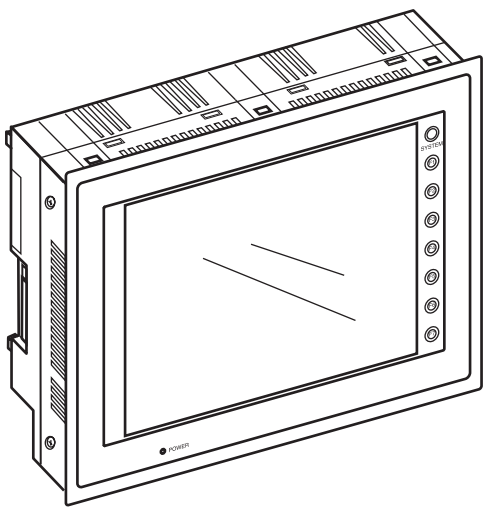
SHARP®

Version 2.0
Produced in Sep. 2005

LCD Control Terminal

ZM-300 Series

User's Manual



Thank you for purchasing the LCD Control Terminal ZM-300 series. Please read the instruction manual carefully, and operate the product with full understanding of its functions and operation methods.

For the details of each LCD Control Terminal functions or the panel editing methods, please refer to the instruction manual for the screen edit software.

Note

To make image data for ZM-300 series, use ZM-71S ver.2.0.0.0 or a newer version. (When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.)

- ZM-71SE
  - Instruction Manual (Function)
  - User's Manualt (Operation)

Classification of ZM-300 series

• In this user's manual, ZM-300 series are referred as follows.

Expression in this manual(series name)		LCD Control Terminal model name
ZM-300	ZM-350	ZM-352D
	ZM-360	ZM-362S, ZM-362SA
	ZM-370	ZM-371T, ZM-371TA, ZM-371S, ZM-371SA, ZM-371TL
		ZM-372T, ZM-372TA, ZM-372S, ZM-372SA
		ZM-373TA, ZM-373TL
	ZM-380	ZM-381S, ZM-381SA
		ZM-382S, ZM-382SA
		ZM-383S, ZM-383SA

Precautions

- When you plan to use SHARP LCD Control Terminal (hereafter referred to as "ZMs"), you are requested to design each system so that even if a fault or malfunction occurs within the ZM, it will not lead to a serious accident in your system. You should incorporate back-up measures and fail-safe features in your system that will thoroughly protect your system from malfunctions if a fault or error occurs in the ZM.
- SHARP ZMs are designed and manufactured with the idea that they will be used in general applications in ordinary industries. Therefore, they must not be used in specific applications that can affect the health or safety of the public, such as nuclear power plants and other power generating plants. Such applications require a special warranty of quality that SHARP explicitly does NOT offer for these ZMs. However, if a user will certify that he/she does not requires a special quality warranty on the ZM, and will limit the use of the ZM to non critical areas of these applications, SHARP will agree to such use.
  If you are planning to use SHARP ZMs for applications that may affect the lives of human beings and property, and you need particularly high reliability performance, such as in the fields of aviation, medicine, transportation, combustion and fuel processing equipment, passenger cars, amusement park rides, and safety equipment, please contact our sales division so that we can confirm the required specifications.

Note

- We have created this instruction manual carefully, but in case you have some doubts or comments on this manual, please contact the affiliated store where you bought this product or directly to our company.
- It is forbidden to copy the content materials of this book, neither partially nor fully.
- Please understand that the content of this manual may be altered for amelioration without any notifications.

Safety Precautions

Read this user's manual and attached documents carefully before installation, operation, maintenance and checking in order to use the machine correctly. Understand all of the machine knowledge, safety information, and cautions before starting to use. In this user's manual, safety precautions are ranked into "danger" and "caution" as follows.

Danger : Wrong handling may possibly lead to death or heavy injury.

Caution : Wrong handling may possibly lead to medium or light injury.

Even in the case of Caution , a serious result may be experienced depending on the circumstances. Anyway, important points are mentioned. Be sure to observe them strictly.

1) Installation

Caution

- Use in the environments specified in the catalog, instruction manual, and user's manual.
  Electric shock, fire or malfunction may be caused when used in the environments of high temperature, high humidity, dusty or corrosive atmosphere, vibration or impact.
- Install according to the instruction manual and user's manual.
  Wrong installation may cause drop, trouble or malfunction.
- Never admit wire chips or foreign matter
  Or fire, trouble or malfunction may be caused.

2) Wiring

Compel

- Be sure to ground.
  Unless grounded, electric shock or malfunction may be caused.

Caution

- Connect the rated power source.
  Connection of a wrong power source may cause a fire.
- Wiring should be done by qualified electrician.
  Wrong wiring may lead to fire, trouble or electric shock.

3) Use

Danger

- Don't touch the terminal while the power is being supplied or you may have on electric shock.
- Assemble the emergency stop circuit and interlock circuit outside of the ZM-300. Otherwise breakdown or accident damage of the machine may be caused by the trouble of the ZM-300.

4) Maintenance

Danger

- ZM-300 is equipped with a lithium battery. Lithium batteries cantain combustible material such as lithium or organic solvent. Mishandling may cause heat, explosion or ignition resulting in fire or injury.

Prohibit

- Don't disassemble or modify the modules. Or fire, breakdown or malfunction may be caused.

Handling Precautions

(1) Precautions for installation locations and environment

Do not install the ZM-300 in the following conditions:

- Exposure to corrosive gas, flammable gas, solvent, grinding liquid vapor location.
- Dust, salt, iron powder location. • Direct sunlight.

(2) Installation

Secure operability, ease of maintenance, durability in harsh installation environment.
Maintain surrounding temperature within the specified operation temperature.

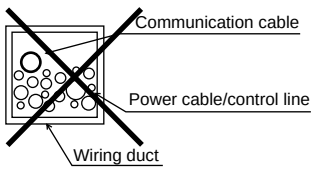
- Provide enough space for ventilation.
- Do not install above thermal generating equipment such as heaters, transformers, or large capacity resistance.
- Do not install the control terminal in a board where high voltage equipment is installed.
- Install the control terminal farther than 200 mm away from high voltage lines and power lines.

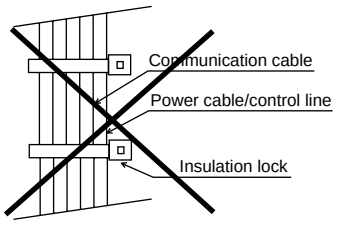
(3) Handling

- Provide an emergency shut off circuit at external relay circuit. Never rely on the switch alone to ensure safety of personnel.
- Do not jar the module by striking, dropping as mis operation may occur.
- The display surface of the control terminal may be damaged. Do not operate or scratch the display with an end shaped object such as a ball point pen. It may cause malfunction.
- Be sure to lock each connector of connection cables and check condition before putting ON power. In an extremely dry area, large amounts of static electricity may be generated in a person. Before touching the module, discharge any static electricity by first touching a grounded metallic object.
- To clean the module, use soft and dry cloth. Do not use volatile liquid such as alcohol or thinner, or a wet cloth as these may deformity or color change.

(4) Wiring

1. Wiring of the power line
   Supply power with allowable power voltage fluctuation range.
   Use noiseless power between lines and between line and ground.
   Do not run 100 VAC line and 24 VDC lines near by high voltage and large current cable lines.
2. Wiring of ground line
   Provide an exclusive ground line.
   Common connection of the ground line with other equipments's ground or a frame of building may cause negative effect.
3. Wiring of the communication cable
   Do not run the communication cable with high voltage circuits.





- Do not run the communication line with high voltage lines in the same duct or bundle them together using insulation locks. It may cause inferior condition for noise preventive means.

(5) Coin type lithium battery (See page. 1-23 through 1-25)

- When using the calendar function or SRAM memory (for battery backup of sampling data or other data), make sure to set the battery.
  SRAM memory data or the contents of the calendar are not restored if the battery power is not supplied.

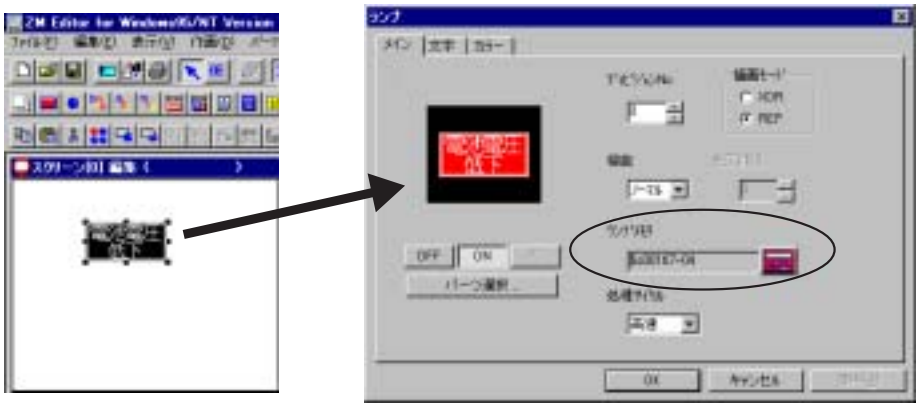
- A lithium battery has its expiration date. Expiration date is usually five years (at ambient temperature of 25℃). If the battery is used at high temperatures, however, the battery power may be lowered sooner. When using the battery for significant use such as setting data that is hard to recover once lost, be sure to set the alarm of the lower battery power and replace the battery when alarmed.

- Detection of lower battery power
  The internal system memory, $s167, of the ZM-300 series has a function that shows the battery condition. It is strongly recommended to build an indication lamp of lower battery power in your screen data.

[Settings]

To build an indication lamp in an abnormal screen made with ZM-71SE:

1. In the lamp parts settings, make an indication lamp whose character sequence reads "Lower Battery Power."
2. Select "$s167-04" for the lamp memory.
3. Put it in the appropriate screen. When the battery power is lowered, the indication lamp turns on.



Battery condition in the internal memory, $s167 (one word data)

MSB LSB

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	0	0	0

00 : normal power
01 : power lowered
02 : battery not inserted

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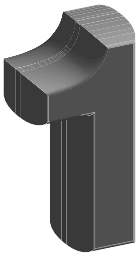


Hardware Specifications

1. Outline

The LCD Control Terminal ZM-300 series is programmable display equipment with the LCD screen and the touch panel functions.
The ZM-300 series programlessly communicates to a programmable controller (PLC), displays a screen in various ways based on the screen data, and allows you to input data through the touch panel.

Note To make screen data for the ZM-300 series, use ZM-71SE, Ver.2.0.0.0 or higher.(When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.)

The ZM-300 series inherits and heightens the features of the ZM-42 to 82 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 ZM-300 (high-performance) 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.
8. Matrix touch panel
   As for ZM-373TA/373TL or ZM-383S/383SA, 2-point touch is possible on the screen, allowing the models to have a broader range of applications.

2. Model Name and Peripheral Equipment

Model name of LCD Control Terminal

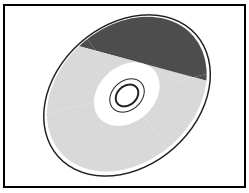
* Compliant with UL/CSA, CE

Series	Model name	Specifications
ZM-350 Series	ZM-352D	7.7 type STN color, 640×480 dots, standard, DC power supply, Analogue touch panel*
ZM-360 Series	ZM-362S	8.4 type TFT color, 800×600 dots, standard, DC power supply, Analogue touch panel*
	ZM-362SA	8.4 type TFT color, 800×600 dots, high-performance, DC power supply, Analogue touch panel*
ZM-370 Series	ZM-371T	10.4 type TFT color, 640×480 dots, standard, AC power supply, Analogue touch panel
	ZM-371TA	10.4 type TFT color, 640×480 dots, high-performance, AC power supply, Analogue touch panel
	ZM-372T	10.4 type TFT color, 640×480 dots, standard, DC power supply, Analogue touch panel*
	ZM-372TA	10.4 type TFT color, 640×480 dots, high-performance, DC power supply, Analogue touch panel*
	ZM-373TA	10.4 type TFT color, 640×480 dots, high-performance, AC power supply, Matrix touch panel
	ZM-371TL	10.4 type TFT color (128 colors), 640 ×480 dots, standard, AC power supply, Analogue touch panel
	ZM-373TL	10.4 type TFT color (128 colors), 640 ×480 dots, standard, AC power supply, Matrix touch panel
	ZM-371S	10.4 type TFT color, 800×600 dots, standard, AC power supply, Analogue touch panel
	ZM-371SA	10.4 type TFT color, 800×600 dots, high-performance, AC power supply, Analogue touch panel
	ZM-372S	10.4 type TFT color, 800×600 dots, standard, DC power supply, Analogue touch panel*
	ZM-372SA	10.4 type TFT color, 800×600 dots, high-performance, DC power supply, Analogue touch panel*
ZM-380 Series	ZM-381S	12.1 type TFT color, 800×600 dots, standard, AC power supply, Analogue touch panel
	ZM-381SA	12.1 type TFT color, 800×600 dots, high-performance, AC power supply, Analogue touch panel
	ZM-382S	12.1 type TFT color, 800×600 dots, standard, DC power supply, Analogue touch panel*
	ZM-382SA	12.1 type TFT color, 800×600 dots, high-performance, DC power supply, Analogue touch panel*
	ZM-383S	12.1 type TFT color, 800×600 dots, standard, AC power supply, Matrix touch panel
	ZM-383SA	12.1 type TFT color, 800×600 dots, high-performance, AC power supply, Matrix touch panel

Peripheral Equipment

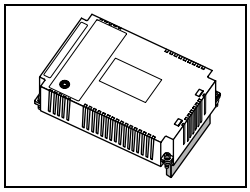
The following options are available for using the ZM-300 series more effectively

Product name	Model name	Use	
Option module	ZM-301EU	Video input + sound output module	
	ZM-302EU	RGB input + sound output module	
	ZM-303EU	RGB output + sound output module	
	ZM-304EU	Sound output module	
Network module	ZM-80NU	・The module to connect ZM-300 to Ethernet. It supports UDP/IP, corresponds to FA link protocol through FL-net and supports cyclic transmission and message transmission (word read/write). - ZM-80NU for Ethernet/FL-net (Ver.1.00) - ZM-80NU2 for Ethernet/FL-net (Ver.2.00) Note: You cannot use ZM-80NU and ZM-80NU2 on the same line.	
	ZM-80NU2		
Expansion memory	ZM-300EM	・A flash memory used to expand the memory capacity for screen data. Its capacity is 8MB	
	ZM-300SM	・An SRAM memory used to backup sampling data, internal memory, and memo pad. Its capacity is 512KB.	
Terminal converter	ZM-1TC	・Used to connect to a PLC at the RS-422/485 terminal block.	
Expansion I/O module	ZM-322ME	・Used as an external I/O module for PLC. Provides 16 input pins and 16 output pins.	
Card recorder	ZM-1REC	・Used for screen data backup or for recording of the memory manager function and the data logging function.	
2 ports adapter	ZM-1MD2	・The module to convert the connector for a programmer of MITSUBISHI's ACPU/QnACPU/FXCPU into a two-port connector.	
Screen data transfer cable	ZM-80C	・Used to connect ZM-300 to a personal computer or connect a personal computer to ZM-1REC.	
Printer cable	ZM-300PC	・Used to connect ZM-300 to a printer.	
Barcode reader connection cable	ZM-80BC	・Used to connect ZM-300 to a bar code reader.	
Multi-link 2 master cable	ZM-80MC	・Used to connect ZM-300 master station to the ZM-300 slave station in the Multi-link 2 connection.	
MJ-to-D-sub conversion cable	ZM-300CC	・Used to converts a Dsub 25-pin connector (millimeter screw type) into a modular jack.	
Installation adapter	ZM-300PD	・Used to attach ZM-370 to the panel cut of a preceding model (ZM-70T/70D).	
Screen edit software	ZM-71S	Japanese version	Used to make screen data (compliant with Windows95/98/NT4.0/Me/2000/XP). ZM-300 needs Ver.2.0.0.0 or higher version. (When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.)
	ZM-71SE	English version	



ZM-71SE (screen edit software: English version)

Application software for editing display data for the ZM series. (Windows95/98/NT4.0/Me/2000/XP compatible) The ZM-300 series is supported with ver. 2.00 and later.



ZM-30*EU (option module)

This option module can only be mounted on the ZM-300 (high-performance) model.

ZM-301EU → Video input + sound output module

Video images can be displayed on ZM-300 (high-performance) directly. WAV files can be played at an external speaker.

ZM-302EU→ RGB input + sound output module

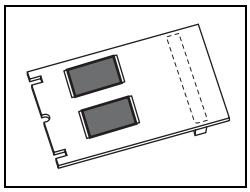
Screen images displayed on a CRT display can be shown on ZM-300 (high-performance). WAV files can be played at an external speaker.

ZM-303EU → RGB output + sound output module

Screen images displayed on ZM-300 (high-performance) can be shown on a CRT display. WAV files can be played at an external speaker.

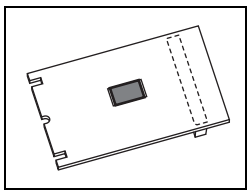
ZM-304EU → Sound output module

WAV files can be played at an external speaker.



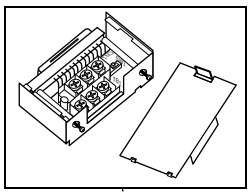
ZM-300EM (FLASH memory cassette)

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



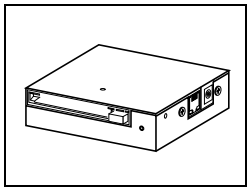
ZM-300EM (SRAM cassette)

Extension print circuit board to back-up the memory for sampling data, ZM-300 internal memory and memo pad. The capacity of an SRAM cassette is 512 Kbyte.



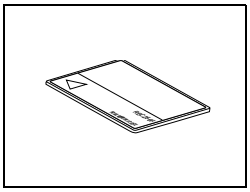
ZM-1TC (terminal converter)

Used for connection between the ZM-300 series and a PLC at the RS-422/485 terminal block.



ZM-1REC (card recorder)

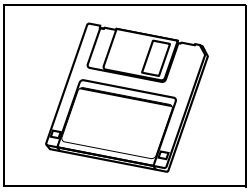
The card recorder creates a backup copy of screen data or works as an external memory storage system for memory manager and data logging functions.



Memory Card on the market compliant with JEIDA ver. 4.0

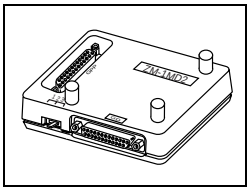
Used with the card recorder when having a backup copy of screen data or saving data on an external medium for memory manager and data logging functions.

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



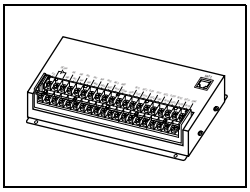
ZM-CARD SOFT (memory card editor)

Application software for editing data stored on a memory card. (Windows95/98/NT4.0/Me/2000/XP compatible)



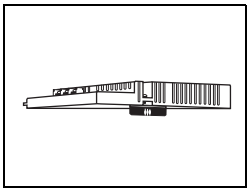
ZM-1MD2 (ACPU/QnACPU/FXCPU dual port interface)

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 ZM-300 series to the ACPU/QnACPU/FXCPU programmer.



ZM-322ME (expansion I/O module)

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

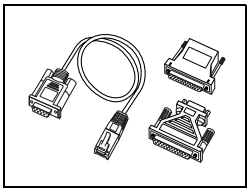


ZM-80NU, ZM-80NU2 (network module)

Used for communications with Ethernet and FL-net network.

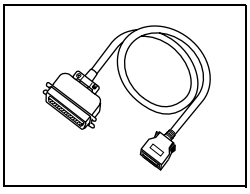
- ZM-80NU : Ethernet/FL-net (Ver.1.00)
- ZM-80NU2 : Ethernet/FL-net (Ver.2.00)

This unit enables connection of multiple ZM-300 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. About the ZM-80NU/80NU2 in detail, see the "ZM-80NU/80NU2 User's Manual"



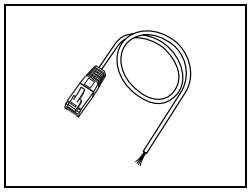
ZM-80C (screen data transfer cable) 3 m

Used for connection between the ZM-300 series and a personal computer, or a personal computer and the card recorder (ZM-1REC).



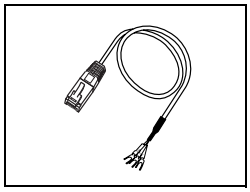
ZM-300PC (printer cable) 2.5 m

Used for connection between the ZM-300 series and a printer.



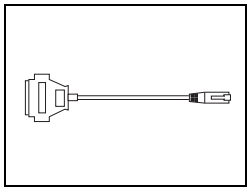
ZM-80BC (barcode reader connection cable) 3 m

Used for connection between the ZM-300 series and a barcode reader.



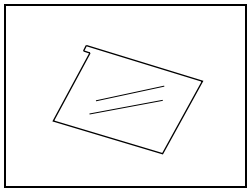
ZM-80MC (multi-link 2 master cable) 3 m

Used for Multi-Link 2 connection between the ZM-300 master station and the ZM-300 slave station.



ZM-300CC (MJ-to-D-sub conversion cable) 0.3 m

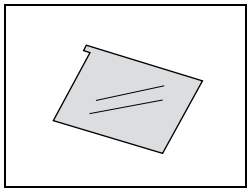
Used for connection between the ZM-300 series and a PLC via PLC2Way.



ZM-361GS/371GS/381GS (protective sheet)

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

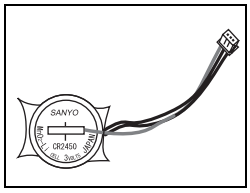
- ZM-361GS : For ZM-350/360 Series
- ZM-371GS : For ZM-370 Series
- ZM-381GS : For ZM-380 Series



ZM-362GS/372GS/382GS (protective sheet)

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

- ZM-362GS : For ZM-350/360 Series
- ZM-372GS : For ZM-370 Series
- ZM-382GS : For ZM-380 Series

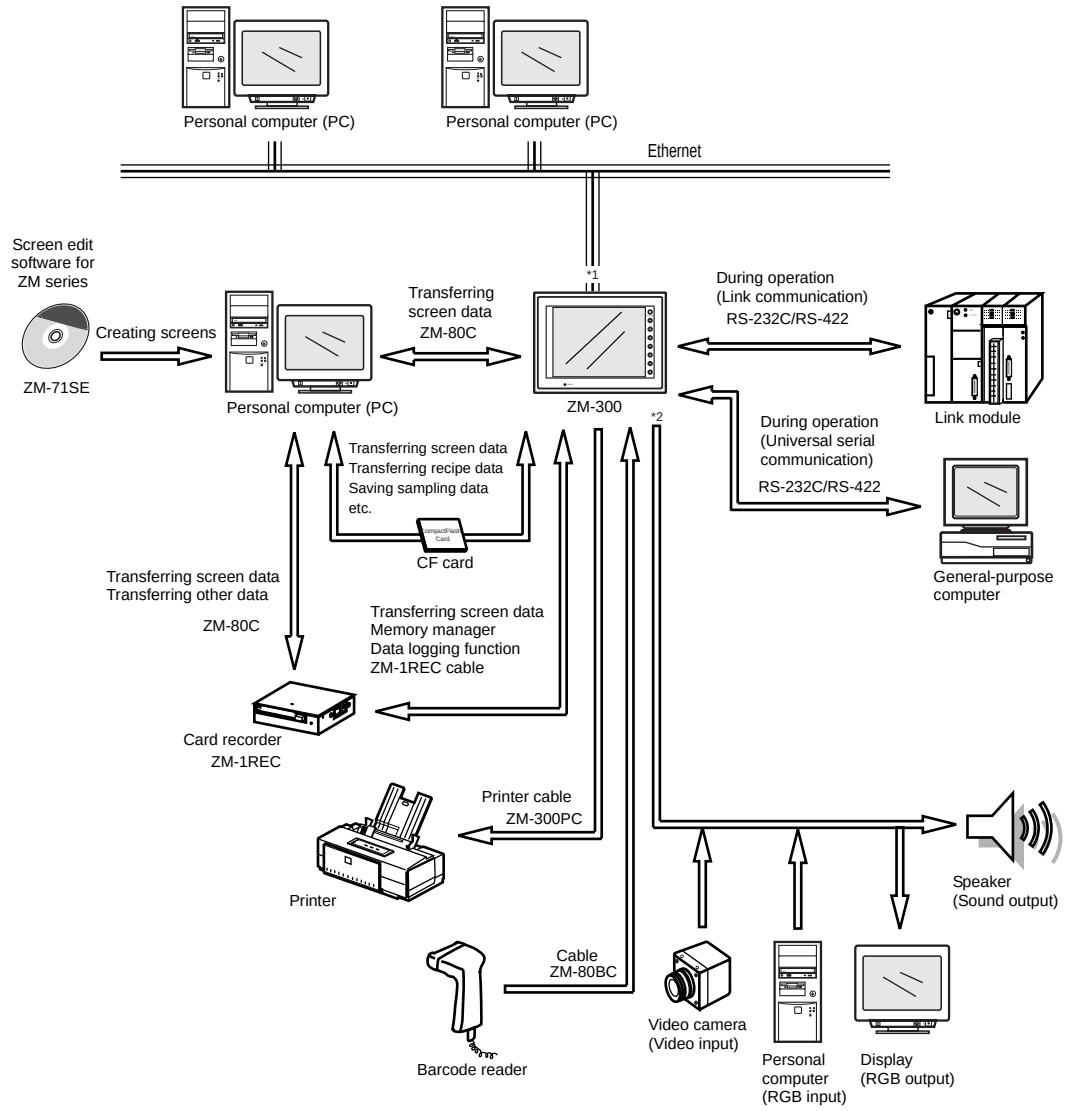


ZM-300BT (battery for replacement)

Replacement lithium battery for the ZM-300 series.

3. System Composition

The following illustration shows possible system configurations using the ZM-300 series.



*1 High-performance models (ZM-3***A) are equipped with the Ethernet connector.
*2 The option module (ZM-30*EU) is required.

4. Specifications

General Specifications

Item		Model	ZM-350/360		ZM-370		ZM-380	
			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)		ZM-350 15 W or less	ZM-360 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 When the mounting angle is between 15° and 45° or when you use the option module, ZM-301EU (video input and audio output), adjust the ambient temperature between 0°C and +40°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: 10 to 150 Hz, Acceleration: 9.8 m/s^2 (1.0G) Single amplitude: 0.075 mm, X, Y, Z: 3 directions for one hour					
	Shock Resistance		Pulse shape: Sine half wave Peak acceleration: 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: front panel compliant with IP65 (when using gasket) rear case: compliant with IP20 Form: in a body Mounting procedure: inserted in a mounting panel					
	Cooling System		Cooling naturally					
	Weight (kg)		Unit: approx. 1.5		Unit: approx. 2.4 (As for ZM-373TA/TL, about 2.8kg)		Unit: approx. 2.7 (As for ZM-383S/SA, about 3.2kg)	
	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)					
Accessories			Four mounting brackets, one instruction manual					

Display Specifications

Item \ Model	ZM-352D	ZM-362S/SA	ZM-37*TL	ZM-37*T/TA	ZM-37*S/SA	ZM-38*S/SA
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	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	220	350	280	350
Contrast Ratio	25 : 1	250 : 1	350 : 1	300 : 1	300 : 1	350 : 1
Angle of Vertical Visibility (°)	+40, –30	+35, –55	+30, –20	+45, –55	+35, –45	+40, –45
Angle of Horizontal Visibility (°)	±50	±50	±45	±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

• Analogue type

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

• Matrix type

Item	Specifications
Method	Matrix resistance sensitive system
Switches	ZM-373TA/TL : 40 (W) x 24 (H) ZM-383S/SA : 50 (W) x 30 (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) ZM-1REC, Barcode, ZM-322ME, Multi-link 2, PLC2Way, ZM-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™
10BASE-T for Ethernet Connection (Standard with ZM-300 high performance)	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
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: ZM-71SE (Ver. 2.00 and later) * Personal computer: Pentium II 450 MHz or above recommended OS: Windows95/98/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

* When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.

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: 8 × 8 dots 1-byte: 8 × 16 dots 2-byte: 16 × 16 dots or 32 × 32 dots Enlarge: 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 (ZM-352D, ZM-371TL/373TL : 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 (ZM-352D, ZM-371TL/373TL : 128 colors + blink 16 colors) Color selection: Foreground, background, boundary (line)				

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
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

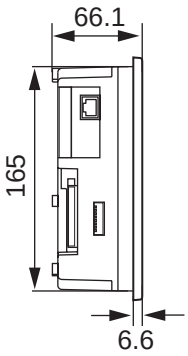
*1 The number of setting memory locations is limited to 1024 per screen.
*2 Layer: 4 per screen (base + 3 overlaps)

5. Dimensions and Panel Cut-out

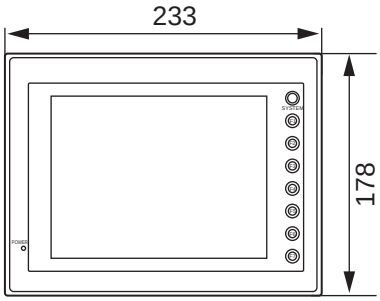
ZM-350/360 Series External View and Dimensions

(Unit: mm)

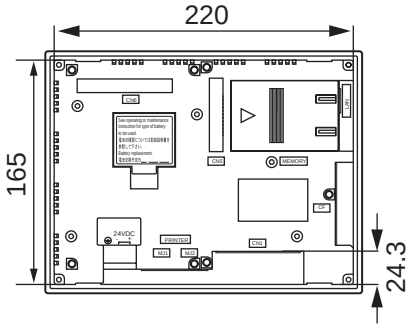
- Side View



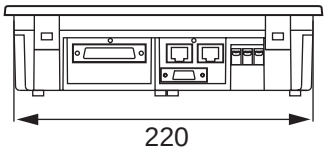
- Front View



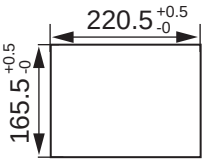
- Rear View



- Bottom View



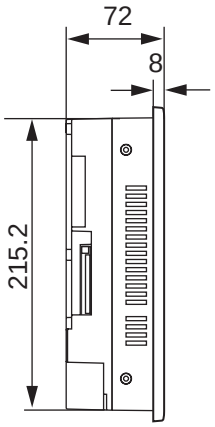
- Panel Cut-out Dimensions



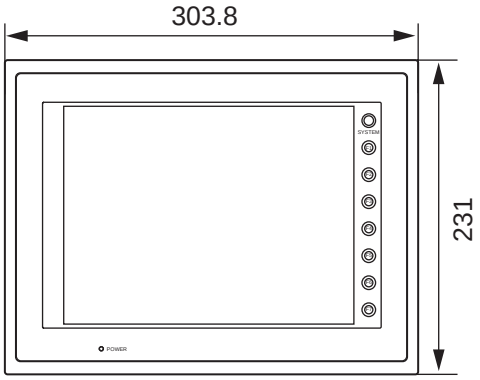
ZM-370 Series External View and Dimensions

(Unit: mm)

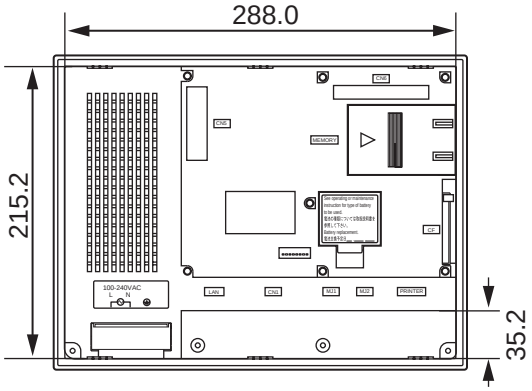
- Side View



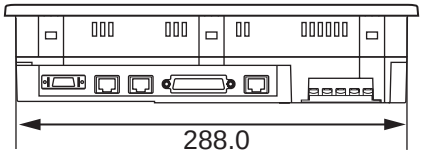
- Front View



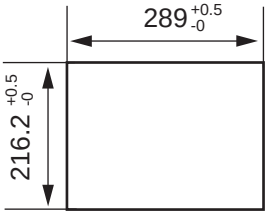
- Rear View



- Bottom View



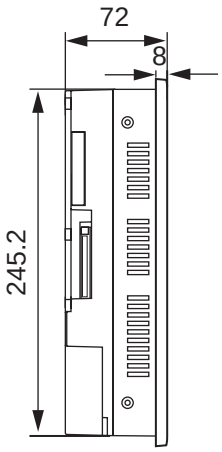
- Panel Cut-out Dimensions



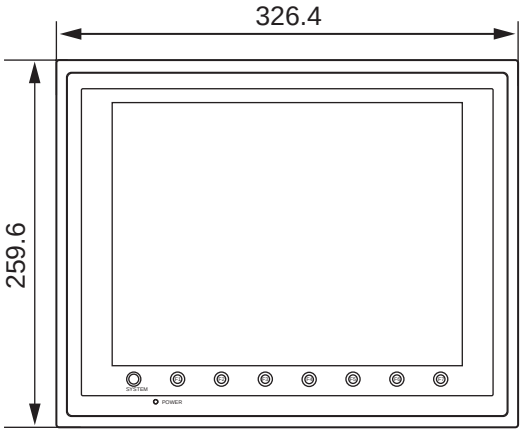
ZM-380 Series External View and Dimensions

(Unit: mm)

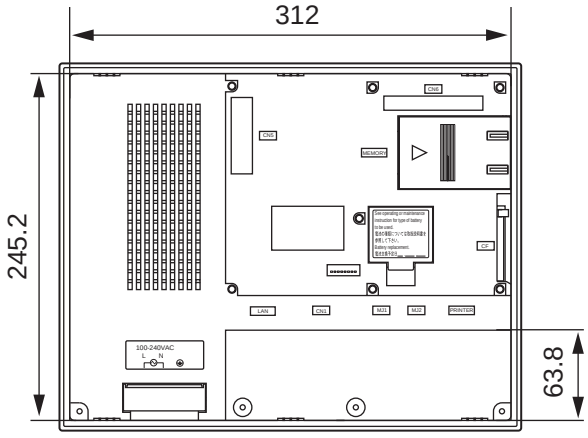
- Side View



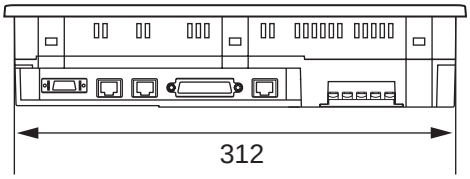
- Front View



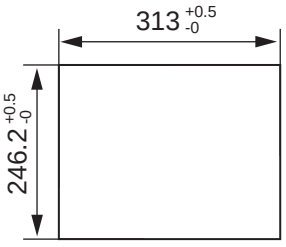
- Rear View



- Bottom View

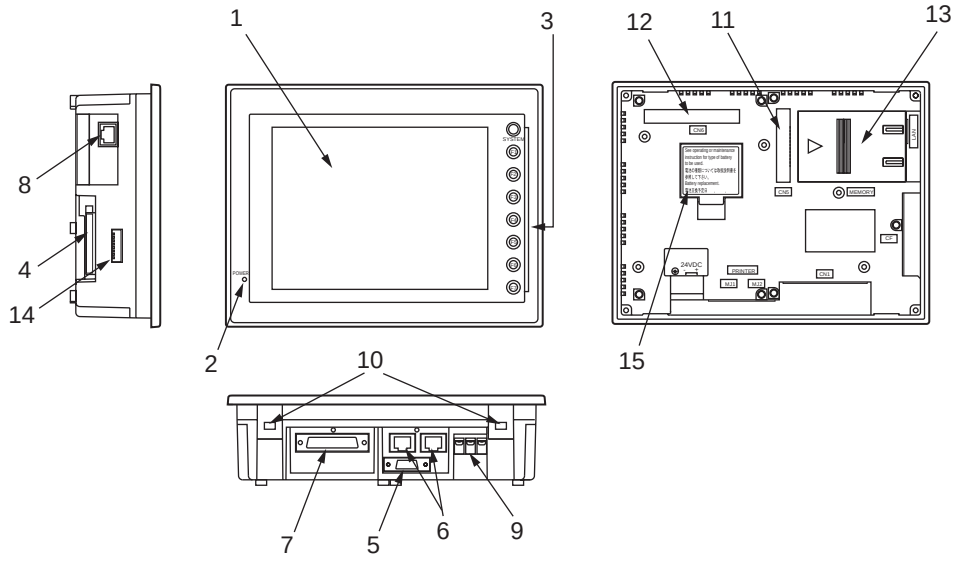


- Panel Cut-out Dimensions

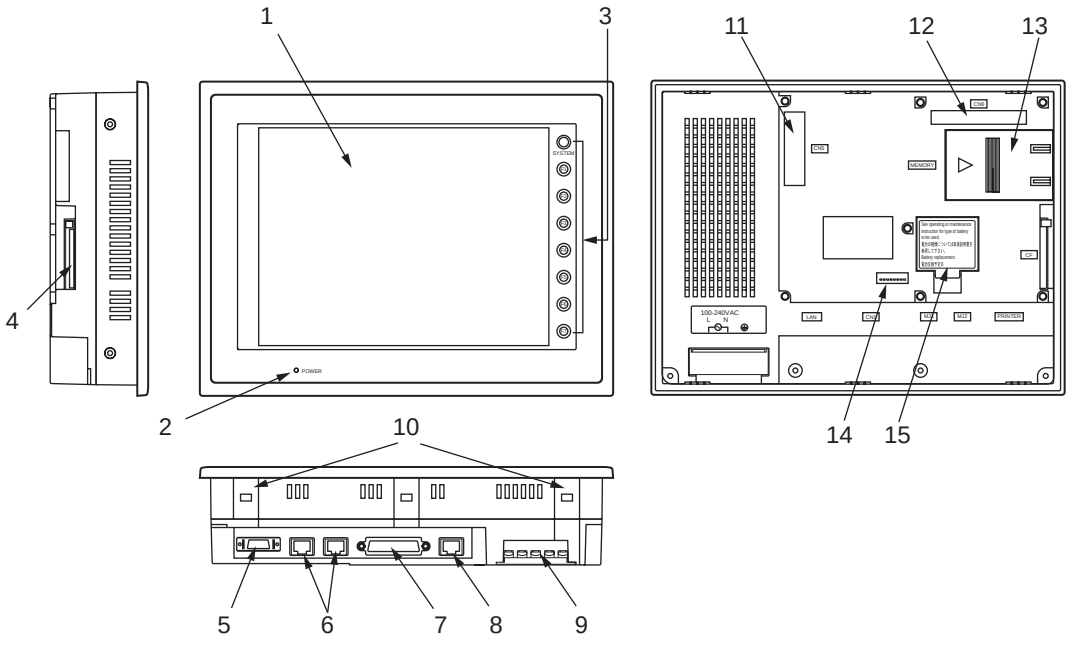


6. Names and Functions of Components

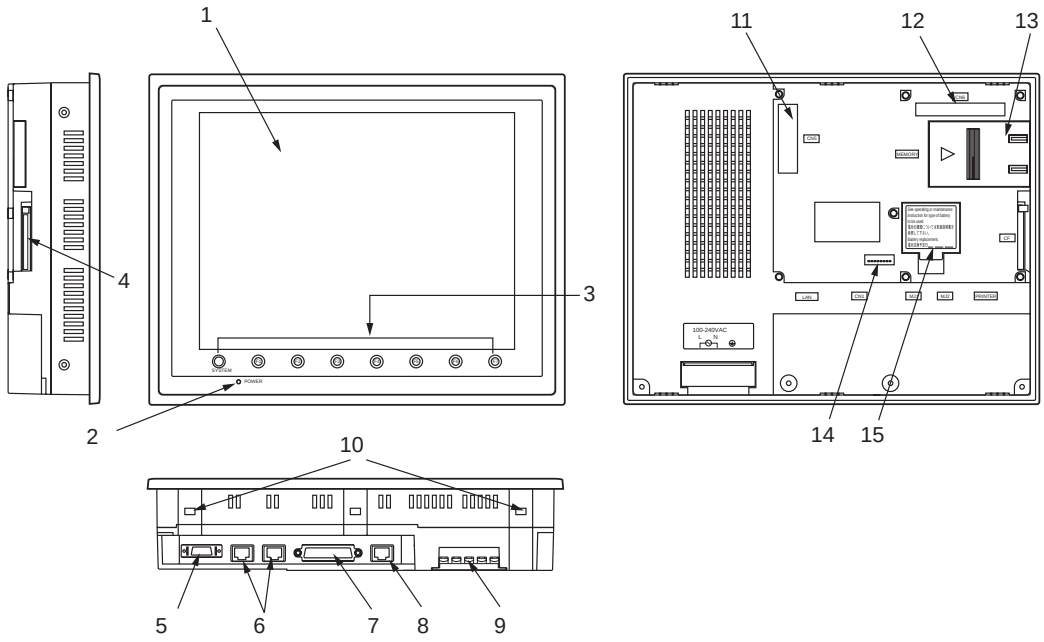
ZM-350/360 Series



ZM-370 Series



ZM-380 Series



1. Display
   This is the display unit.
2. Power Lamp (POWER)
   Illuminates (green) when the power is supplied to the ZM-300 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 barcode reader, ZM-1REC, etc.
7. PLC communication connector (CN1)
   Used for connection between the ZM-300 series and a PLC or an external control unit (computer, custom controller, etc).
8. 10BASE-T connector (LAN) ..... ZM-300 (high-performance) only
   Used for Ethernet connection.
9. Power input terminal block
   Supplies the power to the ZM-300 series (100 to 240 VAC, 24 VDC)

10. Mounting holes
    Used for inserting fixtures when securing the ZM-300 series to the mounting panel.

11. Communication interface unit connector (CN5)
    This is the connector where the network module (ZM-80NU/80NU2) for Ethernet, FL-net is mounted.

12. Option unit connector (CN6).....ZM-300 (high-performance) 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 (ZM-300EM) or SRAM cassette (ZM-300SM) is mounted.

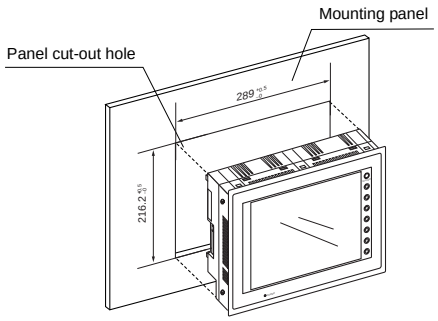
14. DIP switch
    8-bit DIP switch used for setting terminating resistance of the CN1 signal line and the MJ1/MJ2 RS-422/485 signal line.

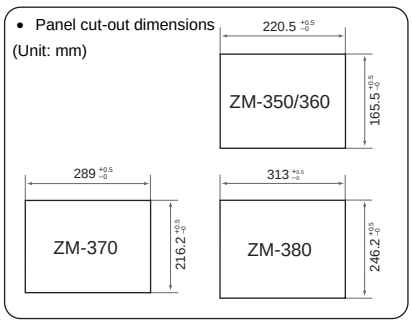
15. Battery holder
    Contains a backup battery for SRAM and clock. When the battery voltage drops, replace the battery with a new one (ZM-300BT).

7. Mounting Procedure

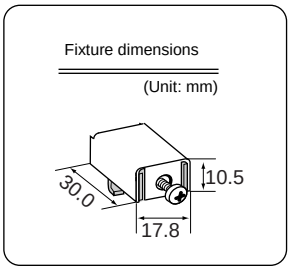
Mounting Procedure

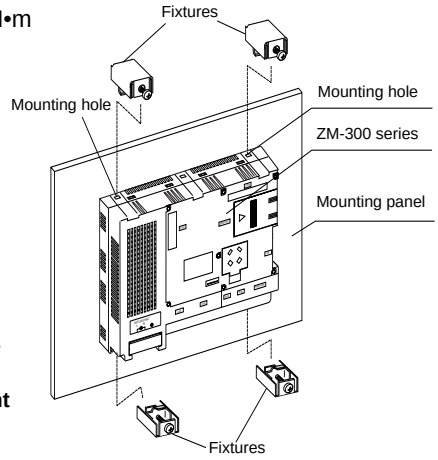
1. Cut out the mounting panel (max. thick: 5 mm) to match the dimensions shown below.





2. Insert four fixtures attached to the ZM-300 series into the mounting holes, and tighten them with the locking screws.
   Tightening torque
   ZM-350/360/370: 0.3 to 0.5 N•m
   ZM-380: 0.5 to 0.7 N•m





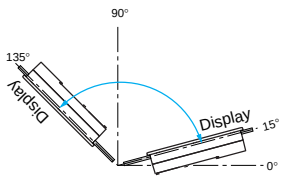
*** When the ZM-300 unit is attached to the mounting panel, the fixtures and frame grounds (FG) are connected. To prevent static electricity, be sure to connect the mounting panel to the frame ground.**

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.

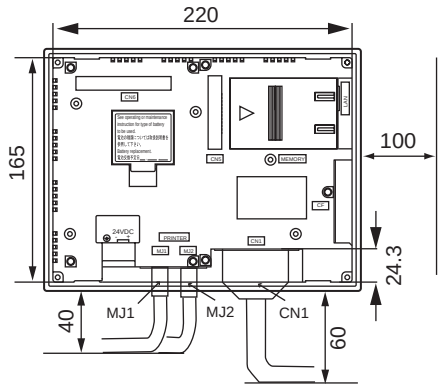
- When the mounting angle is between 15° and 45° or when you use the option module, ZM-301EU (video input and audio output), adjust the ambient temperature between 0°C and +40°C.



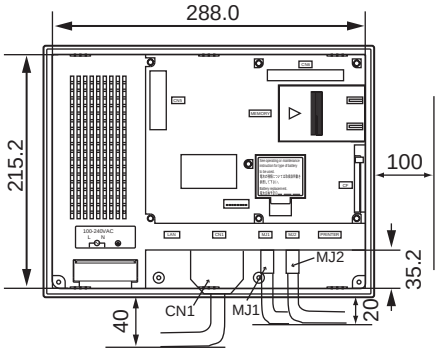
Mounting Margin

About marginal space for connecting to the serial connector (CN1), see the figures below.

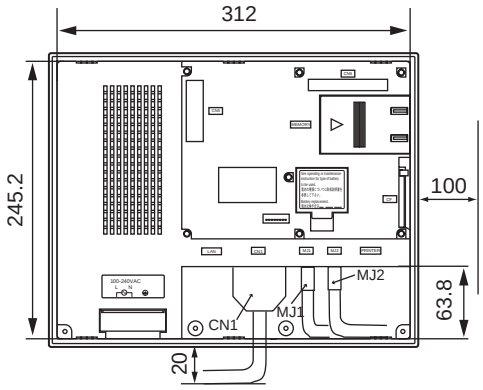
● ZM-350/360 series



● ZM-370 series



● ZM-380 series



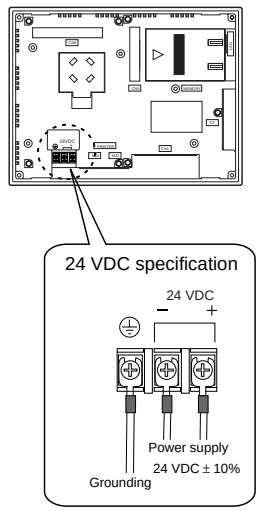
8. Power Supply Cable Connection

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

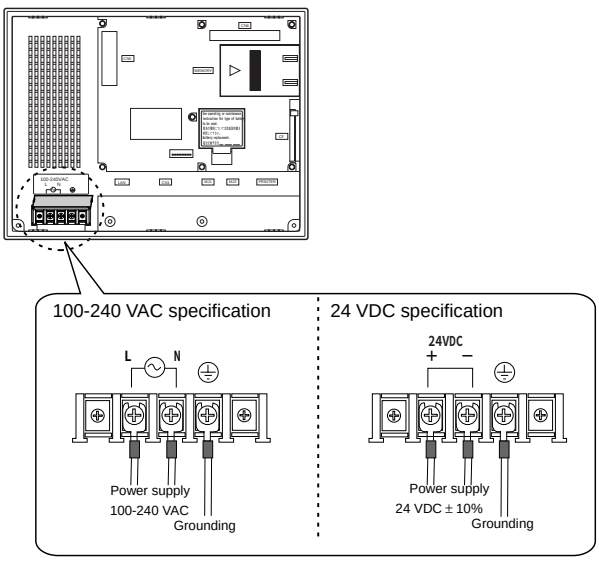
Power Supply Cable Connection

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

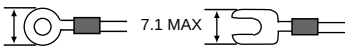
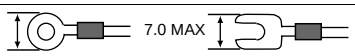
- ZM-350/360



- ZM-370/380

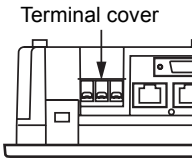


- When connecting the power supply cable, tighten the terminal screws to the following torque.

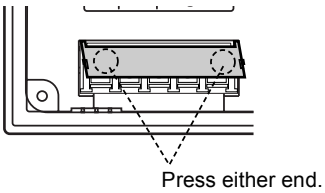
Terminal Screw / Model	Screw Size	Tightening Torque	Crimp-style Terminal (Unit: mm)
ZM-350/360	M3.5	0.5 N•m	7.1 MAX  7.1 MAX
ZM-370/380	M4	0.5 N•m	7.9 MAX  7.0 MAX

- 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 ZM-350/360:
    Attach the terminal cover (supplied) to the terminal block.

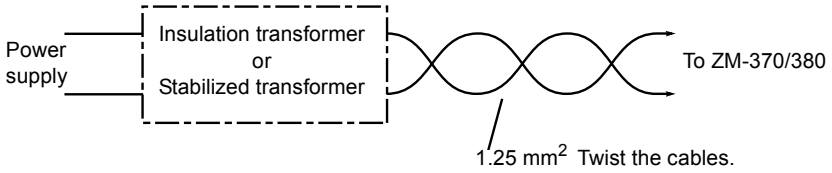


  - For ZM-370/380:
    When closing the terminal cover, hold one end of the cover as shown below.



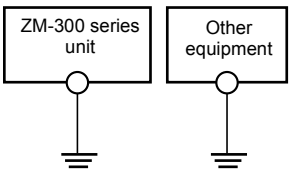
Notes on Usage of 100-240 VAC Specifications

- 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 ZM-300 series unit. (The level of grounding resistance should be less than 100 Ω.)



- An independent earth pole must be used for LCD Control Terminal.
- Use a cable which has a nominal cross section of more than 2 mm^2 for grounding.
- Set the grounding point near the LCD Control Terminal 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 ZM-300 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.**

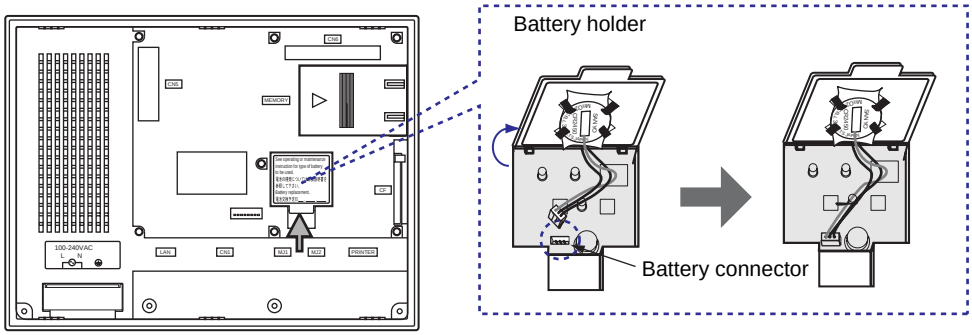
9. Coin-type Lithium Battery

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.

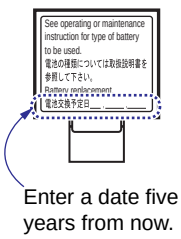
Battery Mounting Procedure

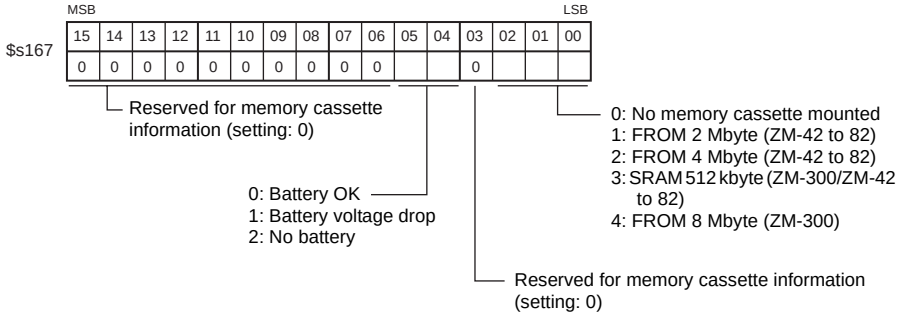
DANGER Electric shock hazard
Steps 2 to 5 must be performed while the power is not supplied to the ZM-300 unit.

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.



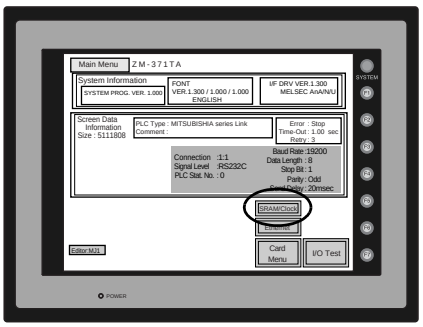
3. Check that the battery is securely attached to the backside of the cover, and connect the battery connector.
4. Close the battery holder cover.
5. Enter a date five years from now for “Battery Replacement” on the sticker on the battery holder.
   * **The battery status is output to the internal memory $s167 of the ZM-300 series. If the battery voltage drops before five years has elapsed, replace the battery immediately.**





About the detection of lower battery power, see the "Notes on Usage" section.

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 “ZM-300BT” (replacement battery for the ZM-300 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.

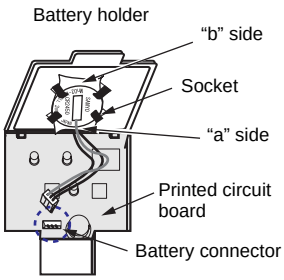
Battery Replacement Procedure

Replacement batteries are available from Sharp Corporation.

Name	Type	Contents
Replacement battery for the ZM-300 series	ZM-300 BT	• Coin-type lithium primary cell (Sanyo) 1 pce • Cautions sticker 1 pce

1. Replace the battery “ZM-300BT” within three minutes after the ZM-300 unit is turned off. If it is not possible to replace within three minutes, use the ZM-71SE editor (cable: ZM-80C) or a CF card and make a backup copy of data in the SRAM cassette.
   - When using the ZM-71SE editor:
     1) Start the ZM-71SE editor.
     2) Click the [Transfer] icon. The [Transfer] dialog is displayed.
     3) Select [Display] for [Transfer Device], and [SRAM Data] for [Transfer Data]. To save a backup copy from the ZM-71SE editor on the server via Ethernet, check [Transfer through Ethernet/IP Address of the ZM-300 Equipped with SRAM]. Keep [Use Simulator] and [Read Comments in Data Transfer] unchecked.
     4) Click the [PC ←] under [Transfer Mode].
     5) 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 LCD Control Terminal Operations.”
2. Turn the unit off, and open the battery holder. A battery is set at the socket.
3. 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.

4. 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.
5. Plug the battery connector and close the battery holder cover.



6. 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 ZM-300 unit.
7. When a RAM file is saved in step 1, turn the ZM-300 unit on and load the RAM file to the unit.

