azbil

No. CP-SP-1278E

CMC15G
Multifunction Gateway Communication Controller
Connection Manual

Thank you for purchasing the CMC15G Multifunction Gateway Communication Controller.

This manual contains information for ensuring the correct use of the CMC15G. It also provides necessary information for installation, maintenance, and troubleshooting.

This manual should be read by those who design and maintain equipment that uses the CMC15G. Be sure to keep this manual nearby for handy reference.

Yamatake Corporation

NOTICE

Be sure that the user receives this manual before the product is used.

Copying or duplicating this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is free from inaccuracies and omissions. If you should find an error or omission, please contact Yamatake Corporation.

In no event is Yamatake Corporation liable to anyone for any indirect, special or consequential damages as a result of using this product.

Conventions Used in This Manual

■ To prevent injury to the operator and others, and to prevent property damage, the following types of safety precautions are indicated:

⚠**WARNING**	Warnings are indicated when mishandling this product might result in death or serious injury.
⚠**CAUTION**	Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to the product.

■ In describing the product, this manual uses the icons and conventions listed below.


Use caution when handling the product.


The indicated action is prohibited.


Be sure to follow the indicated instructions.

Handling Precautions:
Handling Precautions indicate items that the user should pay attention to when handling the CMC15G.

Note: Notes indicate information that might benefit the user.

☞: This indicates the item or page that the user is requested to refer to.

(1), (2), (3): Numbers within parentheses indicate steps in a sequence or parts of an explanation.

[PARA] key:
[enter] key
Indicates keys on the keyboard.

>>: Indicates the result of an operation, details displayed on the personal computer or other devices, or the state of the device after operation.

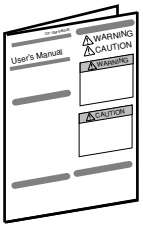
Safety Precautions

⚠CAUTION

Do not wire outside. Doing so might cause an accident due to the lightning.

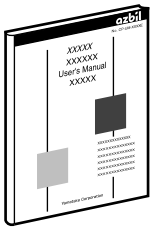
The Role of This Manual

Four different manuals are available for the CMC15G. Read them as necessary for your specific requirements. If a manual you require is not available, contact Yamatake Corporation or a Yamatake.



CMC15G Multifunction Gateway Communication Controller
No. CP-UM-5463JE

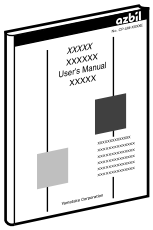
This instruction sheet is supplied with the product. It describes safety precautions, installation and wiring.



CMC15G Multifunction Gateway Communication Controller Installation & Configuration
No. CP-SP-1277E

This manual in PDF format is included on the SLP-G15J50 system disc CD-ROM. Personnel in charge of design, manufacture, operation, and/or maintenance of a system using this unit should thoroughly read this manual.

This manual also describes the installation, wiring, connections for communication, all functions and settings of this unit with the GatewayEditor, operating procedures, troubleshooting, and specifications.

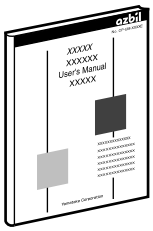


CMC15G Multifunction Gateway Communication Controller Connection Manual
No. CP-SP-1278E

This manual.

This manual in PDF format is included on the SLP-G15J50 system disc CD-ROM. System designers who need to connect the CMC15G with third-party PLCs or dedicated board computers should thoroughly read this manual.

This manual describes PLC connection methods, PLC address maps, and other operations and settings required for making applications using PLCs.



CMC15G Multifunction Gateway Communication Controller Logging Function User's Manual
No. CP-SP-1279E

This manual in PDF format is included on the SLP-G15J50 system disc CD-ROM. Personnel in charge of design, manufacture, operation, and/or maintenance of a system using the logging function on the CMC15GD001 advanced model should thoroughly read this manual.

This manual gives detailed instructions on logging functions and details about LogViewer.

Organization of This User's Manual

This manual is organized as follows:

Chapter 1. COMMUNICATIONS WITH PLCs

This chapter describes host link communications in which the CMC15G works as a master station of the communication, and serial slave communications in which the CMC15G works as a slave station and the microcomputer board for the system control or the PC works as a master station.
Additionally, this chapter describes how to set up each channel with the Gateway Editor.

Chapter 2. CONNECTING TO OTHER DEVICES

This chapter gives examples of connections between external devices made by other manufacturers and the CMC15G. It also describes the settings of the CMC15G and how to configure them.

Chapter 3. SERIAL SLAVE STATION COMMUNICATIONS

With serial slave station communications, the microcomputer board or PC used to control the user's system acts as the master station while data is exchanged with the CMC15G.
This chapter describes how to set up the CMC15G for serial slave station communications, and how to read switch states.

Contents

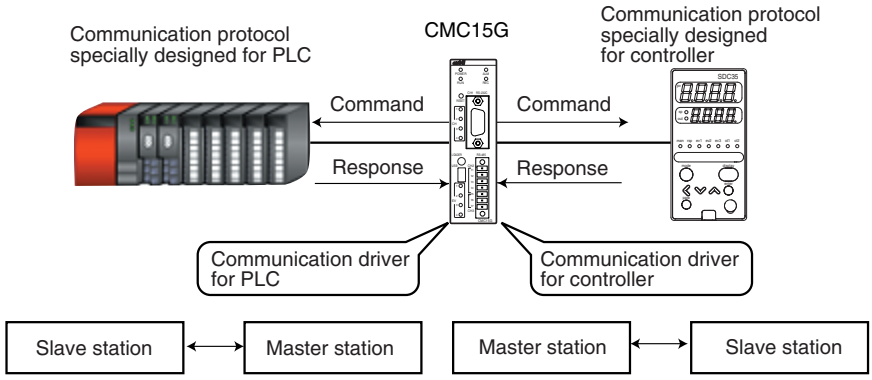
Chapter 3. SERIAL SLAVE STATION COMMUNICATIONS

Chapter 1. COMMUNICATIONS WITH PLCs

1 - 1 Host Link Communication & Serial Slave Communication

In host link communication, the CMC15G acts as a master communication station and a device such as a PLC or controller acts as a slave station, reading or writing data in response to the master station.
When, on the other hand, a system control microcomputer board or personal computer set up by the user works as a master station during data exchange with the CMC15G, the arrangement is called serial slave communication.

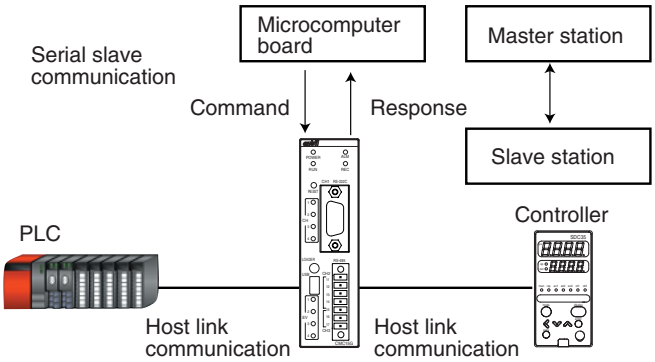
■ Host link communication



When communicating with a PLC or Yamatake controller, the CMC15G operates as the master communication station, and the communication driver selected for each channel sends command using the communication protocol appropriate for the device. The PLC or controller then sends a response to the command transmitted from the CMC15G. The use of host link communication makes it possible to easily perform the operations below.

- Send temperature data from the controller to the PLC.
- Write a set-point temperature from the PLC to the controller.

■ Serial slave communication



In serial slave communication, when a communication program using a communication protocol appropriate for the CMC15G is run on the host microcomputer board or personal computer, data from/to a CMC15G internal device (bit or register) can be read or written. The use of serial slave communication makes it possible to perform the operations below.

- Monitor PLC or controller data using the host microcomputer board.
- Write a temperature set-point value sent from the host personal computer.

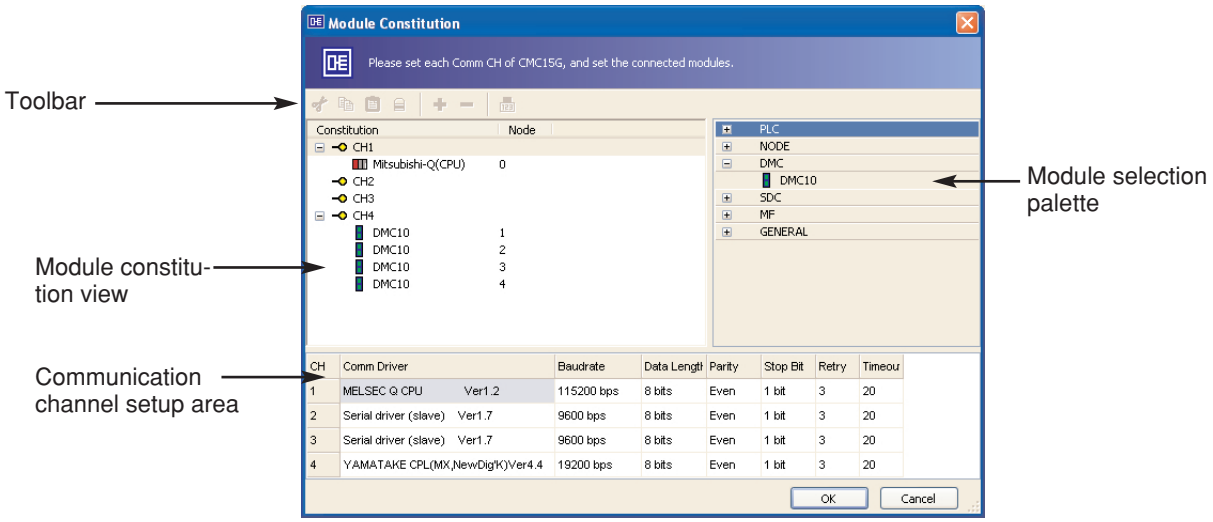
1 - 2 GatewayEditor Communication

■ Communication driver configuration

When using the CMC15G, either host link communication or serial slave communication can be selected for each communication channel (CH1 to CH4).
In host link communication, the communication driver may vary depending on the type of PLC or controller.
The appropriate driver is set on the Module Constitution screen when creating a project with the GatewayEditor. To display the Module Constitution screen, double-click Constitution in the project view or select [System Configuration] → [Constitution] from [Config] on the main menu.

Note

• Details on GatewayEditor setup and operation are described separately.
☞ Chapters 7 to 9 of CMC15G Multifunction Gateway Communication Controller User's Manual: Installation & Configuration CP-SP-1277E.



● Module selection palette

Modules you can connect to the CMC15G are displayed by type.
When the desired type is clicked, a list of modules that can be connected is displayed under the selected type. Modules on the list in module constitution view can be assigned by drag and drop operation.

● Module constitution view

Modules connected to the CMC15G are displayed hierarchically.
Constitution column: Displays the module constitution.
Node column: Displays the node address of the connected module.

Various operations are possible:

- Addition of new modules (up to 500) from the module selection palette
- Node address change for any connected module
- Module configuration editing (copy/paste/delete/move) in the module constitution view
- Selection of multiple items in the same hierarchy

● Communication channel setup area

This area displays configuration options for the communication channels (CH1 to CH4). This configuration applies to all modules connected to the same communication channel. Choose the configuration that is appropriate for the module(s) to be connected.

The following describes the basic steps to set up the module constitution:

(1) Select a module you want to connect from the module selection palette and add it to the module constitution view.

(2) Set up the communication channel assigned to the module.

(3) If necessary, change the node address (Node) of the connected module.

(4) Click the [OK] button.

>> The module selection palette in the main window is then changed.

Communication driver

A communication driver is automatically set up when the module is connected. If no modules are connected to a channel, the serial slave station communication driver is used.

Baud rate (bps)

Select either 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200. The initial value may vary depending on the type of connected module.

Data length

Select “7 bits” or “8 bits.” The initial value is “8 bits.”

Parity

Select “none,” “even,” or “odd.” The initial value is “even.”

Stop bit

Select “1 bit” or “2 bits.” The initial value is “1 bit.”

Time out

Input a value ranging from 1 to 255 (0.1 s to 25.5 s.) The initial value is “20” (2 s.)

Retry

Input a value ranging from 0 to 15. The initial value is “3.”

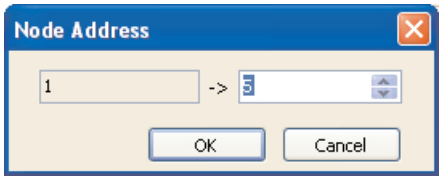
● Changing a node address

To connect multiple modules to one communication channel, each module must be assigned a different node address. To change the node address of the connected module, follow the steps below.

(1) Select the connected module whose address you want to change in the module constitution view, right-click to display the pop-up menu and select [Change node address]. Or, select the module and click on the toolbar.

>> The Node Address window will appear.

(2) Input a node address and click the [OK] button.



■ Configuration of the device

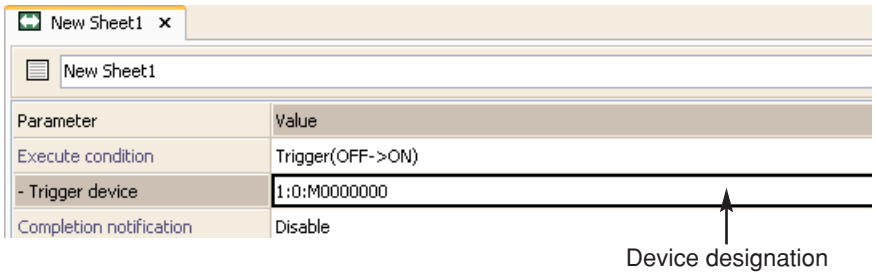
The following describes how to indicate a device on a connected module, such as transfer source or transfer destination of the data transfer, or trigger device in the host link communication:

CH_No.:Device_address_node_No.@Subaddress_No.:Device_address

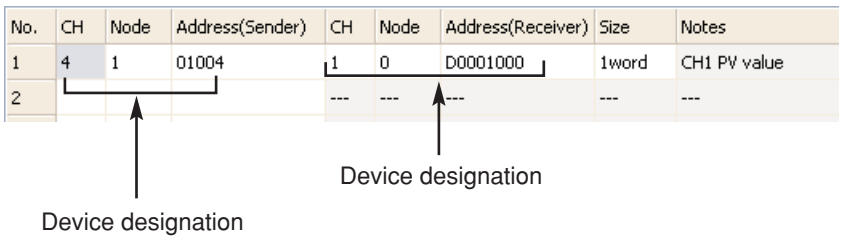
To input a device with the Gateway Editor, there are two kinds of input methods. One is to input a numeric value or symbol directly; the other is to select a device from the node address selection palette.

When inputting an address directly, set it according to the notation method described above.

Example: Input a device directly.



Example: Select a device from the address selection palette.



Channel (CH) No.

This is the communication channel No. on the CMC15G. The communication is performed through the channel you have specified. (Channel No. range is 1 to 4.)

Node address No.

This is the node address of the PLC, Yamatake temperature controller, etc, connected to the specified channel. The node address range varies according to the particular device.

Subaddress No.

This is the node address of a unit connected to some communications channel/network of a communications controller (etc.) connected to a specific channel of the CMC15G. A subaddress can be set only in the case of a Yamatake CPL universal host link.

Device address

This is the device address supported on the PLC, Yamatake temperature controller, etc. For details on device conventions, see Chapter 2, Connecting to Other Devices."

Example: When the node address No. is 1 and the subaddress No. is 1, the node is "1@1."

Handling Precautions

- The subaddress No. is valid only on drivers that support subaddresses. Do not set a subaddress No. if the driver does not support subaddresses. The only driver that currently supports subaddresses is "Yamatake CPL universal host link."

Example 1: If a DMC10 (node address 3) connected to a Yamatake CMC10B (node address 1) is to be used on CH4, enter the following: "4:1@3:3000"

Example 2: If a Yamatake DMC50 CTRL module (node address 2) is to be used through the COM module (node address 1), enter "4:1@2:2000" to specify address No. 2000 of the CTRL module (node address 2) through the COM module (node address 1).

1 - 3 CMC15G Channel Connections

■ Recommended cable

- Use shielded polyethylene insulated vinyl sheathed instrumentation cable for RS-485 input/output and power supply.
- If electromagnetic induction is comparatively low, a shielded multi-core microphone cord (MVVS) can be used.
- Use shielded cable for RS-232C input/output.

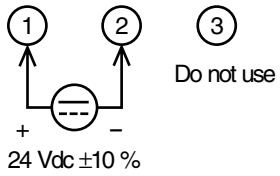
Fujikura Ltd.	2 conductors	IPEV-S-0.9mm^{2}X1P
	3 conductors	ITEV-S-0.9mm^{2}X1T
Hitachi Cable, Ltd.	2 conductors	KPEV-S-0.9mm^{2}X1P
	3 conductors	KTEV-S-0.9mm^{2}X1T

■ Wiring precautions

Be sure to use crimped terminals for wiring terminals. When wiring is finished, check the connections for any miswiring before turning the power ON.

■ Connecting the power supply

Connect a 24 Vdc power supply to terminals (1) and (2) on the base.



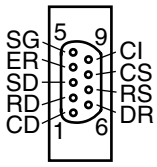
Handling Precautions

- Power is shared between linked modules. Supply power to one of the linked modules.
- Select a power supply that can cover the total power consumption of all linked modules.
- If the power supply capacity is insufficient, the voltage will be too low, resulting in blinking of EV1 to EV4, or repeated resetting.

■ CH1 connection (RS-232C)

Connect the cable to the D-Sub 9-pin connector on the CMC15G.

Pin No.	Signal	Description
1 *1	CD	Not used
2	RD	Receive data (connected module → CMC15G)
3	SD	Send data (CMC15G → connected module)
4 *1	ER	Not used
5	SG	Signal ground
6 *1	DR	Not used
7 *2	RS	Not used
8 *2	CS	Not used
9	CI	Not used



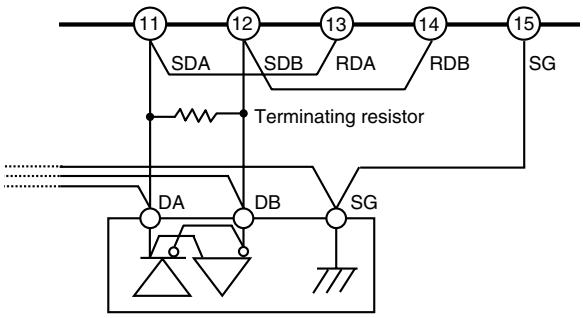
*1 Pins 1, 4 and 6 are connected to each other internally.

*2 Pins 7 and 8 are connected internally.

■ CH2 connection (RS-485)

This channel is for a 5-wire or 3-wire RS-485 connection. The connector for this interface is attached. When connecting terminating resistor, see connection examples with PLCs.

Pin No.	Signal	Description
11	SDA	Send data (+) (CMC15G → connected module)
12	SDB	Send data (–) (CMC15G → connected module)
13	RDA	Receive data (+) (connected module → CMC15G)
14	RDB	Receive data (–) (connected module → CMC15G)
15	SG	Signal ground



Example: connecting to 3-wire product

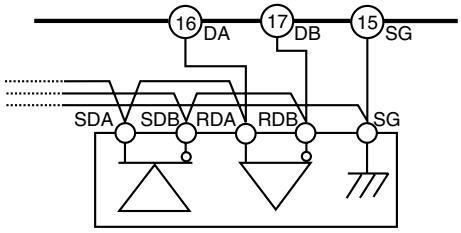
Handling Precautions

- Be sure to connect SG terminals each other. Failure to do so might cause unstable communications.

■ CH3 connection (RS-485)

This channel is for a 3-wire RS-485 connection. The connector for this interface is included with the CMC15G, and is shared with CH2.

Pin No.	Signal	Description
15	SG	Signal ground
16	DA	Send and received data (+) (CMC15G ↔ connected module)
17	DB	Send and received data (–) (CMC15G ↔ connected module)



Example: Connecting to 5-wire product

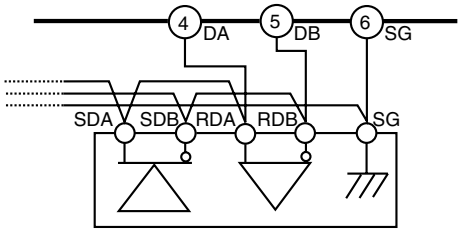
Handling Precautions

- Do not connect a terminating resistor, because an equivalent resistor has already been built in for CH3. Therefore, even if another device used with the CMC15G requires a terminating resistor, do not connect one.
- Be sure to connect SG terminals each other. Failure to do so might cause unstable communications.

■ CH4 connection (RS-485)

This channel is for a 3-wire RS-485 connection. Wiring is to terminal screws on the base.

Pin No.	Signal	Description
4	DA	Send and received data (+) (CMC15G ↔ connected module)
5	DB	Send and received data (–) (CMC15G ↔ connected module)
6	SG	Signal ground



Example: connecting to 5-wire product

Handling Precautions

- Do not connect a terminating resistor, because an equivalent resistor has already been built in for CH4. Therefore, even if another device used with the CMC15G requires a terminating resistor, do not connect one.
- Be sure to connect SG terminals each other. Failure to do so might cause unstable communications.

■ Device connections and configuration

● Number of connected units

A maximum of 31 units can be directly connected to the device communication ports on each of CH2, CH3, and CH4.

Handling Precautions

- When used with the DMC10, a maximum of 15 units can be directly connected, due to the limitation of the rotary switch.

● When connecting 31 or more units

To connect more than 31 Yamatake devices to each channel, the CMC10B communication controller (CPL/CPL converter, sold separately) is required.

Handling Precautions

- The number of connected units refers to the number of units that can be connected electrically. In this kind of connection, you must check whether or not the transmission speed is suited to the required level in the application. Consult a Yamatake sales agent.
- DMC10E event output modules are not included in the number of connected units.

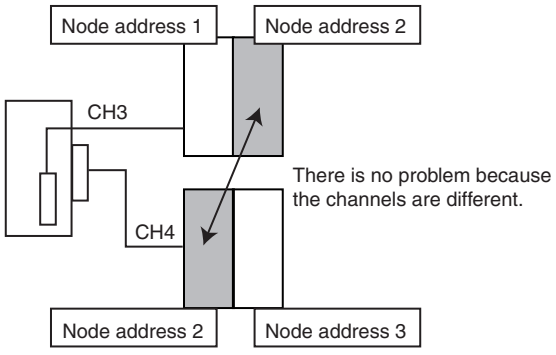
■ Setting the node address

For a device to be used with the CMC15G, it must first be assigned a node address. Set the device address as described below.

