 32 Kwords<br>×<br>1 bank | 32 Kwords<br>×<br>1 bank |         |
| LD instruction exe-<br>cution time | 0.02 μs                    |                                             |                            |                           |                            |                             |                                             |                                             |                           |                          | 0.04 μs                  |                          |         |
| Interrupt functions                | Cannot be used.            |                                             |                            |                           |                            |                             | Can be used.                                |                                             |                           |                          |                          |                          |         |
| Loop control func-<br>tions        | None                       |                                             |                            |                           | Yes (Can be<br>duplexed.)  |                             | Yes, when a Loop Control Board is installed |                                             |                           |                          |                          |                          |         |
| Function blocks                    | Yes                        |                                             | None                       |                           |                            |                             | Yes                                         | None                                        |                           | Yes                      | None                     |                          |         |
| Structured text                    | Yes                        |                                             | None                       |                           |                            |                             | Yes                                         | None                                        |                           | Yes                      | None                     |                          |         |
| Sequential func-<br>tion chart     | Yes                        |                                             | None                       |                           |                            |                             | Yes                                         | None                                        |                           | Yes                      | None                     |                          |         |
| CS1D-CPU65H<br>compatible mode     | None                       | Yes                                         | None                       |                           |                            |                             | None                                        | None                                        |                           | None                     | None                     |                          |         |
| CS1D-CPU67H<br>compatible mode     | None                       | Yes                                         | None                       |                           |                            |                             | None                                        | None                                        |                           | None                     | None                     |                          |         |
| Current<br>consump-<br>tion (A)    | 5 V                        | 0.82 *1,<br>*2                              | 0.82 *1,<br>*2             | 0.82 *1,<br>*2            | 0.82 *1,<br>*2             | 1.04                        | 1.04                                        | 0.82 *1                                     | 0.82 *1                   | 0.82 *1                  | 0.82 *1                  | 0.78 *1                  | 0.78 *1 |
|                                    | 26 V                       | ---                                         | ---                        | ---                       | ---                        | ---                         | ---                                         | ---                                         | ---                       | ---                      | ---                      | ---                      | ---     |

\*1. These values include the current consumption of a connected Programming Console.

\*2. NT-AL001 Link Adapters consume an additional 0.15 A each when used.

# Common Specifications

| Item                                                               |                       | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Control method                                                     |                       | Stored program                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| I/O control method                                                 |                       | Cyclic scan and immediate processing are both supported. *1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Programming                                                        |                       | Ladder diagram<br>Structured text (ST) *2<br>Sequential function chart (SFC) *2<br>Instruction list (IL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Instruction length                                                 |                       | 1 to 7 steps per instruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ladder instructions                                                |                       | Approx. 400 (3-digit function codes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Instruction execution times                                        | Basic instructions    | 0.02 μs min.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                    | Special instructions  | 0.04 μs min.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Number of Tasks                                                    |                       | Cyclic tasks: 32<br>Interrupt tasks: 256<br>(Interrupt tasks can be defined as cyclic tasks to create extra cyclic tasks, making a total of 288 tasks that can be executed each cycle.)<br>Cyclic tasks are executed each cycle and are controlled with TKON and TKOF instructions.<br>The following 4 types of interrupt tasks are supported: Power OFF interrupt task (1 max.), scheduled interrupt tasks (2 max.), I/O interrupt tasks (32 max.), and external interrupt tasks (256 max.).<br>These interrupt tasks are supported in the CS1D-CPU□□S/SA CPU Units for Single CPU Systems.<br>Interrupt tasks are not supported in the CS1D-CPU□□H/P/HA CPU Units for Duplex CPU Systems. |
| Interrupt types                                                    |                       | Scheduled Interrupts: Interrupts generated by the CPU Unit's built-in timer at regular intervals.<br>I/O Interrupts: Interrupts from Interrupt Input Units<br>Power OFF Interrupts: Interrupts executed when the CPU Unit's power is turned OFF.<br>External I/O Interrupts: Interrupts from the Special I/O Units, CS-series CPU Bus Units, or the Inner Board.                                                                                                                                                                                                                                                                                                                            |
| Note: The interrupts can be used in CS1D-CPU□□S/SA CPU Units only. |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Function blocks *2                                                 |                       | Languages in function block definitions: Ladder language, Structured Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CIO (Core I/O) Area                                                | I/O Area              | 5,120: CIO 000000 to CIO 031915 (320 words from CIO 0000 to CIO 0319)<br>The setting of the first word can be changed from the default (CIO 0000) so that CIO 0000 to CIO 0999 can be used.<br>I/O bits are allocated to CS-series Basic I/O Units.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                    | Data Link Area        | 3,200 (200 words): CIO 10000 to CIO 119915 (words CIO 1000 to CIO 1199)<br>Link bits are used for data links and are allocated to Units in Controller Link Systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                    | CPU Bus Unit Area     | 6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899)<br>These words are allocated to CS1 CPU Bus Units.<br>(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)<br>These words are allocated to CS1 Special I/O Units.<br>(10 words per Unit, 96 Units max. The maximum total number of slots, however, is limited to 80 including expansion slots, so the 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)<br>Inner Board bits can be 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)<br>(Can be used as work words in the program.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                    | I/O Terminal Area     | 512 (32 words): CIO 310000 to CIO 313115 (words CIO 3100 to CIO 3131)<br>(Can be used as work words in the program.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Work Areas                                                         | Internal I/O Area     | 4,800 (300 words): CIO 120000 to CIO 149915 (words CIO 1200 to CIO 1499)<br>37,504 (2,344 words): CIO 380000 to CIO 614315 (words CIO 3800 to CIO 6143)<br>These bits in the 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)<br>These bits are used to control the programs only. (I/O from external I/O is not possible.)<br>When using work bits in programming, use the bits in the Work Area first before using bits from other areas.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Holding Area                                                       |                       | 8,192 bits (512 words): H00000 to H51115 (words H000 to H511)<br>Holding bits are used to control the execution of the program, and maintain their ON/OFF status when the PLC is turned OFF or the operating mode is changed.<br>The words from H512 to H1535 are Function Block Holding Area words. *2<br>They can be set only in the FB instance area (internally-assigned range of variables). *2                                                                                                                                                                                                                                                                                        |
| Auxiliary Area                                                     |                       | Read only: 7,168 bits (448 words): A00000 to A44715 (words A000 to A447)<br>Read/write: 8,192 bits (512 words): A44800 to A95915 (words A448 to A959)<br>Auxiliary bits are allocated for specific functions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Temporary Relay (TR) Area                                          |                       | 16 bits (TR0 to TR15)<br>Temporary bits are used to temporarily store the 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)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data Memory (DM) Area                                              |                       | 32 Kwords: D00000 to D32767<br>Special I/O Unit DM Area: D20000 to D29599 (100 words × 96 Units)<br>Used to set parameters for Special I/O Units.<br>CPU Bus Unit DM Area: D30000 to D31599 (100 words × 16 Units)<br>Used to set parameters for CPU Bus Units.<br>Inner Board DM Area: D32000 to D32099<br>Used to set parameters for Inner Boards (Single CPU Systems only).<br>Used as a general-purpose data area for reading and writing data in word units (16 bits).<br>Words in the DM Area maintain their status when the PLC is turned OFF or the operating mode is changed.                                                                                                      |
| Extended Data Memory (EM) Area                                     |                       | 32 Kwords per bank, 25 banks max.: E0_00000 to E18_32767 max. (Not available on some CPU Units.)<br>Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in the EM Area maintain their status when the PLC is turned OFF or the operating mode is changed.<br>The EM Area is divided into banks, and the addresses can be set by either of the following methods: Changing the current bank using the EMBC instruction and setting addresses for the current bank, or setting bank numbers and addresses directly.<br>EM data can be stored in files by specifying the number of the first bank (EM file memory).                                |
| Data Registers                                                     |                       | DR0 to DR15<br>Used to offset the PLC memory addresses in Index Registers when addressing words indirectly.<br>(Data registers can be set to be used independently by each task. One register is 16 bits (1 word).                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Index Registers                                                    |                       | IR0 to IR15<br>Store PLC memory addresses for indirect addressing. One register is 32 bits (2 words).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Task Flags                                                         |                       | 32 (TK0000 to TK0031)<br>Task Flags are read-only flags that are ON when the corresponding cyclic task is executable and OFF when the corresponding task is not executable or in standby status.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Item                                     |                                                                 | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Trace Memory</b>                      |                                                                 | 4,000 words (The maximum amount of data that can be traced in a data trace is 500 samples for 31 bits and 6 words.)                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Source/<br/>comment<br/>memory *2</b> | Program sources,<br>comments, program<br>indexes, symbol tables | Capacity: 2 MB                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>File Memory</b>                       |                                                                 | Memory Cards: A 128 MB/256 MB *2/512 MB *2 OMRON Memory Card can be used (MS-DOS format).<br>EM file memory: The EM Area can be converted to file memory (MS-DOS format). The memory capacity is the maximum capacity of the CPU Unit's EM Area (Maximum capacity of CS1D-CPU68HA: 1,600 KB)                                                                                                                                                                                        |
| <b>Functions</b>                         | <b>Parallel Processing Mode</b>                                 | Program execution and peripheral servicing can be performed simultaneously (CS1D-CPU□□SA/S only).                                                                                                                                                                                                                                                                                                                                                                                   |
|                                          | <b>Battery-free operation</b>                                   | The user program and the system's parameters are backed up automatically in flash memory, which is standard equipment.                                                                                                                                                                                                                                                                                                                                                              |
|                                          | <b>Constant cycle time</b>                                      | 1 to 32,000 ms (Unit: 1 ms)                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                          | <b>Cycle time monitoring</b>                                    | Possible (Unit stops operating if the cycle is too long): 10 to 40,000 ms (Unit: 10 ms)                                                                                                                                                                                                                                                                                                                                                                                             |
|                                          | <b>I/O refreshing</b>                                           | Cyclic refreshing, immediate refreshing *1, refreshing with I/O REFRESH instruction                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                          | <b>I/O memory holding when changing operating modes</b>         | Possible (Depends on the ON/OFF status of the IOM Hold Bit in the Auxiliary Area.)                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                          | <b>Load OFF</b>                                                 | All outputs on Output Units can be turned OFF.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                          | <b>Input response time setting</b>                              | Time constants can be set for inputs from Basic I/O Units.<br>The time constant can be increased to reduce the influence of noise and chattering or it can be decreased to detect shorter pulses on the inputs (CS1 Basic I/O Units only).                                                                                                                                                                                                                                          |
|                                          | <b>Startup mode setting</b>                                     | Supported.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                          | <b>Memory Card functions</b>                                    | Automatically reading programs (autoboot) from the Memory Card when the power is turned ON.                                                                                                                                                                                                                                                                                                                                                                                         |
|                                          |                                                                 | Format in which data is stored in Memory Card<br>User program: Program file format<br>PLC Setup and other parameters: Data file format (binary format)<br>I/O memory: Data file format (binary format), text format, or CSV format                                                                                                                                                                                                                                                  |
|                                          |                                                                 | Functions for which Memory Card read/write is supported<br>User program instructions, Programming Devices (including Programming Consoles), Host Link computers                                                                                                                                                                                                                                                                                                                     |
|                                          | <b>Filing</b>                                                   | Memory Card data and the EM (Extended Data Memory) Area can be handled as files.                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                          | <b>Debugging</b>                                                | Control set/reset, differential monitoring, data tracing (scheduled, each cycle, or when instruction is executed), storing location generating error when a program error occurs                                                                                                                                                                                                                                                                                                    |
|                                          | <b>Online editing</b>                                           | User programs can be overwritten in program-block units when the CPU Unit is in MONITOR or PROGRAM mode.<br>This function is not available for block programming areas.                                                                                                                                                                                                                                                                                                             |
|                                          | <b>Program protection</b>                                       | Overwrite protection: Set using DIP switch.<br>Copy protection: Password set using Programming Device.                                                                                                                                                                                                                                                                                                                                                                              |
|                                          | <b>Error check</b>                                              | User-defined errors (i.e., user can define fatal errors and non-fatal errors)<br>The FPD(269) instruction can be used to check the execution time and logic of each programming block.                                                                                                                                                                                                                                                                                              |
|                                          | <b>Error log</b>                                                | Up to 20 errors are stored in the error log. Information includes the error code, error details, and the time the error occurred.                                                                                                                                                                                                                                                                                                                                                   |
|                                          | <b>Serial communications</b>                                    | Built-in peripheral port: Programming Device (including Programming Console) connections, Host Links, NT Links<br>Built-in RS-232C port: Programming Device (excluding Programming Console) connections, Host Links, no-protocol communications, NT Links                                                                                                                                                                                                                           |
|                                          | <b>Clock</b>                                                    | Provided on all models.<br><b>Note:</b> Used to store the time when power is turned ON and when errors occur.                                                                                                                                                                                                                                                                                                                                                                       |
|                                          | <b>Power OFF detection time</b>                                 | 10 to 25 ms (not fixed)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                          | <b>Power OFF detection delay time</b>                           | 0 to 10 ms (user-defined, default: 0 ms)                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                          | <b>Memory retention during power interruptions</b>              | Held Areas: Holding bits, contents of Data Memory and Extended Data Memory, and status of the counter Completion Flags and present values.<br><b>Note:</b> If the IOM Hold Bit in the Auxiliary Area is turned ON, and the PLC Setup is set to maintain the IOM Hold Bit status when power to the PLC is turned ON, the contents of the CIO Area, the Work Area, part of the Auxiliary Area, timer Completion Flags and PVs, Index Registers, and the Data Registers will be saved. |
|                                          | <b>Power OFF detection delay time</b>                           | FINs commands can be sent to a computer connected via the Host Link System by executing Network Communications Instructions from the PLC.                                                                                                                                                                                                                                                                                                                                           |
|                                          | <b>Remote programming and monitoring</b>                        | Host Link communications can be used for remote programming and remote monitoring through a Controller Link System or Ethernet network.                                                                                                                                                                                                                                                                                                                                             |
|                                          | <b>Multiple-level communications *3</b>                         | Duplex CPU Systems: 3 levels<br>Single CPU Systems: 8 levels                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                          | <b>Storing comments in CPU Unit</b>                             | I/O comments can be stored in the Memory Card, EM file memory, or comment memory in the CPU Unit flash memory. *2                                                                                                                                                                                                                                                                                                                                                                   |
|                                          | <b>Program check</b>                                            | Program checks are performed at the beginning of operation for items such as no END instruction and instruction errors.                                                                                                                                                                                                                                                                                                                                                             |
|                                          | <b>Control output signals</b>                                   | RUN output: The internal contacts will be ON (closed) while the CPU Unit is operating in RUN mode or MONITOR mode. These terminals are provided only on CS1D-PA207R Power Supply Units.                                                                                                                                                                                                                                                                                             |
|                                          | <b>Battery service life</b>                                     | The battery life is 5 years at an ambient temperature of 25°C, although the lifetime can be as short as 1.1 years under adverse temperature and power conditions. (Battery Set: CS1W-BAT01) *4                                                                                                                                                                                                                                                                                      |
|                                          | <b>Self-diagnostics</b>                                         | CPU errors (watchdog timer), I/O verification errors, I/O bus errors, memory errors, and battery errors                                                                                                                                                                                                                                                                                                                                                                             |
|                                          | <b>Other functions</b>                                          | Words in the Auxiliary Area store the number of power interruptions, time of the last power interruption, and total power ON time.                                                                                                                                                                                                                                                                                                                                                  |

\*1. Immediate refreshing cannot be used in the CS1D-CPU□□HA/H/P CPU Units. (It can be used in the CS1D-CPU□□SA/S CPU Units.)

\*2. Supported only by the CPU Unit version 4.0 or later.

\*3. Communications are possible across up to eight levels only for the Controller Link and Ethernet networks (and the CX-Integrator or CX-Net in CX-Programmer version 4.0 or higher is required to set the routing tables). Communications are possible across only up to three communications levels for the SYSMAC LINK, DeviceNet, and FL-net networks.

\*4. Use a replacement battery that was manufactured within the last two years.

