SHARP®

Version 1.0

LCD Control Terminal

ZM-62E

User's Manual

Thank you for purchasing the LCD Control Terminal ZM-62E. 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.

- ZM-71SE
  - Instruction Manual (Function)
  - Instruction Manual (Operation)

Precautions 1

- 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.

Precautions 2

- In this manual, ZM-62E, ZM-52HD, and ZM-42/43/52/72/82 series are referred to as follow.

This manual's expression	Models
ZM-**	ZM-62E ZM-52HD ZM-42/43/52/72/82 series

- If you use a ZM-62E by converting data in ZM-61E, ZM-30E or other, be sure to read "2 ZM-61E --> ZM-62E Conversion" in Chapter 3 to understand what the data converting is all about.

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-62E. Otherwise breakdown or accident damage of the machine may be caused by the trouble of the ZM-62E.

4) Maintenance

Prohibit

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

Contents

1. Hardware Specifications

2. System Menu

3. Editing &Converting Screen

Hardware Specifications

1 Outline

LCD Control Terminal ZM-62E is a programmable display unit using a high-luminance EL panel display and touch panel method. With this unit, you can communicate with a programmable logic controller (hereinafter PLC) without a program, display specified data in many ways, and input data in touch panel method. It is the up-graded model of ZM-61E and has a 8.9-inch EL panel.

1. High-luminance EL panel
   Equipped with a eye-friendly 8.9-inch high-luminance EL panel (TYP: 200cd/m^2)
2. Improved resolution of the touch switch
   The panel has resolution of 40 by 20 switches, which enables more flexible switch layout.
3. Simulator function
   It can be used as a simulator without a PLC to debug edited screens.
4. Macro function
   Multiple bit manipulation with one switch and macro function for data transmission reduce the burden of making a program for PLCs.

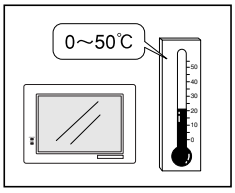
Screen edit software ZM-71SE is compatible with ZM-62E in V1.3.0.0 version.

Note: If you use a ZM-62E by converting data in ZM-61E, ZM-30E or other, be sure to read "2 ZM-61E --> ZM-62E Conversion" in Chapter 3 to understand what the data converting is all about.

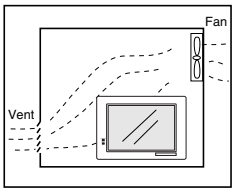
2 Notes on Usage

Environmental Limits

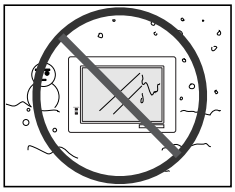
1. Use ZM-62E at an ambient temperature of 0~50°C, and a relative humidity of 85 %RH.



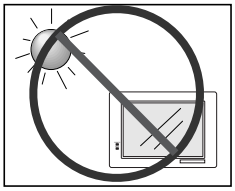
2. Install a forced fan or an air conditioner to maintain the ambient temperature when it is higher than the above mentioned range.



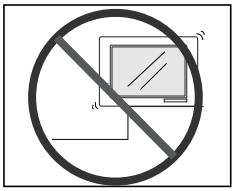
3. Avoid places where moisture may easily condense due to sudden temperature changes.



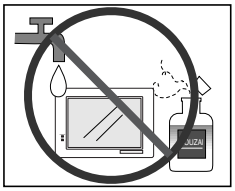
4. Avoid direct sunlight.



5. Never install ZM-62E in a place where impacts or vibrations may be transmitted.

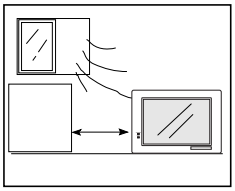


6. Avoid any place in which there is the possibility that water, corrosive gas, flammable gas, solvents, grinding fluids or cutting oil can come in contact with the unit. Never install the unit in a place where dust, salt and metallic particles are present.



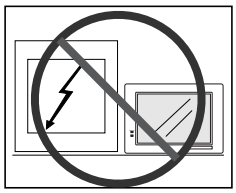
Locations

1. Secure sufficient space around ZM-62E for ventilation.



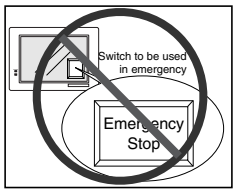
2. Never attach ZM-62E to the top of any apparatus generating high levels of heat (heater, transformer, large-capacity resistor, etc.).

3. Never install ZM-62E in the same compartment as high-voltage equipment. The unit should be at least 200 mm away from high-voltage lines or power cables.



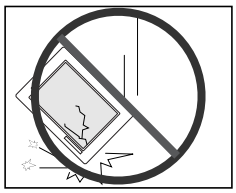
Usage

1. An emergency stop circuit must be composed of an external relay circuit with a start signal for ZM-62E built in. Do not create switches on ZM-62E to be used in case of emergency.



2. In case of using a waterproof sheet (GD-WP80E), mount it in the unit by using 6 pieces of mounting screws (normally 4 pieces of them).

3. ZM-62E has a glass screen. Never drop or subject the unit to strong impacts.



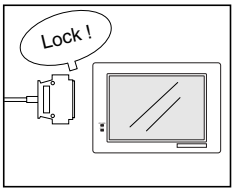
4. Tighten mounting screws with the following torques.

Position of Screw	Screw Size	Torque (N · m)
Mounting Screw	M3	0.3-0.5 (3-5kgf · cm)

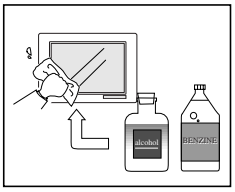
Note :Never fasten these screws too tightly, otherwise the cover of ZM-62E may be deformed.

5. In a dry environment, ZM-62E may generate a large amount of static electricity.
Therefore, before touching the unit, touch a grounded metallic section to discharge the static electricity.

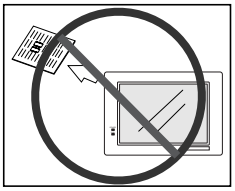
6. Securely fasten and lock every connector for each cable. Double-check this before turning the power on.



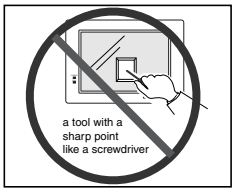
7. Application of thinner may discolor ZM-62E.
Use alcohol or benzine available commercially for cleaning.



8. Never remove any printed circuit board from ZM-62E. (This will harm the unit.)



9. Never operate the display by using a tool with a sharp point like a screwdriver.
Touch the display by fingers.



Notes on Design

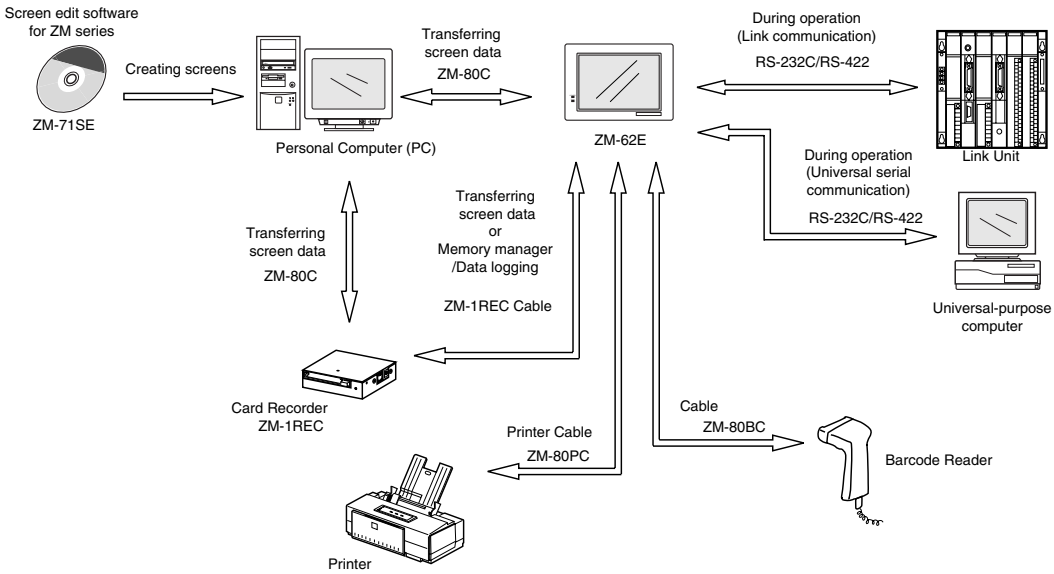
1. Use all the display area evenly and avoid using fixed patterns which may cause afterimages so that the life span of the display can be expanded.

3 System Composition

Under below is a system configuration and its peripheral devices.

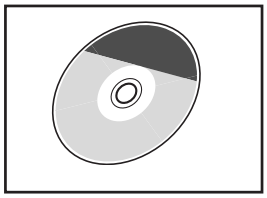
System Composition

The following illustration shows possible system configurations using ZM-62E.



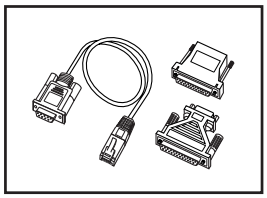
Peripheral Equipment

The following options are available for using ZM-62E more effectively.



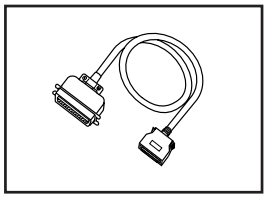
ZM-71SE (Screen edit software for Windows98/NT4.0/Me/ 2000/XP: English version)

Application software for editing display data for ZM series.



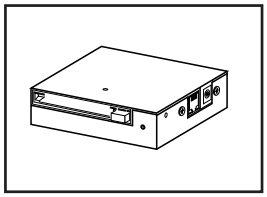
ZM-80C (Data Transfer Cable) 3m

Connects ZM-62E to a personal computer, or a personal computer to ZM-1REC.



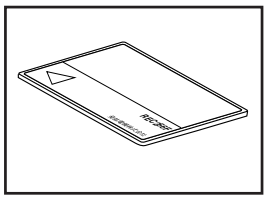
ZM-80PC (Printer Cable) 2.5m

Connects ZM-62E to a printer.



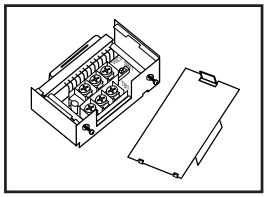
ZM-1REC (Card Recorder)

Reads display data created by personal computer, or works as an external memory storage system for the memory manager and data logging functions.



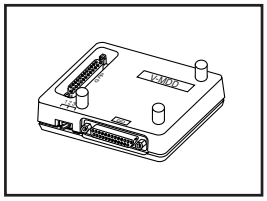
Memory Card on the market compliant

Used as a recording medium for display data back-up and for the memory manager or data logging function.



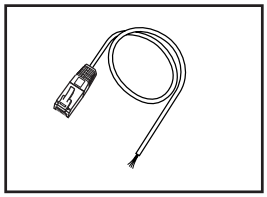
ZM-1TC (Terminal Converter)

Used for connection between a ZM-62E and a PLC at the RS-422/485 terminal block.



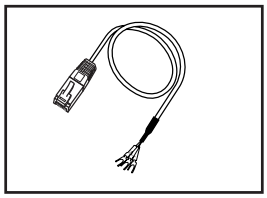
ZM-1MD2 (ACPU/QnACPU/FXCPU Dual Port Interface)

Add-on connector with two ports, specifically designed for the connector on the MITSUBISHI's ACPU/QnACPU/FXCPU programmer. This can improve operability of the ACPU/QnACPU/FXCPU programmer that is directly connected.



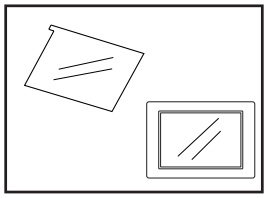
ZM-80BC (Cable for Barcode Reader) 3m

Connects ZM-62E to a barcode reader.



ZM-80MC (Cable for Multi-Link 2 master station) 3m

A cable which is used for connecting the ZM-** master station and the ZM-** slave station in the Multi-Link 2 connection.



0JUGSSHETZ61E (Protection Sheet)

Protects the operation panel surface. Five sheets are included in one package.

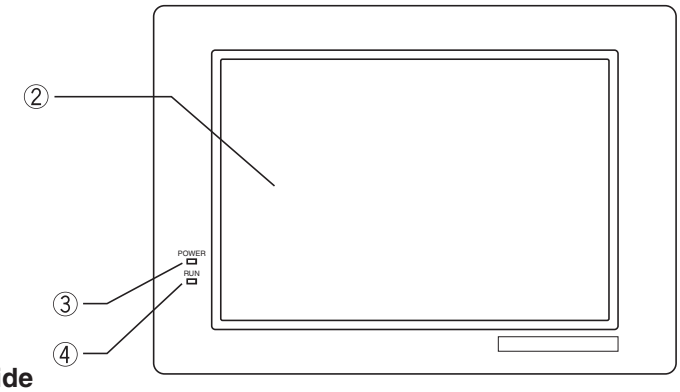
0JUWPSHETZ61E (Waterproof Sheet)

Protects the operation panel surface from water.

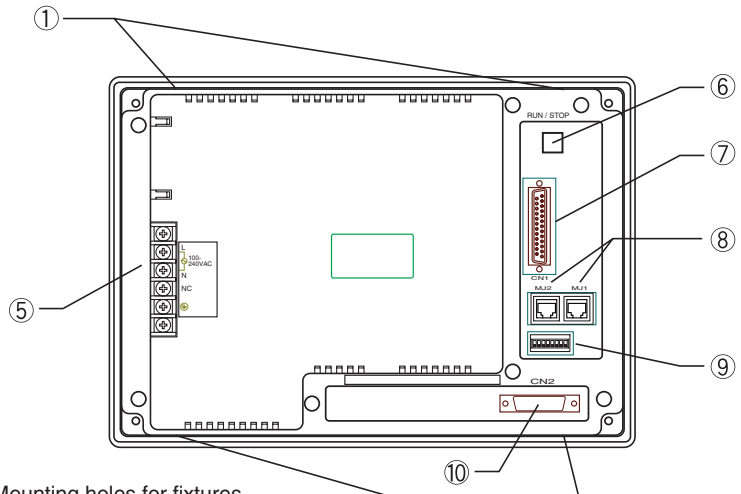
4 Names of Components

The names of ZM-62E's parts and their functions are shown below.

Front Side



Rear Side



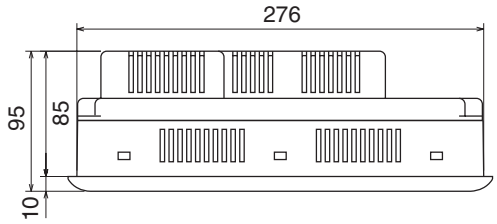
1. Mounting holes for fixtures
2. Display
3. Power lamp: The red LED lights up when power is on.
4. RUN lamp: The green LED lights up when the unit is working.
5. AC input terminal of power supply
6. RUN/STOP switch: To change the operation modes
7. Serial Connector CN1: for PLC (RS-232C, RS-422)
8. Modular Jack MJ1, 2 (Refer to page 1-28)
9. Dip switches
10. Printer connector CN2: for printer

5 Dimensions and Panel Cut-out

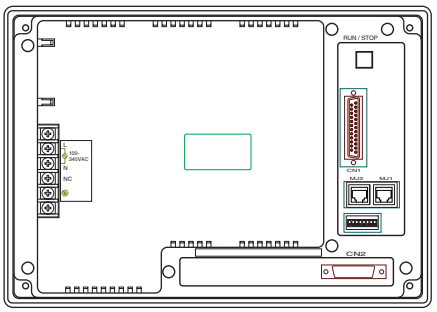
Dimensions of ZM-62E

Unit : mm

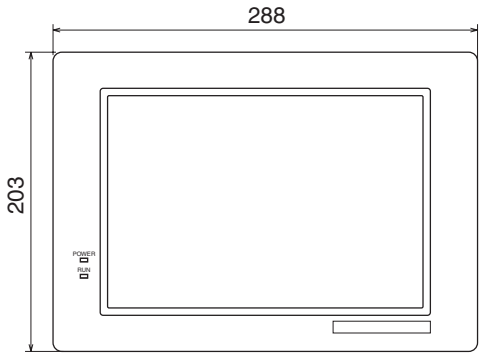
● Bottom View



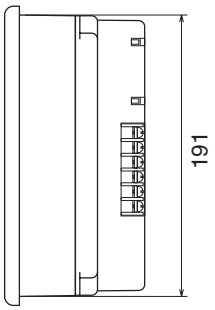
● Rear View



● Front View

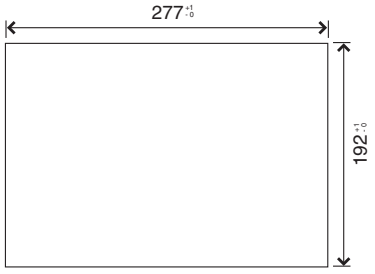


● Side View



Panel Cut-out of ZM-62E

Unit : mm

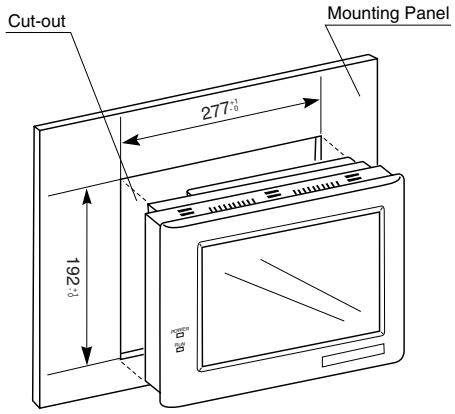


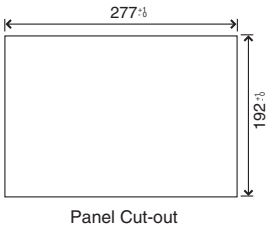
Panel Cut-out

6 Mounting Procedure

Follow the procedure shown below when you fix a ZM-62E to a mounting board.