Handling Precautions

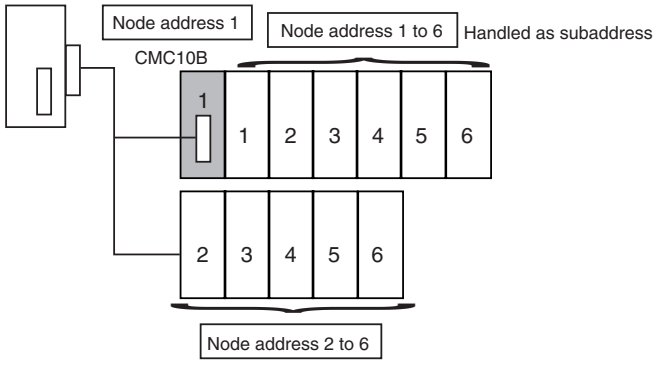
- The same node address number cannot be used twice on the same channel. For the devices connected to the same channel, be sure to use a different node address.

Setup example:
Address of device (1) connected to CH3: 1
Address of device (2) connected to CH3: 2
Address of device (3) connected to CH4: 2
Address of device (4) connected to CH4: 3



● **Connection of Yamatake devices through the CMC10B**

It is necessary also to set up a node address for each device connected through the CMC10B. These addresses are handled as subaddresses by the CMC15G.



Handling Precautions

- Be sure to set the node address of DMC10s connected to the same CMC10B to unique values.
- The same node address can be used when a DMC10 is connected to different CMC10Bs.

☞ CMC10B Communication Controller (CPL/CPL Converter) Design Manual (CP-SP-1064E) (for details on CMC10B settings).

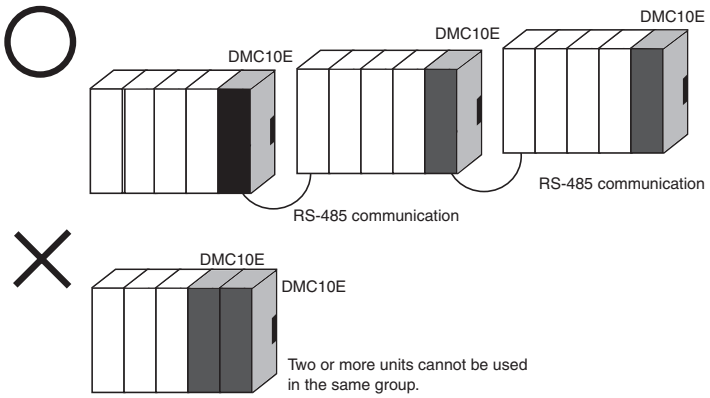
● **Layout of DMC10E event output module**

Only one DMC10E event output module can be used within a group linked by connectors. When the connection is made by wiring from the bases without using the side connectors as shown below, each group is independent and a new event output module can be used.

Handling Precautions

- Within a single group of units connected by side connectors, there can be only one event output module by which output can be done from the CMC15G.

● **Position of event output module**



The DMC10E event output module can be positioned anywhere within a linked group.

Chapter 2. CONNECTING TO OTHER DEVICES

2 - 1 List of Supported Devices

The following is a list of PLCs that can be connected to the CMC15G:

Manufacturers	PLC/Yamatake controller	Driver Name
Yamatake	Controller SDC10, SDC20/21, SDC30/31, SDC40A/40B, SDC15, SDC25/26, SDC35/36, SDC45/46 DMC10, DMC50, AHC2001 Recorder SRF100, SRF200 Flow meter CMQ-V, MPC	Yamatake CPL univ
	Flow meter CMS, MVF, CML, CMF	Yamatake CPL (CMQ)
Mitsubishi Electric	A_N series computer link	MELSEC AnN computer link
	A_A series computer link	MELSEC AnA computer link
	Q series computer link	MELSEC Q computer link
	MELSEC A CPU	MELSEC A CPU
	MELSEC Q CPU	MELSEC Q CPU
	FX1S series	MELSEC FXn CPU
	FX1N, FX2N, FX3U, FX3UC series	MELSEC FX2N CPU
Omron	C/CV series	SYSMAC C/CV host link
	CS/CJ series	SYSMAC FINS host link CS/CJ
Panasonic Electric Works	FP0/1/23/5/10, FP ∑ series	NAiS FP C.C.U
Yokogawa	FA-M3 series	Yokogawa FA-M3 CPU
Siemens	SeriesS7 (RK512)	Siemens SeriesS7 RK512
Yaskawa	MP900 series	Yaskawa MP-900
Sharp	JW series	SHARP JW series
Toshiba	T series	TOSHIBA T2/T3 CPU

! Handling Precautions

The CMC15G does not check the range of usable addresses. For details on addresses ranges,

☞ refer to the manufacturers' instruction manual for the relevant device.

2 - 2 Yamatake Devices

■ Supported devices

● Yamatake

You can set device addresses for Yamatake CPL universal host link or Yamatake CPL host link for the CMQ within the ranges shown in the table below.

Device Type	Address Range
Bit device	0.0 to 65535.F
Word device	0 to 65535

Device designation example: 1:1:534.2
1:1:236

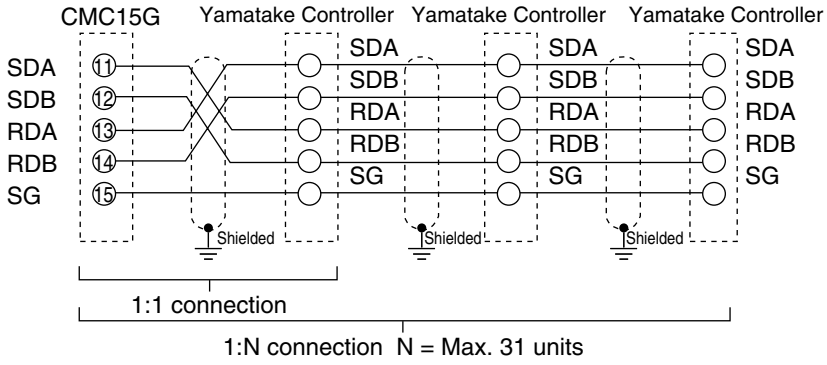
Handling Precautions

- Set the node address between 1 and 127.
  The node address setting must correspond to the available range on the Yamatake device to be connected.

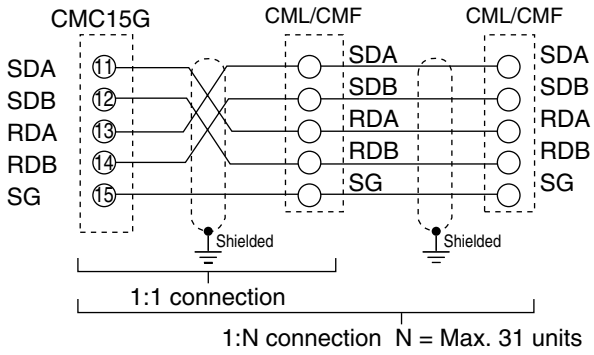
■ Connection examples

● RS-485 5-lead (CH2) connection

Yamatake (host communications module) (1:1, 1:N)

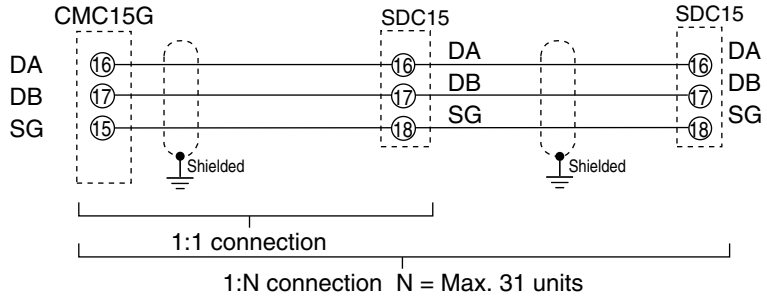


Yamatake (CML/CMF)

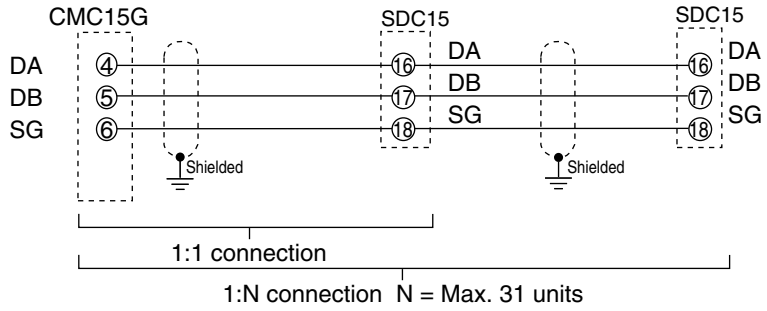


● **RS-485 3-lead (CH3, 4) connection**
Yamatake (SDC15) (1:1, 1:N)

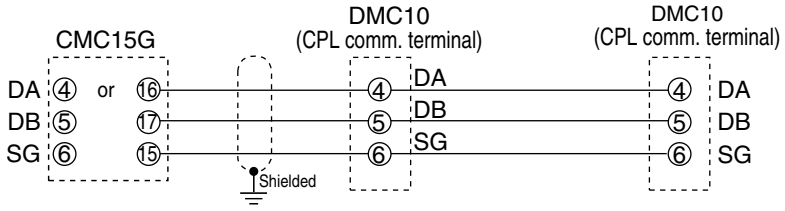
CH3



CH4



● **RS-485 3-lead (CH3, 4) connection**
Yamatake (DMC10) (1:1, 1:N)

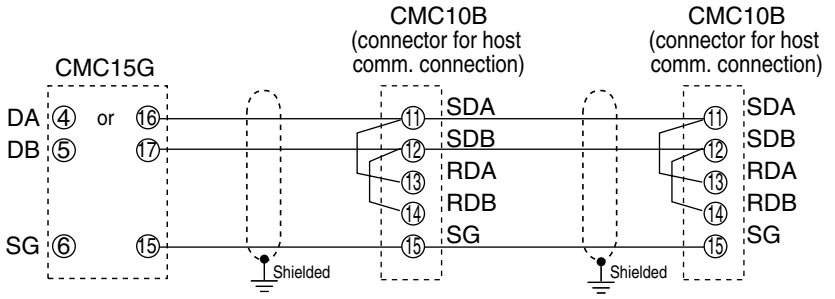


! Handling Precautions

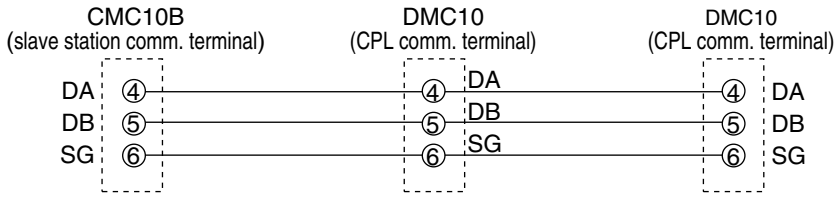
- When linking two or more DMC10s, ensure that the communications disconnection switch is set to the “CONNECT” side (factory setting). Wiring is not needed in this case.
- The DMC10 has a built-in resistance equivalent to a terminator. Do not connect an external terminating resistor.
- Ground the shielded cable at one point on one side of the cable.
- Be sure to connect SG terminals to each other. Failure to do so might cause unstable communications.

● **RS-485 3-lead (CH3, 4) connection**
Yamatake (CMC10B) (1:1, 1:N)

• CMC15G to CMC10B connection



• CMC10B and DMC10 connection



! Handling Precautions

- When linking the DMC10 to a CMC10B, or two or more DMC10s, ensure that the communications disconnection switch is set to the “CONNECT” side (factory setting). Wiring is not needed in this case.
- CH3 and CH4 have built-in resistance equivalent to a terminator. Do not connect an external terminating resistor.
- Ground the shielded cable at one point on one side of the cable.
- Be sure to connect SG terminals to each other. Failure to do so might cause unstable communications.

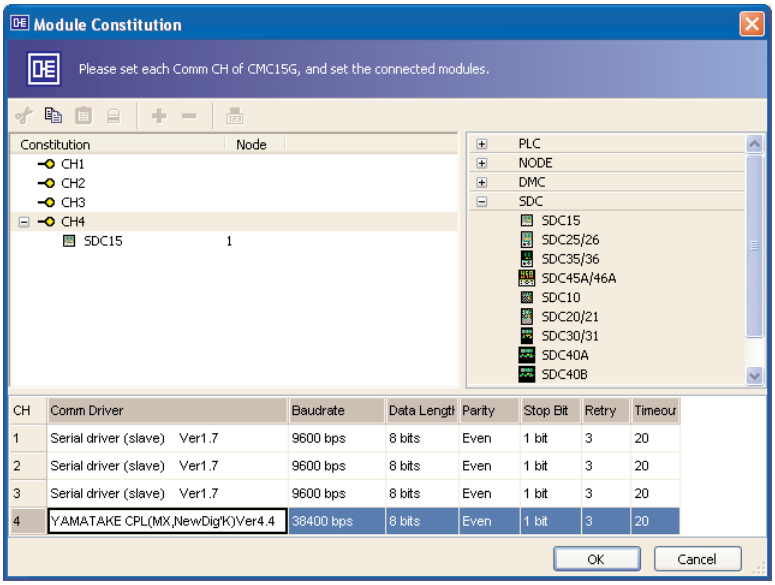
● SDC15

The following table shows an example configuration for the SDC15:

PLC/controller	SDC15
Communications unit	Direct link
Interface	RS-485 (connected to CH4 of CMC15G)
Baud rate	38,400 bps*
Data type	8 bits, even parity, 1 stop bit

*When using CH3 of the CMC15G, the baud rate can be set up to 19,200 bps.

• CMC15G configuration (GatewayEditor)



• SDC15 configuration

(1) Hold down the [para] key for two seconds or more.
>>The parameter mode is entered.
(2) Hold down the [para] key for two seconds or more again.
>>"C01" is displayed, and the setup mode is entered.
(3) Press the [para] key several times until "C64" is displayed.
(4) Set "Communication Type" to "0: CPL Communication" with the [∧] or [∨] key.
(5) Subsequently, change the setup item with the [para] key and set it with the [∧] or [∨] key according to the table shown below in the same manner as described above.

Item	Display	Configuration
Communications type	C64	0: CPL communication
Station address	C65	Set between 1 and 127
Baud rate	C66	3: 38,400 bps
Data length	C67	1: 8 bits
Parity	C68	0: Even parity
Stop bit	C69	0: 1 stop bit

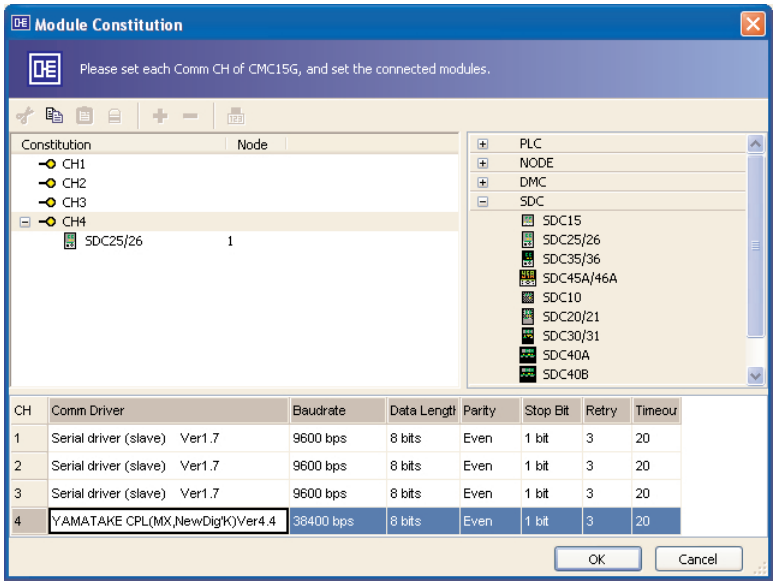
● SDC25/26

The following table shows an example configuration for the SDC25/26:

PLC/controller	SDC25/26
Communications unit	Direct link
Interface	RS-485 (connected to CH4 of CMC15G)
Baud rate	38,400 bps*
Data type	8 bits, even parity, 1 stop bit

*When using CH3 of the CMC15G, the baud rate can be set up to 19,200 bps.

• CMC15G configuration (GatewayEditor)



• SDC25/26 configuration

(1) Hold down the [para] key for two seconds or more.
>> The bank selection appears.
(2) Press the [para] key several times until "StUP" appears. Select the setup bank.
(3) Press the [enter] key to display "C01."
(4) Press the [para] key several times or press the [∧], [∨], or [<] key to display "C64."
(5) Press the [enter] key to put in the input mode. Set "Communications type" to "0" (CPL Communication) with the [∧] or [∨] key and press the [enter] key again to set it.
(6) Subsequently, set each item according to the table shown below in the same manner as described above.

Item	Display	Configuration
Communications type	C64	0: CPL communication
Station address	C65	Set between 1 and 127
Baud rate	C66	3: 38,400bps
Data length	C67	1: 8 bits
Parity	C68	0: Even parity
Stop bit	C69	0: 1 stop bit

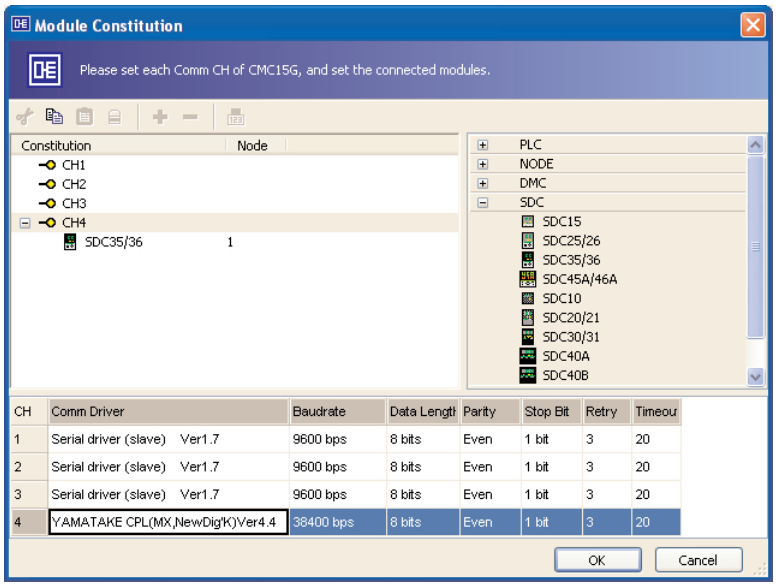
● SDC35/36

The following table shows an example configuration for the SDC35/36:

PLC/controller	SDC35/36
Communications unit	Direct link
Interface	RS-485 (connected to CH4 of CMC15G)
Baud rate	38,400 bps*
Data type	8 bits, even parity, 1 stop bit

*When using CH3 of the CMC15G, the baud rate can be set up to 19,200 bps.

• CMC15G configuration (GatewayEditor)



• SDC35/36 configuration

(1) Hold down the [para] key for two seconds or more.
>> The bank selection appears.
(2) Press the [para] key several times until "StUP" appears. Select the setup bank.
(3) Press the [enter] key to display "C01."
(4) Press the [para] key several times or press the [∧], [∨], or [<] key to display "C64."
(5) Press the [enter] key to put in the input mode. Set "Communications type" to "0" (CPL Communication) with the [∧] or [∨] key and press the [enter] key again to set it.
(6) Subsequently, set each item according to the table shown below in the same manner as described above

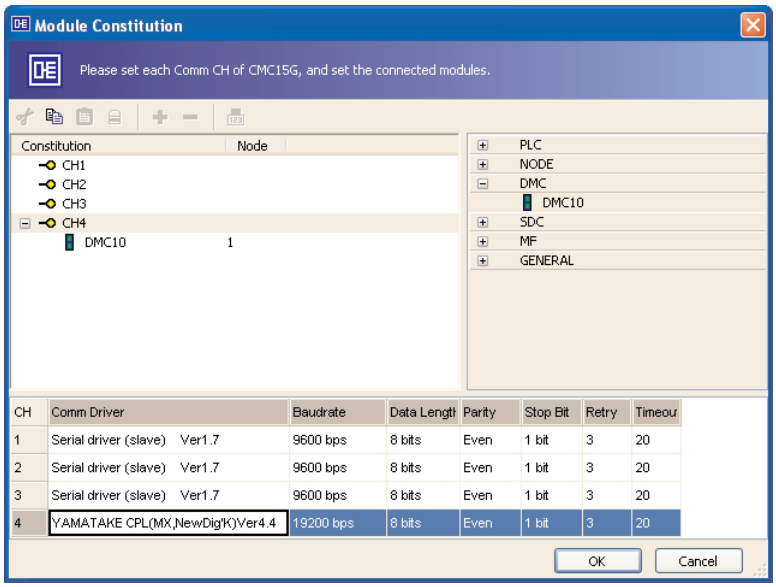
Item	Display	Configuration
Communications type	C64	0: CPL communication
Station address	C65	Set between 1 and 127
Baud rate	C66	3: 38,400 bps
Data length	C67	1: 8 bits
Parity	C68	0: Even parity
Stop bit	C69	0: 1 stop bit

● DMC10

The following table shows an example configuration for the DMC10:

PLC/controller	DMC10
Communications unit	Direct link
Interface	RS-485 (connected to CH4 of CMC15G)
Baud rate	19,200 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration (GatewayEditor)



• DMC10 configuration

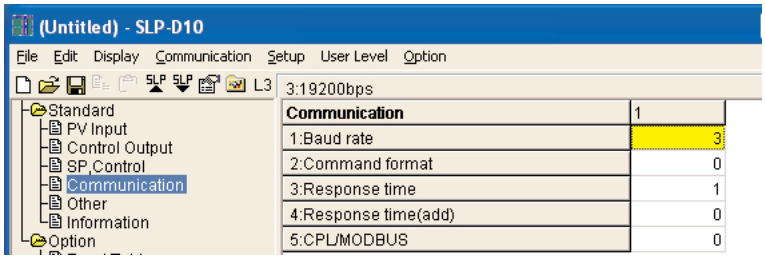
(1) The device address is set with the rotary switch on the DMC10 main unit. Set the device address between 1 and F (15). If multiple DMC10 units are connected, configure so that no device address is duplicated.

(2) Communication conditions are set with the SLP-D10 Smart Loader Package.

☞ DMC10 Distributed Multi-channel Controller SLP-D10 Smart Loader Package User's Manual (CP-UM-5143E).

Necessary settings are shown below.