# Functions Added by Unit Version

## ■ Function Supported by Unit Version

| CPU Unit model                                                                                                                                                                |                                                                             | CS1D-CPU□□H       |          |          |           |           | CS1D-CPU□□HA      | CS1D-CPU□□S         |                     | CS1D-CPU□□SA        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------|----------|----------|-----------|-----------|-------------------|---------------------|---------------------|---------------------|
| System                                                                                                                                                                        |                                                                             | Duplex CPU System |          |          |           |           | Duplex CPU System | Single CPU System   |                     | Single CPU System   |
| Function/Unit version                                                                                                                                                         |                                                                             | No unit version   | Ver. 1.1 | Ver. 1.2 | Ver. 1.3  | Ver. 1.4  | Ver. 4.0          | Ver. 2.0            | Ver. 2.1            | Ver. 4.0            |
| Functions unique to CS1D CPU Units                                                                                                                                            | Duplex CPU Units                                                            | OK                | OK       | OK       | OK        | OK        | OK                | ---                 | ---                 | ---                 |
|                                                                                                                                                                               | Online Unit Replacement using a Programming Device                          | OK                | OK       | OK       | OK        | OK        | OK                | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | Duplex Power Supply Units                                                   | OK                | OK       | OK       | OK        | OK        | OK                | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | Duplex Controller Link Units                                                | OK                | OK       | OK       | OK        | OK        | OK                | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | Duplex Ethernet Units                                                       | ---               | OK       | OK       | OK        | OK        | OK                | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | Unit Removal using a Programming Device during Operations                   | OK                | OK       | OK       | OK        | OK        | OK                | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | Unit Removal without a Programming Device during Operations                 | ---               | ---      | OK       | OK        | OK        | OK                | ---                 | ---                 | ---                 |
|                                                                                                                                                                               | Removal/Addition of Units without a Programming Device during Operations *1 | ---               | ---      | ---      | OK *1     | OK *1     | OK *1             | ---                 | ---                 | ---                 |
|                                                                                                                                                                               | Duplex Connecting Cables                                                    | ---               | ---      | ---      | OK *2     | OK *2     | OK *2             | ---                 | ---                 | ---                 |
|                                                                                                                                                                               | Addition of Units and Backplanes during Operations                          | ---               | ---      | ---      | OK *3, *4 | OK *3, *4 | OK *3, *4         | ---                 | ---                 | ---                 |
|                                                                                                                                                                               | Replacement of Duplex Unit during Operations                                | ---               | ---      | ---      | OK *2     | OK *2     | OK *2             | ---                 | ---                 | ---                 |
| Downloading Individual Tasks                                                                                                                                                  |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Improved Read Protection Using Passwords                                                                                                                                      |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Write Protection from FINS Commands Sent to CPU Units via Networks                                                                                                            |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Online Network Connections without I/O Tables                                                                                                                                 |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Communications through a Maximum of 8 Network Levels                                                                                                                          |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Connecting Online to PLCs via NS-series PTs                                                                                                                                   |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Setting First Slot Words                                                                                                                                                      |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK (64 groups max.) | OK (64 groups max.) | OK (64 groups max.) |
| Automatic Transfers at Power ON without a Parameter File (.STD)                                                                                                               |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Operation Start/End Times                                                                                                                                                     |                                                                             | ---               | OK       | OK       | OK        | OK        | OK                | OK                  | OK                  | OK                  |
| Automatic Allocation of Communications Ports                                                                                                                                  |                                                                             | ---               | ---      | ---      | OK        | OK        | OK                | OK                  | OK                  | OK                  |
| Support of new instructions                                                                                                                                                   | MILH, MILR, MILC                                                            | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | = DT, <>DT, <DT, <= DT, >DT, >= DT                                          | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | BCMP2                                                                       | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | GRY                                                                         | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | TPO                                                                         | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | DSW, TKY, HKY, MTR, 7SEG                                                    | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | EXPLT, EGATR, ESATR, ECHRD, ECHWR                                           | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
|                                                                                                                                                                               | IORD/IOWR reading/writing to CPU Bus Units                                  | ---               | ---      | ---      | ---       | ---       | ---               | OK                  | OK                  | OK                  |
| Function blocks                                                                                                                                                               |                                                                             | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
|                                                                                                                                                                               | Online editing of function blocks                                           | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
|                                                                                                                                                                               | Support for I/O variables (including array variables for I/O variables)     | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
|                                                                                                                                                                               | Support for STRING data type and processing functions for ST language       | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
|                                                                                                                                                                               |                                                                             | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
| ST language can be used in a task program                                                                                                                                     |                                                                             | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
| SFC language can be used in a task program                                                                                                                                    |                                                                             | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
| PLC Setup: FB Communications Instruction Settings:<br>Number of Resends<br>Response Monitoring Time:<br>FB Communications Instruction<br>DeviceNet Communications Instruction |                                                                             | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
| Serial Gateway (converting FINS commands to CompoWay/F commands at the built-in serial port)                                                                                  |                                                                             | ---               | ---      | ---      | ---       | ---       | ---               | ---                 | ---                 | ---                 |
| Free Running Timer (system timers used after the power is turned ON)                                                                                                          |                                                                             | ---               | ---      | ---      | ---       | ---       | OK                | ---                 | ---                 | OK                  |
| Read Protection Using Extended Passwords                                                                                                                                      |                                                                             | ---               | ---      | ---      | ---       | OK        | OK                | ---                 | OK                  | OK                  |

| CPU Unit model                                                                                        |                                                                                                                                             | CS1D-CPU□□H       |          |          |          |          | CS1D-CPU□□HA      | CS1D-CPU□□S       |          | CS1D-CPU□□SA      |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|----------|----------|----------|-------------------|-------------------|----------|-------------------|
| System                                                                                                |                                                                                                                                             | Duplex CPU System |          |          |          |          | Duplex CPU System | Single CPU System |          | Single CPU System |
| Function/Unit version                                                                                 |                                                                                                                                             | No unit version   | Ver. 1.1 | Ver. 1.2 | Ver. 1.3 | Ver. 1.4 | Ver. 4.0          | Ver. 2.0          | Ver. 2.1 | Ver. 4.0          |
| Disabling Password Input after Five Consecutive Incorrect Passwords                                   |                                                                                                                                             | ---               | ---      | ---      | ---      | OK       | OK                | ---               | OK       | OK                |
| Auxiliary Area Notification of Production Lot Number                                                  |                                                                                                                                             | ---               | ---      | ---      | ---      | OK       | OK                | ---               | OK       | OK                |
| Comment Memory (in internal flash memory)                                                             |                                                                                                                                             | ---               | ---      | ---      | ---      | ---      | OK                | ---               | ---      | OK                |
| Expanded simple backup data                                                                           | The following files stored in comment memory can be backed up.<br>• Symbol table files<br>• Comment files<br>• Program index files          | ---               | ---      | ---      | ---      | ---      | OK                | ---               | ---      | OK                |
| TXDU, RXDU (support no-protocol communications with serial communications units version 1.2 or later) |                                                                                                                                             | ---               | ---      | ---      | ---      | ---      | ---               | ---               | ---      | OK                |
| Model conversion instructions: XFERC, DISTC, COLLC, MOVBC, BCNTC                                      |                                                                                                                                             | ---               | ---      | ---      | ---      | ---      | ---               | ---               | ---      | ---               |
| Special function block instructions: GETID                                                            |                                                                                                                                             | ---               | ---      | ---      | ---      | ---      | OK                | ---               | ---      | OK                |
| Additional instruction functions                                                                      | TXD, RXD (support no-protocol communications with serial communications units version 1.2 or later)                                         | ---               | ---      | ---      | ---      | ---      | ---               | ---               | ---      | OK                |
| Use of new special instructions                                                                       | Numerical value to ASCII conversion instructions and ASCII to numerical value conversion instructions: NUM4, NUM8, NUM16, STR4, STR8, STR16 | ---               | ---      | ---      | ---      | ---      | OK                | ---               | ---      | OK                |
| Use of new special instructions                                                                       | Text file write instruction: TWRIT                                                                                                          | ---               | ---      | ---      | ---      | ---      | OK                | ---               | ---      | OK                |

**Note:** OK: Supported, ---: Not supported

- \*1. The Removal/Addition of Units without a Programming Device function is supported only by CS1D CPU Units with unit version 1.3 or later and a Duplex CPU, Dual I/O Expansion System. If the Removal/Addition of Units without a Programming Device function is selected in a Duplex CPU, Single I/O Expansion System, the function operates as the earlier Unit Removal without a Programming Device function.
- \*2. Supported only by a CS1D Duplex CPU, Dual I/O Expansion System.
- \*3. Basic I/O Units and Special I/O Units can be added for the Online Addition of Units and Backplanes function. CPU Units cannot be added.
- \*4. Expansion Backplanes cannot be added with a Duplex CPU, Single I/O Expansion System.

## ■ Unit Versions and Programming Devices

OK: Supported, ---: Not supported, △: Can be used except for new functions added for unit versions

| CPU Unit                                               | Function                                                                                                                  | Required programming device |         |         |                 |         |         |         |         |         |                    |                                            |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------|---------|-----------------|---------|---------|---------|---------|---------|--------------------|--------------------------------------------|
|                                                        |                                                                                                                           | CX-Programmer               |         |         |                 |         |         |         |         |         |                    | Programming Console                        |
|                                                        |                                                                                                                           | Ver. 3.2 or lower           | Ver.3.3 | Ver.4.0 | Ver.5.0 Ver.6.0 | Ver.6.1 | Ver.7.0 | Ver.7.2 | Ver.8.0 | Ver.9.6 | Ver. 9.7 or higher |                                            |
| CS1D CPU Units for Single CPU Systems, Unit Ver. 2.0   | ---                                                                                                                       | ---                         | ---     | OK      | OK              | OK      | OK      | OK      | OK      | OK      | OK                 | OK                                         |
| CS1D CPU Units for Single CPU Systems, Unit Ver.2.1    | Functions added for unit version 2.1                                                                                      | ---                         | ---     | △       | △               | △       | △       | △       | △       | OK      | OK                 | △                                          |
| CS1D CPU Units for Single CPU Systems, Unit Ver.4.0    | Functions added for unit version 4.0                                                                                      | ---                         | ---     | △       | △               | △       | △       | △       | △       | △       | OK                 | △                                          |
| CS1D CPU Units for Duplex CPU Systems, no unit version | ---                                                                                                                       | OK                          | OK      | OK      | OK              | OK      | OK      | OK      | OK      | OK      | OK                 | OK                                         |
| CS1D CPU Units for Duplex CPU Systems, Unit Ver.1.1    | Functions added for unit version 1.1                                                                                      | △                           | △       | OK      | OK              | OK      | OK      | OK      | OK      | OK      | OK                 | OK                                         |
| CS1D CPU Units for Duplex CPU Systems, Unit Ver.1.2    | Functions added for unit version 1.2                                                                                      | △                           | △       | △       | △               | OK      | OK      | OK      | OK      | OK      | OK                 | OK                                         |
| CS1D CPU Units for Duplex CPU Systems, Unit Ver.1.3    | Functions added for unit version 1.3                                                                                      | △                           | △       | △       | △               | △       | OK *    | OK      | OK      | OK      | OK                 | Online addition of Units is not supported. |
| CS1D CPU Units for Duplex CPU Systems, Unit Ver.1.4    | Functions added for unit version 1.4                                                                                      | △                           | △       | △       | △               | △       | △       | △       | △       | OK      | OK                 | △                                          |
| CS1D CPU Units for Duplex CPU Systems, Unit Ver.4.0    | Functions except for functions added for unit version 4.0 when CS1D-CPU67HA is in CS1D-CPU65H/CS1D-CPU67H compatible mode | △                           | △       | △       | △               | △       | △       | △       | △       | OK      | OK                 | △                                          |
| CS1D CPU Units for Duplex CPU Systems, Unit Ver.4.0    | ---                                                                                                                       | ---                         | ---     | ---     | ---             | ---     | ---     | ---     | ---     | ---     | OK                 | △                                          |

\* The CX-Programmer version 7.0 can be used by expanding the unit's functions using the auto update function.

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# Ordering Information

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## International Standards

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### ● Applicable standards

Refer to the OMRON website ([www.ia.omron.com](http://www.ia.omron.com)) or ask your OMRON representative for the most recent applicable standards for each model.

### ● EU Directives

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

### ● EMC Directives

#### Applicable Standards

|      |                          |
|------|--------------------------|
| EMI: | EN61000-6-4<br>EN61131-2 |
| EMS: | EN61000-6-2<br>EN61131-2 |

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.

### ● 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

## Basic System

### SYSTEM 1 CPU Rack (Duplex CPU, Dual I/O Expansion System)

The CPU Rack requires a CS1D CPU Backplane (for a Duplex CPU, Dual I/O Expansion System), one or two CS1D Power Supply Units, and two CS1D CPU Units (for a Duplex CPU, Dual I/O Expansion System or Single I/O Expansion System). When an Expansion Rack is connected, two I/O Control Units are required.

## CS1D CPU Units

| Name                                                                                                                             | Specifications         |                  |                                                      |                     |             |                     | Current consumption (A) |             | Model        |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|------------------------------------------------------|---------------------|-------------|---------------------|-------------------------|-------------|--------------|
|                                                                                                                                  | Number of I/O points   | Program capacity | Data Memory                                          | Programming         | Duplex CPUs | Interrupt functions | 5 V system              | 26 V system |              |
| <b>CS1D CPU Unit for Duplex CPU Systems</b><br> | 5,120 points (7 Racks) | 400 Ksteps       | 832 Kwords (DM: 32 Kwords, EM: 32 Kwords × 25 banks) | Ladder, FB, ST, SFC | OK          | ---                 | 0.82 *                  | ---         | CS1D-CPU68HA |
|                                                                                                                                  |                        | 250 Ksteps       | 448 Kwords (DM: 32 Kwords, EM: 32 Kwords × 13 banks) |                     |             |                     | 0.82 *                  | ---         | CS1D-CPU67HA |
|                                                                                                                                  | 5,120 points (7 Racks) | 250 Ksteps       | 448 Kwords (DM: 32 Kwords, EM: 32 Kwords × 13 banks) | Ladder              | OK          | ---                 | 0.82 *                  | ---         | CS1D-CPU67H  |
|                                                                                                                                  |                        | 60 Ksteps        | 128 Kwords (DM: 32 Kwords, EM: 32 Kwords × 3 banks)  |                     |             |                     | 0.82 *                  | ---         | CS1D-CPU65H  |

**Note:** The interrupt functions cannot be used in a Duplex CPU, Dual I/O Expansion System.

\* NT-AL001 Link Adapters consume an additional 0.15 A each when used.

## CS1D Process-control CPU Units

| Name                                                                                                                        | Specifications                |                                                                                                                                           | Current consumption (A) |             | Model       |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------|-------------|
|                                                                                                                             | CPU section                   | Loop control section                                                                                                                      | 5 V system              | 26 V system |             |
| <b>CS1D Process-control CPU Unit</b><br> | Equivalent to the CS1D-CPU67H | <b>LCB05D</b><br>Operation method: Function block method<br>Number of function blocks: 500 blocks max.<br>Minimum operation cycle: 100 ms | 1.04                    | ---         | CS1D-CPU67P |
|                                                                                                                             | Equivalent to the CS1D-CPU65H | PID control method: PID with two degrees of freedom (with autotuning function)                                                            | 1.04                    | ---         | CS1D-CPU65P |

**Note:** 1. The CS1W-LCB01/05 Loop Control Boards cannot be used in a CS1D-CPU□□H for Duplex CPU, Dual I/O Expansion Systems. If the system requires duplex Loop Control Boards, use the CS1D-CPU□□P Process-control CPU Units. For details, refer to the CS Series PLC-based Process Control Catalog (Cat. No. P051).

2. The interrupt functions cannot be used in a Duplex CPU, Dual I/O Expansion System or Duplex CPU, Single I/O Expansion System.

## CS1D Duplex Unit

| Name                                                                                                           | Specifications                             |                                                                                        |                    | Current consumption (A) |             | Model       |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------|--------------------|-------------------------|-------------|-------------|
|                                                                                                                | Applicable systems                         | Basic functions                                                                        | Online Replacement | 5 V system              | 26 V system |             |
| <b>CS1D Duplex Unit</b><br> | Duplex CPU, Dual I/O Expansion System only | Duplex CPU Unit processing, error monitoring, and CPU Unit switching when error occurs | Supported          | 0.41                    | ---         | CS1D-DPL02D |

## ■CS1D Power Supply Units

Two Power Supply Units can be mounted in each Backplane (Rack) to duplex the power supplies.

When duplexing the power supplies, always use the same model of CS1D Power Supply Unit (CS1D-P□□□□).

When selecting a Power Supply Unit, verify that one Unit can satisfy the Rack's entire current consumption.

| Name                                                                                                             | Power supply voltage                  | Output capacity       |                        |       | Options                      |            | Model       |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------|------------------------|-------|------------------------------|------------|-------------|
|                                                                                                                  |                                       | 5 VDC output capacity | 26 VDC output capacity | Total | 24 V DC service power supply | RUN output |             |
| <b>AC Power Supply Unit</b><br> | 100 to 120 V AC<br>or 200 to 240 V AC | 7 A                   | 1.3 A                  | 35 W  | No                           | Yes        | CS1D-PA207R |
| <b>DC Power Supply Unit</b><br> | 24 V DC                               | 4.3 A                 | 0.56 A                 | 28 W  | No                           | No         | CS1D-PD024  |
|                                                                                                                  |                                       | 5.3 A                 | 1.3 A                  | 40 W  |                              |            | CS1D-PD025  |

## ■CS1D CPU Backplane

| Name                                                                                                           | Specifications                             |                                     |                                                | Current consumption (A) |             | Model       |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------|------------------------------------------------|-------------------------|-------------|-------------|
|                                                                                                                | Applicable systems                         | Number of Power Supply Units        | Number of I/O Units                            | 5 V system              | 26 V system |             |
| <b>CS1D CPU Backplane</b><br> | Duplex CPU, Dual I/O Expansion System only | 2 Units max. (for duplex operation) | 5 Units max. (including the I/O Control Units) | 1.20                    | ---         | CS1D-BC042D |

**Note:** C200H-series Units cannot be mounted.

## SYSTEM 1 Expansion Racks (Dual I/O Expansion System)

Each Expansion Rack requires a CS1D Expansion Backplane (for a Duplex CPU, Dual I/O Expansion System), one or two CS1D Power Supply Units, and one or two I/O Interface Units.

