KEYENCE

**Touch Panel Display
VT3 Series**

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/
Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A)/V7R

Hardware Manual

● Hardware Installation and Operation

Chapter	
Chapter 1	BEFORE USING VT3 SERIES
Chapter 2	SPECIFICATIONS
Chapter 3	INSTALLATION
Chapter 4	OPERATION & UNIT FUNCTIONS
Chapter 5	SYSTEM MODE
Chapter 6	PERIPHERALS
Chapter 7	KL LINK
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	APPENDIX

Preface

This Manual describes how to install and set up the Touch Panel Display VT3 Series hardware.
Before you start to use the Touch Panel Display VT3 Series, be sure to thoroughly read this document in order to fully understand the functions of the Touch Panel Display VT3 Series and VT STUDIO. Please keep it in hand for use.
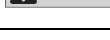The "Touch Screen Display VT3 Series" User's Manual totally include 4 copies (including this manual), please read them all.

Name	Description
VT3 Series Reference Manual	Describes how to operate and configure settings for VT STUDIO when used with VT3 SERIES TOUCHSCREEN DISPLAY.
VT5 Series Reference Manual	Describes how to operate and configure settings for VT STUDIO when used with VT5 SERIES TOUCHSCREEN DISPLAY.
VT3 Series Hardware Manual	This manual. Describes how to install and configure settings for VT3 SERIES TOUCHSCREEN DISPLAY hardware.
VT5 Series Hardware Manual	Describes how to install and configure settings for VT5 SERIES TOUCHSCREEN DISPLAY hardware.
VT5 Series/VT3 Series/DT Series PLC connection Manual	This manual describes how to connect and configure the VT5SERIES/VT3 SERIES TOUCHSCREEN DISPLAY and the DATA STORAGE TERMINAL DT SERIES with a PLC manufactured by other vendors.
VT Transfer Tool User Manual	Describes how to install, operate and configure settings for VT TRANSFER TOOL.

*All of the manuals listed above are provided on the VT STUDIO DVD.

■ Symbols

This manual uses the following symbols to alert you to important information. Be sure to read these.

⚠ DANGER	**It indicates a hazardous situation which, if not avoided, will result in death or serious injury.**
⚠ WARNING	**It indicates a hazardous situation which, if not avoided, could result in death or serious injury.**
⚠ CAUTION	**It indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**
NOTICE	**It indicates a situation which, if not avoided, could result in product damage as well as property damage.**

▶ Important	**It indicates cautions and limitations that must be followed during operation.**
✎ Point	**It indicates additional information on proper operation.**
Reference	It indicates tips for better understanding or useful information.
📖	Indicates a reference item or page to be referred to in this manual and other manuals.

■ Request

(1) No part of this instruction may be reprinted or reproduced without the prior written permission of KEYENCE CORPORATION.
(2) The contents of this manual are subject to change without notice.
(3) Every effort has been made in preparing this document. If, however, you find any unclear points, errors, omissions or other inconsistencies, please feel free to contact us.
(4) Note that KEYENCE CORPORATION shall not be liable for any influence resulting from operation of the VT series regardless of item (3) above.

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• Pentium is a registered trademark of Intel Corporation.
• Other company names, product names, and model names used in this manual are trademarks or registered trademarks of their respective companies.
• UNLHA32. DLL are free software supplied by Mr. Micco.

■ Licenses for software used by this product.

This document describes the license information of the software used by this product.
[libjpeg]
"This software is based in part on the work of the Independent JPEG Group".

Safety Precautions

■ General Precautions

- Do not use this product for the purpose to protect a human body or a part of human body.
- This product is not intended for use as explosion-proof product. Do not use this product in hazardous location and/or potentially explosive atmosphere.
- At startup and during operation, be sure to monitor the functions and performance of the Product.
- We recommend that you take substantial safety measures to avoid any damage in the event that a problem occurs.
- Do not modify the Product or use it in any way other than described in the specifications. The functions and performance of products used or modified in this way cannot be assured.
- When the Product is used in combination with other instruments, functions and performance may be degraded, depending on operating conditions and the surrounding environment.
- The rapid variation of temperature is not allowed in all equipments including external devices. Doing so might cause condensation which may cause the instrument or device to malfunction.
- Please keep the cable away from high-voltage lines or electricity transmission lines as practically as possible. Noise from power lines and high-voltage lines may cause the Product to malfunction.
- Fine dots (black dots or bright dots), color changes from outside view, uneven brightness, blinking or cross talk (appearance of unintended lines or stripes) can occur on the LCD panel. However, these are not defective or trouble products.
- Do not continuously display the same screen for a long time. Doing so might cause a residual image to appear due to the characteristics of the LCD panel.

⚠ WARNING	**Please make use of touch panel (touch switch) and do not attempt to make switches with safety functions.** **In addition, please take measures to avoid mistaken operations of touch panel (touch switch) during system design.**
NOTICE	• **Do not touch the touch panel or touch switches with a sharp-pointed object such as a pen or screwdriver. Otherwise, damage might be caused.** • **Do not subject the touch panel (touch switches) to shock or impact, or touch them with more than necessary force.** **Otherwise, damage might be caused.** • **Do not clean it with diluents and organic solvents. Doing so might damage the display. When wiping the display, use a soft cloth moistened with watered down neutral detergent.** • **Do not copy copyrighted fonts and image data onto this unit for use as this infringes on the copyright.**

■ About CE Marking and UL Certificate

For details on precautions for CE marking and for UL Certificate, refer to 📖 "3-1 Operating Environment".

MEMO

How This Manual Is Organized

Chapter1	**BEFORE YOU START USING VT3 SERIES**	This chapter describes how to check the contents of the package, a brief outline of the product, and information that you need to know before you start using VT3 Series.
Chapter2	**SPECIFICATIONS**	This chapter describes the names of parts on the VT3, and its specifications, and provides external dimensions.
Chapter3	**INSTALLATION**	This chapter describes precautions when installing the VT3 series.
Chapter4	**OPERATION & UNIT FUNCTIONS**	This chapter describe the functions of VT3.
Chapter5	**SYSTEM MODE**	This chapter describes the System mode, the mode for making the basic setup.
Chapter6	**PERIPHERALS**	This chapter describes information about the equipment connected with VT3 series.
Chapter7	**KL LINK**	This chapter describes how to execute a KL link using the VT3 series.
Chapter8	**ETHERNET**	This chapter describes functions, setup and troubleshooting when using the VT2-E1/E2, VT3-E3 to connect the VT3 to a network.
Chapter9	**SPECIAL OPERATION SCREEN**	This chapter describes how to call system mode screen etc. incorporating special operational steps.
Chapter10	**MAINTENANCE & INSPECTION**	This chapter describes maintenance and inspection on the unit, how to replace the LCD backlight and protective sheet, and other useful information.
A	**APPENDIX**	This chapter describes how to remedy errors that may occur on the VT3 series and errors that are displayed.

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A

CONTENT

Chapter 5 SYSTEM MODE

Chapter 6   PERIPHERALS

Chapter 8 ETHERNET

Chapter 9 SPECIAL OPERATION SCREEN

Chapter 10 MAINTENANCE & INSPECTION

APPENDIX

Conventions Used In This Manual

The following shows how pages are configured, and the symbols and terminology used in this manual.

Terminology

This manual uses the following terminology excluding some instances.

Term	Description
PLC	Programmable controllers made by various manufacturers that are connected to the Touch Panel Display VT3 series.
PC	Stands for personal computer.
VT3	Touch Panel Display VT 3 series.
VT STUDIO	Refers to the VT5/VT3 SERIES of DESIGN TOOLS, the VT-H6J (Japanese version) and VT-H6G (Global version).
VT2	Touch Panel Display VT2 series.
VT2 BUILDER	Design tool VT2-H1E (VT2-H1) for the VT2 series.
VT1	Touch Panel Display VT series.
VT BUILDER	Design tool VT-H7W for the VT series.

Symbols

This manual uses the following symbols to show menus and buttons.

Symbol	Description
" "	Menu items, which can be selected from the menu bar.
	Window or items names.
	Buttons containing text used for executing operations or canceling in windows.
Ctrl	Keys on the PC's keyboard.

1

BEFORE USING VT3 SERIES

This chapter describes the unpacking inspection, overview and precautions before use about VT3 Series.

1-1 **Unpacking Inspection**

The package contains the following equipment and accessories. Make sure that the package contains everything that it is supposed to contain before use.

VT-H6J (Japanese version)/VT-H6G (Global version)

VT STUDIO system disk
(3 DVDs)

VT3-X15(D)

Unit   Fixtures   Short bar   Instruction Manual
(connected to PORT4)

VT3-S12(D)/S10/V10(D)

Unit   Fxtures   Short bar   Instruction Manual
(connected to PORT4)

VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Unit   Fixtures   Short bar   Instruction Manual
(connected to PORT4)

VT3-W4T(A)/W4M(A)/W4G(A)

Unit   Fixtures   Instruction Manual

Every effort has been made in preparing this package. If, however, some of the parts are defective, damaged or not packaged, contact your agent.

4-channel video input unit (VT3-VD4)

Unit (mounting screws included)   Instruction Manual

1-channel video input unit (VT3-VD1)

Unit (mounting screws included)   Instruction Manual

RGB output unit (VT3-R1)

Unit (mounting screws included)   Instruction Manual

Ethernet unit (VT2-E1)

Unit (mounting screws included)   Instruction Manual

Ethernet unit (VT2-E2)

Unit (mounting screws included)   Instruction Manual

Ethernet unit (VT3-E3)

Unit (mounting screws included)   Instruction Manual

Printer unit (VT2-P1)

Unit (mounting screws included)   Instruction Manual

Printer unit (VT2-P2)

Unit (mounting screws included)   Instruction Manual

External memory slot (VT2-D2)

Unit   Fixtures (2x)   Connecting cable   Modular cable   Instruction Manual

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Every effort has been made in preparing this package. If, however, some of the parts are defective, damaged or not packaged, contact your agent.

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VT3-V6H(G)/Q5H(G)

Unit	Instruction Manual	Shock absorber (only for VT3-V6H/Q5H)

* Additional wall mounts (OP-87176) or VESA mounts (OP-87177) are available.

OP-87171/87172/87173

Emergency-stop switch unit
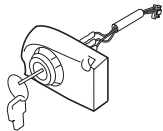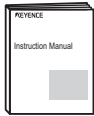
Unit	Instruction Manual	2 screws (M2.5x8)

* Additional button switch protector (OP-87175) is available.

OP-87174

Key-operated switch unit
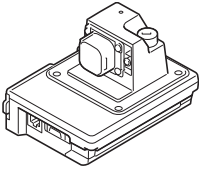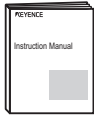
Unit	Instruction Manual	2 screws (M2.5x8)

VT-T1

Puggable connection unit

Unit	Instruction Manual	4 screws (M4x10)

Every effort has been made in preparing this package. If, however, some of the parts are defective, damaged or not packaged, contact your agent.

VT3-V7R

Unit + protectors (2x)

Instruction Manual

A   B+C

Wall mount
+ 6 screws (M4x8)

Nameplate
for cross key

Protective plate for
nameplate

Bracket for cable protector
+ 2 screws (M3x8)

VT3-SW1

Emergency-stop switch unit

Unit

Protectors (2x)

Instruction Manual

7 screws (M3x8)

VT3-SW4

4-position switch unit

Unit + cable(5m)[*1]

Instruction Manual

8 screws (M3x65)

Gaskets for switch
unit (2x)

| Emergency-stop switch: | 1 |
| Lighting switch: | 3 |

A   B

Adjuster A and B
For φ16: 2 sets
For φ19: 2 sets

Cable protector C[*2]

*1 Switch unit cable is connected with the switch unit at factory.
*2 It is connected with the cable at factory.

Every effort has been made in preparing this package. If, however, some of the parts are defective, damaged or not packaged, contact your agent.