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



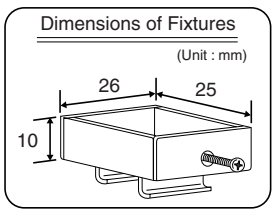


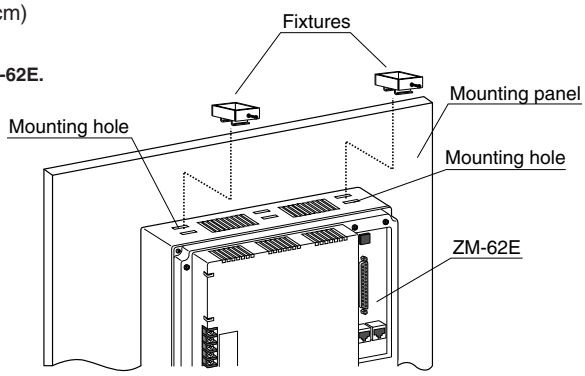
Panel Cut-out

2. Insert 4 pieces of the fixtures attached to ZM-62E into the mounting holes on ZM-62E. Tighten them with the locking screws.

Screws	: 4 pcs
Screw Size	: M3
Torque	: 0.3~0.5 N·m (3~5 kgf·cm)

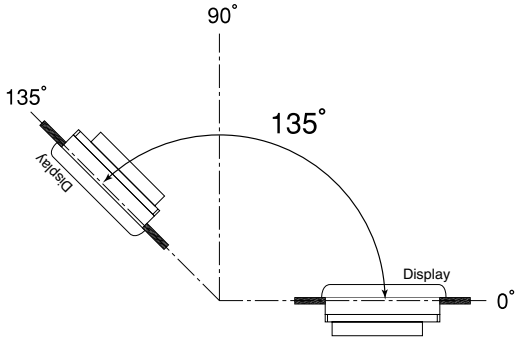
*** Never use 6 pieces of the fixtures to mount ZM-62E.**





Mounting Angle

The unit (ZM-62E) shall be installed within the angle of 0 to 135 degrees as shown below.



7 Specifications

General Specifications

Item		Specifications
Power Supply	Rated Voltage	100-240V AC
	Permissible Range of Voltage	85-265V AC (47-440Hz)
	Permissible Momentary Power Failure	within 20ms
	Demand	25W or less
	Rushed Electric Current	12A, 2.5ms
	With-stand Voltage	AC external terminals to FG: 1500V AC per min.
	Insulation Resistance	500V DC, 10MΩ or more
Physical Environment	Ambient Temperature	0℃ ~+50℃
	Storage Ambient Temperature	-10℃ ~+65℃
	Ambient Humidity	85% RH or less (without dew condensation)
	Dust	No conductive dust
	Solvent Resistance	No cutting oil or no organic solvent to cling to the unit
	Corrosive Gas	No corrosive gas
Mechanical Working Conditions	Vibration Resistance	Vibration frequency: 10~150Hz, Acceleration: 9.8m/s^2 (1.0G) 3 directions of X, Y and Z: one hour
	Shock Resistance	Pulse shape: Sine half wave, Peak acceleration: 147m/s^2 (15G), 3 directions of X, Y and Z: 2 times
Electrical Working Conditions	Noise Resistance	1500Vp-p (noise width: 1μs)
	Static Electricity Discharge Resistance	Contact: 6kV, Air: 8kV
Mounting Conditions	Grounding	Grounding resistance: less than 100Ω
	Structure	Protection structure: front panel complies with IP64 (when using waterproof screen filter 0JUWPSHETZ61E) rear panel complies with IP20 Form: in a body Mounting procedure: inserted in a mounting panel
	Cooling System	Cooling naturally
	Weight	Approx. 2.1kg
	Dimensions W x H x D (mm)	288 x 203 x 95
	Panel Cut-out (mm)	277^{+1}_{-0} x 192^{+1}_{-0}
	Case Color	GREY
	Material	ABS
	Accessories	One 25 pin D-sub connector, Four mounting brackets, One instruction manual

Display Specifications

Item	Specifications
Display Device	High-intensity EL
Resolution W x H (dots)	640 x 400
Dot Pitch W x H (mm)	0.3 x 0.3
Effective Display Area W x H (mm)	192 x 120 (8.9 inches)
Color	Black/orange-yellow + blinking
Auto OFF Function	Always ON, random setting
Backlight Average Life *1	Approx. 30.000 hours
POWER Lamp (red)	The lamp is lit when the power is supplied.
RUN Lamp (green)	The lamp is lit when ZM-62E communicates with PLC normally.

*1 Until the luminance reduce to 70% of its initial value at an operational temperature of 25+/-5ºC.

Display Function Specifications

Item		Specifications				
Display Language*2		Japanese	Eng./W. Europe	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 1st and 2nd	———	Chinese	Chinese (simplified)	Hangul (without Kanji)
	2-byte (32-dot)	JIS 1st	———			
Size of Characters		1/4-size : 8 X 8 dots 1-byte : 8 X 16 dots 2-byte : 16 X 16 dots or 32 X 32 dots Enlarge : W, 1-8 H, 1-8				
Number of Characters		1/4-size	80 columns X 40 lines			
		1-byte	80 columns X 20 lines			
		2-byte	40 columns X 20 lines			
Property of Characters		Display property : normal, reverse, blinking, bold, shadow Color : black/orange-yellow + blinking				
Kind of Drawing		Lines : line, continuous lines, box, parallelogram, polygon Circles : circle, arc, sector, ellipse, elliptical arc, elliptical sector Others : tile patterns				
Property of Drawing		Type of lines : 6 types (fine, thick, dot, chain, broken, two-dot chain) Tile patterns : 16 types (incl. user-definable 8 types) Display property : normal, reverse, blinking Display color : black/orange-yellow + blinking Color specification : foreground, background, boundaries (line)				

*2 Editing screens in foreign languages needs running Screen Edit Software ZM-71SE with a foreign edition Windows application. Concerning Gothic font, use of this font is not recommended since the ZM-62E screen memory capacity (see the next page) could not be sufficient.

Function Performance Specifications

Item		Specifications
Screens		Max. 1024
Screen Memory		FP-ROM (flash ROM), Appox. 760kbytes (different from the language)
Switches		Max.192 per screen
Actions of Switch		Set, reset, momentary, alternate, to light (possible to press a function switch and a display switch at the same time)
Lamps		Reverse, blinking, exchange of graphics Max.192 per screen
Graphs *		Pie, bar, panel meter and closed area graph can be displayed without limit. Total capacity per screen: within 48kB Statics and trend graphs: Max. 256 per layer
Data Setting	Numerical Data Display*	No limits, total capacity per screen: within 48 kB
	Character Display *	No limits, total capacity per screen: within 48 kB
	Message Display *	Resolution : Max. 80 characters No limits, total capacity per screen: within 48 kB
Messages		6144 lines
Sampling		Sampling display of buffer data (constant sample, bit synchronize, bit sample, relay sample, alarm function)
Multi-Overlaps		Max. 1024
Data Blocks		Max. 1024
Graphic Libraries		Max. 2560
Patterns		Max. 1024
Macro Blocks		Max. 1024
Page Blocks		Max. 1024
Direct Blocks		Max. 1024
Screen Blocks		Max. 1024
Temperature Control Network Table		Max. 32
Calendar		provided
Hard-Copy		provided
Buzzer		provided, 3 types (intermittent short, long, continuous beeps)
Back-light Auto OFF Function		ON at all time, specified freely
Self-diagnostic Function		Self-test function of switches Check function of communication parameter setting Check function of communication

* Number of the setting memory per screen: 256

Touch Panel Specifications

Item	Specifications
Switch Resolution	40 (W) X 20 (H)
Form	Matrix resistance film form
Life of Touch Panel	Use of one million times or more
Surface treatment	Hard coating, anti-glare treatment 5%

Interface Specifications

Item	Specifications
Serial Interface for connecting PLC (D-sub 25 pins, 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, 57600bps
Serial Interface 1 and 2 for transferring data/barcode /ZM-1REC (modular jack, 8 pins)	RS-232C, RS-422/485 (2-wire connection) *When ZM-1REC, an optional equipment, is connected: 1 slot SRAM: Max. 4 MB FROM: Max. 16 MB Comply with JEIDA Ver. 4.0 (The limit exists.)
Printer Interface	Complies with centronics, half pitch 36 pins (for PC98x1) NEC : PR201 EPSON : compatibles with ESC/P24-84 or later CBM292/293 printer (The screen copy cannot be printed out.)

Drawing Environment

Item	Specifications
Drawing Method	Exclusive drawing software
Drawing Tool	Name of exclusive drawing software : ZM-71SE Ver. 1.3.0.0 or later Personal computer : Pentium II 450MHz or more is recommended OS : Microsoft Windows 98/NT version 4.0/Me/2000/XP Capacity of hard disk required : free area of approx. 460MB or more (For minimum installation : Approx. 105MB) Display : Resolution of 800 X 600 or more is recommended

Compatible PLC for connection

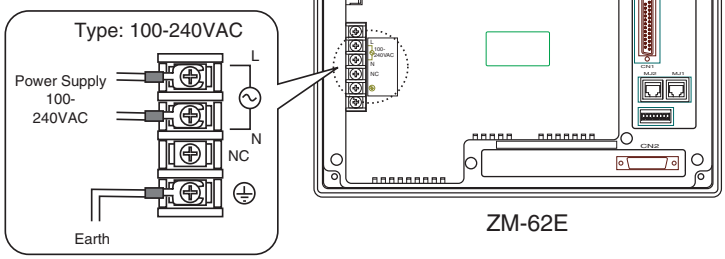
Maker	PLC Model
SHARP	JW10, JW20/20H, JW30H, W70H/100H JW50/70/100, JW50H/70H/100H, J-board
MITSUBISHI	MELSEC A/Q/FX series, CPU port
OMRON	SYSMAC C/CV/CQM series
FUJI	F70/F80H/120H, FLEX-PC CPU/COM, NS/NJ
HITACHI	HIDEC-H300/700/2000 series/S10α
YOKOGAWA	FA-M3, FA-500
YASUKAWA	MEMOBUS, CP9200SH, MP920/930
MATSUSHITA	MEWNET-FP
TOYOPUC	TOYOPUC-PC2/PC2J, L2
KOYO	KOSTAC-SU5/6, SG-8
TOSHIBA	TC200
SHINKO	SELMART
KEYENCE	KZ/KV series
YAMATAKE	MX series
IDEC	MICRO3
FATEK AUTOMATION	FACON FB series
TAIAN	TP02
ALLEN-BRADLEY	PLC5/SLC500
FANUC	Power Mate-Model H/D
GE Fanuc	90 series, 30 series
LG	MASTER-K10/60/2000, K500/1000
MODICON	Modbus RTU
SAMSUNG	SPC
SIEMENS	S5/S7/S7-200PPI, T1540/555

*1 They match to the protocol of the PLC described above, but it does not necessary mean the guarantee of the operation of each PLC such as the noise level.

8 Wiring of Power Supply

Electrical Wiring

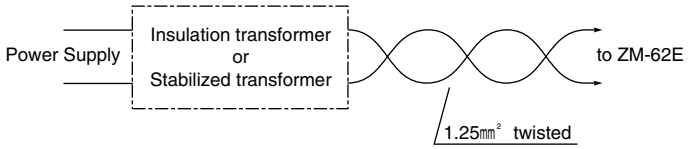
○ Connects the cable for power supply to the terminal on the rear side of ZM-62E.



Screw Size	Torque (N · m)	Clamp Terminal (Unit : mm)
M3.5	0.5 (5kgf · cm)	8.0MAX 8.0MAX

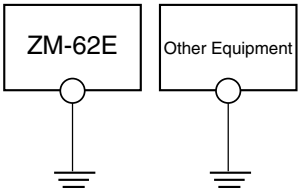
○ The power source used must be within the allowable voltage fluctuation.
○ Use a power source with low noise between the cables or ground and the cable.
○ Use as thick a power cable as possible to minimize any drop in voltage.
○ Keep cables of 100V AC sufficiently away from high-voltage, large-current cables.

○ 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

This equipment must be earthed.



○ An independent earth pole shall be used for ZM-62E. (The level of grounding resistance should be less than 100 Ω.)
○ Use a cable which has a nominal cross section of more than 2mm² for grounding.
○ Grounding point shall be near the ZM-62E to shorten the distance of grounding wires.
○ Using a common grounding cable with other devices or connecting the grounding cable to a beam of the building could backfire.
○ Should your ZM-62E work wrongly after grounding, cut the FG terminal off from the ground.

9 Serial Connector (CN1)

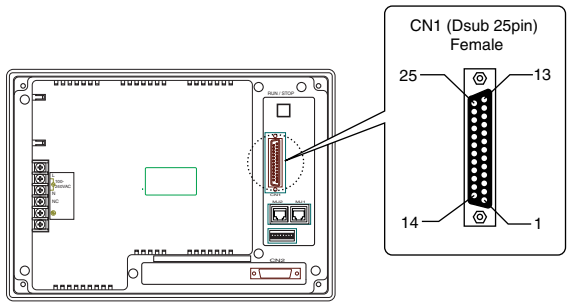
CN1 is used for communicating between a PLC and a ZM-62E (RS-232C, RS-422/485).

Interface Specifications

Item	Specifications
Serial Interface for connecting PLC (D-sub 25 pins, 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, 57600bps

Serial Connector (CN1)

The pin arrangement of serial connector is as follows:

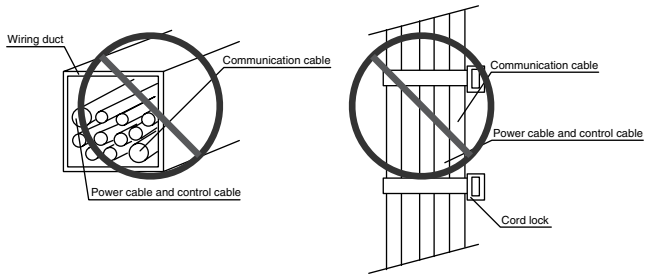


ZM-62E

Pin No.	Signal	Contents
1	FG	Frame ground
2	SD	RS-232C send data
3	RD	RS-232C receive data
4	RS	RS-232C RS request to send
5	CS	RS-232C CS 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		Not used
22		Not used
23		Not used
24	+RD	RS-422 receive data (+)
25	-RD	RS-422 receive data (-)

Wiring for Communication

○ Never place the communication cable with electric circuits.
○ Never bundle these cables together with other wires in ducts or electric boxes using cord locks. Although it is tempting to bundle all the cables neatly together, this does not necessarily lead to a noise-resistant configuration.
○ It is recommended that the communication cable be independently wired.