### ■ CS1D Expansion Backplane

| Name                                                                                                                 | Specifications                             |                                     |                                                                     | Current consumption (A) |             | Model       |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------|---------------------------------------------------------------------|-------------------------|-------------|-------------|
|                                                                                                                      | Applicable systems                         | Number of Power Supply Units        | Number of I/O Units                                                 | 5 V system              | 26 V system |             |
| <b>CS1D Expansion Backplane</b><br> | Duplex CPU, Dual I/O Expansion System only | 2 Units max. (for duplex operation) | 9 Units max. (Slot number 0 is reserved for an I/O Interface Unit.) | 1.21                    | ---         | CS1D-BI082D |

**Note:** 1. C200H-series Units cannot be mounted.

2. CS-series CPU Bus Units can be mounted in an Expansion Rack, but the I/O refreshing time is longer than it is when the CPU Bus Unit is mounted in the CPU Rack.

### ■ I/O Control Unit

When an Expansion Rack is being connected, mount the CS1D-IC102D I/O Control Unit in the left side of the CPU Backplane and connect the Connecting Cable. Two Units can be mounted to duplex the expansion bus.

| Name                                                                                                          | Specifications                             |           |                    |                     |                                             | Current consumption (A) |             | Model       |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------|--------------------|---------------------|---------------------------------------------|-------------------------|-------------|-------------|
|                                                                                                               | Applicable systems                         | Duplexing | Online Replacement | Mounting Backplane  | Connecting Cable                            | 5 V system              | 26 V system |             |
| <b>I/O Control Unit</b><br> | Duplex CPU, Dual I/O Expansion System only | Supported | Supported          | Expansion Backplane | CS1W-CN□□3<br>CS-series<br>Connecting Cable | 0.20                    | ---         | CS1D-IC102D |

**Note:** Connecting Cables for Long-distance Racks (CV500-CN□□2) cannot be used.

### ■ CS1D I/O Interface Unit

When an Expansion Rack is being connected, mount the CS1D-II102D I/O Interface Unit in the left side of the CS1-series Expansion Backplane. Two Units can be mounted to duplex the expansion bus.

| Name                                                                                                                  | Specifications                             |           |                    |                    |                                             | Current consumption (A) |             | Model       |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------|--------------------|--------------------|---------------------------------------------|-------------------------|-------------|-------------|
|                                                                                                                       | Applicable systems                         | Duplexing | Online Replacement | Mounting Backplane | Connecting Cable                            | 5 V system              | 26 V system |             |
| <b>CS1D I/O Interface Unit</b><br> | Duplex CPU, Dual I/O Expansion System only | Supported | Supported          | CPU Backplane      | CS1W-CN□□3<br>CS-series<br>Connecting Cable | 0.22                    | ---         | CS1D-II102D |

**Note:** Connecting Cables for Long-distance Racks cannot be used.

## Basic System

### SYSTEM 2 CPU Rack (Duplex CPU, Single I/O Expansion System)

The CPU Rack requires a CS1D CPU Backplane (for a Duplex CPU System), one or two CS1D Power Supply Units, and two CS1D CPU Units (for a Duplex CPU System). If the length of the Connecting Cables exceeds 12 m, a Long-distance Expansion System must be used and a Long-distance I/O Control Unit must be mounted.

## CS1D CPU Units

| Name                                                                                                                             | Specifications         |                  |                                                      |                     |             |                     | Current consumption (A) |             | Model        |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|------------------------------------------------------|---------------------|-------------|---------------------|-------------------------|-------------|--------------|
|                                                                                                                                  | Number of I/O points   | Program capacity | Data Memory                                          | Programming         | Duplex CPUs | Interrupt functions | 5 V system              | 26 V system |              |
| <b>CS1D CPU Unit for Duplex CPU Systems</b><br> | 5,120 points (7 Racks) | 400 Ksteps       | 832 Kwords (DM: 32 Kwords, EM: 32 Kwords × 25 banks) | Ladder, FB, ST, SFC | OK          | ---                 | 0.82 *                  | ---         | CS1D-CPU68HA |
|                                                                                                                                  |                        | 250 Ksteps       | 448 Kwords (DM: 32 Kwords, EM: 32 Kwords × 13 banks) |                     |             |                     | 0.82 *                  | ---         | CS1D-CPU67HA |
|                                                                                                                                  | 5,120 points (7 Racks) | 250 Ksteps       | 448 Kwords (DM: 32 Kwords, EM: 32 Kwords × 13 banks) | Ladder              | OK          | ---                 | 0.82 *                  | ---         | CS1D-CPU67H  |
|                                                                                                                                  |                        | 60 Ksteps        | 128 Kwords (DM: 32 Kwords, EM: 32 Kwords × 3 banks)  |                     |             |                     | 0.82 *                  | ---         | CS1D-CPU65H  |

**Note:** The interrupt functions cannot be used in a Duplex CPU System.

\* NT-AL001 Link Adapters consume an additional 0.15 A each when used.

## CS1D Process-control CPU Units

| Name                                                                                                                        | Specifications                |                                                                                                                                           | Current consumption (A) |             | Model       |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------|-------------|
|                                                                                                                             | CPU section                   | Loop control section                                                                                                                      | 5 V system              | 26 V system |             |
| <b>CS1D Process-control CPU Unit</b><br> | Equivalent to the CS1D-CPU67H | <b>LCB05D</b><br>Operation method: Function block method<br>Number of function blocks: 500 blocks max.<br>Minimum operation cycle: 100 ms | 1.04                    | ---         | CS1D-CPU67P |
|                                                                                                                             | Equivalent to the CS1D-CPU65H | PID control method: PID with two degrees of freedom (with autotuning function)                                                            | 1.04                    | ---         | CS1D-CPU65P |

**Note:** 1. The CS1W-LCB01/05 Loop Control Boards cannot be used in a CS1D-CPU□□H for Duplex CPU, Dual I/O Expansion Systems. If the system requires duplex Loop Control Boards, use the CS1D-CPU□□P Process-control CPU Units. For details, refer to the CS Series PLC-based Process Control Catalog (Cat. No. P051).

2. The interrupt functions cannot be used in a Duplex CPU System.

## CS1D Duplex Unit

| Name                                                                                                           | Specifications                               |                                                                                        |                    | Current consumption (A) |             | Model      |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------|--------------------|-------------------------|-------------|------------|
|                                                                                                                | Applicable systems                           | Basic functions                                                                        | Online Replacement | 5 V system              | 26 V system |            |
| <b>CS1D Duplex Unit</b><br> | Duplex CPU, Single I/O Expansion System only | Duplex CPU Unit processing, error monitoring, and CPU Unit switching when error occurs | Not supported      | Total: 0.55             | ---         | CS1D-DPL01 |

## ■ CS1D Power Supply Units

Two Power Supply Units can be mounted in each Backplane (Rack) to duplex the power supplies.

When duplexing the power supplies, always use the same model of CS1D Power Supply Unit (CS1D-P□□□□).

When selecting a Power Supply Unit, verify that one Unit can satisfy the Rack's entire current consumption.

| Name                                                                                                             | Power supply voltage                  | Output capacity       |                        |       | Options                      |            | Model       |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------|------------------------|-------|------------------------------|------------|-------------|
|                                                                                                                  |                                       | 5 VDC output capacity | 26 VDC output capacity | Total | 24 V DC service power supply | RUN output |             |
| <b>AC Power Supply Unit</b><br> | 100 to 120 V AC<br>or 200 to 240 V AC | 7 A                   | 1.3 A                  | 35 W  | No                           | Yes        | CS1D-PA207R |
| <b>DC Power Supply Unit</b><br> | 24 V DC                               | 4.3 A                 | 0.56 A                 | 28 W  | No                           | No         | CS1D-PD024  |
|                                                                                                                  |                                       | 5.3 A                 | 1.3 A                  | 40 W  |                              |            | CS1D-PD025  |

## ■ CS1D CPU Backplane

| Name                                                                                                          | Specifications                               |                                     |                     | Current consumption (A) |             | Model      |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------|---------------------|-------------------------|-------------|------------|
|                                                                                                               | Applicable systems                           | Number of Power Supply Units        | Number of I/O Units | 5 V system              | 26 V system |            |
| <b>CS1D CPU Backplane</b><br> | Duplex CPU, Single I/O Expansion System only | 2 Units max. (for duplex operation) | 5 Units max.        | Total: 0.55             | ---         | CS1D-BC052 |

**Note:** C200H-series Units cannot be mounted.

## SYSTEM 2 Expansion Racks (Single I/O or Long-distance Expansion System)

Each Expansion Rack requires a CS1D Expansion Backplane (for a Duplex CPU, Single I/O Expansion System), one or two CS1D Power Supply Units, and one or two I/O Interface Units. If the length of the Connecting Cables exceeds 12 m, a Long-distance Expansion System must be used and an I/O Interface Unit must be mounted.

### ■ CS1D Expansion Backplane

Always use the following Backplane for regular I/O expansion or long-distance expansion.

| Name                                                                                                                 | Specifications                               |                                     |                     | Current consumption (A) |             | Model      |
|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------|---------------------|-------------------------|-------------|------------|
|                                                                                                                      | Applicable systems                           | Number of Power Supply Units        | Number of I/O Units | 5 V system              | 26 V system |            |
| <b>CS1D Expansion Backplane</b><br> | Duplex CPU, Single I/O Expansion System only | 2 Units max. (for duplex operation) | 9 Units max.        | 0.28                    | ---         | CS1D-BI092 |

**Note:** 1. C200H-series Units cannot be mounted.

2. CS-series CPU Bus Units can be mounted in an Expansion Rack, but the I/O refreshing time is longer than it is when the CPU Bus Unit is mounted in the CPU Rack.

### ■ I/O Control Unit

An I/O Control Unit is required only if the length of the Connecting Cables exceeds 12 m. In this case, mount an I/O Control Unit in the CPU Backplane and I/O Interface Units in the CS1 Expansion Backplanes and connect the Racks with Long-distance (CV500-CN□□2) Connecting Cables.

| Name                                                                                                           | Specifications                                               |               |                    |                    |                                | Current consumption (A) |             | Model      |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------|--------------------|--------------------|--------------------------------|-------------------------|-------------|------------|
|                                                                                                                | Applicable systems                                           | Duplexing     | Online Replacement | Mounting Backplane | Connecting Cable               | 5 V system              | 26 V system |            |
| <b>I/O Control Unit</b><br> | Duplex CPU, Single I/O Expansion System or Single CPU System | Not supported | Not supported      | CPU Backplane      | Long-distance Connecting Cable | 0.92                    | ---         | CS1W-IC102 |

### ■ I/O Interface Unit

An I/O Interface Unit is required only if the length of the Connecting Cables exceeds 12 m. In this case, mount I/O Interface Units in the CS1 Expansion Backplanes and connect the Racks with Long-distance (CV500-CN□□2) Connecting Cables.

| Name                                                                                                             | Specifications                                               |               |                    |                     |                                | Current consumption (A) |             | Model      |
|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------|--------------------|---------------------|--------------------------------|-------------------------|-------------|------------|
|                                                                                                                  | Applicable systems                                           | Duplexing     | Online Replacement | Mounting Backplane  | Connecting Cable               | 5 V system              | 26 V system |            |
| <b>I/O Interface Unit</b><br> | Duplex CPU, Single I/O Expansion System or Single CPU System | Not supported | Not supported      | Expansion Backplane | Long-distance Connecting Cable | 0.23                    | ---         | CS1W-II102 |

## Basic System

### SYSTEM 3 CPU Rack (Single CPU System)

The CPU Rack requires a CS1D CPU Backplane (for a Single CPU System), one or two CS1D Power Supply Units, and a CS1D CPU Unit (for a Single CPU System). If the length of the Connecting Cables exceeds 12 m, a Long-distance Expansion System must be used and a Long-distance I/O Control Unit must be mounted.

## CS1D CPU Units

| Name                                                                                                                             | Specifications         |                  |                                                      |                     |             |                     | Current consumption (A) |             | Model          |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|------------------------------------------------------|---------------------|-------------|---------------------|-------------------------|-------------|----------------|
|                                                                                                                                  | Number of I/O points   | Program capacity | Data Memory                                          | Programming         | Duplex CPUs | Interrupt functions | 5 V system              | 26 V system |                |
| <b>CS1D CPU Unit for Single CPU Systems</b><br> | 5,120 points (7 Racks) | 250 Ksteps       | 448 Kwords (DM: 32 Kwords, EM: 32 Kwords × 13 banks) | Ladder, FB, ST, SFC | ---         | OK                  | 0.82 *1                 | ---         | CS1D-CPU67SA   |
|                                                                                                                                  | 1,280 points (3 Racks) | 30 Ksteps        | 64 Kwords (DM: 32 Kwords, EM: 32 Kwords × 1 bank)    |                     |             |                     | 0.82 *1                 | ---         | CS1D-CPU44SA   |
|                                                                                                                                  | 5,120 points (7 Racks) | 250 Ksteps       | 448 Kwords (DM: 32 Kwords, EM: 32 Kwords × 13 banks) | Ladder              |             |                     | 0.82 *1                 | ---         | CS1D-CPU67S *2 |
|                                                                                                                                  | 5,120 points (7 Racks) | 60 Ksteps        | 128 Kwords (DM: 32 Kwords, EM: 32 Kwords × 3 banks)  |                     |             |                     | 0.82 *1                 | ---         | CS1D-CPU65S *2 |
|                                                                                                                                  | 1,280 points (3 Racks) | 30 Ksteps        | 64 Kwords (DM: 32 Kwords, EM: 32 Kwords × 1 bank)    | Ladder              |             |                     | 0.78 *1                 | ---         | CS1D-CPU44S *2 |
|                                                                                                                                  | 960 points (2 Racks)   | 10 Ksteps        | 64 Kwords (DM: 32 Kwords, EM: 32 Kwords × 1 bank)    |                     |             |                     | 0.78 *1                 | ---         | CS1D-CPU42S *2 |

\*1. NT-AL001 Link Adapters consume an additional 0.15 A each when used.

\*2. Product no longer available to order.

## CS1D Power Supply Units

Two Power Supply Units can be mounted in each Backplane (Rack) to duplex the power supplies.

When duplexing the power supplies, always use the same model of CS1D Power Supply Unit (CS1D-P□□□□).

When selecting a Power Supply Unit, verify that one Unit can satisfy the Rack's entire current consumption.

| Name                                                                                                               | Power supply voltage               | Output capacity       |                        |       | Options                      |            | Model       |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------|------------------------|-------|------------------------------|------------|-------------|
|                                                                                                                    |                                    | 5 VDC output capacity | 26 VDC output capacity | Total | 24 V DC service power supply | RUN output |             |
| <b>AC Power Supply Unit</b><br> | 100 to 120 V AC or 200 to 240 V AC | 7 A                   | 1.3 A                  | 35 W  | No                           | Yes        | CS1D-PA207R |
| <b>DC Power Supply Unit</b><br> | 24 V DC                            | 4.3 A                 | 0.56 A                 | 28 W  | No                           | No         | CS1D-PD024  |
|                                                                                                                    |                                    | 5.3 A                 | 1.3 A                  | 40 W  |                              |            | CS1D-PD025  |

## CS1D CPU Backplane

| Name                                                                                                            | Specifications         |                                     |                     | Current consumption (A) |             | Model       |
|-----------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------|---------------------|-------------------------|-------------|-------------|
|                                                                                                                 | Applicable systems     | Number of Power Supply Units        | Number of I/O Units | 5 V system              | 26 V system |             |
| <b>CS1D CPU Backplane</b><br> | Single CPU System only | 2 Units max. (for duplex operation) | 8 slots max.        | 0.17                    | ---         | CS1D-BC082S |

**Note:** C200H-series Units cannot be mounted.

## SYSTEM 3 Expansion Racks (Single I/O or Long-distance Expansion System)

Each Expansion Rack requires a CS1D Expansion Backplane (for a Duplex CPU, Single I/O Expansion System), and one or two CS1D Power Supply Units. If the length of the Connecting Cables exceeds 12 m, a Long-distance Expansion System must be used and an I/O Interface Unit must be mounted.

### ■ CS1D Expansion Backplane

Always use the following Backplane for regular I/O expansion or long-distance expansion.

| Name                                                                                                                 | Specifications                                               |                                     |                     | Current consumption (A) |             | Model      |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|---------------------|-------------------------|-------------|------------|
|                                                                                                                      | Applicable systems                                           | Number of Power Supply Units        | Number of I/O Units | 5 V system              | 26 V system |            |
| <b>CS1D Expansion Backplane</b><br> | Duplex CPU, Single I/O Expansion System or Single CPU System | 2 Units max. (for duplex operation) | 9 Units max.        | 0.28                    | ---         | CS1D-BI092 |

**Note:** 1. C200H-series Units cannot be mounted.

2. CS-series CPU Bus Units can be mounted in an Expansion Rack, but the I/O refreshing time is longer than it is when the CPU Bus Unit is mounted in the CPU Rack.

