



CV/CVM1

Replacement Guide

From CV/CVM1 to CS1

About this document

This document provides the reference information for replacing CV/CVM1 PLC systems with CS1 series PLC.

This document does not include precautions and reminders ;please read and understand the important precautions and reminders described on the manuals of PLCs (both of PLC used in the existing system and PLC you will use to replace the existing PLC) before attempting to start operation.

Related Manuals

CPU Units

Man.No.	Model	Manual
W341	CQM1H-PRO01 CQM1-PRO01 C200H-PRO27 CS1W-KS001	CS/CJ Series Programming Consoles OPERATION MANUAL
W394	CS1G/H-CPU□□H CS1G/H-CPU□□-V1 CS1D-CPU□□H CS1D-CPU□□S CJ1H-CPU□□H-R CJ1G/H-CPU□□H CJ1G-CPU□□P CJ1M/G-CPU□□ NSJ□-□□□□(B)-□□□	CS/CJ/NSJ Series PROGRAMMING MANUAL
W474	CS1G/H-CPU□□H CS1G/H-CPU□□-V1 CS1D-CPU□□H CS1D-CPU□□S CJ1H-CPU□□H-R CJ1G/H-CPU□□H CJ1G-CPU□□P CJ1M/G-CPU□□ NSJ□-□□□□(B)-□□□	CS/CJ/NSJ Series INSTRUCTIONS REFERENCE MANUAL
W342	CS1G/H-CPU□□H CS1G/H-CPU□□-V1 CS1D-CPU□□H CS1D-CPU□□S CS1W-SCU□□-V1 CS1W-SCB□□-V1 CJ1H-CPU□□H-R CJ1G/H-CPU□□H CJ1G-CPU□□P CJ1M/G-CPU□□ CJ1W-SCU□□-V1 CP1H-X□□□□-□ CP1H-XA□□□□-□ CP1H-Y□□□□-□ NSJ□-□□□□(B)-□□□	CS/CJ/CP/NSJ Series Communications Commands REFERENCE MANUAL
W339	CS1G/H-CPU□□H CS1G/H-CPU□□-V1	CS Series OPERATION MANUAL
W202	CVM1 CV500/CV1000/CV2000/	CVM1/CV Series CV500/CV1000/CV2000/ CVM1 OPERATION MANUAL Ladder Diagrams
W195	CVM1 CV500/CV1000/CV2000/	CV-series CV500/CV1000/CV2000/CVM1 Programmable Controllers INSTALLATION GUIDE
W350	CVM1D	CVM1D Duplex System Programmable Controllers INSTALLATION GUIDE
W351	CVM1D	CVM1D Duplex System Programmable Controllers OPERATION MANUAL
W227	CV500/CV1000/ C200H/C1000H/C2000H/3G8F5	FINS Commands Reference Manual
W203	CV Series	CV Series Getting Started Guidebook

Special I/O Units

Man.No.	Model	Manual
W345	CS1W-AD0□□-V1/-AD161 CS1W-DA0□□ CS1W-MAD44 CJ1W-AD0□□-V1/-AD042 CJ1W-DA0□□/-DA042V CJ1W-MAD42	CS/CJ Series Analog I/O Units OPERATION MANUAL
W368	CS1W-PTS□□ CS1W-PTW□□ CS1W-PDC□□ CS1W-PTR□□ CS1W-PPS□□ CS1W-PMV□□ CJ1W-PTS□□ CJ1W-PDC□□ CJ1W-PH41U	CS/CJ Series Analog I/O Units OPERATION MANUAL
W426	CS1W-NC□71 CJ1W-NC□71(-MA)	CS/CJ Series Position Control Units OPERATION MANUAL
W435	CS1W-MCH71 CJ1W-MCH71	CS/CJ series Motion Control Units OPERATION MANUAL
W336	CS1W-SCB□□-V1 CS1W-SCU□□-V1 CJ1W-SCU□□-V1	CS/CJ Series Serial Communications Boards Serial Communications Units OPERATION MANUAL
W440	CS1W-FLN22 CJ1W-FLN22(100BASE-TX)	CS/CJ Series FL-net Units OPERATION MANUAL
W902	CS1W-CT021/041	CS Series High-speed Counter Units OPERATION MANUAL
W378	CS1W-HIO01-V1 CS1W-HCP22-V1 CS1W-HCA22-V1 CS1W-HCA12-V1	CS Series Customizable Counter Units OPERATION MANUAL
W384	CS1W-HIO01 CS1W-HCP22 CS1W-HCA22	CS Series Customizable Counter Units PROGRAMMING MANUAL
W376	CS1W-NC□□□	CS Series Position Control Units OPERATION MANUAL
W359	CS1W-MC□□□-V1	CS Series Motion Control Units OPERATION MANUAL
W124	C200H-TS001/002/101/102	C200H Temperature Sensor Units OPERATION MANUAL
W127	C200H-AD001/-DA001	C200H Analog I/O Units OPERATION GUIDE
W229	C200H-AD002/-DA002	C200H Analog I/O Units OPERATION MANUAL
W325	C200H-AD003 C200H-DA003/-DA004 C200H-MAD01	C200H Analog I/O Units OPERATION MANUAL
W225	C200H-TC001/002/003 C200H-TC101/102/103	C200H Temperature Control Units OPERATION MANUAL
W240	C200H-TV001/002/003 C200H-TV101/102/103	C200H Heat/Cool Temperature Control Units OPERATION MANUAL
W241	C200H-PID01/02/03	C200H PID Control Unit OPERATION MANUAL
W141	C200H-CT001-V1 C200H-CT002	C200H High-speed Counter Units OPERATION MANUAL
W311	C200H-CT021	C200H High-speed Counter Units OPERATION MANUAL
W224	C200H-CP114	C200H Cam Positioner Units OPERATION MANUAL
W334	C200HW-NC113/213/413	C200HW Position Control Units OPERATION MANUAL
W137	C200H-NC111	C200H Position Control Units OPERATION MANUAL
W128	C200H-NC112	C200H Position Control Units OPERATION MANUAL
W166	C200H-NC211	C200H Position Control Units OPERATION MANUAL
W314	C200H-MC221	C200H Motion Control Units OPERATION MANUAL:INTRODUCTION
W315	C200H-MC221	C200H Motion Control Units OPERATION MANUAL:DETAILS
W165	C200H-ASC02	C200H ASCII Unit OPERATION MANUAL
W306	C200H-ASC11/21/31	C200H ASCII Units OPERATION MANUAL

Man.No.	Model	Manual
W304	C200HW-COM01 C200HW-COM02-V1 to C200HW-COM06-EV1	C200HW Communication Boards OPERATION MANUAL
W206	CV500-BSC11/21/31/41/51/61	CVM1/CV Series BASIC Units OPERATION MANUAL
W207	CV500-BSC11/21/31/41/51/61	CVM1/CV Series BASIC Units REFERENCE MANUAL
W254	CV500-MC221/421	CVM1/CV Series Motion Control Unit OPERATION MANUAL:INTRODUCTION
W255	CV500-MC221/421	CVM1/CV Series Motion Control Unit OPERATION MANUAL:DETAILS

Network Communications Units

Man.No.	Model	Manual
W309	CS1W-CLK23 CS1W-CLK21-V1 CJ1W-CLK23 CJ1W-CLK21-V1 C200HW-CLK21 CVM1-CLK21 CQM1H-CLK21 CS1W-RPT0□	Controller Link Units OPERATION MANUAL
W370	CS1W-CLK13 CS1W-CLK12-V1 CVM1-CLK12(H-PCF Cable) CS1W-CLK53 CS1W-CLK52-V1 CVM1-CLK52(GI Cable)	Optical Ring Controller Link Units OPERATION MANUAL
W465	CS1W-EIP21 CJ1W-EIP21 CJ2H-CPU6□-EIP CJ2M-CPU3□	CS/CJ Series EtherNet/IP Units OPERATION MANUAL
W420	CS1W-ETN21 CJ1W-ETN21 (100Base-TX)	CS/CJ Series Ethernet Units OPERATION MANUAL Construction of Networks
W421	CS1W-ETN21 CJ1W-ETN21(100Base-TX)	CS/CJ Series Ethernet Units OPERATION MANUAL Construction of Applications
W456	CS1W-CRM21 CJ1W-CRM21	CS/CJ Series CompoNet Master Units OPERATION MANUAL
W457	CRT1	CRT1 Series CompoNet Slave Units and Repeater Unit OPERATION MANUAL
W380	CS1W-DRM21-V1 CJ1W-DRM21	CS/CJ Series DeviceNet Units OPERATION MANUAL
W267	CS1W/CJ1W/C200HW DRT1/DRT2 GT1 CVM1	DeviceNet OPERATION MANUAL
W266	C200HW-SRM21-V1 CS1W-SRM21 CJ1W-SRM21 CQM1-SRM21-V1 SRT1/SRT2	CompoBus/S OPERATION MANUAL
W136	C500-RM001-(P)V1 C120-RM001(-P) C500-RT001/RT002-(P)V1 C500/C120-LK010(-P) C200H-RM001-PV1 C200H-RT001/002-P B500-I/O	C series Rack PCs Optical Remote I/O SYSTEM MANUAL
W308	C200HW-ZW3DV2/ZW3PC2 3G8F5-CLK11/21 3G8F6-CLK21	Controller Link Support Software OPERATION MANUAL

Man.No.	Model	Manual
W120	C500-RM201/RT201 C200H-RM201/RT201/202 G71-IC16/OD16 G72C-ID16/OD16 S32-RS1	C series Rack PCs Wired Remote I/O SYSTEM MANUAL
W379	CVM1-DRM21-V1 C200HW-DRM21-V1	DeviceNet Master Units OPERATION MANUAL
W347	C200HW-DRT21 CQM1-DRT21 DRT1	DeviceNet Slaves OPERATION MANUAL
W135	C200H-LK401 C500-LK009-V1	C Series PC Link SYSTEM MANUAL
W205	CV500-LK201	CVM1/CV Series OPERATION MANUAL: Host Link System, CV500-LK201 Host Link Unit
W213	CV500-SNT31	CV-series SYSMAC NET Link SYSTEM MANUAL
W242	CV500-ETN01	CV-Series Ethernet System Manual
W244	CV500-TDL21	CV-Series Temperature Controller Data Link Unit OPERATION MANUAL
W212	CV500-SLK11/21	CV-series SYSMAC LINK System Manual
W204	CV500-RM211/221 CV500-RT211/221	SYSMAC BUS/2 CV-series Remote I/O SYSTEM MANUAL
W348	DRT1-COM GT1	DeviceNet MULTIPLE I/O TERMINAL OPERATION MANUAL
W434	CVM1-LK401	CV/CVM1 Series PC Link Unit OPERATION MANUAL
W367	CS1W-SLK11/21	SYSMAC LINK Units OPERATION MANUAL

Support Software

Man.No.	Model	Manual
W463	CXONE-AL□□C-V4 CXONE-AL□□D-V4	CX-One FA Integrated Tool Package SETUP MANUAL
W446		CX-Programmer OPERATION MANUAL
W447		CX-Programmer OPERATION MANUAL : Function Blocks/Structured Text
W469		CX-Programmer OPERATION MANUAL SFC Programming
W464		CX-Integrator OPERATION MANUAL
W344		CX-Protocol OPERATION MANUAL
W222	CVM1-PRS21-EV1	CVM1/CV-series Programming Console OPERATION MANUAL

Read and Understand this Document

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Disclaimers

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Product specifications and accessories may be changed at any time based on improvements and other reasons.