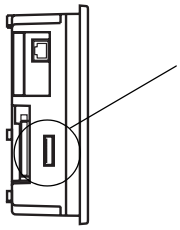
10. DIP Switch Setting

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 ZM-350/360:

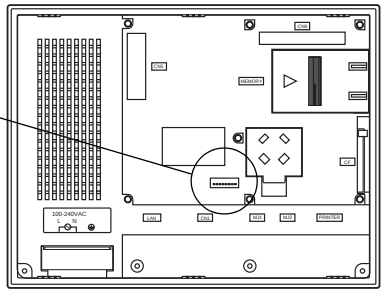
Side View

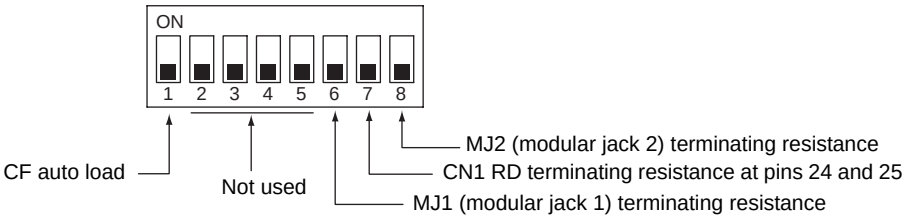


DIP switch

- For ZM-370/380:

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
  - PLC2Way connection via RS-485
  - Connection with the card recorder : ZM-1REC
  - Connection with the serial extension I/O module (ZM-322ME)
  - Connection to the ZM-300 series at the termination of ZM-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 ZM-71SE Instruction 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 ZM-300 unit on. The screen data is automatically loaded into the FLASH memory of the unit.

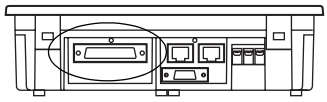
11. Serial Connector (CN1)

Serial Connector for PLC Connection

1. To communicate with the PLC (RS-232C, RS-422/485), connect the cable to the serial connector (CN1) at the bottom of the ZM-300.

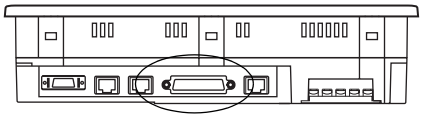
   - For ZM-350/360:

   Bottom View

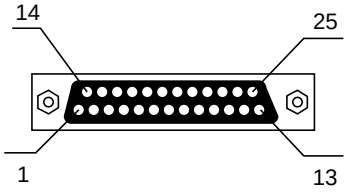
   

   - For ZM-370/380:

   Bottom View

2. 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 (ZM-350/360: not used)
	22	–	Use prohibited (ZM-350/360: not used)
	23		Not used
	24	+RD	RS-422 receive data (+)
	25	–RD	RS-422 receive data (–)

3. The following connector is recommended.
   DDK-make 17JE23250-02 (D8A) D-sub 25-pin, female, metric thread, with hood

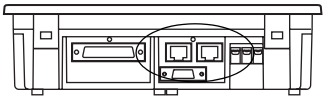
12. Modular Jack (MJ1/MJ2)

Modular Jack 1 (MJ1)/2 (MJ2)

1. This is a modular connector used for connection for screen data transfer, barcode reader, ZM-1REC or serial extension I/O (ZM-322ME).

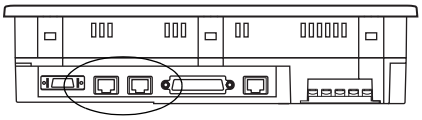
   - For ZM-350/360:

     Bottom View

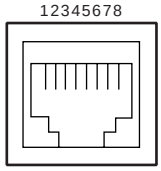


   - For ZM-370/380:

     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

ZM-71SE Setting

1. The use of modular jacks 1 and 2 can be set on the ZM-71SE 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	Modular Jack 2
[Editor Port]*1	[Not used]
[Memory Card]*2	[Memory Card]*2
[Barcode]*3	[Barcode]*3
[External-I/O]*4	[External-I/O]*4
[Multi-Link]*5	[Multi-Link]*5
[Temp. CTRL/PLC2Way]*6	[Temp. CTRL/PLC2Way]*6
[ZM-Link]*7	[ZM-Link]*7
[Touch Switch]*8	[Touch Switch]*8
[Ladder Tool]*9	[Ladder Tool]*9
[Modbus Slave]*10	[Modbus Slave]*10
[Printer (Serial Port)]*11	[Serial Printer (Serial Port)]*11

*1 Refer to the next section “Transferring Screen Data.”
*2 Select this option when connecting the card recorder (ZM-1REC).
*3 Refer to the next section “Barcode Reader Connection.”
*4 Select this option when connecting the serial extension I/O (ZM-322ME).
*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 PLC2Way.
*7 Select this option for ZM-Link connection.
*8 Refer to “ZM-302EU (RGB input + sound output unit User’s Manual).”
*9 Select [Ladder Tool] when using the ladder transfer function with MITSUBISHI’s QnHCPU 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 [PLC2Way] for [Modular Jack 1/2] at the same time.

- Combination of MJ1 and MJ2 Functions

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

MJ2 \ MJ1	Multi-Link 2	ZM-1REC	Barcode	ZM-322ME	PLC2Way	ZM-Link	Touch Switch	Ladder Tool	Printer (Serial Port)
Multi-Link 2		O	O	O	△	O	O	×	O
ZM-1REC	O		O	O	O	O	O	O	O
Barcode	O	O		O	O	O	O	O	O
ZM-322ME	O	O	O		O	O	O	O	O
PLC2Way	△	O	O	O		O	O	O	O
ZM-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 PLC2Way can be used at the same time.

- Combination of Network Module and Modular Jack Function

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

Network Module \ MJ		Multi-Link 2	ZM-1REC	Barcode	ZM-322ME	PLC2Way	ZM-Link	Touch Switch	Ladder Tool	Printer (Serial Port)	Built-in Ethernet
ZM-80NU/ 80NU2	Ethernet (FL-net)	△*1	O	O	O	O	O	O	O	O	×

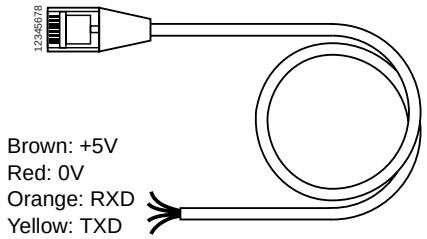
*1 This is not possible when the ZM-300 series and the PLC are connected via Ethernet.

Transferring Screen Data

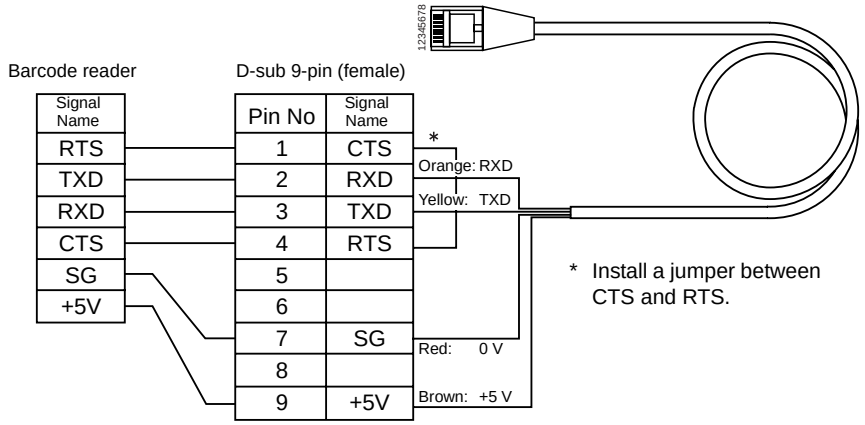
- Use modular jack 1 (MJ1) when transferring screen data.
- When [Editor Port] is selected for [Modular Jack 1] on the ZM-71SE editor, it is possible to transfer data in the RUN mode because the RUN/STOP mode (on the Main Menu screen) can be automatically selected. Also RUN/STOP mode is automatically 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 Sharp Corporation' data transfer cable (ZM-80C) 3m to connect the ZM-300 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 ZM-300 series.
- To connect a barcode reader to the modular jack (MJ1/2), use Sharp Corporation' optional cable (ZM-80BC).
  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 ZM-41/70 series, connect it to the D-sub 9-pin female connector using the ZM-80BC cable as shown below.



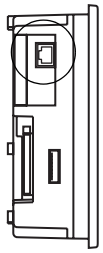
13. 10BASE-T (LAN)

The connector for 10BASE-T is provided as standard on ZM-300 (high-performance). To connect Ethernet with ZM-300 (standard), use the network module “ZM-80NU/80NU2.” If ZM-80NU/80NU2 is attached to ZM-300 (high-performance), it has priority over the built-in 10BASE-T; 10BASE-T cannot be used.

10BASE-T Connector

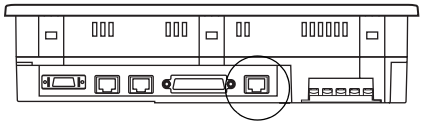
- Use this connector for Ethernet connection.
  - For ZM-360 (high-performance):

Side View



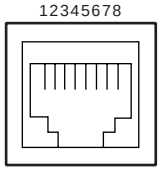
  - For ZM-370/380 (high-performance)

Bottom View



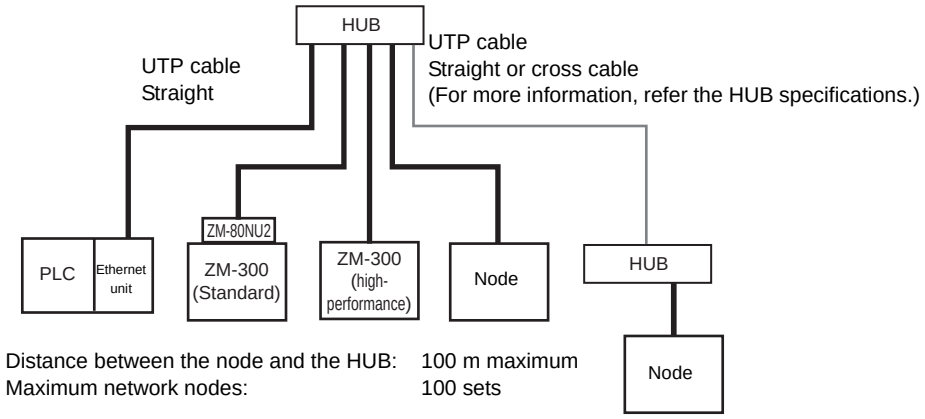
⚠CAUTION MJ1/2 and LAN connector are 8-pin modular jacks. Check the name plate and insert the connector in the correct position.

- 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

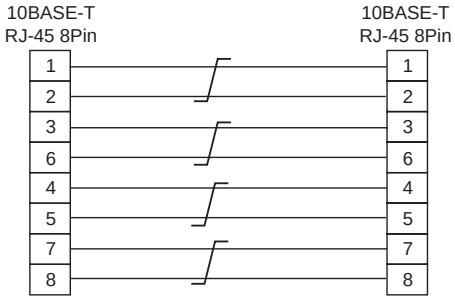
Notes on Wiring

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



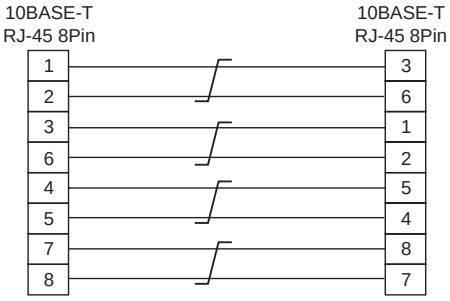
Cable Connection Diagram

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.

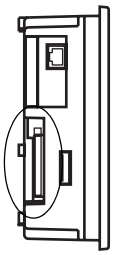
Manufacturer	Type	Capacity
TDK	TC032HS	32 MB
Kodak	KPCN-32	32 MB
SanDisk	SDCFB-64-505	64 MB
I-O Data Device	PCCF-H128MS	128 MB
	PCCF-xxxMS (xxx: 16, 32, 48, 64, 96, 128, 192)	16 to 192 MB

Mounting and Dismounting the CF Card

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

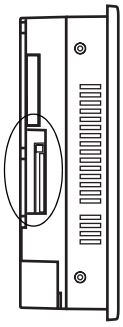
- For ZM-350/360:

Side View

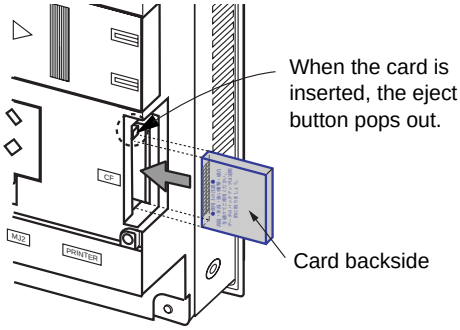


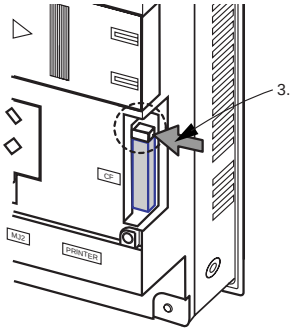
- For ZM-370/380:

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 ZM-300 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).

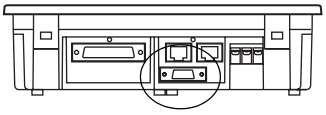
⚠CAUTION Be sure to turn the printer off when the ZM-300 unit is turned off.

Printer Connector (PRINTER)

- This is the printer connector for parallel interface.

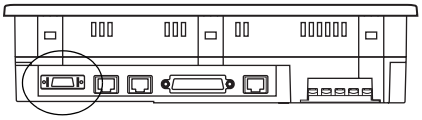
- For ZM-350/360:

Bottom View

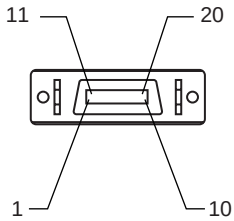


- For ZM-370/380:

Bottom View

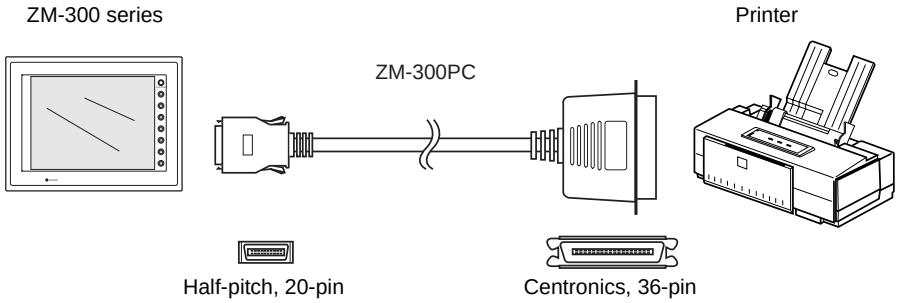


- The printer interface pins correspond to signals as given below.

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 ZM-300 series to a printer, use Sharp Corporation' printer cable "ZM-300PC" 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"

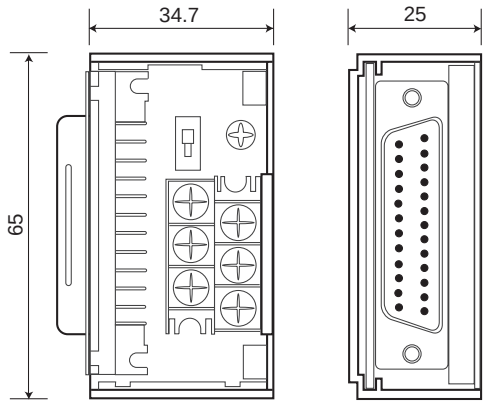
Connection with Printer through Serial Interface

- 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.

16. Terminal Converter (ZM-1TC)

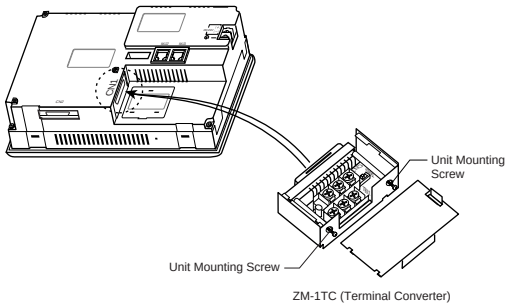
Use the terminal converter ZM-1TC when connecting the ZM-300/ZM-42 to 82 series and PC by the RS-422/485 terminal block.

Size



Installation

1. Make sure that the power of ZM-300 /ZM-42 to 82 series is OFF.
2. Install the ZM-1TC to the serial connector (CN1) of the ZM-300/ZM-42 to 82 series.
3. Settle the ZM-1TC by the module mounting screw.



Tighten terminal screw, module mounting screw

Tighten mounting screws with the following torque.

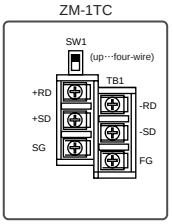
Position of screws	Screw size	Tighten torque (N m)	Pressure connection terminal (Unit : mm)
I/O, I/F terminal screw	M3	0.49	5.9MAX 5.9MAX
Module mounting screw	M2.6	0.1～0.2	——

• Never fasten these screws too tightly, otherwise the cover of Control Terminal may be deformed.

Connection

○Connecting the RS-422 communicating cable

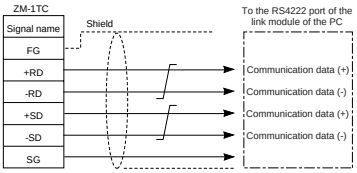
- Choose 4-line or 2-line system by the ZM-1TC DIP switch (SW1)
- Connect the cable if SG exists.
- Connect the shield line to FG.
- End resistance is set by the dip switch located on the back side of ZM-300/ ZM-42 to 82 body.
- Be sure to put the attached cover to ZM-1TC when the connection is terminated.



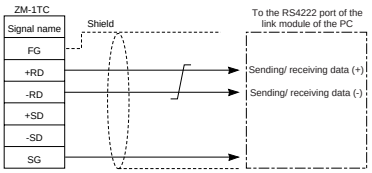
SW1(Above: 4-line system)
Below: 2-line system

▬ In the case of communicating one to the other ▬

○ 4-line system

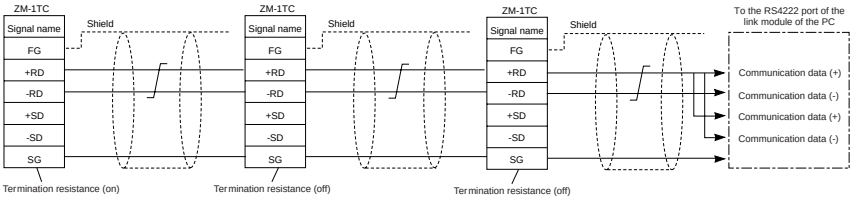


○ 2-line system

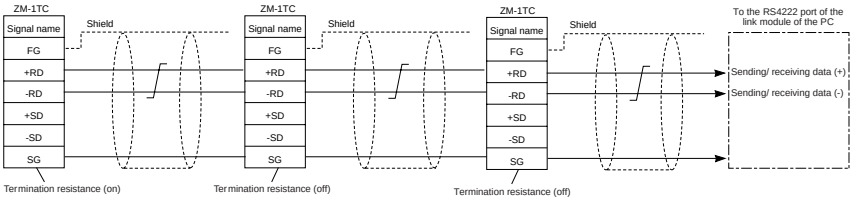


▬ In case of multi-link ▬

○ 2-line system (in the case it has to jump on PC side)



○ 2-line system (in the case it doesn't have to jump on PC side)



17. Expansion I/O Module (ZM-322ME)

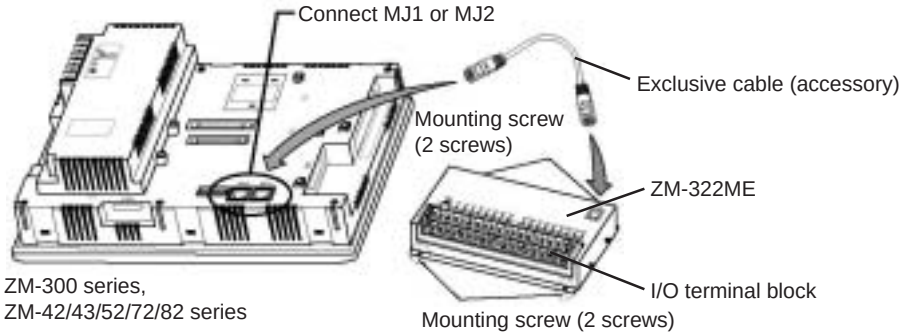
ZM-322ME is an expansion I/O module, with 16 input pins and 16 output pins, that can be externally equipped with the models in the table below through a modular jack. Using ZM-322ME, you can save the power by wiring the sensor actuator around the ZM-series display to the PLC through the display itself. You can set an I/O address from the PLC with the screen editing software, ZM-71SE.

Applicable model (LCD control terminal model name)		
ZM-300 Series	ZM-350 Series	ZM-352D
	ZM-360 Series	ZM-362S, ZM-362SA
	ZM-370 Series	ZM-371T, ZM-371TA, ZM-371S, ZM-371SA, ZM-371TL
		ZM-372T, ZM-372TA, ZM-372S, ZM-372SA
		ZM-373TA, ZM-373TL
	ZM-380 Series	ZM-381S, ZM-381SA
		ZM-382S, ZM-382SA
		ZM-383S, ZM-383SA
ZM-42 Series		ZM-42D, ZM-42L
ZM-43 Series		ZM-43T, ZM-43D, ZM-43L
ZM-52 Series		ZM-52D
ZM-72 Series		ZM-72T, ZM-72TS, ZM-72D
ZM-82 Series		ZM-82T

Handling precautions

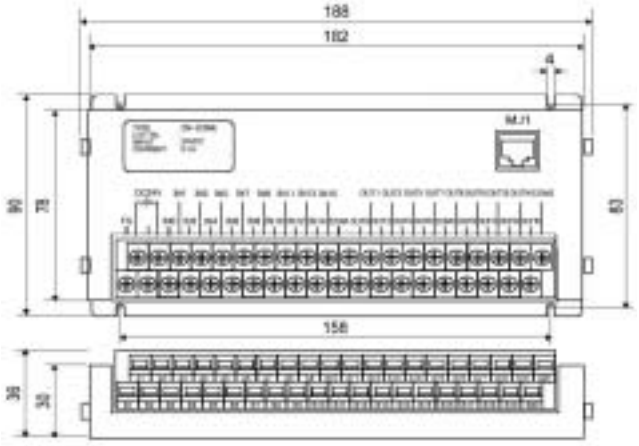
- Since the ZM-322ME has a communication module, such as a link module, it cannot be used for high speed or emergency operation or operation (emergency stop).
- ZM-322M, a built-in type expansion I/O module, cannot be used with the ZM-72/82 series. Choose one of them for your purpose. ZM-322M cannot be used with the ZM-300 or ZM-42/43/52 series, either.

Installation/connection method



1. Installation method
   Fix four corners of the ZM-322ME on the mounting panel with the four mounting screws (screw size : M3 recommended)

   - Dimensions of ZM-322ME



(Unit : mm)

2. Connection method
   Connect MJ1 of the ZM-322ME to MJ1(MJ2) of ZM series with the exclusive cable (2m).

   - When connecting the ZM-322ME to MJ1 of ZM series, set DIPSW6 on the ZM main body to ON.

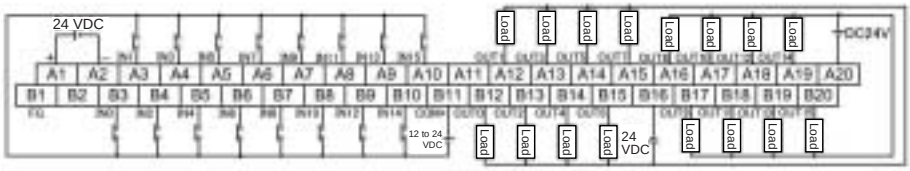
Wiring

In wiring ZM-322ME (I/O terminal block), the terminal screw, the terminal block arrangement, and the input/output circuit are as follows:

1. Terminal screw

Terminal screw of I/O terminal block	Screw size	Torque	Clamp terminal
	M3	0.3～0.5 (N･m)	Max. 6.2 (mm)

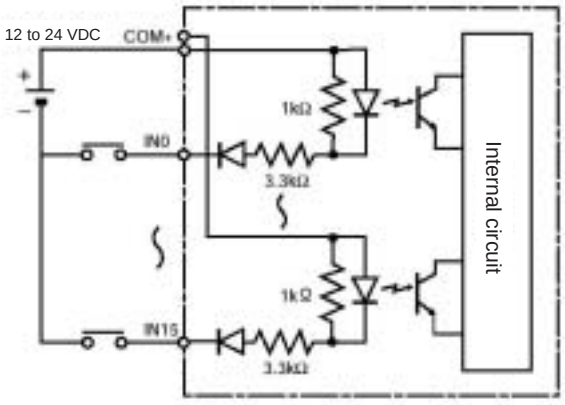
2. Terminal block arrangement
   I/O unit terminal block should arranged as below.



- Connect referring to the above figure.

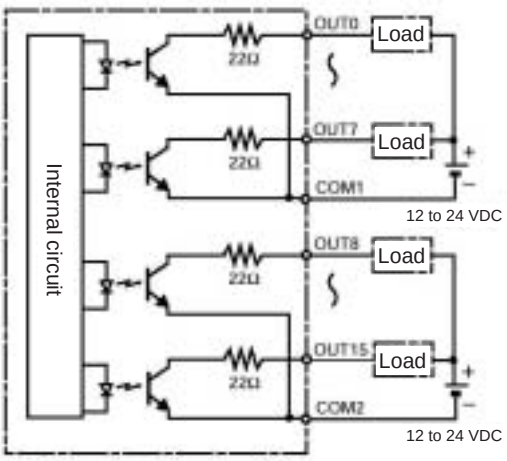
3. Input/output circuit
   Input/output circuits are as shown below.

   - Input circuit



Item	Specifications
Inputs	16
COM points	1(1 common per 16 points)
Input type	Non-voltage contact NPN type (+ common system)
Input voltage	12 to 24 VDC
ON voltage	9.6 to 30V
OFF voltage	0 to 3.6V
Max. permissible voltage	30 VDC
Permissible ripple factor	5% or less
Insulation type	Photo coupler insulation
Input impedance	3 k ohms
Input current	5 to 7ms

- Output circuit



Item	Specifications
Outputs	16
COM points	2(independent by 8 points)
Output type	Transistor, Sink output (minus common system)
Rated voltage	12 to 24 VDC
Max. load current	50 mA
Output delay time	OFF→ON : Max. 1ms or less ON→OFF : Max. 1ms or less
Residual voltage	1.7 V
Leak current in OFF time	Max.0.1mA
Insulation type	Photo coupler insulation

ZM-71SE setting

Specify the following settings in port and memory on screen edit software ZM-71SE.

1. Port setting
   Select [Expansion I/O] in [Modular Jack 1] or [Modular Jack 2].
2. Memory setting
   Specify the addresses of both [DIO Input Mem.] and [DIO Output Mem.].
   - The input memory corresponds to [IN 0 to 15], and the [DIO Output Mem.]corresponds to [OUT 0 to 15].(Refer to page 1-43 "Terminal block arrangement".)

Note

・Use ZM-71SE, Ver.2.0.0.0 or higher.
(When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.)

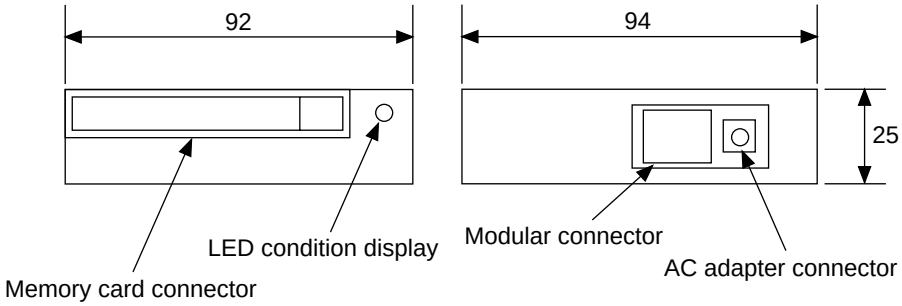
Specifications

The general specifications of ZM-322ME are as follows: (see pp, 1-43 and 1-44 for the information on input and output)

Item		Specifications
Power supply	Rated voltage	24 VDC+10%
	Consumption current	Max.60mA
	Rushed electric current	Max.1.5A (200)
	Withstand voltage	Between DC external terminal and FG : 500 VAC, for 1 minutes
Insulation resistance		40. 10 M ohms or more in 500 VDC (between 24 VDC external terminal and case)
Physical environment	Ambient temperature	0～＋50℃
	Storage ambient temperature	－10～＋60℃
	Ambient humidity	35 to 85%RH or less (without dew condensation)
	Atmosphere	No conductive dust and no corrosive gas
Mechanical working conditions	Vibration resistance	Vibration frequency : 10 to 150Hz, Acceleration : 9.8 m/s^2 3 directions of X,Y, and Z (one hour in each)
	Shock resistance	Pulse shape : Sine half wave, peak acceleration : 147m/s^2 3 directions of X, Y and Z (sixth time in each)
Electrical working conditions	Rectangular wave noise	1500Vp-p, 1 μ s45. (between power supply line and FG by noise simulator)
	Anti-static discharge	IEC1000-4-2 Compliant with IEC1000-4-2: 6kv in contact, 8kv in the air
Mounting conditions	Grounding	D- grounding
	Outside dimensions W × H × D (mm)	47. Cooling naturally
	Panel cut-out W × H (mm)	158 × 83
	Cooling system	Cooling naturally
	Weight	500 g
	Case material	Munsell 5Y3/0.5(dark gray), No painting at the bottom
Accessories		・Exclusive cable (cable that connect ZM series MJ1 or MJ2 and MJ1 of expansion I/O module : 2m) ・One instruction manual

18. Card Recorder (ZM-1REC)

Used for the backup of the panel data or recording the memory manager function and the data longing function.



Memory Card connector

SRAM and flash memory card are used as described in the chart below.
(JEIDA Ver4.0 Maker: ITT Canon)

SRAM card	256K, 512K, 1M, 2M, 4M Bytes
Flash memory card	256K, 512K, 1M, 2M, 4M, 16M Bytes

LED condition display

Display the battery voltage of the SRAM card.
Green: battery voltage normal
Red: battery voltage abnorma

Modular Connector

Connect with the ZM-300/ZM-42 to 82 series by the attached cable.

AC Adapter Connector

When using the external electricity, connect it to the AC adapter

19. Cable for transporting the panel (ZM-80C)

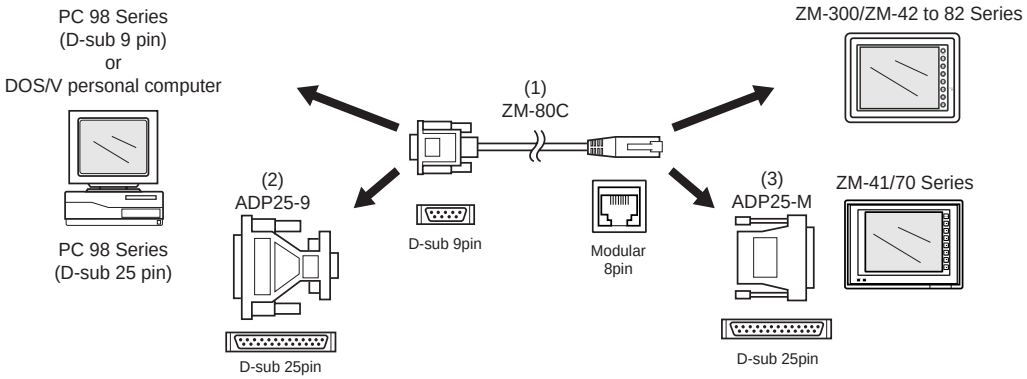
ZM-80C is the cable that transports panel data between ZM-300/ZM-42 to 82 series as well as ZM-41/70 series and the personal computers.
When using, you need to have a Windows screen edit software ZM-71SE.
The convertible adapter ADP25-9 and ADP25-M are attached to ZM-80C.

Examples of the using cable and convertible adapter.

Types of computer	Serial Connector Type	Control Terminal	
		ZM-300/ZM-42 to 82 Series	ZM-41/70
DOS/V	D-sub 9pin	Use the drawing (1)	Use the drawing (1) and (3)
PC98	D-sub 9pin	Use the drawing (1)	Use the drawing (1) and (3)
PC98	D-sub 25pin	Use the drawing (1) and (2)	Use the drawing (1) , (2)and (3)

(Reference) When constructing by using drawing (1) , (2) and (3), the functions are the same as our product ZM-60C.

System Composition

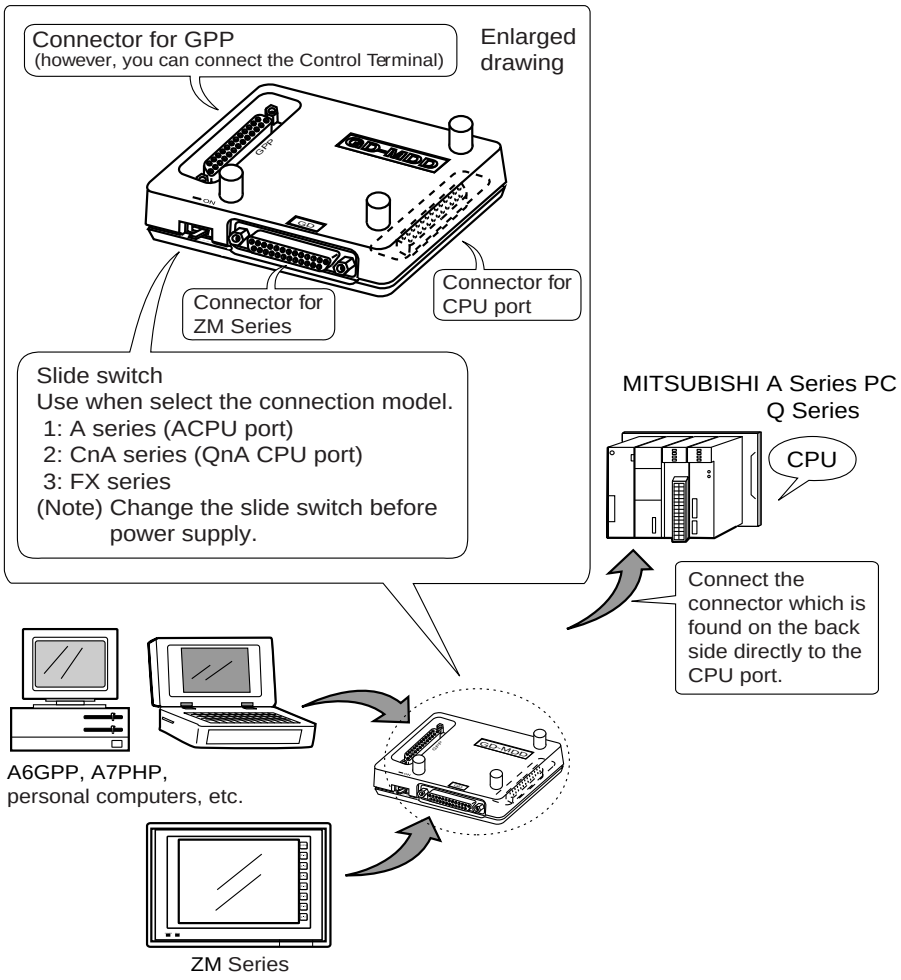


・The length of the ZM-80C cable is three meters.

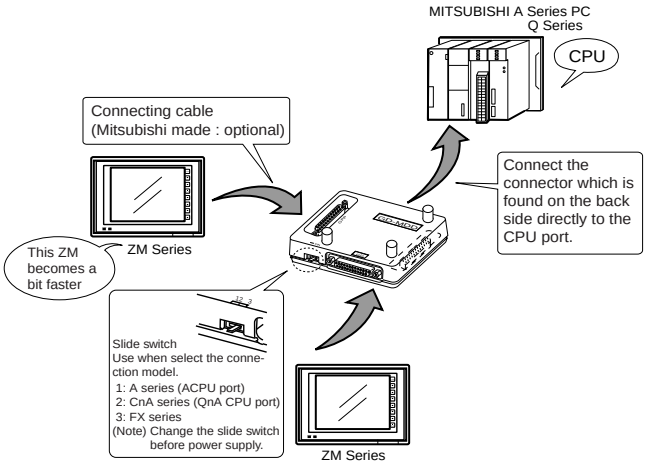
20. 2 Port Adapter (ZM-1MD2)

By mounting to the GPP port of Mitsubishi PC, ZM-1MD2 acts as an module that connects and communicates between GPP (programming tool) and ZM-300/ZM-42 to 82 series. Since it is possible to connect without the link module of the Mitsubishi PC calculator, the cost saving of the hardware machines became possible.

Connection



When connecting 2 units together



Caution

1. Since the power supply of ZM-1MD2 is supplied from CPU, pay attention to capacity of 5V power supply of CPU.
2. For wiring, it is fully careful to a noise.
3. There is the following restriction when ZM-1MD2 is used for QnA series CPU port.

   1) When using it in ZM40/61 series, re-try time is 3 seconds.
   The communication time out is 20 seconds between GPP and CPU.When any communication error occurs between GPP and CPU, ZM-1MD2 maintains 20 seconds as communication time between GPP and CPU.
   After passing 20 seconds, although a communication port is changed to ZM between CPUs, since it is 3 seconds, the re-try time of ZM-40/60 series serves as a time-out, and a communication error occurs.
   Perform re-execution 20 seconds after.

   2) When you use it in ZM-41/70/80 series, choose from the two following methods.
   - With the [Detail Setting] menu of the [Communication Parameter] of a [System Setup], [Communication error processing] is set as "Continuation."
   - [Time-out time]x [re-try time] may become more than 20 seconds.There is the following restriction when ZM-1MD2 is used for QnA series CPU port.

   3) Write in running
   When the write-in operation in running is performed from GPP side and the time required is larger than 20 seconds, ZM-1MD2 cannot be used. In this case, written in STOP state for PC.
   In addition, although the number of steps of the program which can perform writing among RUN in less than 20 seconds has a difference according to the contents of a program, it is computable in the following formula as a standard.

   Time = (Number of steps ÷ 60) × scan time (msec)

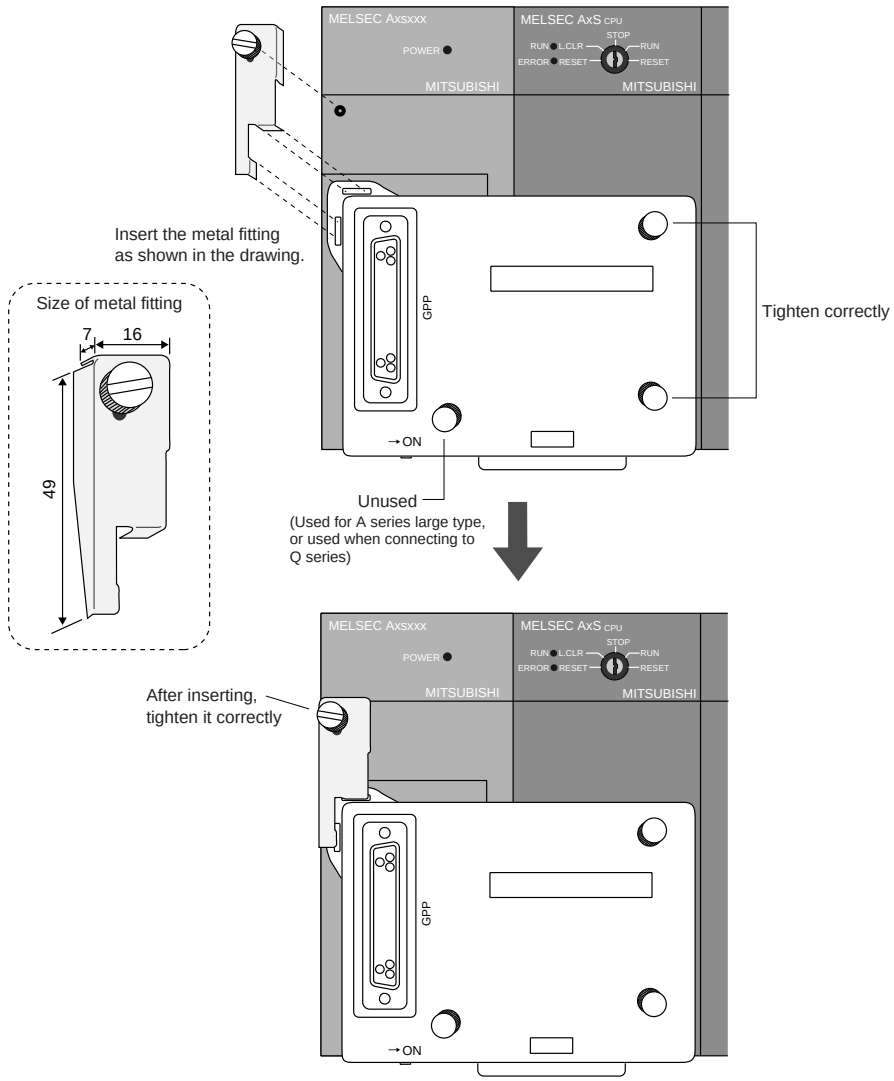
   A standard is asked in this formula. In addition, in the case of constant scan, this formula cannot apply.

4) When a power supply is switched on where a console is connected to the ZM-1MD2, a console will become a communication time-out before completing initialization of the ZM-1MD2.
When it connects again or reset operation of a console is performed once it, removes the cable of a console, it will return to a normal state. (Normal operation of this machine is carried out after 15 seconds progress from the time of a power supply injection.)

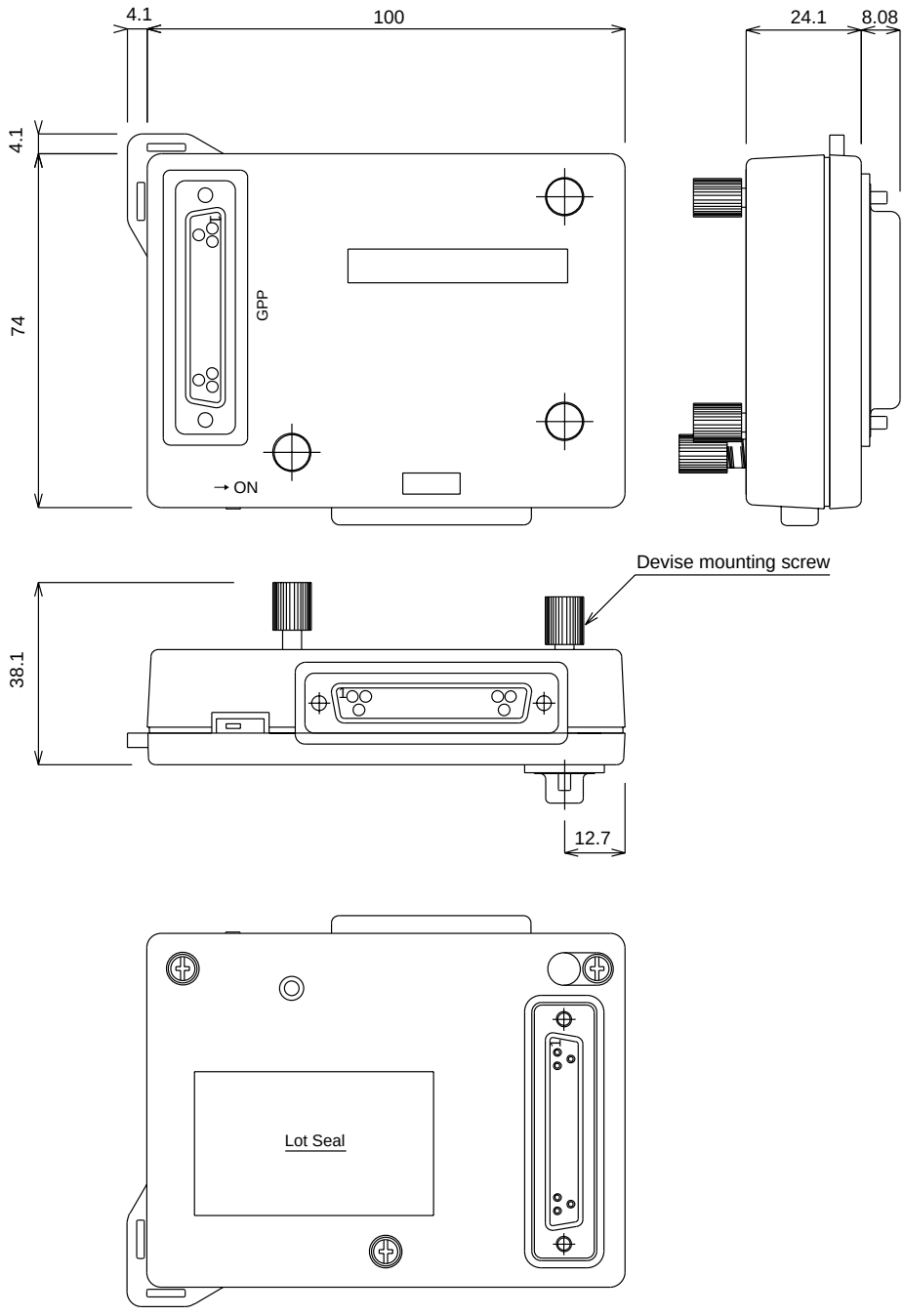
4. When you use ZM-1MD2 for A series/FX series CPU, set time-out time as 1.5 seconds or more by communication parameter setup of ZM41/70/80.

Attachedmetal fittings of ZM-1MD2

When connecting ZM-1MD2 to the small type (A1S, A2US, etc,) of A series PC made by Mitsubishi, use the unit by mounting the attached metal fittings.



Size drawing of ZM-1MD2



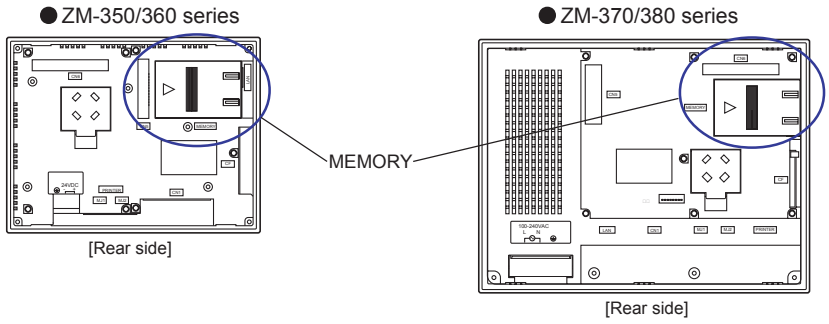
21. Expansion Memory (ZM-300EM)

The expansion memory, ZM-300EM, is an extension board to add 8MB to the screen data memory of the ZM-300 series.

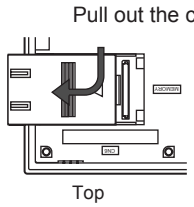
Applicable model (LCD control terminal model name)		
ZM-300 series	ZM-350 series	ZM-352D
	ZM-360 series	ZM-362S, ZM-362SA
	ZM-370 series	ZM-371T, ZM-371TA, ZM-371S, ZM-371SA, ZM-371TL
		ZM-372T, ZM-372TA, ZM-372S, ZM-372SA
		ZM-373TA, ZM-373TL
	ZM-380 series	ZM-381S, ZM-381SA
		ZM-382S, ZM-382SA
		ZM-383S, ZM-383SA

Installation method

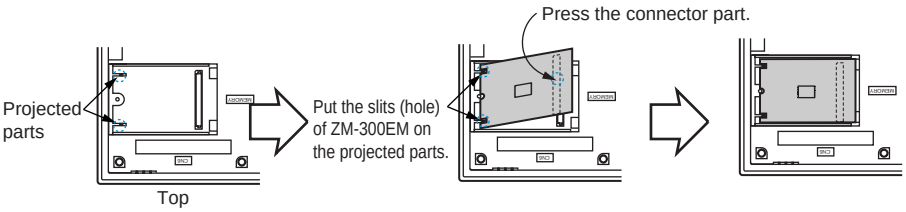
Install ZM-300EM to the connector for expansion memory (MEMORY) on the rear side of the ZM-300 series in the following procedure.



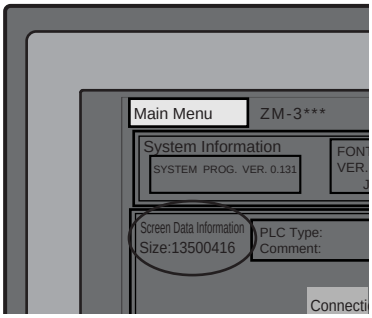
1. Turn off the power.
2. Adjust the direction of the display, and pull out the cover, pressing the ◁ part as shown in the figure.



3. Put the slits of ZM-300EM with the projected parts of the display, and fix ZM-300EM into the rear side of the display by pressing the connector part.



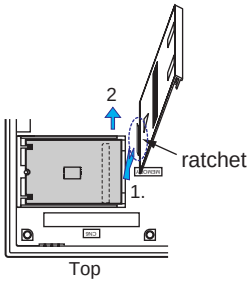
4. Insert the removed cover until you hear clicking sound.
5. Make sure ZM-300EM is appropriately installed in the [Main Menu] screen of the display. When ZM-300EM is appropriately installed, the data size of the [Screen Data Information] in the [Main Menu] screen is 8MB larger than before the expansion memory is installed.



Uninstall

Uninstall ZM-300EM in the following procedure. Before uninstalling, discharge the static electricity in your body.

1. Turn off the power.
2. Remove the MEMORY cover on the rear side of the display.
3. Remove ZM-300SM. When removing it, use the ratchet of the cover.
   1) Insert the cover between the board and the display.
   2) Pull up the cover, and remove the board.
4. Insert the removed cover until you hear clicking sound.



ZM-71SE setting

1. Select [Unit Setting(S)] from the [System Setting (A)] menu. The [Unit Setting] dialog appears.
2. Click the switch menu of [Expansion Memory], and set the [SIZE] to 8M.

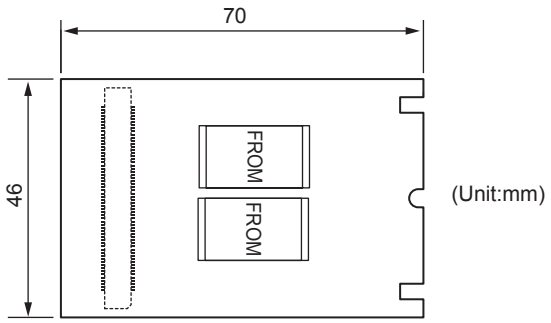
Note

・Use ZM-71SE, Ver.2.0.0.0 or higher.
(When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.)

Specifications

Item	Specifications
Memory type	FLASH memory
Memory size	8Mbytes
Use	Screen data size is expanded
Power supply	3.3 VDC (supply by ZM-300 series main body)
Ambient temperature	0 to +50℃
Ambient humidity	85%RH or less (without dew condensation)
Atmosphere	No conductive dust and no corrosive gas
Storage temperature	-10 to +60℃
Outside dimensions (mm)	70 × 46
Accessories	One instruction manual

● Outside dimensions



22. Expansion Memory (ZM-300SM)

The expansion memory, ZM-300SM, is an extension board to add 512KB to the SRAM backup memory of the ZM-300 series.

Applicable model (LCD control terminal model name)		
ZM-300 series	ZM-350 series	ZM-352D
	ZM-360 series	ZM-362S, ZM-362SA
	ZM-370 series	ZM-371T, ZM-371TA, ZM-371S, ZM-371SA, ZM-371TL
		ZM-372T, ZM-372TA, ZM-372S, ZM-372SA
		ZM-373TA, ZM-373TL
	ZM-380 series	ZM-381S, ZM-381SA
		ZM-382S, ZM-382SA
		ZM-383S, ZM-383SA

Note

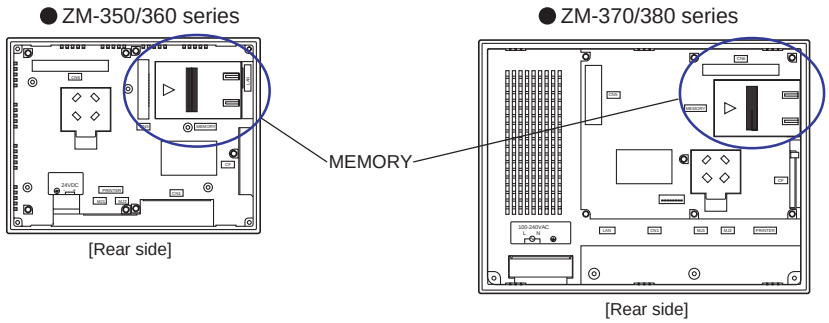
- When you have mounted ZM-300SM, you cannot use the SRAM (64KB) built in the ZM-300 series display.

Hondling precautions

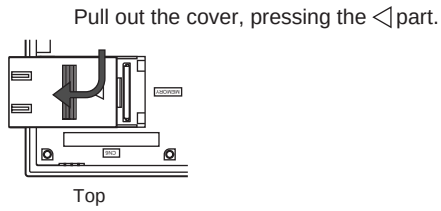
- When using ZM-300SM, be sure to set the battery in the battery holder of the ZM-300 series display. (See page 1-23.)
  If ZM-300SM is not supplied with power, backup data in ZM-300SM is not maintained.
- Before installing or uninstalling ZM-300SM, discharge static electricity in your body.

Installation method

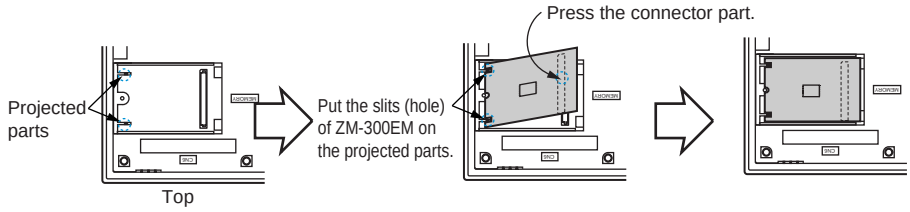
Install ZM-300SM to the connector for expansion memory (MEMORY) on the rear side of the ZM-300 series in the following procedure.



1. Turn off the power.
2. Adjust the direction of the display, and pull out the cover, pressing the ◁ part as shown in the figure.



3. Put the slits of ZM-300EM with the projected parts of the display, and fix ZM-300EM into the rear side of the display by pressing the connector part.

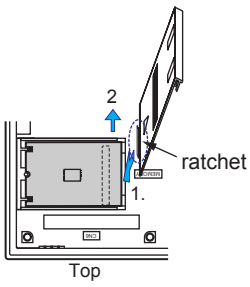


4. Insert the removed cover until you hear clicking sound.
5. Make sure ZM-300SM is appropriately installed in the [Main Menu] screen of the display. When ZM-300SM is appropriately installed. See page 1-57 "Main Menu" screen.

Uninstall

Uninstall ZM-300SM in the following procedure. Before uninstalling, discharge the static electricity in your body.

1. Turn off the power.
2. Remove the MEMORY cover on the rear side of the display.
3. Remove ZM-300SM. When removing it, use the ratchet of the cover.
   1) Insert the cover between the board and the display.
   2) Pull up the cover, and remove the board.
4. Insert the removed cover until you hear clicking sound.



Note

- If you remove ZM-300SM, the backup data disappears.

ZM-71SE setting

Select [SRAM/Clock Setting...] from the [System Setting (A)] menu, and set the [SRAM/Clock Setting] dialog. See ZM-71SE Instruction Manual.
If you have changed the SRAM settings, be sure to format.
You can format ZM-300SM in the [Main Menu] screen. See the [Main Menu] screen below.

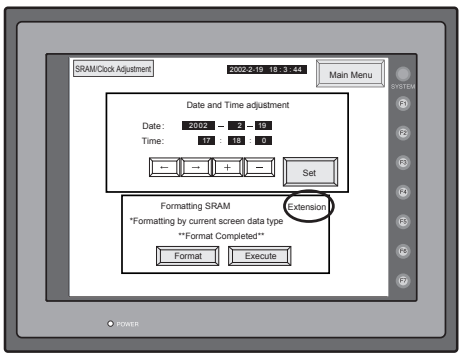
Note

- Use ZM-71SE, Ver.2.0.0.0 or higher.
  (When using ZM-373TA/371TL/373TL, ZM-383S/383SA, use version 2.1.0.0 or a newer version.)

