

Hardware Specifications

MONITOUCH V7



Record of Revisions

Reference numbers are shown at the bottom left corner on the back cover of each manual.

Printing Date	Reference No.	Revised Contents
September, 2002	2010NE0	First edition

Preface

Thank you for selecting the MONITOUCH V7 series.

For correct set-up of MONITOUCH, you are requested to read through this manual to understand more about the product.

For more information about the V7 series, refer to the following related manuals.

Manual Name	Contents	Reference No.
Reference Manual (Operation)	The V-SFT operating procedure is described.	1043NE
Reference Manual (Function)	The functions and instructions of the V7/V6 series are explained.	1044NE
Universal Serial Connection Manual	Universal serial specifications and commands are described.	1021NE
Temperature Control Network	The temperature control network function is explained.	1033NE
Specifications for Communication Unit CC-LINK	Instructions for CC-LINK are contained.	1028NE
Specifications for Communication Unit PROFIBUS-DP	Instructions for PROFIBUS-DP are contained.	1036NE
M-CARD SFTE Operation Manual	The operating procedure of the memory card editor is described.	1023NE

For further details about PLCs (programmable logic controllers), see the manual attached to each PLC.

Notes:

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5. This manual is intended to give accurate information about MONITOUCH hardware. If you have any questions, please contact your local distributor.

Notes on Safe Use of MONITOUCH

In this manual, you will find various notes categorized under the following levels with the signal words “DANGER,” and “CAUTION.”




DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.

Note that there is a possibility that the item listed with  **CAUTION** may have serious ramifications.



DANGER

- Never use the input function of MONITOUCH for operations that may threaten human life or to damage the system, such as switches to be used in case of emergency. Please design the system so that it can cope with malfunction of a touch switch.
- Turn off the power supply when you set up the unit, connect cables or perform maintenance and inspection. Failure to do so could cause an electric shock or damage to the unit.
- Never touch any terminals while the power is on. An electric shock may occur.
- You must put a cover on the terminals on the unit when you turn the power on and operate the unit. Without the terminal cover in place, an electric shock may occur.
- The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, never swallow the leaked liquid crystal. If the liquid crystal spills on your skin or clothing, use soap and wash off thoroughly.

CAUTION

[Notes on System Design]

- Never bundle control cables and input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep these cables at least 200 mm away from the power supply or high-voltage cables. Otherwise, malfunction may occur due to noise.
- For use in a nuclear energy facility, or other facility of such official importance, please consult your local distributor.

[Notes on Installation]

- Operate (or store) MONITOUCH under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage or deterioration.
- Understand the following environmental limits for use and storage of MONITOUCH. Otherwise, fire or damage to the unit may result.
 - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids or cutting oil can come into contact with the unit.
 - Avoid high temperature, high humidity, and outside weather conditions, such as wind, rain or direct sunlight.
 - Avoid locations where excessive dust, salt, and metallic particles are present.
 - Avoid installing the unit in a location where vibration or physical shock may be transmitted.
- Equipment must be correctly mounted so that the main terminal of MONITOUCH will not be touched inadvertently.
- Tighten the MONITOUCH mounting screws to the specified torque. Excessive tightening may distort the panel surface. Loose tightening may cause MONITOUCH to come off, malfunction or be short-circuited.
- Tighten terminal screws on the power input terminal block equally to a torque of 0.5 N•m.
- Check the appearance of MONITOUCH when it is unpacked. Do not use the unit if any damage or deformation is found.
- MONITOUCH has a glass screen. Do not drop or give physical shock to the unit.

[Notes on Cable Connection]

- Connect the cables correctly to the terminals of MONITOUCH in accordance with the specified voltage and wattage. Over-voltage, over-wattage or incorrect cable connection could cause fire, malfunction or damage to the unit.
- Be sure to establish a ground of MONITOUCH. The FG terminal must be used exclusively for the unit with the level of grounding resistance less than 100 Ω .
- Prevent any conductive particles from entering into MONITOUCH. Failure to do so may lead to fire, damage or malfunction.

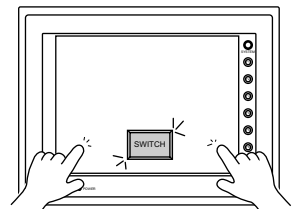
(To be continued)

CAUTION

[Notes on Maintenance and Operation]

- Hakko Electronics Co., Ltd. is not responsible for any damages resulting from repair, overhaul or modification of MONITOUCH that was performed by an unauthorized person.
- Do not use thinners for cleaning because they may discolor the MONITOUCH surface. Use alcohol or benzine commercially available.
- Do not use a sharp-pointed tool when pressing a touch switch.
- Only experts are authorized to set up the unit, connect the cables or perform maintenance and inspection.
- MONITOUCH is equipped with a lithium battery. Lithium batteries contain combustible material such as lithium or organic solvent. Mishandling may cause heat, explosion or ignition resulting in fire or injury. Read this manual and related manuals carefully and handle the lithium battery correctly as instructed.
- If a data receive error occurs when MONITOUCH and the counterpart (PLC, temperature controller, etc.) are started at the same time, read the manual for the counterpart unit and handle the error correctly.
- Switch resolution of the MONITOUCH V7 series is determined by the analog-type resistance film. Do not press two or more positions on the screen at the same time.

If two or more positions are pressed at the same time, the switch located between the pressed positions activates. Please take note of this.



Pressing two positions at the same time activates the switch in the center.

[Notes on Disposal]

- At the time of disposal, MONITOUCH must be treated as industrial waste.

Contents

Chapter 1 Hardware Specifications

1. Features	1-1
2. Models and Peripheral Equipment	1-2
MONITOUCH Models	1-2
Peripheral Equipment	1-3
3. System Composition	1-7
System Composition of V7 (Standard).....	1-7
System Composition of V7i (High-performance).....	1-8
4. Specifications	1-9
General Specifications	1-9
Display Specifications	1-10
Touch Panel Specifications.....	1-10
Function Switch Specifications	1-11
Interface Specifications.....	1-11
Clock and Backup Memory Specifications.....	1-11
Drawing Environment.....	1-12
Display Function Specifications	1-12
Function Performance Specifications	1-13
5. Dimensions and Panel Cut-out.....	1-14
V708/V708i External View and Dimensions.....	1-14
V710/V710i External View and Dimensions.....	1-15
V712/V712i External View and Dimensions.....	1-16
6. Names and Functions of Components	1-17
7. Mounting Procedure	1-20
Mounting Procedure.....	1-20
Mounting Angle	1-20
8. Power Supply Cable Connection.....	1-21
Power Supply Cable Connection	1-21
Notes on Usage of 100-240 VAC Specifications	1-22
Grounding	1-22
9. Coin-type Lithium Battery	1-23
Battery Mounting Procedure	1-23
Battery Replacement	1-24
10. DIP Switch Setting.....	1-26
DIP Switch (DIPSW) Setting.....	1-26
11. Serial Connector (CN1)	1-28
Serial Connector for PLC Connection.....	1-28

12. Modular Jack (MJ1/MJ2).....	1-29
Modular Jack 1 (MJ1)/2 (MJ2)	1-29
V-SFT Setting	1-30
Transferring Screen Data.....	1-32
Barcode Reader Connection.....	1-32
13. 10BASE-T (LAN).....	1-33
10BASE-T Connector	1-33
Notes on Wiring	1-34
14. CF Card (CF)	1-35
Recommended CF Card.....	1-35
Mounting and Dismounting the CF Card.....	1-35
Notes on Handling the CF Card.....	1-36
15. Printer Connection (PRINTER).....	1-37
Printer Connector (PRINTER).....	1-37
Connection with Printer through Serial Interface	1-38

Chapter 2 MONITOUCH Operations

1. Operation of V7 Main Menu	2-1
Initial Screen	2-1
1. Main Menu Screen.....	2-2
2. I/O Test	2-4
2-1. Self-loop Test.....	2-5
2-2. Print Check.....	2-8
2-3. SYSTEM & Function Switch Test.....	2-8
2-4. Touch Switch Test.....	2-9
3. Card Menu Screen.....	2-11
3-1. CREC Menu Screen.....	2-12
3-2. Transferring Screen Data from a CF Card	2-15
3-3. Saving Backup Copies of SRAM.....	2-21
3-4. Messages during Data Transfer	2-23
4. Ethernet.....	2-24
5. SRAM/Clock.....	2-27
6. Extension Program Information.....	2-28
7. Extended Function Setting	2-29
2. Function Switches.....	2-30
Types	2-30
[SYSTEM] Switch.....	2-30
3. Errors Displayed on the V7 Series.....	2-32
1. Communication Error	2-32
2. Check.....	2-36
3. Warning.....	2-36
4. SYSTEM ERROR	2-37
5. Touch Switch is Active	2-37

Chapter 3 Serial Communications

1.	1 : 1 Connection	3-1
	1 : 1 Connection.....	3-1
	Wiring.....	3-2
	V-SFT Setting	3-4
2.	1 : n Connection (Multi-drop).....	3-9
	1 : n Connection.....	3-9
	Wiring (RS-422/485)	3-9
	V-SFT Setting	3-10
	Notes on Communication Errors.....	3-10
3.	n : 1 Connection (Multi-link 2).....	3-11
	Multi-link 2.....	3-11
	Wiring.....	3-12
	V-SFT Setting	3-14
	Communication Error.....	3-15
4.	n : 1 Connection (Multi-link).....	3-16
	Multi-link.....	3-16
	Wiring.....	3-17
	V-SFT Setting	3-18
5.	Universal Serial Communications	3-20
	Universal Serial Communications.....	3-20
6.	V-Link	3-21
	V-Link.....	3-21
	Wiring.....	3-22
	V-SFT Setting	3-24
	Protocol.....	3-25
	NAK: Error Codes	3-29
	1-byte Character Code List.....	3-30
7.	PLC2Way	3-31
	PLC2Way.....	3-31
	Limitations on Connection at the MJ Port	3-32
	PLCs Compatible with PLC2Way Connection at MJ Port.....	3-32
	Wiring.....	3-33
	V-SFT Setting – System Setting	3-35
	V-SFT Setting – When the temperature control network/PLC2Way table is used:.....	3-38
	Indirect Memory Designation	3-45
	User Log Read for YOKOGAWA's PLC.....	3-46
	Processing Cycle	3-47
	Notes on Screen Data Transfer	3-48
	System Memory.....	3-49
8.	Temperature Control Network.....	3-52
	Temperature Control Network.....	3-52

Chapter 4 Network Communications

1. Ethernet	4-1
Ethernet	4-1
Notes on Ethernet Communications	4-3
IP Address for the V7 Series.....	4-3
Communication Interface Unit CU-03	4-3
Wiring.....	4-5
Transferring Screen Data.....	4-8
V-SFT Setting (PLC Type/Communication Parameter)	4-10
V-SFT Setting (Network Table Editing).....	4-14
V-SFT Setting (Macro)	4-19
System Memory	4-22
Ethernet Access Functions (HKEtn10.DLL)	4-26
Server Communication Procedure.....	4-44
Error Display	4-45
2. FL-net (OPCN-2).....	4-48
FL-net (OPCN-2).....	4-48
3. MELSECNET/10.....	4-49
MELSECNET/10	4-49
4. CC-Link.....	4-51
CC-Link	4-51
5. OPCN-1	4-52
OPCN-1	4-52
6. T-LINK.....	4-53
T-LINK.....	4-53
7. PROFIBUS-DP	4-54
PROFIBUS.....	4-54

Chapter 5 Connection to PLCs

1. MITSUBISHI PLC.....	5-1
Available PLCs.....	5-1
Communication Setting.....	5-4
A Series Link, QnA Series Link: Switch Setting.....	5-6
Available Memory	5-8
Wiring.....	5-11
A Link + Net10	5-15
V-MDD (Dual Port Interface).....	5-17
Ladder Transfer Function.....	5-18
2. OMRON PLC.....	5-22
Available PLCs.....	5-22
Communication Setting.....	5-24
Available Memory	5-25
Wiring.....	5-26
SYSMAC CS1 DNA	5-29
3. SHARP PLC	5-30
Available PLCs.....	5-30
Communication Setting.....	5-30
JW Series: Link Unit Switch Setting.....	5-31
JW100/70H COM Port, JW20 COM Port: System Memory Setting.....	5-31
Available Memory	5-32
Wiring.....	5-33
4. HITACHI PLC	5-35
Available PLCs.....	5-35
Communication Setting.....	5-36
HIDIC-H: Switch Setting.....	5-37
Available Memory	5-37
Wiring.....	5-39
5. MATSUSHITA PLC	5-41
Available PLCs.....	5-41
Communication Setting.....	5-41
MEWNET: Link Unit Switch Setting	5-42
Available Memory	5-42
Wiring.....	5-43
6. YOKOGAWA PLC	5-45
Available PLCs.....	5-45
Communication Setting.....	5-46
Available Memory	5-47
Wiring.....	5-48
7. YASKAWA PLC.....	5-50
Available PLCs.....	5-50
Communication Setting.....	5-50
Available Memory	5-51
Wiring.....	5-52

8. Toyopuc PLC	5-55
Available PLCs.....	5-55
Communication Setting.....	5-55
Switch Setting	5-55
Available Memory	5-56
Screen Editing (Memory Input)	5-56
Wiring.....	5-57
9. FUJI PLC	5-58
Available PLCs.....	5-58
Communication Setting.....	5-58
MICREX-F Series, FLEX-PC Series: Switch Setting	5-59
Available Memory	5-60
Wiring.....	5-62
10. KOYO PLC.....	5-64
Available PLCs.....	5-64
Communication Setting.....	5-65
Available Memory	5-66
Switch Setting	5-67
Wiring.....	5-69
11. Allen-Bradley PLC.....	5-72
Available PLCs.....	5-72
Communication Setting.....	5-73
Available Memory	5-74
PLC-5 Series: Switch Setting.....	5-76
SLC500 Series, Micro Logix 100: Transmission Parameter Setting	5-78
Wiring.....	5-79
12. GE Fanuc PLC.....	5-82
Available PLCs.....	5-82
Communication Setting.....	5-82
Available Memory	5-83
Wiring.....	5-84
13. TOSHIBA PLC	5-86
Available PLCs.....	5-86
Communication Setting.....	5-86
Available Memory	5-87
Wiring.....	5-87
14. TOSHIBA MACHINE PLC.....	5-88
Available PLCs.....	5-88
Communication Setting.....	5-88
Available Memory	5-88
Wiring.....	5-89
15. SIEMENS PLC.....	5-90
Available PLCs.....	5-90
Communication Setting.....	5-90
Available Memory	5-92
Wiring.....	5-95

16. SHINKO PLC.....	5-98
Available PLCs.....	5-98
Communication Setting.....	5-98
Available Memory	5-98
Wiring.....	5-99
17. SAMSUNG PLC	5-100
Available PLCs.....	5-100
Communication Setting.....	5-100
Available Memory	5-100
Wiring.....	5-101
18. KEYENCE PLC	5-102
Available PLCs.....	5-102
Communication Setting.....	5-103
Available Memory	5-104
Wiring.....	5-106
19. LG PLC.....	5-108
Available PLCs.....	5-108
Communication Setting.....	5-108
Available Memory	5-109
Wiring.....	5-111
20. FANUC PLC	5-113
Available PLCs.....	5-113
Communication Setting.....	5-113
Available Memory	5-113
Wiring.....	5-114
21. FATEK AUTOMATION PLC.....	5-116
Available PLCs.....	5-116
Communication Setting.....	5-116
Available Memory	5-116
Wiring.....	5-117
22. IDEC PLC	5-118
Available PLCs.....	5-118
Communication Setting.....	5-118
Available Memory	5-118
Wiring.....	5-119
23. MODICON PLC	5-120
Available PLCs.....	5-120
Communication Setting.....	5-120
Available Memory	5-120
Wiring.....	5-121
24. YAMATAKE PLC	5-122
Available PLCs.....	5-122
Communication Setting.....	5-122
Available Memory	5-122
Wiring.....	5-123

25. TAIAN PLC	5-124
Available PLCs.....	5-124
Communication Setting.....	5-124
Available Memory	5-124
Wiring.....	5-125
26. SAIA PLC.....	5-126
Available PLCs.....	5-126
Communication Setting.....	5-126
S-BUS Configuration.....	5-126
Available Memory	5-126
Wiring.....	5-127
27. MOELLER PLC.....	5-128
Available PLCs.....	5-128
Communication Setting.....	5-128
Available Memory	5-128
Wiring.....	5-129
28. Telemecanique PLC	5-130
Available PLCs.....	5-130
Communication Setting.....	5-130
Available Memory	5-130
Wiring.....	5-131
29. Automationdirect PLC.....	5-132
Available PLCs.....	5-132
Communication Setting.....	5-132
Available Memory	5-133
Wiring.....	5-133



Hardware Specifications

1. Features
2. Models and Peripheral Equipment
3. System Composition
4. Specifications
5. Dimensions and Panel Cut-out
6. Names and Functions of Components
7. Mounting Procedure
8. Power Supply Cable Connection
9. Coin-type Lithium Battery
10. DIP Switch Setting
11. Serial Connector (CN1)
12. Modular Jack (MJ1/MJ2)
13. 10BASE-T (LAN)
14. CF Card (CF)
15. Printer Connection (PRINTER)

1. Features

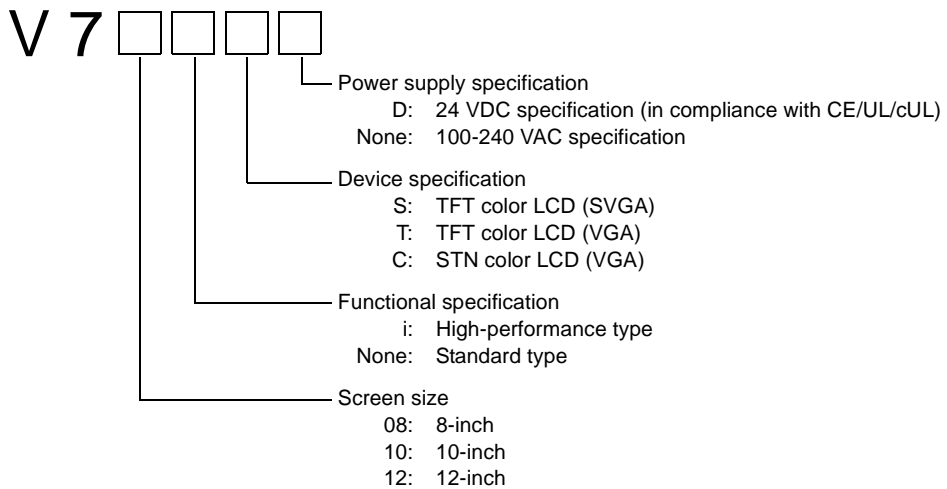
The V7 series inherits and heightens the features of the V6 series as described below.

1. 32k-color Display
32,768-color display makes colorful expression possible. Bitmap files are clearly displayed in brilliant colors.
2. CF Card Interface as Standard
The CF card can be used for saving multiple screen data, sampling data, recipe data, hard copy images, and other various usages. Large-sized video capture images, JPEG or WAV files can be saved.
3. Connector for 10BASE-T (for high-performance type only)
This connector enables Ethernet connection with a host computer. High-speed communications are possible via Ethernet for uploading/downloading screen data and reading/writing data from/to the server.
4. Video Display Upgraded (for high-performance type only, optional)
The video display function is upgraded drastically to allow: saving the current video screen, taking snapshots of multiple exposures, superimposing a semi-transparent operation screen on a video display, showing four video channels at the same time, and so on.
5. Web Server Function (for high-performance type only)
The V7i screens are converted into HTML files and displayed on the WWW browser using the Ethernet.
6. Animation Function
The animation function enables representation of the field close to the real image.
7. Play of WAV File (for high-performance type only, optional)
WAV files can be played with ease simply by connecting the option unit to the speaker. It is possible to use sound for notifying the field conditions, such as an occurrence of an error. The monitoring operator can work from a distance.

2. Models and Peripheral Equipment

MONITOUCH Models

The model name consists of the following information.

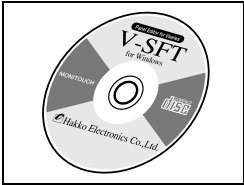


The following models are available.

Series and Size	Model Name	Specifications	Remarks
V708 series 8-inch	V708SD	TFT color, 800 × 600 dots, standard, DC power supply	Compliant with CE/UL/cUL
	V708iSD	TFT color, 800 × 600 dots, high-performance, DC power supply	Compliant with CE/UL/cUL
	V708CD	STN color, 640 × 480 dots, standard, DC power supply	Compliant with CE/UL/cUL
V710 series 10-inch	V710T	TFT color, 640 × 480 dots, standard, AC power supply	
	V710TD	TFT color, 640 × 480 dots, standard, DC power supply	Compliant with CE/UL/cUL
	V710iT	TFT color, 640 × 480 dots, high-performance, AC power supply	
	V710iTD	TFT color, 640 × 480 dots, high-performance, DC power supply	Compliant with CE/UL/cUL
	V710S	TFT color, 800 × 600 dots, standard, AC power supply	
	V710SD	TFT color, 800 × 600 dots, standard, DC power supply	Compliant with CE/UL/cUL
	V710iS	TFT color, 800 × 600 dots, high-performance, AC power supply	
	V710iSD	TFT color, 800 × 600 dots, high-performance, DC power supply	Compliant with CE/UL/cUL
V712 series 12-inch	V712S	TFT color, 800 × 600 dots, standard, AC power supply	
	V712SD	TFT color, 800 × 600 dots, standard, DC power supply	Compliant with CE/UL/cUL
	V712iS	TFT color, 800 × 600 dots, high-performance, AC power supply	
	V712iSD	TFT color, 800 × 600 dots, high-performance, DC power supply	Compliant with CE/UL/cUL

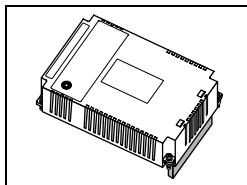
Peripheral Equipment

The following options are available for using the V7 series more effectively.



V-SFT (drawing software: English version)

Application software for editing display data for the V series.
(Windows98/NT4.0/Me/2000/XP compatible) The V7 series is supported with ver. 2.00 and later.

**EU-xx (option unit)**

(* This option unit can only be mounted on the V7i model.)

xx: 00 → Video input + sound output unit

Video images can be displayed on V7i directly. WAV files can be played at an external speaker.

xx: 01 → RGB input + sound output unit

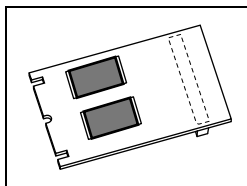
Screen images displayed on a CRT display can be shown on V7i. WAV files can be played at an external speaker.

xx: 02 → RGB output + sound output unit

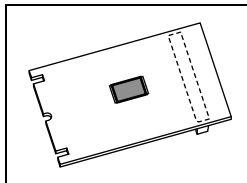
Screen images displayed on V7i can be shown on a CRT display. WAV files can be played at an external speaker.

xx: 03 → Sound output unit

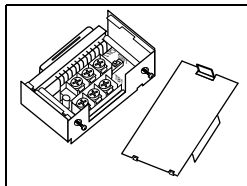
WAV files can be played at an external speaker.

**V7EM-F (FLASH memory cassette)**

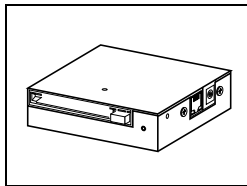
Extension print circuit board to extend the memory for screen data. The capacity of FLASH memory is 8 Mbyte.

**V7EM-S (SRAM cassette)**

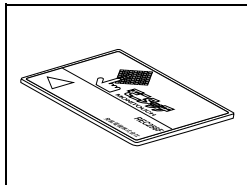
Extension print circuit board to back-up the memory for sampling data, V7 internal memory and memo pad. The capacity of an SRAM cassette is 512 kbyte.

**TC485 (terminal converter)**

Used for connection between the V7 series and a PLC at the RS-422/485 terminal block.

**CREC (card recorder)**

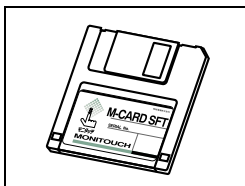
The card recorder creates a backup copy of screen data or works as an external memory storage system for memory manager and data logging functions.

**REC-MCARD (memory card) compliant with JEIDA ver. 4.0**

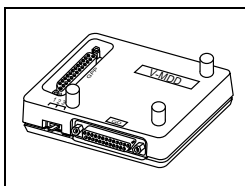
Used with the card recorder when having a backup copy of screen data or saving data on an external medium for memory manager and data logging functions.

SRAM 256 k, 512 k, 1 M, 2 M, 4 Mbyte

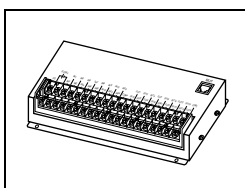
FLASH ROM 256 k, 512 k, 1 M, 2 M, 4 M, 16 Mbyte

**M-CARD SFTE (memory card editor)**

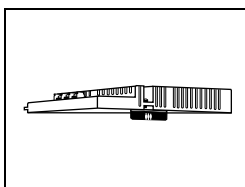
Application software for editing data stored on a memory card.
(Windows98/NT4.0/Me/2000/XP compatible)

**V-MDD (ACPU/QnACPU/FXCPU dual port interface)**

Add-on connector with two ports, specifically designed for the connector on the MITSUBISHI's ACPU/QnACPU/FXCPU programmer. Operability can be improved when directly connecting the V7 series to the ACPU/QnACPU/FXCPU programmer.

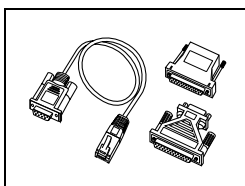
**V-I/O (serial extension I/O)**

Used as an external I/O unit for PLC. It has 16 inputs and 16 outputs.

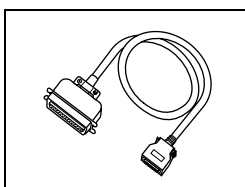


**CU-xx [xx: 00 → OPCN-1, 01 → T-LINK, 02 → CC-Link,
03 → Ethernet/FL-net (OPCN-2), 04 → PROFIBUS-DP,
05 → MELSECNET/10] (communication interface unit)**

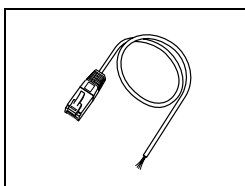
Used for communications with each network. This unit enables connection of multiple V7 series to a single PLC. Since other devices on the same network can be connected, it brings about the reduction in costs of the whole system.

**V6-CP (screen data transfer cable) 3 m**

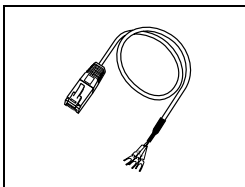
Used for connection between the V7 series and a personal computer, or a personal computer and the card recorder (CREC).

**V7-PT (printer cable) 2.5 m**

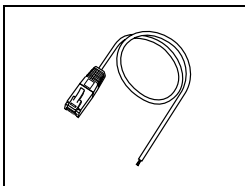
Used for connection between the V7 series and a printer.

**V6-BCD (barcode reader connection cable) 3 m**

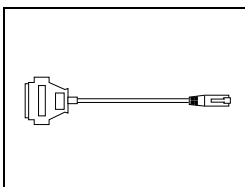
Used for connection between the V7 series and a barcode reader.

**V6-MLT (multi-link 2 master cable) 3 m**

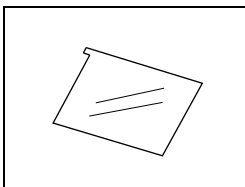
Used for Multi-Link 2 connection between the V7 master station and the V7slave station.

**V6-TMP (temperature controller connection cable) 3 m**

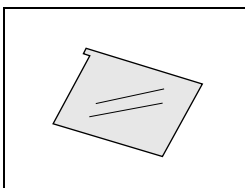
Used for connection between the V7 series and a temperature controller or a PLC via PLC2Way.

**MJ-D25 (MJ-to-D-sub conversion cable) 0.3 m under development**

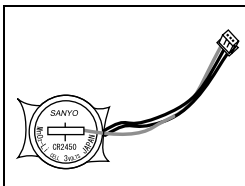
Used for connection between the V7 series and a PLC via PLC2Way.

**V7xx-GS [xx: 08 → V708/V708i, 10 → V710/V710i, 12 → V712/V712i] (protective sheet)**

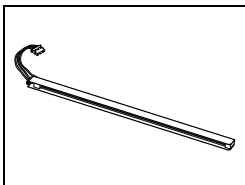
This sheet protects the operation panel surface. (5 sheets/set)

**V7xx-GSN10 [xx: 08 → V708/V708i, 10 → V710/V710i, 12 → V712/V712i] (protective sheet)**

This anti-glare sheet protects the operation panel surface. (5 sheets/set)

**V7-BT (battery for replacement)**

Replacement lithium battery for the V7 series.

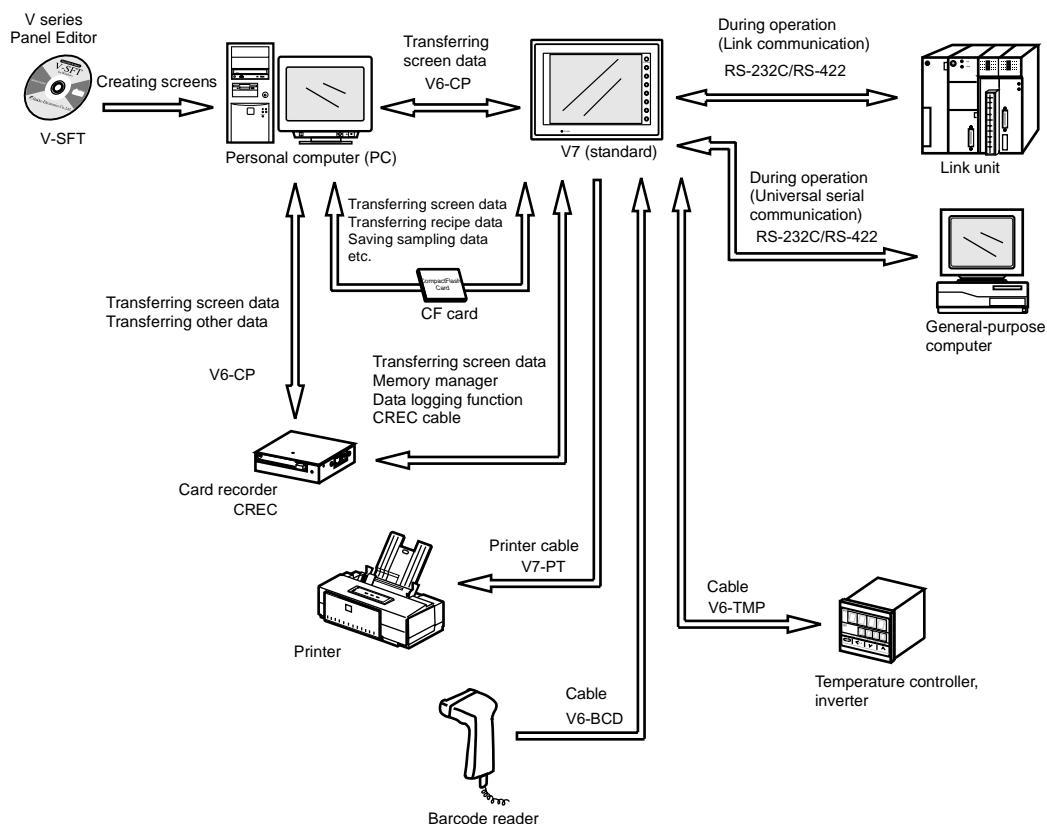
**V708S-FL → V708S/V708iS****V6xxx-FL [xxx: 08C → V708C, 10T → V710T/V710iT, 10S → V710S/V710iS, 12S → V712S/V712iS] (backlight for replacement)**

Replacement backlight parts for the V7 series.

3. System Composition

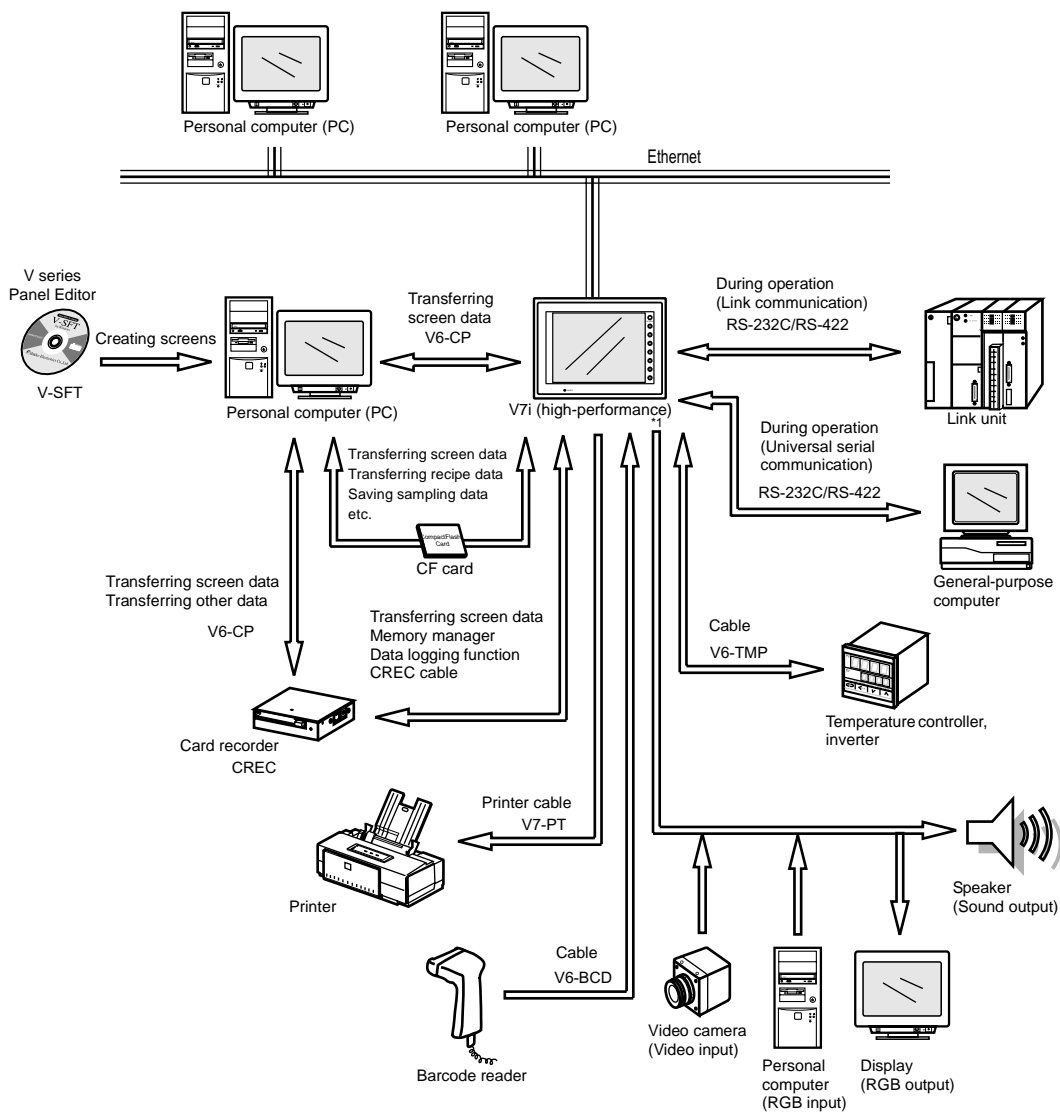
System Composition of V7 (Standard)

The following illustration shows possible system configurations using the V7 series (standard).



System Composition of V7i (High-performance)

The following illustration shows possible system configurations using the V7i series (high-performance).



*1 The option unit (EU-xx) is required.

4. Specifications

General Specifications

Model		V708		V710		V712	
		DC power supply		AC power supply	DC power supply	AC power supply	DC power supply
Power Supply	Rated Voltage	24 VDC		100 - 240 VAC	24 VDC	100 - 240 VAC	24 VDC
	Permissible Range of Voltage	24 VDC ±10%		100 - 240 VAC ±10%	24 VDC ±10%	100 - 240 VAC ±10%	24 VDC ±10%
	Permissible Momentary Power Failure	Within 1 ms		Within 20 ms	Within 1 ms	Within 20 ms	Within 1 ms
	Power Consumption (Maximum Rating)	V708C 15 W or less	V708S/iS 22 W or less	60 VA or less	30 W or less	60 VA or less	30 W or less
	Rush Current	25 A, 0.7 ms		For 100 VAC: 16 A, 6 ms For 200 VAC: 32 A, 7 ms	30A, 1 ms	For 100 VAC: 16 A, 6 ms For 200 VAC: 32A, 7 ms	30 A, 1 ms
	Withstand Voltage	DC external terminals to FG: 500 VAC, 1 minute		AC external terminals to FG: 1500 VAC, 1 minute	DC external terminals to FG: 500 VAC, 1 minute	AC external terminals to FG: 1500 VAC, 1 minute	DC external terminals to FG: 500 VAC, 1 minute
Insulation Resistance		500 VDC, 10 MΩ or above					
Physical Environment	Ambient Temperature	0°C to +50°C					
	Storage Ambient Temperature	-10°C to +60°C					
	Ambient Humidity	85%RH or less (without dew condensation)					
	Solvent Resistance	No cutting oil or organic solvent attached to the unit					
	Atmosphere	No corrosive gas or conductive dust					
Mechanical Working Conditions	Vibration Resistance	Vibration frequency: Single amplitude:		10 to 150 Hz, Acceleration: 9.8 m/s ² (1.0G) 0.075 mm, X, Y, Z: 3 directions for one hour			
	Shock Resistance	Pulse shape: Peak acceleration:		Sine half wave 147 m/s ² (15G), X, Y, Z: 3 directions six times each			
Electrical Working Conditions	Noise Resistance	1500Vp-p (pulse width 1 μs, rising time: 1 ns)					
	Static Electricity Discharge Resistance	Compliant with IEC1000-4-2, contact: 6 kV, air: 8 kV					
Mounting Conditions	Grounding	Grounding resistance: less than 100 Ω					
	Structure	Protection structure: Form: Mounting procedure:		front panel compliant with IP65 (when using gasket) rear case: compliant with IP20 in a body inserted in a mounting panel			
	Cooling System	Cooling naturally					
	Weight (kg)	Unit: approx. 1.5	Unit: approx. 2.4		Unit: approx. 2.7		
	Dimensions W × H × D (mm)	233 × 178 × 66.1		303.8 × 231.0 × 72.0		326.4 × 259.6 × 72.0	
	Panel Cut-out (mm)	220.5 ^{+0.5} ₋₀ × 165.5 ^{+0.5} ₋₀		289.0 ^{+0.5} ₋₀ × 216.2 ^{+0.5} ₋₀		313.0 ^{+0.5} ₋₀ × 246.2 ^{+0.5} ₋₀	
Case Color		Black (Munsell N2.0)					
Material		PC/PS resin (Tarflon)					

Display Specifications

Model Item	V708C	V708S	V708iS	V710T	V710iT	V710S	V710iS	V712S	V712iS
Display Device	STN color LCD	TFT color LCD							
Effective Display Area	7.7-inch	8.4-inch	10.4-inch					12.1-inch	
Colors	128 colors +16-color blinks	32,768 colors +16-color blinks							
Resolution W × H (dots)	640 × 480	800 × 600	640 × 480		800 × 600				
Dot Pitch W × H (mm)	0.246 × 0.246	0.213 × 0.213	0.33 × 0.33		0.264 × 0.264		0.3075 × 0.3075		
Brightness (cd/m ²)	200	350	350		280		350		
Contrast Ratio	25 : 1	250 : 1	300 : 1		300 : 1		350 : 1		
Angle of Vertical Visibility (°)	+40, −30	+35, −55	+45, −55		+35, −45		+40, −45		
Angle of Horizontal Visibility (°)	±50	±50	±70		±50		±55		
Backlight	Cold cathode rectifier (exchangeable by users)								
Backlight Average Life *1	Approx. 40,000 h	Approx. 50,000 h							
Backlight Auto OFF Function	Always ON, random setting								
Contrast Adjustment	Provided *2	Not provided							
Brightness Adjustment	Not provided			3 levels *2					
Surface Sheet	Material: Polycarbonate, 0.3 mm thick								
POWER Lamp	ON when the power is supplied								

*1 When the normal temperature is 25°C, and the surface luminance of the display is 50% of the initial setting.

*2 Adjustable with function switches

Touch Panel Specifications

Item	Specifications
Method	Analog resistance film type
Switch Resolution	1024 (W) × 1024 (H)
Mechanical Life	One million activations or more
Surface Treatment	Hard-coated, anti-glare treatment 5%

Function Switch Specifications

Item	Specifications
Number of Switches	8
Method	Pressure sensitive
Mechanical Life	One million activations or more

Interface Specifications

Item	Specifications
Serial Interface for PLC Connection (D-sub 25-pin, female)	RS-232C, RS-422/485 Asynchronous type Data length: 7, 8 bits Parity: even, odd, none Stop bit: 1, 2 bits Baud rate: 4800, 9600, 19200, 38400, 57600, 76800, 115 kbps
Serial Interface 1, 2 for Screen Data Transfer/External Connection (Modular jack, 8-pin)	RS-232C, RS-422/485 (2-wire connection) CREC, Barcode, V-I/O, Multi-link 2, Temperature control network/PLC2Way, V-link, etc.
Printer Interface for Printer Connection	Compliant with Centronics, half-pitch 36-pin NEC: PR201 EPSON: ESC/P-J84, ESC/P super function, ESC/P24-J84 CBM292/293 printer ^{*1} , HP PCL Level 3 Barcode printer MR400
CF Card Interface	Compliant with CompactFlash TM
10BASE-T for Ethernet Connection (Standard with V7i)	Compliant with IEEE802.3 Baud rate: 10 Mbps Cables: 100 Ω unshielded twist-pair, Category 5, maximum length = 100 m

*1 The CBM292/293 printer cannot print screen hard copies.

Clock and Backup Memory Specifications

Item	Specifications
Battery Specification	Coin-type lithium primary cell
	Battery type: Sanyo CR2450-CN21
Backup Memory	SRAM 64 kbyte
Backup Time Period	5 years (ambient temperature at 25°C)
Battery Voltage Drop Detection	Provided (internal memory allocated)
Calendar Accuracy	Monthly deviation ±90 sec (ambient temperature at 25°C)

Drawing Environment

Item	Specifications
Drawing Method	Exclusive drawing software
Drawing Tool	Name of exclusive drawing software: V-SFT (Ver. 2.00 and later) Personal computer: Pentium II 450 MHz or above recommended OS: Windows98/Me/NT Ver. 4.0/2000/XP Capacity of hard disk required: Free space of approx. 460 Mbyte or more (For minimum installation: approx. 105 Mbyte) Display: Resolution 800 × 600 or above recommended

Display Function Specifications

Item		Specifications				
Display Language*		Japanese	English/ European	Chinese	Chinese (Simplified)	Korean
Characters	1/4-size 1-byte	ANK code	Latin 1	ASCII code	ASCII code	ASCII code
	2-byte 16-dot	JIS #1, #2 level	----	Chinese	Chinese (simplified)	Hangul (without Kanji)
	2-byte 32-dot	JIS #1 level	----	----	----	----
Character Size		1/4-size: 1-byte: 2-byte: Enlarge:	8 × 8 dots 8 × 16 dots 16 × 16 dots or 32 × 32 dots W: 1 to 8 times, H: 1 to 8 times			
Number of Displayable Characters		Resolution	640 × 480		800 × 600	
		1/4-size	80 columns × 60 lines		100 columns × 75 lines	
		1-byte	80 columns × 30 lines		100 columns × 37 lines	
		2-byte	40 columns × 30 lines		50 columns × 37 lines	
Characters Properties		Display properties: Normal, reverse, blink, bold, shadow Colors: 32,768 colors + blink 16 colors (V708C: 128 colors + blink 16 colors)				
Graphics		Lines: Line, continuous line, box, parallelogram, polygon Circles: Circle, arc, sector, ellipse, elliptical arc Others: Tile patterns				
Graphic Properties		Line types: 6 (thin, thick, dot, chain, broken, two-dot chain) Tile patterns: 16 (incl. user-definable 8 patterns) Display properties: Normal, reverse, blink Colors: 32,768 colors + blink 16 colors (V708C: 128 colors + blink 16 colors) Color selection: Foreground, background, boundary (line)				

* Refer to the Reference Manual (Operation) for HK fonts.

Function Performance Specifications

Item		Specifications
Screens		Max. 1024
Screen Memory		Flash memory: Appox. 4,992 kbyte (varies depending on the font)
Switches		768 per screen
Switch Actions		Set, reset, momentary, alternate, to light (Possible to press a function switch and a display switch at the same time)
Lamps		Reverse, blink, exchange of graphics 768 per screen
Graphs		Pie, bar, panel meter and closed area graph: No limitation within 256 kbyte per screen ^{*1} Statistics and trend graphs: Max. 256 per layer ^{*2}
Data Setting	Numerical Data Display	No limitation within 256 kbyte per screen ^{*1}
	Character Display	No limitation within 256 kbyte per screen ^{*1}
	Message Display	Resolution: 640 × 480, max. 80 characters (1-byte) 800 × 600, max. 100 characters (1-byte) No limitation within 256 kbyte per screen ^{*1}
Sampling		Sampling display of buffer data (Constant sample, bit synchronize, bit sample, relay sample, alarm function)
Graphic Library		Max. 1024
Multi-Overlaps		Max. 1024
Data Blocks		Max. 2560
Messages		Max. 6144 lines
Patterns		Max. 1024
Macro Blocks		Max. 1024
Page Blocks		Max. 1024
Direct Blocks		Max. 1024
Screen Blocks		Max. 1024
Data Sheets		Max. 1024
Screen Library		Max. 1024
Animation (Frames)		Max. 1023
Temperature Control Network/ PLC2Way Table		Max. 32
Time Display		Time display function: provided
Hard Copy		Screen hard copy function: provided
Buzzer		Buzzer: provided, 2 sounds (short beep, long beep)
Auto OFF Function		Always ON, random setting
Self-diagnostic Function		Switch self-test function Communication parameter setting check function Communication check function

*1 The number of setting memory locations is limited to 1024 per screen.

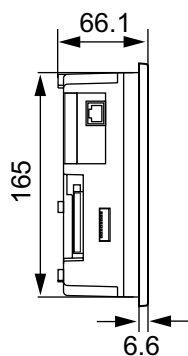
*2 Layer: 4 per screen (base + 3 overlaps)

5. Dimensions and Panel Cut-out

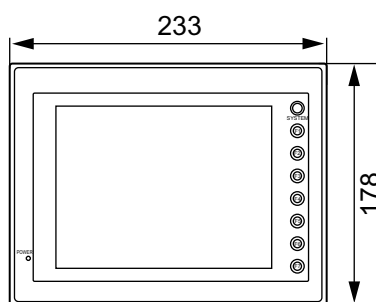
V708/V708i External View and Dimensions

(Unit: mm)

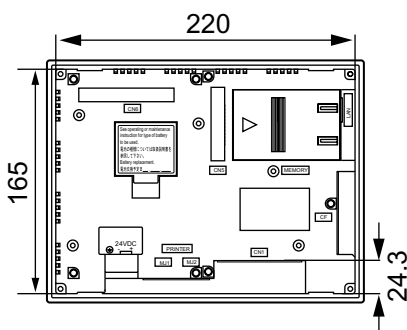
- Side View



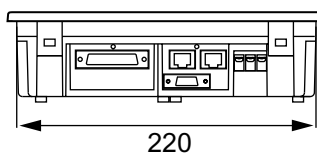
- Front View



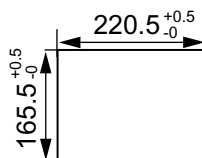
- Rear View



- Bottom View



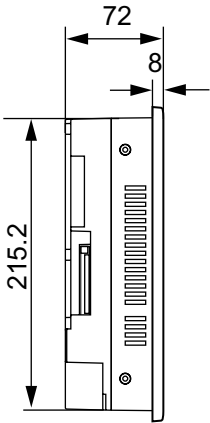
- Panel Cut-out Dimensions



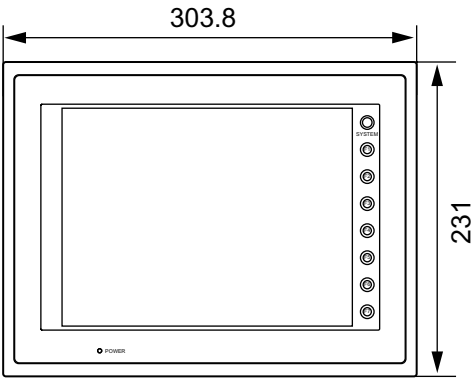
V710/V710i External View and Dimensions

(Unit: mm)

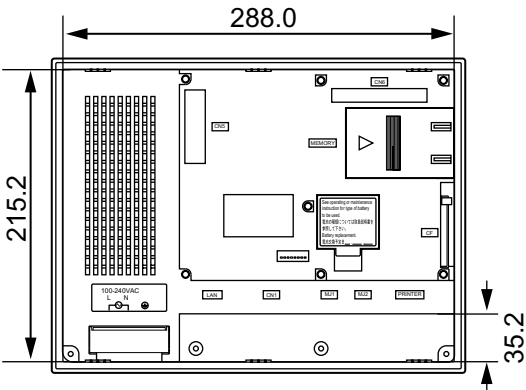
• Side View



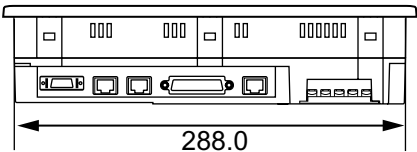
• Front View



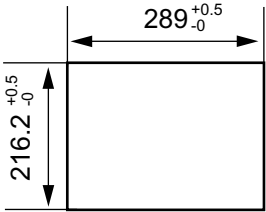
• Rear View



• Bottom View



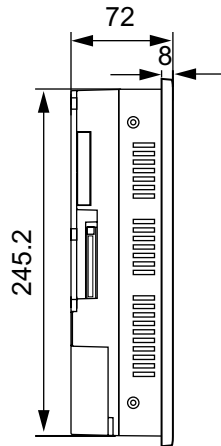
• Panel Cut-out Dimensions



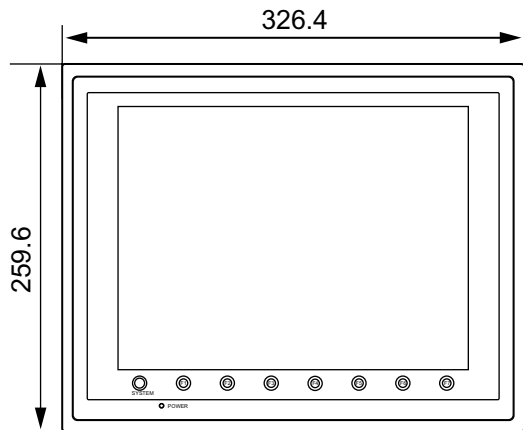
V712/V712i External View and Dimensions

(Unit: mm)

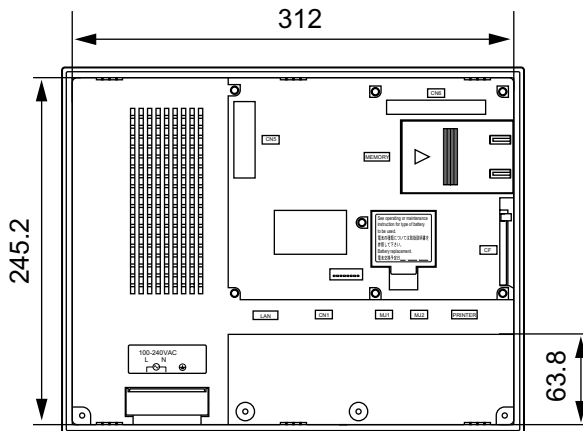
- Side View



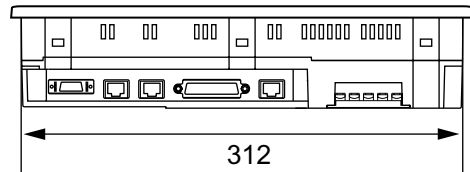
- Front View



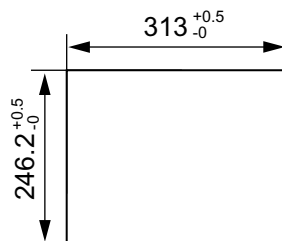
- Rear View



- Bottom View

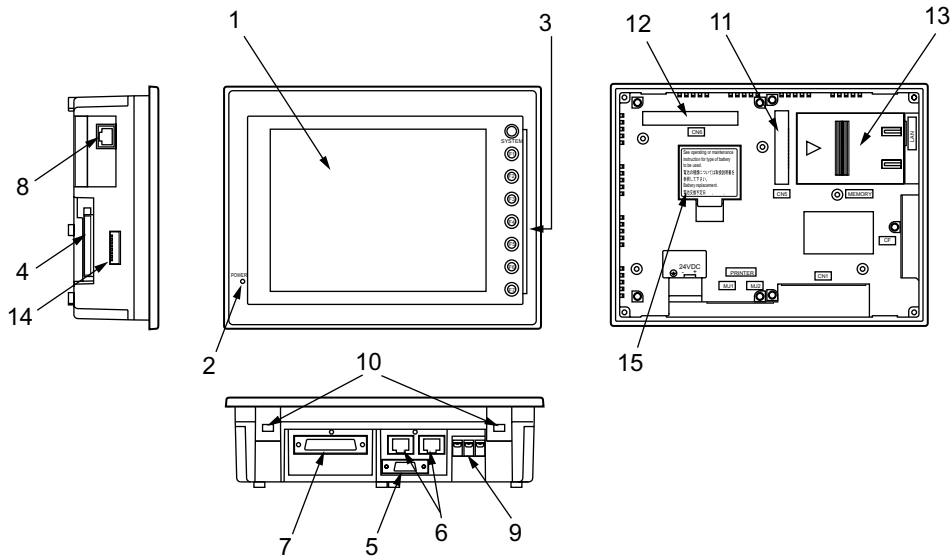


- Panel Cut-out Dimensions

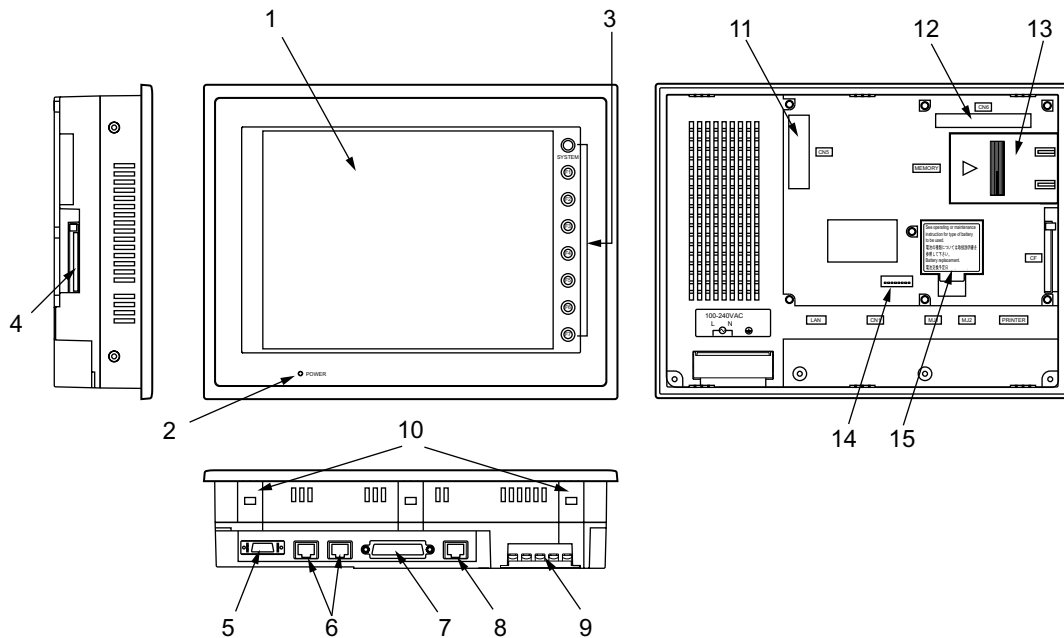


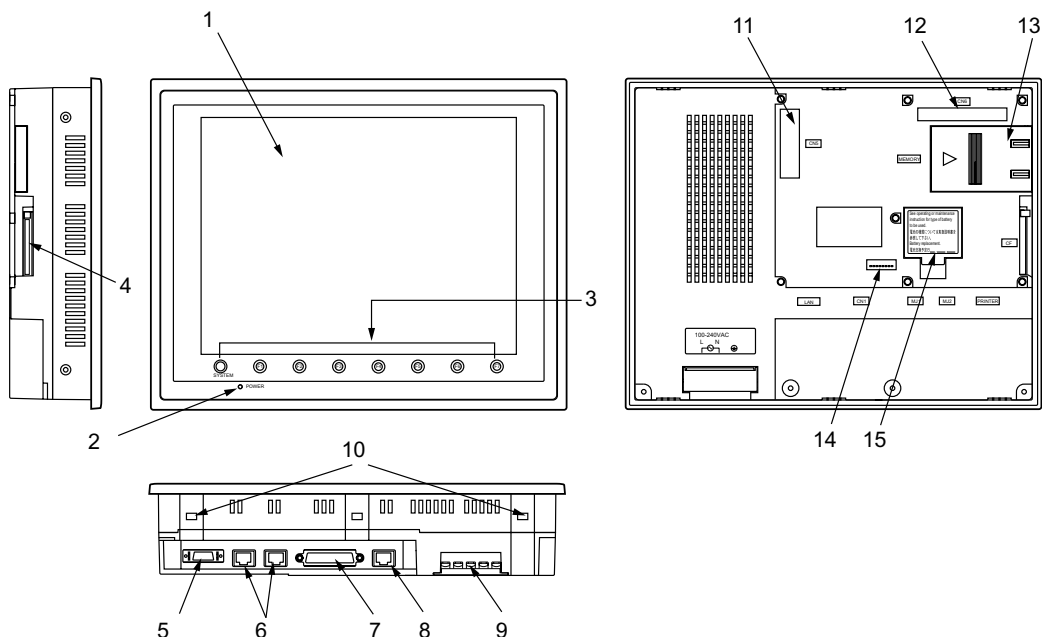
6. Names and Functions of Components

V708/V708i



V710/V710i



V712/V712i

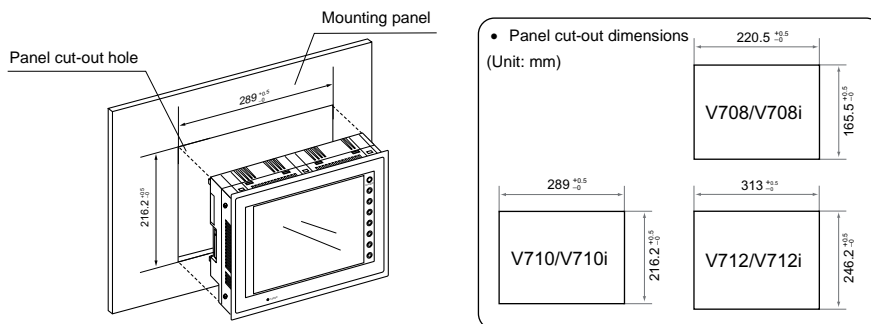
1. Display
This is the display unit.
2. Power Lamp (POWER)
Illuminates (green) when the power is supplied to the V7 series.
3. Function switches
Used for RUN /STOP selection, contrast adjustment, brightness adjustment and backlight ON/OFF (according to the setting). These switches can be used as user switches in the RUN mode.
4. CF card connector (CF)
This is the connector where the CF card is inserted.
5. Printer connector (PRINTER)
Used for printer connection.
6. Modular jack connectors (MJ1, MJ2)
Used for screen data transfer and connection with temperature controller, barcode reader, CREC, etc.
7. PLC communication connector (CN1)
Used for connection between the V7 series and a PLC or an external control unit (computer, custom controller, etc).
8. 10BASE-T connector (LAN) V7i only
Used for Ethernet connection.
9. Power input terminal block
Supplies the power to the V7 series (100 to 240 VAC, 24 VDC)

10. Mounting holes
Used for inserting fixtures when securing the V7 series to the mounting panel.
11. Communication interface unit connector (CN5)
This is the connector where the communication unit (CU-xx, optional) for OPCN-1, T-LINK, CC-Link, Ethernet, FL-net (OPCN-2), PROFIBUS-DP or MELSECNET/10 is mounted.
12. Option unit connector (CN6).....V7i only
This is the connector where the option unit (EU-xx) for video, sound, RGB IN or RGB OUT is mounted.
13. Add-on memory connector (MEMORY)
This is the connector where the optional FLASH memory cassette (V7EM-F) or SRAM cassette (V7EM-S) is mounted.
14. DIP switch
8-bit DIP switch used for setting terminating resistance of the CN1 signal line and the MJ1/MJ2 RS-422/485 signal line.
15. Battery holder
Contains a backup battery for SRAM and clock. When the battery voltage drops, replace the battery with a new one (V7-BT).

7. Mounting Procedure

Mounting Procedure

1. Cut out the mounting panel (max. thick: 5 mm) to match the dimensions shown below.

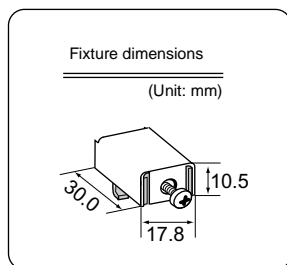


2. Insert four fixtures attached to the V7 series into the mounting holes, and tighten them with the locking screws.

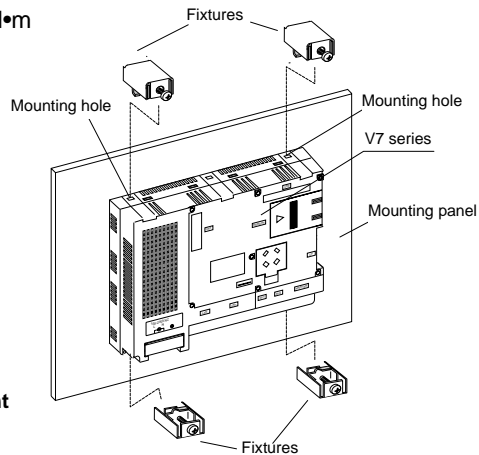
Tightening torque

V708/V708i/V710/V710i: 0.3 to 0.5 N•m

V712/V712i: 0.5 to 0.7 N•m



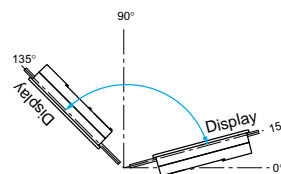
* When the V7 unit is attached to the mounting panel, the fixtures and frame grounds (FG) are connected. To prevent static electricity, be sure to connect the mounting panel to the frame ground.




3. Mount the gasket in contact with the mounting panel so that it will be sandwiched securely between the unit and the mounting plate.

Mounting Angle

Install the unit within the angle of 15° to 135° degrees as shown on the right.



8. Power Supply Cable Connection

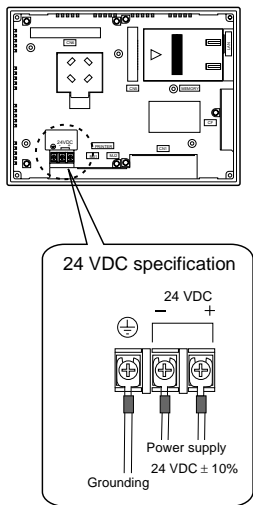
**DANGER**

Electric shock hazard
Shut the power off before connecting the power supply cable.

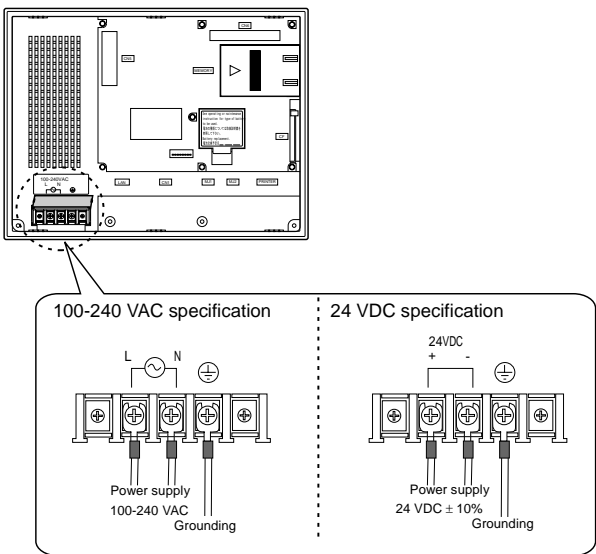
Power Supply Cable Connection

- Connect the power supply cable to the terminal on the backside of the unit.

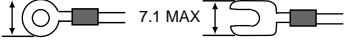
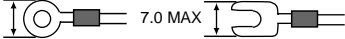
- V708/V708i



- V710/V710i/V712/V712i

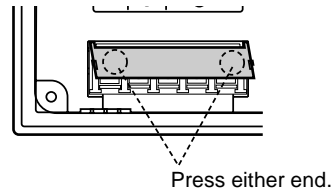
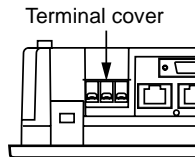


- When connecting the power supply cable, tighten the terminal screws to the following torque.

Model	Terminal Screw	Screw Size	Tightening Torque	Crimp-style Terminal (Unit: mm)
V708/V708i		M3.5	0.5 N•m	7.1 MAX 
V710/V710i/V712/V712i		M4	0.5 N•m	7.9 MAX 

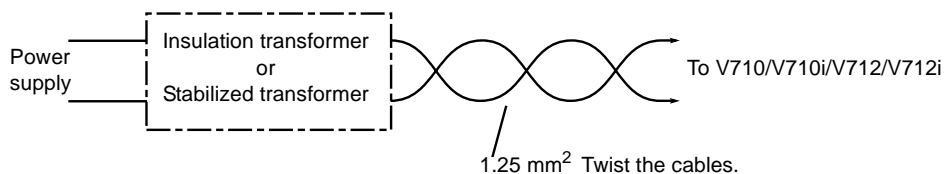
- The power source must be within the allowable voltage fluctuation.
- Use a power source with low noise between the cables or between the ground and the cable.
- Use as thick a power supply cable as possible to minimize drop in voltage.

- Keep cables of 100 VAC and 24 VDC sufficiently away from high-voltage, large-current carrying cables.
- Be sure to attach the terminal cover to the terminal block.
 - For V708/V708i:
Attach the terminal cover (supplied) to the terminal block.
 - For V710/V710i/V712/V712i:
When closing the terminal cover, hold one end of the cover as shown below.



Notes on Usage of 100-240 VAC Specifications

- Generally, an isolating transformer improves noise resistance. However, if the display unit is far away from the secondary port of the transformer and noise gets mixed in, an isolating transformer becomes unnecessary.
- If any power voltage fluctuation caused by noise is expected, it is recommended that a voltage stabilizer (effective in noise resistance) be used.



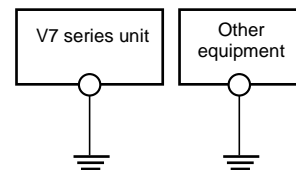
Grounding



CAUTION

Be sure to establish a ground of MONITOUCH. (The level of grounding resistance should be less than 100 Ω.)

- An independent earth pole must be used for MONITOUCH.
- Use a cable which has a nominal cross section of more than 2 mm² for grounding.
- Set the grounding point near the MONITOUCH to shorten the distance of grounding cables.
- When the unit is grounded along with other machines or is grounded to a part of a building, it may be adversely affected.
- If any input-output error occurs due to the grounding, detach the FG terminal (*) from the ground.



* When the V7 unit is attached to the mounting panel, the fixtures and frame grounds (FG) are connected. To detach the FG terminal from the ground, attach the insulating sheet to the fixtures and the mounting panel for insulation.

9. Coin-type Lithium Battery

CAUTION

Be sure to set the battery when using the calendar function or the SRAM cassette. Without a battery, the contents in the SRAM or calendar data will not be retained.

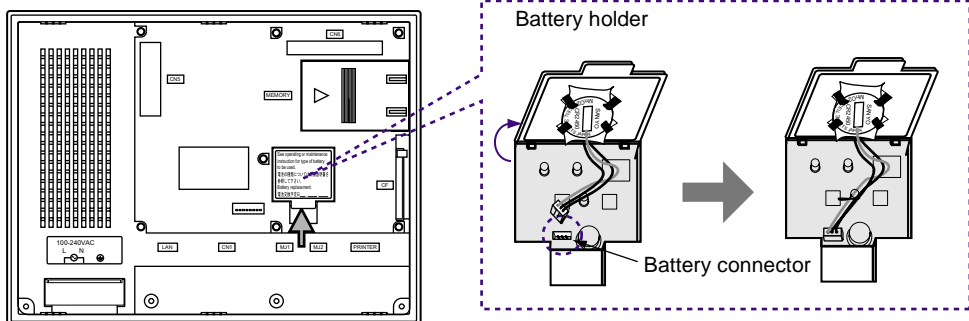
Battery Mounting Procedure

DANGER

Electric shock hazard

Steps 2 to 5 must be performed while the power is not supplied to the V7 unit.

1. A coin-type lithium battery is attached to the battery holder without connection in the backside of the unit before delivery.
2. Turn the unit off. Open the battery holder cover. To open the cover, press the end of the cover in the direction of the arrow as shown in the left illustration below.

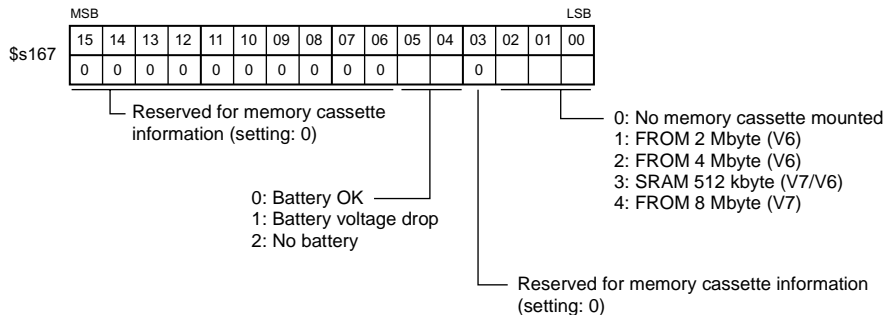


3. Check that the battery is securely attached to the backside of the cover, and connect the battery connector.
4. Close the battery holder cover.
5. Enter a date five years from now for "Battery Replacement" on the sticker on the battery holder.

* The battery status is output to the internal memory \$s167 of the V7 series. If the battery voltage drops before five years has elapsed, replace the battery immediately.

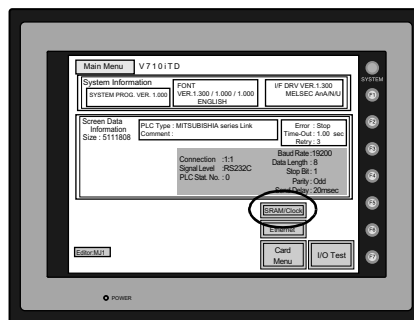


Enter a date five years from now.



6. Check that the battery is correctly connected on the Main Menu screen.

When the battery is not connected, the [SRAM/Clock] switch blinks and the message "Battery not set" is displayed at the bottom left corner. When the battery is correctly connected, the [SRAM/Clock] switch goes out and the message is cleared. When the battery voltage has dropped, the message "Brownout Battery" is displayed.



Battery Replacement

Safety Instructions on Handling the Battery

Lithium batteries contain combustible material such as lithium or organic solvent. Mishandling may cause heat, explosion or ignition resulting in fire or injury. To prevent accidents, pay attention to the following cautions when handling the lithium battery.

CAUTION


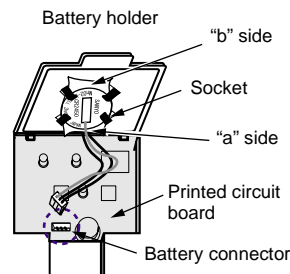
- Be sure to discharge static electricity from your body before battery replacement.
- Use the battery "V7-BT" (replacement battery for the V7 series) for replacement.
- Rough handling of the battery may cause a fire or chemical burn hazard.
- Do not disassemble, incinerate or heat the battery above 212°F.
- Observe the local and governmental regulations when disposing of waste batteries.
- Keep batteries out of reach of children (If swallowed, immediately consult a doctor.)
- Never re-charge the battery.
- When the battery leaks or smells, the leaking battery electrolyte may catch a fire. Keep from heat or flame.

Battery Replacement Procedure

Replacement batteries are available from Hakko Electronics.

Name	Type	Contents
Replacement battery for the V7 series	V7-BT	<ul style="list-style-type: none"> Coin-type lithium primary cell (Sanyo) 1 pce Cautions sticker 1 pce

- Replace the battery "V7-BT" within three minutes after the V7 unit is turned off. If it is not possible to replace within three minutes, use the V-SFT editor (cable: V6-CP) or a CF card and make a backup copy of data in the SRAM cassette.
 - When using the V-SFT editor:
 - Start the V-SFT editor.
 - Click the [Transfer] icon. The [Transfer] dialog is displayed.
 - Select [Display] for [Transfer Device], and [SRAM Data] for [Transfer Data]. To save a backup copy from the V-SFT editor on the server via Ethernet, check [Transfer through Ethernet/IP Address of the V7 Equipped with SRAM]. Keep [Use Simulator] and [Read Comments in Data Transfer] unchecked.
 - Click the [PC ←] under [Transfer Mode].
 - Save the read data in the "*.RAM" file.
 - When using a CF card:

For the backup procedure with a CF card, refer to "Chapter 2 MONITOUCH Operations."
- Turn the unit off, and open the battery holder. A battery is set at the socket.
- Unplug the battery connector, and remove the battery from the socket. When removing the battery, push the center of the battery holder cover as shown on the right.
 
- Set a new battery. Hold the battery with its red cable side (marked with SANYO) facing towards the printed circuit board and the cable hanging down, and insert the battery into the socket. Insert the battery in the "a" side first, and push it down to "a" while inserted in the "b" side.
 