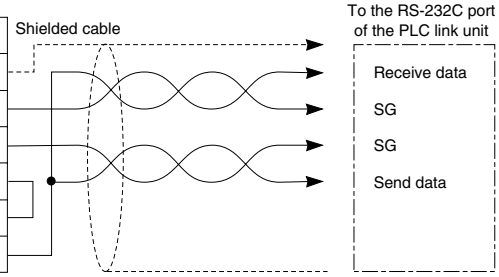


In Case of RS-232C Communication

○ In case of RS-232C, SD and SG, and RD and SG form a pair.
○ Connect the shielded cable to pin No. 1 or the connector case cover.

ZM-62E (CN1)

Signal	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
SG	7

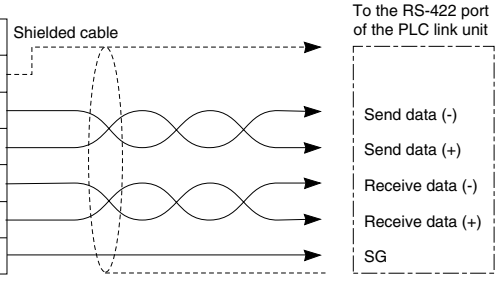


In Case of RS-422 Communication

○ In case of RS-422, +SD and -SD, and +RD and -RD form a pair.
○ Use SG if possible.
○ Connect the shielded cable to pin No. 1 or the connector case cover.
○ Use terminal converter ZM-1TC which is the optional equipment in case of using terminal blocks in RS-422/485 connection.
○ Specify terminal resistance by the dip switches on ZM-62E. (Refer to page 1-29.)

ZM-62E (CN1)

Signal	Pin No.
FG	1
+RD	24
-RD	25
+SD	12
-SD	13
SG	7

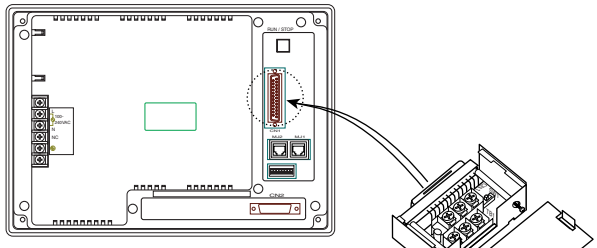


Terminal Blocks of RS-422/485

○ Connect ZM-1TC (Terminal Converter) which is the optional equipment to ZM-62E via the serial connector on ZM-62E (CN1) in case of using terminal blocks in RS-422/485 connection.

○ The RS-422 signal wiring of ZM-1TC is connected to the serial connector (CN1).

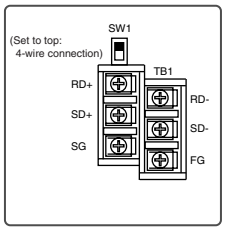
○ Specify 4-wire connection or 2-wire connection by the dip switch on ZM-1TC (SW1).
(set to top: 4-wire connection)



ZM-62E

ZM-1TC (Terminal Converter)

ZM-1TC



CN1

Signal	Pin No.
FG	1
SG	7
+SD	12
-SD	13
+RD	24
-RD	25

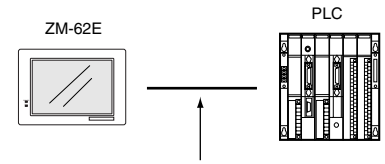
Connection Style

Three kinds of ZM-62E to PLC connection styles are available as shown below.

○ 1 : 1

In this style, a single ZM-62E is connected to a single PLC.

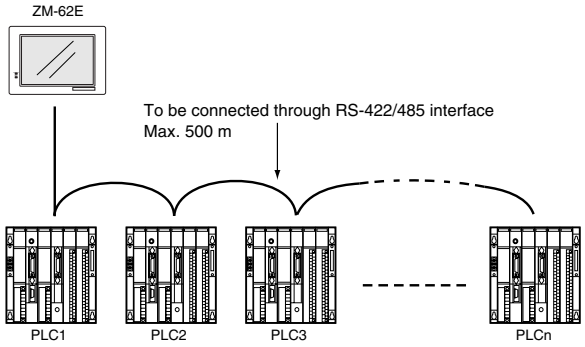
For details, refer to "10 1 : 1 Communications."



○ 1 : n (multi-drop)

In this style, multiple PLCs are connected to a single ZM-62E. (n = 1 to 31)

For details, refer to "11 1 : n Communications."

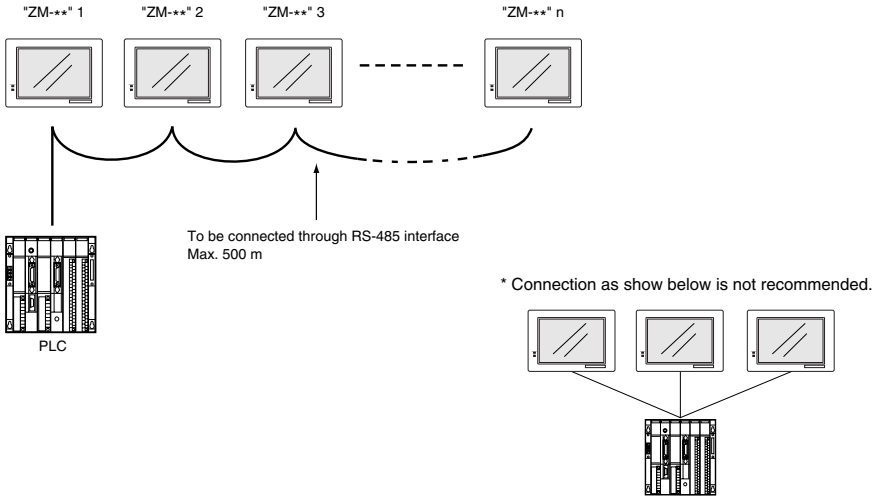


○ n : 1 (multi-link 2, multi-link)

In this style, multiple units of ZM-** (ZM-62E for example) are connected to a single PLC.

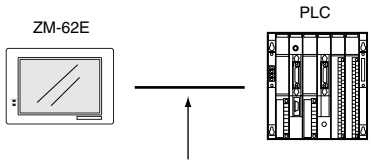
(Multi-link 2: n = 1 to 4, Multi-link: n = 1 to 31)

For details, refer to "12 n : 1 (multi-link 2, multi-link)."



10 1 : 1 Communications

In this style, a single ZM-62E is connected to a single PLC.



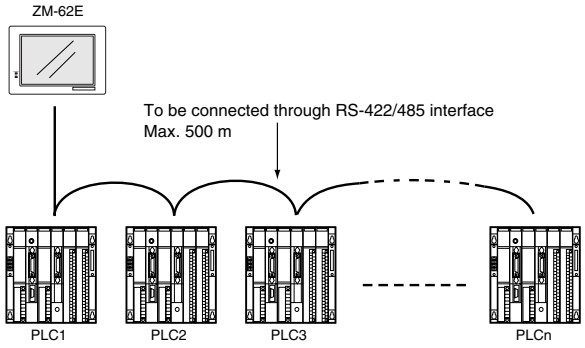
To be connected through RS-232C or RS-422 (RS-485) interface.

Connection to a PLC

About the wiring, communication parameter, etc. in connection between ZM-62E and a PLC, refer to ‘Chapter 2 Connection to Link Units’ of “ZM-42/43/52/72/82 User’s Manual”.

11 1 : n (Multi-drop) Communication

One ZM-62E and multiple PLCs are connected. (n = 1 to 31)



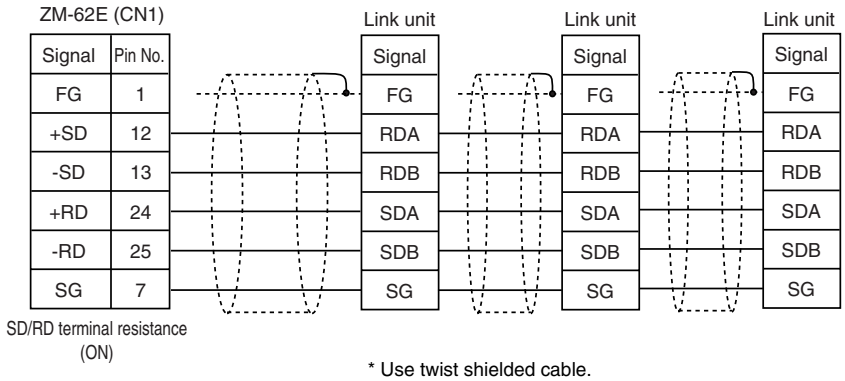
Available PLC for multi-drop communication

Manufacturer	Models
SHARP	JW series, JW100/70H COM port, JW20/30 COM port
MITSUBISHI ELECTRIC	A series link, QnA series link, QnH(Q) series link, Alink+Net10, FX series (A prt)
OMRON	SYSMAC C series, CV series, CQM1 series, CS1 DNA
Hitachi	HIDIC-H
Matsushita Electric Works	MEWNET
Yokogawa Electric	FA500, FA-M3, FA-M3R
Yaskawa Electric	MEMOBUS, CP9200SH/MP900
Toyoda Machine Works	TOYOPUC
Fuji Electric	MICREX-F series, FLEX-PC series, NJ computer link
KOYO ELECTRONICS	SU/SG, SR-T
Allen-Bradley	PLC-5, SLC500, Micro Logix 1000
GE Fanuc	90 series
TOSHIBA	T series
Siemens	S7-200 PPI
SHINKO ELECTRIC	SELMART
SAMSUNG	SPC series, N plus, SECNET
KEYENCE	KZ series, KV series
LG	MASTER-K500 / 1000
FATEK AUTOMATION	FACON FB series
IDEC	MICRO3
MODICON	Modbus RTU
TAIAN	TP02
	Universal Serial

Multi-drop Communication (RS-422)

Refer to the PLC manual of each manufacturer for connection.

<E.g.>
The following example describes how one ZM-62E is connected to three PLCs made by MITSUBISHI.
See MITSUBISHI's manual for further details.



* Use twist shielded cable.

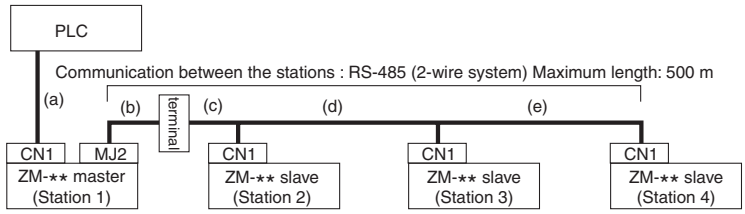
12 n : 1 (Multi-link 2, multi-link)

Multiple units of ZM-** (ZM-62E for example) are connected to a single PLC.
In this style, there are two kinds of communications.

n : 1 Link Communication (Multi-link2)

○ Up to 4 units can be connected to one PLC.

*** Between a PLC and the ZM-** master station is the same as those for 1:1 communication.**



○ Available PLCs for multi-link2.
PLC models which can be used in one-on-one connection with a ZM-** are as follows. (as of April 2001)

<Type>	<Calendar>	<Type>	<Calendar>
MITSUBISHI : AnA/N/U series	Provided	KOYO : SU/SG	Depends on the model
MITSUBISHI : QnA series	Provided	KOYO : SR-T	Provided
MITSUBIAHI : QnH (Q) series	Provided	KOYO : SR-T(K prt)	Not provided
MITSUBISHI : ACPU Port	Provided	A.B : PLC-5	Not provided
MITSUBISHI : FX series	Depends on the model	A.B : SLC500	Provided
MITSUBISHI : QnACPU Port	Provided	A.B : Micro Logix 1000	Not provided
MITSUBISHI : QnHCPU Port (A)	Provided	GE Fanuc : 90 series	Not provided
MITSUBISHI : QnHCPU Port (Q)	Provided	GE Fanuc : 90 series(SNP-X)	Not provided
MITSUBISHI : FX series(A prt)	Provided	TOSHIBA : T series	Provided
MITSUBISHI : FX2N series	Depends on the model	SIEMENS : S5/S7	Not provided
MITSUBISHI : FX1S series	Provided	SIEMENS : S5 ZM70	Not provided
OMRON : SYSMAC C	Depends on the model	SIEMENS : TI500/505	Provided
OMRON : SYSMAC CV	Provided	SIEMENS : TI500/505 ZM70	
OMRON : SYSMAC CS1	Provided	SIEMENS : S5 PG port	Not provided
SHARP : JW series	Provided	SIEMENS : S7-300MPI (HMI ADP)	Provided
SHARP : JW100/70H COM Port	Provided	SIEMENS : S7-300MPI (PC ADP)	Provided
SHARP : JW20 COM Port	Provided	SAMSUNG : SPC series	Not provided
HITACHI : HIDIC-H	Provided	SAMSUNG : SECNET	Depends on the model
HITACHI : HIDIC-S10/2 alpha	Not provided	KEYENCE : KZ series	Not provided
HITACHI : HIDIC-S10/ABS	Not provided	KEYENCE : KZ-A500 CPU Port	Provided
MATSUSHITA : MEWNET	Depends on the model	KEYENCE : KV series	Not provided
YOKOGAWA : FA500	Provided	KEYENCE : KZ24/300 series CPU	Not provided
YOKOGAWA : FA-M3	Provided	KEYENCE : KV10/24 series CPU	Not provided
YOKOGAWA : FA-M3R	Provided	LG : MASTER-K10/60/200	Not provided
YASKAWA : Memobus	Depends on the model	LG : MASTER-K500/1000	Not provided
YASKAWA : CP9200SH/MP900	Not provided	LG : LGMKX00S	Not provided
TOYOPUC	Provided	FANUC : Power Mate	Not provided
FUJI : MICREX-F series	Provided	FATEK AUTOMATION: FACON FB series	Provided
FUJI : MICREX-F series ZM70	Provided	IDEC : MICRO3	Provided
FUJI : FLEX-PC series	Provided	MODICON : Modbus RTU	Depends on the model
FUJI : FLEX-PC CPU	Provided	YAMATAKE : MX series	Provided
FUJI : FLEX-PC COM	Provided	TAIAN : TP02	Provided
FUJI : FLEX-PC(T)	Provided		
FUJI : FLEX-PC CPU(T)	Provided		
FUJI : MICREX-F T link ZM70	Provided		

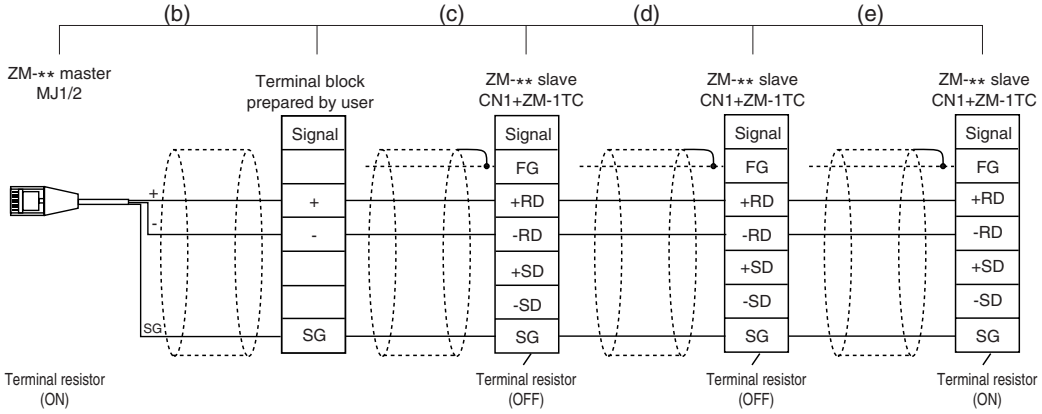
For the I/F driver, the Multi-Link 2 is supported by the version of 1.100 or later and as for a ZM-** master station, make sure the hardware version of the unit is as follows. As for ZM-62E and ZM-42/43 series, any version can be used.