The [Main Menu] screen

You can check the current situation of ZM-300SM or format the SRAM in the [SRAM/Clock Adjustment] screen of the [Main Menu] screen. To display the [SRAM/Clock Adjustment] screen, press the [SRAM/Clock Adjustment] switch.

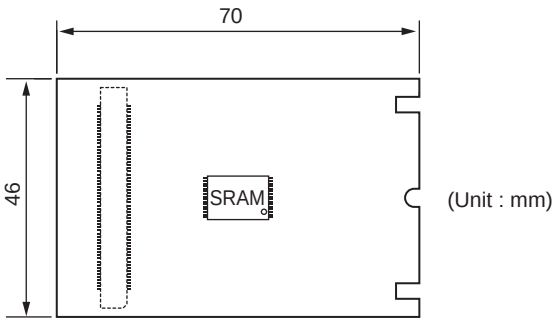
1. The current situation appears beside the characters of "Formatting SRAM".
   When ZM-300SM is mounted: Extension
   When ZM-300SM is not mounted: Built-in
2. To format the SRAM
   Press the [Format] switch; then, press the [Execute] switch.
   When the SRAM is formatted, the message "** Format Completed**" appears.

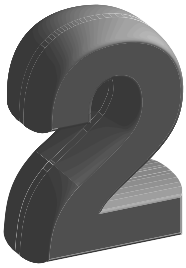


Specifications

Item	Specifications
Memory type	SRAM
Memory size	512 Kbytes
Use	For data backup
Power supply	3.3 VDC (supply by ZM-300 series main body)
Ambient temperature	17.0 to +50℃
Ambient humidity	85%RH or less (without dew condensation)
Atmosphere	No conductive dust and no corrosive gas
Storage temperature	-10 to +60℃
Outside dimensions (mm)	70 × 46
Accessories	One instruction manual

● Outside dimensions





LCD Control Terminal Operations

1. Operation of ZM-300 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 ZM-300 Series
   1. Communication Error
   2. Check
   3. Warning
   4. SYSTEM ERROR
   5. Touch Switch is Active

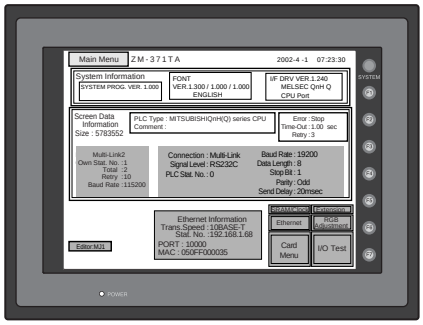
1. Operation of ZM-300 Main Menu

Initial Screen

When the power of LCD Control Terminal 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 ZM-80C 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 (ZM-1REC)
  1) Connect the personal computer with the card recorder and save screen data on the memory card.
  2) Insert the CF card into the ZM-300 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.

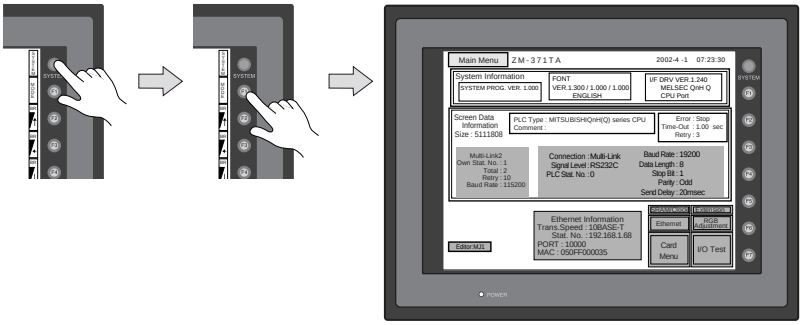
- Transferring screen data via Ethernet
  1) Press the [IP Address (English)] switch.
  2) The “Ethernet” screen is displayed.
  3) Follow the instructions as described in “Ethernet” (page 2-24) and set the IP address.
  4) Press the [Setting Finished] switch. The initial screen displayed again.
  5) Transfer screen data from the computer via Ethernet.

- Auto-uploading screen data from the CF card to the ZM-300 unit
  1) Transfer screen data from the computer to a CF card.
  2) Turn the ZM-300 unit off. Set the DIPSW1 on the ZM-300 unit to the ON position, and insert the CF card.
  3) Turn the ZM-300 unit on. The screen data is automatically uploaded from the CF card to the ZM-300 unit.

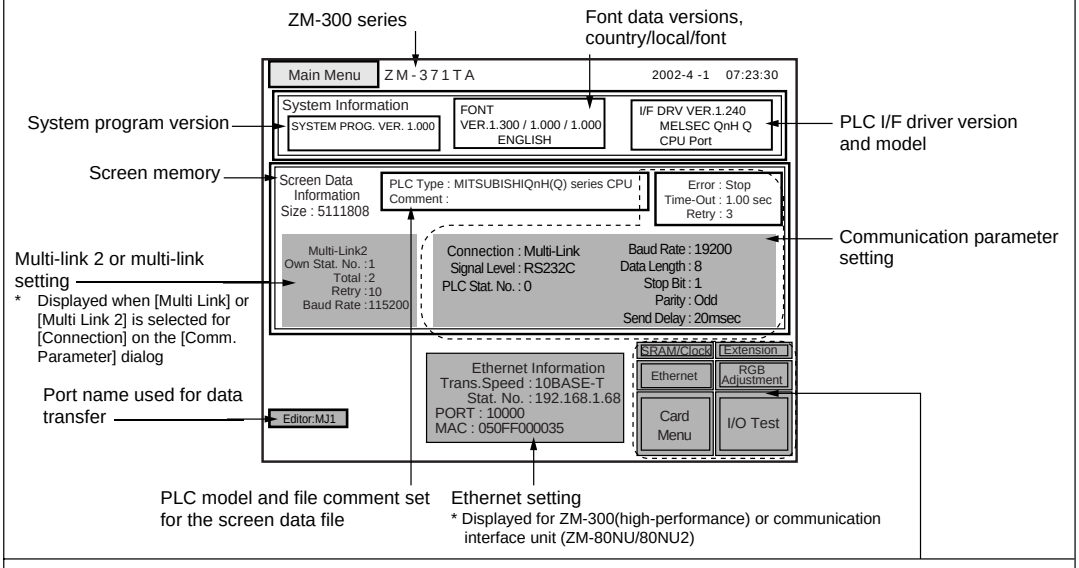
1. Main Menu Screen

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

Main Menu screen



- The Main Menu screen indicates the ZM-300 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 ZM-300 series. When transferring screen data from a personal computer to the ZM-300 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.)



SRAM/Clock
Initializes SRAM and adjusts calendar data. (See page 2-27.)

Ethernet
Sets the IP address. (See page 2-23.)

Card Menu
Transfers screen data between the CF card and the ZM-300 series. (See page 2-11.)

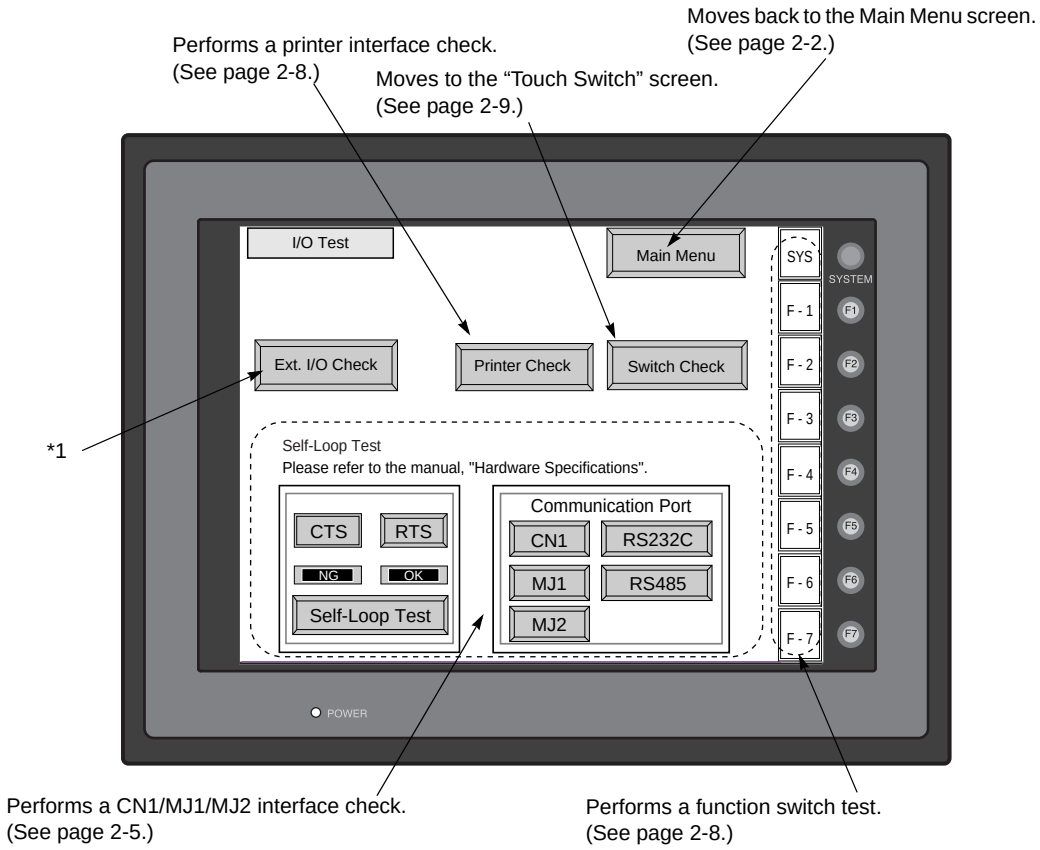
Extension
Indicates the driver setting and parameter setting for temperature controller/PLC2Way communication, ladder transfer function, Modbus slave communication, etc. (See page 2-28.)

RGB Adjustment
Appears when the option unit ZM-302EU is provided.

I/O Test
Checks the ZM-300 Series interfaces and performs a touch switch test. (See page 2-4.)

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 ZM-300 interfaces and touch switch operation.



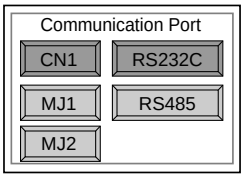
*1 When the serial extension I/O (ZM-322ME) is connected, use this button to check that the ZM-322ME works correctly. The [Ext. I/O Check] switch appears only when [External I/O] is selected for a modular jack on the ZM-71SE editor.

2-1. Self-loop Test

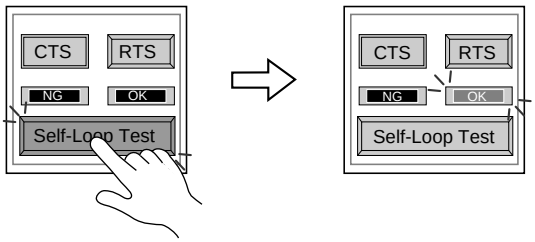
This is a signal test for communications through the CN1, MJ1 or MJ2 connector. Perform this test if the communication is not successful when transferring screen data through MJ1, connecting the PLC using CN1, or selecting multi-link 2, PLC2Way or PLC for MJ1/2, or connecting the ZM-1REC or ZM-322ME.

CN1: RS-232C Signal Test

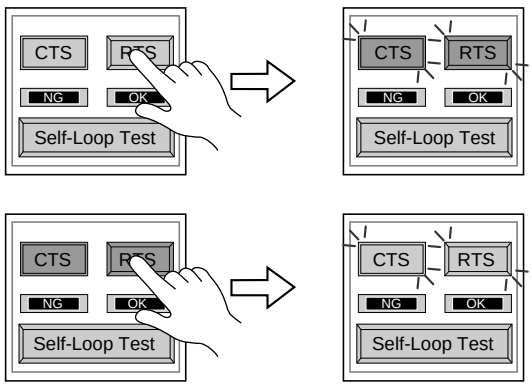
Turn the [CN1] and [RS232C] switches on.



- 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 ZM-300 unit.
  2. Press the [Self-Loop Test] switch. When the [OK] lamp lights up, the test is successfully completed.

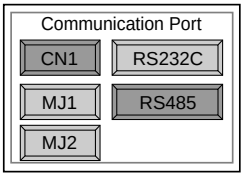


- CTS/RTS Test
  Check the signals [CTS] and [RTS].
  1. Install a jumper between pins 4 (RTS) and 5 (CTS) of CN1 on the backside of the ZM-300 unit.
  2. Press the [RTS] switch and check that both [RTS] and [CTS] lamps light up at the same time. Press the [RTS] switch again and check that both [RTS] and [CTS] lamps go off at the same time.

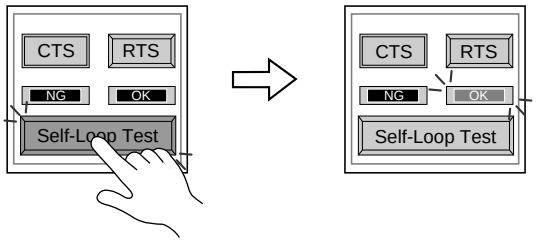


CN1: RS-485 Signal Test

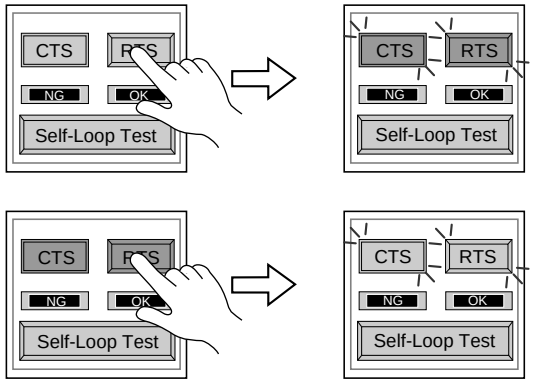
Turn the [CN1] and [RS485] switches on.



- 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 ZM-300 unit.
  2. Press the [Self-Loop Test] switch. When the [OK] lamp lights up, the test is successfully completed.

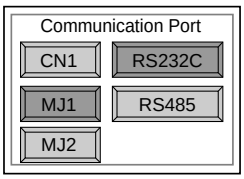


- CTS/RTS Test
  Check the signals [CTS] and [RTS].
  1. Install a jumper between pins 14 (+RTS) and 19 (+CTS) of CN1 and between pins 17 (–RTS) and 18 (–CTS) on the backside of the ZM-300 unit.
  2. Press the [RTS] switch and check that both [RTS] and [CTS] lamps light up at the same time. Press the [RTS] switch again and check that both [RTS] and [CTS] lamps go off at the same time.

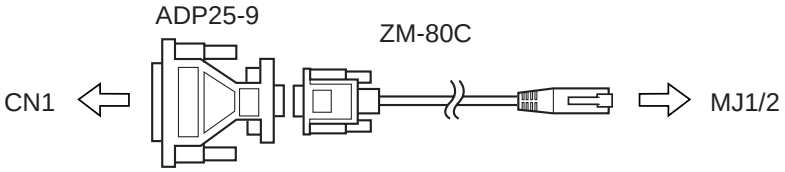


MJ1/2: RS-232C Signal Test

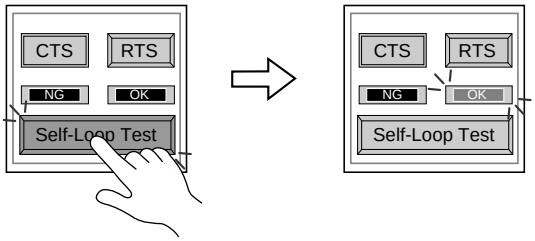
Turn the [MJ1] (or [MJ2]) and [RS232C] switches on.



- RS-232C Self-loop Test
  Check the signals [SD] and [RD]. Connect the data transfer cable (ZM-80C) to CN1 for the test.



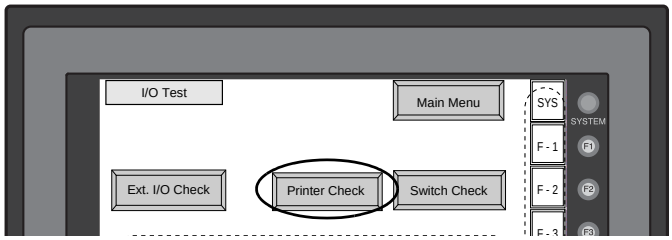
1. Set the adaptor ADP25-9 (attached to ZM-80C) to the cable ZM-80C. Connect the modular jack side of the cable to MJ1 (or MJ2) and the ADP25-9 side to CN1.
2. Press the [Self-Loop Test] switch. When the [OK] lamp lights up, the test is successfully completed.



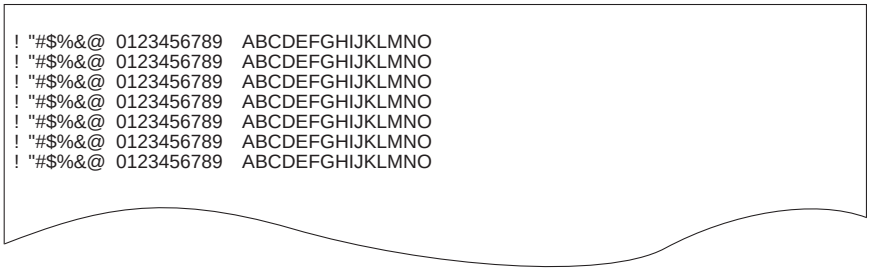
2-2. Print Check

Check that the ZM-300 series transmits the signals to the printer correctly.

1. Connect the ZM-300 series to the printer.
2. Press the [Printer Check] switch. The test is successful when a test page is printed out without problem.

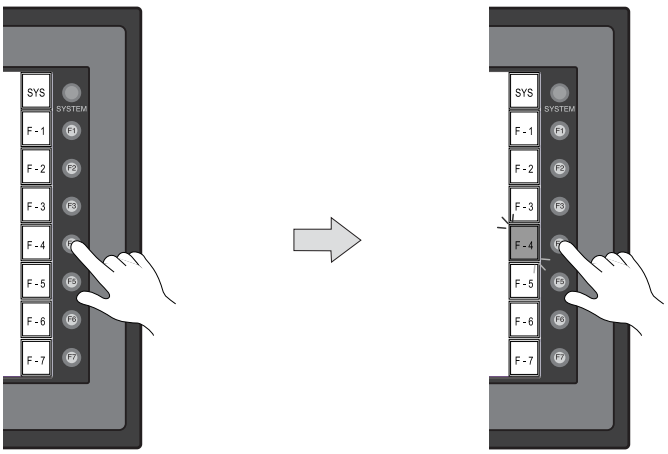


Example:



2-3. SYSTEM & Function Switch Test

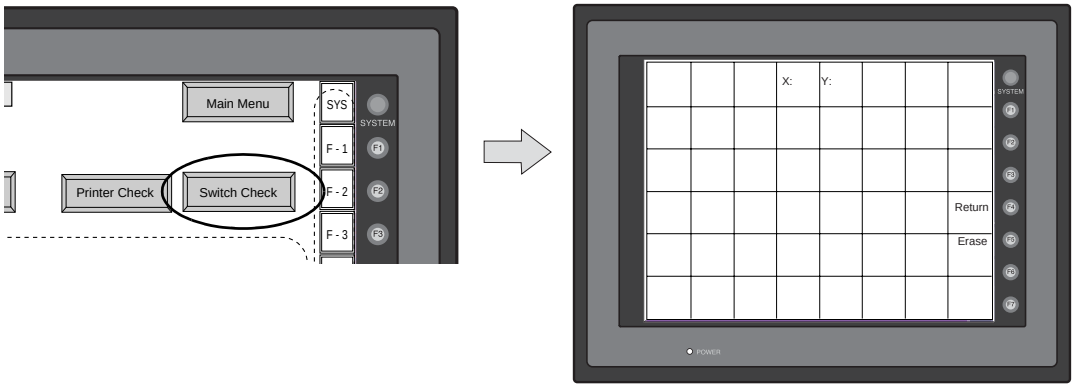
Check operations of eight switches provided vertically on the right side of the ZM-300 panel. Press the switch, and check that the lamp on the screen lights up while the switch is held down.



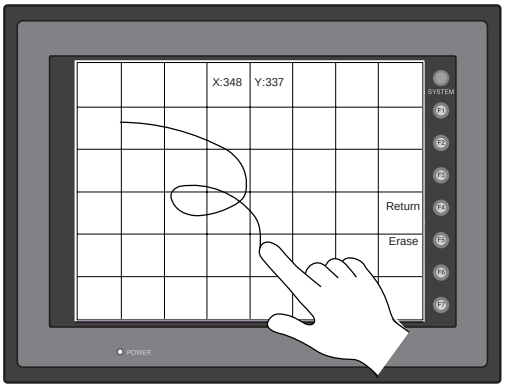
2-4. Touch Switch Test

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 ZM-300 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.

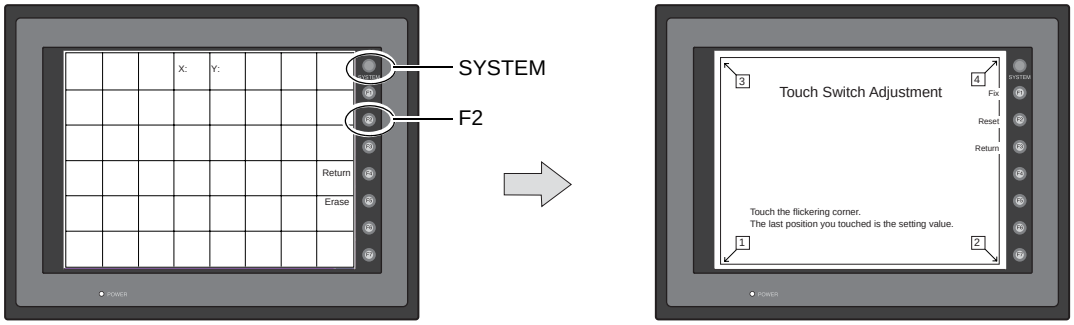


3. If a position different from the pressed position turns white, refer to “Touch Switch Adjustment” on the next page and adjust the touch switch position.

Touch Switch Adjustment

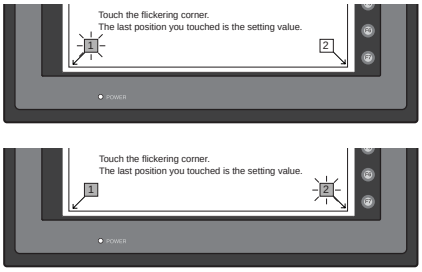
If a position different from the pressed position turns white on the touch switch test screen, follow the steps described below to adjust the touch switch position.

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

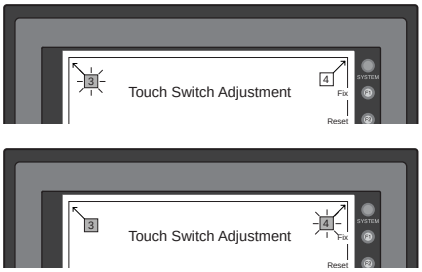


2. Press on “1” that is flashing at the corner on the touch switch adjustment screen. When the finger is released, a beep sounds and the position is set. “2” flashes.

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.

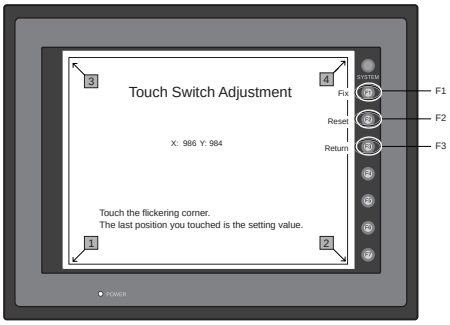


5. Press on “4” that is flashing at the corner. When the finger is released, a beep sounds and the position is set.

6. To re-set the positions, press the [F2] switch and follow step 2 and later.

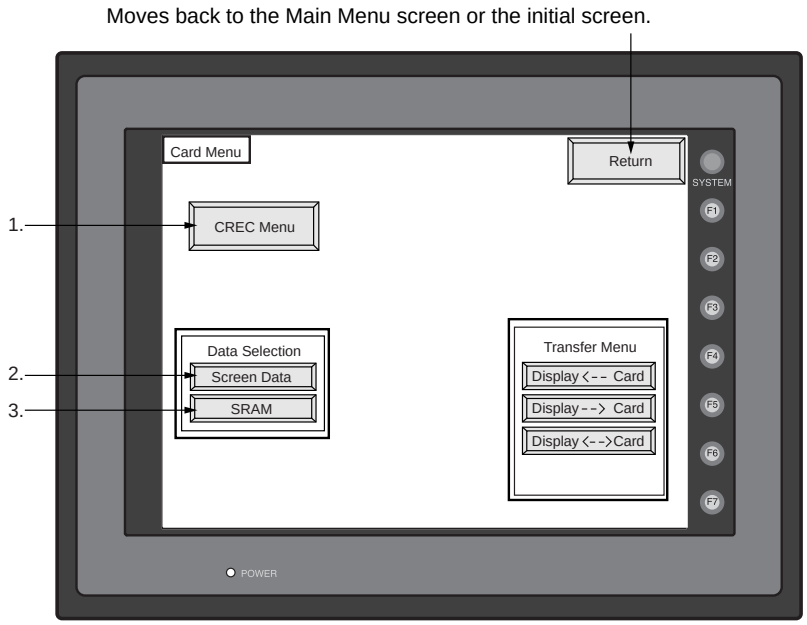
7. Press the [F1] switch. A long beep sounds and the positions are determined. The touch switch test screen is displayed again.

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 ZM-300 series and a CF card or a memory card.



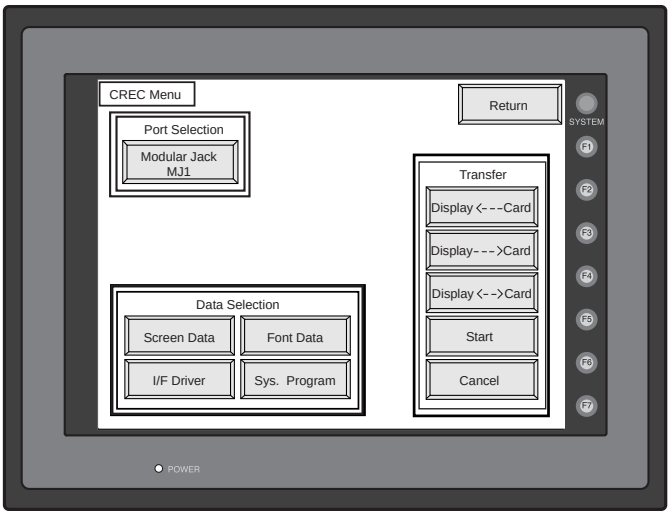
1. [CREC Menu] switch
   Press this switch when connecting the ZM-1REC to the MJ port of the ZM-300 series and transferring screen data between the ZM-300 series and a memory card.

2. [Screen Data] switch
   Press this switch when transferring screen data between the ZM-300 series and a CF card.

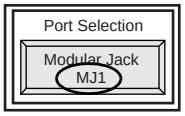
3. [SRAM] switch
   Press this switch when saving backup copies of the SRAM memory or ZM-300SM (SRAM cassette) or when uploading the backup data from the CF card to the ZM-300 series.

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 ZM-300 series and a memory card. The procedure for transferring data is described below.

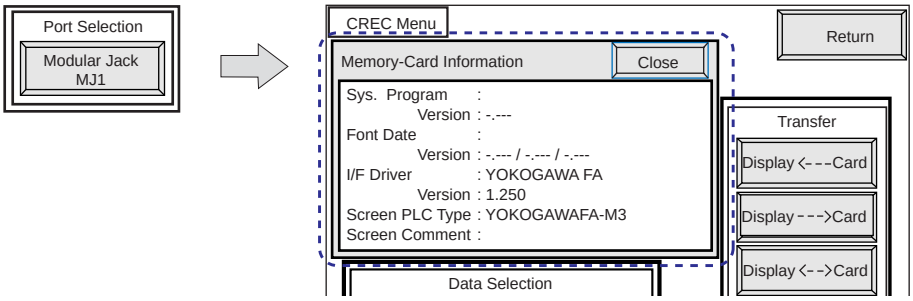


1. Connecting the ZM-1REC
   Check on the “Port Selection” field that the ZM-1REC cable is connected to a modular jack port.
   - MJ1: Connect the ZM-1REC to the MJ1 port. Normally MJ1 is selected.
   - MJ2: Connect the ZM-1REC to the MJ2 port. Only when [Memory Card] is selected for [Modular Jack 2], “MJ2” is indicated in the “Port Selection” field.



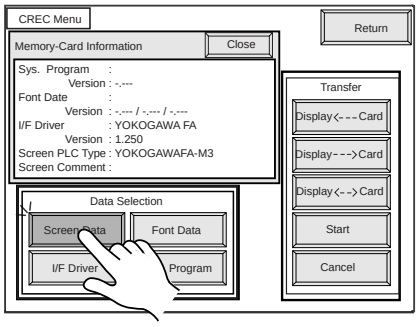
2. Mounting the Memory Card
   Insert a memory card into the card recorder (ZM-1REC).

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.

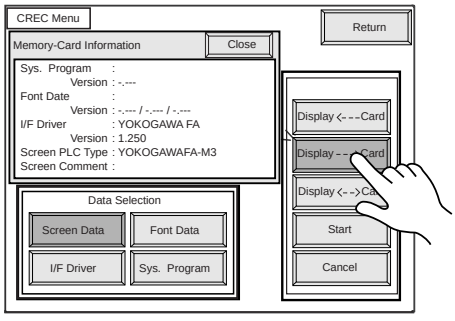


4. Data Selection and Transfer Selection
   In the “Transfer” field, select [Display <--Card], [Display --> Card] or [Display <--> Card]. Press the desired switch to turn the switch on. Multiple switches can be pressed in the “Data Selection” field.

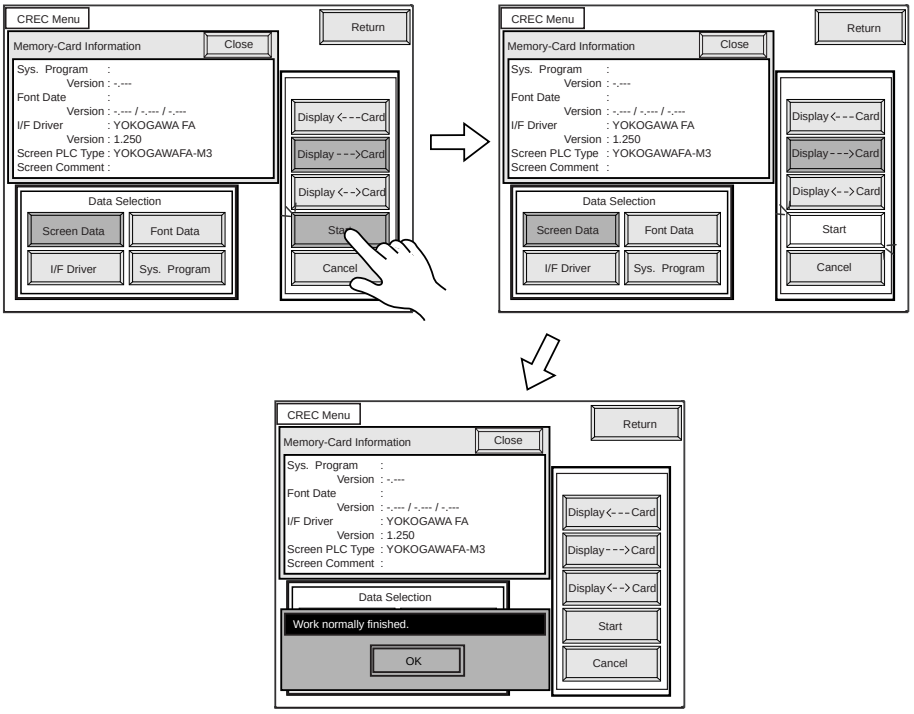
Data selection



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.



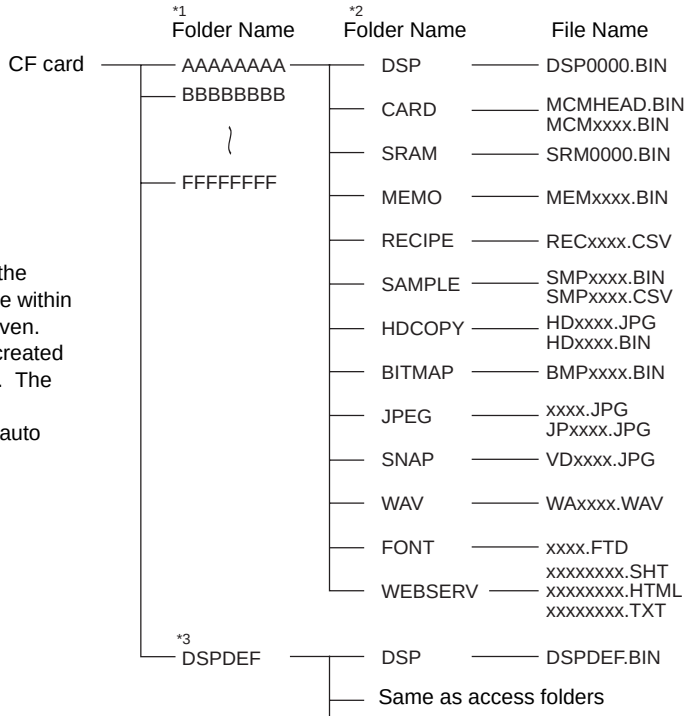
   Press the [OK] switch.

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.



*1 These are access folders set by the ZM-71SE editor. Any folder name within eight 1-byte characters can be given.
*2 These folders are automatically created when access folders are created. The folder name cannot be changed.
*3 The folder name for screen data auto uploading cannot be changed.

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 ZM-300 series using the ZM-42 to 82-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 ZM-300 series (for ZM-352D: 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 ZM-352D).	WEBSERV	Saves files to be accessed from the Web browser.
MEMO	Saves memo pad data drawn with the ZM-300 series.		

DSPDEF (screen data auto upload folder)

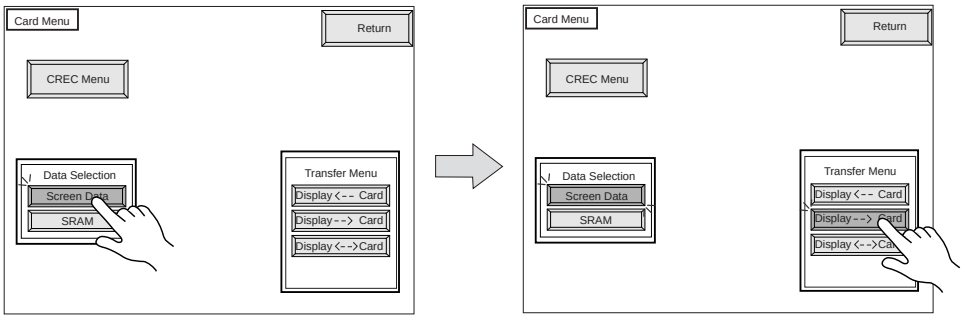
Folder Name	Contents
DSP	Automatically reads screen data in this folder when the CF card is inserted in the ZM-300 unit after the DIP switch is set.

(Other folders are the same as access folders.)

Transferring Screen Data from a CF Card

The procedure of transferring data between the ZM-300 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 ZM-300 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].

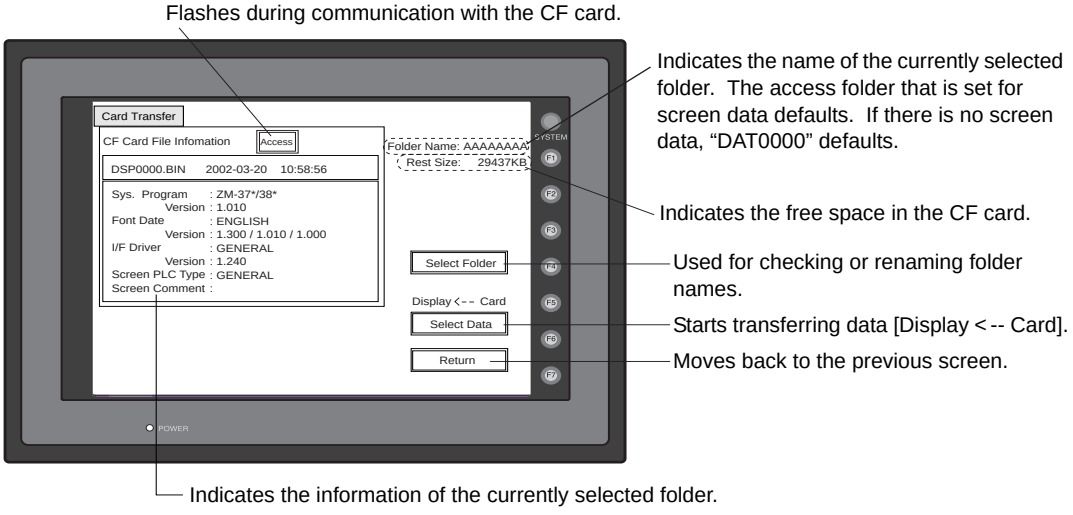


Data selection Transfer selection

When [Display <-- Card] is Selected:

Transfer screen data from the computer to the CF card.

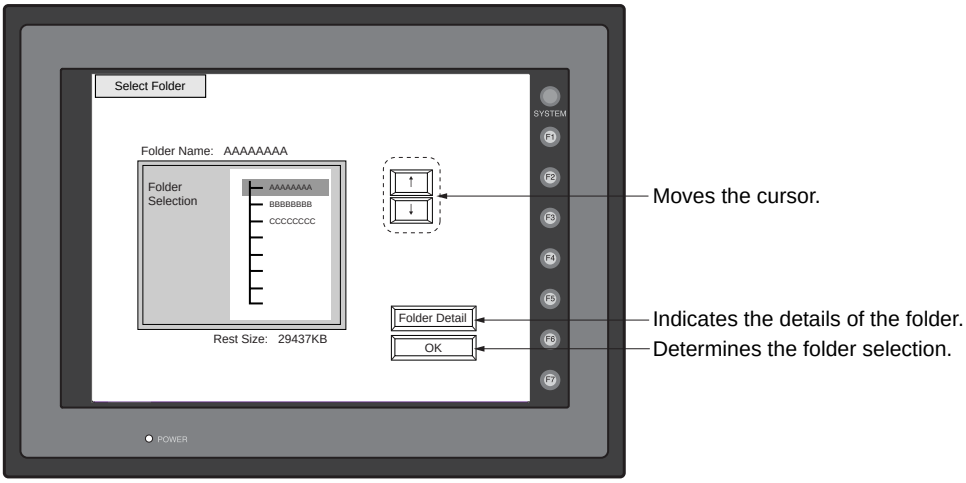
1. When [Display <-- Card] is selected, the “Card Transfer” screen is displayed.



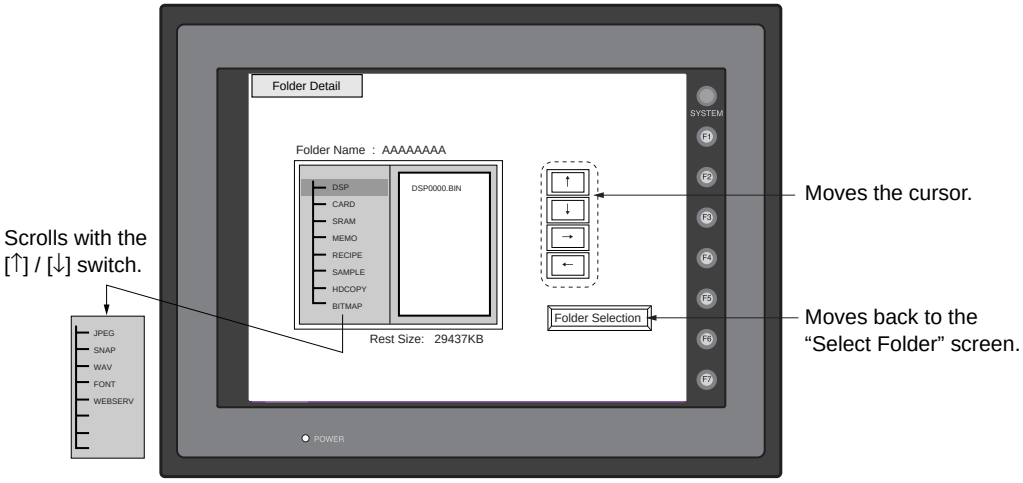
2. Check the folder name, free space, and CF card file information. If the correct folder is selected, move to step 4.

   - 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.

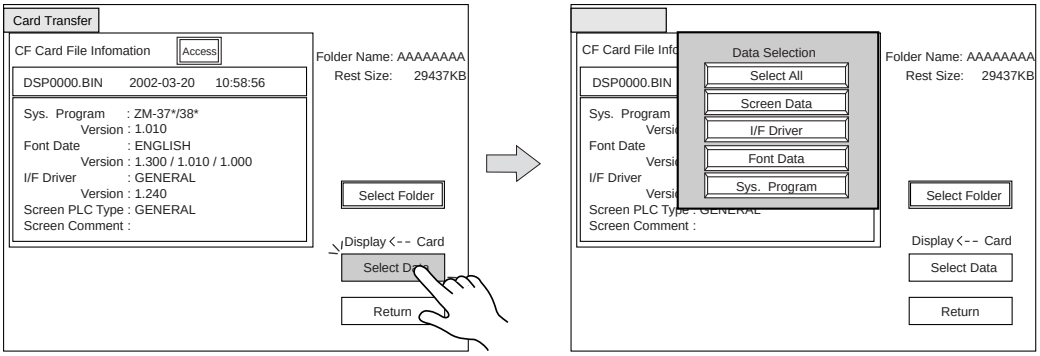
3. To change to another folder, press the [Select Folder] switch. The “Select Folder” screen is displayed.



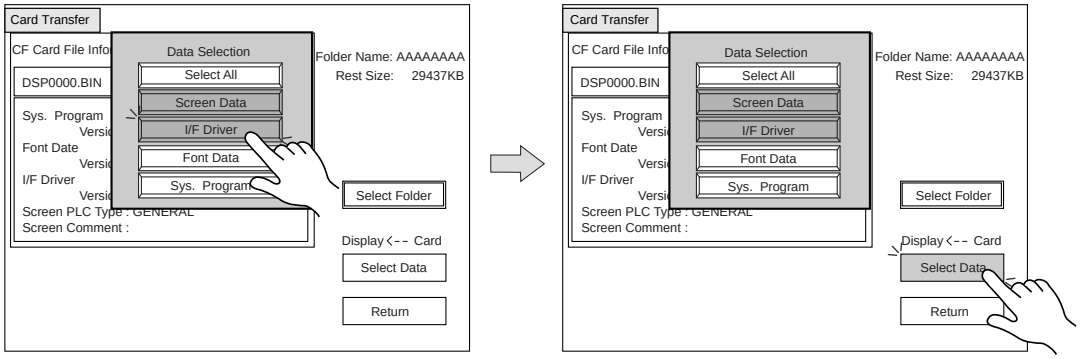
   - Select the desired folder using the [↑] / [↓] switch, and press the [OK] switch. The Card Transfer screen is displayed again and the CF card file information of the selected file is indicated.
   - To see the details of the folder, press the [Folder Detail] switch. The “Folder Detail” screen is displayed.



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

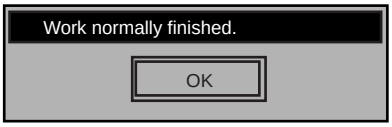


Select the desired data, and press the [Select Data] switch.



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

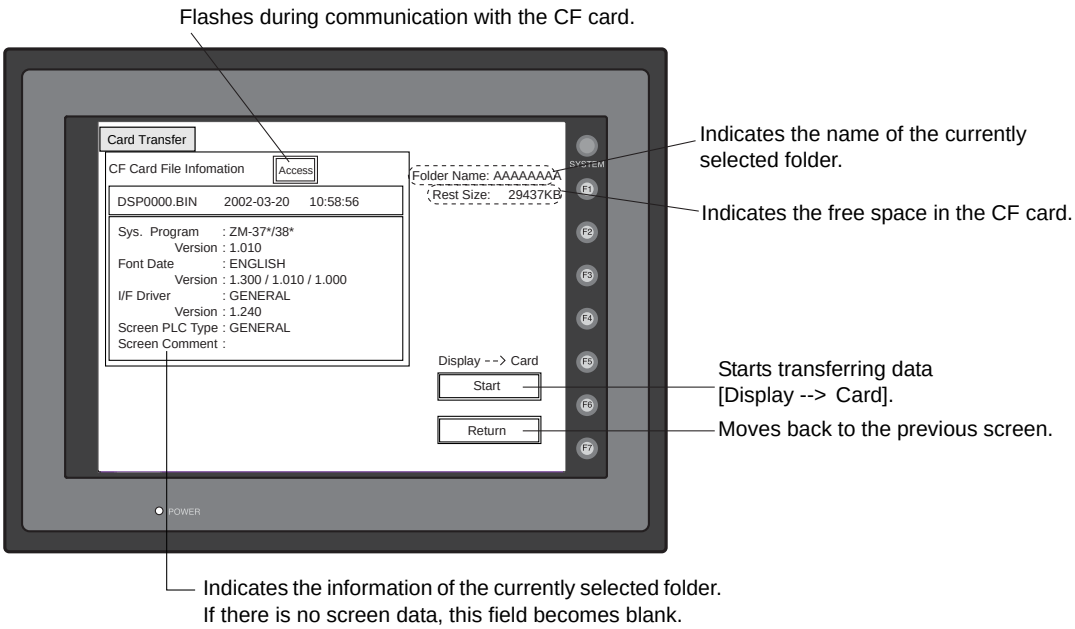
5. During data transfer, the [Start] switch changes into [Busy] and flashes. When data has been transferred successfully, the following window is displayed. However, when [Sys. Program] or [Select All] is selected, the “Main Menu” screen is displayed without this message window on completion of data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



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

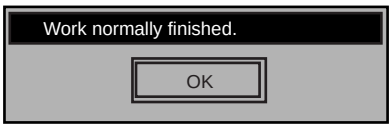
When [Display --> Card] is Selected:

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



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 ZM-300 series overwrites the CF card data. Note that the CF card data is lost when data in the ZM-300 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.

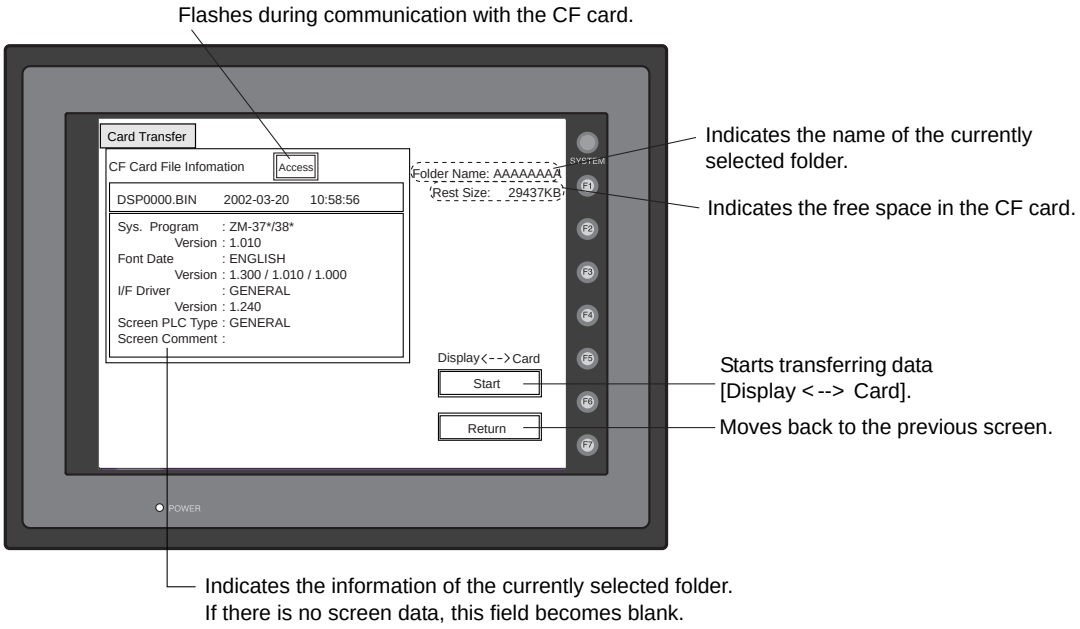


   Press the [OK] switch. The CF card file information shows data that has been transferred. If any other message is displayed, refer to page 2-23.

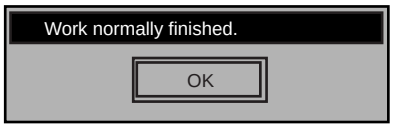
4. Press the [Return] switch. The “Card Menu” screen is displayed again.

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 ZM-71SE editor.



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.



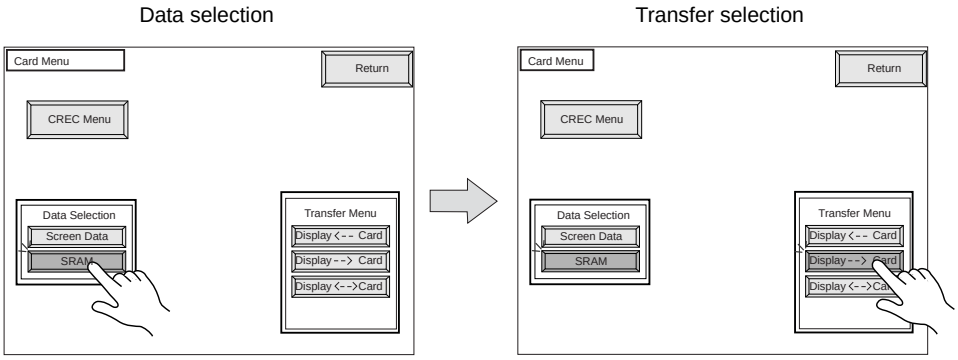
Press the [OK] switch. If any other message is displayed, refer to page 2-23.

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

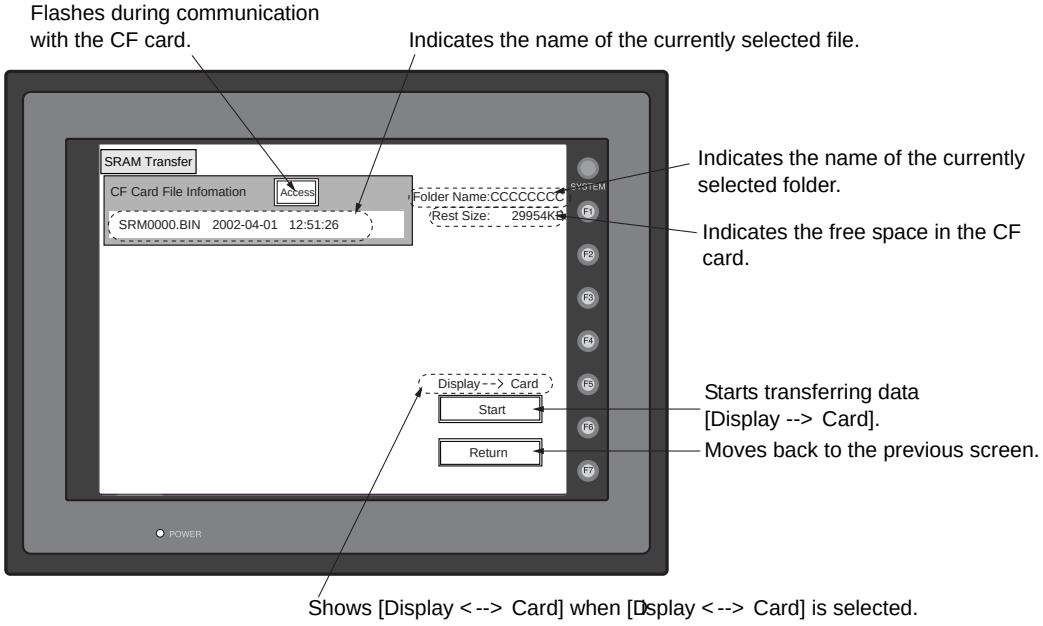
3-3. Saving Backup Copies of SRAM

In this section, the procedure for saving backup copies of the SRAM memory or ZM-300SM (SRAM cassette) for battery replacement is explained.

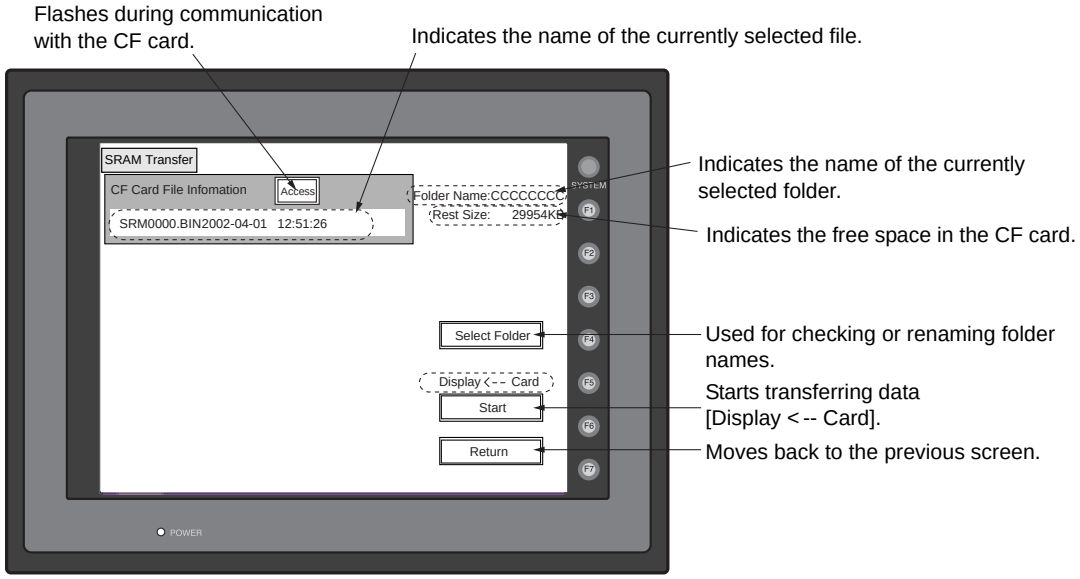
1. Press the [SRAM] switch on the “Card Menu” screen. When the lamp is red, it is selected.
2. Select [Display < -- Card], [Display --> Card] or [Display < --> Card].



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 ZM-300 series. The name is shown on the screen. The transferred file is named as “SRAM0000.BIN.”



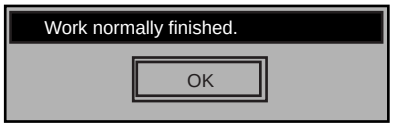
- When [Display < -- Card] is selected, the following screen is displayed.



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.”