Item	Configuration
Baud rate	3: 19,200 bps
Data type	0: 8 bits (8 bits, even parity, 1 stop bit)

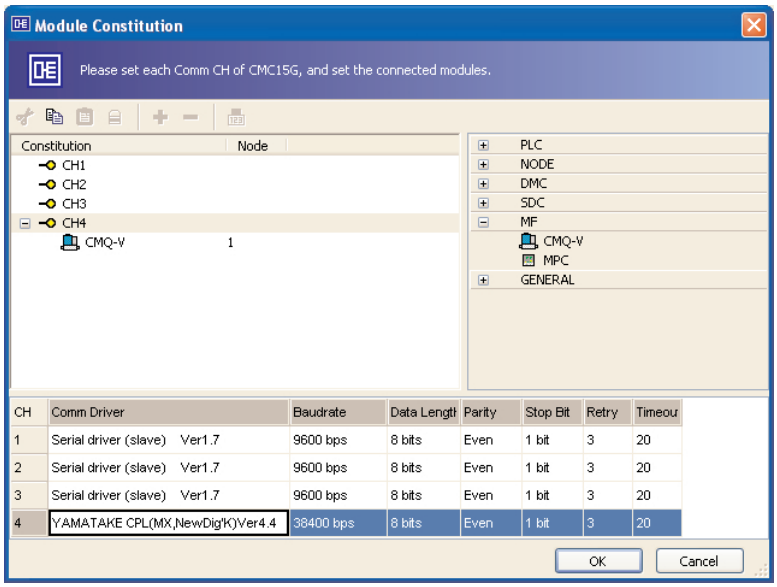


● CMQ-V

The following table shows an example configuration for the CMQ-V:

PLC/controller	CMQ-V
Communications unit	Direct link
Interface	RS-485 (connected to CH4 of CMC15G)
Baud rate	38,400 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration (GatewayEditor)



• CMQ-V configuration

(1) Press the [DISP] key to display instantaneous PV.
>>The "PV" and "L/min" lamps light.

(2) Hold down the [▼] key and [ENT] key simultaneously for three seconds.
>>The item No. "C-01" is displayed on the 7-segment display, and the function setting mode is entered.

(3) Press the [▲] or [▼] key to select a desired setup item No., and then press the [ENT] key.
>> The current setting is flashing on the 7-segment display.

(4) Press the [▲] or [▼] key to select a desired setting.

(5) When you have selected the desired setting, press the [ENT] key to apply the setting.
>> The setting is updated at this moment. (The item No. display returns after about one second.)

(6) If there are other items to be set, return to step (3) and set them. If there are no other items to be set, move to step (7).

(7) Press the [DISP] key to return to the instantaneous PV display from the function settings mode.

Item	Display	Configuration
Station address	C30	Set between 1 and 127
Baud rate	C31	0: 38,400 bps
Data type	C32	0: 8 bits (8 bits, even parity, 1 stop bit)

● **DMC50/AHC2001**

Handling Precautions

- When connecting the CMC15G to a DMC50/AHC2001, pay attention to the data range. In particular, for unsigned binary, hexadecimal, or BCD (binary-coded decimal) data, or for alarm monitoring, data conversion using the ISaGRAF program is necessary for the CMC15G to handle the data as unsigned.
- The DCM50/AHC2001 uses 32-bit integer data, but 16-bit data is used for communications between the DCM50/AHC2001 and the CMC15G. If the data is not 16-bit,
  - either the DMC50 will truncate the data and notify the operator of a communications error, or
  - the AHC2001 will truncate the data without notifying the operator of a communications error.

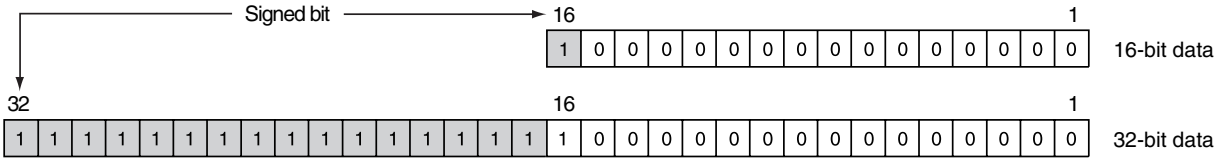
  In this case, a data conversion program is needed for reading or writing the data. It can be created using ISaGRAF software on the DCM50/AHC2001.

Example: reading 00008000h (32 bits) as 8000h (16 bits)
Both are converted to -32768.

Data type	Hexadecimal form	Decimal form
16-bit integer data	8000h	-32768
32-bit integer data	00008000h	32768
	FFFF8000h	-32768

Right: 00008000h → converted → FFFF8000h → read out through communications → 8000h

Wrong: 00008000h → read out through communications → limited to 7FFFh resulting in a communication error



Note

- The ranges of 32-bit/16-bit integer data types are shown in the table below.

Data type	Minimum value	Maximum value
16-bit integer data	-32768 8000h	32767 7FFFh
32-bit integer data	-2147483648 80000000h	2147483647 7FFFFFFFh

2 - 3 Mitsubishi MELSEC PLCs (Computer Link)

■ Supported devices

● Mitsubishi Electric A_N series/A_A series/Q series computer link

Devices can be set within the ranges shown in the table below.

Device Type	Address Range		
	A_N series	A_A series	Q series
Input relay	X0000 to X0FFF	X000000 to X00FFFF	X00000 to X0FFFF
Output relay	Y0000 to Y0FFF	Y000000 to Y00FFFF	Y00000 to Y0FFFF
Internal relay Special relay	M0000 to M8999 M9000 to M9999	M000000 to M008999 M009000 to M009999	M00000 to M08191 SM00000 to SM02047
Step relay Link relay Latch relay	S0000 to S8191 B0000 to B0FFF L0000 to L4095	S000000 to S008191 B000000 to B000FFF L000000 to L004095	S00000 to S08191 B00000 to B01FFF L00000 to L08191
Annunciator	F0000 to F9999	F000000 to F009999	F00000 to F002047
Timer (contact) Timer (coil) Total timer (contact) Total timer (coil)	TS0000 to TS4095 TC0000 to TC4095 – –	TS00000 to TS04095 TC00000 to TC04095 – –	TS00000 to TS02047 TC00000 to TC02047 SS00000 to SS02047 SC00000 to SC02047
Counter (contact) Counter (coil)	CS0000 to CS4095 CC0000 to CC4095	CS00000 to CS04095 CC00000 to CC04095	CS00000 to CS01023 CC00000 to CC01023
Data register	D0000 to D9999	D000000 to D009999	D00000 to D65534
Link register	W0000 to WFFFF	W000000 to W00FFFF	W00000 to W01FFF
File register	R0000 to R9999	R000000 to R009999	ZR00000 to ZRFE7FF
Special register	D9000 to D9999	D009000 to D009999	SD00000 to SD02047
Timer PV Total timer PV	TN0000 to TN9999 –	TN00000 to TN09999 –	TN00000 to TN02047 SN00000 to SN02047
Counter PV	CN0000 to CN9999	CN00000 to CN09999	CN0000 to CN01023
Other devices		Not supported	

Device designation example: 1:1:M123
1:1:D236

Handling Precautions

- If using a QnU series cpu module, access to the following devices will be denied.
  Timer (contact)
  Timer (coil)
  Total timer (contact)
  Total timer (coil)
  Counter (contact)
  Counter (coil)

Handling Precautions

- The communications station number for two computer link units, A1SJ71C24-R2 and A1SJ71C24-PRF, is fixed at “0.”
  Device designation example: 1:0:M123
  1:0:D236

- The Mitsubishi communications protocol (3C frames, format 4) is used for the computer link units.
  Set the MODE setting switch as follows:

Computer Link Unit	Port Type	MODE Setup Switch
AJ71C24 AJ71C24-S3	RS-232C	4
AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-422	8
A1SJ71C24-R2 A1SJ71UC24-R2 A1SJ71C24-PRF A1SJ71UC24-PRF	RS-232C	4
A1SJ71C24-R4	RS-422/RS-485	8

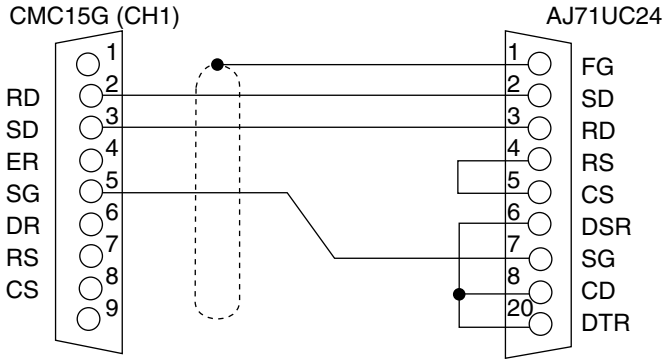
- The Mitsubishi communications protocol (3C frames, format 4) is used for computer link units.
- For Q series computer link units QJ71C24-R2 and QJ71C24, set the parameters with Mitsubishi GPPW. Set the communications protocol to "4."
- The sum check enable/disable setup switch for the computer link unit must always be set at "Sum check."
- When selecting Mitsubishi MELSEC PLC in the communication channel settings section of the configuration information, set the driver as shown below.

Series Name	Driver Name
MELSEC A_N	MELSEC AnN Computer Link
MELSEC A2C	
MELSEC A1S	
MELSEC A2S	
MELSEC A_A	MELSEC AnA Computer Link
MELSEC A_U	
MELSEC A2US	
MELSEC Q	MELSEC Q Computer Link

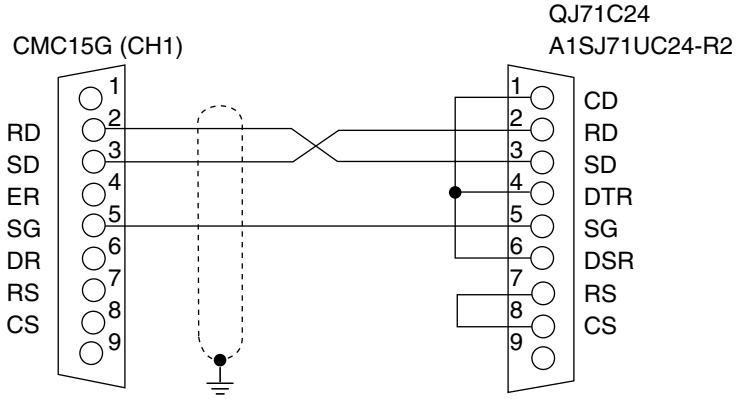
■ Connection examples

● RS-232C connection

Mitsubishi (MELSEC-A series) (1:1)

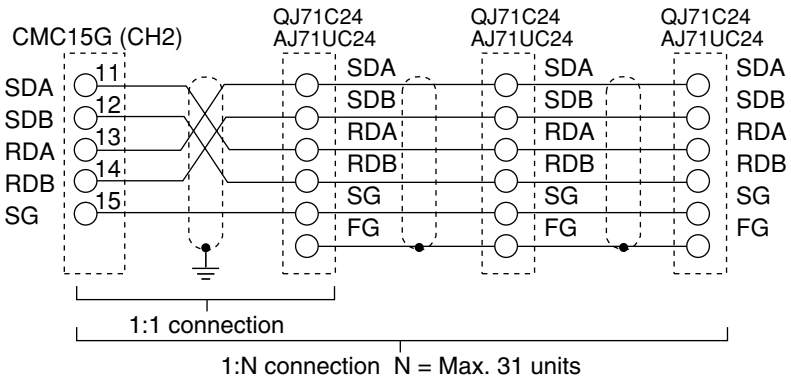


Mitsubishi (MELSEC-A1S series/Q series) (1:1)



● RS-485 5-lead (CH2) connection

Mitsubishi (MELSEC-A series/Q series) (1:1, 1:N)



■ Environment configuration examples

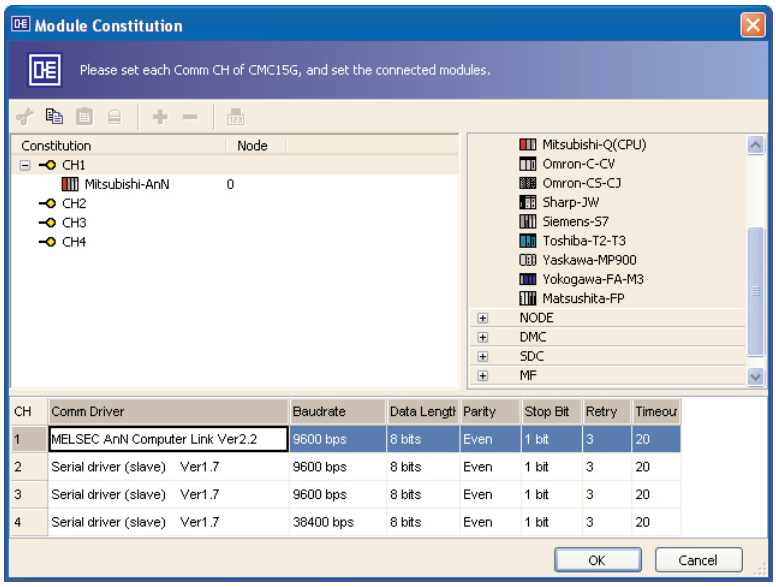
● A_N series

The following table shows an example configuration for the A_N series:

PLC	A2SH/A2S/A1SH/A1S/A1SJH/A1SJ
Communications unit	A1SJ71UC24-R2/A1SJ71UC24-PRF
Interface	RS-232C
Baud rate	9600 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

• Communications channel configuration



Handling Precautions

Select “MELSEC AnN Computer Link” as the communications driver setting. Communications will not be possible if “MELSEC AnA Computer Link” is selected.

• How to specify an address

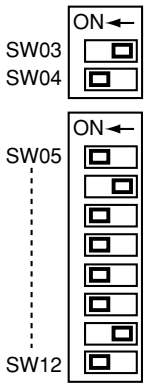
1 : 0 : D100

- PLC device address
- PLC communications address (fixed at "0")
  Set the PLC communications address to "0."
  The station No. of the computer link unit (A1SJ71UC24-R2/-PRF) is fixed at "0."
- CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-232C communications with a PLC, channel "1" is used.

- **PLC configuration (A1SJ71UC24-R2/-PRF)**
  - Station No. switch configuration

    There is no switch for setting the station No. The station No. is fixed at "0."
  - Mode switch configuration

    Set the rotary switch No. to "4" (format 4 protocol mode).
  - Communications configuration

Setup Switch Settings	Setup Switch	Setting Item	Setup Switch States		
			ON		OFF
	SW03	Not used	—		—
	SW04	Write in Run mode	Possible		Not possible
		Baud rate	4800	9600	19200
	SW05	Transmission speed	OFF	ON	OFF
	SW06		OFF	OFF	ON
	SW07		ON	ON	ON
	SW08	Data bit	8 bits		7 bits
	SW09	Parity bit	Available		None
	SW10	Parity	Even		Odd
	SW11	Stop bit	2 bits		1 bit
	SW12	Checksum	Available		None

The following setting items must be set:

- Write in Run mode: ON (possible)
- Checksum: ON (available)

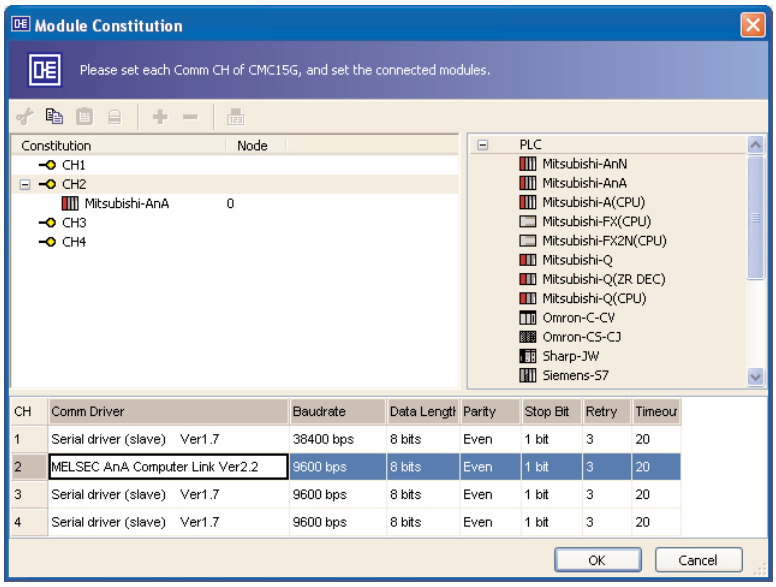
● A_A series

The following table shows an example configuration for the A_A series:

PLC	A3A/A2A-S1/A2A
Communications unit	AJ71UC24
Interface	RS-485
Baud rate	9600 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

- Communications channel configuration



Handling Precautions

Select “MELSEC AnA Computer Link” as the communications driver setting. If “MELSEC AnN Computer Link” is selected, the range of communicable devices is restricted to the same range as the A3HCPU, and the extended device range of the AnACPU cannot be accessed.

- How to specify an address

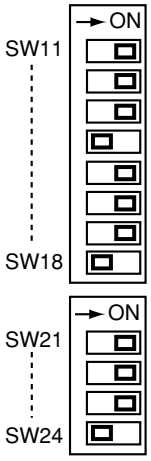
2 : 1 : D100

- PLC device address
- PLC communications address (0 to 31)
  Set the PLC communications address to the same value as the station No. setting of the computer link unit (AJ71UC24) to be connected to the CMC.
- CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-485 (5-lead) communications, channel "2" is used.

- **PLC configuration (AJ71UC24)**
  - Station No. switch configuration

    Set the Station No. of the AJ71UC24 to between 0 and 31.
  - Mode switch configuration

    Set the rotary switch No. to "8" (RS-485 side, format 4 protocol mode).
  - Communications configuration

Setup Switch Settings	Setup Switch	Setting Item	Setup Switch States		
			OFF		ON
	SW11	Main channel	RS-232C		RS-422/485
	SW12	Data bit	7 bits		8 bits
		Baud rate	4800	9600	19200
	SW13	Transmission speed	OFF	ON	OFF
	SW14		OFF	OFF	ON
	SW15		ON	ON	ON
	SW16	Parity bit	None		Available
	SW17	Parity	Odd		Even
	SW18	Stop bit	1 bit		2 bits
	SW19, 20	Not used	—		—
	SW21	Checksum	None		Available
	SW22	Write in Run mode	Not possible		Possible
	SW23	Computer/multidrop link	Multidrop link		Computer link
	SW24	Not used	—		—

The following setting items must be set:

- Write in Run mode: ON (possible)
- Checksum: ON (available)
- Computer/multidrop link: ON (computer link)

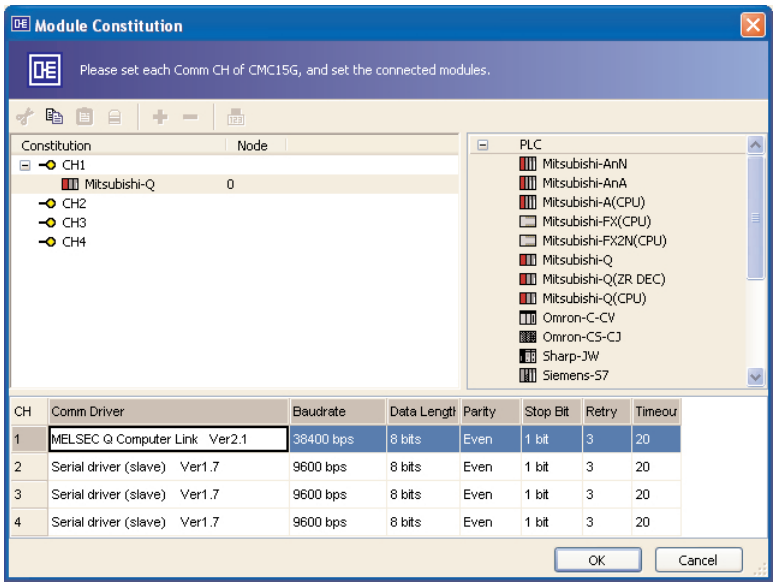
● Q series

The following table shows an example configuration for the Q series:

PLC	Q02/Q02H/Q06H/Q12H/Q25H
Communications unit	QJ71C24
Interface	RS-232C
Baud rate	38400 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

- Communications channel configuration



Handling Precautions

Select “MELSEC Q Computer Link” as the communications driver setting.

- How to specify an address

1 : 0 : D100

- PLC device address
- PLC communications address (0 to 31)
  Set the PLC communications address to the same value as the station No. setting of the computer link unit (QJ71C24) to be connected to the CMC.
- CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-232C communications with a PLC, channel "1" is used.

- **PLC configuration (QJ71C24)**

Set the following items on the PLC according to the Mitsubishi GPPW:

(1) I/O assignments

[GPPW] → [PC Parameters] → [Set I/O Assignments]

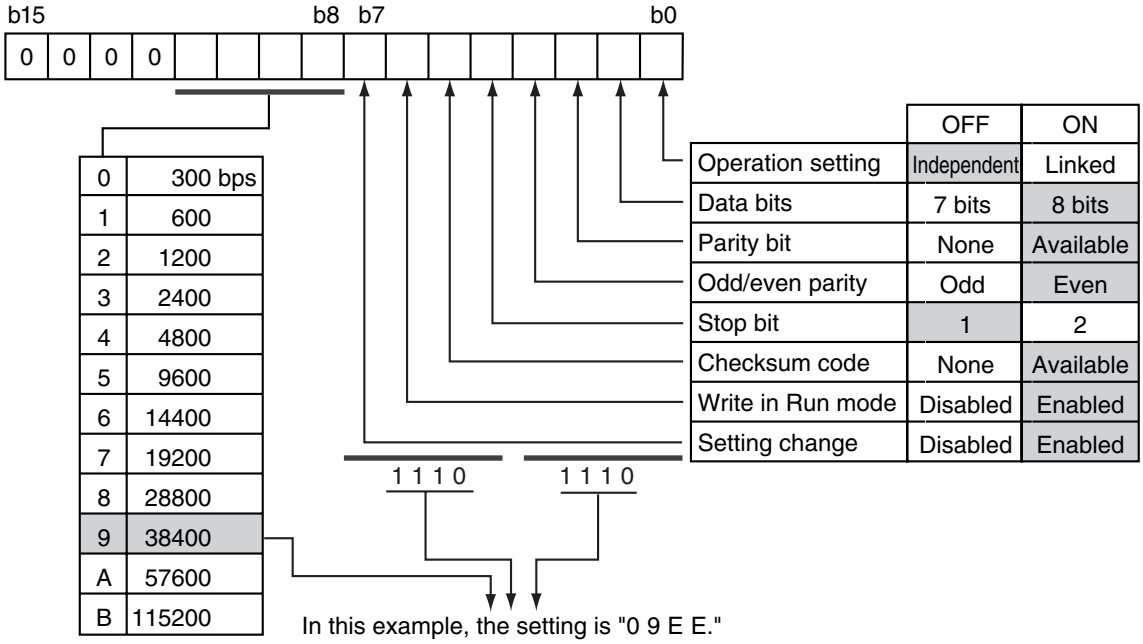
* For details on how to display screens, refer to the GPPW Operating Manual.