· ZM-82T series --> D, ZM-82D series --> C, ZM-72TS series --> D, ZM-72T series --> D, ZM-72D series --> C, ZM-52D series --> F

*** When a ZM-62E or one in ZM-42/43 series is the master, the models which can be used as the slaves are "ZM-62E or ZM-42/43 series".**

○ Example of wiring for multiple ZM-** units.
Use the terminal converter (ZM-1TC), the optional equipment.
See Multi-link2 manual for further details.
*** Wire the shielded FG only at the one of both sides so that they are not connected.**

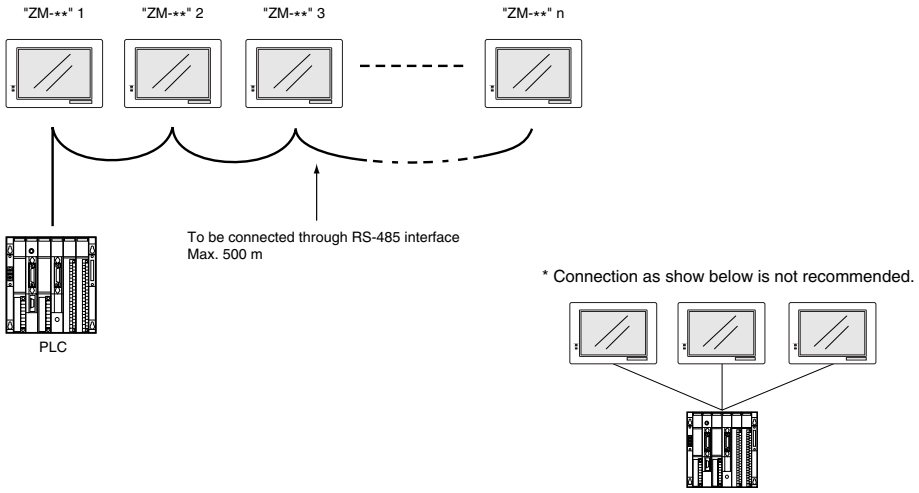
• Set the dip switch (SW1) of ZM-1TC as 2-wire connection when the ZM-1TC terminal converter is used.



• Short-circuit between +RD and +SD, and -RD and -SD when the ZM-1TC terminal converter is not used.

n : 1 Link Communication (Multi-link)

○ Multiple ZM-∗∗ and a PLC are connected. (n=1 to 31)



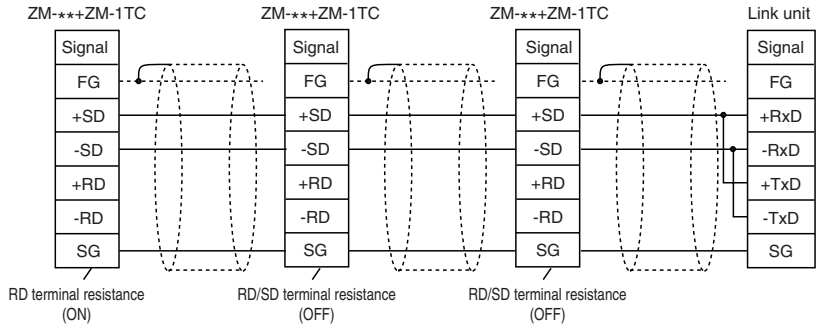
○ Available PLCs for multi-link

Manufacturer	Models
SHARP	JW series (JW-10CM, JW-21CM, Z-331J/332J, ZW-10CM)
MITSUBISHI ELECTRIC	An/A/N/U series, Net10, FX series (A protocol) QnA CPU port (with ZM-1MD2)
OMRON	SYSMAC C series, CV series
Hitachi	HIDIC-H
Matsushita Electric Works	MEWNET
Yokogawa Electric	FA500, FA-M3, FA-M3R
Toyoda Machine Works	TOYOPUC
Fuji Electric	MICREX-F series, NJ computer link
TOSHIBA	T series
TOSHIBA MACHINE	TC200
Siemens	S7-200 PPI
SHINKO ELECTRIC	SELMART
SAMSUNG	SPC series, N plus, SECNET
LG	MASTER-K500/K1000

* With regard to the SHARP models, only the link units are compatible with multi-link connection, but the communication ports and others are not.

○ When multiple ZM-∗∗ are connected to a link unit of PLC, use the terminal converter (ZM-1TC), the optional equipment for RS-485 connection.

- Set the dip switch (SW1) of ZM-1TC as 2-wire connection when the ZM-1TC terminal converter is used.

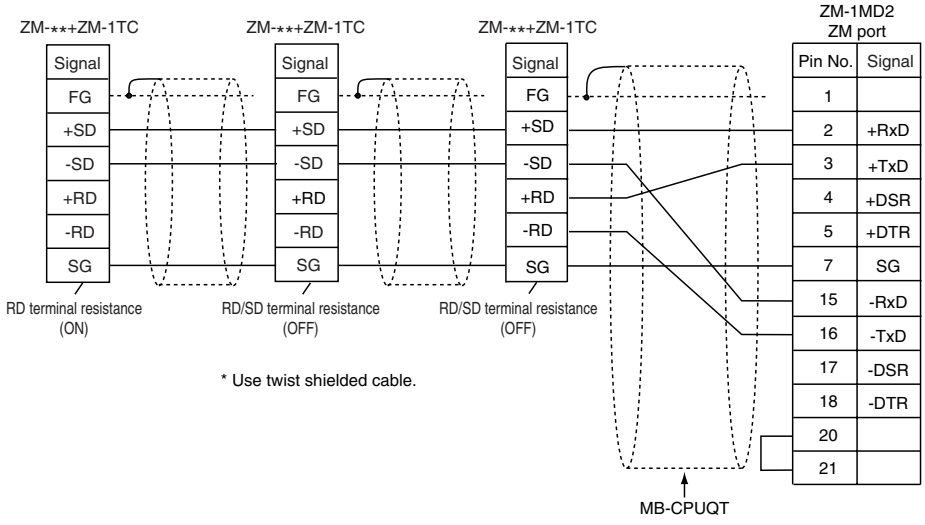


* Use twist shielded cable.

- Short-circuit between +RD and +SD, and -RD and -SD when the ZM-1TC terminal converter is not used.

○ When multiple ZM-∗∗ are connected directly to MITSUBISHI's QCPU port, the optional equipment, ZM-1MD2 is required. Make sure to use ZM-1MD2 GD port. It is recommended to use a cable, MB-CPUQT, to connect between a terminal converter ZM-1TC (sold separately) for a ZM-∗∗ and a ZM-1MD2 for the Mitsubishi Q series' CPU too.

- Set the dip switch (SW1) of ZM-1TC as 2-wire connection when the ZM-1TC terminal converter is used.



* Use twist shielded cable.

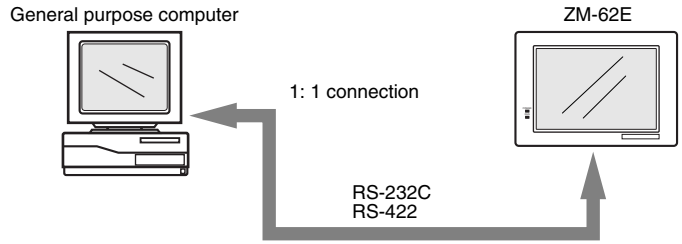
- Short-circuit between +RD and +SD, and -RD and -SD when the ZM-1TC terminal converter is not used.

13 General Purpose Serial Communication

The ZM-62E can connected with a general purpose computer using the user program (exclusive command use). Refer to ZM (general purpose serial) user's manual in detail.

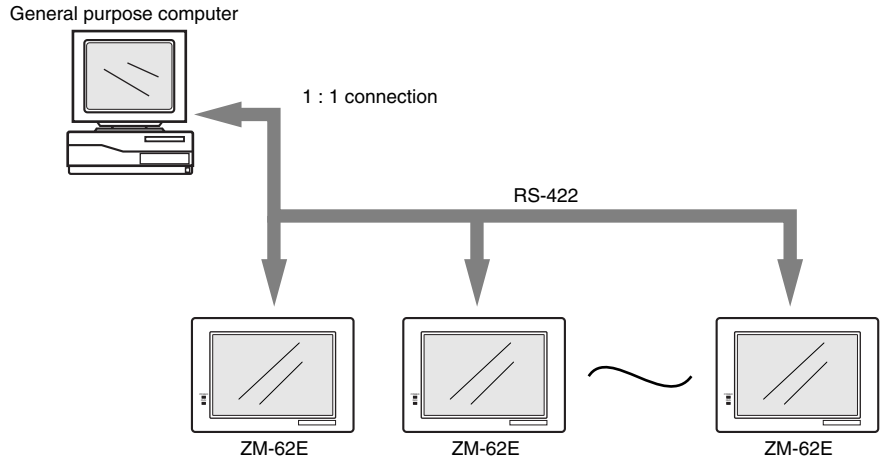
When a computer and ZM-62E are 1 : 1

○ RS-232C can use it by less than 15m, and RS-422 (485) can use transmision distance by less than 500m.
○ Interruption processing can be used. (Switch ON/OFF, the write-in key of a ten-key, screen change)



When a computer and ZM-** are 1 : n (Up to ZM-** 32 sets are connectable.)

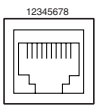
○ The command point needs to be station number specified.
○ Interruption processing cannot be used.(Switch ON/OFF, the write-in key of a ten-key, screen change)



14 Modular Jack 1 & 2

Modular Jack 1 & 2 (MJ1/2)

The right diagram is the pin arrangement and the signal name of modular jack 1 & 2.



MJ1/2	Pin No.	Signal	
	1	+SD/RD	
	2	-SD/RD	
	3	+5V	
	4	+5V	Output power supply Max. 150mA
	5	0V	
	6	0V	
	7	RD	
	8	SD	

Setting of Modular Jack 1 & 2 (MJ1/MJ2)

○ Specify the use of MJ1/MJ2 by the screen edit software (ZM-71SE).

○ Select [Modular] of [System Setting], and then the [Modular Jack] dialog is displayed. The setting items of [Modular Jack 1] and [Modular Jack 2] in this dialog are as follows.

Modular Jack 1	Modular Jack 2
[Editor port]	[Not used]
[Memory Card]	[Memory Card]
[Barcode]	[Barcode]
[ZM-I/O]	[ZM-I/O]
[Multi-Link] *	[Multi-Link] *
[Temp./ PLC2Way]	[Temp./ PLC2Way]
[ZM-Link]	[ZM-Link]
[Modbus Slave]	[Modbus Slave]
[Printer(Serial Port)]	[Printer(Serial Port)]

It is impossible to select both [Multi-Link] and [Temp./ PLC2Way] in each setting of modular jack.

*** It is possible to select this item when [Multi-Link 2] is selected for [Connection] and [Local Port] is set to [1] in the [Comm. Parameter] dialog.**

Editor Transferring

○ Use modular jack 1 (MJ1) in case of editor transferring.

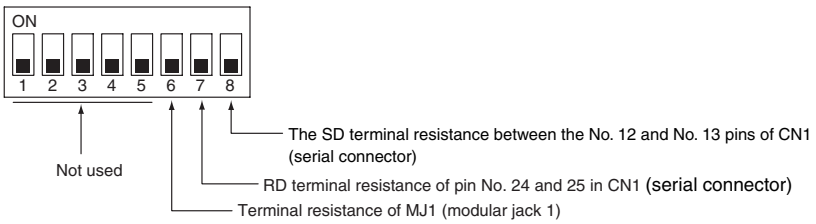
○ When [Editor port] is selected for [Modular Jack 1] in the [Modular Jack] dialog, it is also possible to transfer the data while running, because the auto change of the local mode and the run mode is valid. When [Editor port] is selected, on-line editing and the simulation mode are also available.

○ When the item other than [Editor port] is selected for [Modular Jack 1] in the dialog, be sure to transfer the data by the software in the local mode. On-line editing and the simulation mode are not available.

○ When the data is transferred by software, use the cable for data transferring which is the optional equipment (ZM-80C: 3m) to connect ZM-62E to a personal computer.

15 Setting of Dip Switches

Setting of Dip Switches



○ Setting of Terminal Resistance

- When connecting a PLC and RS-422/485 by 4-wire method, turn DIPSW 7 and 8 on.
- When connecting a PLC and RS-422/485 by 2-wire method, turn DISW 7 on.
- When using Modular jack 1 for multi-link 2 connection or using a card recorder or added serial I/O, turn DIPSW 6 on.
- Modular jack 2's terminal resistance is always on.

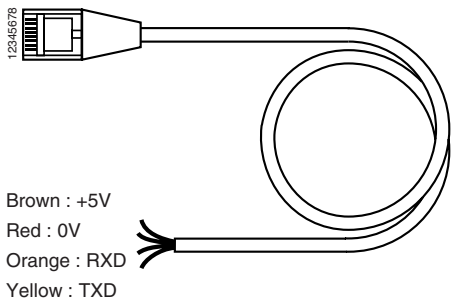
○ Keep DIPSW 1, 2, 3, 4, 5 and 8 (not used) OFF.

16 Barcode Reader Interface

○ It is possible to receive the signal from a barcode reader by connecting a barcode reader to ZM-62E via the modular jack (MJ1/MJ2) of ZM-62E.

○ To connect a barcode reader to ZM-62E via MJ1/MJ2, use the cable which is the cable for barcode reader (ZM-80BC: order product).

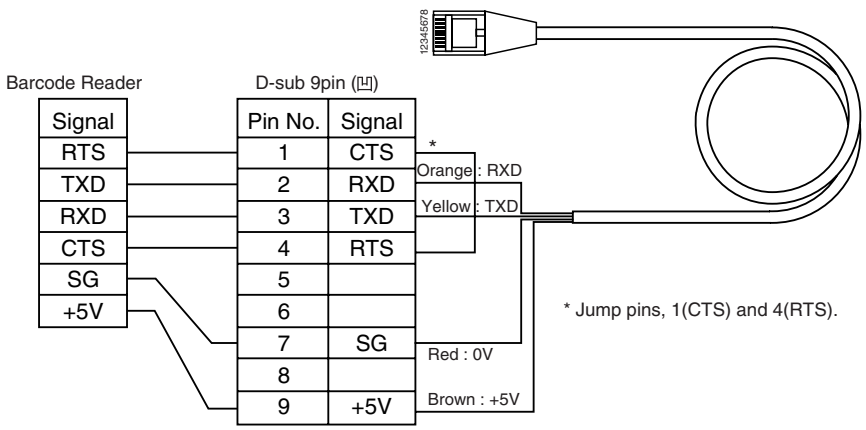
Length : 3m



◎ Notes on Connection

- In case of using the barcode reader which uses the CTS and RTS control, the barcode reader may not work normally without jumping RTS and CTS.
- The output power supply (+5V) is max. 150mA. (Refer to page 1-26.)

○ When the barcode reader connected to ZM-61E is used, connect it to ZM-80BC by the following cable.

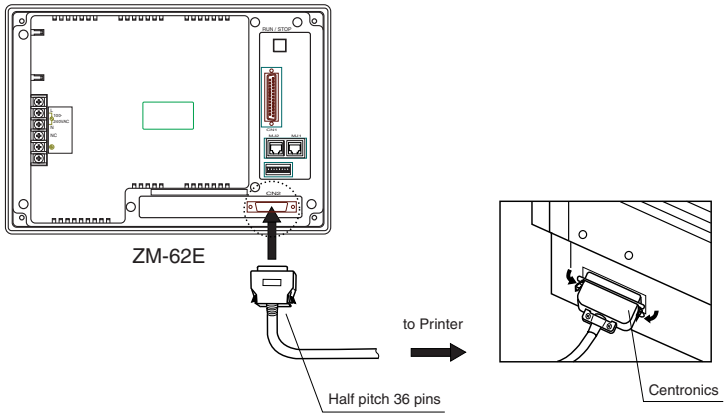


17 Printer Interface (CN2)

○ When a printer is connected to ZM-62E via the connector (CN2), it is possible to hard-copy the screen display of ZM-62E, the data sheet, or the sampling data.