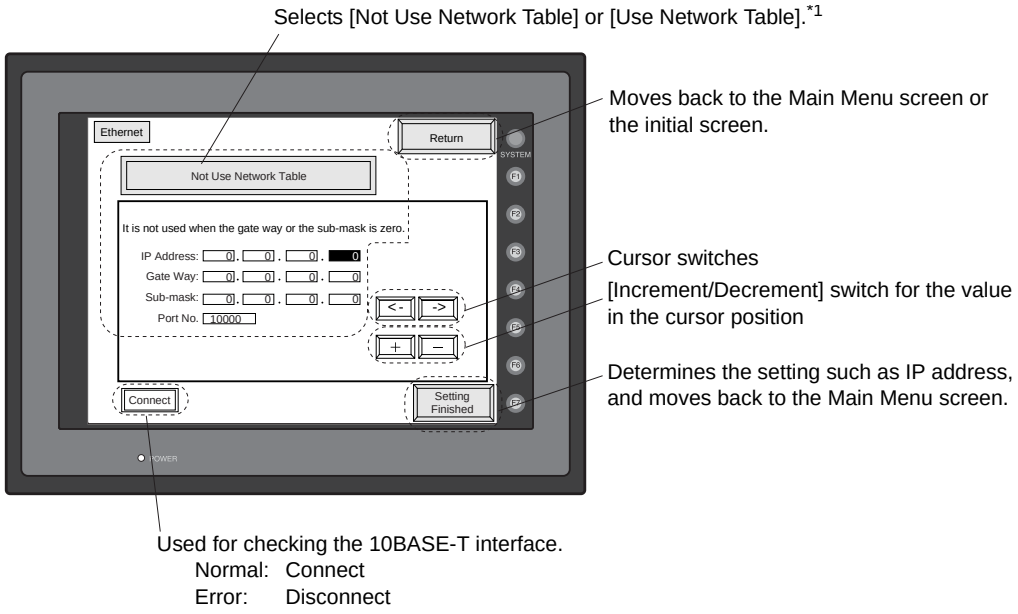
Messages	Contents
Work normally finished.	The specified operation has been concluded normally.
ZM-1REC not connecting	CREC is not connecting when selecting a modular jack.
ZM-1REC Communication Error	A communication error occurred between ZM-300 and ZM-1REC when selecting a modular jack.
Memory-Card 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 ZM-300 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.
ZM-300 type is different.	The specified type of the data in ZM-300 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 ZM-300.
Data discrepant	There is some discrepancy in data, when comparing data between a memory card and ZM-300.
Screen data on ZM-300 will be broken.	Warning about data destruction in ZM-300 that may occur when transferring the font data larger than the present data from a memory card to ZM-300. (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 ZM-300 series. This screen is used for setting the IP address (a number that identifies the ZM-300 series on the network) that is indispensable for Ethernet communications.

Depending on whether the LAN (10BASE-T) connector at ZM-300(high-performance) or the network module ZM-80NU/80NU2 for ZM-300 is used, the “Ethernet” screen contents and the required settings vary as described below.

Connection with LAN (10BASE-T) Connector at ZM-300(high-performance)

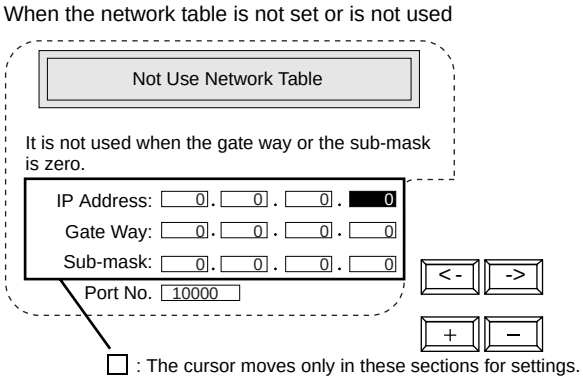


*1 Network Table
Register IP addresses and other information for the ZM-300 series, PLCs or computers that should be included for Ethernet communications on the ZM-71SE editor. ([System Setting] → [Network Table Setting] → [Ethernet] → Edit Network Table) The registered network table can be used or not used depending on the [Not Use Network Table/Use Network Table] switch.

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 ZM-300 series.
- If the network table is set for screen data of the ZM-300 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].

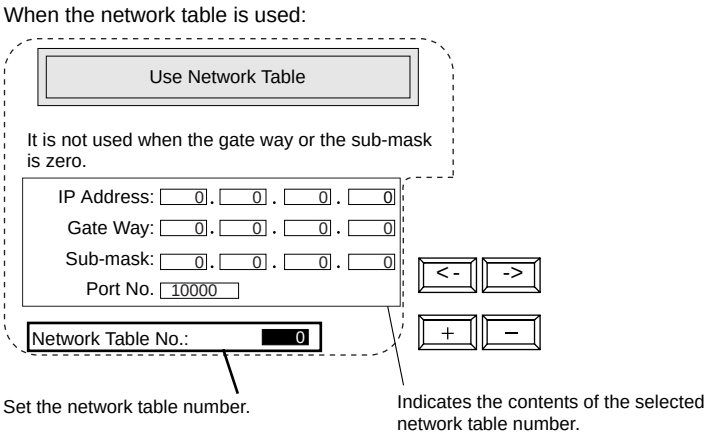


1. Set the IP address. (If necessary, set the default gateway and subnet mask.)
2. Press the [Setting Finished] switch. The IP address is determined.
3. The Main Menu screen is displayed again. (If the “Ethernet” screen is displayed from the initial screen, the initial screen is displayed again.)

Use Network Table

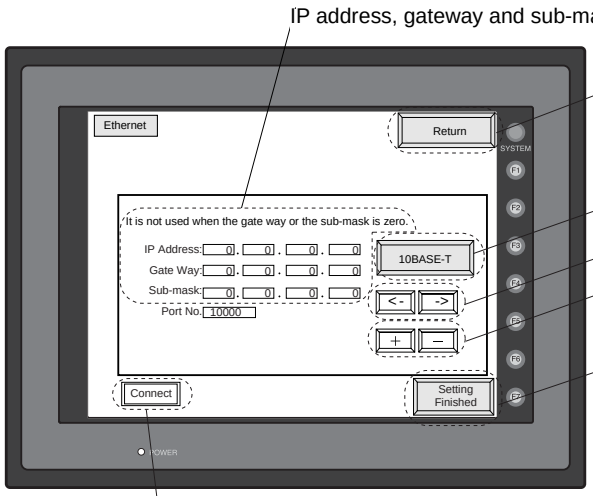
In the following cases, select [Use Network Table].

- The network table is set for screen data of the ZM-300 series and you would like to change the 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 ZM-80NU/80NU2 on ZM-300



Moves back to the Main Menu screen.

Selects [10BASE-T] or [AUI].

Cursor switches

[Increment/Decrement] switch for the value in the cursor position

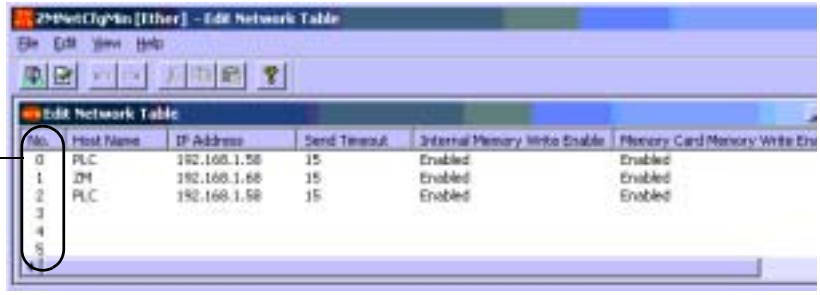
Determines the setting such as IP address, and moves back to the Main Menu screen.

Used for checking the 10BASE-T interface.
Normal: Connect
Error: Disconnect

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.

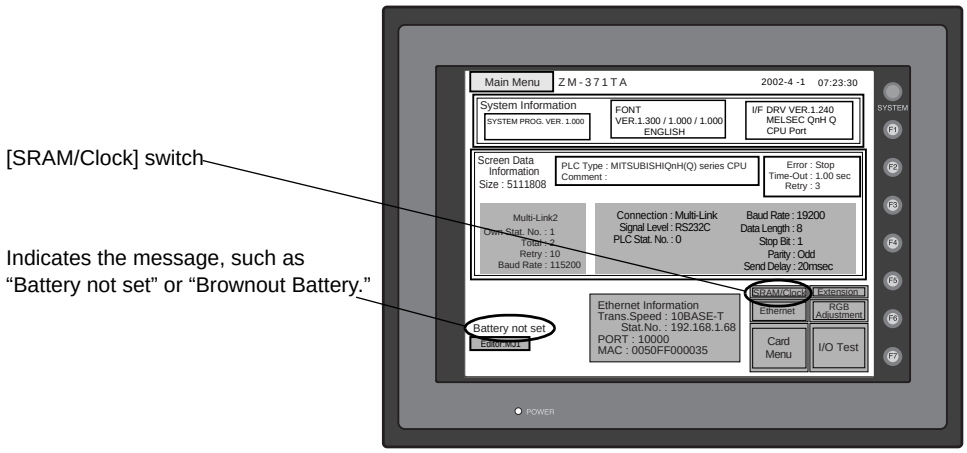
- Rotary Switch and Network Table
  Register IP addresses and other information for the ZM-300 series, PLCs or computers that should be included for Ethernet communications on the ZM-71SE editor. ([System Setting] → [Network Table Setting] → [Ethernet] → [Edit Network Table]) Set the network table number with the rotary switch on the network module ZM-80NU/80NU2.

Port number to be set with the rotary switch on the network module ZM-80NU/80NU2

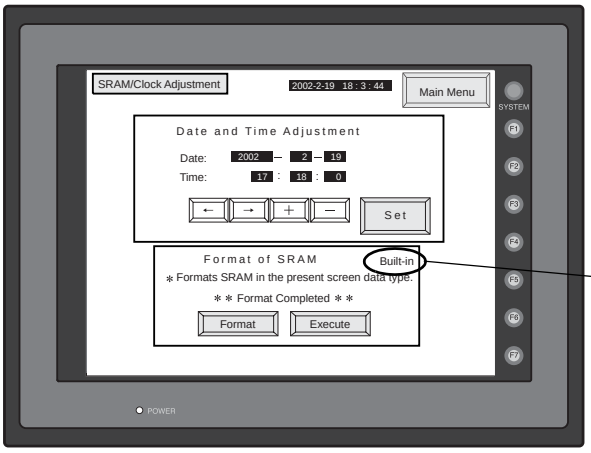


5. SRAM/Clock

- To use the built-in clock of the ZM-300 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 ZM-71SE Instruction Manual.
- Be sure to set the battery when using the built-in clock of the ZM-300 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.



ZM-300SM mounted: Extension
ZM-300SM 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.

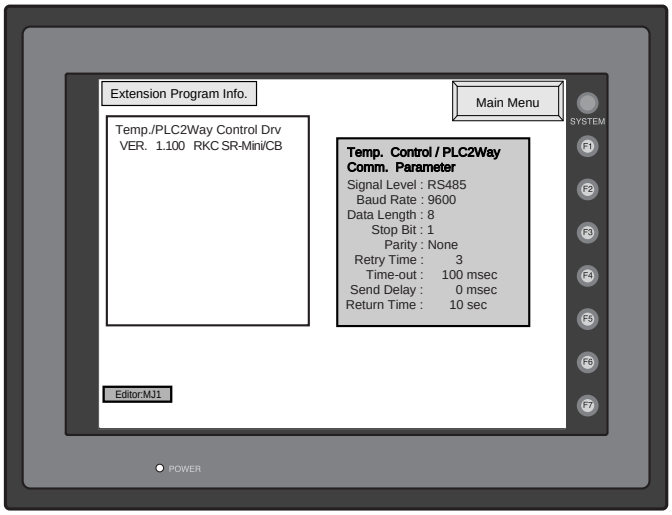
Initializing SRAM

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 ZM-300SM (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

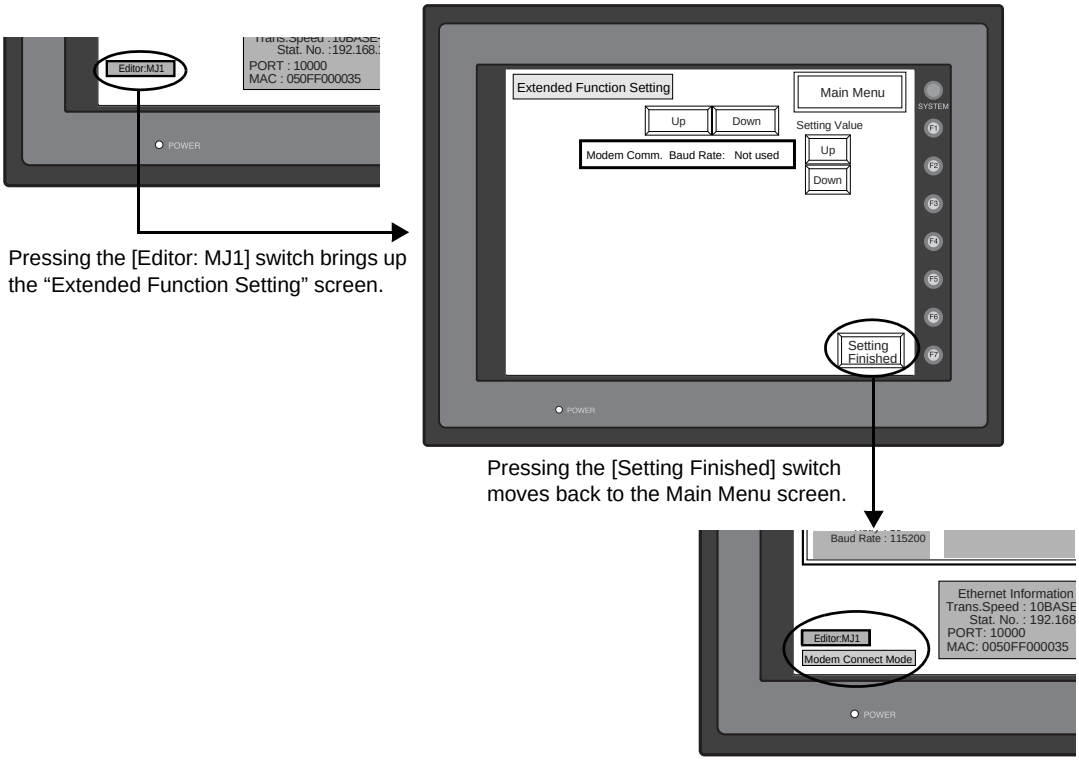
When the [Extension] switch on the Main Menu screen is pressed, the following “Extension Program Info.” screen appears. The driver setting and parameter setting for temperature controller/PLC2Way communication, ladder transfer function, Modbus slave communication, etc. are displayed.



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 ZM-300 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 ZM-300 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 ZM-300 series and the computer via ZM-80C, select “Not used” for [Modem Comm. Baud Rate].



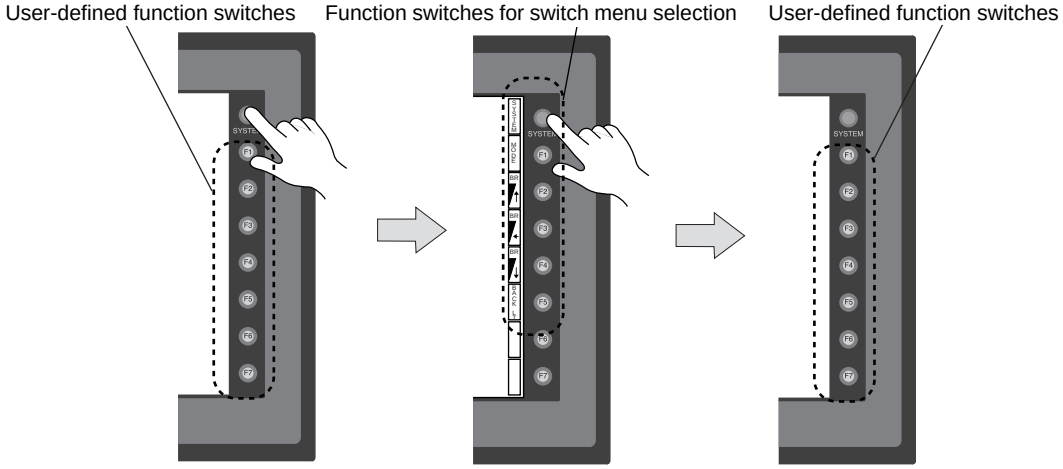
2. Function Switches

Types

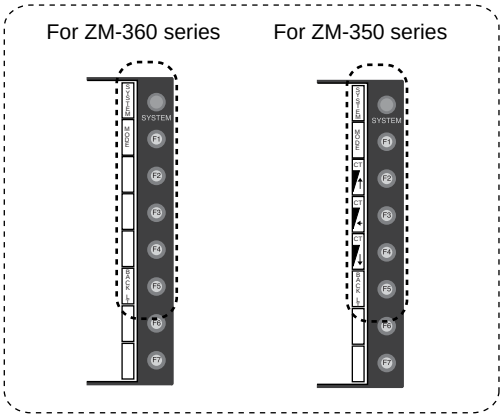
- There are eight function switches provided.
  [SYSTEM], [F1], [F2], [F3], [F4], [F5], [F6], [F7]

[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 ZM-370/380 series



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

- User-defined function switches [F1] to [F7] do not work in the STOP mode.
- When the ZM-300 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 ZM-71SE 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

<table>
<tr><td></td><td>Functions</td><td colspan="5">Contents</td></tr>
<tr><td>F1</td><td>Mode</td><td colspan="5">Selects the operation mode between STOP ↔ RUN.</td></tr>
<tr><td rowspan="4">F2
F3
F4</td><td rowspan="4">Contrast
Brightness</td><td rowspan="2">Item</td><td>Contrast Adjustment</td><td colspan="3">Brightness Adjustment</td></tr>
<tr><td>Adjust the contrast. Holding down the switch for one second or more changes the contract rapidly.</td><td colspan="3">Adjusts the screen brightness in three levels.</td></tr>
<tr><td>Applicable models</td><td>ZM-352D</td><td colspan="3">ZM-37*/38*</td></tr>
<tr><td>Adjustment</td><td>F2 F3 F4
← →
Dark Medium Pale</td><td>F2</td><td>F3*1</td><td>F4*1</td></tr>
<tr><td colspan="3"></td><td>1
Bright</td><td>2
Medium</td><td>3
Dark</td></tr>
<tr><td rowspan="3">F5</td><td rowspan="3">Backlight</td><td colspan="5">Turn the backlight on and off.
Backlight control should be set on the ZM-71SE editor.
([System Setting] → [Unit Setting] → [Unit Setting] dialog, [Backlight] tab window)</td></tr>
<tr><td>Always ON</td><td>Auto 1/Auto 2</td><td colspan="3">Manual/Manual 2</td></tr>
<tr><td>Ignored</td><td>• 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).</td><td colspan="3">• 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:
ON → Backlight ON
OFF → Backlight OFF
The backlight will be in the above status.</td></tr>
</table>

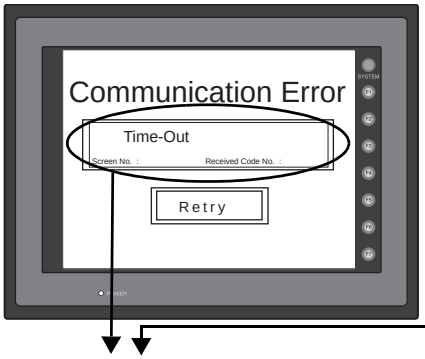
*1 When a medium or dark brightness is set, the backlight service life may become shorter.

3. Errors Displayed on the ZM-300 Series

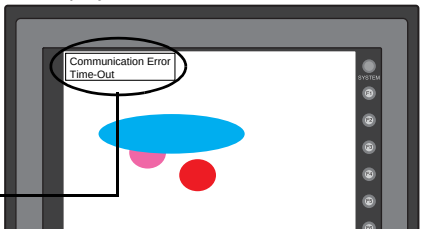
There are five kinds of error messages displayed on the ZM series:

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 ZM-300 series without establishing communication between ZM-300 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 ZM-300'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 ZM 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 (ZM-71SE) 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.

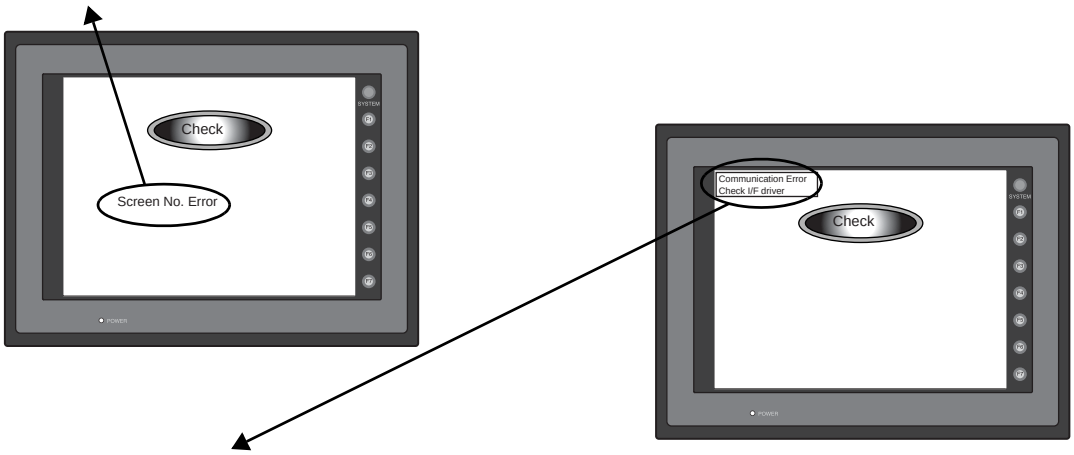
Error Messages for Network Communication

- 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.”

2. Check

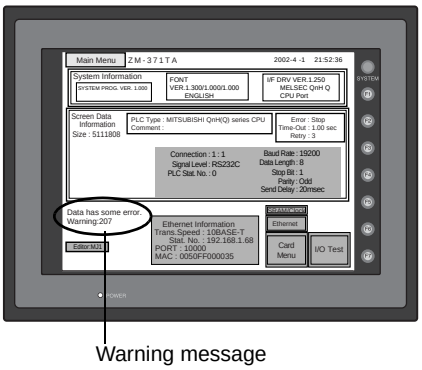
Error Message	Contents	Solution
Screen No. Error	There is no setting for the received screen.	At the start of communications, the ZM-300 series regards the value in the read area “n + 2” as the screen number. Check that this value is an existing screen number on the PLC.
Data has some error. Error : 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 “ZM-71SE Instruction 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.

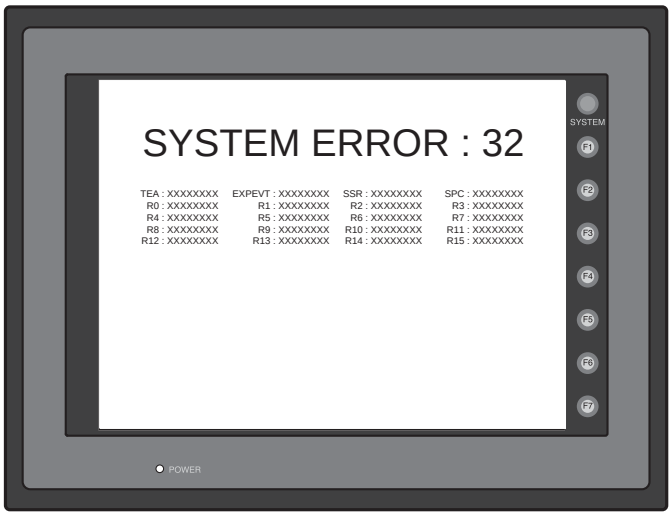
3. Warning

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 ZM-71SE Instruction Manual and correct screen data.



4. SYSTEM ERROR

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



ERROR: XX

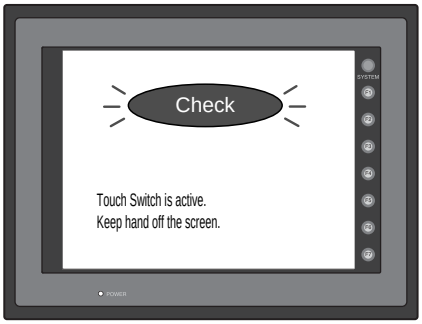
1: Watch dock timer error
11: Switch table error
30: Request for displaying full error
31: Memory allocation system error
32: General exceptions/MMU address system error
33: RTOS system error
34: Memory error
35: Inaccurate memory error

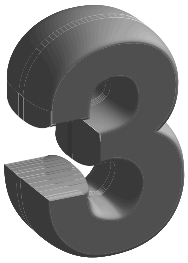
The source of the error could be one of the following three problems. Contact your local distributor.

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.





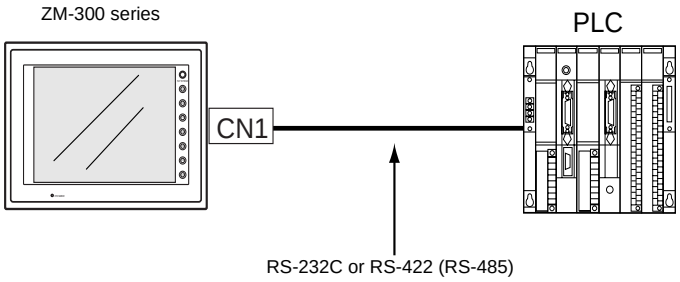
Serial Communications

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. ZM-Link
7. PLC2Way

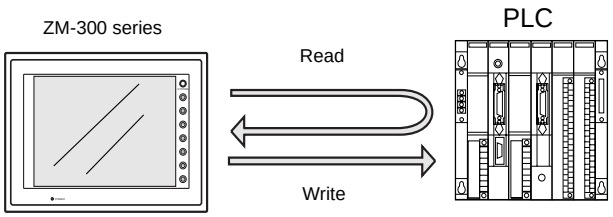
1. 1 : 1 Connection

1 : 1 Connection

- One set of the ZM-300 series is connected to one PLC (1 : 1 connection).



- The host link unit of the PLC or the CPU port is used and the ZM-300 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 ZM-300 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.



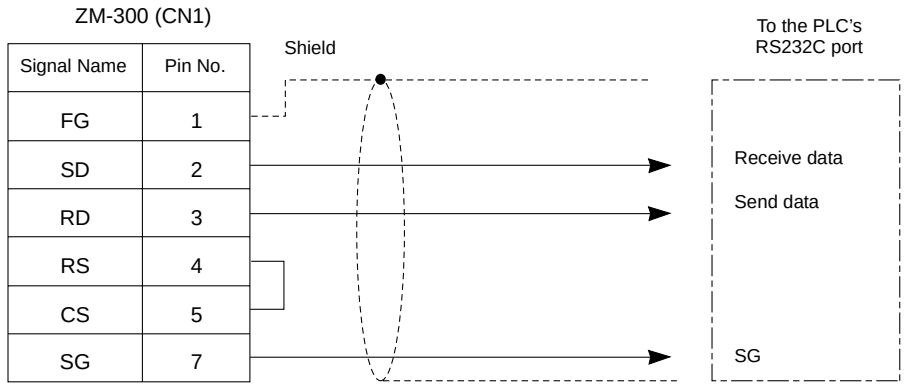
Wiring

DANGER Electric shock hazard
Shut the power off before connecting cables.

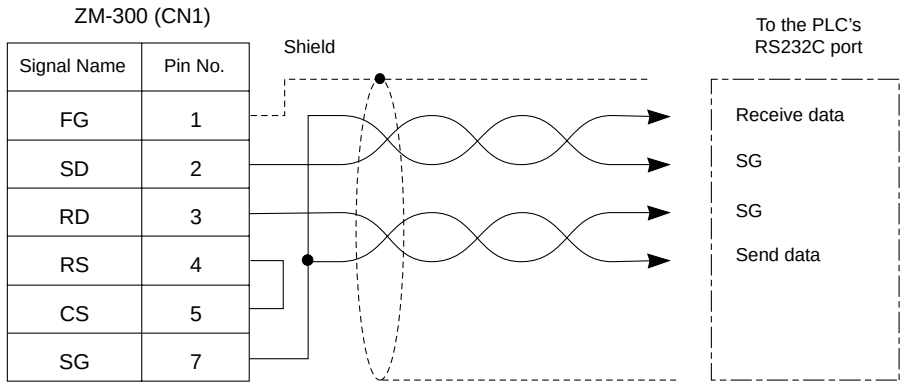
Prepare the communication cable with the PLC on your side. Refer to the following information for the cable. For more information on the connection to respective PLCs, refer to “Chapter 5 Connection to PLCs.”

RS-232C Connection

- Connect the shielded cable either to the ZM-300 series or PLC side. This connection diagram shows the case where the shielded cable is connected on the ZM-300 series side. When connecting the shielded cable to the ZM-300 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.



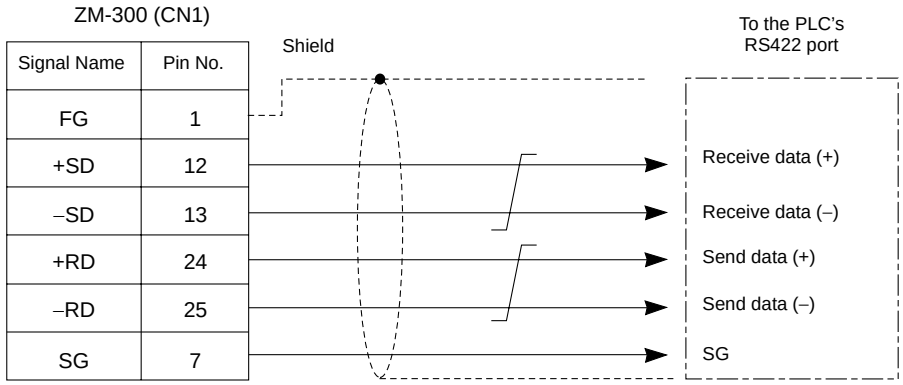
- If noise disturbs communications, use twist-pair cables between SD/SG and RD/SG.



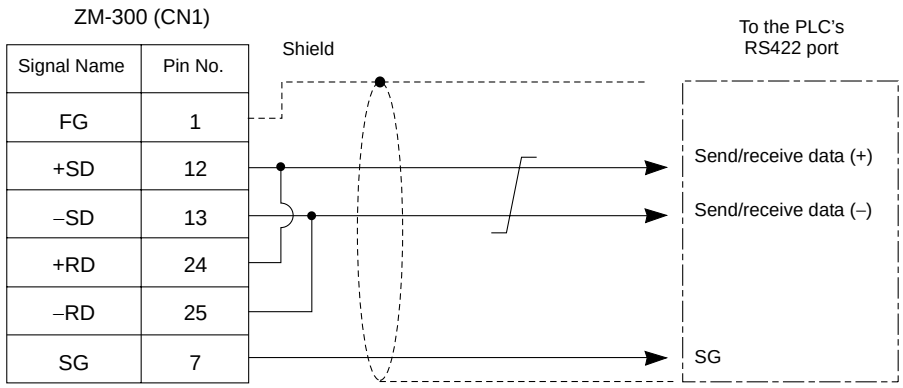
RS-422/485 Connection

- 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 ZM-300 series or PLC side. This connection diagram shows the case where the shielded cable is connected on the ZM-300 series side. When connecting the shielded cable to the ZM-300 series side, connect it to pin 1 of the connector or the connector case cover.
- To use a terminal block for connection, use Sharp Corporations' "ZM-1TC" optionally available.
- For the terminating resistance on the ZM-300 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:



ZM-71SE Setting

For serial communications, the following settings on the ZM-71SE editor are required. The settings in the [Select PLC Type] and [Comm. Parameter] dialogs are shown on the Main Menu screen of the ZM-300 series. (Refer to "Chapter 2 LCD Control Terminal 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 ZM-300 series ↔ PLC. Check the communication parameter setting on the PLC before making the setting on LCD Control Terminal.

- 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 ZM-300 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 ZM-300 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.”)

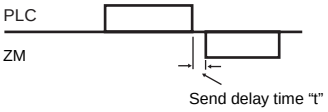
    [Baud Rate] (4800, 9600, 19200, 38400, 57600, 76800, 115 kbps)
    Set the same communication speed as the PLC.

    [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 ZM-300 series to avoid a delay in PLC processing that may occur when the ZM-300 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 ZM-300 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 ZM-300 series).

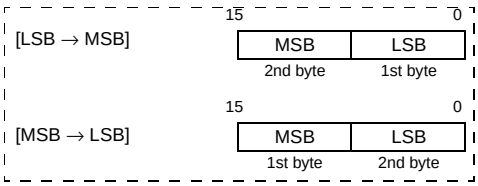
  [Continuous] If any communication error has arisen, it is indicated at the top left corner on the ZM-300 screen. The ZM-300 series conducts polling of the PLC, and if OK, the error state is automatically reset.

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

  [Time-out Time] (0 to 999) (Unit: ×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 retrial is attempted.

  [Retrials] (1 to 255)
  Specify the number of retrial times. When the problem persists even after as many retrials as specified, the system will start the error handling routine.

- [Text Processing]
  (LSB → MSB / MSB → 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 ZM-30 Compatible]
  When converting screen data files created on ZM-30 into those of the ZM-300 series, this option is automatically checked. When this option is checked, ZM-30 compatibility is supported by securing 2 words each for [Read Area] and [Write Area] in the same format as ZM-30. For more information, refer to the ZM-30 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 ZM-300 series and the PLC.

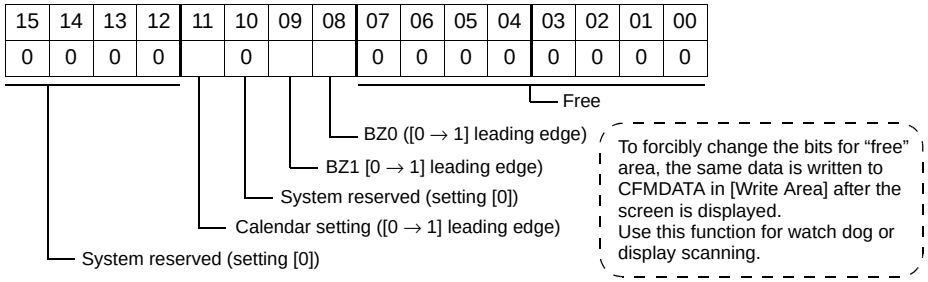
- Setting Position
  [System Setting] → [Comm. Parameter] → [Comm. Parameter] dialog
- Setting Items
  [Read Area] (3 words or more)*
  - This is the area where commands from the PLC are received for screen display changes. Consecutive three words from the specified memory address are used as "read area."

Address	Name	Contents
n	RCVDAT	Sub command/data
n + 2	SCRN_ COM	Screen status command
n + 1	SCRN_ No	Screen number command

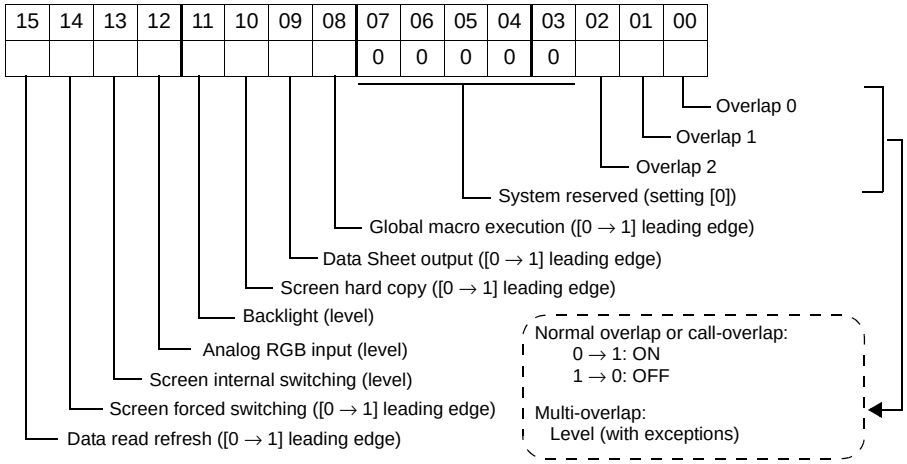
*** When you have created screens with the following function,the number of required memory addresses vary.**
- **When the sampling function is used:**
  Refer to the ZM-71SE Instruction Manual (Function).
- **When [☐ Read/Write Area ZM-30 Compatible] is checked:**
  Refer to the ZM-30 User's Manual.

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

- RCVDAT (n) Sub command/data



- SCRN_ COM (n + 1) Screen status command



- 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													

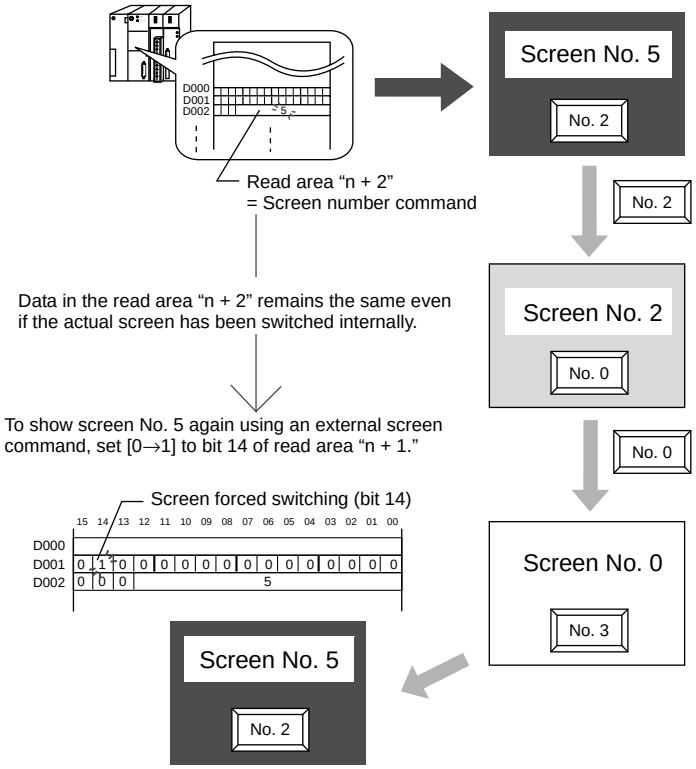
System reserved (setting [0])

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).



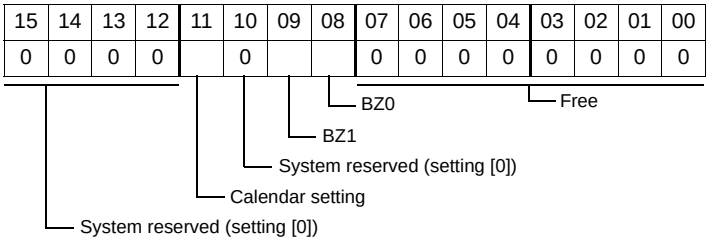
[Write Area] (3 words)*

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

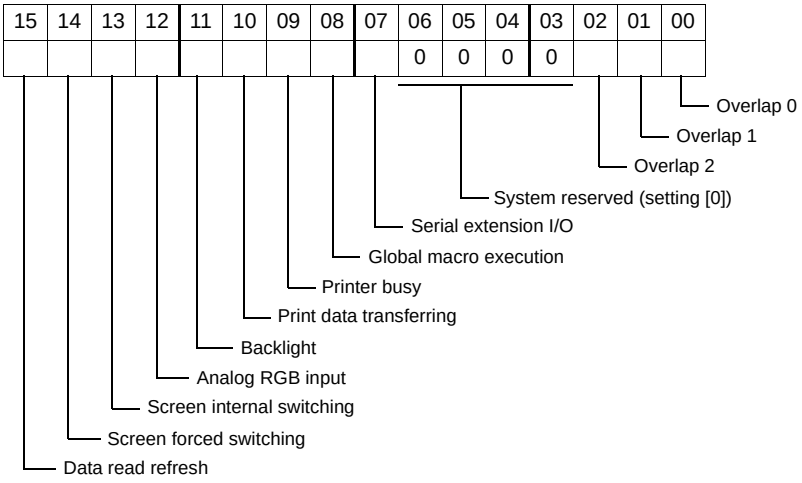
*** When you have converted ZM-30 data to the ZM-300 series data, the number of required memory addresses vary. Refer to the ZM-30 User’s Manual.**

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

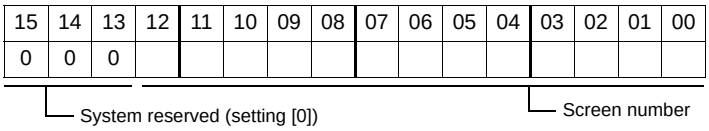
- CFMDAT (n)



- SCRN_ COM (n + 1) Screen status



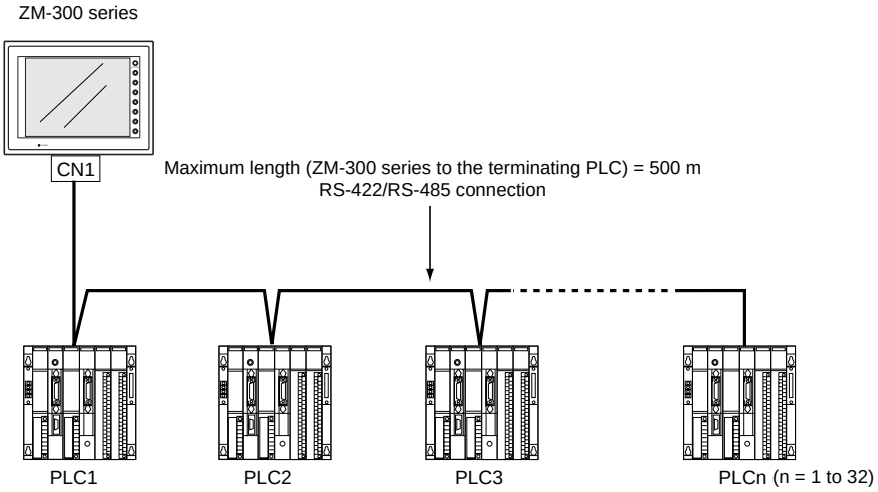
- SCRN_ No. (n + 2) Displayed screen number



2. 1 : n Connection (Multi-drop)

1 : n Connection

One ZM-300 series is connected to multiple PLCs. (Maximum connectable PLCs: 32)

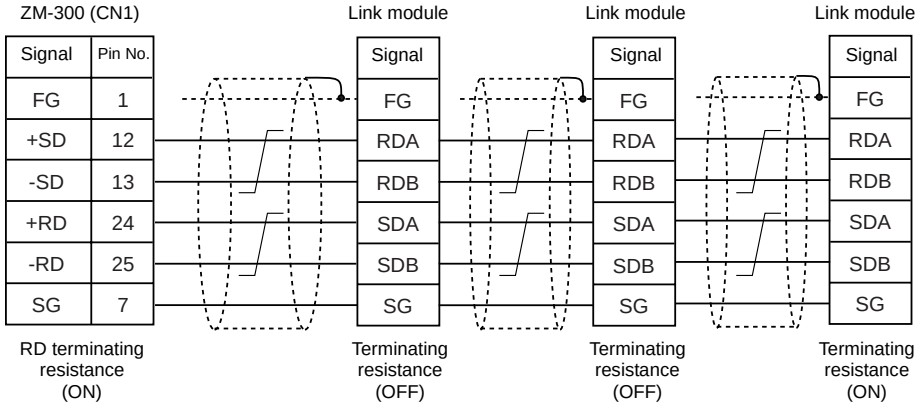


Wiring (RS-422/485)

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

Example:

The following example shows how one ZM-300 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.

ZM-71SE Setting

The following settings must be made on the ZM-71SE editor. Only the points different from those described in "1 : 1 Connection/ZM-71SE 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 ZM-300 internal system memory address $s114 to 129.

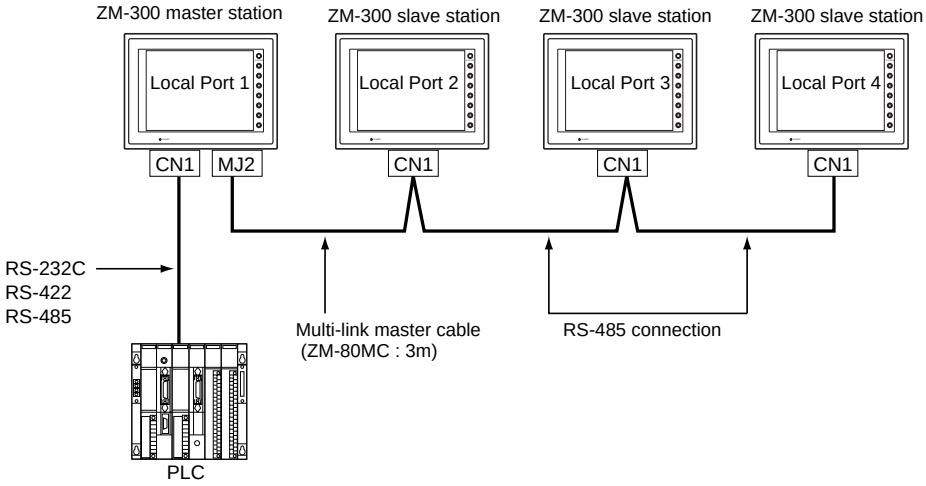
Supplemental Information:	Internal system memory The internal system memory is the one for the ZM-300 series system.

- 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 ZM-300 series establishes communications with the PLC for the first time. A communication error occurs on the ZM-300 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 ZM-300 series.
- An original network is created where the ZM-300 series (Local Port 1) that is directly connected to the PLC is the master station, and other three ZM-300 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.

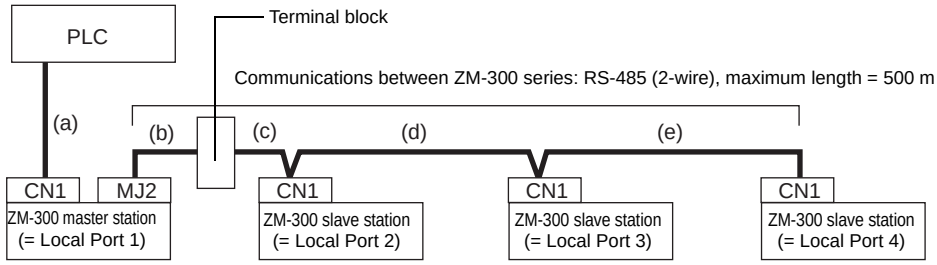


- Communications between the ZM-300 master station and the PLC depend on the communication speed set on the PLC. The maximum available speed for the ZM-300 series is 115 kbps, which is higher than the one available with multi-link connection described in “4. n : 1 Connection (Multi-link).”
- This multi-link 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 ZM-300 series. Please use multi-link 2 master cable (ZM-80MC) 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 network module (Ethernet, etc) is used.
  2. The ZM-300 series (master or slave station) is used for the PLC2Way function.

- The ZM-300 and ZM-42 to 82 series can be used together. The ZM-42 to 82 series can be the master station. (However, when ZM-42/43 is the master station, the slave station must be ZM-42/43. Also, depending on the hardware version of the ZM-42 to 82 series, multi-link 2 connection may not be supported. Refer to the ZM-42 to 82 User's Manual.)

Wiring

Connection



(a) Connection between PLC ↔ ZM-300 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.")

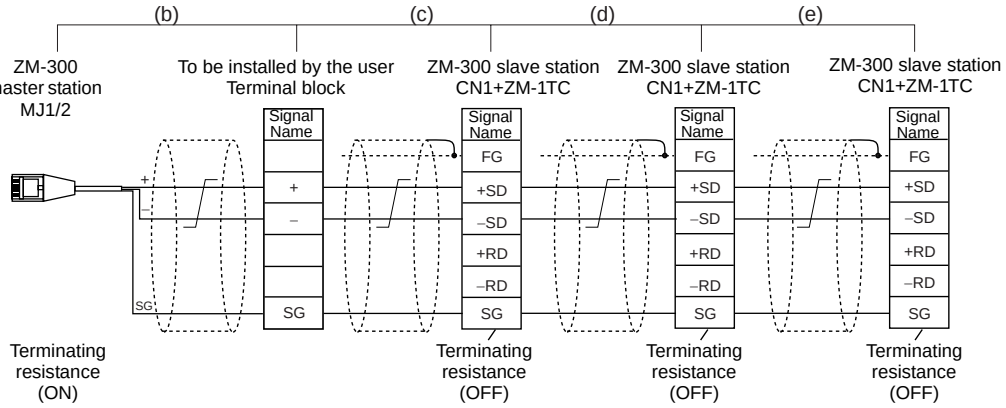
(b)(c) Connection between ZM-300 series master station ↔ ZM-300 slave station
The connecting port for the ZM-300 series master station depends on the selection for [Multi-Link] (either [Modular Jack 1] or [Modular Jack 2]) on the ZM-71SE editor. Selection of [Modular Jack 2] is recommended. ([Editor Port] is set as default for [Modular Jack 1].) The connecting port of the ZM-300 series slave station should be CN1. It is recommended that CN1 be equipped with a terminal converter "ZM-1TC" (set to 2-wire connection). The multi-link 2 master cable (b) (ZM-80MC) is 3 m long. If the distance (c) between the ZM-300 series master station and the ZM-300 series slave station is longer than 3 m, use a terminal block and connect the cables.

(d)(e) Connection between ZM-300 series slave station ↔ ZM-300 slave station
Use the RS-485 2-wire connection. It is recommended that CN1 be equipped with a terminal converter "ZM-1TC" (set to 2-wire connection).

(b)(c)(d)(e) The maximum length between ZM-300 series should be 500 m.

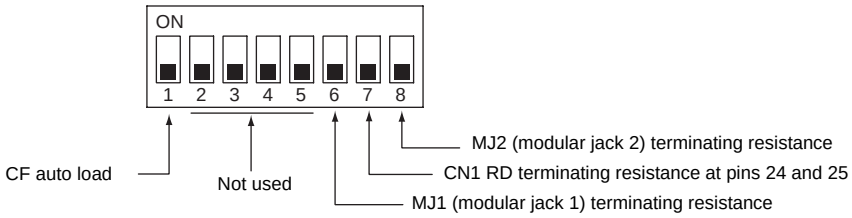
*** To avoid line-noise problems, connect one terminal only so that the shielded frame ground of each cable will not be connected between the ZM-300 series.**
The shielded frame ground of ZM-80MC must be connected to the ZM-1TC series master station.

*** When the terminal converter "ZM-1TC" is not used, install jumpers between +RD/+SD and –RD/–SD.**



Terminating Resistance Setting

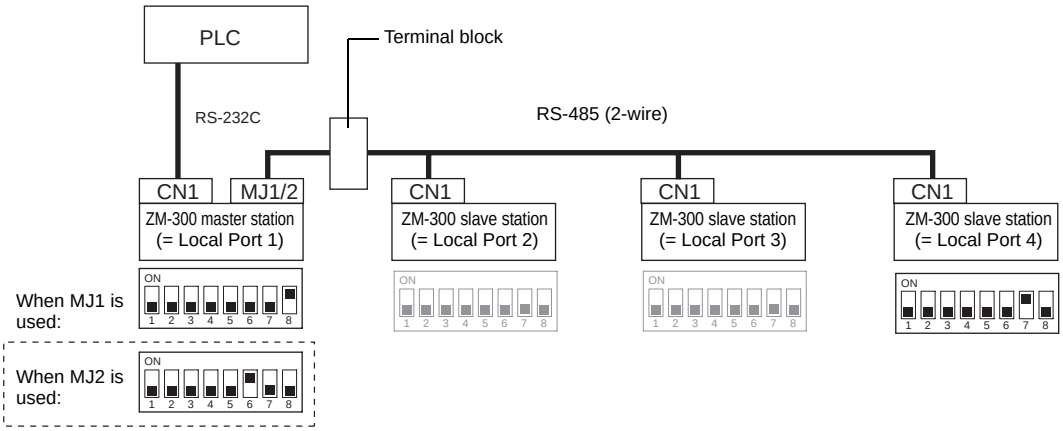
- The terminating resistance of the ZM-300 series should be set on the DIP switch.



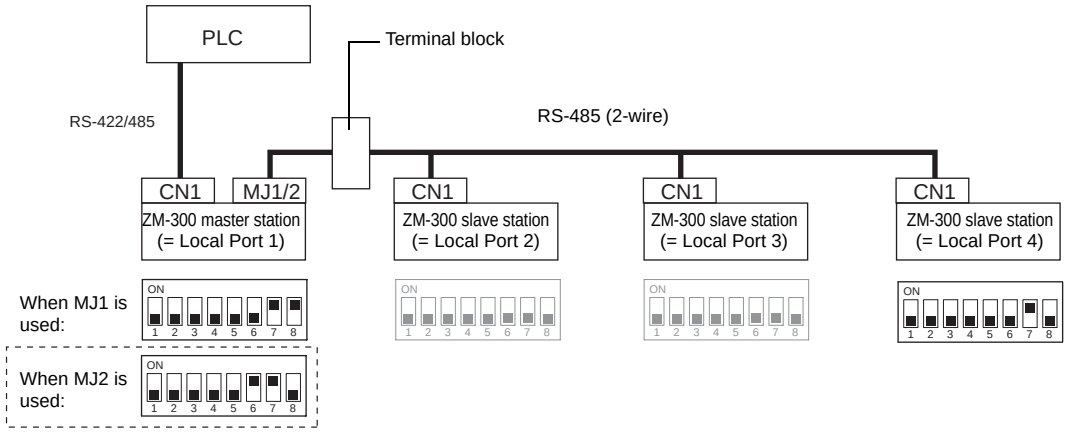
- When the PLC and the master station are connected via RS-422/485, set the terminating resistance at the PLC and the master station (CN1).
- When the ZM-300 series (master and slave stations) are connected via RS-485 (2-wire), set the terminating resistance at the ZM-300 series master station (MJ1/2) and the terminating slave station (CN1).

Terminating Resistance Setting Example

1. When the PLC is connected to ZM-300 series master station via RS-232C:



2. When the PLC is connected to ZM-300 series master station via RS-422/485:



ZM-71SE Setting

The following settings must be made on the ZM-71SE editor.
Only the points different from those described in “1. 1 : 1 Connection/ZM-71SE 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.

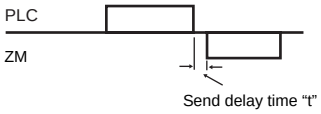
Communication Parameter Setting

- 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 ZM-300 series master station, set the following items. For the ZM-300 series slave station, set the items marked with ♦.

  [Local Port]♦ (1 to 4)
  Set the port number of the ZM-300 series. For the ZM-300 series master station, set “1.” For the ZM-300 series slave station, set “2” to “4.” Set the unique port number for each ZM-300 series. If the number duplicates, communications will not be performed correctly.

[Send Delay Time] (0 to 255) (Unit: ×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 ZM-300 series included in the multi-link 2 connection.

[Retry Cycle] (×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 ZM-300 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 ZM-300 series. The setting must be the same as other ZM-300 series on the same communication line.

*** For [Total] and [Baud Rate of Multi-Link], the same values must be set on all the ZM-300 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 ZM-300 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 (ZM-80MC) to the modular jack selected for [Multi-Link].

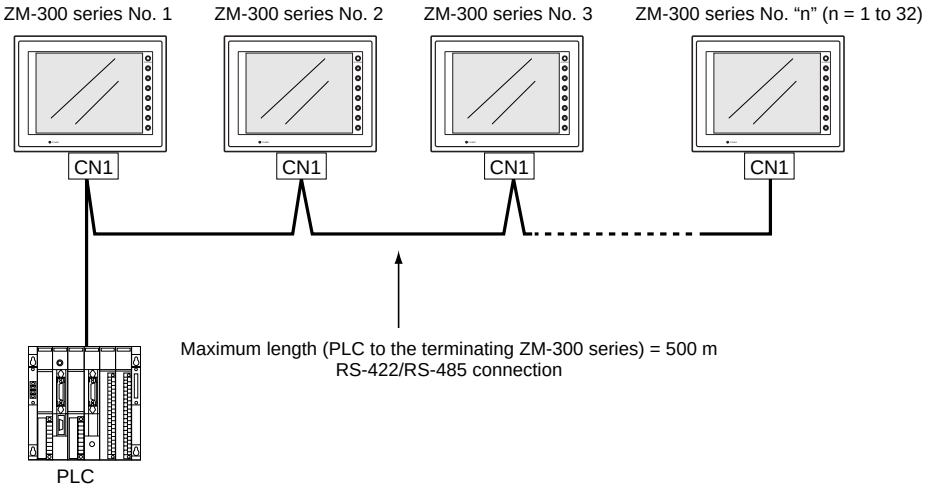
Communication Error

- When the master station has a communication error, the slave stations do not work and the communication error "Time-out" is displayed. When the ZM-300 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 ZM-300 series. (Maximum connectable ZM series: 32)



- The PLC must be of the type of signal level RS422/RS485 with port numbers. RS422 connection between the ZM-300 series ↔ PLC must be in 2-wire connection.
- The ZM-300 and ZM-42 to 82 series can be used together.