### ■ I/O Control Unit (Used for Long-distance Expansion)

An I/O Control Unit is required only if the length of the Connecting Cables exceeds 12 m. In this case, mount an I/O Control Unit in the CPU Backplane and I/O Interface Units in the CS1 Expansion Backplanes and connect the Racks with Long-distance (CV500-CN□□2) Connecting Cables.

| Name                                                                                                           | Specifications                                               |               |                    |                    |                                | Current consumption (A) |             | Model      |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------|--------------------|--------------------|--------------------------------|-------------------------|-------------|------------|
|                                                                                                                | Applicable systems                                           | Duplexing     | Online Replacement | Mounting Backplane | Connecting Cable               | 5 V system              | 26 V system |            |
| <b>I/O Control Unit</b><br> | Duplex CPU, Single I/O Expansion System or Single CPU System | Not supported | Not supported      | CPU Backplane      | Long-distance Connecting Cable | 0.92                    | ---         | CS1W-IC102 |

### ■ I/O Interface Unit

An I/O Interface Unit is required only if the length of the Connecting Cables exceeds 12 m. In this case, mount I/O Interface Units in the CS1 Expansion Backplanes and connect the Racks with Long-distance (CV500-CN□□2) Connecting Cables.

| Name                                                                                                             | Specifications                                               |               |                    |                     |                                | Current consumption (A) |             | Model      |
|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------|--------------------|---------------------|--------------------------------|-------------------------|-------------|------------|
|                                                                                                                  | Applicable systems                                           | Duplexing     | Online Replacement | Mounting Backplane  | Connecting Cable               | 5 V system              | 26 V system |            |
| <b>I/O Interface Unit</b><br> | Duplex CPU, Single I/O Expansion System or Single CPU System | Not supported | Not supported      | Expansion Backplane | Long-distance Connecting Cable | 0.23                    | ---         | CS1W-II102 |

## Connecting Cables (Compatible with All Systems)

Connecting Cables are always required when using Expansion Backplanes in a CS1D system.

Long-distance Connecting Cables are required only when connecting Expansion Racks at a long distance in a Duplex CPU, Single I/O Expansion System or Single CPU System.

| Name                                                                                                                        | Specifications                                                                                     |                                                                                                                                        |              | Model         |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|
|                                                                                                                             | Applicable systems                                                                                 | Function                                                                                                                               | Cable length |               |
| <b>CS1-series Connecting Cables</b><br>    | All systems other than long-distance systems                                                       | Use to connect the expansion bus between the CPU Backplane and CS1 Expansion Backplanes                                                | 0.3 m        | CS1W-CN313    |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 0.7 m        | CS1W-CN713    |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 2 m          | CS1W-CN223    |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 3 m          | CS1W-CN323    |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 5 m          | CS1W-CN523    |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 10 m         | CS1W-CN133    |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 12 m         | CS1W-CN133-B2 |
| <b>Long-distance Connecting Cables</b><br> | Duplex CPU, Single I/O Expansion Systems or Single CPU Systems (only with long-distance expansion) | In a Long-distance Expansion System, use to connect from the I/O Control Unit to an I/O Interface Unit or between I/O Interface Units. | 0.3 m        | CV500-CN312   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 0.6 m        | CV500-CN612   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 1 m          | CV500-CN122   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 2 m          | CV500-CN222   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 3 m          | CV500-CN322   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 5 m          | CV500-CN522   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 10 m         | CV500-CN132   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 20 m         | CV500-CN232   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 30 m         | CV500-CN332   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 40 m         | CV500-CN432   |
|                                                                                                                             |                                                                                                    |                                                                                                                                        | 50 m         | CV500-CN532   |

## Programming Devices

## Support Software

| Product name                                      | Specifications                                                                                                  | Media                          |     | Model          |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------|-----|----------------|
|                                                   |                                                                                                                 | No. of licenses                |     |                |
| <b>FA Integrated Tool Package CX-One Ver. 4.□</b> | The CX-One is a comprehensive software package that integrates Support Software for OMRON PLC's and components. | ---                            | DVD | CXONE-AL00D-V4 |
|                                                   |                                                                                                                 | (Media only) *1                |     |                |
|                                                   |                                                                                                                 | 1 license                      |     | CXONE-AL01D-V4 |
|                                                   |                                                                                                                 | 3 licenses                     |     | CXONE-AL03D-V4 |
|                                                   |                                                                                                                 | 10 licenses                    |     | CXONE-AL10D-V4 |
|                                                   |                                                                                                                 | 30 licenses                    |     | CXONE-AL30D-V4 |
|                                                   |                                                                                                                 | 50 licenses                    |     | CXONE-AL50D-V4 |
|                                                   |                                                                                                                 | Unrestricted *2 (Site license) |     | CXONE-ALXXD-V4 |

**Note:** For details, refer to the CX-One Catalog (Cat. No. R134), visit your local OMRON website.

\*1. The CXONE-AL00D-V4 contains only the DVD installation media for users who have purchased the CX-One Version 4.□ and does not include the license number. Enter the license number of the CX-One Version 4.□ when installing. (The license number of the CX-One Version 3.□ or lower cannot be used for installation.)

\*2. This is a site license for users who want to use CX-One on many computers.

- The number of users is unrestricted for the same company and site.
- Only one license number must be managed.
- All computers that use the site license can take advantage of automatic updates and software downloads.

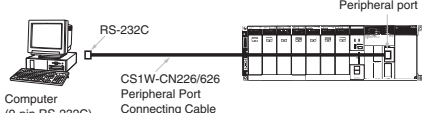
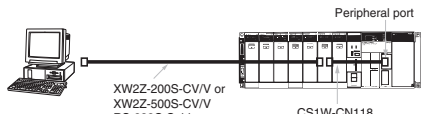
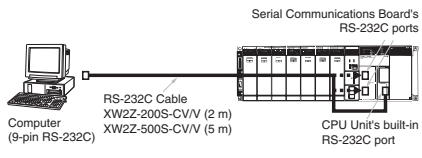
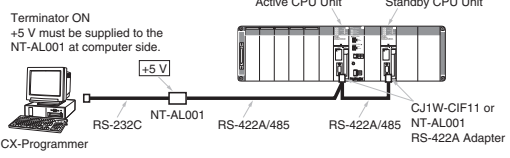
## Support Software in CX-One Ver.4.□

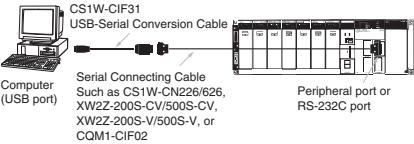
The following tables lists the Support Software that can be installed from CX-One.

| Support Software in CX-One           | Outline                                                                                                                                                                                                                                                                        |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CX-Programmer                        | Application software to create and debug programs for SYSMAC CS/CJ/CP/NSJ-series, C-series, and CVM1/C-series CPU Units. Data can be created and monitored for high-speed-type Position Control Units and Position Control Units with EtherCAT® interface.                     |
| CX-Integrator                        | Application software to build and set up FA networks, such as Controller Link, DeviceNet, CompoNet, CompoWay, and Ethernet networks. The Routing Table Component and Data Link Component can be started from here. DeviceNet Configuration functionality is also included.     |
| Switch Box Utility                   | Utility software that helps you to debug PLCs. It helps you to monitor the I/O status and to monitor/change present values within the PLC you specify.                                                                                                                         |
| CX-Protocol                          | Application software to create protocols (communications sequences) between SYSMAC CS/CJ/CP/NSJ-series or C200HX/HG/HE Serial Communications Boards/Units and general-purpose external devices.                                                                                |
| CX-Simulator                         | Application software to simulate SYSMAC CS/CJ/CP/NSJ-series CPU Unit operation on the computer to debug PLC programs without a CPU Unit.                                                                                                                                       |
| CX-Position                          | Application software to create and monitor data for SYSMAC CS/CJ-series Position Control Units. (except for High-speed type)                                                                                                                                                   |
| CX-Motion-NCF                        | Application software to create and monitor data for SYSMAC CS/CJ-series Position Control Units with MECHATROLINK-II interface (NC□71).                                                                                                                                         |
| CX-Motion-MCH                        | Application software to create data and monitor program and monitor data SYSMAC CS/CJ-series Motion Control Units with MECHATROLINK-II interface (MCH71).                                                                                                                      |
| CX-Motion                            | Application software to create data for SYSMAC CS/CJ-series, C200HX/HG/HE, and CVM1/CV-series Motion Control Units, and to create and monitor motion control programs.                                                                                                         |
| CX-Drive                             | Application software to set and control data for Inverters and Servos.                                                                                                                                                                                                         |
| CX-Process Tool                      | Application software to create and debug function block programs for SYSMAC CS/CJ-series Loop Controllers (Loop Control Units/Boards, Process Control CPU Units, and Loop Control CPU Units).                                                                                  |
| Faceplate Auto-Builder for NS        | Application software that automatically outputs screen data as project files for NS-series PTs from tag information in function block programs created with the CX-Process Tool.                                                                                               |
| CX-Designer                          | Application software to create screen data for NS-series PTs.                                                                                                                                                                                                                  |
| NV-Designer                          | Application software to create screen data for NV-series small PTs.                                                                                                                                                                                                            |
| CX-Configurator FDT                  | Application software for setting various units by installing its DTM module.                                                                                                                                                                                                   |
| CX-Thermo                            | Application software to set and control parameters in components such as Temperature Control Units.                                                                                                                                                                            |
| CX-FLnet                             | Application software for system setting and monitoring of SYSMAC CS/CJ-series FL-net Units                                                                                                                                                                                     |
| Network Configurator                 | Application software for set up and monitor tag datalink for CJ2 (Built-in EtherNet/IP) CPU Units and EtherNet/IP Units.                                                                                                                                                       |
| NX-IO Configurator                   | Application software to set up and maintain EtherNet/IP Coupler Units and NX-series I/O Units on an EtherNet/IP Coupler Unit.                                                                                                                                                  |
| CX-Server                            | Middleware necessary for CX-One applications to communicate with OMRON components, such as PLCs, Display Devices, and Temperature Control Units.                                                                                                                               |
| Communications Middleware            | Middleware necessary to communicate with CP1L CPU Units with built-in Ethernet port.                                                                                                                                                                                           |
| PLC Tools (Installed automatically.) | A group of components used with CX-One applications, such as the CX-Programmer and CX-Integrator. Includes the following: I/O tables, PLC memory, PLC Setup, Data Tracing/Time Chart Monitoring, PLC Error Logs, File Memory, PLC clock, Routing Tables, and Data Link Tables. |

**Note:** If the complete CX-One package is installed, approximately 4.0 GB of Hard disk space will be required.

## ■ Connecting Cables for CX-One Components (e.g. CX-Programmer)

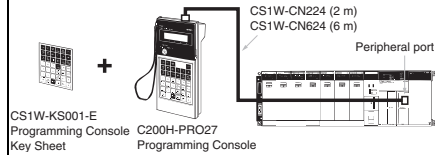
| Name                                                                        |                                                                                    | Specifications                                 |                                                                                                                                                                                                                                                                                                                                                                                                          |              |                                                                                                    | Model        |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------|--------------|
|                                                                             |                                                                                    | Applicable computers                           | Connection configuration                                                                                                                                                                                                                                                                                                                                                                                 | Cable length | Remarks                                                                                            |              |
| Connecting Cables between Programming Device (computer) and peripheral port |   | IBM PC/AT or compatible computer (D-Sub 9-pin) | IBM PC/AT or compatible computer ↔ CS1W-CN226/626 ↔ Peripheral port of CPU Unit*                                                                                                                                                                                                                                                                                                                         | 2 m          | Can be used for both peripheral bus and host link.                                                 | CS1W-CN226   |
|                                                                             |                                                                                    |                                                |  <p>* If the system is a Duplex CPU System, connect to the active CPU Unit.</p>                                                                                                                                                                                                                                         | 6 m          |                                                                                                    | CS1W-CN626   |
|                                                                             |   | IBM PC/AT or compatible computer (D-Sub 9-pin) | <p>The following configuration can be used when using an RS-232C cable to connect to an IBM PC/AT or compatible computer.</p> <p>IBM PC/AT or compatible computer ↔ XW2Z-200S-CV/V or XW2Z-500S-CV/V ↔ Peripheral port of CPU Unit*</p>  <p>* If the system is a Duplex CPU System, connect to the active CPU Unit.</p> | 0.1 m        | Use when connecting to the peripheral port with a CXW2Z-200S-CV/V or XW2Z-500S-CV/V RS-232C Cable. | CS1W-CN118   |
| Connecting Cables between Programming Device (computer) and RS-232C port    |  | IBM PC/AT or compatible computer (D-Sub 9-pin) | IBM PC/AT or compatible computer ↔ XW2Z-200S-CV/V or XW2Z-500S-CV/V ↔ RS-232C port of CPU Unit * or Serial Communications Board/Unit                                                                                                                                                                                                                                                                     | 2 m          | Can be used for both peripheral bus and host link, and is equipped with an anti-static connector.  | XW2Z-200S-CV |
|                                                                             |                                                                                    |                                                |  <p>* If the system is a Duplex CPU System, connect to the active CPU Unit.</p>                                                                                                                                                                                                                                        | 5 m          |                                                                                                    | XW2Z-500S-CV |
|                                                                             |                                                                                    |                                                | <p><b>Note:</b> We recommend the following configuration if the CX-Programmer is always connected and you want to avoid switching to the other CPU Unit when an error occurs.</p>  <p>Terminator ON<br/>+5 V must be supplied to the NT-AL001 at computer side.</p> <p>CX-Programmer</p>                              | 2 m          | Can be used for host link only. Cannot be used for peripheral bus.                                 | XW2Z-200S-V  |
|                                                                             |                                                                                    |                                                |                                                                                                                                                                                                                                                                                                                                                                                                          | 5 m          |                                                                                                    | XW2Z-500S-V  |

| Name                                                                                                                                                                                              | Specifications                              |                                                                                                                                                                                                                                                                |              |                                                                    | Model      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------|------------|
|                                                                                                                                                                                                   | Applicable computers                        | Connection configuration                                                                                                                                                                                                                                       | Cable length | Remarks                                                            |            |
| <b>USB-Serial Conversion Cable (PC driver CD-ROM included)</b><br><br><b>Conforms to USB 2.0 Specifications.</b> | IBM PC/AT or compatible computer (USB port) | IBM PC/AT or compatible computer ↔ CS1W-CIF31 ↔ CS1W-CN226/626 ↔ Peripheral port of CPU Unit *<br><br>* If the system is a Duplex CPU System, connect to the active CPU Unit. | 0.5 m        | Can be used for both peripheral bus and host link.                 | CS1W-CIF31 |
|                                                                                                                                                                                                   |                                             | IBM PC/AT or compatible computer ↔ CS1W-CIF31 ↔ XW2Z-200S-CV/500S-CV ↔ CS1W-CN118 ↔ Peripheral port of CPU Unit                                                                                                                                                |              | Can be used for both peripheral bus and host link.                 |            |
|                                                                                                                                                                                                   |                                             | IBM PC/AT or compatible computer ↔ CS1W-CIF31 ↔ XW2Z-200S-V/500S-V ↔ CS1W-CN118 ↔ Peripheral port of CPU Unit                                                                                                                                                  |              | Can be used for host link only. Cannot be used for peripheral bus. |            |
|                                                                                                                                                                                                   |                                             | IBM PC/AT or compatible computer ↔ CS1W-CIF31 ↔ XW2Z-200S-CV/500S-CV ↔ CS1W-CN118 ↔ RS-232C port of CPU Unit or Serial Communications Board/Unit                                                                                                               |              | Can be used for both peripheral bus and host link.                 |            |
|                                                                                                                                                                                                   |                                             | IBM PC/AT or compatible computer ↔ CS1W-CIF31 ↔ XW2Z-200S-V/500S-V ↔ RS-232C port of CPU Unit or Serial Communications Board/Unit                                                                                                                              |              | Can be used for host link only. Cannot be used for peripheral bus. |            |

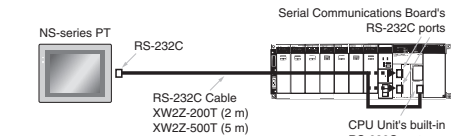
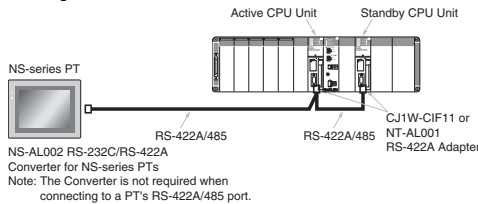
**Note:** Either of the serial communications modes listed in the following table can be used to connect CX-One Support Software (e.g., the CX-Programmer) to a CS1-series PLC.

| Serial communications mode | Features                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Peripheral bus</b>      | This mode can provide high-speed communications, so this mode is normally used to connect when using CX-One component software such as the CX-Programmer. <ul style="list-style-type: none"> <li>• Supports 1:1 connections only.</li> <li>• The Programming Device's baud rate can be detected automatically and matched.</li> </ul>                                              |
| <b>Host Link (SYSWAY)</b>  | This is a general host computer communications protocol, which supports 1:1 and 1:N connections. <ul style="list-style-type: none"> <li>• Host link operates at a slower speed than peripheral bus.</li> <li>• Host link supports 1:N connections as well as long-distance connections when RS-422A/RS-485 is used for a connection through a modem or optical adapter.</li> </ul> |

## ■ Programming Consoles

| Name                                                                                                                             | Specifications                                                                                                                                                                                                                                                | Cable model<br>(Separate item)     | Connection configuration                                                           | Model         |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------|---------------|
| <b>Programming Console</b><br>                  | Can be connected to the CPU Unit's peripheral port only *. Cannot be connected to the RS-232C port.<br>A CS1W-KS001-E Programming Console Key Sheet is required (sold separately).<br>* If the system is a Duplex CPU System, connect to the active CPU Unit. | CS1W-CN224: 2 m<br>CS1W-CN624: 6 m |  | C200H-PRO27-E |
| <b>Programming Console Key Sheet</b>                                                                                             | For the following Programming Consoles: C200H-PRO27                                                                                                                                                                                                           |                                    |                                                                                    | CS1W-KS001-E  |
| <b>Programming Console Connecting Cable</b><br> | For CQM1-PRO01 connection, Cable length: 0.05 m                                                                                                                                                                                                               |                                    |                                                                                    | CS1W-CN114    |
|                                                                                                                                  | For C200H-PRO27 connection, Cable length: 2 m                                                                                                                                                                                                                 |                                    |                                                                                    | CS1W-CN224    |
|                                                                                                                                  | For C200H-PRO27 connection, Cable length: 6 m                                                                                                                                                                                                                 |                                    |                                                                                    | CS1W-CN624    |