- Plug the battery connector and close the battery holder cover.
- Remove the existing caution sticker. Enter a date five years from now for "Battery Replacement" on the new caution sticker, and attach it to the backside of the V7 unit.
- When a RAM file is saved in step 1, turn the V7 unit on and load the RAM file to the unit.

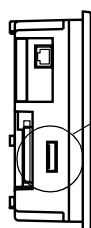
10. DIP Switch Setting

DIP Switch (DIPSW) Setting

Set the terminating resistance for RS-422/485 connection with the DIP switch. When setting the DIP switch, turn the power off.

- For V708/V708i:

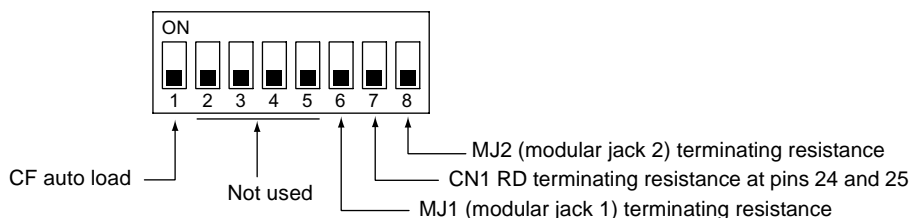
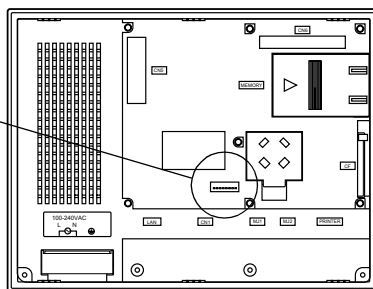
Side View



DIP switch

- For V710/V710i/V712/V712i:

Rear View



* Set DIPSW2 to 5 (not used) to the OFF position.

Terminating Resistance Setting (DIPSW6, 7, 8)

- When connecting the PLC at CN1 via RS-422/485 interface, set DIPSW7 to the ON position.
- For the following connections at modular jack 1 (2), set DIPSW 6 (DIPSW8) to the ON position.
 - Master station for multi-link 2 connection
 - Temperature controller network/PLC2Way connection via RS-485
 - Connection with the card recorder CREC (optional)
 - Connection with the serial extension I/O V-I/O (optional)
 - Connection to the V7 unit at the termination of V-link connection via RS-485

CF Auto Load (DIPSW1)

A screen data file saved on a CF card can be auto-loaded as described below.

1. Transfer screen data from the computer to a CF card. (Refer to the Reference Manual for more information.)
2. Set DIPSW1 in the ON position, and insert the CF card that contains the screen data file.
3. Turn the V7 unit on. The screen data is automatically loaded into the FLASH memory of the unit.

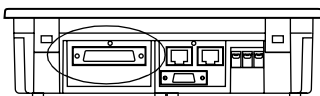
11. Serial Connector (CN1)

Serial Connector for PLC Connection

- To communicate with the PLC (RS-232C, RS-422/485), connect the cable to the serial connector (CN1) at the bottom of the V7 unit.

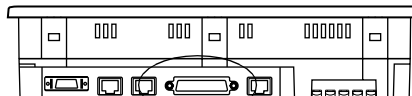
- For V708/V708i:

Bottom View

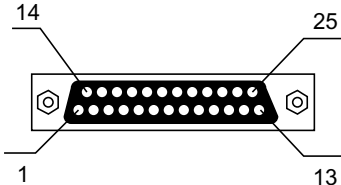


- For V710/V710i/V712/V712i:

Bottom View



- The serial connector pins correspond to signals as given below.

CN1 (D-sub 25-pin, female)	Pin No.	Signal Name	Contents
	1	FG	Frame ground
	2	SD	RS-232C send data
	3	RD	RS-232C receive data
	4	RS	RS-232C request to send
	5	CS	RS-232C clear to send
	6		Not used
	7	SG	Signal ground
	8		Not used
	9	+5V	Use prohibited
	10	0V	Use prohibited
	11		Not used
	12	+SD	RS-422 send data (+)
	13	-SD	RS-422 send data (-)
	14	+RS	RS-422 RS send data (+)
	15		Not used
	16		Not used
	17	-RS	RS-422 RS send data (-)
	18	-CS	RS-422 CS receive data (-)
	19	+CS	RS-422 CS receive data (+)
	20		Not used
	21	-	Use prohibited (V708: not used)
	22	-	Use prohibited (V708: not used)
	23		Not used
	24	+RD	RS-422 receive data (+)
	25	-RD	RS-422 receive data (-)

- The following connector is recommended.

DDK-make 17JE23250-02 (D8A)

D-sub 25-pin, female, metric thread, with hood

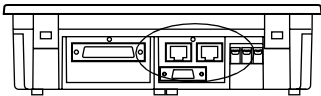
12. Modular Jack (MJ1/MJ2)

Modular Jack 1 (MJ1)/2 (MJ2)

1. This is a modular connector used for connection for screen data transfer, temperature controller, barcode reader, card recorder (CREC) or serial extension I/O (V-I/O).

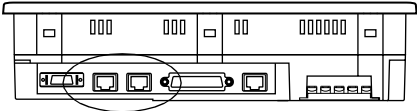
- For V708/V708i:

Bottom View

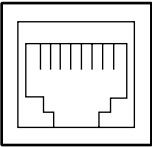


- For V710/V710i/V712/V712i:

Bottom View



2. Pins of modular jacks 1 and 2 correspond to signals as given below.

MJ1/2	Pin No.	Signal Name	Contents
	1	+SD/RD	RS-485 + data
	2	-SD/RD	RS-485 - data
	3	+5V	Externally supplied +5 V MAX 150 mA
	4	+5V	
	5	SG	Signal ground
	6	SG	
	7	RD	RS-232C receive data
	8	SD	RS-232C send data

V-SFT Setting

1. The use of modular jacks 1 and 2 can be set on the V-SFT editor.
2. Select [Modular] from the [System Setting] menu. The [Modular Jack] dialog is displayed. Select the use of modular jacks 1 and 2 from the following options.

Modular Jack 1

[Editor Port]^{*1}
 [Memory Card]^{*2}
 [Barcode]^{*3}
 [V-I/O]^{*4}
 [Multi-Link]^{*5}
 [Temp. CTRL/PLC2Way]^{*6}
 [V-Link]^{*7}
 [Touch Switch]^{*8}
 [Ladder Tool]^{*9}
 [Modbus Slave]^{*10}
 [Printer (Serial Port)]^{*11}

Modular Jack 2

[Not used]
 [Memory Card]^{*2}
 [Barcode]^{*3}
 [V-I/O]^{*4}
 [Multi-Link]^{*5}
 [Temp. CTRL/PLC2Way]^{*6}
 [V-Link]^{*7}
 [Touch Switch]^{*8}
 [Ladder Tool]^{*9}
 [Modbus Slave]^{*10}
 [Serial Printer (Serial Port)]^{*11}

*1 Refer to the next section "Transferring Screen Data."

*2 Select this option when connecting the card recorder (CREC).

*3 Refer to the next section "Barcode Reader Connection."

*4 Select this option when connecting the serial extension I/O (V-I/O).

*5 Select this open when "Multi-link 2" is selected for [Connection] and "1" is set for [Local Port] on the [Comm. Parameter] dialog.

*6 Select this option when connecting the temperature controller network or PLC2Way.

*7 Select this option for V-Link connection.

*8 Refer to "EU-01 (RGB input + sound output unit)."

*9 Select [Ladder Tool] when using the ladder transfer function with MITSUBISHI's QnH CPU port (Q mode) selected for the PLC type.

*10 Select this option for Modbus slave connection.

*11 Select this option when connecting the printer with serial interface. Refer to page 1-37.

3. Do not select [Multi-link] and [Temp. CTRL/PLC2Way] for [Modular Jack 1/2] at the same time.

• Combination of MJ1 and MJ2 Functions

O: Usable at the same time, Δ: Usable from system program Ver. 1.010, ×: Not usable at the same time

MJ2 \ MJ1	Multi-Link 2	CREC	Barcode	V-I/O	Temp. CTRL/PLC 2Way	V-Link	Touch Switch	Ladder Tool	Printer (Serial Port)
Multi-Link 2		O	O	O	Δ	O	O	×	O
CREC	O		O	O	O	O	O	O	O
Barcode	O	O		O	O	O	O	O	O
V-I/O	O	O	O		O	O	O	O	O
Temp. CTRL/PLC 2Way	Δ	O	O	O		O	O	O	O
V-Link	O	O	O	O	O		O	O	O
Touch Switch	O	O	O	O	O	O		O	O
Ladder Tool	×	O	O	O	O	O	O		O
Printer (Serial Port)	O	O	O	O	O	O	O	O	

Supplemental Remark: Multi-link communication and temperature control network/PLC2Way can be used at the same time.

• Combination of Communication Unit (CU-xx) and Modular Jack Function

O: Usable at the same time, ×: Not usable at the same time

Communication Unit \ MJ		Multi-Link 2	CREC	Barcode	V-I/O	Temp. CTRL/PLC 2Way	V-Link	Touch Switch	Ladder Tool	Printer (Serial Port)	Built-in Ethernet
CU-00	OPCN-1	×	O	O	O	O	O	O	O	O	O
CU-01	T-LINK	×	O	O	O	O	O	O	O	O	O
CU-02	CC-Link	×	O	O	O	O	O	O	O	O	O
CU-03	Ethernet (FL-net)	Δ *1	O	O	O	O	O	O	O	O	×
CU-04	PROFIBUS-DP	×	O	O	O	O	O	O	O	O	O
CU-05	MELSECNET/10	×	O	O	O	O	O	O	O	O	O

*1 This is not possible when the V7 series and the PLC are connected via Ethernet.

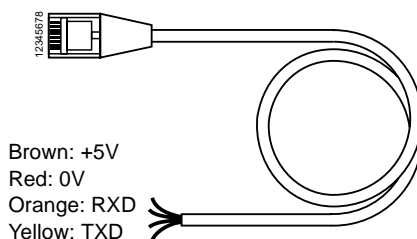
Transferring Screen Data

- Use modular jack 1 (MJ1) when transferring screen data.
- When [Editor Port] is selected for [Modular Jack 1] on the V-SFT editor, it is possible to transfer data in the RUN mode because the RUN/STOP mode (on the Main Menu screen) can be automatically selected. Also RUN/STOP mode is automatically selected for on-line editing and simulation.
- When an option other than [Editor Port] is selected for [Modular Jack 1], select the STOP mode (on the Main Menu screen) and transfer screen data. Simulation or on-line editing is not available.
- When transferring screen data, use Hakko Electronics' data transfer cable (V6-CP) 3 m to connect the V7 series to a personal computer.

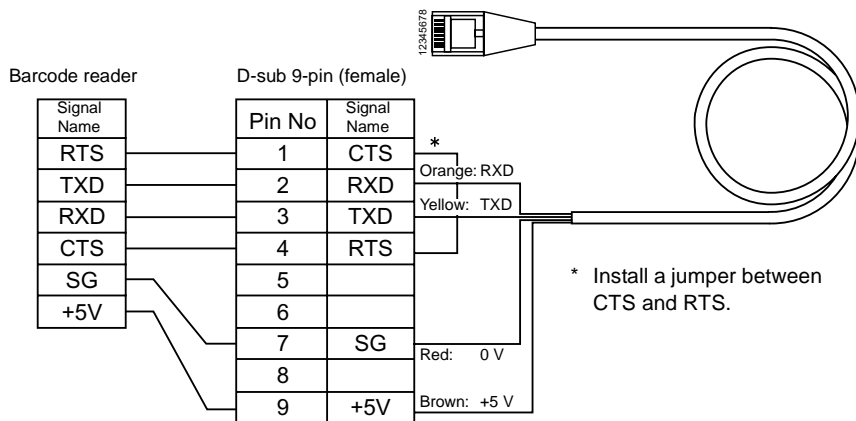
Barcode Reader Connection

- It is possible to receive the signal from a barcode reader by connecting the barcode reader at the modular jack (MJ1/2) of the V7 series.
- To connect a barcode reader to the modular jack (MJ1/2), use Hakko Electronics' optional cable (V6-BCD).

Length: 3 m
with modular plug



- Notes on Connection
 - In the case of barcode readers with CTS and RTS control, it may be necessary to install a jumper to RTS and CTS. Otherwise the barcode reader may not work correctly.
 - The external power supply (+5 V) is max. 150 mA. (Refer to page 1-29.)
- When using the barcode reader that was connected to V4 (MONITOUCH's old version), connect it to the D-sub 9-pin female connector using the V6-BCD cable as shown below.



13. 10BASE-T (LAN)

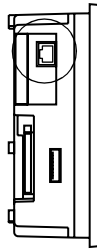
The connector for 10BASE-T is provided as standard on V7i (high-performance). To connect Ethernet with V7 (standard), use the communication unit "CU-03." If CU-03 is attached to V7i, it has priority over the built-in 10BASE-T; 10BASE-T cannot be used.

10BASE-T Connector

- Use this connector for Ethernet connection.

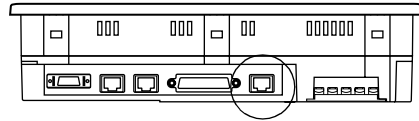
- For V708i:

Side View



- For V710i/V712i:

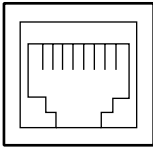
Bottom View



CAUTION

MJ1/2 and LAN connector are 8-pin modular jacks. Check the name plate and insert the connector in the correct position.

- The LAN (10BASE-T) pins correspond to signals as given below.

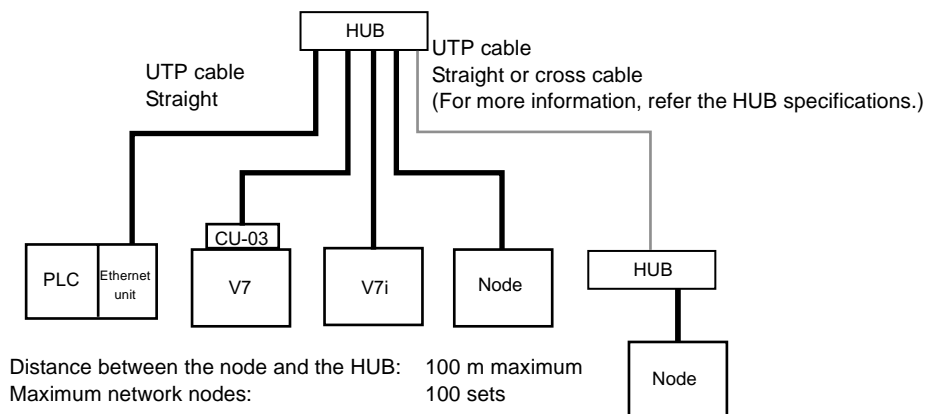
LAN	Pin No.	Signal Name	Contents
	1	TX+	Ethernet send signal (+)
	2	TX-	Ethernet send signal (-)
	3	RX+	Ethernet receive signal (+)
	4	NC	Not used
	5	NC	Not used
	6	RX-	Ethernet receive signal (-)
	7	NC	Not used
	8	NC	Not used

Notes on Wiring



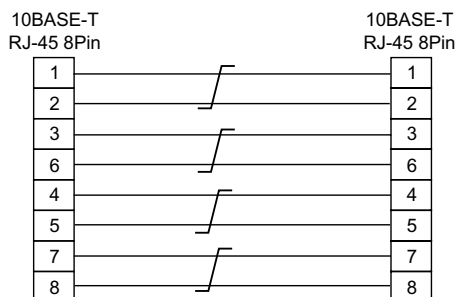
CAUTION

When using the LAN port, keep the LAN cable away from the power supply cable as much as possible.



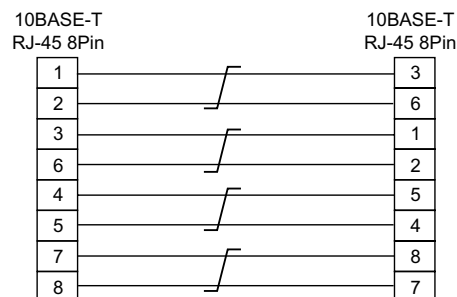
Cable Connection Diagram

Straight cable (with HUB)



* Unshielded twist-pair cable

Cross cable (without HUB)



* Unshielded twist-pair cable

Notes on Cables

Use the following recommended cable.

Recommended cable (10BASE-T)

Type: Twist-pair cable, category 5

14. CF Card (CF)

Recommended CF Card

CF cards in compliance with CompactFlash™ can be used. The following card is recommended.

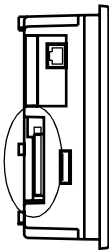
Manufacturer	Type	Capacity
TDK	TC032HS	32 MB
Kodak	KPCN-32	32 MB
SanDisk	SDCFB-64-505	64 MB
I-O Data Device	PCCF-H128MS	128 MB
	PCCF-xxxMS (xxx: 16, 32, 48, 64, 96, 128, 192)	16 to 192 MB

Mounting and Dismounting the CF Card

1. The CF card interface is provided on the side of the unit.

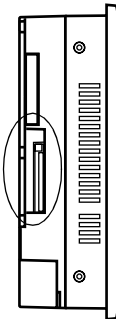
- For V708/V708i:

Side View

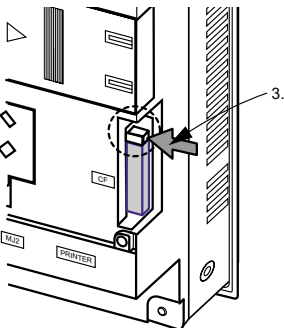
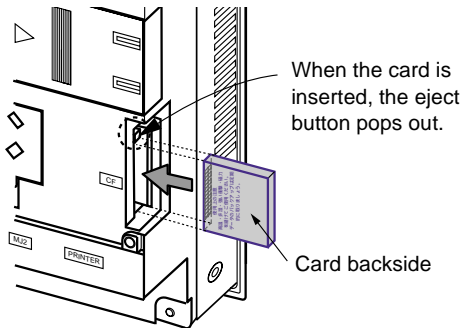


- For V710/V710i/V712/V712i:

Side View



2. Insert the card securely into the interface with the card backside outwards viewed from the rear of the unit as shown below.



3. To remove the card, press the eject button. The card pops out.



Notes on Handling the CF Card

1. Do not insert or remove the CF card during access. Doing so may destroy data on the CF card. The CF card can be inserted or removed safely when the Main Menu screen is displayed. However, if the [Card Menu] switch is pressed on the Main Menu screen and the CF card operation screen is displayed, it is not possible to insert or remove the CF card. Before mounting or removing the CF card, be sure to check that the CF card is not being accessed.
2. Do not turn the power off or on during access to the CF card.
3. Make a backup copy of the CF card at regular intervals.
4. If a disk error occurs and data read/write operation is disabled, perform a scan disk on Windows and try to restore the disk. If not restored, initialize the CF card. (For information on scan disk and Windows operations, refer to the manual for Windows.)
5. The number of writing times per CF card is limited (approx. 300,000 times). Consequently, frequent writing at short intervals may shorten service life of the CF card. To use the CF card for saving sampling data, check the setting for sampling time. Also, avoid repeated writing using a CYCLE macro command.

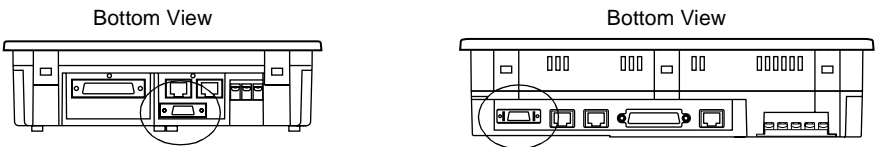
15. Printer Connection (PRINTER)

When the V7 series is connected to a printer, a screen hard copy, data sheet or sampling data can be printed. To connect a printer with parallel interface, insert the cable into the printer connector (PRINTER); to connect a printer with serial interface, insert the cable into a modular jack (MJ1/MJ2).

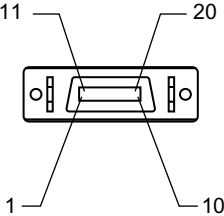
CAUTION Be sure to turn the printer off when the V7 unit is turned off.

Printer Connector (PRINTER)

- This is the printer connector for parallel interface.
 - For V708/V708i:
 - For V710/V710i/V712/V712i:

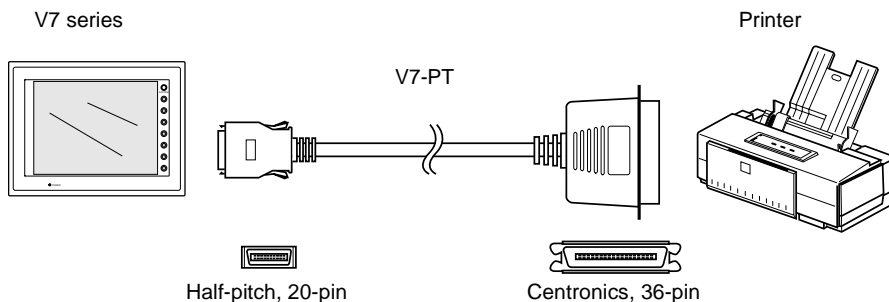


- The printer interface pins correspond to signals as given below.

PRINTER (half-pitch 20-pin)	Pin No.	Signal Name	Contents
	1	STB#	Strobe
	2	PD0	Data 0
	3	PD1	Data 1
	4	PD2	Data 2
	5	PD3	Data 3
	6	PD4	Data 4
	7	PD5	Data 5
	8	PD6	Data 6
	9	PD7	Data 7
	10	GND	
	11	BUSY#	Busy
	12	GND	
	13	SELECT	
	14	INTP#	INP PROME#
	15	PFAT#	FAULT#
	16	GND	
	17	GND	
	18	P+5V	PRN+5
	19	GND	
	20	GND	

Connecting Cable

- To connect the V7 series to a printer, use Hakko Electronics' printer cable "V7-PT" 2.5 m for 20-pin parallel interface.



Compatible Printer Models

Control code system:

- NEC PC-PR201 series compatible with MS-DOS computer
- EPSON ESC/P24-J84, ESC/P-J84, ESC/super function compatible with MS-DOS computer
- CBM292/293 CBM's line thermal printer (Screen hard copying is not possible.)

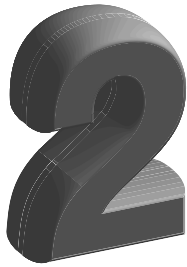
Barcode printers:

(It is not possible to print a screen hard copy, data sheet or sampling data.)

- MR400 Sato's barcode printer "MR400 series"

Connection with Printer through Serial Interface

- To connect a printer through serial interface, connect the cable to a modular jack (MJ1/MJ2).
- Refer to the specification sheet of the printer to be used for the connecting cable for serial interface. For information on MJ1/MJ2 signals, refer to page 1-29.
- When two printers are connected through parallel interface and serial interface, the one connected to MJ1/MJ2 (refer to page 1-29 for the setting) takes precedence.
- Printer models and available print functions are the same as those for parallel interface.



MONITOUCH

Operations

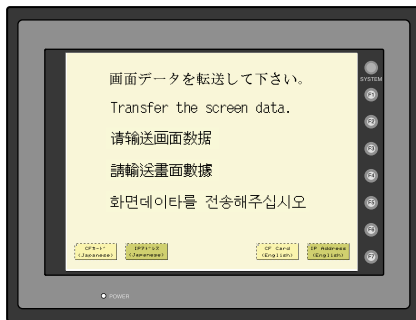
1. Operation of V7 Main Menu
 - Initial Screen
 - 1. Main Menu Screen
 - 2. I/O Test
 - 3. Card Menu Screen
 - 4. Ethernet
 - 5. SRAM/Clock
 - 6. Extension Program Information
 - 7. Extended Function Setting
2. Function Switches
 - Types
 - [SYSTEM] Switch
3. Errors Displayed on the V7 Series
 - 1. Communication Error
 - 2. Check
 - 3. Warning
 - 4. SYSTEM ERROR
 - 5. Touch Switch is Active

1. Operation of V7 Main Menu

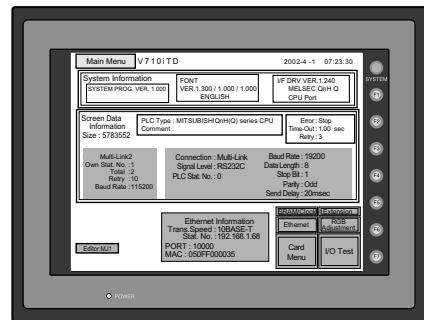
Initial Screen

When the power of MONITOUCH is turned on for the first time, the Main Menu screen shown below on the left is displayed.

Initial screen displayed when power is turned on for the first time



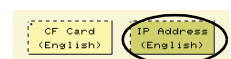
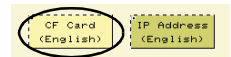
Main Menu screen after transferring screen data



Transferring Screen Data for the First Time

There are four methods for transferring screen data for the first time.

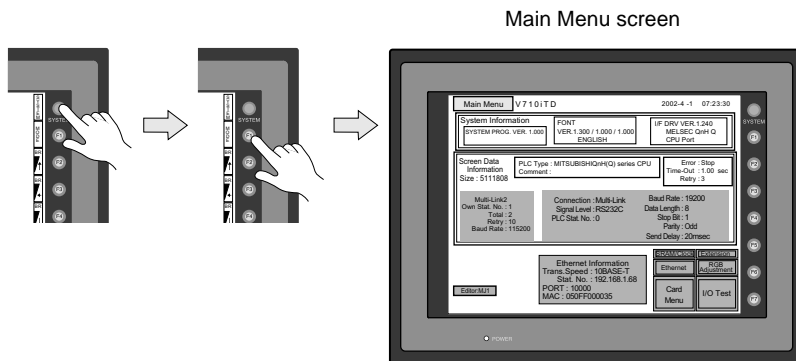
- Transferring screen data via the V6-CP cable
Transfer screen data while the initial screen is displayed.
- Transferring screen data using the CF card or the memory card and the card recorder (CREC)
 - 1) Connect the personal computer with the card recorder and save screen data on the memory card.
 - 2) Insert the CF card into the V7 unit or connect the card recorder and insert the memory card into the card recorder.
 - 3) Press the [CF Card (English)] switch. The "Card Menu" screen is displayed.
 - 4) Follow the instructions as described in "Card Menu Screen" (page 2-11) and transfer screen data.
- Transferring screen data via Ethernet
 - 1) Press the [IP Address (English)] switch.
 - 2) The "Ethernet" screen is displayed.
 - 3) Follow the instructions as described in "Ethernet" (page 2-24) and set the IP address.
 - 4) Press the [Setting Finished] switch. The initial screen displayed again.
 - 5) Transfer screen data from the computer via Ethernet.



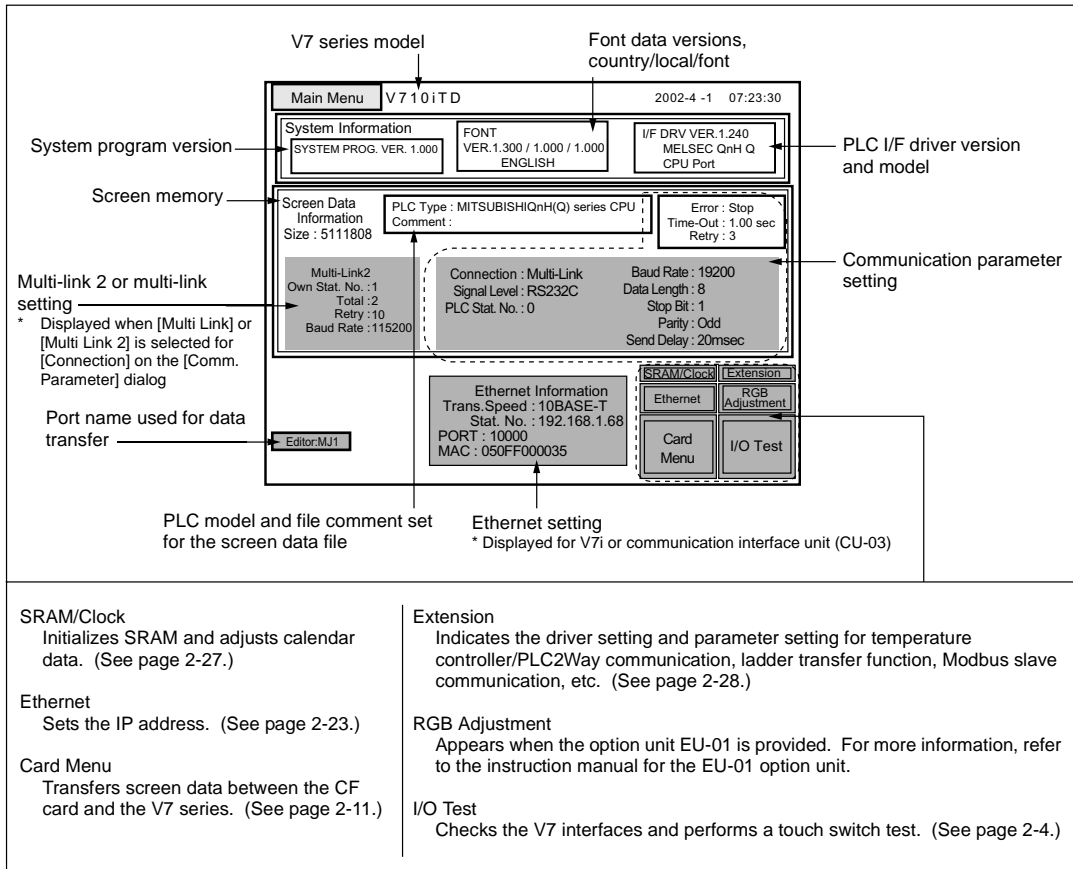
- Auto-uploading screen data from the CF card to the V7 unit
 - 1) Transfer screen data from the computer to a CF card.
 - 2) Turn the V7 unit off. Set the DIPSW1 on the V7 unit to the ON position, and insert the CF card.
 - 3) Turn the V7 unit on. The screen data is automatically uploaded from the CF card to the V7 unit.

1. Main Menu Screen

- To bring up the Main Menu screen in the RUN mode, press the [SYSTEM] switch and the [F1] switch.

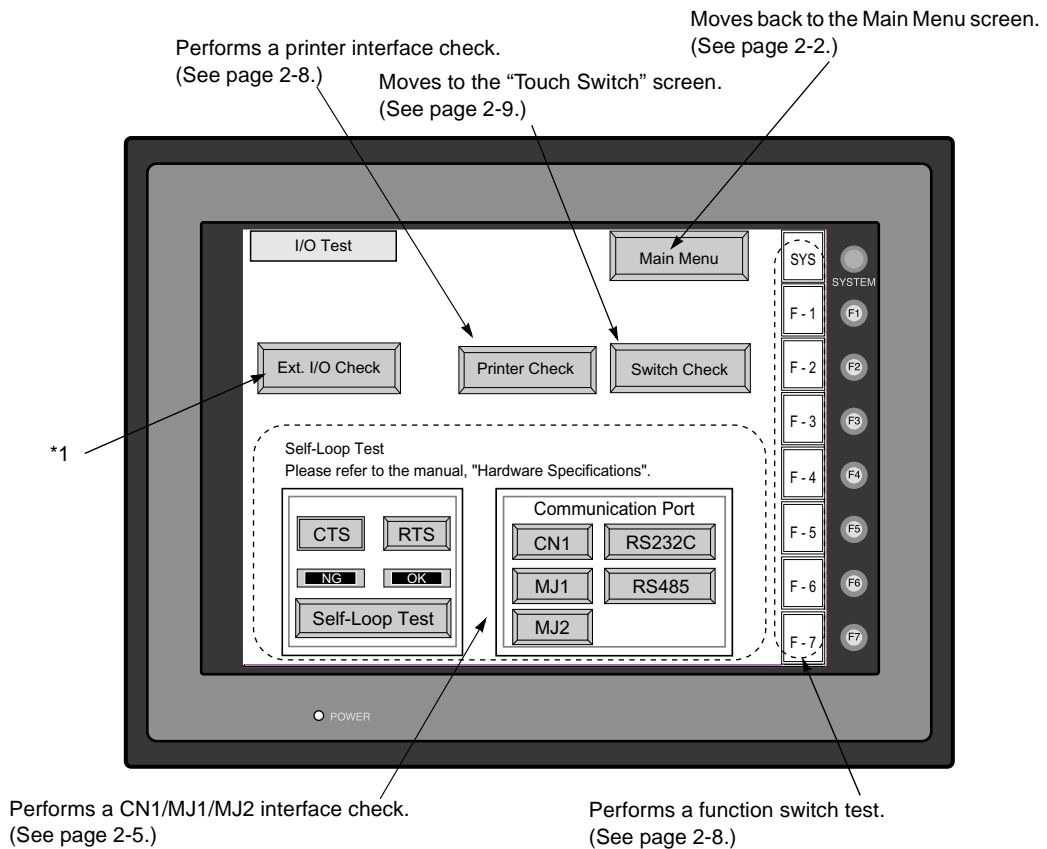


- The Main Menu screen indicates the V7 series model, system information, and screen data information.
- The Main Menu screen is the system menu screen for transferring screen data between a personal computer and the V7 series. When transferring screen data from a personal computer to the V7 series, this Main Menu screen must be displayed. (However, if [Editor Port] is selected for [Modular Jack 1] or on-line editing is used, it is not necessary to bring up this screen.)



2. I/O Test

When the [I/O Test] switch on the Main Menu screen is pressed, the following "I/O Test" screen appears. This screen is used to check that there is no problem with the V7 interfaces and touch switch operation.



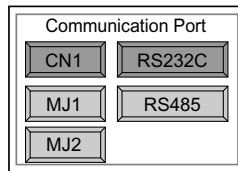
*1 When the serial extension I/O (V-I/O) is connected, use this button to check that the V-I/O works correctly. The [Ext. I/O Check] switch appears only when [V-I/O] is selected for a modular jack on the V-SFT editor.

2-1. Self-loop Test

This is a signal test for communications through the CN1, MJ1 or MJ2 connector. Perform this test if the communication is not successful when transferring screen data through MJ1, connecting the PLC using CN1, or selecting multi-link 2, temperature controller/PLC2Way or PLC for MJ1/2, or connecting the card recorder or serial extension I/O.

CN1: RS-232C Signal Test

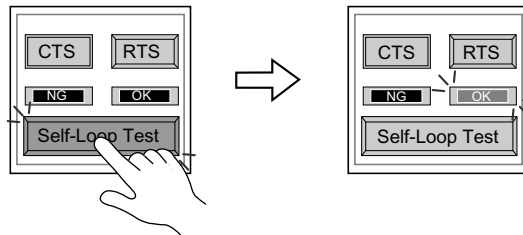
Turn the [CN1] and [RS232C] switches on.



- SD/RD Test

Check the signals [SD] and [RD].

1. Install a jumper between pins 2 and 3 of CN1 on the backside of the V7 unit.
2. Press the [Self-Loop Test] switch. When the [OK] lamp lights up, the test is successfully completed.

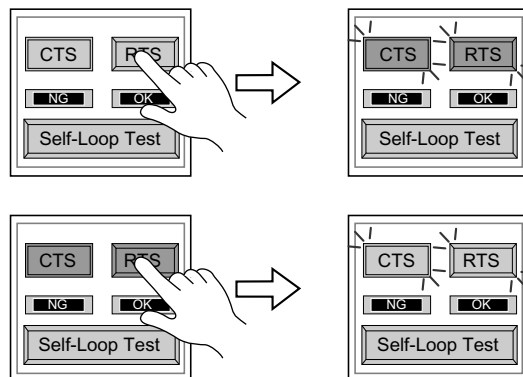


* If the [NG] lamp lights up, consult your local distributor.

- CTS/RTS Test

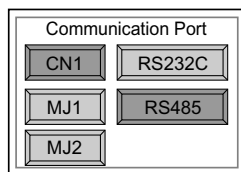
Check the signals [CTS] and [RTS].

1. Install a jumper between pins 4 (RTS) and 5 (CTS) of CN1 on the backside of the V7 unit.
2. Press the [RTS] switch and check that both [RTS] and [CTS] lamps light up at the same time. Press the [RTS] switch again and check that both [RTS] and [CTS] lamps go off at the same time.



CN1: RS-485 Signal Test

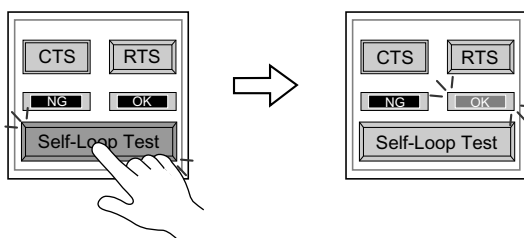
Turn the [CN1] and [RS485] switches on.



- SD/RD Test

Check the signals [SD] and [RD].

1. Install a jumper between pins 12 and 24 and between pins 13 and 25 of CN1 on the backside of the V7 unit.
2. Press the [Self-Loop Test] switch. When the [OK] lamp lights up, the test is successfully completed.

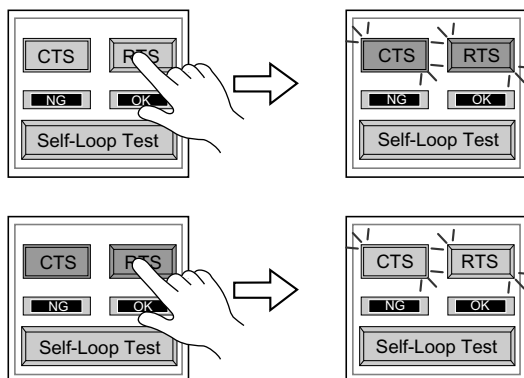


* If the [NG] lamp lights up, consult your local distributor.

- CTS/RTS Test

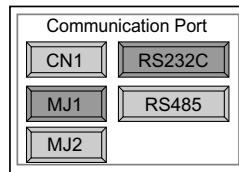
Check the signals [CTS] and [RTS].

1. Install a jumper between pins 14 (+RTS) and 19 (+CTS) of CN1 and between pins 17 (-RTS) and 18 (-CTS) on the backside of the V7 unit.
2. Press the [RTS] switch and check that both [RTS] and [CTS] lamps light up at the same time. Press the [RTS] switch again and check that both [RTS] and [CTS] lamps go off at the same time.



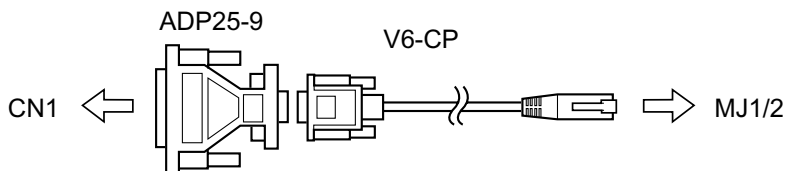
MJ1/2: RS-232C Signal Test

Turn the [MJ1] (or [MJ2]) and [RS232C] switches on.

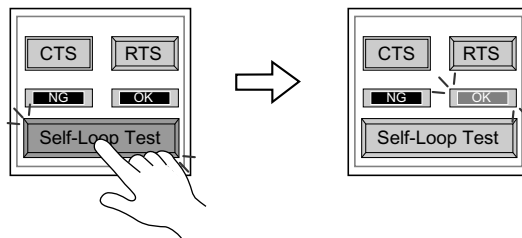


- RS-232C Self-loop Test

Check the signals [SD] and [RD]. Connect the data transfer cable (V6-CP) to CN1 for the test.



1. Set the adaptor ADP25-9 (attached to V6-CP) to the cable V6-CP. Connect the modular jack side of the cable to MJ1 (or MJ2) and the ADP25-9 side to CN1.
2. Press the [Self-Loop Test] switch. When the [OK] lamp lights up, the test is successfully completed.



* If the [NG] lamp lights up, consult your local distributor.

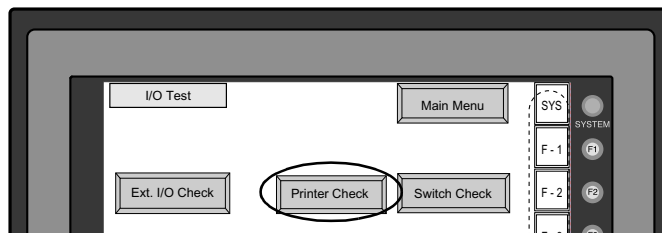
MJ1/2: RS-485 Signal Test

If you would like to perform MJ1/2 RS-485 signal test, consult your local distributor.

2-2. Print Check

Check that the V7 series transmits the signals to the printer correctly.

1. Connect the V7 series to the printer.
2. Press the [Printer Check] switch. The test is successful when a test page is printed out without problem.

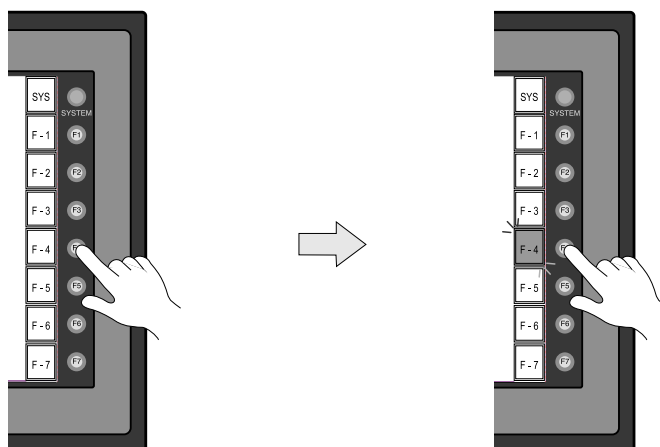


Example:

```
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
!"#$%&@ 0123456789 ABCDEFGHIJKLMNO
```

2-3. SYSTEM & Function Switch Test

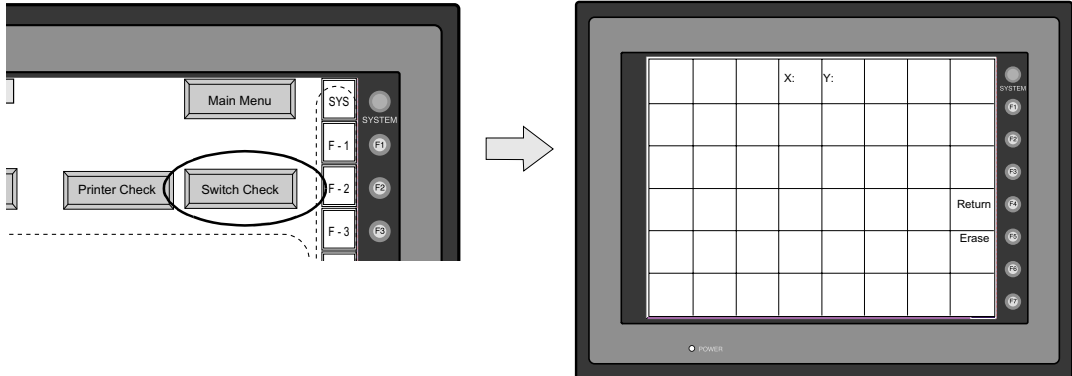
Check operations of eight switches provided vertically on the right side of the V7 panel. Press the switch, and check that the lamp on the screen lights up while the switch is held down.



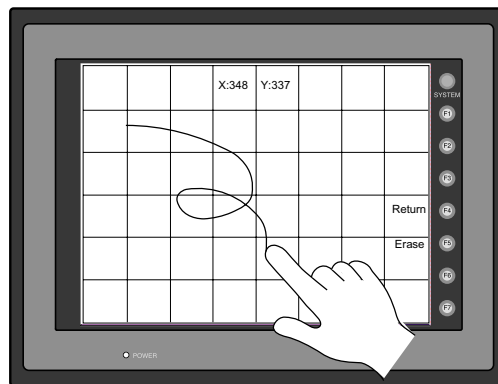
2-4. Touch Switch Test

If a touch switch does not activate at all or if an operation is performed without pressing any touch switch, check that the touch switches on the V7 panel are working properly.

1. Press the [Switch Check] switch. Grids appear on the screen as shown below.



2. Press a position on the panel, and check that the pressed position turns white. The white color means that the touch switch activates correctly. To move back to the "I/O Test" screen, press the [F4] switch. To delete white dots press the [F5] switch.

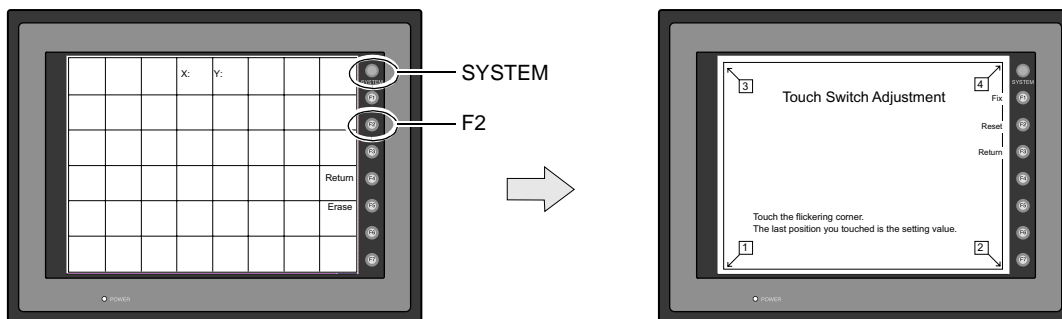


3. If a position different from the pressed position turns white, refer to "Touch Switch Adjustment" on the next page and adjust the touch switch position.

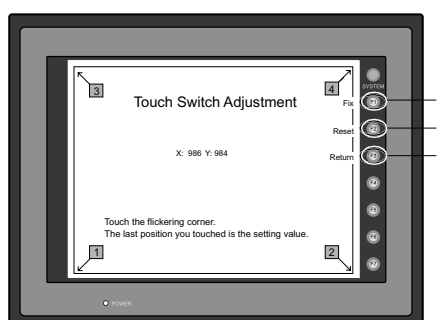
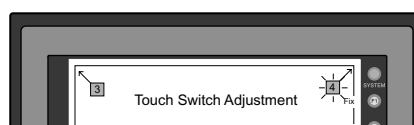
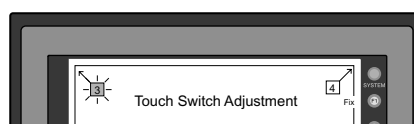
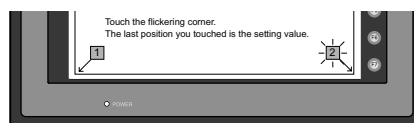
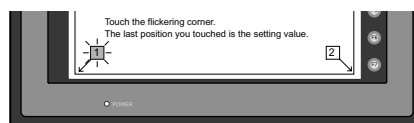
Touch Switch Adjustment

If a position different from the pressed position turns white on the touch switch test screen, follow the steps described below to adjust the touch switch position.

1. Hold down the [SYSTEM] switch and press the [F2] switch on the touch switch test screen. The "Touch Switch Adjustment" screen appears.



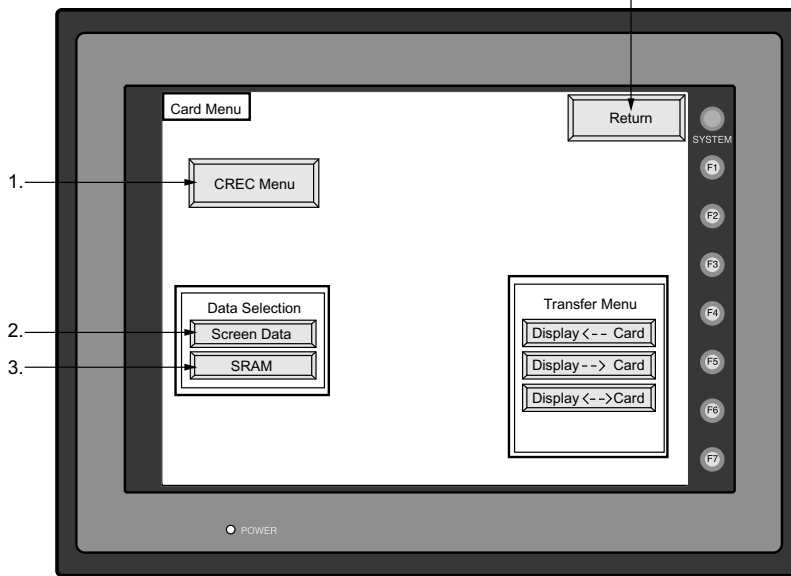
2. Press on "1" that is flashing at the corner on the touch switch adjustment screen. When the finger is released, a beep sounds and the position is set. "2" flashes.
3. Press on "2" that is flashing at the corner. When the finger is released, a beep sounds and the position is set. "3" flashes.
4. Press on "3" that is flashing at the corner. When the finger is released, a beep sounds and the position is set. "4" flashes.
5. Press on "4" that is flashing at the corner. When the finger is released, a beep sounds and the position is set.
6. To re-set the positions, press the [F2] switch and follow step 2 and later.
7. Press the [F1] switch. A long beep sounds and the positions are determined. The touch switch test screen is displayed again.
8. To cancel the setting, press the [F3] switch. The touch switch test screen is displayed again.



3. Card Menu Screen

When the [Card Menu] switch on the Main Menu screen is pressed, the following "Card Menu" screen appears. This screen is used to transfer screen data between the V7 series and a CF card or a memory card.

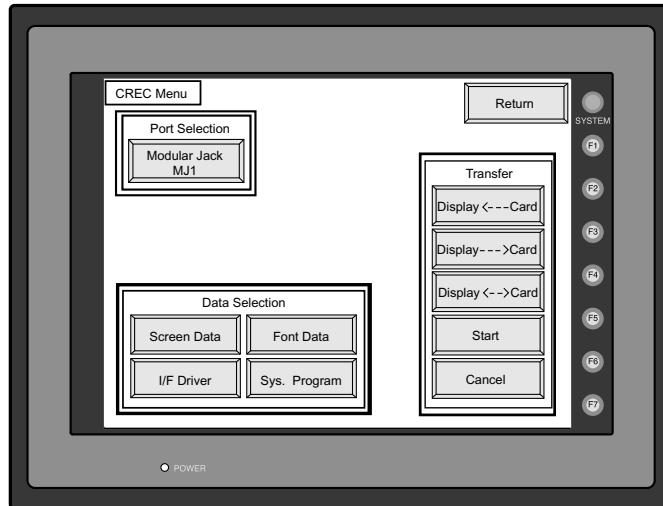
Moves back to the Main Menu screen or the initial screen.



1. [CREC Menu] switch
Press this switch when connecting the card recorder to the MJ port of the V7 series and transferring screen data between the V7 series and a memory card.
2. [Screen Data] switch
Press this switch when transferring screen data between the V7 series and a CF card.
3. [SRAM] switch
Press this switch when saving backup copies of the SRAM memory or V7EM-S (SRAM cassette) or when uploading the backup data from the CF card to the V7 series.

3-1. CREC Menu Screen

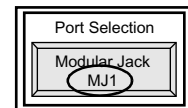
When the [CREC Menu] switch on the "Card Menu" screen is pressed, the following "CREC Menu" screen appears. This screen is used to transfer screen data between the V7 series and a memory card. The procedure for transferring data is described below.



1. Connecting the CREC

Check on the "Port Selection" field that the CREC cable (CREC-CP) is connected to a modular jack port.

- MJ1: Connect the CREC to the MJ1 port. Normally MJ1 is selected.
- MJ2: Connect the CREC to the MJ2 port. Only when [Memory Card] is selected for [Modular Jack 2], "MJ2" is indicated in the "Port Selection" field.

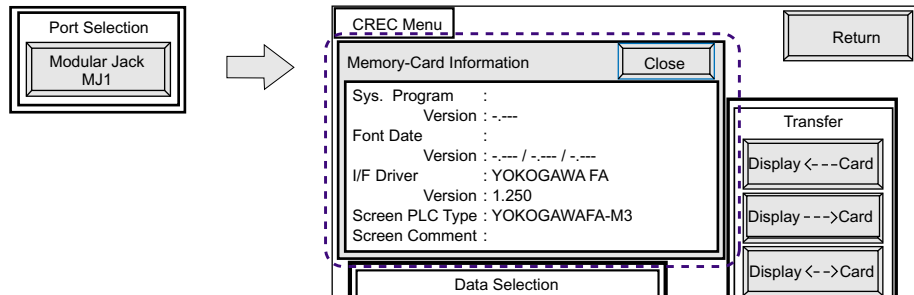


2. Mounting the Memory Card

Insert a memory card into the card recorder (CREC).

3. Memory Card Information

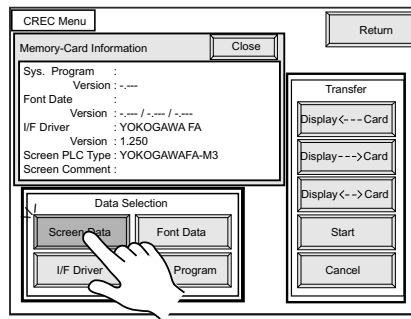
Press the [Modular Jack MJ1 (MJ2)] switch. The memory card information contained in the inserted memory card is indicated. Switches in the "Data Selection" field and "Transfer" field become active.



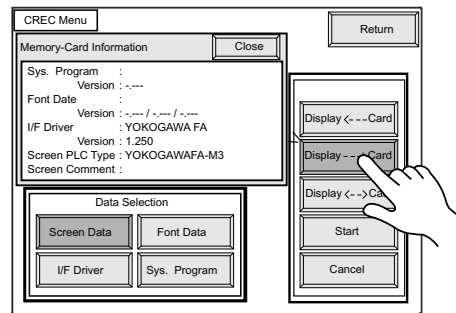
4. Data Selection and Transfer Selection

In the "Transfer" field, select [Display <- -> Card], [Display -> -> Card] or [Display <- -> Card]. Press the desired switch to turn the switch on. Multiple switches can be pressed in the "Data Selection" field.

Data selection

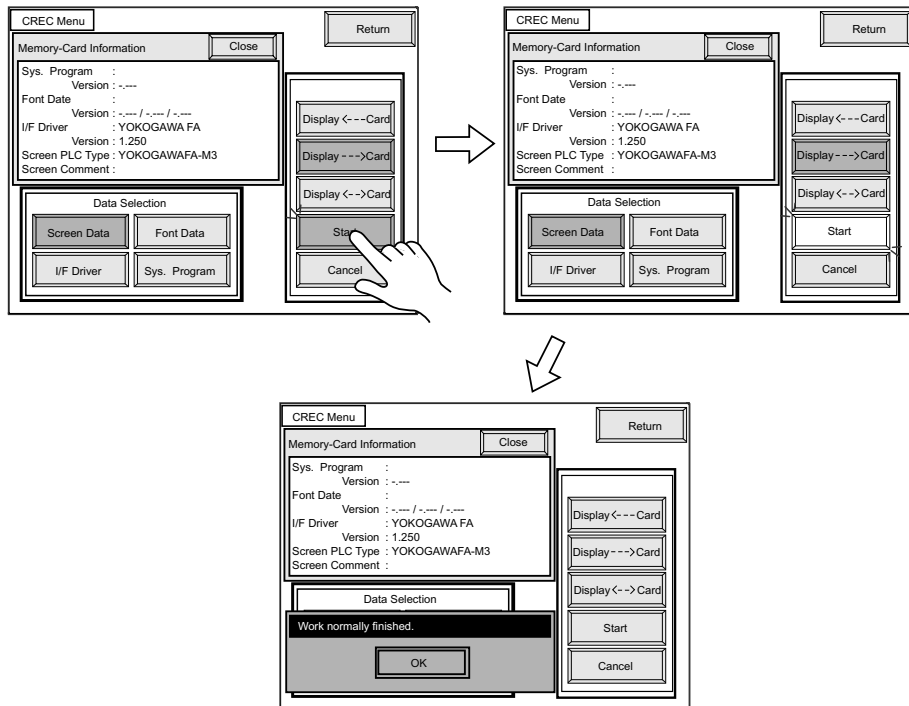


Transfer selection



5. Starting Data Transfer

Press the [Start] switch. Data transfer is started. During data transfer, the [Start] switch changes into [Busy] and flashes. When data is transferred, the following message is displayed.



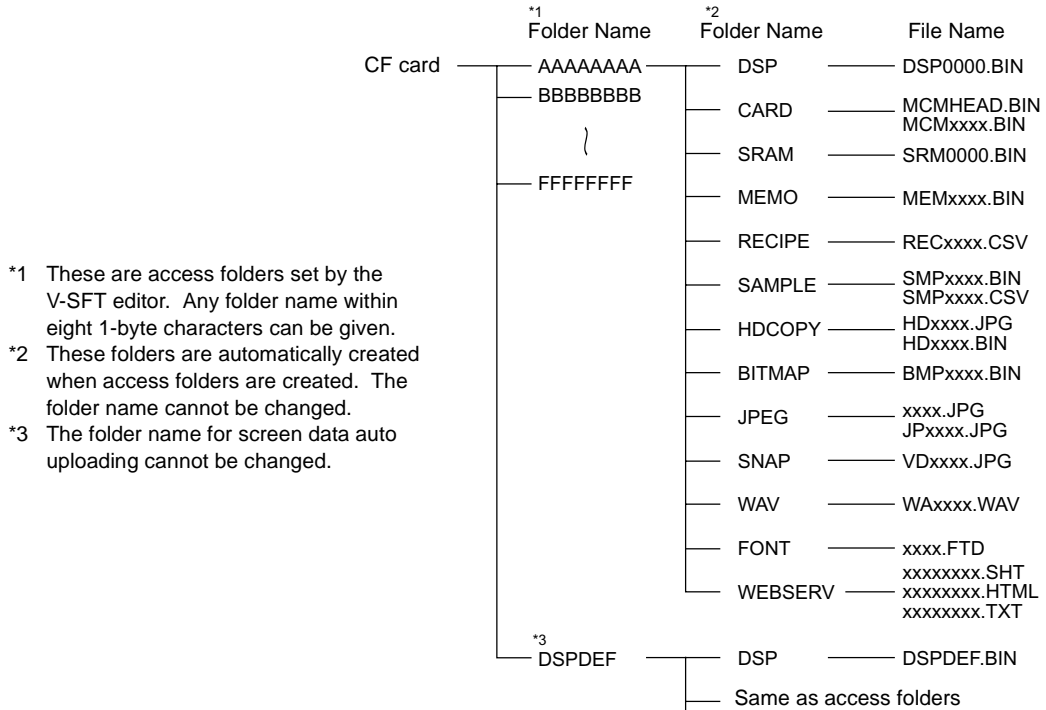
Press the [OK] switch.

6. Press the [Close] switch. The "Card Menu" screen is displayed again.

3-2. Transferring Screen Data from a CF Card

CF Card Folder Configuration

Folders in the CF card are configured as shown below.



DAT0000 (access folder)

Folder Name	Contents	Folder Name	Contents
BITMAP	Saves pattern data (bitmap data) to reduce the screen data capacity.	RECIPE	Reads and writes recipe data.
CARD	Write recipe data from the V7 series using the V6-compatible memory manager function.	SAMPLE	Saves history data of the data logging function.
DSP	Reads and writes screen data.	SNAP	Saves video snap images.
FONT	Saves Gothic fonts or language data to reduce the screen data capacity.	SRAM	Saves backup data of SRAM.
HDCOPY	Writes hard copy images in the JPEG file format from the V7 series (for V708C: BIN file).	WAV	Saves WAV files for sound output to reduce the screen data capacity.
JPEG	Saves JPEG files for display on the screen (except for V708C).	WEBSERV	Saves files to be accessed from the Web browser.
MEMO	Saves memo pad data drawn with the V7 series.		

DSPDEF (screen data auto upload folder)

Folder Name	Contents
DSP	Automatically reads screen data in this folder when the CF card is inserted in the V7 unit after the DIP switch is set.

(Other folders are the same as access folders.)

Transferring Screen Data from a CF Card

The procedure of transferring data between the V7 series and a CF card is described below.

1. Mounting the CF Card

Insert the CF card into the CF card connector at the side of the V7 unit.

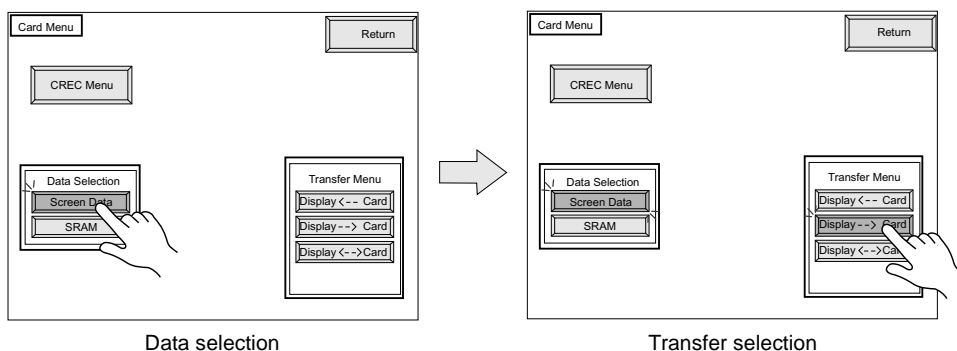
* **Do not remove or insert the CF card in the later steps.**

2. Data selection

Select [Screen Data]. When the lamp is red, it is selected.

3. Transfer selection

Select [Display <-- Card], [Display --> Card] or [Display <--> Card].

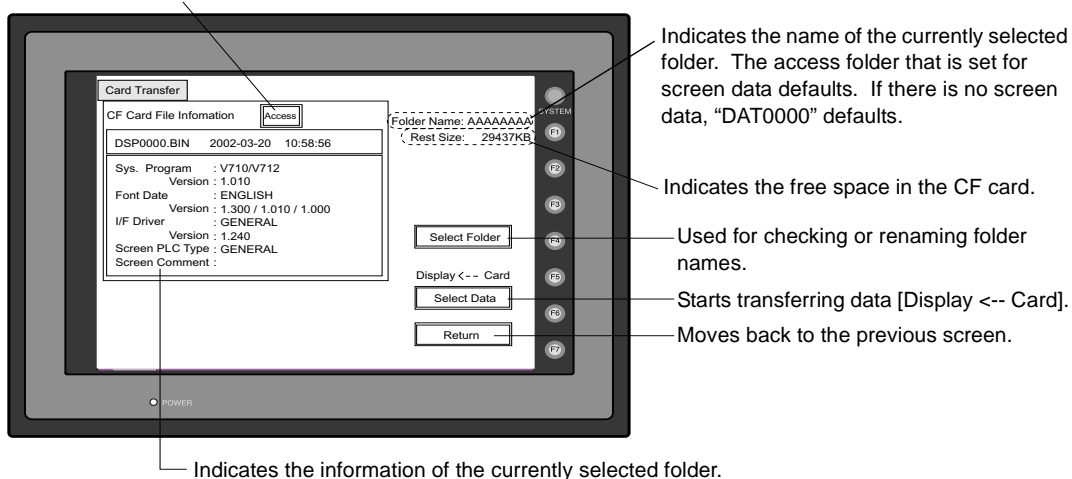


When [Display <-- Card] is Selected:

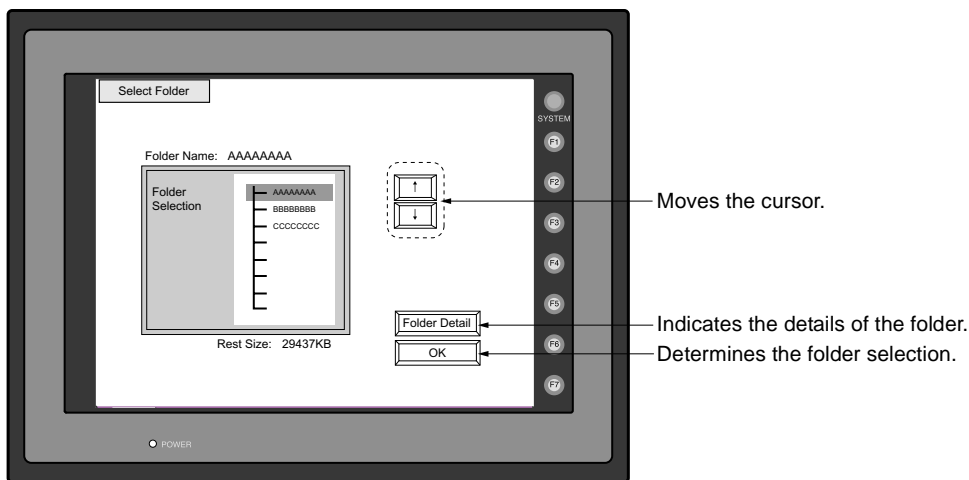
Transfer screen data from the computer to the CF card.

1. When [Display <-- Card] is selected, the "Card Transfer" screen is displayed.

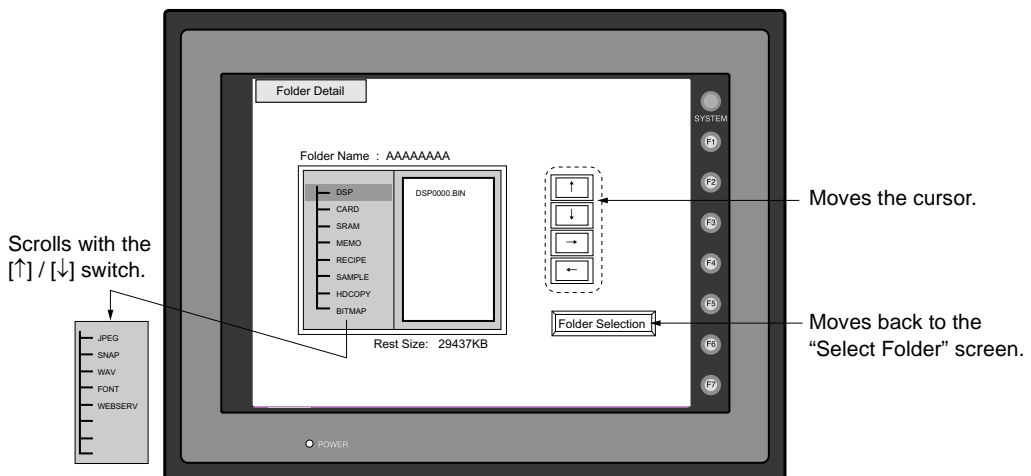
Flashes during communication with the CF card.



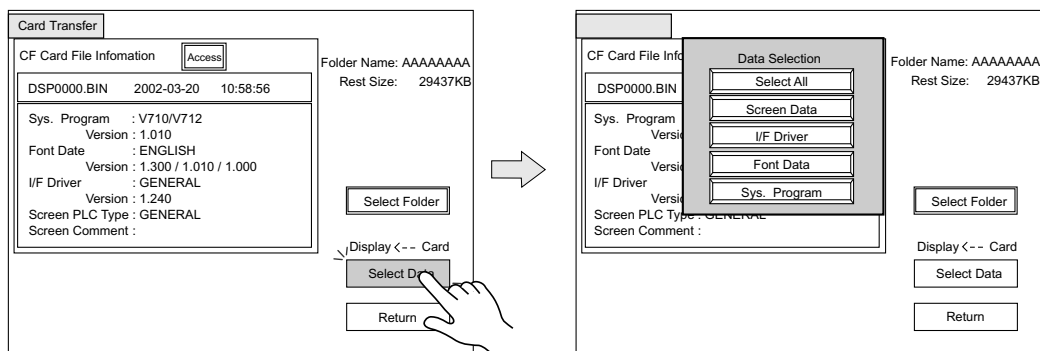
2. Check the folder name, free space, and CF card file information. If the correct folder is selected, move to step 4.
 - **Folder Name**
Indicates the name of the currently selected folder. The access folder that is set for screen data defaults. If there is no screen data, "DAT0000" defaults.
 - **Rest Size**
Indicates the free space in the CF card.
 - **CF Card File Information**
Indicates the information of the currently selected folder.
3. To change to another folder, press the [Select Folder] switch. The "Select Folder" screen is displayed.



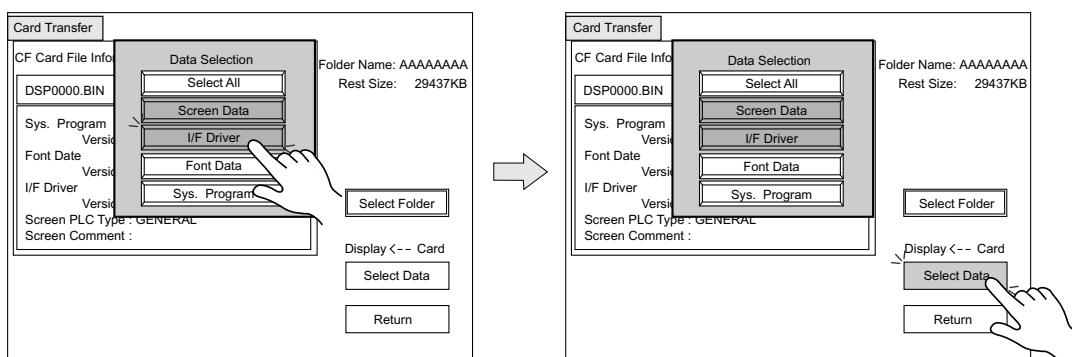
- Select the desired folder using the [↑] / [↓] switch, and press the [OK] switch. The Card Transfer screen is displayed again and the CF card file information of the selected file is indicated.
- To see the details of the folder, press the [Folder Detail] switch. The "Folder Detail" screen is displayed.



4. Press the [Select Data] switch. The [Data Selection] window is displayed and the [Select Data] switch changes to [Start].

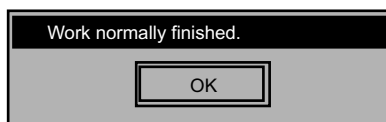


Select the desired data, and press the [Select Data] switch.



To cancel the [Data Selection] window, press the [Return] switch.

5. During data transfer, the [Start] switch changes into [Busy] and flashes. When data has been transferred successfully, the following window is displayed. However, when [Sys. Program] or [Select All] is selected, the "Main Menu" screen is displayed without this message window on completion of data transfer.

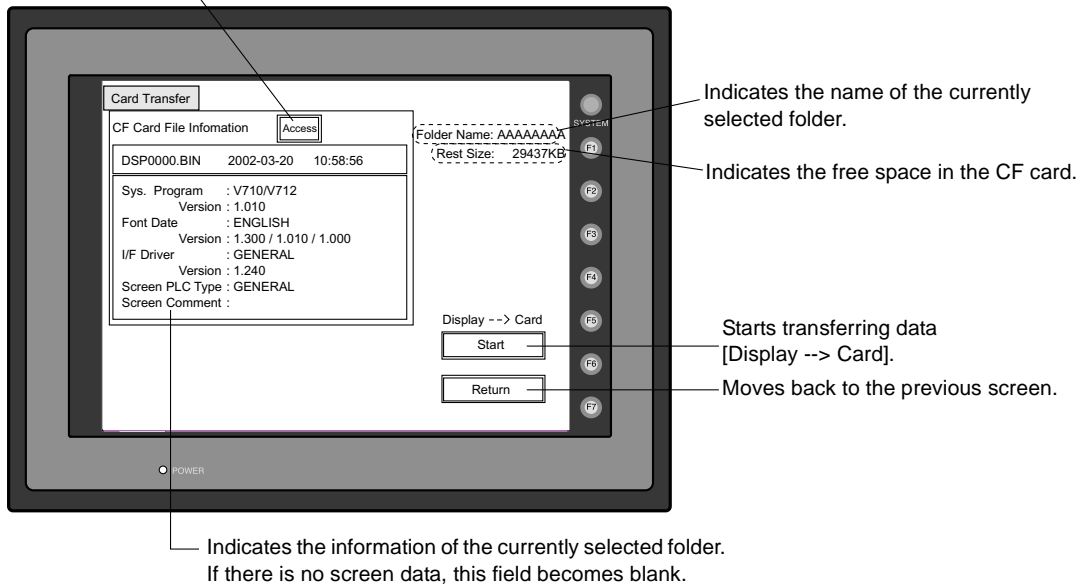


Press the [OK] switch. The "Card Menu" screen is displayed. If any other message is displayed, refer to page 2-23.

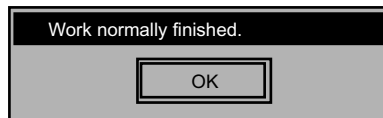
When [Display --> Card] is Selected:

1. When [Display --> Card] is selected, the "Card Transfer" screen is displayed.

Flashes during communication with the CF card.



2. Check the folder name and CF card file information, and press the [Start] switch.
 - * When the access folder name of screen data is the same as that in the CF card, the CF card file information is indicated on the screen, and data in the V7 series overwrites the CF card data. Note that the CF card data is lost when data in the V7 series overwrites. When the CF card file information is blank, a new file "DSP0000.BIN" is created in the DSP folder.
3. During data transfer, the [Start] switch changes into [Busy] and flashes. When data has been transferred successfully, the following window is displayed.



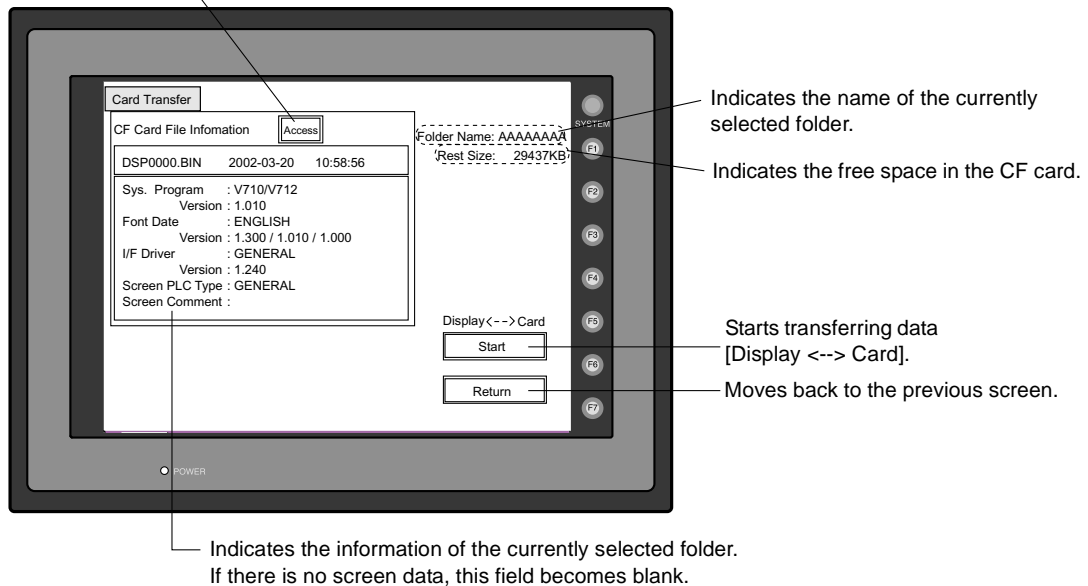
Press the [OK] switch. The CF card file information shows data that has been transferred. If any other message is displayed, refer to page 2-23.