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DIMENSIONS AND WEIGHTS

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

PERFORMANCE DATA

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

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The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

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

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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

PROGRAMMABLE PRODUCTS

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

MEMO

CV/CVM1 Replacement Guide

From CV/CVM1 to CS1

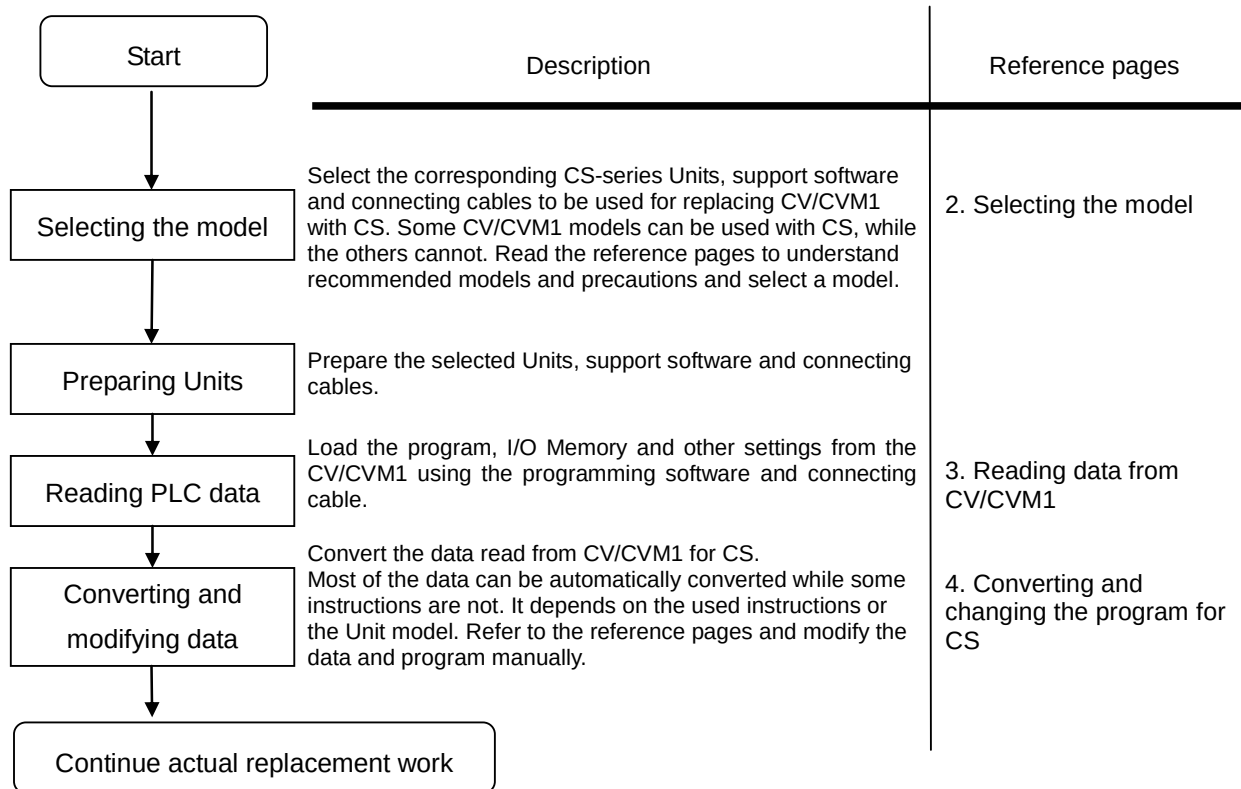
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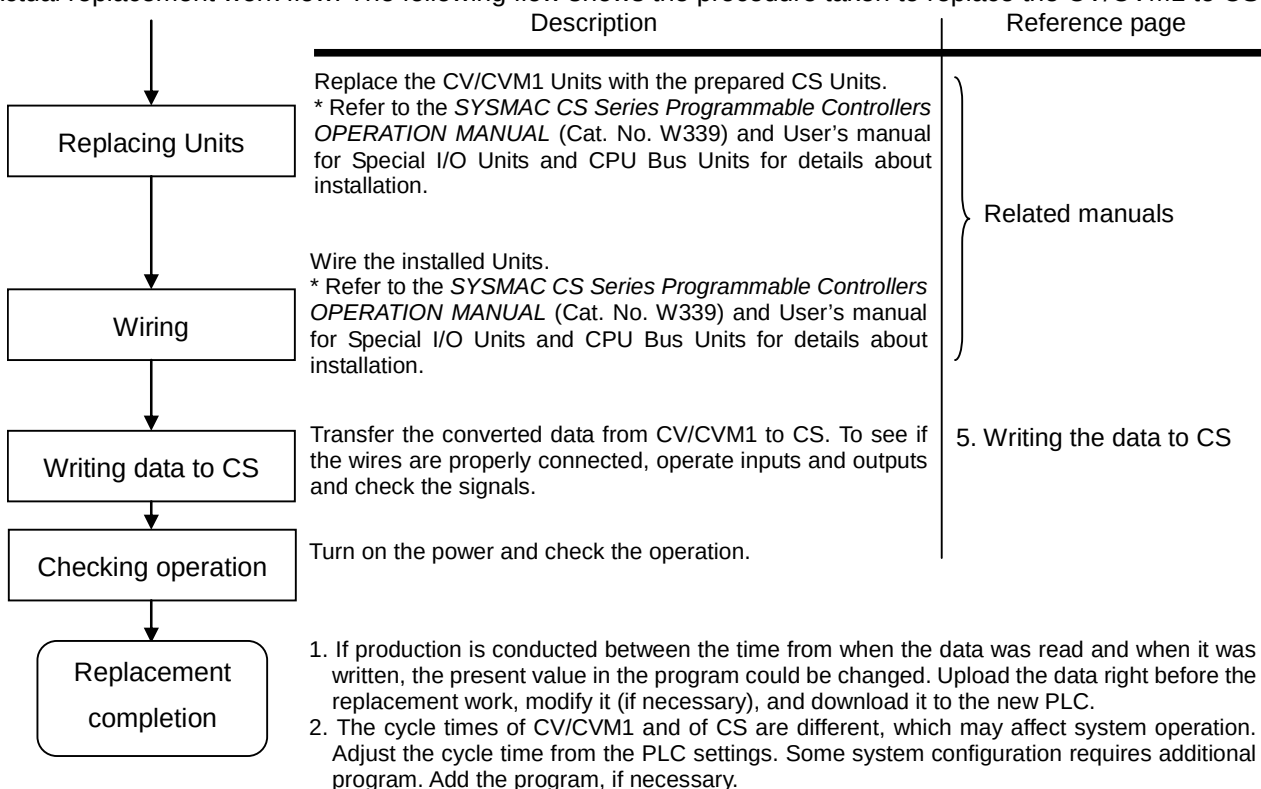
1. Work flow

This section describes the flow of work you have to follow when you replace CV/CVM1 CPU Units with CS-series CPU Units. Read the reference pages for details.

1) Preliminary Steps: Take the following steps before starting the replacement work.

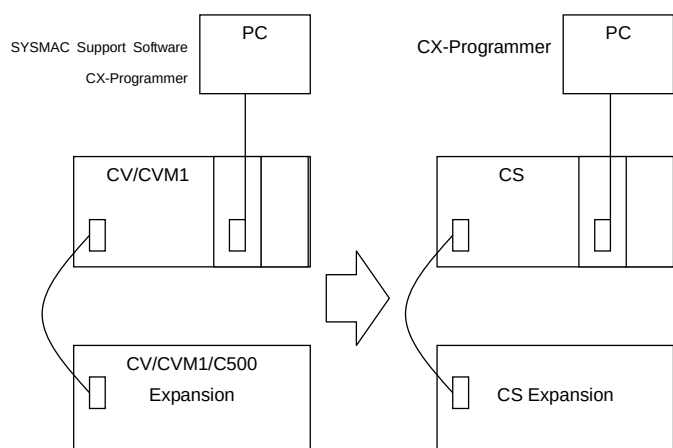


2) Actual replacement work flow: The following flow shows the procedure taken to replace the CV/CVM1 to CS.



2. Selecting the model

Outline of the system configuration



The table below lists the models of CV/CVM1 series Units and corresponding models of CS-series Units. Select a CS series model which is compatible with or one with similar specification to the CV/CVM1 series model you use.

Refer to the following manual for details of each model.

CS Series CPU Unit OPERATION MANUAL (Cat. No. W339)

CPU Rack

Unit name	CV/CVM1 series	CS-series	Description
CPU Units	CV500-CPU01(-V1) CVM1-CPU01(-V1/V2) CVM1-CPU11(-V1/V2)	CS1G-CPU44H to 45H CS1H-CPU64H to 65H	UM: 30K to 60K steps, DM+EM: 64K to 128K words Number of expansions: CPU44H: 3 max., CPU45H/64H/65H: 7 max.
	CV1000-CPU01(-V1) CV2000-CPU01(-V1) CVM1-CPU21(-V1/V2)	CS1G-CPU45H CS1G-CPU65H to 67H	UM: 60K to 250K steps DM+EM: 64K to 448K words Number of expansions: 7 max.
Memory card	HMC-ES□□□□ (SRAM) HMC-EE□□□□ (EEP-ROM) HMC-EP□□□□ (EP-ROM)	HMC-EF□□□□	Flash memory type only for CS
Expansion Data Memory	CV1000-DM641 (64 KW) CV1000-DM151 (128 KW) CV1000-DM251 (256 KW)	Unnecessary	CS-series CPU Units have built-in EM Area. The memory capacity is different by models. Select CPU Units with enough memory capacity.
Power Supply Units	CV500-PS221 CVM1-PA208	C200HW-PA209R C200HW-PA204R C200HW-PA204 C200HW-PA204C	AC type Note: The Power Supply Units with a RUN Output have "-R" at the end of their model No.
	CV500-PS211	C200HW-PD025 C200HW-PD024	DC type Note: No RUN Output type provided.
CPU Backplanes	CV500-BC031 (3 slots) CV500-BC053 (5 slots) CV500-BC101 (10 slots) CVM1-BC053 (5 slots) CVM1-BC103 (10 slots)	CS1W-BC033/032 (3 slots)* CS1W-BC053/052 (5 slots)* CS1W-BC083/082 (8 slots)* CS1W-BC103/102 (10 slots)*	Both CS1 Units and C200H Units can be used for CS1W-BC□□□3. Only CS1 Units can be used for CS1W-BC□□□2. C200H Units cannot be used. *When an I/O Control Unit for long distance expansion is mounted, the number of Units that can be mounted on the backplane will decrease by one.
Expansion Units (I/O Control Units)	CV500-IC101 CV500-IC201 CV500-IC301	CS1W-IC101 (I/O Control Unit for long distance expansion) or Unnecessary (when total expansion length is 12 m or less.)	The I/O Control Unit is necessary when the total expansion cable length exceeds 12 m. (The Unit can be used even if the total expansion length is 12 m or less. You can also directly connect the Expansion cable to the Backplane without using an I/O Control Unit.) Note: When an I/O Control Unit for long distance expansion is mounted, the number of available slots decreases by one.
Electrical Isolation Sleeve (CV500-ATT04/ATT05)	CV500-ATT04 CV500-ATT05	Unnecessary	The noise-preventing spacer is unnecessary for CS, because CS Units are installed by isolating from the control panel.