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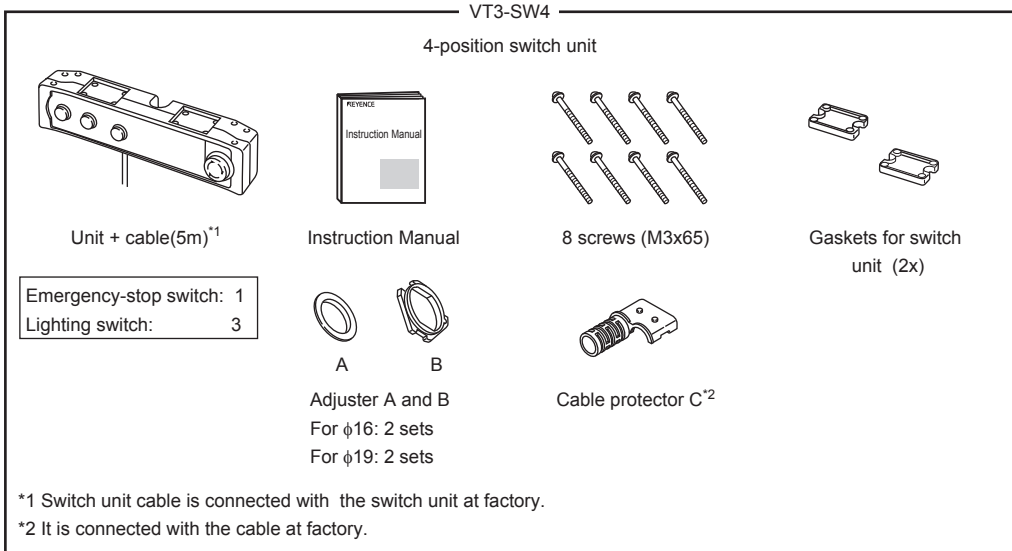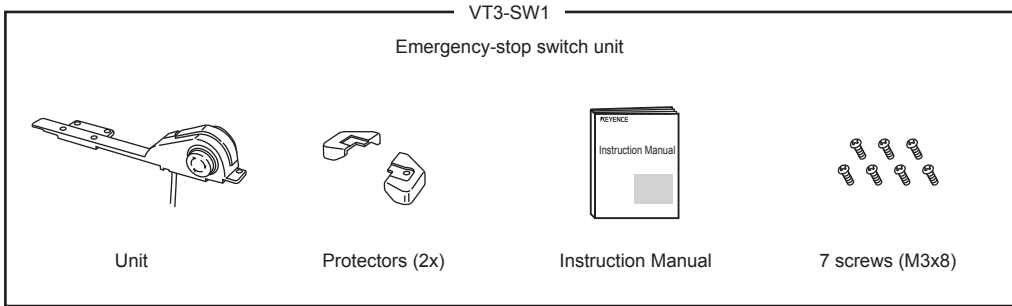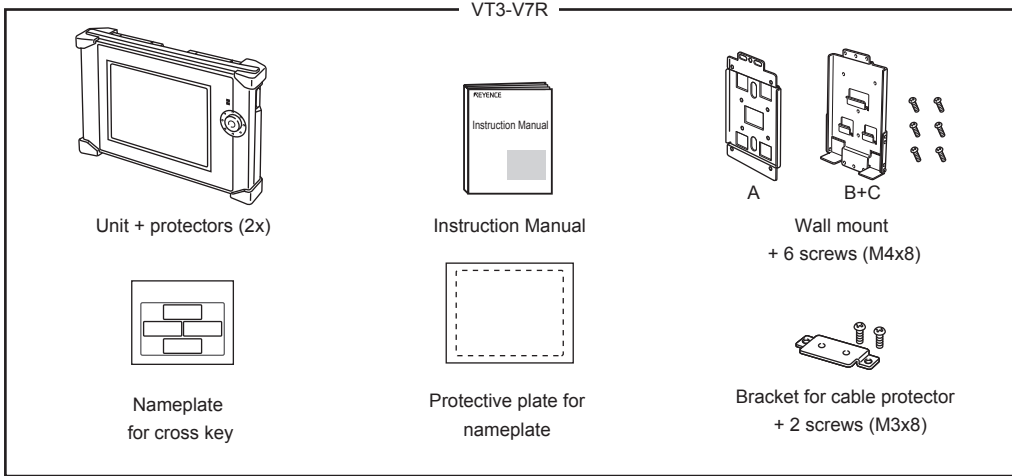
VT3-SW6

6-positition switch unit

Unit + cable (5m)[*1]

Emergency-stop switch: 1
Lighting switch: 5

Instruction Manual

8 screws (M3x65)

Gaskets for switch unit (2x)

A   B

Adjuster A and B
For φ16: 2 sets
For φ19: 2 sets

Cable protector C[*2]

*1 Switch unit cable is connected with the switch unit at factory.

*2 It is connected with the cable at factory.

Every effort has been made in preparing this package. If, however, some of the parts are defective, damaged or not packaged, contact your agent.

This section describes the system configuration with VT3 Series touch panel display and peripheral equipment.

■ **VT3-X15(D)/S12(D)/S10/V10(D)/V8**

VT3-X15(D)/S12(D)/S10/V10(D)/V8

4ch video input unit VT3-VD4[*1]

1ch video input unit VT3-VD1[*1]

Printer unit VT2-P1/P2[*2] Ethernet unit VT2-E1/E2[*2]

RGB output unit[*1] VT3-R1

RGB output[*3]

RGB input (PC etc.)

External camera

Image sensor console connection

Color printer

Thermal printer [*4]

Ethernet unit VT2-E1/E2, VT3-E3[*2]

Router

PLC from other company

PLC from other conmay

Up to 16 units

Memory card

Expansion memory[*5]

Barcode reader

Color printer[*9]

External memory slot VT2-D2

KL slave KL slave KL slave

Up to 128 words

PLC

VT3 series[*8]

VT2 series

VT3 series

Up to 16 units

KV-7500/7300 KV-5500/5000/3000 KV-1000/700

High-speed multi-link unit KV-LM2˚V/KV-LM20[*6]

VT3 series

VT2 series[*7]

Up to 15 units

Thermoregulator Thermoregulator Thermoregulator Thermoregulator

Up to 31 units

Converter/servo etc. Converter/servo etc. Converter/servo etc. Converter/servo etc.

Up to 31 units

PC

VT STUDIO

*1   Only one of VT3-VD4, VT3-VD1 or VT3-R1 can be connected with the unit.
*2   Only one of the VT2-E1/E2, VT3-E3 or VT2-P1/P2 can be connected to the VT3 unit.
*3   Only VT3-X15(D) allows RGB output without VT3-R1.
*4   Thermo-printer can be connected to VT2- E1/VT2- P1.
      Only CBM-293/CT-P293 from CITIZEN SYSTEMS company can be connected.
*5   VT3-V8 is not used.
*6   VT1Series cannot connect. KV-LM20 cannot connect to KV-7000 Series or KV-5000/3000 Series.
*7   VT2 Series cannot connect to KV-7000 Series or KV-5000/3000 Series + KV-LM2*V.
*8   Multi-link connection via VT2 cannot be achieved when MultiTalk function used.
*9   The VT3 System Program must be in Ver. 4.81 or above.

■ **VT3-V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**

VT3-V7/Q5T(W)/Q5S(W)/
Q5M(W)/Q5T(W)A/Q5M(W)A

Printer unit VT2-P1/P2*1
ethernet unit VT2-E1/E2*1

Color printer

Thermal printer*2

Router

Ethernet unit
VT2-E1/E2, VT3-E3*1

PLC from
other company

PLC from
other company

Up to 16 units

Color printer*6

Memory card

Barcode reader

External memory slot
VT2-D2

KL slave   KL slave   KL slave   Up to 128 words

PLC   VT3 series*5   VT2 series   VT3 series   Up to 16 units

KV-7500/7300
KV-5500/5000/3000
KV-1000/700

High-speed multi-link unit
KV-LM2*V/KV-LM20*3

VT3 series   VT2 series*4   Up to 15 units

Thermoregulator Thermoregulator Thermoregulator Thermoregulator   Up to 31 units

Converter/servo etc.i Converter/servo etc. Converter/servo etc. Converter/servo etc.   Up to 31 units

PC   VT STUDIO

*1 One of VT2-E1, VT2-E2, VT3-E3, VT2-P1 or VT2-P2 can be connected with
the unit. VT3-Q5M(W)/Q5M(W)A cannot be connected.
*2 Thermo-printer can be connected to VT2- E1/VT2- P1.
Only CBM-293/CT-P293 from CITIZEN SYSTEMS company can be connected.
*3 VT1 Series cannot connect. KV-LM20 cannot connect to KV-7000 Series or
KV-5000/3000 Series.
*4 VT2 Series cannot connect to KV-7000 Series or KV-5000/3000 Series +
KV-LM2*V.
*5 Multi-link connection via VT2 cannot be achieved when MultiTalk function used.
*6 The VT3 System Program must be in Ver. 4.81 or above.

■ **VT3-V6H(G)/Q5H(G)**

VT3-V6H(G)/Q5H(G)

Key-operated switch unit
OP-87174

Emergency-stop switch unit
OP-87171/87172/87173

128MB   Memory card

Puggable connection unit
VT-T1

PLC from other company*3   VT3 series*4   VT2 series   VT3 series   Up to 16 units

Hub

PLC from
other company   PLC from
other company   Up to 16 units

Color printer*5

KV-7500/7300
KV-5500/5000/3000
KV-1000/700   High-speed multilink unit
KV-LM2*V/KV-LM20*1   VT3 series   VT2 series*2   Up to 15 units

Thermoregulation   Thermoregulation   Thermoregulation   Thermoregulation   Up to 31 units

Converter/servo etc.   Converter/ servo etc.   Converter/servo etc.   Converter/ servo etc.   Up to 31 units

PC   VT STUDIO

*1   VT1 Series cannot connect. KV-LM20 cannot connect to KV-7000 Series or KV-5000/3000 Series.
VT3-V6H (G)/Q5H (G) can only connect to both terminals via wire.
*2   VT2 Series cannot connect to KV-7000 Series or KV-5000/3000 Series + KV-LM2*V.
*3   It cannot be used as VT2 multilink master and only be connected at both ends of the wiring as slave.
*4   Multilink connection via VT2 cannot be achieved,When multi-token function used.
*5   The VT3 System Program must be in Ver. 4.81 or above.

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■ **VT3-W4T/W4M/W4G**

VT3-W4T/W4M/W4G[*1]

PLC from other company

KV-7500/7300
KV-5500/5000/3000
KV-1000/700

Thermoregulation

Converter/servo etc.

VT STUDIO

PC

[*1] MultiTalk function is impossible.

■ **VT3-W4TA/W4MA/W4GA**

VT3-W4TA/W4MA/W4GA[*1]

PLC from other company [*4]　VT3 series　VT2 series　VT3 series　Up to 16 units

KV-7500/7300
KV-5500/5000/3000
KV-1000/700

High-speed multilink unit
KV-LM2*V/KV-LM20[*2]　VT3 series　VT2 series[*3]　Up to 15 uints

Thermoregulation　Thermoregulation　Thermoregulation　Thermoregulation　Up to 31 units

Converter/servo etc.　Converter/servo etc.　Converter/servo etc.　Converter/servo etc.　Up to 31 units

PC　VT STUDIO

[*1]　MultiTalk function is not available.
[*2]　VT1Series cannot connect. KV-LM20 cannot connect to KV-7000 Series or KV-5000/3000 Series.
[*3]　VT2 Series cannot connect toKV-7000 Series or KV-5000/3000 Series + KV-LM2*V.
[*4]　It cannot be used as the master in the VT2 Mult-link.

■ **VT3-V7R**

1

BEFORE USING VT3 SERIES

VT3-V7R[*1]

Emergency-stop switch unit
VT3-SW1

4-position switch unit
VT3-SW4

6-position switch unit
VT3-SW6

128MB

Memory card

PLC from other company[*4]

VT3 series[*5]

VT2 series

VT3 series

Up to 16 units

KV-7500/7300
KV-5500/5000/3000
KV-1000/700

high-speed multi-link unit
KV-LM2[*V]/KV-LM20[*2]

VT3 series

VT2 series[*3]

Up to 15 units

Thermoregulation Thermoregulation Thermoregulation Thermoregulation

Up to 31 units

Converter/ servo etc. Converter/ servo etc. Converter/ servo etc. Converter/ servo etc.

Up to 31 units

PC

VT STUDIO

*1   MultiTalk function is not available.
*2   VT1 Series cannot connect. KV-LM20 cannot connect to KV-7000 Series or
     KV-5000/3000 Series.
     VT3-V7R can only connect to both terminals via wire.
*3   VT2 Series cannot connect to KV-7000 Series or KV-5000/3000 Series +
     KV-LM2*V.
*4   It cannot be used as master in the VT2 Multi-link, and only can be connected
     at both ends of the wiring cable as slave.
*5   Multi-link connection cannot be performed via VT2 when MultiTalk function used.