4. Press the [Return] switch. The "Card Menu" screen is displayed again.

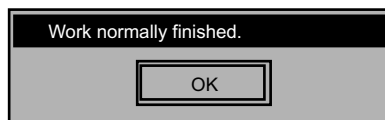
When [Display <--> Card] is Selected:

1. When [Display <--> Card] is selected, the "Card Transfer" screen is displayed. Screen data used for comparison is that in the DSP folder under the folder having the same name as the access folder that is set by the V-SFT editor.

Flashes during communication with the CF card.



2. Press the [Start] switch.
3. During data transfer, the [Start] switch changes into [Busy] and flashes. When data has been transferred successfully, the following window is displayed.



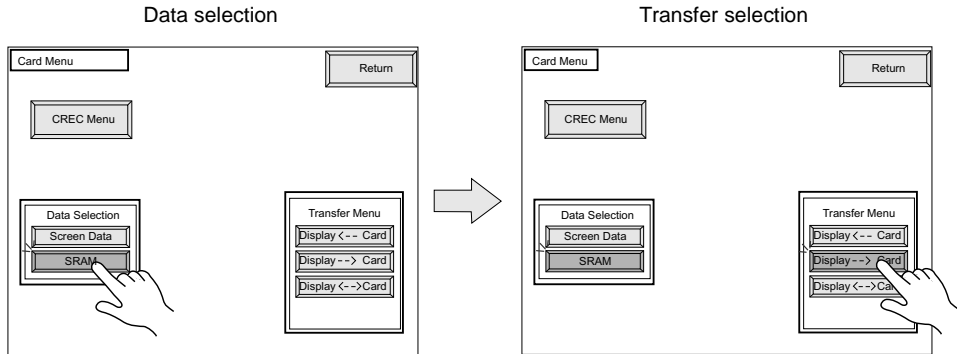
Press the [OK] switch. If any other message is displayed, refer to page 2-23.

4. Press the [Return] switch. The "Card Menu" screen is displayed again.

3-3. Saving Backup Copies of SRAM

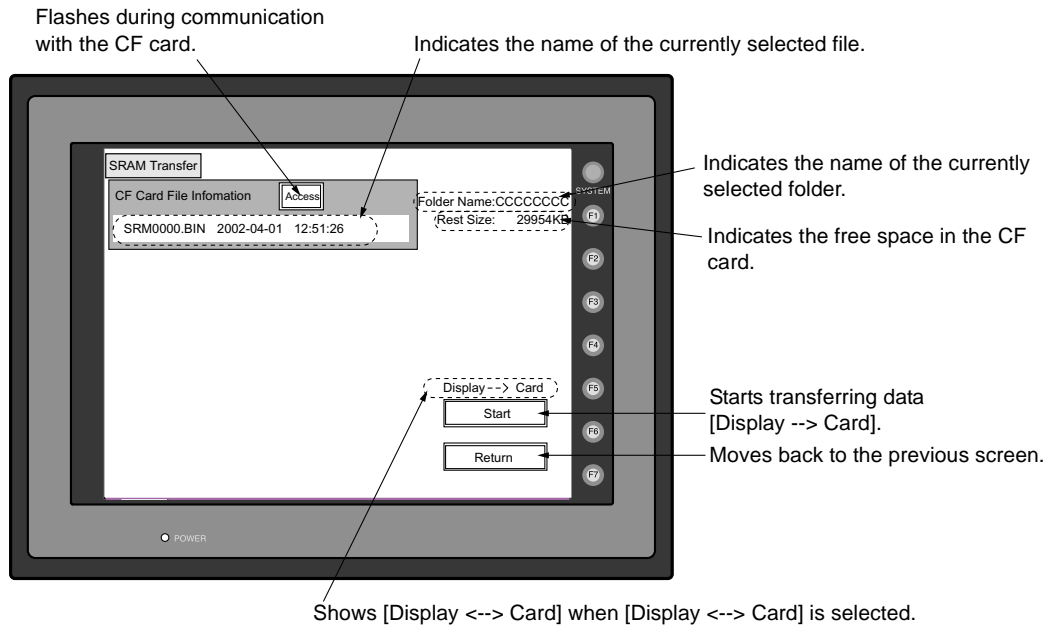
In this section, the procedure for saving backup copies of the SRAM memory or V7EM-S (SRAM cassette) for battery replacement is explained.

1. Press the [SRAM] switch on the "Card Menu" screen. When the lamp is red, it is selected.
2. Select [Display <-- Card], [Display --> Card] or [Display <--> Card].

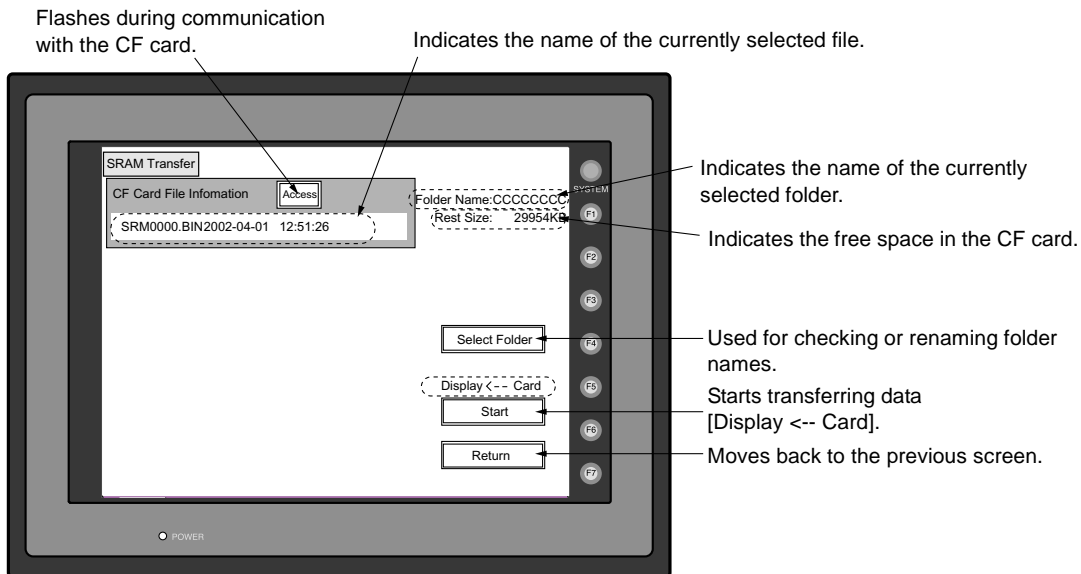


3. The "SRAM Transfer" screen is displayed.

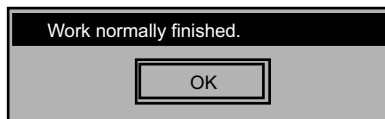
- When [Display --> Card] or [Display <--> Card] is selected, the following screen is displayed. Select the CF card folder having the same name as the access folder for screen data in the V7 series. The name is shown on the screen. The transferred file is named as "SRAM0000.BIN."



- When [Display <-- Card] is selected, the following screen is displayed.



- 1) To change another folder, press the [Select Folder] switch. (The folder name must be "SRAM0000.BIN.")
- 2) The "Select Folder" screen is displayed as shown on page 2-17. Select the desired folder (refer to page 2-17), and press the [OK] switch.
- 3) Moves back to the "SRAM Transfer" screen.
4. Starting Data Transfer
Check the folder name, free space and transfer selection, press the [Start] switch. Data transfer is started.
5. Ending Data Transfer
When data has been transferred successfully, the following window is displayed.

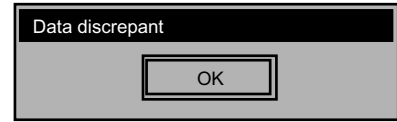


Press the [OK] switch. If any other message is displayed, refer to the next page.

6. Pressing the [Return] switch moves back to the "Card Menu" screen.

3-4. Messages during Data Transfer

If an error occurs during data transfer, the message window shown on the right is displayed.



The kinds and the contents of the messages are shown below. The same messages are used for the memory card and CF card. When using the CF card, the "memory card" in the explanation should read as the "CF card."

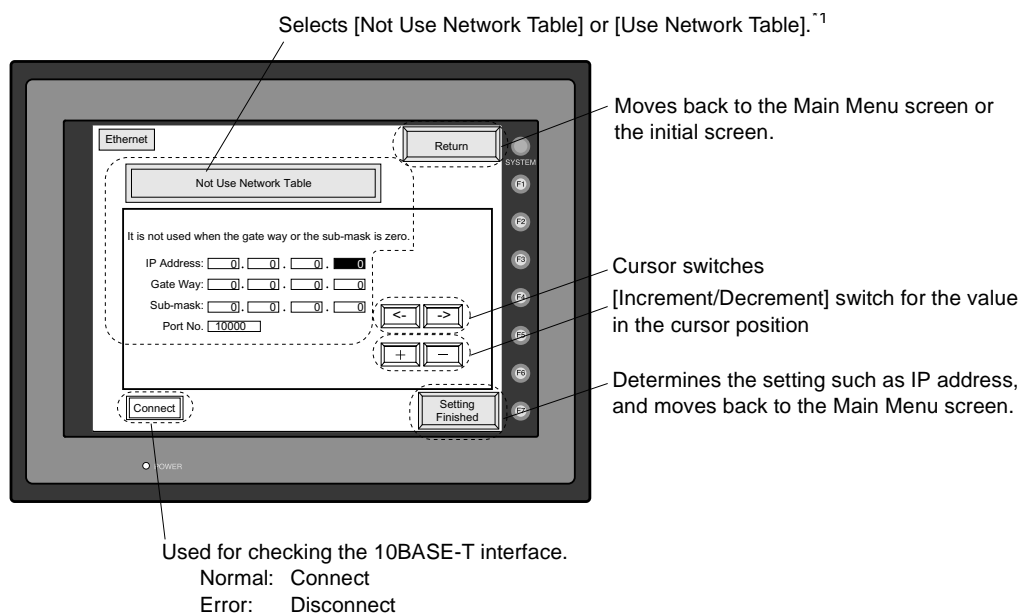
Messages	Contents
Work normally finished.	The specified operation has been concluded normally.
CREC not connecting	CREC is not connecting when selecting a modular jack.
CREC Communication Error	A communication error occurred between V7 and CREC when selecting a modular jack.
Memory-Card not setting	A memory card is not inserted.
Memory-Card Capacity over	Cannot write the data into a memory card because the data size in V7 is larger than the capacity of a memory card.
Write Protect: ON	Cannot write data into a memory card because the write protect switch in a memory card is ON.
Writing Error occurred.	The error occurred while writing data into a memory card.
Selected data does not exist.	The data in the reading target does not exist.
V7 type is different.	The specified type of the data in V7 is different from the type of the memory card data.
Selected data can not be read.	The data in a memory card cannot be read.
Reading Error occurred.	The error occurred during writing data into a flash ROM of V7.
Data discrepant	There is some discrepancy in data, when comparing data between a memory card and V7.
Screen data on V7 will be broken.	Warning about data destruction in V7 that may occur when transferring the font data larger than the present data from a memory card to V7. (The [OK] switch continues transferring; the [Cancel] switch stops transferring.)
Undefined Error occurred.	The error occurred due to some cause other than mentioned above.

4. Ethernet

The "Ethernet" screen is displayed by pressing the [IP Address (English)] switch on the initial screen when transferring screen data via Ethernet for the first time, or by pressing the [Ethernet] switch on the Main Menu screen when transferring screen data to the V7 series. This screen is used for setting the IP address (a number that identifies the V7 series on the network) that is indispensable for Ethernet communications.

Depending on whether the LAN (10BASE-T) connector at V7i or the communication interface unit CU-03 for V7 is used, the "Ethernet" screen contents and the required settings vary as described below.

Connection with LAN (10BASE-T) Connector at V7i



*1 Network Table

Register IP addresses and other information for the V series, PLCs or computers that should be included for Ethernet communications on the V-SFT editor. ([System Setting] → [Network Table Setting] → [Ethernet] → Edit Network Table) The registered network table can be used or not used depending on the [Not Use Network Table/Use Network Table] switch.

Network table number

No.	Host Name	IP Address	Send Timeout	Internal Memory Write ...	Memory Card Memory ...	Pt
0	PLC	192.168.1.58	15	Enabled	Enabled	17
1	V7	192.168.1.68	15	Enabled	Enabled	16
2	PLC	192.168.1.66	15	Enabled	Enabled	17
3						
4						
5						

Not Use Network Table

In the following cases, select [Not Use Network Table].

- Screen data is transferred for the first time via Ethernet.
- The network table is not set for screen data of the V7 series.
- If the network table is set for screen data of the V7 series but you would like to use an IP address that is different from that set on the network table tentatively, press the [Use Network Table] switch to select [Not Use Network Table].

When the network table is not set or is not used

Not Use Network Table

It is not used when the gate way or the sub-mask is zero.

IP Address: 0.0.0.0

Gate Way: 0.0.0.0

Sub-mask: 0.0.0.0

Port No. 10000

<-> <-> + -

□ : The cursor moves only in these sections for settings.

1. Set the IP address. (If necessary, set the default gateway and subnet mask.)
2. Press the [Setting Finished] switch. The IP address is determined.
3. The Main Menu screen is displayed again. (If the "Ethernet" screen is displayed from the initial screen, the initial screen is displayed again.)

Use Network Table

In the following cases, select [Use Network Table].

- The network table is set for screen data of the V7 series and you would like to change the network table number.

When the network table is used:

Use Network Table

It is not used when the gate way or the sub-mask is zero.

IP Address: 0.0.0.0

Gate Way: 0.0.0.0

Sub-mask: 0.0.0.0

Port No. 10000

Network Table No.: 0

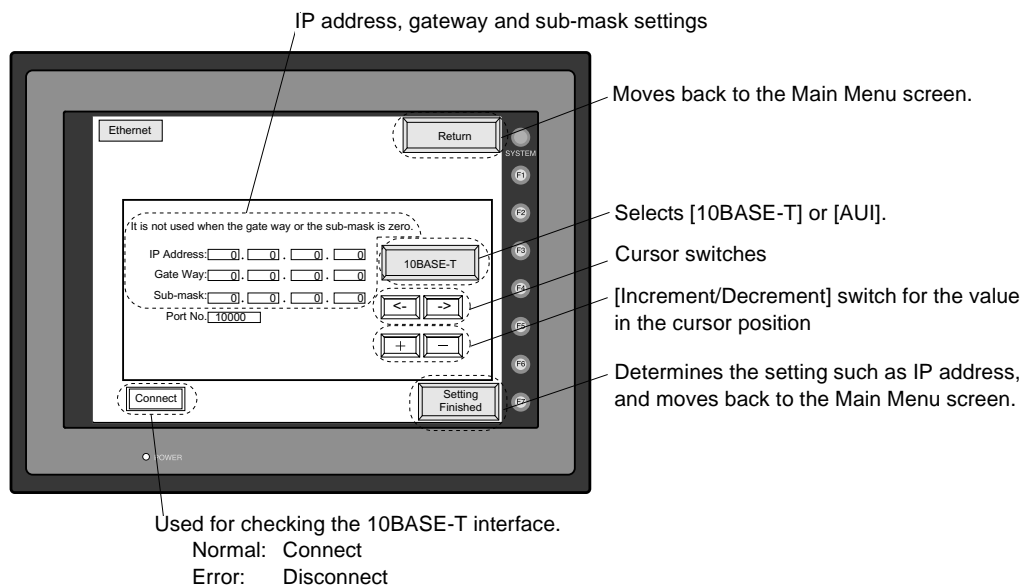
<-> <-> + -

Set the network table number.

Indicates the contents of the selected network table number.

1. Set the network table number.
2. Press the [Setting Finished] switch. The IP address is determined.
3. The Main Menu screen is displayed again.

Connection with CU-03 on V7



1. Select either [10BASE-T] or [AUI] for the connecting method.
2. Set the IP address. (If necessary, set the default gateway and subnet mask.)
3. Press the [Setting Finished] switch. The settings are determined.
4. The Main Menu screen is displayed again.

- Rotary Switch and Network Table

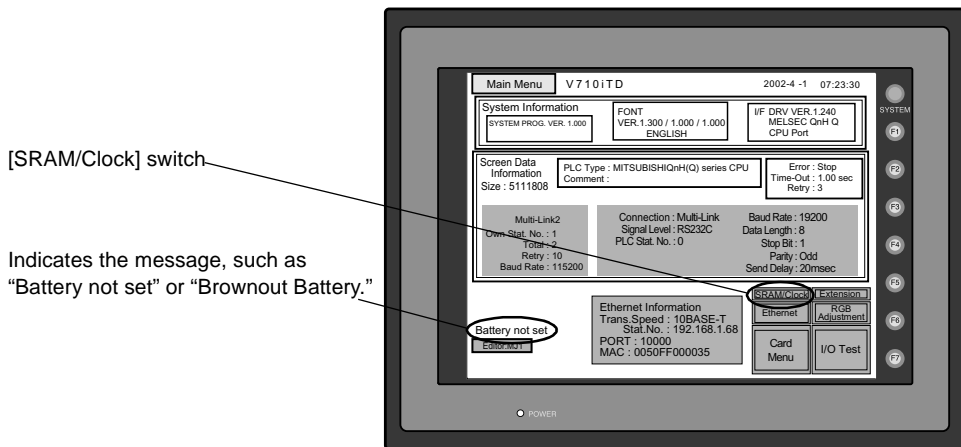
Register IP addresses and other information for the V series, PLCs or computers that should be included for Ethernet communications on the V-SFT editor. ([System Setting] → [Network Table Setting] → [Ethernet] → [Edit Network Table]) Set the network table number with the rotary switch on the communication interface unit CU-03.

Port number to be set with the rotary switch on the communication interface unit CU-03

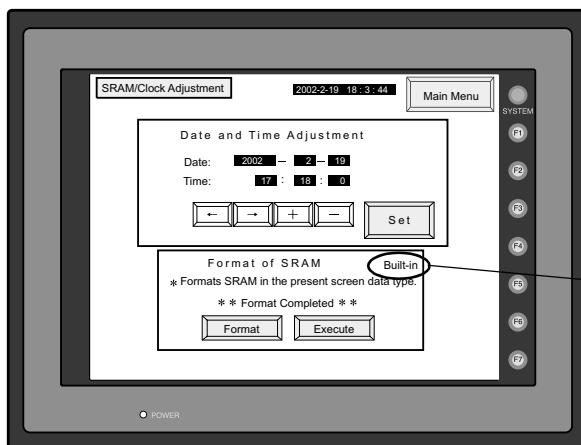
No.	Host Name	IP Address	Send Timeout	Internal Memory Write ...	Memory Card Memory ...	Port
0	PLC	192.168.1.58	15	Enabled	Enabled	12
1	V7	192.168.1.68	15	Enabled	Enabled	10
2	PLC	192.168.1.66	15	Enabled	Enabled	12
3						
4						
5						

5. SRAM/Clock

- To use the built-in clock of the V7 series or to use the SRAM memory or cassette, it is necessary to select [SRAM/Clock Setting] from the [System Setting] menu and make the SRAM/clock setting. For the setting procedure, refer to the Reference Manual.
- Be sure to set the battery when using the built-in clock of the V7 series or the SRAM memory or cassette. Without battery, the contents in the SRAM or clock data will not be retained. When the battery is not connected, the message "Battery not set" is displayed and the [SRAM/Clock] switch flashes on the Main Menu screen. Connect the battery immediately. When the battery is to be replaced, the message "Brownout Battery" is displayed.



- When the [SRAM/Clock] switch on the Main Menu screen is pressed, the following "SRAM/Clock Adjustment" screen appears. This screen is used for adjusting the built-in calendar and for initializing the SRAM area.



V7EM-S mounted: Extension
 V7EM-S not mounted: Built-in
 The above is displayed.

Date and Time Setting

1. Move the cursor using the [←] / [→] switch, and change the value by pressing the [+] / [-] switch.
2. When the desired date and time are set, press the [Set] switch to determine the setting.
3. The calendar data is updated as set.

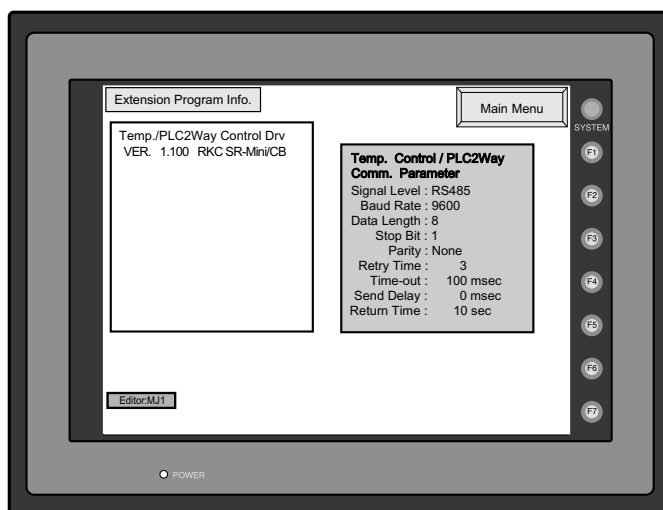
Initializing SRAM

When the SRAM memory or cassette is initialized, the data contained is cleared.
Double-check before initializing the SRAM memory or cassette.

1. "Extension" is shown when V7EM-S (SRAM cassette) is mounted; "Built-in" is shown when it is not mounted.
2. Press the [Format] switch and the [Execute] switch. The SRAM area is initialized in the current screen data format. When initialization has been completed, the message "**Format Completed**" is displayed.

6. Extension Program Information

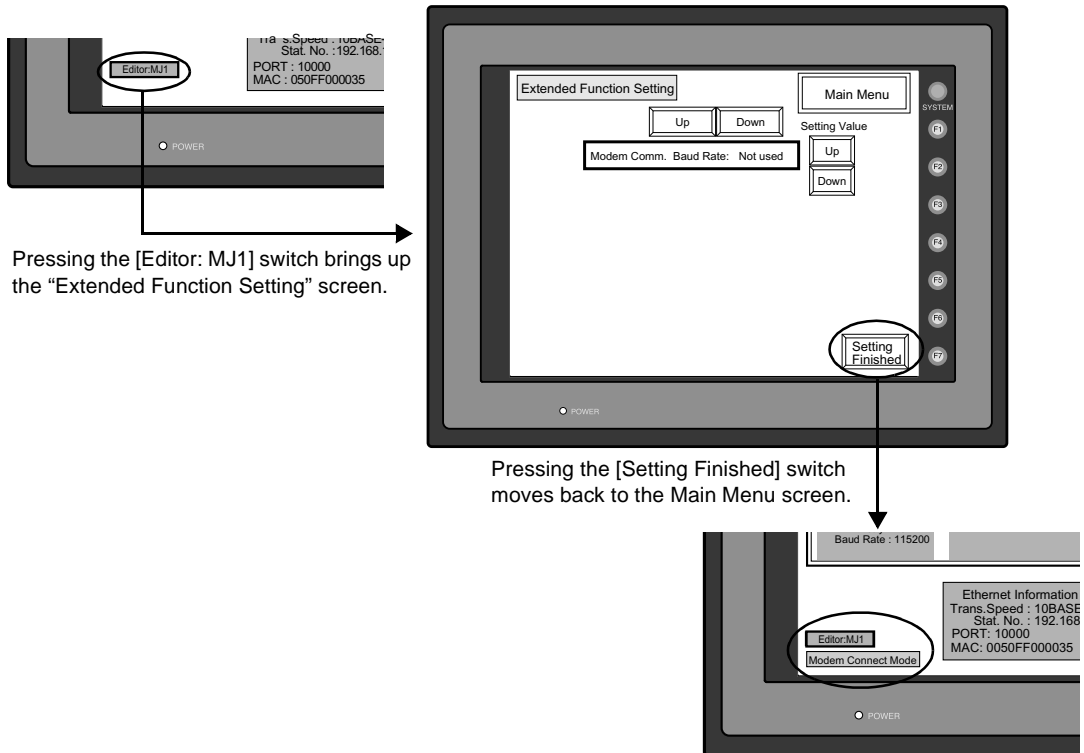
When the [Extension] switch on the Main Menu screen is pressed, the following "Extension Program Info." screen appears. The driver setting and parameter setting for temperature controller/PLC2Way communication, ladder transfer function, Modbus slave communication, etc. are displayed.



7. Extended Function Setting

When the [Editor: MJ1] switch on the Main Menu screen is pressed, the following “Extended Function Setting” screen appears. Set the baud rate to be used when transferring screen data between the V7 series and a modem.

1. Select the desired baud rate using the [↑] / [↓] switch, and press the [Setting Finished] switch. (Setting range: 4800, 9600, 19200, 38400, 57600, 115200)
 - * The function switches and switches on the Main Menu screen are not valid for 15 seconds after the [Setting Finished] switch is pressed.
 - * When the [Setting Finished] switch is pressed, an AT command is automatically sent to the modem and the baud rate used between the V7 series and the modem is set.
2. The Main Menu screen is displayed automatically, and “Modem Connect Mode” is displayed below the [Editor: MJ1] switch.
3. To transfer screen data without a modem, select “Not used” for [Modem Comm. Baud Rate]. To transfer screen data by connecting the V7 series and the computer via V6-CP, select “Not used” for [Modem Comm. Baud Rate].



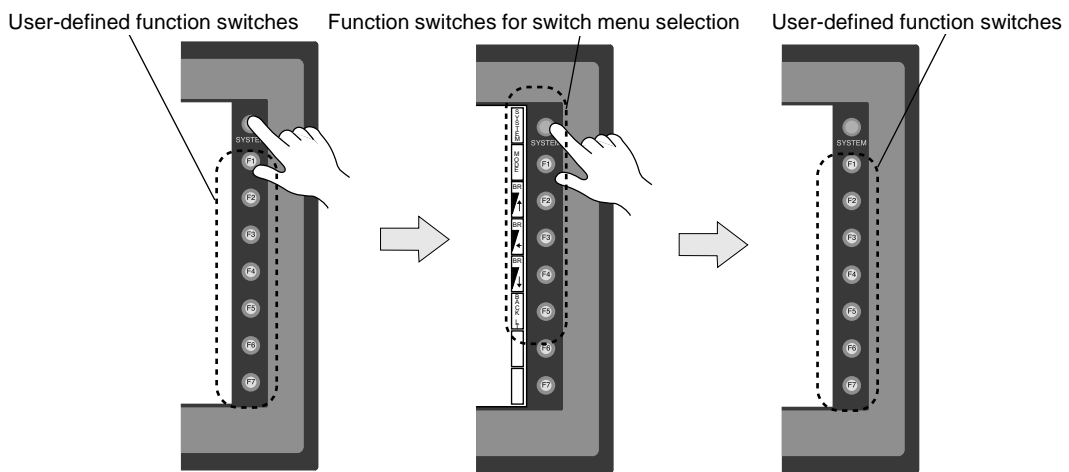
2. Function Switches

Types

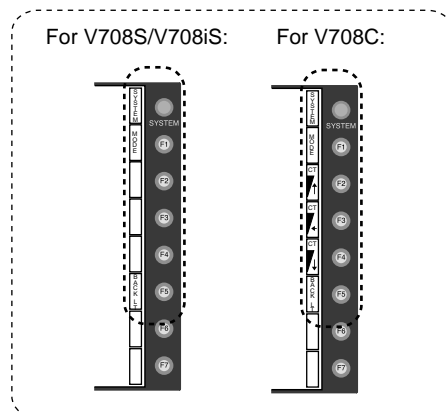
- There are eight function switches provided.
[SYSTEM], [F1], [F2], [F3], [F4], [F5], [F6], [F7]

[SYSTEM] Switch

The [SYSTEM] switch works in “alternate” operations. When this switch is pressed once, the switch menu is displayed at the side of the function switches [F1] to [F5], and each function switch corresponds to the menu item displayed in the switch menu. When the [SYSTEM] switch is pressed again, the switch menu disappears, and the function switches [F1] to [F7] work as defined by the user.



For V710T, V710iT, V710S, V710iS, V710iS, V712S and V712T



User-defined Function Switches [F1] to [F7]

- User-defined function switches [F1] to [F7] do not work in the STOP mode.
- When the V7 series is in the RUN mode and the switch menu by the [SYSTEM] switch is not displayed, the function switches can be defined by the user.
- User-defined function switches should be set in the following dialogs of the V-SFT editor.
 - Settings for each screen
[Edit] → [Local Function Switch Setting] → [Function Switch Setting] dialog
 - Setting for all screens
[System Setting] → [Function Switch Setting] → [Function Switch Setting] dialog

[F1] to [F5] Switch Functions with Switch Menu

Functions		Contents					
F1	Mode	Selects the operation mode between STOP ↔ RUN.					
F2 F3 F4	Contrast Brightness	Item	Contrast Adjustment		Brightness Adjustment		
			Adjust the contrast. Holding down the switch for one second or more changes the contract rapidly.		Adjusts the screen brightness in three levels.		
		Applicable models	V708C		V710T, V710iT, V710S, V710iS, V712S, V712T		
		Adjustment	<div><div>F2F3F4</div><div>←————→</div><div>DarkMediumPale</div></div>		F2	F3 ^{*1}	F4 ^{*1}
				1 Bright	2 Medium	3 Dark	
F5	Backlight	Turn the backlight on and off. Backlight control should be set on the V-SFT editor. ([System Setting] → [Unit Setting] → [Unit Setting] dialog, [Backlight] tab window)					
		Always ON	Auto 1/Auto 2		Manual/Manual 2		
		Ignored	<ul style="list-style-type: none">When the [F5] switch is pressed, the backlight goes off even before the setting OFF time is reached.This is valid when the backlight control bit (bit 11) in the read area “n + 1” in the system memory is reset (OFF: 0).		<ul style="list-style-type: none">The [F5] switch turns the backlight on and off.[Backlight Power ON Time Control] that determines the backlight status at power-up becomes valid. When the power is turned on: OFF → Backlight ON ON → Backlight OFF The backlight will be in the above status.		

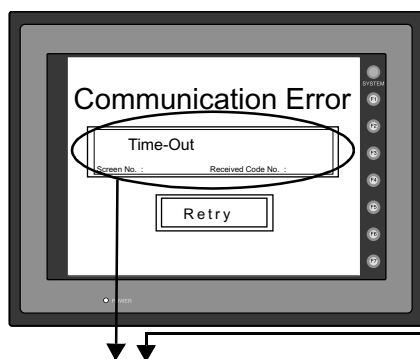
*1 When a medium or dark brightness is set, the backlight service life may become shorter.

3. Errors Displayed on the V7 Series

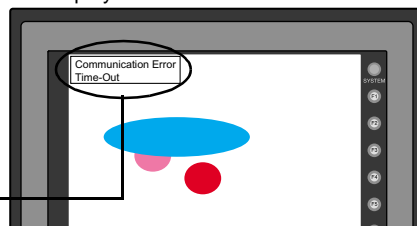
There are five kinds of error messages displayed on the V series:

1. Communication Error
2. Check
3. Warning
4. SYSTEM ERROR
5. Touch switch is active

1. Communication Error



* When you go to [Comm. Parameter], bring up the [Detail] tab window and set [Continue] for [Comm. Error Handling], a screen like the one shown below is displayed.



Error Message	Contents	Solution	Remarks
Time-Out	Although a request to send is given to the PLC, no answer is returned within the specified time.	1) Check the communication parameters. 2) Check the cables and wiring.	1
		3) Data may be disrupted because of noise. Fix noise.	2
Parity	An error occurred in parity check.	1) Check the cables and wiring.	1
		2) Data may be disrupted because of noise. Fix noise.	2
Framing	Although the stop bit must be [1], it is detected as [0].	1) Check the communication parameters. 2) Check the cables and wiring.	1
		3) Data may be disrupted because of noise. Fix noise.	2
Overrun	After one character is received, the next character is received before internal processing is completed.	1) Check the communication parameters.	1
		2) Data may be disrupted because of noise. Fix noise.	2
Check Code	The check code in the PLC response was not correct.	1) Check the communication parameters.	1
		2) Data may be disrupted because of noise. Fix noise.	2

* If the above error messages are displayed on the V7 series without establishing communication between V7 and PLC, test the solution of remark "1."

If the error occurs suddenly in communication, test the solution of remark "2."

Error Message	Contents	Solution
Error code received	An error code was sent to the link unit by the CPU of the PLC.	Examine the CPU error code and solve the problem.
Break	The PLC's SD (TXD) remains at the low level.	Examine the connection between the PLC's SD (TXD) and the V7's RD (RXD).
Invalid memory (applicable to MITSUBISHI CPU)	You specified an address that exceeds the memory range of the PLC that you are linked to.	Check the type and range of memory that you set.
Invalid CPU model (applicable to MITSUBISHI CPU)	The PLC currently being supported does not have a corresponding CPU.	Confirm whether or not the CPU that you are using can be used with the V Series.
Format	The code of the received data is invalid.	Check 1, 2, 3 described below.
Compare (applicable to HIDIC S10)	Transmission data and received data are different.	Check 1, 2, 3 described below.
NAK (applicable to Allen-Bradley PLC)	A NAK code is received.	Check 1, 2, 3 described below.
TNS discrepant (applicable to Allen-Bradley PLC)	Transmitted TNS data and received TNS data are not in agreement.	Check 1, 2, 3 described below.
Communication Error	An unclear communication error is detected.	Check 1, 2, 3 described below.
Count error (applicable to MITSUBISHI CPU/Q link unit)	The expected data amount is different from the count value.	Check 1, 2, 3 described below.
Command error (applicable to MITSUBISHI CPU/Q link unit)	The response code differs from the expected code.	Check 1, 2, 3 described below.
Invalid cassette (applicable to MITSUBISHI ACPU)	This cassette is not included in the memory cassettes currently being supported.	Contact your local distributor.
Password error (applicable to MITSUBISHI QCPU)	The password is incorrect.	Contact your local distributor.

Solution

1. Confirm link unit settings. (After making settings, cut power to the PLC.)
2. Go to the editor (V-SFT) and confirm the settings in the [Comm. Parameter] dialog in the [System Setting] menu.
3. If errors only occur from time to time, it is possible that there is a noise-based communication error.

* If you still cannot solve the error even after following the suggestions above, contact your local distributor.

Error Messages for Network Communication

- Ethernet

Error Message	Contents	Solution
Ethernet Error: XXXX	The Ethernet status is saved at system memory address \$s518 and a code other than "0" (normal) is received. XXXX: Error No.	For the contents and solution to each error number, refer to "Chapter 4 Network Communications/Error Display."

- MELSECNET/10

Error Message	Contents	Solution
I/F Board Err	The I/F unit for NET/10 has an error.	Contact your local distributor.
Request Code Err	The request command from NET/10 has an error.	
Request Data Err	The request data from NET/10 has an error.	
Word Writing to Sp. Relay (MITSUBISHI: A Series)	Word writing to a special relay (M9000 and later) is attempted. (Notes: Only bit writing is possible for special relays when connecting with NET/10.)	Do not attempt to perform word writing to special relays.

- CC-LINK

Error Message	Contents	Solution
I/F Board Err	The I/F unit for CC-LINK has an error.	Contact your local distributor.
No. of Occupy Setting Err	The number of occupy in [Comm. Parameter] is different from the number of occupy by switches.	Check the setting of the number of occupy.
Network I/O Access Err	MONITOUCH is about to access exceeding the set number of input/output words.	Check the memory for the network I/O in the screen data file.
Station Number Err	The port number set by a switch is not within the setting range (1 to 64).	Specify the port number within the setting range.
Word Writing to Sp. Relay	Word writing to a special relay (M9000 and later) is attempted. (Notes: Only bit writing is possible for special relays when connecting with CC-LINK.)	Do not attempt to perform word writing to special relays.

• OPCN-1

Error Message	Contents	Solution
I/F Board Err	The I/F unit for OPCN-1 has an error.	Contact your local distributor.
Stat. No. out of range	The port number set by a switch is not within the setting range (1 to 127).	Specify the port number within the setting range.
Network Link Error	Cannot connect to the master station in the network.	Check the condition of the master station (PLC). Check the network connection.
Network I/O Access Err	MONITOUCH is about to access exceeding the set number of input/output words.	Check the memory for the network I/O in the screen data file.
Waiting for Reply	1) Less than "Max_int" time (communication monitoring time for slave station) set on the PLC for OPCN-1 communications 2) Timeout on the V-SFT editor (The timeout time can be set from [System Setting] → [Comm. Parameter] on the V-SFT editor.) This error is indicated when the above 1) and 2) are present.	When the "Max_int" time is too long (infinite, for example) on the PLC, it is not possible to know whether or not the response from the PLC is correctly made. This error message disappears when a response from the PLC is received within the "Max_int" time.
Word Writing to Sp. Relay (MITSUBISHI: A Series)	Word writing to a special relay (M9000 and later) is attempted. (Notes: Only bit writing is possible for special relays when connecting with OPCN-1.)	Do not attempt to perform word writing to special relays.

• T-LINK

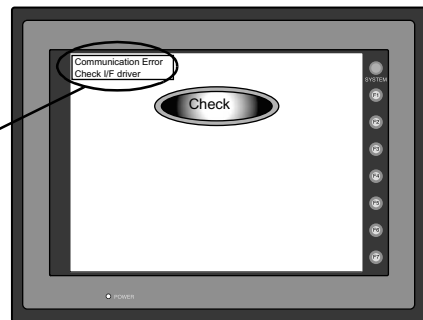
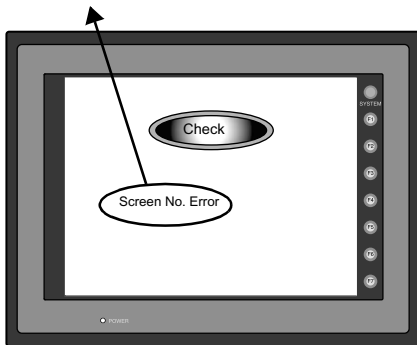
Error Message	Contents	Solution
T-LINK I/F Board Err	The I/F unit for T-LINK has an error.	Contact your local distributor.
Network I/O Access Err	MONITOUCH is about to access exceeding the set number of input/output words.	Check the memory for the network I/O in the screen data file.
Access denied by Loader	The PLC loader is being accessed so that processing is not performed on V7. (This error occurs during program transfer from the PLC loader for most cases.)	Wait for the PLVC loader to finish processing, and press the [RETRY] switch on the V7 screen.
Communication Error Received Code No. 36	The number of monitor registration points is too small.	Correct the number of monitor registration points. For monitor registration, refer to the user manual of the PLC you are using.

• PROFIBUS-DP

Error Message	Contents	Solution
Time-Out	"Check" is displayed 2 or 3 seconds before this error occurs when connecting V7 and PROFIBUS-DP in the RUN mode.	The setting for [Own Stat. No.] on V7 is discrepant with that for [Address] for [V7 series] on the SIMATIC Manager. Check and correct the setting.
	A screen is displayed instantaneously (= communications performed) before this error occurs when connecting V7 and PROFIBUS-DP in the RUN mode.	The DB address set on the V7 screen may not exist on the PLC (memory over). Check the setting.

2. Check

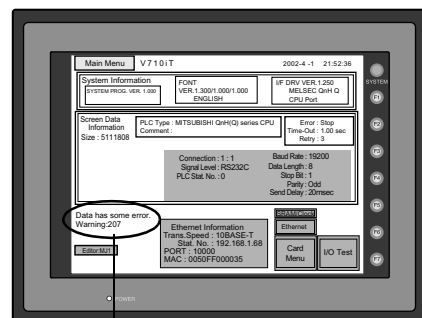
Error Message	Contents	Solution
Screen No. Error	There is no setting for the received screen.	At the start of communications, the V7 series regards the value in the read area "n + 2" as the screen number. Check that this value is an existing screen number on the PLC.
Data has some error. Error : XX (XX : XXX)	There is an error in the created screen data.	"Error : XX (XX : XXX)" indicates the edited screen and the contents of the error. For the error details and solutions, refer to "Reference Manual" and correct screen data.



Error Message	Contents	Solution
Communication Error Check I/F driver	Although a request to send is given to the computer, no answer is returned within the specified time.	The I/F driver for simulator is transferred. If you don't use the simulator, uncheck [Use Simulator] before transferring data.

3. Warning

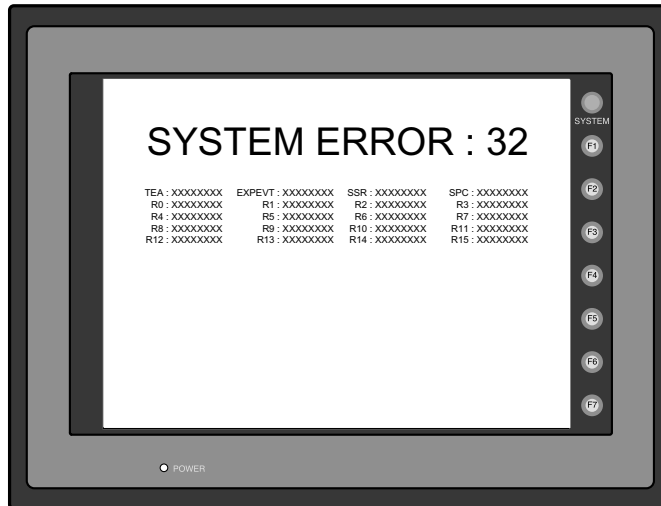
An error may be displayed on the Main Menu screen during data transfer. This is a warning message. For the warning details and solutions, refer to the Reference Manual and correct screen data.



Warning message

4. SYSTEM ERROR

When a system error is detected, the following error screen is displayed.



ERROR: XX

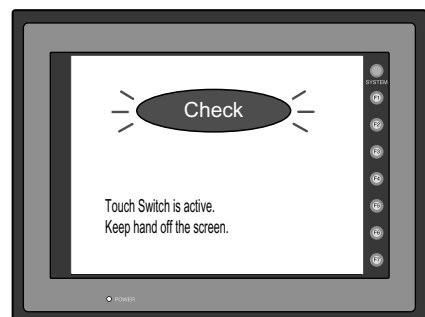
- 1: Watch dock timer error
- 11: Switch table error
- 30: Request for displaying full error
- 31: Memory allocation system error
- 32: General exceptions/MMU address system error
- 33: RTOS system error
- 34: Memory error
- 35: Inaccurate memory error

The source of the error could be one of the following three problems. Contact your local distributor.

- 1) Program crash due to noise
- 2) Hardware problem
- 3) Bad program

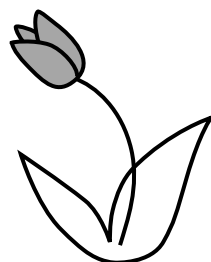
5. Touch Switch is Active

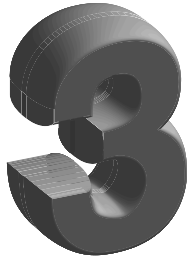
If the power is turned off while a touch switch is activated, the following error screen is displayed. Remove your finger from the screen.



MEMO

Please use this page freely.





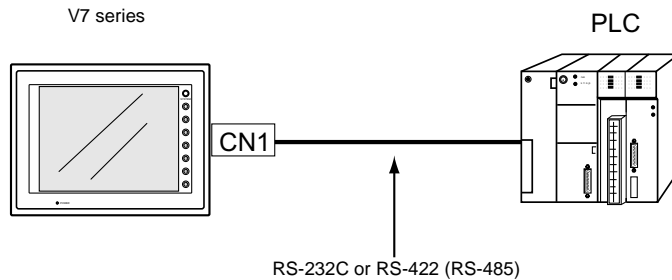
Serial Communications

1. 1 : 1 Connection
2. 1 : n Connection (Multi-drop)
3. n : 1 Connection (Multi-link 2)
4. n : 1 Connection (Multi-link)
5. Universal Serial Communications
6. V-Link
7. PLC2Way
8. Temperature Control Network

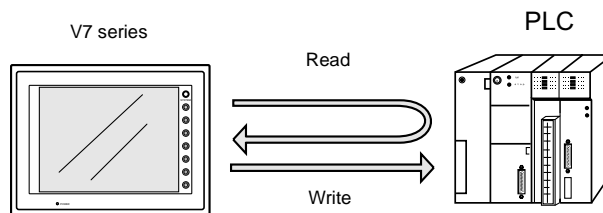
1. 1 : 1 Connection

1 : 1 Connection

- One set of the V7 series is connected to one PLC (1 : 1 connection).



- The host link unit of the PLC or the CPU port is used and the V7 series (master station) establishes communications according to the protocol of the PLC. Consequently, it is not necessary to have the dedicated communication program on the PLC (slave station). The V7 series reads the PLC memory for screen display. It is also possible to write switch data or numerical data entered through the keypad directly to the PLC memory.



Wiring



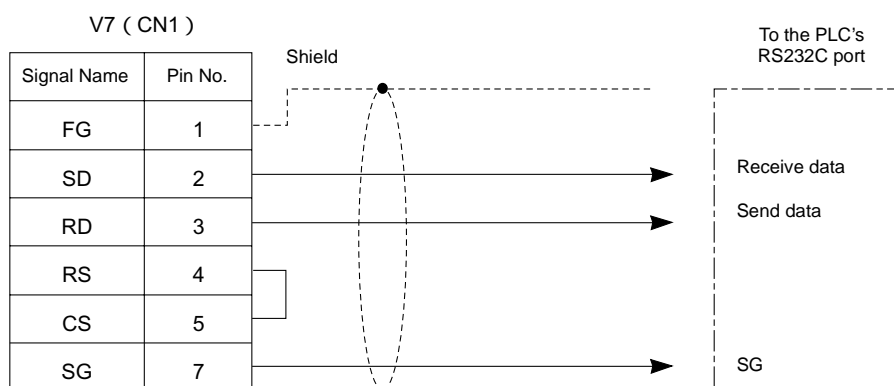
DANGER

Electric shock hazard
Shut the power off before connecting cables.

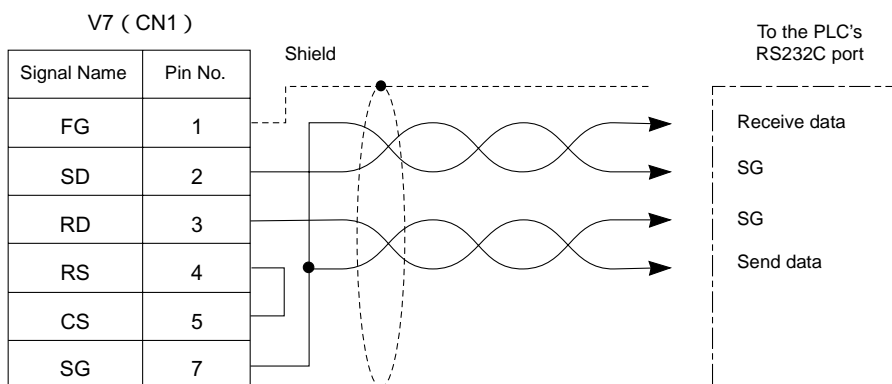
Prepare the communication cable with the PLC on your side. Refer to the following information for the cable. For more information on the connection to respective PLCs, refer to “Chapter 5 Connection to PLCs.”

RS-232C Connection

- Connect the shielded cable either to the V7 series or PLC side. This connection diagram shows the case where the shielded cable is connected on the V7 series side. When connecting the shielded cable to the V7 series side, connect it to pin 1 of the connector or the connector case cover.
- Twisted pairs of 0.3 mm sq. or above are recommended.



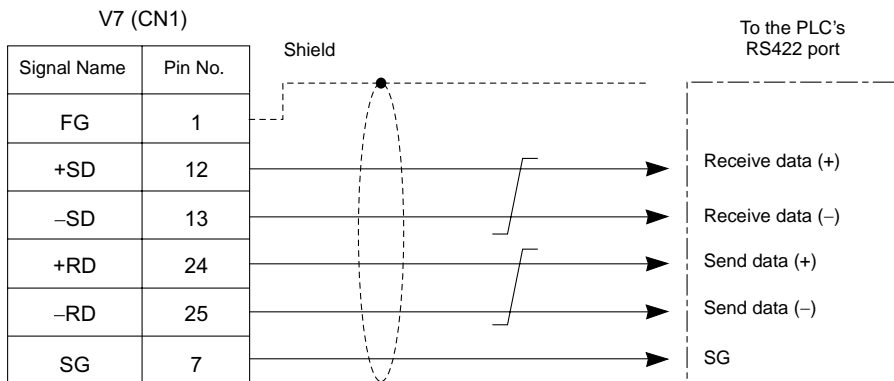
- If noise disturbs communications, use twist-pair cables between SD/SG and RD/SG.



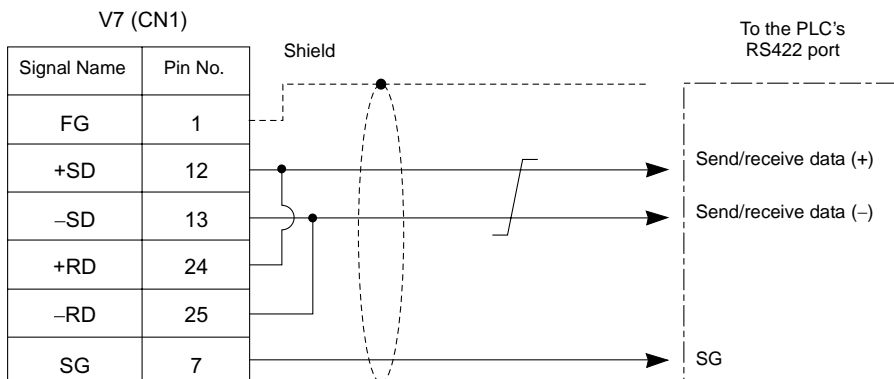
RS-422/485 Connection

- Connect twist-pair cables between +SD/-SD and +RD/-RD.
- If the PLC has the terminal for signal ground (SG), be sure to connect a wire.
- Connect the shielded cable either to the V7 series or PLC side. This connection diagram shows the case where the shielded cable is connected on the V7 series side. When connecting the shielded cable to the V7 series side, connect it to pin 1 of the connector or the connector case cover.
- To use a terminal block for connection, use Hakko Electronics' "TC485" optionally available.
- For the terminating resistance on the V7 series, turn the DIP switch (DIPSW7) to the ON position on the side towards the rear.
- Twist-pair cables of 0.3 mm sq. or above are recommended.

4-wire system:



2-wire system:



V-SFT Setting

For serial communications, the following settings on the V-SFT editor are required. The settings in the [Select PLC Type] and [Comm. Parameter] dialogs are shown on the Main Menu screen of the V7 series. (Refer to "Chapter 2 MONITOUCH Operations.")

PLC Selection

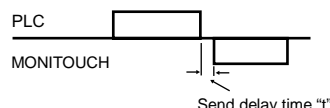
Select the PLC that is connected.

- Setting Position
[System Setting] → [PLC Type] → [Select PLC Type] dialog

Communication Parameter Setting

The communication parameter setting is essential for successful communications between the V series ↔ PLC. Check the communication parameter setting on the PLC before making the setting on MONITOUCH.

- Setting Position
[System Setting] → [Comm. Parameter] → [Comm. Parameter] dialog
- Setting Items
 - [Connection] (1 : 1 / 1 : n / Multi-Link / Multi-Link 2)
Select the type of connection between the V7 series and the PLC. There are four types available. Depending on the selected type, the setting items in the [Comm. Parameter] dialog or those for the memory vary. Select [1 : 1] for 1 : 1 connection.
 - [Local No.]
Set the port number of the PLC.
 - [Trans. Mode] (Trans. Mode 1/Trans. Mode 4)
When the PLC has a transmission mode setting, set the same on the V7 series. (This setting must be used for PLCs of MITSUBISHI, OMRON, HITACHI, YOKOGAWA, Toyoda Machinery and YASKAWA.)
 - [Baud Rate] [Signal Level] [Data Length] [Stop Bit] [Parity]
Make the same setting as the PLC. (Refer to "Chapter 5 Connection to PLCs.")
[Baud Rate] (4800, 9600, 19200, 38400, 57600, 76800, 115 kbps)
Set the same communication speed as the PLC.
[Signal Level] (RS232C/RS422)
Set the same communication interface as the PLC.
[Data Length] (7-bit/8-bit)
Choose either data length for communication.
[Stop Bit] (1-bit/2-bit)
Choose either stop bit for communication.
[Parity] (None/Odd/Even)
Choose any of the parity options for communication.
 - [Send Delay Time] (0 to 255) (Unit: × 1 msec)
Set a time delay in sending the next command to the PLC after receipt of a response from the PLC. Normally use the default setting.
 - [Start Time]
Set a time delay in seconds in starting communications on the V7 series to avoid a delay in PLC processing that may occur when the V7 series and the PLC are turned on at the same time.



- Choose the action to be taken against communication errors.

[Comm. Error Handling]

Set error handling routine in the case that a communication error between the V7 series and the PLC occurs.

[Stop] If any communication error has arisen, the communications are stopped. When restoring, use the Retry switch (found on the error screen of the V7 series).

[Continuous] If any communication error has arisen, it is indicated at the top left corner on the V7 screen. The V7 series conducts polling of the PLC, and if OK, the error state is automatically reset.

Supplemental Information: Polling
"Polling" means to constantly monitor and check the state of the other station.

[Time-out Time] (0 to 999) (Unit: $\times 10$ msec)

Specify a time for monitoring the receiving of a response from the PLC. If no response is received within the specified time, a retrieval is attempted.

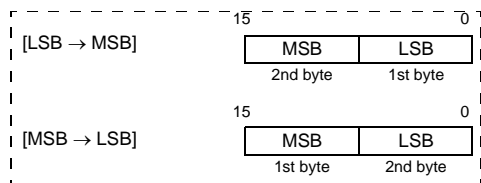
[Retrials] (1 to 255)

Specify the number of retrieval times. When the problem persists even after as many retrials as specified, the system will start the error handling routine.

- [Text Processing]

(LSB \rightarrow MSB / MSB \rightarrow LSB)

When processing characters, choose either option for arranging 1st/2nd bytes in one word.



- [Code] (DEC/BCD)

Choose the code for entering numerical data. For some numerical data, such as those for data displays or data sampling in the sampling mode, this setting is not applied because BCD or DEC should be chosen for [Input Format].

- [Read Area] [Write Area]

Refer to the next section "System Memory."

- ☐ Read/Write Area GD-80 Compatible]

When converting screen data files created on GD-80 into those of the V7 series, this option is automatically checked. When this option is checked, GD-80 compatibility is supported by securing 2 words each for [Read Area] and [Write Area] in the same format as GD-80. For more information, refer to the GD-80 User's Manual.

- ☐ Use Ethernet]

When using Ethernet communications, check this option. For more information, refer to "Chapter 4 Network Communications/1. Ethernet."

System Memory

[Read Area]/[Write Area] of the system memory must be secured for communications between the V7 series and the PLC.

- Setting Position

[System Setting] → [Comm. Parameter] → [Comm. Parameter] dialog

- Setting Items

[Read Area] (3 words or more)*

- This is the area where commands from the PLC are received for screen display changes. Consecutive three words from the specified memory address are used as "read area."

Address	Name	Contents
n	RCVDAT	Sub command/data
n + 2	SCRN_COM	Screen status command
n + 1	SCRN_No	Screen number command

* When you have created screens with the following function, the number of required memory addresses vary.

- When the sampling function is used:

Refer to the Reference Manual (Function).

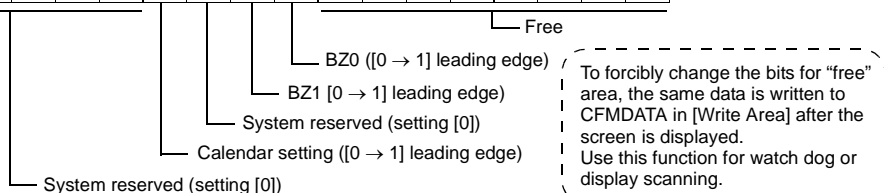
- When [☐ Read/Write Area GD-80 Compatible] is checked:

Refer to the GD-80 User's Manual.

- Set "0" for all the bits not used in the read area.

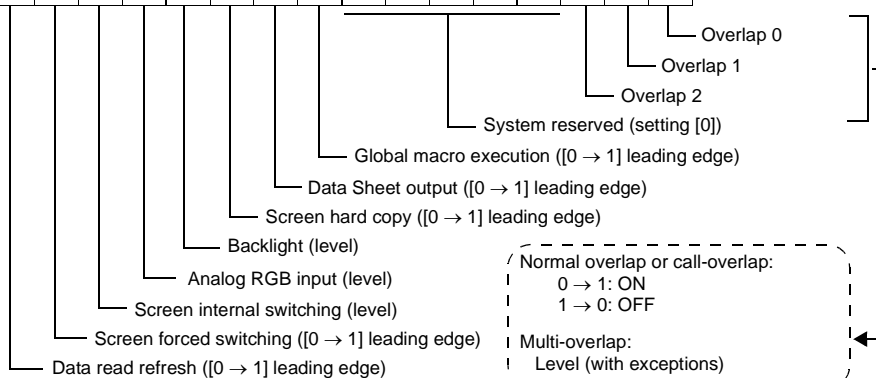
- RCVDAT (n) Sub command/data

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0		0			0	0	0	0	0	0	0	0



- SCRN_COM (n + 1) Screen status command

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
								0	0	0	0	0			



• SCRN_No. (n + 2) Screen number command

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0													

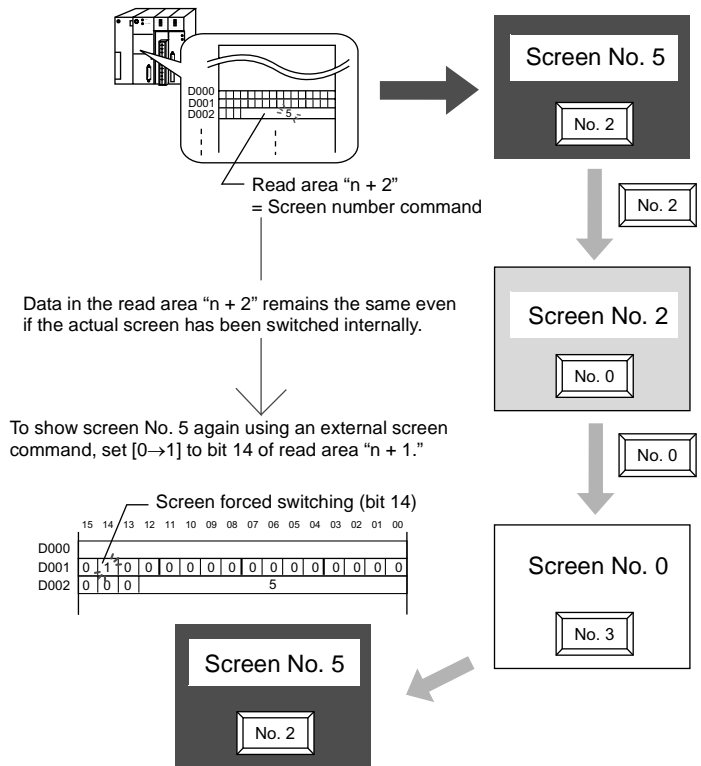
└─ System reserved (setting [0]) ─┬─ Screen number

Use example: To specify a screen number from the PLC:

When "D0" is set for [Read Area], the screen number is written in "D2" of the PLC.

Problem example: The screen display does not change when a screen number is specified from the PLC.

If the same number as the one specified for "n + 2" is already contained in this memory address, the screen display does not change even if it is specified again. For example, if screen No. 5 is specified from the PLC and it was once changed to screen No. 2 → No. 0 by internal switches, normally it cannot be returned to the former screen No. 5 that was specified by an external command, because the external screen command number (5) remains the same as before in the memory address ("D2" in the read area) for the screen number command. In such a case, it is possible to forcibly switch the screen to the screen number contained in "D2" in the read area at the leading edge [0 → 1] of bit 14 of the memory address for the screen status command ("D1" in the read area).



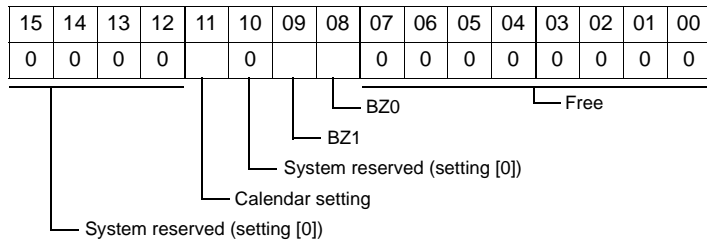
[Write Area] (3 words)*

This is an area where the screen status is written. Consecutive three words from the specified memory address are used as "write area."

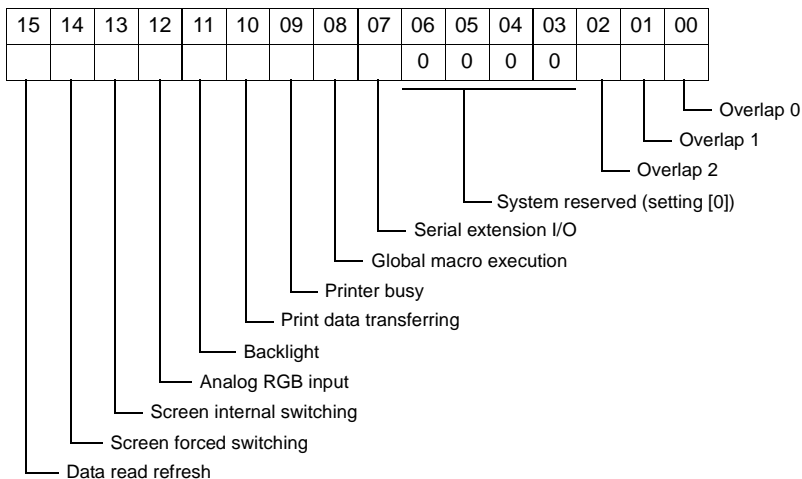
* When you have converted GD-80 data to the V7 series data, the number of required memory addresses vary. Refer to the GD-80 User's Manual.

Address	Name	Contents
n	CFMDAT	Same as data in read area "n"
n + 2	SCRN_COM	Screen status
n + 1	SCRN_No	Displayed screen number

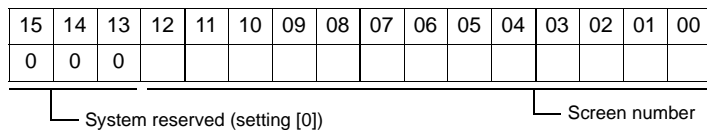
• CFMDAT (n)



• SCRN_COM (n + 1) Screen status



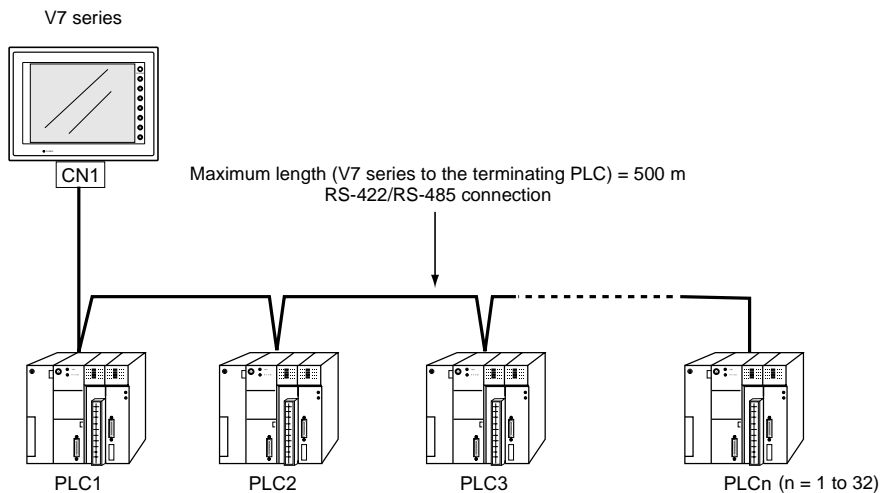
• SCRN_No. (n + 2) Displayed screen number



2. 1 : n Connection (Multi-drop)

1 : n Connection

One V7 series is connected to multiple PLCs. (Maximum connectable PLCs: 32)

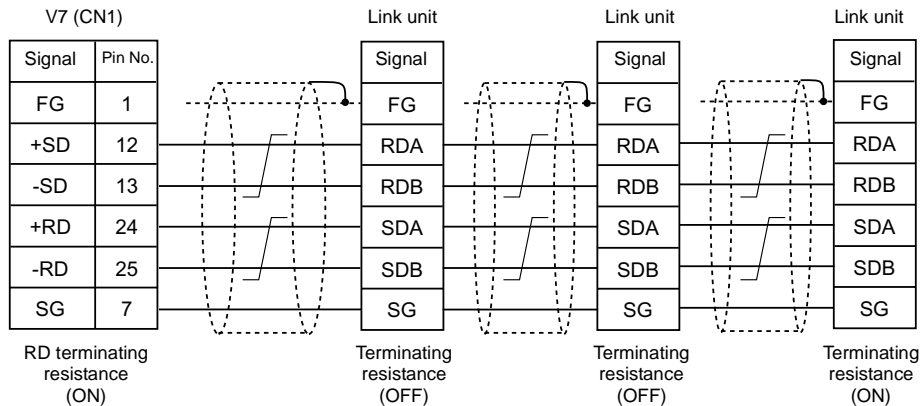


Wiring (RS-422/485)

For connecting information, refer to the instruction manual for the PLC.

Example:

The following example shows how one V7 series is connected to three PLCs made by MITSUBISHI. For more information, refer to the MITSUBISHI's instruction manual for the PLC.



* Use shielded twist-pair cables.

V-SFT Setting

The following settings must be made on the V-SFT editor. Only the points different from those described in “1 : 1 Connection/V-SFT Setting” (page 3-3) are explained here.

PLC Selection

Select the PLC that is connected. Check that the PLC to be connected is ready for 1 : n connection. Refer to the Appendix.

- Setting Position
[System Setting] → [PLC Type] → [Select PLC Type] dialog

Communication Parameter Setting

- Setting Position
[System Setting] → [Comm. Parameter] → [Comm. Parameter] dialog
- Setting Items
Select “1 : n” for [Connection].

PLC Port Setting

Set the port number of each PLC not in the [Comm. Parameter] dialog but in the [Memory Setting] dialog for each part.

Notes on Communication Errors

- Be sure to select the PLC memory either for [Read Area] or [Calendar] in the [Comm. Parameter] dialog.
- Processing for PLC failure
When a communication error or timeout has been detected during communications with a PLC, no further communication with this PLC is attempted until the display screen changes. The information of PLC failure is stored in the V7 internal system memory address \$s114 to 129.

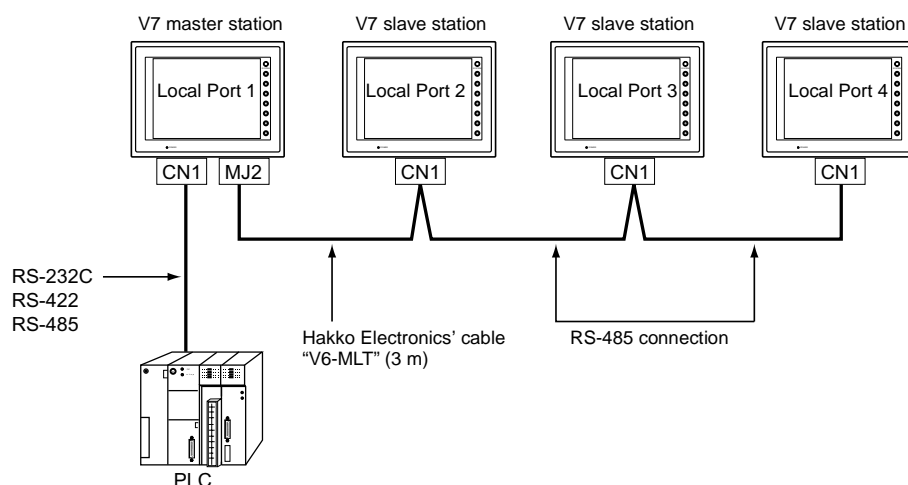
Supplemental Information:	Internal system memory The internal system memory is the one for the V7 series system.
---------------------------	-------------------------------------------------------------------------------------------

- In the case that the internal memory is set for [Read Area], [Write Area] and [Calendar], no initial connection check is performed, and calendar information is read when the V7 series establishes communications with the PLC for the first time. A communication error occurs on the V7 series if a timeout is detected while accessing the PLC.

3. n : 1 Connection (Multi-link 2)

Multi-link 2

- One PLC is connected to a maximum of four V7 series.
- An original network is created where the V7 series (Local Port 1) that is directly connected to the PLC is the master station, and other three V7 series are slave stations. Only the master station makes communications directly with the PLC, and the slave stations make communications with the PLC via the master station.

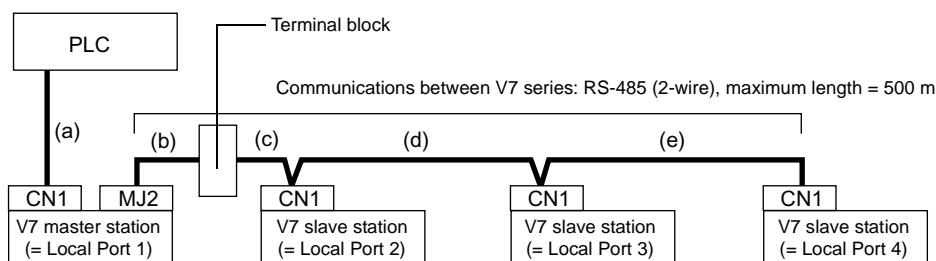


- Communications between the V7 master station and the PLC depend on the communication speed set on the PLC. The maximum available speed for the V7 series is 115 kbps, which is higher than the one available with multi-link connection described in "4. n : 1 Connection (Multi-link)."
- This multi-link connection is available with almost all the PLC models that support 1 : 1 connection (refer to the Appendix). The connection between the master station and the PLC is the same as the one for 1 : 1 connection).
- Use the RS-485 2-wire connection between stations of the V7 series. Please use Hakko Electronics' multi-link 2 master cable (V6-MLT) for connection between the master station (Local Port 1) and the slave station (Local Port 2).
- In the following cases, multi-link 2 connection is not available.
 1. A communication interface unit (example: OPCN-1, CC-LINK, Ethernet, etc) is used.
 2. The V7 series (master or slave station) is used for the temperature control network or PLC2Way function.

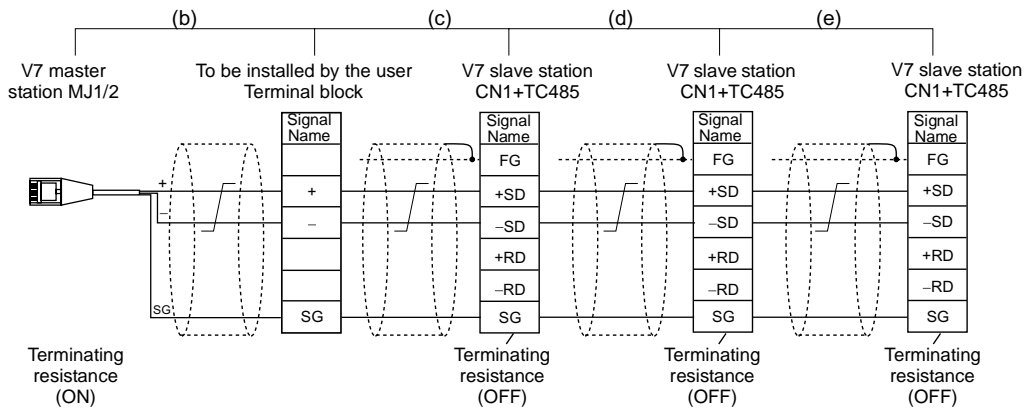
- The V7 and V6 series can be used together. The V6 series can be the master station. (However, when V606/V606i is the master station, the slave station must be V606/V606i. Also, depending on the hardware version of the V6 series, multi-link 2 connection may not be supported. Refer to the V6 Hardware Specifications.)

Wiring

Connection

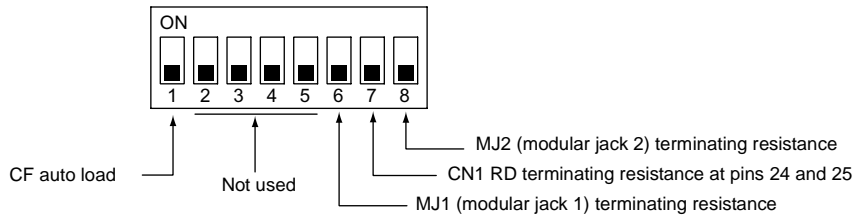


- (a) Connection between PLC ↔ V7 master station
The communication parameter setting and connecting method are the same as those for 1 : 1 connection. (Refer to “Chapter 5 Connection to PLCs.”)
- (b)(c) Connection between V7 series master station ↔ V7 slave station
The connecting port for the V7 series master station depends on the selection for [Multi-Link] (either [Modular Jack 1] or [Modular Jack 2]) on the V-SFT editor. Selection of [Modular Jack 2] is recommended. ([Editor Port] is set as default for [Modular Jack 1].) The connecting port of the V7 series slave station should be CN1. It is recommended that CN1 be equipped with a terminal converter “TC485” (set to 2-wire connection). The multi-link 2 master cable (b) (V6-MLT) is 3 m long. If the distance (c) between the V7 series master station and the V7 series slave station is longer than 3 m, use a terminal block and connect the cables.
- (d)(e) Connection between V7 series slave station ↔ V7 slave station
Use the RS-485 2-wire connection. It is recommended that CN1 be equipped with a terminal converter “TC485” (set to 2-wire connection).
- (b)(c)(d)(e) The maximum length between V7 series should be 500 m.
- * To avoid line-noise problems, connect one terminal only so that the shielded frame ground of each cable will not be connected between the V7 series.
The shielded frame ground of V6-MLT must be connected to the V7 series master station.
 - * When the terminal converter “TC485” is not used, install jumpers between +RD/+SD and –RD/–SD.