Expansion Rack

Unit name	CV/CVM1 series	CS-series	Description
Power Supply Units	CV500-PS221 CVM1-PA208 ----- CV500-PS211	C200HW-PA209R C200HW-PA204R C200HW-PA204 C200HW-PA204C C200HW-PD024 C200HW-PD025	AC type Note: RUN Output cannot be used on Expansion Backplanes. ----- DC type Note: No RUN output type provided.
Backplanes (Expansion Backplanes)	< CPU Expansion Backplane > CV500-BI111(11slot) < I/O Expansion Backplane > CV500-BI042(4 slots) CV500-BI062(6 slots) CV500-BI112(11 slots) CVM1-BI064(6 slots) CVM1-BI114(4 slots) [I/O Backplanes for C500] C500-BI***	CS1W-BI033/Bi032 (3 slots) CS1W-BI053/Bi052 (5 slots) CS1W-BI083/Bi082 (8 slots) CS1W-BI103/Bi102 (10 slots) *	Both CS1 Units and C200H Units can be used for CS1W-BC[]3. Only CS1 Units can be used for CS1W-BC[]2. C200H Units cannot be used. *When an I/O Control Unit for long distance expansion is mounted, the number of Units that can be mounted on the backplane will decrease by one.
Expansion Units (I/O Interface Units)	CV500-II101 CV500-II201 C500-II002	CS1W-IC102 (I/O Control Unit for long distance expansion) or Unnecessary (when total expansion length is 12 m or less.)	The I/O Control Unit for long distance expansion is necessary when the total expansion cable length exceeds 12 m. (The Unit can be used even if the total expansion length is 12 m or less. You can also directly connect the expansion cable to the Backplane without using an I/O Control Unit.) Note: When an I/O Control Unit is mounted, the number of available slots decreases by one.
Connecting Cables for Expansion Backplanes	< CPU Bus Cable > CV500-CN311 (30 cm) CV500-CN611 (60 cm)	< CS/CJ I/O Connecting Cables > CS1W-CN313 (30 cm) CS1W-CN713 (70 cm) CS1W-CN223 (2 m)	The cable connects a CS-series CPU Rack or Extension Rack with another Expansion Rack. With CV/CVM1, you have to connect two cables between a CPU Unit and an Expansion Rack: one is this connecting cable and the other is an I/O Cable. With CS/CJ-series, you need only one cable, i.e. an I/O connection cable for CS/CJ.
	< I/O Cable > CV500-CN312 (30 cm) CV500-CN612 (60 cm) CV500-CN122 (1 m) CV500-CN222 (2 m) CV500-CN322 (3 m) CV500-CN522 (5 m) CV500-CN132 (10 m) CV500-CN232 (20 m) CV500-CN332 (30 m) CV500-CN432 (40 m) CV500-CN532 (50 m)	< CV-series I/O Connecting Cables: Connects CS-series Long distance Expansion Racks.> CV500-CN312 (30 cm) CV500-CN612 (60 cm) CV500-CN122 (1 m) CV500-CN222 (2 m) CV500-CN322 (3 m) CV500-CN522 (5 m) CV500-CN132 (10 m) CV500-CN232 (20 m) CV500-CN332 (30 m) CV500-CN432 (40 m) CV500-CN532 (50 m)	An Expansion Unit and a cable for long distance expansion are required when the total length of the expansion cable exceeds 12 m. Reference: The CS-series uses CV/CVM1-series I/O Cables for long distance expansion. You can reuse them when you replace the CV/CVM1-series. The number of available slots, however, decreases by one because CS-series uses I/O Control Unit for long distance expansion. Note: If you want to use the existing connecting cables for Expansion Backplanes, be sure to check the conditions of the cables. - Check for disconnected wire or wire that can be easily disconnected. - Check for rust or corrosion. - Check for damage of connectors (The connector must be inserted and fixed firmly.)
		< CS/CJ I/O Connecting Cables > CS1W-CN313 (30 cm) CS1W-CN713 (70 cm) CS1W-CN223 (2 m) CS1W-CN323 (3 m) CS1W-CN523 (5 m) CS1W-CN133 (10 m) CS1W-CN133-B2 (12 m)	With the CS series, no Expansion Unit is necessary if the total length of expansion cable is 12 m or less. You can connect the cable directly to the Backplane.
	< I/O Cable (for connecting single Expansion I/O Rack via Backplanes)> CV500-CN413 (40cm) CV500-CN613 (60cm)	< CS/CJ I/O Connecting Cables > CS1W-CN313 (30 cm) CS1W-CN713 (70 cm) CS1W-CN223 (2 m)	An I/O Control Unit is unnecessary for expansion.
	< I/O connecting cable for C500> C500-CN312N (30cm) C500-CN512N (50cm) C500-CN812N (80cm) C500-CN122N (1m) C500-CN222N (2m)	< I/O connecting cables for CS/CS > CS1W-CN313 (30 cm) CS1W-CN713 (70 cm) CS1W-CN223 (2 m)	An I/O Control Unit is unnecessary for expansion.
Electrical Isolation Sleeve (CV500-ATT04/ATT05)	CV500-ATT04 CV500-ATT05	Unnecessary	The noise-preventing spacer is unnecessary for CS, because CS Units are installed by isolating from the control panel.

I/O Units & Special I/O Units

Unit name	CV/CVM1 series	CS-series	Description
Basic I/O Units	C500-ID/IA/IM[] C500-OD/OC/OA[] C500-MD[]	CS1W-ID/IA/IM[] CS1W-OD/OC/OA[] CS1W-MD[] or C200H-ID/IA/IM[] C200H-OD/OC/OA[] C200H-MD[]	Use CS or C200H Basic I/O Units. The terminal block wirings and input/output specifications are different with some Units. To improve maintainability, it is recommended that you renew the system with CS-series Units.
Special I/O Unit	C500-[]	CS1W-[] or C200H-[]	Use CS or C200H Special I/O Units. Replacement in this method involves change of the terminal block wirings and internal specifications. To improve the system performance and maintainability, it is recommended that you renew the system with Special I/O Unit for CS-series.

Communications Unit

Unit name	CV/CVM1 series	CS-series	Description
Special Units for communication	[SYSMAC LINK] Coaxial: CV500-SLK21 Optical Fiber Cable: CV500-SLK11	[SYSMAC LINK] Coaxial: CS1W-SLK21 Optical Fiber: CS1W-SLK11 or [Controller Link] Wire: CS1W-CLK23 Optical Fiber: CS1W-CLK13/53	To improve the system performance and maintainability, consider renewing the system with Controller Link. Refer to the following manuals: <i>Controller Link Units OPERATION MANUAL (Cat. No. W309)</i> and <i>SYSMAC Optical Ring Controller Link Units OPERATION MANUAL (Cat. No. W370)</i> .
	[SYSNET] CV500-SNT31	[SYSNET] None [Controller Link] Wire: CS1W-CLK23 Optical Fiber: CS1W-CLK13/53	SYSNET cannot be used with CS-series CPU Units. Consider renewing the system with Controller Link. Refer to the following manuals: <i>Controller Link Units OPERATION MANUAL (Cat. No. W309)</i> and <i>SYSMAC Optical Ring Controller Link Units OPERATION MANUAL (Cat. No. W370)</i> .
	[Controller Link] Wire: CVM1-CLK21 Optical Fiber Cable: CVM1-CLK12/52	[Controller Link] Wire: CS1W-CLK23 Optical Fiber: CS1W-CLK13/53	You have to modify related areas such as status area. Refer to <i>Controller Link Units OPERATION MANUAL (Cat. No. W309)</i> for details.
	[Host Link] CV500-LK201 RS232C×1, RS232C/RS422 ×1	[Serial Communication Unit] CS1W-SCU21-V1(RS232×2), CS1W-SCU31-V1 (RS422/485×2), or [Serial Communications Board] CS1W-SCB21-V1(RS232×2) CS1W-SCB41-V1 (RS232×1, RS422/485×1)	You have to change connecting cables and connectors, or modify related areas such as status area. Refer to <i>SYSMAC CS/CS Series Serial Communications Board / Serial Communications Unit OPERATION MANUAL (Cat No. W336)</i> for details.
	[PC Link] CVM1-LK401	[PC Link] C200H-LK401 or [Controller Link] (Recommended) Wire: CS1W-CLK23 Optical fiber: CS1W-CLK13/53	C200H PC Link Units can be used. Refer to the following manuals: <i>SYSMAC C Series/ PC Link System Manual (Cat. No. W135)</i> Consider renewing the system with Controller Link which has better system performance and maintainability. Refer to the following manuals: <i>Controller Link Units OPERATION MANUAL (W309)</i> and <i>SYSMAC Optical Ring Controller Link Units OPERATION MANUAL (W370)</i> .
	[DeviceNet] CVM1-DRM21(-V1)	[DeviceNet] CS1W-DRM21-V1 or C200HW-DRM21(-V1)	Both Device Net Units for CS-series and C200H-series can be used. Consider replacing the system using the CS-series DeviceNet Unit for higher system performance and maintenance. You have to modify the I/O allocation areas. Refer to the following manuals for details: <i>DeviceNet Unit OPERATION MANUAL (W380)</i> (for CS/CJ) <i>DeviceNet Master Units OPERATION MANUAL (W379)</i> (for C200HW)
	[SYSBUS] Wire: C500-RM201. Optical Fiber Cable: C500-RM001-(P)(V1)	[SYSBUS] Wire: C200H-RM201 Optical fiber: C200H-RM001-PV1 or [CompoNet] CS1W-CRM21 or [DeviceNet] CS1W-DRM21-V1 or [CompoBus/S] CS1W-SRM21	C200H SYSBUS Unit can be used with CS-series CPU Units. You have to modify the memory areas. We recommend you to replace the system with other remote system (CompoNet, DeviceNet or CompoBus/S) which have better system performance and maintainability. Refer to <i>CompoNet Master Units OPERATION MANUAL (W456)</i> and <i>CRT1 Series CompoNet Slave Units and Repeater Units OPERATION MANUAL (W457)</i> for details of CompoNet. Refer to <i>CS/CS Series DeviceNet Units OPERATION MANUAL (W380)</i> for details of DeviceNet. Refer to <i>CompoBus/S OPERATION MANUAL (No. W266)</i> for details of CompoBus/S.
	[SYSMAC BUS/2] Wire: CV500-RM221 Remote I/O Master Unit CV500-RT221 Remote I/O Slave Optical Fiber Cable: CV500-RM211 Remote I/O Slave CV500-RT211 Remote I/O Slave	[SYSMAC BUS/2] None [CompoNet] CS1W-CRM21 or [DeviceNet] CS1W-DRM21-V1 or [CompoBus/S] CS1W-SRM21	SYSMAC BUS/2 Remote I/O cannot be used with CS-series CPU Units. We recommend you to replace the system with other remote system (CompoNet, DeviceNet or CompoBus/S). Refer to <i>CompoNet Master Units OPERATION MANUAL (W456)</i> and <i>CRT1 Series CompoNet Slave Units and Repeater Units OPERATION MANUAL (W457)</i> for details of CompoNet. Refer to <i>CS/CS Series DeviceNet Units OPERATION MANUAL (W380)</i> for details of DeviceNet. Refer to <i>CompoBus/S OPERATION MANUAL (W266)</i> for details of CompoBus/S.