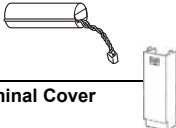
## ■ Connecting Cables for NS-series PTs

| Name                                                                                                                            | Specifications                                                                                                                                                                                                                                                                                                                                                                                                 |              | Model       |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|
|                                                                                                                                 | Connection configuration                                                                                                                                                                                                                                                                                                                                                                                       | Cable length |             |
| <b>Connecting Cables for NS-series PTs</b><br> | Connecting Cables between an NS-series PT and the RS-232C port of CPU Unit * or Serial Communications Board/Unit<br><br>* If the system is a Duplex CPU System, connect to the active CPU Unit.<br><b>Note:</b> We recommend the following configuration if the PT is always connected to a Duplex CPU System for monitoring. | 2 m          | XW2Z-200T   |
|                                                                                                                                 | <br>NS-AL002 RS-232C/RS-422A Converter for NS-series PTs<br>Note: The Converter is not required when connecting to a PT's RS-422A/485 port.                                                                                                                                                                                 | 5 m          | XW2Z-500T   |
|                                                                                                                                 | Connecting Cables between an NS-series PT and the peripheral port of CPU Unit                                                                                                                                                                                                                                                                                                                                  | 2 m          | XW2Z-200T-2 |
|                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                | 5 m          | XW2Z-500T-2 |

**Note:** NS-series PT is no longer available to order.

## Accessories and Maintenance Parts

| Name                                                                                                     | Specifications                                                                   | Model     |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------|
| <b>Memory Cards</b><br> | Flash Memory, 128 MB                                                             | HMC-EF183 |
|                                                                                                          | Flash Memory, 256 MB (Supported only by the CS1D CPU Unit version 4.0 or later.) | HMC-EF283 |
|                                                                                                          | Flash Memory, 512 MB (Supported only by the CS1D CPU Unit version 4.0 or later.) | HMC-EF583 |
|                                                                                                          | Memory Card Adapter (Adapts to a computer's PCMCIA card slot.)                   | HMC-AP001 |

| Name                                                                                                           | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                             | Model       |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Battery Set</b><br>        | Battery for CS-series maintenance<br><b>Note:</b> <ol style="list-style-type: none"> <li>1. A battery is included with the CPU Unit as standard equipment.</li> <li>2. The battery life is 5 years at an ambient temperature of 25°C, although the lifetime can be as short as 1.1 years under adverse temperature and power conditions.</li> <li>3. Use a replacement battery that was manufactured within the last two years.</li> </ol> | CS1W-BAT01  |
| <b>I/O Terminal Cover</b><br> | Cover for 10-pin Terminal Blocks                                                                                                                                                                                                                                                                                                                                                                                                           | C200H-COV11 |
| <b>Connector Cover</b><br>    | Protective cover for unused Power Supply Unit connector in CS1D Backplane                                                                                                                                                                                                                                                                                                                                                                  | C500-COV01  |
|                                                                                                                | Protective cover for unused CS-series Unit connector in Backplane                                                                                                                                                                                                                                                                                                                                                                          | CV500-COV01 |
| <b>Space Units</b><br>        | For unused I/O slot spaces in the CS1D-BC□□(S) or CS1D-BI□□□ Backplanes                                                                                                                                                                                                                                                                                                                                                                    | CS1W-SP001  |
|                                                                                                                | For unused power supply slot spaces (same shape as PA207R)                                                                                                                                                                                                                                                                                                                                                                                 | CS1D-SP001  |
|                                                                                                                | For unused power supply slot spaces (same shape as PD024)                                                                                                                                                                                                                                                                                                                                                                                  | CS1D-SP002  |
| <b>Terminator</b><br>         | Connect a Terminator to the last CS1D Long-distance Expansion Rack in each series (for use with the CS1W-IC102). Two Terminators are included with the CS1W-IC102 I/O Control Unit.                                                                                                                                                                                                                                                        | CV500-TER01 |
| <b>RS-422A Converter</b>                                                                                       | The RS-422A Converter converts RS-232C to RS-422A/RS-485 format.                                                                                                                                                                                                                                                                                                                                                                           | CJ1W-CIF11  |
| <b>RS-232C/RS-422A Link Adapter</b>                                                                            | One RS-232C port<br>One RS-422 terminal block                                                                                                                                                                                                                                                                                                                                                                                              | NT-AL001    |

## Basic I/O Units

Basic I/O Units can be used in all of the CS1D systems: Duplex CPU Dual I/O Expansion System, Duplex CPU Single I/O Expansion System, and Single CPU System. In addition, there are no restrictions on the mounting location based on the type of expansion system being used, except for some special Units such as Interrupt Input Units.

### Input Units

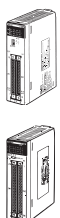
| Unit type          | Name                                                                                            | Specifications       |                                    | Words required | Current consumption (A) |             | Model      |
|--------------------|-------------------------------------------------------------------------------------------------|----------------------|------------------------------------|----------------|-------------------------|-------------|------------|
|                    |                                                                                                 | Number of I/O points | Input voltage and current          |                | 5 V system              | 26 V system |            |
| CS1 Basic I/O Unit |  DC Input Unit | 16 inputs            | 24 V DC, 7 mA                      | 1 word         | 0.10                    | ---         | CS1W-ID211 |
|                    |                                                                                                 | 32 inputs            | 24 V DC, 6 mA                      | 2 words        | 0.15                    | ---         | CS1W-ID231 |
|                    |                                                                                                 | 64 inputs            | 24 V DC, 6 mA                      | 4 words        | 0.15                    | ---         | CS1W-ID261 |
|                    |                                                                                                 | 96 inputs            | 24 V DC, approx. 5 mA              | 6 words        | 0.20                    | ---         | CS1W-ID291 |
|                    |  AC Input Unit | 16 inputs            | 100 to 120 V AC<br>100 to 120 V DC | 1 word         | 0.11                    | ---         | CS1W-IA111 |
|                    |                                                                                                 | 16 inputs            | 200 to 240 V AC                    | 1 word         | 0.11                    | ---         | CS1W-IA211 |

### Output Units

| Unit type          | Name                                                                                                           | Specifications       |                                                                      |          | Words required | Current consumption (A) |             | Model        |
|--------------------|----------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------|----------|----------------|-------------------------|-------------|--------------|
|                    |                                                                                                                | Number of I/O points | Switching capacity                                                   |          |                | 5 V system              | 26 V system |              |
| CS1 Basic I/O Unit | Relay Output Units<br>      | 8 outputs            | 250 V AC or 24 V DC, 2 A max.<br>DC120V 0.1A<br>Independent contacts |          | 1 word         | 0.10                    | 0.048 max.  | CS1W-OC201   |
|                    |                                                                                                                | 16 outputs           | 250 V AC or 24 V DC, 2 A max.<br>120 V DC, 0.1 A max.                |          | 1 word         | 0.13                    | 0.096 max.  | CS1W-OC211   |
|                    | Transistor Output Units<br> | 16 outputs           | 12 to 24 V DC, 0.5 A                                                 | Sinking  | 1 word         | 0.17                    | ---         | CS1W-OD211   |
|                    |                                                                                                                |                      | 24 V DC, 0.5 A                                                       | Sourcing | 1 word         | 0.17                    | ---         | CS1W-OD212   |
|                    |                                                                                                                | 32 outputs           | 12 to 24 V DC, 0.5 A                                                 | Sinking  | 2 words        | 0.27                    | ---         | CS1W-OD231   |
|                    |                                                                                                                |                      | 24 V DC, 0.5 A                                                       | Sourcing | 2 words        | 0.27                    | ---         | CS1W-OD232   |
|                    |                                                                                                                | 64 outputs           | 12 to 24 V DC, 0.3 A                                                 | Sinking  | 4 words        | 0.39                    | ---         | CS1W-OD261   |
|                    |                                                                                                                |                      | 24 V DC, 0.3 A                                                       | Sourcing | 4 words        | 0.39                    | ---         | CS1W-OD262   |
|                    |                                                                                                                | 96 outputs           | 12 to 24 V DC, 0.1 A                                                 | Sinking  | 6 words        | 0.48                    | ---         | CS1W-OD291   |
|                    |                                                                                                                |                      | 12 to 24 V DC, 0.1 A                                                 | Sourcing | 6 words        | 0.48                    | ---         | CS1W-OD292   |
|                    | Triac Output Units<br>      | 8 outputs            | 250 V AC, 1.2 A max.                                                 |          | 1 word         | 0.23 max.               | ---         | CS1W-OA201 * |
|                    |                                                                                                                | 16 outputs           | 250 V AC, 0.5 A max.                                                 |          | 1 word         | 0.406 max.              | ---         | CS1W-OA211   |

\* Product no longer available to order.

## ■ Mixed I/O Units

| Unit type          | Name                                                                                                                 | Specifications        |                                                                                  | Words required                   | Current consumption (A) |             | Model      |
|--------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------|----------------------------------|-------------------------|-------------|------------|
|                    |                                                                                                                      | Number of I/O points  | Input voltage and current, or Switching capacity                                 |                                  | 5 V system              | 26 V system |            |
| CS1 Basic I/O Unit | DC Input/Transistor Output Unit<br> | 32 inputs, 32 outputs | Inputs: 24 V DC, 6 mA<br>Outputs: 0.3 A output at 12 to 24 V DC, Sinking         | 2 input words and 2 output words | 0.27                    | ---         | CS1W-MD261 |
|                    |                                                                                                                      | 32 inputs, 32 outputs | Inputs: 24 V DC, 6 mA<br>Outputs: 0.3 A output at 24 V DC, Sourcing              |                                  | 0.27                    | ---         | CS1W-MD262 |
|                    |                                                                                                                      | 48 inputs, 48 outputs | Inputs: 24 V DC, approx. 5 mA<br>Outputs: 0.1 A output at 12 to 24 V DC, Sinking | 3 input words and 3 output words | 0.35                    | ---         | CS1W-MD291 |
|                    |                                                                                                                      | 48 inputs, 48 outputs | Inputs: 24 V DC, approx. 5 mA<br>Outputs: 0.1 A output at 24 V DC, Sourcing      |                                  | 0.35                    | ---         | CS1W-MD292 |
|                    | TTL I/O Unit<br>                    | 32 inputs, 32 outputs | 5 VDC                                                                            | 2 input words and 2 output words | 0.27                    | ---         | CS1W-MD561 |

## Applicable Connectors

### Connector for CS1 Basic I/O Units (32 inputs, 64 inputs, 32 outputs, 64 outputs, 32 inputs/32 outputs)

| Name                  | Connection      | Applicable Units         |                                                                     | Model                              |
|-----------------------|-----------------|--------------------------|---------------------------------------------------------------------|------------------------------------|
| Applicable Connectors | Soldered        | Connector                | Fujitsu FCN-361J040-AU<br>Fujitsu FCN-360C040-J2<br>OTAX N360C040J2 | C500-CE404<br>(Included with Unit) |
|                       | Crimped         | Housing                  | Fujitsu FCN-363J040<br>OTAX N363J040                                | C500-CE405                         |
|                       |                 | Contact                  | Fujitsu FCN-363J-AU<br>OTAX N363JAU                                 |                                    |
|                       |                 | Connector cover          | Fujitsu FCN-360C040-J2<br>OTAX N360C040J2                           |                                    |
|                       | Pressure welded | Fujitsu FCN-367J040-AU/F |                                                                     | C500-CE403                         |

### Connector for CS1 Basic I/O Units (96 inputs, 96 outputs, 48 inputs/48 outputs)

| Name                  | Connection      | Applicable Units                             |                                                                     | Model                              |
|-----------------------|-----------------|----------------------------------------------|---------------------------------------------------------------------|------------------------------------|
| Applicable Connectors | Soldered        | Connector                                    | Fujitsu FCN-361J056-AU<br>Fujitsu FCN-360C056-J3<br>OTAX N360C056J3 | CS1W-CE561<br>(Included with Unit) |
|                       | Crimped         | Housing                                      | Fujitsu FCN-363J056<br>OTAX N363J056                                | CS1W-CE562                         |
|                       |                 | Contact                                      | Fujitsu FCN-363J-AU<br>OTAX N363JAU                                 |                                    |
|                       |                 | Connector cover                              | Fujitsu FCN-360C056-J3<br>OTAX N360C056J3                           |                                    |
|                       | Pressure welded | Fujitsu FCN-367J056-AU/F<br>OTAX N367J056AUF |                                                                     | CS1W-CE563                         |

## ■ Interrupt Input Unit

| Unit type          | Name                                                                                                        | Specifications       |         |         |                             |             |                          | Words required | Current consumption (A) |             | Model      |
|--------------------|-------------------------------------------------------------------------------------------------------------|----------------------|---------|---------|-----------------------------|-------------|--------------------------|----------------|-------------------------|-------------|------------|
|                    |                                                                                                             | Number of I/O points | Voltage | Current | Pulse width of input signal |             | External connections     |                | 5 V system              | 26 V system |            |
|                    |                                                                                                             |                      |         |         | ON time                     | OFF time    |                          |                |                         |             |            |
| CS1 Basic I/O Unit | Interrupt Input Unit<br> | 16 inputs            | 24 VDC  | 7 mA    | 0.1 ms min.                 | 0.5 ms min. | Removable terminal block | 1 word         | 0.10                    | ---         | CS1W-INT01 |

- Note:** 1. An Interrupt Input Unit cannot be used in the CPU Rack of a Duplex CPU System. (The Interrupt Input Unit will function as a standard Input Unit.) An Interrupt Input Unit can be used in the CPU Rack of a Single CPU System to generate interrupt inputs.
2. An Interrupt Input Unit cannot be used in a CS1D Expansion Rack to generate interrupt inputs. (The Interrupt Input Unit will function as a standard Input Unit.)

## ■ High-speed Input Unit

| Unit type          | Name                                                                                                       | Specifications       |               |               |                                             |                          | Words required | Current consumption (A) |             | Model      |
|--------------------|------------------------------------------------------------------------------------------------------------|----------------------|---------------|---------------|---------------------------------------------|--------------------------|----------------|-------------------------|-------------|------------|
|                    |                                                                                                            | Number of I/O points | Input voltage | Input current | Readable input signal pulse width (ON time) | External connections     |                | 5 V system              | 24 V system |            |
| CS1 Basic I/O Unit | High-speed Input Unit<br> | 16 inputs            | 24 VDC        | 7 mA          | 0.1 ms min.                                 | Removable terminal block | 1 word         | 0.10                    | ---         | CS1W-IDP01 |

## Special I/O Units, CPU Bus Units, and Inner Boards

Special I/O Units can be used in all of the CS1D systems: Duplex CPU Dual I/O Expansion System, Duplex CPU Single I/O Expansion System, and Single CPU System. In addition, there are no restrictions on the mounting location based on the type of expansion system being used.