Terminating Resistance Setting

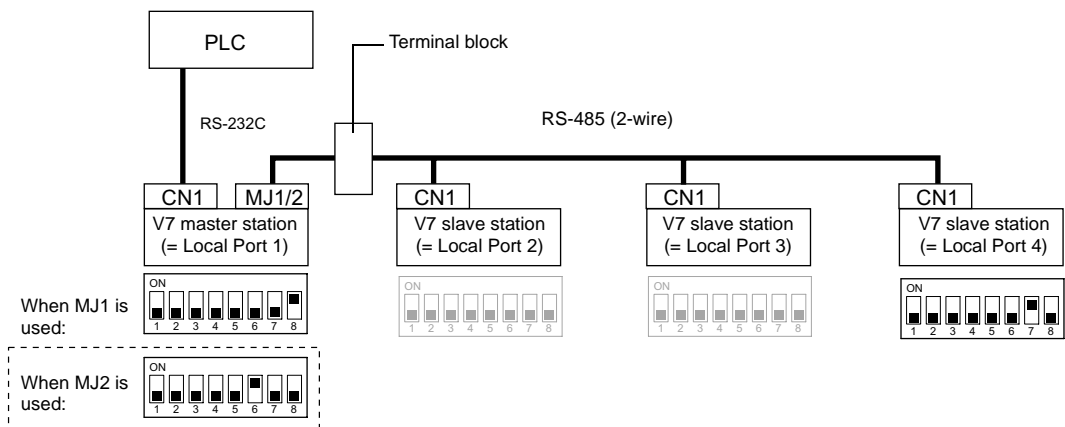
- The terminating resistance of the V7 series should be set on the DIP switch.



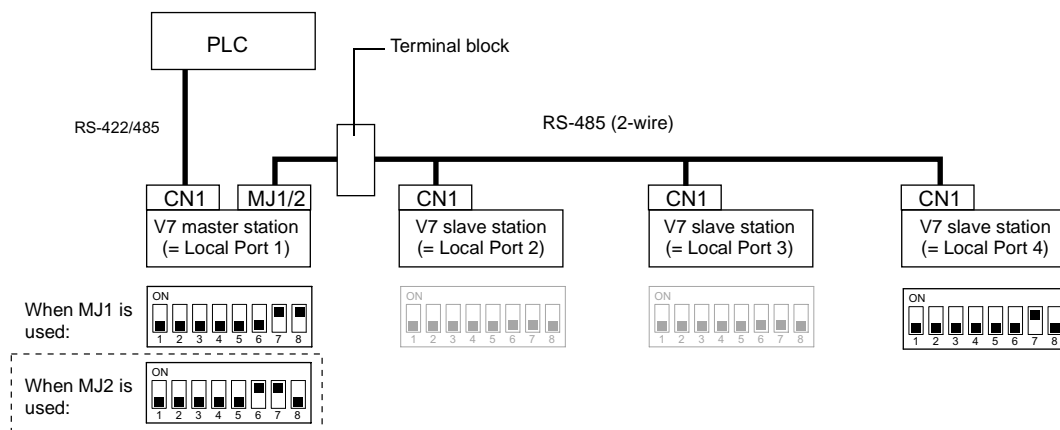
- When the PLC and the master station are connected via RS-422/485, set the terminating resistance at the PLC and the master station (CN1).
- When the V7 series (master and slave stations) are connected via RS-485 (2-wire), set the terminating resistance at the V7 series master station (MJ1/2) and the terminating slave station (CN1).

Terminating Resistance Setting Example

- When the PLC is connected to V7 series master station via RS-232C:



2. When the PLC is connected to V7 series master station via RS-422/485:



V-SFT Setting

The following settings must be made on the V-SFT editor.

Only the points different from those described in "1. 1 : 1 Connection/V-SFT Setting" (page 3-3) are explained here.

PLC Selection

Select the PLC that is connected.

- Setting Position
[System Setting] → [PLC Type] → [Select PLC Type] dialog
→ Check [☒ Display Multi-link2 PLC]. The PLC list compatible with multi-link 2 connection is displayed.

Communication Parameter Setting

- Setting Position
[System Setting] → [Comm. Parameter] → [Comm. Parameter] dialog
- Setting Items

[Connection]

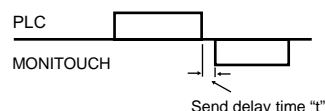
Select [Multi-Link 2]. Click [Setting]. The [Multi-Link 2] dialog is displayed. Make the necessary settings. For the V7 series master station, set the following items. For the V7 series slave station, set the items marked with ♦.

[Local Port] ♦ (1 to 4)

Set the port number of the V7 series. For the V7 series master station, set "1." For the V7 series slave station, set "2" to "4." Set the unique port number for each V7 series. If the number duplicates, communications will not be performed correctly.

[Send Delay Time] (0 to 255) (Unit: $\times 1$ msec)

Set a time delay in sending the response to the PLC after receipt of data from the PLC. Normally use the default setting (0).



[Total] ♦ (2 to 4)

Set the total number of the V7 series included in the multi-link 2 connection.

[Retry Cycle] ($\times 10$)

Set the number of cycles before the master station sends an inquiry for restoration to the slave station that has a communication problem (= system down). When a slave station has a problem, it is temporarily removed from the communication targets, and the master station sends an inquiry for restoration every number of cycles specified for [Retry Cycle]. This setting does not affect the communication speed if no problem is occurring; however, if there is any problem, it does affect the communication speed.

- When the setting value is small: It will not take a long time before restoration.
- When the setting value is large: It will take a longer time before restoration.

Supplemental Information: [Retrials] in the [Detail] tab window of the [Comm. Parameter] dialog is the number of retrials that the V7 series master station sends an inquiry to the PLC.

[Baud Rate of Multi-Link] ♦ (4800, 9600, 19200, 38400, 57600, 76800, 115 kbps)

Set the baud rate used for communications between the V7 series. The setting must be the same as other V7 series on the same communication line.

*** For [Total] and [Baud Rate of Multi-Link], the same values must be set on all the V7 series that are connected in the same communication line.**

3. Make the following setting when "1" is set for [Local Port] on the [Comm. Parameter] dialog on the V7 series master station. Select [System Setting] → [Modular Jack]. Select [Multi-Link] for [Modular Jack 1] or [Modular Jack 2]. Connect the multi-link 2 master cable (V6-MLT) to the modular jack selected for [Multi-Link].

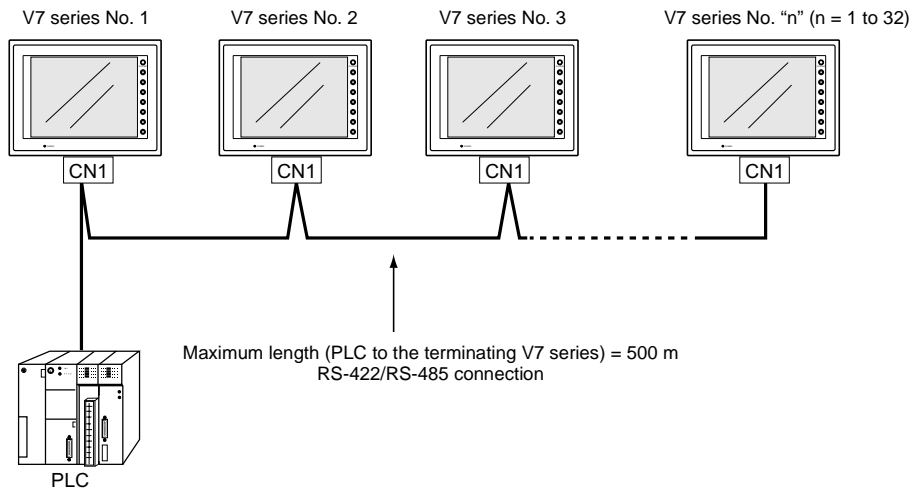
Communication Error

- When the master station has a communication error, the slave stations do not work and the communication error "Time-out" is displayed. When the V7 series slave station has a failure, a communication error occurs only on this station.

4. n : 1 Connection (Multi-link)

Multi-link

- One PLC is connected to multiple V7 series. (Maximum connectable V series: 32)



- The PLC must be of the type of signal level RS422/RS485 with port numbers. RS422 connection between the V7 series ↔ PLC must be in 2-wire connection.
- The V7 and V6 series can be used together.

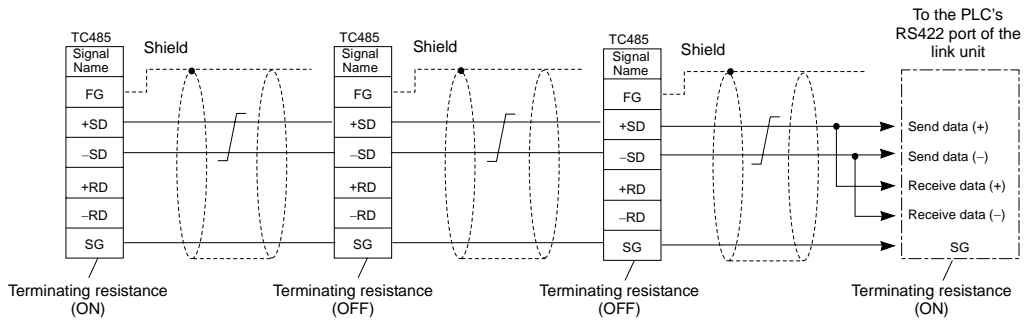
Wiring

Connection with Link Unit

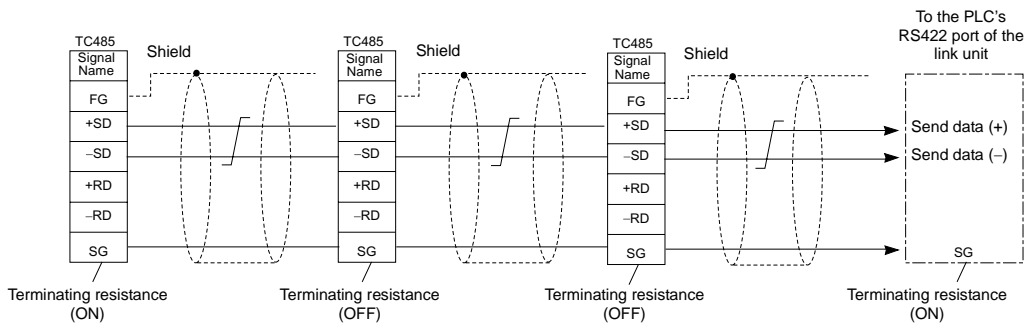
Use the RS-485 2-wire connection. (It is recommended that Hakko Electronics' optional terminal converter "TC485" be used.)

- When TC485 is used:

Set "2-wire connection" at the DIP switch (SW1) on TC485. When a jumper is required on the PLC:



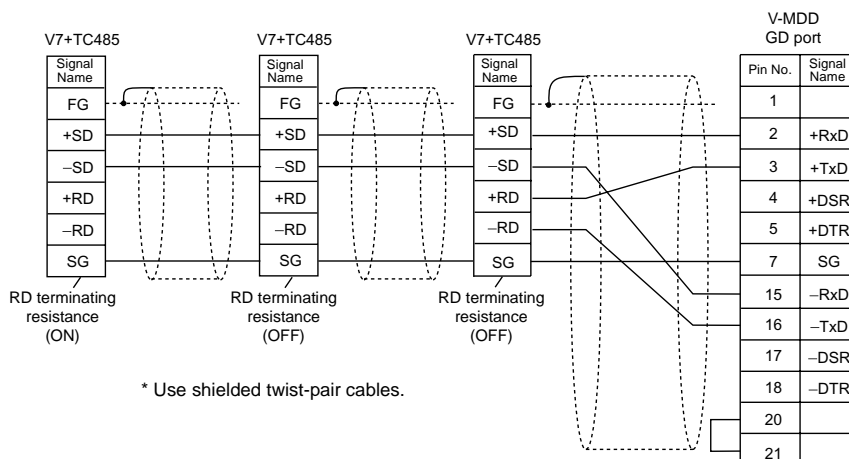
When no jumper is required on the PLC:



- When TC485 is not used:

Install jumpers between +RD/+SD and -RD/-SD.

When connecting directly to the CPU of the MITSUBISHI QnA series:



Use the GD port of Hakko Electronics' optional dual port interface V-MDD.

V-SFT Setting

The following settings must be made on the V-SFT editor. Only the points different from those described in "1. 1 : 1 Connection/V-SFT Setting" (page 3-3) are explained here.

PLC Selection

Select the PLC that is connected. Check that the PLC to be connected is ready for multi-link connection. Refer to the Appendix.

- Setting Position
[System Setting] → [PLC Type] → [Select PLC Type] dialog

Communication Parameter Setting

- Setting Position
[System Setting] → [Comm. Parameter] → [Comm. Parameter] dialog

- Setting Items

[Connection]

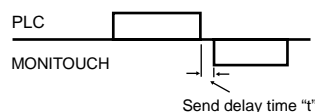
Select [Multi-Link]. Click [Setting]. The [Multi-Link] dialog is displayed. Make the necessary settings.

[Local Port] (1 to 32)

Set the port number of the V7 series. Set the unique port number for each V7 series. If the number duplicates, communications will not be performed correctly.

[Send Delay Time] (0 to 255) (Unit: $\times 1$ msec)

Set a time delay in sending the response to the PLC after receipt of data from the PLC. (Default setting: 20 msec)



[Total] (2 to 32)

Set the total number of the V7 series included in the connection.

[Retry Cycle] (×10)

When the V7 series has a problem, it is temporarily removed from the communication targets, and the master station sends an inquiry for restoration every number of cycles specified for [Retry Cycle]. This setting does not affect the communication speed if no problem is occurring; however, if there is any problem, it does affect the communication speed.

- When the setting value is small: It will not take a long time before restoration.
- When the setting value is large: It will take a longer time before restoration.

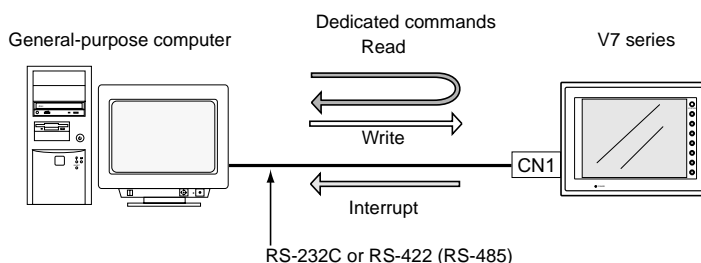
Supplemental Information: [Retrials] in the [Detail] tab window of the [Comm. Parameter] dialog is the number of retrials that the V7 series sends an inquiry to the PLC.

*** For [Send Delay Time], [Total] and [Retry Cycle], the same values must be set on all the V7 series that are connected in the same communication line.**

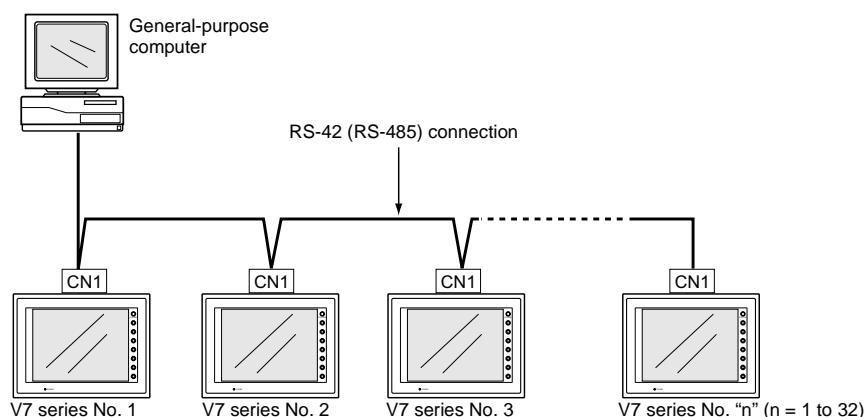
5. Universal Serial Communications

Universal Serial Communications

- A general purpose computer or an ASCII unit of the PLC (master station) controls the V7 series (slave station) using dedicated commands.



- The V7 series internal user memory addresses (\$u) must be used for memory allocation for switch, lamp or data display parts. When the master station specifies a screen number, data is written to the internal memory address (\$u) allocated for the screen. If the screen is switched internally, the new screen number is read and is written to the internal memory address (\$u) allocated for the screen.
- For 1 : 1 connection, the V7 series can send an interrupt to the master station through switch activation, write command from the keypad, and screen change.
- Use CN1 of the V7 series for connection with a general-purpose computer. Either signal level RS-232C or RS-422 (RS-485) can be selected.
- In addition to 1 : 1 connection, 1 : n connection is available between the general-purpose computer and the V7 series via RS-422. (A maximum of 32 V7 series can be connected.) For 1 : n connection, interrupts cannot be used.

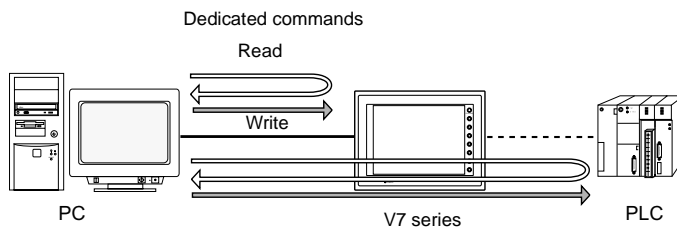


- For more information, refer to the V series Universal Serial Connection Manual.

6. V-Link

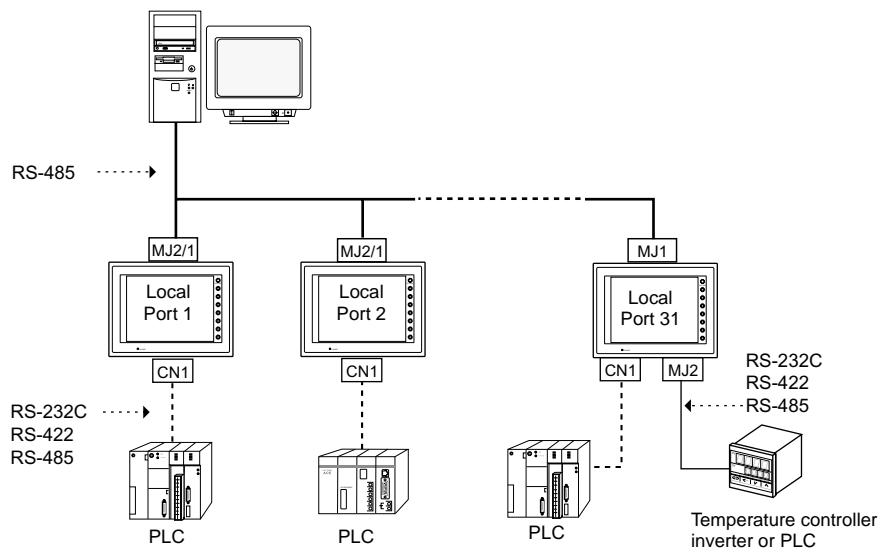
V-Link

- “V-Link” is the network where the computer reads from and writes to the internal memory of the V7 series, memory card, PLC memory or temperature control/PLC2 memory using a dedicated protocol.



- Use the MJ port of the V7 series for connection with a general-purpose computer. For connection with the PLC using a temperature controller or the PLC2Way function, use the other MJ port and use CN1 for communications with the PLC. Data of the PLC or temperature controller can be collected through communications with the V7 series. Data collection is available even between the products of different manufacturers.
- Either signal level RS-232C or RS-485 can be selected. With RS-232C, one V7 series can be connected; with RS-485, a maximum of 31 V7 series can be connected.

<RS-485 connection>



Wiring

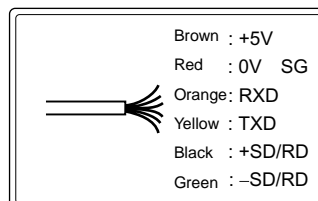
Cable

Use Hakko Electronics' cable "V6-TMP" (3 m) for connection with a computer. The shielded frame ground of V6-TMP must be connected to the V7 series.

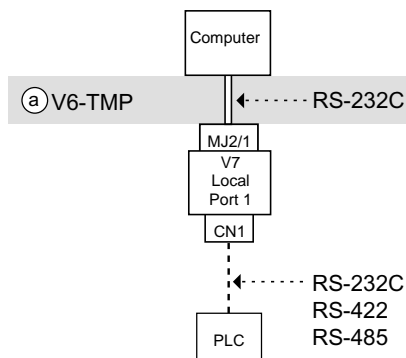
*** Notes on Use of V6-TMP**

There are six wires in the V6-TMP cable as shown on the right. The wires to be used are determined depending on the connecting method. For the wires not used, be sure to properly insulate with tape, etc.

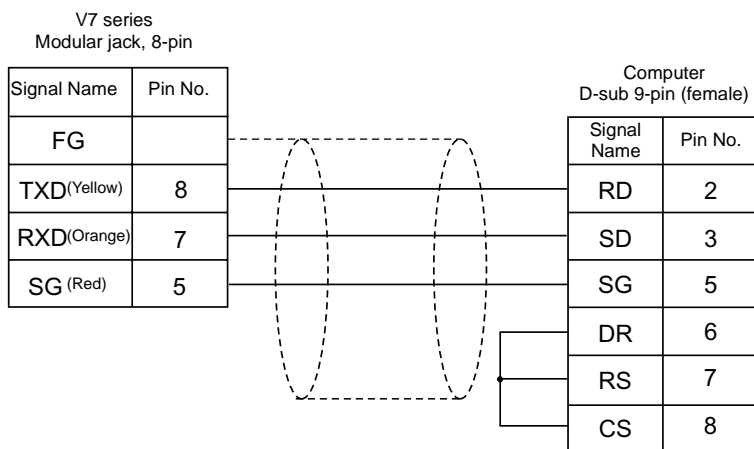
V6-TMP



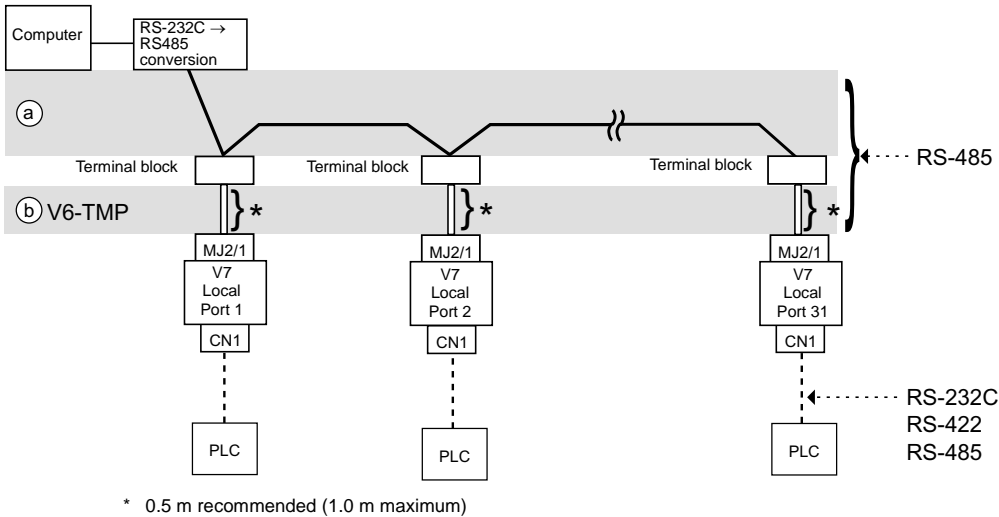
RS-232C (V7 series: 1 set)



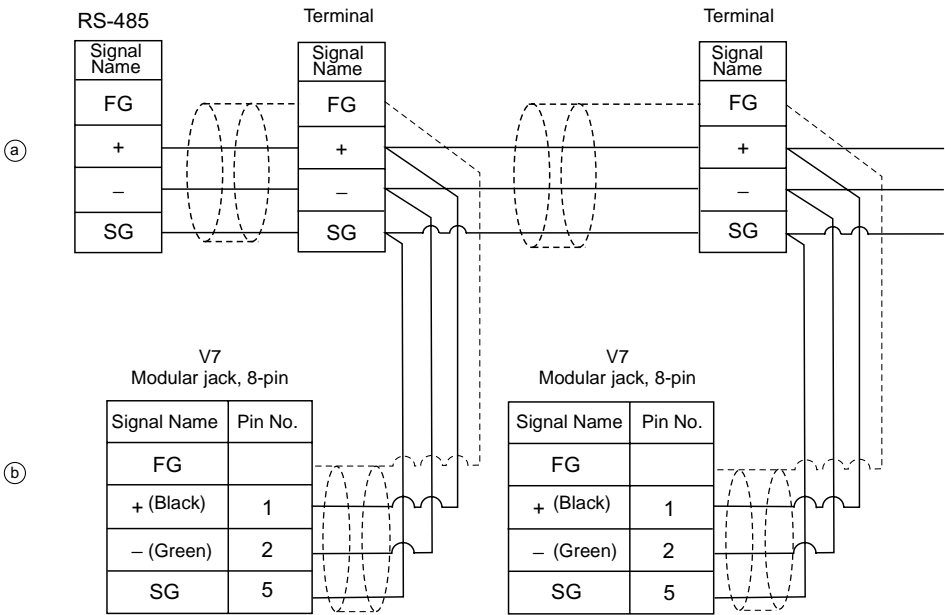
Wiring example of above (a)



RS-485 (V7 series: maximum 31 sets)



Wiring example of above (a) and (b)



V-SFT Setting

The V-SFT settings required for V-Link are explained.

V-Link Setting

1. Click [System Setting] → [V-Link Setting].
2. The [V-Link Setting] dialog is displayed.
3. Check [☐ Use MJ port as V-Link] and make the setting for communications between the V7 series and the computer.

[Refer to Modular]

Select the modular jack to be used. Modular Jack 1/Modular Jack 2

[Baud Rate]

4800 / 9600 / 19200 / 38400 / 57600 / 115 kbps

[Local Port] (1 to 31)

Set the port number of the V7 series.

[Send Delay Time] (msec)

Set a time delay in sending a response after receipt of data.

[Parity]

None/Odd/Even

[Signal Level]

RS-232C / RS-485

With RS-232C, one V7 series can be connected; with RS-485, a maximum of 31 V7 series can be connected.

[Data Length]

7-bit/8-bit

[Stop Bit]

1-bit/2-bit

[Use sum check]

Check this option when using a sum check.

[Add CR/LF]

Check this option when adding CR/LF.

Protocol

Read (with sum check and CR/LF)

Read Command

Command

STX	V7 local No.	Read command	Number of words to read	* Read target memory setting	ETX	SUM	CR	LF
1	2	2	2	18	1	2	1	1

Bytes

Response

(Normal communication)

STX	V7 local No.	ACK	Memory data 0	Memory data n	ETX	SUM	CR	LF
1	2	2	4	4	1	2	1	1

Bytes

(When an error occurs)

STX	V7 local No.	NACK	ETX	SUM	CR	LF
1	2	2	1	2	1	1

Bytes

* Read target memory setting

V7 internal memory

Reserved for system	Address	Type	Model
2	2	4	10

PLC memory within 16 bits
Temperature cotrol/
PLC memory within 16 bits

Reserved for system	Station Number (in [n-1] connection)	Reserved for system	Expansion code	Address	Type	Model
2	2	2	2	2	2	4

PLC memory over 16 bits
Temperature cotrol/
PLC memory over 16 bits

Station Number (in [n-1] connection)	Reserved for system	Expansion code	Address	Type	Model
2	2	8	2	2	2

Memory card

Reserved for system	Address	Record No.	File No.	Model
2	2	4	4	4

Bytes

e.g.

Reads the 2-word data, "ABCD" starting with the address \$u0020(0014H) on the V7 of the station number 1.

Command

STX	V7 local No.	Read command	Number of words to read	Model	Type	Address	Reserved for system	ETX	SUM	CR	LF
02H	01H 30H-31H	20H 32H-30H	02H 30H-32H	00H 30H-30H	00H 30H-30H	0014H 30H-30H-31H-34H	0000000000H 30H-30H-30H-30H-30H-30H-30H-30H-30H-30H	03H	8FH 38H-46H	0DH	0AH

Response

(Normal communication)

STX	V7 local No.	ACK	Data				ETX	SUM	CR	LF
			A	B	C	D				
01H 02H	01H 30H-31H	00H 30H-30H	41H 34H-31H	42H 34H-32H	43H 34H-33H	44H 34H-34H	60H 03H	60H 36H-30H	0DH	0AH

Write Command

Command

STX	V7 local No.	Write command	Number of words to write	* Write target memory setting	Memory data 0
1	2	2	2	18	4

Response

(Normal communication)

STX	V7 local No.	ACK	ETX	SUM	CR	LF
1	2	2	1	2	1	1

Bytes

(When an error occurs)

STX	V7 local No.	NAK	ETX	SUM	CR	LF
1	2	2	1	2	1	1

Bytes

V6 internal memory

Reserved for system	10
Address	4
Type	2
Model	2

PLC memory within 16 bits
Temperature control/
PLC memory within 16 bits

Reserved for system	4
Station Number (in [n:1] connection)	2
Reserved for system	2
Expansion code	2
Address	4
Type	2
Model	2

PLC memory over 16 bits
Temperature control/
PLC memory over 16 bits

Station Number (in [n-1] connection)	2
Reserved for system	2
Expansion code	2
Address	8
Type	2
Model	2

Memory card

Reserved for system	4
Address	4
Record No.	4
File No.	2
Model	2

e.g.) Writes "AB12" to the addresses D0100 to 101(0064 to 0065H) on the PLC connected to the V7 of the station number 1.

Command	STX	V7 local No.	Write command	Number of words to write	Model	Type	Address	Reserved for system	Data				ETX	SUM	CR	LF
									A	B	1	2				
	01H	21H	02H	01H	00H	0064H	0000000000H		41H	42H	31H	32H		2AH	0DH	0AH
	02H	30H~31H	32H~31H	30H~32H	30H~31H	30H~30H	30H~30H, 36H~34H	30H~30H, 30H~30H, 30H~30H, 30H~30H, 30H~30H, 30H~30H	34H~31H	34H~32H	33H~31H	33H~32H	03H	32H~41H	0DH	0AH

Response	STX	V7 local No.	ACK	ETX	SUM	CR	LF
	01H		00H		C6H		
	02H	30H~31H	30H~30H	03H	43H~36H	0DH	0AH

(Normal communication)

Data Items for Protocols

- Transmission control code: 1 byte

Signal Name	Code (Hexadecimal)	Contents
STX	02H	Start of transmission block
ETX	03H	End of transmission block
CR	0DH	Carriage return
LF	0AH	Line feed

- V7 port number: 2 bytes

Port numbers are used so that the host computer can identify each V7 series for access. The data range is from 01H to 1FH (1 to 31) and is converted into the ASCII code before use. The port number of the V7 series should be set on the V-SFT editor. (Refer to “V-SFT Setting.”)

- Command: 2 bytes

Available commands are shown below.

Name	Code (Hexadecimal)	ASCII	Contents
Read	20H	32 30	Read from memory
Write	21H	32 31	Write to memory

- The number of words to be read or written: 2 bytes

Set the number of words to be read or written by one command. The data range is from 01H to FFH (1 to 255) and is converted into the ASCII code before use.

- Memory address to be read or written: 18 bytes

Specify the memory address to be accessed. Set the following code in the format as shown for “Read target memory setting” on page 3-25 and “Write target memory setting” on page 3-26.

- Model

		Code (Hexadecimal)	ASCII
V7 series internal memory		00H	3030
PLC memory	16-bit	01H	3031
	32-bit	81H	3831
Memory card		02H	3032
Temperature control/PLC2 memory	16-bit	03H	3033
	32-bit	83H	3833

- Type

	Type	Code (Hexadecimal)	ASCII
V7 internal memory	\$u (user memory)	00H	3030
	\$s (system memory)	01H	3031
	\$L (non-volatile word memory)	02H	3032
	\$LD (non-volatile double-word memory)	03H	3033
PLC memory	Depends on the PLC to be used. Set the type number indicated for "Available Memory" of respective PLCs on the Hardware Specifications.		
Temperature control/PLC2 memory	Depends on the PLC to be connected to the temperature controller and PLC2 function. Set the type number indicated for "Available Memory" of respective temperature controllers on the Temperature Control Network Manual. Set the type number indicated for "Available Memory" of respective PLCs on the Hardware Specifications when using the PLC2Way function.		

- Address

Specify the memory address to be accessed.

- Expansion code

Set the slot number of the SPU memory of the MITSUBISHI PLC or the CPU number of the YOKOGAWA PLC.

Example:

MITSUBISHI Slot No. 0: 00H
 MITSUBISHI Slot No. 1: 01H
 YOKOGAWA CPU No. 1: 00H
 YOKOGAWA CPU No. 2: 01H

*** If no expansion code or port number is required, enter "00" (= 3030 in the ASCII code).**

- Port number

1 : 1, Multi-link..... Not used
 Multi-drop..... PLC port number
 Temperature controller..... Temperature controller port number

- File No.

Specify the file number set in the [Memory Card Setting] dialog of the V-SFT editor.

- Record No.

Specify the record number set in the [Memory Card Setting] dialog of the V-SFT editor.

- System reserved

Enter "0" (= 30 in the ASCII code) for the number of bytes. The number of bytes for "system reserved" varies depending on the model.

Example:

Model	No. of Bytes	Code (Hexadecimal)	ASCII
V7 internal memory	10	0000000000H	30303030303030303030

Sum Check Code (SUM): 2 bytes

Data is added up (SUM), and the lower one byte (8 bits) of the sum is converted into the 2-digit ASCII code (hexadecimal). A sum check code is shown below.

Example: Transmission mode: without CR/LF, with sum check
Command: 20 (data read)
Address: 10 words from \$u1000 (03E8H)
When reading, a sum check will be performed as shown below.

STX	V7 Port number	Command	Read Words	Memory Model	Memory Type	Address	System reserved	ETX	SUM
	01H	20H	0AH	00H	00H	03E8H	0 0 0 0 0 0 0 0 0H		B9H
02H	30H31H	32H30H	30H41H	30H30H	30H30H	30H 33H 45H 38H	30H 30H 30H 30H 30H 30H 30H 30H 30H 30H	03H	42H39H

02H + 30H + 31H + 32H + 30H + 30H + 41H + 30H + 30H + 30H + 30H + 30H + 33H + 45H + 38H

+ 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 03H = 4B9H

Response Code: 2 bytes

- [ACK]
This code is received at normal termination.
00H (3030: ASCII)
- [NAK]
This code is received at abnormal termination. (ASCII) Refer to the next page for more information.

NAK: Error Codes

- 02H: Overrun/Framing error
An overrun or framing error is detected in the received data. Send the command again.
- 03H: Parity error
A parity error is detected in the received data. Send the command again.
- 04H: Sum check error
A sum error occurs with the received data.
- 06H: Count error
The memory read/write count is "0."
- 0FH: ETX error
No ETX code is found.
- 11H: Character error
A character not used in the received data is found. (other than 0 to F) Check the character and send the command again.
- 12H: Command error
An invalid command is given.
- 13H: Memory setting error
The address or device number is invalid.

1-byte Character Code List

Upper

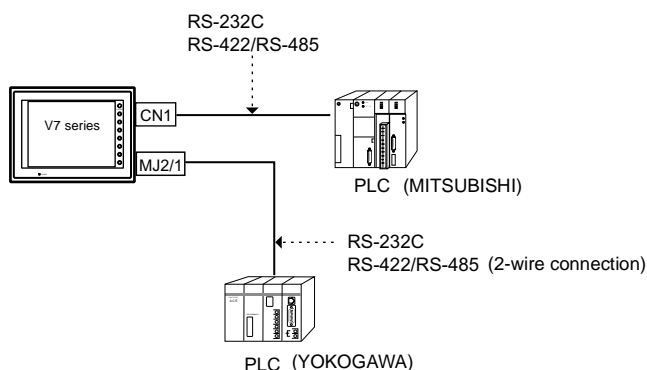
Lower

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	'	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			\$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	¥	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	■								

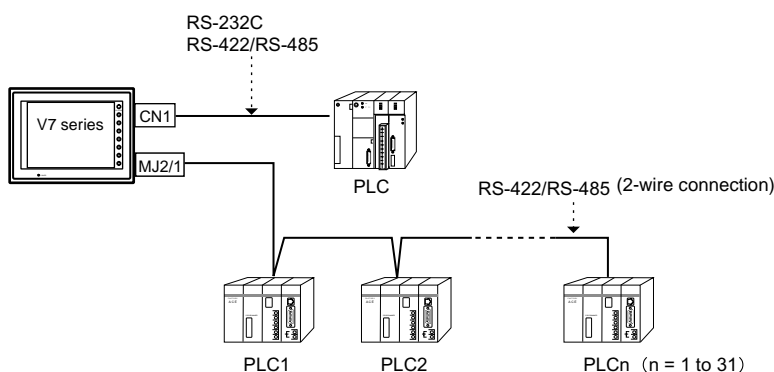
7. PLC2Way

PLC2Way

- The “PLC2Way” function is an original network function where one V7 series can be connected to two PLCs. Even if the manufacturers of these PLCs are not the same, they can be connected to one V7 series.



- Connect one PLC to the CN1 connector, and the second PLC to the MJ port.
- With the PLC2Way function, it is possible to communicate with PLCs without special program in the same way as 1 : 1 connection. Two PLCs that are connected to the V7 series are controlled at the same time, and memory read/write operations are available with these two PLCs.
- Connection at the MJ port can be performed via RS-232C or RS-485 (2-wire). With RS-232C, one PLC can be connected; with RS-485, a maximum of 31 PLCs can be connected.



- Constant reading/sampling of PLC data connected to the MJ port
When read/write memory addresses are preset on the temperature control network/PLC2Way table, background data transfer is performed at regular intervals. It is also possible to save the read data in the V7 internal buffer, SRAM or CF card.

- Data transfer between PLCs

The PLC memory data can be transferred to another PLC in blocks using a macro command.

Connection at the CN1 connector is described in “1. 1 : 1 Connection” to “4. n : 1 Connection (Multi-link).” Hereunder the PLC connection at the MJ port and settings required for PLC2Way connection are described.

Limitations on Connection at the MJ Port

There are some limitations on the connection at the MJ port.

1. It is not possible to make a selection for [Code] and [Text Processing] in the communication parameter setting.
[Code]: Fixed to DEC or BCD appropriate for the PLC.
[Text Processing]: Fixed to [LSB → MSB].
2. Even if a communication error occurs, it is not possible to stop communications. Only error codes are stored in \$s730 to 763 for each station.
3. Multi-link 2 connection is not available.
4. RS-232C or RS-485/485 (2-wire) connection must be used. The PLC that allows RS-422 (4-wire) connection only cannot be connected directly.

PLCs Compatible with PLC2Way Connection at MJ Port

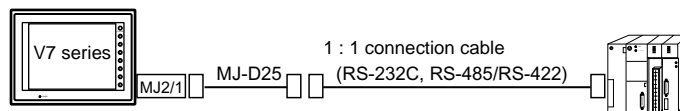
- When connecting the V7 series to the PLC at the MJ port using PLC2Way function, use the RS232C or RS-485 (RS-422) 2-wire connection. The PLC that allows RS-485 (RS-422) (4-wire) connection only cannot be connected directly.
- PLCs compatible with PLC2Way connection at MJ port as of April 1, 2002 are shown below.
MITSUBISHI, OMRON, SHARP, YOKOGAWA, FUJI ELECTRIC
For the applicable PLCs, refer to the “PLC2Way” column in “Available PLCs” in “Chapter 5 Connection to PLCs.” (○: Connectable ×: Not connectable)
- The communication parameter setting and available memory for the PLC connected at the MJ port for PLC2Way connection are the same as those for 1 : 1 connection. Refer to the communication parameter setting and the available memory for each manufacturer in “Chapter 5 Connection to PLCs.”

Wiring

Two kinds of cables are available for PLC2Way connection at the MJ port. Cable connections are explained.

Connecting method 1 (using MJ-D25)

- To connect the PLC and the V7 series at the MJ port, use the Hakko Electronics' MJ to D-sub conversion cable "MJ-D25" (0.3 m, metric thread) and the cable for 1 : 1 connection at CN1. For more information on the cable for 1 : 1 connection at CN1, refer to "Wiring" in "Chapter 5 Connection to PLCs."
- This combination of cables (MJ-D25 + 1 : 1 connection cable) can be used either for RS-232C or RS-485 (RS-422) 2-wire connection.



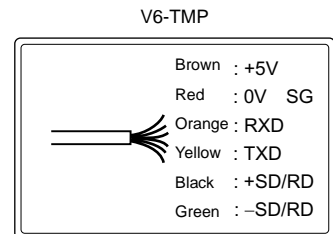
- With RS-485 (2-wire connection), a maximum of 31 PLCs can be connected. For information on connection between PLCs, refer to the instruction manual for the PLC.

Connecting method 2 (using V6-TMP)

- Use Hakko Electronics' cable "V6-TMP" (3 m) when connecting the V7 series to a PLC at the MJ port. The shielded frame ground of V6-TMP must be connected to the V7 series.

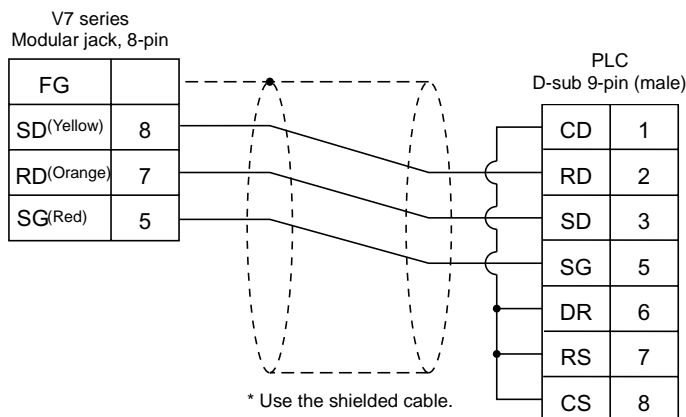
* Notes on Use of V6-TMP

There are six wires in the V6-TMP cable as shown on the right. The wires to be used are determined depending on the connecting method. For the wires not used, be sure to properly insulate with tape, etc.



<RS-232C Connection>

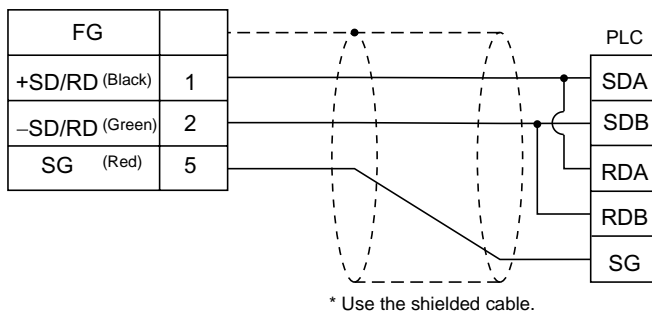
- Connection example with MITSUBISHI A1SJ71UC24-R2



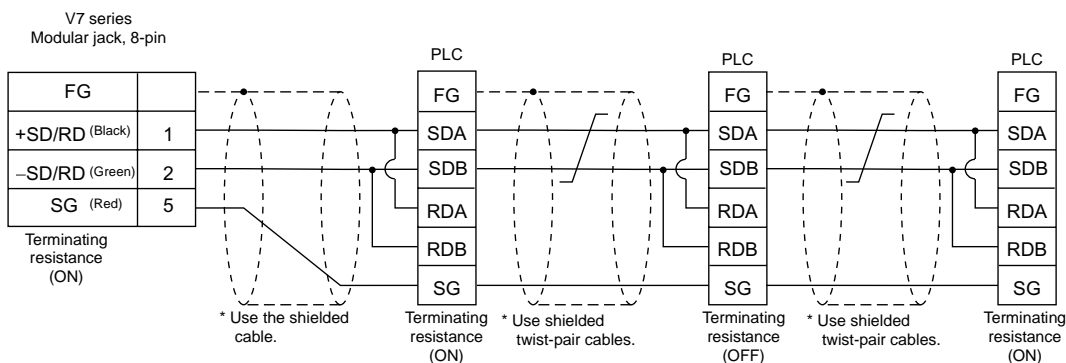
<RS-485 Connection>

- Connection example with MITSUBISHI A1SJ71UC24-R4 (1 set)

V7 series
Modular jack, 8-pin

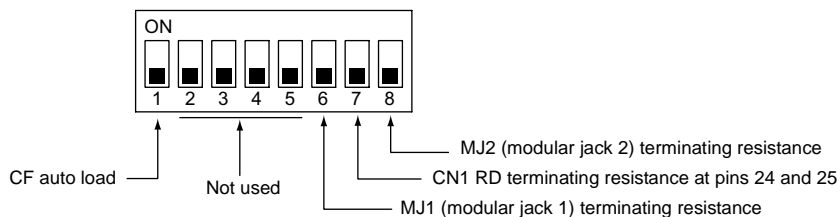


- Connection example with MITSUBISHI A1SJ71UC24-R4 (3 set)



Terminating Resistance Setting

- The terminating resistance of the V7 series should be set on the DIP switch in the backside of the unit.
- When MJ1 is used: Set DIPSW6 to the ON position.
When MJ2 is used: Set DIPSW8 to the ON position.



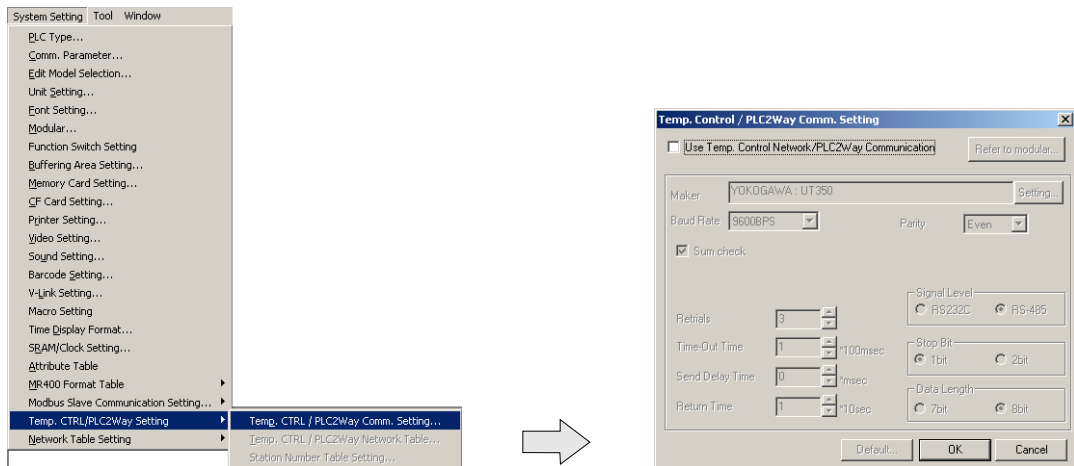
V-SFT Setting – System Setting

PLC model selection and parameter setting to be made on the V-SFT editor for the PLC2Way connection at the MJ port are explained.

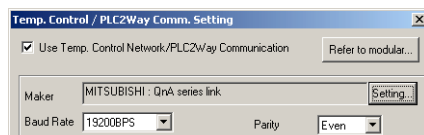
Temp. CTRL/PLC2Way Setting

Select the PLC model and make the parameter setting as described below.

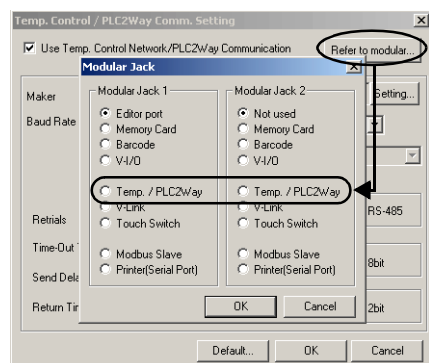
1. Select [System Setting] → [Temp. CTRL/PLC2Way Setting] → [Temp. CTRL/PLC2Way Comm. Setting]. The [Temp. Control/PLC2Way Comm. Setting] dialog is displayed.



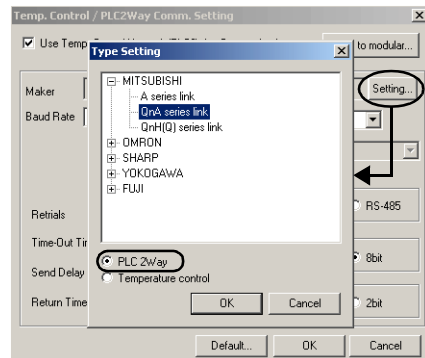
2. Check [Use Temp. Control Network/PLC2Way Communication].



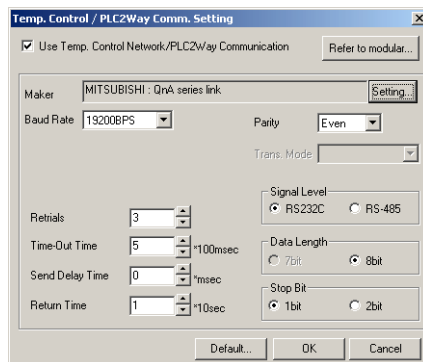
3. Select the MJ port.
Click the [Refer to Modular] button. The [Modular Jack] dialog is displayed. Select [Temp./PLC2Way] for modular jack 1 or 2 that is used for PLC2Way communication.



4. Select the PLC model to be connected at the MJ port. Click the [Setting] button. The [Type Setting] dialog is displayed. Select [PLC2Way]. The PLC manufacturer names who support PLC2Way communication are displayed. Click [+]. The available model names of the selected manufacturer are displayed. Select the PLC model name and click [OK]. The message communication “Communication parameters are reset. OK?” is displayed. Click [Yes].



5. Set the parameters for the PLC to be connected at the MJ port.



[Baud Rate] (4800, 9600, 19200, 38400, 57600, 115000, 115 kbps)

Select the communication speed with the PLC connected at the MJ port.

[Parity] (None/Odd/Even)

Select the parity setting for communications with the PLC connected at the MJ port.

[Data Length] (7-bit/8-bit)

Select the data length for communications with the PLC connected at the MJ port.

[Stop Bit] (1-bit/2-bit)

Select the stop bit setting for communications with the PLC connected at the MJ port.

[Signal Level] (RS232C/RS485)

Select the signal level for communications with the PLC connected at the MJ port.

[Retrials]

Set the number of retries to be attempted in the case that a communication error occurs.

[Time-out Time] (×100 msec)

Select the receive time of the response from the PLC connected at the MJ port. If no response is received within the specified time, a retry is attempted.

[Send Delay Time] (× msec)

Set a time delay in sending the response to the PLC after receipt of data from the PLC connected at the MJ port.

[Return Time] ($\times 10$ sec)

When the PLC in the PLC2Way communication is turned off, data read from the PLC is temporarily prohibited. An inquiry for restoration is sent each time the specified return time has elapsed.

The following options may be set depending on the PLC model.

- MITSUBISHI: A series Link
 [Trans. Mode] (Trans. Mode 1/Trans. Mode 4)
 Trans. Mode 1: Without CR/LF
 Trans. Mode 4: With CR/LF
- OMRON: SYSMAC C, SYSMAC CV, SYSMAC CS1
 [Trans. Mode] (Trans. Mode 1/Trans. Mode 2)
 Trans. Mode 1: Standard (BCD without signs)
 Trans. Mode 2: Special BCD (BCD with sign)
- YOKOGAWA: FA-M3, FAM3R
 [Trans. Mode] (with sum check/without sum check)

6. To reset the setting, click the [Default] button, or set the desired value.

Code and Text Processing

For the PLC connected at the MJ port, [Code] and [Text Processing] cannot be set in the [Temp. Control/PLC2Way Comm. Setting] dialog.

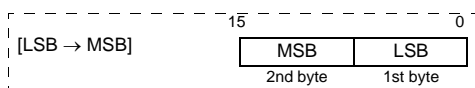
- Code (numerical data input format)

The code is fixed as shown below. For some numerical data, such as those for data displays or data sampling in the sampling mode, BCD or DEC should be chosen for [Input Format].

Manufacturer	Model	Code	Text Processing
MITSUBISHI	A series link	DEC	LSB → MSB
	QnA series link		
	QnH (Q) series link		
OMRON	SYSMAC C	BCD	
	SYSMAC CV		
	SYSMAC CS1		
SHARP	JW series	BCD	
	JW100/70H COM Port		
	JW20 COM Port		
YOKOGAWA	FA-M3	DEC	
	FA-M3R		
FUJI ELECTRIC	MICREX-F series	BCD	
	FLEX-PC series	DEC	

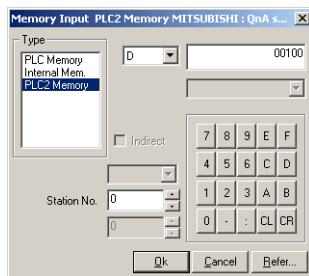
- Text Processing

When processing characters, choose either option for arranging 1st/2nd bytes in one word. As shown on the right, it is fixed to [LSB → MSB].



Setting the PLC Memory Connected at the MJ Port

1. Open the [Memory Input] dialog for the part where the PLC memory connected at the MJ port should be allocated.



2. For the PLC memory connected at the MJ port, select [PLC2 Memory] for [Type] and specify the memory address.
3. Set the port number of the PLC.

V-SFT Setting

When the temperature control network/PLC2Way table is used:

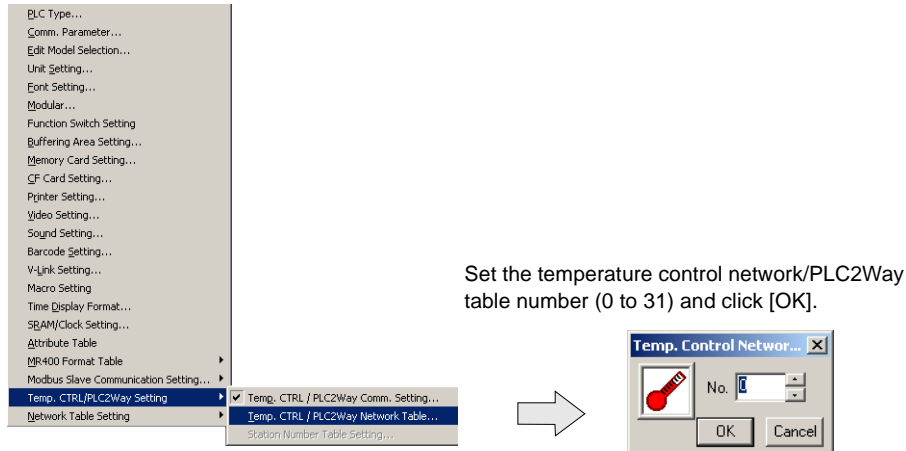
The following operations are available when the temperature control network/PLC2Way table is used.

1. Constant read from the PLC memory
When the temperature control network/PLC2Way table is set, the data read from the PLC2 memory can be stored in the PLC memory or the V7 internal memory at regular intervals.
2. Data Sampling from the PLC Memory Connected at the MJ Port
It is possible to link the temperature control network/PLC2Way table with the buffering area and perform sampling of data in the PLC memory that is connected at the MJ port.
3. Data transfer from the PLC2 memory
Data in the PLC2 memory can be transferred to the PLC memory, V7 internal memory or a memory card at one time according to the temperature control network/PLC2Way table.

Temperature Control Network/PLC2Way Table

1. Starting

Click [System Setting] → [Temp. CTRL/PLC2Way Setting] → [Temp. CTRL/PLC2Way Network Table]. ([Temp. CTRL/PLC2Way Network Table] becomes active only when the setting in the [Temp. Control/PLC2way Comm. Setting] dialog has been completed as described in the previous section.)



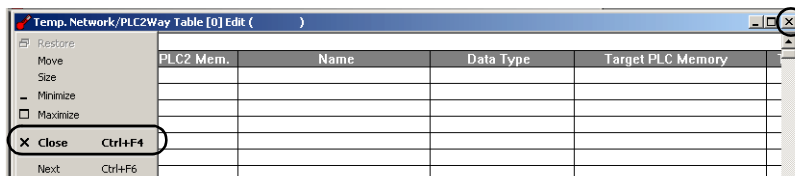
The [Temp. Network/PLC2Way Table Edit] window is opened.

No.	Temp. CTRL/PLC2 Mem.	Name	Data Type	Target PLC Memory	Target Internal Memory
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

There are 32 tables of temperature control network/PLC2Way table No. 0 to 31. A maximum of 128 addresses of the PLC2 memory can be set for each table.

2. Closing

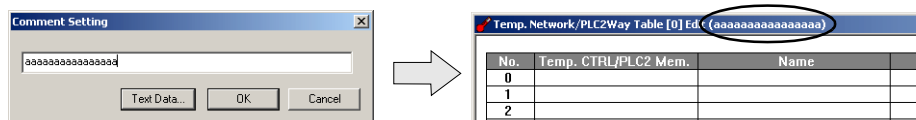
Click [Close] in the drop-down menu, or click the [Close] button at the top right corner.



3. Comment setting

There are 32 temperature control network/PLC2Way tables and a comment can be set for each table.

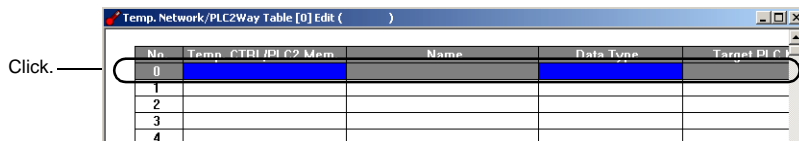
Click [Edit] → [Comment]. The [Comment Setting] dialog is displayed.



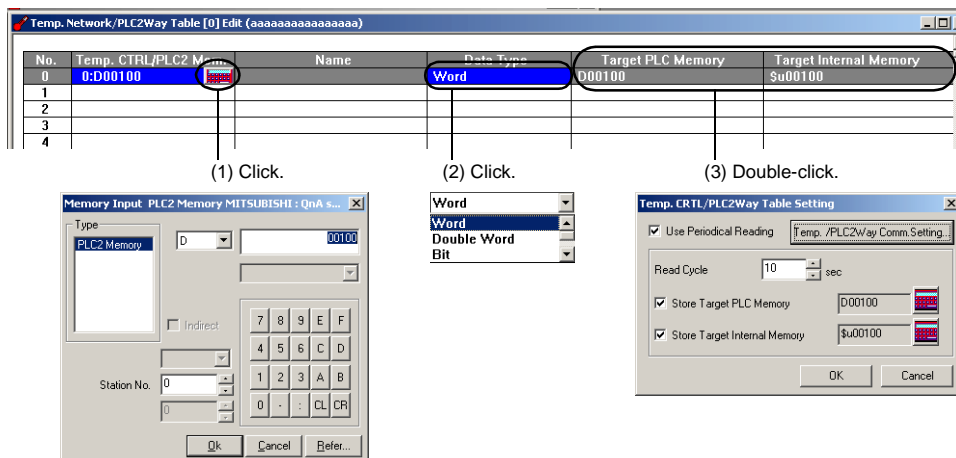
Enter the desired comment and click [OK]. The entered comment is displayed at the top right corner.

4. Setting data in the table

Click on a line in the table. The selected line turns blue.



Double-clicking brings up the default setting for the PLC2 memory, data type, etc.



When (1) is clicked, the [Memory Input] dialog is displayed.

Set the memory address to be read from the PLC connected at the MJ port.

When (2) is clicked, a data type for the PLC2 memory can be set.

[Word]

This is the data length setting for the memory address to be used. Numerical data of one word is handled. Data is transferred to the target memory address in the numerical data code of the PLC2 memory.

[Double Word]

This is the data length setting for the memory address to be used. Numerical data of two words is handled. Data is transferred to the target memory address in the numerical data code of the PLC2 memory.

[Bit]

Data in the PLC2 memory is handled as bit information of one word. Data is transferred to the target memory address without conversion.

[Dummy Word] [Dummy Double]

The memory addresses for [Target PLC Memory] and [Target Internal Memory] are automatically allocated consecutively in the [Temp. CTRL/PLC2Way Table Setting] dialog. If you would like to skip any memory address, keep the cell in the [Temp. CTRL/PLC2 Mem.] column blank (no setting). It is regarded as a dummy word or double-word. In this case, "0" is stored in the target memory address.

When the data code in the target memory address is BCD:


The code (numerical data format) for the PLC2 memory is fixed as mentioned above. (Refer to page 3-37.) Normally the V7 series handles numerical data as "DEC with signs." For numerical data to be handled on the PLC connected to the MJ port, select [Word] or [Double Word] for [Data Type]; for data to be handled as bits, select [Bit].

Example: [Word] [Double Word]

	Code	Bit	Data																																
Temperature control/PLC2 memory	BCD	MSB <table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	10	
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																		
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0																					
V7 series	DEC	MSB <table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	10
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																				
0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0																				
Target PLC memory (Depends on the communication parameter setting)	BCD	MSB <table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	10
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																				
0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0																				

Not necessary to be aware

Example: [Bit]

	Code	Bit																Data																																																																																																	
	Temperature control/PLC2 memory	BCD																	10																																																																																																
	V7 series	DEC	<table><tr><td colspan="16">MSB</td><td colspan="16">LSB</td></tr><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td colspan="16"></td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td colspan="16"></td></tr></table>																MSB																LSB																15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0																
MSB																LSB																																																																																																			
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																																																																																				
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0																																																																																																			
	Target PLC memory (Depends on the communication parameter setting)	BCD																	10																																																																																																

Not necessary to be aware

When (3) is double-clicked, the [Temp. CTRL/PLC2Way Table Setting] dialog is displayed.

Set the memory addresses of the target PLC memory and target internal memory at one time in the [Temp. CTRL/PLC2Way Table Setting] dialog.

[Use Periodical Reading]

Check this option when the following operation is required.

- Constant read from the PLC memory
- Data sampling in the PLC2 memory

[Read Cycle] (sec)

Set the cycle of reading data in the PLC2 memory.

[Store Target PLC Memory]

When storing data read from the PLC2 memory into the PLC memory, check this box and set the desired memory address.

[Store Target Internal Memory]

When storing data read from the PLC2 memory into the V7 internal memory, check this box and set the desired memory address.

[Temp. CTRL/PLC2Way Comm. Setting]

Clicking this button brings up the [Temp. CTRL/PLC2Way Comm. Setting] dialog and allows you to review the setting.

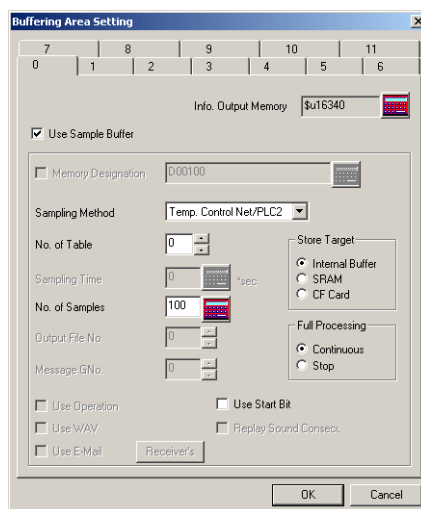
Data Sampling in the PLC2 Memory

To perform data sampling in the PLC2 memory, the following settings are required.

- Temperature control network/PLC2Way table editing
- Buffering area setting
- Memory card setting (when [SRAM] or [CF Card] is selected for [Store Target] in the [Buffering Area Setting] dialog)
- Trend sampling or data sampling setting (setting for displaying data stored in the specified buffer)

1. Buffering area setting

Click [System Setting] → [Buffering Area Setting]. The [Buffering Area Setting] dialog is opened.



[Sampling Method]

Temperature Control Net/PLC2

[No. of Table]

Select the temperature control network/PLC2Way table number for sampling.

[Sampling Time]

Specify the number of sampling times.

[Store Target] (Internal Buffer/SRAM/SF Card)

Choose the desired medium for storing sampling data.

Internal Buffer: Stores data in the internal buffer of the V7 series. (RAM)

SRAM: Stores data in the SRAM area. (SRAM mounted on the unit, V7EM-S, REC-MCARD SRAM)

CF Card: Stores data in the CF card.

[Full Processing] (Continuous/Stop)

Choose the desired processing when the target medium space has been used up.

- Continuous: When [Sampling Time] has been exceeded, data from the oldest is discarded.

- Stop: When [Sampling Time] has been exceeded, sampling is stopped.

- Calculating the buffering area capacity

When [Internal Buffer] is selected for [Store Target] in the [Buffering Area Setting], the maximum available capacity is 32K words. When [Temp Control Net/PLC2] is selected for [Sampling Method], the required capacity can be calculated as shown below.

1 sample = [Words*] + 2 words

Buffer size = [Sampling Times] × 1 sample

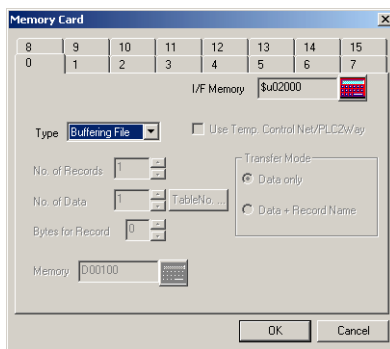
* [Words] here means the number of words in the memory addresses used in the temperature control network/PLC2Way table that is set for [No. of Table].

2. Memory card setting

When [SRAM] or [CF Card] is selected for [Store Target] in the [Buffering Area Setting] dialog, the memory card setting is required.

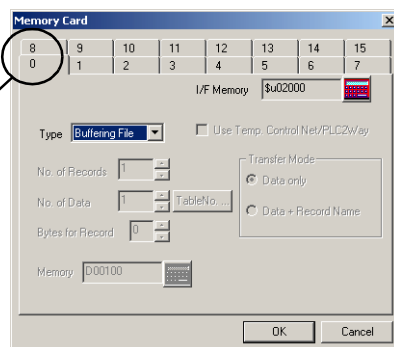
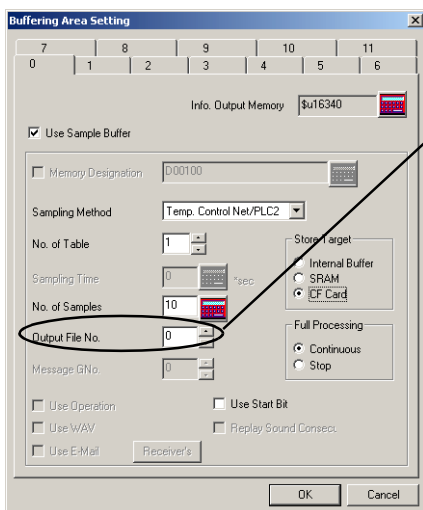
* The used memory capacity of SRAM and CF card can be calculated in the same way as the buffering area.

- 1) Click [System Setting] → [Memory Card Setting]. The [Memory Card] dialog is opened.



- 2) Select [Buffering File] for [Type].

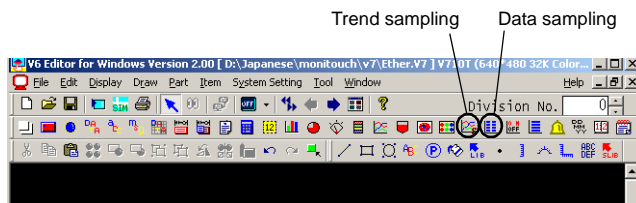
- 3) Match the file number (tab) in the [Memory Card] dialog with [Output File No.] in the [Buffering Area Setting] dialog.



Select the tab of the same number.

3. Trend sampling or data sampling setting

To show data stored in the specified buffer number, trend sampling or data sampling must be set. Click the [Trend Sampling] or [Data Sampling] icon and make the setting. For more information, refer to the Reference Manual (Function).



Data Transfer from the PLC2 Memory

Data in the PLC2 memory can be transferred to the PLC memory, V7 internal memory or a memory card at one time. Conversely, it is also possible to transfer data in the PLC memory, V7 internal memory or a memory card to the PLC2 memory at one time. To perform batch data transfer from the PLC2 memory, the following settings are required.

- Temperature control network/PLC2Way table editing
For temperature control network/PLC2Way table editing, the setting in the [Temp. CTRL/PLC2Way Table Setting] dialog is not necessary.
- Macro (TEMP_READ/TEMP_WRITE)
- Memory card setting (when a memory card is used)

1. Macro

[TEMP_READ]

Data in the PLC2 memory addresses set in the temperature control network/PLC2Way table specified for F1 is transferred to the memory addresses starting from F0.

Usable Devices

	PLC Memory	Internal Memory	Constant (Temperature Control Table No.)	Memory Card	Indirect Designation
F0	○	○		○	○
F1		○	○		

TEMP_READ: Temperature control network table read

TEMP_READ F0 <- TABLE : F1

[TEMP_WRITE]

Data in memory addresses starting from F1 is transferred to the PLC2 memory of the temperature control network/PLC2Way table specified for F0.

Usable Devices

	PLC Memory	Internal Memory	Constant (Temperature Control Table No.)	Memory Card	Indirect Designation
F0		○	○		
F1	○	○		○	○

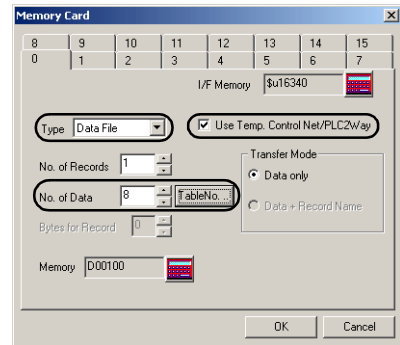
TEMP_WRITE: Temperature control network table write

TEMP_WRITE TABLE : F0 <- F1

2. Memory card setting

The memory card setting should be made when the memory card is used as the source or target memory for a macro command.

- 1) Click [System Setting] → [Memory Card Setting]. The [Memory Card] dialog is opened.
- 2) Select [Data File] for [Type].
Check [Use Temp. Control Net/PLC2Way].
- 3) Click the [Table No.] button and select the table number to be used. The appropriate number is automatically set for [No. of Data].



Indirect Memory Designation

It is possible to have access to the PLC2 memory using the indirect memory designation as a macro command. In this section, the indirect designation of the PLC2 memory is explained. The internal user memory (\$u) is used for the indirect memory designation.

Designating the indirect memory

- PLC2 memory

Less than 16 bits

	15	8 7	0
n + 0	Model	Memory type	
n + 1	Memory number (address)		
n + 2	00	Bit designation	
n + 3	00	Port number	

16 to 32 bits

	15	8 7	0
n + 0	Model	Memory type	
n + 1	Memory number (address) upper		
n + 2	Memory number (address) lower		
n + 3	00	Bit designation	
n + 4	00	Port number	

- Model
 - 03: PLC2 memory (less than 16 bits)
 - 83: PLC2 memory (16 to 32 bits)
- Memory type
 - Depends on the PLC model. Refer to "Chapter 5 Connection to PLCs/Available PLCs" when setting.
- Port number
 - Set the port number of the PLC connected at the MJ port.

User Log Read for YOKOGAWA's PLC

The user log set with YOKOGAWA's PLC "FA-M3/FA-M3R" connected at the MJ port can be read using the macro command TEMP_CTL.

Macro

[TEMP_CTL]

This macro command controls the operation set in the memory addresses starting from the one specified for F0 for the number of words specified for F1.

Usable Devices

	PLC Memory	Internal Memory	Constant (Words)	Memory Card	Indirect Designation
F0		○			
F1			○		

TEMP_CTL: Temperature controller/PLC2Way control function

TEMP_CTL F0 F1

	F0 (= \$u n)												F1
	n	n + 1	n + 2	n + 3	n + 4	n + 5	n + 6	n + 7	n + 8	n + 9	n + 10	n + 11	Words
User log registration number read	Port number	CPU No. -1*1 (0 - 3)	Command -1	Registration number*2	-	-	-	-	-	-	-	-	3
Latest user log read	Port number	CPU No. -1*1 (0 - 3)	Command 0	Header 0: Normal -1: Error*3	Year	Month	Day	Hour	Minute	Second	Main code	Sub code	3
					(ASCII)						(DEC)		
"n"th user log read	Port number	CPU No. -1*1 (0 - 3)	Command 1 to 63	Header 0: Normal -1: Error*3	Year	Month	Day	Hour	Minute	Second	Main code	Sub code	3
					(ASCII)						(DEC)		

Return data: Data stored from PLC2Way → V7 series

*1 Set "0" for CPU No. 1.

*2 The registration number is stored in special register Z105.

*3 If there is no user log in the "n + 2" memory or there is an error in communications, [-1] is stored.

Processing Cycle

The processing cycle on the V7 series with the PLC2Way function is explained.

Fig. a. When the temperature control network/PLC2Way table is not used:

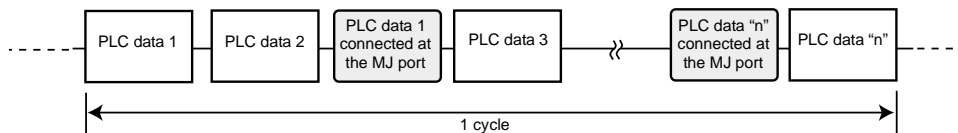
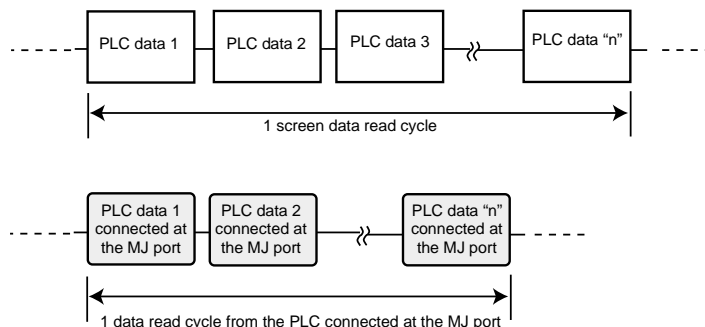


Fig. b. When the temperature control network/PLC2Way table is used:



When the temperature control network/PLC2Way table is not used (Fig. a), PLC data is not read while the data is read from the PLC connected at the MJ port. When the temperature control network/PLC2Way table is used (Fig. b), PLC data is read while the data is read from the PLC connected at the MJ port. Consequently, it is possible to communicate with the PLC connected at the MJ port without reducing the processing capacity between the V7 ↔ the PLC.