■ PC connecting cables
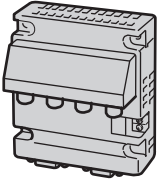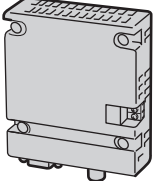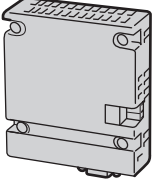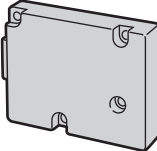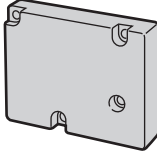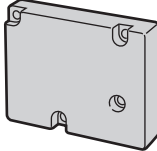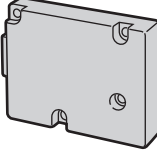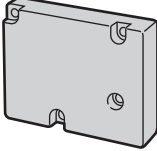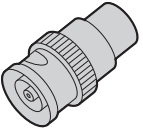
The PC connecting cable varies according to the shape of the ports (USB or D-Sub 9-pin) connected to the PC.

For USB

• Cable...model: OP-35331

OP-35331

USB connector

DOS/V compatible

Port1 (USB) at VT3 side

* External USB port adapter (KV-S2) can be used extended 1m from the panel .

For D-Sub 9-pin connector

• Cable...model: OP-26487
• D-Sub9 connector...model: OP-26486

OP-26486

RS-232C connector

OP-26487

DOS/V compatible

Port1(serial) at VT3 side
(VT3-V6H(G)/Q5H(G)/W4 series excluded)

For Ethernet

Hub

10BASE-T/
100BASE-TX

Ethernet port at
VT2-E1/E2/VT3-E3 side

VT3

+

VT2-E1/E2/
VT3-E3

DOS/V compatible

Crossover cable

(VT3-V7R/Q5M(W)/Q5M(W)A/
W4 series excluded)

VT3-V6H(G)/Q5H(G)

⟍ Point | **After the screen data is transferred to VT3-V6H(G)/Q5H(G)/V7R, ensure the USB cable removed, the panel closed, and the screws tightened. Otherwise, the protective structure (IP65f) cannot be guaranteed.**

1
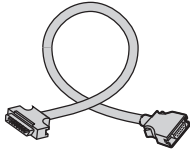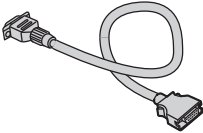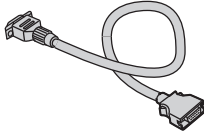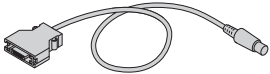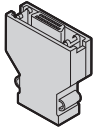
■ **Expansion unit**

4ch video input unit VT3-VD4	1ch video input unit VT3-VD1	RGB output unit VT3-R1
Ethernet unit VT2-E1	Ethernet unit VT2-E2	Ethernet unit VT3-E3
Printer unit VT2-P1	Printer unit VT2-P2	BNC-RCA convertible connector OP-91634

■ **PLC connection**

● **PLC communication cable**
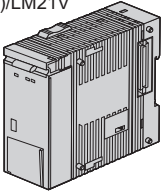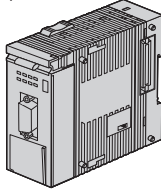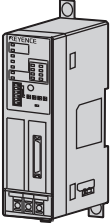
RS-232C link cable (5m) OP-24027 white	RS-422A link cable (5m) OP-24028 black	KZ/KV series direct-connect cable for programmable port (for PORT2) OP-26484(5m) OP-35403(1m)
KV series direct-connect cable for programmable port (for PORT3) * OP-24045(1m) OP-24025(5m)	MITSUBISHI A/FX series direct-connect cable for programmable port MT-C5(5m) MT-C10(10m) MT-C20(20m)	MITSUBISHI FXN series direct-connect cable for programmable port (5m) OP-31096

MITSUBISHI Q series (Q mode) direck-connect cable (5m) OP-51415	Multilink/KL-link cable OP-30591(20m) OP-30592(100m)	VT-L16CA MELSEC A series cable (1m) OP-35376
VT-L16CA SYSMACα series cable (1m) OP-35377	OMRON link cable (5m) OP-86921	Panasonic FP series direct-connect cable for programmable port (5m) OP-86923
Serial I/F connector (20-pin) OP-26275	D-Sub 9-pin convertible connector OP-26486	
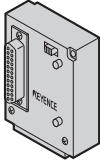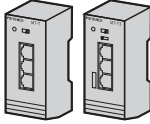
* • When KV Series is connected to PORT3, it must be used together with D-Sub 9-pin convertible connector OP-26486.
 • KZ Series cannot be connected to PORT3.

KZ/ KV series direct-connect cable for programmable port for VT3-W4 series OP-86917(5m) OP-86916(1m)	Mitsubishi FXN series direct-connect cable for programmable port for VT3-W4 series OP-86919(5m) OP-86918(1m)	Mitsubishi Q series (Q mode) Straight cable for VT3-W4 series (5m) OP-86920
Panasonic FP series direct-connect cable for programmable port for VT3-W4 series (5m) OP-86924 Jumper x 1	Omron link cable for VT3-W4 series (5m) OP-86922 Jumper x 1	

● **Multilink unit**
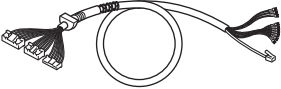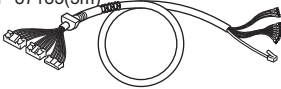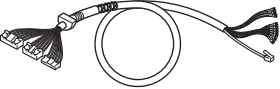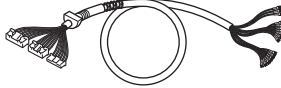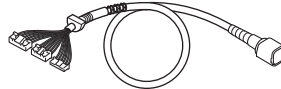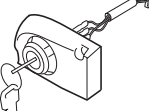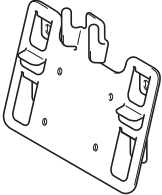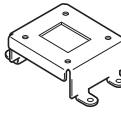
High-speed multilink unit KV-LM20(V)/LM21V	Multi-communication unit KV-L20(V/R)/L21V	Multilink unit for MELSECA series/ SYSMAC α series VT-L16CA

● **2-port adapter**
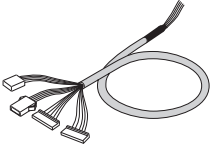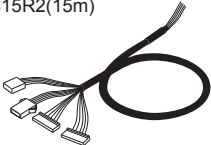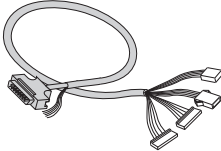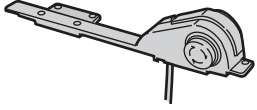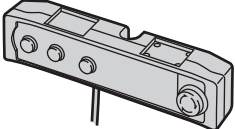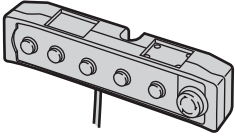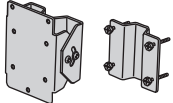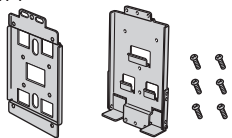
MITSUBISHI A/FX series 2-port adapter MT-T1	KZ series 2-port adapter MT-T2 (KZ-10~80/300/350) MT-T3 (KZ-A500)

* VT3-W4T (A)/W4M (A)/W4G (A) not supported.

1

■ **VT3-V6H(G)/Q5H(G) options**

VT3-V6H(G)/Q5H(G) option KV series direct-connect cable for programmable port OP-87180(3m) OP-87181(5m) 	VT3-V6H(G)/Q5H(G) option MITSUBISHI Q series (Q mode) direct-connect cable for programmable port OP-87182(3m) OP-87183(5m) 	VT3-V6H(G)/Q5H(G) option MITSUBISHI FXN series direct-connect cable for programmable port OP-87184(5m)
VT3-V6H(G)/Q5H(G) option RS-232C/422 connecting cable OP-87185(3m) OP-87186(5m) OP-87187(10m) 	VT3-V6H(G)/Q5H(G) option Ethernet connecting cable OP-87188(3m) OP-87189(5m) OP-87190(10m) 	VT3-V6H(G)/Q5H(G) option RS-232C/422/485/Ethernet connecting cable OP-87191(3m) OP-87192(5m) OP-87193(10m)
VT3-V6H(G)/Q5H(G) option cable with removable connector OP-87194(3m) OP-87195(5m) OP-87196(10m) 	VT3-V6H(G)/Q5H(G) option Emergency-stop button switch unit (red) OP-87171 	VT3-V6H(G)/Q5H(G) option button switch unit (grey) OP-87172
VT3-V6H(G)/Q5H(G) option button switch unit (yellow) OP-87173 	VT3-V6H(G)/Q5H(G) option key-operated switch unit OP-87174 	VT3-V6H(G)/Q5H(G) option button switch protector OP-87175
VT3-V6H(G)/Q5H(G) option wall mounts OP-87176 	VT3-V6H(G)/Q5H(G) option VESA mounts OP-87177 	

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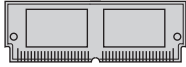
■ VT3-V7R options

VT3-V7R option RS-232C/485 link cable (5m) VT-C5R1	VT3-V7R option RS-422A link cable VT-C5R2(5m) VT-C15R2(15m)	VT3-V7R option[1] KZ/KVseries (except KZ-A500) direct-connect cable for programmable port(5m) VT-C5K1
VT3-V7R option[2] KZ-A500 direct-connect cable for programmable port(5m) VT-C5K2	VT3-V7R option Mitsubishi A/ FX series direct-connect cable for programmable port (5m) VT-C5A	VT3-V7R option Mitsubishi FXN series direct-connect cable for programmable port (5m) VT-C5F
VT3-V7R option Mitsubishi Q series direct-connect cable for programmable port (5m) OP-75039	Emergency-stop switch unit VT3-SW1	4-position switch unit VT3-SW4
6-position switch unit VT3-SW6	Cable for converter unit (5m) OP-35433	Column mounts (for VT3-V7R) OP-35432
Wall mounts (for VT3-V7R) OP-35471		

NOTICE	*1 Except KZ-A500, failure occurs when KZ/KV Series direct-connect cable for programmable port (VT-C5K1) are connected to control ports of KZ-A500. So precautions should be taken when selecting the cables. *2 KZ/KV may be damaged when the KZ-A500 direct-connect cable for programmable port (VT-C5K2) are connected to the KZ/KV control ports other than KZ-A500. So precautions should be taken when selecting the cables.
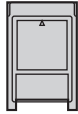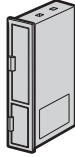
■ Peripheral Equipment

● Expansion memory

Expansion memory (16M bytes)
(only VT3-X15 (D)/S12 (D)/S10/
V10 (D) supported)
OP-42253
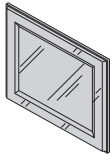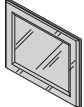
● Memory card

Memory card (128M bytes) OP-42254	Memory card adapter C-A1	External memory card slot VT2-D2
128 MB		
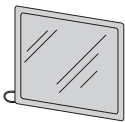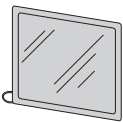
* VT3-W4T(A)/W4M(A)/W4G(A) not supported.

■ Options
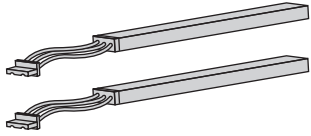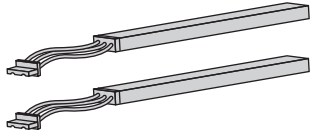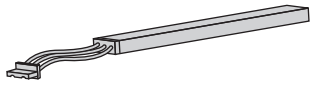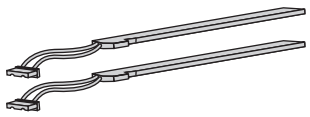
● Weather resistive cover

Weather resistive cover VT2-B12(VT3-S12(D)) VT2-B10(VT3-S10/V10(D))	Weather resistive cover VT2-B8(VT3-V8) VT2-B7(VT3-V7) VT3-B5(VT3-Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A) VT3-B4(VT3-W4T(A)/W4M(A)/W4G(A))

● Protection plate

Protection plate (for both cracking and anti-reflection protection: 5 x) OP-80928(VT3-X15(D))	Protection plate (for both cracking and anti-reflection protection: 5 x) OP-42255(VT3-S12(D)) OP-42256(VT3-S10/V10(D))	Protection plate (for both cracking anti-reflection protection and: 5 x) OP-42257(VT3-V8) OP-42258(VT3-V7) OP-87189（VT3-V6H(G)） OP-87178(VT3-Q5H(G)) OP-79357(VT3-Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A) OP-86925(VT3-W4T(A)/W4M(A)/W4G(A)) OP-75038(VT3-V7R)

● **Replacement LCD cold cathode tube backlights**

LCD back light for replacement OP-80929(VT3-X15(D))	LCD back light for replacement OP-75035(VT3-S12(D))	LCD back light for replacement OP-75036(VT3-S10)
LCD back light for replacement OP-42262(VT3-V10(D))	LCD back light for replacement OP-75037(VT3-V8)	

✎ Point	**The liquid crystal backlight can be replaced only in products with serial numbers that are not underlined.**
	Products with underlined serial numbers are white LED backlights that cannot be replaced.
	📖 **"1-3 Serial Number Label"**

● **Bracket for commissioning**

● **Console cable**

OP-80930 (only for VT3-X15(D))

Console cable for CV (3m) OP-42290

1
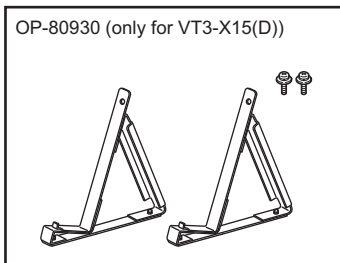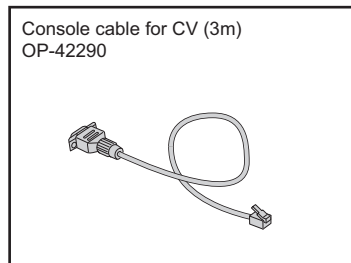
The backlights of the models listed below have changed from cold cathode tubes to white LED.