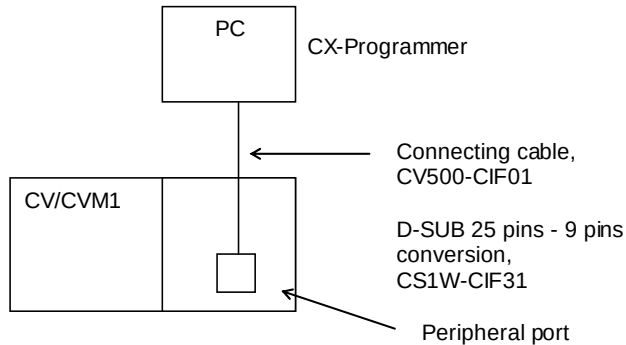
Support software and Programming devices

Product Name	CV/CVM1 series	CS-series	Description
Support software	CV Support Software SYSMAC Support Software CX-Programmer	CX-Programmer Ver.3.0 or higher	Only CX-Programmer can be used with CS-series CPU Units. CX-Programmer is included in Omron CX-One FA Integrated Tool Package.
Factory intelligent terminal	FIT10 FIT20	None	Use commercially available personal computers.
PLC-PC connecting cable	CV500-CIF01	CS1W-CN226/626 (+CS1W-CIF31)	If your PC has no RS232C port, you need to add a USB serial conversion cable.
Programming Console (Connecting cable)	CV500-PRS21 (CV500-CN[[[4]])	C200H-PRO27 (+CS1W-CN[[[4]]) or CQM1-PRO01(+CS1W-CN114)	A CS1W-CN[[[4]] is a connecting cable.

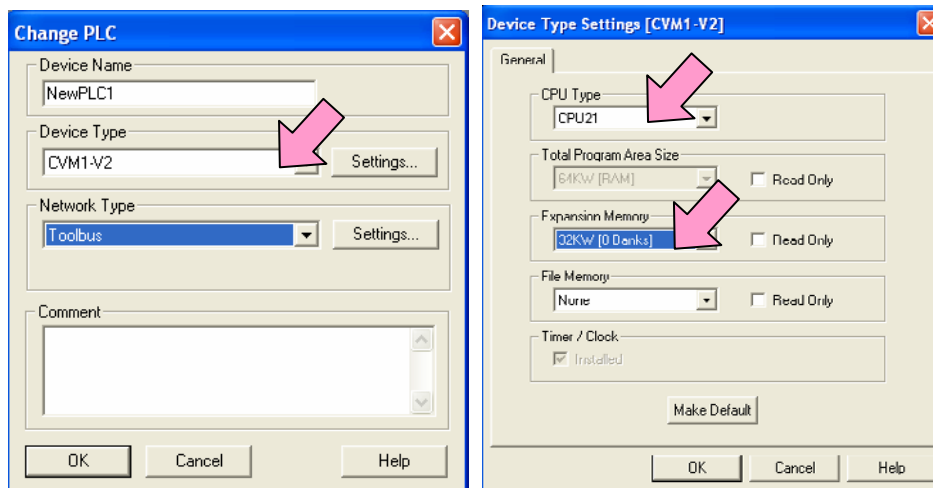
3. Reading data from CV/CVM1

Use the CX-Programmer, and read the ladder programs, PLC settings and Data Memory from the CV/CVM1.

Required items	Support software (PC)	CX-One (CXONE-AL[]C-V[], CXONE-AL[]D-V[]) Or, CX-Programmer (WS02-CXPC[]-V[])
	Connecting cable	CV500-CIF01 + Conversion connector: D-SUB25 pin (female)-9 pins (female) + CS1W-CIF31

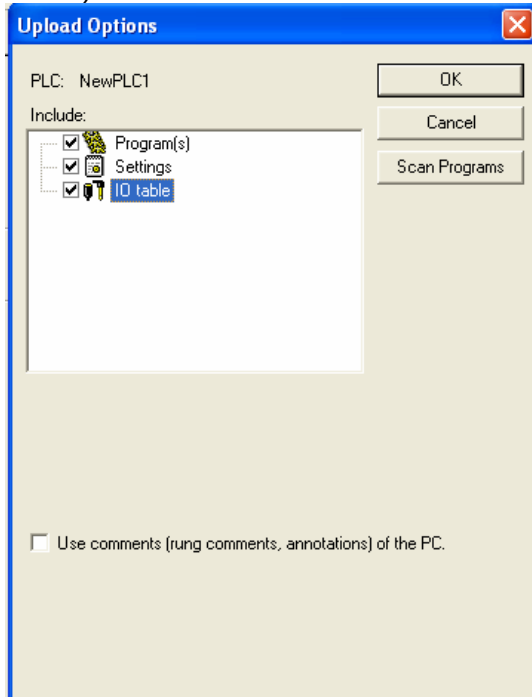


- (1) Mount the peripheral interface (CV500-CIF01) to the CV/CVM1 CPU unit, and connect it with the personal computer.
- (2) Start up the CX-Programmer. (From the Windows Start menu, select **All Programs - OMRON - CX-One - CX-Programmer - CX-Programmer.**)
- (3) Select CV500, CV1000, CV2000, CVM1 or CVM1-V2 for the Device Type. (Select **File – New** to show the below dialog box.) (The following example selects CVM1-CPU21-V2.)

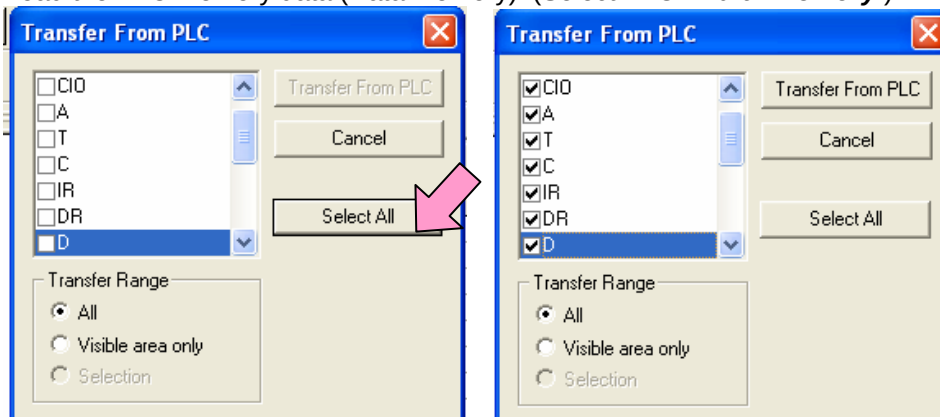


- (4) Connect the PLC and the CX-Programmer online. (Select **PLC - Work Online**)

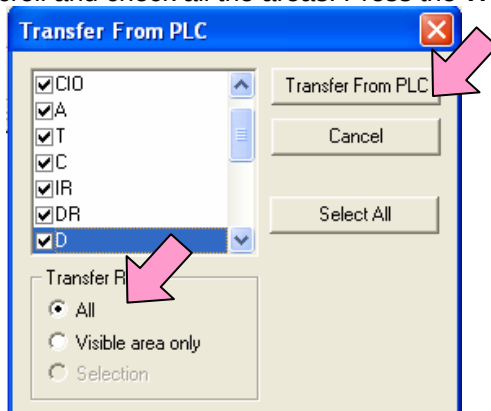
- (5) Load ladder programs, PLC setting and I/O table from the CV/CVM1. (Select **PLC – Transfer – From PLC to PC.**) Click the **OK** Button to read them.



- (6) Load the PLC memory data (Data Memory). (Select **PLC - Edit - Memory.**)



Scroll and check all the areas. Press the **Transfer From PLC** Button to start loading.