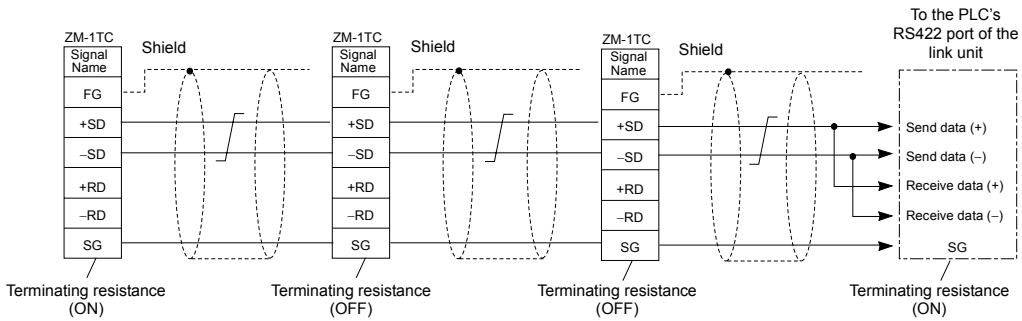
Wiring

Connection with Link Unit

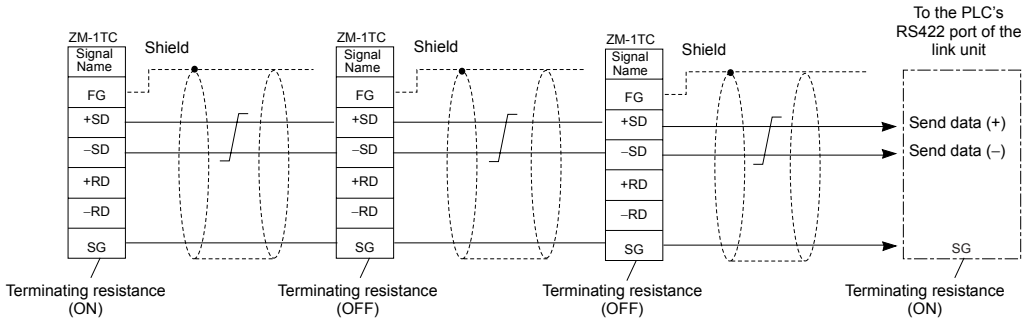
Use the RS-485 2-wire connection. (It is recommended that terminal converter “ZM-1TC” be used.)

- The communication port of Sharp's PLCs is not capable of multilinked connection.

- When ZM-1TC is used:
  Set “2-wire connection” at the DIP switch (SW1) on ZM-1TC. When a jumper is required on the PLC:

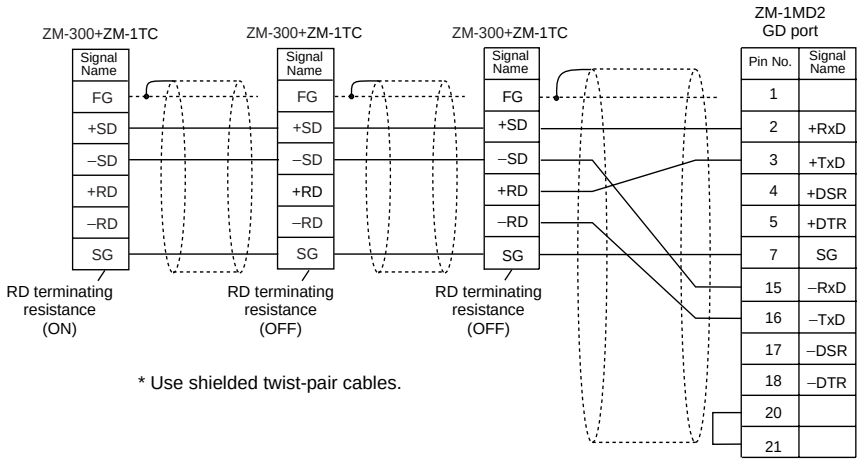


When no jumper is required on the PLC:



- When ZM-1TC 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 dual port interface ZM-1MD2.

ZM-71SE Setting

The following settings must be made on the ZM-71SE editor. Only the points different from those described in “1. 1 : 1 Connection/ZM-71SE 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

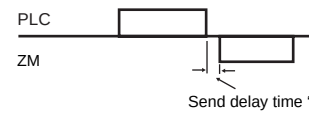
Communication Parameter Setting

- 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 ZM-300 series. Set the unique port number for each ZM-300 series. If the number duplicates, communications will not be performed correctly.

  [Send Delay Time] (0 to 255) (Unit: ×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 ZM-300 series included in the connection.

[Retry Cycle] (×10)

When the ZM-300 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.

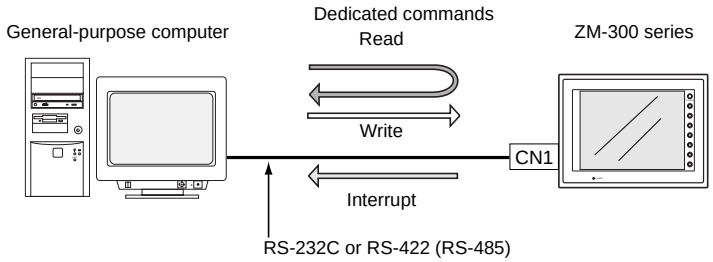
Supplemental Information:	[Retrials] in the [Detail] tab window of the [Comm. Parameter] dialog is the number of retrials that the ZM-300 series sends an inquiry to the PLC.

*** For [Send Delay Time], [Total] and [Retry Cycle], the same values must be set on all the ZM-300 series that are connected in the same communication line.**

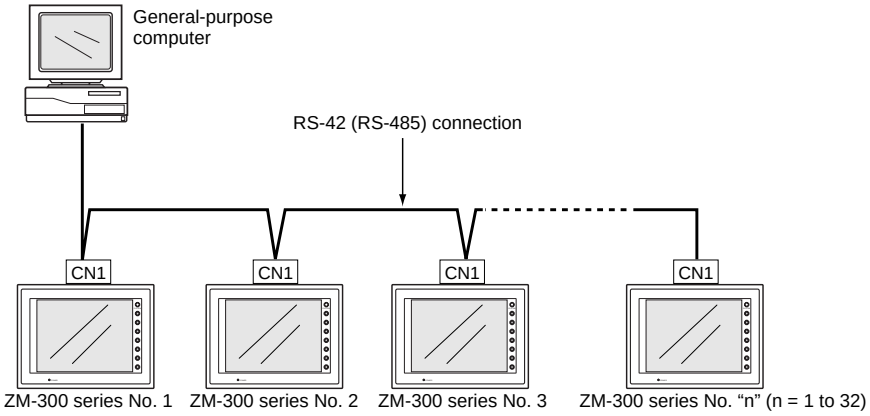
5. Universal Serial Communications

Universal Serial Communications

- A general purpose computer or an ASCII unit of the PLC (master station) controls the ZM-300 series (slave station) using dedicated commands.



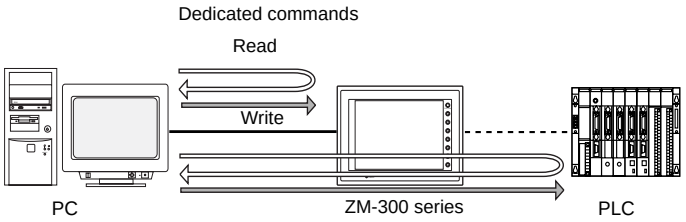
- The ZM-300 series internal user memory addresses ($u) must be used for memory allocation for switch, lamp or data display parts. When the master station specifies a screen number, data is written to the internal memory address ($u) allocated for the screen. If the screen is switched internally, the new screen number is read and is written to the internal memory address ($u) allocated for the screen.
- For 1 : 1 connection, the ZM-300 series can send an interrupt to the master station through switch activation, write command from the keypad, and screen change.
- Use CN1 of the ZM-300 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 ZM-300 series via RS-422. (A maximum of 32 ZM-300 series can be connected.) For 1 : n connection, interrupts cannot be used.



6. ZM-Link

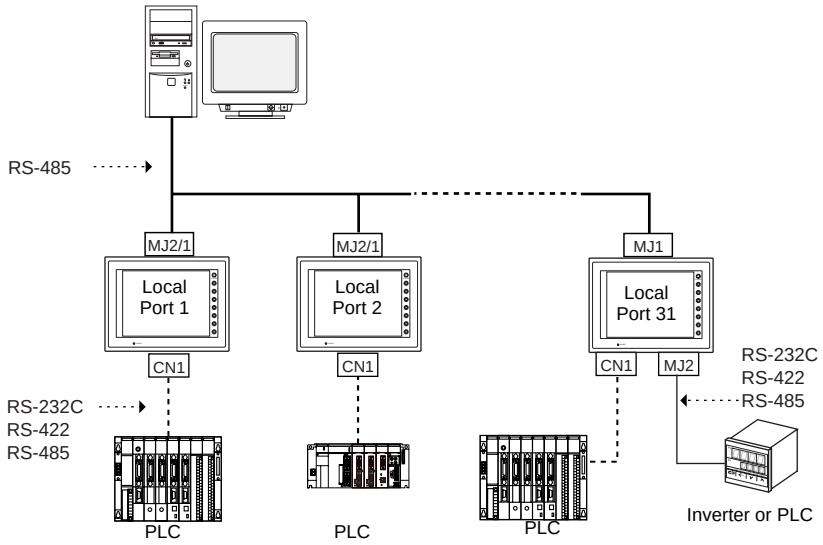
ZM-Link

- “ZM-Link” is the network where the computer reads from and writes to the internal memory of the ZM-300 series, memory card, PLC memory or temperature control/PLC2 memory using a dedicated protocol.



- Use the MJ port of the ZM-300 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 ZM-300 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 ZM-300 series can be connected; with RS-485, a maximum of 31 ZM-300 series can be connected.

<RS-485 connection>



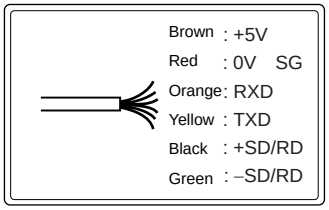
Wiring

Cable

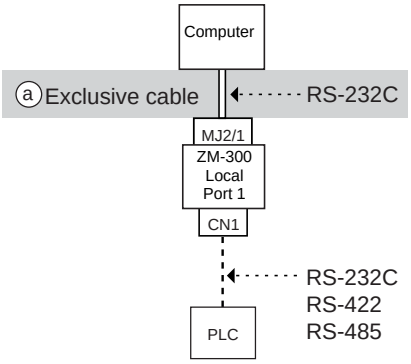
Use exclusive cable (order product) for connection with a computer. The shielded frame ground of must be connected to the ZM-300 series.

*** Notes on Use of exclusive cable.**
There are six wires in the exclusive 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.

Exclusive cable



RS-232C (ZM-300 series: 1 set)



Wiring example of above (a)

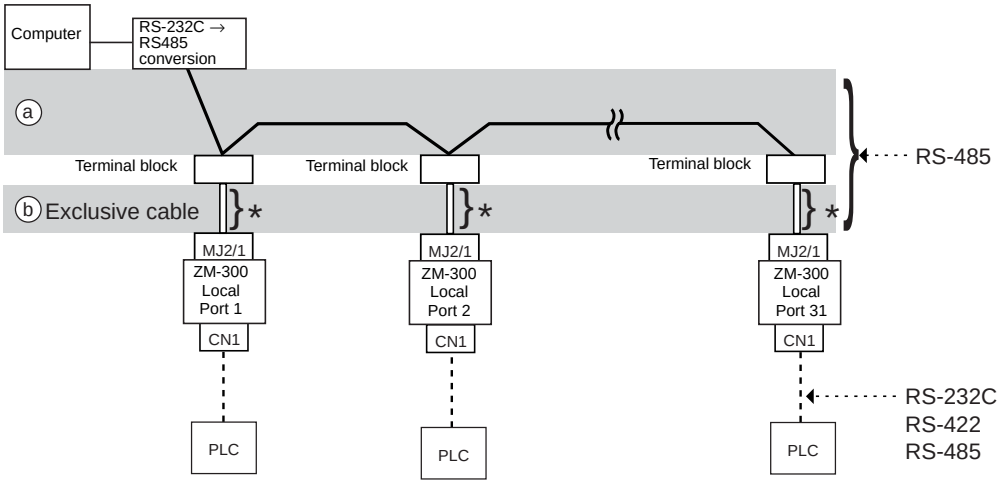
ZM-300 series
Modular jack, 8-pin

Signal Name	Pin No.
FG	
TXD(Yellow)	8
RXD(Orange)	7
SG (Red)	5

Computer
D-sub 9-pin (female)

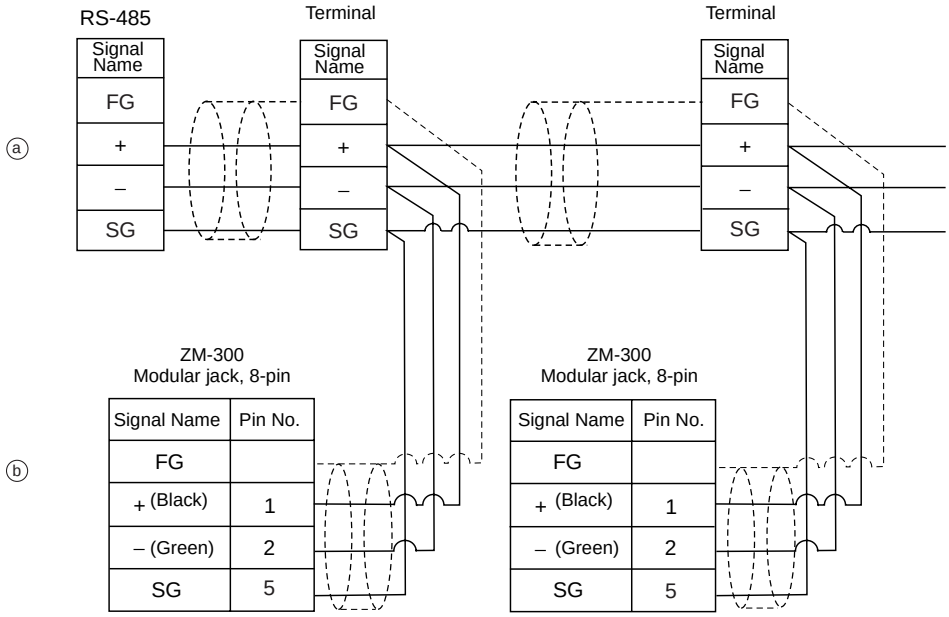
Signal Name	Pin No.
RD	2
SD	3
SG	5
DR	6
RS	7
CS	8

RS-485 (ZM-300 series: maximum 31 sets)



* 0.5 m recommended (1.0 m maximum)

Wiring example of above (a) and (b)



ZM-71SE Setting

The ZM-71SE settings required for ZM-Link are explained.

ZM-Link Setting

1. Click [System Setting] → [ZM-Link Setting].
2. The [ZM-Link Setting] dialog is displayed.
3. Check [☐ Use MJ port as ZM-Link] and make the setting for communications between the ZM-300 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 ZM-300 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 ZM-300 series can be connected; with RS-485, a maximum of 31 ZM-300 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	ZM-300 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	ZM-300 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	ZM-300 local No.	NAK	ETX	SUM	CR	LF
1	2	2	1	2	1	1

Bytes

* Read target memory setting

ZM-300 internal memory

Model	Type	Address	Reserved for system
2	2	4	10

PLC memory within 16 bits
PLC memory within 16 bits

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

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

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

Memory card

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

Bytes

e.g. Reads the 2-word data, "ABCD" starting with the address $u0020(0014H) on the ZM-300 of the station number 1.

Command

STX	ZM-300 local No.	Read command	Number of words to read	Model	Type	Address	Reserved for system	ETX	SUM	CR	LF
	01H	20H	02H	00H	00H	0014H	0000000000H		8FH		
02H	30H 31H	32H 30H	30H 32H	30H 30H	30H 30H	30H 30H 31H 34H	30H 30H 30H 30H 30H 30H 30H 30H 30H 30H	03H	38H 46H	0DH	0AH

Response

(Normal communication)

STX	ZM-300 local No.	ACK	Data A	Data B	Data C	Data D	ETX	SUM	CR	LF
	01H	00H	41H	42H	43H	44H		60H		
02H	30H 31H	30H 30H	34H 31H	34H 32H	34H 33H	34H 34H	03H	36H 30H	0DH	0AH

Write (with sum check and CR/LF)

Write Command

Command

STX	ZM-300 local No.	Write command	Number of words to write	* Write target memory setting	Memory data 0	...	Memory data n	ETX	SUM	CR	LF
1	2	2	2	18	4		4	1	2	1	1

Bytes

Response

(Normal communication)

STX	ZM-300 local No.	ACK	ETX	SUM	CR	LF
1	2	2	1	2	1	1

Bytes

(When an error occurs)

STX	ZM-300 local No.	NAK	ETX	SUM	CR	LF
1	2	2	1	2	1	1

Bytes

* Write target memory setting

ZM-300 internal memory

Model	Type	Address	Reserved for system
2	2	4	10

PLC memory within 16 bits
PLC memory within 16 bits

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

PLC memory over 16 bits
PLC memory over 16 bits

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

Memory card

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

Bytes

e.g. Writes "AB12" to the addresses D0100 to 101(0064 to 0065H) on the PLC connected to the ZM-300 of the station number 1.

Command

STX	ZM-300 local No.	Write command	Number of words to write	Model	Type	Address	Reserved for system	Data A	Data B	Data 1	Data 2	ETX	SUM	CR	LF
	01H	21H	02H	01H	00H	0064H	0000000000H	41H	42H	31H	32H		2AH		
02H	30H31H	32H31H	30H32H	30H31H	30H30H	30H30H36H34H	30H30H30H30H30H30H30H30H30H30H	34H31H	34H32H	33H31H	33H32H	03H	32H41H	0DH	0AH

Response

(Normal communication)

STX	ZM-300 local No.	ACK	ETX	SUM	CR	LF
	01H	00H		C6H		
02H	30H31H	30H30H	03H	43H36H	0DH	0AH

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

- ZM-300 port number: 2 bytes
  Port numbers are used so that the host computer can identify each ZM-300 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 ZM-300 series should be set on the ZM-71SE editor. (Refer to “ZM-71SE 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
ZM-300 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
ZM-300 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 this manual.		
PLC2 memory	Depends on the PLC to be connected to the PLC2 function. Set the type number indicated for "Available Memory" of respective PLCs on this manual.		

- 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

- File No.
  Specify the file number set in the [Memory Card Setting] dialog of the ZM-71SE editor.

- Record No.
  Specify the record number set in the [Memory Card Setting] dialog of the ZM-71SE 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
ZM-300 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	ZM-300 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 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

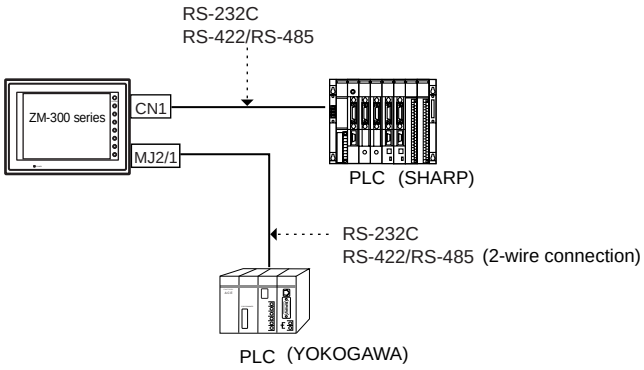
Upper

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	■								

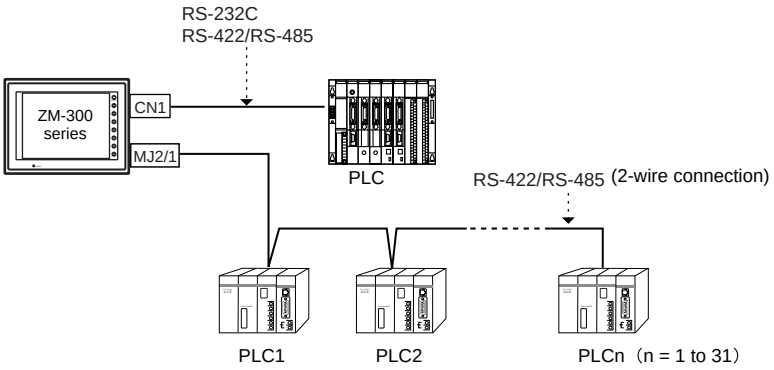
7. PLC2Way

PLC2Way

- The “PLC2Way” function is an original network function where one ZM-300 series can be connected to two PLCs. Even if the manufacturers of these PLCs are not the same, they can be connected to one ZM-300 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 ZM-300 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 PLC2Way table, background data transfer is performed at regular intervals. It is also possible to save the read data in the ZM-300 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

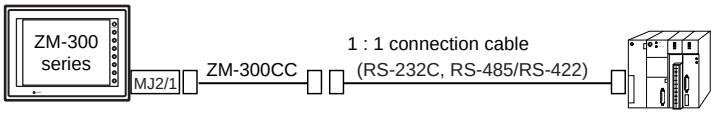
- When connecting the ZM-300 series to the PLC at the MJ port using PLC2Way function, use the RS232C or RS-485 (RS-422) 2-wire connection. The PLC that allows RS-485 (RS-422) (4-wire) connection only cannot be connected directly.
- PLCs compatible with PLC2Way connection at MJ port are shown below.
  SHARP, MITSUBISHI, OMRON, 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 ZM-300CC)

- To connect the PLC and the ZM-300 series at the MJ port, use the MJ to D-sub conversion cable “ZM-300CC” (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 (ZM-300CC + 1 : 1 connection cable) can be used either for RS-232C or RS-485 (RS-422) 2-wire connection.



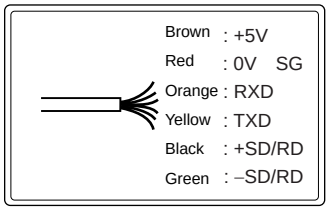
- With RS-485 (2-wire connection), a maximum of 31 PLCs can be connected. For information on connection between PLCs, refer to the instruction manual for the PLC.

Connecting method 2 (using exclusive cable)

- Use exclusive cable (3 m) when connecting the ZM-300 series to a PLC at the MJ port. The shielded frame ground of exclusive cable must be connected to the ZM-300 series.

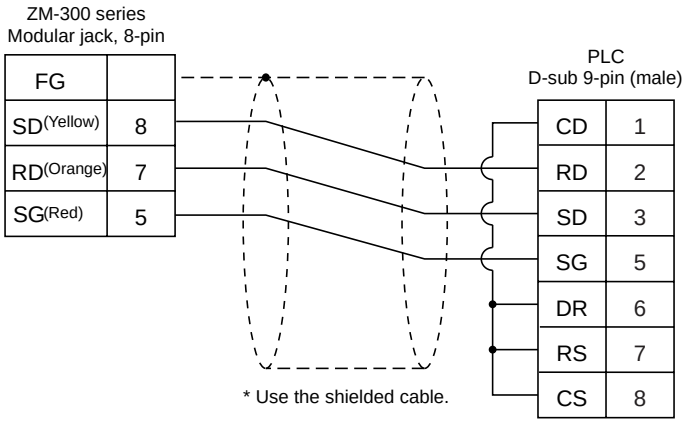
*** Notes on Use of exclusive cable**
There are six wires in the exclusive cable as shown on the right. The wires to be used are determined depending on the connecting method. For the wires not used, be sure to properly insulate with tape, etc.

Exclusive cable



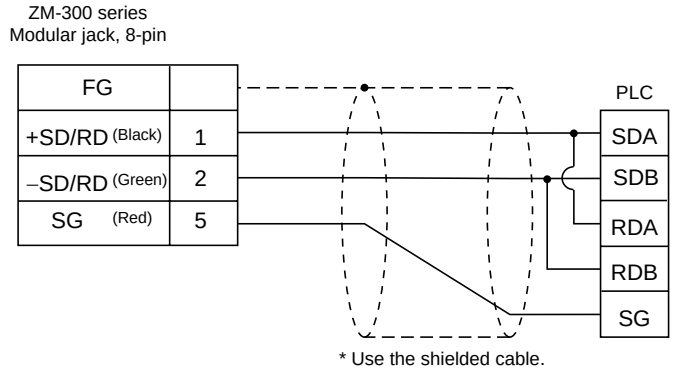
<RS-232C Connection>

- Connection example with MITSUBISHI A1SJ71UC24-R2

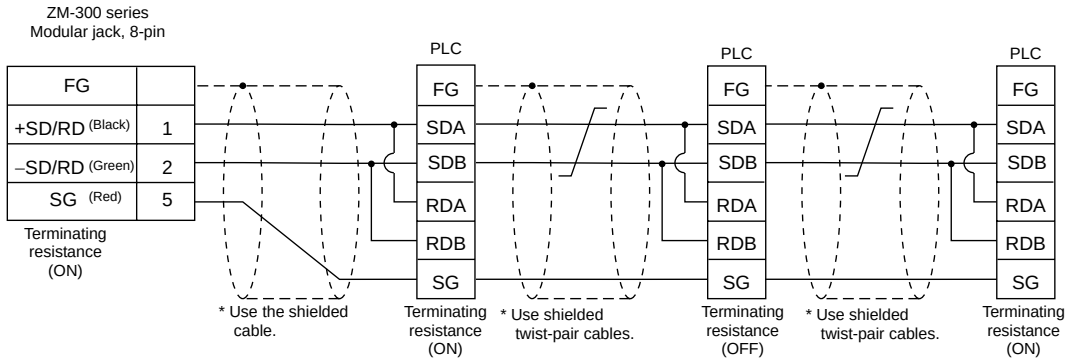


<RS-485 Connection>

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

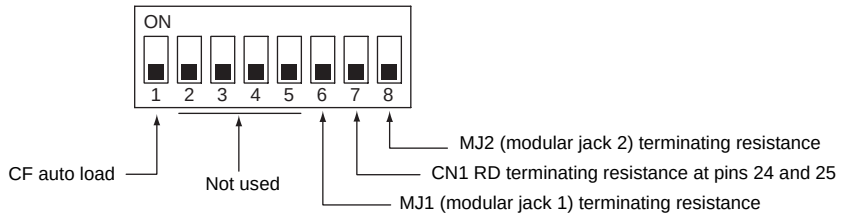


- Connection example with MITSUBISHI A1SJ71UC24-R4 (3 set)



Terminating Resistance Setting

- The terminating resistance of the ZM-300 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.



ZM-71SE Setting – System Setting

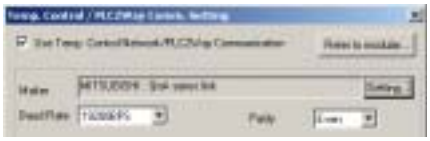
PLC model selection and parameter setting to be made on the ZM-71SE editor for the PLC2Way connection at the MJ port are explained.

Temp. CTRL/PLC2Way Setting

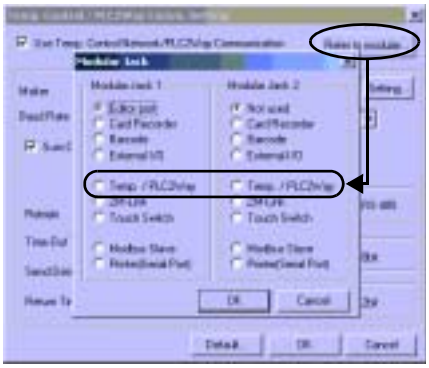
Select the PLC model and make the parameter setting as described below.

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

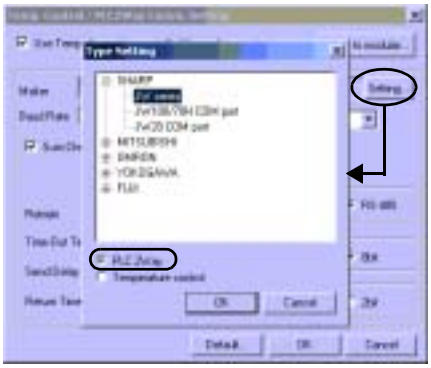
2. Check [Use Temp. Control Network/PLC2Way Communication].



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 retrials 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 retrial 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] (×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.

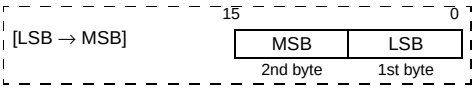
Code and Text Processing

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
SHARP	JW series	BCD	LSB → MSB
	JW100/70H COM Port		
	JW20 COM Port		
MITSUBISHI	A series link	DEC	
	QnA series link		
	QnH (Q) series link		
OMRON	SYSMAC C	BCD	
	SYSMAC CV		
	SYSMAC CS1		
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.

ZM-71SE Setting
When the temperature control network/PLC2Way table is used:

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

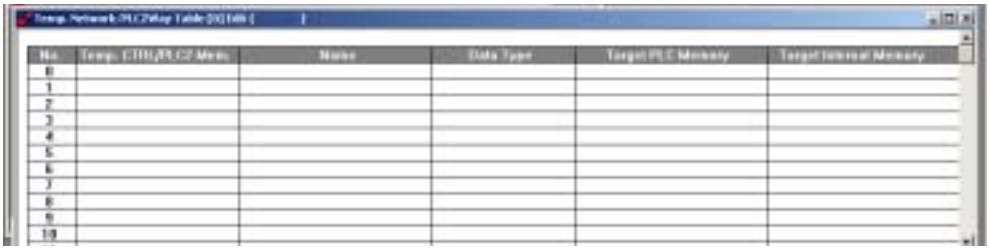
1. Constant read from the PLC memory
   When the temperature control network/PLC2Way table is set, the data read from the PLC2 memory can be stored in the PLC memory or the ZM-300 internal memory at regular intervals.
2. Data Sampling from the PLC Memory Connected at the MJ Port
   It is possible to 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, ZM-300 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.)

Set the temperature control network/PLC2Way table number (0 to 31) and click [OK].

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

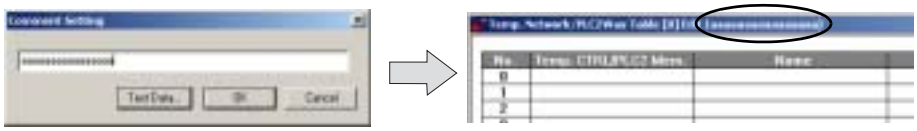


   There are 32 tables of temperature control network/PLC2Way table No. 0 to 31. A maximum of 128 addresses of the PLC2 memory can be set for each table.

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

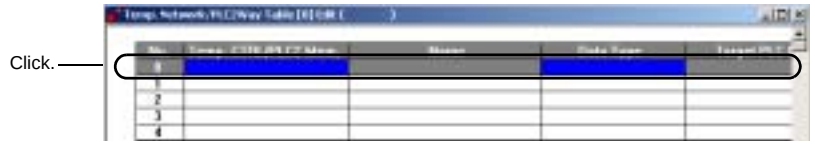
3. Comment setting
   There are 32 temperature control network/PLC2Way tables and a comment can be set for each table.

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

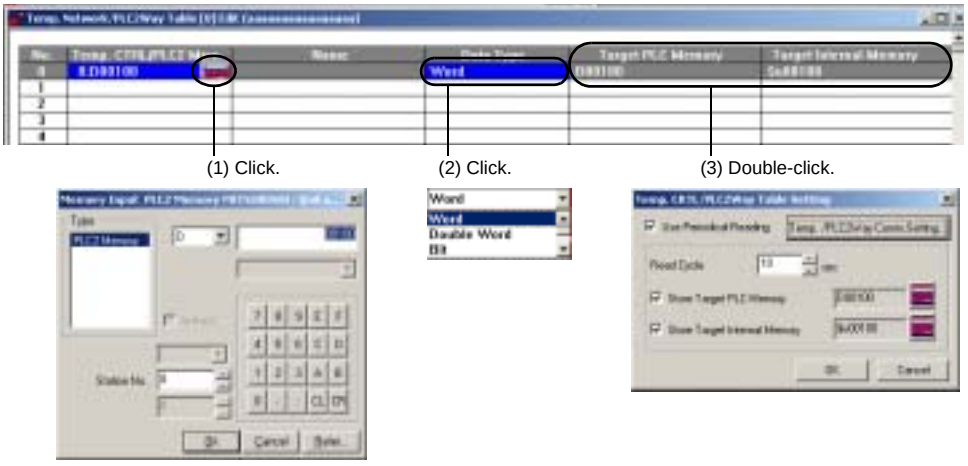


Enter the desired comment and click [OK]. The entered comment is displayed at the top right corner.

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.

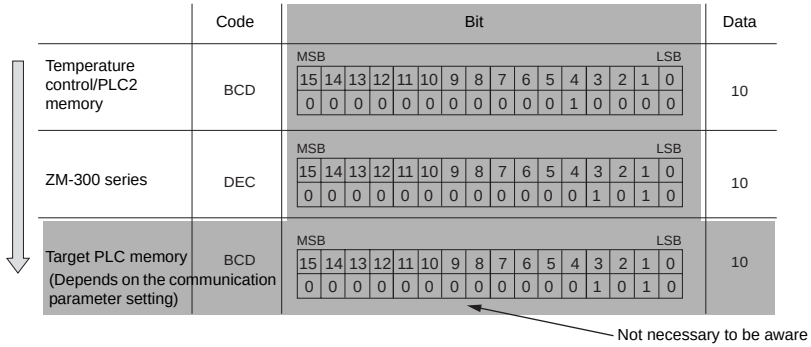
[Bit]
Data in the PLC2 memory is handled as bit information of one word. Data is transferred to the target memory address without conversion.

[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 ZM-300 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]



Example: [Bit]

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 ZM-300 internal memory, check this box and set the desired memory address.

[Temp. CTRL/PLC2Way Comm. Setting]

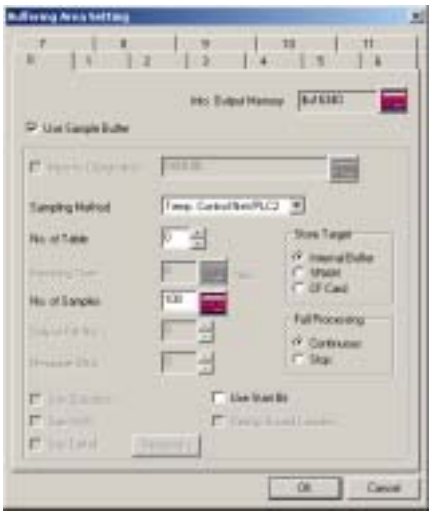
Clicking this button brings up the [Temp. CTRL/PLC2Way Comm. Setting] dialog and allows you to review the setting.

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 ZM-300 series. (RAM)
SRAM:	Stores data in the SRAM area. (SRAM mounted on the unit, ZM-300, Memory card on the market 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.

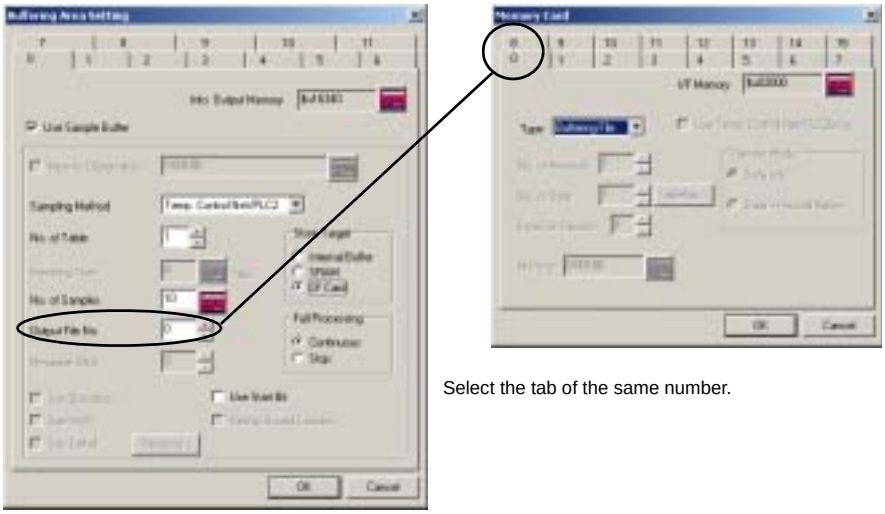
- Calculating the buffering area capacity
  When [Internal Buffer] is selected for [Store Target] in the [Buffering Area Setting], the maximum available capacity is 32K words. When [Temp Control Net/PLC2] is selected for [Sampling Method], the required capacity can be calculated as shown below.
  1 sample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

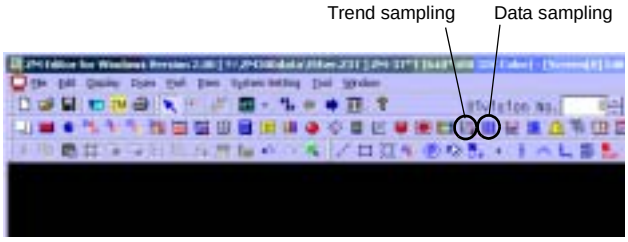
   2) Select [Buffering File] for [Type].

   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 ZM-71SE Instruction Manual (Function).



Data Transfer from the PLC2 Memory

Data in the PLC2 memory can be transferred to the PLC memory, ZM-300 internal memory or a memory card at one time. Conversely, it is also possible to transfer data in the PLC memory, ZM-300 internal memory or a memory card to the PLC2 memory at one time. To perform butch 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 → ZM-300 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 ZM-300 series with the PLC2Way function is explained.

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

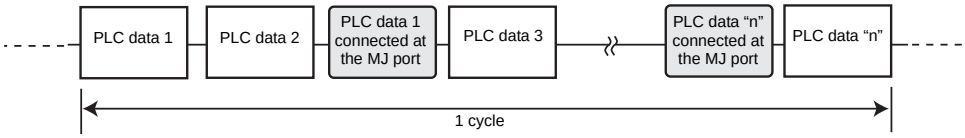
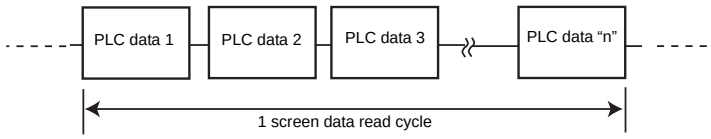
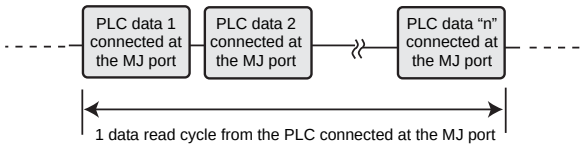


Fig. b. When the temperature control network/PLC2Way table is used:





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 ZM-300 ↔ 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 ZM-300 series. When the temperature control network/PLC2Way setting has been made, the program is automatically transferred to the ZM-300 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 ZM-300 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 LCD Control Terminal Operations.”

System Memory

The status of the PLC connected at the MJ port for PLC2Way communications is output to the system memory ($s) of the ZM-300 series. The memory addresses ($s730 to 763) of the PLC connected at the MJ port are explained.

List

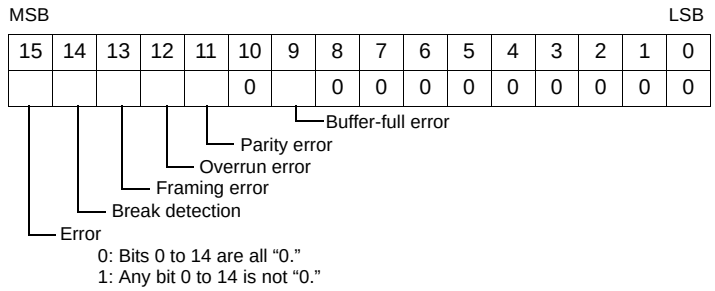
Address	Contents
⋮	⋮
$s730	Temperature controller/PLC2Way Station No. 00 status
731	Temperature controller/PLC2Way Station No. 01 status
732	Temperature controller/PLC2Way Station No. 02 status
733	Temperature controller/PLC2Way Station No. 03 status
734	Temperature controller/PLC2Way Station No. 04 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 ZM-300 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 ZM-300 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.**

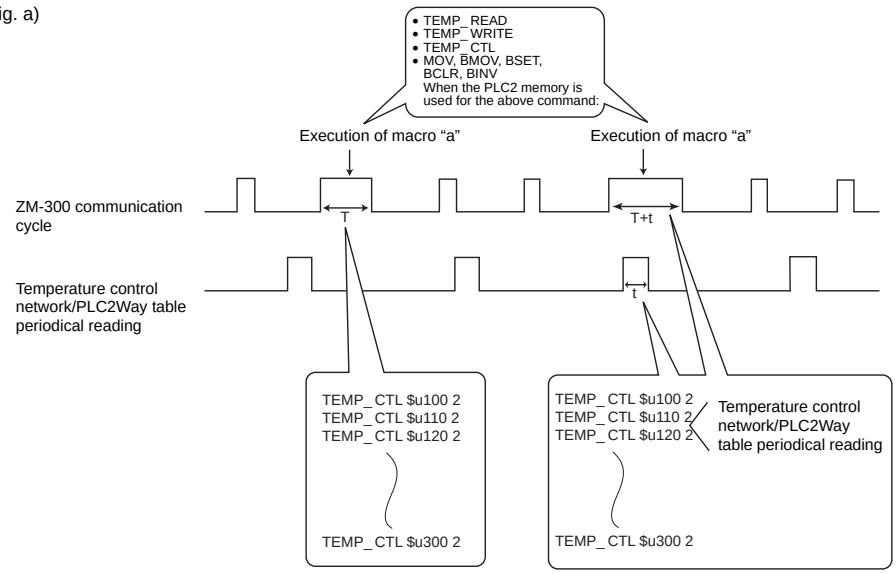
- $s762

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

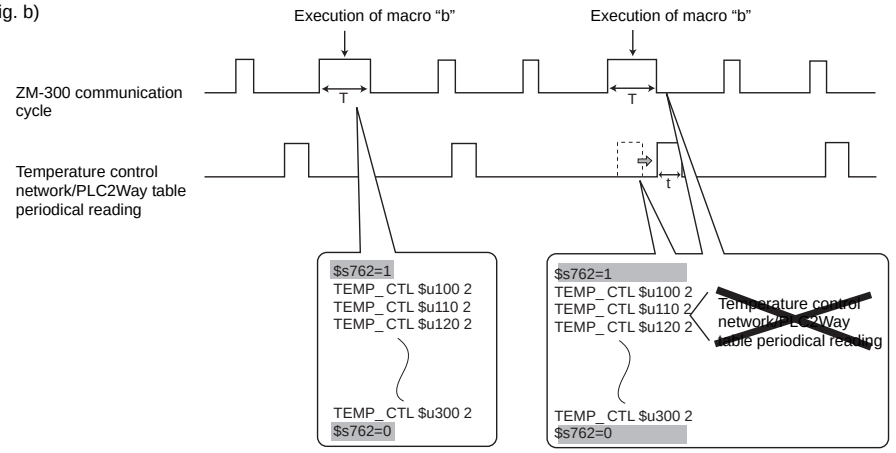
  - [0]: Periodical reading is performed.
  - [Other than “0”]: Periodical reading is suspended.

  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)

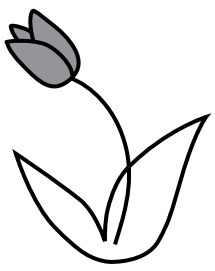


- $s763

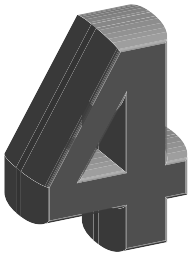
  Forced execution of macro commands [TEMP_ READ] and [TEMP_WRITE] using the temperature control network/PLC2Way table

  - [0]: When any station that has failed is included in the specified table, the macro command is not executed.
  - [Other than “0”]: The macro command is forcibly executed to the stations that are working properly.

MEMO



Please use this page freely.



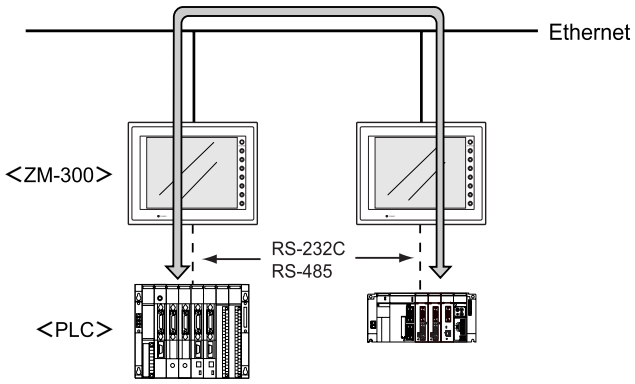
Network Communications

1. Ethernet
2. FL-net

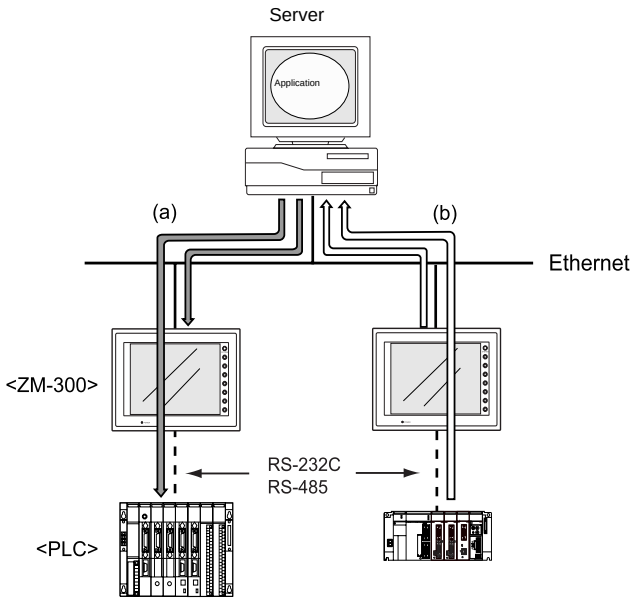
1. Ethernet

Ethernet

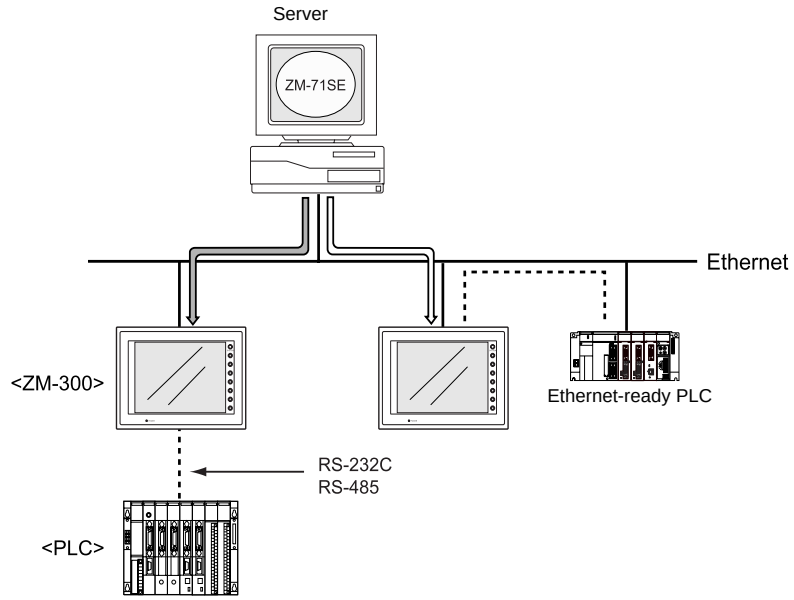
- Transferring data in memory
  Data in memory can be transferred to the ZM-300 series on the Ethernet or to the PLCs linked to the ZM-300 series as a host by using macro commands (EREAD/EWRITE).



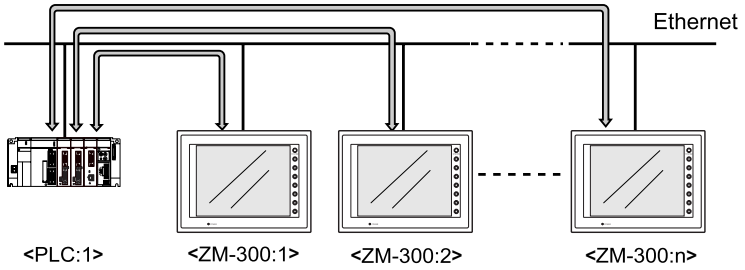
- Communications between the server and the ZM-300 series
  - "HKEtn10.dll" (for UDP/IP protocol) is provided so that the user can create an original application by using Visual C++ or Visual Basic, etc. to allow the server to access the memory device, such as ZM-300 internal memory, memory card or the PLC memory linked with the ZM-300 series as a host..... (a)
  - The macro command (SEND) enables the ZM-300 series to access the server..... (b)



- Screen data can be transferred from the ZM-71SE editor on the server to the ZM-300 series.

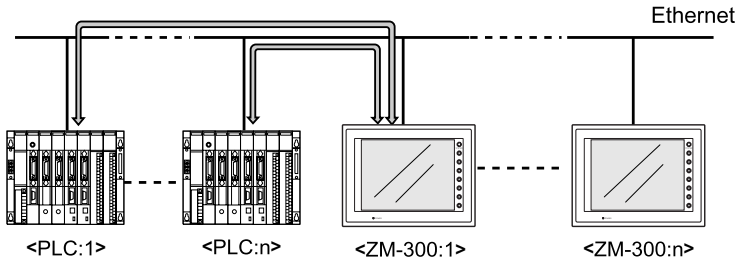


- Communications between the Ethernet-ready PLC and the ZM-300 series
  - The ZM-300 series can communicate with the PLC on the Ethernet.



* Ethernet-ready PLC only

  - The ZM-300 series can communicate with multiple PLCs on the Ethernet.



* Ethernet-ready PLC only

Notes on Ethernet Communications

For ZM-300 (high-performance):

- To use Ethernet communications on ZM-300 (high-performance), 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 network module ZM-80NU/80NU2 to ZM-300 (high-performance) at the same time. When ZM-80NU/80NU2 is mounted, the 10BASE-T connector (LAN) provided on the unit cannot be used.
- When using Ethernet communications with ZM-80NU/80NU2 mounted, the Web server or e-mail function cannot be used.

For ZM-300 (standard):

- To use Ethernet communications on ZM-300 (standard), the ZM-80NU/80NU2 must be mounted. When ZM-300 (standard) is equipped with the ZM-80NU/80NU2, it becomes Ethernet-ready. In this case, however, the Web server or e-mail function is not available.

IP Address for the ZM-300 Series

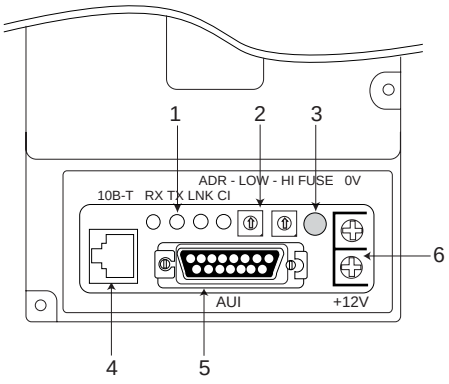
To enable Ethernet communications on the ZM-300 series, it is necessary to set the IP address for identification of the ZM-300 series on the network. The IP address should be set on the Main Menu screen of the ZM-300 series. For more information, refer to “Chapter 2 LCD Control Terminal Operations.”

Communication Network Module ZM-80NU/80NU2

Specifications of ZM-80NU/80NU2

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

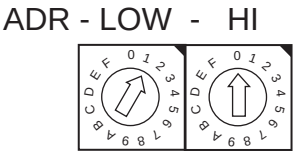
Nomenclature and Functions of ZM-80NU/80NU2



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 ZM-300 specified on the network table using the following rotary switches.
   Example: To set port No. 1:



*** 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)

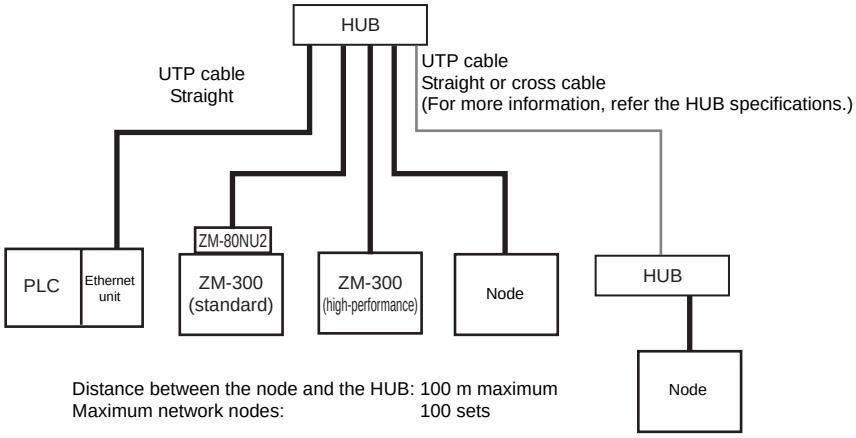
5. AUI connector
   This connector is used for connecting the transceiver cable in the case of 10BASE2 or 10BASE5.

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 ZM-80NU/80NU2 (max. 0.7 V).
   *** It is not necessary to use 10BASE-T.**

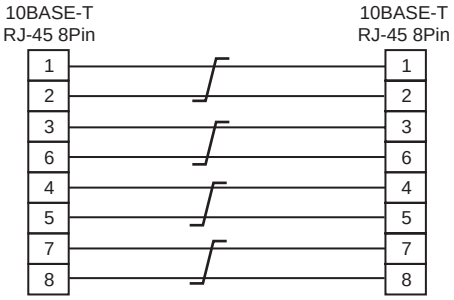
Wiring

10BASE-T Connection

- Cable connection diagram

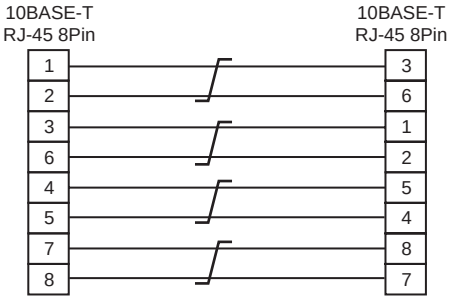


Straight cable (with HUB)



* Unshielded twist-pair cable

Cross cable (without HUB)



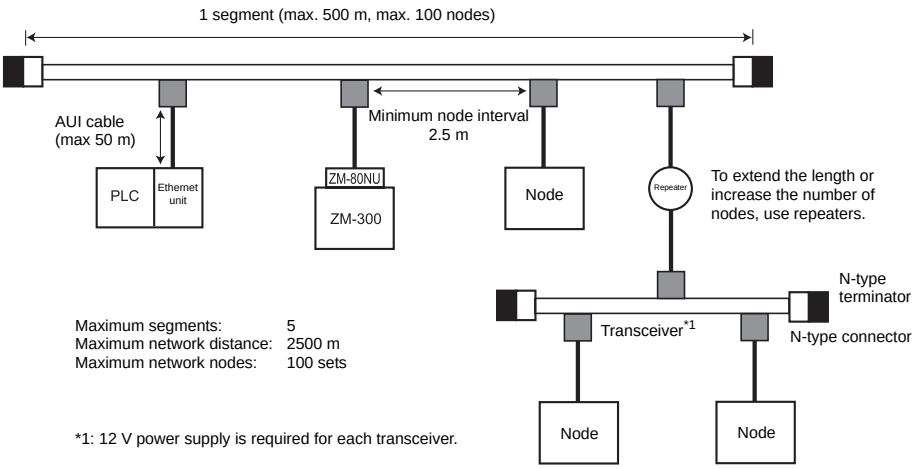
* Unshielded twist-pair cable

- 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)

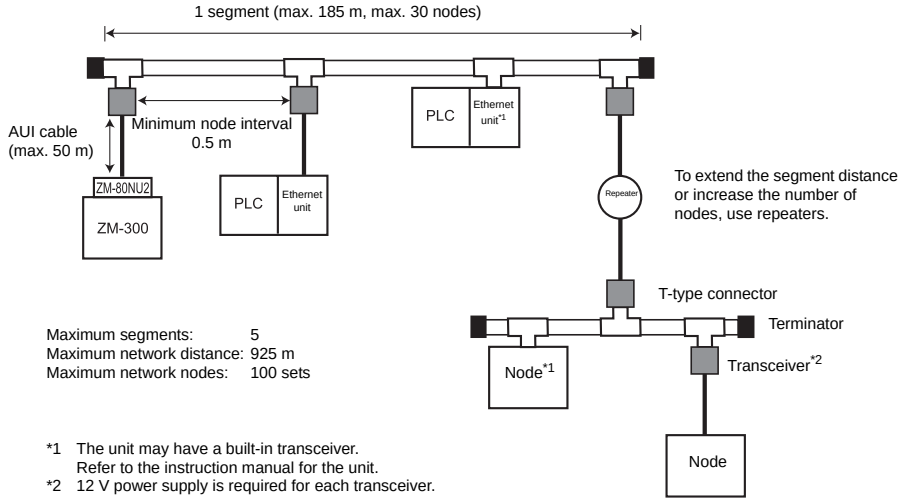
  Recommended transceiver

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 ZM-80NU/80NU2. For the replacement procedure, refer to the manual "ZM-80NU/80NU2 User's Manual".**

- 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 ZM-80NU/80NU2. For the replacement procedure, refer to the manual "ZM-80NU/80NU2 User's Manual".**

Transferring Screen Data

This section describes the procedure for transferring screen data from the ZM-71SE editor on the server to ZM via Ethernet. For the procedure using the ZM-80C cable, refer to the Manual.