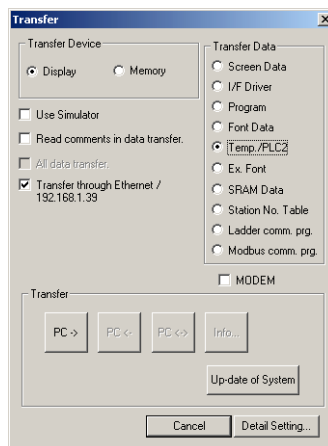
When the temperature control network/PLC2Way table is used:

If periodical reading of the PLC data is performed while the PLC connected at the MJ port is accessed using a macro command, the macro execution may be delayed. It is possible to temporarily stop periodical reading from the PLC connected at the MJ port using the system memory address (\$s762). For more information, refer to page 3-51.

Notes on Screen Data Transfer

Temperature Control/PLC2 Program

When using the temperature control network/PLC2Way communications, it is necessary to transfer the temperature control/PLC2 program to the V7 series. When the temperature control network/PLC2Way setting has been made, the program is automatically transferred to the V7 series together with screen data. When [● Temp./PLC2] is selected in the [Transfer] dialog, only the temperature control/PLC2 program can be transferred to the V7 series.



When the Main Menu screen is displayed after transferring screen data, the [Extension] switch appears. If the [Extension] switch does not appear, transfer font data. Pressing the switch brings up the "Extension Program Info." screen where the temperature control/PLC2Way driver setting and temperature control network/PLC2way setting can be reviewed. For more information, refer to "Chapter 2 MONITOUCH Operations."

System Memory

The status of the PLC connected at the MJ port for PLC2Way communications is output to the system memory (\$s) of the V7 series. The memory addresses (\$s730 to 763) of the PLC connected at the MJ port are explained.

List

Address	Contents
:	:
\$s730	Temperature controller/PLC2Way Station No. 00 status
731	Temperature controller/PLC2Way Station No. 01 status
732	Temperature controller/PLC2Way Station No. 02 status
733	Temperature controller/PLC2Way Station No. 03 status
734	Temperature controller/PLC2Way Station No. 04 status
735	Temperature controller/PLC2Way Station No. 05 status
736	Temperature controller/PLC2Way Station No. 06 status
737	Temperature controller/PLC2Way Station No. 07 status
738	Temperature controller/PLC2Way Station No. 08 status
739	Temperature controller/PLC2Way Station No. 09 status
740	Temperature controller/PLC2Way Station No. 10 status
741	Temperature controller/PLC2Way Station No. 11 status
742	Temperature controller/PLC2Way Station No. 12 status
743	Temperature controller/PLC2Way Station No. 13 status
744	Temperature controller/PLC2Way Station No. 14 status
745	Temperature controller/PLC2Way Station No. 15 status
746	Temperature controller/PLC2Way Station No. 16 status
747	Temperature controller/PLC2Way Station No. 17 status
748	Temperature controller/PLC2Way Station No. 18 status
749	Temperature controller/PLC2Way Station No. 19 status
750	Temperature controller/PLC2Way Station No. 20 status
751	Temperature controller/PLC2Way Station No. 21 status
752	Temperature controller/PLC2Way Station No. 22 status
753	Temperature controller/PLC2Way Station No. 23 status
754	Temperature controller/PLC2Way Station No. 24 status
755	Temperature controller/PLC2Way Station No. 25 status
756	Temperature controller/PLC2Way Station No. 26 status
757	Temperature controller/PLC2Way Station No. 27 status
758	Temperature controller/PLC2Way Station No. 28 status
759	Temperature controller/PLC2Way Station No. 29 status
760	Temperature controller/PLC2Way Station No. 30 status
761	Temperature controller/PLC2Way Station No. 31 status
762	Other than "0": periodical reading suspended
763	Other than "0": temperature control network/PLC2Way transfer macro forced execution

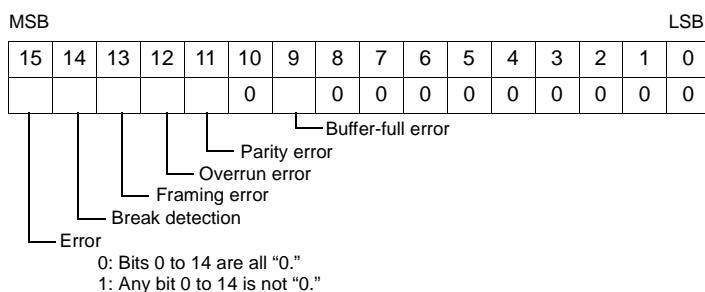
Details

- \$s730-761

The following status code for the PLC connected at the MJ port is stored.

Code	Contents
0000H	Normal
FFFFH	Timeout
8001H	Check code error
8002H	Data error
800BH	Error code received from the PLC connected at the MJ port

Errors other than the above are stored as shown below.



Error	Details	Solution
Timeout	Although a request to send is given to the PLC connected at the MJ port, no answer is returned within the specified time.	Check 1, 2, 3 described below.
Check code error	The check code in the PLC connected at the MJ port response was not correct.	Check 1, 3 described below.
Data error	The code of the received data is invalid.	Check 1, 2, 3 described below.
Error code received	An error occurs at the PLC connected at the MJ port.	Refer to the instruction manual for the PLC.
Buffer full	The V7 buffer is full.	Contact your local distributor.
Parity	An error occurred in parity check.	Check 2, 3 described below.
Overrun	After one character is received, the next character is received before internal processing is completed.	Check 1, 3 described below.
Framing	Although the stop bit must be [1], it is detected as [0].	Check 1, 2, 3 described below.
Break detection	SD (TXD) of the PLC connected at the MJ port remains at the low level.	Examine the connection between SD (TXD) of the PLC connected at the MJ port and RD (RXD) of the V7 series.

Solution

1. Check the parameter setting of the PLC connected at the MJ port and the setting in the [Temp. CTRL/PLC2Way Comm. Setting] dialog.
2. Check the cable connection.
3. Data may be disrupted because of noise. Fix noise.

* If you still cannot solve the error even after following the suggestions above, contact your local distributor.

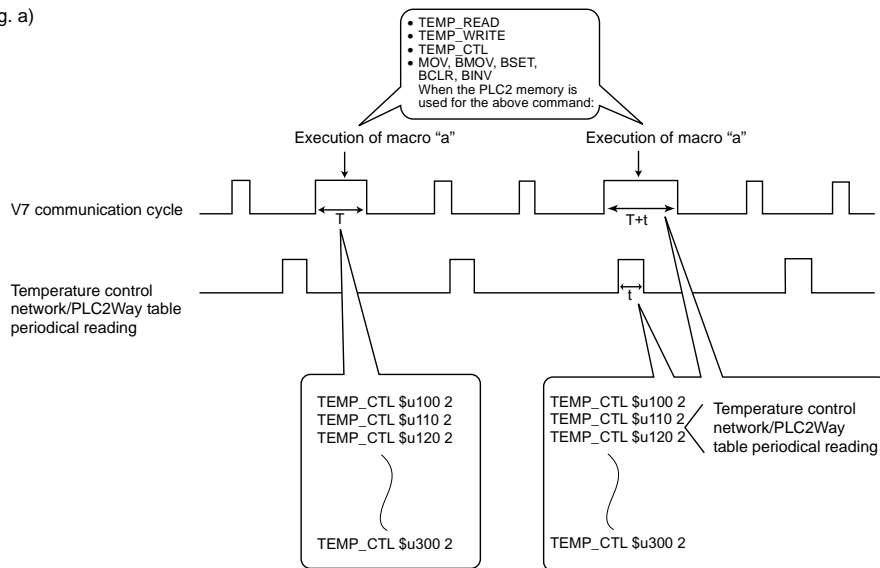
- \$s762

Periodical reading that is set in the [Temp. CTRL/PLC2Way Table Setting] dialog can be suspended.

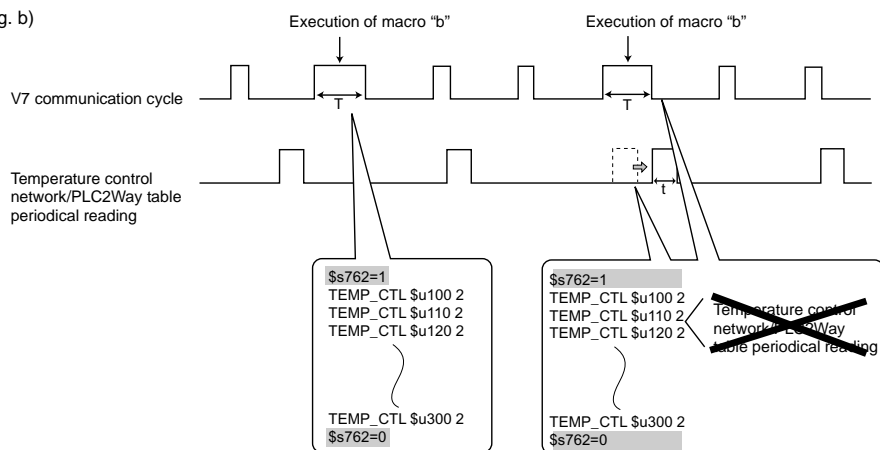
- [0]: Periodical reading is performed.
- [Other than "0"]:

If periodical reading of the temperature control network/PLC2Way table is performed while the PLC2 memory is being accessed using a macro command, the macro execution will be delayed (Fig. a). To avoid this, periodical reading can be suspended using memory address \$s762 (Fig. b).

(Fig. a)



(Fig. b)



- \$s763

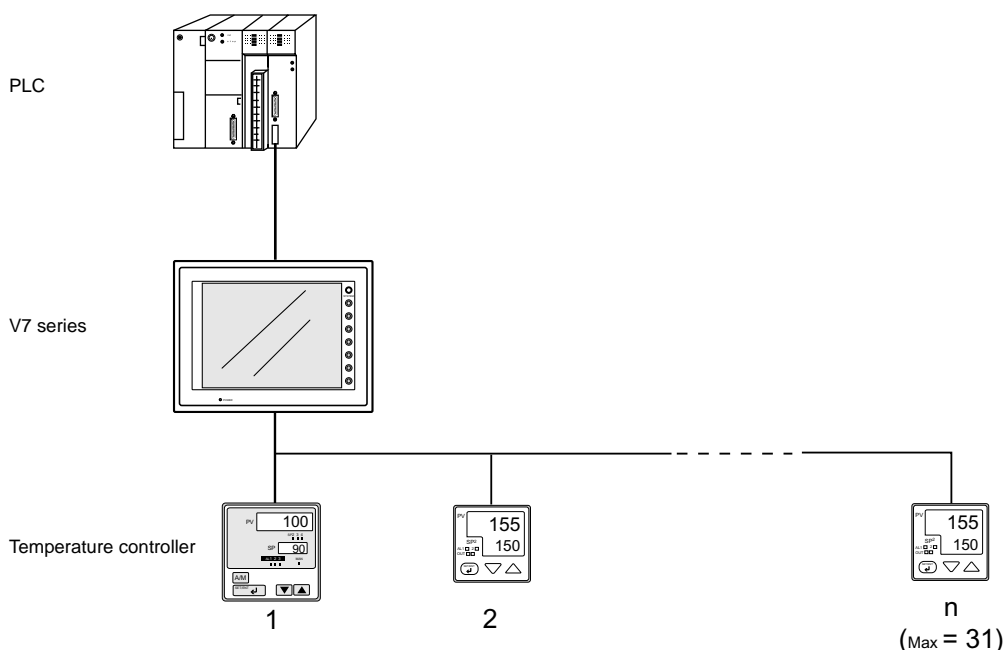
Forced execution of macro commands [TEMP_READ] and [TEMP_WRITE] using the temperature control network/PLC2Way table

- [0]: When any station that has failed is included in the specified table, the macro command is not executed.
- [Other than "0"]:

8. Temperature Control Network

Temperature Control Network

- Using the temperature control network, the V7 series can be connected to the temperature controller. With RS-232C, one PLC can be connected; with RS-485, a maximum of 31 temperature controllers can be connected.



- Data of temperature controllers connected to the V7 series can be set or monitored.
- Periodical reading/sampling of temperature controller data
Temperature controller data can be read into the PLC memory or V7 internal memory at regular intervals using the temperature control network table. It is also possible to save the read data in the V7 internal buffer, SRAM or CF card.
- Data transfer
It is also possible to transfer data in the PLC memory, V7 internal memory or a memory card to the temperature controller at one time using a macro command. Conversely, data in the temperature controller can be transferred to the PLC memory, V7 internal memory or a memory card at one time.
- For more information on compatible temperature controllers and the required settings, refer to "Temperature Control Network."

Network Communications

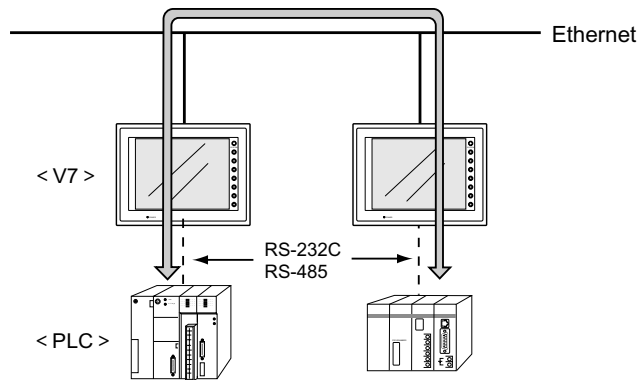
1. Ethernet
2. FL-net (OPCN-2)
3. MELSECNET/10
4. CC-Link
5. OPCN-1
6. T-LINK
7. PROFIBUS-DP

1. Ethernet

Ethernet

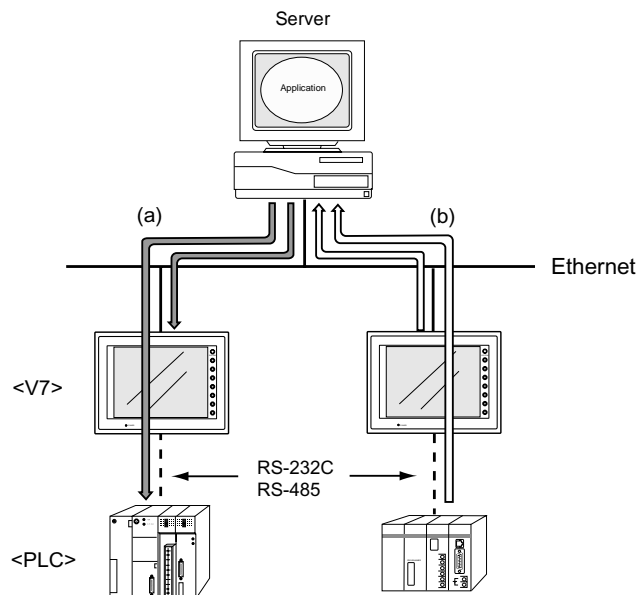
- Transferring data in memory

Data in memory can be transferred to the V7 series on the Ethernet or to the PLCs linked to the V7 series as a host by using macro commands (EREAD/EWRITE).

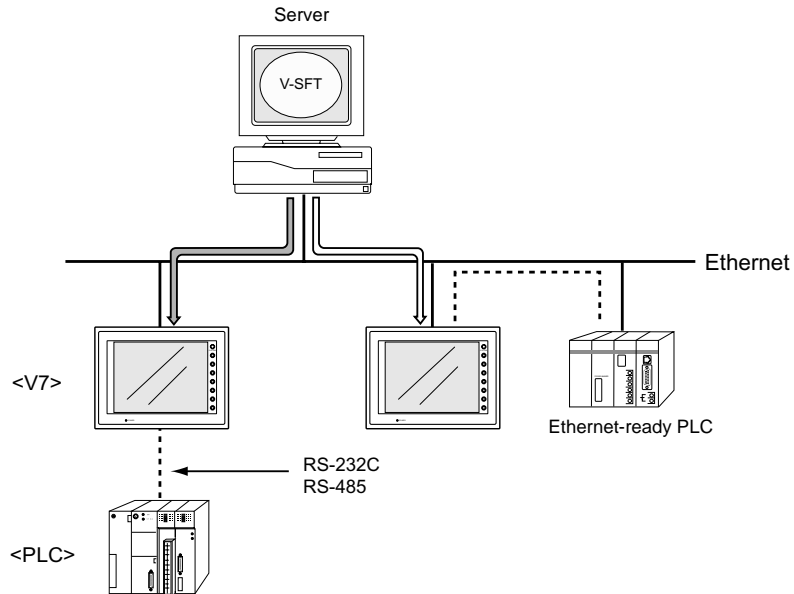


- Communications between the server and the V7 series

- "HKEtn10.dll" (for UDP/IP protocol) is provided so that the user can create an original application by using Visual C++ or Visual Basic, etc. to allow the server to access the memory device, such as V7 internal memory, memory card or the PLC memory linked with the V7 series as a host..... (a)
- The macro command (SEND) enables the V7 series to access the server..... (b)

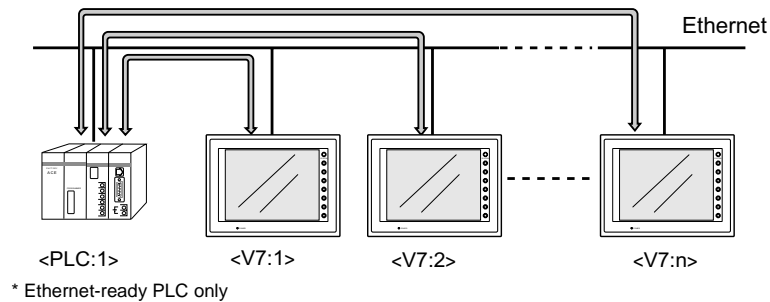


- Screen data can be transferred from the V-SFT editor on the server to the V7 series.

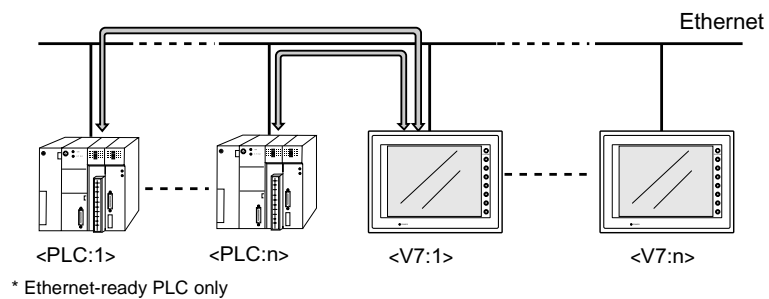


- Communications between the Ethernet-ready PLC and the V7 series

- The V7 series can communicate with the PLC on the Ethernet.



- The V7 series can communicate with multiple PLCs on the Ethernet.



Notes on Ethernet Communications

For V7i:

- To use Ethernet communications on V7i, use the 10BASE-T connector (LAN) provided on the unit. It is not possible to use Ethernet or FL-net (OPCN-2) communications by attaching the communication I/F unit CU-03 to V7i at the same time. When CU-03 is mounted, the 10BASE-T connector (LAN) provided on the unit cannot be used.
- When using Ethernet communications with CU-03 mounted, the Web server or e-mail function cannot be used.

For V7:

- To use Ethernet communications on V7, the communication interface unit “CU-03” must be mounted. When V7 is equipped with the communication interface unit CU-03, it becomes Ethernet-ready. In this case, however, the Web server or e-mail function is not available.

IP Address for the V7 Series

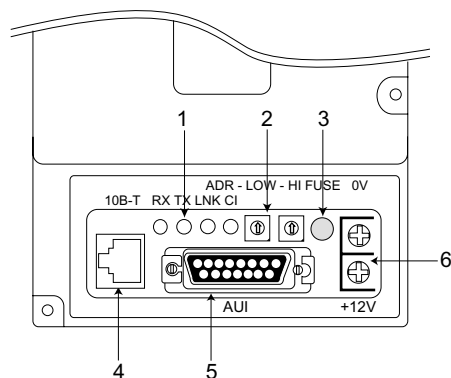
To enable Ethernet communications on the V7 series, it is necessary to set the IP address for identification of the V7 series on the network. The IP address should be set on the Main Menu screen of the V7 series. For more information, refer to “Chapter 2 MONITOUCH Operations.”

Communication Interface Unit CU-03

Specifications of Communication Interface Unit CU-03

Item	Specifications		
	AUI		10BASE-T
	10BASE5	10BASE2	
Baud rate	10 Mbps		
Transmission method	Base band		
Maximum network distance or maximum node interval	2500 m (5 segments)	925 m (5 segments)	500 m (4 HUBs)
Maximum segment length	500 m	185 m	100 m Between the node and the HUB
Maximum number of nodes	100/segment	30/segment	2/segment
Minimum node interval	2.5 m	0.5 m	None
Connecting cable	Ethernet coaxial cable (50 Ω)	RG58A/U, RG58C/U coaxial cable (50 Ω)	UTP (unshielded twisted pair) 22-26AWG

Nomenclature and Functions of Ethernet I/F Unit CU-03



1. LED

Indicates the status of the communication.

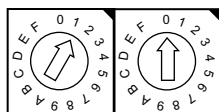
Name	Contents	On	Off
RX	Data receive status	Currently receiving	Not receiving
TX	Data send status	Currently sending	Not sending
LNK	Link status (for 10BASE-T only)	Normal	Error
CI	Collision	Data collision	Normal

2. Port number setting switches

Set the port number of V7 specified on the network table using the following rotary switches.

Example: To set port No. 1:

ADR - LOW - HI



* Make sure that each I/F unit on the network has a unique port number.

3. Fuse

This is the fuse for 12 VDC power supply. (Rating 2A)

4. 10BASE-T connector

This connector is used for 10BASE-T connection. (Compliant with IEEE802.3)

5. AUI connector

This connector is used for connecting the transceiver cable in the case of 10BASE2 or 10BASE5.

6. 12 VDC power supply terminal

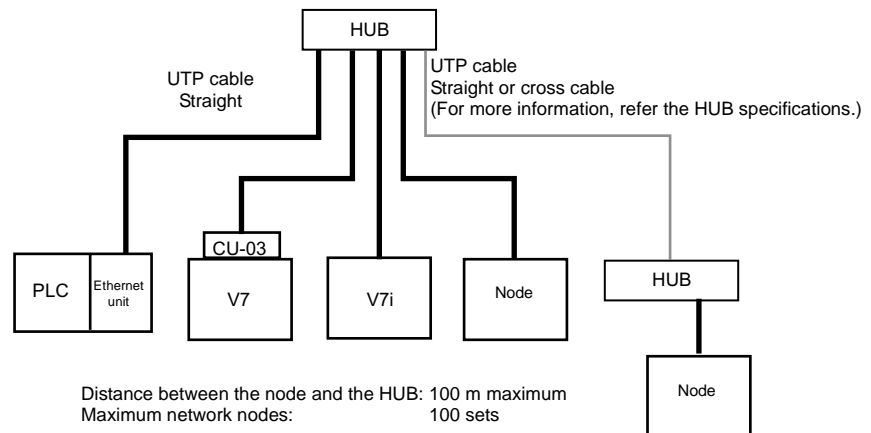
The power source is required for the transceiver of AUI connection. Be sure to take account of a voltage drop at CU-03 (max. 0.7 V).

* It is not necessary to use 10BASE-T.

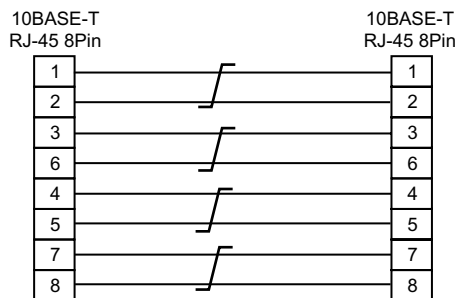
Wiring

10BASE-T Connection

- Cable connection diagram

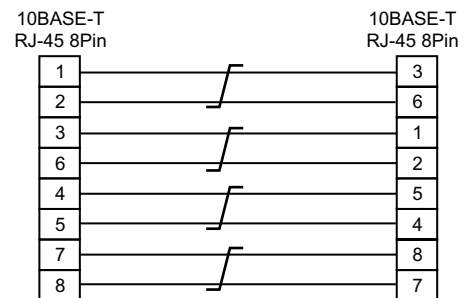


Straight cable (with HUB)



* Unshielded twist-pair cable

Cross cable (without HUB)



* Unshielded twist-pair cable

- Notes on cables
Use the following recommended cable.

Recommended cable (10BASE-T)

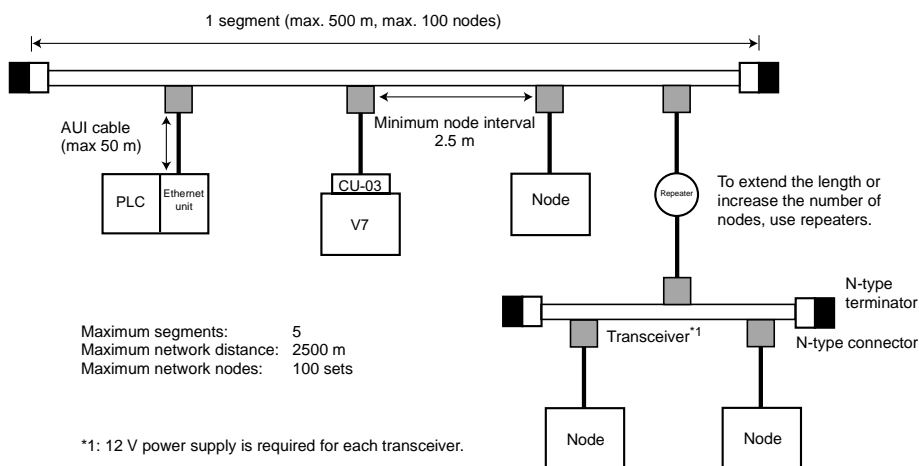
Type: Twist-pair cable, category 5

AUI Connection

- 10BASE5

The following devices are required for 10BASE5 connection:

- Coaxial cable for 10BASE5
- AUI cable
- N-type connector
- N-type terminator
- Transceiver
- Power supply for the transceiver: 12 VDC



- Transceiver

Use the transceiver equipped with the SQE TEST function. (SQE TEST: Signal Quality Error Test)

Recommended transceiver

Manufacturer	Type
Allied Telesis	CentreCOM 107

* The I/F unit may be broken if the AUI connector is subject to strong force. Use the AUI cable when connecting the transceiver.

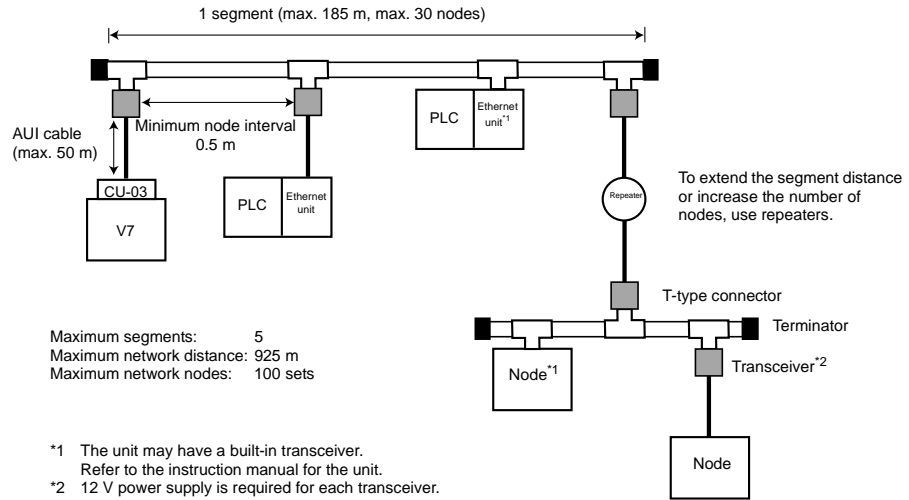
* When the power lamp of the transceiver is not turned on, check the wiring of 12 VDC power supply, then replace the fuse (refer to page 4-4) of the I/F unit CU-03. For the replacement procedure, refer to the manual "CU-03 OPERATING INSTRUCTIONS," attached to CU-03.

- 10BASE2

The following devices are required for 10BASE2 connection:

- Coaxial cable for 10BASE2
- AUI cable
- T-type adaptor
- Terminator for 10BASE2
- Transceiver
- Power supply for the transceiver: 12VDC

- Transceiver



Use the transceiver equipped with the SQE TEST function. (SQE TEST: Signal Quality Error Test)

Recommended transceiver

Manufacturer	Type
Allied Telesis	CentreCOM 107

- * The I/F unit may be broken if the AUI connector is subject to strong force. Use the AUI cable when connecting the transceiver.
- * When the power lamp of the transceiver is not turned on, check the wiring of 12 VDC power supply, then replace the fuse (refer to page 4-4) of the I/F unit CU-03. For the replacement procedure, refer to the manual "CU-03 OPERATING INSTRUCTIONS," attached to CU-03.

Transferring Screen Data

This section describes the procedure for transferring screen data from the V-SFT editor on the server to MONITOUCH via Ethernet. For the procedure using the V6-CP cable, refer to the Reference Manual (Operation).

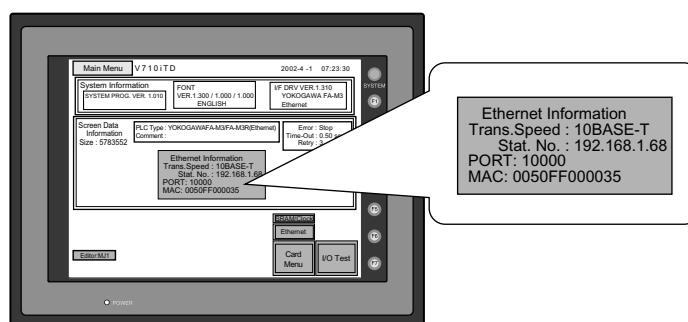
Prerequisites

When screen data is to be transferred for the first time via Ethernet or when the V7 series has been replaced due to trouble, the server cannot transfer screen data because the network table has not been transferred to the V7 series. In this case, the following setting must be made on the Main Menu screen:

- IP address
- Default gateway
- Subnet mask

Note that this is the tentative setting. The port number must be "10000." When the network table is transferred from the V-SFT editor, the above data is updated.

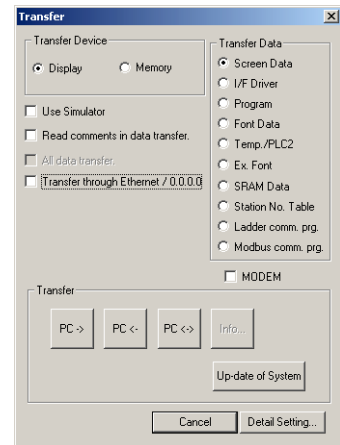
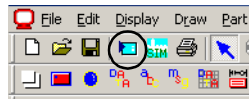
- Setting procedure
 1. Press the [Ethernet] switch on the Main Menu screen.
 2. The Ethernet screen is displayed. (For more information, refer to "Chapter 2 MONITOUCH Operations.") Set the IP address. If necessary, set the default gateway and subnet mask. (When attaching the I/F unit to V7, set the connecting method (10BASE-T/AUI) as well.)
 3. When the setting has been completed, press the [Setting Finished] switch. The Main Menu screen is displayed again.
 4. The setting data can be reviewed on the Main Menu screen.



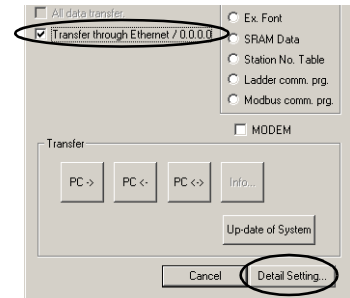
5. Transfer screen data from the server.

Transferring Screen Data from V-SFT Editor

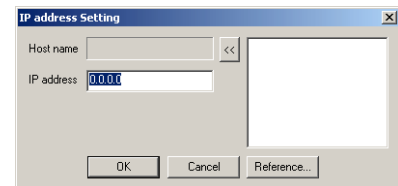
1. Click the [Transfer] icon. The [Transfer] dialog is displayed.



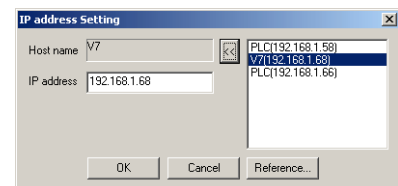
2. Attach a check mark (☑) to ☐ [Transfer through Ethernet].



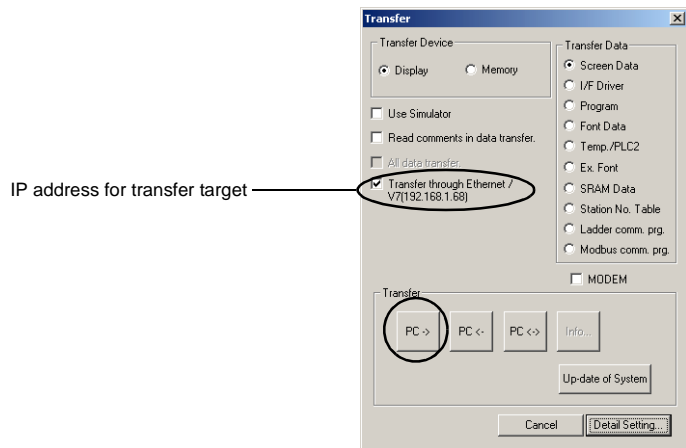
3. Press the [Detail Setting] switch. The [IP Address Setting] dialog is displayed.
4. Enter the IP address of the V7 series to which the screen data is to be transferred.



When a list is shown, select the IP address of the V7 series, and click the [<<] switch. The host name and the IP address are automatically entered. Click [OK].



5. Check the IP address, and click [PC->].



6. Data transfer is started.

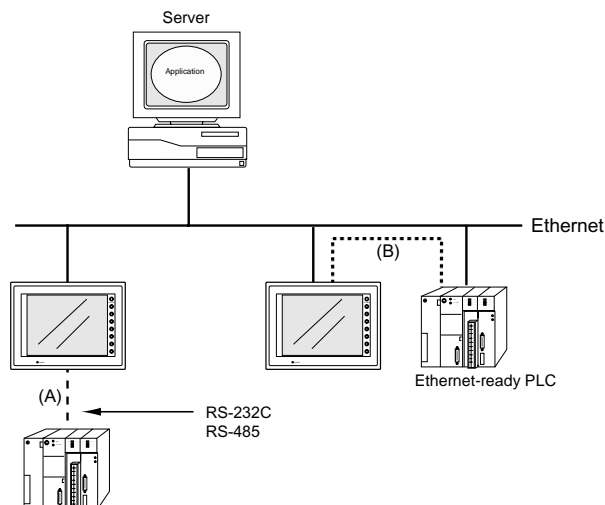
V-SFT Setting (PLC Type/Communication Parameter)

To enable Ethernet communications on the V7 series, the following setting is required on the V-SFT editor.

- PLC type setting
- Communication parameter setting
- Network table editing

In this section, the PLC type setting and communication parameter setting are explained.

Connection Example



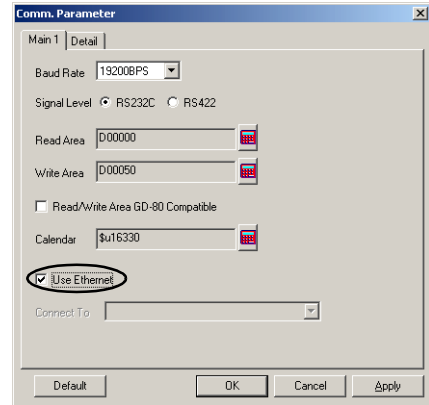
There are two connecting methods between the V7 series and the PLC.

- (A) Connecting to the PLC through RS-232C or RS-485 interface
- (B) Connecting to the PLC on the Ethernet

The contents of the system setting vary depending on the method selected. Check the connecting method and make the setting on the V-SFT editor.

(A) Connecting to the PLC through RS-232C or RS-485 interface

1. PLC type setting
Select [System Setting] → [PLC Type] and select the PLC to be used.
2. Communication parameter setting
Select [System Setting] → [Comm. Parameter]. Attach a check mark (☑) to [Use Ethernet].
3. Select [System Setting] → [Network Table Setting] → [Ethernet] →. The network table edit window is displayed. Edit the network table. For more information on network table editing, refer to page 4-14.



(B) Connecting to the PLC on the Ethernet

1. PLC type setting
Select [System Setting] → [PLC Type] and select the PLC that shows [xxxxx (Ethernet)]. At present (April 2002), the following PLC models are supported.

PLC Model Section on V-SFT	PLC	Unit	Connection
QnA series (Ethernet)	Q2A, Q3A, Q4A Q2ASx	AJ71QE71, AJ71QE71-B5 A1SJ71QE71-B2, A1SJ71QE71-B5	10BASE-T connection: Twist-pair cable Category 5 AUI connection ^{*1} : AUI cable
QnH (Q) series (Ethernet)	QnH (Q mode)	QJ71E71, QJ71E71-B2	
FA-M3/FA-M3 R (Ethernet)	FA-M3 FA-M3 R	F3LE01-5T, F3LE11-0T	

^{*1} For AUI connection, a transceiver is required.

- The memory use is the same as the one for 1 : 1 connection. (Refer to "Chapter 5 Connection to PLCs.")

* The data code of the V7 series is fixed to the binary code. Be sure to set the binary code for the data code on the PLC.

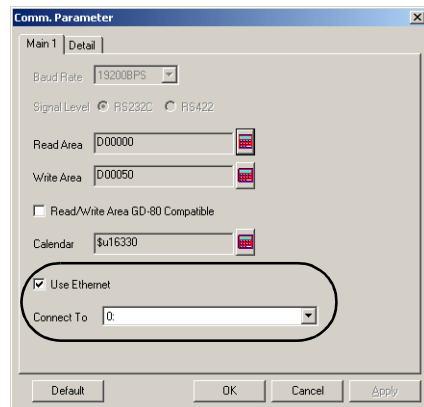
2. Communication parameter setting

- Select [System Setting] → [Comm. Parameter]. Set the PLC to the V7 series which is connected.

When the network table is not set:

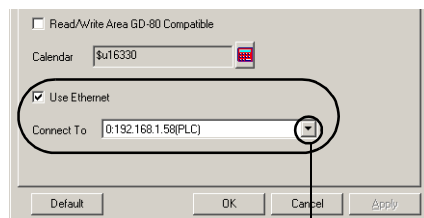
Network table No. 0 is displayed.

It is not possible to select an option for [Connect To]. Select [System Setting] → [Network Table Setting] → [Ethernet]. The [Edit Network Table] window is displayed. Set the network table, and then go back to the communication parameter setting. For more information on network table editing, refer to page 4-14.



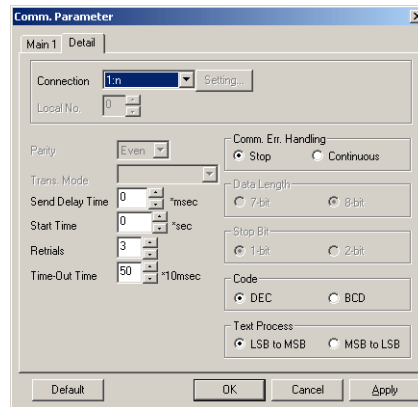
When the network table is set:

The IP addresses that are set on the network table are displayed. Select the IP address of the desired PLC.

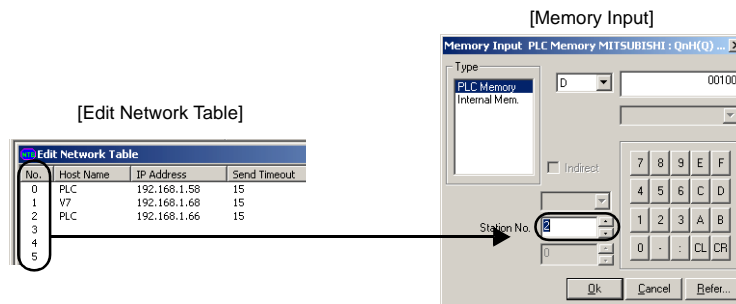


Click here. A drop-down list is displayed.

- When communicating with multiple PLCs (same model) on the Ethernet, select [1 : n] for [Connection] on the [Detail] tab window.



Set the port number (network table number) of the PLC in the [Memory Input] dialog for each part. For more information on the network table, refer to page 4-14.

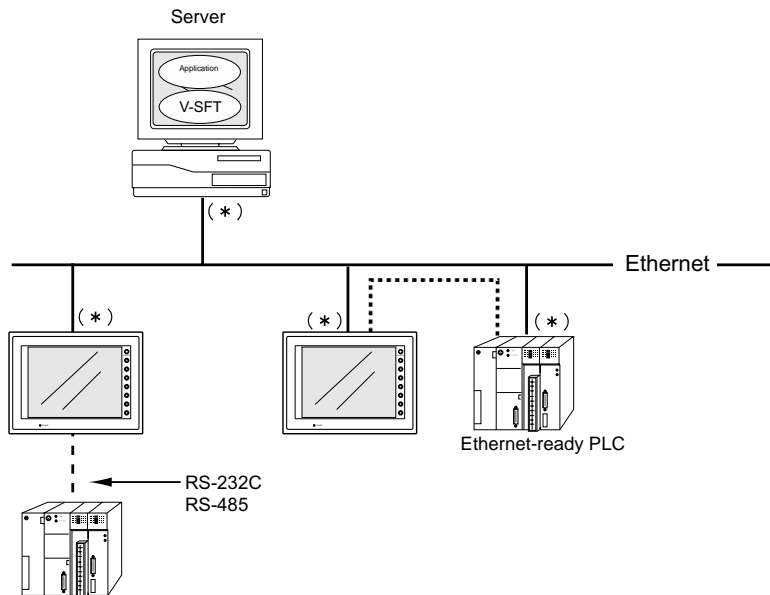


V-SFT Setting (Network Table Editing)

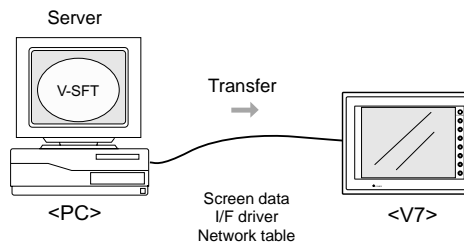
To enable Ethernet communications on the V7 series, the following network table setting is required on the V-SFT editor.

Network Table

- The V7 series, PLCs and PCs on the Ethernet must be registered on the network table. In the case of the network illustrated below, the nodes with (*) should be registered on the network table.



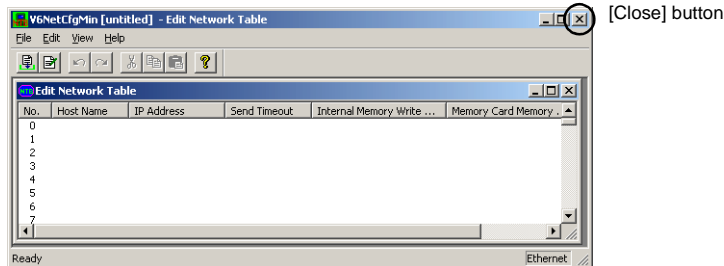
- The network table is transferred to the V7 series together with screen data.



When [Use Ethernet] is selected in the [Comm. Parameter] dialog, be sure to edit the network table.

Starting and Closing

- Starting
Select [System Setting] → [Network Table Setting] → [Ethernet]. The network table edit window is displayed.

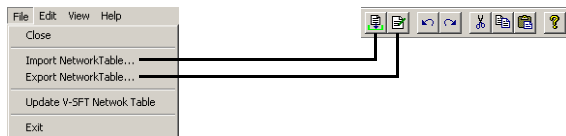


- Closing
Select [File] → [Exit], or click the [Close] button.

Menu and Icons

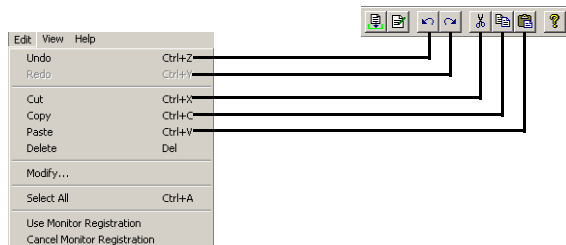
Each menu item corresponds to the icons as shown below.

- [File] menu



- Import Network Table
Imports a network table saved as a file "*.ntb."
- Export Network Table
Exports a network table as a file "*.ntb."

- [Edit] menu



- Use Monitor Registration
Only one V7 series can be registered as the monitor for Ethernet communications.

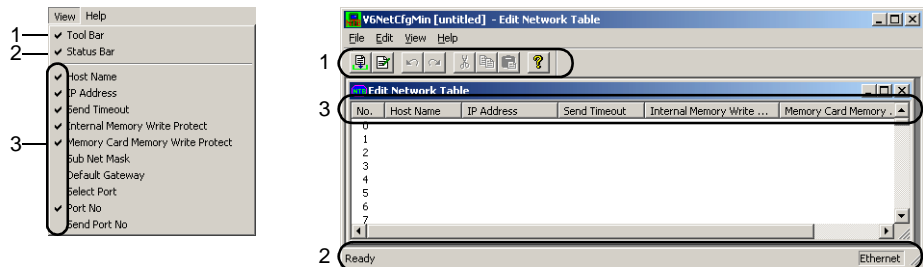
No.	Host Name	IP Address	Send Timeout	Internal Memory Write ...
0	PLC	192.168.1.58	15	Enabled
1	V7	192.168.1.68	15	Enabled
2	PLC	192.168.1.66	15	Enabled
3				
4				
5				
6				

A mark is shown on the left of the network table number.

- Cancel Monitor Registration
Click this menu when canceling monitor registration.

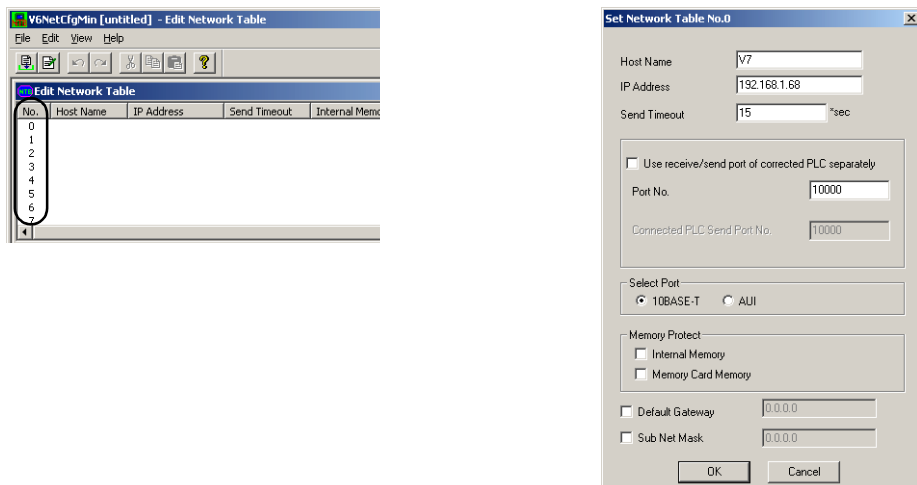
- [View] menu

The items with a check mark are shown on the network table editing window.



Editing the Network Table

Double-click the number.



The [Set Network Table No. *] dialog is displayed.

[Host Name]

Set the name for the V7 series, etc. to be used on the Ethernet.

[IP Address]

Set the IP address.

- * When registering Ethernet-ready PLC, set the same IP address as that of the PLC. For the setting procedure of the IP address on the PLC, see the manual attached to each PLC.
- * When registering a computer as the server, set the same IP address as that of the computer. When setting the IP address on the computer, open [Property] of [TCP/IP] in [Network] on the Windows.
- * To connect to the intra-company network, consult with the network administrator.

IP Address

This is an address that is used for recognizing each node on the Ethernet and should be unique. The IP address is 32-bit data which consists of the network address and the host address and can be classified into A to C depending on the network size.

Class A	0	Network address (7)	Host address (24)
Class B	10	Network address (14)	Host address (16)
Class C	110	Network address (21)	Host address (8)

Notation

A string of 32-bit data is divided into four, and each segment delimited with a period is in decimal notation.

Example: The IP address in class C shown below is represented as "192.128.1.50."
11000000 10000000 00000001 00110010

[Send Timeout]

Set the time-out time for the V7 series to send a command on the Ethernet.

[Port No.] (2049 to 65535) (Default: 10000)

Set the port number. The port number may be fixed depending on the PLC model. Refer to the instruction manual for the PLC.

Example: YOKOGAWA FA-M3 12289: Fixed
MITSUBISHI Q series auto-open UDP port 5000: Default
(changeable by sequence)

Port No.

Multiple applications are running on each node, and communications are carried out for each application between the nodes. Consequently, it is necessary to have a means to identify the application that data should be transferred to. The port number works as this identifier. Each port number is 16-bit data (from 0 to 65535). However, since some numbers are already used, the setting range available with V7i is from 2049 to 65535. It is recommended to set a greater number.

[Select Port]

Select either AUI or 10BASE-T. When connecting to the 10BASE-T connector (LAN) of V7i, select [10BASE-T]. Select either [10BASE-T] or [AUI] when CU-03 is mounted.

[Memory Protect]

Attach a check mark (☑) when write-protecting the internal memory or memory card.

[Default Gateway]

Attach a check mark (☑) when setting the default gateway.

Default Gateway

A gateway and a router are used for communicating between different networks. The IP address of the gateway (router) should be set to communicate with the node(s) on other network.

[Subnet Mask]

Attach a check mark (☑) when setting the subnet mask. When this option is checked, it is set to [255.255.255.0].

Subnet Mask

A subnet mask is used for dividing one network address into multiple networks (subnet). The subnet is assigned by specifying a part of the host address in the IP address as a subnet address.

Class B	10	Network address (14)	Host address (16)
Subnet mask	255.	255.	255.0
	11111111	11111111	1111111100000000
	Network address	Subnet address	Host address

V-SFT Setting (Macro)

This section explains the macro commands (SEND/EREAD/EWRITE) used for the Ethernet. For more information on macro commands, refer to the Reference Manual (Function).

Macro Command

[EREAD]

Words from the F1 memory in the V7 series of the network table number specified for F3 are read into the F0 memory. F2 designates the number of words to be read.

Usable Devices

	Internal Memory	PLC Memory	Constant	Memory Card	Indirect Designation	Double-word	IP Address
F0	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
F1	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
F2	<input type="radio"/>		<input type="radio"/>				
F3	<input type="radio"/>		<input type="radio"/>				<input type="radio"/>

EREAD: Read into memory

EREAD F0 = F1 C: F2 F3

Example: Macro command at the V7 (A)

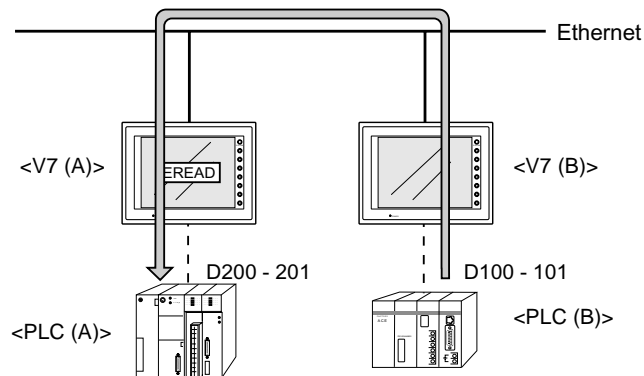
The macro command for V7 (A) to read data from PLC (B) and transfer it to PLC (A) is shown below.

[Description] EREAD D200 = D100 C: 2 B

|
 Top memory address of the source
 |
 Address of the source (Network table number)

|
 Top memory address of the target
 |
 The number of words to be transferred

[Contents] Two words starting from D100 in PLC (B) are read into D200 in PLC (A).



[EWRITE]

Words from the F2 memory are written into the F0 memory in the V7 series of the network table number specified for F1. F3 designates the number of words to be written.

Usable Devices

	Internal Memory	PLC Memory	Constant	Memory Card	Indirect Designation	Double-word	IP Address
F0	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
F1	<input type="radio"/>		<input type="radio"/>				<input type="radio"/>
F2	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
F3	<input type="radio"/>		<input type="radio"/>				

EWRITE: Write to memory

EWRITE F0 F1 = F2 C: F3

Example: Macro command at the V7 (A)

The macro command for V7 (A) to write data in V7 (A) to PLC (B) is shown below.

[Description] EWRITE D100 B = \$u100 C: 2

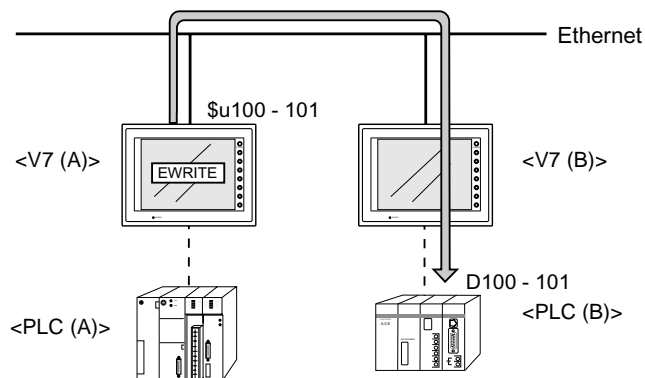
|
 Address of the target
 (Network table number)

|
 The number of words
 to be transferred

Top memory address
 of the target

Top memory address of
 the source

[Contents] Two words starting from \$u100 in V7 (A) are written into D100 in PLC (B).



[SEND]

Words from the F0 memory are transferred to the server of the network table number specified for F2. F1 designates the number of words to be transferred.

Usable Devices

	Internal Memory	PLC Memory	Constant	Memory Card	Indirect Designation	Double-word	IP Address
F0	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
F1	<input type="radio"/>		<input type="radio"/>				
F2	<input type="radio"/>		<input type="radio"/>				<input type="radio"/>

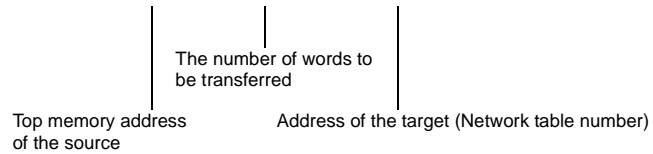
SEND: Send to server

SEND F0 C: F1 TO: F2

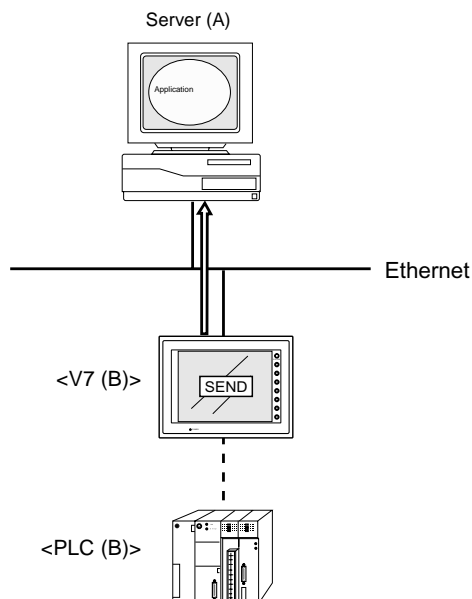
Example: Macro command at the V7 (B)

The macro command for V7 (B) to transfer data to server (A) is shown below.

[Description] SEND \$u100 C: 2 TO: A



[Contents] Two words starting from \$u100 in V7 (B) are transferred to server (A).



System Memory

The Ethernet status is output to the system memory (\$s) of the V7 series. This section explains the memory addresses (\$s514 to 619) where the Ethernet status is output. For other memory addresses, refer to the Reference Manual (Function).

List

Address	Contents
:	:
\$s514	Macro user request wait (0: absent 1: present)
515	Result of executing the macro user request wait
516	
517	
518	Ethernet status
519	
520	Network table 0 status
521	Network table 1 status
522	Network table 2 status
523	Network table 3 status
524	Network table 4 status
525	Network table 5 status
526	Network table 6 status
527	Network table 7 status
528	Network table 8 status
529	Network table 9 status
530	Network table 10 status
531	Network table 11 status
532	Network table 12 status
533	Network table 13 status
534	Network table 14 status
535	Network table 15 status
536	Network table 16 status
537	Network table 17 status
538	Network table 18 status
539	Network table 19 status
540	Network table 20 status
541	Network table 21 status
542	Network table 22 status
543	Network table 23 status
544	Network table 24 status
545	Network table 25 status
546	Network table 26 status
547	Network table 27 status
548	Network table 28 status

Address	Contents
\$s549	Network table 29 status
550	Network table 30 status
551	Network table 31 status
552	Network table 32 status
553	Network table 33 status
554	Network table 34 status
555	Network table 35 status
556	Network table 36 status
557	Network table 37 status
558	Network table 38 status
559	Network table 39 status
560	Network table 40 status
561	Network table 41 status
562	Network table 42 status
563	Network table 43 status
564	Network table 44 status
565	Network table 45 status
566	Network table 46 status
567	Network table 47 status
568	Network table 48 status
569	Network table 49 status
570	Network table 50 status
571	Network table 51 status
572	Network table 52 status
573	Network table 53 status
574	Network table 54 status
575	Network table 55 status
576	Network table 56 status
577	Network table 57 status
578	Network table 58 status
579	Network table 59 status
580	Network table 60 status
581	Network table 61 status
582	Network table 62 status
583	Network table 63 status
584	Network table 64 status
585	Network table 65 status
586	Network table 66 status
587	Network table 67 status
588	Network table 68 status
589	Network table 69 status
590	Network table 70 status
591	Network table 71 status
592	Network table 72 status

Address	Contents
\$s593	Network table 73 status
594	Network table 74 status
595	Network table 75 status
596	Network table 76 status
597	Network table 77 status
598	Network table 78 status
599	Network table 79 status
600	Network table 80 status
601	Network table 81 status
602	Network table 82 status
603	Network table 83 status
604	Network table 84 status
605	Network table 85 status
606	Network table 86 status
607	Network table 87 status
608	Network table 88 status
609	Network table 89 status
610	Network table 90 status
611	Network table 91 status
612	Network table 92 status
613	Network table 93 status
614	Network table 94 status
615	Network table 95 status
616	Network table 96 status
617	Network table 97 status
618	Network table 98 status
619	Network table 99 status

Addresses

- \$s514, 515

These addresses are related to macro commands [SEND], [ERead] and [EWRITE].

\$s514: Sets the executing status of the macro.

In the case of "0," the next step of the macro is executed without waiting for the completion of the command when a command request is given to the Ethernet. In the case of other than "0," the wait status continues until the command completes, and then the next step of the macro is executed.

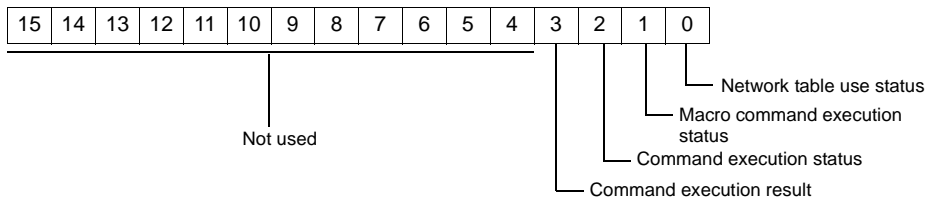
\$s515: Stores the result of macro execution. An error occurs if a value other than "0" is stored. For more information, refer to the error codes (page 4-47). However, when \$s514 is "0," the data before the command request is stored.

- \$s518

Stores the current status of the Ethernet. An error occurs if a value other than "0" is stored. For more information, refer to the error codes (page 4-46).

- \$s520 to 619

Stores the statuses of network table No. 0 to 99.



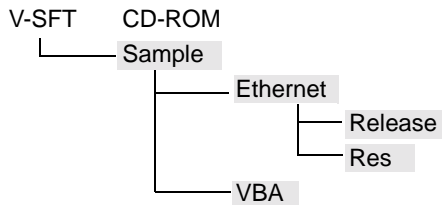
- Bit 0 (Network table use status)
[0]: Not used [1]: Used
For the current station, "0" (not used) is input.
- Bit 1 (Macro command execution status)
Stores the execution status of macro command [SEND], [ERead] or [EWRITE].
[0]: Waiting [1]: Executing
- Bit 2 (Command execution status)
Stores the execution status of the command from the server or other station.
[0]: Waiting [1]: Executing (read/write command)
- Bit 3 (Macro command execution result)
Stores the execution result of macro command [SEND], [ERead] or [EWRITE].
[0]: Normal [1]: Error
- Bits 4 to 15 (System reserved)
Not used at present. Always set "0."

Ethernet Access Functions (HKEtn10.DLL)

To enable Ethernet communications between the server and the V7 series, it is necessary to create an application based on HKEtn10.dll (for UDP/IP) provided by us, using Visual C++, Visual Basic, etc.

Sample Folder

The “Sample” folder for Ethernet communications is included in the V-SFT CD-ROM. The [Ethernet] folder contains sample programs created using Visual C++, and the [VBA] folder contains those created using VBA. Refer to these sample program when creating an application. If necessary, you can copy and tailor the program to your requirements.



- Ethernet

The following files are contained in the respective folders.

[Ethernet]

- ESmpl.dsp	- ESmpl.h	- ESmpl.cpp	- ESmpl.rc
- ESmpl.clw	- MainFrm.h	- MainFrm.cpp	- ESmplDoc.h
- ESmplDoc.cpp	- ESmplView.h	- ESmplView.cpp	- StdAfx.h
- StdAfx.cpp	- Resource.h	- ReadMe.txt	- HKEtn10.h

[Release]

- HKEtn10.dll	- HKEtn10.lib
---------------	---------------

[res]

- ESmpl.ico	- ESmpl.rc2	- Toolbar.bmp	- ESmplDoc.ico
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- VBA

The following files are contained in this folder.

[VBA]

- HKEtn10.dll
- VBA_Sample.xls

* To execute this program, copy the above files to the “C:\TEST” folder.

Port No. 10000 and IP address 192.168.1.52 are set.

When changing the copy target, the port number or the IP address, change the setting in the program accordingly.

- Notes on use of the sample programs

The data type to be set when creating a program varies depending on whether Visual C++ or Visual Basic is used. For the data type and range, refer to the following tables.

Visual C++	VB
BYTE	Byte
short	Integer
unsigned short	
WORD	
int	Long
long	
DWORD	
char	String

Visual C++

Data Type	Bytes	Data Range
BYTE	1	0 to 255
short	2	–32768 to 32767
unsigned short	2	0 to 65535
int	4	–2147483648 to 2147483647
long	4	–2147483648 to 2147483647
WORD	2	0 to 65535
DWORD	4	0 to 4294967295
char	1	–128 to 127

Visual Basic

Data Type	Bytes	Data Range
Byte	1	0 to 255
Boolean	2	TRUE(0) / FALSE(–1)
Integer	2	–32768 to 32767
Long	4	–2147483648 to 2147483647
Double	8	4.94E–324 to 1.79E+308
String	Variable	0 to 2 GB

Function Specifications

List

• Read

PLC memory Word	int HKEtn_ReadPlcMemory(WORD *dp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-29
PLC memory Double-word	int HKEtn_ReadPlcMemory2(DWORD *dp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-30
Internal memory Word	int HKEtn_ReadInternalMemory(WORD *dp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-31
Memory card memory Word	int HKEtn_ReadCardMemory(WORD *dp,unsigned short Wordcnt,int FileNo,int RecordNo,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-32
PLC memory Bit	int HKEtn_ReadPlcBitMemory(int *lpOnFlag,int DeviceType,DWORD addr,int BitNo,char *lpAddr)	Page 4-33
Internal memory Bit	int HKEtn_ReadInternalBitMemory(int *lpOnFlag,int DeviceType,DWORD addr,int BitNo,char *lpAddr)	Page 4-34
Memory card memory Bit	int HKEtn_ReadCardBitMemory(int *lpOnFlag,int FileNo,int RecordNo,DWORD addr,int BitNo,char *lpAddr)	
PLC memory Word (block)	int HKEtn_ReadBlockMemory(WORD *sp,BYTE *pReadblockData,int BlockCnt,char *lpAddr)	Page 4-34

• Write

PLC memory Word	int HKEtn_WritePlcMemory(WORD *sp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-35
PLC memory Double-word	int HKEtn_WritePlcMemory2(DWORD *sp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-36
Internal memory Word	int HKEtn_WriteInternalMemory(WORD *sp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-37
Memory card memory Word	int HKEtn_WriteCardMemory(WORD *sp,unsigned short Wordcnt,int FileNo,int RecordNo,DWORD addr,char *lpAddr,int DFlag=1)	Page 4-38
PLC memory Bit	int HKEtn_WritePlcBitMemory(int DeviceType,DWORD addr,int BitNo,int OnFlag,char *lpAddr)	Page 4-39
Internal memory Bit	int HKEtn_WriteInternalBitMemory(int DeviceType,DWORD addr,int BitNo,int OnFlag,char *lpAddr)	Page 4-40
Memory card memory Bit	int HKEtn_WriteCardBitMemory(int FileNo,int RecordNo,DWORD addr,int BitNo,int OnFlag,char *lpAddr)	

• Others

Initialization function	int HKEtn_Init(unsigned short Port=10000,int Retry=3,int RecvTime=2,int RecvTime2=10)	Page 4-41
Receive wait from V7	int HKEtn_Recvfrom(BYTE *dp,short *lpCnt)	
Cancel receive wait function	void HKEtn_Cancel(void)	Page 4-41
Request connection information	int HKEtn_GetInf(struct inf *lpinf,char *lpAddr)	
Close processing	int HKEtn_Close()	
Get source's IP Address	int HKEtn_GetSinAddr(char *lpAddr)	
Get error contents	int HKEtn_GetLastError()	Page 4-43

Read

Read Words from PLC Memory

int HKEtn_ReadPlcMemory(WORD *dp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *IpAddr, int DFlag=1)

This function is retained until PLC data is transferred from the V7 series.

- Parameters

*dp Target pointer of the data to be read

Contents	Word Count
No. 1	1
No. 2	1
⋮	⋮
No. n	1

Wordcnt Word count to be read (max. 2000 words)

DeviceType Address of the device to be read (Refer to "Chapter 5 Connection to PLCs.")

addr Top memory address to be read
For YOKOGAWA or YASKAWA PLCs, specify a number "-1" for the address (addr).

Example: D400 → 399 D25 → 24

*IpAddr IP address shown as a string of characters separated by dots

Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to the table below.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

- Priority and communication procedure depending on the DFlag setting are shown below.

DFlag	Priority	Communication Procedure
0	Communications	
1	Display	
2	Display	

Read Double-words from PLC Memory

int HKEtn_ReadPlcMemory2(DWORD *dp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *IpAddr, int DFlag=1)

This function is retained until PLC data is transferred from the V7 series.

- Parameters

*dp Target pointer of the data to be read

Contents	Word Count
No. 1	2
No. 2	2
⋮	⋮
No. n	2

Wordcnt Word count to be read (max. 1000 words)

DeviceType Address of the device to be read (Refer to "Chapter 5 Connection to PLCs.")

addr Top memory address to be read
For YOKOGAWA or YASKAWA PLCs, specify a number "-1" for the address (addr).

Example: D400 → 399 D25 → 24

*IpAddr IP address shown as a string of characters separated by dots

Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Read Words from Internal Memory

int HKEtn_ReadInternalMemory(WORD *dp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *IpAddr,int DFlag=1)

This function is retained until data is transferred from the V7 series.

- Parameters

*dp Target block pointer

Contents	Word Count
No. 1	1
No. 2	1
⋮	⋮
No. n	1

Wordcnt Word count to be transferred (max. 2000 words)

DeviceType 0: \$u 1: \$s

addr Top memory address to be read

*IpAddr IP address shown as a string of characters separated by dots
Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Read Words from Memory Card Memory

int HKEtn_ReadCardMemory(WORD *dp,unsigned short Wordcnt,int FileNo,int RecordNo,DWORD addr,char *IpAddr,int DFlag=1)

This function is retained until data is transferred from the V7 series.

- Parameters

*dp Target block pointer

Contents	Word Count
No. 1	1
No. 2	1
⋮	⋮
No. n	1

Wordcnt Word count to be transferred (max. 2000 words)

FileNo File number

RecordNo Record number

addr Top memory address to be read

*IpAddr IP address shown as a string of characters separated by dots
Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Read Bits from PLC Memory

int HKEtn_ReadPlcBitMemory(int *IpOnFlag,int DeviceType,DWORD addr,int BitNo,char *IpAddr)

This function is retained until PLC data is transferred from the V7 series.

- Parameters

*IpOnFlag	Returns the bit status. 0: OFF 1: ON
DeviceType	Address of the device to be read (Refer to "Chapter 5 Connection to PLCs.")
addr	Top memory address to be read For YOKOGAWA or YASKAWA PLCs, specify a number "-1" for the address (addr). Example: D400 → 399 D25 → 24
BitNo	Bit number to be read Example 1: When accessing to D20-05 of MITSUBISHI PLC DeviceType 0 addr 20 BitNo 5 Example 2: When accessing to M20 of MITSUBISHI PLC $20 \div 16 = 1 \dots 4$ DeviceType 6 addr 1 BitNo 4
*IpAddr	IP address shown as a string of characters separated by dots Example: "192.168.XXX.XXX"

- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Read Bits from Internal Memory

int HKEtn_ReadInternalBitMemory(int *IpOnFlag,int DeviceType,DWORD addr,int BitNo,char *IpAddr)

This function is retained until data is transferred from the V7 series.

- Parameters

*IpOnFlag	Returns the bit status. 0: OFF 1: ON
DeviceType	0: \$u 1: \$s
addr	Top memory address to be read
BitNo	Bit number to be read
*IpAddr	IP address shown as a string of characters separated by dots Example: "192.168.XXX.XXX"

- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Read Bits from Memory Card Memory

int HKEtn_ReadCardBitMemory(int *IpOnFlag,int FileNo,int RecordNo,DWORD addr,int BitNo,char *IpAddr)

This function is retained until data is transferred from the V7 series.

- Parameters

*IpOnFlag	Returns the bit status.	0: OFF	1: ON
FileNo	File number		
RecordNo	Record number		
addr	Top memory address to be read		
BitNo	Bit number to be read		
*IpAddr	IP address shown as a string of characters separated by dots		
	Example: "192.168.XXX.XXX"		
- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Read Words (Blocks) from PLC Memory

int HKEtn_ReadBlockMemory(WORD *sp,BYTE *pReadblockData,int BlockCnt,char *IpAddr)

This function is retained until data is transferred from the V7 series.

- Parameters

*sp	Returns the read data.
*pReadblockData	Top pointer of the read data

Word Count	2 bytes
Source PLC memory	9 bytes

BlockCnt	Block count to be read
*IpAddr	IP address shown as a string of characters separated by dots
	Example: "192.168.XXX.XXX"
- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Write

Write Words to PLC Memory

int HKEtn_WritePlcMemory(WORD *sp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *IpAddr, int DFlag=1)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the PLC memory.)

- Parameters

*sp Target block pointer

Contents	Word Count
No. 1	1
No. 2	1
⋮	⋮
No. n	1

Wordcnt Word count to be transferred (max. 2000 words)

DeviceType Address of the device to be written (Refer to "Chapter 5 Connection to PLCs.")

addr Top memory address to be written
For YOKOGAWA or YASKAWA PLCs, specify a number "-1" for the address (addr).

Example: D400 → 399 D25 → 24

*IpAddr IP address shown as a string of characters separated by dots
Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Write Double-words to PLC Memory

int HKEtn_WritePlcMemory2(DWORD *sp,unsigned short Wordcnt,int DeviceType,DWORD addr,char *IpAddr, int DFlag=1)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the PLC memory.)

- Parameters

*sp Target block pointer

Contents	Word Count
No. 1	2
No. 2	2
⋮	⋮
No. n	2

Wordcnt Word count to be transferred (max. 1000 words)

DeviceType Address of the device to be written (Refer to “Connection to PLCs.”)

addr Top memory address to be written

For YOKOGAWA or YASKAWA PLCs, specify a number “-1” for the address (addr).

Example: D400 → 399 D25 → 24

*IpAddr IP address shown as a string of characters separated by dots

Example: “192.168.XXX.XXX”

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Write Words to Internal Memory

int HKEtn_WriteInternalMemory(WORD *sp,unsigned short Wordcnt,int DeviceType,DWORD addr,chr *IpAddr,int DFlag=1)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the internal memory.)

- Parameters

*sp Target block pointer

Contents	Word Count
No. 1	1
No. 2	1
⋮	⋮
No. n	1

Wordcnt Word count to be transferred (max. 2000 words)

DeviceType 0: \$u 1: \$s

addr Top memory address to be written

*IpAddr IP address shown as a string of characters separated by dots
Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Write Words to Memory Card Memory

int HKEtn_WriteCardMemory(WORD *sp,unsigned short Wordcnt,int FileNo,int RecordNo,DWORD addr,char *IpAddr,int DFlag=1)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the memory card memory.)

- Parameters

*sp Target block pointer

Contents	Word Count
No. 1	1
No. 2	1
⋮	⋮
No. n	1

Wordcnt Word count to be transferred (max. 2000 words)

FileNo File number

RecordNo Record number

addr Top memory address to be written

*IpAddr IP address shown as a string of characters separated by dots
Example: "192.168.XXX.XXX"

DFlag 0, 1, 2 (Refer to page 4-29.)

- Return values

Success TRUE

Failure FALSE

Error details Get using HKEtn_GetLastError ().

Write Bits to PLC Memory

int HKEtn_WritePlcBitMemory(int DeviceType,DWORD addr,int BitNo,int OnFlag,char *IpAddr)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the PLC memory.)

- Parameters

DeviceType	Address of the device to be written (Refer to “Chapter 5 Connection to PLCs.”)
addr	Top memory address to be written For YOKOGAWA or YASKAWA PLCs, specify a number “-1” for the address (addr). Example: D400 → 399 D25 → 24
BitNo	Bit number to be accessed Example 1: When accessing to D20-05 of MITSUBISHI PLC <div style="margin-left: 40px;">DeviceType 0</div> <div style="margin-left: 40px;">addr 20</div> <div style="margin-left: 40px;">BitNo 5</div> Example 2: When accessing to M20 of MITSUBISHI PLC <div style="margin-left: 40px;">$20 \div 16 = 1 \dots 4$</div> <div style="margin-left: 40px;">DeviceType 6</div> <div style="margin-left: 40px;">addr 1</div> <div style="margin-left: 40px;">BitNo 4</div>
OnFlag	0: OFF 1: ON
*IpAddr	IP address shown as a string of characters separated by dots Example: “192.168.XXX.XXX”

- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Write Bits to Internal Memory

int HKEtn_WriteInternalBitMemory(int DeviceType,DWORD addr,int BitNo,int OnFlag,char *IpAddr)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the internal memory.)