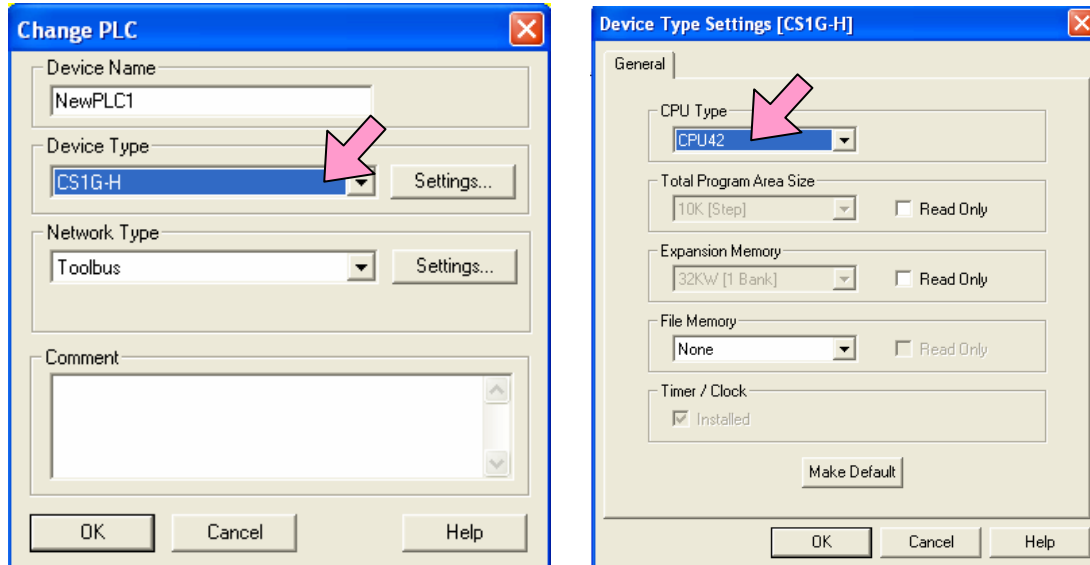


- (7) Make the CX-Programmer offline. (Select **PLC – Work online.**)
- (8) Save the program by specifying the project name. (Select **File - Save As.**)

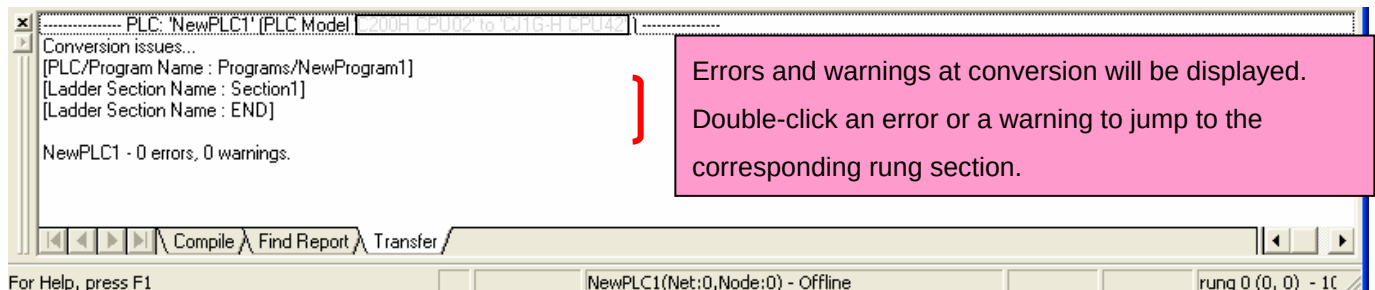
4. Converting the program for CS

On the CX-Programmer, convert the program for CS.

- (1) Start the CX-Programmer, and open the program file for CV/CVM1. (Select **File – Open.**)
- (2) Change the Device Type from CV/CVM1 to CS1 (Select **PLC - Change Model** to show the below dialog box.)
 - * Keep the data loaded from CV/CVM1 when you change the model to convert the program. The only data that can be converted is ladder program. The others will be cleared to default state.

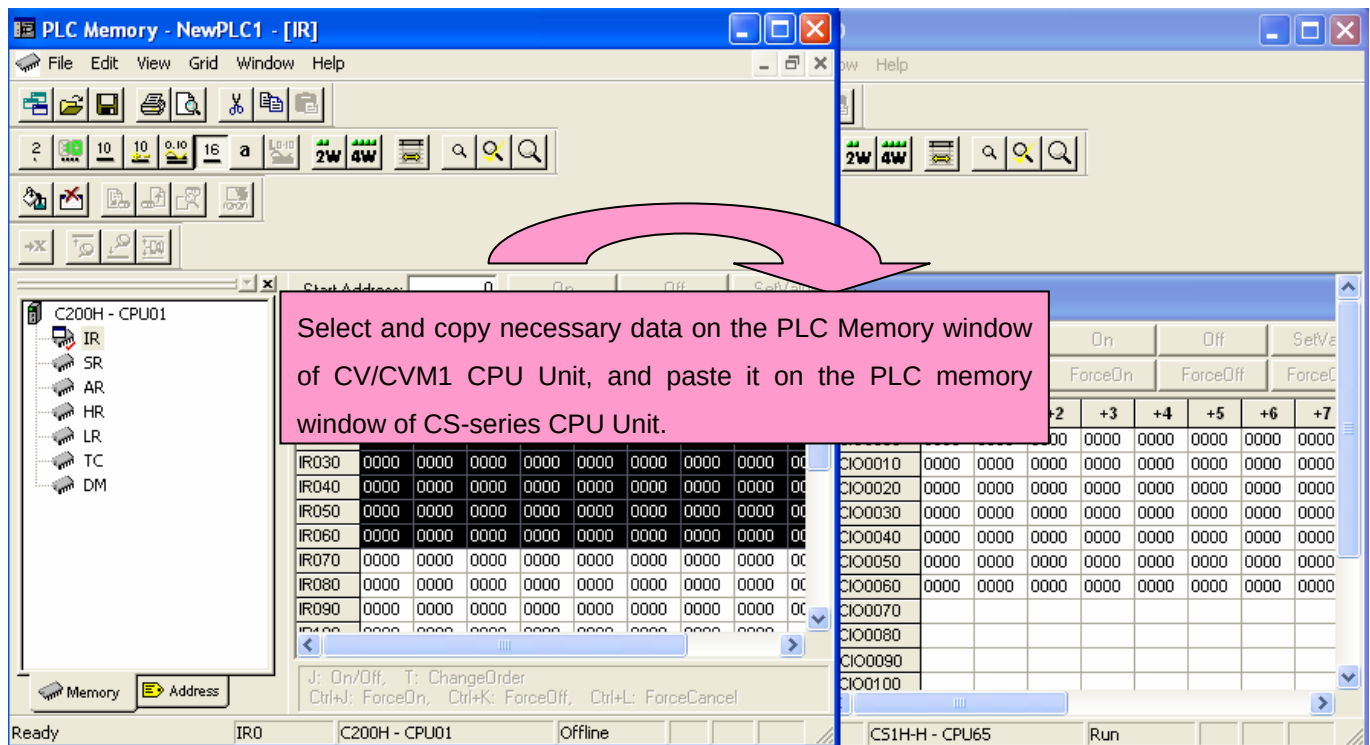


- (3) The instructions are converted. The Output Window shows the conversion results. Double-click an error shown on the Output Window to jump to the corresponding section of the ladder program.



Some instructions can not be converted. In that case, modify the ladder program according to the procedures in *Appendix A. Instruction conversion by the Change Model function of CX-Programmer*. You can check the program by selecting **Program - Compile** from the menu. The Output Window shows the checking results. Be sure to execute the Program Check because there are some instructions to which an error is not displayed when the model is changed.

- (4) The PLC memory data cannot be maintained when the PLC model is changed. Open the PLC Memory windows for both CV/CVM1 and CS-series PLCs, and copy the necessary memory data after conversion.

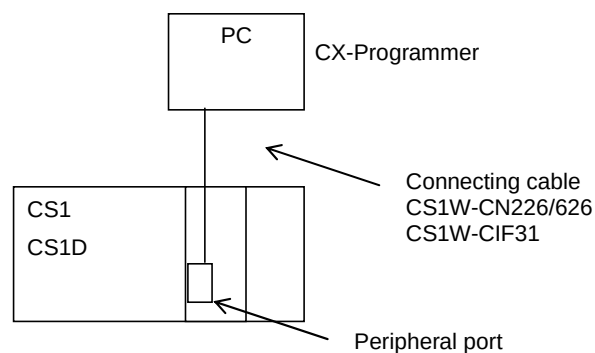


- (5) CV/CVM1 and CS-series are different in the word allocation. Refer to *Appendix B. Difference in data area allocation*, and modify the ladder program.
- (6) CV/CVM1 and CS-series are different in a part of PLC setting. Refer to *Appendix C. Change in PLC settings*, and change the PLC settings.
- (7) Check the program. If an error is detected, correct it. (Select **Program - Compile (Program Check)**)
- (8) Save the program by specifying the project name. (Select **File - Save As**)

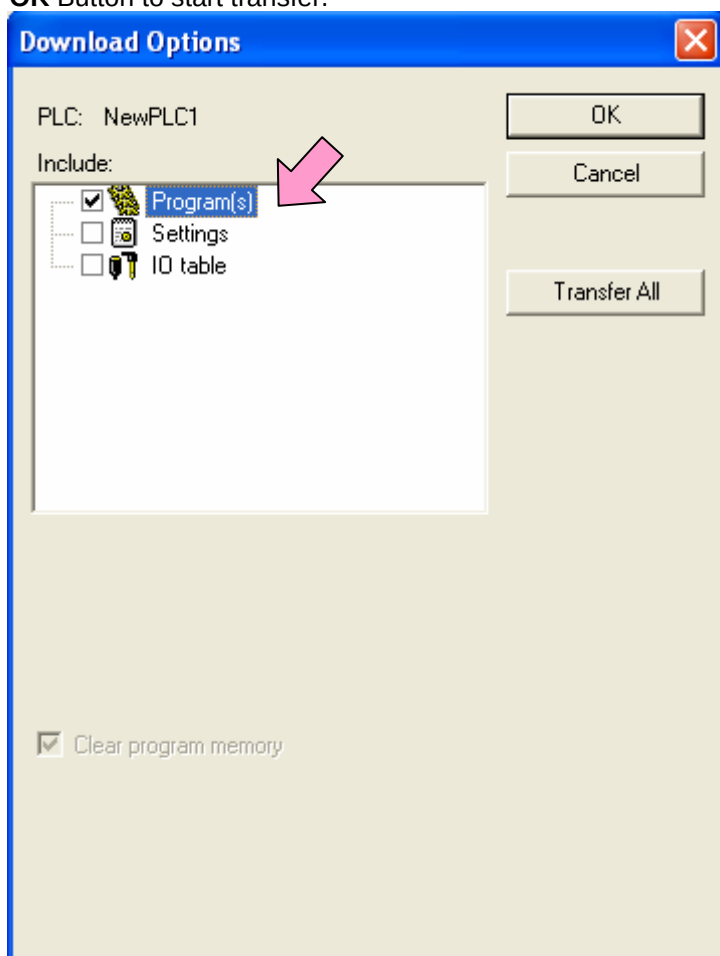
5. Writing data to CS

Transfer the converted and modified programs, PLC settings and data memory to CS-series CPU Unit.