Prerequisites

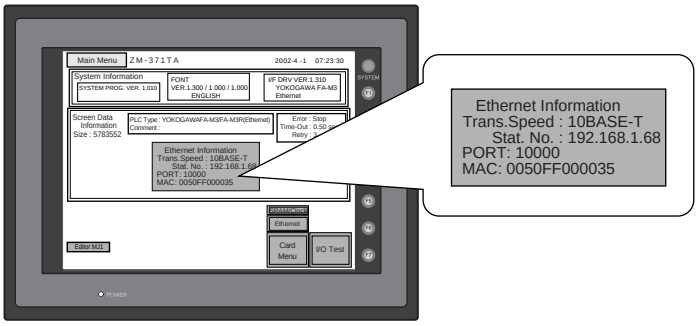
When screen data is to be transferred for the first time via Ethernet or when the ZM-300 series has been replaced due to trouble, the server cannot transfer screen data because the network table has not been transferred to the ZM-300 series. In this case, the following setting must be made on the Main 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 ZM-71SE editor, the above data is updated.

- Setting procedure

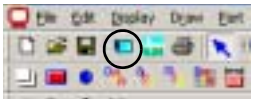
1. Press the [Ethernet] switch on the Main Menu screen.
2. The Ethernet screen is displayed. (For more information, refer to “Chapter 2 LCD Control Terminal Operations.”) Set the IP address. If necessary, set the default gateway and subnet mask. (When attaching the I/F unit to ZM-300, set the connecting 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 ZM-71SE Editor

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



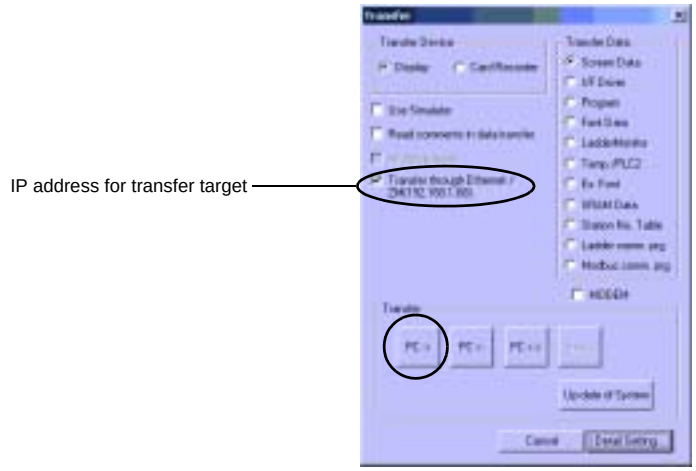
2. Attach a check mark (☑) to [☐Transfer through Ethernet].

3. Press the [Detail Setting] switch. The [IP Address Setting] dialog is displayed.

4. Enter the IP address of the ZM-300 series to which the screen data is to be transferred.

When a list is shown, select the IP address of the ZM-300 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.

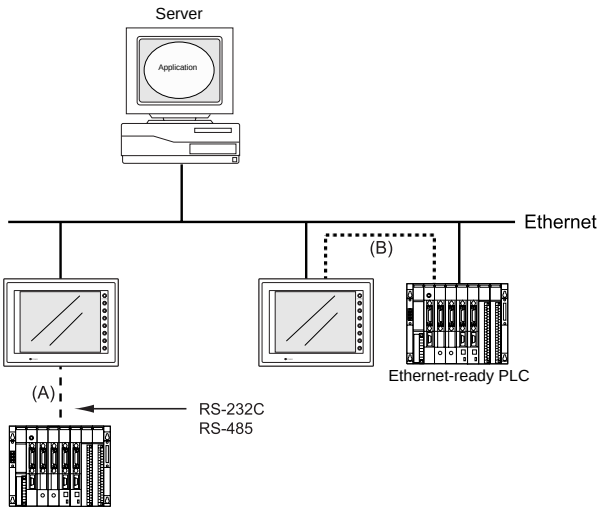
ZM-71SE Setting (PLC Type/Communication Parameter)

To enable Ethernet communications on the ZM-300 series, the following setting is required on the ZM-71SE 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

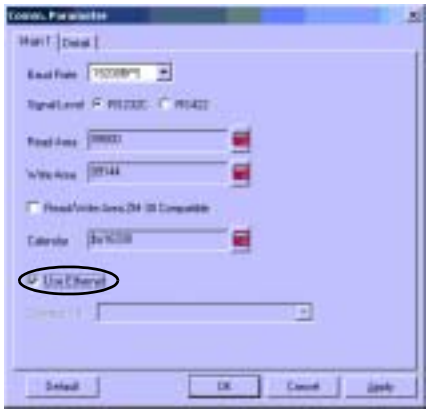


There are two connecting methods between the ZM-300 series and the PLC.
(A) Connecting to the PLC through RS-232C or RS-485 interface
(B) Connecting to the PLC on the Ethernet

The contents of the system setting vary depending on the method selected. Check the connecting method and make the setting on the ZM-71SE 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)]. The following PLC models are supported.

PLC Model Section on ZM-71SE	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.”

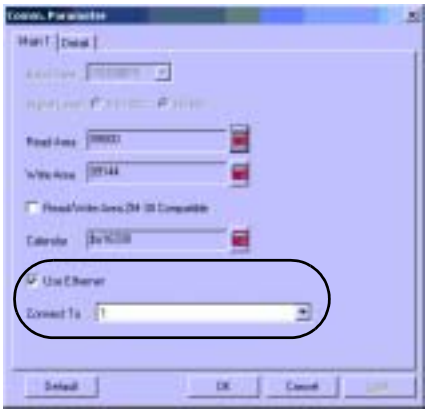
*** The data code of the ZM-300 series is fixed to the binary code. Be sure to set the binary code for the data code on the PLC.**

2. Communication parameter setting

- Select [System Setting] → [Comm. Parameter]. Set the PLC to the ZM-300 series which is connected.

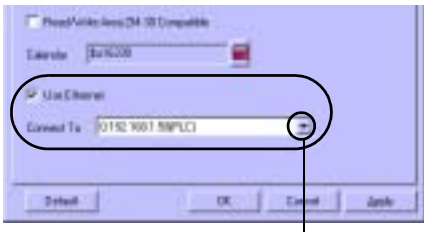
When the network table is not set:

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.

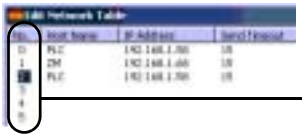


Click here. A drop-down list is displayed.

- 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.

[Edit Network Table]



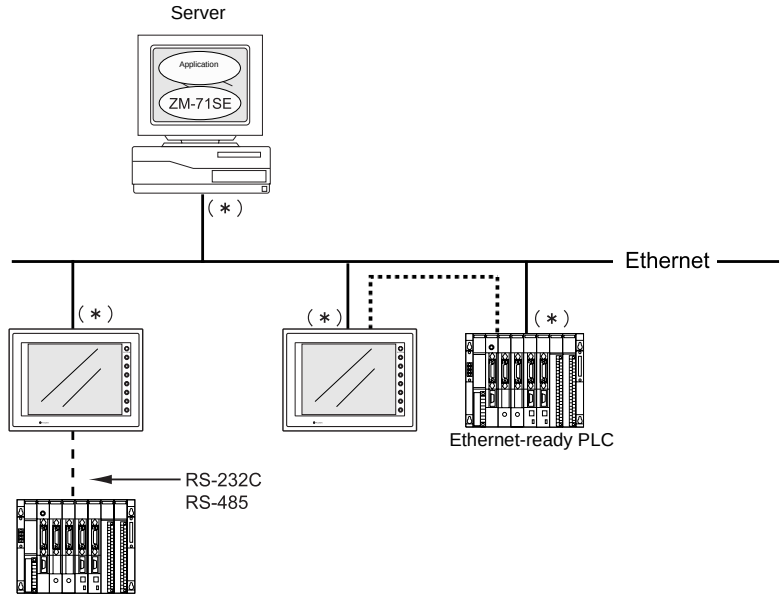
[Memory Input]

ZM-71SE Setting (Network Table Editing)

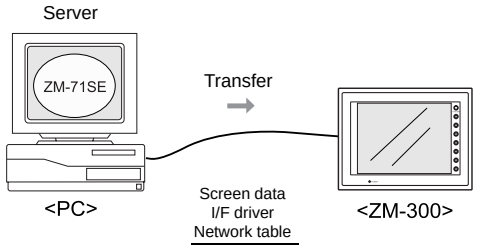
To enable Ethernet communications on the ZM-300 series, the following network table setting is required on the ZM-71SE editor.

Network Table

- The ZM-300 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 ZM-300 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

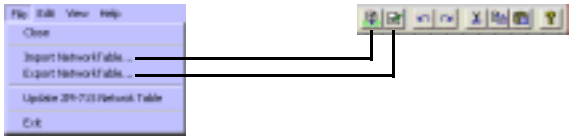
- Starting
  Select [System Setting] → [Network Table Setting] → [Ethernet]. The network table edit window is displayed.

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

Menu and Icons

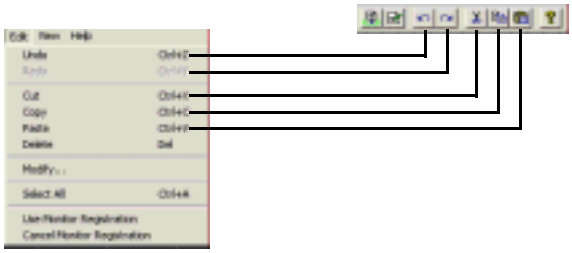
Each menu item corresponds to the icons as shown below.

- [File] menu

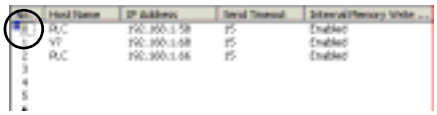


  - Import Network Table
    Imports a network table saved as a file "∗.ntb."
  - Export Network Table
    Exports a network table as a file "∗.ntb."

- [Edit] menu



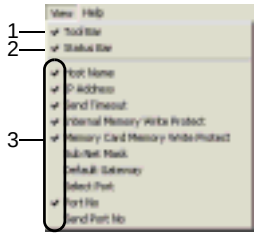
  - Use Monitor Registration
    Only one ZM-300 series can be registered as the monitor for Ethernet communications.

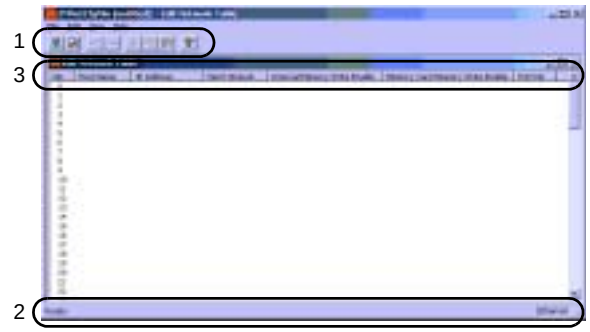


    A mark is shown on the left of the network table number.

- 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 ZM-300 series, etc. to be used on the Ethernet.

[IP Address]
Set the IP address.

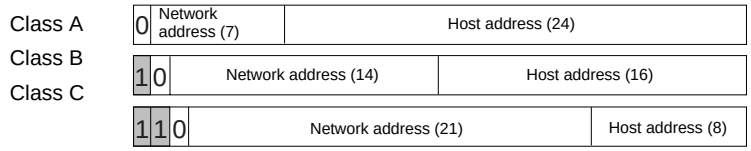
*** When registering Ethernet-ready PLC, set the same IP address as that of the PLC. For the setting procedure of the IP address on the PLC, see the manual attached to each PLC.**

*** 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.



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 ZM-300 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 ZM-300 (high-performance) 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 ZM-300 (high-performance), select [10BASE-T]. Select either [10BASE-T] or [AUI] when ZM-80NU/80NU2 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

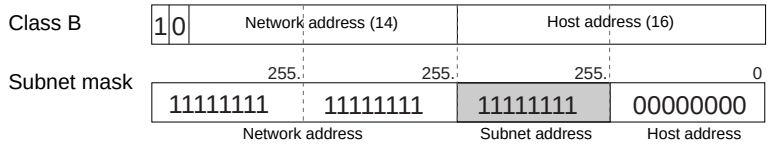
A gateway and a router are used for communicating between different networks. The IP address of the gateway (router) should be set to communicate with the node(s) on other network.

[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.



ZM-71SE Setting (Macro)

This section explains the macro commands (SEND/EREAD/EWRITE) used for the Ethernet. For more information on macro commands, refer to the ZM-71SE Instruction Manual (Function).

Macro Command

[EREAD]

Words from the F1 memory in the ZM-300 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	○	○		○	○		
F1	○	○		○	○		
F2	○		○				
F3	○		○				○

EREAD: Read into memory

EREAD F0 = F1 C: F2 F3

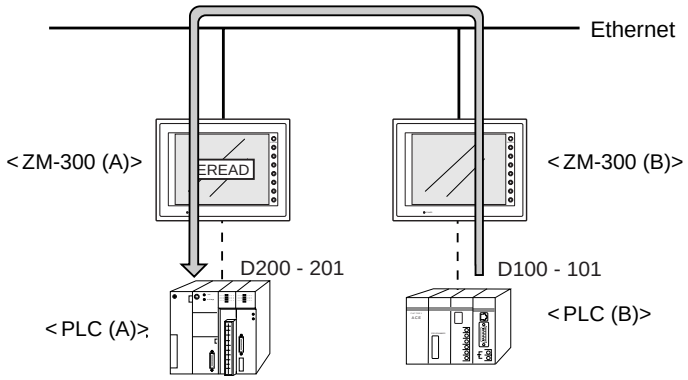
Example: Macro command at the ZM-300 (A)

The macro command for ZM-300 (A) to read data from PLC (B) and transfer it to PLC (A) is shown below.

[Description] EREAD D200 = D100 C: 2 B

- D200: Top memory address of the target
- D100: Top memory address of the source
- 2: The number of words to be transferred
- B: Address of the source (Network table number)

[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 ZM-300 series of the network table number specified for F1. F3 designates the number of words to be written.

Usable Devices

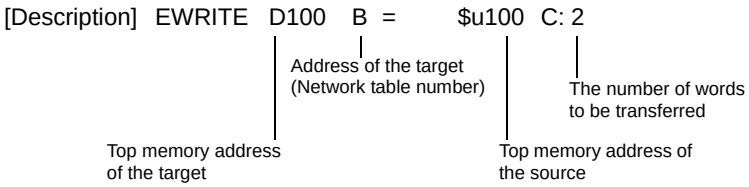
	Internal Memory	PLC Memory	Constant	Memory Card	Indirect Designation	Double-word	IP Address
F0	○	○		○	○		
F1	○		○				○
F2	○	○		○	○		
F3	○		○				

EWRITE: Write to memory

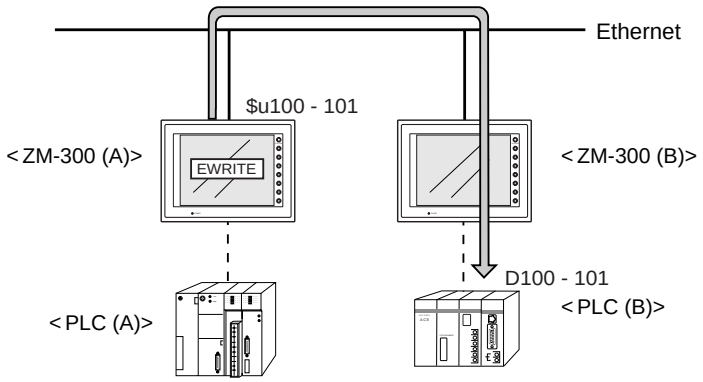
EWRITE F0 F1 = F2 C: F3

Example: Macro command at the ZM-300 (A)

The macro command for ZM-300 (A) to write data in ZM-300 (A) to PLC (B) is shown below.



[Contents] Two words starting from $u100 in ZM-300 (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	○	○		○	○		
F1	○		○				
F2	○		○				○

SEND: Send to server

SEND F0 C: F1 TO: F2

Example: Macro command at the ZM-300 (B)

The macro command for ZM-300 (B) to transfer data to server (A) is shown below.

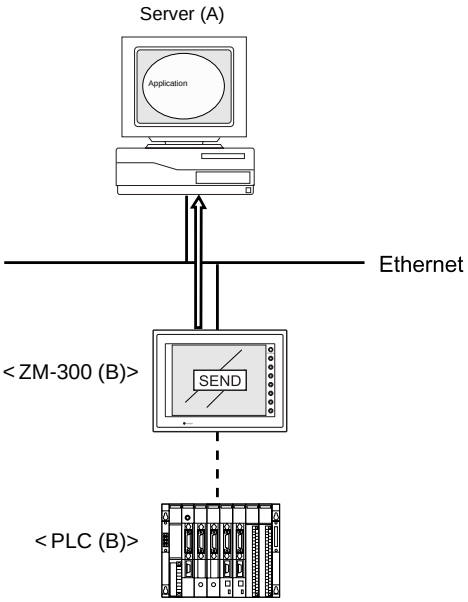
[Description] SEND $u100 C: 2 TO: A

The number of words to be transferred

Top memory address of the source

Address of the target (Network table number)

[Contents] Two words starting from $u100 in ZM-300 (B) are transferred to server (A).



System Memory

The Ethernet status is output to the system memory ($s) of the ZM-300 series. This section explains the memory addresses ($s514 to 619) where the Ethernet status is output. For other memory addresses, refer to the ZM-71SE Instruction 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

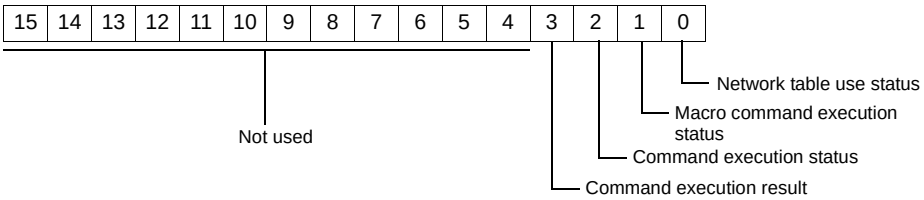
- $s514, 515
  These addresses are related to macro commands [SEND], [EREAD] and [EWRITE].

  $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

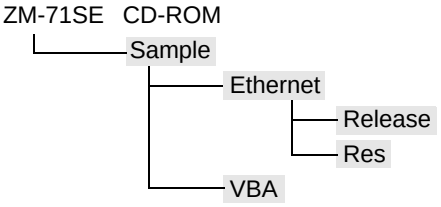
  - Bits 4 to 15 (System reserved)
    Not used at present. Always set "0."

Ethernet Access Functions (HKEtn10.DLL)

To enable Ethernet communications between the server and the ZM-300 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 ZM-71SE 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

- 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 ZM-300	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 *lpAddr, int DFlag=1)

This function is retained until PLC data is transferred from the ZM-300 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

*lpAddr 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.)

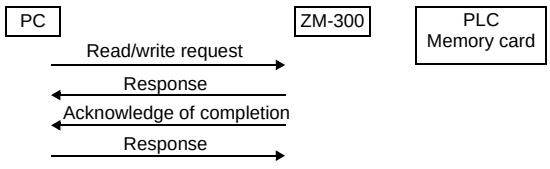
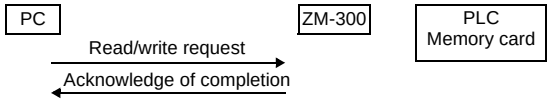
- Return values

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 *lpAddr, int DFlag=1)

This function is retained until PLC data is transferred from the ZM-300 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

*lpAddr — 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 *lpAddr,int DFlag=1)

This function is retained until data is transferred from the ZM-300 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
*lpAddr 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 *lpAddr,int DFlag=1)

This function is retained until data is transferred from the ZM-300 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
*lpAddr 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 *lpOnFlag,int DeviceType,DWORD addr,int BitNo,char *lpAddr)

This function is retained until PLC data is transferred from the ZM-300 series.

- Parameters

*lpOnFlag	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 ÷ 16 = 1 ... 4 DeviceType 6 addr 1 BitNo 4
*lpAddr	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 *lpOnFlag,int DeviceType,DWORD addr,int BitNo,char *lpAddr)

This function is retained until data is transferred from the ZM-300 series.

- Parameters

*lpOnFlag	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
*lpAddr	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 *lpOnFlag,int FileNo,int RecordNo,DWORD addr,int BitNo,char *lpAddr)

This function is retained until data is transferred from the ZM-300 series.

- Parameters

*lpOnFlag	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
*lpAddr	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 *lpAddr)

This function is retained until data is transferred from the ZM-300 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
*lpAddr	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 *lpAddr, int DFlag=1)

This function is retained until write completion is received from the ZM-300 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

*lpAddr — 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 *lpAddr, int DFlag=1)

This function is retained until write completion is received from the ZM-300 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

*lpAddr — 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 *lpAddr,int DFlag=1)

This function is retained until write completion is received from the ZM-300 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
*lpAddr 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 *lpAddr,int DFlag=1)

This function is retained until write completion is received from the ZM-300 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
*lpAddr 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 *lpAddr)

This function is retained until write completion is received from the ZM-300 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 DeviceType 0 addr 20 BitNo 5 Example 2: When accessing to M20 of MITSUBISHI PLC 20 ÷ 16 = 1 ... 4 DeviceType 6 addr 1 BitNo 4
OnFlag	0: OFF 1: ON
*lpAddr	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 *lpAddr)

This function is retained until write completion is received from the ZM-300 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
*lpAddr	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 *lpAddr)

This function is retained until write completion is received from the ZM-300 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
*lpAddr	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 ZM-300

int HKEtn_Recvfrom(BYTE *dp,short *lpCnt)

This function is retained internally until data is received from the ZM-300 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 *lpinf,char *lpAddr)

- Parameters

*lpinf	All “0”
*lpAddr	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 *lpAddr)

Execute this function after the recvfrom() function or receiving the data.

Get Error Contents

int HKEtn_GetLastError()

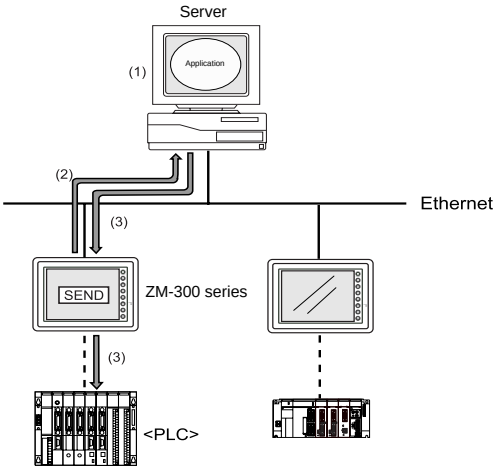
- Error codes and solutions

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 ZM-300 to Server

(1) Execute the receive wait thread using “int HKEtn_ RecvFrom()” on the application of the server.
(2) Send the command from the ZM-300 series to the server using macro command SEND.
(3) The server analyzes the command and takes the appropriate action.

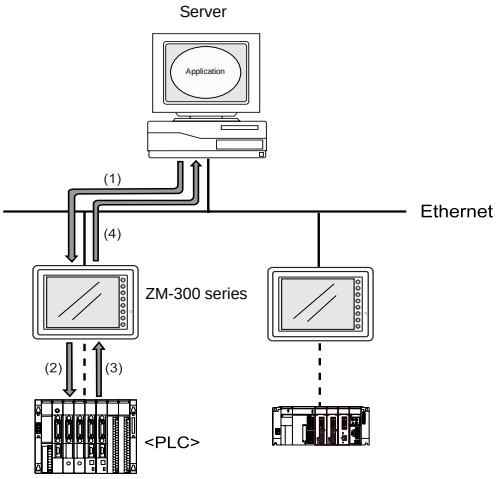


User data format
Transfer from the ZM-300 series

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 ZM-300

(1) A request is sent from the application of the server to the ZM-300 series. Use “int HKEtn_ ReadPlcMemory()” for a memory request.
(2) (3) The ZM-300 series reads the PLC memory.
(4) The ZM-300 series returns data read from the PLC memory to the server.



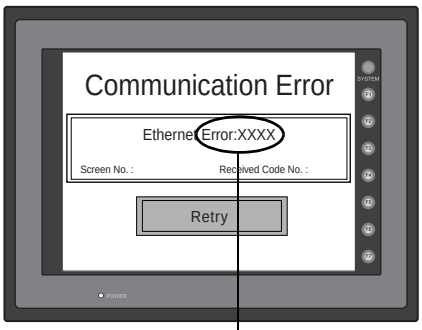
Error Display

Error messages displayed on the ZM-300 series and those stored in the system memory are explained.

Communication Errors

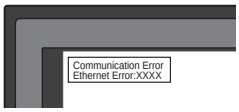
The Ethernet status is stored in system memory address $s518 of the ZM-300 series during Ethernet communications. The communication error occurs when a code other than “0” (normal) is stored in system memory address $s518.

- In the RUN mode

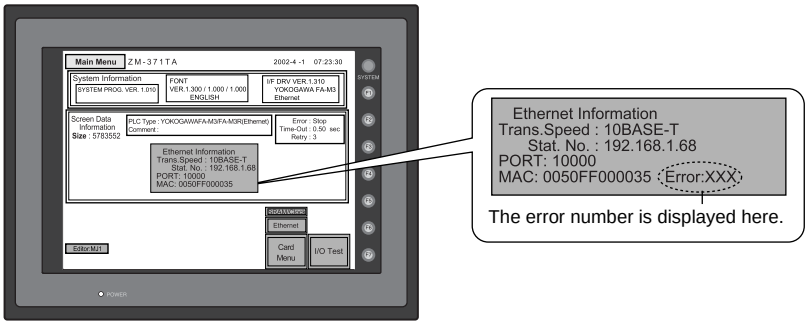


The error number is displayed here.

*** 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:



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 ZM-300 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 ZM-300 high-performance LAN port is used)	Turn the power off and back it on.
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.
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.
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.

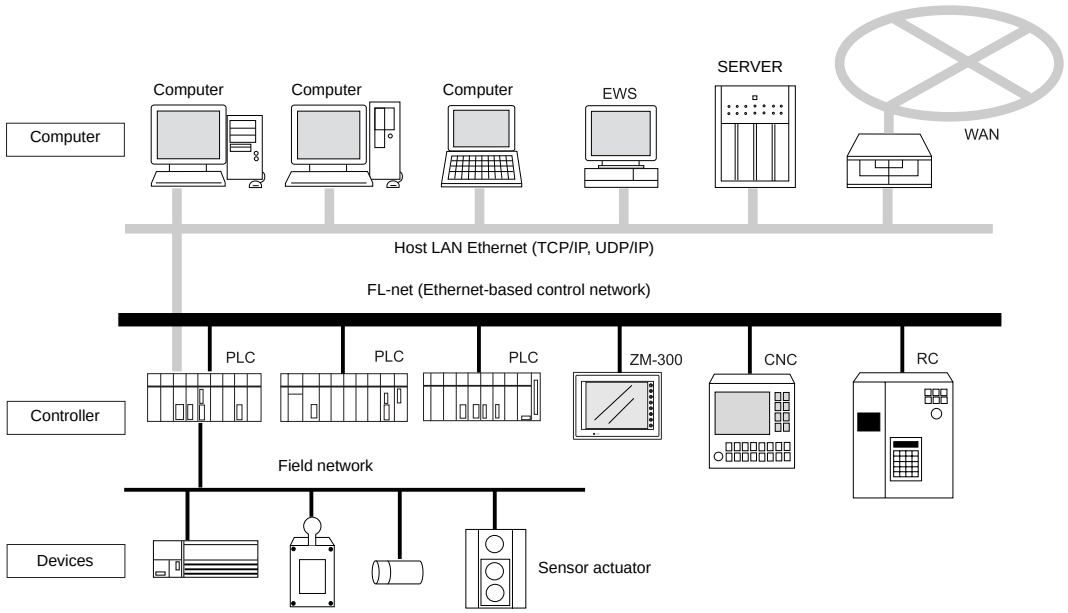
- System memory address: $s515 (response to the request)

Code	Contents	Solution
0	Normal	
200 - 2000	Communication error	Refer to “Communication Errors.”
–30	Timeout	Check if an error is occurring to the target ZM-300.
–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

FL-net

- FL-net 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 communications on the ZM-300 series, the network module ZM-80NU/80NU2 must be mounted. When the ZM-300 series is equipped with the ZM-80NU/80NU2, it becomes an FL-net (OPCN-2)-ready device.
  - ZM-80NU:Ethernet/FL-net (Ver.1.00)
  - ZM-80NU2:Ethernet/FL-net (Ver.2.00)
    You cannot use ZM-80NU2 (for FL-net, Ver.2.00) and ZM-80NU (for FL-net, Ver.1.00) on the same circuit. (They cannot communicate each other because of difference of the communication commands.)
- When ZM-80NU/80NU2 is mounted for FL-net (OPCN-2) communications on ZM-300 (high-performance), 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 ZM-80NU/80NU2. Be sure to set the IP address, etc. on the Main Menu and Ethernet screens. For the setting procedure, refer to “Chapter 2 LCD Control Terminal Operations.” For data transfer, refer to page 4-9.

Connection to PLCs

1. SHARP PLC*
2. MITSUBISHI PLC*
3. OMRON 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. SHARP PLC

Link module

ZM-71SE PLC Selection	PLC		Link module	PLC 2way
JW Series	W70H, W100H JW50, JW70, JW100 JW50H, JW70H, JW100H		ZW-10CM JW-10CM	○
	JW20, JW20H JW30H		JW-21CM	
	JW10 (JW-1324K/1342K JW-1424K/1442K JW-1624K/1642K)		MMI Port Communication Port	
	J-board		Z-331J/332J	
JW100/70H COM Port	JW70(JW-70CU) JW100(JW-100CU) JW70H(JW-70CUH) JW100H(JW-100CUH)		Communication Port	
JW20 COM Port	JW20(JW-22CU) JW20H(JW-22CU)			
	JW30H (JW-32CUH/H1/M1 JW-33CUH/H1/H2/H3)		PG/COMM1 Port PG/COMM2 Port	
	J-board	(Z-311J Z-312J)	Upper Communication Port CN3 Upper Communication Port TC1	
		(Z-511J)	Upper Communication Port CN8 Upper Communication Port CN12	
		(Z-512J)	PG/COMM1 Port PG/COMM2 Port	

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

Item	Setting on PLC	ZM-300 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

(1) Switch setting of JW-10CM, ZW-10CM and JW-21CM

Switch	Setting	Contents
SW0	4	Comand 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:19200 bps
SW7	ON	Termination resistance provided

(2) Switch setting of Z-331J/332J

Switch	Setting	Contents
SW0	4	Computer link
SW1	1	Station address (lower half)
SW2	0	Station address (upper half)
SW3-1	OFF	Not used
SW3-2	OFF	Used only for 2-line system
SW3-3	OFF	Not used
SW3-4	ON	Even parity
SW4	0	Baud rate:19200 bps
SW7	ON	Termination resistance provided

JW100/70H COM Port, JW20 COM Port: System Memory Setting

The settings for communications with the ZM-300 series should be made at the system memory as shown below.

(1) System memory setting of JW-70CUH/100CUH, JW-70CU/100CU, JW-22CU, and Z-311J/312J

System memory	Setting	Contents
#236	30 (H)	Stop bit : 2 bit, Parity : Even Baud rate:19200 bps
#237	01 (H)	Station address

(2) System memory setting of JW-32CUH/H1/M1, JW-33CUH/H1/H2/H3, Z-511J/512J

• Communication port 1 (PG/COMM 1 port)

System memory	Setting	Contents
#234	30 (H)	Stop bit : 2 bit, Parity : Even Baud rate:19200 bps
#235	01 (H)	Station address

• Communication port 2 (PG/COMM 2 port)

System memory	Setting	Contents
#236	30 (H)	Stop bit : 2 bit, Parity : Even Baud rate:19200 bps
#237	01 (H)	Station address

(3) System memory setting of JW-1324K/1342K, JW-1424K/1442K and JW-1624K/1642K

• Communication port

System memory	Setting	Contents
#234	00 (H)	Computer link
#236	30 (H)	Stop bit : 2 bit, Parity : Even Baud rate:19200 bps Data Length : 7 bit
#237	01 (H)	Station address

• MMI port

System memory	Setting	Contents
#226	30 (H)	Stop bit : 2 bit, Parity : Even Baud rate:19200 bps Data Length : 7 bit
#227	01 (H)	Station address

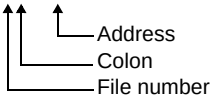
Available Memory

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 ZM-71SE Editor
Enter “file number” + “: (colon)” + address in order.

Example: F1 : 00002

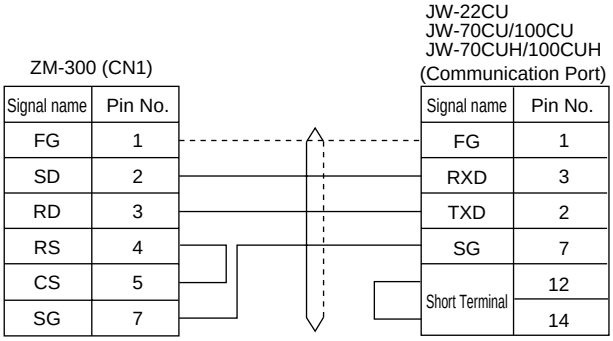


Wiring

Indicate the connection of ZM-300 and each module. CN1 is used alternately with RS-422.

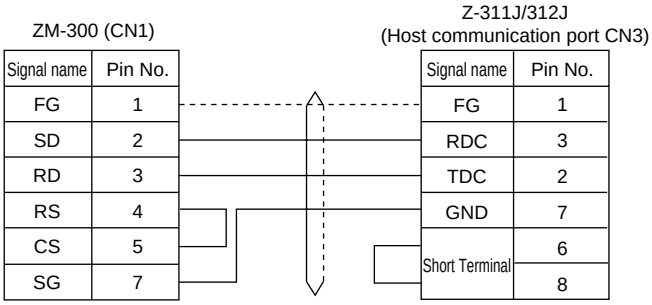
RS-232C

• Connection with JW-70CUH/100CUH, JW-70CU/100CU, JW-22CU



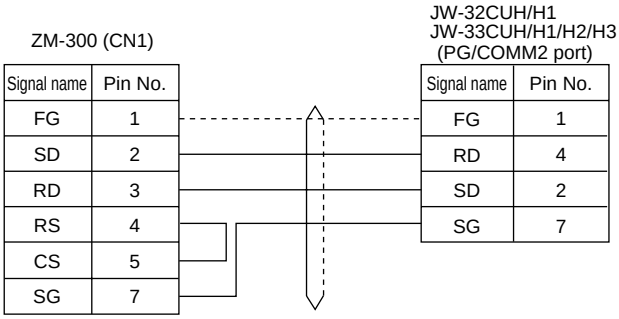
* Used shielded cables

• Connection with Z-311J/312J



* Used shielded cables

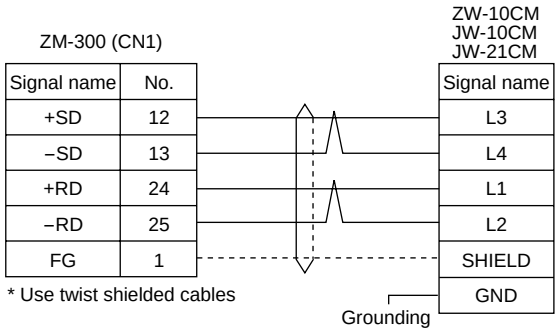
• Connection with JW-32CUH/H1, JW-33CUH/H1/H2/H3



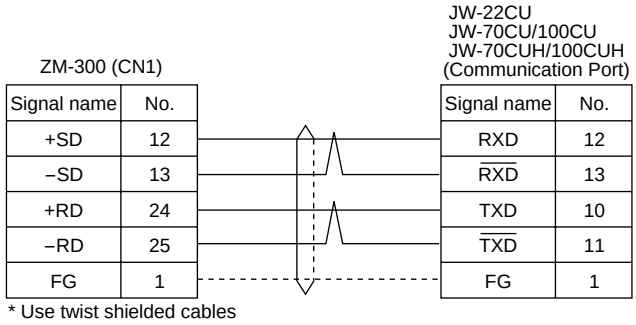
* Use twist shielded cables

RS-422

• Connection with JW-10CM, ZW-10CM, and JW-21CM

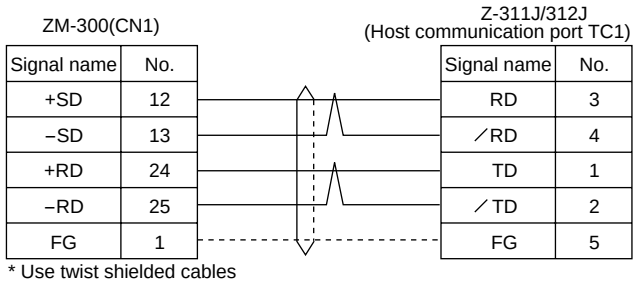


• Connection with JW-70CUH/100CUH, JW-70CU/100CU, and JW-22CU

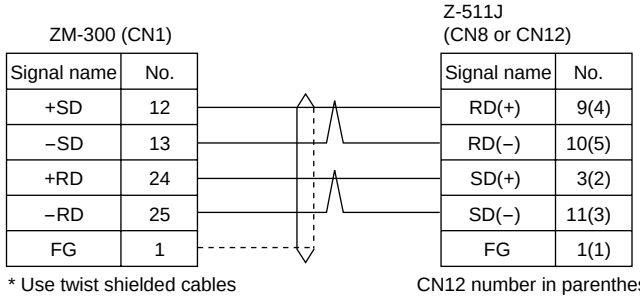


(Attention : In the case of JW-70CUH/100CUH, connect the termination resistance.)
(Connect the pin No.6 of the communication port with the pin No.13.)

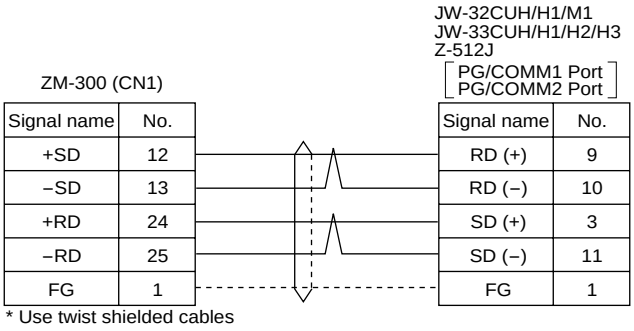
• Connection with Z-311J/312J



• Connection with Z-511J

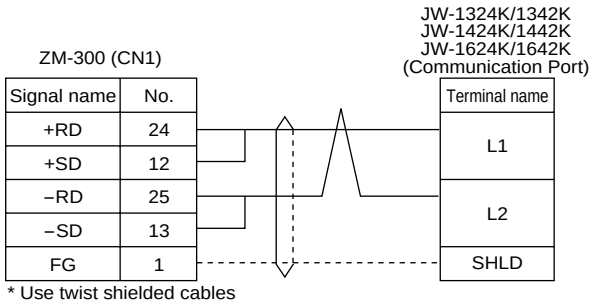


• Connection with JW-32CUH/H1/M1, JW-33CUH/H1/H2/H3, and Z-512J



* Use twist shielded cables

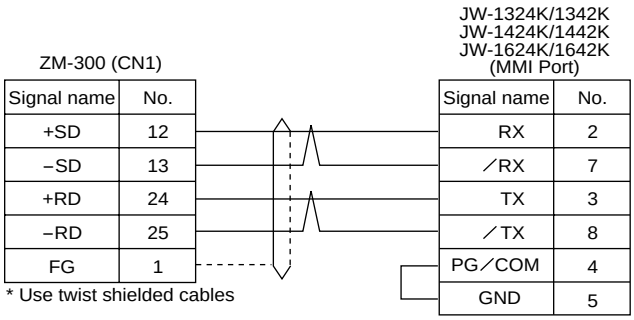
• Connection with JW-1324K/1342K, JW-1424K/1442K, and JW-1624K/1642K
[In case of connecting to the communication port]



* Use twist shielded cables

(Attention : set the termination resistance switch naught (off) at the termination resistance)

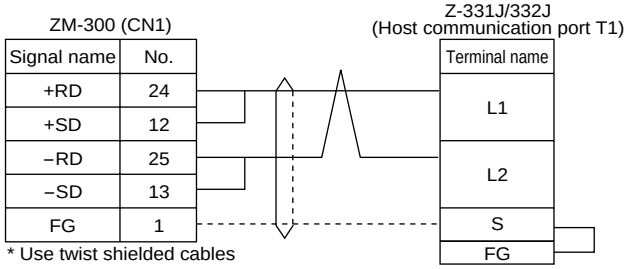
[When connecting to MM1 port]



* Use twist shielded cables

(Attention: set the termination resistance switch naught (off) at the termination resistance)

• Connection with Z-331J/332J



* Use twist shielded cables

2. 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			×

*2 For more information on A link + Net10, refer to page 5-22.

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 Exclusive cable (order product) or [Wiring Diagram 7]	×
QnA series CPU	Q2A, Q3A, Q4A Q2AS(H)			
QnH (A) series CPU	Q06H-A	Tool port*2	RS-232C Exclusive cable (order product)	×
QnH (Q) series CPU	Q02, Q02H Q06H Q12H Q25H			

*1 For more information of ZM-1MD2 (dual port interface), refer to page 5-24.
*2 For the ladder transfer function used when directly connecting the QnH series CPU, refer to page 5-25.

FX Series

Select PLC Type	CPU	Unit/Port	Connection	PLC2Way
FX series CPU	FX1/2	Tool port*1	RS-232C Exclusive cable (order product) RS-422 Exclusive cable (order product) or [Wiring Diagram 7]	×
	FX0N	Tool port*1	RS-422 Exclusive cable (order product) or Exclusive cable (order product) + 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 Exclusive cable (order product)	×
	FX1N FX1S	FX1N-232-BD	RS-232C [Wiring Diagram 3]	×
		FX1N-485-BD	RS-485 [Wiring Diagram 8]	×
		FX1N-422-BD	RS-422 Exclusive cable (order product)	×
	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 ZM-1MD2 (dual port interface), refer to page 5-24.

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

A Series Link

Item		Setting on PLC	ZM-300 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 ZM-300 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	ZM-300 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 ZM-300 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 ZM-300 series are automatically set.

QnH (A) Series CPU, QnH(Q) Series CPU

Communication parameters for the ZM-300 series except the baud rate are automatically set.

*** The maximum baud rate available with the ZM-300 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 ZM-300 series are automatically set.

FX Series Link (A Protocol)

Item		Setting on PLC	ZM-300 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.

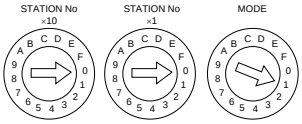
*** We recommend to set 2 ms or above for [Send Delay Time] in the [Detail] tab window of the [Comm. Parameter] dialog of the ZM-300 series.**

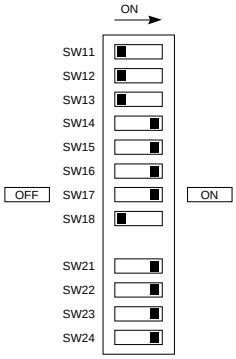
A Series Link, QnA Series Link: Switch Setting

The following is an example that shows the settings for both rotary DIP switches and DIP switches on the PLC.

AJ71UC24

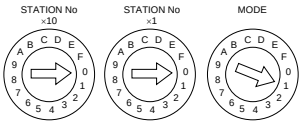
Example 1 Signal level: RS-232C, baud rate: 19200 bps, transmission mode 1

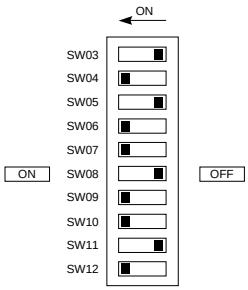




A1SJ71C24-R2, A1SJ71UC24-R2

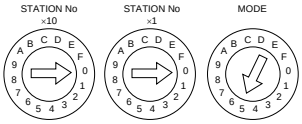
Example 2 Signal level: RS-232C, baud rate: 19200 bps, transmission mode 1

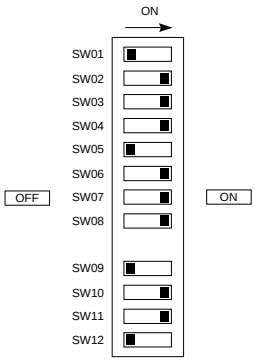




AJ71QC24, A1SJ71QC24, AJ71QC24N

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 ZM-71SE 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.

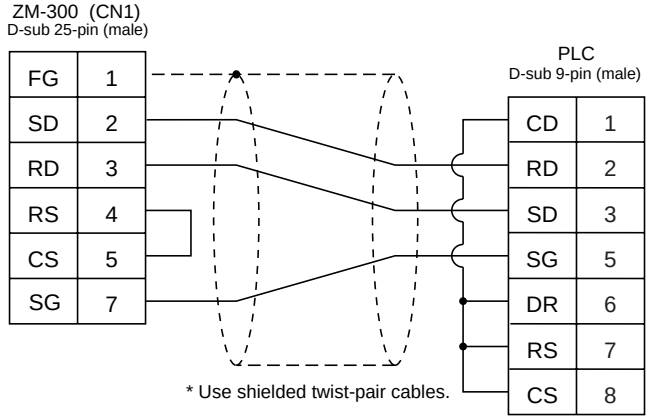
For output “0” is written for upper 16 bits.

Wiring

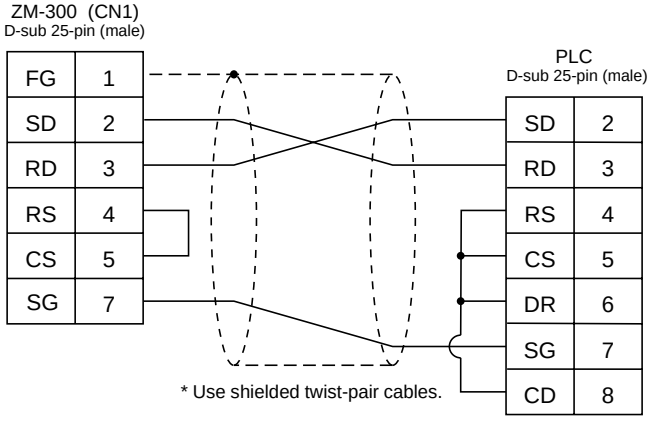
Wiring diagrams with the PLC are shown below.

RS-232C

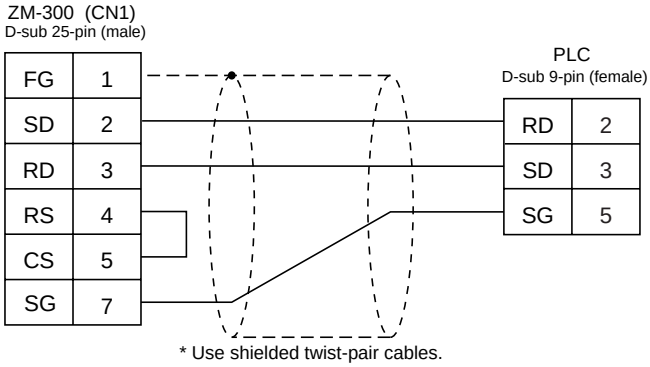
Wiring Diagram 1



Wiring Diagram 2

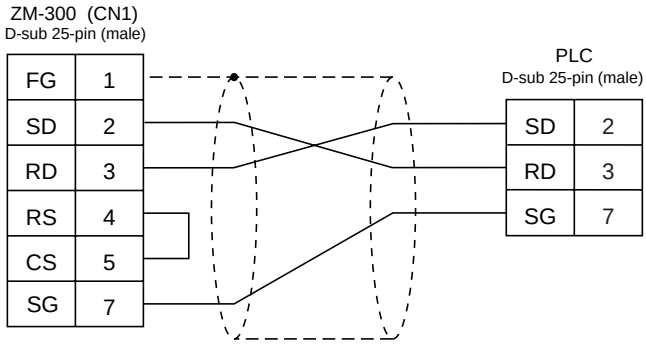


Wiring Diagram 3



* Use shielded twist-pair cables.

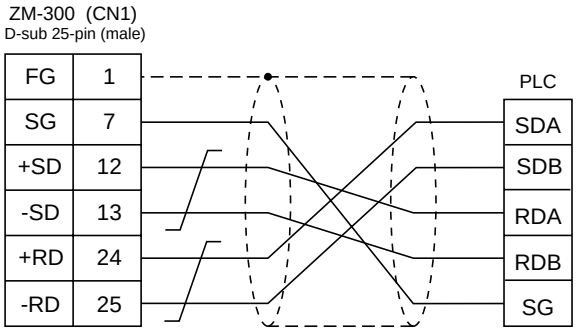
Wiring Diagram 4



* Use shielded twist-pair cables.

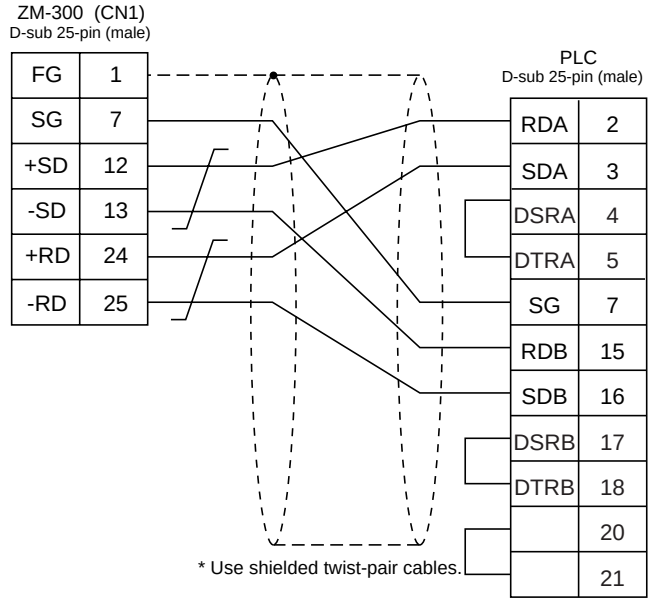
RS-422

Wiring Diagram 5

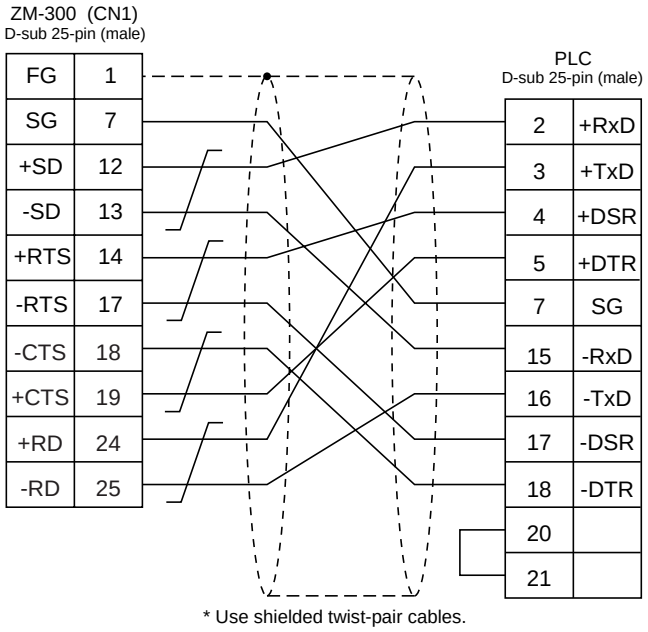


* Use shielded twist-pair cables.

Wiring Diagram 6

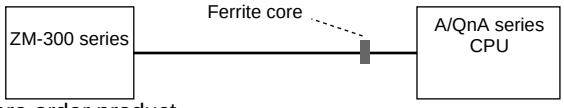


Wiring Diagram 7



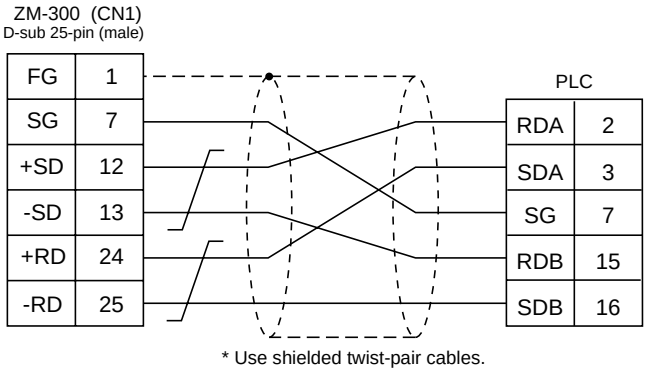
According to our noise tests, the attachment of a ferrite core improves noise voltage by 650 to 900 V and aids in preventing communication errors.

- When connecting to the A/QnA series CPU directly, attach a ferrite core to the communication cable between the ZM-300 series and A/QnA series CPU to avoid noise problems.



- Ferrite cores are order product.
- 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.

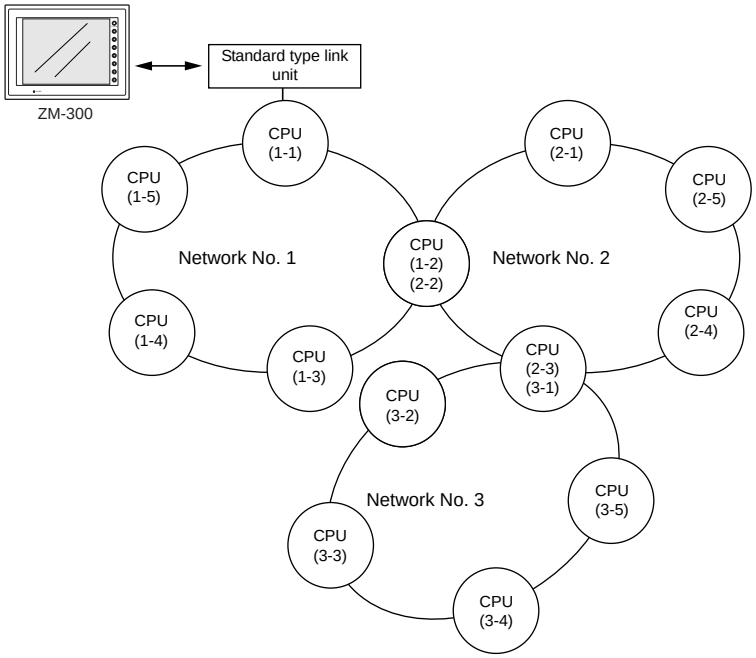
Wiring Diagram 8



* Use shielded twist-pair cables.