- Parameters

DeviceType	0: \$u 1: \$s
addr	Top memory address to be written
BitNo	Bit number to be accessed
OnFlag	0: OFF 1: ON
*IpAddr	IP address shown as a string of characters separated by dots Example: "192.168.XXX.XXX"
- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Write Bits to Memory Card Memory

int HKEtn_WriteCardBitMemory(int FileNo,int RecordNo,DWORD addr,int BitNo,int OnFlag,char *IpAddr)

This function is retained until write completion is received from the V7 series. (It is reset on receipt of write completion to the memory card memory.)

- Parameters

FileNo	File number
RecordNo	record number
addr	Top memory address to be written
BitNo	Bit number to be accessed
OnFlag	0: OFF 1: ON
*IpAddr	IP address shown as a string of characters separated by dots Example: "192.168.XXX.XXX"
- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Others Functions

Initialization Function

int HKEtn_Init(unsigned short Port=10000,int Retry=3,int RecvTime=2,int RecvTime2=10)

Creates a socket.

- Parameters
 - Port Set 10000 or above.
 - Retry Number of send retrials
 - RecvTime Receive timeout
 - RecvTime2 Receive timeout 2
- Return values
 - Success TRUE
 - Failure FALSE
 - Error details Get using HKEtn_GetLastError ().

Receive Wait from V7

int HKEtn_Recvfrom(BYTE *dp,short *lpCnt)

This function is retained internally until data is received from the V7 series. The function returns a response and ends only when a command is received. The user should interpret the received data and create the next action. This function must be executed within the thread.

- Parameters
 - *dp Top pointer of receive buffer
Allocate 5000 bytes.
 - *lpCnt Returns the number of bytes received.
- Return values
 - Success TRUE
 - Failure FALSE
 - Error details Get using HKEtn_GetLastError ().

Cancel Receive Wait Function

void HKEtn_Cancel(void)

Cancels the function in the receive wait status, such as Recvfrom().

Request Connection Information**int HKEtn_GetInf(struct inf *IpInf,char *IpAddr)**

- Parameters

*IpInf	All "0"
*IpAddr	IP address shown as a string of characters separated by dots Example: "192.168.XXX.XXX"
- Return values

Success	TRUE
Failure	FALSE
Error details	Get using HKEtn_GetLastError ().

Close processing**int HKEtn_Close()**

Execute this function when ending HKEtn10.dll.

Get Source's IP Address**int HKEtn_GetSinAddr(char *IpAddr)**

Execute this function after the recvfrom() function or receiving the data.

Get Error Contents

int HKEtn_GetLastError()

- Error codes and solutions

Code	Contents	Solution
-1	Undefined command (receive timeout)	Check the command.
-2	Undefined IP address	Check the IP address.
-3	Target station busy	Reduce the frequency of communications.
-4	Illegal packet bytes	Check response processing at the target station.
-5	Packet bytes exceed the maximum number.	Reduce the send packet size.
-6	Local mode error	Check that the target station is in the RUN mode.
-7	Preparing for communications	Start communications when the target station is ready.
-8	Communication failure – Cannot access	Check the target station.
-9	Cannot process due to short memory	Check the memory space at the target station.
-10	Illegal received data	Check the command.
-20	Socket initialization error	Check parameters for initialization.
-50	Requested packet byte exceeds the maximum number.	Reduce the requested size.
-51	Address error	Check the requested memory type.
-52	Communication failure – Cannot access	Check the target station.
-54	Write protected	Check write-protection of the card.
-55	Cannot process due to short memory	Check the memory space at the target station.
-56	Sampling buffer error	Check the command.
-100	Processing another command	Continue retrying.
-101	Command control – Buffer over	Reduce the frequency of communications.
-120	Communications aborted by the user	Communications are forcedly aborted.
-121	Received during command processing	Reduce the frequency of communications.

Server Communication Procedure

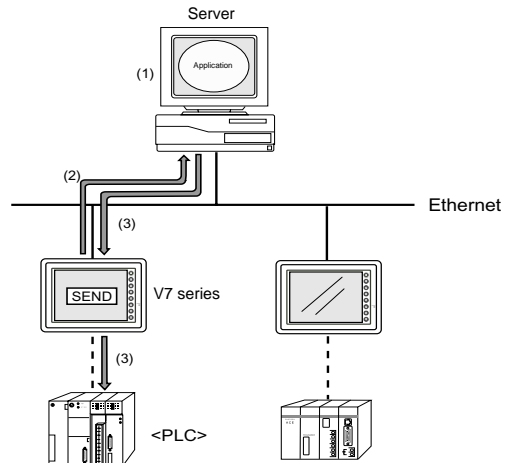
Data Request from V7 to Server

- (1) Execute the receive wait thread using "int HKEtn_RecvFrom()" on the application of the server.
- (2) Send the command from the V7 series to the server using macro command SEND.
- (3) The server analyzes the command and takes the appropriate action.

User data format

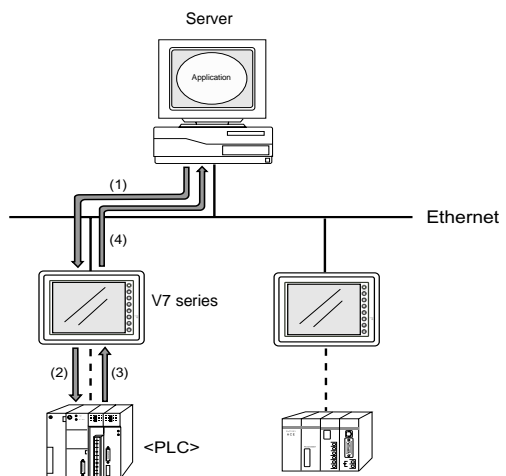
Transfer from the V7 series

Item	Bytes
Packet bytes 2 + 2 + 1 + n bytes	2
Transaction No.	2
Command (0x33)	1
User data	n



PLC Data Request from Server to V7

- (1) A request is sent from the application of the server to the V7 series. Use "int HKEtn_ReadPlcMemory()" for a memory request.
- (2) (3) The V7 series reads the PLC memory.
- (4) The V7 series returns data read from the PLC memory to the server.



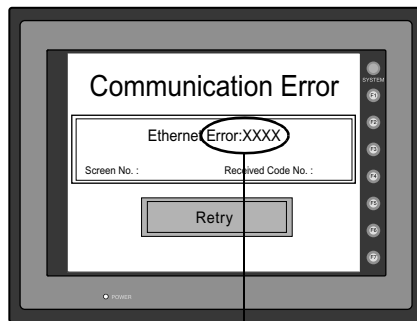
Error Display

Error messages displayed on the V7 series and those stored in the system memory are explained.

Communication Errors

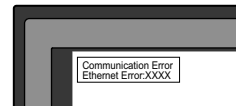
The Ethernet status is stored in system memory address \$s518 of the V7 series during Ethernet communications. The communication error occurs when a code other than "0" (normal) is stored in system memory address \$s518.

- In the RUN mode

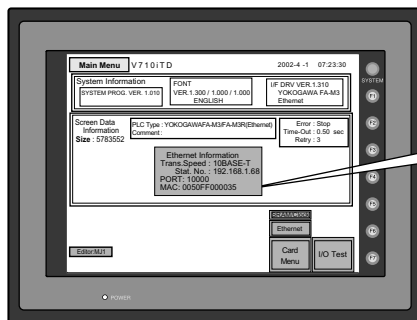


The error number is displayed here.

- * When [Continue] is selected for [Comm. Error Handling] in the [Detail] tab window of the [Comm. Parameter] dialog, a following screen is displayed.



- To check the occurrence of an error on the Main Menu screen:



Ethernet Information
Trans.Speed : 10BASE-T
Stat.No. : 192.168.1.68
PORT: 10000
MAC: 0050FF000035 Error:XXX

The error number is displayed here.

- System memory: \$s518

No.	Contents	Solution
0	Normal	
200	Failed in send request	Check cable connection and network table setting of the target station.
201	Send error	Check that the setting on the target station is consistent with the network table setting.
202	Internal port error	The communication unit is in the older version or is faulty.
204	TCP connection over	The number of connections reaches the maximum, and no more connection is possible. Check the communication lines.
205	TCP connection error	Connection cannot be established. Check the communication lines, or turn the power off and on.
206	TCP connection end error	TCP communication disconnection has failed. Check that the communication partner with the V7 series is present on the line.
207	TCP send error	TCP sending has failed. Check the communication lines.
350	Send buffer full	The line is busy. Consult the network administrator of your company. The communication unit is in the older version or is faulty.
351	IC receive buffer overflow	
352	Driver receive buffer overflow	
801	Receive processing error, link down error	Check the HUB or the link confirmation LED on the communication unit. If the LED is not on, check cable connection and the port setting on the network table.
802	Transceiver error	Check the transceiver and cable connection.
900	No IP address at local port	Check that the IP address of the local port is set on the network table. Check if the same IP address is set on the network.
901	Duplicated IP address error	
902	Send socket ID error (error that may occur when V7i LAN port is used)	Turn the power off and back it on. If the problem persists, contact your local distributor.
1000	Ethernet I/F unit not mounted	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, contact your local distributor.
1001	Ethernet I/F unit not ready	
1002	Ethernet I/F unit DPRAM error	
1003	No response from Ethernet I/F unit	
1004	Ethernet receive buffer over	
1005	Ethernet send registration error	
1006	I/F unit unregistered interrupt	
1100 - 1115	Initialization error (communication unit)	
1120	Dual port access error	
1200	Undefined register	
1201	Send/receive buffer area over	
1202	MAC address error	
1203	Port error	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, contact your local distributor.
1301	Watch dog overflow	
1302	JAVA error LANC error	

Errors during Macro Command Execution

The execution result of macro commands SEND/ERead/EWRITE is stored in system memory address \$s515.

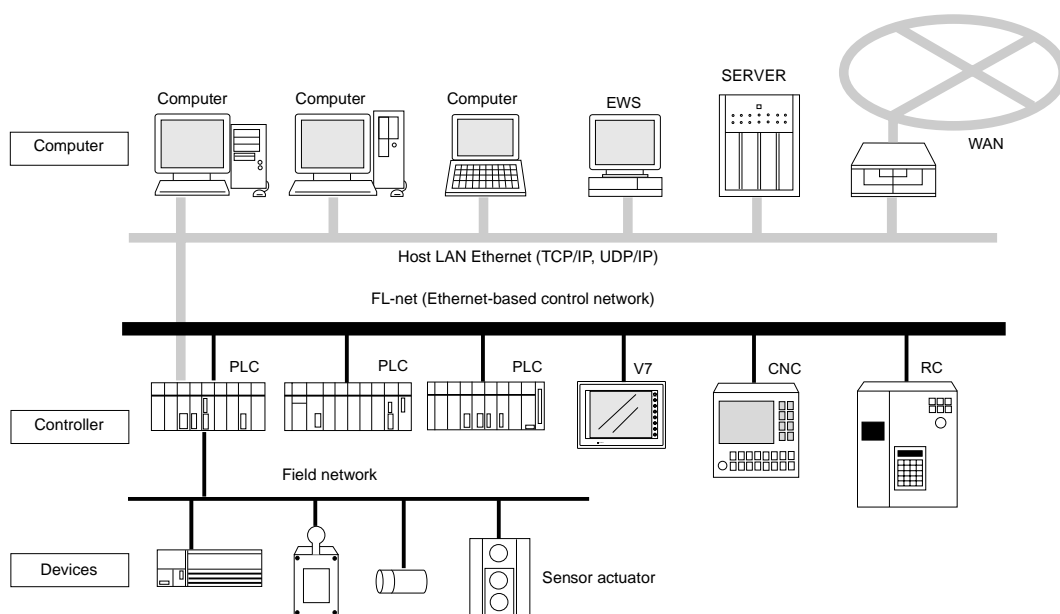
- System memory address: \$s515 (response to the request)

Code	Contents	Solution
0	Normal	
200 - 2000	Communication error	Refer to "Communication Errors."
-30	Timeout	Check if an error is occurring to the target V7.
-31	The number of words being sent exceeds the limit.	Check the number of words that can be sent in macro editing.
-32	Specified table not used	Check the setting on the network table.
-33	Cannot use the send command.	Check the macro command in macro editing.
-34	Specified table being used	Check that system memory address \$s514 is set. If not, reduce the frequency of communications.
-35	Cannot process due to short memory	Check the memory space at the target station.
-36	Illegal receive packet bytes	Check the requested number of words.
-37	Memory access error	Check the setting of the requested memory.
-38	Macro setting error	Check the macro setting.

2. FL-net (OPCN-2)

FL-net (OPCN-2)

- FL-net (OPCN-2) is an open FA network that FA Open Systems Promotion Forum (JOP) of the Manufacturing Science and Technology Center, an affiliated organization of the Ministry of Economy, Trade and Industry, has standardized. It is possible to connect FA controllers and computers, such as programmable controllers (PLCs) or NC controllers (CNCs), of different manufacturers as shown below for control and monitoring.

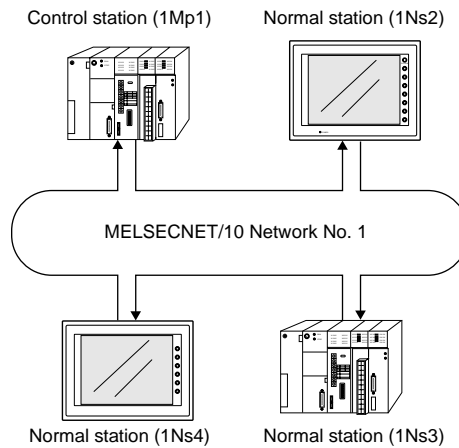


- To use FL-net (OPCN-2) communications on the V7 series, the communication interface unit "CU-03" must be mounted. When the V7 series is equipped with the communication interface unit CU-03, it becomes an FL-net (OPCN-2)-ready device.
- When CU-03 is mounted for FL-net (OPCN-2) communications on V7i, the 10BASE-T connector (LAN) provided on the unit cannot be used. Consequently, it is not possible to use FL-net (OPCN-2) communications and Ethernet communications at the same time.
- When transferring screen data, use the 10BASE-T connector on the communication interface unit CU-03. Be sure to set the IP address, etc. on the Main Menu and Ethernet screens. For the setting procedure, refer to "Chapter 2 MONITOUCH Operations." For data transfer, refer to page 4-9.

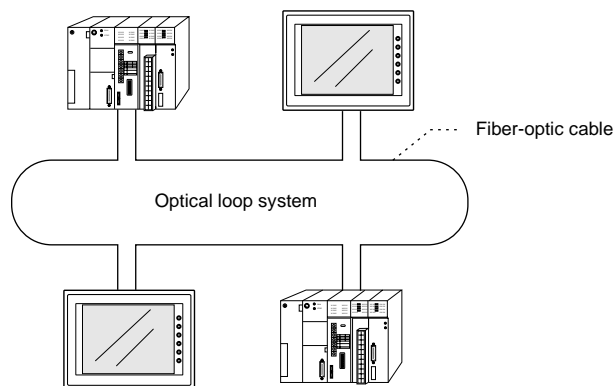
3. MELSECNET/10

MELSECNET/10

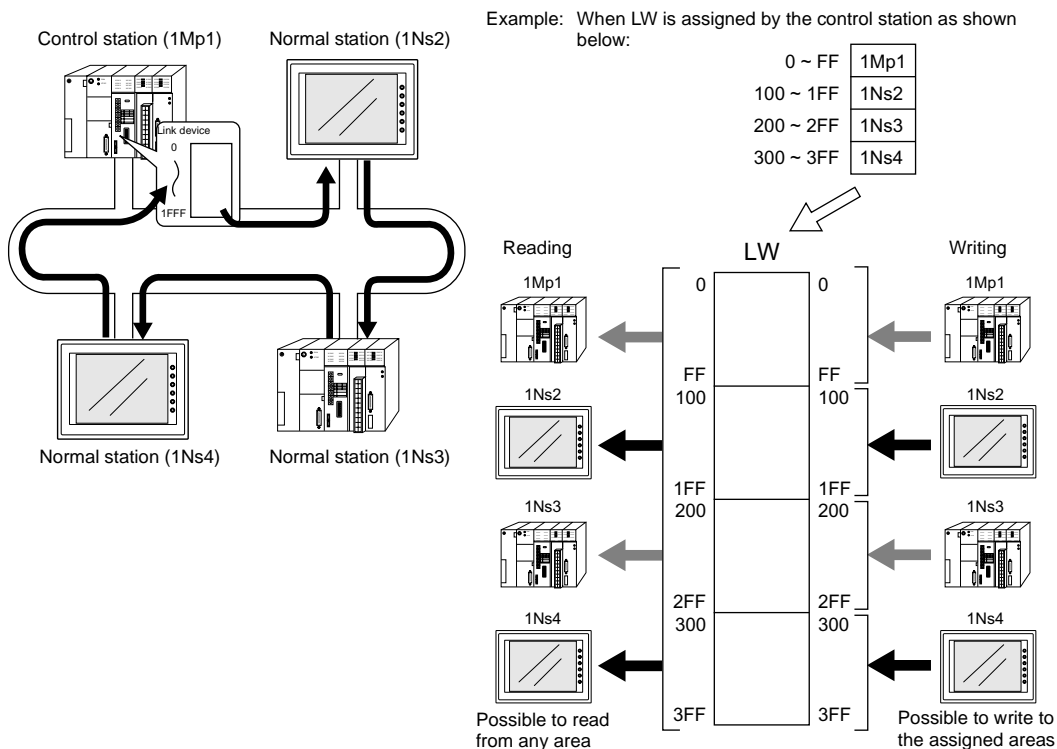
- MELSECNET/10 is the network system that is developed by MITSUBISHI Electric Corporation. When the V7 series is equipped with the communication interface unit CU-05 is mounted, it can work as a NET/10 station (a sub-control station).



- For communications with the PLC, no program is required in the same way as communications via a link unit.
- The V7 series supports the optical loop system of NET/10. Use fiber-optic cables for connection.



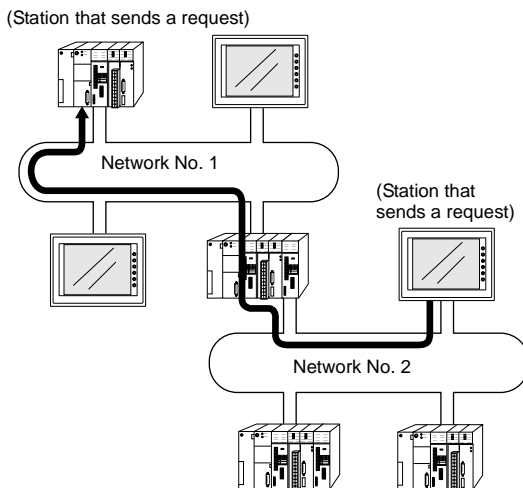
- This network system supports cyclic transmission and enables direct reading from link devices (LB, LW, LX or LY). Also it is possible to directly write data to link devices that are assigned by the control station.



- Transient transmission is also supported. It is possible to access to memory addresses such as D or M that are usable with the ordinary 1 : 1 communications. All the memory areas in the PLCs on NET/10 can be accessed.

Note:

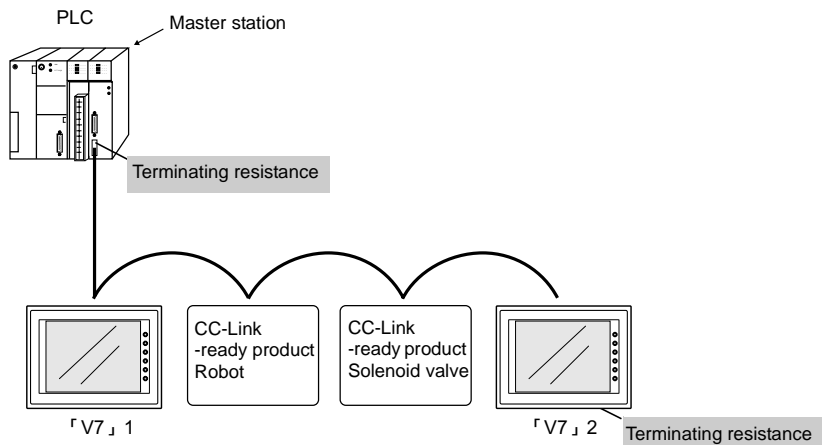
Transient transmission is slower than cyclic transmission (2- or 3-times longer response time than cyclic transmission). To achieve high-speed communications, use cyclic transmission.



4. CC-Link

CC-Link

- CC-Link is the network that is developed by MITSUBISHI Electric Corporation. The V7 series works as a local station (intelligent device station).
- To use CC-Link communications on the V7 series, the communication interface unit "CU-02" must be mounted. When the V7 series is equipped with the communication interface unit CU-02, it becomes a CC-Link-ready device.
- For communications with the PLC, no program is required in the same way as communications via a link unit.
- It is possible to perform high-speed communications by connecting multiple remote/local stations to one master station (PLC).
Example: System configuration with two V7 series

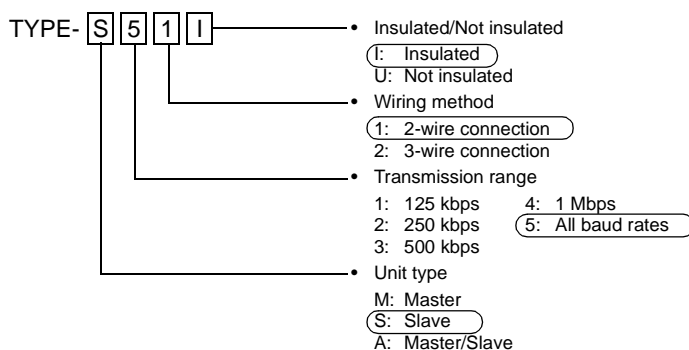


- For more information, refer to the Specifications for Communication Unit "CC-Link."

5. OPCN-1

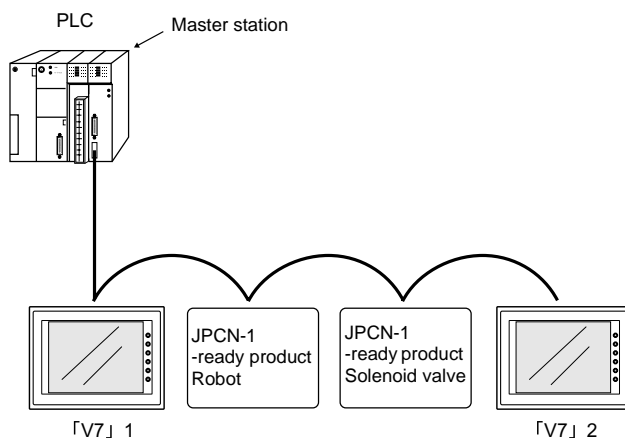
OPCN-1

- To use OPCN-1 communications on the V7 series, the communication interface unit "CU-00" must be mounted. When the V7 series is equipped with the communication interface unit CU-00, it becomes an OPCN-1-ready device.
- The V7 series that supports OPCN-1 communications is a programmable display that can perform data transfer with the master station (PLC, etc.) in compliance with "JEM-F3008 programmable controller field network standard (level 1)" (normally called "OPCN-1") that is determined by the Japan Electrical Manufacturers' Association.
- The GET/PUT service is supported, and communications with the PLC can be performed without program in the same way as communications via a link unit.
- The V7 series that supports OPCN-1 communications falls in the TYPE-S51I class.



- It is possible to perform high-speed communications by connecting multiple slave stations to one master station (PLC).

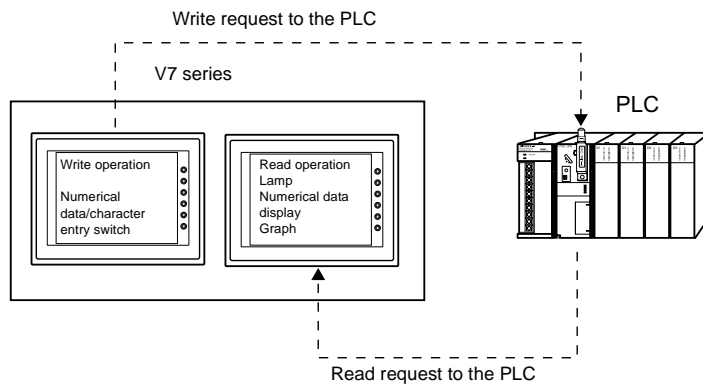
Example: System configuration with two V7 series



6. T-LINK

T-LINK

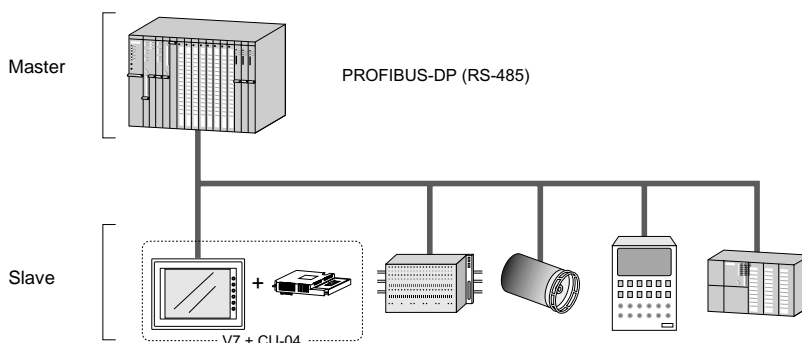
- To use T-LINK communications on the V7 series, the communication interface unit “CU-01” must be mounted. When the V7 series is equipped with the communication interface unit CU-01, it becomes a T-LINK-ready device.
- The V7 series that supports T-LINK communications can perform long-distance high-speed data transmission with the FUJI ELECTRIC's PLC MICREX-F series.
- The V7 series updates the display when the read data (V7 series ← PLC) is changed. The V7 series reads data from the PLC memory addresses that are allocated to the items placed on the screen, such as lamp parts or counter parts. When switch data or counter setting data on the V7 series should be written, the V7 series issues a write command to the PLC and writes the output data to the PLC memory. These operations are automatically performed on the V7 series and no special communication program is required on the PLC side.



7. PROFIBUS-DP

PROFIBUS

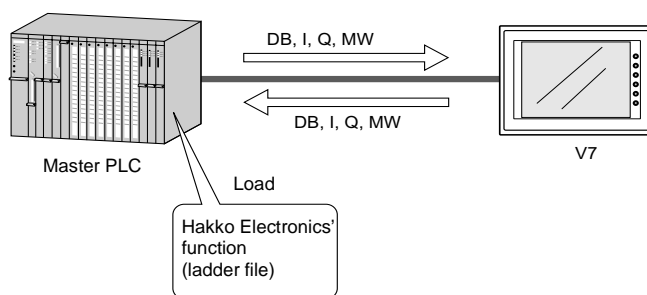
- PROFIBUS is an open field bus independent on the bender that is used for various applications in factory automation and process automation. PROFIBUS provides a communication protocol (communication profile) that supports system hierarchy, i.e. DP and FMS.
- When the V7 series is equipped with the communication interface unit CU-04 is mounted, PROFIBUS-DP communications can be performed.



The V7 series can work as a slave station on PROFIBUS-DP. A maximum of 12 Mbps is available (automatically set to the BUS baud rate). The signal level is RS-485.

* **The V7 series can only communicate with the master PLC.**

- PROFIBUS-DP supports I/O communications only. With I/O communication, it is not possible to directly access the device memory (DB or MW) used in the CPU. To enable the V7 series to have direct access to these memory devices, Hakko Electronics supplies the function (ladder file) for message communications. When this function is loaded in the master CPU, message communications using the Hakko Electronics' original protocol are enabled, and the V7 series can have access to any memory address.



- For the procedure of loading Hakko Electronics' function, refer to the Specifications for Communication Unit "PROFIBUS-DP."



Connection to PLCs

1. MITSUBISHI PLC*
2. OMRON PLC*
3. SHARP PLC*
4. HITACHI PLC
5. MATSUSHITA PLC
6. YOKOGAWA PLC*
7. YASKAWA PLC
8. Toyopuc PLC
9. FUJI PLC*
10. KOYO PLC
11. Allen-Bradley PLC
12. GE Fanuc PLC
13. TOSHIBA PLC
14. TOSHIBA MACHINE PLC
15. SIEMENS PLC
16. SHINKO PLC
17. SAMSUNG PLC
18. KEYENCE PLC
19. LG PLC
20. FANUC PLC
21. FATEK AUTOMATION PLC
22. IDEC PLC
23. MODICON PLC
24. YAMATAKE PLC
25. TAIAN PLC
26. SAIA PLC
27. MOELLER PLC
28. Telemecanique PLC
29. Automationdirect PLC

* Indicates manufacturers who support PLC2Way connection at the MJ port. For the applicable PLC models, refer to the "PLC2Way" column in "Available PLCs." (○: connectable, ×: not connectable)

1. MITSUBISHI PLC

Available PLCs

A Series Link, QnA Series Link, QnH (Q) Series Link, A Link + Net10^{*1}

Select PLC Type	CPU	Unit/Port	Connection		PLC2Way
A series link	A2A, A3A	AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-232C	[Wiring Diagram 2]	○
	A2U, A3U, A4U	AJ71UC24			
	A1, A2, A3 A1N, A2N, A3N A3H, A3M, A73	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-422	[Wiring Diagram 5]	○
	A0J2, A0J2H	A0J2C214-S1			
	A2US	A1SJ71UC24-R2	RS-232C	[Wiring Diagram 1]	○
		A1SJ71UC24-R4	RS-422	[Wiring Diagram 5]	○
		A1SJ71UC24-PRF	RS-232C	[Wiring Diagram 1]	○
	A1S, A1SJ, A2S	A1SJ71C24-R2	RS-232C	[Wiring Diagram 1]	○
		A1SJ71C24-R4	RS-422	[Wiring Diagram 5]	○
		A1SJ71C24-PRF	RS-232C	[Wiring Diagram 1]	○
	A2CCPUC24	CPU built-in link port	RS-232C	[Wiring Diagram 1]	○
	QnH (A mode)	A1SJ71UC24-R2	RS-232C	[Wiring Diagram 1]	○
		A1SJ71UC24-R4	RS-422	[Wiring Diagram 5]	○
QnA series link	Q2A, Q3A, Q4A Q2ASx	AJ71QC24N	RS-232C	[Wiring Diagram 2]	○
			RS-422	[Wiring Diagram 5]	×
		AJ71QC24	RS-232C	[Wiring Diagram 2]	○
			RS-422	[Wiring Diagram 5]	×
		A1SJ71QC24	RS-232C	[Wiring Diagram 1]	○
			RS-422	[Wiring Diagram 5]	×
		AJ71QC24-R4(CH1)	RS-422	[Wiring Diagram 6]	×
AJ71QC24-R4(CH2)	RS-422	[Wiring Diagram 5]	×		
QnH (Q) series link	QnH (Q mode)	QJ71C24	RS-232C	[Wiring Diagram 1]	○
			RS-422	[Wiring Diagram 5]	×
A link + Net10	Communication link unit for A series link* ¹				×

^{*1} For more information on A link + Net10, refer to page 5-15.

A Series CPU, QnA Series CPU, QnH Series CPU

Select PLC Type	CPU	Unit/Port	Connection	PLC2Way
A series CPU	A2A, A3A A2U, A3U, A4U A2US(H) A1N, A2N, A3N A3V, A73 A3H, A3M A0J2H A1S(H), A1SJ(H), A2S(H) A2CCPUC24 A1FX	Tool port ^{*1}	RS-422 Hakko Electronics' cable "MB-CPUQ" or [Wiring Diagram 7]	×
QnA series CPU	Q2A, Q3A, Q4A Q2AS(H)			
QnH (A) series CPU	Q06H-A			
QnH (Q) series CPU	Q02, Q02H Q06H Q12H Q25H	Tool port ^{*2}	RS-232C Hakko Electronics' cable "QCPU2"	×

*1 For more information of V-MDD (dual port interface), refer to page 5-17.

*2 For the ladder transfer function used when directly connecting the QnH series CPU, refer to page 5-18.

FX Series

Select PLC Type	CPU	Unit/Port	Connection	PLC2Way
FX series CPU	FX1/2	Tool port ^{*1}	RS-232C Hakko Electronics' cable "PC-CX24A" RS-422 Hakko Electronics' cable "MB-CPUQ" or [Wiring Diagram 7]	×
	FX0N	Tool port ^{*1}	RS-422 Hakko Electronics' cable "MI4-FX" or Hakko Electronics' cable "MB-CPUQ" + MITSUBISHI's conversion cable "FX-20P-CADP"	×
FX2N series CPU	FX2N/1N			
	FX2NC			
FX1S series CPU	FX1S			
FX series link (A Protocol)	FX2N	FX2N-232-BD	RS-232C [Wiring Diagram 3]	×
		FX2N-485-BD	RS-485 [Wiring Diagram 8]	×
		FX2N-422-BD	RS-422 Hakko Electronics' cable "MI4-FX"	×
	FX1N FX1S	FX1N-232-BD	RS-232C [Wiring Diagram 3]	×
		FX1N-485-BD	RS-485 [Wiring Diagram 8]	×
		FX1N-422-BD	RS-422 Hakko Electronics' cable "MI4-FX"	×
	FX0N	FX0N-232ADP	RS-232C [Wiring Diagram 4]	×
		FX0N-485ADP	RS-485 [Wiring Diagram 8]	×
	FX2NC	FX0N-232ADP	RS-232C [Wiring Diagram 4]	×
		FX0N-485ADP	RS-485 [Wiring Diagram 8]	×

*1 For more information of V-MDD (dual port interface), refer to page 5-17.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

A Series Link

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0 for both stations ×10, ×1	0
Parity		Even	Even
Transmission mode ^{*1}	RS-232C	MODE1	Trans. Mode 1
	RS-422	MODE5	Trans. Mode 1
Transmission code	Data length	7	7
	Stop bit	1	1
Sumcheck		Provided (fixed)	–
Write while running		Possible (fixed)	–
Terminating resistance at sender		Provided (fixed)	–
Terminating resistance at receiver		Provided (fixed)	–

^{*1} Trans. Mode 1: without CR/LF, Trans. Mode 4: with CR/LF

If [Trans. Mode 4] is selected for [Trans. Mode] in the [Comm. Parameter] dialog of the V7 series, select [MODE4] in the case of RS-232C, or [MODE8] in the case of RS-422.

QnA Series Link, QnH (Q) Series Link

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate*		19200 bps	19200 bps
Port		0 for both stations ×10, ×1	0
Parity		Even	Even
Transmission mode	RS-232C	MODE5 (binary mode) (fixed)	–
	RS-422		
Transmission code	Data length	8 (fixed)	–
	Stop bit	1	1
Sumcheck		Provided (fixed)	–
Write while running		Possible (fixed)	–

* The maximum baud rate available with the V7 series is 115200 bps. Select the appropriate baud rate depending on the used PLC and environment.

A Series CPU, QnA Series CPU

Communication parameters for the V7 series are automatically set.

QnH (A) Series CPU, QnH(Q) Series CPU

Communication parameters for the V7 series except the baud rate are automatically set.

- * The maximum baud rate available with the V7 series is 115200 bps. Select the appropriate baud rate depending on the used PLC and environment.

FX Series CPU, FX2N Series CPU, FX1S Series CPU

Communication parameters for the V7 series are automatically set.

FX Series Link (A Protocol)

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Parity		Even	Even
Transmission code	Data length	7	7
	Stop bit	1	1
Protocol		Special protocol communication (fixed)	—
H/W type*1		Normal/RS-232C	RS-232C
Sumcheck		Added (fixed)	—
Transmission mode		Mode 1	Trans. Mode 1

*1 Select RS-485 when the link unit FX2N-485-BD, FX2N-422-BD, FX1N-485-BD, FX1N-422-BD or FX0N-485-ADP is used.

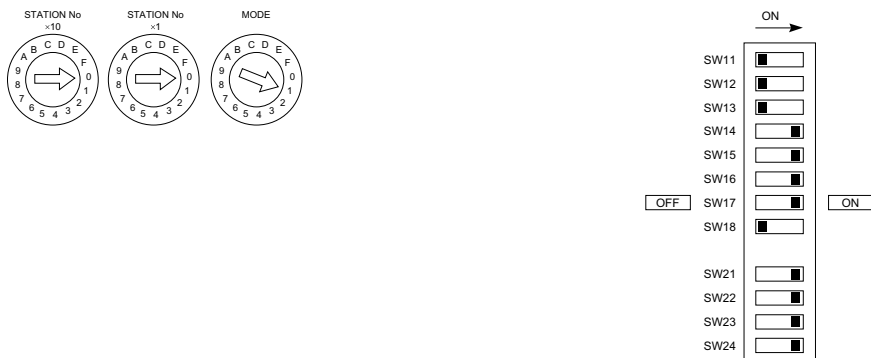
* We recommend to set 2 ms or above for [Send Delay Time] in the [Detail] tab window of the [Comm. Parameter] dialog of the V7 series.

A Series Link, QnA Series Link: Switch Setting

The following is an example that shows the settings for both rotary DIP switches and DIP switches on the PLC.

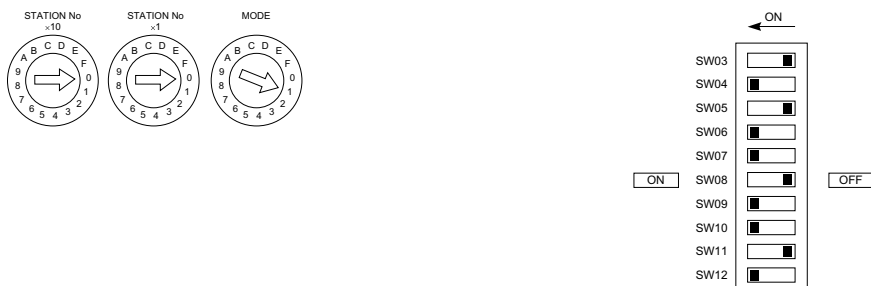
AJ71UC24

Example 1 Signal level: RS-232C, baud rate: 19200 bps, transmission mode 1



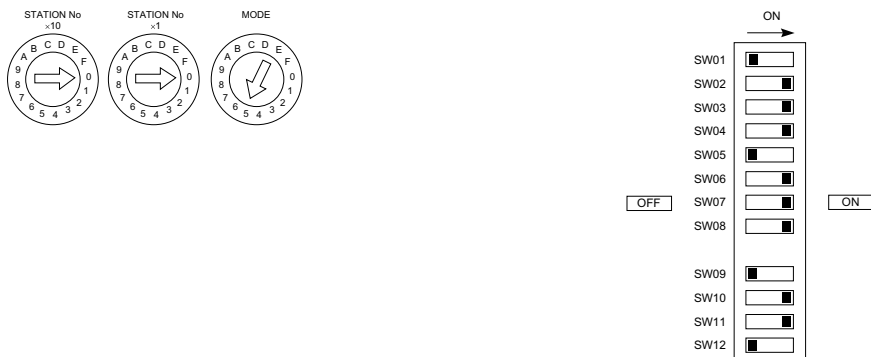
A1SJ71C24-R2, A1SJ71UC24-R2

Example 2 Signal level: RS-232C, baud rate: 19200 bps, transmission mode 1



AJ71QC24, A1SJ71QC24, AJ71QC24N

Example 3 Baud rate: 19200 bps



A1SJ71UC24-R4, A1SJ71C24-R4

Example 4 Signal level: RS-422, baud rate: 19200 bps, transmission mode 1



Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

A Series Link, QnA Series Link, QnH (Q) Series Link, A Series CPU, QnA Series CPU, QnH (A) Series CPU, QnH (Q) Series CPU, A Link + Net10

Memory	TYPE	Remarks
D (data register)	0	
W (link register)	1	
R (file register)	2	*1
TN (timer/current value)	3	
CN (counter/current value)	4	
SPU (special unit)	5	*2
M (internal relay)	6	
L (latch relay)	7	
B (link relay)	8	
X (input relay)	9	
Y (output relay)	10	
TS (timer/contact)	11	
TC (timer/coil)	12	
CS (counter/contact)	13	
CC (counter/coil)	14	
H (link unit buffer memory)	15	
SD (special register)	16	QnA, QnH (Q) series only (both link unit and CPU)
SM (special relay)	17	QnA, QnH (Q) series only (both link unit and CPU)
SB (special link relay)	18	QnA, QnH (Q) series only (both link unit and CPU)
SW (special link register)	19	QnA, QnH (Q) series only (both link unit and CPU)
ZR (file register (continuous access))	20	QnA, QnH (Q) series only (both link unit and CPU)

*1 When the A series CPU is in ROM operation, R register cannot be used.

*2 The unit number is required in addition to the memory type and address. Convert byte address into word address when entering the data on the V-SFT editor if the memory device of link unit is given byte address.

FX Series, FX1S Series

Memory	TYPE	Remarks
D (data register)	0	
TN (timer/current value)	1	
CN (counter/current value)	2	
32CN (counter 32 bits)	3	*1
M (internal relay)	4	
S (state)	5	
X (input relay)	6	Read only
Y (output relay)	7	
TS (timer/contact)	8	
CS (counter/contact)	9	
DX (data register)	10	*2

*1 For numerical data format where double-words can be used (Num. Data Display, Graph, Sampling), data is processed as double-words. For those where bits or words can be used, data is processed as words consisting of lower 16 bits.

For input Upper 16 bits are ignored.

For output "0" is written for upper 16 bits.

*2 Use DX for D1000 to 2999.

FX2N Series

Memory	TYPE	Remarks
D (data register)	0	
TN (timer/current value)	1	
CN (counter/current value)	2	
32CN (counter 32 bits)	3	*1
M (internal relay)	4	
S (state)	5	
X (input relay)	6	Read only
Y (output relay)	7	
TS (timer/contact)	8	
CS (counter/contact)	9	

*1 For numerical data format where double-words can be used (Num. Data Display, Graph, Sampling), data is processed as double-words. For those where bits or words can be used, data is processed as words consisting of lower 16 bits.

For input Upper 16 bits are ignored.

For output "0" is written for upper 16 bits.

FX Series (A Protocol)

Memory		TYPE	Remarks
D	(data register)	0	
TN	(timer/current value)	1	
CN	(counter/current value)	2	*1
32CN	(counter 32 bits)	3	*2
M	(internal relay)	4	
S	(state)	5	
X	(input relay)	6	Read only
Y	(output relay)	7	
TS	(timer/contact)	8	
CS	(counter/contact)	9	

*1 CN200 to CN255 equals 32CN (32-bit counter).

*2 For numerical data format where double-words can be used (Num. Data Display, Graph, Sampling), data is processed as double-words. For those where bits or words can be used, data is processed as words consisting of lower 16 bits.

For input Upper 16 bits are ignored.

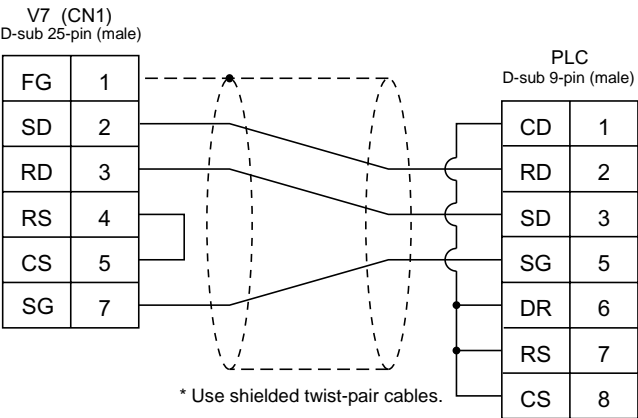
For output "0" is written for upper 16 bits.

Wiring

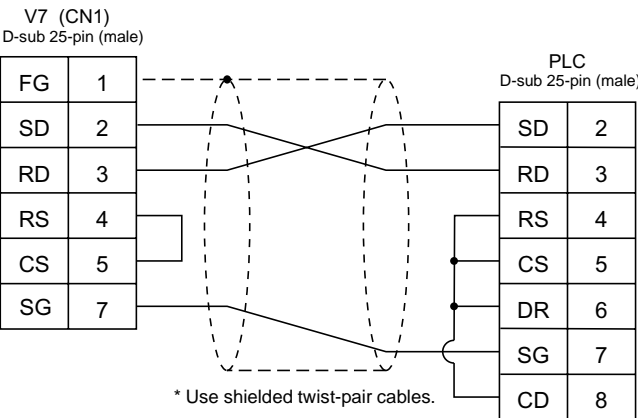
Wiring diagrams with the PLC are shown below.

RS-232C

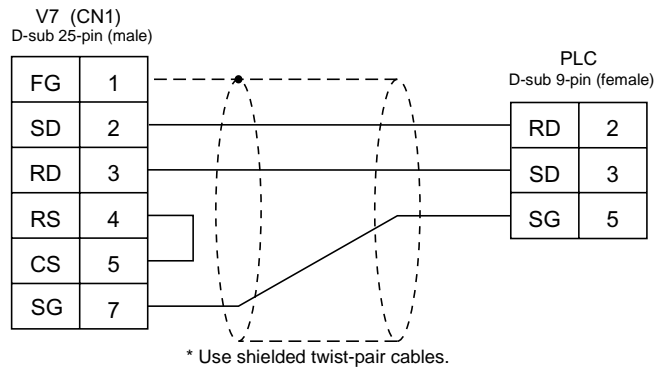
Wiring Diagram 1



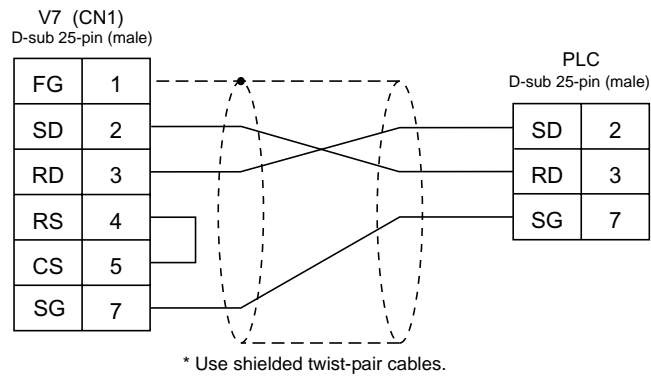
Wiring Diagram 2



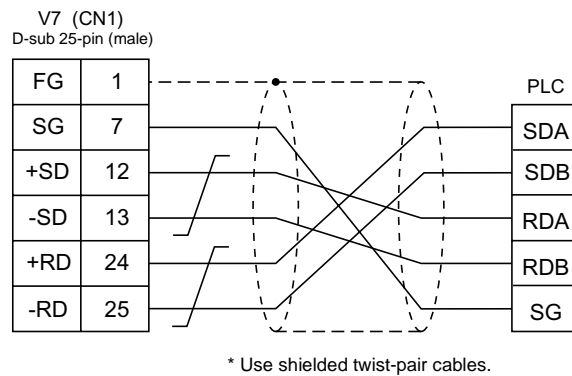
Wiring Diagram 3



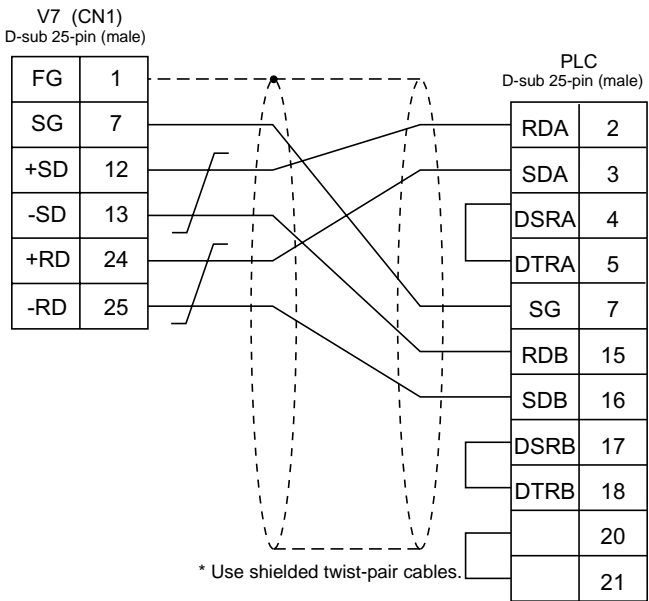
Wiring Diagram 4

**RS-422**

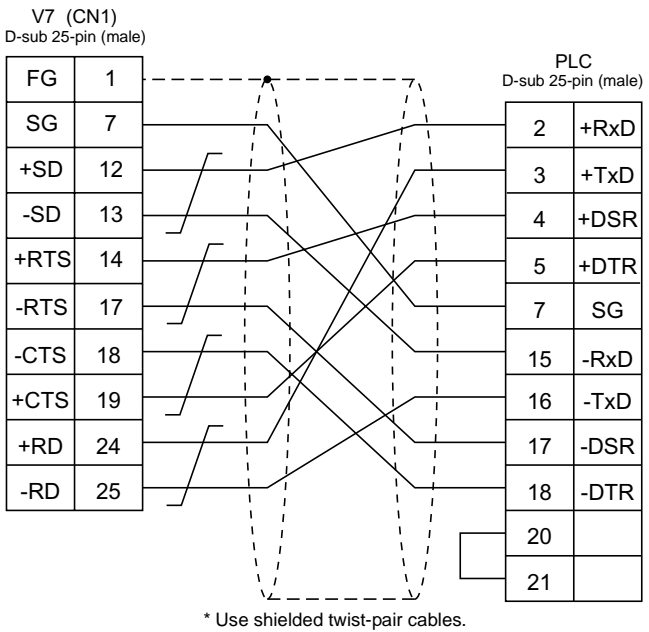
Wiring Diagram 5



Wiring Diagram 6

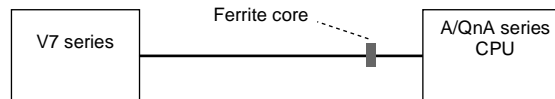


Wiring Diagram 7



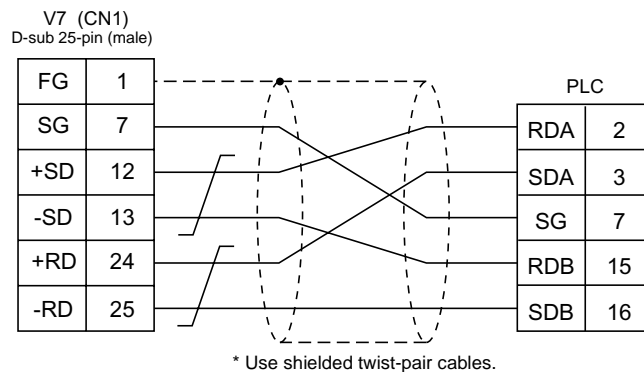
According to our noise tests, the attachment of a ferrite core improves noise voltage by 650 to 900 V and aids in preventing communication errors.

- When connecting to the A/QnA series CPU directly, attach a ferrite core to the communication cable between the V7 series and A/QnA series CPU to avoid noise problems.



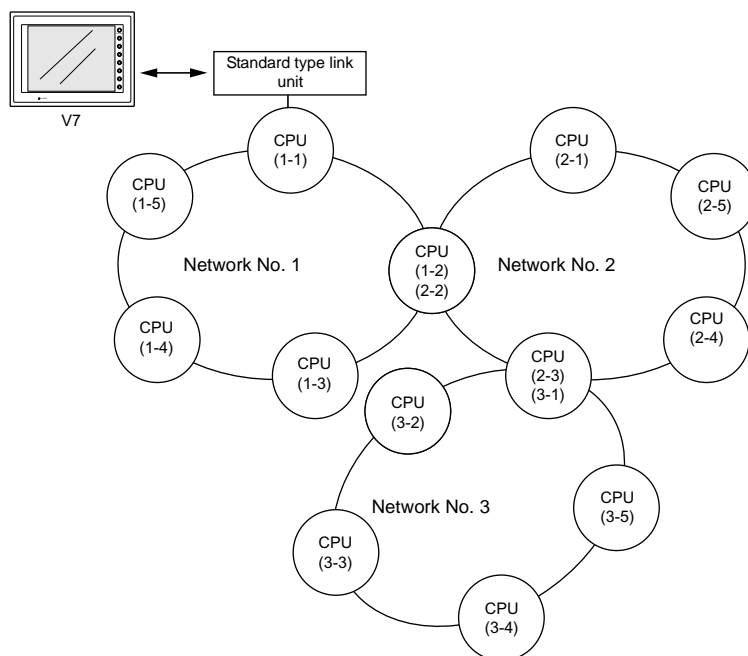
- Ferrite cores are optionally available. When ordering the ferrite core, state "GD-FC (ID: 8 mm, OD: 20 mm)."
- In consideration of such noise problems, it is recommended that the standard type link unit be used when the cable length of 15 m or longer is required.

Wiring Diagram 8



A Link + Net10

- When the V7 series is connected to the standard type link unit on the CPU that is connected to the data link system or network system, the V7 series can have access to CPUs on NET II (/B) and NET/10. In this case, select "A Link + Net10" for [PLC Type] on the VSFT editor.
- When the V7 series has access to the CPU on NET II (/B) or NET/10:
 - With NET II (/B), the V7 series can only have access to CPUs in the network of the CPU equipped with the standard type link unit that is connected to the V7 series. (Available CPU No. 0 to 30)
 - With NET/10, the V7 series can have access to CPUs in the network (No. 1 in the illustration below) of the CPU equipped with the standard type link unit that is connected to the V7 series as well as those in the other networks (Nos. 2 and 3 in the illustration below) that are connected. (Available CPU No. 1 to 30)



- When the V7 series reads from or writes to the CPU ("1-1" in the above illustration) equipped with the standard type link unit:
Set "31" for [CPU No.] for memory setting on the V-SFT editor. The response time is the same as that with 1 : 1 connection between the V7 series and the PLC.

When the V7 series reads from or writes to the CPU memory of the CPU number other than "31":

Transient transmission is performed and the response time is not fast. Please understand beforehand.

- To have access to the PLC in the other network on NET/10, specify the network number in the OPEN macro for the screen on the V-SFT editor. This macro command should be [OUT_ENQ] of system call [SYS]. It is not possible to have access to the CPU on the different network from the same screen.
- Network specifying macro[OUT_ENQ] of system call [SYS]

F1 memory

n + 0	Always 0
n + 1	Network selection: 2
n + 2	System code
n + 3	Network number

“n + 0” and “n + 1” are fixed to “0” and “2,” respectively.

“n + 2” (system code) should be: 1: NET/10 2: NET II (/B)

For “n + 3” (network number), set “0” when NET II (/B) is selected for “n + 2” (system code) or the network number to be accessed when NET/10 is selected.

Do not use this macro for any purpose other than OPEN macro for a screen. Doing so triggers network switching at the time of macro execution, resulting in a communication error.

For more information on the macro function, refer to the Reference Manual (Function). Also refer to the explanation on network registration contained in the operation manual for MITSUBISHI's Standard Link/Multi-drop Link Unit.

- For the NET II (/B) data link system and NET/10 network system, refer to MITSUBISHI's manual.

Available Memory

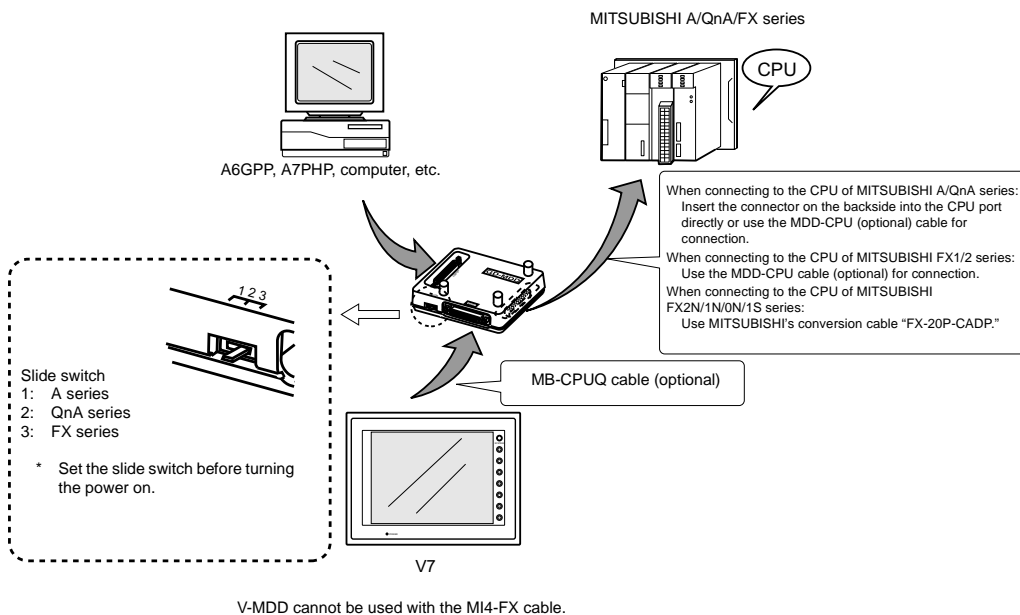
For the available memory of the PLC to be accessed, refer to “Available Memory” page 5-8. Note that the CPU number must be set on the V-SFT editor.

Wiring

Refer to the wiring diagram with the standard type link unit.

V-MDD (Dual Port Interface)

V-MDD is the add-on connector with two ports, specifically designed for the connector on MITSUBISHI's A series, QnA series or FX series CPU programmer.

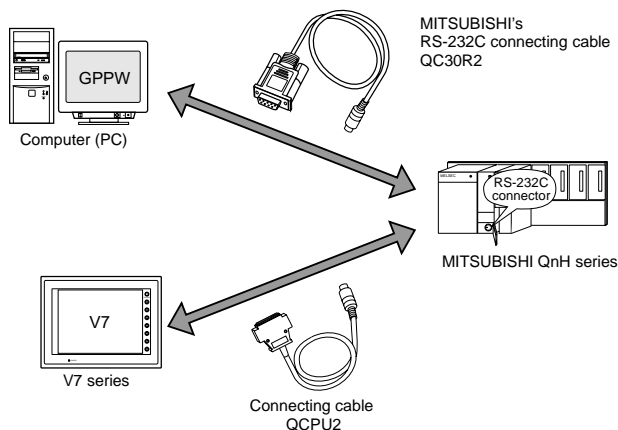


- The power to the V-MDD is supplied from the CPU. Check the electric capacity of 5 V at the CPU. (Current consumption: max. 350 mA)
- Keep the cable between the CPU and V-MDD as short as possible. (Max. 1 to 1.5 m)
- Be sure to consider noise problems when performing wiring.
- When V-MDD is used for connection with the V7 series, set 1.5 seconds or above for the timeout time in the [Comm. Parameter] dialog.
- Please read the instruction manual for V-MDD before use.

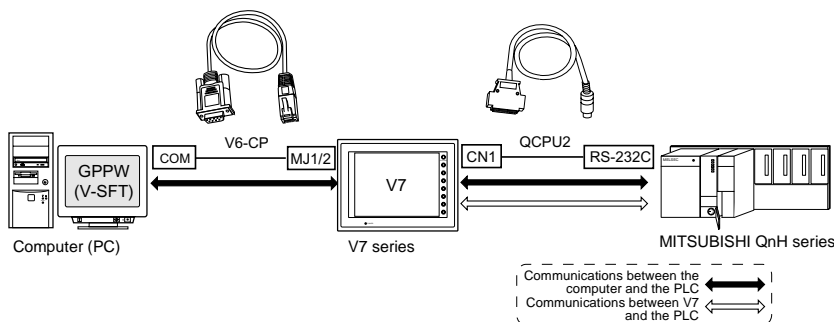
Ladder Transfer Function

Up until now it was necessary to debug the data by removing and mounting two cables repeatedly as shown below when the V7 series is directly connected to MITSUBISHI's QnH CPU equipped with only one RS-232C port.

- RS232C cable between the computer and the PLC that is used for monitoring data in the PLC or writing ladder programs: MITSUBISHI's QC30R2
- The cable between the V7 series and the PLC that is used for communications with the V7 series: Hakko Electronics' QCPU2



When using the ladder transfer function by connecting the computer (PLC programming software) to the V7 series, it is possible to write ladder programs or monitor the PLC memory using the V7 series.



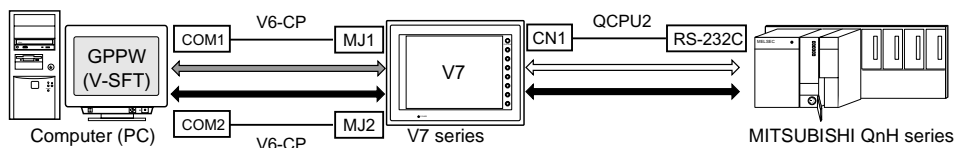
Applicable PLCs

MITSUBISHI PLCs

Q02, Q02H, Q06H CPU port (Q mode)

Connection

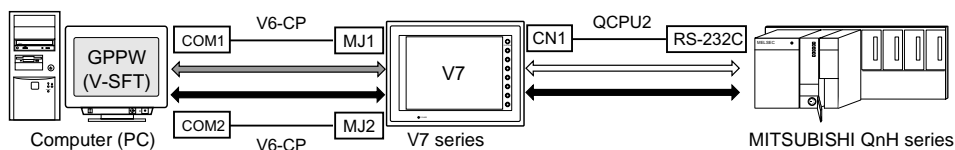
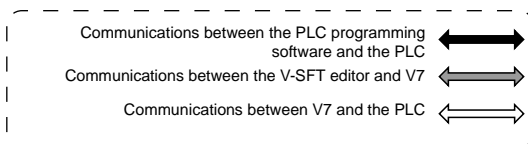
- Use Hakko Electronics' QCPU2 cable when connecting the V7 series (CN1) to the PLC (RS-232C port).
- Use Hakko Electronics' V6-CP cable when connecting the computer (PLC programming software) and the V7 series (MJ1/2).



- When using the V-SFT editor and the PLC programming software:

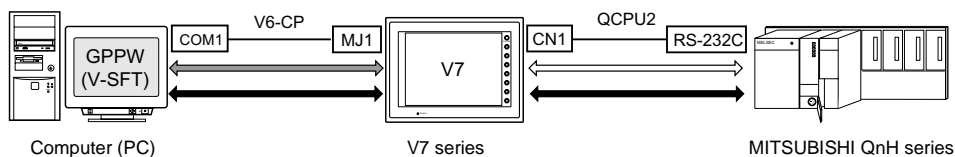
- When using two V6-CP cables:

When the computer has two COM ports, use one port for the V-SFT editor and the other port for the PLC programming software. Use the V6-CP cables. (It is not possible to transfer the V-SFT editor and the PLC programming software at the same time.)



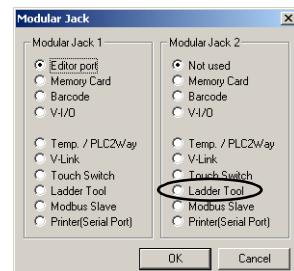
- When using one V6-CP cable:

When using the V-SFT editor and the PLC programming software, it is not possible to use one COM port for both purposes at the same time. Stop using both software for communications.



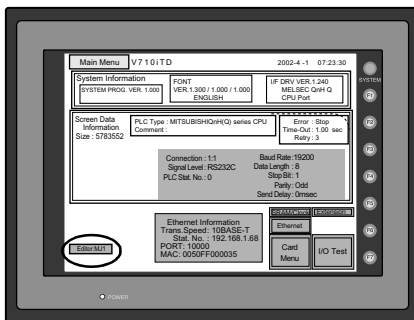
Settings and Communications

1. PLC type setting
Select [PLC Type] from the [System Setting] menu. Select [MITSUBISHI: QnH (Q) series CPU] in the [Select PLC Type] dialog.
2. PLC programming software port setting
Select [Modular Jack] from the [System Setting] menu. Select [Ladder Tool] for [Modular Jack 1] or [Modular Jack 2] in the [Modular Jack] dialog.



Communications with V-SFT editor (for screen data transfer)

- * On-line editing between the V-SFT editor and the V7 series is not possible. If attempted, communications between the PLC programming software and the PLC will not be performed correctly.
- With [Ladder Tool] selected for [Modular Jack 2], MJ1 will be [Editor Port] when the Main Menu screen is displayed on the V7 series, and communications with the V-SFT editor become possible.
- With [Ladder Tool] selected for [Modular Jack 1], even when the Main Menu screen is displayed on the V7 series, communications with the PLC programming software continue so that communications with the V-SFT editor are not available.



When communicating with the V-SFT editor, hold down the F2 switch for three seconds. [Editor: ...] changes to [Editor: MJ1] and communications with the V-SFT editor become possible.

Communications with the PLC programming software possible

Communications with the V-SFT editor possible



When the F2 switch is held down for three seconds, [Editor: MJ1] changes to [Editor: ...] and communications with the PLC programming software become possible.

- Communicating statuses with the PLC programming software and the PLC during communications between the V-SFT editor and the V7 series

V-SFT	PLC programming software
Writing to V7	Communications disconnected (normal communications on completion of writing)
Reading from V7	Normal communications
Comparing with V7	Normal communications

3. PLC programming software communication setting

For communication specifications between the PLC programming software and the PLC, the communication parameter settings for the V7 series and the PLC can be used. Select [Comm. Parameter] from the [System Setting] menu and check the settings in the [Comm. Parameter] dialog.

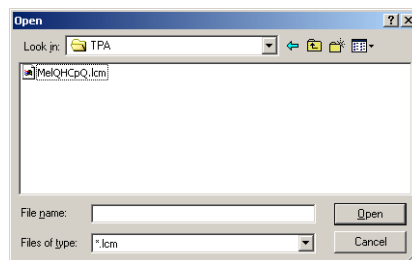
- Baud rate setting

There will be no problem if the setting for [Baud Rate] in the [Comm. Parameter] dialog of the V-SFT editor is not consistent with the baud rate setting on the PLC programming software. The baud rate set on the PLC programming software is automatically selected when communications (monitoring, etc.) are performed. When the V7 series is turned off and back on, the setting for [Baud Rate] in the [Comm. Parameter] dialog becomes valid again.

4. Transferring the ladder communication program

When transferring screen data, the ladder communication program is also transferred. To transfer the ladder communication program only, follow the procedure described below.

- 1) Select [Ladder com. prg.] in the [Transfer] dialog, and click [PC->].
- 2) The dialog shown on the right is displayed. Select "MelQHCpQ.lcm" and click [Open]. The program is transferred to the V7 series.



Notes on Ladder Transfer Function

1. When [Ladder Tool] is selected for a modular jack, monitor registration on the PLC is prohibited so that the screen display speed becomes slower than usual during communications between the V7 series and the PLC even if the PLC programming software is not started.
2. Also, when the ladder program is transferred in the RUN mode of the V7 series, communications are synchronized; therefore, the performance of both the V7 series and the PLC programming software decreases.

2. OMRON PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection	PLC2Way
SYSMAC C	C20H, C28H, C40H	CPU unit with built-in port (host link port)	RS-232C [Wiring Diagram 1]	○
	C120, C120F C200H C500, C500F C1000H C2000, C2000H	C120-LK201-V1 C120-LK202-V1	RS-232C [Wiring Diagram 3]	○
			RS-422 [Wiring Diagram 4]	×
	C200H C200HS-CPU01, 03 C200HS-CPU21, 23 C200HS-CPU31, 33	C200H-LK201 C200H-LK201-V1 C200H-LK202 C200H-LK202-V1	RS-232C [Wiring Diagram 3]	○
			RS-422 [Wiring Diagram 4]	×
	C200HS-CPU21, 23 C200HS-CPU31, 33 CQM1-CPU21 CQM1-CPU41, 42, 43, 44	CPU unit with built-in port (host link port)	RS-232C [Wiring Diagram 2]	○
	C500, C500F C1000H C2000, C2000H	C500-LK203	RS-232C [Wiring Diagram 3]	○
			RS-422 [Wiring Diagram 4]	×
	C200HX C200HG C200HE	CPU unit with built-in port (host link port)	RS-232C [Wiring Diagram 2]	○
		Mounted on the CPU slot (C200HW-COM02 to 06)	RS-232C [Wiring Diagram 2]	○
			RS-422 [Wiring Diagram 5]	×
	SRM1-C02	RS-232C interface	RS-232C [Wiring Diagram 2]	○
	CPM1A	CPU unit (peripheral port)	OMRON's cable [CQM1-CIF01]*1	×
	CPM2A	RS-232C interface	RS-232C [Wiring Diagram 2]	○
		CPU unit (peripheral port)	OMRON's cable [CQM1-CIF01]*1	×
	CPM2C	CPU unit (peripheral port)	OMRON's adaptor unit [CPM2C-CIF01] + RS-232C [Wiring Diagram 2]	○
			OMRON's cable [CS1W-CN118] + RS-232C [Wiring Diagram 2]	○

(To be continued)

Select PLC Type	PLC	Unit/Port	Connection	PLC2Way
SYSMAC CV	CV500, CV1000 CV2000 CVM1	CPU unit with built-in port (host link port)	RS-232C [Wiring Diagram 2]	○
			RS-422 [Wiring Diagram 6]	×
		CV500-LK201	RS-232C PORT1 [Wiring Diagram 3]	○
			PORT2 [Wiring Diagram 2]	○
			RS-422 PORT2 [Wiring Diagram 5]	×
SYSMAC CS1 SYSMAC CS1 DNA ^{*2}	CS1	CPU unit (RS-232C port)	RS-232C [Wiring Diagram 2]	○
		CS1W-SCU21		
		Mounted on the CPU slot (CS1W-SCB21)		
		Mounted on the CPU slot (CS1W-SCB41)	RS-422 [Wiring Diagram 7]	×

*1 Replace the shell on the D-sub 25-pin side before use. (Recommended part: DDK's 17J-25)

*2 For SYSMAC CS1 DNA, refer to page 5-29.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate*		19200 bps	19200 bps
Port		0	0
Parity		Even	Even
Transmission code	Data length	7 (ASCII)	7
	Stop bit	2	2
Command level		3 (fixed)	–
Protocol		1 : n protocol (fixed)	–
Synchronizing switch		Internal synchronization (fixed)	–
CTS switch		0 V (always ON) (fixed)	–
5 V supply switch		OFF (fixed)	–
Terminating resistance		ON for RS-422	–

* The maximum baud rate available with the V7 series is 115200 bps.
Select the appropriate baud rate depending on the used PLC and environment.

V-SFT Setting

Set [Trans. Mode] in the [Detail] tab window of the [Comm. Parameter] dialog of the V-SFT editor.

Transmission Mode	Contents
Trans. Mode 1	BCD w/o sign
Trans. Mode 2	BCD w/ signs ^{*1}

^{*1} BCD w/ signs
Data in the PLC memory can be shown as data with signs.

When higher 4 bits in the memory indicates [F] or [A], it is treated as negative.

[F]: Regards higher 4 bits as [–0].

[A]: Regards higher 4 bits as [–1].

- Displayable range 1 word: –1999 to +9999
 2 words: –19999999 to +99999999

Example:

PLC Memory	Indication on V7
0000 to 9999	0 to 9999
F001 to F999	–1 to –999
A000 to A999	–1000 to –1999
00000000 to 99999999	0 to 99999999
F0000001 to F9999999	–1 to –9999999
A0000000 to A9999999	–10000000 to –19999999

- Setting procedure: Num. Data Display [Input Type] BCD
 [Display Type] DEC(w/ –sign, w/ +–signs)

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

SYSMAC C

Memory	TYPE	Remarks
DM (data memory)	0	
CH (input/output relay)	1	
HR (holding relay)	2	
LR (latch relay)	3	
AR (alarm relay)	4	
T (timer/current value)	5	
C (counter/current value)	6	
EMn (extensional data memory)	7	*1
TU (timer/contact)	9	Read only
CU (counter/contact)	10	Read only

SYSMAC CV

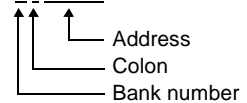
Memory	TYPE	Remarks
DM (data memory)	0	
CH (input/output relay)	1	
AR (alarm relay)	4	
T (timer/current value)	5	
C (counter/current value)	6	*1
EMn (extensional data memory)	7	Read only
TU (timer/contact)	9	Read only
CU (counter/contact)	10	

SYSMAC CS1, SYSMAC CS1 DNA

Memory	TYPE	Remarks
DM (data memory)	0	
CH (input/output relay)	1	
H (holding relay)	2	
A (alarm relay)	4	
T (timer/current value)	5	
C (counter/current value)	6	
EMn (extensional data memory)	7	*1
W (internal relay)	8	
TU (timer/contact)	9	Read only
CU (counter/contact)	10	Read only

- *1 When using EMn (extended data memory), specify the bank number (CV: 0 to 7, CS1: 0 to C). The assigned memory is indicated when editing the screen as shown on the right.

Example: EM0 : 30000

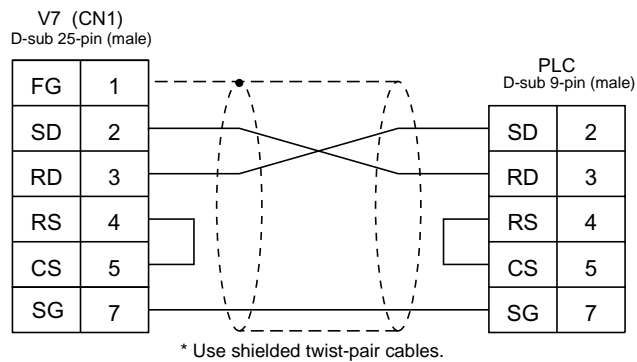


Wiring

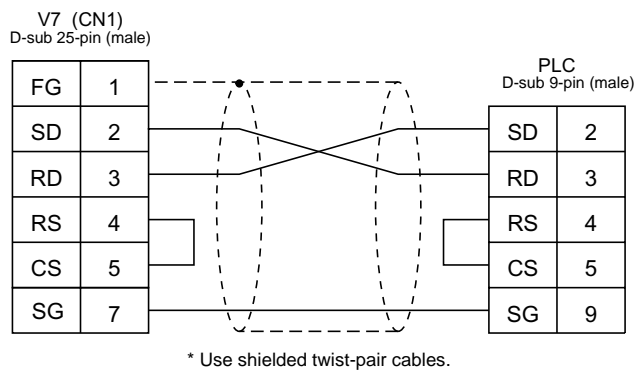
Wiring diagrams with the PLC are shown below.