Set as follows:

Type	"Intelligent"
Model name	"QJ71C24"
Number of points	"32"

(2) Switches

[GPPW] → [PC Parameters] → [Set I/O Assignments] → [Set Switches]



0	300 bps
1	600
2	1200
3	2400
4	4800
5	9600
6	14400
7	19200
8	28800
9	38400
A	57600
B	115200

	OFF	ON
Operation setting	Independent	Linked
Data bits	7 bits	8 bits
Parity bit	None	Available
Odd/even parity	Odd	Even
Stop bit	1	2
Checksum code	None	Available
Write in Run mode	Disabled	Enabled
Setting change	Disabled	Enabled

- Switch 1 (CH1 baud rate setting, CH1 transmission setting)
  Bit assignments are as follows:
- Switch 2 (CH1 communications protocol setting)
  Set to "4."
- Switch 3 (CH2 baud rate setting, CH2 transmission setting)
  Set to "0."
- Switch 4 (CH2 communications protocol setting)
  Set to "0."
- Switch 5 (station No. setting)
  Set to "0."

2 - 4 Mitsubishi PLCs (Direct Link)

■ Supported devices

● Mitsubishi Q series CPU direct link

You can set device addresses within the ranges shown in the table below.

Device Type	Address Range
Input relay	X00000 to X0FFFF
Output relay	Y00000 to Y0FFFF
Internal relay Special relay	M00000 to M32766 SM00000 to SM02047
Step relay Link relay Latch relay	S00000 to S08191 B00000 to B01FFF L00000 to L08191
Annunciator	F00000 to F002047
Timer (contacts) Timer (coil) Counter (contacts) Counter (coil)	TS00000 to TS02047 TC00000 to TC02047 SS00000 to SS02047 SC00000 to SC02047
Counter (contacts) Counter (coil)	CS00000 to CS01023 CC00000 to CC01023
Data register	D00000 to D65534
Link register	W00000 to W01FFF
File register	ZR00000 to ZRFE7FF
Special register	SD00000 to SD02047
Timer current value Integrating timer current value	TN00000 to TN02047 SN00000 to SN02047
Counter current value	CN0000 to CN01023
Other devices	Not supported

Device designation example: 1:0:M123
1:0:D236

Handling Precautions

- Our operational check has verified the following Mitsubishi Electric PLC models as CMC-compatible: Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU.
- Select “MELSEC Q Computer Link” as the communications driver setting when connecting the CMC directly to either of the following Mitsubishi Electric PLC models: Q00CPU, Q01CPU:
- The CPU cannot be connected directly with the QnU series.

● Mitsubishi Electric A series/FX series direct link

You can set device addresses within the ranges shown in the tables below.

• A series CPU Direct Link

Device Type	Address Range
Input relay*	X00000 to X007FF
Output relay	Y00000 to Y007FF
Internal relay Special relay	M00000 to M08191 M09000 to M09255
Step relay Link relay Latch relay	S00000 to S08191 B00000 to B01FFF L00000 to L02047
Annunciator	F00000 to F02047
Timer (contacts) Timer (coil)	TS0000 to TS2047 TC0000 to TC2047
Counter (contacts) Counter (coil)	CS0000 to CS1023 CC0000 to CC1023
Data register	D00000 to D08191
Link register	W00000 to W01FFF
File register	R00000 to R09999
Special register	D09000 to D09255
Timer current value	TN0000 to TN2047
Counter current value	CN0000 to CN01023
Other devices	Not supported

* With the CPU units used for A_N and for A_S, read/write in the input relay area is not possible.

• FX series CPU Direct Link

Device Type	Address Range
Input relay	X0000 to X0337
Output relay	Y0000 to Y0337
Auxiliary relay	M0000 to M3071
State	S0000 to S0999
Timer relay	TS0000 to TS0255
Counter relay	CS0000 to CS0255
Data register (special)	D0000 to D0999 D1000 to D2999 D3000 to D5999 (FX2N only) D6000 to D7999 D8000 to D8255
Timer register	TN0000 to TN0255
Counter register	CN0000 to CN0199 CN0200 to CN0255
Index Reg Z V	Z (FXn only) V (FXn only)

Device designation example: 2:0:M123
2:0:D236

Handling Precautions

- Select one of the following in the CH2 driver settings section of the configuration information if a Mitsubishi Electric MELSEC PLC is to be used:

Series Name	Driver
MELSEC A CPU	Mitsubishi A series CPU direct link
MELSEC FX2C, FX0N	Mitsubishi FXn CPU direct link
MELSEC FX2N	Mitsubishi FX2N CPU direct link

The following table shows PLC models made by Mitsubishi Electric for which CMC15G operation has been confirmed.

Type	Model No.	Compatibility
CPU unit for A_U	A2UCPU	Confirmed
CPU unit for A_A	A3ACPU, A3ACPUP21, A3ACPUR21, A2ACPU A2ACPUP21, A2ACPUR21, A2ACPU-S1 A2ACPUP21-S1, A2ACPUR21-S1	Confirmed
CPU unit for A_ N	A3NCPU, A3NCPUP21, A3NCPUR21, A2NCPU A2NCPUP21, A2NCPUR21, A2NCPU-S1 A2NCPUP21-S1, A2NCPUR21-S1, A1NCPU A1NCPUP21, A1NCPUR21	Confirmed
CPU unit for A_S	A1SCPU, A2SCPU, A1SJCPU	Confirmed
CPU unit for A_US	A2USCPU, A2USCPU-S1	Confirmed
FX CPU unit	FX2C, FX0N, FX2N, FX3U*, FX3UC*	Confirmed

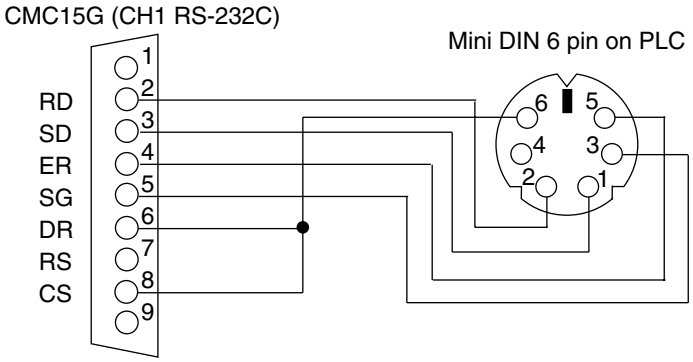
* Entire device range is not accessible. Accessible range is the same as for FX2N.

The following table shows PLC models made by Mitsubishi Electric for which CMC15G operation has not been confirmed:

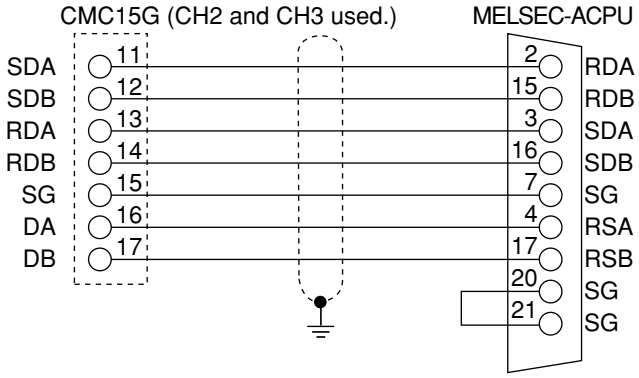
Type	Model No.	Compatibility
A2C CPU unit	A2CCPU, A2CCPU-DC24V, A2CCPUC24 A2CCPUC24-PRF, A2CCPUP21, A2CCPUR21	Unconfirmed
A2CJ CPU unit	A2CJCPU	Unconfirmed
A0J2H CPU unit	A0J2HCPU, A0J2HCPU-DC24V, A0J2HCPUP21 A0J2HCPUR21	Unconfirmed
A0J2 CPU unit	A0J2CPU, A0J2CPU-DC24V A0J2CPUP23, A0J2HCPUR23	Unconfirmed

■ Connection examples

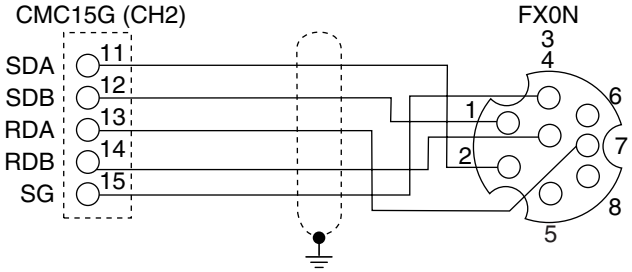
● MELSEC-Q connection



● MELSEC-A CPU/FX2C connection



● MELSEC FX0N, FX2N CPU connection



■ Environment configuration examples

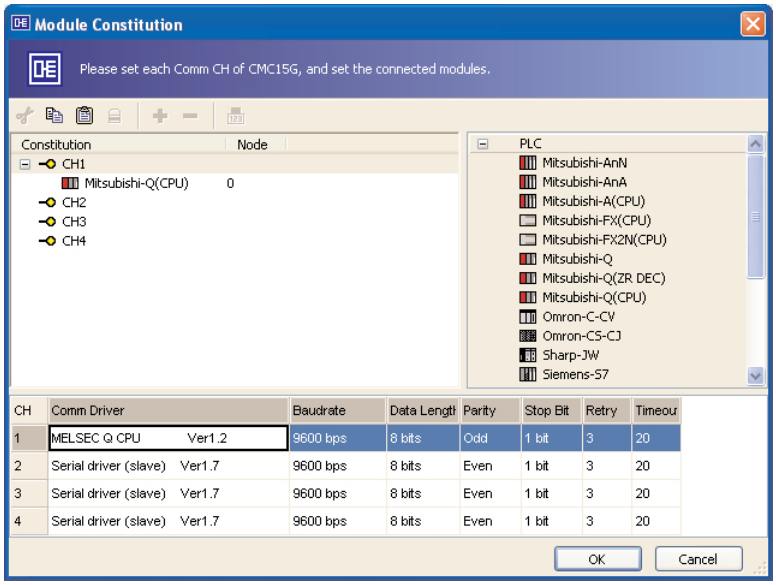
● Mitsubishi Electric Q series CPU direct link

The following table shows an example configuration for the Mitsubishi Electric Q Series CPU direct link:

PLC	MELSEC Q CPU
Communications unit	Direct link
Interface	RS-232C
Baud rate	9,600 bps
Data type	8 bits, odd parity, 1 stop bit

• CMC15G configuration

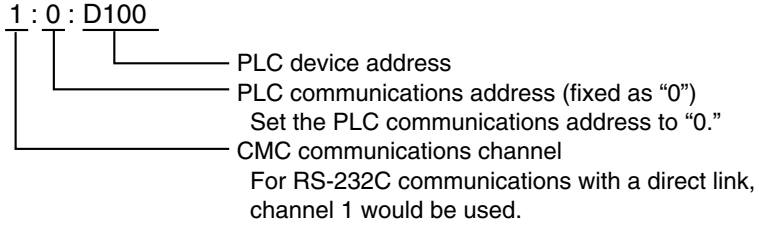
• Communications channel configuration



Handling Precautions

• Select “MELSEC Q Computer Link” as the communications driver setting when connecting the CMC15G directly to either of these Mitsubishi Electric PLC models: Q00CPU, Q01CPU.

• How to specify an address



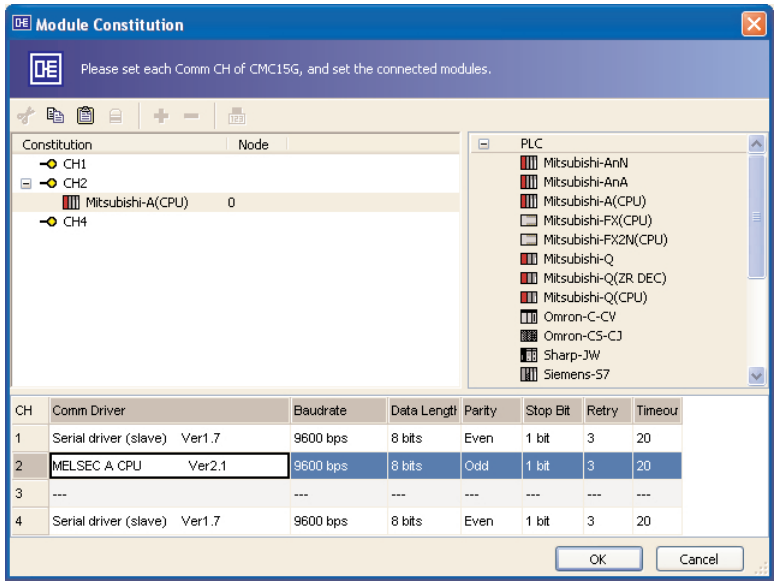
● Mitsubishi Electric A Series CPU direct link

The following table shows an example configuration for the Mitsubishi Electric A Series CPU direct link:

PLC	MELSEC A CPU
Communications unit	Direct link
Interface	RS-485
Baud rate	9,600 bps
Data type	8 bits, odd parity, 1 stop bit

• CMC15G configuration

• Communications channel configuration



Handling Precautions

• This driver requires two ports, channels 2 and 3, for communications. The transmission speed and communications format are 9600 bps, 8 bits, odd parity and 1 stop bit.

• How to specify an address

2 : 0 : D100

- PLC device address
- PLC communications address (fixed at "0")
  The PLC communications address need not be set. However, use "0."
- CMC communications channel
  The communications channel when connected directly to a Mitsubishi Electric A Series CPU is "2."

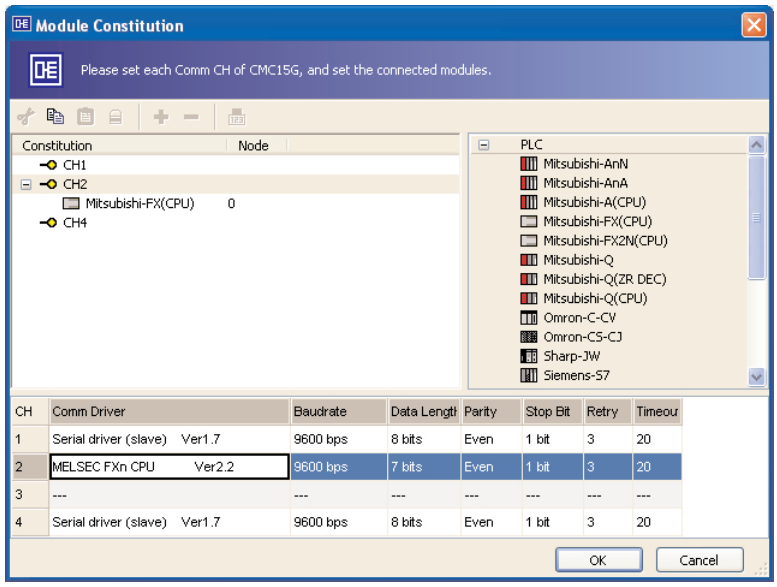
● FX-0N/FX-2C direct link configuration

The following table shows an example configuration for the FX-0N/FX-2C direct link:

PLC	FX0N/FX2C
Communications unit	Direct link
Interface	RS-485
Baud rate	9,600 bps
Data type	7 bits, even parity, 1 stop bit

• CMC15G configuration

• Communications channel configuration



Handling Precautions

• This driver requires two ports, channels 2 and 3, for communications. The transmission speed and communications format are 9600 bps, 7 bits, even parity and 1 stop bit.

• How to specify an address

2 : 0 : D100

- D100: PLC device address
- 0: PLC communications address (fixed at "0")
  The PLC communications address need not be set. However, use "0."
- 2: CMC communications channel
  The communications channel when connected directly to a Mitsubishi Electric FX Series CPU is "2."

2 - 5 Omron PLCs

■ Supported devices

● Omron C/CV series, CS/CJ series

You can set device addresses within the ranges shown in the table below.

Device Type	Address Range		
	C series	CV series	CS/CJ series
Input relay Output relay	0000 to 409515	0000 to 409515 (including hold relay on CV series)	0.00 to 4095.15
Internal auxiliary relay			W0000.00 to W4095.15
Special auxiliary relay			A0000.00 to A4095.15*1
Link relay	LR0000 to LR409515	–	–
Auxiliary storage relay	AR0000 to AR409515	–	–
Hold relay	HR0000 to HR409515	–	H0000.00 to H4095.15
Timer *2	T0000 to T4095	T0000 to T4095	T0000 to T4095
Counter *2	C0000 to C4095	C0000 to C4095	C0000 to C4095
Data register	DM0000 to DM9999	DM0000 to DM9999	D00000 to D32767
Timer (PV)	DT0000 to DT4095	DT0000 to DT4095	TR0000 to TR4095
Counter (PV)	DC0000 to DC4095	DC0000 to DC4095	CR0000 to CR4095
Extended data memory E0	–	–	E0_00000 to E0_32767
Extended data memory E1	–	–	E1_00000 to E1_32767
Extended data memory E2	–	–	E2_00000 to E2_32767
Extended data memory E3	–	–	E3_00000 to E3_32767
Extended data memory E4	–	–	E4_00000 to E4_32767

Device designation example: 1:1:02311
1:1:DM236

*1. Data cannot be written at an address ranging from A0000.00 to A447.15.
*2. This data cannot be written into the T/C.

! Handling Precautions

- Select one of the following under the communications driver configuration section of the configuration information when an Omron PLC is to be used:

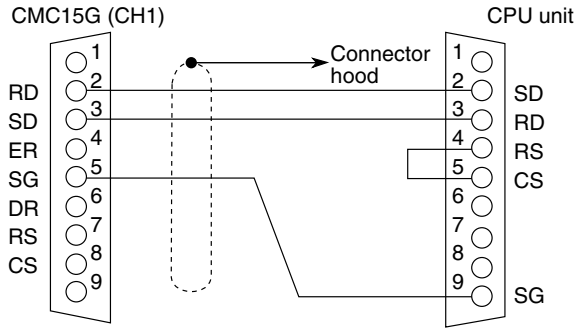
Series Name	Driver
C series	Omron C/CV host link
CV series	
CS series	Omron FINE host link CS/CJ
CJ series	

- When writing a bit with the C/CV series, the word data containing this bit is read, and then the word data is written after the bit has been operated. Therefore, do not operate another bit in the same word with the PLC during this period.

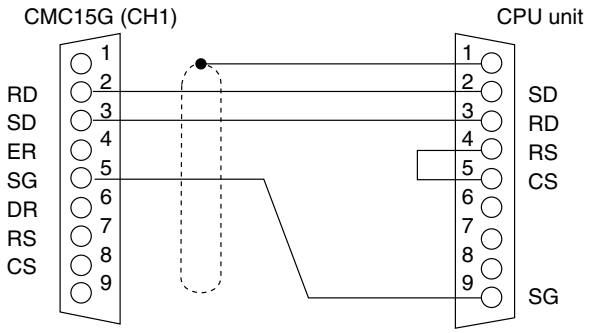
■ Connection examples

● RS-232C connection

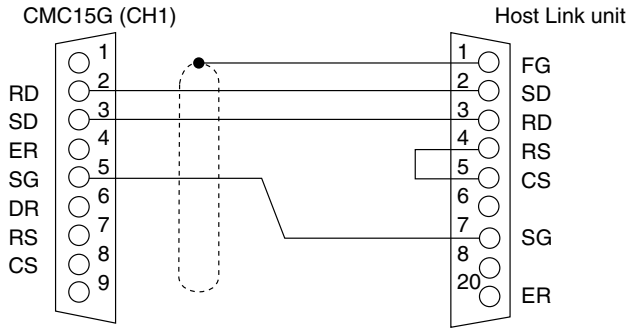
Omron (CV series) (1:1)



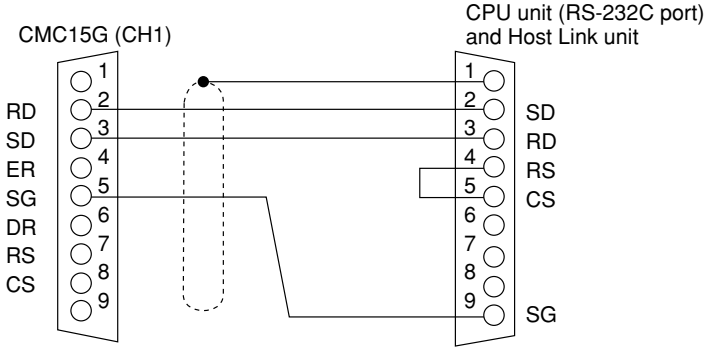
Omron (CPU built-in RS-232C port on C200HS, CQM1 series, C200HX, C200HG, C200HE) (1:1)



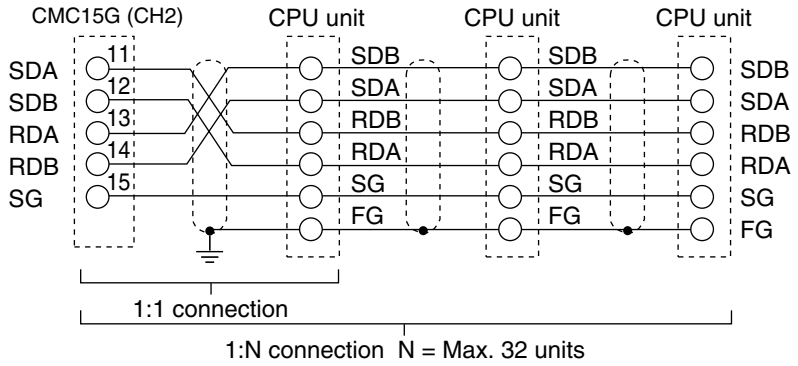
Omron (C series) (1:1)



Omron (CS/CJ series) (1:1)



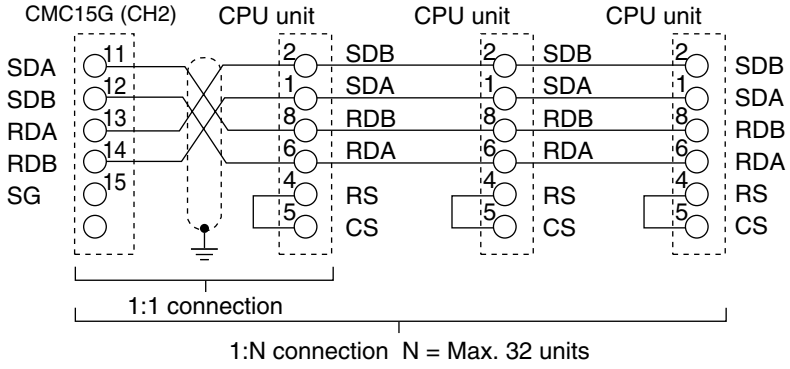
● **RS-485 5-lead (CH2) connection**
Omron (C series) (1:1, 1:N)



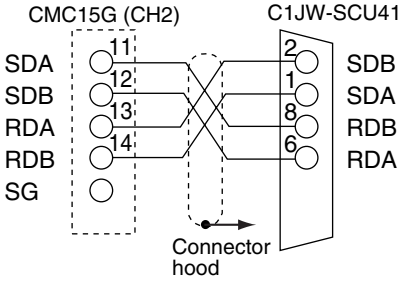
Handling Precautions

Some models do not have an SG. In this case, leave the CMC15G open.