A Link + Net10

- When the ZM-300 series is connected to the standard type link unit on the CPU that is connected to the data link system or network system, the ZM-300 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 ZM-71SE editor.
- When the ZM-300 series has access to the CPU on NET II (/B) or NET/10:
  - With NET II (/B), the ZM-300 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 ZM-300 series. (Available CPU No. 0 to 30)
  - With NET/10, the ZM-300 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 ZM-300 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 ZM-300 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 ZM-71SE editor. The response time is the same as that with 1 : 1 connection between the ZM-300 series and the PLC.

  When the ZM-300 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 ZM-71SE editor. This macro command should be [OUT_ ENQ] ofsystem 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.

  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

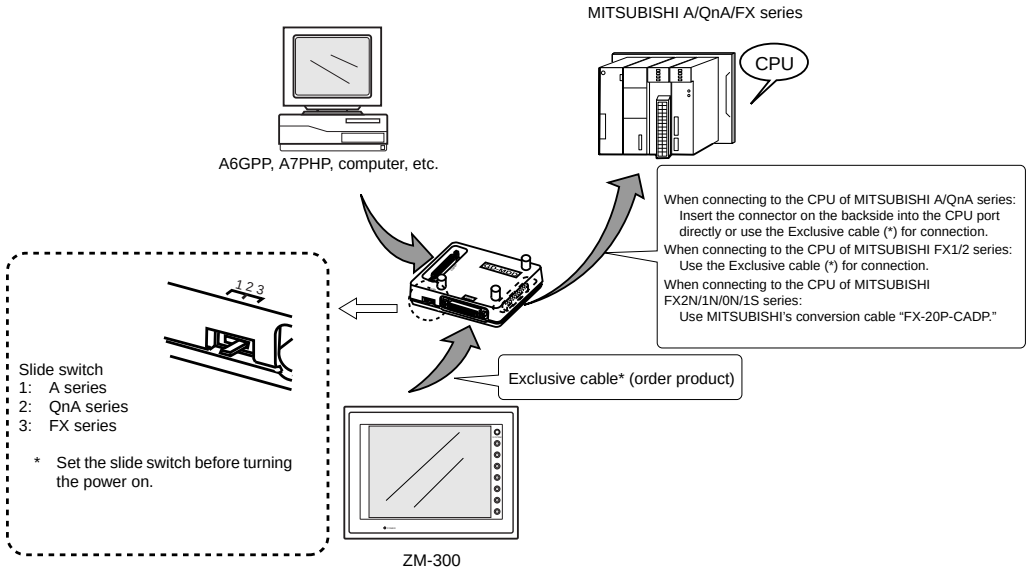
For the available memory of the PLC to be accessed, refer to “Available Memory” page 5-15. Note that the CPU number must be set on the ZM-71SE editor.

Wiring

Refer to the wiring diagram with the standard type link unit.

ZM-1MD2 (Dual Port Interface)

ZM-1MD2 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.



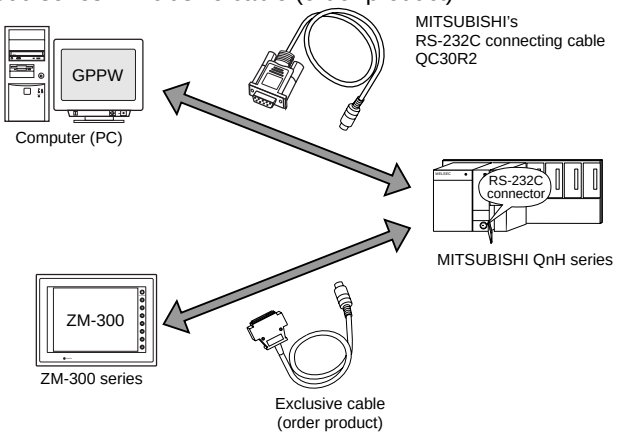
ZM-1MD2 cannot be used with the MI4-FX cable.

- The power to the ZM-1MD2 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 ZM-1MD2 as short as possible. (Max. 1 to 1.5 m)
- Be sure to consider noise problems when performing wiring.
- When ZM-1MD2 is used for connection with the ZM-300 series, set 1.5 seconds or above for the timeout time in the [Comm. Parameter] dialog.

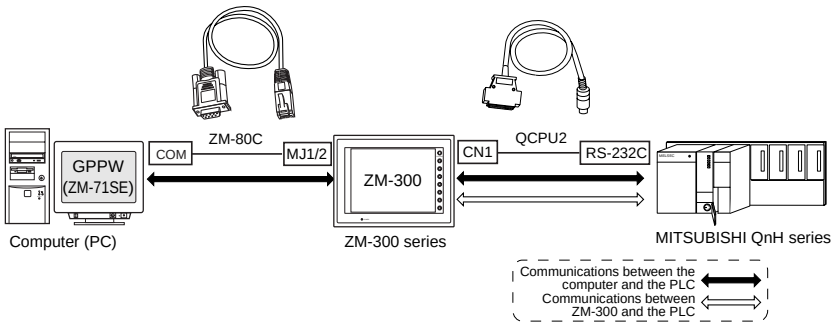
Ladder Transfer Function

Up until now it was necessary to debug the data by removing and mounting two cables repeatedly as shown below when the ZM-300 series is directly connected to MITSUBISHI's QnHCPU 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 ZM-300 series and the PLC that is used for communications with the ZM-300 series: Exclusive cable (order product)



When using the ladder transfer function by connecting the computer (PLC programming software) to the ZM-300 series, it is possible to write ladder programs or monitor the PLC memory using the ZM-300 series.



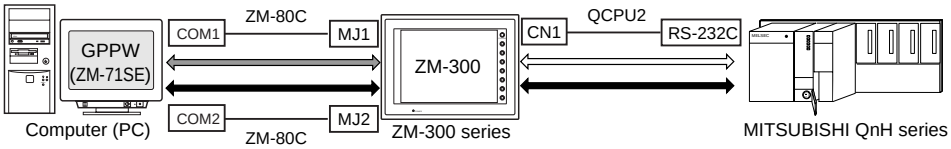
Applicable PLCs

MITSUBISHI PLCs

Q02, Q02H, Q06HCPU port (Q mode)

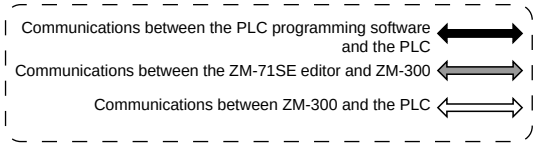
Connection

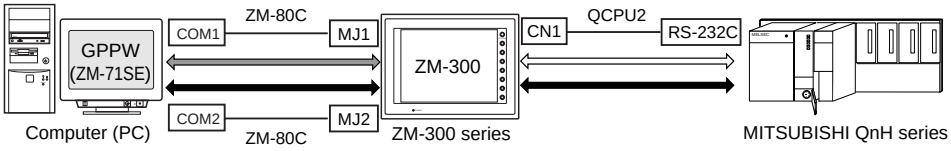
- Use exclusive cable when connecting the ZM-300 series (CN1) to the PLC (RS-232C port).
- Use Sharps' ZM-80C cable when connecting the computer (PLC programming software) and the ZM-300 series (MJ1/2).



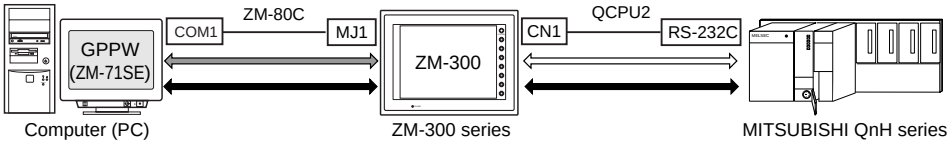
- When using the ZM-71SE editor and the PLC programming software:

  - When using two ZM-80C cables:
    When the computer has two COM ports, use one port for the ZM-71SE editor and the other port for the PLC programming software. Use the ZM-80C cables. (It is not possible to transfer the ZM-71SE editor and the PLC programming software at the same time.)





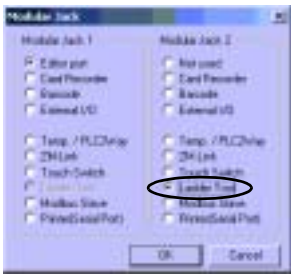
  - When using one ZM-80C cable:
    When using the ZM-71SE editor and the PLC programming software, it is not possible to use one COM port for both purposes at the same time. Stop using both software for communications.



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.

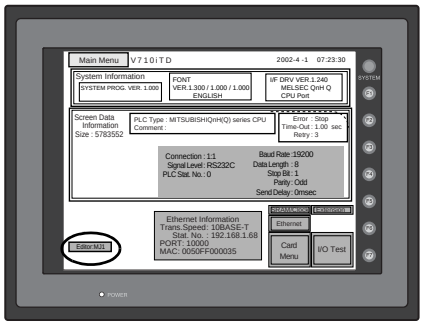
2. PLC programming software port setting
   Select [Modular Jack] from the [System Setting] menu. Select [Ladder Tool] for [Modular Jack 1] or [Modular Jack 2] in the [Modular Jack] dialog.



Communications with ZM-71SE editor (for screen data transfer)

*** On-line editing between the ZM-71SE editor and the ZM-300 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 ZM-300 series, and communications with the ZM-71SE editor become possible.
- With [Ladder Tool] selected for [Modular Jack 1], even when the Main Menu screen is displayed on the ZM-300 series, communications with the PLC programming software continue so that communications with the ZM-71SE editor are not available.



When communicating with the ZM-71SE editor, hold down the F2 switch for three seconds. [Editor: ...] changes to [Editor: MJ1] and communications with the ZM-71SE editor become possible.

Communications with the PLC programming software possible

Communications with the ZM-71SE editor possible

Editor: MJ1 → Editor:

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 ZM-71SE editor and the ZM-300 series

ZM-71SE	PLC programming software
Writing to ZM-300	Communications disconnected (normal communications on completion of writing)
Reading from ZM-300	Normal communications
Comparing with ZM-300	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 ZM-300 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 ZM-71SE 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 ZM-300 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 ZM-300 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 ZM-300 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 ZM-300 series, communications are synchronized; therefore, the performance of both the ZM-300 series and the PLC programming software decreases.

3. 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 5-36.

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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 ZM-300 series is 115200 bps.
Select the appropriate baud rate depending on the used PLC and environment.

ZM-71SE Setting

Set [Trans. Mode] in the [Detail] tab window of the [Comm. Parameter] dialog of the ZM-71SE 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 ZM-300
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

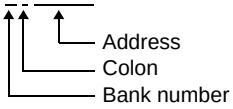
Memory		TYPE	Remarks
DM	(data memory)	0	
CH	(input/output relay)	1	
AR	(alarm relay)	4	
T	(timer/current value)	5	
C	(counter/current value)	6	*1
EMn	(extensional data memory)	7	Read only
TU	(timer/contact)	9	Read only
CU	(counter/contact)	10	

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

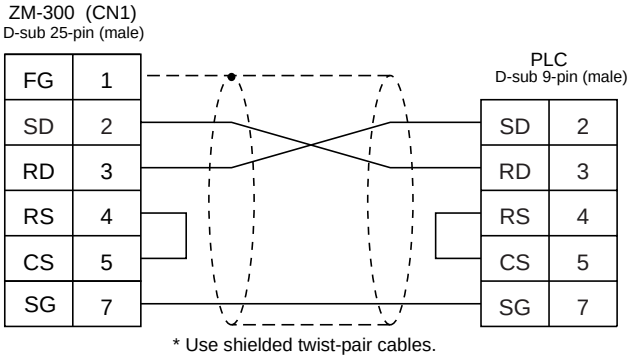


Wiring

Wiring diagrams with the PLC are shown below.

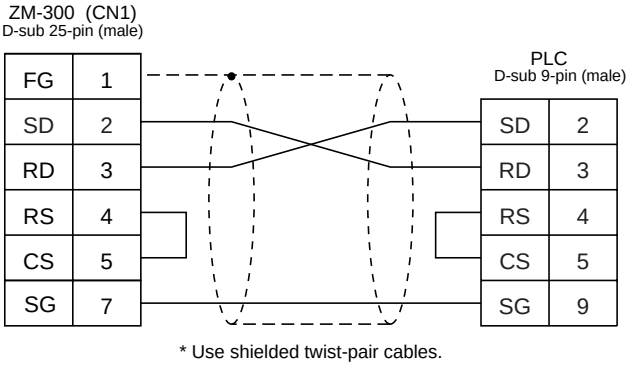
RS-232C

Wiring Diagram 1



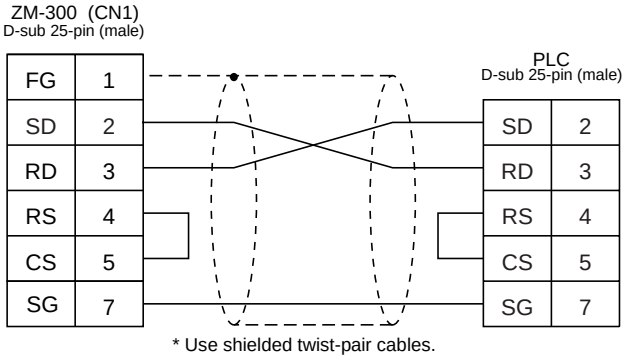
* Use shielded twist-pair cables.

Wiring Diagram 2



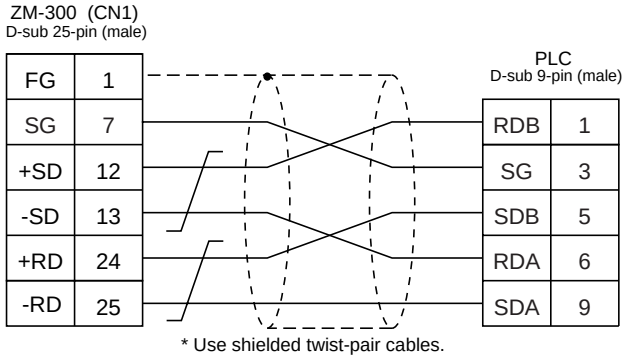
* Use shielded twist-pair cables.

Wiring Diagram 3

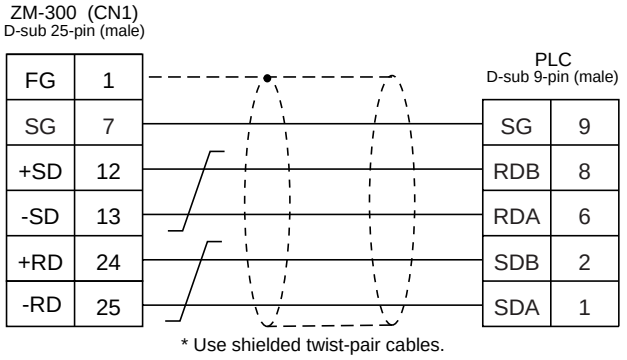


RS-422

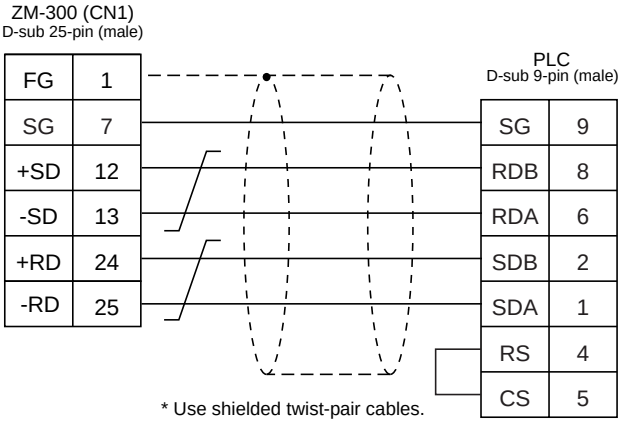
Wiring Diagram 4



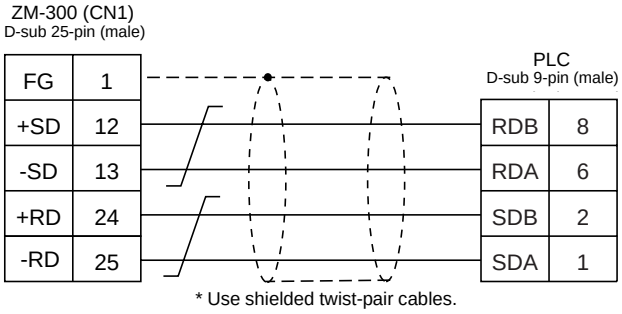
Wiring Diagram 5



Wiring Diagram 6

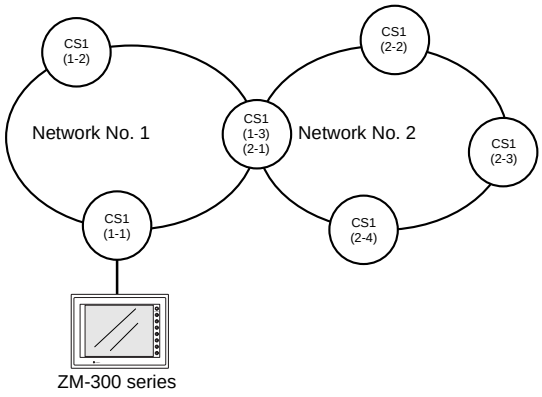


Wiring Diagram 7



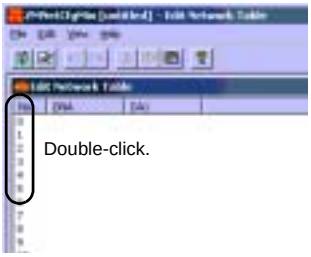
SYSMAC CS1 DNA

When connecting the ZM-300 series to CS1 on a network (Controller Link), the ZM-300 series can also access another CS1 on the network.



ZM-71SE 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.



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 2α	Interface on the CPU unit	RS-422 [Wiring Diagram 5]
HIDIC-S10/2α	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 ZM-300 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 ZM-300 series is as follows:

COMM-2H

Item		Setting on PLC	ZM-300 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	ZM-300 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-S10α

Item	Setting on PLC	ZM-300 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 ×10, ×1
DIP switch

Switch	Setting	Contents
1	OFF	Bit length
2	OFF	Same as that set on ZM-300 (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-S10/2α

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-short 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

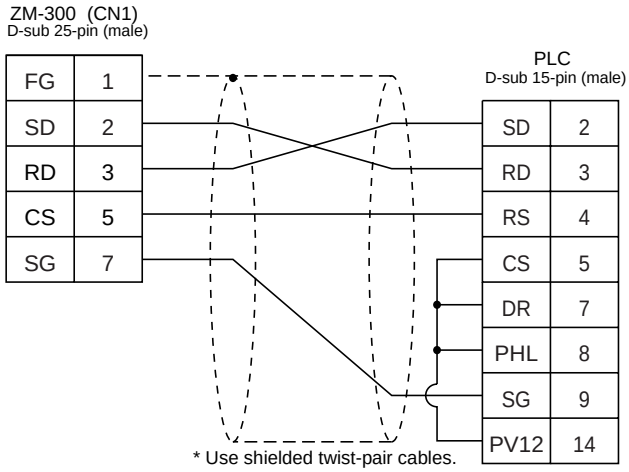
Memory	TYPE	Remarks
0E	0	
06	1	
18	2	
19	3	
1A	4	
1B	5	
1C	6	
1D	7	

Wiring

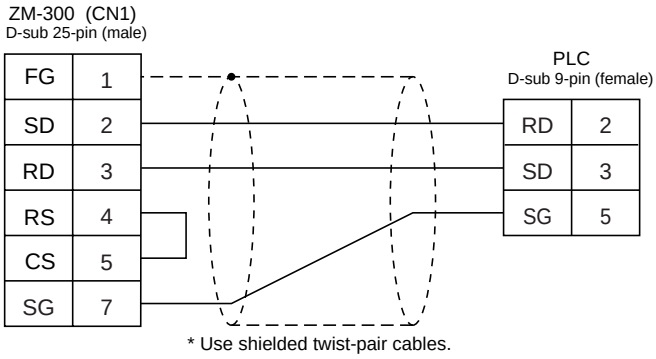
Wiring diagrams with the PLC are shown below.

RS-232C

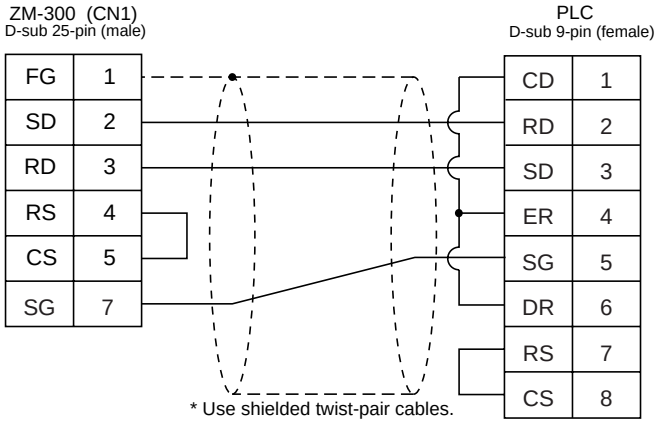
Wiring Diagram 1



Wiring Diagram 2

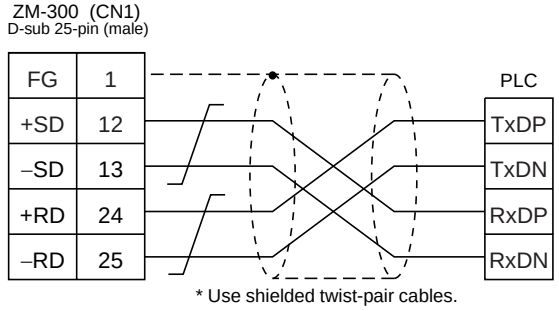


Wiring Diagram 3



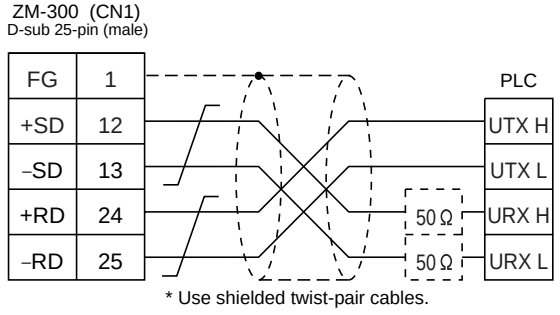
RS-422

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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 ZM-300 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 ZM-300 (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.

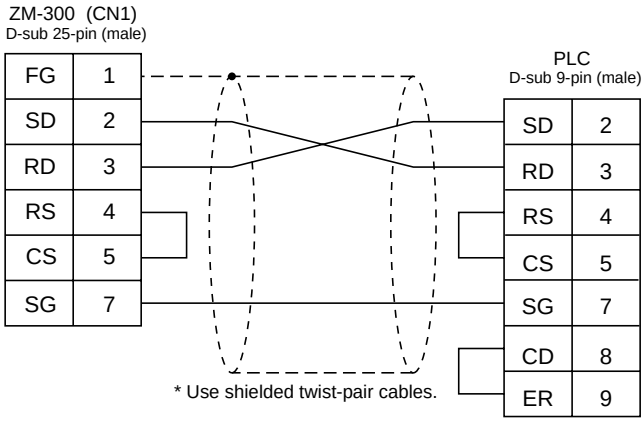
Memory		TYPE	Remarks
DT	(data register)	0	
X	(external input relay)	1	WX as word device, read only
Y	(external output relay)	2	WY as word device
R	(internal relay)	3	WR as word device, including special relays
L	(link relay)	4	WL as word device
LD	(link register)	5	
FL	(file register)	6	
SV	(timer/counter set value)	7	
EV	(timer/counter elapsed time)	8	
T	(timer/contact)	9	Read only
C	(counter/contact)	10	Read only

Wiring

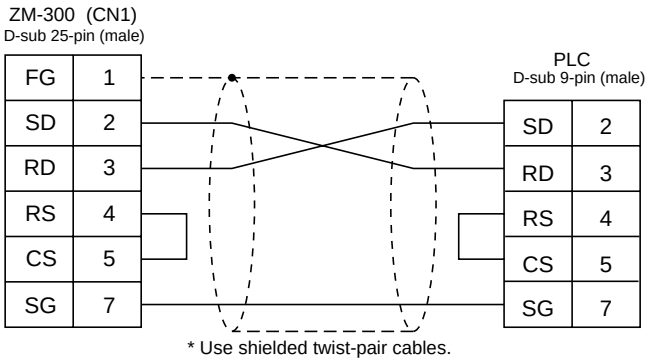
Wiring diagrams with the PLC are shown below.

RS-232C

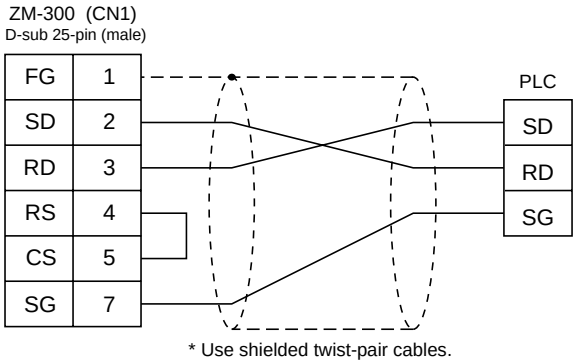
Wiring Diagram 1



Wiring Diagram 2

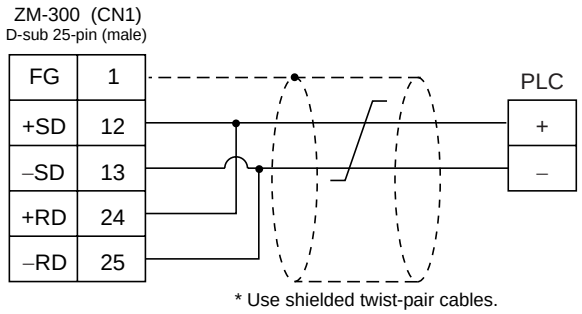


Wiring Diagram 3



RS-422

Wiring Diagram 4



* Use shielded twist-pair cables.

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 ZM-300 series is as follows:

FA500

Item		Setting on PLC	ZM-300 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	ZM-300 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 ZM-300 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 ZM-300 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.

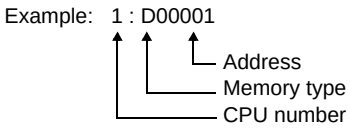
FA500

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.

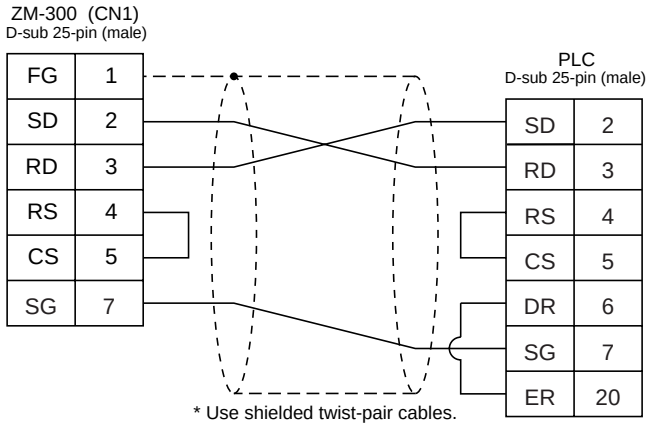


Wiring

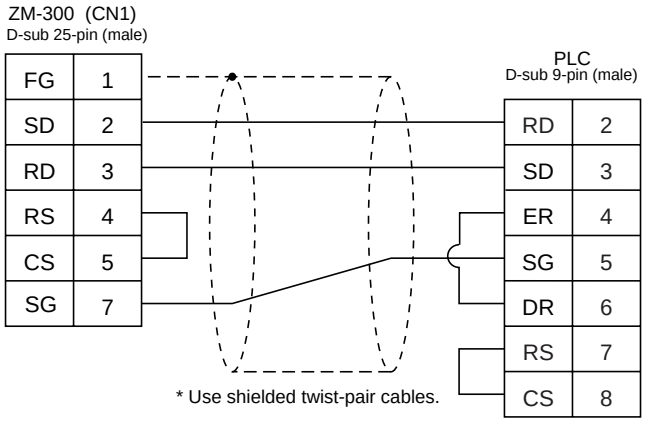
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

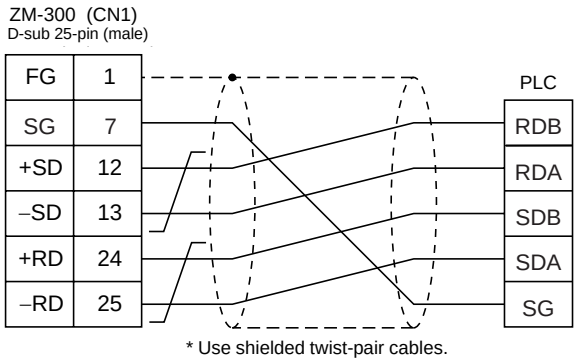


Wiring Diagram 2



RS-422

Wiring Diagram 3



* Use shielded twist-pair cables.

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] [Wiring Diagram 4] RS-422 [Wiring Diagram 7]
	MP920 MP930	Memobus port on the CPU module	RS-232C [Wiring Diagram 1]
		217IF	RS-232C [Wiring Diagram 3] RS-422 [Wiring Diagram 8]

*** Other PLCs can also be connected with Memobus.**

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

Memobus

Item		Setting on PLC	ZM-300 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 ZM-71SE editor.

PLC Model	ZM-300 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	ZM-300 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

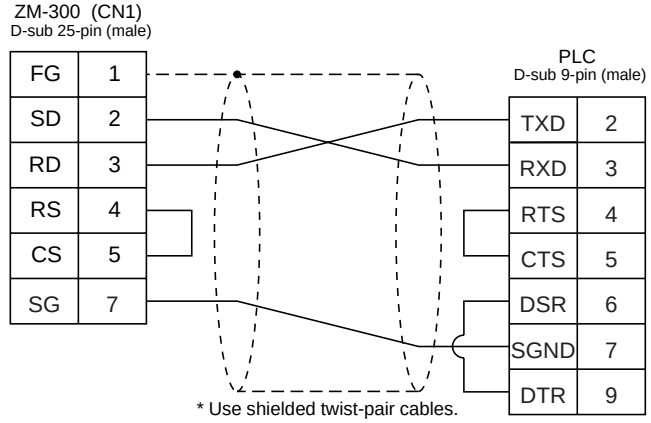
Bit No.: HEX

Wiring

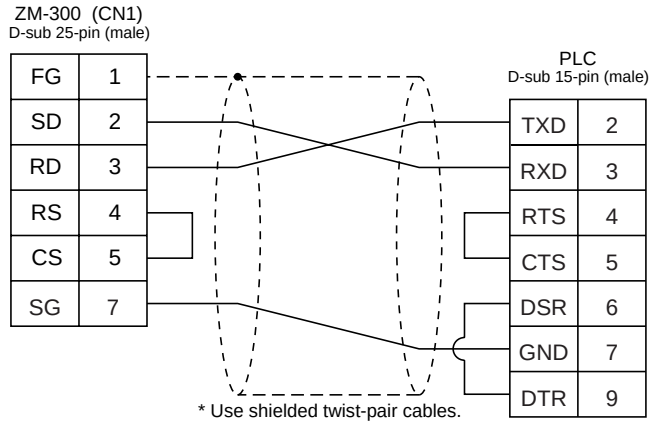
Wiring diagrams with the PLC are shown below.

RS-232C

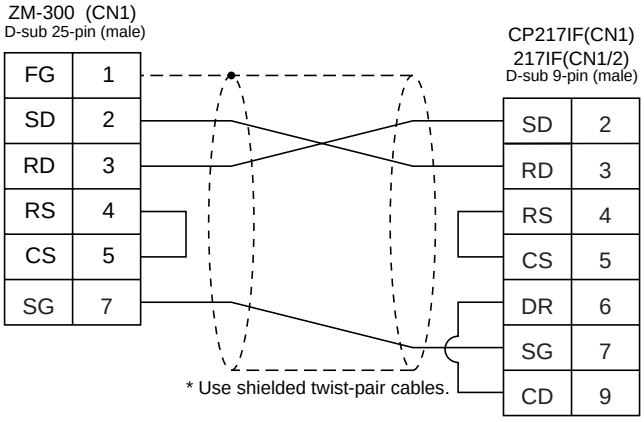
Wiring Diagram 1



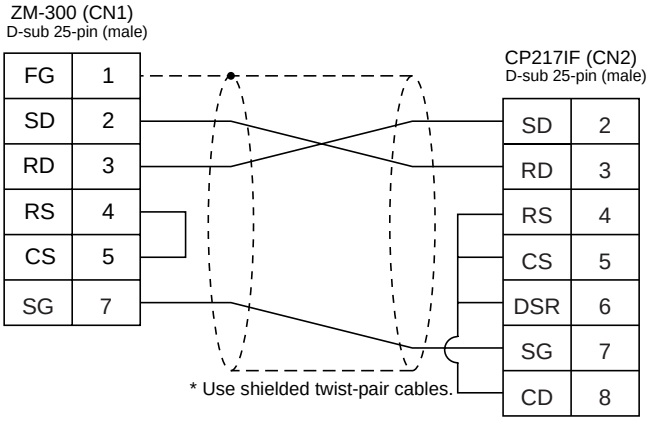
Wiring Diagram 2



Wiring Diagram 3

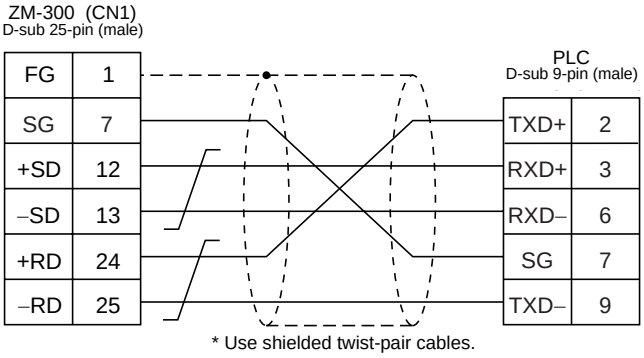


Wiring Diagram 4

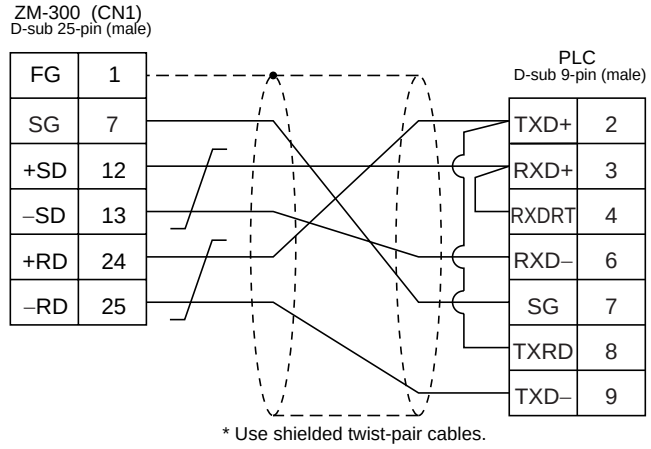


RS-422

Wiring Diagram 5

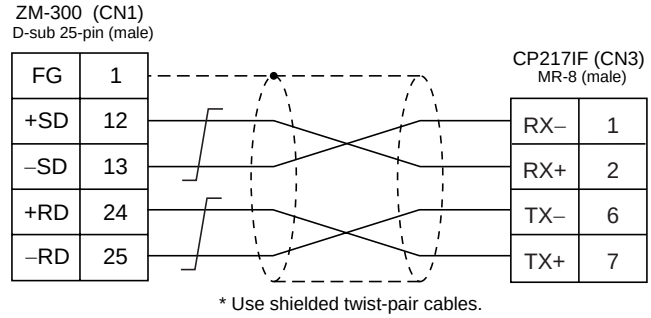


Wiring Diagram 6



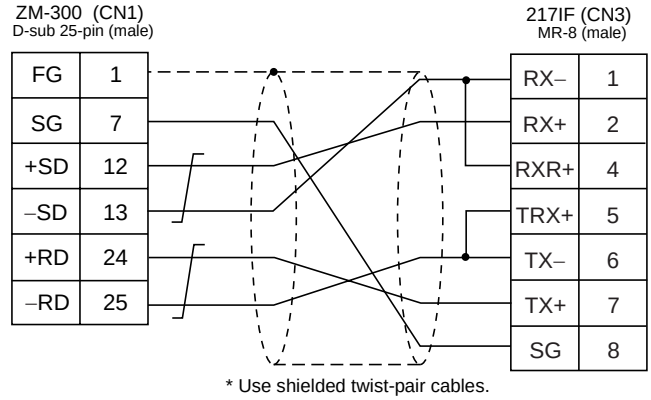
* Use shielded twist-pair cables.

Wiring Diagram 7



* Use shielded twist-pair cables.

Wiring Diagram 8



* Use shielded twist-pair cables.

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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 ZM-71SE 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.

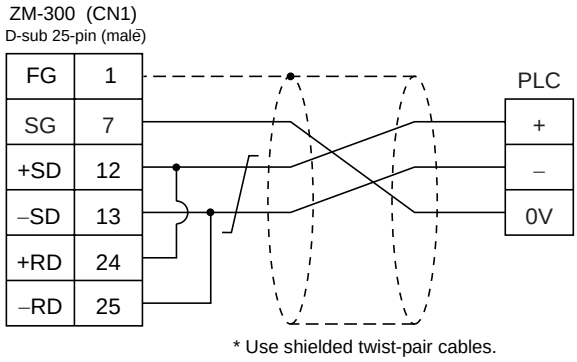
- Range for [PRG No.]: 1 to 3

Wiring

Wiring diagrams with the PLC are shown below.

RS-422

Wiring Diagram 1



* Use shielded twist-pair cables.

9. FUJI PLC

Available PLCs

Select PLC Type	PLC	Unit/Port	Connection	PLC2Way
MICREX-F series (MICREX-F series ZM41/70)	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 ZM-300 series is as follows:

MICREX-F Series, FLEX-PC Series

Item		Setting on PLC	ZM-300 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 ZM-300 series are automatically set.

FLEX-PC COM (T) (NJ Computer Link) Toyota Version

Item		Setting on PLC	ZM-300 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 ZM-300 (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

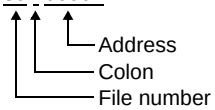
Memory		TYPE	Remarks
M	(auxiliary relay)	0	WM as word device
K	(keep relay)	1	WK as word device
B	(input/output relay)	2	WB as word device
L	(link relay)	9	WL as word device
F	(special relay)	10	WF as word device
TS	(timer/set value)	11	*1
TR	(timer/current value)	12	*1
W9	(timer/current value 0.1)	13	*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 ZM-71SE editor, enter "file number" + ": (colon)" + address in order.

Example: W30 : 00002



*** Notes on ZM-41/70 (or ZM-30) data conversion**
When converting data of ZM-41/70 (or ZM-30) into the ZM-300 data, [MICREX-F series ZM-41/70] 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

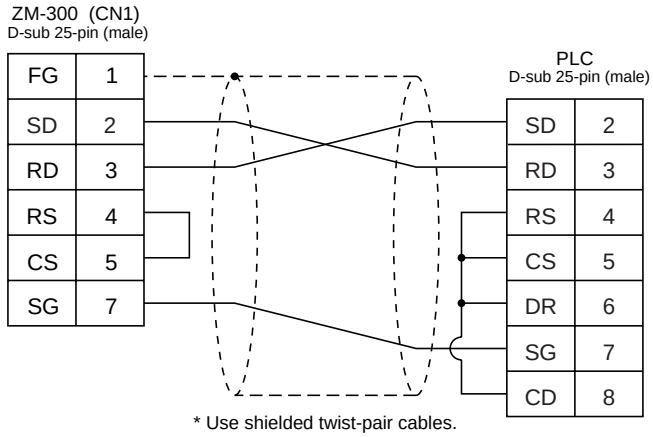
Memory		TYPE	Remarks
D	(data register)	0	
R	(link register)	1	
M	(internal relay)	2	WM as word device
K	(latch relay)	3	WK as word device
X	(input relay)	4	WX as word device
Y	(output relay)	5	WY as word device
W	(file register)	6	
TN	(timer/current value)	7	
CN	(counter/current value)	8	
T	(timer/contact)	9	
C	(counter/contact)	10	
Z	(special register)	12	
V	(special relay)	13	WV as word device

Wiring

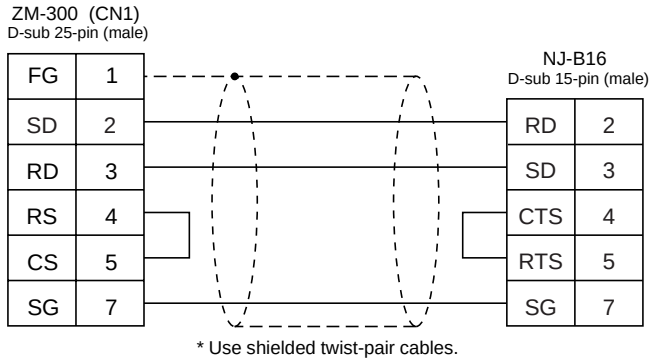
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

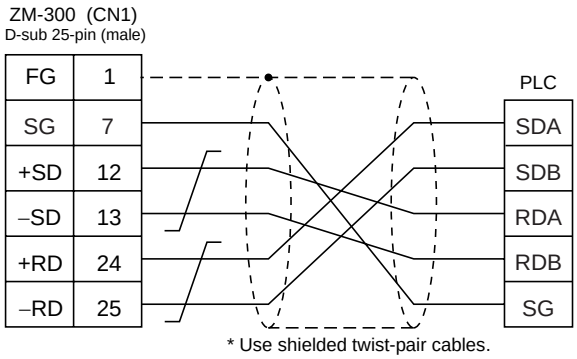


Wiring Diagram 2



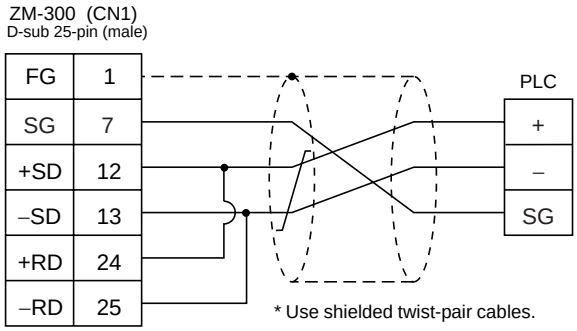
RS-485

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 [Wiring Diagram 1] RS-422 [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 [Wiring Diagram 1] RS-422 [Wiring Diagram 4]
		Port on CPU	RS-232C [Wiring Diagram 1] RS-422 [Wiring Diagram 4]
	PZ3	Universal communication port on the CPU unit	RS-232C [Wiring Diagram 2] RS-485 [Wiring Diagram 6]
SR-T	SR-6T (Toyota version)	U01-DM	RS-232C [Wiring Diagram 1] RS-422 [Wiring Diagram 3]
		G01-DM	RS-232C [Wiring Diagram 1] RS-422 [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)	
		PORT2 on CPU (universal communication port)	RS-232C KOYO's programmer connecting cable S-30JG-E + KOYO's conversion connector cable 15CNJ + KOYO's conversion connector S-15HCNP1

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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 ZM-300 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: On-line
Short plug 1: open
Short plug 2: 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:

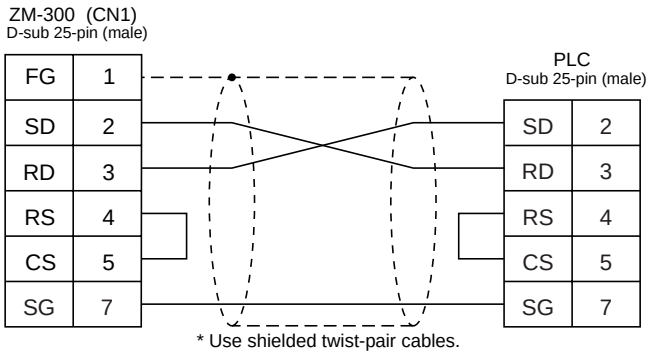
No	Setting	Contents
1	ON	Same as that set on ZM-300 Normally 19200 bps
2	ON	
3	ON	
4	ON	With parity
5	OFF	Self-diagnosis
6	OFF	Turn-around delay
7	OFF	Response delay time 0 msec
8	OFF	
9	OFF	HEX mode

Wiring

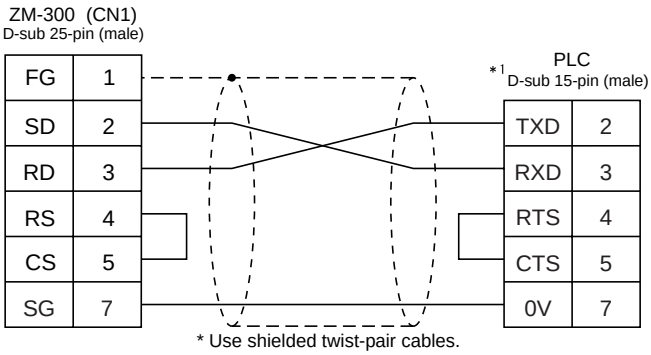
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



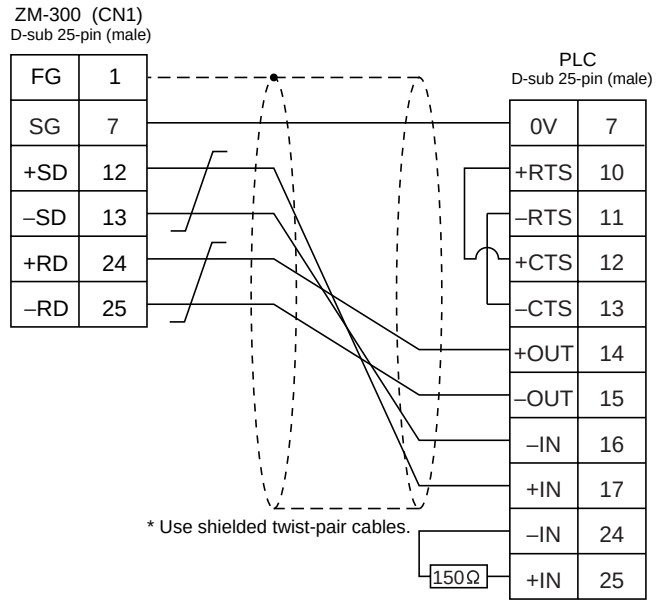
Wiring Diagram 2



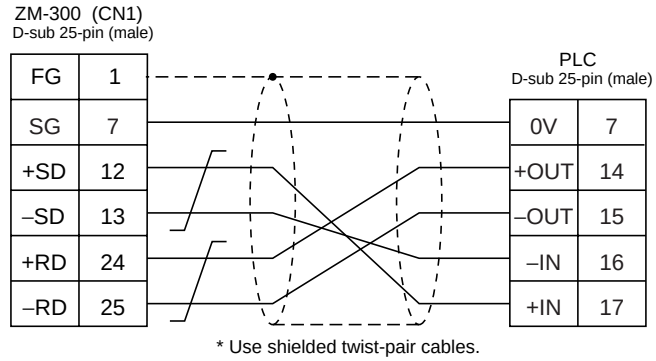
*1 High-density D-sub 15-pin

RS-422

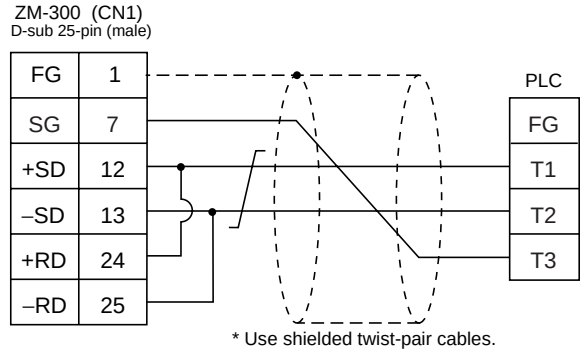
Wiring Diagram 3



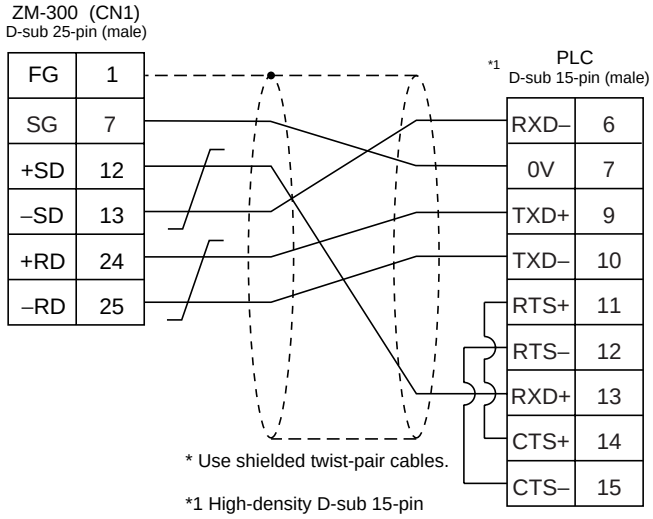
Wiring Diagram 4



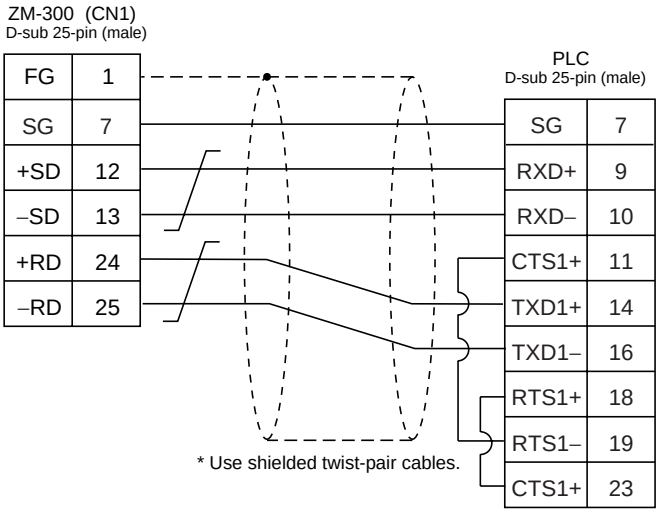
Wiring Diagram 5



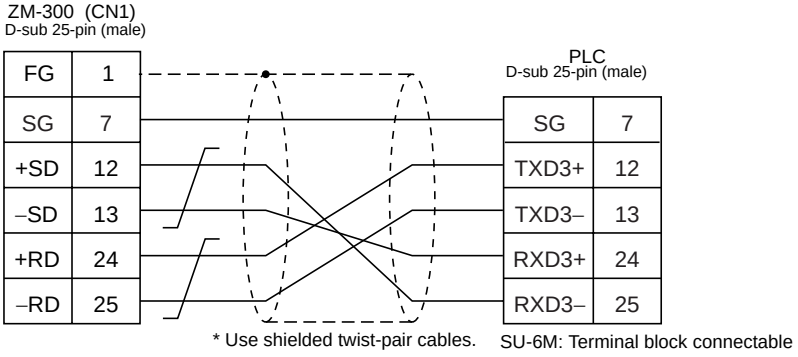
Wiring Diagram 6



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 ZM-300 series.

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

PLC-5 series

Item		Setting on PLC	ZM-300 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	ZM-300 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	ZM-300 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	Link communication speed (19.2 kbps)
4	ON	
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 ZM-300 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

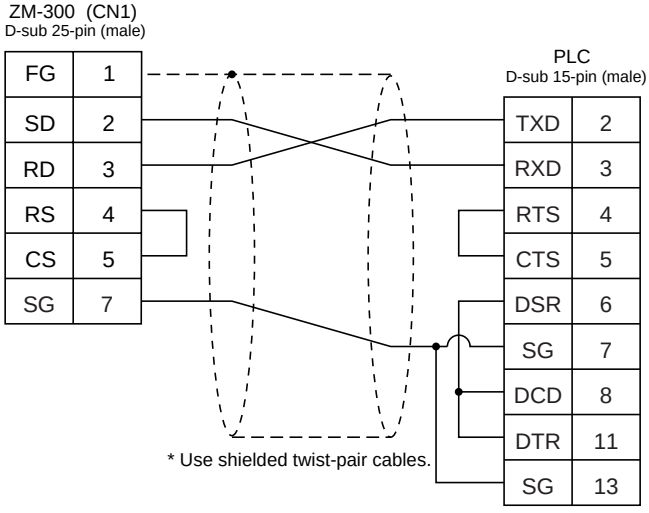
Duplicate Packet Detection	: Enabled
Checksum	: BCC
Constant Carrier Detect	: Disabled
Message Timeout	: 400
Hardware Handshaking	: Disabled
Embedded Response Detect	: Auto Detect
ACK Timeout (× 5 ms)	: 90
ENQuiry Retries	: 3
NAK Received Retries	: 3

Wiring

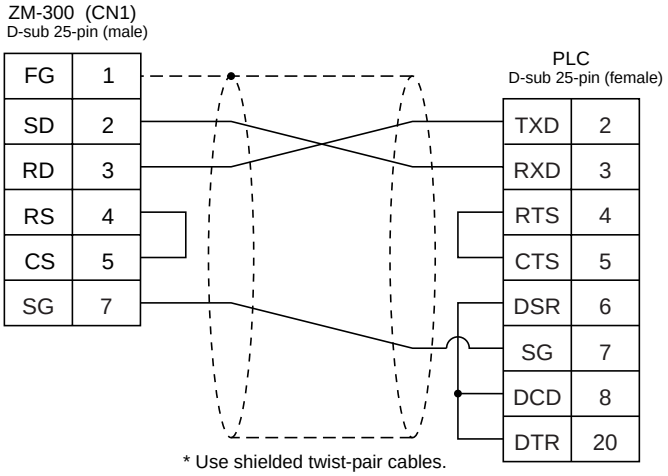
Wiring diagrams with the PLC are shown below.