- VT3-X15
- VT3-X15D
- VT3-S12
- VT3-S12D
- VT3-S10
- VT3-S10D
- VT3-V10
- VT3-V10D
- VT3-V8
- VT3-V7

■ **Changes to serial numbers**

Underlined serial numbers indicate products for which the backlight has changed.

Underlined

2
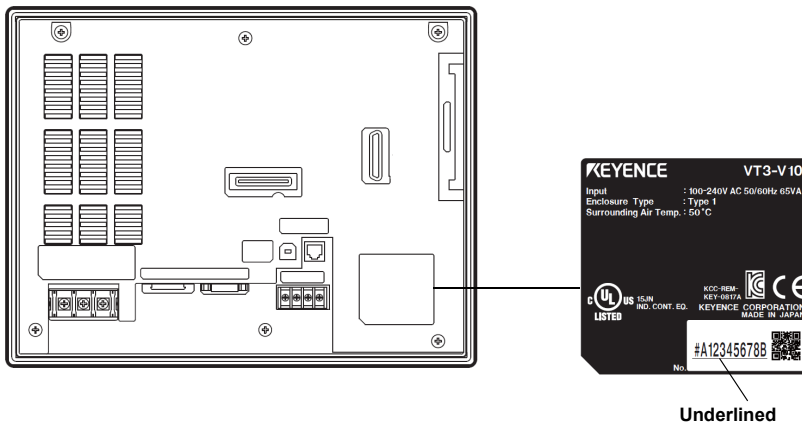
SPECIFICATIONS

This chapter describes names of parts on the VT3 Series, as well as its specifications and dimensions.

2

SPECIFICATIONS

Main Unit

■ VT3-X15(D)

●Front   ●Back

(11)   (13)

(1)
(2)
(3)

(10)
(12)

(4)   (5)   (8)   (7) (6)   (9)

Name		Description
(1)	Display area	Displays setup screens, messages, and data from the PLC and other external devices.(resolution 1024x768 pixels)
(2)	Touch panel	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	POWER indicator	Lights when the power is ON.

(4)	Power supply terminal block	Terminals used for connecting power supply.
		  VT3-X15 : AC100 to 240V ± 10% 50/60Hz
		  VT3-X15D : DC24V ± 10%

(5)	Serial I/F for connecting PC (PORT1:SERIAL/USB)	For connecting to a PC when writing or reading data with VT STUDIO.
(6)	Serial I/F for connecting PLC and peripherals (PORT2)	RS-232C or RS-422A interface, used for connecting peripherals such as thermoregulator.
(7)	Serial I/F for connecting bar-code reader/PLC/ peripharals (PORT3)	RS-232C interface, used for connecting peripherals such as PLC and thermoregulator, in addition to our bar-code readers BL-80RK/210RK/TL-30K/ RF-500 and 550.
(8)	Serial I/F for connecting mega-link/multi-link/ KL-link/peripherals (PORT4)	For connecting multi-link unit VT-L16Z/L16CA, multi-communicaton unit KV-L20(V/ R)/L21V, high-speed multi-link unit KV-LM20(V)/LM21V, or KL-link, peripherals such as thermoregulators.
(9)	RGB output I/F	Analog RGB output interface, supporting XGA(1024x768) standard.
(10)	Memory card slot	For inserting memory card OP-42254 (128 Mbytes).
(11)	Expansion memory	Expansion memory OP-42253 (16 Mbytes) is inserted onto a base plate inside the VT3 series.
(12)	Expansion connector 1	For connecting Ethernet unit VT2-E1/E2/ VT3-E3 or printer unit VT2-P1/P2.
(13)	Expansion connector 2	For connecting 4ch video unit VT3-VD4,1ch video unit VT3-VD1 or RGB output unit VT3-R1.

■ **VT3-S12(D)/S10/V10(D)**

●Front   ●Back

	Name	Description
(1)	**Display area**	Displays setup screens, messages, and data from the PLC and other external devices. VT3-S12(D)/S10 : resolution 800x600 pixels VT3-V10 (D) : resolution 640x480 pixels
(2)	**Touch panel**	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	**POWER indicator**	Lights when the power is ON.

(4)	**Power supply terminal block**	Terminals used for connecting power supply.
		  VT3-S12/S10/V10 : AC100 to 240V ± 10% 50/60Hz
		  VT3-S12D/V10D : DC24V ± 10%

(5)	**Serial I/F for connecting PC (PORT1:SERIAL/USB)**	For connecting to a PC when writing or reading data with VT STUDIO.
(6)	**The serial I/F for connecting PLC and peripherals (PORT2)**	RS-232C or RS-422A interface, used for connecting peripherals such as thermoregulator.
(7)	**Serial I/F for connecting barcode reader (PORT3)**	RS-232C interface, used for connecting peripherals such as PLC and thermoregulator, in addition to our bar-code readers BL-80RK/210RK/TL-30K/RF-500 and 550.
(8)	**Serial I/F for connecting mega-link/multi-link/KL-link/peripherals (PORT4)**	For connecting the multi-link unit VT-L16Z/L16CA, multi-communicaton unit KV-L20(V/R)/L21V, high-speed multi-link unit KV-LM20(V)/LM21V, KL-link, or peripherals such as thermoregulators.
(9)	**Memory card slot**	For inserting memory card OP-42254 (128 Mbytes).
(10)	**Expansion memory**	Expansion memory OP-42253 (16 Mbytes) is inserted onto a base plate inside the VT3 series.
(11)	**Expansion connector 1**	For connecting Ethernet unit VT2-E1/E2/VT3-E3 or printer unit VT2-P1/P2.
(12)	**Expansion connector 2**	For connecting 4ch video unit VT3-VD4, 1ch video unit VT3-VD1 or RGB output unit VT3-R1.

2

■ **VT3-V8/V7**

●Front ●Back

	Name	Description
(1)	**Display area**	Displays setup screens, messages, and data from the PLC and other external devices. VT3-V8/V7 : resolution 640x480 pixels
(2)	**Touch panel**	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	**POWER indicator**	Lights when the power is ON.
(4)	**Power supply terminal block**	Terminals block is for connecting the power supply (DC24V±10%).
(5)	**Serial I/F for connecting PC (PORT1:SERIAL/USB)**	For connecting to a PC when writing or reading data with VT STUDIO.
(6)	**The serial I/F for connecting PLC and peripherals (PORT2)**	RS-232C or RS-422A interface, used for connecting peripherals such as thermoregulator.
(7)	**Serial I/F for connecting bar-code reader/PLC/peripharals(PORT3)**	RS-232C interface, used for connecting the peripherals such as PLC and thermoregulator, in addition to our bar-code readers BL-80RK/210RK/TL-30K/RF-500 and 550.
(8)	**Serial I/F for connecting mega-link/multi-link/ KL-link/peripherals (PORT4)**	For connecting multi-link unit VT-L16Z/L16CA, multi-communicaton unit KV-L20(V/R)/L21V, high-speed multi-link unit KV-LM20(V)/LM21V, KL-link, or peripherals such as thermoregulators.
(9)	**Memory card slot**	For inserting memory card OP-42254 (128 Mbytes).
(10)	**Expansion connector 1**	For connecting Ethernet unit VT2-E1/E2/VT3-E3 or printer unit VT2-P1/P2.
(11)	**Expansion connector 2 (only for VT3-V8)**	For connecting 4ch video unit VT3-VD4, 1ch video unit VT3-VD1 or RGB output unit VT3-R1.

■ VT3-V6H(G)/Q5H(G)

	Name	Description
(1)	**Display area**	Displays setup screens, messages, and data from the PLC and other external devices.
(2)	**Touch panel**	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	**POWER indicator**	Lights when the power is ON.
(4)	**Operation indicator**	For indicating input enable/disable status of the touch switch or function switch.
(5)	**Function switch**	With the same functions as the switch on touch panel 8-point (F1 to F8) hardware switch, and 4-points (F1, F2, F5, F6) can be used as external outputs.
(6)	**Operation switch**	For controlling input enable/disable of the touch switch and funcrion switch.
(7)	**Emergency-stop switch unit**	It can be used as external output. * Only when Emergency-stop switch unit (OP-87171) or switch unit (OP-87172/ 87173) is installed.
(8)	**Key-operated switch**	It can be used as external output. * Only when key-operated switch unit (OP-87174) is installed.
(9)	**USB I/F (Port1) for connecting with PC**	For connecting with PC when sending/receiving data via VT STUDIO.
(10)	**Memory card slot**	For inserting a memory card (OP-42254)
(11)	**Hand grip**	It can be grasped by both hands easily.
(12)	**Enable switch**	It can be used as external output of 3 positions. * only available for VT3-V6H(G)/Q5H(G)
(13)	**Cable connecting part**	For connecting cables of PLC serial port (RS-232C/422/485), Ethernet, power supply, button switch, key switch, and function switch with the connectors (CN1, CN2A or CN2B, CN3)
(14)	**Cable protector installation part**	For fixing the cable protector on the left or right installation part. *A protector cover is used to shade the unused hole.

(15)	**Ethernet indicator**	For indicating current Ethernet communication status.
		Left.....LINK (green) indicating link stadus of the connected device.
		     ON : link established (flashing when sending/receiving data packet)
		     OFF: not established
		Right...100M(green) indicating data transimission rate (active when the LINK is ON).
		     ON : 100Mbos.
		     OFF: 10Mbps.

Name		Description
(16)	Dip switch	For setting up terminal resistors of RS-422/485 RS-422 RS-485 / TMC TMR ON / OFF 1 2 3 ON: with terminal resistor OFF: without terminal resistor

Switch No..	Description
1	**Terminal resrstor between CTSA-CTSB (RS-422)**
2	**Terminal resistor between RXDA-RXDB (RS-422)**
3	**Terminal resistor between A-B (RS-485)**

*All of them are set to ON at ex-factory.

	Name	Description
(17)	Strap mounting hole	2 holes are available on the left and right respectively, which is used for mounting commercial strap (max. width: 12mm)

■ **VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**

●Front
●Back

Name		Description
(1)	Display area	Displays setup screens, messages, and data from the PLC and other external devices. VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A: resolution 320x240 pixels
(2)	Touch panel	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	POWER indicator	Lights when the power is ON.
(4)	Power supply terminal block	Terminals block used for connecting the power supply (DC24V±10%).
(5)	Serial I/F forconnecting PC (PORT1:SERIAL/USB)	For connecting to a PC when writing or reading data with VT STUDIO.
(6)	Serial I/F for connecting PLC and peripherals. (PORT2)	RS-232C or RS-422A interface, used for connecting peripherals such as thermoregulator.
(7)	Serial (I/F) for connecting barcode reader/PLC/peripharais. (PORT3)	RS-232C interface, used for connecting peripherals such as PLC and thermoregulator, in addition to our bar-code readers BL-80RK/210RK/TL-30K/RF-500 and 550.
(8)	Serial I/F for connecting mega-link/multi-link/ KL-link/peripherals (PORT4)	For connecting multi-link unit VT-L16Z/L16CA, multi-communicaton unit KV-L20(V/R)/L21V, high-speed multi-link unit KV-LM20(V)/LM21V, or KL-link, peripherals such as thermoregulators.
(9)	Memory card slot	For inserting memory card OP-42254 (128 Mbytes).
(10)	Expansion connector 1 (only for VT3-Q5T(W)/ Q5S(W)/Q5T(W)A)	For connecting Ethernet unit VT2-E1/E2/VT3-E3 or printer unit VT2-P1/P2.