Omron (CV series) (1:N)



Omron (CS/CJ series) (1:N)



Handling Precautions

- On Omron PLCs, SDA and RDA are negative (-) while SDB and RDB are positive (+).

■ Environment configuration examples

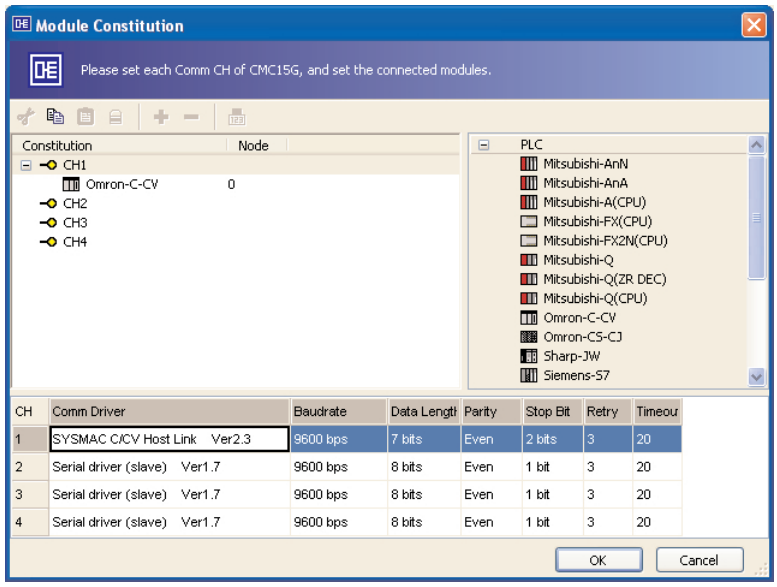
● CV series

The following table shows an example configuration for the CV series:

PLC	CVM1/CV500/CV1000/CV2000
Communications unit	Connector for CPU host link connection
Interface	RS-232C
Baud rate	9,600 bps
Data type	7 bits, even parity, 2 stop bits

- **CMC15G configuration**

  - Communications channel configuration



Handling Precautions

- Select “SYSMAC C/CV Host Link” as the communications driver setting.

  - How to specify an address

1 : 0 : DM100

- PLC device address
- PLC communications address (0 to 31)
  Set the PLC communications address to the same value as the station No. setting of the CPU unit to be connected to the CMC.
- CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-232C communications with a PLC, channel "1" is used.

- **CPU unit configuration**

  - Communications path selector switch

    (host link RS-422/RS-232 selector switch)

    Set to “RS-232C.”

  - DIP switch settings

    Open the cover of the memory card storage unit to set the DIP switches.

    Set switch Nos. 3 and 4 to “OFF.”

  - Host link setting

    Use the following as the “Host Link Settings” under “PC System Settings” in FIT.

Setting Item	Configuration
Unit No.	Set within 0 to 31 range
Baud rate	9,600 bps
Data length	7 bits
Parity	Even parity
Stop bit	2 bits

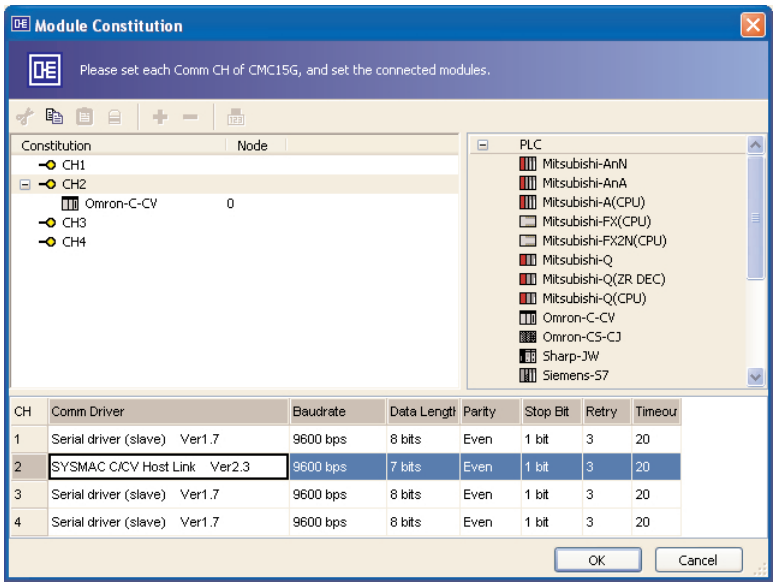
● C series (host link unit)

The following table shows an example configuration for the C series (host link unit):

PLC	C200HX/HG/HE, C200HS, C200H
Communications unit	C500-LK202V1
Interface	RS-485
Baud rate	9,600 bps
Data type	7 bits, even parity, 2 stop bits

• CMC15G configuration

• Communications channel configuration



Handling Precautions

Select “SYSMAC C/CV Host Link” as the communications driver setting.

• How to specify an address

2 : 1 : DM100

- PLC device address
- PLC communications address (0 to 31)
  Set the PLC communications address to the same value as the station No. setting of the host link unit (C200H-LK202-V1) to be connected to the CMC.
- CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-485 (5-lead) communications, channel "2" is used.

- **PLC configuration (C200H-LK202-V1)**
  - Station No. setting (SW1, SW2)

    Set the unit No. of the C200H-LK202 within the 0 to 31 range.

  - Transmission speed setting (SW3)

SW3	Transmission speed
4	4800 bps
5	9600 bps
6	19200 bps

    Factory setting: 9600 bps

  - Command level/parity/transmission code setting (SW4)

SW4	Command Level	Parity	Transmission code
0	Only level 1 enabled	Even	ASCII, 7 bits, 2 stop bits
4	Only level 1 enabled	Odd	ASCII, 7 bits, 2 stop bits
8	Only level 1 enabled	Even	JIS, 8 bits, 1 stop bit
C	Only level 1 enabled	Odd	JIS, 8 bits, 1 stop bit

    Factory setting: SW4-0

  - Rear panel switch settings

Setting Item	ON	OFF
Communications procedure	1:1 procedure	1:N procedure
Terminator connection	Available	None

    Factory setting: OFF

    Set the terminator as necessary.

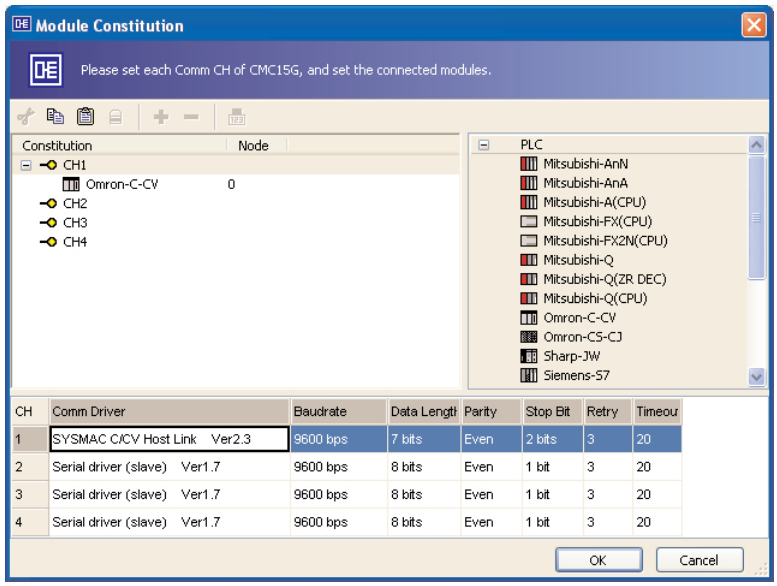
● C series (CPU unit)

The following table shows an example configuration for the C series (CPU unit):

PLC	C200HX/HG/HE, C200HS
Communications unit	CPU RS-232C port
Interface	RS-232C
Baud rate	9,600 bps
Data type	7 bits, even parity, 2 stop bits

• CMC15G configuration

• Communications channel configuration



Handling Precautions

• Select “SYSMAC C/CV Host Link” as the communications driver setting.

• How to specify an address

1 : 0 : DM100

PLC device address

PLC communications address (0 to 31)

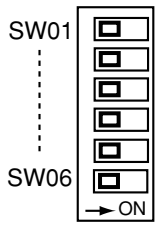
Set the PLC communications address to the same value as the station No. setting of the CPU unit to be connected to the CMC

CMC communications channel

The type of communications to the external device will be determined according to the channel to be used.
For RS-232C communications with a PLC, channel "1" is used.

- **CPU configuration**

  - DIP switch configuration

Setup Switch Settings	Setup Switch	Switch Description	Setup Switch States	
			OFF	ON
	SW01	Write to user memory area	Possible	Not possible
	SW02	Memory cassette operation at power ON	Automatic reading OFF	Automatic reading ON
	SW03	PLC messages	Japanese	English
	SW04	Application instruction setting function	Disabled	Enabled
	SW05	Communications port setting	Fixed settings canceled	Fixed settings
	SW06	PLC	Console mode	Extended terminal mode

Set switch No. 5 to "OFF."

  - RS-232C port configuration

Channel No.	Bits	Functions	Setting	Description
DM6645	00 to 03	Communications format	0	0: 9600 bps, 7bits, even, 2 stop bits 1: According to DM6646 settings
	04 to 07	CTS control	0	None
	08 to 11	1:1 link	0	–
	12 to 15	Mode setting	0	Host link
DM6646	00 to 07	Baud rate	03	02: 4800 bps 03: 9600 bps 04: 19200 bps
	08 to 15	Format setting	03	00: 7 bits, even, 1 stop bit 03: 7 bits, even, 2 stop bits 06: 8 bits, even, 1 stop bit
DM6647	00 to 15	Transmission delay	0000	0000 to 9999 (BCD: X10ms)
DM6648	00 to 07	Unit No. setting	00	00 to 31 (BCD)

The default PLC communications configuration is as follows:

- Mode: Host link
- Unit No.: 0
- Communications format: 9600 bps, 7 bits, even parity, 2 stop bits

When a connection is made using a configuration other than the above, set the communications format (DM6645) to "1", and set the baud rate, format (DM6646), and unit No. (DM6648).

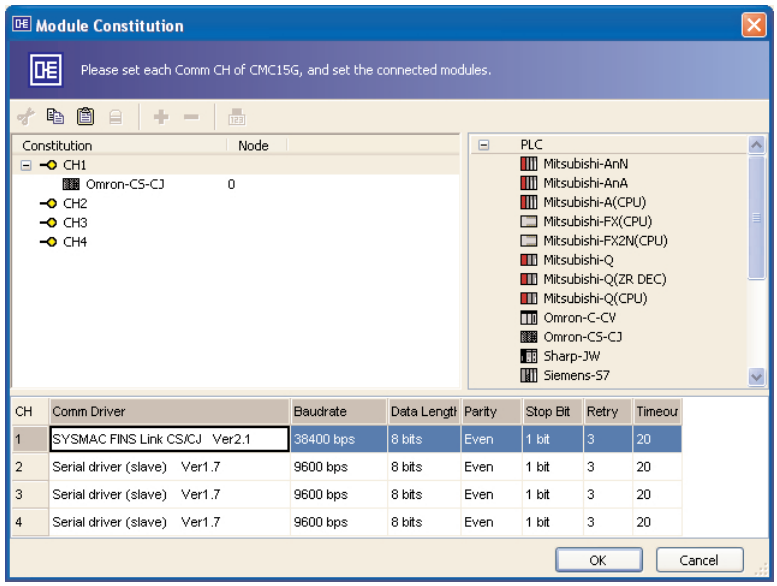
● CJ1 (With use of serial communication unit)

The following table shows an example configuration for the CJ1:

PLC	CJ1G-CPU44
Communications unit	CJ1W-SCU41 PORT2
Interface	RS-232C
Baud rate	38400 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

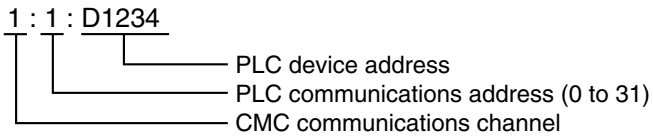
• Communications channel configuration



Handling Precautions

• Select “SYSMAC FINS Host Link CS/CJ” as the communications driver setting.

• How to specify an address



- **CJ1W-SCU41 configuration**

Set the module DIP switch (unit No.) to "1."

(1) Start up the Omron CX-Programmer.

(2) Open the project.

(3) Connect to the PLC in Online mode.
[PLC] → [Work Online]

(4) Put the PLC into Program mode.
[PLC] → [Operation Mode] → [Program]

(5) Open [PLC IO Table].
[PLC] → [Edit] → [IO Table and Unit setup]

(6) Transfer the settings from the PLC.
[Options] → [Transfer from the PLC]

(7) Select the serial communication unit and double-click it.
The [Edit Parameters] window will appear.

(8) Set up port 2 as shown below.

Port 2: Port settings	User settings
Port 2: Serial communications mode	Host Link (default)
Port 2: Data length	8 bits
Port 2: Stop bits	1 bit
Port 2: Parity	Even
Port 2: Baud rate	38400 bps
Port 2: Send delay	Default (0 ms)
Port 2: Send delay (user-specified)	0
Port 2: CTS control	No
Port 2: Host Link unit number	1

(9) Transfer the settings to the PLC.
[Options] → [Transfer to PLC]

(10) After you have quit the CX-Programmer, power ON the CJ1 again.

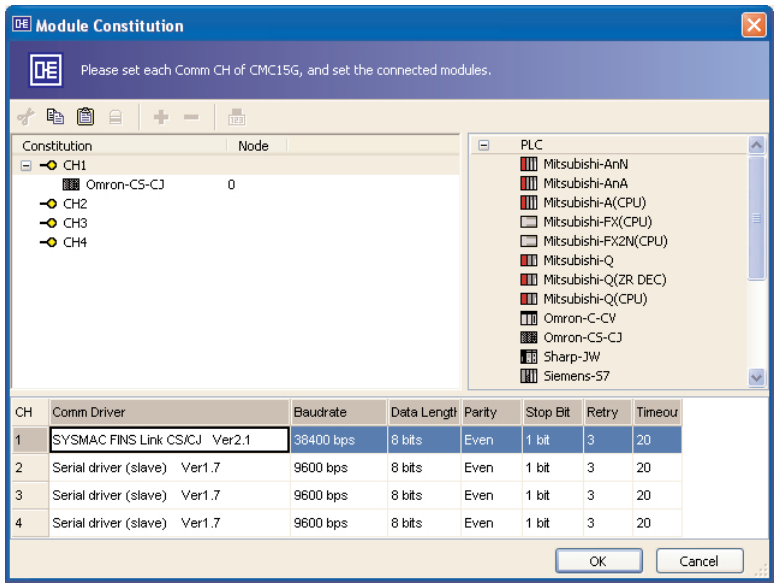
● CJ1 (CPU port)

The following table shows an example configuration for the C series (CPU unit):

PLC	CJ1G-CPU44
Communications unit	None
Interface	RS-232C
Baud rate	38400 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

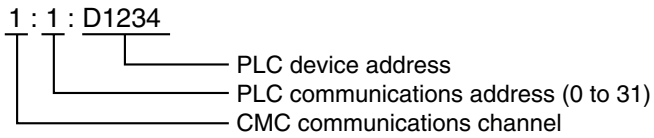
• Communications channel configuration



Handling Precautions

• Select “SYSMAC FINS Host Link CS/CJ” as the communications driver setting.

• How to specify an address



- **CPU port configuration**

Set the module DIP switch (unit No.) of the module to "1."

(1) Start up the Omron CX-Programmer.

(2) Open the project.

(3) Connect to the PLC in Online mode.
[PLC] → [Work Online]

(4) Put the PLC into Program mode.
[PLC] → [Operation Mode] → [Program]

(5) Open [PLC Settings].
[PLC] → [Edit] → [Settings]

(6) Transfer the settings from the PLC.
[Options] → [Transfer from PLC]

(7) Open [Host Link Port] tab.

(8) Set up [Communications Settings] as shown below.

Communications Settings	Custom
Baud	38400
Format	8, 1, E
Mode	Host Link
Unit Number	1

(9) Transfer the settings to the PLC.
[Options] → [Transfer to PLC]

(10) After you have quit the CX-Programmer, power ON the CJ1 again.

2 - 6 Panasonic Electric Works PLCs

■ Supported devices

● Panasonic Electric Works FP3/5/10 series

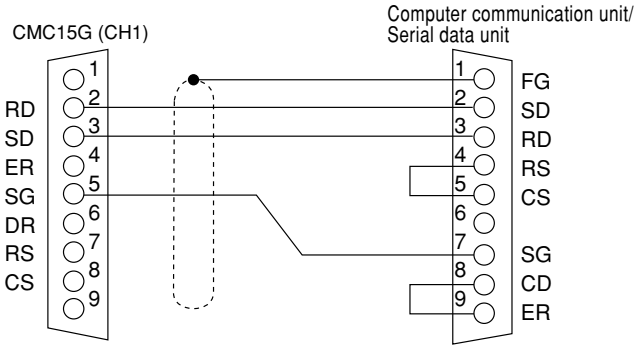
You can set device addresses within the ranges shown in the table below.

Device Type	Address Range
External input External output	X0000 to X255F Y0000 to Y255F
Timer relay Counter relay	T0000 to T1999 C0000 to C2047
Special internal relay	R9000 to R910F
Internal relay	R0000 to R875F
Link relay	L0000 to L639F
Data register	DT00000 to DT10239
External input External output Internal relay Link relay	WX000 to WX255 WY000 to WY255 WR000 to WR875 WL000 to WL639
Link register	LD0000 to LD8447
File register	FL00000 to FL32764
Timer, counter SP Timer, counter PV	SV0000 to SV2047 EV0000 to EV2047
Index register	IX IY
Special data register	DT90000 to DT90255

Device designation example: 1:0:M123
1:0:D236

■ Connection examples

Panasonic Electric Works (FP3/FP5/FP10/FP10SH series) (1:1)



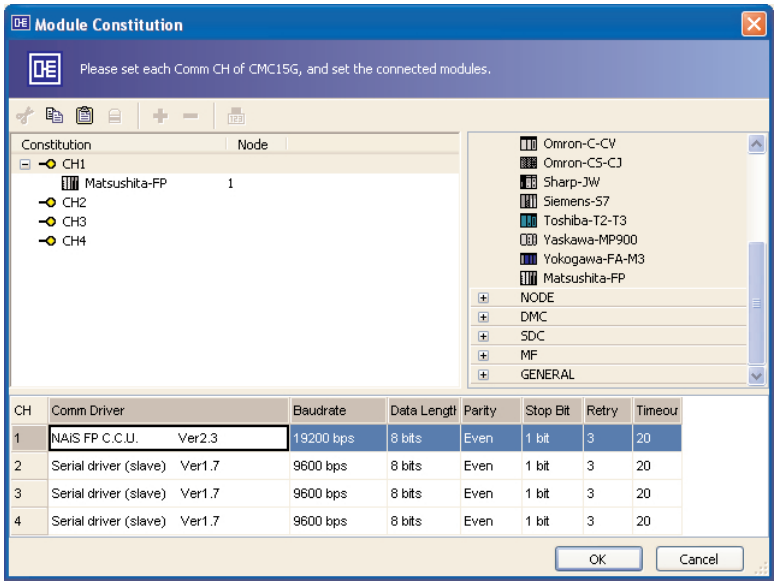
■ Environment configuration example

● Panasonic Electric Works FP3/5/10 series

PLC	FP10SH
Communications unit	C.C.U
Interface	RS-232C
Baud rate	19200 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

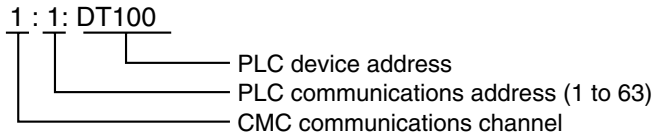
• Communications channel configuration



Handling Precautions

• Select “NAiS FP C.C.U.” as the communications driver setting.

• How to specify an address

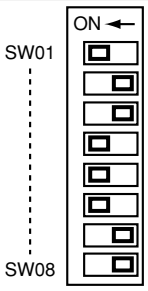


Handling Precautions

• In the case of 1:1 C.C.U. communications, set the PLC communications address to “1.”

- **C.C.U. configuration**

  - DSW configuration

Setup Switch Settings	Setup Switch	Configured Item	Description		
	SW01 to SW03	Transmission speed	SW01	SW02	SW03
		19200 bps	ON	OFF	OFF
		9600 bps	OFF	ON	OFF
		4800 bps	ON	ON	OFF
		2400 bps	OFF	OFF	ON
		1200 bps	ON	OFF	ON
		600 bps	OFF	ON	ON
		300 bps	ON	ON	ON
			OFF		ON
	SW04	Data length	7 bits		8 bits
	SW05	Parity check	None		Available
	SW06	Parity setting	Odd		Even
	SW07	Stop bit	1 bit		2 bits
	SW08	Control signals	CS, CD disabled		CS, CD enabled

: Factory setting

2 - 7 YOKOGAWA PLCs

■ Supported devices

● YOKOGAWA FA-M3 series

You can set device addresses within the ranges shown in the table below.