RS-232C

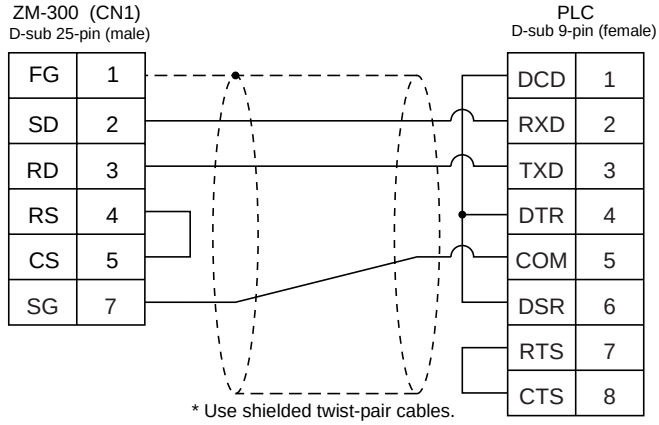
Wiring Diagram 1



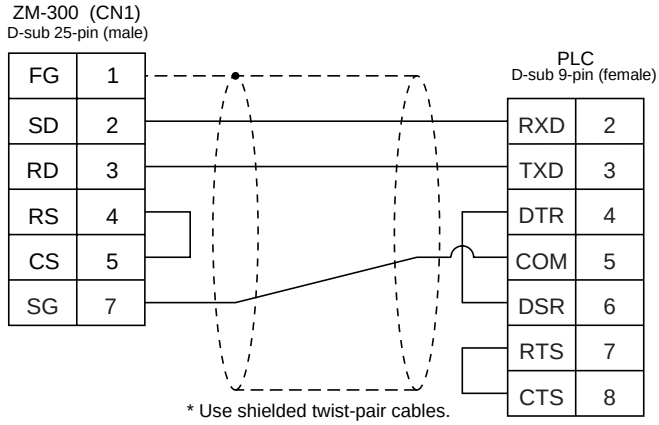
Wiring Diagram 2



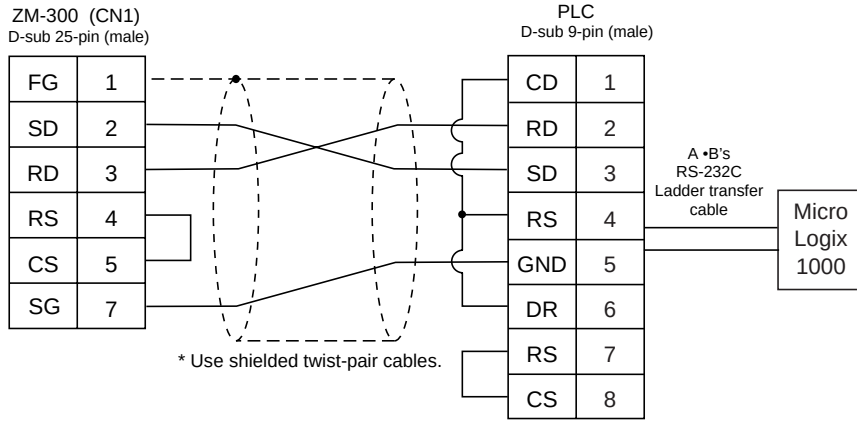
Wiring Diagram 3



Wiring Diagram 4

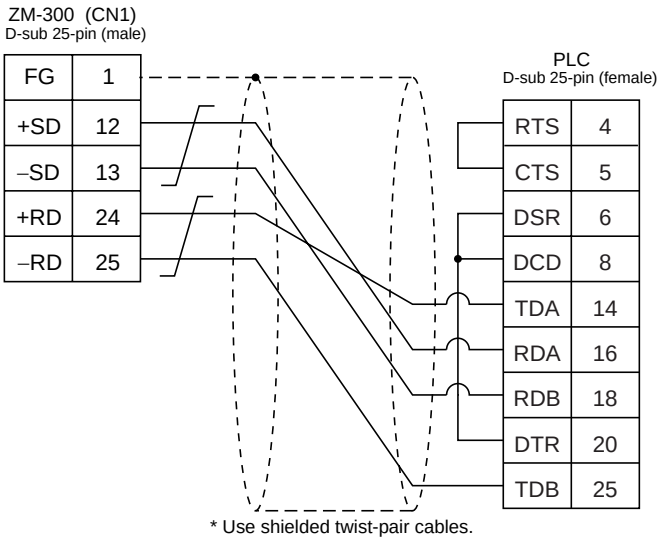


Wiring Diagram 5



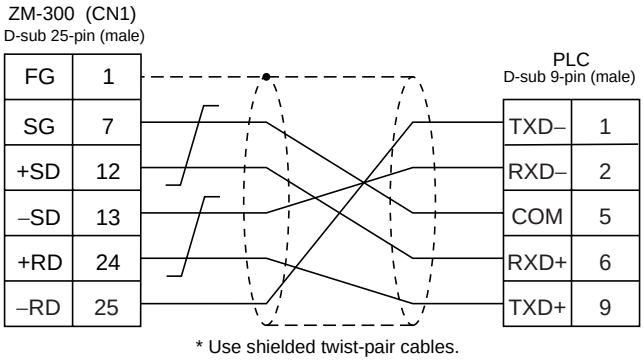
RS-422

Wiring Diagram 6



* Use shielded twist-pair cables.

Wiring Diagram 7



* Use shielded twist-pair cables.

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 ZM-300 series is as follows:

90 Series

Item		Setting on PLC	ZM-300 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	ZM-300 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

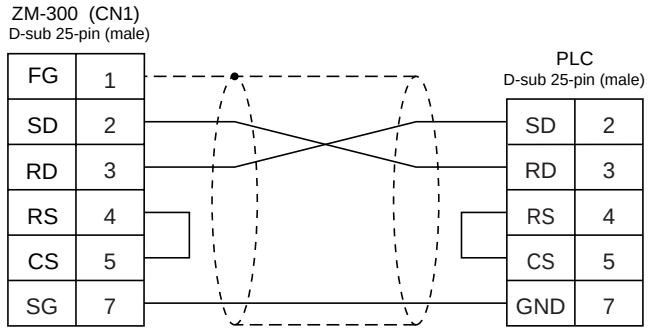
Memory		TYPE	Remarks
R	(data register)	0	
I	(input)	1	
Q	(output)	2	
M	(internal relay)	3	
G	(global relay)	4	
AI	(analog input)	5	
AQ	(analog output)	6	
T	(temporary memory relay)	7	
S	(system status)	8	Read only
SA	(system status)	9	
SB	(system status)	10	
SC	(system status)	11	

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

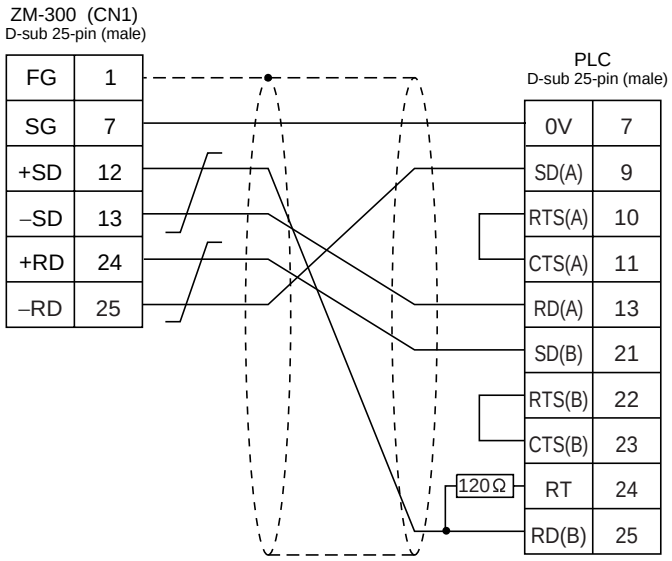
Wiring Diagram 1



* Use shielded twist-pair cables.

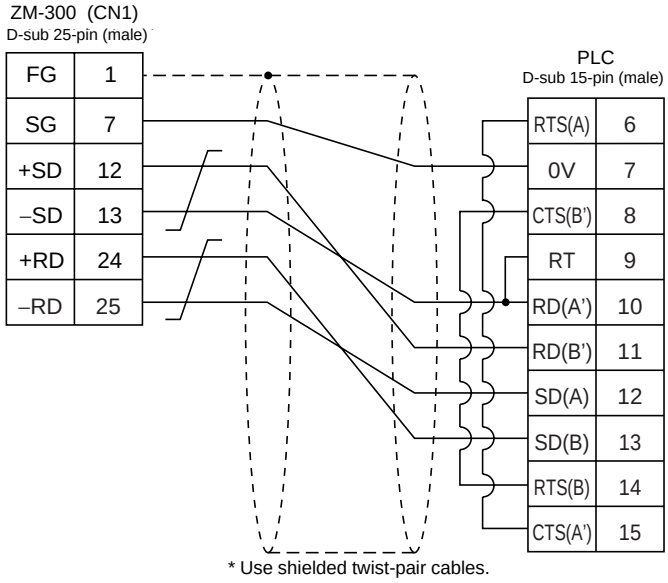
RS-485

Wiring Diagram 2



* Use shielded twist-pair cables.

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

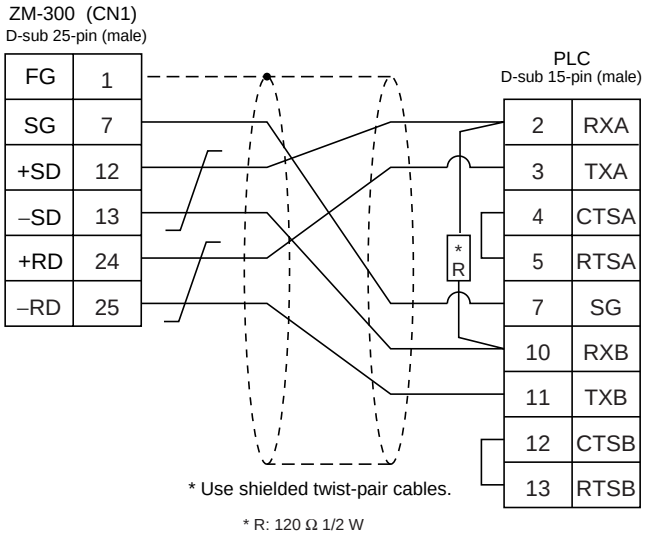
Memory		TYPE	Remarks
D	(data register)	0	
X	(input register)	1	XW as word device
Y	(output register)	2	YW as word device
R	(auxiliary relay)	5	RW as word device
L	(link relay)	6	LW as word device
W	(link register)	7	
F	(file register)	8	
TN	(timer/current value)	9	Read only
CN	(counter/current value)	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 ZM-300 series is as follows:

Item	Setting on PLC	ZM-300 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.

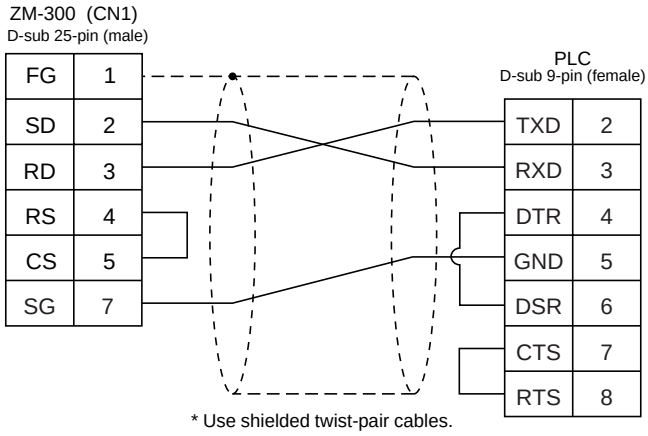
Memory		TYPE	Remarks
D	(register 1)	0	
B	(register 2)	1	
X	(input relay)	2	XW as word device
Y	(output relay)	5	YW as word device
R	(temporary storage)	6	RW as word device
G	(extension temporary storage 1)	7	GW as word device
H	(extension temporary storage 2)	8	HW as word device
L	(latch relay)	9	LW 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 ZM-41/70)	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* + RS-232C [Wiring Diagram 3]
S5 PG port	S5 series	Programming port on the CPU unit	
S7	S7-300	CP-341 (3964R/RK512)	RS-232C [Wiring Diagram 2] RS-422 [Wiring Diagram 6]
	S7-400	CP-441 (3964R/RK512)	
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 ZM-41/70)	TI545/555	CPU port (bulit-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 ZM-300 series.

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

S5, S5 ZM-41/70 (S5-90U, S5-95U, S5-100U)

Item		Setting on PLC	ZM-300 Comm. Parameter Setting
Baud rate		9600 bps	9600 bps
Parity		Even parity	Even
Transmission code	Data length	8	8
	Stop bit	1	1
Busy signal		NO (fixed)	–
Hand shake		OFF (fixed)	–

S5, S5 ZM-41/70 (S5-115U, S5-135U, S5-155U, S7-300, S7-400)

Item		Setting on PLC	ZM-300 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	ZM-300 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	ZM-300 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 ZM-71SE editor.

Item	MPI SETTING
Node Cnt	15/31/63/126
Source No. (ZM-300 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 ZM-41/70

Item		Setting on PLC	ZM-300 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 ZM-41/70, 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.

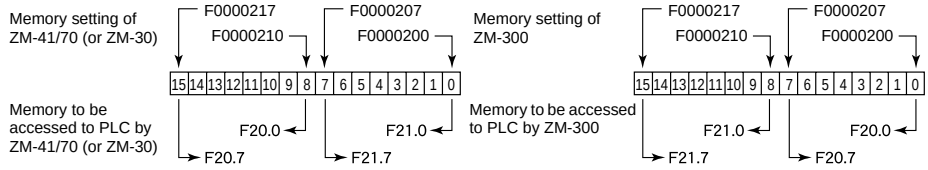
Example: DB003 000

Address

Block number

*** Notes on ZM-41/70 (or ZM-30) data conversion**

- **When converting data of ZM-41/70 (or ZM-30) into the ZM-300 data, [S5 ZM-41/70] is automatically selected for the PLC type.**
- **With ZM-41/70 (or ZM-30), the order of bit strings of I (input relay), Q (output relay) and F (internal relay) is byte-reversed. Please take note of this.**

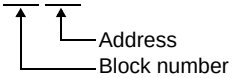


S5 PG port

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

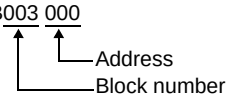
Memory		TYPE	Remarks
V	(data memory)	0	VW as word device
I	(input)	1	IW as word device Possible to write to the unused area
Q	(output)	2	QW as word device
M	(bit memory)	3	MW as word device
T	(timer/current value)	4	
C	(counter/current value)	5	
TB	(timer/contact)	6	Read only
CB	(counter/contact)	7	Read 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

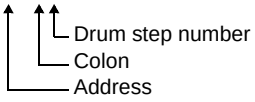


TI500/505 (TI500/505 ZM-41/70)

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.

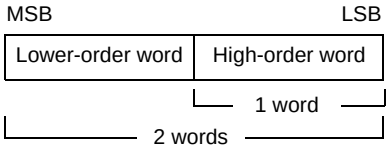
Example: DCP3000 : 1



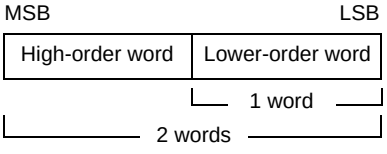
*** Notes on ZM-41/70 (or ZM-30) data conversion**

- **When converting data of ZM-41/70 (or ZM-30) into the ZM-300 data, [TI500/505 ZM-41/70] is automatically selected for the PLC type.**
- **With ZM-41/70 (or ZM-30), the order of words is reversed in the case of double-words. Please take note of this.**

For ZM-41/70 (or ZM-30):



For ZM-300:

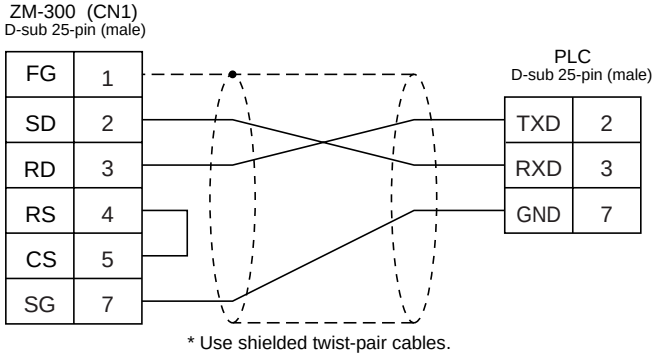


Wiring

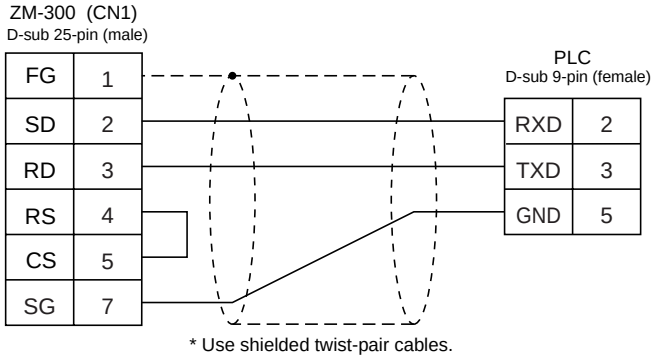
Wiring diagrams with the PLC are shown below.

RS-232C

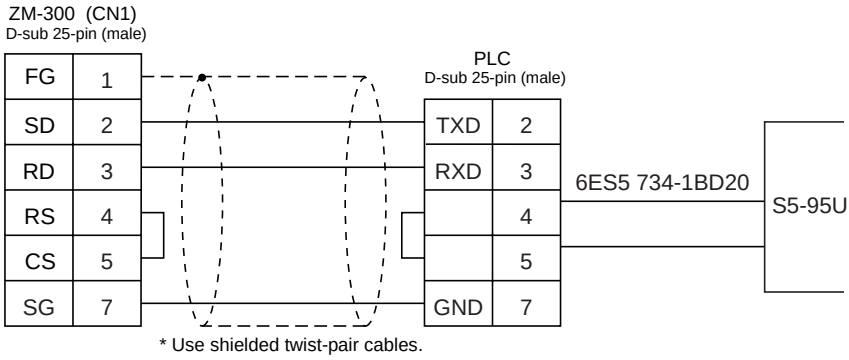
Wiring Diagram 1



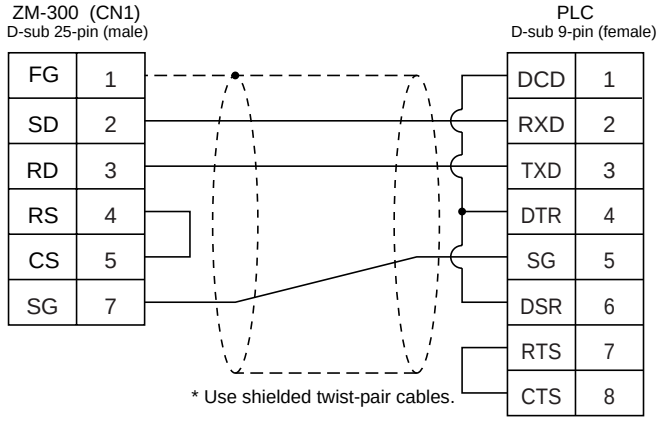
Wiring Diagram 2



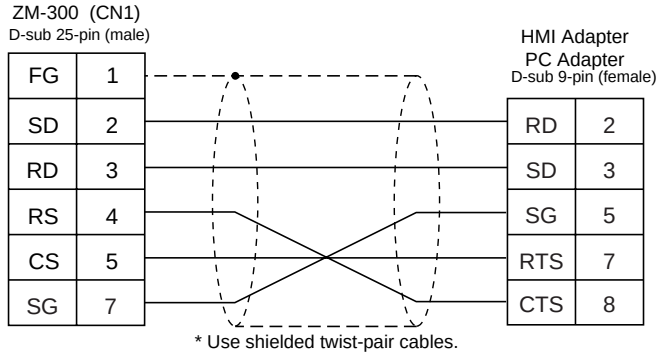
Wiring Diagram 3



Wiring Diagram 4

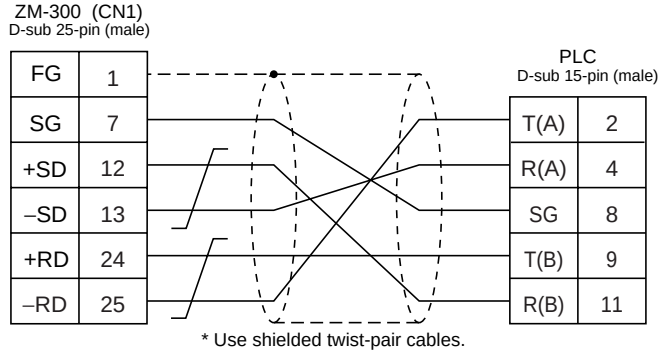


Wiring Diagram 5

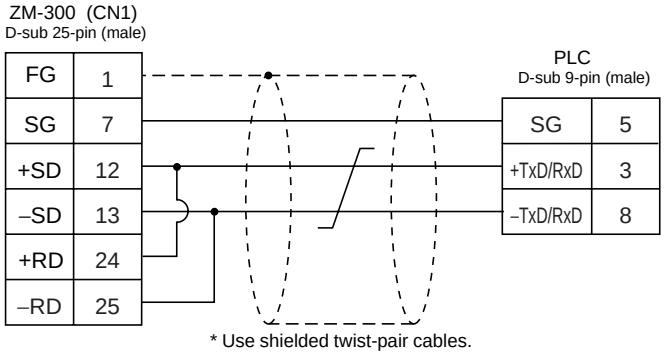


RS-422

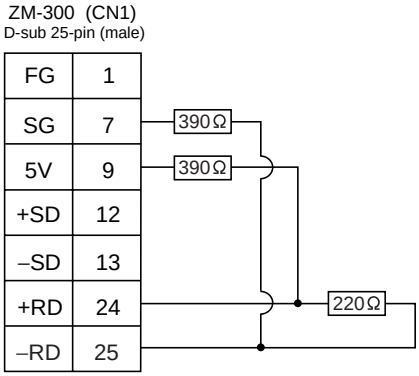
Wiring Diagram 6



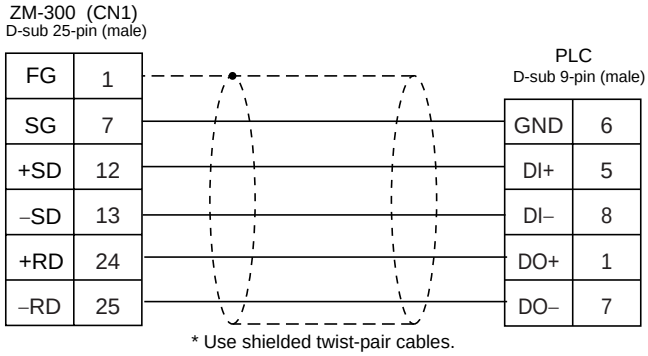
Wiring Diagram 7



- Terminating Resistance Setting
  Set the DIP switch 7 and 8 of the ZM-300 series to the OFF position. Connect terminating resistance to the serial connector (CN1) of the ZM-300 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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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	

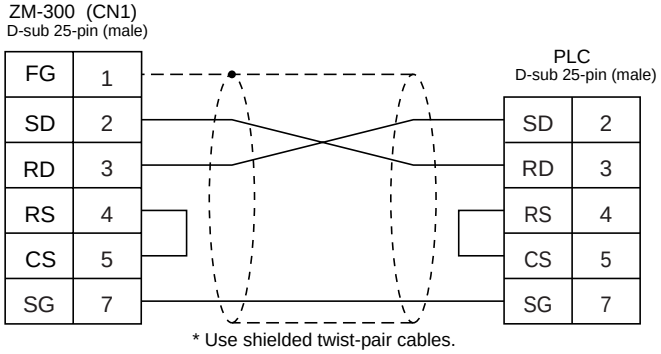
Only D register of SELMART is available. No other devices can be used.
Be sure to note the above though the setting on the ZM-71SE editor is possible.

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 ZM-300 series is as follows:

Item	Setting on PLC	ZM-300 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.

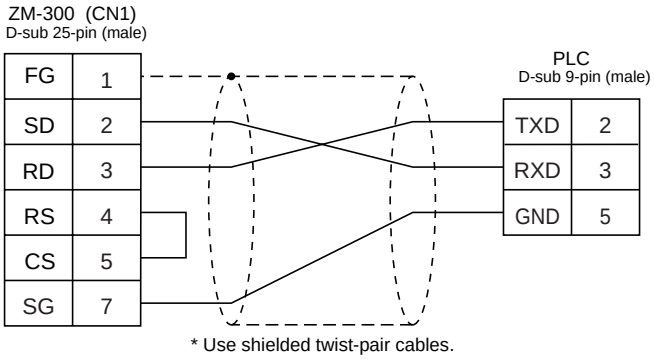
Memory		TYPE	Remarks
R	(input/output)	0	
L	(link relay)	1	
M	(internal relay)	2	
K	(keep relay)	3	
F	(special relay)	4	
W	(data register)	5	

Wiring

Wiring diagrams with the PLC are shown below.

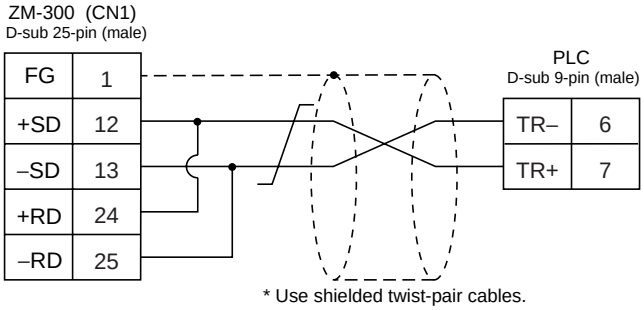
RS-232C

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" + Exclusive cable (order product)
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" + Exclusive cable (order product)
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 ZM-71SE editor.

*2 To connect KZ-10, 24 via RS-232C, select [KV10, 24CPU] for the PLC type on the ZM-71SE editor.

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

KZ Series Link

Item		Setting on PLC	ZM-300 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	ZM-300 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	ZM-300 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 ZM-300 series are automatically set.

KZ24/300 CPU

Item		Setting on PLC	ZM-300 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	ZM-300 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

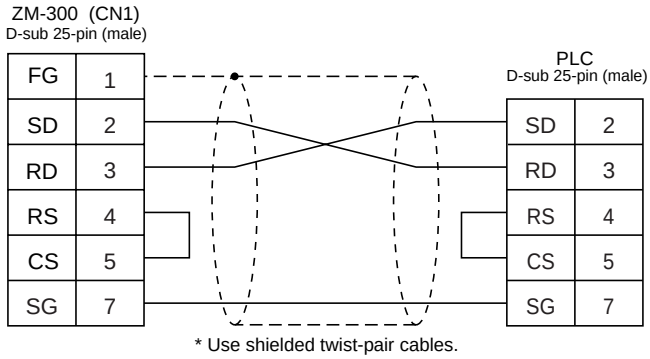
Memory		TYPE	Remarks
DM	(data memory)	0	
CH	(input/output relay)	1	
TC	(timer/current value)	2	
CC	(counter/current value)	3	
TS	(timer/set value)	4	
CS	(counter/set value)	5	
T	(timer/contact)	6	
C	(counter/contact)	7	
TM	(temporary data memory)	8	
CTH	(high-speed counter/current value)	9	KV700 only
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

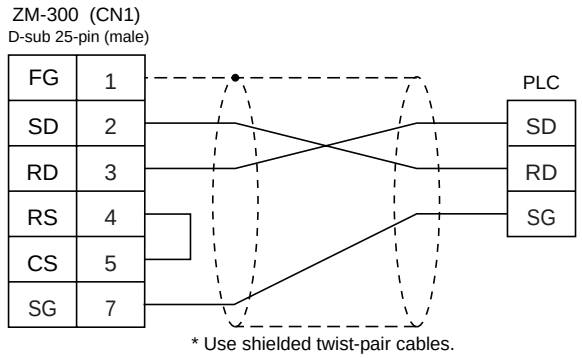
Wiring diagrams with the PLC are shown below.

RS-232C

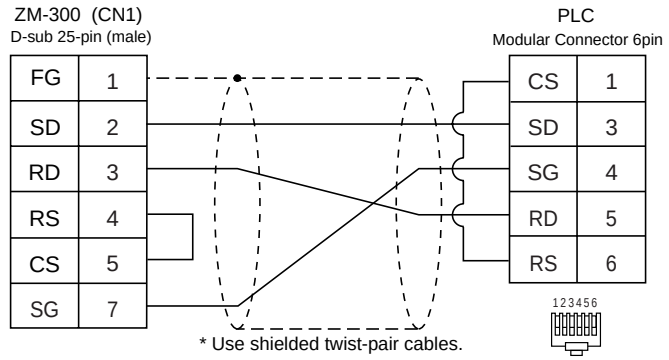
Wiring Diagram 1



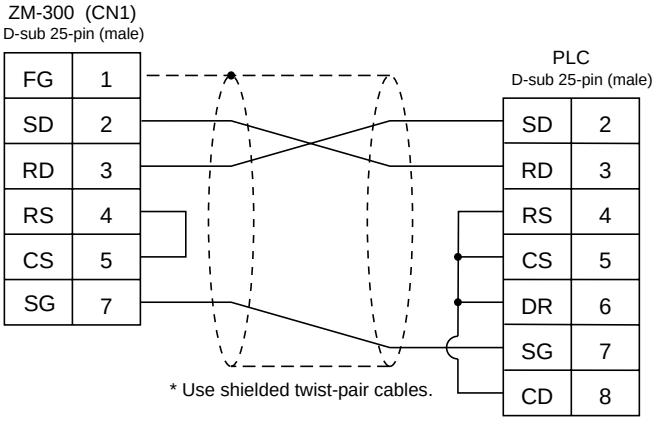
Wiring Diagram 2



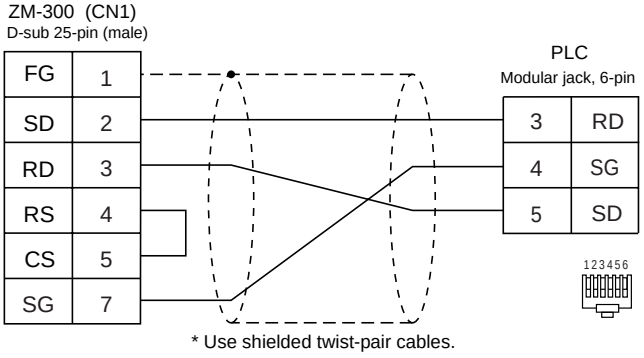
Wiring Diagram 3



Wiring Diagram 4

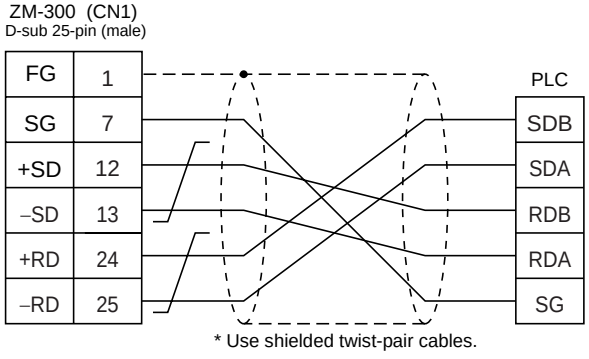


Wiring Diagram 5



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] RS-422 [Wiring Diagram 6]
GLOFA CNET	G4L-CUEA	

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

MASTER-K10/60/200

Item		Setting on PLC	ZM-300 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	ZM-300 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	ZM-300 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	ZM-300 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

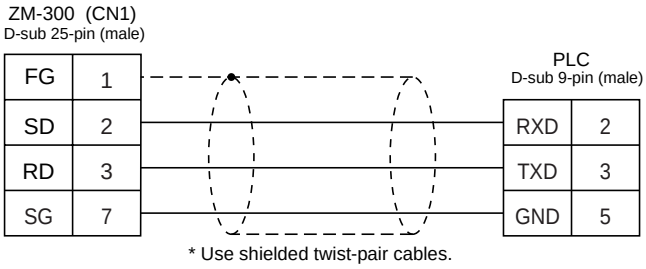
Memory		TYPE	Remarks
M	(internal memory)	0	MW as word device
Q	(output)	1	QW as word device
I	(input)	2	IW as word device

Wiring

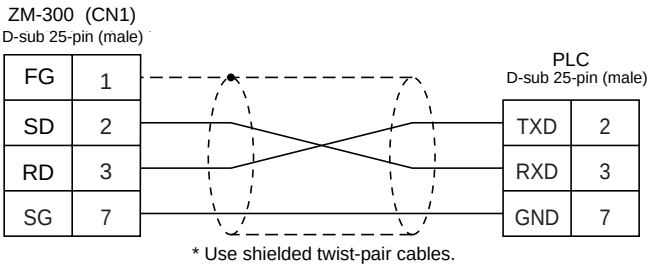
Wiring diagrams with the PLC are shown below.

RS-232C

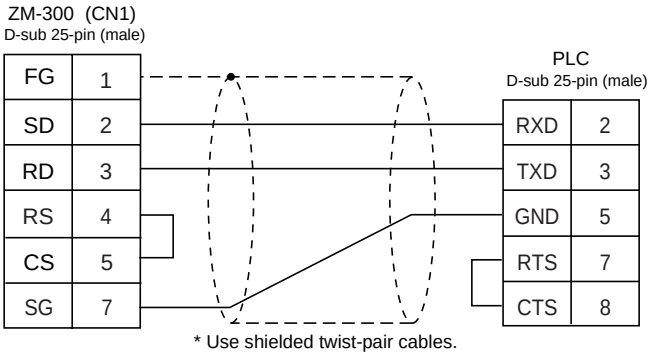
Wiring Diagram 1



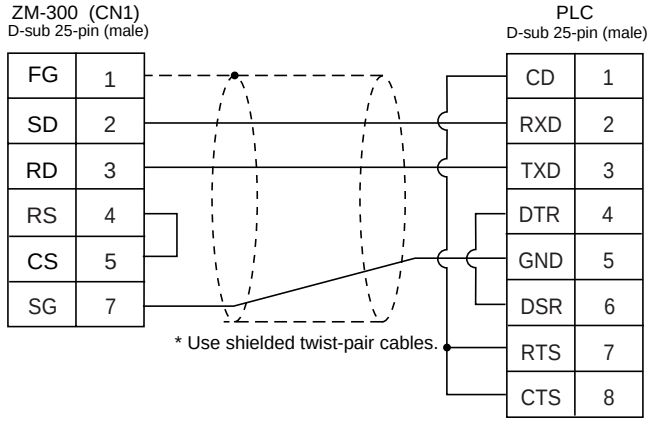
Wiring Diagram 2



Wiring Diagram 3

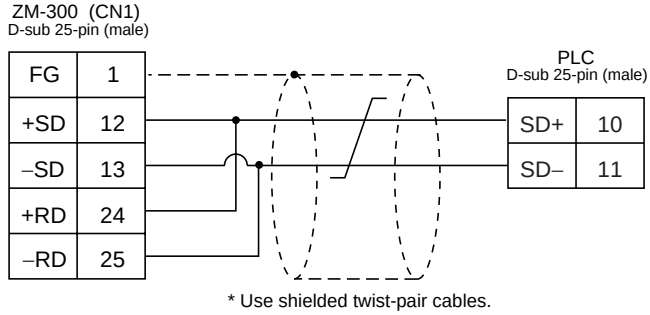


Wiring Diagram 4

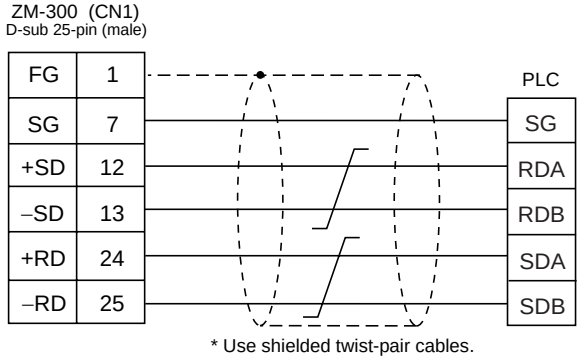


RS-422

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

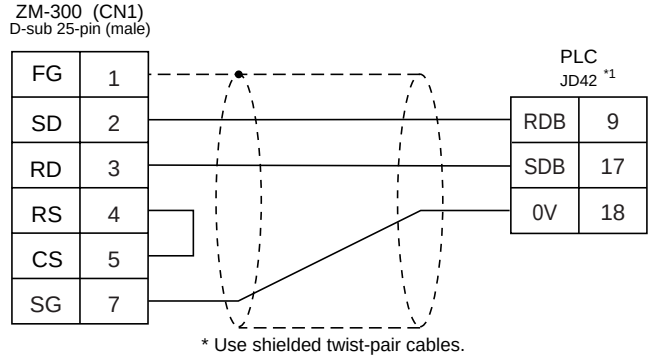
Memory		TYPE	Remarks
D	(data table)	0	
X	(input relay)	1	WX as word device
Y	(output relay)	2	WY as word device
R	(internal relay)	3	WR as word device
K	(keep relay)	4	WK as word device
T	(timer)	5	
C	(counter)	6	

Wiring

Wiring diagrams with the PLC are shown below.

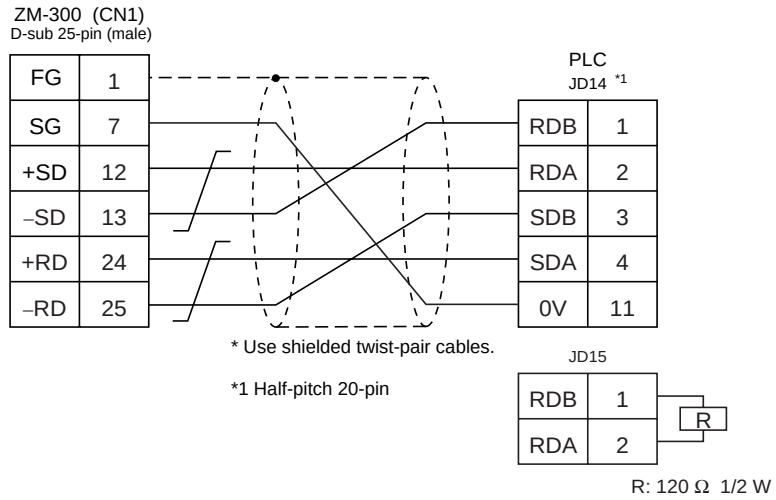
RS-232C

Wiring Diagram 1

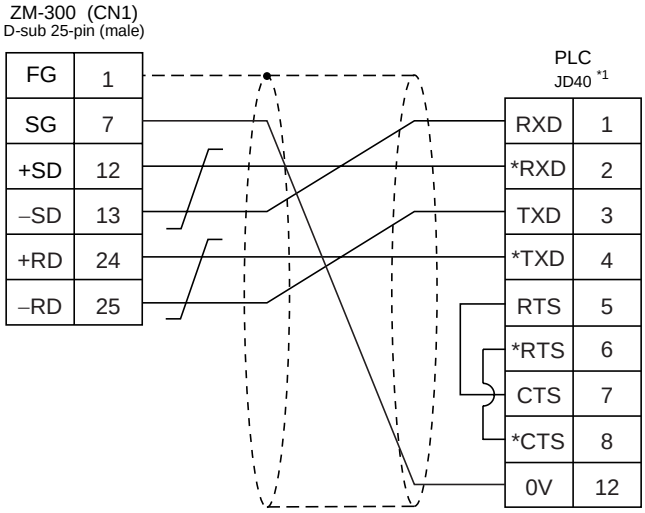


RS-422

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

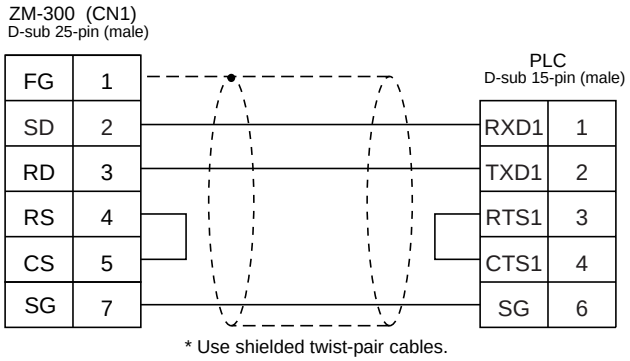
Memory		TYPE	Remarks
HR	(data register)	0	
DR	(data register)	1	
X	(input relay)	2	
Y	(output relay)	3	
M	(internal relay)	4	
S	(step relay)	5	
T	(timer contact)	6	Read only
C	(counter contact)	7	Read only
RT	(timer/current value)	8	
RC	(counter/current value)	9	
DRC	(32-bit counter/current value)	10	

Wiring

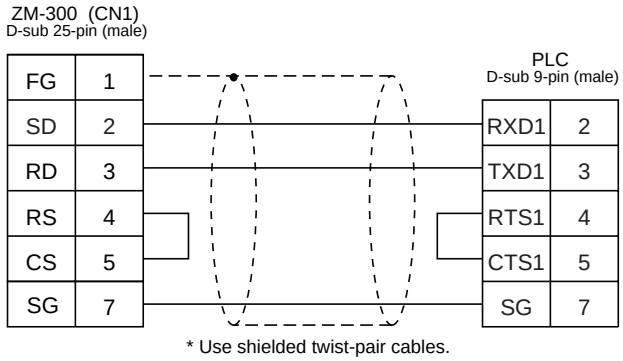
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

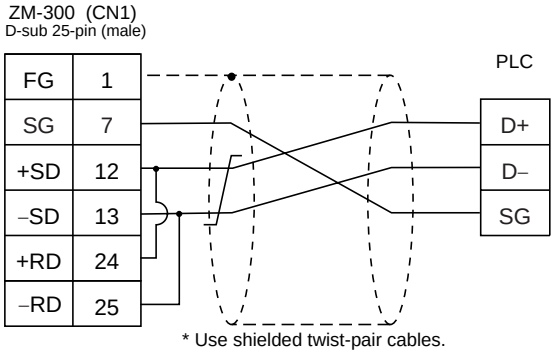


Wiring Diagram 2



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 ZM-300 series.

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

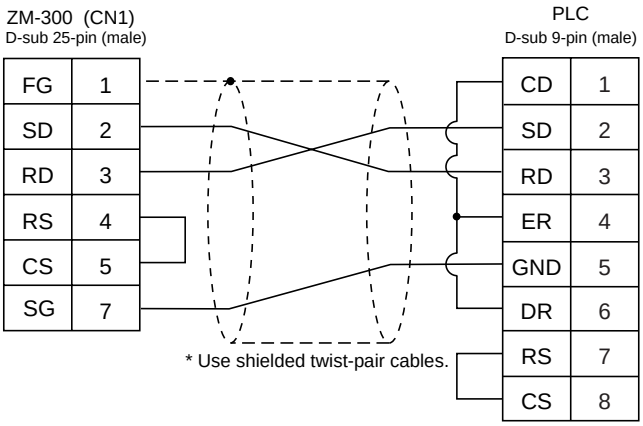
Memory		TYPE	Remarks
D	(data register)	0	
I	(input)	1	
Q	(output)	2	
M	(internal relay)	3	
R	(shift register)	4	
TS	(timer/set value)	5	
TN	(timer/enumerated value)	6	
T	(timer/contact)	7	Read only
CS	(counter/set value)	8	
CN	(counter/enumerated value)	9	
C	(counter/contact)	10	Read only

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

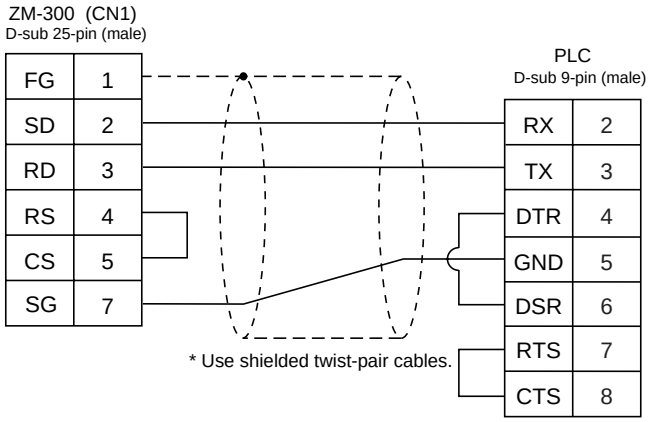
Memory		TYPE	Remarks
4	(holding register)	0	
3	(input register)	1	
0	(output coil)	4	
1	(input relay)	6	Read only

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

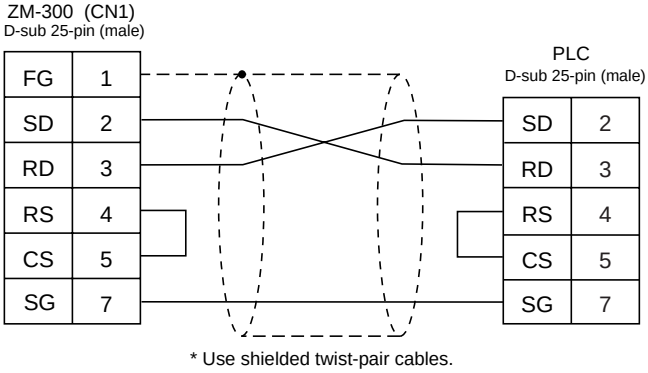
Memory		TYPE	Remarks
R	(data register)	0	
M	(auxiliary relay)	1	
L	(latch relay)	2	
X	(input relay)	3	
Y	(output relay)	4	
TP	(timer/current value)	5	
TS	(timer/setting value)	6	
CP	(counter/current value)	7	
CS	(counter/set value)	8	
T	(timer/contact)	9	
C	(counter/contact)	10	
P	(link register)	11	

Wiring

Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1



* Use shielded twist-pair cables.

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

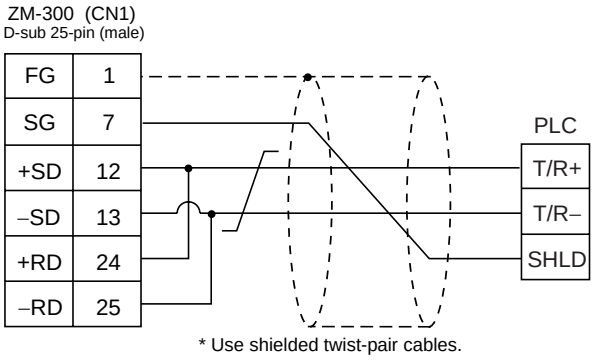
Memory		TYPE	Remarks
D	(data register timer•counter/contact)	0	
V	(timer•counter/contact)	1	
WS	(system register)	2	
WC	(constant register)	3	
X	(input relay)	4	
Y	(output relay)	5	
C	(internal relay)	6	
SC	(special register)	7	

Wiring

Wiring diagrams with the PLC are shown below.

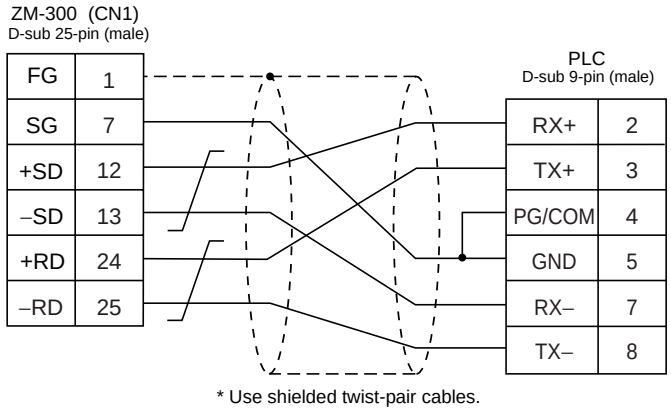
RS-422

Wiring Diagram 1



* Use shielded twist-pair cables.

Wiring Diagram 2



* Use shielded twist-pair cables.

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

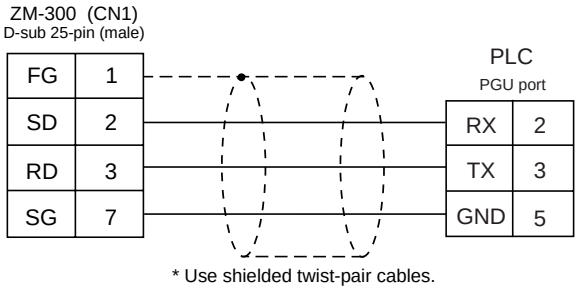
Memory		TYPE	Remarks
R	(register word)	0	
Rfp	(float)	1	
T	(timer-counter word)	2	
C	(timer-counter coil)	3	
I	(input bit)	4	read only
O	(output bit)	5	
F	(flag bit)	6	

Wiring

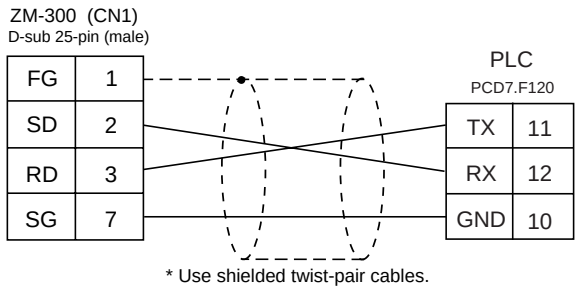
Wiring diagrams with the PLC are shown below.

RS-232C

Wiring Diagram 1

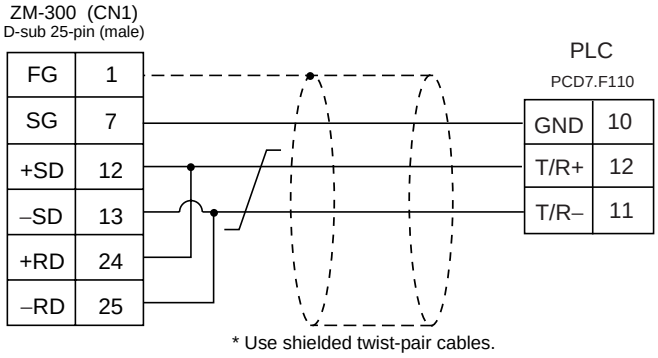


Wiring Diagram 2



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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

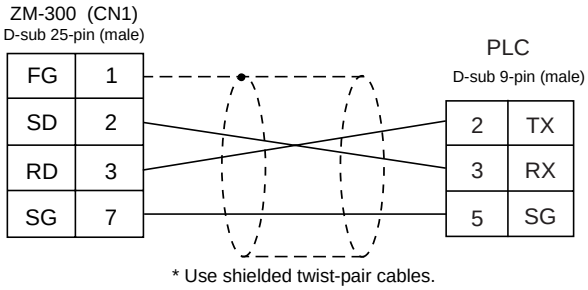
Memory	TYPE	Remarks
M (marker)	0	MW as word device

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 ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

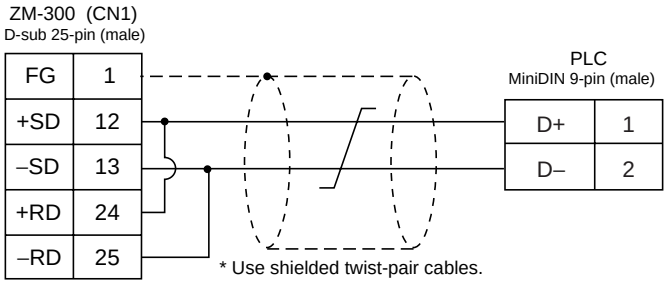
Memory		TYPE	Remarks
MW	(memory word)	0	
KW	(constant word)	1	
M	(bit memory)	2	

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	
	D2-250	Port 2 on a CPU unit	RS-232C [Wiring Diagram 3]
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	
		Port 2 on a CPU unit	RS-232C [Wiring Diagram 3]

Communication Setting

The recommended communication parameter settings of the PLC and the ZM-300 series is as follows:

Item		Setting on PLC	ZM-300 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.

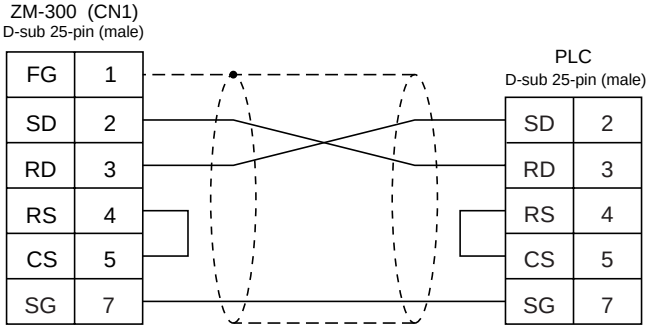
Memory		TYPE	Remarks
V	(data register)	0	
X	(input relay)	1	
Y	(output relay)	2	
C	(internal relay)	3	
S	(stage)	4	
GX	(global inputs)	5	
GY	(global outputs)	6	
T	(timer/contact)	7	
CT	(counter/contact)	8	

Wiring

Wiring diagrams with the PLC are shown below.

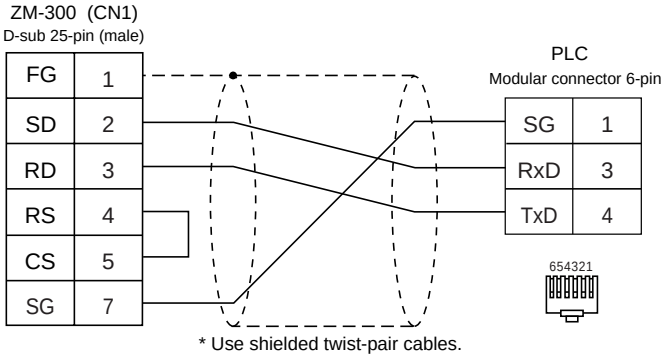
RS-232C

Wiring Diagram 1

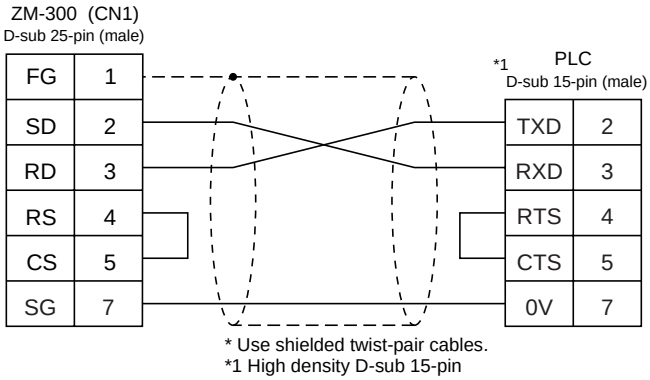


* Use shielded twist-pair cables.

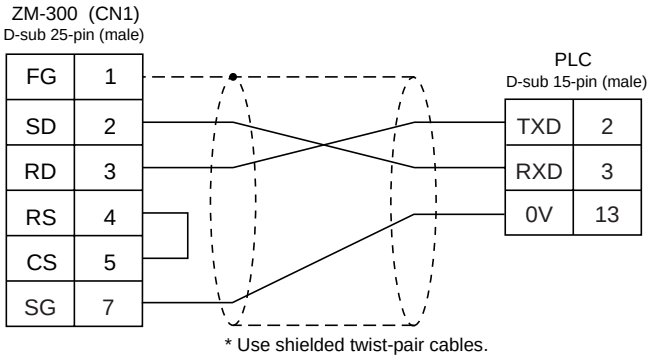
Wiring Diagram 2



Wiring Diagram 3

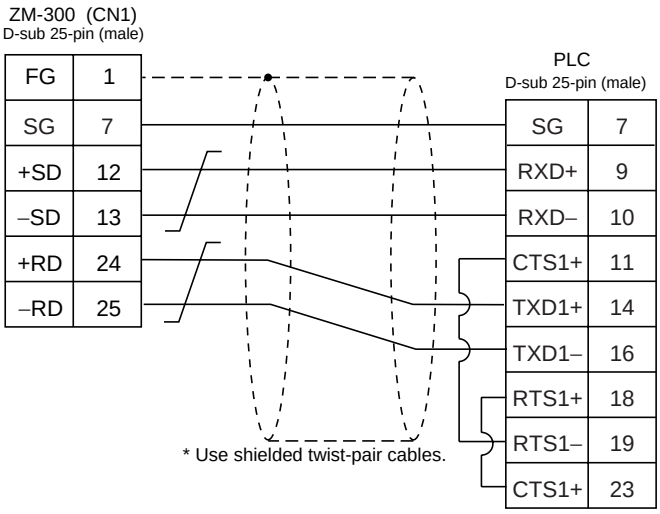


Wiring Diagram 4

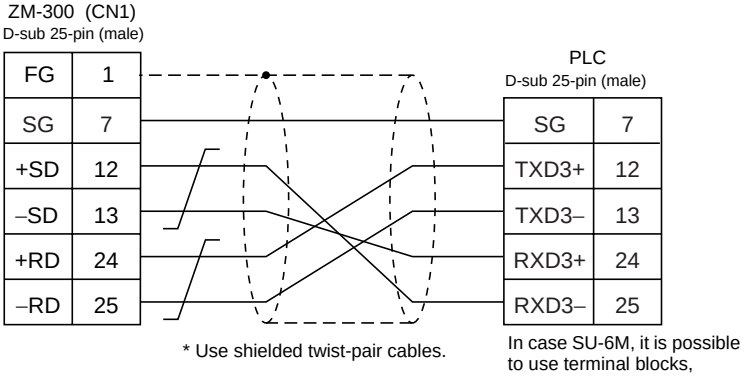


RS-422

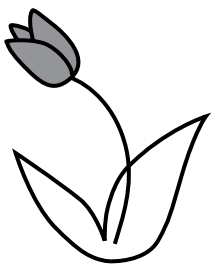
Wiring Diagram 5



Wiring Diagram 6



MEMO



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SHARP MANUFACTURING SYSTEMS CORPORATION

♦Information about Sharp image sensor camera and programmable controller is available at our internet homepage
http://sharp-world.com/sms/

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