○ To connect a printer to ZM-62E, use the parallel interface cable of 36 pins which is optional equipment. (ZM-80PC: 2.5m)

*** The printer cable for ZM-61E/ZM-70 cannot be used.**



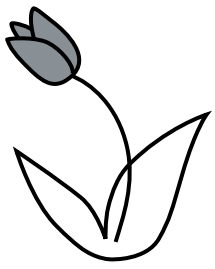
○ Compatible Printer Control Code System and Printer Models

NEC	PC-PR201 series
EPSON	Compatibles with ESC/P24-84 or later
HP(HEWLETT PACKARD)	PCL Level 3

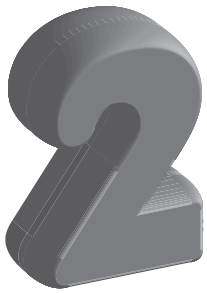
Note of Usage of SRAM Memory Card (via ZM-1REC);

In case of connecting a printer to ZM-62E with a “Memory Card on the market compliant (SRAM)” at all times, be sure to turn off a printer at the same time when turning off ZM-62E. If a printer is not turned off when ZM-62E is turned off, the voltage will circulate from the power supply line of a printer to make the power consumption of SRAM cassette’s backup battery increase, and finally, the backup battery will consume drastically within a few months.

MEMO



Please use this page freely.



System Menu

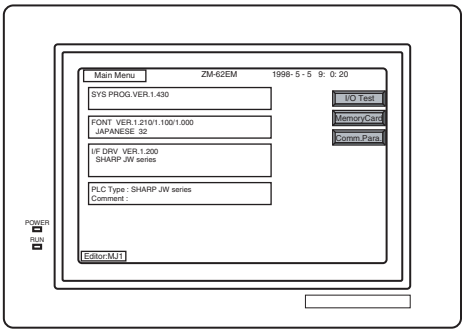
1. Operation of Main Menu
2. Errors Caused on the ZM-62E

1 Operation of Main Menu

When the power of ZM-62E is turned on for the first time, the screen on the below left is displayed. After transferring the screen data to ZM-62E, the following "Main Menu" is displayed.

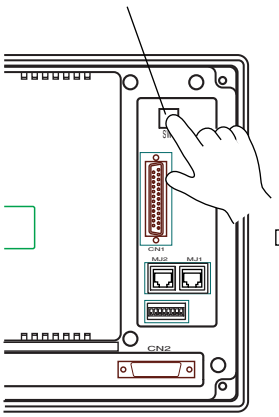
When power is turned on for the first time:

"Main Menu" after transferring data

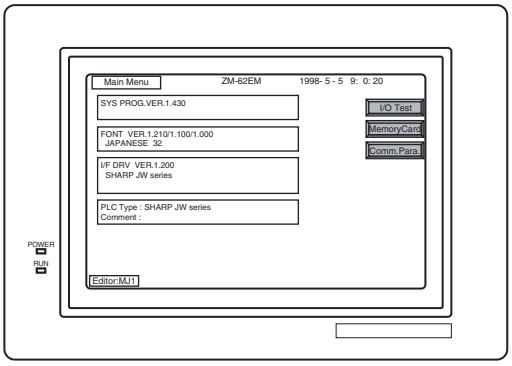


If the screen data has been already transferred to ZM-62E, press the [RUN/STOP] switch on the rear side. The [Main Menu] is displayed.

RUN/STOP switch
on the rear side

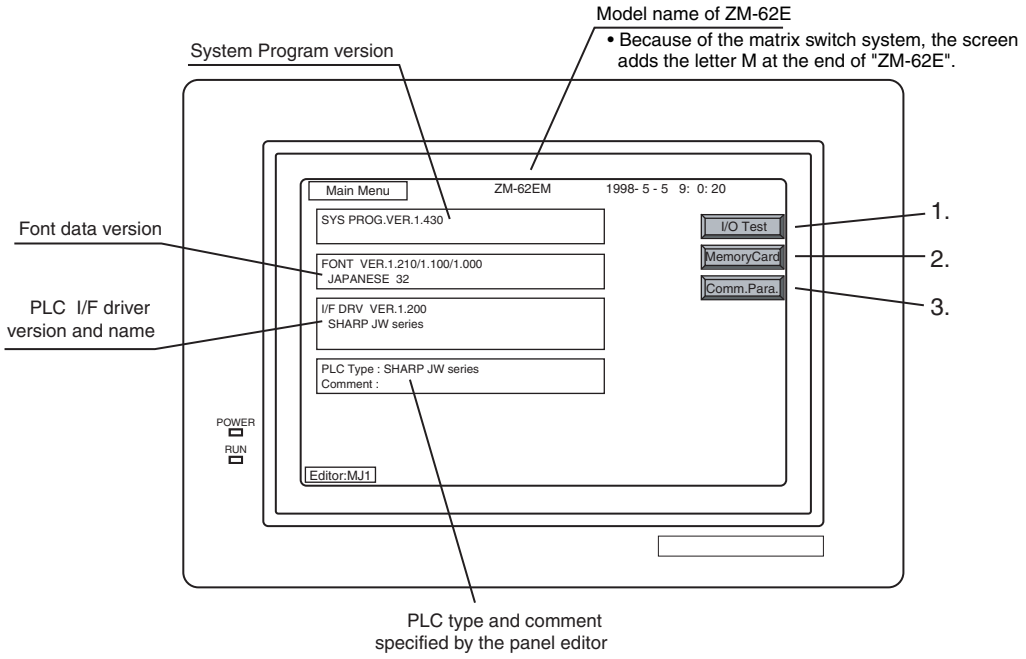


"Main Menu" after transferring the screen data



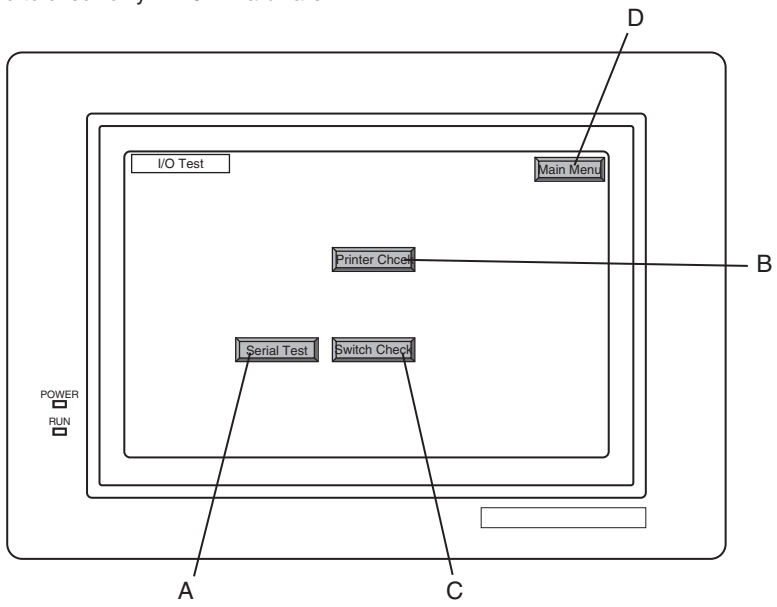
Main Menu

The "Main Menu" is the system menu for transferring the data between a personal computer and ZM-62E. When the screen data is transferred from a personal computer to ZM-62E, the "Main Menu" or “Comm. Parameter” (see page 2-10) must be displayed.
(If [Editor port] is selected for [Modular Jack 1] in the [Modular] of the editing software, it is not necessary to display the "Main Menu.")



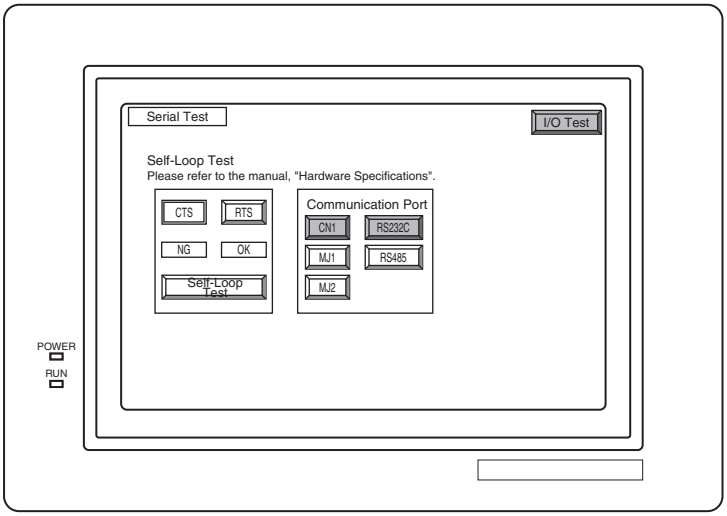
I/O Test

When the switch '1.' on the "Main Menu" is pressed, the following "I/O Test" is displayed.
This is the test menu to check only ZM-62E hardware.



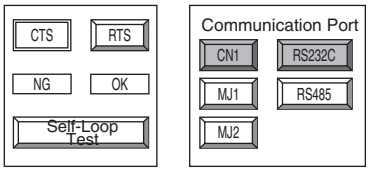
A. Self-loop Test

Pressing the switch 'A' on the "I/O Test" brings to the [Serial Test] screen.
This is the test menu to check the signals necessary for ZM-62E to communicate with PLC or a personal computer by using only ZM-62E.



◇ Signal Test of RS-232C in CN1

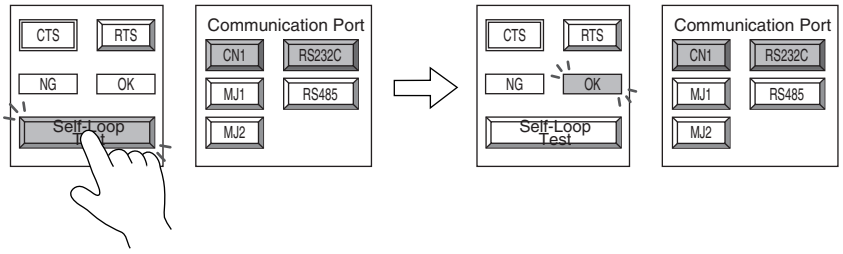
Select [CN1] and [RS-232C] in [Communication Port] by pressing each switch.



◆ Loop-back Test

Check the [SD] and [RD] signals.

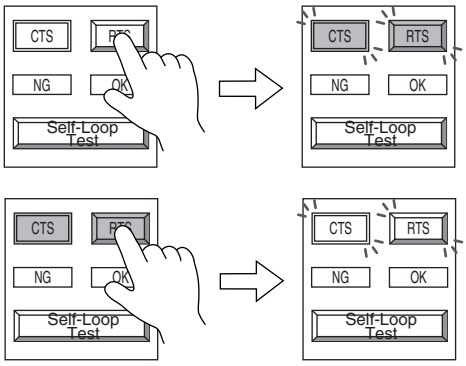
1. Jump pins, 2 and 3 of CN1.
2. The test is OK, if the [OK] lamp turns on when the [Self-Loop Test] switch is pressed.



◆ Test of CTS/RTS

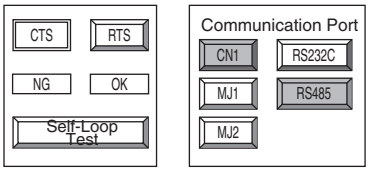
Check the [CTS] and [RTS] signals.

1. Jump pins, 4(RTS) and 5(CTS) of CN1.
2. The test is OK if the [CTS] lamp and the [RTS] lamp turn on at the same time that the [RTS] switch is pressed. Similarly, the test is OK if the [CTS] turns off at the same time that the [RTS] is turned off.



◇ Signal Test of RS-485 in CN1

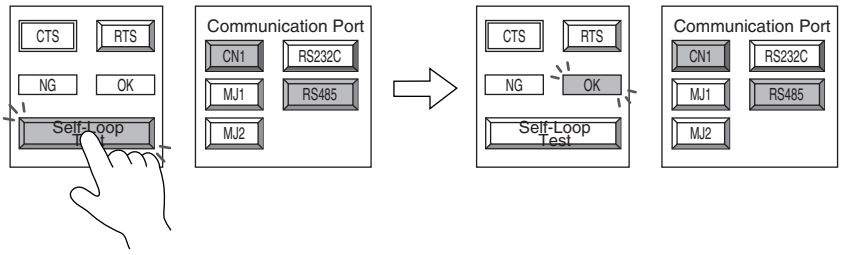
Select [CN1] and [RS-485] in [Communication Port] by pressing each switch.



◆ Loop-back Test

Check the [SD] and [RD] signals.

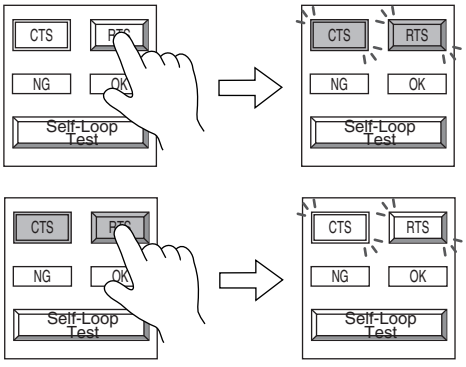
1. Jump each pin, 12 and 24, 13 and 25 of CN1.
2. The test is OK, if the [OK] lamp turns on when the [Self-Loop Test] switch is pressed.



◆ Test of CTS/RTS

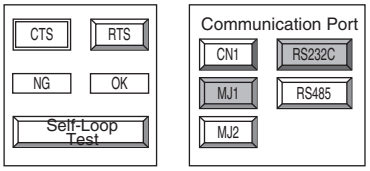
Check the [CTS] and [RTS] signals.

1. Jump each pin, 14(+RTS) and 19(+CTS), 17(-RTS) and 18(-CTS) of CN1.
2. The test is OK if the [CTS] lamp and the [RTS] lamp turn on at the same time that the [RTS] switch is pressed. Similarly, the test is OK if the [CTS] turns off at the same time that the [RTS] is turned off.



◇ Signal Test of RS-232C in MJ1 and MJ2

Select [MJ1] (or [MJ2]) and [RS-232C] in [Communication Port] by pressing each switch.

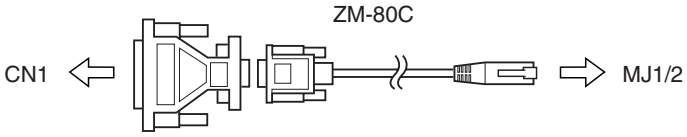


◆ Loop-back Test

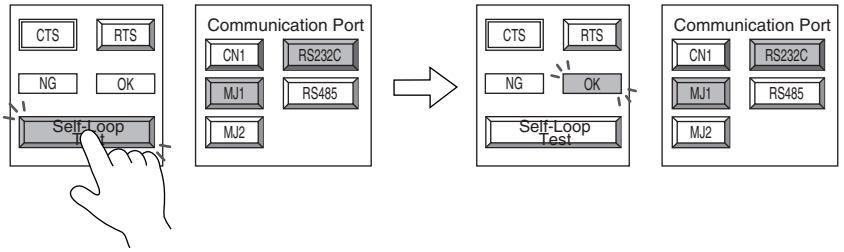
Check the [SD] and [RD] signals.

Execute the test by connecting the data transfer cable (ZM-80C) to CN1.

1. Set the adaptor, ADP25-9, which is attached to ZM-80C, to ZM-80C. And connect the modular jack side of ZM-80C to MJ1 (or MJ2), ADP25-9 side of ZM-80C to CN1.



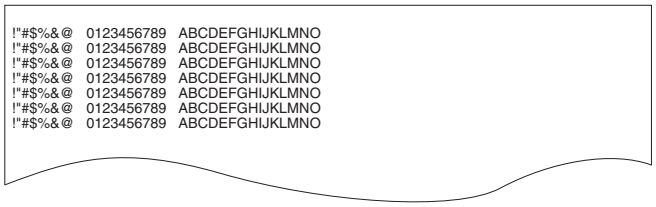
2. The test is OK, if the [OK] lamp turns on when the [Self-Loop Test] switch is pressed.



B. Printer Check

Check the signal of printer.

The test is OK if the test printout is executed satisfactorily when connecting ZM-62E to a printer and pressing this [Printer Check] switch (B).