RS-232C

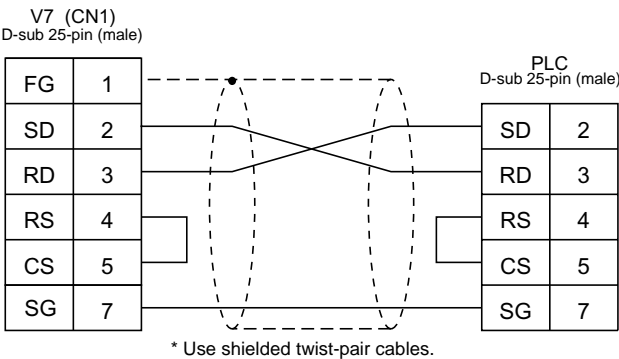
Wiring Diagram 1



Wiring Diagram 2

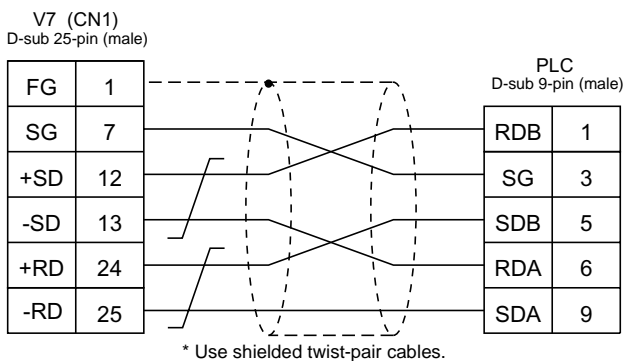


Wiring Diagram 3

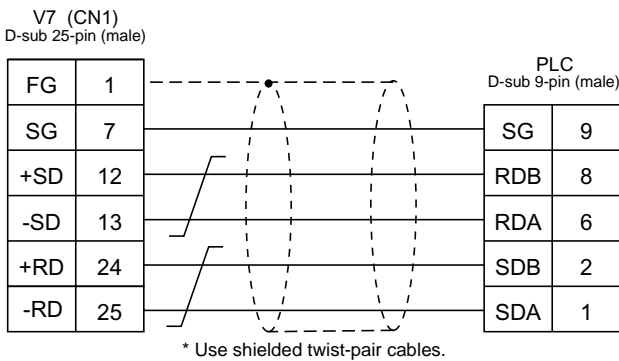


RS-422

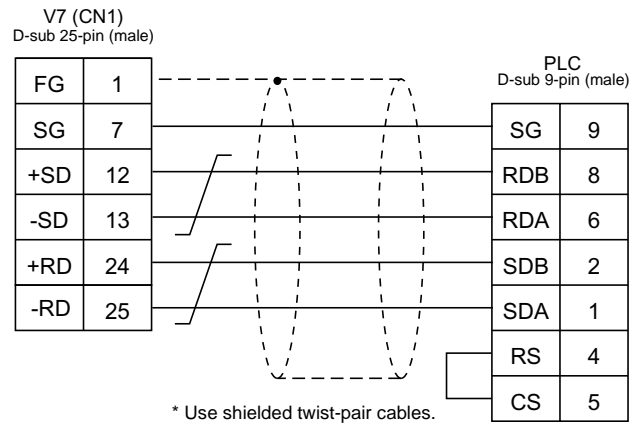
Wiring Diagram 4



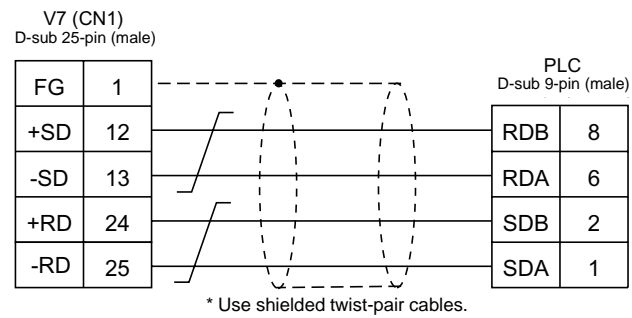
Wiring Diagram 5



Wiring Diagram 6

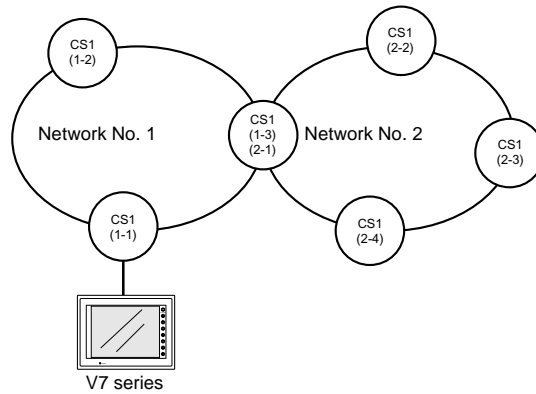


Wiring Diagram 7



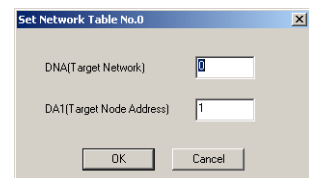
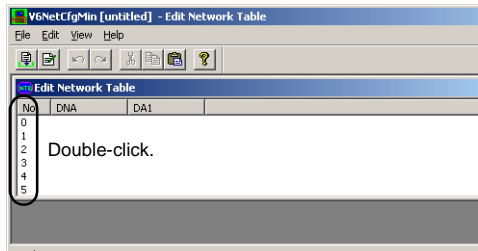
SYSMAC CS1 DNA

When connecting the V7 series to CS1 on a network (Controller Link), the V7 series can also access another CS1 on the network.



V-SFT Setting

- Select [System Setting] → [Comm. Parameter] → [Detail] tab, and select [1 : n] for [Connection].
- Select [System Setting] → [Network Table Setting] → [PLC]. The network table edit window is displayed.
Double-clicking on the number brings up the dialog where CS1 on the network can be registered.



3. SHARP PLC

Available PLCs

Select PLC Type	CPU	Unit/Port	Connection	PLC2Way
JW series	JW50, JW70, JW100 JW50H, JW70H JW100H	ZW-10CM JW-10CM	RS-422 [Wiring Diagram 4]	<input type="radio"/>
	JW20 JW-31CUH	JW-21CM	RS-422 [Wiring Diagram 4]	<input type="radio"/>
JW100/70H COM port	JW70CU/JW100CU JW70CUH, JW100CUH	Communication port on the CPU unit	RS-232C [Wiring Diagram 1]	<input type="radio"/>
JW20 COM port	JW22CU		RS-422 [Wiring Diagram 3]	<input type="radio"/>
	JW-32CUH JW-33CUH	Communication port 1 on the CPU unit Communication port 2 on the CPU unit	RS-232C PG/COMM2 [Wiring Diagram 2]	<input type="radio"/>
			RS-422 PG/COMM1 [Wiring Diagram 5]	<input type="radio"/>
			PG/COMM2 [Wiring Diagram 5]	<input type="radio"/>

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	19200 bps	19200 bps
Port	0 for STA.NO ×10, 1 for STA.NO ×1	1
Parity	Even	Even
RS-422	4-wire system (fixed)	–
Data length	7	7
Stop bit	2	2
Error check	Sumcheck (fixed)	–
Transmission mode	Command mode (fixed)	–

JW Series: Link Unit Switch Setting

Baud Rate: 19200 bps

Switch	Setting	Contents
SW0	4	Command mode
SW1	1	Station address (lower half)
SW2	0	Station address (upper half)
SW3-1	OFF	Not used
SW3-2	ON	4-wire system
SW3-3	OFF	Not used
SW3-4	ON	Even parity
SW4	0	Baud rate 0: 19200 1: 9600 2: 4800 3: 2400 4: 1200 5: 600
SW7	ON	Terminating resistance provided

JW100/70H COM Port, JW20 COM Port: System Memory Setting

The settings for communications with the V7 series should be made at the system memory as shown below.

- JW-70CU/100CU, JW70CUH/100CUH, JW22CU

System Memory	Setting	Contents
#236	30H	Stop bit: 2 bits, parity: even, baud rate: 192000
#237	01H	Port

- JW-32CUH/33CUH
 - Communication port 1

System Memory	Setting	Contents
#234	30H	Stop bit: 2 bits, parity: even, baud rate: 192000
#235	01H	Port

- Communication port 2

System Memory	Setting	Contents
#236	30H	Stop bit: 2 bits, parity: even, baud rate: 192000
#237	01H	Port

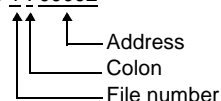
Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

Memory	TYPE	Remarks
X9XXX (register)	0	
XXXXX (relay)	1	] for word device
EXXXX (self diagnosis)	2	
bXXXX (timer counter)	3	
Fn (file register)	7	*1

*1 File Register Setting on V-SFT Editor
Enter "file number" + ":" (colon) + address in order.

Example: F1 : 00002

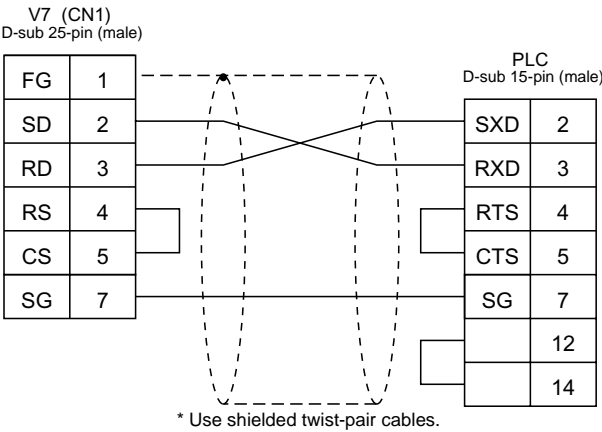


Wiring

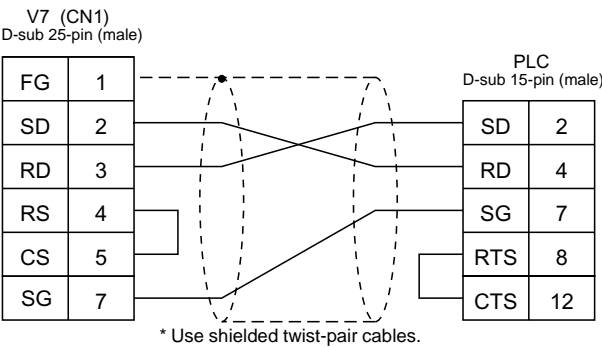
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

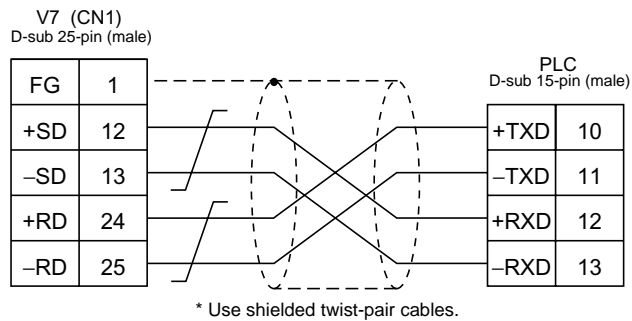


Wiring Diagram 2

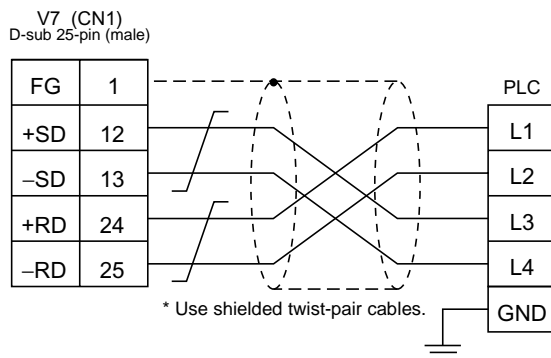


RS-422

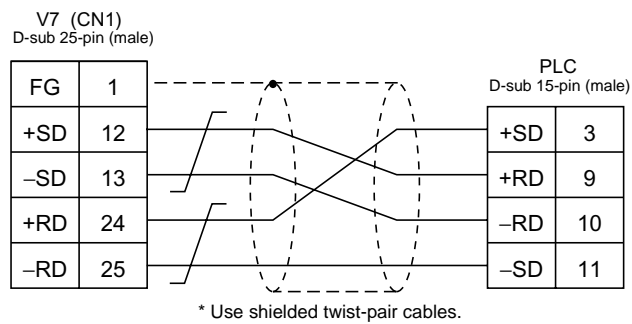
Wiring Diagram 3



Wiring Diagram 4



Wiring Diagram 5



4. HITACHI PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
HIDIC-H	HIDIC H series	COMM-2H	RS-232C [Wiring Diagram 1] RS-422 [Wiring Diagram 4]
		Peripheral port 1 on the CPU module	RS-232C [Wiring Diagram 1]
		EH150	HITACHI's EH-RS05 cable ^{*1} + RS-232C [Wiring Diagram 1]
		On H-252C CPU module	PERIPHERAL 1 RS-232C [Wiring Diagram 1] PERIPHERAL 2 HITACHI's CNCOM-05cable ^{*1} + RS-232C [Wiring Diagram 1]
	S10 2 α	Interface on the CPU unit	RS-422 [Wiring Diagram 5]
HIDIC-S10/2 α	S10 mini	RS-232C connector on the CPU unit	RS-232C [Wiring Diagram 2]
		LQE060	RS-232C [Wiring Diagram 3]
HIDIC-S10/ABS	ABS ^{*2}		RS-422 [Wiring Diagram 5]

*1 When using the HITACHI's EH-RS05 or CNCOM-05 cable, connect the cable shown in [Wiring Diagram 1] to the D-sub 15-pin side for communications with the V7 series.

*2 Specify the absolute memory address. For more information, refer to the instruction manual for the PLC.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

COMM-2H

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0 for both ST No ×10, ×1	0
Parity		Even	Even
Transmission mode	RS-232C	MODE7	Protocol 2 with port
	RS-422	MODE9	Protocol 2 with port
Transmission code	Data length	7 (ASCII)	7
	Stop bit	1	1
Sumcheck		Provided (fixed)	–

If the transmission mode is any type other than listed the above, set the mode as shown below.

Item		Setting on PLC	V7 Comm. Parameter Setting
Transmission mode	RS-232C	MODE1 MODE2 MODE9	Protocol 1 without port Protocol 1 with port Protocol 2 without port
	RS-422	MODE2	Protocol 1 with port ^{*1}

^{*1} Multi-link connection is not available.

CPU module

The peripheral port setting should be “transmission control protocol 1 without port.” No other setting is available.

HIDIC-S10 α

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	7	19200 bps

HIDIC-H: Switch Setting

Baud rate: 19200 bps
 MODE switch: To connect to both RS-232C and RS-422, set MODE switch to 9.
 RS-232C (protocol 2 without port) RS-422 (protocol 2 with port)
 ST No switch: "0" for both $\times 10$, $\times 1$
 DIP switch

Switch	Setting	Contents
1	OFF	Bit length
2	OFF	Same as that set on V7 (normally 19200 bps)
3	ON	
4	ON	
5	ON	With parity
6	ON	Even
7	OFF	Stop bit 1
8	ON	With sumcheck

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

HIDIC-H

Memory	TYPE	Remarks
WR (internal word output)	0	
X (external bit input)	1	WX as word device
Y (external bit output)	2	WY as word device
L (bit CPU link area)	3	WL as word device
M (bit data area)	4	WM as word device
TC (timer counter/elapsed time)	5	
R (relay)	6	
TD (timer counter/contact)	7	
WN (network input/output)	8	

HIDIC-S10/2 α

Memory		TYPE	Remarks
FW	(work register)	0	
X	(input relay)	1	XW as word device
Y	(output relay)	2	YW as word device
R	(internal relay)	3	RW as word device
G	(global link)	4	GW as word device
K	(keep relay)	5	KW as word device
T	(on-delay timer contact)	6	TW as word device
U	(one-shot timer contact)	7	UW as word device
C	(up/down counter contact)	8	CW as word device
TS	(on-delay timer set value)	9	
TC	(on-delay timer elapsed value)	10	
US	(one-shot timer set value)	11	
UC	(one-shot timer elapsed value)	12	
CS	(up/down counter set value)	13	
CC	(up/down counter elapsed value)	14	
DW	(data register)	15	
E	(event register)	16	EW as word device
S	(system register)	17	SW as word device
J	(transfer register)	18	JW as word device
Q	(receive register)	19	QW as word device
M	(extensional internal register)	20	MW as word device

HIDIC-S10/ABS

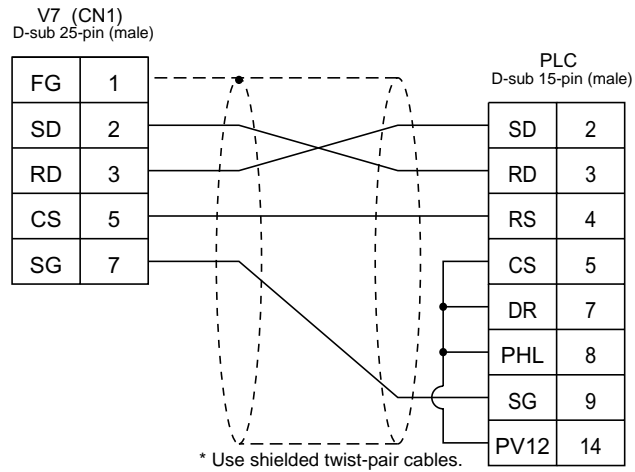
Memory		TYPE	Remarks
0E		0	
06		1	
18		2	
19		3	
1A		4	
1B		5	
1C		6	
1D		7	

Wiring

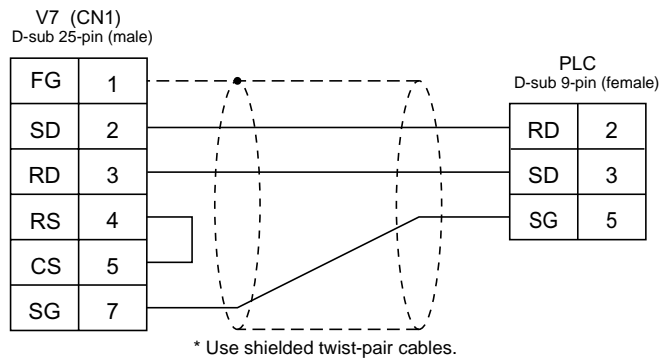
Wiring diagrams with the PLC are shown below.

RS-232C

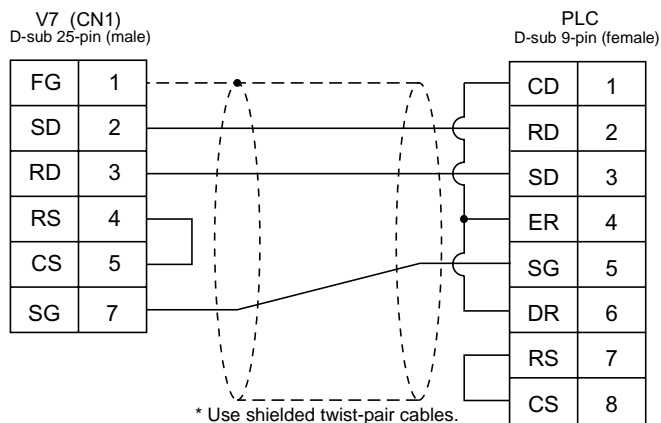
Wiring Diagram 1



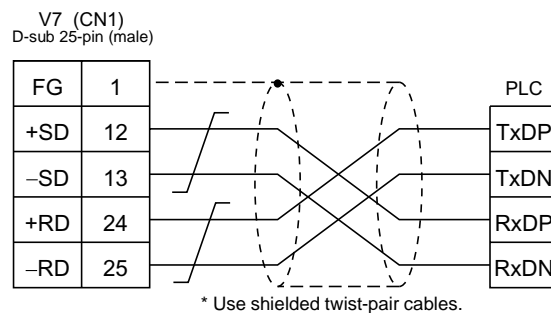
Wiring Diagram 2



Wiring Diagram 3

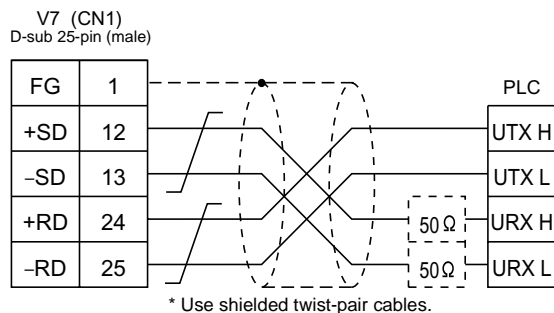
**RS-422**

Wiring Diagram 4



Wiring Diagram 5

When connecting to the S10xα series, add a resistor of 50 Ω (1/2 W) as shown below.



5. MATSUSHITA PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
MEWNET	FP1	RS-232C port on the CPU unit	RS-232C [Wiring Diagram 1]
	FP3	AFP3462	RS-232C [Wiring Diagram 1]
		AFP3463	RS-422 [Wiring Diagram 4]
	FP5	AFP5462	RS-232C [Wiring Diagram 1]
	FP10	RS-232C tool port on the CPU unit	RS-232C [Wiring Diagram 1]
		AFP5462	RS-232C [Wiring Diagram 1]
	FP10S	RS-232C port on the CPU unit	RS-232C [Wiring Diagram 1]
		AFP3462	RS-232C [Wiring Diagram 1]
		AFP3463	RS-422 [Wiring Diagram 4]
	FP0	RS-232C tool port on the CPU unit	MATSUSHITA's RS-232C cable AFC8513
		RS-232C port on the CPU unit	RS-232C [Wiring Diagram 3]
	FP2	RS-232C tool port on the CPU unit	MATSUSHITA's RS-232C cable AFC8513
		RS-232C port on the CPU unit	RS-232C [Wiring Diagram 2]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		[0] × 10, [1] × 1	1
Parity		Even	Even
Transmission code	Data bit	7 (ASCII)	7
	Stop bit	1	1
Transmission mode		Computer link function (fixed)	—
Control signal		Invalid (fixed)	—

* If a tool port (the ladder port for RS-232C) is used, the range of PLC parameter setting is limited as below. Adjust the PLC parameter setting to communication parameter setting of the V7 series.

Baud rate: 9600, 19200bps (115 kbps available with FP2)
 Parity: Odd (fixed)
 Data bit: 8 (or 7, select "8" normally)
 Stop bit: 1 (fixed)

MEWNET: Link Unit Switch Setting

Switch	Setting	Contents
1	ON	Same as that set on V7 (normally 19200 bps)
2	OFF	
3	OFF	
4	OFF	Data length: 7 bits
5	ON	With parity
6	ON	Even
7	OFF	Stop bit 1
8	OFF	CS, CD invalid

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

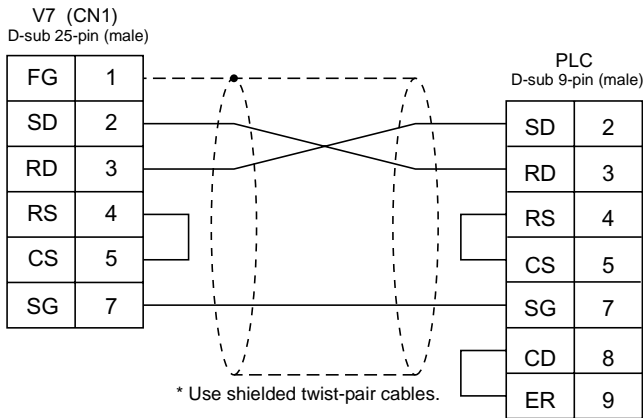
Memory	TYPE	Remarks
DT (data register)	0	
X (external input relay)	1	WX as word device, read only
Y (external output relay)	2	WY as word device
R (internal relay)	3	WR as word device, including special relays
L (link relay)	4	WL as word device
LD (link register)	5	
FL (file register)	6	
SV (timer/counter set value)	7	
EV (timer/counter elapsed time)	8	
T (timer/contact)	9	Read only
C (counter/contact)	10	Read only

Wiring

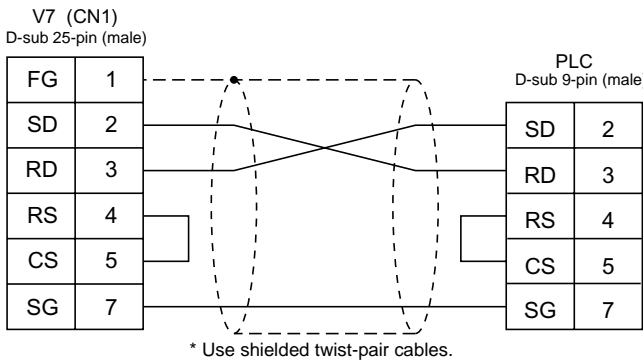
Wiring diagrams with the PLC are shown below.

RS-232C

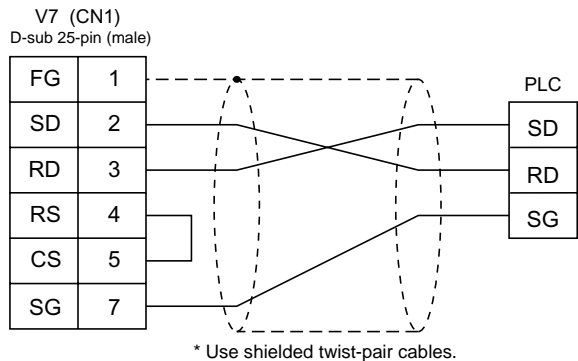
Wiring Diagram 1



Wiring Diagram 2

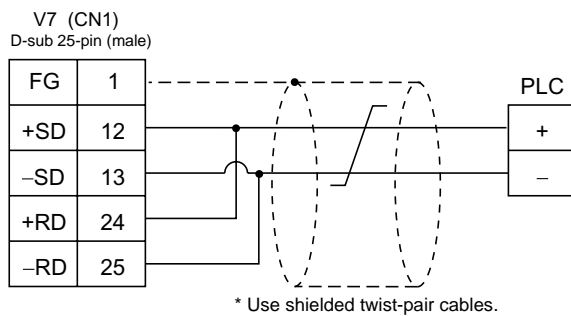


Wiring Diagram 3



RS-422

Wiring Diagram 4



6. YOKOGAWA PLC

Available PLCs

Select PLC Type	CPU	Unit/Port	Connection	PLC2Way
FA500	FA500	LC01-0N	RS-232C [Wiring Diagram 1]	×
		LC02-0N	RS-232C [Wiring Diagram 1]	×
			RS-422 [Wiring Diagram 3]	×
FA-M3	FA-M3	Programming tool port on the CPU module* ¹	YOKOGAWA's ladder transfer cable "KM11-2N"	○
		F3LC01-1N* ²	RS-232C [Wiring Diagram 2]	○
		F3LC11-1N		○
		F3LC11-2N	RS-422 [Wiring Diagram 3]	○
FA-M3R	FA-M3 R	Programming tool port on the CPU module* ¹	YOKOGAWA's ladder transfer cable "KM11-2N"	○
		F3LC12-1F	RS-232C [Wiring Diagram 2]	○

*¹ The CPUs that can be connected directly to the programming tool port on the CPU module are "F3SP21-0N," "F3SP25-2N," "F3SP35-5N," "F3SP28-3N," "F3SP38-6N," "F3SP53-4H" and "F3SP58-6H."

*² When the link unit "F3LC01-1N" is used, the communication setting and available memory are the same as those for "FA-500." However, B (common register) cannot be used.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

FA500

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length	7	7
	Stop bit	1	1
Sumcheck		Provided (fixed)	–
Terminal character		None (fixed)	–
Protection function		None (fixed)	–

FA-M3/FA-M3R

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate ^{*1}		19200 bps	19200 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length ^{*2}	7	7
	Stop bit	1	1
Sumcheck		Provided	Provided
Terminal character		None (fixed)	–
Protection function		None (fixed)	–

^{*1} The maximum baud rate available with the V7 series is 115200 bps.

Select the appropriate baud rate depending on the used PLC and environment.

^{*2} When directing connecting to the programming tool port on the CPU module, the data length is fixed to "8." Select [8-bit] for [Data Length] in the [comm. Parameter] dialog of the V7 series. Also, set "CPU Communication Port" of "Configuration" in the ladder creation tool as below.

Personal computer link function: Use

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

FA500

Memory	TYPE	Remarks
D (data register)	0	
B (common register)	1	
TP (timer/current value)	2	
TS (timer/set value)	3	
CP (counter/current value)	4	
CS (counter/set value)	5	
X (input relay)	6	
Y (output relay)	7	
I (internal relay)	8	
E (external relay)	9	

FA-M3/FA-M3R

Memory	TYPE	Remarks
D (data register)	0	
R (common register)	1	
V (index register)	2	
W (link register)	3	
Z (special register)	4	
TP (down timer current value)	5	
TS (timer set value)	6	Read only
CP (down counter current value)	7	
CS (down counter set value)	8	
X (input relay)	9	
Y (output relay)	10	
I (internal relay)	11	
E (common relay)	12	
L (link relay)	13	
M (special relay)	14	
B (file register)	15	

* The CPU number is required in addition to the memory type and address. The assigned memory is indicated when editing the screen as shown on the right.

Example: 1 : D00001

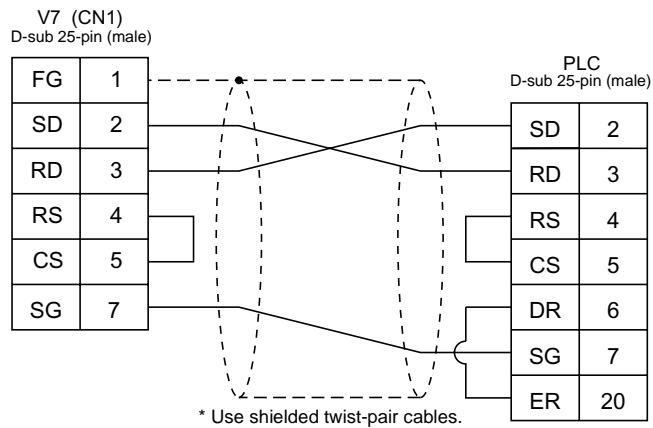
Address
Memory type
CPU number

Wiring

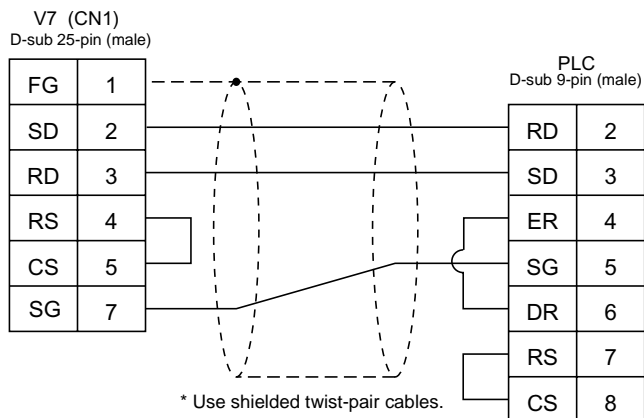
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

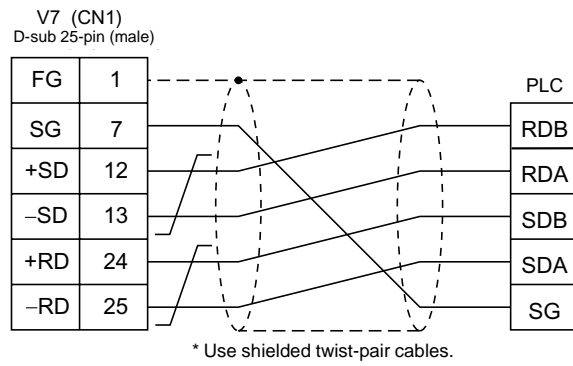


Wiring Diagram 2



RS-422

Wiring Diagram 3



7. YASKAWA PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection	
memobus	GL60 series	JAMSC-IF60 JAMSC-IF61 JAMSC-IF611	RS-232C	[Wiring Diagram 1]
		JAMSC-IF612 JAMSC-IF613	RS-422	[Wiring Diagram 5]
	GL120, GL130 series	Memobus port on the CPU module	RS-232C	[Wiring Diagram 1]
		JAMSC-120NOM27100	RS-422	[Wiring Diagram 6]
	PROGIC-8	PORT2 on the CPU unit	RS-232C	[Wiring Diagram 2]
CP9200SH/MP900	CP9200SH	CP-217IF	RS-232C	[Wiring Diagram 3]
			RS-422	[Wiring Diagram 4] [Wiring Diagram 7]
	MP920 MP930	Memobus port on the CPU module	RS-232C	[Wiring Diagram 1]
		217IF	RS-232C RS-422	[Wiring Diagram 3] [Wiring Diagram 8]

* Other PLCs can also be connected with Memobus.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Memobus

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length	8-bit RTU (fixed)	–
	Stop bit	1	1
Error check		CRC (fixed)	–
Port delay timer		0 (fixed)	–

Select [TYPE 1] or [TYPE 2] for [Trans. Mode] in the [Comm. Parameter] dialog of the V-SFT editor.

PLC Model	V7 Setting	Contents
GL60 series, PROGIC-8	TYPE 1	Special binary code
GL120/130 series	TYPE 2	Standard binary code

CP9200SH/MP900

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length	8	8
	Stop bit	1	1
Error check		CRC (fixed)	–
Port delay timer		0 (fixed)	–

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

Memobus

Memory		TYPE	Remarks
4	(word device)	0	
3	(input register)	1	Including constant register, read only
R	(link register)	2	
A	(extension register)	3	
0	(coil)	4	
D	(link coil)	5	
1	(input relay)	6	Read only
7	(constant register)	7	

CP9200SH/MP900

Memory		TYPE	Remarks
MW	(holding register)	0	
IW	(input register)	1	Read only
MB	(coil)	4	
IB	(input relay)	6	Read only

When setting the MB/IB memory, set the bit numbers in the hexadecimal notation.

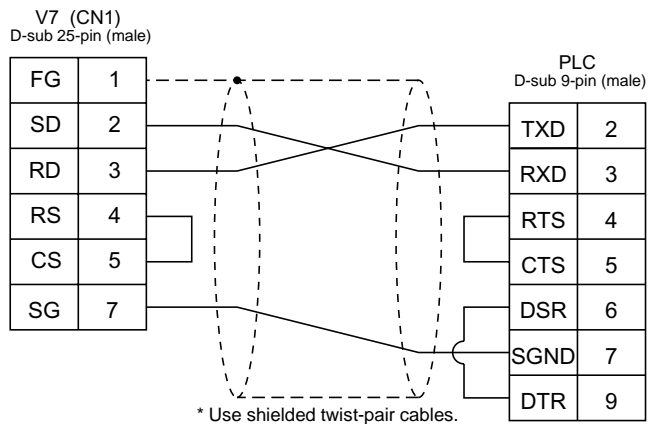
MBxxxxx□
 |
 DEC
 |
 Bit No.: HEX

Wiring

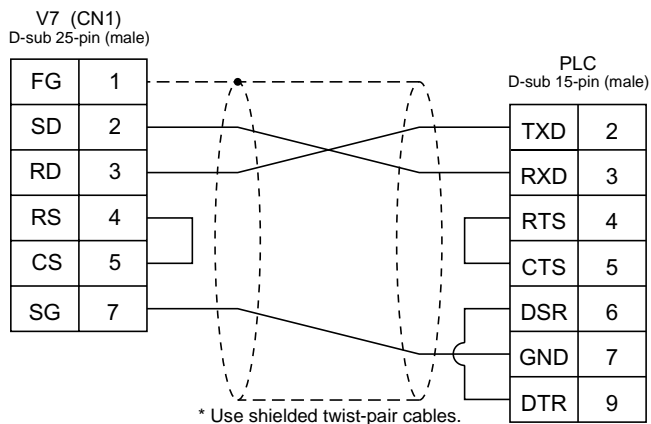
Wiring diagrams with the PLC are shown below.

RS-232C

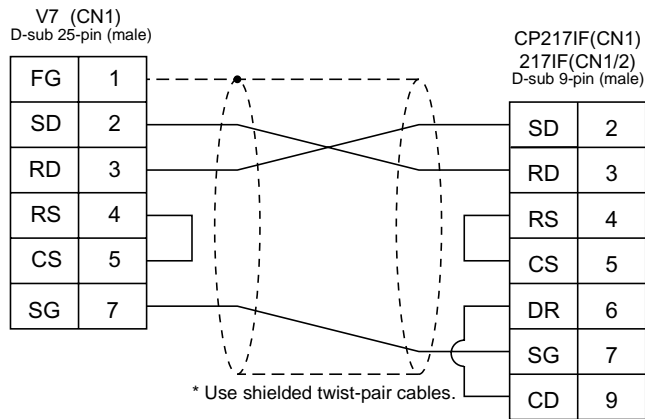
Wiring Diagram 1



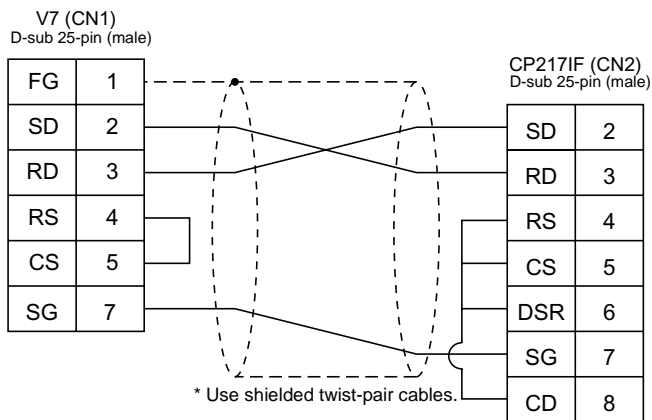
Wiring Diagram 2



Wiring Diagram 3

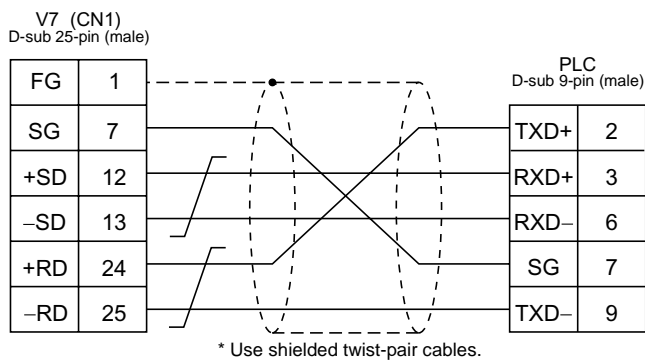


Wiring Diagram 4

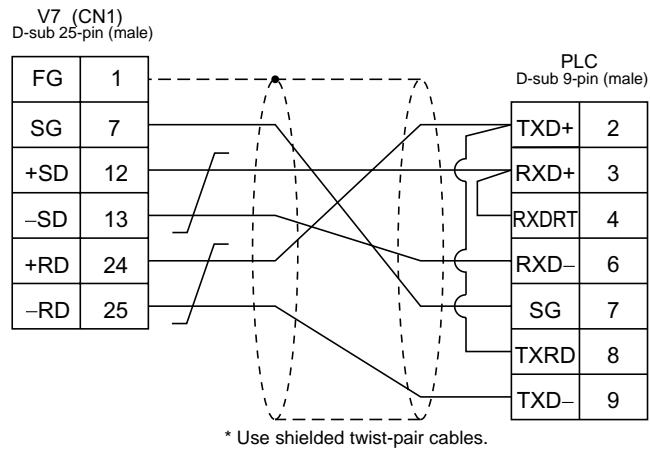


RS-422

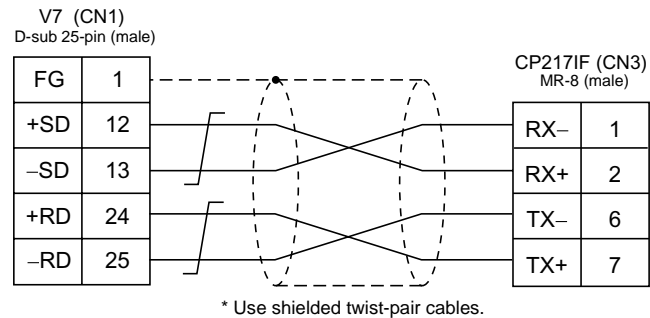
Wiring Diagram 5



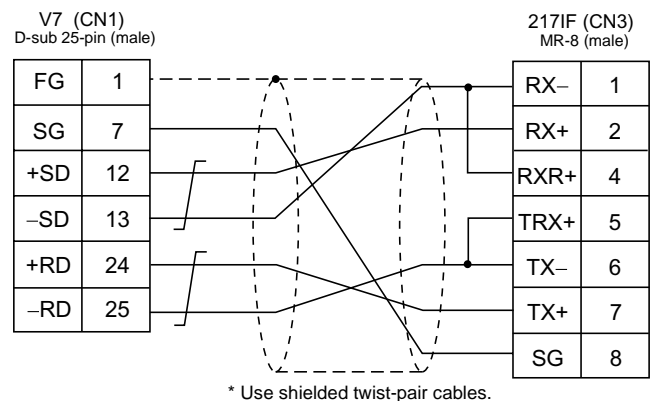
Wiring Diagram 6



Wiring Diagram 7



Wiring Diagram 8



8. Toyopuc PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
TOYOPUC	L2/PC2 series PC3J	CMP-LINK	RS-422 [Wiring Diagram 1]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0	0
Parity		Even	Even
Transmission code	Data length	7 (ASCII)	7
	Stop bit	2	2

Set [Trans. Mode] in the [Detail] tab window of the [Comm. Parameter] dialog of the V-SFT editor.

- PC3J: Select [Single Data Area] or [Split Data Area].
- L2/PC2 series: Select [Single Data Area].

Transmission Mode	Contents
Single Data Area	Data area is common.
Split Data Area	Each PLC device is divided into program files.

Switch Setting

Baud rate: 19200 bps

Switch	Setting	Contents
SW1	0	Station address (lower half)
SW2	0	Station address (upper half)
SW3	1	Baud rate 1: 19200 2: 9600 3: 4800 4: 2400 5: 1200 6: 600

Switch	Short Bar	Contents
SET2	Provided	Data length: 7 bits
SET3	Provided	Stop bit: 2 bits

Available Memory

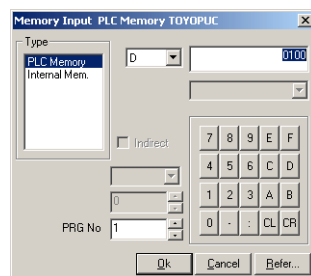
The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

Memory	TYPE	Remarks
D (data register)	0	
R (link register)	1	
B (file register)	2	
N (current value register)	3	
X (input relay)	4	WX as word device
Y (output relay)	5	WY as word device
M (internal relay)	6	WM as word device
K (keep relay)	7	WK as word device
L (link relay)	8	WL as word device
T (timer/contact)	9	WT as word device
C (counter/contact)	10	WC as word device
U (extensional data register)	11	
H (extensional set value register)	12	
EN (extensional current value register)	13	
EX (extensional input relay)	14	WEX as word device
EY (extensional output relay)	15	WEY as word device
EM (extensional internal relay)	16	WEM as word device
EK (extensional keep relay)	17	WEK as word device
EL (extensional link relay)	18	WEL as word device
ET (extensional timer/contact)	19	WET as word device
EC (extensional counter/contact)	20	WEC as word device
V (special register)	21	WV as word device

Screen Editing (Memory Input)

When [Split Data Area] is selected for [Trans. Mode], the [PRG No] setting is available in the [Memory Input] dialog.

- Range for [PRG No.]: 1 to 3

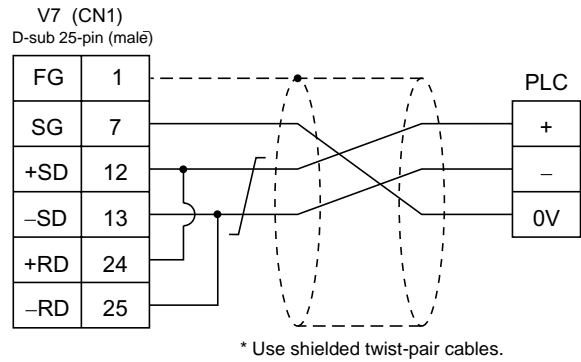


Wiring

Wiring diagrams with the PLC are shown below.

RS-422

Wiring Diagram 1



9. FUJI PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection	PLC2Way
MICREX-F series (MICREX-F series V4)	F55	NV1L-RS2	RS-232C [Wiring Diagram 1]	○
	F70, F70S	NC1L-RS2	RS-232C [Wiring Diagram 1]	○
		NC1L-RS4	RS-485 [Wiring Diagram 3]	○
	F80H, F120H, F120S F140S, F15□S	FFU120B	RS-232C [Wiring Diagram 1]	○
		FFK120A	RS-485 [Wiring Diagram 3]	○
FLEX-PC series*1	NS-T	NJRS-1	RS-232C [Wiring Diagram 1]	○
	NJ-T	NJRS-2	RS-232C [Wiring Diagram 1]	○
		NJRS-4	RS-485 [Wiring Diagram 3]	×
FLEX-PC CPU*2	FLEX-PC	CPU port	RS-485 Hakko Electronics' cable "FU-CPUNS"	×
	NJ-B16	RS-232C port	RS-232C [Wiring Diagram 2]	×
FLEX-PC COM (T)	FLEX-PC NJ-JM	Computer link terminal block	RS-422 [Wiring Diagram 4]	×

*1 To use FLEX-PC of Toyota version, select [FLEX-PC (T)].

*2 To use FLEX-PC CPU of Toyota version, select [FLEX-PC CPU (T)].

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

MICREX-F Series, FLEX-PC Series

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0	0
Parity		Even	Even
Transmission mode	RS-232C	1 (asynchronous non-protocol by command) (fixed)	—
	RS-422	3 (asynchronous non-protocol by command) (fixed)	—
Transmission code	Data length	7 (ASCII)	7
	Stop bit	1	1
Terminating resistance at receiver		Provided for RS-485	—

FLEX-PC CPU Port

Connect to the CPU port. Communication parameters for the V7 series are automatically set.

FLEX-PC COM (T) (NJ Computer Link) Toyota Version

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0	0
Parity		Even	Even
Transmission code	Data length	7	7
	Stop bit	2	2

MICREX-F Series, FLEX-PC Series: Switch Setting

MODE switch: RS-232C: 1 RS-485: 3
 RS-485 Port Setting SW: "0" for both ×10, ×1
 RS-485 terminating resistance: ON
 Character switches

No	Setting	Contents
8	ON	Switch Setting
7	ON	With parity
6	ON	Even
5	ON	7 bits
4	ON	1 bit
3	ON	Same as that set on V7 (normally 19200 bps)
2	ON	
1	OFF	

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

MICREX-F Series

Memory	TYPE	Remarks
M (auxiliary relay)	0	WM as word device
K (keep relay)	1	WK as word device
B (input/output relay)	2	WB as word device
L (link relay)	9	WL as word device
F (special relay)	10	WF as word device
TS (timer/set value)	11	*1
TR (timer/current value)	12	*1
W9 (timer/current value 0.1)	13	*1
CS (counter/set value)	14	*1
CR (counter/current value)	15	*1
BD (data memory)	16	*1
WS (step control relay)	17	*2
Wn (file memory)	18	*3

*1 For numerical data format where double-words can be used (Num. Data Display, Graph, Sampling), data is processed as double-words. For those where bits or words can be used, data is processed as words consisting of lower 16 bits.

For input Upper 16 bits are ignored.

For output "0" is written for upper 16 bits.

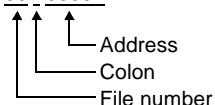
*2 Byte device such as step relay is processed as described below.

For input Upper 8 bits are "0."

For output: Lower 8 bits are written.

*3 To set up the file memory on the V-SFT editor, enter "file number" + ":" (colon)" + address in order.

Example: W30 : 00002



* **Notes on V4 (or GD-80) data conversion**

When converting data of V4 (or GD-80) into the V7 data, [MICREX-F series V4] is automatically selected for the PLC type.

FLEX-PC Series, FLEX-PC CPU Port

	Standard Memory	Toyota Version	TYPE	Remarks
D	(data register)	D	0	
W	(link register)	R	1	
M	(internal relay)	M	2	WM as word device
L	(latch relay)	K	3	WL (WK) as word device
X	(input relay)	X	4	WX as word device
Y	(output relay)	Y	5	WY as word device
R	(file register)	W	6	
TN	(timer/current value)	TN	7	
CN	(counter/current value)	CN	8	
T	(timer/contact)	T	9	
C	(counter/contact)	C	10	
WS	(step relay)	Not provided	11	

FLEX-PC COM (T) (NJ Computer Link) Toyota Version

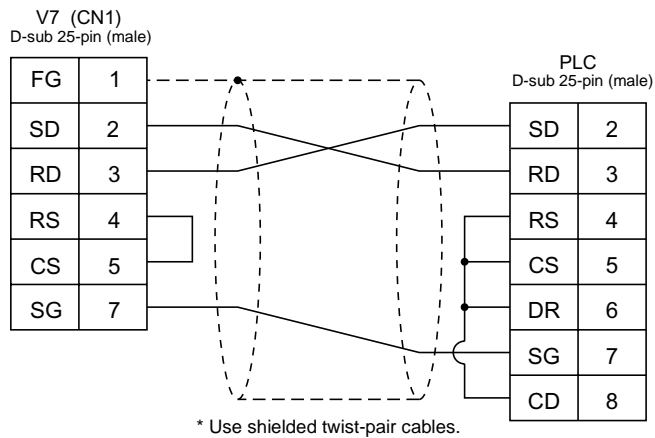
	Memory	TYPE	Remarks
D	(data register)	0	
R	(link register)	1	
M	(internal relay)	2	WM as word device
K	(latch relay)	3	WK as word device
X	(input relay)	4	WX as word device
Y	(output relay)	5	WY as word device
W	(file register)	6	
TN	(timer/current value)	7	
CN	(counter/current value)	8	
T	(timer/contact)	9	
C	(counter/contact)	10	
Z	(special register)	12	
V	(special relay)	13	WV as word device

Wiring

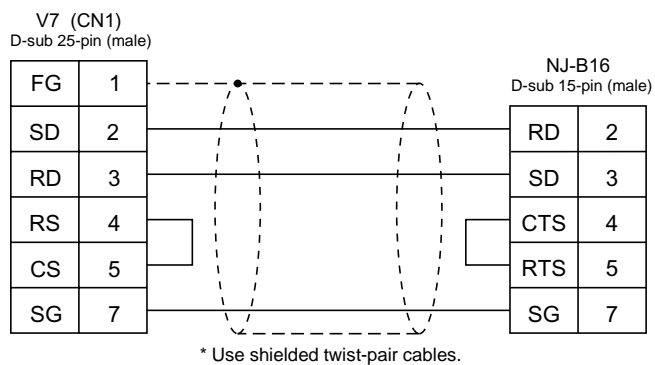
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

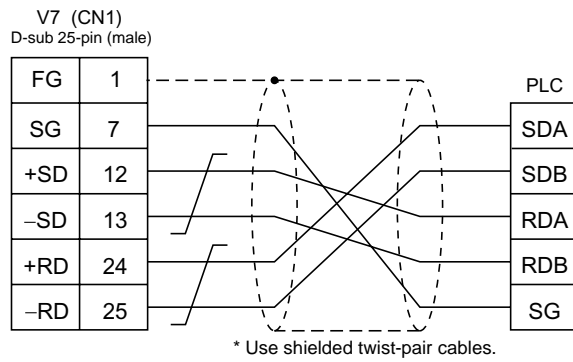


Wiring Diagram 2

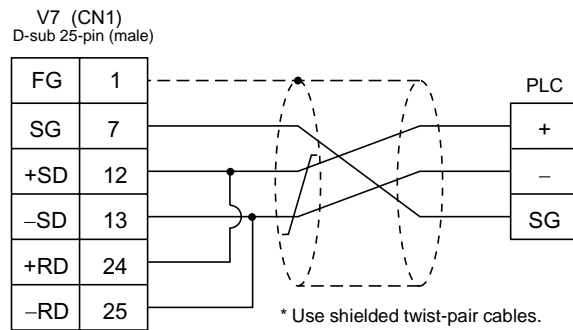


RS-485

Wiring Diagram 3

**RS-422**

Wiring Diagram 4



10. KOYO PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection	
SU/SG	SU-5/5E/6B/5M/6M	U01-DM	RS-232C RS-422	[Wiring Diagram 1] [Wiring Diagram 3]
	SU-5E/6E	Universal port 1 on CPU	RS-232C	[Wiring Diagram 1]
	SU-5M/6M		RS-422	[Wiring Diagram 7]
		Universal port 3 on CPU	RS-485	[Wiring Diagram 8]
		Universal port 2 on CPU	RS-232C KOYO's programmer connecting cable S-30JG-E + KOYO's conversion connector S-15CNJ	
	SZ-4	PORT2 on CPU (universal communication port)		
	SZ-4M	PORT2 on CPU (universal communication port)	RS-232C KOYO's programmer connecting cable S-30JG-E + KOYO's conversion connector S-15CNJ + KOYO's conversion connector S-15HCNP1	
	SG-8	G01-DM	RS-232C RS-422	[Wiring Diagram 1] [Wiring Diagram 4]
		Port on CPU	RS-232C RS-422	[Wiring Diagram 1] [Wiring Diagram 4]
		PZ3	Universal communication port on the CPU unit	RS-232C RS-485	[Wiring Diagram 2] [Wiring Diagram 6]
SR-T	SR-6T (Toyota version)	U01-DM	RS-232C RS-422	[Wiring Diagram 1] [Wiring Diagram 3]
		G01-DM	RS-232C RS-422	[Wiring Diagram 1] [Wiring Diagram 4]
SR-T (K protocol)	SR-1T (Toyota version)	Terminal block on the CPU unit	RS-422	[Wiring Diagram 5]

(To be continued)

Select PLC Type	PLC	Unit/Port	Connection
SU/SG (K-Sequence)	SU-5E/6B	Universal port 1 on CPU	RS-232C [Wiring Diagram 1] RS-485 [Wiring Diagram 7]
	SU-5M/6M	Programmer port on CPU	RS-232C KOYO's programmer connecting cable S-30JG-E
		Universal port 3 on CPU	RS-485 [Wiring Diagram 8]
		Universal port 2 on CPU	RS-232C KOYO's programmer connecting cable S-30JG-E + KOYO's conversion connector cable S-15CNJ
	SZ-4	PORT1 on CPU (programmer port)	
		PORT2 on CPU (universal communication port)	
	SZ-4M	PORT1 on CPU (programmer port)	RS-232C KOYO's programmer connecting cable S-30JG-E + KOYO's conversion connector cable 15CNJ + KOYO's conversion connector S-15HCNP1
		PORT2 on CPU (universal communication port)	

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		[0] × 10, [1] × 1	1
Parity		Odd	Odd
Transmission code	Data length	8	8
	Stop bit	1	1
Functions		Host link function (fixed)	—
Response delay time		0 (fixed)	—
Timeout		None (fixed)	—
ASCII/HEX		HEX (fixed)	—

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

SU/SG, SU/SG (K-Sequence)

Memory	TYPE	Remarks
R (data register)	0	
I (input relay)	1	
Q (output relay)	2	
M (internal relay)	3	
S (stage)	4	
GI (global input)	5	
GQ (global output)	6	
T (timer/contact)	7	
C (counter/contact)	8	

SR-T/SR-T (K Protocol)

Memory	TYPE	Remarks
D (data register)	0	
X (input relay)	1	Common to X/Y
Y (output relay)	2	Common to X/Y
M (internal relay)	3	
S (stage)	4	
K (keep relay)	5	
L (link relay)	6	
T (timer/contact)	7	
C (counter/contact)	8	

Switch Setting

U-01DM

On-line/Off-line switch:

On-line

UNIT ADR switch:

"0" for ×10, "1" for ×1

SW4 DIP switch:

No	Setting	Contents
1	ON	Same as that set on V7 Normally 19200 bps
2	ON	
3	ON	
4	ON	With parity
5	OFF	Self-diagnosis
6	OFF	Response delay time 0 msec
7	OFF	
8	OFF	

SW5 DIP switch:

No	Setting	Contents
1	OFF	Master/slave control
2	OFF	Slave
3	OFF	Communication timeout
4	OFF	HEX mode

G-01DM

On-line/Off-line switch:

Short plug 1:

Short plug 2:

On-line

open

RS-232C ENABLE

RS-422. DISENABLE

SW1 DIP switch:

No	Setting	Contents
1	ON	Unit No. 1
2	OFF	
3	OFF	
4	OFF	
5	OFF	
6	OFF	
7	OFF	
8	OFF	1: N
9	OFF	Slave

SW2 DIP switch:

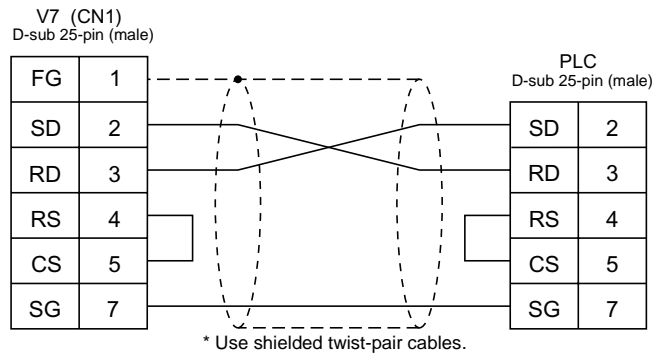
No	Setting	Contents
1	ON	Same as that set on V7 Normally 19200 bps
2	ON	
3	ON	
4	ON	With parity
5	OFF	Self-diagnosis
6	OFF	Turn-around delay
7	OFF	Response delay time 0 msec
8	OFF	
9	OFF	HEX mode

Wiring

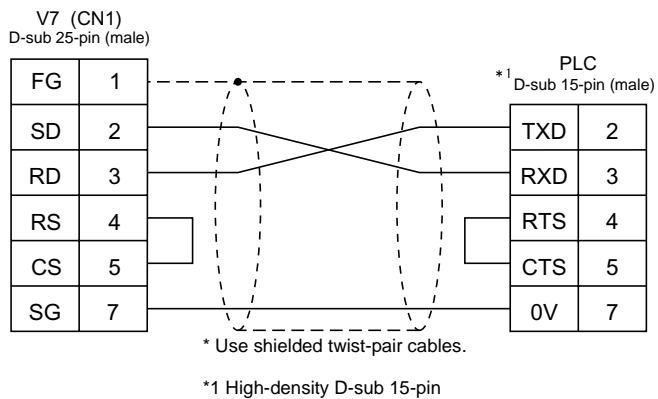
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

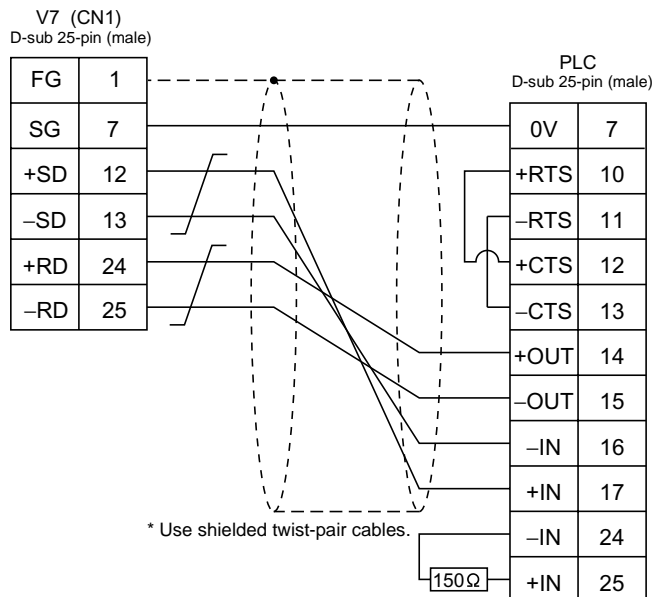


Wiring Diagram 2

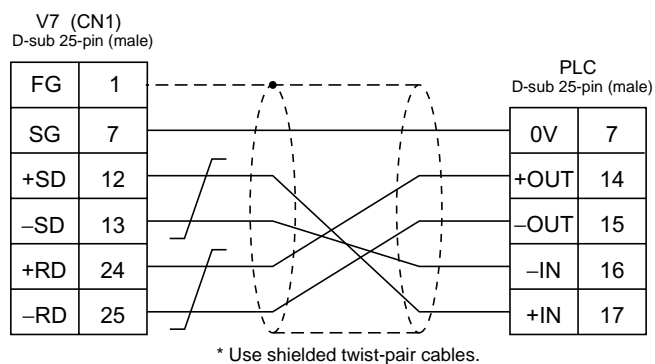


RS-422

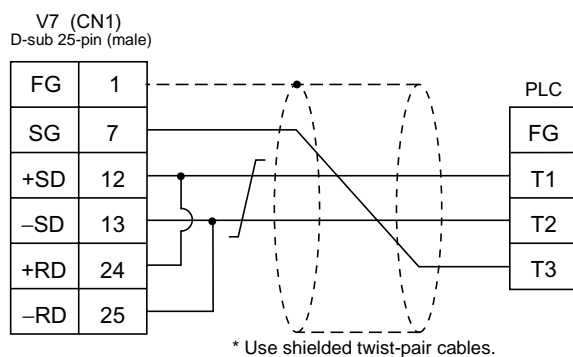
Wiring Diagram 3



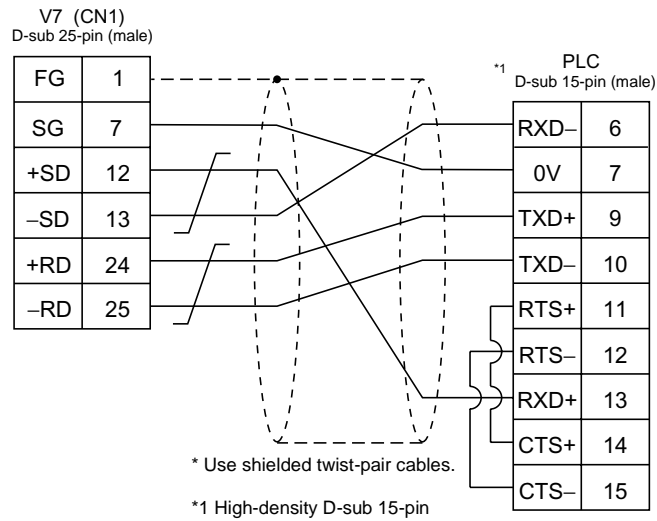
Wiring Diagram 4



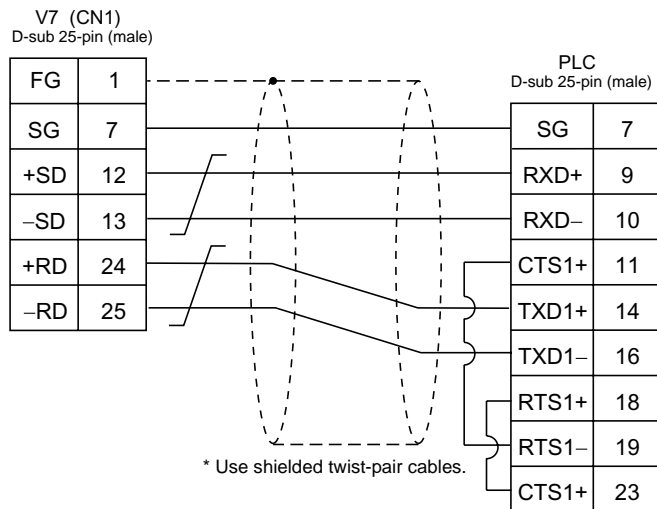
Wiring Diagram 5



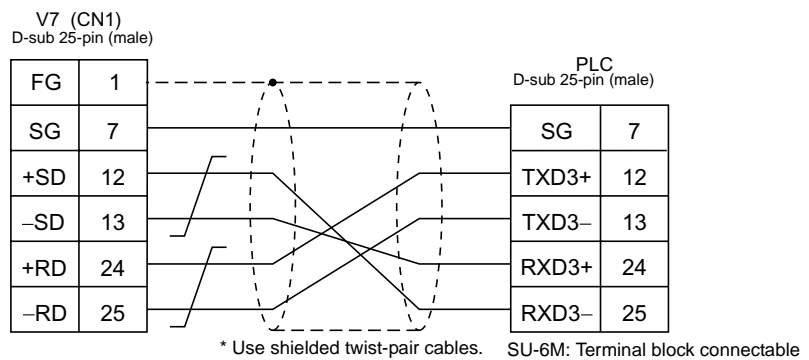
Wiring Diagram 6



Wiring Diagram 7



Wiring Diagram 8



11. Allen-Bradley PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
PLC-5	PLC-5	1785-KE	RS-232C [Wiring Diagram 1]
		1770-KF2	RS-232C [Wiring Diagram 2] RS-422 [Wiring Diagram 6]
SLC500	SLC 5/03 and later	CPU (processor module) RS-232C channel	RS-232C [Wiring Diagram 3]
		1747-KE	RS-232C [Wiring Diagram 4] RS-422 [Wiring Diagram 7]
Micro Logix 1000	Micro Logix 1000	Port on CPU	A•B's RS-232C Ladder transfer cable*1 + RS-232 [Wiring Diagram 5]
Control Logix	Control Logix 1756 system	Logix5550	

*1 When using RS-232C ladder transfer cable made by Allen-Bradley, connect the cable shown in [Wiring Diagram 3] to the D-sub 9-pin side of the ladder transfer cable for communications with the V7 series.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

PLC-5 series

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0	0
Parity		Even	Even
Transmission mode	RS-232C	–	–
	RS-422	1785-KE not supported	–
Transmission code	Data length	8	8
	Stop bit	1	1
Protocol		Full duplex (fixed)	–
Error check		BCC (fixed)	–
Response		NO (fixed)	–

SLC500 series

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0	0
Parity		Even	Even
Transmission mode	RS-232C	–	–
	RS-422	Channel 0 not supported	–
Transmission code	Data length	8	8
	Stop bit	1	1
Protocol		Full duplex (fixed)	–
Error check		BCC (fixed)	–
Response		NO (fixed)	–

Micro Logix 1000

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Port		0	0
Parity		None (fixed)	Not provided
Transmission code	Data length	8 (fixed)	8
	Stop bit	1 (fixed)	1
Error check		CRC (fixed)	–

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

PLC-5 Series

Memory		TYPE	Remarks
N	(integer)	0	
B	(bit)	1	
T.ACC	(timer/current value)	2	
T.PRE	(timer/set value)	3	
C.ACC	(counter/current value)	4	
C.PRE	(counter/set value)	5	
I	(input)	6	
O	(output)	7	
S	(status)	8	
T	(timer/control)	9	
C	(counter/control)	10	
R	(control)	11	
R.LEN	(control/data length)	12	
R.POS	(control/data position)	13	
D	(BCD)	14	
A	(ASCII)	15	

SLC500 Series, Micro Logix 1000

Memory		TYPE	Remarks
N	(integer)	0	
B	(bit)	1	
T.ACC	(timer/current value)	2	
T.PRE	(timer/set value)	3	
C.ACC	(counter/current value)	4	
C.PRE	(counter/set value)	5	
I	(input)	6	
O	(output)	7	
S	(status)	8	
T	(timer/control)	9	
C	(counter/control)	10	
R	(control)	11	
R.LEN	(control/data length)	12	
R.POS	(control/data position)	13	
D	(BCD)	14	
A	(ASCII)	15	
F	(FLOAT)	16	
ST	(STRING)	17	

PLC-5 Series: Switch Setting

1785-KE

SW1 (Protocol)

No	Setting	Contents
1	ON	BCC, even, no
2	OFF	
3	OFF	
4	ON	Duplicated message unacceptable
5	OFF	Handshaking signal ignored
6	ON	Execution of diagnosis command

SW2 (Port)

Set the port number of 1785-KE. (This port should not be duplicated in the network.)

No	Setting	Contents
1	ON	1st digit (octal)
2	ON	
3	ON/OFF	2nd digit (octal)
4	ON/OFF	
5	ON/OFF	
6	ON/OFF	3rd digit (octal)
7	ON/OFF	
8	ON/OFF	

SW3 (Network link communication speed)

Adjust to the settings of the network you are using.

No	Setting	Contents
1	ON	Data highway (57.6 kbps)
2	ON	
3	ON	
4	ON	Link communication speed (19.2 kbps)
5	ON	
6	ON	Local/remote selection

SW4 (Spare)

No	Setting	Contents
1	OFF	For extension, always OFF
2	OFF	
3	OFF	
4	OFF	

1770-KF2**SW1 (Protocol)**

No	Setting	Contents
1	ON	Protocol
2	OFF	Protocol
3	ON	Duplicated message unacceptable
4	OFF	Handshaking signal ignored
5	OFF	Protocol

SW2, SW3, SW4 (Port)

Set the port number of 1770-KF2. (This port should not be duplicated in the network.)

SW5 (Network link communication speed)

Adjust to the settings of the network you are using.

Switch Setting		Contents
1	2	
ON	ON	57.6 kbps

SW6 (asynchronous link communication speed)

Adjust to the settings of the V7 series.

No	Setting	Contents
1	OFF	9600 bps
2	ON	
3	ON	
4	ON	Execution of diagnosis command

SW7 (Network link selection)

Switch Setting		Contents
1	2	
ON	OFF	Peer transmission link

SW8 (RS-232C/RS-422 selection)

Switch Setting		Contents
1	2	
OFF	ON	RS232C
ON	OFF	RS422

SLC500 Series, Micro Logix 100: Transmission Parameter Setting

CPU Port Channel 0

Set up the parameters for CPU port channel 0 using the software specifically designed for this purpose.

Baud Rate	: 19200
Duplicate Detect	: ON
ACK Timeout (x 20 ms)	: 20
Control Line	: No Handshaking
Parity	: EVEN
Error Detection	: BCC
NAK Retries	: 3
ENQ Retries	: 3
Embedded Responses	: AUTO-DETECT

1747-KE

Set up the parameters for 1747-KE using the software specifically designed for this purpose.

DF1 Port Setup Menu

Baudrate	: 19200
Bits Per Character	: 8
Parity	: Even
Stop Bits	: 1

DF1 Full-Duplex Setup Parameters

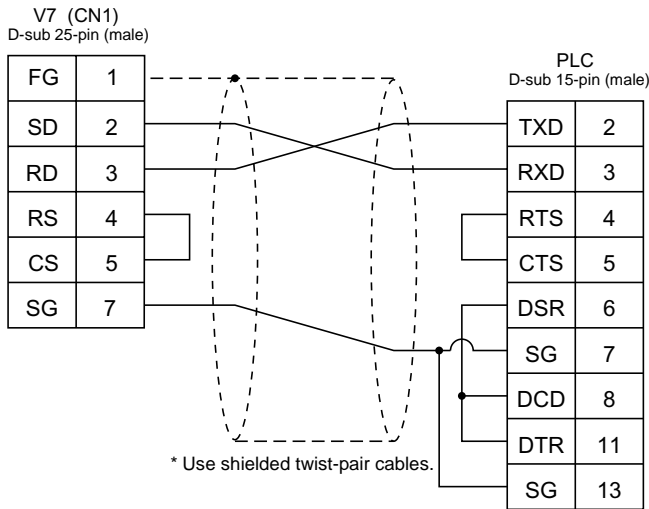
Duplicate Packet Detection	: Enabled
Checksum	: BCC
Constant Carrier Detect	: Disabled
Message Timeout	: 400
Hardware Handshaking	: Disabled
Embedded Response Detect	: Auto Detect
ACK Timeout (× 5 ms)	: 90
ENquiry Retries	: 3
NAK Received Retries	: 3

Wiring

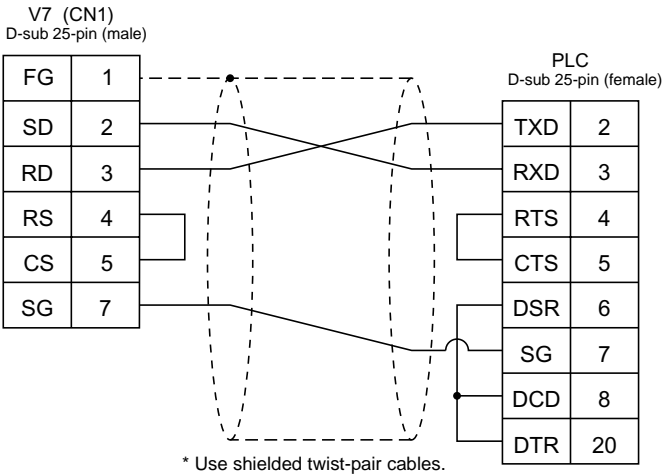
Wiring diagrams with the PLC are shown below.