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SPECIFICATIONS

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

● Front view
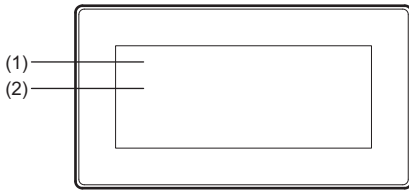
● Rear view
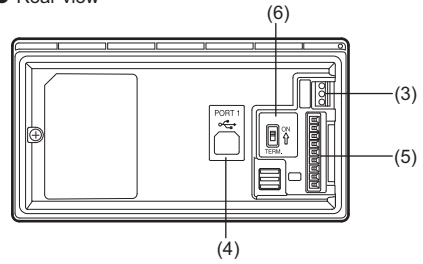
(1)
(2)

(6)
(3)
(5)

(4)

	Name	Description
(1)	**Display area**	Displays setup screens, messages, and data from the PLC and other external devices. (resolution 320 x 128 pixels)
(2)	**Touch panel**	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	**Power supply terminal block**	Terminals block is for connecting the power supply (DC24V±10%).
(4)	**Serial I/F for connecting PC (PORT1: USB)**	For connecting to a personal computer when writing or reading data with VT STUDIO.
(5)	**The serial I/F for connecting PLC and peripherals (PORT2)**	For connecting peripherals such as thermoregulator. VT3-W4T/W4M/W4G : RS-232C VT3-W4TA/W4MA/W4GA : RS-422A/485
(6)	**Termination resistor selector switch (TERM.) (Only for VT3-W4TA/W4MA/ W4GA)**	For setting up the termination resistor to ON or OFF.

2

■ **VT3-V7R**

● **Front and Side View**
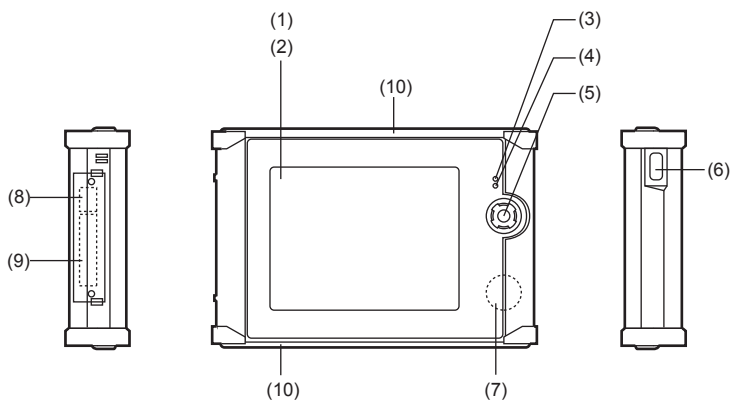
● **Back View**

	Name	Description
(1)	**Display area**	Displays setup screens, messages, and data from the PLC and other external devices. (resolution 640x480 pixels)
(2)	**Touch panel**	Screens are switched or data is written to PLCs or other external devices by touching the touch switch.
(3)	**POWER indicator**	Lights when the power is ON.
(4)	**GRIP indicator**	Lights when the touch panel and cross key are enabled.
(5)	**Cross Key**	Used as the external output (NPN Open Collector), or configured to function the same as the touch screen switch.
(6)	**Grip Switch**	For key protection.
(7)	**Beeper**	For alarming
(8)	**PC Connection Serial I/F for connecting (PORT1:USB)**	For connecting to a PC when writing or reading data with VT STUDIO.
(9)	**Memory Card slot**	Memory Card OP-42254 (128 Mbytes) is inserted in this slot.
(10)	**Protector**	Shock-resistant (at both top and bottom).
(11)	**Cable Connecting part**	For connecting cables and Emergency-stop switch unit (VT3-SW1).
(12)	**Cable protector Installation part**	For using the enclosed fixture to mount the cable protector.

2

SPECIFICATIONS

Peripheral

■ Pluggable connection unit (VT-T1)
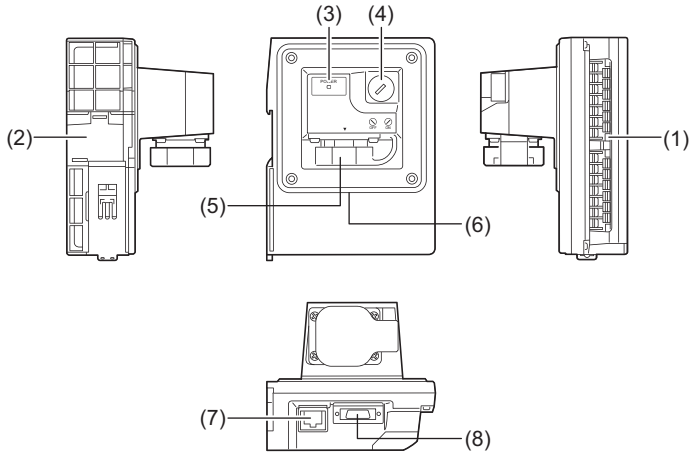
	Name	Description
(1)	**Terminal block**	For connecting power supply, function switch, button switch, terminal block for PLC serial port. (RS-485)
(2)	**DIN rail installation part**	For installing on DIN rail.
(3)	**POWER indicartor**	Lights when power supply to VT3 handy series is available.
(4)	**Key-operated switch**	For switching power supply ON/OFF of VT3 handy series, as well as enable/disable of the button switch.
(5)	**Removable connector for connecting VT series**	For connecting VT3 handy series. With cover.
(6)	**Filling**	Protective structure for installation of the panel (IP65f).
(7)	**Ethernet connector**	For connecting to Ethernet. (max. cable length: 90m)
(8)	**RS-232c/422 connector**	RS-232C/422 interface, for connecting with peripherals such as PLC and thermoregulator

2-2 Specifications

General Specifications

■ VT3-X15(D)

Item	VT3-X15				VT3-X15D
Rated voltage	AC100 to240 V ±10% 50/60 Hz				24 VDC±10%
Power consumption	110 VA or less				-
Current consumption	-				1800 mA or less
Noise immunity	1500 Vp-p or more; Pulse width: 1μs, 50 ns (based on noise simulator)				
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)				
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)				
Shock resistance	Compliant with JIS B3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z-axes (for 100 or more)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Grounding	Class D grounding(Class 3 grouding)				
Operation environment	Less dust and corrosive gas				
Ambient temperature	0 to +50°C[*1]				
Ambient humidity	35 to 85%RH (no condensing)[*2]				
Storage ambient temperature	-10 to +60°C (no icing)				
Storage ambient humidity	35 to 85%RH (no condensing)[*2]				
Overvoltage category	II				I
Pollution degree	2				
Weight	Approx. 4400 g[*3]				Approx. 4150 g[*3]

*1 The values when the VT3 Series is mounted vertically.
    For details on other mounting Modes, see 📖 "3-2 Mounting"
*2 For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).
*3 Weight for a white LED backlight (with an underlined serial number).
    Weights for a cold-cathode tube backlight (with a serial number that is not underlined) are as follows:
    VT3-X15: approx. 4750 g
    VT3-X15D: approx. 4500 g
    📖 "1-3 Serial Number Label"

SPECIFICATIONS

2

■ **VT3-S12(D)/S10/V10(D)**

Item	VT3-S12	VT3-S10	VT3-V10	VT3-S12D	VT3-V10D
Rated voltage	AC 100 to 240 V ±10% (50/60 Hz)			24 VDC ±10%	
Power consumption	70 VA or less	65 VA or less	65 VA or less	-	-
Current consumption	-	-	-	1100 mA or less	1000 mA or less
Noise immunity	1500 Vp-p or more; Pulse width: 1µs, 50 ns (based on noise simulator)				
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)				
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)				

Shock resistance	Compliant with JIS B3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z-axes (for 100 mins.)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	$9.8 m/s^2$	-	
		Continuous Vibration			
		Frequency	Acceleration	Amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	$4.9 m/s^2$	-	

Grounding	Class D grounding (Class 3 grouding)				
Operation environment	Less dust and corrosive gas				
Ambient temperature	0 to +50°C[1]				
Ambient humidity	35 to 85%RH (no condensing)[2]				
Storage ambient temperature	-10 to +60°C (no icing)				
Storage ambient humidity	35 to 85%RH (no condensing)[2]				
Overvoltage category	II			I	
Pollution degree	2				
Weight	Approx. 2450 g[3]	Approx. 2250 g[3]	Approx. 2300 g	Approx. 2350 g[3]	Approx. 2200 g

[1]   The values when the VT3 Series is mounted vertically.
    For details on other mounting Modes, see 📖 "3-2 Mounting"
[2]   For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).
[3]   Weight for a white LED backlight (with an underlined serial number).
    Weights for a cold-cathode tube backlight (with a serial number that is not underlined) are as follows:
    VT3-S12: approx. 2600 g
    VT3-S10: approx. 2300 g
    VT3-S12D: approx. 2500 g
    📖 "1-3 Serial Number Label"

2

SPECIFICATIONS

2

■ **VT3-V8/V7**

Item	VT3-V8			VT3-V7	
Rated voltage	24 VDC ±10%				
Current consumption	950 mA or less			800 mA or less	
Noise immunity	1500 Vp-p or more; Pulse width: 1μs, 50 ns (based on noise simulator)				
Withstand voltage	1500 VAC for 1 minute (between power supply terminal and housing)				
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)				
Shock resistance	Compliant with JIS B3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z-axes (for 100 mins.)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operation environment	Less dust and corrosive gas				
Ambient temperature	0 to +50°C[*1]				
Ambient humidity	35 to 85%RH (no condensing)[*2]				
Storage ambient temperature	-10 to +60°C (no icing)				
Storage ambient humidity	35 to 85%RH (no condensing)[*2]				
Overvoltage category	I				
Pollution degree	2				
Weight	Approx. 1150g[*3]			Approx. 1150g[*3]	

*1   The values when the VT3 Series is mounted vertically.

For details on other mounting Modes, see 📖 "3-2 Mounting"

*2   For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).

*3   Weight for a white LED backlight (with an underlined serial number).

Weights for a cold-cathode tube backlight (with a serial number that is not underlined) are as follows:

VT3-V8: approx. 1250 g

📖 "1-3 Serial Number Label"

■ **VT3-V6H(G)/Q5H(G)**

Item	VT3-V6H(G)				VT3-Q5H(G)
Rated voltage	24 VDC ± 10%				
Current consumption	380 mA or less				250 mA or less
Noise immunity	1500 Vp-p or more; Pulse width: 1ms, 50 ns (based on noise simulator)				
Withstand voltage	AC 1500V 1 minute (between the power terminal and enclosure)				
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)				
Shock resistance	Compliant with JIS B3502 IEC61131-2	Intermittent Vibration			Scan time
		Frequency	Acceleration	Half amplitude	Number of scans: 10 times each on X-, Y- and Z- axes (for 100 mins.)
		5 to 9 Hz	-	3.5mm	
		9 to 150Hz	9.8 m/s²	-	
		Continuous Vibration			
		Frequency	Acceleration	One-end amplitude	
		5 to 9 Hz	-	1.75mm	
		9 to 150 Hz	4.9m/s²	-	
Grounding	Class D grounding (Class 3 grouding)				
Structure	Panel built-in type, IP65f equivalent dust-proof, waterjet-proof on only front panel				
Shock resistance	compliant with JIS B3502, IEC61131-2 (1.3m[*2])				
Operation environment	Less dust and corrosive gas				
Ambient temperature[*1]	0 to + 50°C (**), 0 to + 40°C (***)[*3]				0 to +50°C
Ambient humidity[*1]	35 to 85%RH (no condensing)				
Storage ambient temperature	-10 to +60°C (no icing)				
Storage ambient humidity[*1]	35 to 85%RH (no condensing)				
Overvoltage category	I				
Pollution degree	3				
Weight[*4]	VT3-V6H: Approx. 1100g VT3-V6H(G): Approx. 1120g				VT3-Q5H: Approx. 970g VT3-Q5H(G): Approx. 990g

*1   For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).

*2   Only limited to the specification of VT3-V6H(G)/Q5H(G) body (excluding the installation of OP-87171/87172/87173/87174).

*3   The operating temperature varies with the setting of backlight adjustment.

*4   The unit body, excluding cable.

2

SPECIFICATIONS

2

SPECIFICATIONS

■ **VT3-Q5T(W)/Q5S(W)/Q5M(W)**

Item	VT3-Q5T(W)	VT3-Q5S(W)	VT3-Q5M(W)
Rated voltage	24 VDC ± 10%		
Current consumption	650 mA or less	650 mA or less	400 mA or less
Noise immunity	1500 Vp-p or more; Pulse width: 1μs, 50 ns (based on noise simulator)		
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)		
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)		
Shock resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z-axes (for 100 mins.)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operation environment	Less dust and corrosive gas		
Ambient temperature	0 to +50°C[*1]		
Ambient humidity	35 to 85%RH (no condensing)[*2]		
Storage ambient temperature	-10 to +60°C (no icing)		
Storage ambient humidity	35 to 85%RH (no condensing)[*2]		
Overvoltage category	I		
Pollution degree	2		
Weight	Approx. 900g	Approx. 850g	Approx. 850g

[*1] The values when the VT3 Series is mounted vertically.
For details on other mounting Modes, see 📖 "3-2 Mounting"
[*2] For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).