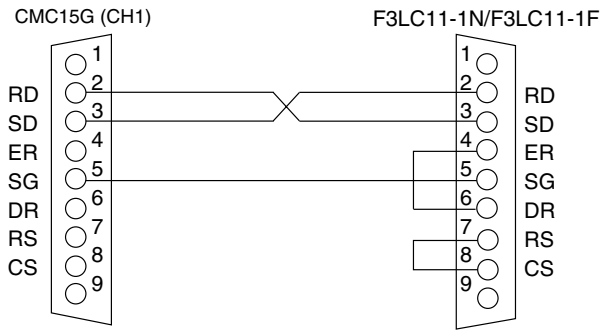
Device Type	Address Range
Input relay	XImmnn I: Unit No. (0 to 6) mm: Slot location (1 to 13) nn: Terminal No. (1 to 64)
Output relay	YImmnn I: Unit No. (0 to 6) mm: Slot location (1 to 13) nn: Terminal No. (1 to 64)
Internal relay	I00001 to I65536
Shared relay	E00001 to E65536
Link relay	L00001 to L65536
Special relay	M00001 to M65536
Timer Counter	TU0001 to TU9999 CU0001 to CU9999
Data register	D00001 to D65536
Shared register	R00001 to R65536
Index register	V00001 to V65536
Link register	W00001 to W65536
Special register	Z00001 to Z65536
Timer SP *	TS0001 to TS9999
Counter PV *	CS0001 to CS9999
File register	B00001 to B65536

Device designation example: 1:1:Y00101
1:1:D00001

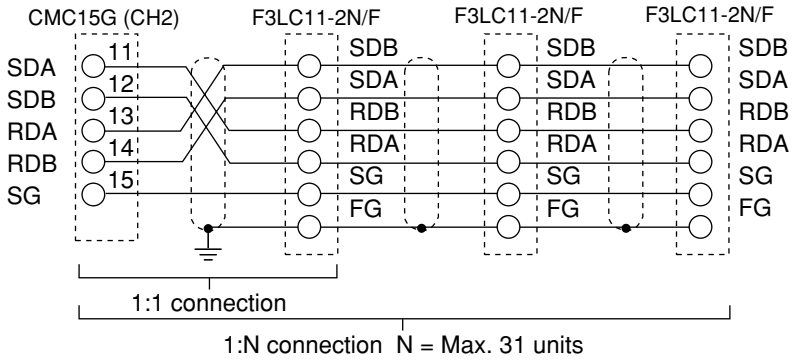
* Timer SP and counter PV data cannot be changed by the CMC.

■ Connection examples

● YOKOGAWA (COMPUTER LINK F3LC11-1N/F3LC11-1F) (1:1)



● **YOKOGAWA (COMPUTER LINK F3LC11-2N/F3LC11-2F) (1:1, 1:N)**



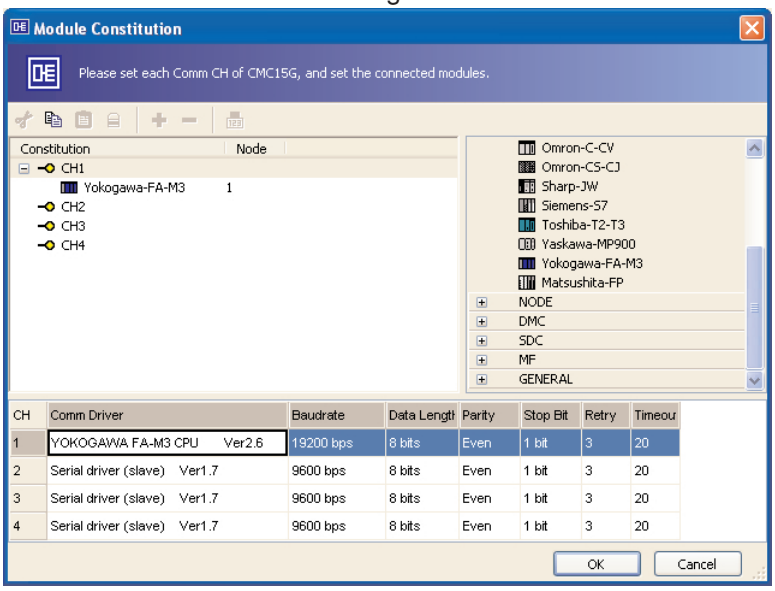
■ Environment configuration examples

● **YOKOGAWA FA-M3 series**

PLC	F3SP28-3N
Communications unit	F3LC11-1F
Interface	RS-232C
Baud rate	19200 bps
Data type	8 bits, even parity, 1 stop bit

• **CMC15G configuration**

• Communications channel configuration



Handling Precautions

• Select “YOKOGAWA FA-M3 CPU” as the communications driver setting.

• How to specify an address

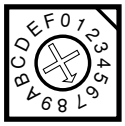
1 : 1: D1234

- D1234 — PLC device address
- 1: — PLC communications address (1 to 32: fixed at "01" for the RS-232C)
- 1 : — CMC communications channel

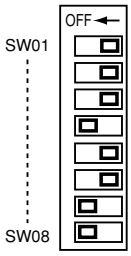
• F3CL11-1F configuration

• SW1 configuration

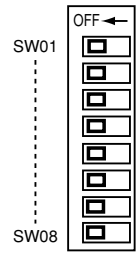
No.	Transmission speed (bps)
0	300
1	600
2	1200
3	2400
4	4800
5	9600
6	14400
7	19200
8	28800
9	38400
A	57.6K
B	76.8K
C	115.2K
D	
E	
F	



• SW2 configuration

Setup Switch Settings	Setup Switch	Configured Item	Setup Switch States	
			OFF	ON
	SW01	Data length	7 bit	8 bit
	SW02	Parity check	None	Available
	SW03	Parity setting	Odd	Even
	SW04	Stop bit	1 bit	2 bits
	SW05	Checksum	None	Available
	SW06	Termination letter	None	Available
	SW07	Protection	None	Available
	SW08	Password check	None	Available

• SW3 configuration

Setup Switch Settings	Setup Switch	Configured Item	Setup Switch States	
			OFF	ON
	SW01	Not used	- (usually OFF)	-
	SW02	Not used	- (usually OFF)	-
	SW03	Not used	- (usually OFF)	-
	SW04	Not used	- (usually OFF)	-
	SW05	Not used	- (usually OFF)	-
	SW06	Not used	- (usually OFF)	-
	SW07	F3LM01 mode	None	Available
	SW08	MODEM	None	None

Handling Precautions

• Set the PLC communications address to "1" for 1:1 communications. Set COMPUTER LINK to "check sum available, termination letter available."

2 - 8 Siemens PLCs

■ Supported devices

● Siemens series S7

You can set device addresses within the ranges shown in the table below.

Device Type	Address Range
Input device*	I000.0 to I255.7
Output device*	Q000.0 to Q255.7
Internal relay*	M000.0 to M255.7
Data register	D000.W000 to D000.W510 D001.W000 to D001.W510 : D255.W000 to D255.W510 (W: even only)
Timer register*	T00000 to T00255
Counter register*	C00000 to C00255

Device designation example: 2:1:M012.5
2:1:D002.W004

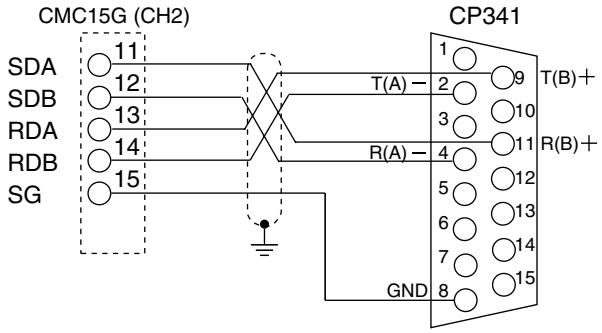
* Data other than the data register cannot be changed by the CMC.

! Handling Precautions

The CMC cannot change any device (that is, write to any device) except for devices in the data register. For that reason, if a device outside of the data register is set as a trigger device, the trigger device initialization function cannot be used for that trigger.

■ Connection examples

Siemens S7-300 CP341(RS-422)

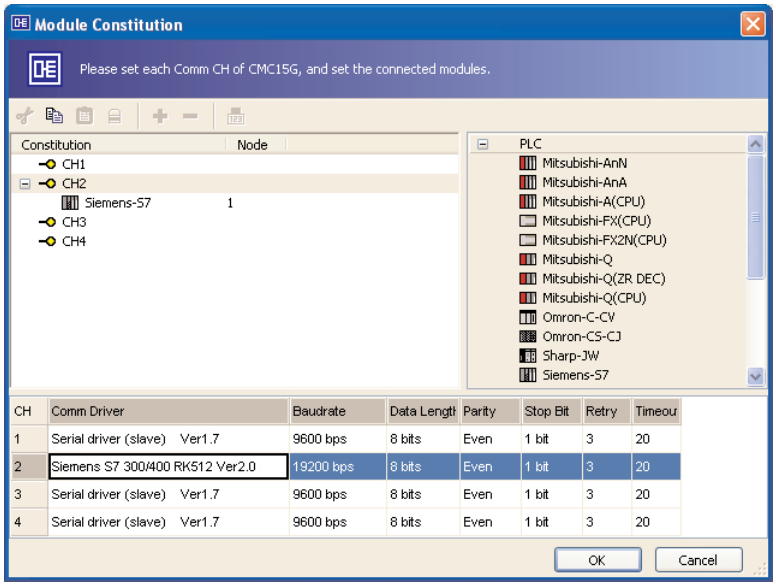


■ Environment configuration examples

● Siemens S7-300 CP341

PLC	CP315
Communications unit	CP341
Interface	RS-422
Baud rate	19200 bps
Data type	8 bits, even parity, 1 stop bit

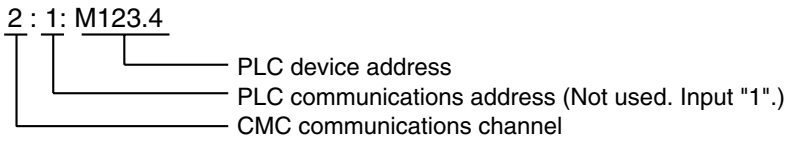
- **CMC15G configuration**
  - Communications channel configuration



Handling Precautions

- Select “Siemens S7 RK512” as the communications driver setting.

- How to specify an address



- **CP341 configuration**

The PLC is set using the SIMATEC manager.

1. CP341 hardware assignments are made.
   (1) Select [Parameter] from the [CP341] objects.
   (2) Set Protocol to "RK512"
   (3) Select [Protocol].
   (4) Set [Speed] to "19200."
   (5) Set [Character Frame] to "1stop, even."

2. In [Program elements], add the "Librarise¥CP PtP¥CP341¥FB7P_RCV_RK" library.
   (The name should agree with the name of the data block mentioned below.)

3. Prepare a data block and allocate it to FB7.

2 - 9 YASKAWA PLCs

■ Supported devices

● YASKAWA MP900 series

You can set device addresses within the ranges shown in the table below.

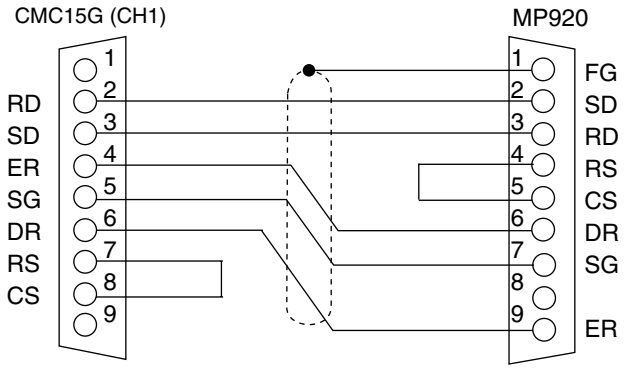
Device Type	Address Range
Coil	MB00000 to MB4095F
Input relay*	IB00000 to IB0FFFF
Holding register	MW00000 to MW32767
Input register*	IW0000 to IW7FFF

Device designation example: 2:1:IB0012D
2:1:MW1000

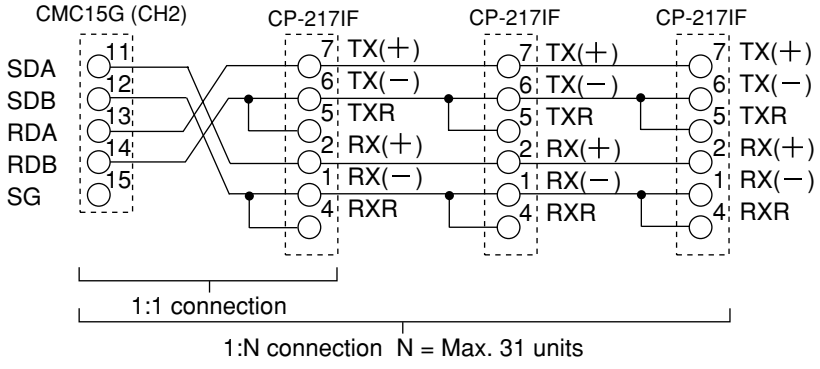
* Input relay and input register data cannot be changed by the CMC.

■ Connection examples

YASKAWA MP920 (CPU port1/2, CP-217IF CN1/2)



YASKAWA MP920 (CP-217IF CN3) (1:1, 1:N)



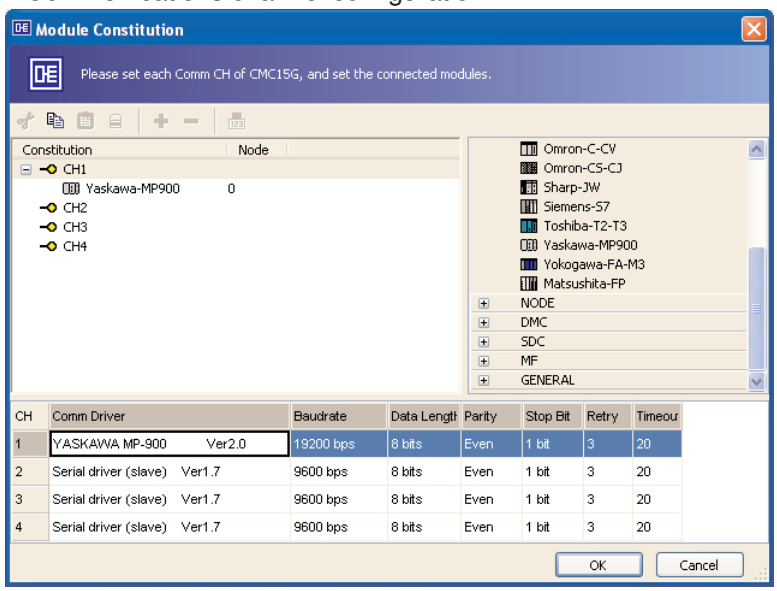
■ Environment configuration examples

● YASKAWA MP920

PLC	MP920
Communications unit	None
Interface	RS-232C
Baud rate	19200 bps
Data type	8 bits, even parity, 1stop bit

• CMC15G configuration

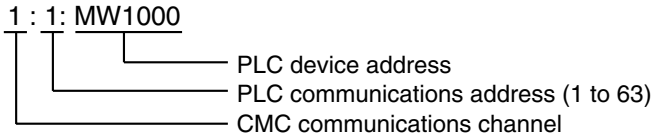
• Communications channel configuration



Handling Precautions

• Select “YASKAWA MP-900” as the communications driver setting.

• How to specify an address



• MP-920 configuration

The PLC is set up using the CP-717.

Configure the MP920 general-use settings for module No.00 under [Definition folder] → [Module configuration].

Set as follows:

• [Transmission protocol] to "memo bus."
• [Master/slave] to "slave."
• [Transmission mode] to "RTU."
• [Data length] to "8-bit."
• [Parity bit] to "even."
• [Stop bit] to "1 stop."
• [Baud rate] to "19.2K."

2 - 10 Sharp PLCs

■ Supported devices

● Sharp JW series

You can set device addresses within the ranges shown in the table below.

Device Type	Address Range
Input relay Output relay Auxiliary relay Keep relay General relay	00000 to 15777 20000 to 75777
Timer relay	T0000 to T1777
Counter relay	C0000 to C1777
File register 0 File register 10 to 2C	0000000 to 0177776 10000000 to 2C177776
Register A Register B (Timer, counter PV) Register 0 Register 1 Register 2 Register 3 Register 4 Register 5 Register 6 Register 7 Register 8 Register 9 Register E	]0000 to]1576 (A0000 to A1576)]2000 to]7576 (A2000 to A7576) b0000 to b3776 (B0000 to B3776) 09000 to 09776 19000 to 19776 29000 to 29776 39000 to 39776 49000 to 49776 59000 to 59776 69000 to 69776 79000 to 79776 89000 to 89776 99000 to 99776 E0000 to E7776
File register 1 File register 2 File register 3	1000000 to 1177776 2000000 to 2177776 3000000 to 3177776
System memory	# 0000 to # 2176 (S0000 to S2176)

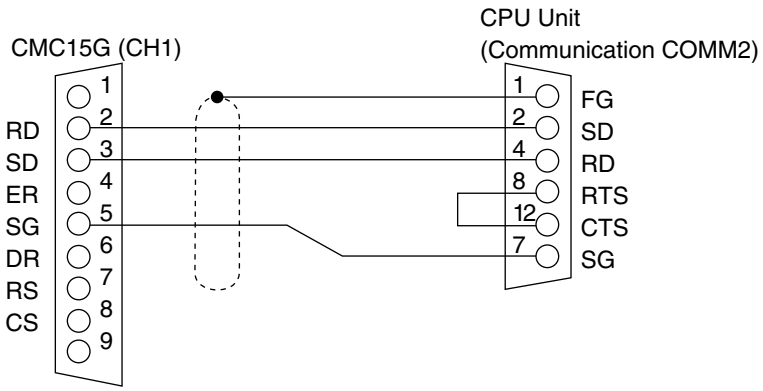
Device designation example: 1:1:09000
2:2:T0002

- Input a 7-digit value for file registers 0, 1, and 2.
- The current value of the timer is not distinguished from the current value of the counter.
- The device indications for register A, register B, and system memory are converted into "]," "b," and "#," respectively when inputting a value.

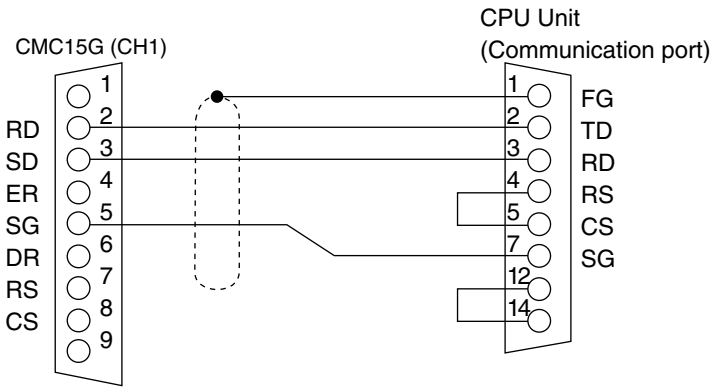
■ Connection examples

● RS-232C connection

Sharp (JW-30 series CPU) (1:1)

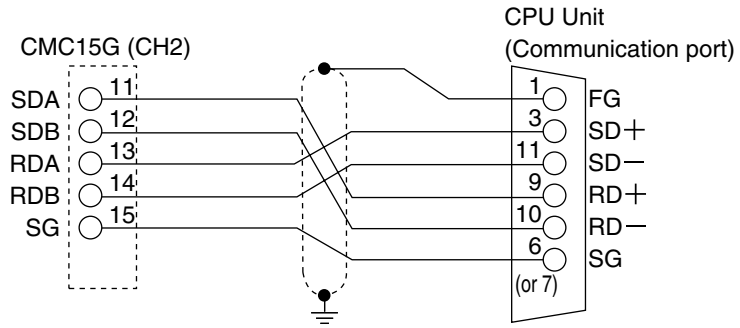


Sharp (JW-70 series CPU) (1:1)

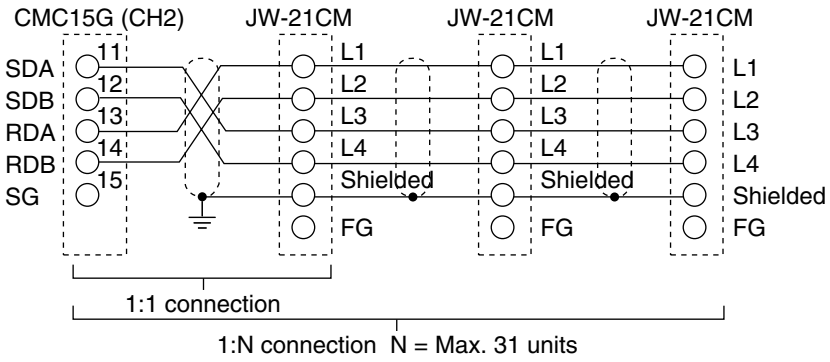


● **RS-485 connection**

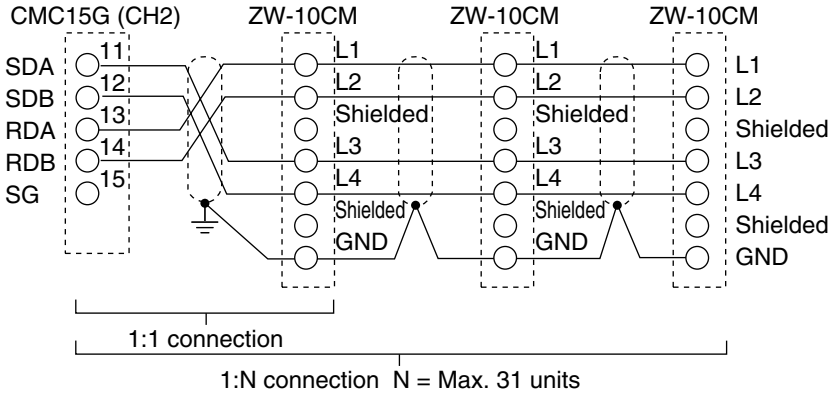
Sharp (JW-30 series CPU) (1:1)



Sharp (Link unit JW-21 CM) (1:1, 1:N)



Sharp (Link unit ZW-20 CM) (1:1, 1:N)



Handling Precautions

- There are two Shielded terminals, which are each internally connected to the GND terminal respectively. Keep the SG terminal of the CMC open.

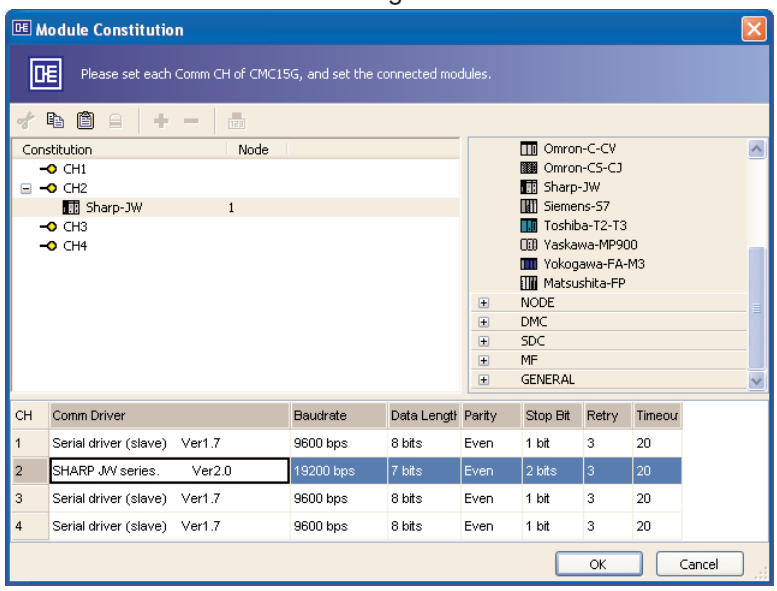
■ Environment configuration examples

● JW Series (Host link unit)

PLC	JW-32CUH1
Communications unit	JW-21CM
Interface	RS-485
Baud rate	19200 bps
Data type	7 bits, even parity, 2 stop bits

• CMC15G configuration

• Communications channel configuration



Handling Precautions

• Select “Sharp JW series” as the communications driver setting.