C. Switch Check

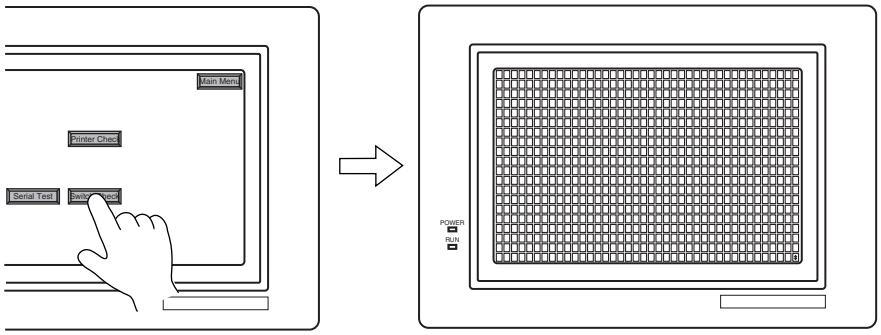
Check the reaction of the touch switches on the ZM-62E panel.

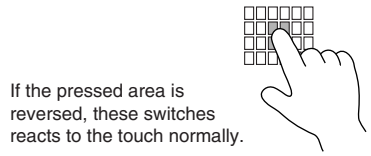
When the [Switch Check] switch (C) is pressed, the following screen is displayed.

Confirm that the color of the pressed area changes into orange-yellow.

The orange-yellow color means that the switch reacts to the touch normally.

Pressing the corner right below [*] leads to the previous [I/O Test] screen.

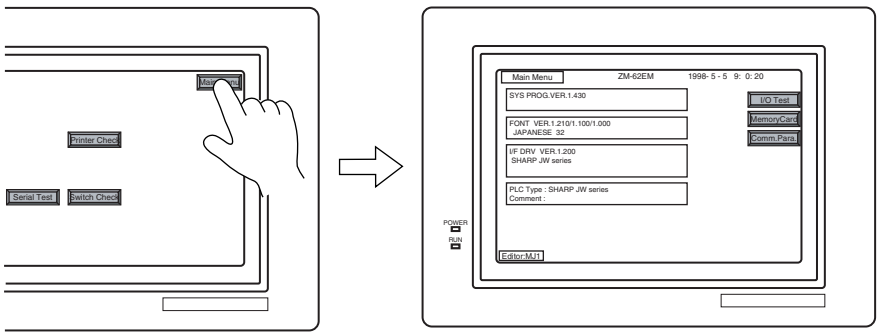




If the pressed area is reversed, these switches reacts to the touch normally.

D. Main Menu

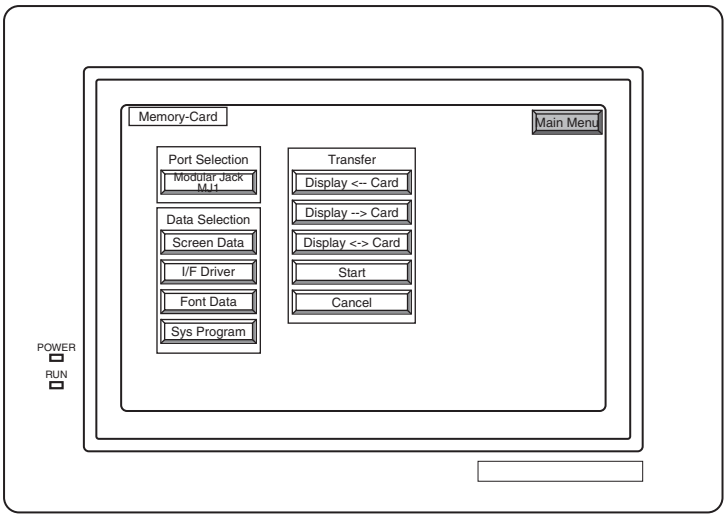
Pressing this [Main Menu] switch (D) leads to the previous [Main Menu].



Memory-Card

When the [Memory-Card] switch (2.) on the "Main Menu" is pressed, the following "Memory-Card" is displayed.

This screen is to transfer the screen data between ZM-62E and a memory-card.



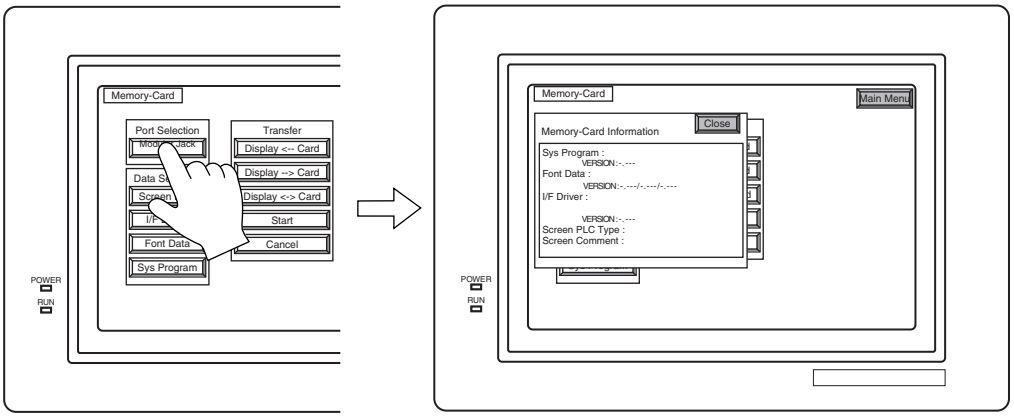
◆ Procedure of Data Transferring

1) Port Selection

Select the [Modular Jack MJ1] switch (or [Modular Jack MJ2]) in case of using a modular jack.

When each switch is pressed, the “Memory-Card Information” window is displayed.

Pressing the “Close” switch leads to the original screen after checking the memory card information.

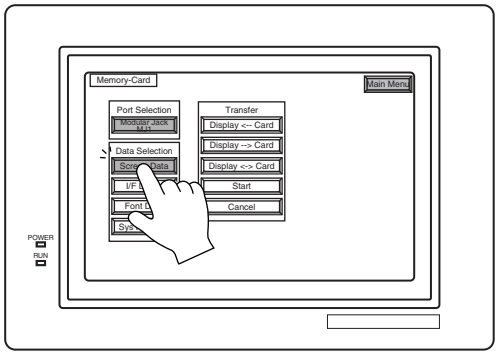


*** In case of selecting [Card Recorder] from [Modular Jack 2] on ZM-71SE and transferring data, it is possible to select the [Modular Jack 2] switch in the [Port Selection] menu of the [Memory-Card] screen on ZM-62E.**

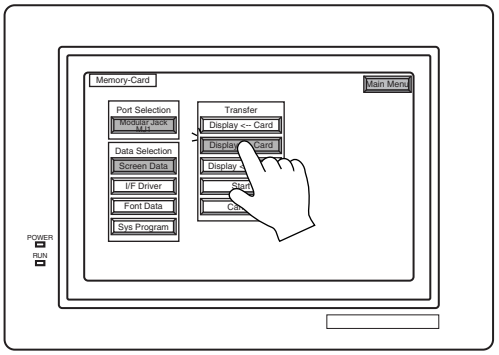
2) Data Selection, Transfer

Pressing each switch leads to selection of the target for data transferring. (Possible to select multiple items.)

Data Selection



Transfer

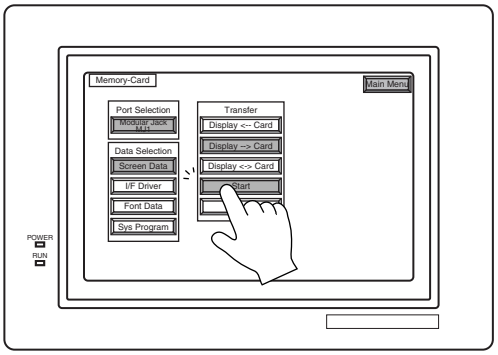


3) Start

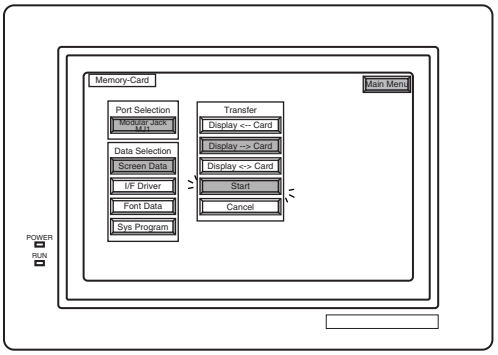
When the [Start] switch is pressed, the data transferring starts. During data transfer, the character, the lamp of 'Start' switch is turned ON.

After transferring data, the following message is displayed. Press the [OK] switch.

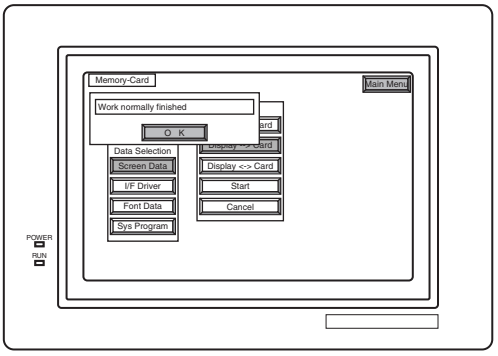
Start transferring



During transferring

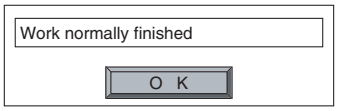


Finish transferring



◆ Message Display in Data Transferring

If an error occurs during transferring data, the message display window shown on the right is displayed. The kinds and the contents of the messages are as shown below.

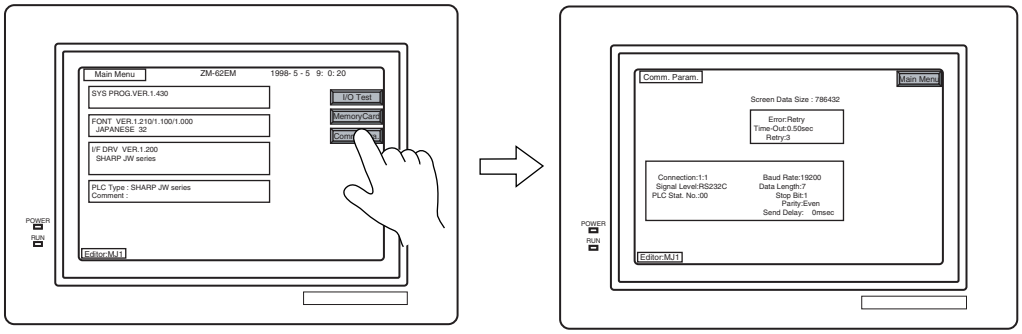


Message	Contents
Work normally finished.	The specified operation has been concluded normally.
ZM-1REC not connecting	ZM-1REC is not connecting when selecting a modular jack.
ZM-1REC Communication Error	A communication error occurred between ZM-62E and ZM-1REC when selecting a modular jack.
Memory-Card 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-62E 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 type is different.	The specified type of the data in ZM-62E 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-62E.
Data discrepant	There is some discrepancy in data, when comparing data between a memory card and ZM-62E.
Screen data on ZM will be broken.	This message appears to inform the user that the data in ZM-62E will be broken by transferring the font data (the size which is larger than the present data) from a memory card to ZM-62E. (The [OK] switch continues the transferring. The [Cancel] switch stops transferring.)
Undefined Error occurred.	The error occurred due to some cause other than the above mentioned.

Comm. Para.

When the [Comm. Para.] switch (3.) on the "Main Menu" is pressed, the following "Comm. Param." is displayed.

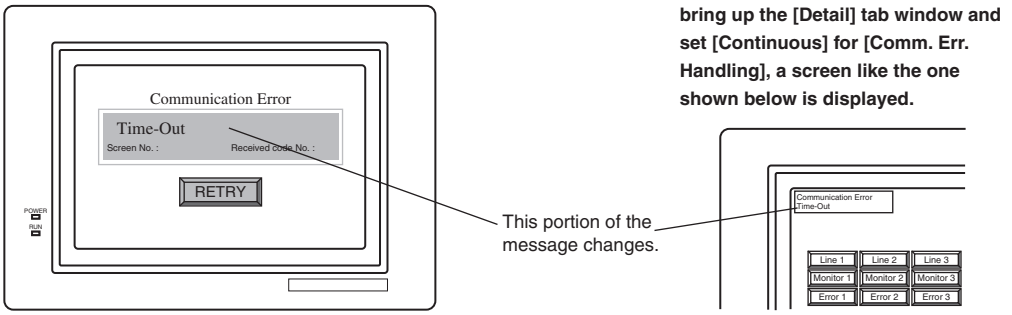
This screen is to show the setting of communication parameter of ZM-62E.



2 Errors Caused on the ZM-62E

Communication Error

The followings are the errors which are often caused on the ZM-62E.
About any other errors except these errors, refer to 'Appendix 3 Error' in "ZM-71SE Instruction Manual (Function)."



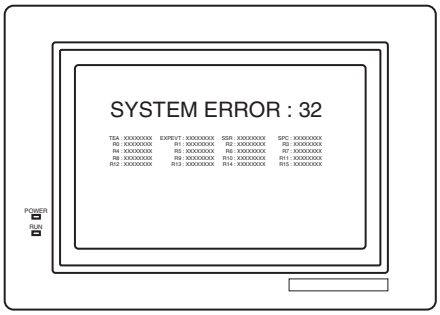
*** When you go to [Comm. Parameter], bring up the [Detail] tab window and set [Continuous] for [Comm. Err. Handling], a screen like the one shown below is displayed.**

Message	Contents	Solution	Remarks
Time-Out *	Although a request is sent for transmission to the PLC, an answer is not returned within the required amount of time.	1) Check the communication parameter. 2) Check the cable and wiring.	A
		3) Data may be disrupted because of noise. Fix noise.	B
Error code received	An error code was sent to the link unit by the CPU of the PLC.	Solve the problem by examining the CPU error code.	
Check I/F driver (applicable to I/F driver for Simulator)	When sending a communication request to a personal computer (simulator), there is no reply from a personal computer.	If a simulator is not used, transfer the I/F driver for PLC again.	

* If the above error messages are displayed on the ZM-62E without establishing communication between ZM-62E and PLC, test the solution of remark "A."
If the error occurs suddenly in communication, test the solution of remark "B."

System Error

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

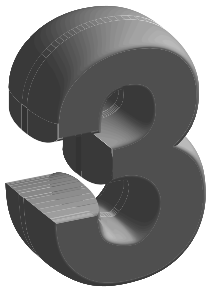


Error : XX

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 (when detecting an error by self-check of RAM)
35	: Inaccurate memory error (when detecting an access to a memory of an inaccurate memory model, e.g. PLC or internal memory etc.)

The source of the error could be one of the following three problems.

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



Editing & Converting Screen

1. Screen Editing of ZM-62E
2. ZM-61E -> ZM-62E Conversion

1 Screen Editing of ZM-62E

ZM-62E is developed as a higher-level model that replaces ZM-61E.

Concerning the items to be taken into consideration when converting the ZM-61E data to ZM-62E screen data, refer to "2 ZM-61E --> ZM-62E Conversion."

The following describes the procedure for newly creating the screens using ZM-62E.

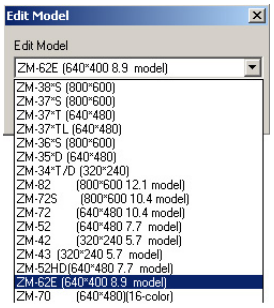
Setting Procedure

A new ZM-62E screen will be created according to the following procedure.

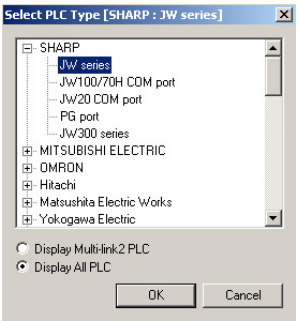
1. Start ZM-71SE (Ver.1.3.0.0 or later), and click the [New] icon, or select [New] from the [File] menu.

Or

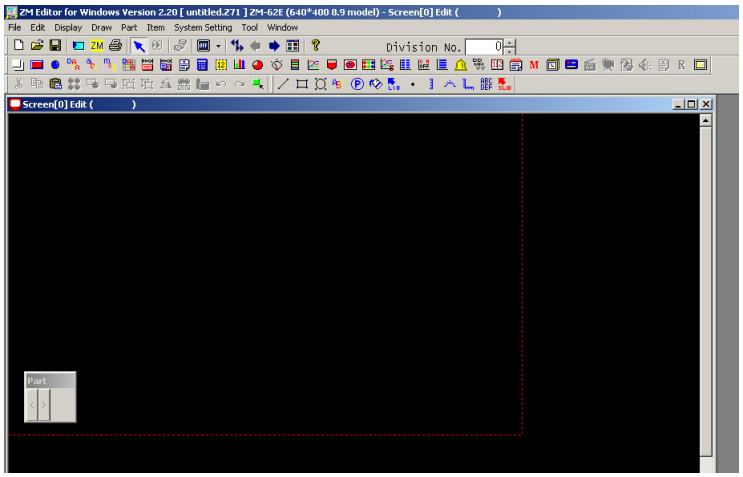
2. The [Edit Model] dialog is displayed.
   Select [ZM-62E (640*400 8.9 model)], then click [OK].