■ **VT3-Q5T(W)A/Q5M(W)A**

Item	VT3-Q5T(W)A	VT3-Q5M(W)A
Rated voltage	24 VDC ± 10%	
Current consumption	650 mA or less	400 mA or less
Noise immunity	1500 Vp-p or more; Pulse width: 1μs, 50 ns (based on noise simulator)	
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)	
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)	
Shock resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z-axes (for 100 mins.)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operation environment	Less dust and corrosive gas	
Ambient temperature	0 to +50°C[*1]	
Ambient humidity	35 to 85%RH (no condensing)[*2]	
Storage ambient temperature	-10 to +60°C (no icing)	
Storage ambient humidity	35 to 85%RH (no condensing)[*2]	
Overvoltage category	I	
Pollution degree	2	
Weight	Approx. 850g	Approx. 850g

[*1] The values when the VT3 Series is mounted vertically.
For details on other mounting Modes, see 📖 "3-2 Mounting"
[*2] For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

Item	VT3-W4T(A)	VT3-W4M(A)		VT3-W4G(A)
Rated voltage	24 VDC ± 10%			
Current consumption	200 mA or less			
Noise immunity	1500 Vp-p or more; Pulse width: 1μs, 50 ns (based on noise simulator)			
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)			
Insulation resistor	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)			
Shock resistance	Compliant with JIS B3502 IEC61131-2	Intermittent Vibration		Number of scans: 10 times each on X-, Y- and Z-axes (for 100 mins.)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous Vibration		
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operation environment	Less dust and corrosive gas			
Ambient temperature	0 to +50°C			
Ambient humidity	35 to 85%RH (no condensing)[1]			
Storage ambient temperature	-20 to +60°C (no icing)			
Storage ambient humidity	35 to 85%RH (no condensing)			
Overvoltage category	I			
Pollution degree	2			
Weight	Approx. 250 g			

*1 For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).

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SPECIFICATIONS

2

■ **VT3-V7R**

Item	VT3-V7R				
Rated voltage	24 VDC ± 10%				
Current consumption	550 mA or less				
Noise immunity	1500 Vp-p or more; Pulse width: 1μs, 50 ns (based on noise simulator)				
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)				
Insulation resistor	50 MW or more (with DC 500 V mega meter between power supply terminal and housing)				
Shock resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z- axes (for 100 mins.)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Intermittent Vibration			
		Frequency	Acceleration	Amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Grounding	Class D grounding(Class 3 grouding)				
Structure	Panel built-in type, IP65f equivalent dust-proof, waterjet-proof on only front panel				
Operation environment	Less dust and corrosive gas				
Ambient temperature	0 to +50°C				
Ambient humidity	35 to 85%RH (no condensing)[1]				
Storage ambient temperature	-10 to +60°C (no icing)				
Storage ambient humidity	35 to 85%RH (no condensing)[1]				
Overvoltage category	I				
Pollution degree	3				
Weight	Approx. 1600g (not including cable)				

[1] For ambient temperature above 40°C, the absolute humidity should be less than 85%RH (40°C).

Performance Specification

■ VT3-X15(D)

Item		VT3-X15(D)
Display panel	**Displayed components**	TFT LCD
	Display color	32768 colors
	Number of points displayed (W×H points)	1024x768
	Efficient display area (W×Hmm)	304.1x228.1
	Service life (normal temperature and humidity)	approx. 50,000 hours
Light source	**Mode**	White LED (non-changeable)[*1]
	Service life	approx. 50,000 hours[*2]
Touch control switch	**Number of switches**	64 x 48 per screen
	Mode	Analog resistive film
	Operation force	up to 1.96N
	Service life	1,000,000 cycles or more
Text font		Outline font, bitmap font, stroke font, Windows font, Image font, Minimum font
Screen data Internal memory	**Memory capacity**	28 Mbytes (expandable to 44 Mbytes)
	Number of pages can be registered	Up to 1024 pages
	Number of screens can be registered	Up to 1024 screens
	Screen No. can be registered	Page No.: 0 to 8999, Global window No.: G000 to G999
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)
Data backup	**Screen data**	Flash ROM can be erased for 100000 times
	Record data	SRAM backup: lithium battery

*1 Products with serial numbers that are not underlined contain cold-cathode tubes (that are replaceable).
LED backlight to replace VT3-X15 (D):OP-80929

*2 Cold-cathode tube products (with underlined serial numbers) have a life of approximately 45,000 hours.
📖 "1-3 Serial Number Label"

■ **VT3-S12(D)/S10/V10(D)**

Item		VT3-S12(D)	VT3-S10	VT3-V10(D)
Display panel	Displayed components	TFT LCD		
	Display color	32768 colors		
	Number of points displayed (W×H points)	800x600		640x480
	Efficient display area (W×Hmm)	246.0x184.5	211.2x158.4	
	Service life (normal temperature and humidity)	approx. 50,000 hours		
Light source	Mode	White LED (non-changeable)[1]		
	Service life	approx. 50,000 hours[2]		
Touch control switch	Number of switches	50 x 38 per screen		40 x 30 per screen
	Mode	Analog resistive film		
	Operation force	up to 0.98 N		
	Service life	1,000,000 cycles or more		
Text font		Outline font, bitmap font, stroke font,Windows font, Image font, Minimum font		
Screen data Internal memory	Memory capacity	12 Mbytes (expandable to 28 Mbytes)		
	Number of pages can be registered	Up to 1024 pages		
	Number of screens can be registered	Up to 1024 screens		
	Screen No. can be registered	Page No.: 0 to 8999, Global window No.: G000 to G999		
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)		
Data backup	Screen data	Flash ROM can be erased for 100000 times		
	Record data	SRAM backup: lithium battery		

*1   Products with serial numbers that are not underlined contain cold-cathode tubes (that are replaceable).

    Replacement LCD backlight for VT3-S12(D) : OP-75035

    Replacement LCD backlight for VT3-S10 : OP-75036

    Replacement LCD backlight for VT3-V10(D) : OP-42262

*2   Cold-cathode tube products (with serial numbers that are not underlined) have a life of approximately 43,000 hours.

    📖 "1-3 Serial Number Label"

■ **VT3-V8/V7**

Item		VT3-V8	VT3-V7
Display panel	Displayed components	TFT LCD	
	Display color	32768 colors	
	Number of points displayed (W×H points)	640x480	
	Efficient display area (W×Hmm)	170.9x128.2	151.7x113.8
	Service life (normal temperature and humidity)	approx.50000 hours	approx.50000 hours
Light source	Mode	White LED (non-changeable)[1]	White LED (non-changeable)[2]
	Service life	approx. 50,000 hours[3]	approx. 54,000 hours
Touch control switch	Number of switches	40 x 30 per screen	
	Mode	Analog resistive film	
	Operation force	up to 0.98 N	
	Service life	1,000,000 cycles or more	
Text font		Outline font, bitmap font, stroke font, Windows font, Image font, Minimum font	
Screen data Internal memory	Memory capacity	12 Mbytes	
	Number of pages can be registered	Up to 1024 pages	
	Number of screens can be registered	Up to 1024 screens	
	Screen No. can be registered	Page No.: 0 to 8999, Global window No.: G000 to G999	
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)	
Data backup	Screen data	Flash ROM can be erased for 100000 times	
	Record data	SRAM backup: lithium battery	

[1]   Products with serial numbers that are not underlined contain cold-cathode tubes (that are replaceable).
Replacement LCD backlight for VT3-V8: OP-75037

[2]   Products with serial numbers that are not underlined contain cold-cathode tubes (that are not replaceable).

[3]   Cold-cathode tube products (with serial numbers that are not underlined) have a life of approximately 40,000 hours.

   📖 "1-3 Serial Number Label"

■ VT3-V6H(G)/Q5H(G)

Item		VT3-V6H(G)	VT3-Q5H(G)
Display panel	Displayed components	TFT LCD	
	Display color	32768 colors	
	Number of points displayed (W×H points)	640 x 480	320 x 240
	Efficient display area (W×Hmm)	132.5 x 99.4	115.2 x 86.4
	Service life (normal temperature and humidity)	approx. 50000 hours	
Light source	Mode	white LED (non-changeable)	
	Service life	approx. 50000 hours	
Text font		Outline font, bitmap font, stroke font, Windows font, Image font, Minimum font	
Touch control switch	Number of switches	80 x 60 per screen	40 x 30 per screen
	Mode	Analog resistive film	
	Operation force	up to 0.98 N	
	Service life	1,000,000 cycles or more	
Screen data Internal memory	Memory capacity	12 Mbytes (cannot be extended)	4 Mbytes (cannot be extended)
	Number of pages can be registered	Up to 1024 pages	
	Number of screens can be registered	Up to 1024 screens	
	Screen No. can be registered	Page No.: 0 to 8999, Global window No.: G000 to G999 Bill menu: P00 to P15 (only the saving on memory card is available)	
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)	
Data backup	Screen data	Flash ROM can be erased for 100000 times	
	Record data	SRAM backup:lithium battery	

2 SPECIFICATIONS

■ **VT3-Q5T(W)/Q5S(W)/Q5M(W)**

Item		VT3-Q5T(W)	VT3-Q5S(W)	VT3-Q5M(W)
Display panel	Displayed components	TFT LCD	STN LCD	STN monochromatic LCD
	Display color	32768 colors		2-color/monochromatic, 8-pattern, 32-level gray scale
	Number of points displayed (W×H points)	320 x 240		
	Efficient display area (W×Hmm)	115.2 x 86.4		
	Service life (normal temperature and humidity)	approx. 50,000 hours		
Light source	Mode	Cold-cathode tube (non-changeable)		
	Service life	approx. 75,000 hours		approx. 54,000 hours
Touch control switch	Number of switches	20 x 15 per screen		
	Mode	Analog resistive film		
	Operation force	up to 0.98 N		
	Service life	1,000,000 cycles or more		
Text font		Outline font, Bitmap font, Stroke font, Windows font, Image font, Minimum font		
Screen data Internal memory	Memory capacity	4 Mbytes		
	Number of pages can be registered	Up to 1024 pages		
	Number of screens can be registered	Up to 1024 screens		
	Screen No. can be registered	Page No.: 0 to 8999, Global window No.: G000 to G999		
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)		
Data backup	Screen data	Flash ROM can be erased for 100000 times		
	Record data	SRAM backup: lithium battery		

■ **VT3-Q5T(W)A/Q5M(W)A**

Item		VT3-Q5T(W)A	VT3-Q5M(W)A
Display panel	Displayed components	TFT LCD	
	Display color	32768 colors	2-color/monochromatic, 8-pattern, 32-level gray scale
	Number of points displayed (W×H points)	320 x 240	
	Efficient display area (W×Hmm)	115.2 x 86.4	
	Service life (normal temperature and humidity)	approx. 50,000 hours	
Light source	Mode	white LED (non-changeable)	
	Service life	approx. 75,000 hours	approx. 54,000 hours
Touch control switch	Number of switches	20 x 15 per screen	
	Mode	Analog resistive film	
	Operation force	up to 0.98 N	
	Service life	1,000,000 cycles or more	
Text font		Outline font, Bitmap font, Stroke font, Windows font, Image font	
Screen data Internal memory	Memory capacity	4 Mbytes	
	Number of pages can be registered	Up to 1024 pages	
	Number of screens can be registered	Up to 1024 screens	
	Screen No. can be registered	Page No.: 0 to 8999, Global window No.: G000 to G999	
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)	
Data backup	Screen data	Flash ROM can be erased for 100000 times	
	Record data	SRAM backup: lithium battery	

2

SPECIFICATIONS

2

SPECIFICATIONS

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

Items		VT3-W4T(A)	VT3-W4M(A)/W4G(A)
Display panel	Displayed components	TFT LCD	STN monochromatic LCD
	Display color	32768 colors	32-level gray scale
	Number of points displayed (W×H points)	320 x 128	
	Efficient display area (W×Hmm)	110.4 x 44.2	99.2 x 39.7
	Service life (normal temperature and humidity)	approx. 50000 hours	
Light source	Mode	white LED (non-changeable)	VT3-W4M(A): white/red LED (non-changeable) VT3-W4G(A): green/red LED (non-changeable)
	Service life (normal temperature and humidity)	approx. 50000 hours	VT3-W4M (A): About 50000 hours VT3-W4G (A): About 40000/50000 hours (green/red)
	Display color	-	VT3-W4M (A): 3 colors (white/red/pink) VT3-W4G (A): 3 colors (green/red/orange)
Touch control switch	Number of switches	40 x 16 / 1 image	
	Mode	Simulation resistance membrane mode	
	Operation force	up to 0.98N	
	Service life	More than one million times	
Text font		Outline font, Bitmap font, Stroke font, Windows font, Image font, Minimum font	
Screen data Internal memory	Memory capacity	3 Mbytes	
	Number of pages can be registered	Up to 1024 pages	
	Number of screens can be registered	Up to 1024 screens	
	Screen No. can be registered	Page No.: page 0 to 8999, Global window No. : G000 to G999	
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)	
Data backup	Screen data	Flash ROM can be erased for 100000 times	
	Record data	SRAM backup: lithium battery	