• How to specify an address

2 : 1 : 09002

- PLC device address
- PLC communications address (1 to 31)*
  Set the PLC communications address to the same value as the station No. of the host link unit (JW-21CM) to be connected to the CMC.
- CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-485 communications with a PLC, channel "2" is used.

* The station No. of the PLC is indicated in octal notation. Therefore, set the machine No. after converting it into a relevant decimal value.

Example: $15_{oct} \rightarrow 13_{dec}$

- **PLC (JW-21CM) configuration**

  - Station No. configuration (SW1, SW2)
    Set the station No. of the JW-21CM to within the 01oct to 37oct range.

  Handling Precautions
  - SW1 and SW2 are indicated in octal notation.

  - Transmission speed configuration (SW4)

SW4 setting	Transmission speed	SW4 setting	Transmission speed
0	19200 bps	8	Setting disabled.
1	9600 bps	9	Setting disabled.
2	4800 bps	A	Setting disabled.
3	2400 bps	B	Setting disabled.
4	1200 bps	C	Setting disabled.
5	600 bps	D	Setting disabled.
6	300 bps	E	Setting disabled.
7	Setting disabled.	F	Setting disabled.

  - Communication method/parity configuration (SW3)

Setup switch of SW3	ON	OFF
SW3-1	Fixed at OFF.	
SW3-2	4-wire RS-485	2-wire RS-485
SW3-3	Fixed at OFF.	
SW3-4	Parity: Even	Parity: Odd

  - Other configuration

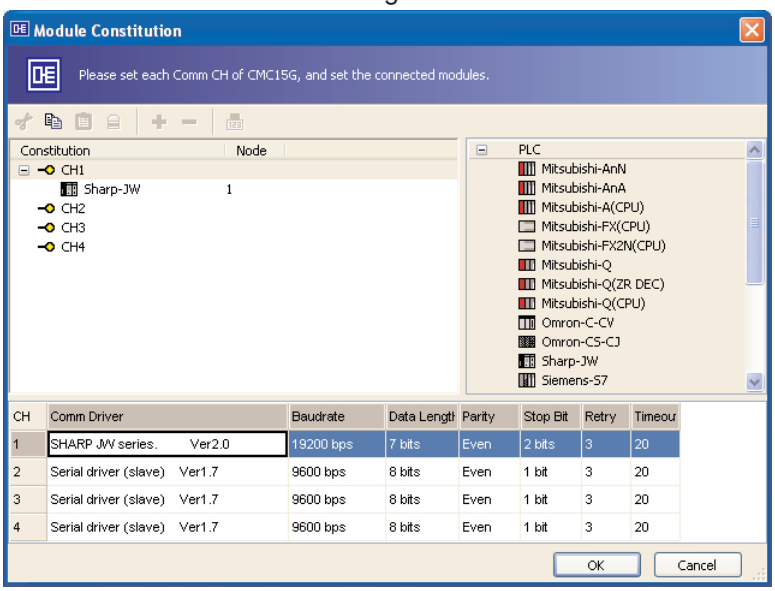
Setup switch	Function	Setting
SW0	Function setting	Set at "4."
SW7(LT)	Terminating resistor setting	ON: Terminating resistor provided. OFF: Terminating resistor not provided

● JW Series (CPU unit)

PLC	JW-32CUH1
Communications unit	CPU Communication port COMM2
Interface	RS-232C
Baud rate	19200 bps
Data type	7 bits, even parity, 2 stop bits

• CMC15G configuration

• Communications channel configuration



Handling Precautions

• Select “Sharp JW series” as the communications driver setting.

• How to specify an address

1 : 1 : 09002

- 09002: PLC device address
- 1: PLC communications address (1 to 31)*
  Set the PLC communications address to the same value as the station No. of the CPU unit to be connected to the CMC.
- 1: CMC communications channel
  The type of communications to the external device will be determined according to the channel to be used.
  For RS-232C communications with a PLC, channel "1" is used.

* The station No. of the PLC is indicated in octal notation. Therefore, set the machine No. after converting it into a relevant decimal value.
Example: $15_{oct} \rightarrow 13_{dec}$

- **CPU unit configuration**

Set the following configuration in the system memory of the PLC with the Ladder Design Support Software TW-100SP:

System memory No.	Contents	Description
#234	Transmission speed, parity, stop bits	Setting for communication port 1 (RS-442A only)
#235	Station No.	
#236	Transmission speed, parity, stop bits	Setting for communication port 2 (RS-232C/442A)
#237	Station No.	

234, # 236:

7	6	5	4	3	2	1	0
-	-	D5	D4	D3	D2	D1	D0

D5	Stop bits
0	1 bit
1	2 bits

D4	D3	Parity
0	0	None
0	1	Odd
1	0	Even
1	1	-

D2	D1	D0	Baud rate
0	0	0	19200 bps
0	0	1	9600 bps
0	1	0	4800 bps
0	1	1	2400 bps
1	0	0	1200 bps
1	0	1	11520 bps*
1	1	0	57600 bps*
1	1	1	38400 bps*

* Not available for some models.

#235, #237: The setting range is 01oct to 37oct.

In the configuration example, set 30h in #236. Additionally, set the station No. in #237.

2 - 11 Toshiba PLCs

■ Supported devices

You can set device addresses within the ranges shown in the table below.

Device Type	Address Range
Input devices	X0000 to X999F
Output devices	Y0000 to Y999F
Auxiliary relay	R0000 to R999F
Special relay	S0000 to S999F
Timer relay	TC000 to TC999
Counter relay	CC000 to CC999
Link register relay	Z0000 to Z999F
Link relay	L0000 to L999F
Input register	XW000 to XW999
Output register	YW000 to YW999
Auxiliary register	RW000 to RW999
Special register	SW000 to SW999
Timer register	T000 to T999
Counter register	C000 to C999
Data register	D0000 to D9999
Link register	W0000 to W9999
Link relay register	LW000 to LW999
File register	F0000 to F9999

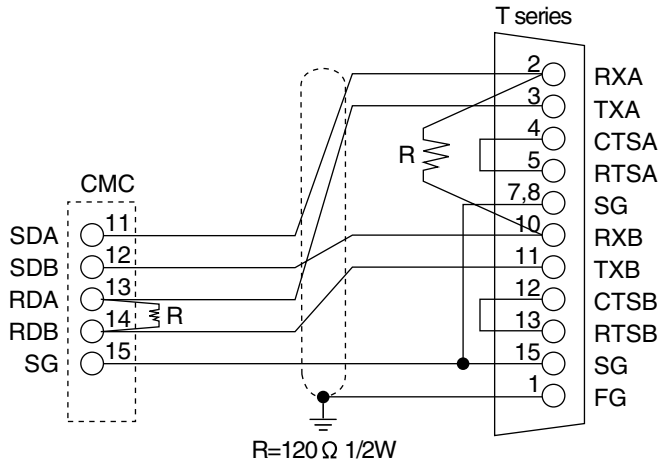
Device designation example: 1:1:Y002D
2:2:D0125

Handling Precautions

- The following devices are not supported:
  Direct input register IW, Direct output register OW,
  Direct input device I, Direct output device O, Index registers I, J, and K
- Data cannot be written into the following devices:
  Timer register T, Counter register C, Timer relay TC, Counter relay CC

■ Connection examples

● RS-485 5-lead (CH2) connection (1:1, 1:N)



■ Environment configuration examples

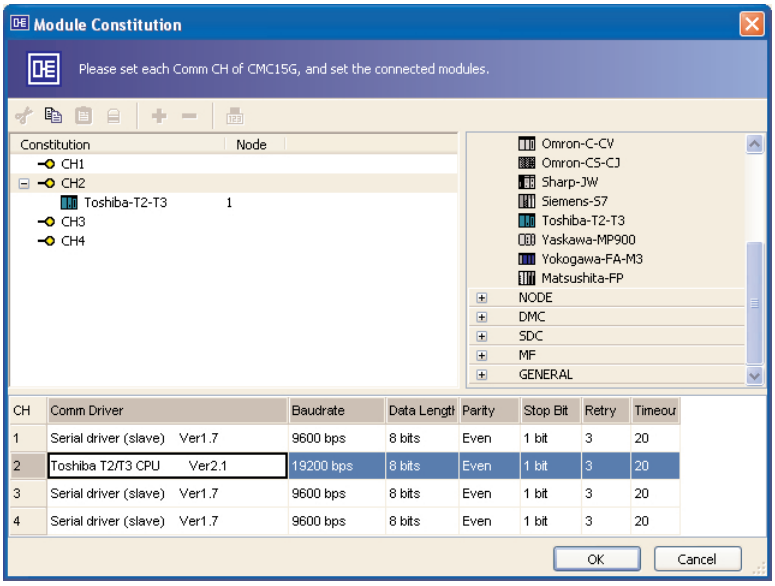
● T3 series

The following table shows an example configuration for the T3 series:

PLC	TOSHIBA T3
Communications unit	Direct link
Interface	RS-485
Baud rate	19200 bps
Data type	8 bits, even parity, 1 stop bit

• CMC15G configuration

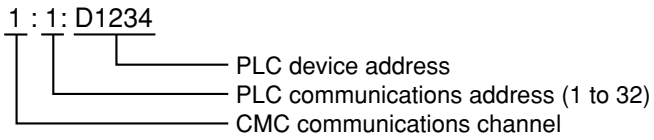
• Communications channel configuration



Handling Precautions

• Select “Toshiba T2/T3 CPU” as the communications driver setting.

• How to specify an address



• T3 configuration

With the T-series programmer, set necessary items of the system information as well as those of the computer link.

Chapter 3. SERIAL SLAVE STATION COMMUNICATIONS

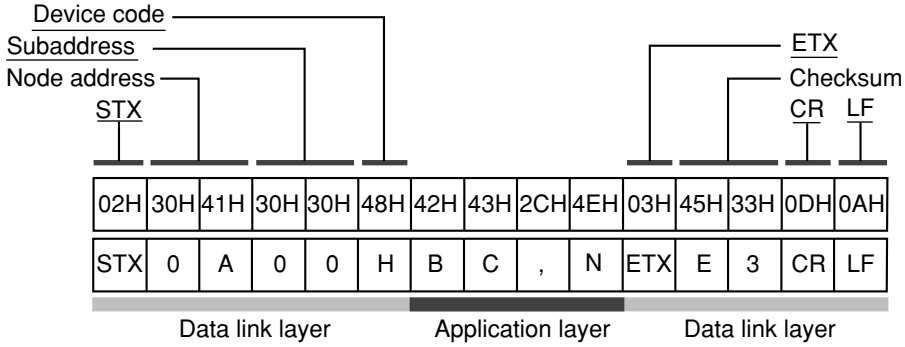
3 - 1 Communications Frame

This item describes the structure of the communications frame.

■ Description of data link layer

- The data link layer contains eight basic types of information for transmitting messages.
- The structure of instruction messages and response messages is the same in the data link layer.

Characters whose names are underlined below are fixed at all times when used with this device.



The following describes each of the functions of the data link layer:

● STX (Start of TeXt)

Role:
- This indicates the start of the text.

Description:
- Fixed as 02 Hex.
- When the device receives “STX,” STX is treated as the first character of a new instruction message, even if it is received midway through a message.

● Station address

Role:
- This specifies the transmission destination device. Communication can take place with only one specified device.

Details:
- Set the station address as a value within the 01 to 7E range. 00 is invalid.
- Set the address as two hex characters as in the following example:

Example:
- If the address of the other device is 10:
  1. 10 (decimal) = 0A Hex
  2. Convert the node address to character codes.
     0 = 30 Hex
     A = 41 Hex
  3. “0A” (30 Hex, 41 Hex) calculated above is used as the node address.

● Subaddress

Description:
- Be sure to set “00” (30 Hex, 30 Hex) in the same format as the node address.

● **Device code**

Description:
- In this device, only the following character codes can be specified:
  "H" (48H) H slave station command
  "X" (58H) X slave station command

● **ETX (End of TeXt)**

Role:
- This indicates the end of the application layer part of the communications frame.

Description:
- ETX is fixed as 03 Hex.

● **Checksum**

Role:
- The checksum is a value for checking if the message was corrupted (e.g. by noise) during communications.

Description:
- Set the checksum as two characters in Hex.
- How to prepare the checksum
  1. Add the message from STX through to ETX in single byte units.
  2. Take the 2's complement of the addition result.
  3. Convert the result to character codes.

Example:
- This example uses the instruction message from the previous page:
  1. Add the character codes from STX through to ETX one byte at a time.
     02+30+41+30+30+48+42+43+2C+4E+03=21D
     The lower 1 byte of the calculation result is 1D Hex.
  2. Take the 2's complement of the addition result.
     The result is E3 Hex.
  3. Convert the result to character codes.
     The result, "E3," is 45 Hex and 33 Hex.

  For details on conversion to character codes, refer to the node address example.

! Handling Precautions

- The checksum of instruction messages can be omitted. However, in this case the checksum will also not be included in the response to the messages. We recommend using the checksum to ensure correct reception and transmission of messages.

● **CR and LF (Carriage Return/Line Feed)**

Role: • CR and LF indicate the end of a message.

Description: • "CR" is 0D Hex and "LF" is 0A Hex.
• CR and LF must be used as a pair.

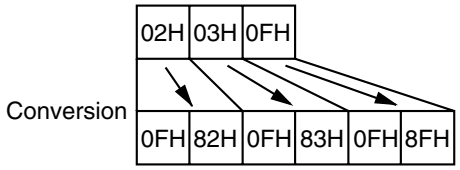
! Handling Precautions

- The device will not respond if the following kind of inconsistencies are seen in the contents of the data link layer:
  - The communications conditions do not match. (For example, the transmission speeds do not match, or a parity error occurs.)
  - The transmitted node address differs from the node address of the target device.
  - The node address is set to "00."
  - The subaddress is not "00."
  - STX, ETX, CR or LF are not at the determined positions.
  - The device code is not "H" or "X."
  - The node address, subaddress, or checksum is not composed of two characters.
  - Calculated of the checksum does not match the checksum of the message.
  - The communications frame contains invalid characters.
- The response message should have the same data link layer contents (excluding the checksum) as the instruction message.
- Use upper case characters "A" to "F" in the Hex numeric sections used for the node address and checksum.

■ Alteration of data codes to express literal 02H, 03H, 0FH

When the binary data 02 Hex, 03 Hex or 0F Hex is to be included in the message, convert the data codes as follows to distinguish them from STX (02 Hex) and ETX (03 Hex).

02 Hex → 0F Hex, 82 Hex
03 Hex → 0F Hex, 83 Hex
0F Hex → 0F Hex, 8F Hex



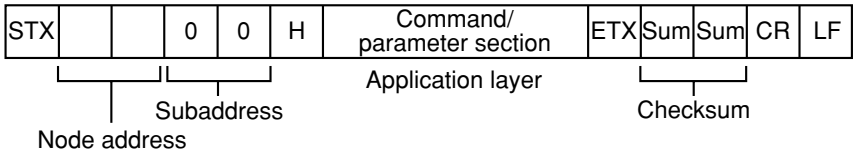
! Handling Precautions

- The previously described checksum is calculated as 02 Hex even if the 0F, 82 Hex pair is transmitted. Ensure that the communications are configured for 8 bits when the RI and WI commands are used.

■ Communications format

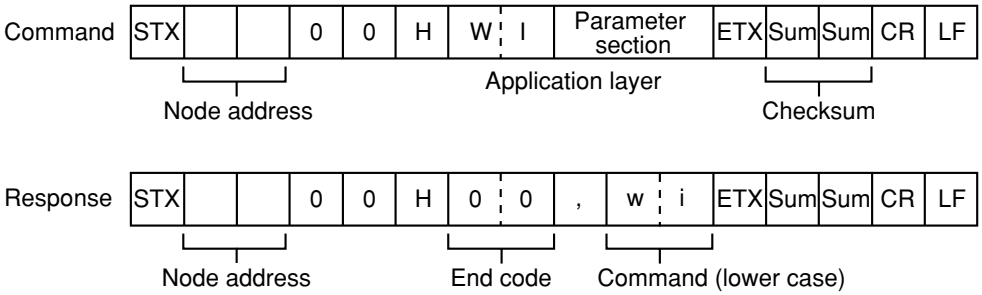
The communications format is as follows:

- The communications format is the same for both reception and transmission.
- The subaddress is fixed at “00.”
- Limit communications to 256 bytes from the STX to LF.



The response is returned after the command is received.
If the data requested by the command is available, it is included in the response message,
Subsequent commands are not accepted until transmission of the response message has been completed.
The end code is a numeric value for learning how the command was processed on the CMC15G.
For details on end codes, see the individual command descriptions in section 3-4.

Example, in a case where the response does not contain data:



3 - 2 Reception and Transmission Timing

■ Timing specifications for instruction and response message

When a slave station is connected with the master station directly via the RS-232C or RS-485, or the CMC10L, the precautions mentioned below regarding the transmission timing of instruction messages from the master station and response messages from the slave station should be observed:

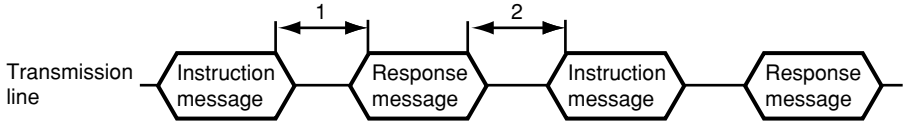
● Response time-out

The maximum response time from the end of the instruction message transmission by the master station until when the master station receives a response message from the slave station is 2 seconds (1 in the figure below). So, the response time-out should be set to 2 s.
Generally, when a response time-out occurs, the instruction message is resent.

● Transmission start time

A wait time of 10 ms or more is required before the master station starts to transmit the next instruction message (to the same slave station or a different slave station) after in has finished receiving a response message (2 in the figure below).

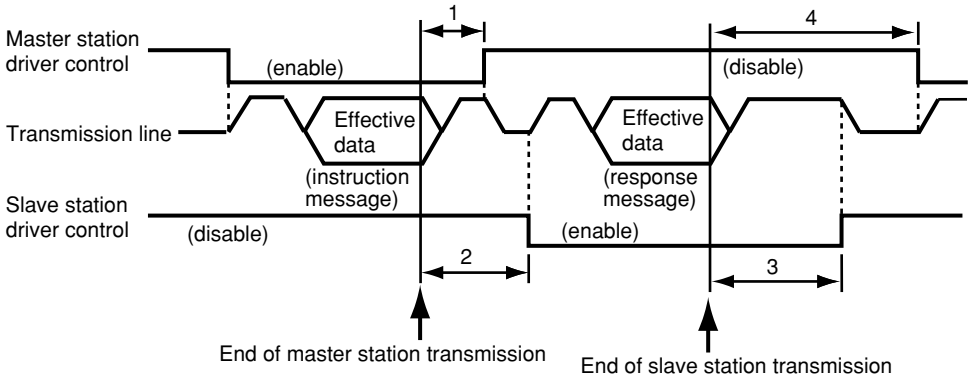
• RS-485 3-wire system



1. End of master station transmission — Transmission start time of slave station = 2000 ms max.
2. End of slave station transmission — Transmission start time of master station = 10 ms min.

■ RS-485 driver control timing specifications

When the transmission/reception on the RS-485 3-wire system is directly controlled by the master station, care should be paid to the timing shown below.



1. End of master station transmission — Driver disable time = 500 s max.
2. End of slave station reception — Driver enable time = 1 ms min.
3. End of slave station transmission — Driver disable time = 10 ms max.
4. End of master station reception — Driver enable time = 10 ms min.

3 - 3 Cautions for System Design

In serial communications, noise on the communications path or a power disruption to the peer device could prevent responses from being received, or could corrupt the responses. When designing a microcomputer board or personal computer for system control (hereafter referred to as "microcomputer board") to work as a communication master station, include appropriate retry processing in case the response is not returned successfully.

■ Retry processing

In serial communication retry processing, the command frame is sent again after the response wait time has elapsed.
If retry processing commences too soon, the returned response may be corrupted, responses to previous commands may be received by mistake*, or other abnormalities may occur.
The standard response wait time (time-out time) for the CMC15G is 2 seconds. However, if a complicated project is running, a longer period of time is needed. After the project has actually been created, test its operation before beginning to use it.

Note

*This is because the instruction message and response message are not distinguished in the CMC15G's serial slave station communications protocol, which is a general feature of simple communications.

3 - 4 Details of Communications Commands

There are two kinds of serial slave communication commands, commands with device classification code H (hereafter referred to as "H slave station commands") and commands with device classification code X (hereafter referred to as "X slave station commands"). The H slave station commands are originally designed for the CMC15G. The X slave station commands include commands common to other Yamatake devices.

■ H slave station command table

Command	Command Name	Command Function
BJ	Set block constant	Sets the constants from the smallest address towards the largest in the specified continuous register.
RC	Read clock	Reads the contents of the CMC15G internal calendar clock.
RH	Read continuous ASCII	Reads the specified continuous area data (ASCII) in word units.
RI	Read continuous binary	Reads the specified continuous area binary data in word units.
WC	Adjust clock	Adjusts the time of the CMC15G internal calendar.
WH	Write continuous ASCII	Writes the specified continuous area data (ASCII) in word units.
WI	Write continuous binary	Writes the specified continuous area binary data in word units.
WM	Manipulate continuous bits	Manipulates (sets, resets) the bits of the specified continuous area data of the bit device in internal devices.

■ X slave station command table

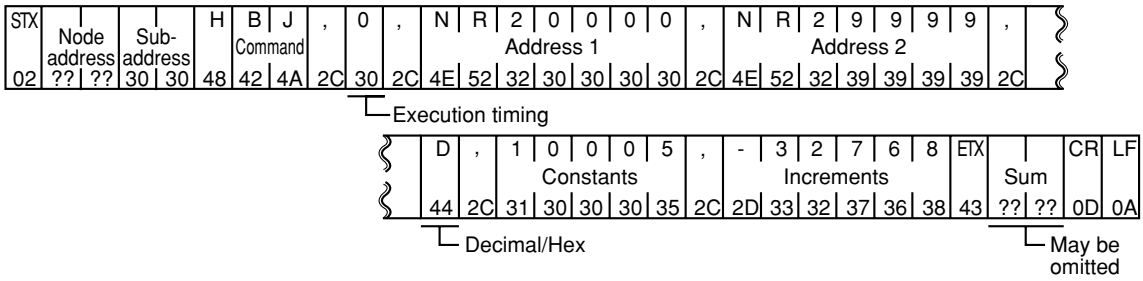
Command	Command Name	Command Function
RS	Continuous data read command	Reads the specified continuous area data (decimal ASCII) in word units.
WS	Continuous data write command	Writes the specified continuous area data (decimal ASCII) in word units.