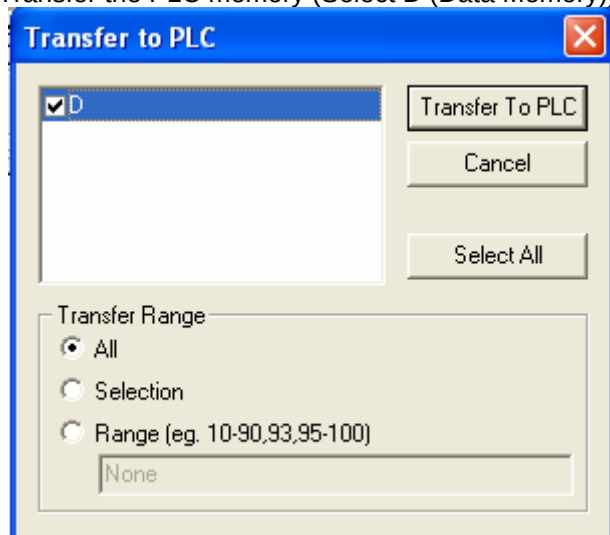
Required items	Support software (PC)	CX-One CXONE-AL[]C-V[]/ AL[]D-V[] (CX-Programmer)
	Connecting cable	CS1W-CN226/626 + CS1W-CIF31



- (1) Connect the CS1 CPU Unit and the PC.
- (2) Start up the CX-Programmer, and open the program file for CS that you converted or changed.
- (3) Connect the CS and CX-Programmer online.
- (4) Transfer the ladder program. (Select **PLC - Transfer - To PLC.**) Select the checkbox for **Program**. Press the **OK** Button to start transfer.



- (5) Transfer the PLC memory (Select D (Data Memory)). (Select **PLC - Edit - Memory.**)



- (6) Make the CX-Programmer offline.

6. Appendix

Appendix A: Instruction conversion by the Change Model function of CX-Programmer

- (1) The data type of operand is changed from BCD to BIN data for some instructions.
- (2) The number of operands is changed for some instructions.
- (3) Interrupt control instructions must be changed. (Use MSKS, MSKR, CLI, DI, and EI.)

Refer to the table below for detail. The table contains only the instructions whose states will differ by conversions. The other instructions are converted in the same state. Due to difference in CPU Unit versions or CX-Programmer versions, however, a part of these instructions can not be converted or cause different operations. Be sure to read the following related manuals and to perform operation tests to confirm that there is no problem.

SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat. No. W474)

CS/CS/NJS PROGRAMMING MANUAL (Cat. No. W394)

CX-Programmer Ver9.[] OPERATION MANUAL SFC Programming (Cat. No. W469)

CV/CVM1 instruction	CS-series Instruction	Operand	Number of Operands
JMP(4)	JMP(4) or JMP0(515)	If the operand data is #0, this instruction is converted to JMP0, and the operand data is deleted. In other cases, the operation remains the same.	Changes from 1 to 0, or remains the same.
JME(5)	JME(5) or JME0(516)	If the operand data is #0, this instruction is converted to JME0, and the operand data is deleted. In other cases, the operation remains the same.	Changes from 1 to 0, or remains the same.
STEP(8)	STEP(8)	The operand data must be set by Work Area (WR) or Index Resistors (indirect). Change the operand.	Same as CV/CVM1
SNXT(9)	SNXT(9)	The operand data must be set by Work Area (WR) or Index Resistors (indirect). Change the operand.	Same as CV/CVM1
EQU(25)	=(300)	Same as CV/CVM1	Same as CV/CVM1
MOVQ(37)	MOV(21)	Same as CV/CVM1	Same as CV/CVM1
XFER(40)	XFERC(565)	Same as CV/CVM1	Same as CV/CVM1
MOVB(42)	MOVBC(568)	Same as CV/CVM1	Same as CV/CVM1
DIST(44)	DISTC(566)	Same as CV/CVM1	Same as CV/CVM1
COLL(45)	COLLC(567)	Same as CV/CVM1	Same as CV/CVM1
BXFR(46)	None	This instruction is not supported. Consider programming with the XFER instruction.	
SETA(47)	SETA(530)	The data types of the 2nd and 3rd operands are changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
RSTA(48)	RSTA(531)	The data types of the 2nd and 3rd operands are changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
NSFL(54)	NSFL(578)	The data types of the 2nd and 3rd operands are changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
NSFR(55)	NSFR(579)	The data types of the 2nd and 3rd operands are changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
NASL(56)	NASL(580)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
NASR(57)	NASR(581)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
NSLL(58)	NSLL(582)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
NSRL(59)	NSRL(583)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
ADD(70)	+BC(406)	Same as CV/CVM1	Same as CV/CVM1
SUB(71)	-BC(416)	Same as CV/CVM1	Same as CV/CVM1
MUL(72)	*B(424)	Same as CV/CVM1	Same as CV/CVM1
DIV(73)	/B(434)	Same as CV/CVM1	Same as CV/CVM1
ADDL(74)	+BCL(407)	Same as CV/CVM1	Same as CV/CVM1
SUBL(75)	-BCL(417)	Same as CV/CVM1	Same as CV/CVM1
MULL(76)	*BL(425)	Same as CV/CVM1	Same as CV/CVM1
DIVL(77)	/BL(435)	Same as CV/CVM1	Same as CV/CVM1
ADB(80)	+C(402)	Same as CV/CVM1	Same as CV/CVM1
SBB(81)	-C(412)	Same as CV/CVM1	Same as CV/CVM1
MLB(82)	*U(422)	Same as CV/CVM1	Same as CV/CVM1
DVB(83)	/U(432)	Same as CV/CVM1	Same as CV/CVM1
ADBL(84)	+CL(403)	Same as CV/CVM1	Same as CV/CVM1
SBSL(85)	-CL(413)	Same as CV/CVM1	Same as CV/CVM1
MLSL(86)	*UL(423)	Same as CV/CVM1	Same as CV/CVM1
DVBL(87)	/UL(433)	Same as CV/CVM1	Same as CV/CVM1
INC(90)	++B(452)	Same as CV/CVM1	Same as CV/CVM1
DEC(91)	--B(454)	Same as CV/CVM1	Same as CV/CVM1
INCB(92)	++(448)	Same as CV/CVM1	Same as CV/CVM1
DECB(93)	--(450)	Same as CV/CVM1	Same as CV/CVM1
INCL(94)	++BL(453)	Same as CV/CVM1	Same as CV/CVM1
DECL(95)	--BL(455)	Same as CV/CVM1	Same as CV/CVM1
INBL(96)	++L(449)	Same as CV/CVM1	Same as CV/CVM1
DCBL(97)	--L(451)	Same as CV/CVM1	Same as CV/CVM1
BCNT(114)	BCNTC(621)	Same as CV/CVM1	Same as CV/CVM1

CV/CVM1 instruction	CS-series Instruction	Operand	Number of Operands
LINE(115)	LINE(63)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
COLM(116)	COLM(64)	The data type of the 3rd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
TCNT(123)	None	This instruction is not supported. Consider programming with the CNT instruction.	
TSR(124)	TSR(780)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
TSW(125)	TSW(781)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
SSET(160)	SSET(630)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
SRCH(164)	SRCH(181)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
MAX(165)	MAX(182)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
MIN(166)	MIN(183)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
SUM(167)	SUM(184)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
EMBC(171)	EMBC(281)	The data type of operand is changed from BIN data to BCD. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
REGL(175)	None	This instruction is not supported. Consider programming with other data transfer instruction.	
REGS(176)	None	This instruction is not supported. Consider programming with other data transfer instruction.	
FPD(177)	FPD(269)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
FILR(180)	None	This instruction is not supported. Consider programming with the FREAD instruction.	
FILW(181)	None	This instruction is not supported. Consider programming with the FWRIT instruction.	
FILP(182)	None	This instruction is not supported. Consider the online editing or so.	
FLSP(183)	None	This instruction is not supported. Consider the online editing or so.	
IOSP(187)	None	This instruction is not supported. Consider selecting "Normal" for the Execution Mode of CS/CJ. (Select "Normal" for the Execution mode on Peripheral Service tab on the PLC Settings window.).	
IORS(188)	None	This instruction is not supported. Consider selecting "Normal" for the Execution Mode of CS/CJ. (Select "Normal" for the Execution mode on Peripheral Service tab on the PLC Settings window.).	
IODP(189)	None	This instruction is not supported. Consider displaying data by using a touch panel or other device.	
READ(190)	None	This instruction is not supported. Consider programming with the IORD instruction. The data of the Special I/O Unit is reflected directly in the I/O memory of PLC. Please refer to the operation manual of the Special I/O Unit that you use.	
WRIT(191)	None	This instruction is not supported. Consider programming with the IOWR instruction. The data that is written to the I/O memory of PLC is directly reflected to the Special I/O Unit. Please refer to the operation manual of the Special I/O Unit that you use.	
MSG(195)	MSG(46)	The data type of the 1st operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
TOUT	None	This instruction is not supported. Consider programming with the OUT instruction.	
SA(210)	SA(784)	The data specification of operand is different. Refer to the SYSMAC CS/CJ/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat. No. W474) and CX-Programmer Ver.9.[] OPERATION MANUAL SFC Programming (Cat. No. W469), and correct the data.	Same as CV/CVM1
SP(211)	None	This instruction is not supported. Consider programming with another SFC related instruction.	
SR(212)	None	This instruction is not supported. Consider programming with another SFC related instruction.	
SF(213)	None	This instruction is not supported. Consider programming with another SFC related instruction.	
SE(214)	SE(785)	The data specification of operand is different. Refer to the SYSMAC CS/CJ/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat. No. W474) and CX-Programmer Ver.9.[] OPERATION MANUAL SFC Programming (Cat. No. W469), and correct the data.	Same as CV/CVM1
SOFF(215)	None	This instruction is not supported. Consider programming with other SFC related instructions.	
CSP(221)	CSP(510)	The data type of operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
CSPN(222)	CSPN(511)	The data type of operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
CNR(236)	CNR(545)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	It might be different.
PID(270)	PID(190)	The data specification of the operand is different. Refer to the SYSMAC CS/CS/NSJ Series INSTRUCTIONS REFERENCE MANUAL (Cat No. W474), and correct the data.	Same as CV/CVM1
RD2(280)	None	This instruction is not supported. Consider programming with the IORD instruction. The data of the Special I/O Unit is reflected directly in the I/O memory of PLC. Please refer to the operation manual of the Special I/O Unit that you use.	
WR2(281)	None	This instruction is not supported. Consider programming with the IOWR instruction. The data that is written to the I/O memory of PLC is directly reflected to the Special I/O Unit. Please refer to the operation manual of the Special I/O Unit that you use.	
TST(350)	TST(350)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1
TSTN(351)	TSTN(351)	The data type of the 2nd operand is changed from BCD to BIN. For a constant, the # mark is converted to & mark. To use word data, change the data type of word from BCD to BIN.	Same as CV/CVM1

Appendix B: Difference in data area allocation

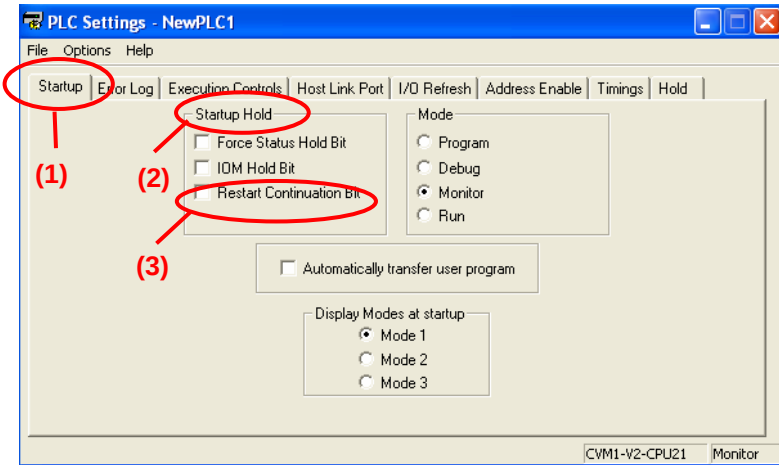
This table outlines the difference in the data allocation between CV/CVM1 and CS. Refer to the related manuals for details.