3. The [Select PLC Type] dialog is displayed. Select a PLC model, then click [OK].
   According to the selected PLC model, the [Comm. Parameter] dialog may be displayed. After checking the setting, click [OK].



4. The [Screen [0] Edit] window is displayed. Start screen editing.



Restrictions on Creating New Screens with ZM-62E

When creating a screen newly using ZM-62E, restrictions indicated below should be taken into consideration.

◆ Screen memory

About 760k bytes (could increase according to the font to be used)

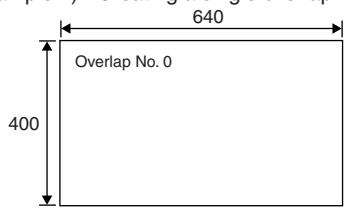
Expansion of memory size is not allowed.

◆ Overlap size

Although up to 3 overlaps can be displayed simultaneously on a screen, data size for overlapping is limited.

Total data size of overlaps is 256,000 bytes.

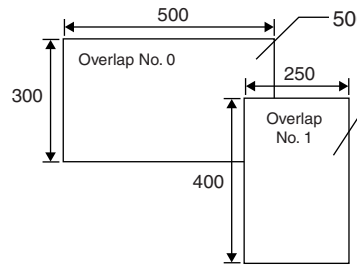
Example 1) Creating a single overlap



640 x 400 = 256,000 <= 256,000

* Displaying other overlaps is not possible.

Example 2) Creating two overlaps



500 x 300 = 150,000

250 x 400 = 100,000

150,000 + 100,000 = 250,000 <= 256,000

* Another overlap of up to 6,000-byte size may be registered.

*** When a total data size of overlaps displayed in one screen exceeds the limit indicated above, error message "Data has some error Error:54" is displayed in ZM-62E and communication with a PLC is disabled. Always observe the limit of the data size when creating overlaps.**

<Example> Error : 54 (17 : 3)

Screen No.3 (a number within the item)

Screen (an item number)

Memory size of overlaps are too large.

◆ Display colors

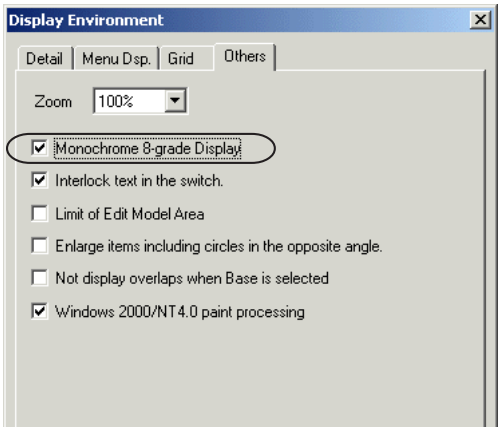
ZM-62E has only two colors - black and orange yellow.

The relationship between the color setting at the editor and displayed color on ZM-62E is indicated in the table below.

Software setting / Hardware	ZM-71SE (Default)		ZM-71SE Setting of [Display: Reversed image] ([Unit Setting] --> [Backlight])	
	Black	Other than black	Black	Other than black
ZM-62E	Black	Orange yellow	Orange yellow	Black

Create a screen taking the relationship above into consideration.

* **It is possible to check the display image using the screen editor.**
Select [Display Environment] from the [Display] menu.
In the [Display Environment] dialog, click the [Others] tab window.
Check the [Monochrome 8-grade Display] and click [OK].



Display colors on the screen are set as shown below with the setting above.

Software	[Display Environment]	ZM-71SE (Default)		ZM-71SE Setting of [Display: Reversed image] ([Unit Setting] --> [Backlight])	
	[☐Monochrome 8-grade Display]	Black	Other than black	Black	Other than black
	[☑Monochrome 8-grade Display]	Black	White	Black	White
Hardware	ZM-62E	Black	Orange yellow	Orange yellow	Black

2 ZM-61E -> ZM-62E Conversion

CONSIDERATIONS ON HARDWARE

When you replace ZM-61E with ZM-62E, note the following points.

Item \ Model	ZM-61E	ZM-62E	Countermeasures
Effective display area	8.9"	8.9"	—
Panel cutout dimensions	277 W x192 H mm	277 W x192 H mm	—
Display device	ZM-61E : EL	High-intensity EL	—
Resolution for touch switches	20 (horizontal) x 10 (vertical) switches (Matrix type)	40 (horizontal) x 20 (vertical) switches (Matrix type)	—
External I/O terminals	With RUN, STOP and BZ terminals	RUN, STOP and BZ terminals are not available.	None
RS-422 terminal	Available	Not available	Use terminal converter ZM-1TC.
D-sub 15-pin connector (For direct connection to Mitsubishi A/Q/FX CPU)	—	Not available Direct connection to CPU is possible using standard D-sub 25-pin connector	—
Screen data transfer cable	Connected to D-sub 25-pin connector. ZM-60C	Connected to modular jack. Accordingly, the cable prepared for ZM-61E cannot be used.	Use screen data transfer cable ZM-61E.
Printer port	Centronics 14-pin connector Standard printer cable for PC-9801 is used.	Half-pitch 36-pin connector Accordingly, the printer cable prepared for ZM-61E can not be used.	Use printer cable ZM-80PC.
Barcode reader connection	None	Connected to the modular jack.	Use barcode reader cable ZM-80BC.

Item \ Model	ZM-61E	ZM-62E	Countermeasures
Memory card function	—	—	Use card recorder ZM-1REC.
Protective screen filter	[0JUGSSHETZ61E]	[0JUGSSHETZ61E]	—
Water-proof screen filter	[0JUWPSHETZ61E]	[0JUWPSHETZ61E] (Complies with IP64)	—

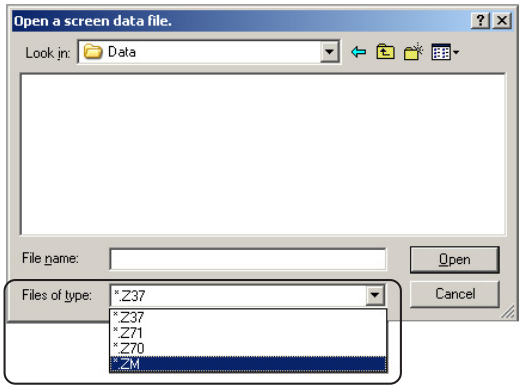
CONSIDERATIONS ON SOFTWARE

Converting Procedure

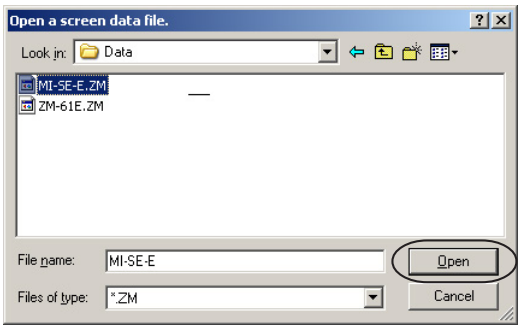
1. Start ZM-71SE (Ver.1.3.0.0 or later), then click the [Open] icon, or select [Open] from the [File] menu.

Or

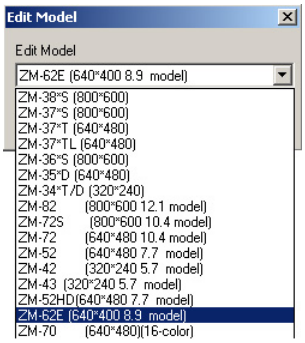
2. The [Open a screen data file] dialog is displayed.
   Change the [Files of type] to [*.ZM].



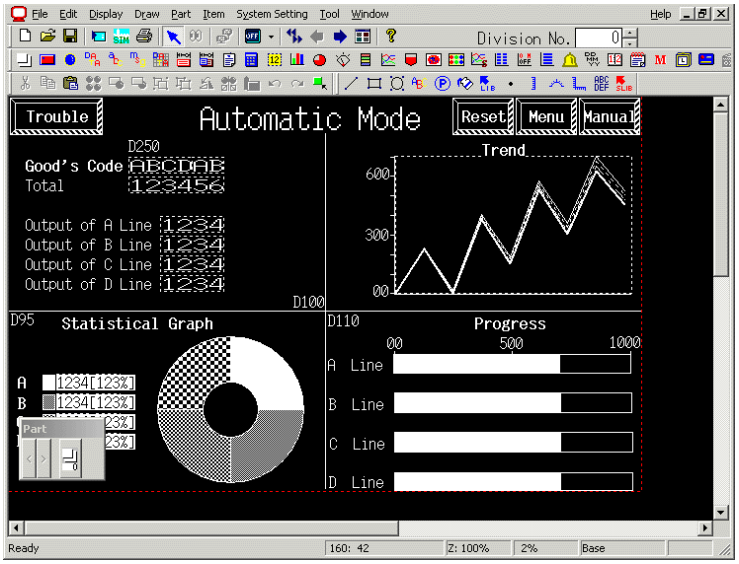
3. The ZM-61E screen data files are displayed in this dialog.
   Specify the ZM-61E screen data file to convert, and click [Open].



4. The [Edit Model] dialog is displayed.
   Select [ZM-62E (640*400 8.9 model)], then click [OK].



5. The screen edit window is displayed.
   ZM-61E screen converted for ZM-62E is displayed.



Cautions on conversion

Conversion contents are largely classified into three categories when converting the ZM-61E screen data into the data for ZM-62E.

- ◆ ZM-61E compatible functions implemented by ZM-71SE Ver. 1.3.0.0
- ◆ Data converted as ZM-61E compatible data
- ◆ Functions that cannot be converted as ZM-61E compatible data (as of ZM-71SE Ver. 1.3.0.0)

Described below are cautionary items to be taken into consideration for each conversion content.

ZM-61E Compatible Functions Implemented by Ver. 1.3.0.0

With the introduction of ZM-71SE Ver. 1.3.0.0, several ZM-61E compatible functions are added. Conversion of the items below, which could not be converted using the previous editor version, are now made possible.

Item \ Model	ZM-61E	ZM-71SE Ver. 1.3.0.0 or later
Continuous buzzer sound	The buzzer keeps sounding while read area n, bit 10 is ON.	Possible By checking [Use continuous buzzer sound] in the [Environment Setting] tab window of [Unit Setting]
Overlap bit command	Overlap is displayed while read area "n+1", bit 12 is ON. (The overlap is kept displayed even if the display is changed.)	Possible By checking [Display an overlap be level of ON bit] in the [Environment Setting] tab window of [Unit Setting] With check mark : Same operation as ZM-61E. Without check mark : Bit 12 setting is recognized at the signal edge. (Even if the bit is set ON, the overlap is cleared when the display is changed.)

Item \ Model	ZM-61E	ZM-71SE Ver. 1.3.0.0 or later
Numerical data display	In the case of overflow, lower digits are displayed. Example: D100 = D1234 4-digit display: 1234 2-digit display: 34	Possible By checking [Num. Display: displays the significant figures when overflowing] in the [Environment Setting] tab window of [Unit Setting] With check mark : Same display mode as with ZM-61E. Without check mark : Display is given in the manner shown below. 4-digit display: 1234 2-digit display: --
Numerical data display	In the setting of [Code: BCD], display at the ZM-61E is as shown below. PLC side 0 to 9 / ZM-61E side 0 to 9 A . B : C - D + E (space) F (space)	Possible By checking [Num. Display: displays special characters instead of A to F in BCD] in the [Environment Setting] tab window of [Unit Setting] With check mark : Same display mode as with ZM-61E. Without check mark : “A” - “F” are always displayed in “0.”

<table>
<tr><th>Item \ Model</th><th>ZM-61E</th><th>ZM-71SE Ver. 1.3.0.0 or later</th></tr>
<tr><td>Character 1/
Character 2</td><td>Usage differs between Character 1 display and Character 2 display.

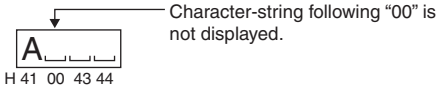
<Character 1 display>
• 1-byte characters and 2-byte characters are distinguished.
• For 1-byte characters, NULL code is processed as indicated below.

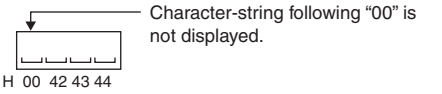
D100 = H0041
D101 = H4443
 

D100 = H4200
D101 = H4443
 

• 2-byte characters are displayed in JIS code.</td><td>Conversion is made in [Char. Display].
Compatibility to character display on ZM-61E is possible by checking [JIS/ASCII] of the [Detail] tab window.

<Character 2 display: ☐ JIS/ASCII>
• Unlike ZM-61E, NULL code is processed as indicated below.

• Compatible with JIS code

<Character 1 display: ☑ JIS/ASCII>
• In case of [◉ 1-byte]
Same display as ZM-61E
Same NULL code processing
• In case of [◉ 2-byte]
Display 2-byte characters in the same JIS code as ZM-61E</td></tr>
<tr><td>Character entry mode</td><td>Continuous entry of characters is permitted even after pressing the [ENT] key.</td><td>Possible
By checking [Clear characters when cursor is on the 1st character in Entry Mode] in the [Environment Setting] tab window of [Unit Setting]</td></tr>
<tr><td>Calendar display</td><td>Message representing day of week is registered in message edit</td><td>Possible
Calendar is converted as [Calendar parts] and the message in the message edit is automatically copied to and registered in the [Week] tab window in the calendar parts.</td></tr>
<tr><td>Bar code reader</td><td>[Read Data] to be entered in the memory address set for [I/F Memory] of [Bar Code Setting] is “word units.”</td><td>Possible
By checking [Output the number of data read by a bar-code reader by words] in the [Environment Setting] tab window of [Unit Setting]
With check mark : Same display as ZM-61E.
Without check mark : To be output in byte units.</td></tr>
</table>

Data converted as ZM-30 (ZM-61E) compatible data

There are notes on converting ZM-30 (ZM-61E) to ZM-42/43/52/72/82 in some functions that are possible in ZM-71SE before adding ZM-62E to ZM-42/43/52/72/82 series line up.
Basically, these functions are automatically converted as ZM-30 (ZM-61E) compatible functions.

Item \ Model	ZM-30 (ZM-61E)	ZM-** (ZM-62E)
Read/Write Area	—	Possible [Main 1] tab window of [Comm. Parameter] Check [Read/Write Area ZM-30 (ZM-61E) Compatible].
Background of screen	• Screen with only background color • Screen with only background graphics • Screen with both background color and graphics	--> Converted as unregistered screen --> Converted as a screen with a graphic call --> Converted as a screen with a background color and a graphic call
Overlap	• Normal No items are registered in a screen except an overlap in DIV0. • Other items except an overlap are registered in other DIV, or an overlap is not registered in DIV0.	--> An overlap is registered in the same number of a multi-overlap edit as one of a screen in ZM-30 (ZM-61E) automatically. --> An overlap is registered as a normal overlap in a screen.
Switch/Lamp	[Frame type: graphics]	[Graphic Call] is automatically set on the screen for creating/editing switch/lamp parts.
Switch	[Switch Memory] of the following [Function]: [Normal] [Block] [+/- Block] [Mode] [Bit Operation]	--> Converted to [Output Memory].
Relay mode	• DIV0 • DIV1 • DIV2 • DIV3	--> Converted to [Relay Info. Output] as Write Area n+5. --> Converted to [Relay Info. Output] as Write Area n+8. --> Converted to [Relay Info. Output] as Write Area n+11. --> Converted to [Relay Info. Output] as Write Area n+14.
Tenkey mode	—	Entry mode • The contents of [Command Memory] are the same as that of ZM-30 (ZM-61E). • Write Area n+2 is automatically specified for [Info. Output Memory]. • Characters in a keypad [0] to [9] and [.] are converted to the drawing characters on a screen. [0] to [9] and [.] are also stored in [Char. Entry] in the [Switch] dialog in 1-byte character. The characters within the switch are placed off the screen so that they do not cover the drawing characters.