■ **VT3-V7R**

Item		VT3-V7R
Display Panel	Displayed components	TFT LCD
	Display colour	32768 colors
	Number of pixels	640 x 480
	Efficient display area	151.7(W)x113.8(H)
	Service life (normal temperature and humidity)	approx. 50000 hours
Light source	Mode	Cold-cathode tube (non-changeable)
	Service life	approx. 54,000 hours
Switch Check	Number of switches	40 x 30 per screen
	Mode	Analog resistive film
	Input	Piezoelectric
	Operation force	up to 0.98N
	Service life	1,000,000 cycles or more
Cross key	Service life	100,000 cycles or more
Fastening Switch	Service life	50,000 cycles or more
Text font		Outline font, Bitmap font, Stroke font, Windows font, Image font, Minimum font
Screen data Internal memory	Memory capacity	12 Mbytes (cannot be extended)
	Number of pages can be registered	Up to 1024 pages
	Number of screens can be registered	Up to 1024 screens
	Screen No. can be registered	Page No.: 0 to 8999, global window No.: G000 to G999
Calendar clock		Accuracy:± 40s/month (25°C), Backup:1lithium battery (5 years above of service life at 25°C)
Data backup	Screen data	Flash ROM can be erased for 100000 times
	Record data	SRAM backup: lithium battery

2

Power Terminal Block Layouts

■ VT3-X15
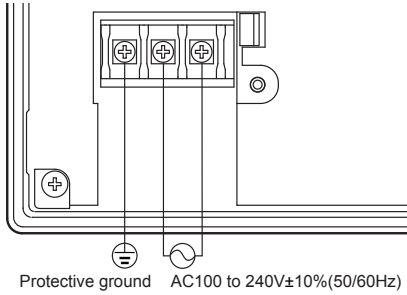
Protective ground   AC100 to 240V±10%(50/60Hz)

● **Specification**

Item	Description
Wire gage	AWG8-20
Tightening torque	1.4N•m (12lbf•in)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

■ VT3-X15D

N.C   24 VDC±10%
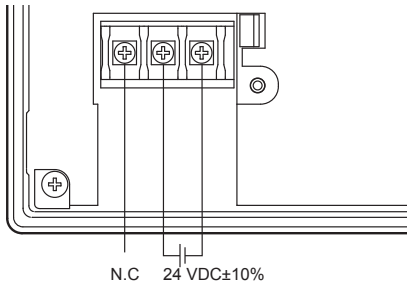
● **Terminal Block Specification**

Item	Description
Wire gage	AWG8-20
Tightening torque	1.4N•m (12lbf•in)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

■ VT3-S12/S10/V10

Protective ground   AC100 to 240V±10%(50/60Hz)

● **Terminal Block Specification**

Item	Description
Wire gage	AWG8-20
Tightening torque	1.4N•m (12lbf•in)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

■ VT3-S12D/V10D

N.C   24 VDC±10%

● **Terminal Block Specification**

Item	Description
Wire gage	AWG8-20
Tightening torque	1.4N•m (12lbf•in)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

2

SPECIFICATIONS

■ **VT3-V8/V7**

DC24V±10% N.C
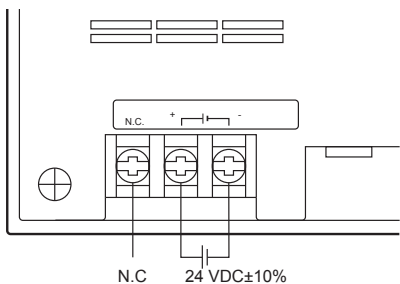
● **Terminal Block Specification**

Item	Description
Wire gage	AWG14-20
Tightening torque	0.5N•m (5.1kgf•cm)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

■ **VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**
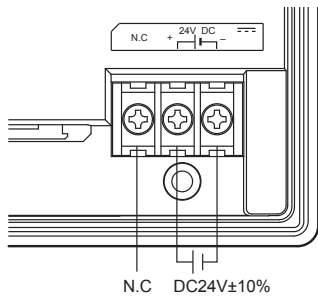
N.C   DC24V±10%

● **Terminal Block Specification**

Item	Description
Wire gage	AWG14-20
Tightening torque	0.5N•m (5.1kgf•cm)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

N.C.
DC24V±10%
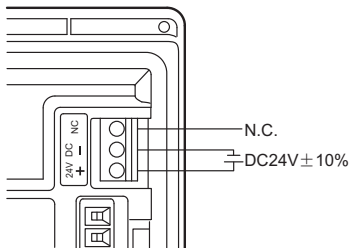
● **Terminal block specification**

Items	Contents
Wire gage	AWG16-26
Tightening torque	1.7lbf•in (0.19N•m)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

I/O Specification

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

■ Serial I/F for PC connection (PORT1: SERIAL)

Item	Specification
Applicable standard	EIA RS-232C compliant
Synchronization mode	synchronous demodulation, full-duplex
Communication distance	15 m
Data length	7/8 bits
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s

(1) (2) (3) (4) (5) (6)
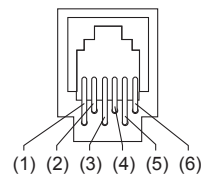
6-pin modular connector

* External view

Pin No.	Signal name	Name
1	NC	Not connected
2	NC	Not connected
3	RD	Receive data (input)
4	SG	Signal ground
5	SD	Send data (output)
6	NC	Not connected

■ Serial I/F (PORT2) used for the connection between PLC and peripherals

Item	Specification
Applicable standard	EIA RS-232C compliant/RS-422A compliant shared
Synchronization mode	synchronous demodulation, full-duplex
Communication distance	15 m (RS-232C)/500 m (RS-422A)
Data length	7/8 bits
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s

(1)   (10)

(11)   (20)
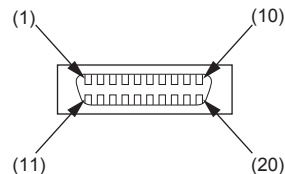
20-pin half-pitch connector

* External view

Pin No.	Signal name	Name	Pin No.	Signal name	Name
1	NC	Not connected	11	TXDA	RS-422A: Send data A
2	TXD (SD)	RS-232C: Send data	12	TXDB	RS-422A: Send data B
3	RXD (RD)	RS-232C: Receive data	13	RXDA	RS-422A: Receive data A
4	RTS (RS)	RS-232C: Send request	14	RXDB	RS-422A: Receive data B
5	CTS (CS)	RS-232C: Send enable	15	RTSA	RS-422A: Send requestA
6	DSR (DR)	RS-232C: Data send ready	16	RTSB	RS-422A: Send requestB
7	SG	Signal ground	17	CTSA	RS-422A: Send enable A
8	TMC1[*]	Terminator (between (17) and (18))	18	CTSB	RS-422A: Send enable B
9	TMC2[*]		19	TMR1[*]	Terminator (between (13) and (14))
10	DTR (ER)	RS-232C: Data terminal ready	20	TMR2[*]	

* Termination resistor 100W.

■ **Serial I/F for connecting bar-code reader/PLC and Peripherals (PORT3)**

Item	Specification
Applicable standard	EIA RS-232C compliant[*1]
Synchronization mode	synchronous demodulation, full-duplex
Communication distance	15m[*2]
Data length	7/8Bit
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bit/s

(1)   (5)

(6)   (9)

D-sub9 Connector(male)

* External view

Pin No.	Signal name	name
1	NC	Not connected
2	TXD	Send data
3	RXD	Receive data
4	NC	Not connected
5	SG	Signal ground
6	NC	Not connected
7	CTS	Send enable
8	RTS	Send request
9	Vcc(5V)	Power supply for barcode reader (5 VDC)

*1   Pin 9 is assigned to DC 5 V. To connect PLC or the bar-code reader with special power supply, please keep "not connected".

*2   When a separate power supply is provided for the barcode reader. when connecting PLC.

■ **Serial I/F for connecting with mega-link/multi-link/KL-link/peripherals(PORT4)**

● **Mega-link**

Item	Specification
Applicable standard	RS-485
Synchronization mode	synchronous demodulation, half-duplex
Baud rate	19200, 115200, 0.5M, 1M, 2M bit/s
Connection mode	Multi-drop (branches not allowed)
Max. number of connected units	15 units

A   B   SG
TERM
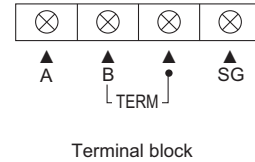
Terminal block

Communication distance

Baud Rate	Max. Extension Distance (m)
19200	1000
115200	1000
0.5M	500
1M	200
2M	100

Terminal block specification

Terminal Name	Description
A	Mega-link communication line A
B	Mega-link communication line B
TERM	Mega-link terminator setting
SG	Mega-link communications line SG

Item	Description
Wire gage	AWG14-20
Tightening torque	0.5N•m (5.1kgf•cm)
Wire material	Copper
Wire type	Stranded wire

● **VT2 Multi-link**

Item	Specification
Applicable standard	RS-485
Synchronization mode	synchronous demodulation, half-duplex
Communication distance	within 500 m (when extended)
Baud rate	19200, 115200, 0.5M, 1M bit/s
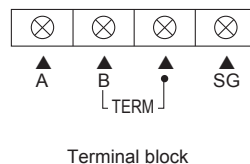
Terminal block

Communications distance

Baud Rate	Max. Extension Distance
< 115200	500m
0.5M	100m
1M	50m

Terminal block specification

Terminal Name	Description
A	VT2 Multi-link communications line A
B	VT2 Multi-link communications line B
TERM	VT2 Multi-link terminator setting
SG	VT2 Multi-link communications line SG

Item	Description
Wire gage	AWG14-20
Tightening torque	0.5N•m(5.1kgf•cm)
Wire material	Copper
Wire type	Stranded wire

● **Multi-link**

Item	Specification
Applicable standard	RS-485
Synchronization mode	synchronous demodulation, half-duplex
Communication Distance	within 500 m (when extended)
Baud rate	19200, 38400, 57600, 115200 bit/s
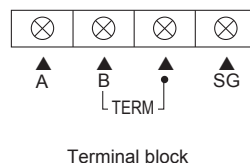
Terminal block

Terminal block specification

Terminal Name	Description
A	Multi-link communications line A
B	Multi-link communications line B
TERM	Multi-link terminator setting
SG	Multi-link communications line SG

Item	Description
Wire gage	AWG14-20
Tightening torque	0.5N•m (5.1kgf•cm)
Wire material	Copper
Wire type	Stranded wire

● **KL link**

Item	Specification
Coding system	f, f/2 coding
Control mode	Autonomous distributed token bus control
Connection mode	T-branch, multi-drop
Baud rate	5Mbit/s, 2.5Mbit/s, 625kbit/s, 156kbit/s
Communication medium	Dedicated cable KPEV-SB (1P) (2-core STP) * Conductor cross-section area: 0.5 to 1.25 mm^2
Max. number of connected units	129 (including master, excluding KL-T1)
Error control	Vertical parity, checksum, duplicate sampling, burst noise detection

Communication distance

Baud Rate	Max. Trunk Length (m)	Max. Branch Length(m)
5Mbit/s	50	20
2.5Mbit/s	120	40
625Kbit/s	500	150
156Kbit/s	1200	350

Communication cable

Conductor Cross-sectional Area (mm^2)	Max. Extension Distance (m)
0.5	1000
0.75	1200
0.9	1200
1.25	1200

Terminal block specification

Terminal Name	Description
A	KL link communications line A
B	KL link communications line B
TERM	KL link terminator setting
SG	KL link communications line SG
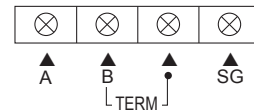
Terminal block

Item	Description
Wire gage	AWG14-20
Tightening torque	0.5N•m(5.1kgf•cm)
Wire material	Copper
Wire type	Stranded wire

2

■ **Analog RGB Output (VT3-X15(D) only)**

Item	Specification
Signal Mode	Analog RGB
Horizontal synchronizing frequency	48.4kHz
Vertical synchronizing frequency	60.3Hz
Size of output	XGA: 1024x768