### Temperature Sensor Input Units (Process Analog I/O Units)

| Unit type            | Name                                                                                                                                  | Specifications   |                  |                                                    |                                |                          | Words required        | Current consumption (A) |             | Model         |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|----------------------------------------------------|--------------------------------|--------------------------|-----------------------|-------------------------|-------------|---------------|
|                      |                                                                                                                                       | Number of inputs | Signal selection | Signal ranges                                      | Conversion speed               | External connections     |                       | 5 V system              | 26 V system |               |
| CS1 Special I/O Unit | Isolated-type Thermocouple Input Units<br>           | 4                | 4 independent    | B, E, J, K, N, R, S, T, U, WRε5-26, PL II, ±100 mV | 20 ms/4 inputs, 10 ms/2 inputs | Removable terminal block | 1 unit number's words | 0.12                    | 0.08        | CS1W-PTS11    |
|                      |                                                                                                                                       | 4                | 4 independent    | R, S, K, J, T, L, B                                | 250 ms/4 inputs                |                          |                       | 0.25                    | ---         | CS1W-PTS51    |
|                      |                                                                                                                                       | 8                | 8 independent    | R, S, K, J, T, L, B                                | 250 ms/8 inputs                |                          |                       | 0.18                    | 0.06        | CS1W-PTS55    |
|                      |                                                                                                                                       | 4                | 4 independent    | B, E, J, K, N, R, S, T, ±80 mV                     | 150 ms/4 inputs                |                          |                       | 0.15                    | 0.15        | CS1W-PTS01-V1 |
|                      | Isolated-type Resistance Thermometer Input Units<br> | 4                | 4 independent    | Pt100 Ω (JIS, IEC), JPt100 Ω, Pt50 Ω, Ni100 Ω      | 20 ms/4 inputs, 10 ms/2 inputs |                          |                       | 0.12                    | 0.07        | CS1W-PTS12    |
|                      |                                                                                                                                       | 4                | 4 independent    | Pt100 Ω (JIS, IEC), JPt100 Ω                       | 250 ms/4 inputs                |                          |                       | 0.25                    | ---         | CS1W-PTS52    |
|                      |                                                                                                                                       | 8                | 8 independent    | Pt100 Ω (JIS, IEC), JPt100 Ω                       | 250 ms/8 inputs                |                          |                       | 0.18                    | 0.06        | CS1W-PTS56    |
|                      |                                                                                                                                       | 4                | 4 independent    | Pt100 Ω (JIS, IEC), JPt100 Ω                       | 100 ms/4 inputs                |                          |                       | 0.15                    | 0.15        | CS1W-PTS02    |
|                      | Isolated-type Resistance Thermometer Input Unit (Ni508.4 Ω)                                                                           | 4                | 4 independent    | Ni508.4 Ω                                          | 100 ms/4 inputs                |                          |                       | 0.15                    | 0.15        | CS1W-PTS03    |
|                      |                                                                                                                                       |                  |                  |                                                    |                                |                          |                       |                         |             |               |
|                      |                                                                                                                                       |                  |                  |                                                    |                                |                          |                       |                         |             |               |
|                      |                                                                                                                                       |                  |                  |                                                    |                                |                          |                       |                         |             |               |

### Analog Input Units

#### Analog Input Units

| Unit type            | Name                                                                                                             | Specifications |                  |                                                        |                                       |                                               |                          | Words required        | Current consumption (A) |             | Model         |            |
|----------------------|------------------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------------------------------------------|---------------------------------------|-----------------------------------------------|--------------------------|-----------------------|-------------------------|-------------|---------------|------------|
|                      |                                                                                                                  | I/O points     | Signal selection | Signal ranges                                          | Resolution                            | Conversion speed                              | External connections     |                       | 5 V system              | 26 V system |               |            |
| CS1 Special I/O Unit | <b>Analog Input Units</b><br> | 4 inputs       | 4 independent    | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/8,000 (Can also be set to 1/4,000.) | 250 μs/input (Can also be set to 1 ms/input.) | Removable terminal block | 1 unit number's words | 0.12                    | 0.09        | CS1W-AD041-V1 |            |
|                      |                                                                                                                  | 8 inputs       | 8 independent    | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/8,000 (Can also be set to 1/4,000.) | 250 μs/input (Can also be set to 1 ms/input.) | MIL connector            |                       | 0.12                    | 0.09        | CS1W-AD081-V1 |            |
|                      |                                                                                                                  | 16 inputs      | 16 independent   | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/8,000 (Can also be set to 1/4,000.) | 250 μs/input (Can also be set to 1 ms/input.) | MIL connector            |                       | 2 unit numbers' words   | 0.15        | 0.06          | CS1W-AD161 |
|                      | <b>Connector-Terminal Block Conversion Unit</b>                                                                  | For CS1W-AD161 |                  |                                                        |                                       |                                               |                          |                       |                         |             | XW2D-34G6     |            |
|                      |                                                                                                                  |                |                  |                                                        |                                       |                                               |                          |                       |                         |             | XW2Z-200C     |            |

## Process Analog Input Units such as Isolated-type DC Input Units

| Unit type            | Name                                                                                                              | Specifications   |                                                                                                         |                                |                          | Words required        | Current consumption (A) |             | Model      |
|----------------------|-------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                                   | Number of inputs | Signal ranges                                                                                           | Conversion speed               | External connections     |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | Isolated-type DC Input Units<br> | 4                | 4 to 20 mA, 0 to 20 mA, 0 to 10 V, $\pm 10$ V, 0 to 5 V, $\pm 5$ V, 1 to 5 V, 0 to 1.25 V, $\pm 1.25$ V | 20 ms/4 inputs, 10 ms/2 inputs | Removable terminal block | 1 unit number's words | 0.12                    | 0.12        | CS1W-PDC11 |
|                      |                                                                                                                   | 8                | 4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V                                                               | 250 ms/8 inputs                |                          |                       | 0.18                    | 0.06        | CS1W-PDC55 |
|                      |                                                                                                                   | 4                | 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V, $\pm 5$ V, 0 to 10 V, $\pm 10$ V                            | 100 ms/4 inputs                |                          |                       | 0.15                    | 0.16        | CS1W-PDC01 |
|                      | Isolated-type 2-Wire Transmitter Input Unit                                                                       | 4                | 4 to 20 mA, 1 to 5 V                                                                                    | 100 ms/4 inputs                |                          |                       | 0.15                    | 0.16        | CS1W-PTW01 |
|                      | Power Transducer Input Unit                                                                                       | 8                | 0 to 1 mA, $\pm 1$ mA                                                                                   | 200 ms/8 inputs                |                          |                       | 0.15                    | 0.08        | CS1W-PTR01 |
|                      | DC Analog Input Unit (100 mV)                                                                                     | 8                | 0 to 100 mV, $\pm 100$ mV                                                                               | 200 ms/8 inputs                |                          |                       | 0.15                    | 0.08        | CS1W-PTR02 |

## ■ Analog Output Units

### Analog Output Units

| Unit type            | Name                                                                                                       | Specifications    |                  |                                                        |            |                  |                          | Words required        | Current consumption (A) |             | Model      |
|----------------------|------------------------------------------------------------------------------------------------------------|-------------------|------------------|--------------------------------------------------------|------------|------------------|--------------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                            | Number of outputs | Signal selection | Signal ranges                                          | Resolution | Conversion speed | External connections     |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | Analog Output Units<br> | 4                 | 4 independent    | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/4,000    | 1 ms/output      | Removable terminal block | 1 unit number's words | 0.13                    | 0.18        | CS1W-DA041 |
|                      |                                                                                                            | 8                 | 8 independent    | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V             | 1/4,000    | 1 ms/output      |                          |                       | 0.13                    | 0.18        | CS1W-DA08V |
|                      |                                                                                                            | 8                 | 8 independent    | 4 to 20 mA                                             | 1/4,000    | 1 ms/output      |                          |                       | 0.13                    | 0.25        | CS1W-DA08C |

### Isolated-type Control Output Units (Process Analog I/O Units)

| Unit type            | Name                                                                                                                     | Specifications    |                  |                                                                |                  |                          | Words required        | Current consumption (A) |             | Model      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|----------------------------------------------------------------|------------------|--------------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                                          | Number of outputs | Signal selection | Signal ranges                                                  | Conversion speed | External connections     |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | Isolated-type Control Output Unit<br> | 4                 | 4 independent    | 4 to 20 mA, 1 to 5 V                                           | 100 ms/4 outputs | Removable terminal block | 1 unit number's words | 0.15                    | 0.16        | CS1W-PMV01 |
|                      |                                                                                                                          | 4                 | 4 independent    | 0 to 10 V, $\pm 10$ V, 0 to 5 V, $\pm 5$ V, 0 to 1V, $\pm 1$ V | 40 ms/4 outputs  |                          |                       | 0.12                    | 0.12        | CS1W-PMV02 |

## ■ Analog I/O Unit

| Unit type            | Name                                                                                                   | Specifications |                  |                                                        |            |                  |                          | Words required        | Current consumption (A) |             | Model      |
|----------------------|--------------------------------------------------------------------------------------------------------|----------------|------------------|--------------------------------------------------------|------------|------------------|--------------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                        | I/O points     | Signal selection | Signal ranges                                          | Resolution | Conversion speed | External connections     |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | Analog I/O Unit<br> | 4 inputs       | 4 independent    | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA | 1/4,000    | 1 ms/input       | Removable terminal block | 1 unit number's words | 0.20                    | 0.20        | CS1W-MAD44 |
|                      |                                                                                                        | 4 outputs      |                  | 1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V             | 1/4,000    | 1 ms/output      |                          |                       |                         |             |            |

## ■ Isolated-type Pulse Input Unit (Process Analog I/O Unit)

| Unit type            | Name                                                                                                                | Specifications   |                      |                                                                  |                                          |                                |                          | Words required        | Current consumption (A) |             | Model      |
|----------------------|---------------------------------------------------------------------------------------------------------------------|------------------|----------------------|------------------------------------------------------------------|------------------------------------------|--------------------------------|--------------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                                     | Number of inputs | Input type selection | Pulse input types                                                | Highest input rate                       | Accumulation conversion period | External connections     |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | Isolated-type Pulse Input Unit<br> | 4                | 4 independent        | Voltage input, no-voltage semiconductor input, and contact input | 0 to 20,000 pulses/s or 0 to 20 pulses/s | 100 ms/4 inputs                | Removable terminal block | 1 unit number's words | 0.20                    | 0.16        | CS1W-PPS01 |

## ■ Loop Control Boards and Loop Control Units

| Unit type          | Name                                                                                                     | Specifications                                                                                                                                                                                                                                                        | Words required | Current consumption (A) |             | Model      |
|--------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------|-------------|------------|
|                    |                                                                                                          |                                                                                                                                                                                                                                                                       |                | 5 V system              | 26 V system |            |
| CS1 Inner Board *1 | Loop Control Boards<br> | <b>LCB01</b><br>Operation method: Function block method<br>Number of function blocks: 50 blocks max. (total control blocks and operation blocks)<br>Minimum operation cycle: 10 ms<br>PID control method: PID with two degrees of freedom (with autotuning function)  | ---            | 0.22 *2                 | ---         | CS1W-LCB01 |
|                    |                                                                                                          | <b>LCB05</b><br>Operation method: Function block method<br>Number of function blocks: 500 blocks max. (total control blocks and operation blocks)<br>Minimum operation cycle: 10 ms<br>PID control method: PID with two degrees of freedom (with autotuning function) |                | 0.22 *2                 | ---         | CS1W-LCB05 |

\*1. A CS1 Inner Board can be mounted only to the Inner Board mounting slot in the CPU Unit of a Single-CPU System. Only one CS1 Inner Board can be mounted.

\*2. NT-AL001 Link Adapters consume an additional 0.15 A each when used.

## ■ High-speed Counter Units

| Unit type            | Name                                                                                                            | Number of count channels | Encoder A and B inputs, and Z pulse input signal                                                  | Maximum count speed | Words required        | Current consumption (A) |             | Model      |
|----------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------|---------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                                 |                          |                                                                                                   |                     |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | High-speed Counter Units<br> | 2                        | Open collector<br>Input voltage: 5 V DC, 12 V DC, or 24 V DC (only 1 axis for 5 V or 12 V input)  | 50 kHz              | 4 unit numbers' words | 0.36                    | ---         | CS1W-CT021 |
|                      |                                                                                                                 |                          | RS-422 line driver                                                                                | 500 kHz             |                       |                         |             |            |
|                      |                                                                                                                 | 4                        | Open collector<br>Input voltage: 5 V DC, 12 V DC, or 24 V DC (up to 2 axes for 5 V or 12 V input) | 50 kHz              |                       | 0.45                    | ---         | CS1W-CT041 |
|                      |                                                                                                                 |                          | RS-422 line driver                                                                                | 500 kHz             |                       |                         |             |            |

## ■ Customizable Counter Units

| Unit type            | Name                                                                                                              | Specifications                                                |                                      | Words required        | Current consumption (A) |             | Model         |
|----------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------|-----------------------|-------------------------|-------------|---------------|
|                      |                                                                                                                   |                                                               |                                      |                       | 5 V system              | 26 V system |               |
| CS1 Special I/O Unit | Customizable Counter Units<br> | Two-axis pulse input                                          | 12 DC inputs                         | 1 unit number's words | 0.80                    | ---         | CS1W-HCP22-V1 |
|                      |                                                                                                                   | Two-axis pulse output                                         | 8 transistor outputs                 |                       |                         |             |               |
|                      |                                                                                                                   | Single-axis pulse input<br>1 analog input<br>2 analog outputs | 12 DC inputs<br>8 transistor outputs |                       | 0.75                    | 0.15        | CS1W-HCA12-V1 |
|                      |                                                                                                                   | Two-axis pulse input<br>2 analog outputs                      | 12 DC inputs<br>8 transistor outputs |                       |                         |             |               |
|                      |                                                                                                                   | ---                                                           | 12 DC inputs<br>8 transistor outputs |                       | 0.60                    | ---         | CS1W-HIO01-V1 |

## ■ Position Control Units

| Unit type            | Name                                                                                                              | Specifications                    |                                                          | Words required                                                           | Current consumption (A)     |                     | Model         |
|----------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------|---------------------|---------------|
|                      |                                                                                                                   | Number of axes                    | Control output interface                                 |                                                                          | 5 V system                  | 26 V system         |               |
| CS1 Special I/O Unit | <b>Position Control Unit</b><br> | 1                                 | Pulse-train, open-collector outputs                      | 1 unit number's words                                                    | 0.25                        | ---                 | CS1W-NC113    |
|                      |                                                                                                                   | 2                                 |                                                          |                                                                          | 0.25                        | ---                 | CS1W-NC213    |
|                      |                                                                                                                   | 4                                 |                                                          | 2 unit numbers' words                                                    | 0.36                        | ---                 | CS1W-NC413    |
|                      |                                                                                                                   | 1                                 | Pulse-train, line-driver outputs                         | 1 unit number's words                                                    | 0.25                        | ---                 | CS1W-NC133    |
|                      |                                                                                                                   | 2                                 |                                                          |                                                                          | 0.25                        | ---                 | CS1W-NC233    |
|                      |                                                                                                                   | 4                                 |                                                          | 2 unit numbers' words                                                    | 0.36                        | ---                 | CS1W-NC433    |
|                      | <b>Relay Unit for Servo</b>                                                                                       | For use with the CS1W-NC1□3       | Number of axes supported: 1                              |                                                                          |                             |                     | XW2B-20J6-1B  |
|                      |                                                                                                                   | For use with the CS1W-NC2□3/NC4□3 | Number of axes supported: 2                              |                                                                          |                             |                     | XW2B-40J6-2B  |
|                      |                                                                                                                   | For use with the CS1W-NC□□3       | Number of axes supported: 2, with communications support |                                                                          |                             |                     | XW2B-40J6-4A  |
|                      | <b>Servo Relay Unit Connecting Cable (Position Control Unit end)</b>                                              | Open-collector output             | For use with the CS1W-NC113                              | Connectable Servo Drive: G5 Series, G Series, W Series *, or SMARTSTEP 2 | Number of axes supported: 1 | Cable length: 0.5 m | XW2Z-050J-A6  |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A6  |
|                      |                                                                                                                   |                                   | For use with the CS1W-NC213/NC413                        | Connectable Servo Drive: SMARTSTEP Junior or A Series                    | Number of axes supported: 2 | Cable length: 0.5 m | XW2Z-050J-A8  |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A8  |
|                      |                                                                                                                   | Line-driver outputs               | For use with the CS1W-NC133                              | Connectable Servo Drive: G5 Series, G Series, W Series *, or SMARTSTEP 2 | Number of axes supported: 1 | Cable length: 0.5 m | XW2Z-050J-A7  |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A7  |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 0.5 m | XW2Z-050J-A9  |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A9  |
|                      |                                                                                                                   |                                   | For use with the CS1W-NC233/NC433                        | Connectable Servo Drive: SMARTSTEP Junior or A Series                    | Number of axes supported: 2 | Cable length: 0.5 m | XW2Z-050J-A10 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A10 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 0.5 m | XW2Z-050J-A12 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A12 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 0.5 m | XW2Z-050J-A11 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A11 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 0.5 m | XW2Z-050J-A13 |
|                      |                                                                                                                   |                                   |                                                          |                                                                          |                             | Cable length: 1 m   | XW2Z-100J-A13 |

\* W-series is no longer available to order.