Item	CV/CVM1-series	CS-series	Remark
I/O allocation Basic I/O Units	"Free location and free words allocation" CIO 0 to 127 (The number of words differs by models.) CIO 0 to 511 (When you set the words allocated to each rack.)	"Free location and free words allocation" CIO 0 to 319 (The number of words differs by models.) CIO 0 to 999 (When you set the words allocated to each rack.)	Refer to <i>CS-series CPU Unit Operation Manual (Cat. No. W339)</i> for details of the I/O allocation.
I/O allocation Special I/O Units	"Free location and free words allocation" CIO 0 to 127 (The number of words differs by models.) CIO 0 to 511 (When you set the words allocated to each rack.)	CIO 2,000 to 2,199 (Allocates 10 words for each Unit No.) DM 20,000 to 21,999 (Allocates 100 words for each Unit No.)	
I/O allocation CPU Bus Units	1,500 to 1,899 words (Allocates 25 words for each Unit No.) DM 2,000 to 3,599 (Allocates 100 words for each Unit No.)	1,500 to 1,899 words (Allocates 25 words for each Unit No.) DM 30,000 to 31,599 (Allocates 100 words for each Unit No.)	
I/O allocation SYSMAC BUS	CIO 2,300 to 2,555 (default)	CIO 3,000 to 3,079 * [Allocation of other remote I/O] DeviceNet: I/O allocation of CPU Bus Unit CompoNet: I/O allocation of Special I/O Unit CompoBus/S: I/O allocation of Special I/O Unit	* This is the allocation when a C200H SYSMAC BUS Unit is used with a CS-series CPU Unit.
I/O allocation SYSMAC BUS/2	CIO 200 to 999 (default)	None [Allocation of other remote I/O] DeviceNet: I/O allocation of CPU Bus Unit CompoNet: I/O allocation of Special I/O Unit CompoBus/S: I/O allocation of Special I/O Unit	CS series CPU do not support SYSMAC BUS/2. Consider replacing it with other remote I/O system.
I/O allocation DeviceNet	CIO 1,900 to 1,963 CIO 2,000 to 2,063	[When using CS-series DeviceNet Unit] I/O allocation of CPU Bus Unit [When using C200H-series DeviceNet Unit] CIO 50 to 99 CIO 350 to 399	
Work Area (WR)	CIO 0032(*) to 0199CH (* The start word differs by models.) CIO 1,964 to 1,999 CIO 2,064 to 2,299	CIO 1,200 to 1,499 CIO 3,800 to 6,143 W 000 to 511	Areas unused can be used as Work Area with CS-series. However, some area will be used for future expansion. Therefore, do not use the area.
Link Area	CIO 1000 to 1199 D 0000 to 0127 (Unless specific link words are designated.)	CIO 1000 to 1199	
Holding Area (HR)	CIO 1200 to 1499	H 000 to 511	
Temporary Relay Area (TR)	TR0 to 7	TR0 to 15	
CPU Bus Link Area	G 000 to 255	G 000 to 004: AR G 008-255: None	CPU status and the clock have been allocated to Auxiliary Area (AR) with CS-series CPU Unit.
Auxiliary Area	A 000 to 511	(1) AR Area and Bit: Change the word address and bit address used in the program. (2) Condition Flag and clock pulse: Change the operation flags in the program to the condition flags and the clock pulse respectively. Use global variables such as P_0_1ms, and P_1ms instead of clock pulse.	The operation flags and the condition flags are specified with the label.

Appendix C: Difference in the PLC setting methods

This section explains the difference of PLC settings on CV/CVM1 and CS-series CPU Units.

The figure below shows the 1) setting tab on the PLC Settings window, 2) Group of settings in the tab, and 3) Setting items in each group. Check the circle and square check boxes for your settings. Be sure to confirm the system safety and system operation, though most of settings are same for both CV/CVM1 and CS-series.



CV/CVM1 CPU Unit	CS-series CPU Unit	Remark
Startup Startup Hold - Forced Status Hold Bit	Startup Startup Hold - Forced Status Hold Bit	Settings to hold the force on/off status and at power interruption. If this setting is enabled, status is maintained when the power is turned on again. There is no functional difference between the CV/CVM1 and CS.
Startup hold Startup Startup Hold - IOM Hold Bit	Startup Startup Hold - IOM Hold Bit	Settings to hold the I/O memory hold bits status at power interruption. The status is maintained when the power is turned on. There is no functional difference between the CV/CVM1 and CS.
Startup Startup Hold - Restart Continuation Bit	None	Setting to hold the status of restart continuation bits at power interruption. The status is maintained when the power is turned on. There are no restart continuation bits on the CS.
Startup Mode - Program - Debug - Monitor - Run	Mode Operating mode - Program - Monitor - Run - Use programming console (Run)	Specifies the operating mode at power on. There is no debug mode on the CS. To debug the program, use CX-Simulator.
Startup - Automatically transfer user programs	None	Specifies whether to transfer user program from the memory card at power on, or not. For CS, it can not be set from the PLC Settings. It is set with the DIP switches on the front panel of CPU Unit.
Startup display Display Mode at startup - Mode 1 - Mode 2 - Mode 3	None	Specifies the display mode for the 7 segment indicators on the expansion unit or SYSMAC BUS/2 system. CS series does not have this function. Consider using a touch panel to display this information, if necessary.
Error log - Enable Error Log.	None	Specifies the area to save error logs and number of logs to be saved. With CS, error log area is fixed.
Execution Controls Execution Process - Synchronous - Asynchronous	Peripheral Service Sync/Async Comms Execution mode - Normal - Peripheral Service - Synchronous - Asynchronous	Specifies whether to synchronize the execution of PLC instructions and peripheral servicing. For CS, select "Normal" to synchronize them and select other one for asynchronous execution. The various execution modes as shown on the left may have different operations. Be sure to check the effect of this setting onto operation.
Execution Controls Indirect DM - Binary - BCD	None	Selects data type (Binary or BCD) to be used for Indirect DM. CS specifies the indirect DM by using the settings below in the program. BIN mode: D with @ BCD mode: D with *

Execution Controls Step Timer - 0.1 s - 1.0 s	None	Settings for SFC step timer. For CS, right-click on the SFC editor to display the setting menu.
Execution controls Execution Conttols 1 - Measures CPU Bus unit cycle	None	Specifies whether to measure the CPU Bus Unit cycle time on the CPU Unit. CS does not support this function. Note: The execution time of cycle time is saved in A262 to 268.
Execution controls Execution Conttols 1 - Don't detect Low Battery	CPU Settings Execute process -Do not detect Low Battery (Battery-free operation).	Specifies whether to turn on the specified bit when battery error is detected with the PLC or the memory card. There is no functional difference between CV/CVM1 and CS.
Execution controls Execution Conttols 1 - Run program when Bus Units initialize	Startup Execution Setting - Start tunning program when initializing Unit/Inner board recognition	Specifies whether to run program when the CPU Bus Units are initializing. There is no functional difference between CV/CVM1 and CS.
Execution controls Execution Conttols 1 - Error on power off interrupts	None	Specifies whether to handle the power off interruption as not fatal error or not. The Auxiliary Area (AR) holds the power-ON time and power-OFF time with CS. Consider using this clock information and the FAL instruction.
Execution controls Execution Conttols 2 - Duplicate action error	None	Specifies whether to detect duplicate action error as a non-fatal error. No duplicate action error occurs on CS, due to difference of operation specifications.
Execution controls Execution Conttols 2 - Allow multiple JPM000 use	None	Specifies if two or more JMP0 instruction can be used or not. Two or more JMP0 instructions can be used by default with CS.
Execution controls Execution Conttols 2 - Run program on I/O verify error	None	Specifies if program is run at I/O verification error, or execution is suspended. CS always runs program at I/O verification error. To stop the program with CS, use the I/O verification error flag in AR area.
Execution controls Execution Conttols 2 - Startup trace enabled	None	Settings to automatically execute trace using pre-defined settings at power on or when operationg mode is changed. CS does not have this setting; consider creating a ladder program to execute this function.
Execution controls Execution Conttols 2 - Nest I/O interrupts	None	Specifies to suspend an interrupt task execution while other I/O interrupt task is being executed or execute one with higher priority first. With CS, use MSKS instruction for this setting.
Execution controls Execution Conttols 2 - Power OFF interrupt enabled.	Timings - Power Off Interrupt disabled	Specifies whether to execute power off interrupt program (task) or not. There is not functional difference between the CV/CVM1 and CS.
Host Link Port Port Settings	Host Link Port Communication Setting and others	Settings for built-in host link port. There is no functional difference between CV/CVM1 and CS, when the port is used for host link. When the CS used NT Link, select NT Link for "Mode" in this setting.
I/O Refresh - Zero-Cross - Cyclic - Scheduled	None	Specifies the I/O refreshing method. Only cyclic refreshing and immediate refreshing with instructions are possible with CS.
Address Enable ·Local Racks Set the first words for Racks 0 to 7. ·Group 1 and Group 2 Set the first words for RM0 to 3. ·Group 3, RT Slaves Set the first words for RM0-RT0 to RM7-RT7. ·I/O Slaves Set the first words for RM0 to 7.	None	Specify the start address of a local rack. For CS, start address can be set on the PLC I/O Table window. CS does not support SYSMAC BUS/2. SYSMAC BUS Unit for C200H-series can be used with CS. If it is used, the memory area allocated is fixed.
Timings - Watch Cycle Time	Timings - Watch cycle time	Set the monitoring time for cycle time. There is no functional difference between the CV/CVM1 and CS.
Timings - Power Off Interrupt	Timings - Power OFF detection time	Set the delay time to detect power interruption. There is no functional difference between the CV/CVM1 and CS.