■ Set block constant (BJ)

● Function

This command sets constant values in the specified continuous register area from the lowest address towards the highest.

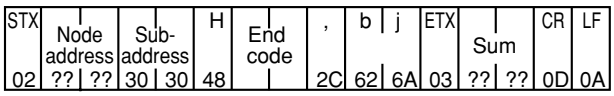
✦ Command frame



Parameter description

Execution timing	Fixed at 0.
Address 1	Write destination address 1. Zero suppression is not allowed.
Address 2	Write destination address 2. Zero suppression is not allowed.
Decimal/Hex	This parameter specifies the write data format. D: Decimal H: Hex
Constant	1-word constant Decimal –32768 ≤ constant ≤ +32767 Hex 0000 ≤ constant ≤ FFFF
Increment	Increment for constants from address 1 to address 2 Decimal –32768 ≤ increment ≤ +32767 Hex 0000 ≤ increment ≤ FFFF When 0 or when omitted, the same constant is set to all addresses.

✧ Response frame



Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error

Operation/processing when an error occurs

A parameter error occurs if an out-of-range parameter is specified.

! Handling Precautions

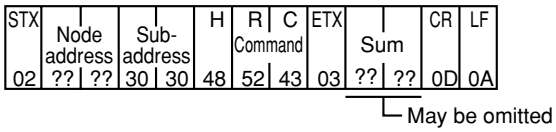
- The increment can be omitted. When the increment is omitted, the same constant is set. (The increment is interpreted as being “0.”)
- In the case of bit devices, the bit specification is ignored, and the constant is written in word units (specified device bits 0 to F).
- Calculation of the increment is performed by calculating the 2’s complement of one word, ignoring whether the number of digits in creases or decreases.

■ Read clock (RC)

● Function

This command reads the contents of the CMC15G internal calendar clock.

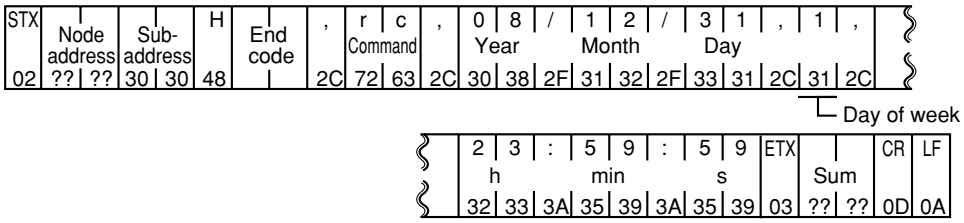
✦ Command frame



Parameter description

None

✧ Response frame



Parameter description

End code	00: Normal end 10: Parameter error 13: Command execution error
Year	Final 2 digits of year Range: (20) 00 to (20) 99
Month	Month Range: 01 to 12 (month)
Day	Day Range: 01 to 31 (day)
Day of week	Day of week Range: 0 to 6 Code: 0 1 2 3 4 5 6 Day of week: Sun Mon Tue Wed Thu Fri Sat
h	Hours Range: 00 to 23
min	Minutes Range: 00 to 59
s	Seconds Range: 00 to 59

! Handling Precautions

- Year/month/day/day-of-week/hours/minutes/seconds are stored as continuous 7-word BCD starting from internal device SR90143.
- Response parameters are returned in two digits. For example, “9 minutes” is returned as “09.” Note, however, that the day of the week is returned in one digit.

■ Adjust clock (WC)

● Function

This command adjusts the CMC15G internal calendar time.

✦ Command frame

STX	Node address	Sub-address	H	W	C	,	0	8	/	1	2	/	3	1	,	2	3	:	5	9	:	5	9	ETX	Sum		CR	LF
				Command			Year			Month			Day			h			min			s							
02	??	??	30	30	48	57	43	2C	30	38	2F	31	32	2F	33	31	2C	32	33	3A	35	39	3A	35	39	03	??	??	0D	0A

May be omitted

Parameter description

Year	Final 2 digits of year	Range: (20) 00 to (20) 99
Month	Month	Range: 01 to 12 (month)
Day	Day	Range: 01 to 31 (day)
h	Hours	Range: 00 to 23
min	Minutes	Range: 00 to 59
s	Seconds	Range: 00 to 59

✧ Response frame

STX	Node address	Sub-address	H	End code	,	w	c	ETX	Sum		CR	LF
02	??	??	30	30	48	2C	77	63	03	??	??	0D	0A

Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error

! Handling Precautions

- The day of the week is automatically calculated by the CMC15G unit, and the day of the week code on the previous page is set to the internal device.
- Year/month/day/day of week/hours/minutes/seconds are stored as continuous 7-word BCD starting from internal device SR90143.
- Ensure that each command parameter is specified with two digits.

■ Read continuous area communications ASCII (RH)

● Function

This command reads the specified continuous area of CMC15G internal devices in word units. (ASCII)

✦ Command frame

STX	Node address	Sub-address	H	R H Command	,	0	,	N R 2 9 0 0 0 Read start address	,	3 2 Number of reads	,	D	ETX	Sum	CR	LF
02	?? ??	30 30	48	52 48	2C	30	2C	4E 52 32 39 30 30 30	2C	33 32	2C	44	03	?? ??	0D	0A

Execution timing: 0 (30)
Decimal/Hex: D (44)
Sum: ?? ?? — May be omitted

Parameter description

Execution timing	Fixed at 0.
Number of reads	Number of data items to read Range: 1 to 99
Read start address	Start address of read source Zero suppression is not allowed.
Decimal/Hex	This parameter specifies the write data format. D: Decimal H: Hex

✧ Response frame

STX	Node address	Sub-address	H	End code	,	r h	,	+ 1 2 3 4 Read data	,	- 9 9 9 9 Read data	ETX	Sum	CR	LF
02	?? ??	30 30	48		2C	61 68	2C	2B 31 32 33 34	2C	2D 39 39 39 39	03	?? ??	0D	0A

Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error
Data	Read data (ASCII) Decimal –32768 ≤ data ≤ +32767 Hex 0000 ≤ data ≤ FFFF

! Handling Precautions

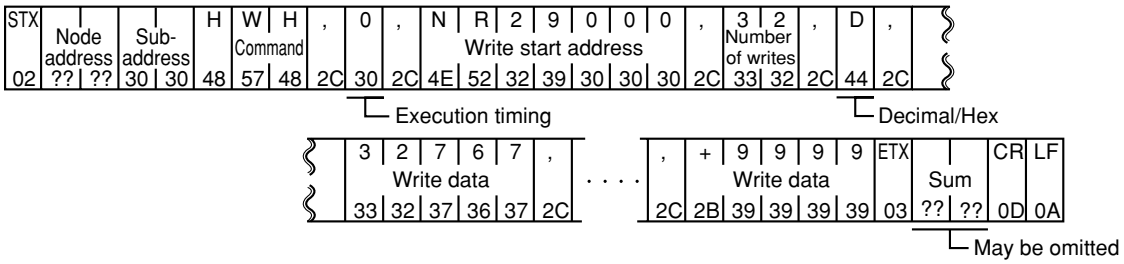
- In the case of bit devices, the bit specification is ignored, and the data is read in word units (specified device bits 0 to F).
- If decimal is specified, the data is prefixed with + (for plus numbers and zero) or – (for minus numbers) depending on its value.
- When hexadecimal notation is specified, data from A to F is uppercase.

■ Write continuous area communications ASCII (WH)

● Function

This command writes the specified continuous area of CMC15G internal devices in word units. (ASCII)

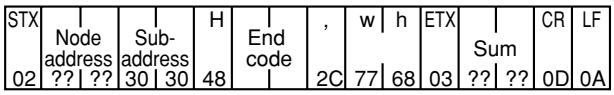
✦ Command frame



Parameter description

Execution timing	Fixed at 0.
Number of writes	Number of data items to write Range: 1 to 99
Write start address	Write start address Zero suppression is not allowed.
Decimal/Hex	This parameter specifies the write data format. D: Decimal H: Hex
Write data	Input data (ASCII) Decimal –32768 ≤ data ≤ +32767 Hex 0000 ≤ data ≤ FFFF

✧ Response frame



Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error

! Handling Precautions

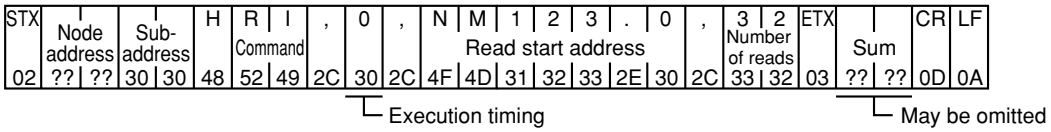
- In the case of bit devices, the bit specification is ignored, and the data is read in word units (specified device bits 0 to F).
- The + (plus number) sign for decimal write data can be omitted, and zero can be suppressed.
  Note, however, that when the value is 0, it is expressed as "+0."
  Be sure to prefix negative data with the – (minus) sign.
- When hexadecimal notation is specified, data from A to F is uppercase.

■ Read continuous area communications binary (RI)

● Function

This command reads the specified continuous area of CMC15G internal devices in word units.(binary)

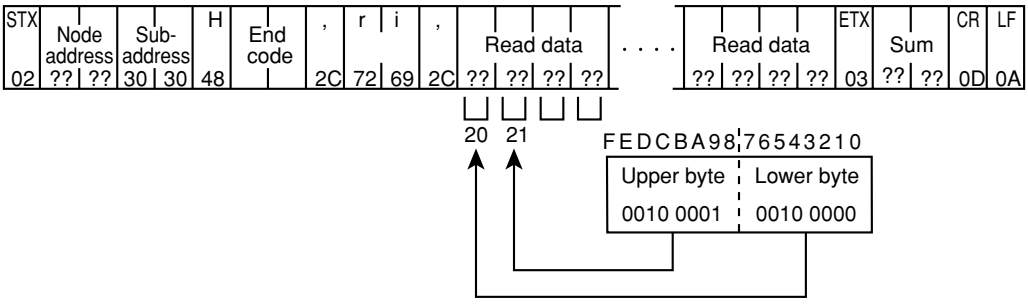
✦ Command frame



Parameter description

Execution timing	Fixed at 0.
Number of reads	Number of data items to read Range: 1 to 99
Read start address	Start address of read source Zero suppression is not allowed.

✧ Response frame



Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error
Data	Read data (binary processed by altered codes) 1-word data is output “as is” in byte units.

! Handling Precautions

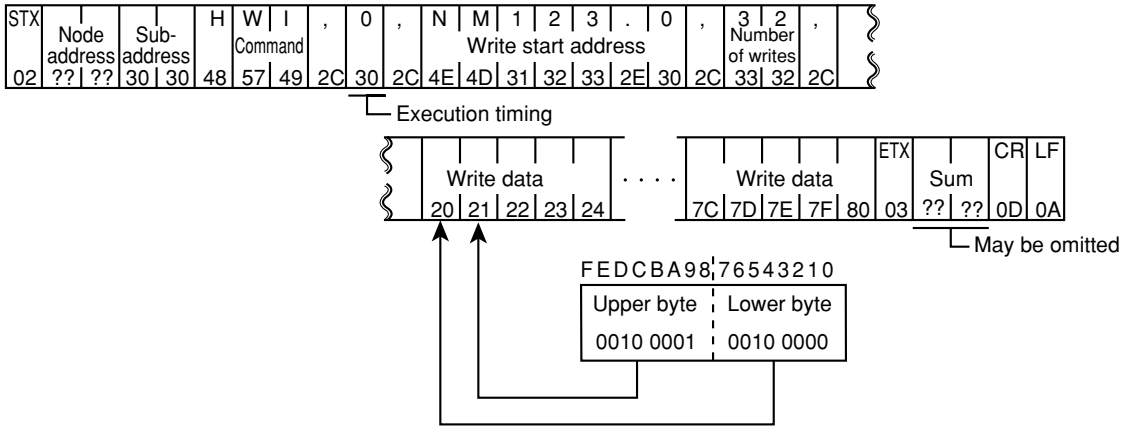
- In the case of bit devices, the bit specification is ignored, and the data is read in word units (specified device bits 0 to F).
- For details on processing altered codes, see “Alteration of Data Codes to Express Literal 02H, 03H, 0FH” (page 3-3).
- When the RI command is used, ensure that communication is configured for 8 bits.

■ Write continuous area communications binary (WI)

● Function

This command writes the specified continuous area of CMC15G internal devices in word units (binary).

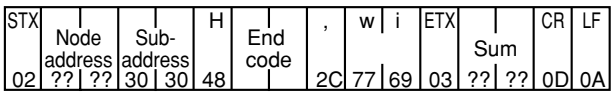
✦ Command frame



Parameter description

Execution timing	Fixed at 0.
Number of writes	Number of data items to write Range: 1 to 99
Write start address	Write start address Zero suppression is not allowed.
Write data	Write data (binary processed by altered codes) 2 bytes × the number of writes 1-word data is input in binary “as is” in byte units.

✧ Response frame



Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error

! Handling Precautions

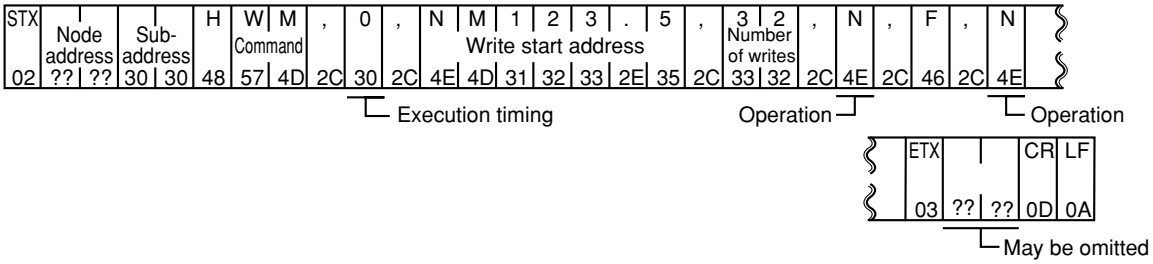
- In the case of bit devices, the bit specification is ignored, and the data is read in word units (specified device bits 0 to F).
- For details on processing altered codes, see “Alteration of Data Codes to Express Literal 02H, 03H, 0FH” (page 3-3).
- When the WI command is used, ensure that communication is configured for 8 bits.

■ Manipulate continuous area communications bits (WM)

● Function

This command manipulates (sets, resets) bits in the specified continuous area of CMC15G internal bit devices.

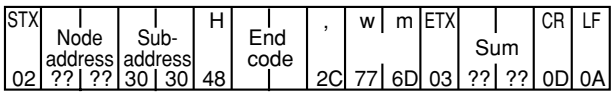
✦ Command frame



Parameter description

Execution timing	Fixed at 0.
Number of writes	Number of data items to write Range: 1 to 32
Write start address	Start address of data write destination internal device Zero suppression is not allowed.
Operation	Bit manipulation operation N: Bit ON The specified bit is set to “1.” F: Bit OFF The specified bit is set to “0.” T: Toggle The specified bit is reversed/toggled.

✧ Response frame



Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error

■ Continuous data read command (RS)

● Function

Reads the specified continuous area data (decimal ASCII) in word units.

✦ Command frame

STX	Node address		Sub-address		X R S Command			,	1 0 0 W Start address				,	3 2 Number of reads		ETX	Sum		CR	LF
02	??	??	30	30	58	52	53	2C	31	30	30	57	2C	33	32	03	??	??	0D	0A

May be omitted

Parameter description

Number of reads	Number of data items to read Range: 1 to 32
Read start address	Start address of data read source Capital W is added after completion of zero suppression.

✧ Response frame

STX	Node address		Sub-address		X	End code		,	1 2 3 4 Read data				,	- 9 9 9 9 Read data					ETX	Sum		CR	LF
02	??	??	30	30	58			2C	31	32	33	34	2C	2D	39	39	39	39	03	??	??	0D	0A

Parameter description

End code	00: Normal end 10: Parameter error 11: Out of parameter range 13: Command execution error
Data	Read data (ASCII) –32768 ≤ data ≤ +32767

! Handling Precautions

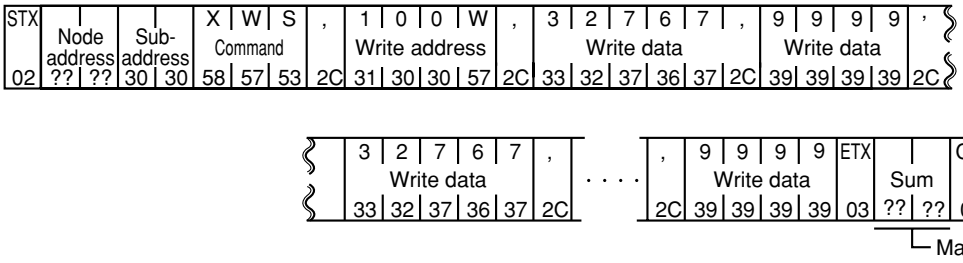
- A negative sign (-) is added to the data, depending on its value.

■ Continuous data write command (WS)

● Function

Writes the specified continuous area data (decimal ASCII) in word units.

✦ Command frame

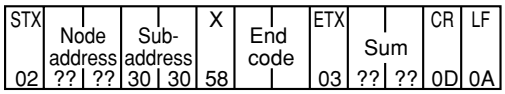


Parameter description

✧

Data address	Start address of data write destination Capital W is added after completion of zero suppression.
Write data	Input data (ASCII) –32768 ≤ data ≤ +32767

Response frame



Parameter description

End code	00:	Normal end
	10:	Parameter error
	11:	Out of parameter range
	13:	Command execution error

⚠ Handling Precautions

- It is possible to suppress zero in the write data. When the value is "0", the data is set to "0." A negative sign (-) must always be used.

3 - 5 Device Address of X Slave Command

The X slave command uses assigned data address when accessing the internal device of the CMC15G.
Data addresses are as shown below.

Data address	Internal device	Non-access ranges	Read	Write
0(0000) to 24575(5FFF)	NR0000 to NR24575	NR24576 to NR32767	❍	❍
35328(8A00) to 35347(8A13)	EM000.0 to EM001.3		❍	×
34816(8800) to 34819(8803)	BM00000 to BM10003		❍	×
24576(6000) to 34575(870F)	NM0000.0 to NM9999.F		❍	❍
36864(9000) to 61439(EFFF)	SR00000 to SR24575	SR24576 to SR32767	❍	❍
61440(F000) to 62339(F383)	SM000.0 to SM899.F		❍	❍
63488(F800) to 63587(F863)	SM900.0 to SM999.F		❍	×
63744(F900) to 63999(F9FF)	SR90000 to SR90255	SR90256 to SR94799	❍	×
64000(FA00) to 65535(FFFF)	SR94800 to SR96335	SR96336 to SR99999	❍	×

Handling Precautions

- When accessing with an X slave command, it is not possible to access all devices due to limitations on address ranges.

Revision History

Printed date	Manual Number	Edition	Revised pages	Description
Feb. 2009	**CP-SP-1278E**	**1st Edition**		

Terms and Conditions

We would like to express our appreciation for your purchase and use of Yamatake products.
You are required to acknowledge and agree upon the following terms and conditions for your purchase of Yamatake products (field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1. Warranty period and warranty scope
   1.1 Warranty period
   Yamatake products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.
   1.2 Warranty scope
   In the event that Yamatake product has any failure attributable to Yamatake during the aforementioned warranty period, Yamatake shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place. Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:
   (1) Failure caused by your improper use of Yamatake product
   (noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
   (2) Failure caused for other reasons than Yamatake product;
   (3) Failure caused by any modification or repair made by any person other than Yamatake or Yamatake's subcontractors;
   (4) Failure caused by your use of Yamatake product in a manner not conforming to the intended usage of that product;
   (5) Failure that the state-of-the-art at the time of Yamatake's shipment did not allow Yamatake to predict; or
   (6) Failure that arose from any reason not attributable to Yamatake, including, without limitation, acts of God, disasters, and actions taken by a third party.
   Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Yamatake shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Yamatake products.

2. Ascertainment of suitability
   You are required to ascertain the suitability of Yamatake product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:
   (1) Regulations and standards or laws that your Equipment is to comply with.
   (2) Examples of application described in any documents provided by Yamatake are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
   (3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use
   Although Yamatake is constantly making efforts to improve the quality and reliability of Yamatake products, there exists a possibility that parts and machinery may break down. You are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, safety design, or the like so that the said Equipment may satisfy the level of the reliability and safety required in your use, whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth.

3. Precautions and restrictions on application
   Yamatake products other than those explicitly specified as applicable (e.g. Yamatake Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area). Any Yamatake products shall not be used for/with medical equipment.
   In addition,
   you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual , etc. in case that you intend to use Yamatake product for any purposes specified in (1) through (6) below.
   Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design and other designs of protection/safety circuit on your own responsibility to ensure the reliability and safety, whereby preventing problems caused by failure or nonconformity.
   (1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
   (2) For use of specific purposes, such as:
   * Nuclear energy/radiation related facilities
   [For use outside nuclear energy controlled areas] [For use of Yamatake Limit Switch For Nuclear Energy]
   * Machinery or equipment for space/sea bottom
   * Transportation equipment
   [Railway, aircraft, vessels, vehicle equipment, etc.]
   * Antidisaster/crime-prevention equipment
   * Burning appliances
   * Electrothermal equipment
   * Amusement facilities
   (3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
   (4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
   (5) Machinery or equipment that may affect human lives, human bodies or properties
   (6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4. Precautions against long-term use

Use of Yamatake products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification. Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Yamatake products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5. Recommendation for renewal

Mechanical components, such as relays and switches, used for Yamatake products will reach the end of their life due to wear by repetitious open/close operations.
In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used. Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc.
as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Yamatake products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.
Field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts.
For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6. Other precautions

Prior to your use of Yamatake products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Yamatake products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7. Changes to specifications

Please note that the descriptions contained in any documents provided by Yamatake are subject to change without notice for improvement or for any other reason.
For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8. Discontinuance of the supply of products/parts

Please note that the production of any Yamatake product may be discontinued without notice.
For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts.
For field instruments, we may not be able to undertake parts replacement for similar reasons.

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