## MECHATROLINK-II-compatible Position Control Unit

| Unit type        | Name                                                                                                                                                                                    | Specifications                |                                                                                                                                                                                | Words required        | Current consumption (A) |             | Model        |                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|-------------|--------------|-----------------|
|                  |                                                                                                                                                                                         |                               |                                                                                                                                                                                |                       | 5 V system              | 26 V system |              |                 |
| CS1 CPU Bus Unit | <b>Position Control Unit</b><br>                                                                       | 2 axes                        | Control commands are sent using MECHATROLINK-II communications.<br>Direct operation from ladder program.<br>Control modes: Position control, speed control, and torque control | 1 unit number's words | 0.36                    | ---         | CS1W-NC271   |                 |
|                  |                                                                                                                                                                                         | 4 axes                        |                                                                                                                                                                                |                       |                         |             | CS1W-NC471   |                 |
|                  |                                                                                                                                                                                         | 6 axes                        |                                                                                                                                                                                |                       |                         |             | CS1W-NCF71   |                 |
|                  |                                                                                                                                                                                         | <b>MECHATROLINK-II Cables</b> | MECHATROLINK-II Cables<br>(without ring core and USB connector on both ends)<br><b>Note:</b> Can be connected to R88D-GN and R88D-KN only.                                     |                       | Cable length: 0.5 m     |             | FNY-W6002-A5 |                 |
|                  | Cable length: 1 m                                                                                                                                                                       |                               |                                                                                                                                                                                |                       | FNY-W6002-01            |             |              |                 |
|                  | Cable length: 3 m                                                                                                                                                                       |                               |                                                                                                                                                                                |                       | FNY-W6002-03            |             |              |                 |
|                  | Cable length: 5 m                                                                                                                                                                       |                               |                                                                                                                                                                                |                       | FNY-W6002-05            |             |              |                 |
|                  | MECHATROLINK-II Cables<br>(with ring core and USB connector on both ends)<br>(Yaskawa Electric Corporation)<br>Use the model numbers provided in this catalog when ordering from OMRON. |                               | Cable length: 0.5 m                                                                                                                                                            |                       | FNY-W6003-A5            |             |              |                 |
|                  |                                                                                                                                                                                         |                               | Cable length: 1 m                                                                                                                                                              |                       | FNY-W6003-01            |             |              |                 |
|                  |                                                                                                                                                                                         |                               | Cable length: 3 m                                                                                                                                                              |                       | FNY-W6003-03            |             |              |                 |
|                  |                                                                                                                                                                                         |                               | Cable length: 5 m                                                                                                                                                              |                       | FNY-W6003-05            |             |              |                 |
|                  |                                                                                                                                                                                         |                               | Cable length: 10 m                                                                                                                                                             |                       | FNY-W6003-10            |             |              |                 |
|                  |                                                                                                                                                                                         |                               | Cable length: 20 m                                                                                                                                                             |                       | FNY-W6003-20            |             |              |                 |
|                  |                                                                                                                                                                                         |                               | Cable length: 30 m                                                                                                                                                             |                       | FNY-W6003-30            |             |              |                 |
|                  | <b>MECHATROLINK-II Terminating Resistors</b>                                                                                                                                            |                               | Terminating Resistor for MECHATROLINK-II (Yaskawa Electric Corporation)<br>Use the model numbers provided in this catalog when ordering from OMRON.                            |                       |                         |             |              | FNY-W6022       |
|                  | <b>MECHATROLINK- II Repeater</b>                                                                                                                                                        |                               | For more than 15 slaves/30 m<br>(Yaskawa Electric Corporation)                                                                                                                 |                       |                         |             |              | JEPMC-REP2000-E |

## Motion Control Units

| Unit type            | Name                                                                                                                                                                                                      | Specifications |                                        | Words required        | Current consumption (A)                        |               | Model         |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|-----------------------|------------------------------------------------|---------------|---------------|
|                      |                                                                                                                                                                                                           |                |                                        |                       | 5 V system                                     | 26 V system   |               |
| CS1 Special I/O Unit | <b>Motion Control Units</b><br><br> | 4 axes         | G-language programming, analog outputs | 5 unit numbers' words | 0.70 (1.00 A when a Teaching Box is connected) | ---           | CS1W-MC421-V1 |
|                      |                                                                                                                                                                                                           | 2 axes         | G-language programming, analog outputs | 3 unit numbers' words | 0.60 (0.80 A when a Teaching Box is connected) | ---           | CS1W-MC221-V1 |
|                      | <b>Teaching Box</b>                                                                                                                                                                                       |                | ---                                    |                       |                                                | CVM1-PRO01-V1 |               |
|                      | <b>Teaching Box Connecting Cable</b>                                                                                                                                                                      |                | Cable length: 2 m                      |                       |                                                | CV500-CN224   |               |
|                      | <b>ROM Cassette (Memory Pack)</b>                                                                                                                                                                         |                | ---                                    |                       |                                                | CVM1-MP702-V1 |               |
|                      | <b>MC Terminal Block Conversion Unit for 2 Axes</b>                                                                                                                                                       |                | Simplifies I/O connector wiring.       |                       |                                                | XW2B-20J6-6   |               |
|                      | <b>MC Terminal Block Conversion Unit for 4 Axes</b>                                                                                                                                                       |                |                                        |                       |                                                | XW2B-40J6-7   |               |
|                      | <b>MC Terminal Block Conversion Unit Cable</b>                                                                                                                                                            |                | ---                                    |                       |                                                | XW2Z-100J-F1  |               |

## Serial Communications Boards/Units

| Unit type             | Name                                                                                                             | Specifications                            |                                                                                                                                                                                 | Words required        | Current consumption (A) |             | Model         |
|-----------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|-------------|---------------|
|                       |                                                                                                                  |                                           |                                                                                                                                                                                 |                       | 5 V system              | 26 V system |               |
| CS1 Inner Board<br>*1 | Serial Communications Board<br> | Two RS-232C ports                         | The following communications protocols can be selected for each port: protocol macro, host link, NT Link (1:N mode), serial gateway *2, no-protocol *3, or Modbus-RTU Slave *4. | ---                   | 0.28 *5                 | ---         | CS1W-SCB21-V1 |
|                       |                                                                                                                  | One RS-232C port and one RS-422A/485 port |                                                                                                                                                                                 |                       | 0.36 *5                 | ---         | CS1W-SCB41-V1 |
| CS1 CPU Bus Unit      | Serial Communications Unit<br>  | Two RS-232C ports                         |                                                                                                                                                                                 | 1 unit number's words | 0.29 *5                 | ---         | CS1W-SCU21-V1 |
|                       |                                                                                                                  | Two RS-422A/485 ports                     |                                                                                                                                                                                 |                       | 0.40                    | ---         | CS1W-SCU31-V1 |

\*1. A CS1 Inner Board can be mounted only to the Inner Board mounting slot in the CPU Unit of a Single-CPU System. Only one CS1 Inner Board can be mounted.

\*2. The serial gateway function is supported by Serial Communications Boards and Units with unit version 1.2 or later only.

\*3. The Serial Communications Unit's no-protocol function is supported by Serial Communications Units with unit version 1.2 or later only. In addition the CPU Unit must be unit version 3.0 or later.

\*4. The Modbus-RTU Slave function is supported by Serial Communications Boards and Units with unit version 1.3 or later only.

\*5. NT-AL001 Link Adapters consume an additional 0.15 A each when used.

## EtherNet/IP Unit

| Unit type        | Product name                                                                                            | Specifications                                                  |                                                           | No. of unit numbers allocated | Current consumption (A) |             | Model       |
|------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------|-------------------------------|-------------------------|-------------|-------------|
|                  |                                                                                                         | Communications cable                                            | Communications functions                                  |                               | 5 V system              | 26 V system |             |
| CS1 CPU Bus Unit | EtherNet/IP Unit<br> | STP (shielded twisted-pair) cable of category 5, 5e, or higher. | Tag data link and message communications                  | 1 unit number's words         | 0.41                    | ---         | CS1W-EIP21  |
|                  |                                                                                                         |                                                                 | Tag data link, message communications, and socket service |                               | 0.62                    | ---         | CS1W-EIP21S |

## Ethernet Units

| Unit type        | Name                                                                                                  | Specifications       |                                                                                                                                                                                                                                 |               |                                                     | Words required        | Current consumption (A) |             | Model       |
|------------------|-------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------|-----------------------|-------------------------|-------------|-------------|
|                  |                                                                                                       | Communications cable | Communications functions                                                                                                                                                                                                        | Duplexing     | Units per CPU Unit                                  |                       | 5 V system              | 26 V system |             |
| CS1 CPU Bus Unit | Ethernet Units<br> | 100BASE-TX Cable     | FINS communications service (TCP/IP and UDP/IP), FTP server function, socket service, mail send service, mail reception (remote command reception), auto-adjustment of PLC's internal clock, and server host name specification | Supported     | Not duplexed: 4 Units<br>Duplexed: 4 pairs, 8 Units | 1 unit number's words | 0.38                    | ---         | CS1D-ETN21D |
|                  |                                                                                                       |                      |                                                                                                                                                                                                                                 | Not supported | 4 Units                                             |                       | 0.38                    | ---         | CS1W-ETN21  |

## Industrial Switching Hubs

| Product name              | Appearance                                                                          | Functions                                                                                   | No. of ports | Accessories            | Current consumption (A) | Model    |
|---------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------|------------------------|-------------------------|----------|
| Industrial Switching Hubs |  | Quality of Service (QoS): EtherNet/IP control data priority 10/100BASE-TX, Auto-Negotiation | 5            | Power supply connector | 0.07                    | W4S1-05D |

# Controller Link Units

## Controller Link Units

| Unit type        | Name                 | Specifications                                                                                                            |                                |                                                        |                                                                                            | Words required        | Current consumption (A) |             | Model      |
|------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------|-------------------------|-------------|------------|
|                  |                      | Communications cable                                                                                                      | Communications type            | Duplexing                                              | Units per CPU Unit                                                                         |                       | 5 V system              | 26 V system |            |
| CS1 CPU Bus Unit | Controller Link Unit | Wired shielded twisted-pair cable *1<br> | Data links and message service | No                                                     | 8                                                                                          | 1 unit number's words | 0.33                    | ---         | CS1W-CLK23 |
|                  |                      | Optical ring H-PCF cable *2<br>          |                                | Yes. Unit duplexing and cable loop back are supported. | Non-duplex: 8, Duplex: 11 (6 Units comprising 3 sets of Duplex Units + 5 Non-duplex Units) |                       | 0.52                    | ---         | CS1W-CLK13 |
|                  |                      | Optical ring GI cable *3<br>             |                                |                                                        |                                                                                            |                       | 0.65                    | ---         | CS1W-CLK53 |

\*1. Use the following special cable for shielded, twisted-pair cable.

- ESVC0.5 × 2C-13262 (Bando Electric Wire: Japanese Company)
- ESNC0.5 2C-99-087B (JMACS Japan Co., Ltd.: Japanese Company)
- ESPC 1P × 0.5m<sup>2</sup> (Nagaoka Electric Wire Co., Ltd.: Japanese Company)
- Li2Y-FCY2 × 0.56qmm (Kromberg & Schubert, Komtec Department: German Company)
- 1 × 2 × AWG-20PE+Tr.CUSN+PVC (Draka Cables Industrial: Spanish Company)
- #9207 (Belden: US Company)

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

\*3. When using a wire-to-optical (GI) cable, use a GI optical cable that matches the specifications.

## Controller Link Support Boards

| Name                                                                                                                                   | Specifications                       |                                | Accessories                                                                                                             | Model            |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------|
|                                                                                                                                        | Communications cable                 | Communications type            |                                                                                                                         |                  |
| <b>Controller Link Support Boards for PCI Bus</b><br> | Wired shielded twisted-pair cable *1 | Data links and message service | • CD-ROM × 1 *2<br>• Installation Guide (W467) × 1<br>• Communications Connector × 1                                    | 3G8F7-CLK23-E *3 |
|                                                                                                                                        | H-PCF optical model                  |                                | • CD-ROM × 1 *2<br>• Installation Guide (W467) × 1<br>• Optical Fiber Cable Bracket × 1<br>• Power Supply Connector × 1 | 3G8F7-CLK13-E *3 |
|                                                                                                                                        | GI optical model                     |                                |                                                                                                                         | 3G8F7-CLK53-E *3 |

\*1. Use the following special cable for shielded, twisted-pair cable.

- ESVC0.5 × 2C-13262 (Bando Electric Wire: Japanese Company)
- ESNC0.5 2C-99-087B (JMACS Japan Co., Ltd.: Japanese Company)
- ESPC 1P × 0.5m<sup>2</sup> (Nagaoka Electric Wire Co., Ltd.: Japanese Company)
- Li2Y-FCY2 × 0.56qmm (Kromberg & Schubert, Komtec Department: German Company)
- 1 × 2 × AWG-20PE+Tr.CUSN+PVC (Draka Cables Industrial: Spanish Company)
- #9207 (Belden: US Company)

\*2. The CD-ROM contains FinsGateway Version 2003 (PCI-CLK Edition) and FinsGateway Version 3 (PCI-CLK Edition).

Install the software from CD Ver 3.10 or higher if the operating system is Windows 7 (32bit) or Windows Vista.

Install FinsGateway version 3 if the operating system is Windows NT 4.0 (Service pack 3 or higher), Windows ME, or Windows 98SE.

\*3. Final order entry date: The end of June, 2024

## Repeater Units

| Name                                                                                                                        | Specifications                   | Model      |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------|
| <b>Controller Link Repeater Unit</b><br> | Wire-to-Wire Model               | CS1W-RPT01 |
|                                                                                                                             | Wire-to-Optical (H-PCF) Model *1 | CS1W-RPT02 |
|                                                                                                                             | Wire-to-Optical (GI) Model *2    | CS1W-RPT03 |

Using Repeater Units enables T-branches and long-distance wiring for Wired Controller Link networks, 62-node configurations, and converting part of the network to optical cable.

\*1. When using wire-to-optical (H-PCF) cable, use a H-PCF cable (for both Controller Link and SYSMAC LINK) or a H-PCF optical fiber cable with connector.

\*2. When using wire-to-optical (GI) cable, use a GI optical cable (for Controller Link).

## Relay Terminal Block

| Name                                                                                                                                                | Specifications                                  | Model      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------|
| <b>Relay Terminal Blocks for Wired Controller Link Units</b><br> | Used for Wired Controller Link Units (set of 5) | CJ1W-TB101 |

Controller Link Units can be replaced without stopping the communications of the entire network if a Relay Terminal Block is installed in advance on the Unit in a Wired Controller Link network. Relay Terminal Blocks cannot be used on Controller Link Support Boards.

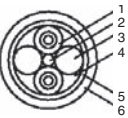
## Duplex Optical Fiber Cable (H-PCF Cable)

| Name                              | Application                                    | Specifications                                                              | Model      |
|-----------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|------------|
| <b>Duplex Optical Fiber Cable</b> | CS1W-CLK13 or CS1W-CLK12-V1 * in a CS1D system | H-PCF cable for connecting Duplex Controller Link Units Cable length: 50 cm | CS1D-CN051 |

This cable is used to connect Units in active mode (ACT) and standby mode (STB) in a CS1D Duplex System.

\* Discontinuation models in July 2012.

## H-PCF Cables (For Controller Link and SYSMAC LINK)

| Name                                                                              | Application and construction                                                                   |                                                                                                                                                                                                                                                                                                                                                                                   | Specifications                             |                                                                                                                                                         | Model                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Optical Fiber Cable                                                               | Controller Link<br>SYSMAC LINK<br>SYSBUS                                                       |  <ol style="list-style-type: none"> <li>Optical fiber single-core cord</li> <li>Tension member (plastic-sheathed wire)</li> <li>Filler (plastic)</li> <li>Filler surrounding signal wires (plastic, yarn, or fiber)</li> <li>Holding tape (plastic)</li> <li>Heat-resistant PV sheath</li> </ol> | Two-core optical cable with tension member | Black 10 m<br>Black 50 m<br>Black 100 m<br>Black 500 m<br>Black 1,000 m<br>Orange 10 m<br>Orange 50 m<br>Orange 100 m<br>Orange 500 m<br>Orange 1,000 m | S3200-HCCB101<br>S3200-HCCB501<br>S3200-HCCB102<br>S3200-HCCB502<br>S3200-HCCB103<br>S3200-HCCO101 *1<br>S3200-HCCO501 *1<br>S3200-HCCO102 *1<br>S3200-HCCO502 *1<br>S3200-HCCO103 *1 |
| Optical Connectors (Crimp-cut)                                                    |               | Controller Link: CS1W-CLK13<br>3G8F7-CLK13-E *1<br>CS1W-RPT02<br>SYSMAC LINK: CS1W-SLK11<br>3G8F7-SLK11-E *1<br>C200HW-SLK13/14 *1                                                                                                                                                                                                                                                | Half-lock                                  |                                                                                                                                                         | S3200-COCF2571                                                                                                                                                                        |
|  | Controller Link: CS1W-CLK13<br>3G8F7-CLK13-E *1<br>CS1W-RPT02<br>SYSMAC LINK: 3G8F7-SLK11-E *1 | Full-lock                                                                                                                                                                                                                                                                                                                                                                         |                                            |                                                                                                                                                         | S3200-COCF2071 *2                                                                                                                                                                     |

\*1. Discontinuation models.

\*2. Full-lock Optical Connectors (Crimp-cut) (S3200-COCF2071) cannot be used with the CS1W-SLK11. Use a Half-lock Cable (S3200-COCF2571) or a H-PCF Optical Fiber Cable with Connectors (S3200-CN□□□-□□-□□)

## H-PCF Optical Fiber Cables with Connectors

### (Black Composite Cables with Two-Optical Lines and Two Power Supply Lines)

| Applicable Units | Appearance                                                                          | Model             |
|------------------|-------------------------------------------------------------------------------------|-------------------|
| Controller Link  |  | S3200-CN□□□-20-20 |
| SYSMAC LINK      |  | S3200-CN□□□-20-25 |
|                  |  | S3200-CN□□□-25-25 |

Optical connectors for H-PCF Optical Cables with Connectors are adhesive polished.

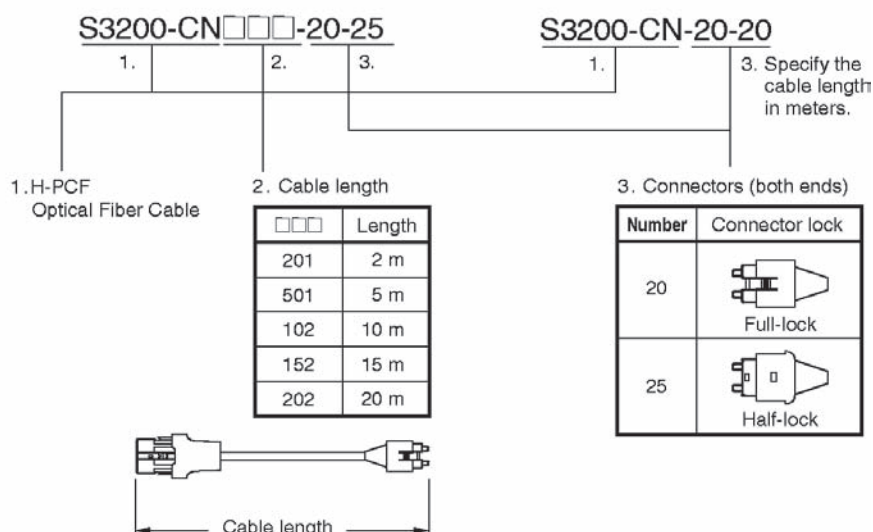
## Cable Length

The following cable lengths are available: 2 m, 5 m, 15 m, and 20 m. For lengths of 21 m or more, contact your OMRON sales representative.