Timings - Cycle Time	Timings - Constant Cycle Time	Specifies the cycle time. The cycle time is set to the set time. There is no functional difference between the CV/CVM1 and CS.
Timings - Scheduled Interrupt Interval	Timings - Schedule Interrupt Interval	Set the interval of scheduled interrupt. There is no functional difference between the CV/CVM1 and CS.
Timings - CPU Bus Link Service	None	Settings of whether to use CPU Bus Link function. CS does not have this function. This function is used mainly to exchange data with BASIC Unit. Consider changing the BASIC program to CPU Unit and sharing data using the global variables.
Hold - Enable Hold Area	None	Set the start address and end address of Hold area. Hold Area (Word H000 to 511) is fixed with CS.
Hold - CPU Set the hold status of Rack 0 to 7. ·Sys Bus/2 Set the hold status of RM 0 to 3. ·Sys Bus Set the hold status of RM 0 to 7.	None	Set the holding status of each Rack. Holding status can not be set individually for each rack or RM with CS.

Appendix D: Corresponding Input/Output Units

- Input Units

- (1) If the terminal block or connector is different, you have to change the wiring.
- (2) If the input specification is not same, check if there is no problem in operation.
- (3) If the number of circuits is different (or increased), wire and connect the terminals and each common terminals.
- (4) If the internal current consumption is different, check if enough power supply capacity is provided.
- (5) Detailed specifications are different. Refer to the related manuals for the detailed specifications.

DC Input Units

CV/CVM1-series Unit	Corresponding CS-series Unit
Model: C500-ID112 Specification: 5 to 12 VDC, 16 mA Terminal block, 16 points,	Model: CS1W-ID211 Specification: 24 VDC, 7 mA Terminal block, 16 points
Model: C500-ID213 Specification: 12 to 24 VDC, 10 mA Terminal block, 16 points,	Model: CS1W-ID211 Specification: 24 VDC, 7 mA Terminal block, 16 points
Model: C500-ID215 Specification: 12 to 24 VDC, 10 mA Terminal block, 32 points,	Model: CS1W-ID231 Specification: 24 VDC, 6 mA Connector, 32 points
Model: C500-ID218 Specification: 12 to 24 VDC, 10 mA Terminal block, 32 points	Model: CS1W-ID231 Specification: 24 VDC, 6 mA Connector, 32 points
Model: C500-ID218CN Specification: 12 to 24 VDC, 10 mA Connector, 32 points	Model: CS1W-ID231 Specification: 24 VDC, 6 mA Connector, 32 points
Model: C500-ID114 Specification: 12 VDC, 7 mA Connector, 64 points	Model: CS1W-ID261 Specification: 24 VDC, 6 mA Connector, 64 points
Model: C500-ID212 Specification: 24 VDC, 10 mA Terminal block, 64 points dynamic	None * Consider using a static type (CS1W-ID261).
Model: C500-ID219 Specification: 12 to 24 VDC, 7 mA Connector, 64 points	Model: CS1W-ID261 Specification: 24 VDC, 6 mA Connector, 64 points

TTL Input Unit

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-ID501CN Specification: 5 VDC, 3.5 mA Connector, 32 points	None *Consider changing to the 24-VDC input type (CS1W-ID231) or the TTL I/O (CS1W-MD561).

Interrupt Input Unit

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C2000-ID216 Specification: 12 to 24 VDC, 13 mA Terminal block, 8 points (independent common)	Model: CS1W-INT01 Specification: 24 VDC, 7 mA Terminal block, 16 points (8points/common)

AC Input Units

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-IA121 Specification: 100 to 120 VAC, 10 mA Terminal block 16 points	Model: CS1W-IA111 Specification: 100 to 120 VAC, 10 mA Terminal block, 16 points
Model: C500-IA222 Specification: 200 to 240 VAC, 10 mA Terminal block, 16 points	Model: CS1W-IA211 Specification: 200 to 240 VAC, 10 mA Terminal block, 16 points
Model: C500-IA122 Specification: 100 to 120 VAC, 10 mA Terminal block. 32 points	Model: CS1W-IA111 ×2 Specification: 100 to 120 VAC, 10 mA Terminal block, 16 points
Model: C500-IA223 Specification: 200 to 240 VAC, 10 mA Terminal block, 32 points	Model: CS1W-IA211 ×2 Specification: 200 to 240 VAC, 10 mA Terminal block, 16 points

AC/DC Input Units

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-IM211 Specification: 12 to 24 VAC/VDC, 10 mA Terminal block, 16 points	Model: CS1W-ID211 Specification: 24 VDC, 7 mA, Terminal block, 16 points *When you use the AC Input Unit, change wiring for DC Input Unit.
Model: C500-IM212 Specification: 12 to 24 VAC/VDC, 10 mA Terminal block, 32 points	Model: CS1W-ID231 Specification: 24 VDC, 6 mA, Connector, 32 points *When you use the AC Input Unit, change wiring for DC Input Unit.

- Output Units

- (1) If the terminal block or connector is different, you have to change the wiring.
- (2) If the number of circuits is different (or increased), wire and connect the terminals and each common terminals.
- (3) If the output specification is different, check if there is no problem in operation.
- (4) When the used relays are different, you have to be aware that the relay service life might change depending on the usage. (Refer to the related manuals for details.)
- (5) If the internal current consumption is different, check if enough power supply capacity is provided.
- (6) If the voltage and current consumption of external power supply is different, check if enough power supply capacity is provided.
- (7) Detailed specifications are different. Refer to the related manuals for the detailed specifications.

Relay Output Units

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-OC221 Specification: 250 VAC/24 VDC, 2 A Terminal block, 16 points	Model: CS1W-OC211 Specification: 250 VAC/24 VDC, 2 A Terminal block, 16 points
Model: C500-OC223 Specification: 250 VAC/24 VDC, 2 A Terminal block, 16 points (independent common)	Model: CS1W-OC201 ×2 Specification: 250 VAC/24 VDC, 2 A Terminal block, 8 points (independent common)
Model: C500-OC224 Specification: 250 VAC/24 VDC, 2 A Terminal block, 32 points	Model: CS1W-OC211 ×2 Specification: 250 VAC/24 VDC, 2 A Terminal block, 16 points

Transistor Output Units

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-OD217 Specification: 12 to 24 VDC, 1 A Terminal block, 16 points	Model: CS1W-OD211 Specification: 12 to 24 VDC, 0.5 A Terminal block, 16 points
Model: C500-OD219 Specification: 12 to 24 VDC, 2.1 A Terminal block, 16 points	Model: CS1W-OD211 Specification: 12 to 24 VDC, 0.5 A Terminal block, 16 points
Model: C500-OD411 Specification: 12 to 48 VDC, 1 A Terminal block, 16 points	Model: CS1W-OD211 Specification: 12 to 24 VDC, 0.5 A Terminal block, 16 points
Model: C500-OD215 Specification: 24 VDC, 50 mA Terminal block, 16 points (independent common)	Model: CS1W-OD211 Specification: 12 to 24 VDC, 0.5 A Terminal block, 16 points (8 points/common)
Model: C500-OD218 Specification: 12 to 24 VDC, 0.3 A Terminal block, 32 points	Model: CS1W-OD231 Specification: 12 to 24 VDC, 0.5 A Connector, 32 points
Model: C500-OD414 Specification: 12 to 48 VDC, 0.3 A Terminal block, 32 points	Model: CS1W-OD231 Specification: 12 to 24 VDC, 0.5 A Connector, 32 points
Model: C500-OD412 Specification: 12 to 48 VDC, 0.3 A Terminal block, 32 points	Model: CS1W-OD231 Specification: 12 to 24 VDC, 0.5 A Connector, 32 points
Model: C500-OD415CN Specification: 12 to 48 VDC, 0.3 A Connector, 32 points	Model: CS1W-OD231 Specification: 12 to 24 VDC, 0.5 A Connector, 32 points
Model: C500-OD212 Specification: 12 to 24 VDC, 0.3 A Terminal block, 32 points (PNP output)	Model: CS1W-OD232 Specification: 12 to 24 VDC, 0.5 A Connector, 32 points (source output)
Model: C500-OD211 Specification: 24 VDC, 0.1 A Terminal block, 64 points, dynamic	None *Consider changing to the static type (CS1W-OD261).
Model: C500-OD213 Specification: 24 VDC, 0.1 A Terminal block, 64 points	Model: CS1W-OD261 Specification: 12 to 24 VDC, 0.3 A Connector, 64 points

TTL Output Unit

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-OD501CN Specification: 5 VDC, 35 mA Connector, 32 points	None - Consider changing to a 24-VDC input type (CS1W-OD231) or a TTL I/O (CS1W-MD561).

Triac Output Units

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-OA121 Specification: 132 VAC, 1 A Terminal block, 16 points	Model: CS1W-OA211 Specification: 250 VAC, 0.5 A Terminal block, 16 points
Model: C500-OA222 Specification: 250 VAC, 1 A Terminal block, 16 points	Model: CS1W-OA211 Specification: 250 VAC, 0.5 A Terminal block, 16 points
Model: C500-OA223 Specification: 250 VAC, 1 A Terminal block, 24 points	Model: CS1W-OA211 ×2 Specification: 250 VAC, 0.5 A Terminal block, 16 points
Model: C500-OA225 Specification: 250 VAC, 1 A Terminal block, 32 points	Model: CS1W-OA211 ×2 Specification: 250 VAC, 0.5 A Terminal block, 16 points
Model: C500-OA226 Specification: 250 VAC, 1.2 A Terminal block, 16 points	Model: CS1W-OA211 Specification: 250 VAC, 0.5 A Terminal block, 16 points

- Input/Output Units

- (1) If the terminal block or connector is different, you have to change the wiring.
- (2) If the input or output specification is different, check if there is no problem in operation.
- (3) If the number of circuits is different (or increased), wire and connect the terminals and each common terminals.
- (4) If the internal current consumption is different, check if enough power supply capacity is provided.
- (5) If the voltage and current consumption of external power supply is different, check if enough power supply capacity is provided.
- (6) Functionally they are supported. Refer to the related manuals for the detailed specifications.

DC Input/Transistor Output Unit

CV/CVM1 Unit	Corresponding CS-series Unit
Model: C500-MD211CN Specification: 12 to 24 VDC Input, 10 mA 12 to 24 VDC Output, 0.3 A Connector, 16 points/16 points	Model: CS1W-MD261 Specification: 24 VDC Input, 6 mA 12 to 24 VDC Output, 0.3 A Connector, 32 points/32 points

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