<table>
<tr><th>Item \ Model</th><th>ZM-30 (ZM-61E)</th><th>ZM-** (ZM-62E)</th></tr>
<tr><td rowspan="5">Tenkey mode</td><td>[Type: Direct]</td><td>• [Type: Direct]
• For numerical displays on a screen, [Display Function: No] is set.</td></tr>
<tr><td>[Type: Indirect]</td><td>• [Type: Data Display]
• [Target Memory: Output Memory]
• [Input Item Select: External]
• [ZM-30 (ZM-61E) Compatible: (checked)]
When there is no overlap, "4" is set. When there is an overlap, the DIV No. for the overlap of ZM-30 (ZM-61E) is set.
• For numerical displays on a screen, [Display Function: Entry Target] is set. The number of [Order] is converted automatically as shown below.
<table>
<tr><th colspan="2">ZM-30 (ZM-61E)</th><th>ZM-** (ZM-62E)</th></tr>
<tr><th>DIV No.</th><th>Data No.</th><th>Order</th></tr>
<tr><td>0</td><td>0 to 31</td><td>0 to 31</td></tr>
<tr><td>1</td><td>0 to 31</td><td>32 to 63</td></tr>
<tr><td>2</td><td>0 to 31</td><td>64 to 95</td></tr>
<tr><td>3</td><td>0 to 31</td><td>96 to 127</td></tr>
</table></td></tr>
<tr><td>[Type: Block]</td><td>• [Type: Block]
• [Target Memory: Output Memory]
• [Input Item Select: Internal]
• [ZM-30 (ZM-61E) Compatible] cannot be specified (but checked).
• The settings of tenkey blocks are set in DIV4 as settings for [Data Block Area] mode.
[Data Block Area] mode
· [Division No: 4]
· [Command: Internal]
· [Initial Block/Min. Block: (Set the number of [Start].)]
· [Max. Block: (Set the number of [End].)]
· [Item Select: (unchecked)] (Set if necessary.)
· [ZM-30 (ZM-61E) Compatible: (checked)]</td></tr>
<tr><td>[Type: Block Direct]</td><td>• [Type: Block]
• [Target Memory: Direct]
• [Input Item Select: Internal]
• [ZM-30 (ZM-61E) Compatible] cannot be specified (but checked).
• The settings of tenkey blocks are set in DIV4 as settings for [Data Block Area] mode.
[Data Block Area] mode
· [Division No: 4]
· [Command: Internal (same as ZM-30 (ZM-61E)]
* When [Command: External] is set, the address of [Block No. Read Mem.] is the same as of [Command Memory] in [Entry] mode.
· [Item Select: (checked)]
* Specify the same number as [Command Memory] n+1 and choose [2] words.
· [ZM-30 (ZM-61E) Compatible: (checked)]</td></tr>
<tr><td>[Type: Multi]</td><td>• [Type], [Target Memory], [Input Item Select] and [ZM-30 (ZM-61E) Compatible] are set same as that in case of [Type: Block Direct].
• The settings of tenkey blocks are the same as that of [Data Block Area] mode in case of [Type: Block Direct].
* When [Command: External] is set, the address of [Block No. Read Mem.] is the same as of [Command Memory] in [Entry] mode. When the overlap containing the keypad is stored in another screen (= multi-overlap is used), [Block No. Read Mem.] is temporarily set in [$u4000]. Be sure to change it from [$u4000] to the address of [Command Memory].</td></tr>
</table>

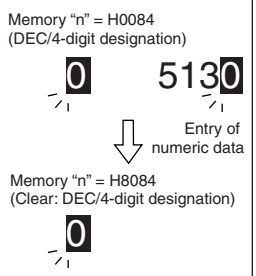
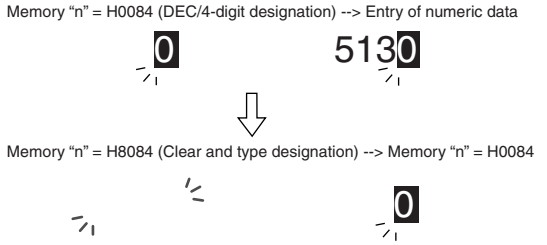
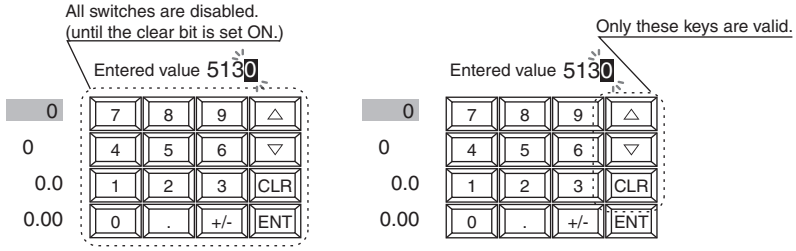
Item \ Model	ZM-30 (ZM-61E)	ZM-** (ZM-62E)
Character Entry mode	—	Entry mode • [Type: Data Display] • [Command Memory: (same as [Memory] in ZM-30 (ZM-61E)] • [Info. Output Memory: (converted to Write Area n+2)] • [Target Memory: Direct] • [Input Item Select: Internal] • [Detail] tab window [Use Graphic] • For character displays on a screen, [Display Function: Entry Target] is set.
Statistics graph mode	—	• The DIV No is converted as follows. • For [Result Display: checked], the numerical display [Display Function: No] is set in the same DIV No. as that of a statistics graph. [Memory] of each numerical display is the same as [Memory] of the graph. • For [% Display: checked], the numerical display [Display Function: Display Statistics Graph %] is set in the same DIV No. as that of a statistics graph.

Incompatible Functions after Conversion

There are functions for which compatibility with ZM-30 (ZM-61E) cannot be maintained after converting to ZM-** (ZM-62E).

The following describes these functions

Item \ Model	ZM-30 (ZM-61E)	ZM-** (ZM-62E)
General-purpose serial communication	General-purpose serial communication protocol, special to ZM-30 (ZM-61E), is used.	Impossible Since the general-purpose communication protocol, special to ZM-** (ZM-62E) series, is used, the protocol is not compatible.
Communication parameter	Baud rate 1200 and 2400 bps are available.	Impossible Both baud rates are automatically converted to 4800 bps.
Display characters	Characters to be displayed are not influenced by “Enlarge X/Y” setting.	When an even value is set for “Enlarge X/Y,” such characters are automatically displayed in 32-dot font. Accordingly, displayed image will somewhat differs from the characters displayed at ZM-30 (ZM-61E).
Overlap [Type: Multi]	Memory “n”: Indicates the screen No. where the displayed overlap is registered. When the overlap is cleared, the screen No. entered last remains in memory “n.”	Memory “n”: The number in the [multi-overlap] in which the displayed overlap is registered. When the overlap is cleared “-1” (= HFFFF) is set in memory “n.”
Character-string of switch/memory	Character-strings are created in graphics.	Character-strings are converted as graphics. They are not converted as character-strings in the [Switch] (or [Lamp]) dialog.

<table>
<tr><th>Item \ Model</th><th>ZM-30 (ZM-61E)</th><th>ZM-** (ZM-62E)</th></tr>
<tr><td>Numeric key mode
[Type: Direct Command]</td><td>Memory “n”:
Clear (bit 15)
The write flag and displayed value of numeric data entry are cleared at the timing this bit is turned ON (0 --> 1).
 
</td><td>Input mode [Command Memory]: n
Clear (bit 15)
When this bit is turned ON, the write flag is cleared, and the display of entered data itself is also cleared.
Entry is enabled when data type and the digit number, etc. are designated after turning OFF the clear bit (bit 15).
 
</td></tr>
<tr><td>Numeric key mode
[Type: Block Entry]</td><td>Memory “n”:
Clear (bit 15)
After the entry of numeric data using the numeric keypad, the keys are completely disabled.
At the leading edge (0 --> 1) of bit 15, the write flag using the numeric keypad is cleared and the keypad disabled state is canceled.</td><td>Input mode [Command Memory]: n
Clear (bit 15)
After the entry of numeric data using the numeric keypad, entry for the same data item is not allowed. However, since the clear (CL) key is valid, the numeric keypad is enabled by pressing the clear key.
In addition, since the [UP] and [DW] keys are always valid, entry using the numeric keypad is accepted after moving the cursor to the next data entry objective data item.
To enter the data for the same data item continuously, this bit is valid</td></tr>
<tr><td></td><td colspan="2"> 
</td></tr>
<tr><td>Trend graph</td><td>Control Memory
Memory “n” specified by each [0 to 15 tab windows] (“n” exists by the number of display counts)

Graph value memory
Memory “n” (specified by each [0 to 15 tab windows]) + 1</td><td>Control Memory
Only “memory n” specified by No. 0 of graph at ZM-30 (ZM-61E)
(All graph broken lines are controlled by memory “n”)
* It is not possible to gain the totally identical control as ZM-30 (ZM-61E).
Graph value memory
Memory “n” (specified by each [0 to 15 tab windows]) + 1</td></tr>
<tr><td>Sampling
(Bit / Data / Trend)</td><td>During scrolling in the sampling data area using the [Roll Up]/[Roll Down] /[Plus Block]/[Minus Block] switch, nothing is displayed in the display area.</td><td>During scrolling in the sampling data area using the [Roll Up]/[Roll Down]/[Plus Block]/[Minus Block] switch, the cursor is displayed and the data currently selected can be recognized.</td></tr>
</table>

<table>
<tr><th>Item \ Model</th><th>ZM-30 (ZM-61E)</th><th>ZM-** (ZM-62E)</th></tr>
<tr><td>Sampling
(Trend)</td><td>Count value is displayed only at ZM.

Count of the zero position is displayed at the lower left area of the graph.</td><td>Numeric values [Display Function: Sample Count Display], [Digits: 3] and [Char. Type: 1/4] are set at the lower left area of the graph.

The current count is displayed.</td></tr>
<tr><td>Sampling
(bit)</td><td>A space of 1-byte character size is provided between the display in the area and the message.</td><td>A space of four 1-byte character size is provided between the display in the area and the message.</td></tr>
<tr><td>Memory card mode</td><td>Card No.
/Card name
/File name
/Record name edit
Edited and entered No./ name are once stored in the PLC memory.</td><td>Card No.
/Card name
/File name
/Record name edit
Impossible
Since No./name is directly written in the memory card, nothing is stored in the PLC memory.</td></tr>
<tr><td></td><td>Switch [Action]
• [File Select]
• [Record Select]
• [Selection Complete]

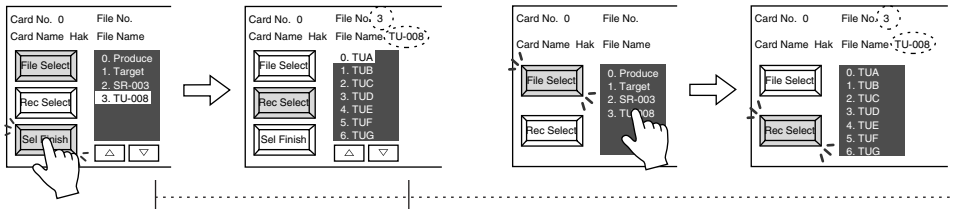
To select a file/record in the card, follow either of the procedures below.
[File Select] -> (1) [Selection Complete] -> (2) [Selection Complete], or [Record Select] -> [Selection Complete]</td><td>Switch [Function]
-> [File Select]
-> [Record Select]
-> (None)

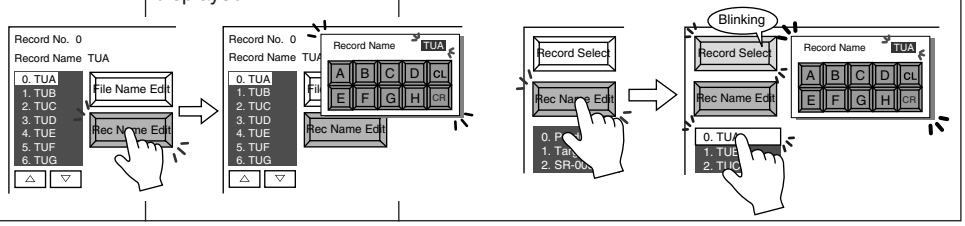
To select a file/record in the card, follow either of the procedures below.
[File Select] -> (1)(2) (Press the display area)
[File Select] -> [Record Select] -> (Press the display area)

The operation “press the display area” is used instead of pressing the [Selection Complete] at ZM-30 (ZM-61E).</td></tr>
<tr><td></td><td>Switch [Action]
• [File Name Edit]
• [Record Name Edit]

Press [File Name Edit] or [Record Name Edit] after selecting a file or a record, and the multi-overlap for which the character entry mode is set is displayed.</td><td>Switch [Function]
-> [File Name Edit]
-> [Record Name Edit]

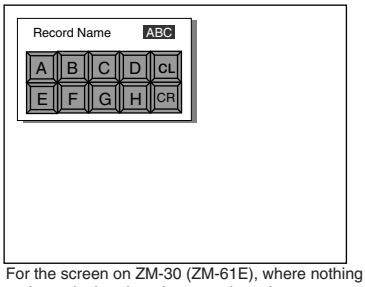
Select a file or a record after turning ON the [File Name Edit] or [Record Name Edit] switch, and the multi-overlap for which the entry mode is set is displayed.</td></tr>
</table>



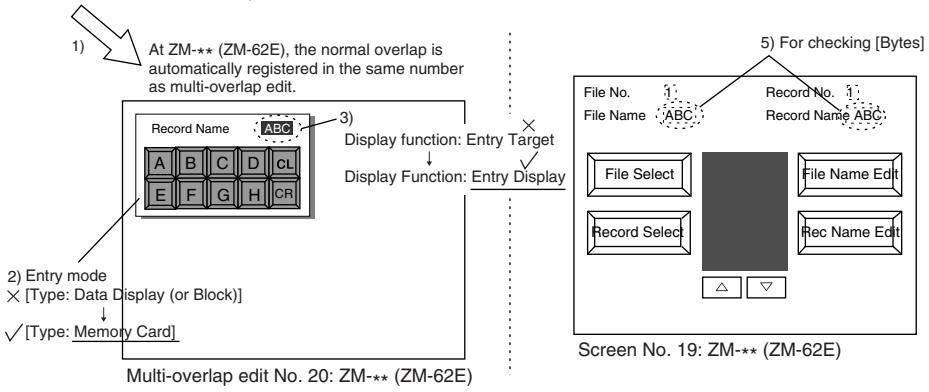


Item \ Model	ZM-30 (ZM-61E)	ZM-** (ZM-62E)
Editing No./name in the memory card mode	• Multi-overlap is always used. • Editing is impossible unless [Memory] bit 12 of the numeric keypad entry mode/character entry mode for No./ editing is set ON. • An overlap is deleted when the [ENT] key is pressed and the card No. or the card name /file name/record name is entered	In the state after conversion, converted data cannot be used as it is. Take the following into consideration. 1) In the state the normal overlap for [Type: Multi] is registered in the screen, the overlap is transferred to the same area of the screen No. of [multi-overlap edit]. 2) The entry mode on the overlap is always changed to [Type: Memory Card]. 3) [Num. Display] parts or [Char. Display] parts of [Display Function: Entry display] are always set in the same DIV as the entry mode on the overlap. 4) If [Data Block Area] is set on the overlap, it is deleted since it is unnecessary. 5) Name display parts are automatically converted in [Bytes: 3]. Therefore, setting should be changed if necessary. The memory card mode operates normally by the setting indicated above. * [Command Memory] operation in the [Entry] mode is not necessary.

Screen No. 20: ZM-30 (ZM-61E)



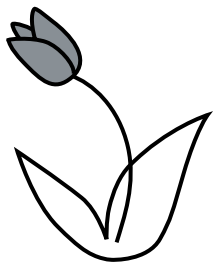
For the screen on ZM-30 (ZM-61E), where nothing is registered other than the normal overlap.



Multi-overlap edit No. 20: ZM-** (ZM-62E)

Screen No. 19: ZM-** (ZM-62E)

MEMO



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