## Model Numbers

(1) 2 m, 5 m, 10 m, 15 m, or 20 m

(2) 21 m or longer



## Optical Connector Assembly Tool

| Name                          | Applicable Units                                                                                                                                                                              | Model    | Maker                              |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------|
| Optical Fiber Assembly Tool * | This tool is used on site for mounting crimp-cut connectors and hard plastic-clad silica optical fiber for optical transmission systems of C-series SYSBUS, SYSMAC LINK, and Controller Link. | CAK-0057 | Sumitomo Electric Industries, Ltd. |

\* There is a risk of quality problems when using cables assembled by typical users, so we recommend purchasing cables with pre-attached connectors or having a qualified technician assemble the cables.

## GI Optical Cables

A qualified technician must select, assemble, and install GI Optical Fiber Cable, so always let an optical cable specialist handle the GI cable.

### Usable Optical Fiber Cables and Optical Connectors

- Optical fiber types: Graded, indexed, multi-mode, all quartz glass, fiber (GI-type AGF cable)
- Optical fiber construction (core diameter/clad diameter): 62.5/125  $\mu\text{m}$  or 50/125  $\mu\text{m}$
- Optical fiber optical characteristics of optical fiber: Refer to the tables.
- Optical connectors: ST connectors (IEC-874-10)

### 50/125 $\mu\text{m}$ AGF Cables

| Items                            | Minimum | Typical | Maximum                | Notes                                               |                                                                   |
|----------------------------------|---------|---------|------------------------|-----------------------------------------------------|-------------------------------------------------------------------|
| Numerical Aperture (N.A)         | ---     | 0.21    | ---                    | ---                                                 |                                                                   |
| Transmission loss (dB)           | ---     | ---     | 3.0 Lf                 | $0.5 \text{ km} \leq \text{Lf}$                     | $\lambda = 0.8 \text{ }\mu\text{m}$ ,<br>$T_a = 25^\circ\text{C}$ |
|                                  |         |         | $3.0 \text{ Lf} + 0.2$ | $0.2 \text{ km} \leq \text{Lf} \leq 0.5 \text{ km}$ |                                                                   |
|                                  |         |         | $3.0 \text{ Lf} + 0.4$ | $\text{Lf} \leq 0.2 \text{ km}$                     |                                                                   |
| Connection loss (dB)             | ---     | ---     | 1.0                    | $\lambda = 0.8 \text{ }\mu\text{m}$ , one location  |                                                                   |
| Transmission band width (MHz·km) | 500     | ---     | ---                    | $\lambda = 0.85 \text{ }\mu\text{m}$ (LD)           |                                                                   |

Lf is Fiber length in km, Ta is ambient temperature, and  $\lambda$  is the peak wavelength of the test light source.

### 62.5/125 $\mu\text{m}$ AGF Cables

| Items                            | Mini-<br>mum | Typi-<br>cal | Maximum                | Notes                                               |                                                                   |
|----------------------------------|--------------|--------------|------------------------|-----------------------------------------------------|-------------------------------------------------------------------|
| Numerical Aperture (N.A)         | ---          | 0.28         | ---                    | ---                                                 |                                                                   |
| Transmission loss (dB)           | ---          | ---          | 3.5 Lf                 | $0.5 \text{ km} \leq \text{Lf}$                     | $\lambda = 0.8 \text{ }\mu\text{m}$ ,<br>$T_a = 25^\circ\text{C}$ |
|                                  |              |              | $3.5 \text{ Lf} + 0.2$ | $0.2 \text{ km} \leq \text{Lf} \leq 0.5 \text{ km}$ |                                                                   |
|                                  |              |              | $3.5 \text{ Lf} + 0.4$ | $\text{Lf} \leq 0.2 \text{ km}$                     |                                                                   |
| Connection loss (dB)             | ---          | ---          | 1.0                    | $\lambda = 0.8 \text{ }\mu\text{m}$ , one location  |                                                                   |
| Transmission band width (MHz·km) | 200          | ---          | ---                    | $\lambda = 0.85 \text{ }\mu\text{m}$ (LD)           |                                                                   |

Lf is Fiber length in km, Ta is ambient temperature, and  $\lambda$  is the peak wavelength of the test light source.

## ■ SYSMAC LINK Units

| Unit type        | Name                                                                                                                          | Specifications           |                                                                         |               |                    | Words required        | Current consumption (A)                                                                                 |             | Model      |  |                  |
|------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------|---------------|--------------------|-----------------------|---------------------------------------------------------------------------------------------------------|-------------|------------|--|------------------|
|                  |                                                                                                                               | Communications cable     | Communications functions                                                | Duplexing     | Units per CPU Unit |                       | 5 V system                                                                                              | 26 V system |            |  |                  |
| CS1 CPU Bus Unit | SYSMAC LINK Unit<br>                         | Coaxial (5C-2V cable)    | Data link and message communications functions                          | Not supported | 4                  | 1 unit number's words | 0.48                                                                                                    | ---         | CS1W-SLK21 |  |                  |
|                  |                                                                                                                               | Optical (H-PCF cable) *1 |                                                                         |               |                    |                       | 0.47                                                                                                    | ---         | CS1W-SLK11 |  |                  |
|                  | SYSMAC LINK Support Board, PCI interface<br> | Coaxial (5C-2V cable)    |                                                                         |               |                    |                       | The 3G8F7-SLK□□ SYSMAC LINK Support Board includes the FinsGateway communications middleware version 3. |             |            |  | 3G8F7-SLK21-E *2 |
|                  |                                                                                                                               | Optical (H-PCF cable) *1 |                                                                         |               |                    |                       |                                                                                                         |             |            |  | 3G8F7-SLK11-E *2 |
|                  | F Adapter                                                                                                                     | ---                      | One Adapter is included with each Coaxial-cable SYSMAC LINK Unit/Board. |               |                    |                       | C1000H-CE001                                                                                            |             |            |  |                  |
|                  | F Adapter Cover                                                                                                               | ---                      |                                                                         |               |                    |                       | C1000H-COV01                                                                                            |             |            |  |                  |
|                  | Terminator<br>                               | ---                      | A Terminator must be installed at each node on the ends of the network. |               |                    |                       | C1000H-TER01                                                                                            |             |            |  |                  |

\*1. When using wired optical (H-PCF) communications, use the H-PCF Cable or H-PCF Cable with pre-attached connectors.

\*2. Final order entry date: The end of March, 2020

## ■ FL-net Units

| Unit type        | Name                                                                                                      | Specifications       |                                                                                            |               |                    | Words required        | Current consumption (A) |             | Model      |
|------------------|-----------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|---------------|--------------------|-----------------------|-------------------------|-------------|------------|
|                  |                                                                                                           | Communications cable | Communications functions                                                                   | Duplexing     | Units per CPU Unit |                       | 5 V system              | 26 V system |            |
| CS1 CPU Bus Unit | <b>FL-net Unit</b><br> | 100BASE-TX Cable     | FL-net (OPCN-2)<br>Ver. 2 specifications<br>Data link and message communications functions | Not supported | 4                  | 1 unit number's words | 0.38                    | ---         | CS1W-FLN22 |

## ■ DeviceNet Unit

| Unit type        | Name                                                                                                         | Specifications          |                                                                                                                                                                                                                           |               |                    | Words required        | Current consumption (A) |             | Model         |
|------------------|--------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------------|-------------------------|-------------|---------------|
|                  |                                                                                                              | Communications cable    | Communications types                                                                                                                                                                                                      | Duplexing     | Units per CPU Unit |                       | 5 V system              | 26 V system |               |
| CS1 CPU Bus Unit | <b>DeviceNet Unit</b><br> | Special DeviceNet cable | <ul style="list-style-type: none"> <li>Remote I/O Master communications (Fixed or user-set allocation)</li> <li>Remote I/O Slave communications (Fixed or user-set allocation)</li> <li>Message communications</li> </ul> | Not supported | 16                 | 1 unit number's words | 0.29                    | ---         | CS1W-DRM21-V1 |

## ■ CompoNet Master Unit

| Unit type            | Name                                                                                                      | Specifications                                                                                              |                                                                                                                                                       | Words required                               | Current consumption (A) |             | Model      |
|----------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------|-------------|------------|
|                      |                                                                                                           | Communications types                                                                                        | Maximum number of I/O points per Master                                                                                                               |                                              | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | CompoNet Master Unit<br> | <ul style="list-style-type: none"> <li>Remote I/O communications</li> <li>Message communications</li> </ul> | Word Slave Units:<br>1,024 inputs and 1,024 outputs (2,048 I/O points total)<br>Bit Slave Units:<br>256 inputs and 256 outputs (512 I/O points total) | 1, 2, 4, or 8 unit numbers' words (variable) | 0.4                     | ---         | CS1W-CRM21 |

## ■ ID Sensor Units

| Unit type            | Name                                                                              | Specifications          |                    |                       | Words required        | Current consumption (A) |             | Model        |
|----------------------|-----------------------------------------------------------------------------------|-------------------------|--------------------|-----------------------|-----------------------|-------------------------|-------------|--------------|
|                      |                                                                                   | Connecting ID System    | Number of RW Heads | External power supply |                       | 5 V system              | 26 V system |              |
| CS1 Special I/O Unit | ID Sensor Unit                                                                    | V680-series RFID system | 1 head             | Not required          | 1 unit number's words | 0.26 *                  | 0.13 *      | CS1W-V680C11 |
|                      |                                                                                   |                         | 2 heads            | 24 V DC               | 2 unit numbers' words | 0.32                    | ---         | CS1W-V680C12 |
|                      | ID Sensor Unit                                                                    | V600-series RFID system | 1 head             | Not required          | 1 unit number's words | 0.26                    | 0.12        | CS1W-V600C11 |
|                      |  |                         | 2 heads            | 24 V DC               | 2 unit numbers' words | 0.32                    | ---         | CS1W-V600C12 |

\* The current consumption is 0.28 A when connected to the V680-H01. For details, refer to the *V680 Series RFID System Catalog* (Cat. No. Q151).

## ■ GP-IB Interface Unit

| Unit type            | Name                                                                                                        | Specifications                            | Words required        | Current consumption (A) |             | Model      |
|----------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------|-------------------------|-------------|------------|
|                      |                                                                                                             |                                           |                       | 5 V system              | 26 V system |            |
| CS1 Special I/O Unit | GP-IB Interface Unit<br> | Supports both Master mode and Slave mode. | 1 unit number's words | 0.33                    | ---         | CS1W-GPI01 |

**Note:** Up to 4 CS1W-GPI01 GP-IB Interface Units can be mounted (controlled by one CPU) in a CS1D CPU Backplane (CS1D-BC052 in a Duplex CPU System or CS1D-BC082S in a Single CPU System) or CS1D Expansion Backplane (CS1D-BI092). Up to 4 Units can be controlled by one CPU.

## ■ SPU Unit (High-speed Data Storage Units)

### SPU Unit (High-speed Data Storage Units)

| Unit type        | Name                                                                                                                                | Specifications                                                               |                            | Words required        | Current consumption (A) |             | Model         |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------|-----------------------|-------------------------|-------------|---------------|
|                  |                                                                                                                                     | PC Card slot                                                                 | Ethernet LAN port          |                       | 5 V system              | 26 V system |               |
| CS1 CPU Bus Unit | <b>SPU Unit (High-speed Data Storage Unit)</b><br> | 1 PC Card Type II slot<br>Insert an OMRON HMC-EF□□□□ to use the Memory Card. | 1 port<br>(10/100BASE-TX)  | 1 unit number's words | 0.56                    | ---         | CS1W-SPU01-V2 |
|                  |                                                                                                                                     |                                                                              | 2 ports<br>(10/100BASE-TX) |                       | 0.70                    |             | CS1W-SPU02-V2 |

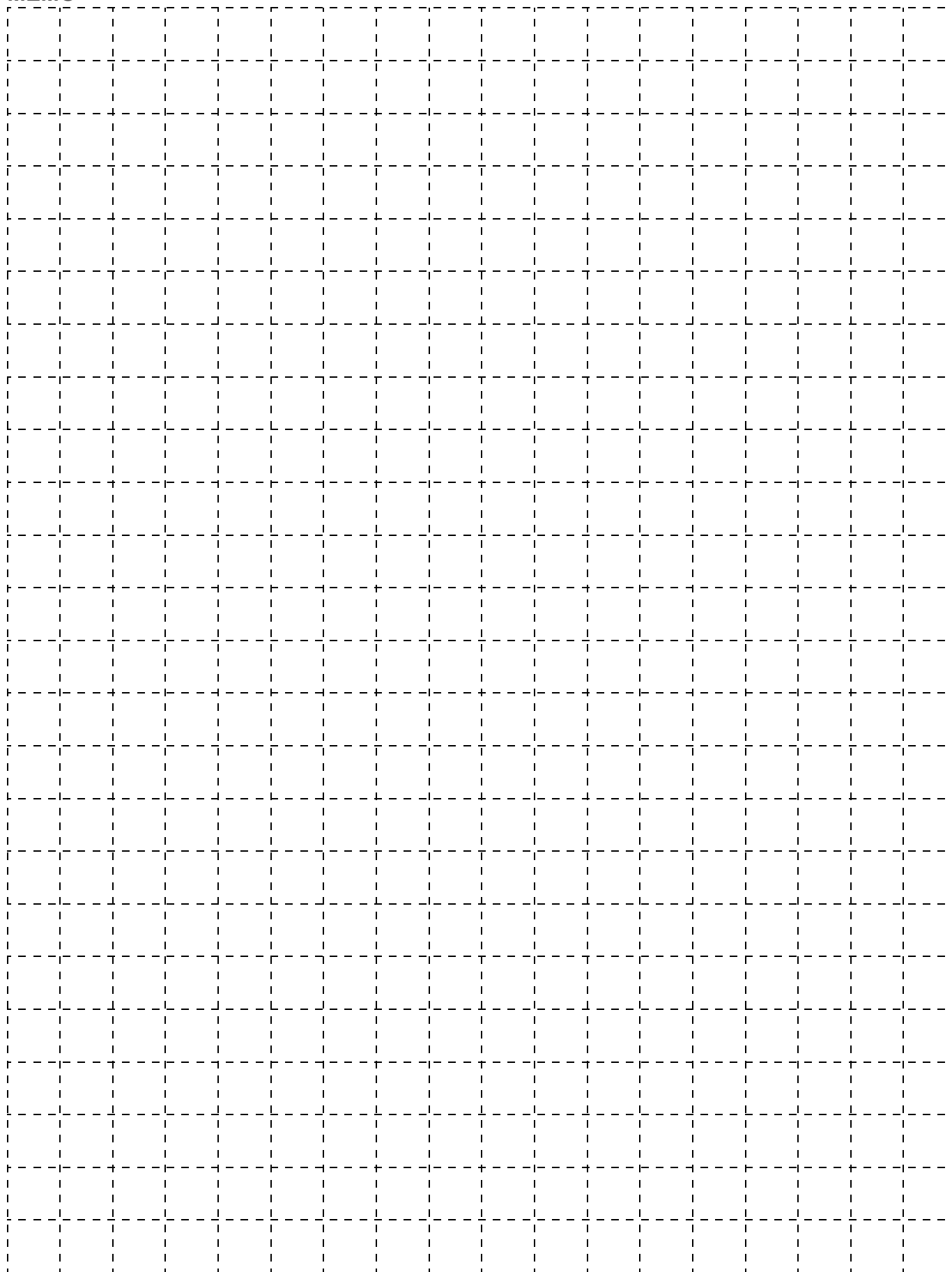
### Programming Device

| Name                                | Specifications                                                                                                                                                                                                                                                                                                                                      | Model         |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>SPU-Console Support Software</b> | Functions: Setting the High-speed Data Storage Unit's unit settings, sampling settings, etc.<br>(The software is required to make the High-speed Data Storage Unit's settings.)<br>OS : Microsoft Windows 10 (32 bit/64 bit)<br>Microsoft Windows 8.1 (32 bit/64 bit)<br>Microsoft Windows 8 (32 bit/64 bit)<br>Microsoft Windows 7 (32 bit/64 bit) | WS02-SPTC1-V2 |

### Options

| Name                                                                                             | Specifications                                                                                                                                                                                                                                                                                                                                                                   |                                                         | Model            |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------|
| SPU Data Management Middleware                                                                   | Functions: Automatically uploads collected data files from the SPU Unit to the computer, and can also register the data in a database.<br><br>OS : Microsoft Windows 10 (32 bit/64 bit)<br>Microsoft Windows 8.1 (32 bit/64 bit)<br>Microsoft Windows 8 (32 bit/64 bit)<br>Microsoft Windows 7 (32 bit/64 bit)<br>Microsoft Windows Server 2012<br>Microsoft Windows Server 2008 | 1 license                                               | WS02-EDMC1-V2    |
|                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  | 5 licenses                                              | WS02-EDMC1-V2L05 |
|  Memory Cards | Flash memory: 128 MB                                                                                                                                                                                                                                                                                                                                                             | <b>Note:</b> A memory Card is required to collect data. | HMC-EF183        |
|                                                                                                  | Flash memory: 256 MB                                                                                                                                                                                                                                                                                                                                                             |                                                         | HMC-EF283        |
|                                                                                                  | Flash memory: 512 MB                                                                                                                                                                                                                                                                                                                                                             |                                                         | HMC-EF583        |
|                                                                                                  | Memory Card Adapter (for a computer's PCMCIA slot)                                                                                                                                                                                                                                                                                                                               |                                                         | HMC-AP001        |

## MEMO



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