RS-232C

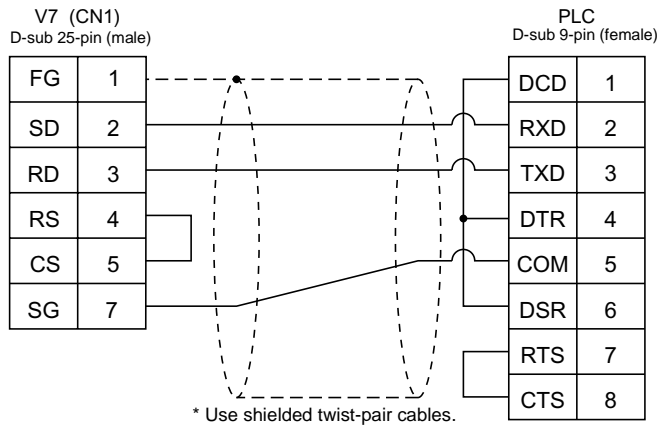
Wiring Diagram 1



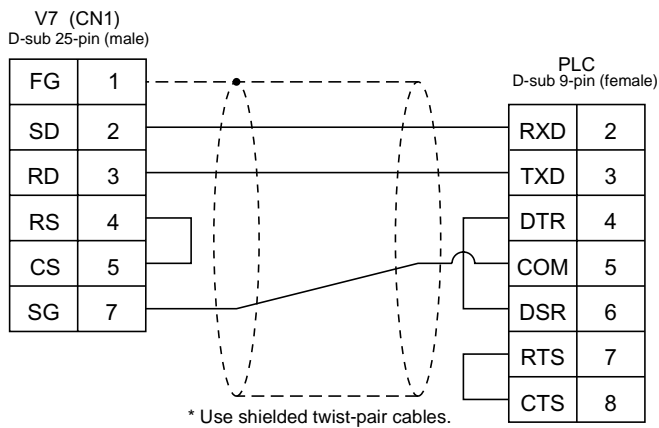
Wiring Diagram 2



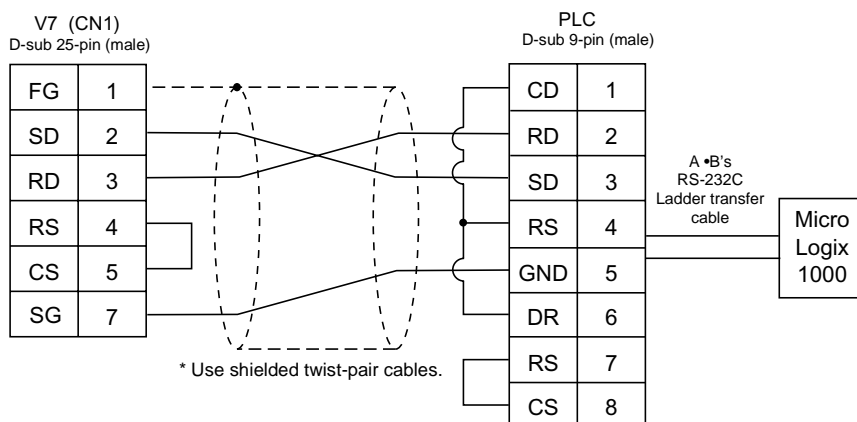
Wiring Diagram 3



Wiring Diagram 4

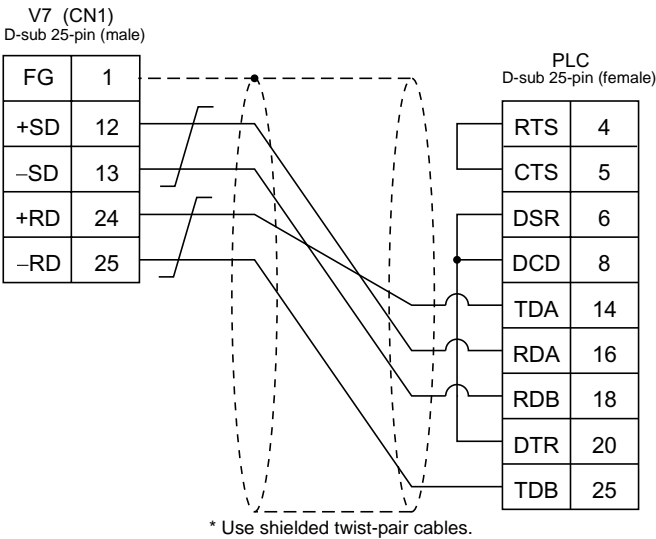


Wiring Diagram 5

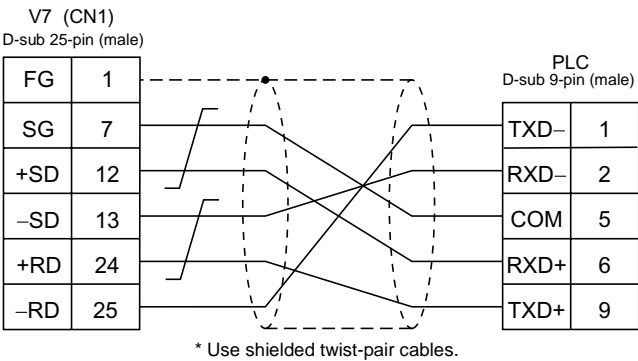


RS-422

Wiring Diagram 6



Wiring Diagram 7



12. GE Fanuc PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
90 series	Series 90-30	Programmable coprocessor (PCM)	RS-232C [Wiring Diagram 1] RS-485 [Wiring Diagram 2]
90 series (SNP-X)	Series 90 micro Series 90-30	CPU port	RS-485 [Wiring Diagram 3]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

90 Series

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		01 ("0" for ×10, "1" ×1)	1
Parity		Odd	Odd
Transmission code	Data length	8	8
	Stop bit	1	1
Functions		Host link function (fixed)	–
Response delay time		0 (fixed)	–
Timeout		None (fixed)	–
ASCII/HEX		HEX (fixed)	–

90 Series SNP-X

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Parity		Odd	Odd
Transmission code	Data length	8	8
	Stop bit	1	1
Functions		SNP-X (fixed)	–

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

90 Series

Memory	TYPE	Remarks
R (data register)	0	
I (input)	1	
Q (output)	2	

90 Series SNP-X

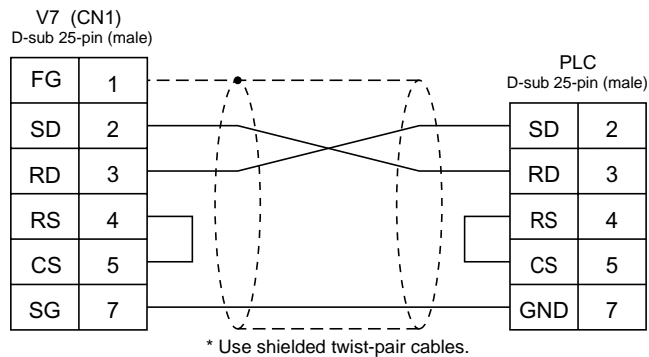
Memory	TYPE	Remarks
R (data register)	0	
I (input)	1	
Q (output)	2	
M (internal relay)	3	
G (global relay)	4	
AI (analog input)	5	
AQ (analog output)	6	
T (temporary memory relay)	7	
S (system status)	8	Read only
SA (system status)	9	
SB (system status)	10	
SC (system status)	11	

Wiring

Wiring diagrams with the PLC are shown below.

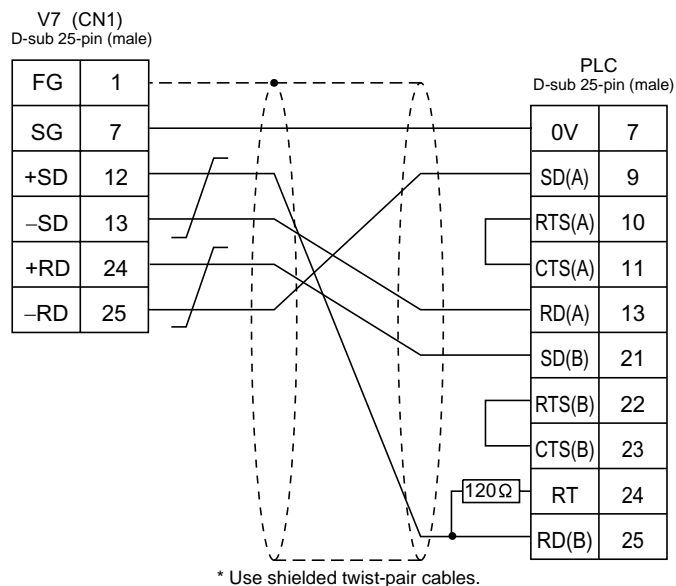
RS-232C

Wiring Diagram 1

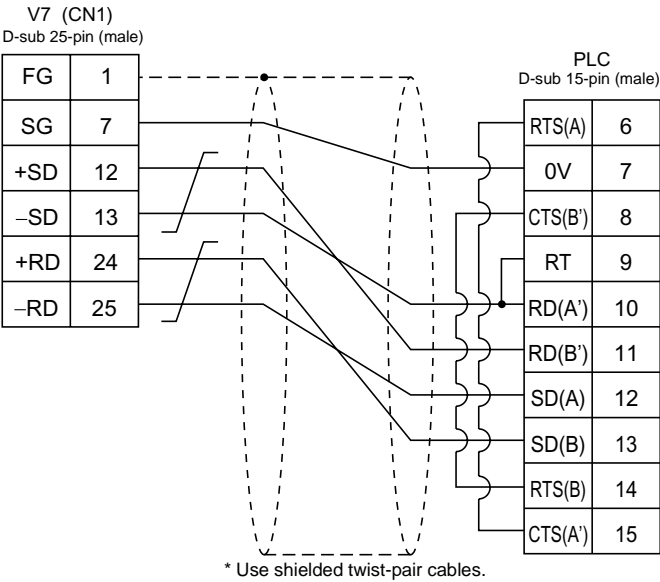


RS-485

Wiring Diagram 2



Wiring Diagram 3



13. TOSHIBA PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
T series	T series	Computer link port on CPU	RS-422 [Wiring Diagram 1]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		01	1
Parity		Odd	Odd
Transmission code	Data length	8	8
	Stop bit	1	1

- PLC Transmission Parameter Setting

When setting parameters on the PLC, use the T series programmer and enter the following data for system information "7. COMPUTER LINK."

Station number	1
Baud rate	19200 bps
Parity	Odd
Data length	8 bits
Stop bit	1 bit

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

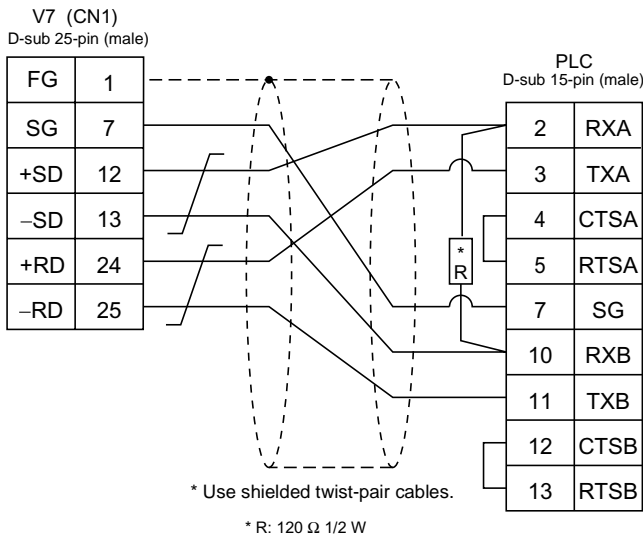
Memory	TYPE	Remarks
D (data register)	0	
X (input register)	1	XW as word device
Y (output register)	2	YW as word device
R (auxiliary relay)	5	RW as word device
L (link relay)	6	LW as word device
W (link register)	7	
F (file register)	8	
TN (timer/current value)	9	Read only
CN (counter/current value)	10	Read only
TS (timer/contact)	11	Read only
CS (counter/contact)	12	Read only

Wiring

Wiring diagrams with the PLC are shown below.

RS-422

Wiring Diagram 1



14. TOSHIBA MACHINE PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
TC200	TC200	Port on the CPU unit	RS-232C [Wiring Diagram 1]
		TCCMW TCCMO	
	TCmini	—	

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	9600 bps	9600 bps
Port	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

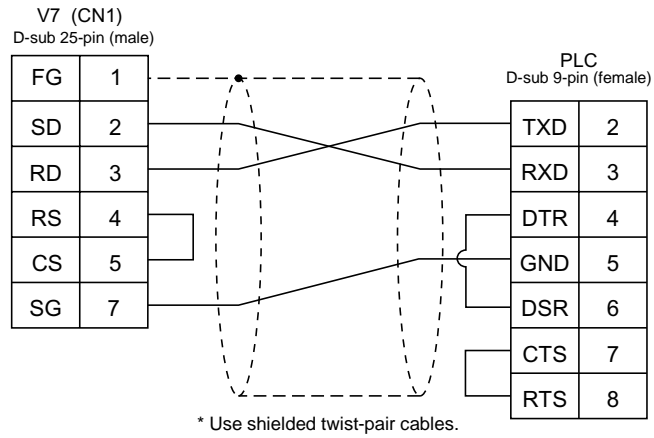
Memory	TYPE	Remarks
D (register 1)	0	
B (register 2)	1	
X (input relay)	2	XW as word device
Y (output relay)	5	YW as word device
R (temporary storage)	6	RW as word device
G (extension temporary storage 1)	7	GW as word device
H (extension temporary storage 2)	8	HW as word device
L (latch relay)	9	LW as word device
S (shift register)	10	SW as word device
E (edge relay)	11	EW as word device
P (timer counter current value)	12	
V (timer counter set value)	13	
T (timer)	14	TW as word device
C (counter)	15	CW as word device
A (special auxiliary relay)	16	AW as word device

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



15. SIEMENS PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
S5 (S5 V4)	S5-90U S5-95U S5-100U	CP-521SI (3964R Transmission Protocol)	RS-232C [Wiring Diagram 1]
	S5-115U S5-135U S5-155U	CP-524 (3964R/RK512) CP-544 (3964R/RK512)	RS-232C [Wiring Diagram 1] RS-422 [Wiring Diagram 6]
	S5-95U	Second serial interface (3964R Transmission Protocol)	SIEMENS's 6ES5 734-1BD20 cable [*]
S5 PG port	S5 series	Programming port on the CPU unit	RS-232C [Wiring Diagram 3] ⁺
S7	S7-300	CP-341 (3964R/RK512)	RS-232C [Wiring Diagram 2]
	S7-400	CP-441 (3964R/RK512)	RS-422 [Wiring Diagram 6]
S7-200 PPI	S7-200 series	PPI	RS-422 [Wiring Diagram 7]
S7-300MPI (HMI ADP)	S7-300/400 series (MPI port)	SIEMENS's HMI Adapter 6ES7 972 0CA11-0XA0	RS-232C [Wiring Diagram 5]
S7-300MPI (PC ADP)		SIEMENS's PC Adapter 6ES7 9720CA23-0XA0	
TI500/505 (TI500/505 V4)	TI545/555	CPU port (built-in)	RS-232C [Wiring Diagram 4] RS-422 [Wiring Diagram 8]

* When using the 6ES5 734-1BD20 cable made by SIEMENS, connect the cable shown in [Wiring Diagram 3] to the D-sub 25-pin side of the 6ES5 734-1BD20 cable for communications with the V7 series.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

S5, S5 V4 (S5-90U, S5-95U, S5-100U)

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	9600 bps	9600 bps
Parity	Even parity	Even
Transmission code	Data length	8
	Stop bit	1
Busy signal	NO (fixed)	—
Hand shake	OFF (fixed)	—

S5, S5 V4 (S5-115U, S5-135U, S5-155U, S7-300, S7-400)

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Parity		–	Even (fixed)
Transmission code	Data length	–	8 (fixed)
	Stop bit	–	1 (fixed)

S5 PG port

Communication parameters are automatically set.

S7-200PPI

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Port		2	2
Parity		Even (fixed)	–

S7-300MPI (HMI ADP), S7-300MPI (PC ADP)

Item		Setting on PLC	V7 Comm. Parameter Setting	
Baud rate		38400 bps	HMI ADP	38400 bps (fixed)
			PC ADP	38400 bps
Parity		–	Odd (fixed)	
Transmission code	Data length	–	8 (fixed)	
	Stop bit	–	1 (fixed)	
Local No. (PLC port number)		2	2	

- Set [MPI SETTING] in the [Comm. Parameter] dialog of the V-SFT editor.

Item	MPI SETTING
Node Cnt	15/31/63/126
Source No. (V7 port number)	0

Set different numbers for [Source No.] and [Local No.], and make sure that [Source No] ≤ [Node Cnt].

[Node Cnt] is equivalent to [Local No.] of the PLC. (For example, if [Local No.] is "13," [Node Cnt] is "15.")

TI500/505, TI500/505 V4

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Parity		–	None (fixed)
Transmission code	Data length	–	8 (fixed)
	Stop bit	–	1 (fixed)

Available Memory

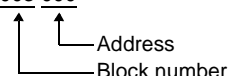
The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

S5, S5 V4, S7

Memory		TYPE	Remarks
DB	(data register)	0	Use memory address DB1 and later for S7, or DB3 or later for S5.
I	(input relay)	1	IW as word device, read only
Q	(output relay)	2	QW as word device, read only
F	(flag/internal relay)* ¹	3	FW as word device, read only, only in S5 series
M	(flag/internal relay)* ¹	3	MW as word device, read only, only in S7 series
T	(timer/current value)	4	Read only
C	(counter/current value)	5	Read only
AS	(absolute address)	6	Unavailable with the S7 series

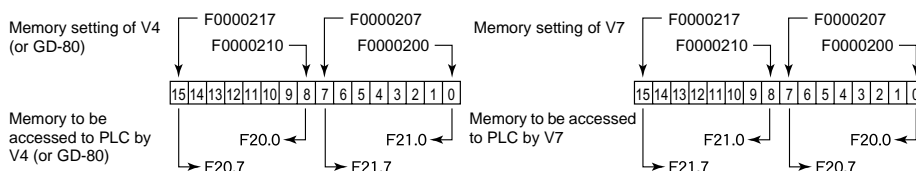
*¹ The assigned memory is indicated when editing the screen as shown on the right.

Example: DB003 000



* Notes on V4 (or GD-80) data conversion

- When converting data of V4 (or GD-80) into the V7 data, [S5 V4] is automatically selected for the PLC type.
- With V4 (or GD-80), the order of bit strings of I (input relay), Q (output relay) and F (internal relay) is byte-reversed. Please take note of this.

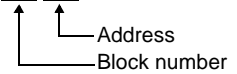


S5 PG port

Memory	TYPE	Remarks
DB (data register)	0	Use memory address DB3 and later.
I (input relay)	1	IW as word device
Q (output relay)	2	QW as word device
F (flag/internal relay)	3	FW as word device
T (timer/current value)	4	
C (counter/current value)	5	
AS (absolute address)	6	

The assigned memory is indicated when editing the screen as shown on the right.

Example: DB003 000



S7-200PPI

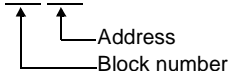
Memory	TYPE	Remarks
V (data memory)	0	VW as word device
I (input)	1	IW as word device Possible to write to the unused area
Q (output)	2	QW as word device
M (bit memory)	3	MW as word device
T (timer/current value)	4	
C (counter/current value)	5	
TB (timer/contact)	6	Read only
CB (counter/contact)	7	Read only
HC (high-speed counter/contact)	8	Double-word usable
AIW (analog input)	9	
AQW (analog output)	10	
SM (special memory/special relay)	11	SMW as word device
S (stage)	12	SW as word device

S7-300/400MPI

Memory	TYPE	Remarks
DB (Data Word)	0	Use memory address DB1 and later.
I (input)	1	IW as word device
Q (output)	2	QW as word device
M (Marker Word)	3	MW as word device
T (timer/current value)	4	
C (counter/current value)	5	

The assigned memory is indicated when editing the screen as shown on the right.

Example: DB003 000



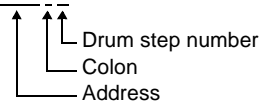
TI500/505 (TI500/505 V4)

Memory	TYPE	Remarks
V (variable memory)	0	
WX (word input)	1	
WY (word output)	2	
X (discrete input)	3	
Y (discrete output)	4	
CR (control relay)	5	
TCP (timer, counter/set value)	6	
TCC (timer, counter/current time)	7	
DCP (drum count/set value)	8	*1
DCC (drum count/current value)	9	Read only
DSP (drum step/set value)	10	
DSC (drum step/current value)	11	
K (fixed memory)	12	
STW (system state)	13	

*1 In case of using DCP (drum count/setting value), set drum step No.1 to 16.

The assigned memory is indicated when editing the screen as shown on the right.

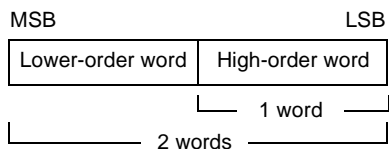
Example: DCP3000 : 1



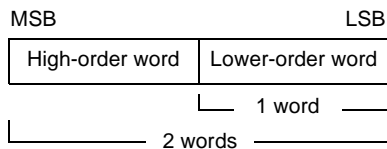
* Notes on V4 (or GD-80) data conversion

- When converting data of V4 (or GD-80) into the V7 data, [TI500/505 V4] is automatically selected for the PLC type.
- With V4 (or GD-80), the order of words is reversed in the case of double-words. Please take note of this.

For V4 (or GD-80):



For V7:

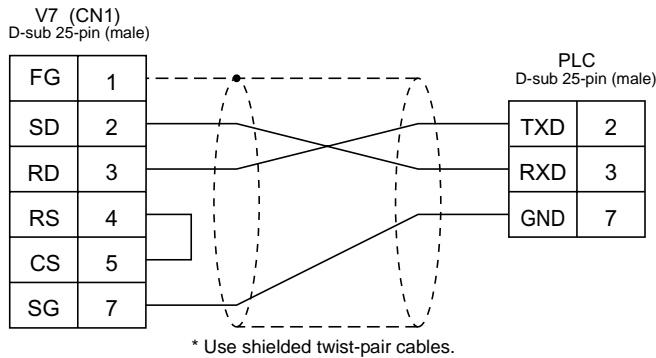


Wiring

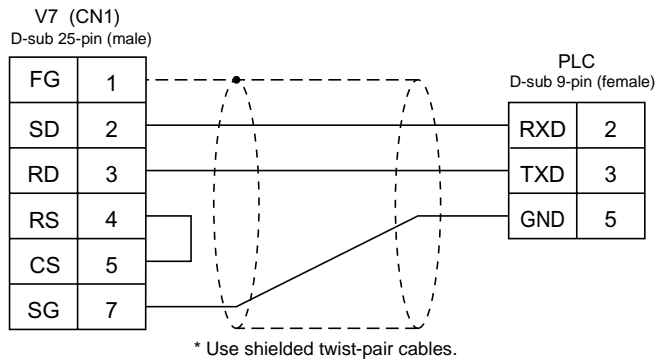
Wiring diagrams with the PLC are shown below.

RS-232C

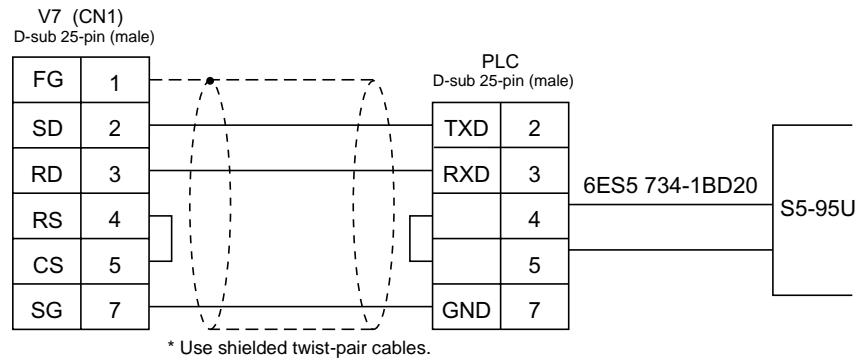
Wiring Diagram 1



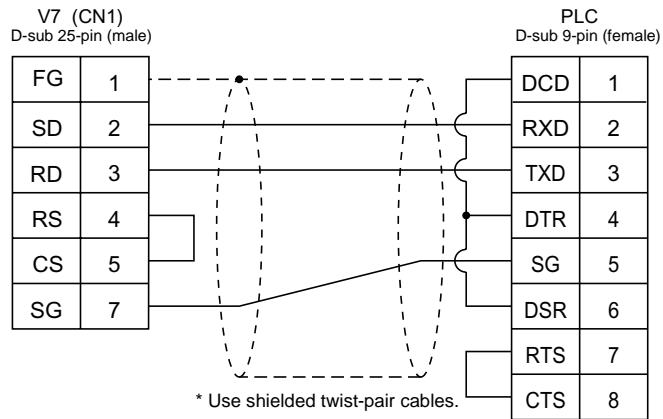
Wiring Diagram 2



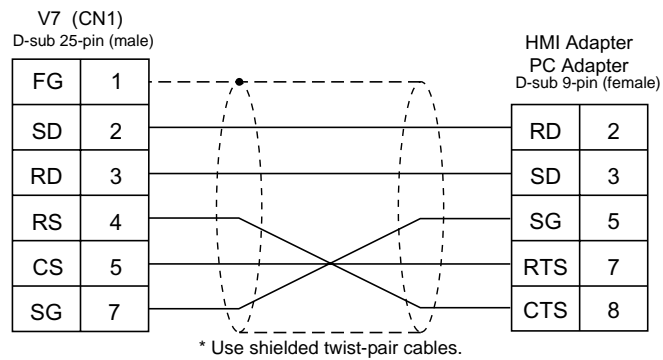
Wiring Diagram 3



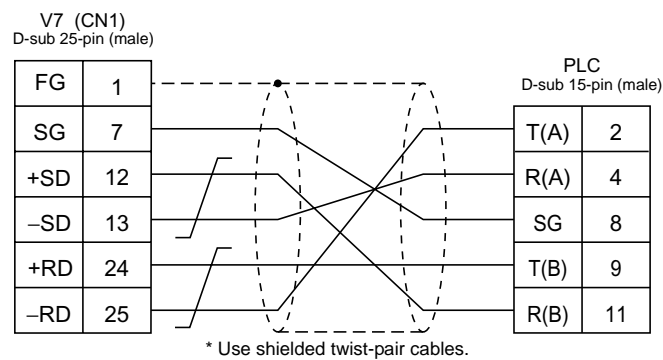
Wiring Diagram 4



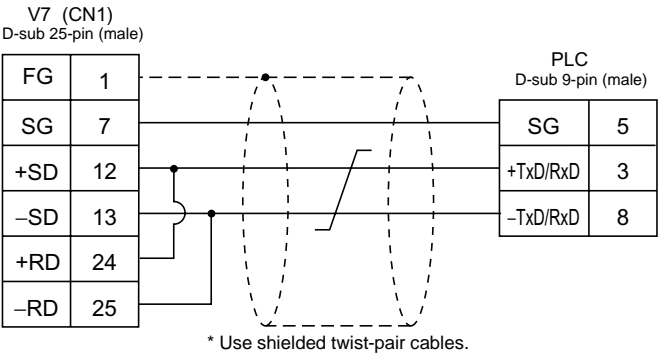
Wiring Diagram 5

**RS-422**

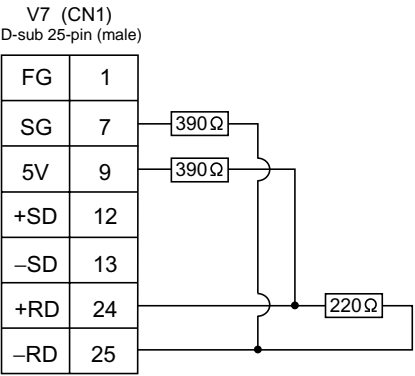
Wiring Diagram 6



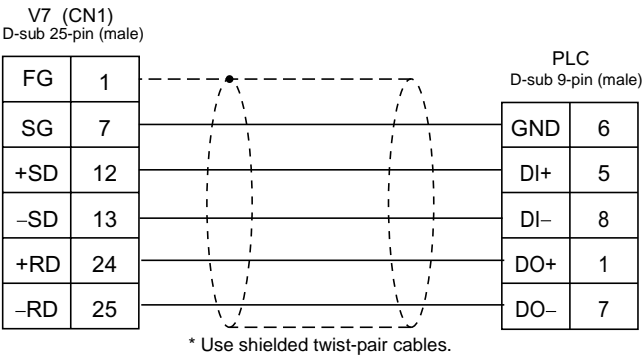
Wiring Diagram 7



- Terminating Resistance Setting
Set the DIP switch 7 and 8 of the V7 series to the OFF position. Connect terminating resistance to the serial connector (CN1) of the V7 series as shown below. If the terminating resistance is not connected, a communication error may occur.



Wiring Diagram 8



16. SHINKO PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
SELMART	SELMART-100 and later	Version O1M2-UCI-6□	RS-232C [Wiring Diagram 1]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Parity		Even	Even
Transmission code	Data length	7 (ASCII)	7
	Stop bit	1	1
Sumcheck		Provided (fixed)	—

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

Memory	TYPE	Remarks
D (data register)	0	

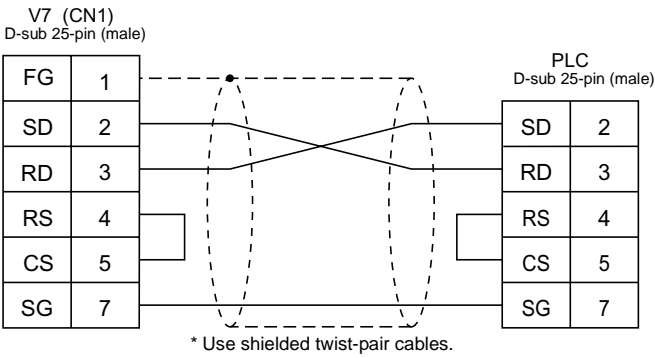
Only D register of SELMART is available. No other devices can be used.
Be sure to note the above though the setting on the V-SFT editor is possible.

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



17. SAMSUNG PLC

Available PLCs

Select PLC Type	PLC	Connection
SPC series	SPC series	RS-232C [Wiring Diagram 1] RS-422/485 [Wiring Diagram 2]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	9600 bps	9600 bps
Parity	Not provided	Not provided
Stop bit	1	1
Terminating resistance	ON for RS-485	—

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

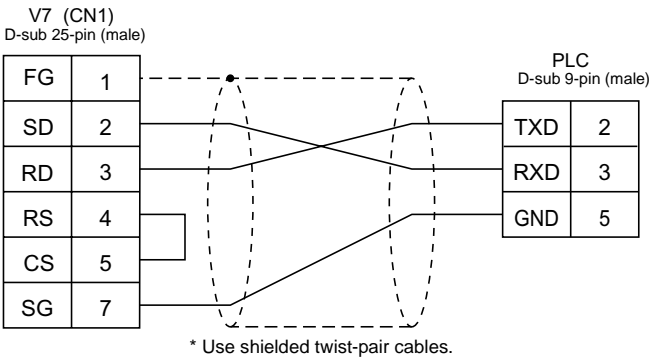
Memory	TYPE	Remarks
R (input/output)	0	
L (link relay)	1	
M (internal relay)	2	
K (keep relay)	3	
F (special relay)	4	
W (data register)	5	

Wiring

Wiring diagrams with the PLC are shown below.

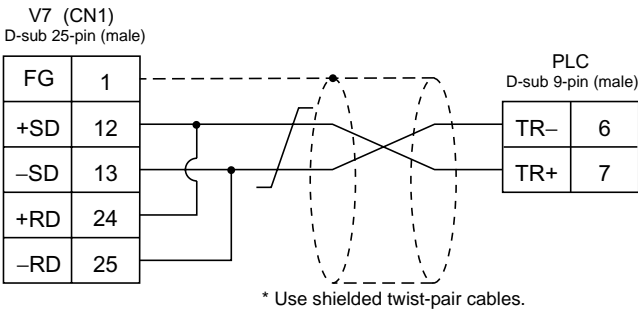
RS-232C

Wiring Diagram 1



RS-422

Wiring Diagram 2



18. KEYENCE PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
KZ series link	KZ300 KZ350	KZ-L2	Port 1 RS-232C [Wiring Diagram 1] Port 2 RS-232C [Wiring Diagram 2] RS-422 [Wiring Diagram 6]
KZ-A500 CPU	KZ-A500	CPU modular port	RS-232C [Wiring Diagram 3] RS-422 KEYENCE's cable "KZ-C20" + Hakko Electronics' cable "MB-CPUQ"
Mistubishi A series link		KZ-L10	Port 1 RS-232C [Wiring Diagram 4] Port 2 RS-232C [Wiring Diagram 2] RS-422 [Wiring Diagram 6]
KZ/KV series CPU	KZ-10, 16, 24 ^{*1} , 40, 80, 300, 350 KV series ^{*2}	CPU modular port	RS-232C [Wiring Diagram 5] or KEYENCE's cable "OP-26487" + Connector "OP-26485" RS-422 KEYENCE's cable "KZ-C20" + Hakko Electronics' cable "MB-CPUQ"
KZ24/300 CPU	KZ-24, 300 ^{*1}	CPU modular port	RS-232C [Wiring Diagram 5] or KEYENCE's cable "OP-26487" + Connector "OP-26485"
KV10/24 CPU	KV-10, 24 ^{*2}	CPU modular port	
KV-700 CPU	KV-700	CPU modular port	

*1 To connect KZ-24, 300 via RS-232C, select [KZ24/300CPU] for the PLC type on the V-SFT editor.

*2 To connect KZ-10, 24 via RS-232C, select [KV10, 24CPU] for the PLC type on the V-SFT editor.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

KZ Series Link

Item		Setting on PLC	V7 Comm. Parameter Setting
Port		0	0
Baud rate		19200 bps	19200 bps
Parity		Even	Even
Transmission code	Data length	7 (ASCII)	7
	Stop bit	2	2
Terminating resistance		ON for RS-422	–

Set the port with the port setting switch, the terminating resistance with terminator, and the baud rate/data bit/parity/stop bit with SET B DIP switches.

KZ-A500 CPU (CPU Modular Port)

Item		Setting on PLC	V7 Comm. Parameter Setting
Port		0	0
Baud rate		9600 bps	9600 bps*1
Parity		Odd	Odd
Transmission code	Data length	8	8
	Stop bit	1	1
Terminating resistance		ON for RS-422	–

*1 For signal level RS-422, baud rate is fixed to 9600 bps.

Mistubishi A Series Link (Link Unit KZ-L10)

Item		Setting on PLC	V7 Comm. Parameter Setting
Port		0	0
Baud rate		19200 bps	19200 bps
Parity		Even	Even
Transmission code	Data length	7	7
	Stop bit	1	1
Terminating resistance		ON for RS-422	–

Set the port with the port setting switch, the terminating resistance with terminator, and the baud rate/data bit/parity/stop bit with SET B DIP switches. For more information, refer to the instruction manual for KZ-L10.

KZ/KV Series CPU / KV-700 CPU

Communication parameters for the V7 series are automatically set.

KZ24/300 CPU

Item		Setting on PLC	V7 Comm. Parameter Setting
Port		0	0
Baud rate		38400 bps	38400 bps ^{*1}
Parity		Even	—
Transmission code	Data length	8	—
	Stop bit	1	—
Terminating resistance		—	—

*1 Maximum baud rate available is 38400 bps. If a higher baud rate is selected, communications are performed at 9600 bps.

KV10/24 CPU

Item		Setting on PLC	V7 Comm. Parameter Setting
Port		0	0
Baud rate		57600 bps	57600 bps ^{*1}
Parity		Even	—
Transmission code	Data length	8	—
	Stop bit	1	—
Terminating resistance		—	—

*1 Maximum baud rate available is 57600 bps. If a higher baud rate is selected, communications are performed at 9600 bps.

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

KZ Series Link

Memory		TYPE	Remarks
DM	(data memory)	0	
CH	(input/output relay)	1	

KZ-A500 CPU, MITSUBISHI A Series Link

Memory	TYPE	Remarks
D (data register)	0	
W (link register)	1	
R (file register)	2	
TN (timer/current value)	3	
CN (counter/current value)	4	
M (internal relay)	6	
L (latch relay)	7	
B (link relay)	8	
X (input relay)	9	
Y (output relay)	10	
TS (timer/contact)	11	
TC (timer/coil)	12	
CS (counter/contact)	13	
CC (counter/coil)	14	

KZ/KV Series CPU, KZ24/300 CPU, KV10/24 CPU, KV-700 CPU

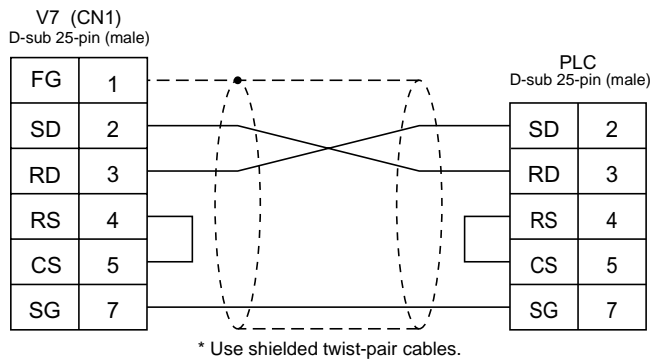
Memory	TYPE	Remarks
DM (data memory)	0	
CH (input/output relay)	1	
TC (timer/current value)	2	
CC (counter/current value)	3	
TS (timer/set value)	4	
CS (counter/set value)	5	
T (timer/contact)	6	
C (counter/contact)	7	
TM (temporary data memory)	8	
CTH (high-speed counter/current value)	9	KV700 only
CTC (high-speed counter comparator/setting value)	10	KV700 only
CT (high-speed counter comparator/contact)	11	KV700 only
CR control relay	12	KV700 only
CM control relay	13	KV700 only

Wiring

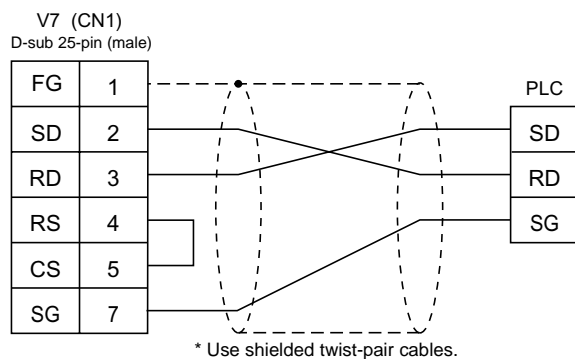
Wiring diagrams with the PLC are shown below.

RS-232C

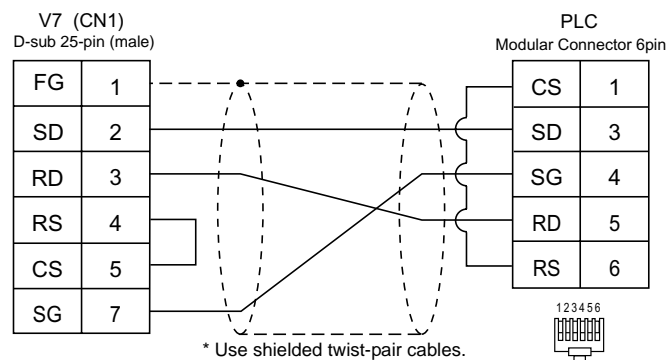
Wiring Diagram 1



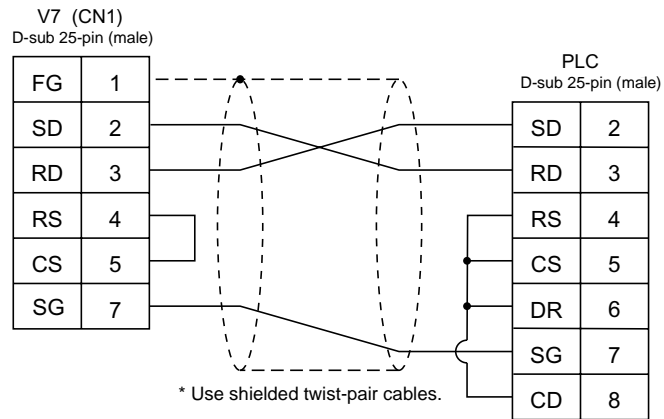
Wiring Diagram 2



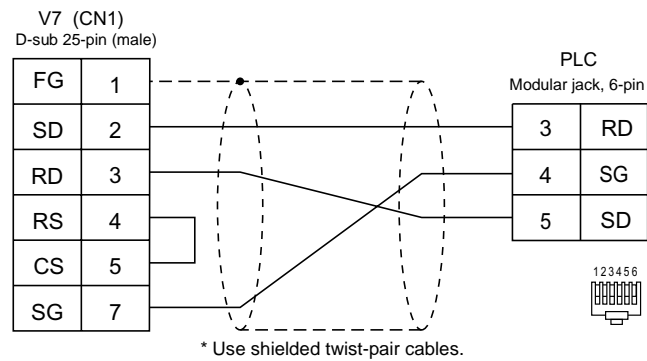
Wiring Diagram 3



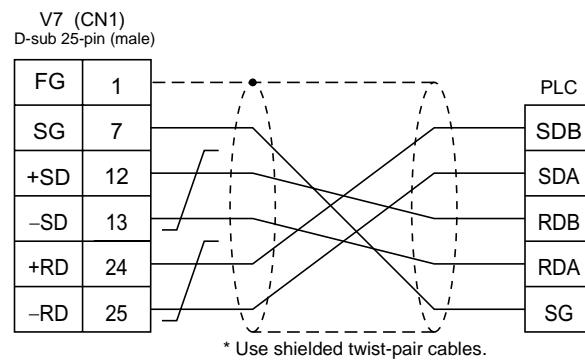
Wiring Diagram 4



Wiring Diagram 5

**RS-422**

Wiring Diagram 6



19. LG PLC

Available PLCs

Select PLC Type	PLC	Connection
MASTER-K10/60/200	K10/60/200	RS-232C [Wiring Diagram 1]
MASTER-K500/1000	K500/1000	RS-232C [Wiring Diagram 2] RS-422 [Wiring Diagram 5]
MASTER-KxxxS	K200S/K300S/K1000S CPU port	RS-232C [Wiring Diagram 3]
MASTER-KxxxS CNET	K4F-CUEA	RS-232C [Wiring Diagram 4]
GLOFA CNET	G4L-CUEA	RS-422 [Wiring Diagram 6]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

MASTER-K10/60/200

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	9600 bps (fixed)	—
Parity	None (fixed)	—
Transmission code	Data length	8 (fixed)
	Stop bit	1 (fixed)

MASTER-K500/1000

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	19200 bps ^{*1}	19200 bps
Parity	None (fixed)	—
Transmission code	Data length	8 (fixed)
	Stop bit	1 (fixed)

^{*1} For signal level RS-422, baud rate is fixed to 9600 bps.

MASTER-KxxxS

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		38400 bps	38400 bps
Parity		None (fixed)	–
Transmission code	Data length	8 (fixed)	–
	Stop bit	1 (fixed)	–

MASTER-KxxxS CNET / GLOFA CNET

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		38400 bps	38400 bps
Parity		Not provided	Not provided
Transmission code	Data length	8	8
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

MASTER-K10/60/200

Memory		TYPE	Remarks
D	(data register)	0	
M	(auxiliary relay)	1	
P	(input/output relay)	2	Input: Read only
K	(keep relay)	3	
TC	(timer/current value)	4	
CC	(counter/current value)	5	
TS	(timer/set value)	6	
CS	(counter/set value)	7	

MASTER-K500/1000

Memory	TYPE	Remarks
P (input/output relay)	0	Input: Read only
M (relay)	1	
L (link relay)	2	
K (keep relay)	3	
F (special relay)	4	Read only
T (timer/current value)	5	
C (counter/set value)	6	
D (data register)	7	

MASTER-KxxxS

Memory	TYPE	Remarks
P (input/output relay)	0	Input: Read only
M (auxiliary relay)	1	
L (link relay)	2	
K (keep relay)	3	
F (special relay)	4	Read only
T (timer/current value)	5	
C (counter/set value)	6	
D (data register)	7	
TC (timer/contact)	9	
CC (counter/contact)	10	

MASTER-KxxxS CNET

Memory	TYPE	Remarks
P (input/output relay)	0	PW as word device, input: read only
M (auxiliary relay)	1	MW as word device
L (link relay)	2	LW as word device
K (keep relay)	3	KW as word device
F (special relay)	4	FW as word device, read only
T (timer/current value)	5	
C (counter/setting value)	6	
D (data register)	7	
TC (timer/contact)	9	
CC (counter/contact)	10	

GLOFA CNET

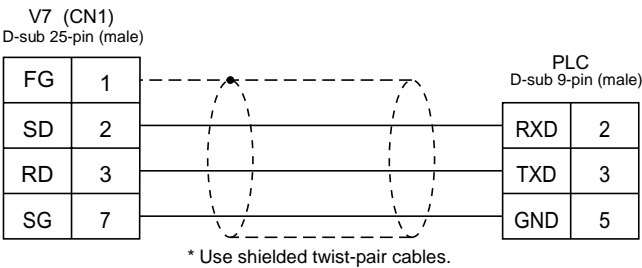
Memory		TYPE	Remarks
M	(internal memory)	0	MW as word device
Q	(output)	1	QW as word device
I	(input)	2	IW as word device

Wiring

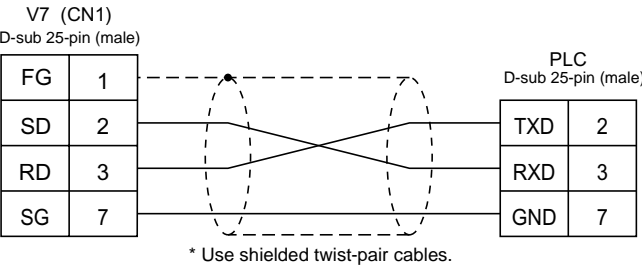
Wiring diagrams with the PLC are shown below.

RS-232C

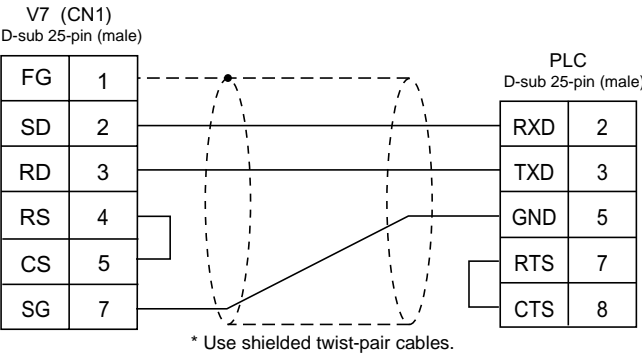
Wiring Diagram 1



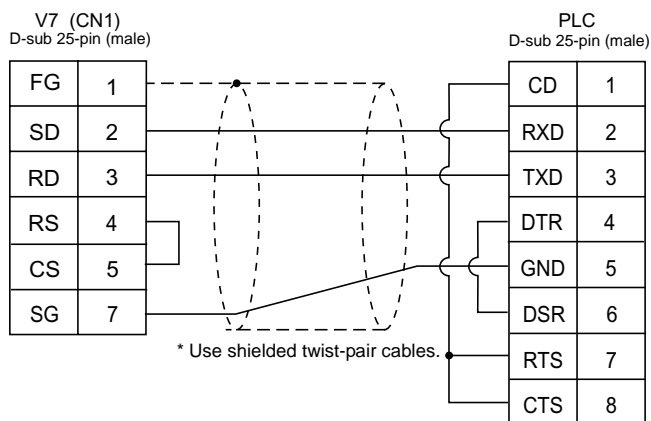
Wiring Diagram 2



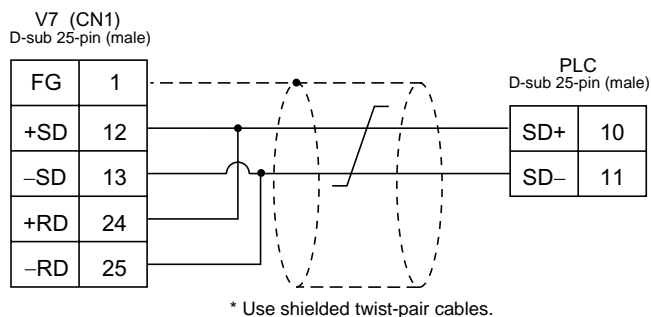
Wiring Diagram 3



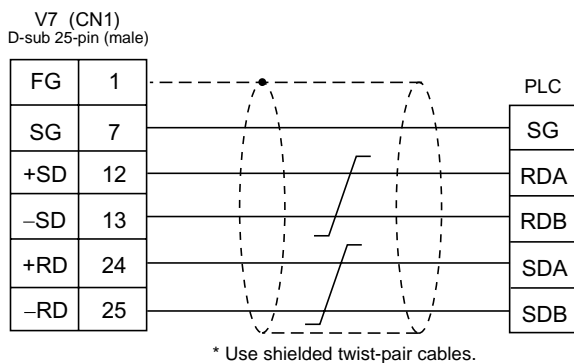
Wiring Diagram 4

**RS-422**

Wiring Diagram 5



Wiring Diagram 6



20. FANUC PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
Power Mate	Power Mate-Model H/D	Port on the CPU unit (JD14)	RS-422 [Wiring Diagram 2]
	Power Mate i Model H/D	JD42	RS-232C [Wiring Diagram 1]
		JD40	RS-422 [Wiring Diagram 3]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps (fixed)	—
Port		0 (fixed)	—
Parity		Even (fixed)	—
Transmission code	Data length	8 (fixed)	—
	Stop bit	1 (fixed)	—

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

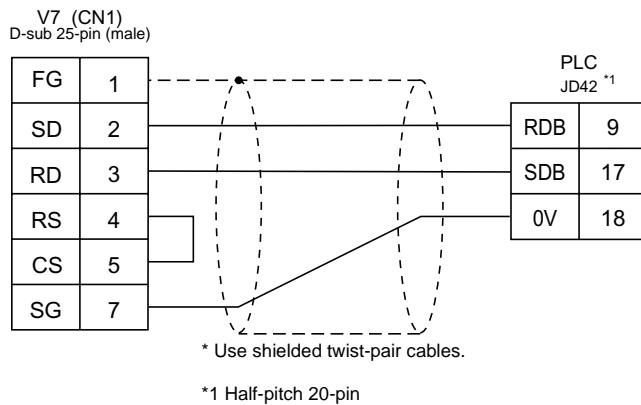
Memory		TYPE	Remarks
D	(data table)	0	
X	(input relay)	1	WX as word device
Y	(output relay)	2	WY as word device
R	(internal relay)	3	WR as word device
K	(keep relay)	4	WK as word device
T	(timer)	5	
C	(counter)	6	

Wiring

Wiring diagrams with the PLC are shown below.

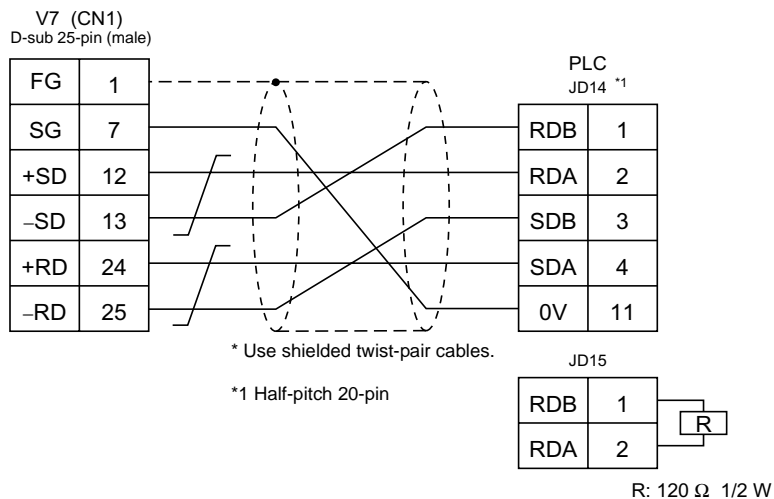
RS-232C

Wiring Diagram 1

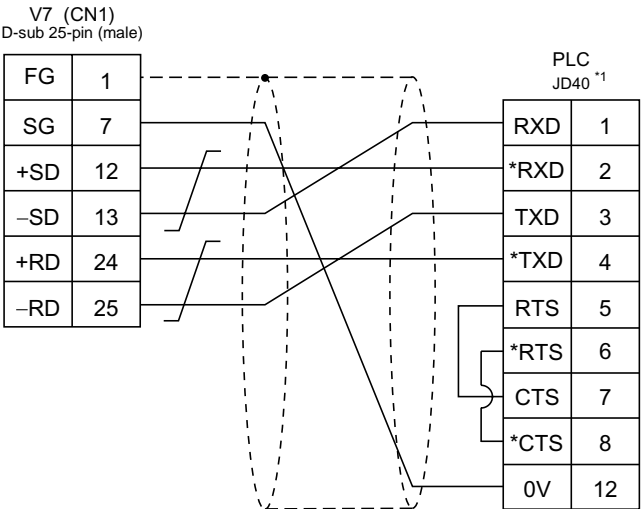


RS-422

Wiring Diagram 2



Wiring Diagram 3



* Use shielded twist-pair cables.

*1 Half-pitch 20-pin

21. FATEK AUTOMATION PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
FACON FB series	FACON FB series	FB-DTBR	RS-232 [Wiring Diagram 1] [Wiring Diagram 2] RS-422 [Wiring Diagram 3]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item	Setting on PLC	V7 Comm. Parameter Setting
Baud rate	9600 bps	9600 bps
Parity	Even (fixed)	–
Transmission code	Data length	7 (fixed)
	Stop bit	1 (fixed)

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

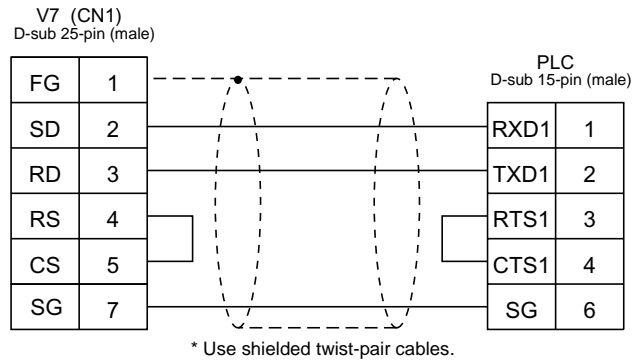
Memory	TYPE	Remarks
HR (data register)	0	
DR (data register)	1	
X (input relay)	2	
Y (output relay)	3	
M (internal relay)	4	
S (step relay)	5	
T (timer contact)	6	Read only
C (counter contact)	7	Read only
RT (timer/current value)	8	
RC (counter/current value)	9	
DRC (32-bit counter/current value)	10	

Wiring

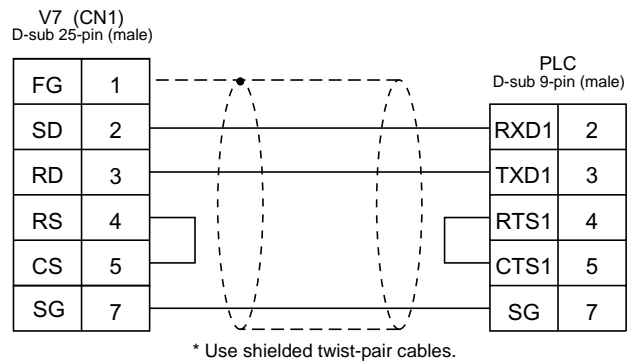
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

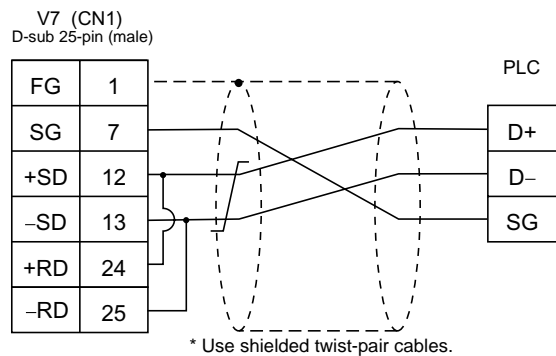


Wiring Diagram 2



RS-422

Wiring Diagram 3



22. IDEC PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
MICRO3	MICRO3	Loader port	RS-232C IDEC cable "FC2A-KC1" or IDEC cable "FC2A-KC2"* + [Wiring Diagram 1]

* When using RS-232C cable "FC2A-KC2" made by IDEC, connect the cable shown in [Wiring Diagram 3] to the D-sub 9-pin side of the FC2A-KC2 cable for communications with the V7 series.

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length	7	7
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

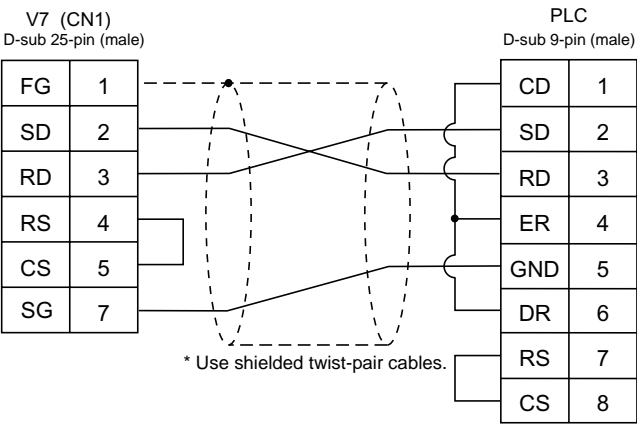
Memory		TYPE	Remarks
D	(data register)	0	
I	(input)	1	
Q	(output)	2	
M	(internal relay)	3	
R	(shift register)	4	
TS	(timer/set value)	5	
TN	(timer/enumerated value)	6	
T	(timer/contact)	7	Read only
CS	(counter/set value)	8	
CN	(counter/enumerated value)	9	
C	(counter/contact)	10	Read only

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



23. MODICON PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
Modbus RTU	Modbus RTU	Modbus	RS-232C [Wiring Diagram 1]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length	8	8
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

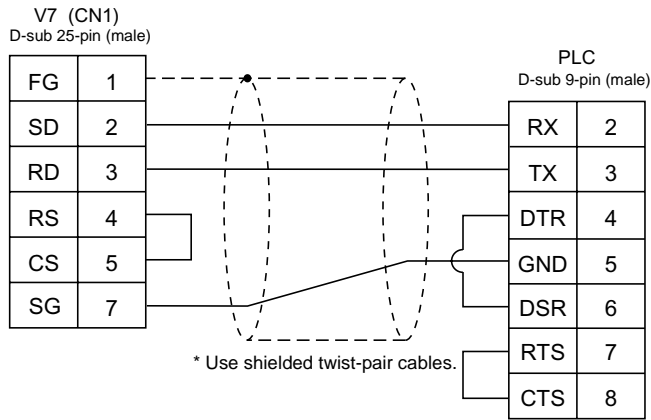
Memory		TYPE	Remarks
4	(holding register)	0	
3	(input register)	1	
0	(output coil)	4	
1	(input relay)	6	Read only

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



24. YAMATAKE PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
MX series	MX200/MX50	ASCII connector	RS-232C [Wiring Diagram 1]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Port		1	1
Parity		Even	Even
Transmission code	Data length	8	8
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

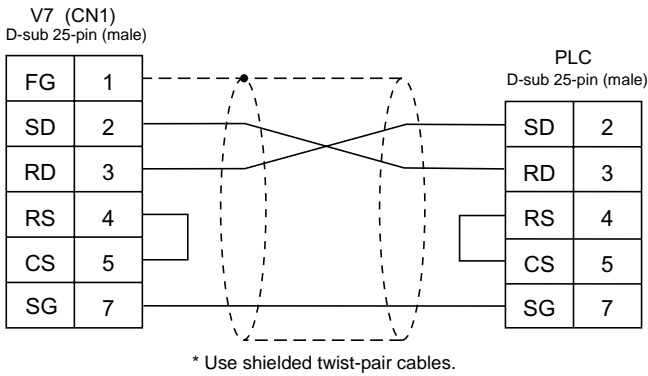
Memory		TYPE	Remarks
R	(data register)	0	
M	(auxiliary relay)	1	
L	(latch relay)	2	
X	(input relay)	3	
Y	(output relay)	4	
TP	(timer/current value)	5	
TS	(timer/setting value)	6	
CP	(counter/current value)	7	
CS	(counter/set value)	8	
T	(timer/contact)	9	
C	(counter/contact)	10	
P	(link register)	11	

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



25. TAIAN PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
TP02	TP02	Communication Port (T/R+, T/R-)	RS-422 [Wiring Diagram 1]
		MMI Port (9pin) (4-5 Short Computer Link Mode)	RS-422 [Wiring Diagram 2]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		1	1
Parity		Not provided	Not provided
Transmission code	Data length	7	7
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

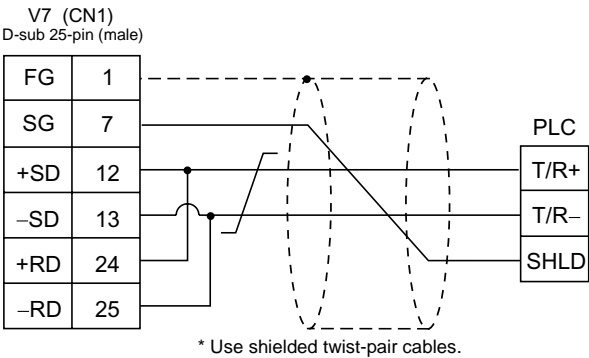
Memory		TYPE	Remarks
D	(data register timer•counter/contact)	0	
V	(timer•counter/contact)	1	
WS	(system register)	2	
WC	(constant register)	3	
X	(input relay)	4	
Y	(output relay)	5	
C	(internal relay)	6	
SC	(special register)	7	

Wiring

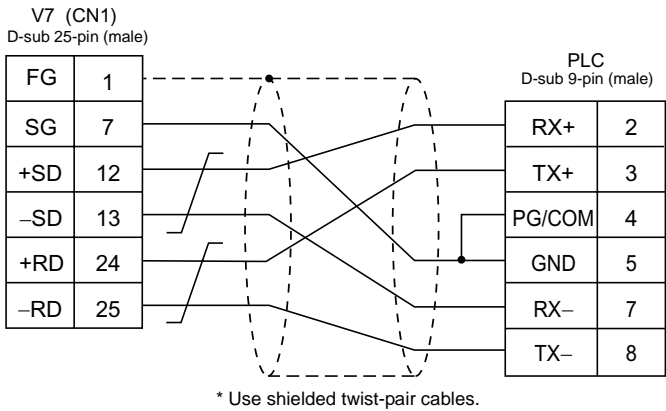
Wiring diagrams with the PLC are shown below.

RS-422

Wiring Diagram 1



Wiring Diagram 2



26. SAIA PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
PCD	PCD1	PGU port	RS-232C [Wiring Diagram 1]
		PCD7.F120	RS-232C [Wiring Diagram 2]
		PCD4.F110	RS-485 [Wiring Diagram 3]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		0	1
Transmission code	Data length	8	8
	Stop bit	1	1

S-BUS Configuration

S-BUS Mode Parity
GU Port Number 0 (PGU port), 1 (PCD7.F120, PCD4.F110)

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

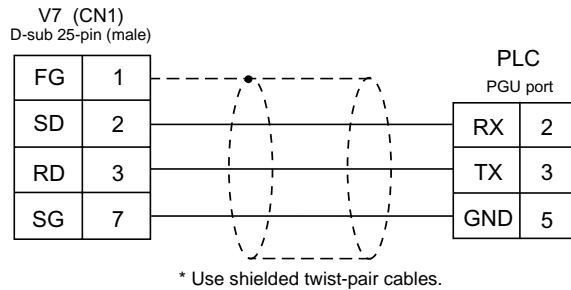
Memory		TYPE	Remarks
R	(register word)	0	
Rfp	(float)	1	
T	(timer-counter word)	2	
C	(timer-counter coil)	3	
I	(input bit)	4	read only
O	(output bit)	5	
F	(flag bit)	6	

Wiring

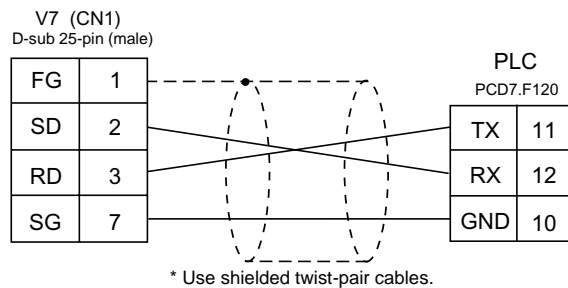
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

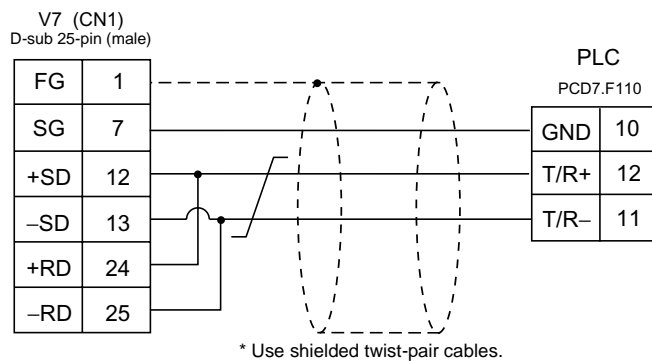


Wiring Diagram 2



RS-485

Wiring Diagram 3



27. MOELLER PLC

Available PLCs

Select PLC Type	PLC	Connection
PS4	PS4-201-MM1 (PRG port)	RS-232C [Wiring Diagram 1] + ZB4-303-KB1 Cable made by MOELLER

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Port		1	1
Parity		Not provided	Not provided
Transmission code	Data length	8	8
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

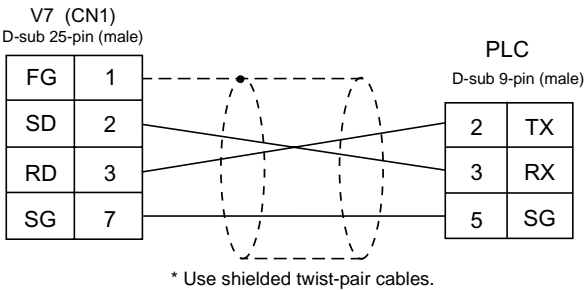
Memory		TYPE	Remarks
M	(marker)	0	MW as word device

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



28. Telemecanique PLC

Available PLCs

Select PLC Type	PLC	Connection
TSX Micro	TSX Micro	RS-485 [Wiring Diagram 1]

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Connection		–	Multi-Link (fixed)
Parity		Odd	Odd
Transmission code	Data length	8 (fixed)	8
	Stop bit	1	1

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

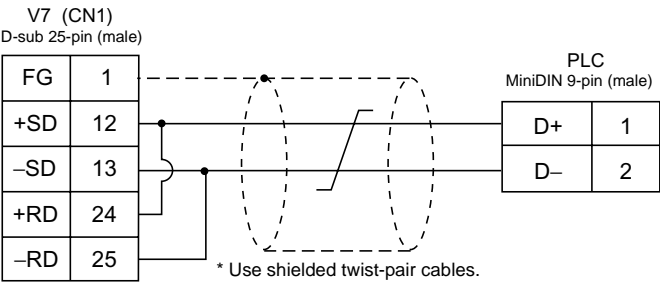
Memory		TYPE	Remarks
MW	(memory word)	0	
KW	(constant word)	1	
M	(bit memory)	2	

Wiring

Wiring diagrams with the PLC are shown below.

RS-485

Wiring Diagram 1



29. Automationdirect PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection
Direct LOGIC	D4-430 D4-440	Port 1 on a CPU unit	RS-232C [Wiring Diagram 1] RS-422 [Wiring Diagram 5]
	D4-450	Port 3 on a CPU unit	RS-485 [Wiring Diagram 6]
		Port 2 on a CPU unit	RS-232C [Wiring Diagram 2]
	D2-240	Port 2 on a CPU unit	RS-232C [Wiring Diagram 3]
	D2-250	Port 2 on a CPU unit	
Direct LOGIC (K-Sequence)	D4-430 D4-440	Port 1 on a CPU unit	RS-232C [Wiring Diagram 1] RS-422 [Wiring Diagram 5]
	D4-450	Port 0 on a CPU unit	RS-232C [Wiring Diagram 4]
		Port 3 on a CPU unit	RS-485 [Wiring Diagram 6]
		Port 2 on a CPU unit	RS-232C [Wiring Diagram 2]
	D2-240	Port 1 on a CPU unit	
		Port 2 on a CPU unit	
	D2-250	Port 1 on a CPU unit	RS-232C [Wiring Diagram 3]
		Port 2 on a CPU unit	

Communication Setting

The recommended communication parameter settings of the PLC and the V7 series is as follows:

Item		Setting on PLC	V7 Comm. Parameter Setting
Baud rate		19200 bps	19200 bps
Port		"0" for ×10, "1" for ×1	1
Parity		Odd	Odd
Transmission code	Data length	8	8
	Stop bit	1	1
Function		Host link system (fixed)	—
Response delay time		0 (fixed)	—
Time-out		None (fixed)	—
ASCII/HEX		HEX (fixed)	—

Available Memory

The available memory setting range varies depending on the PLC model. Be sure to set within the range available with the PLC to be used. Use [TYPE] when assigning the indirect memory for macro programs.

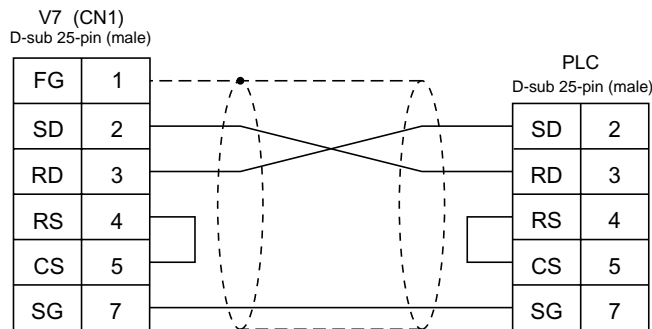
Memory		TYPE	Remarks
V	(data register)	0	
X	(input relay)	1	
Y	(output relay)	2	
C	(internal relay)	3	
S	(stage)	4	
GX	(global inputs)	5	
GY	(global outputs)	6	
T	(timer/contact)	7	
CT	(counter/contact)	8	

Wiring

Wiring diagrams with the PLC are shown below.

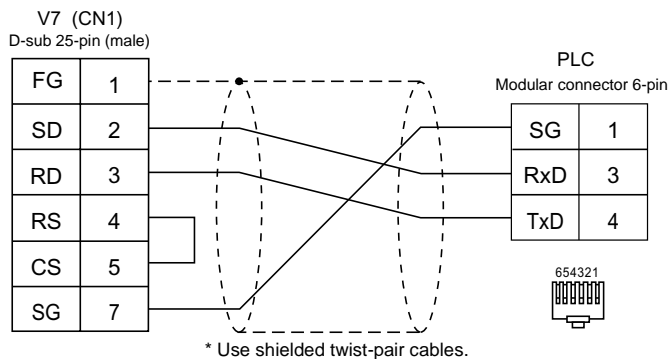
RS-232C

Wiring Diagram 1

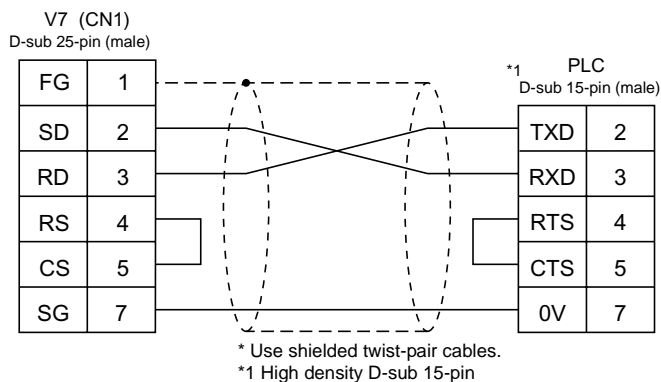


* Use shielded twist-pair cables.

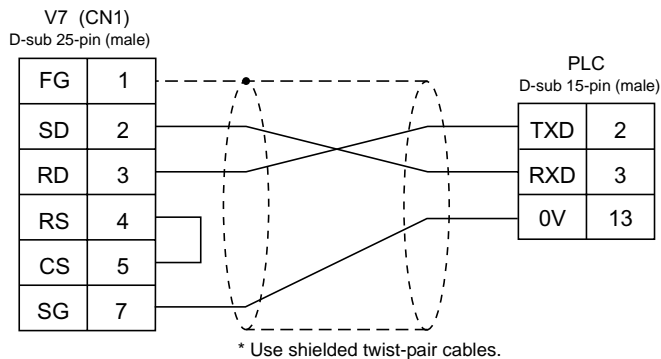
Wiring Diagram 2



Wiring Diagram 3

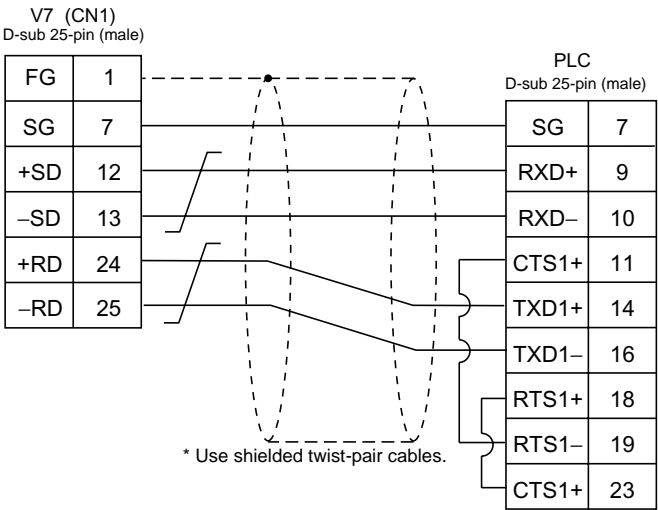


Wiring Diagram 4

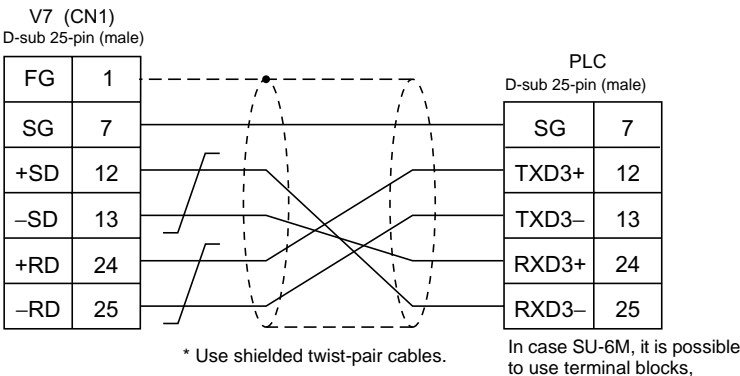


RS-422

Wiring Diagram 5

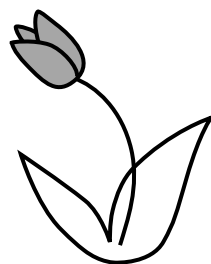


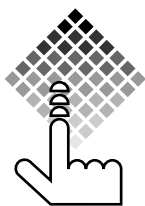
Wiring Diagram 6



MEMO

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**MONITOUCH
V7**

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