(5) (1)

(10) (6)

(15) (11)

D-Sub15 Connector(female)
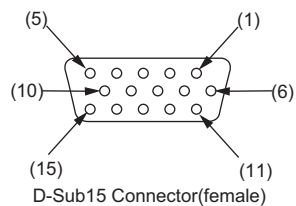
* External view

Pin No.	Signal name	Name
1	R	Output Red
2	G	Output Green
3	B	Output Blue
4	N.C	Not connected
5	GND	Ground
6	R-GND	Output Red/Ground
7	G-GND	Output Green,/Ground
8	B-GND	Output Blue/Ground
9	N.C	Not connected
10	GND	Ground
11	N.C	Not connected
12	N.C	Not connected
13	H_SYNC	Horizontal synchronizing Signal
14	V_SYNC	Vertical synchronizing Signal
15	N.C	Not connected

VT3-V6H(G)/Q5H(G)

■ Connectors for cables at back side
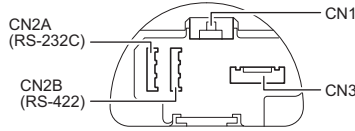
Connector Name	Signal Abbreviation	Signal name	I/O	Cable Color	Cable Mark	
CN1	PB1A	Emergency-stop button switch 1A (N.C.)	Output	Red	Black 1	Load
	PB1B	Emergency-stop button switch 1B (N.C.)			Black 2	
	PB2A	Emergency-stop button switch 2A (N.C.)			Black 3	Load
	PB2B	Emergency-stop button switch 2B (N.C.)			Black 4	
	PBAM/TPAM	Emergency-stop button switch monitor A (N.O.)	Output	Pink	Black 1	Load
	PBBM/TPBM	Emergency-stop button switch monitor B (N.O.)			Black 2	
	EN1A	Enable switch 1A (N.O.)	Output	Purple	Black 1	Load
	EN1B	Enable switch 1B (N.O.)			Black 2	
	EN2A	Enable switch 2A (N.O.)			Black 3	Load
	EN2B	Enable switch 2B (N.O.)			Black 4	
	KSW1	Key switch 1 (left)	Output	Yellow	Red 1	Load
	KSW2	Key switch 2 (right)			Red 2	Load
	KSWC	Key switch common			Red 3	
CN2A/CN2B	TXD/TXDA	Serial (RS-232C/422) communication signal	Output	Orange	Black 1	
	NC/TXDB	Serial (RS-232C/422) communication signal			Black 2	
	RXD/RXDA	Serial (RS-232C/422) communication signal	Input		Black 3	
	NC/RXDB	Serial (RS-232C/422) communication signal			Black 4	
	RTS/RTSA	Serial (RS-232C/422) communication signal	Output		Red 1	
	DTR/RTSB	Serial (RS-232C/422) communication signal			Red 2	
	CTS/CTSA	Serial (RS-232C/422) communication signal	Input		Red 3	
	DSR/CTSB	Serial (RS-232C/422) communication signal			Red 4	
	SG	Serial (RS-232C/422) communication ground	-		None	
CN3	TX-	Ethernet Communications Signal	Output	White	None	
	TX+	Ethernet Communications Signal		Blue	None	
	RX-	Ethernet Communications Signal	Input	Gray	None	
	RX+	Ethernet Communications Signal		Brown	None	
	A	RS-485 Communication signal A	I/O	Pink	Red 1	
	B	RS-485 Communication signal B			Red 2	
	G	RS-485 Communication signal G	-		Red 3	
	FSWC	Function switch common	Output	Yellow	None	
	FSW1	Function switch 1			Black 1	Load
	FSW2	Function switch 2			Black 2	Load
	FSW5	Function switch 5			Black 3	Load
	FSW6	Function switch 6			Black 4	Load
	+24V	Power input (24V)	Input	Brown	Black 4	
	0V	Power input (0V)		Blue	Black 4	
	FG	Frame ground	-	Green	None	⏚

* Cable colors and dots are available for RS-232C/422/485 or Ethernet Connection Cable specifications. For details abut connection cables, see VT5 Series/VT3 Series/DT Series PLC Connection Manual and Connection Cable User's Manual for VT3 Handy Series.

<cable color and mark>

Cable color (e.g., orange)
Dot color (e.g., black)
Number of dots (e.g., 2)

Cable color (e.g., pink)
Dot color (e.g., red)
Number of dots (e.g., 1)
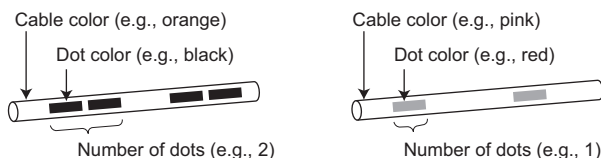
■ Function switch (FSW1/FSW2/FSW5/FSW6)

Item	VT3-V6H(G)/Q5H(G)
Outputs	4 (FSW1/FSW2/FSW5/FSW6)
Common terminal	4/1 common (FSWC)
Output mode	MOSFET(N-ch) (with overcurrent protection function)
Rated load	DC30V 0.1A
Leak current at OFF	100μA or less
Residual current at ON	1.0V or less
Service life	300,000 circles or more

Insulation power

Internal circuit

opto-isolation

load

Load power supply
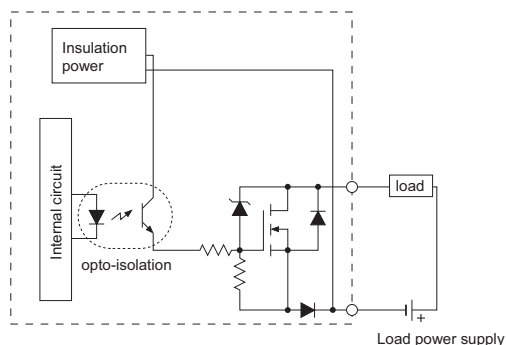
■ Enable switch (EN1A/EN1B/EN2A/EN2B)

Item		VT3-V6H(G)/Q5H(G)
Rated voltage		DC 30 V
Rated current		1A (resistive load), 0.7A (inductive load)
Contact type		2 A contact
Service life	**Mechanical**	Position 1-> 2-> 1 : 1,000,000 circles or more Position 1-> 2-> 1 : 100,000 circles or more
	Electrical	100,000 circles or more
Function		3 operating positions are available Position 1: OFF (not pressed) Position 2: ON (mid position) Position 3: OFF (final position) * when returning from Position 3 (final position) to Position 1 (not pressed), the contact remains OFF.
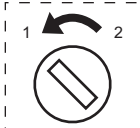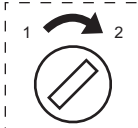
⚠ Warning	• **If excessive force is applied on the enable switch, the switch keeps ON, which may cause the equipment unable to stop. The user must fully understand the usage of enable switch, then conduct risk assessment, and take appropriate measures for protection.** • **Failure detection function of the enable switch is not available on VT3-V6H(G)/Q5H(G). Therefore, 2 outputs of the enable switch should be connected with a circuit (e.g., safety relay unit etc) which enables to detect the unmatched status.**

■ **Button switch (PB1A/PB1B/PB2A/PB2B/PBAM/PBBM)**

Item		OP-87171/87172/87173
Rated voltage		DC 30 V
Rated current		1A (resistive load), 1A (inductive load)
Contact type		2 B contact (PB1A/PB1B/PB2A/PB2B)/1 A contact (PBAM/PBBM)
Service life	Mechanical	250,000 cycles or more
	Electrical	100,000 cycles or more
Function		Locked in OFF status when pressing to the lock position. Two unlocking methods are available: • Turn the switch rightwards (arrow direction) • Pull the switch outwards directly
Weight		approx.25g

⚠ Warning	• **Failure detection function of Emergency-stop switch unit (OP-87171) is not available on VT3-V6H(G)/Q5H(G). Therefore, 2 outputs of the Emergency-stop switch unit (OP-87171) should be connected with a circuit (e.g., safety relay unit etc) which enables to detect the unmatched status.** • **The Emergency-stop switch unit (OP-87171) may be deformed or damaged when suffering from too large impact or vibration, and further result in function problems. In routine maintenance, whether the Emergency-stop switch works normally should be checked.**
NOTICE	• **The main contact (N.C.) may chatter or bounce during reset operation, so appropriate measures should be taken. In addition, the monitor contact (N.O.) may chatter or bounce when pressed.**

■ **Key switch (KSW1/KSW2)**

Item		OP-87174
Rated voltage		DC 24V
Rated current		1A (resistive load), 0.7A (inductive load)
Contact type		1c contact
Service life	Mechanical	250,000 cycles or more
	Electrical	100,000 cycles or more
	Push/pull	250,000 cycles or more
Function		To set the contact ON at left/right positions respectively. Please check KSW1 and KSWC has connected — Please check KSW2 and KSWC has connected Key can be pushed/pulled at the left/right positions.
Weight		approx.30g

NOTICE	• **Please make sure to turn the key after it is pushed.** • **Please do not push or pull the key by force.** • **Please operate the key with the torque below 0.1N.m**

■ **RS-232C/422 Communication (CN2A/CN2B)**

Item	Specification
Applicable standard	EIA RS-232C/RS-422 compatible
Synchro mode	Synchronous/full duplex
Communication distance	15m(RS-232C)/500m(RS-422)
Data length	7/8 bit
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bit/s

2

■ **Ethernet Communication (CN3)**

Item	10BASE-T	100BASE-TX
Applicable standard	IEEE802.3	
Baud rate	10.0Mbit/s	100.0Mbit/s
Transmission medium[*1]	STP(Cat.3 or more) or UTP	STP (Cat.5 or more) or UTP
Max. cable length	100m	
Max. number of hubs	4	2
Max. number of connected units	PC applications[*2]: 3 FTP: 4	

*1 STP: shielded twisted pair cable

   UTP: unshielded twisted pair cable

*2 PC applications referto VT STUDIO/DATA BUILDER.

■ **MegaLink/multi-link (A/B/G)**

● **Mega link**

Item	Specification
Applicable standard	RS-485
Synchro mode	Synchronous demodulation/half duplex
Baud rate	19200, 115200, 0.5M, 1M, 2Mbit/s
Connection mode	Multi-drop (branches not allowed)
Max. number of connected units	15 units

Communication Distance

Baudrate	Max. Extension distance (m)
19200	1000
115200	1000
0.5M	500
1M	200
2M	100

● **VT multi-link**

Item	Specification
Applicable standard	RS-485
Synchro mode	Synchronous demodulation/half duplex
Communication distance	within 500 m (when extended)
Baud rate	19200, 115200, 0.5M, 1Mbit/s

Communication Distance

Baudrate	Max. Extension distance (m)
115200 below	500
0.5M	100
1M	50

● **Multi-link**

Item	Specification
Applicable standard	RS-485
Synchro mode	Synchronous demodulation/half duplex
Communication distance	within 500 m (when extended)
Baud rate	19200, 38400, 57600, 115200 bit/s

VT3-W4T/W4M/W4G

■ Serial I/F for the connection between PLC and peripherals (PORT2)

| Item	Specification
Applicable standard	EIA RS-232C compliant
Synchro mode	Start-stop Full duplex
Communication distance	15m
Data length	7/8 bits
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bit/s

Pin No.	Signal name	Name
1	TXD(SD)	RS-232C: Send data
2	RXD(RD)	RS-232C: Receive data
3	RTS(RS)	RS-232C: Send request
4	CTS(CS)	RS-232C: Send enable
5	S.G.	Signal Ground
6	DTR(ER)	RS-232C: Data Terminal Ready
7	DSR(DR)	RS-232C: Data Send Ready
8	N.C.	Not connected
9	N.C.	Not connected

1	TXD
2	RXD
3	RTS
4	CTS
5	SG
6	DTR
7	DSR
8	NC
9	NC

● Terminal specifications

Item	Description
Wire size[1]	AWG14-30
Cable sheath length	7mm
Fastening torque	0.22 to 0.45N•m
Recommended tool	Blade 0.4 x 2.5mm

* When 2 wires are connected to one terminal, 2 conductors with the following cross sections must be used.
• Single wire $0.08 \times 0.5mm^2$
• Stranded wire $0.08 \times 0.75mm^2$

● Cable used for terminal block

(1) When twisted cable or single cable is processed directly
    (a) Confirm the end of the twisted cable is not exposed.
    (b) Cannot galvanize for the end of cable.

Approx. 7mm

(2) When rod terminal with insulating sleeve is used
    The cable may be not easy to insert into the insulating sleeve due to different thicknesses of cable sheath, then please select proper cable according to the outline dimension diagram.

Insulating sleeve

Contact

2 to 2.5mm

6mm

10.5 to 12mm

Maker	Type name
	AI0.25-6BU(AWG24)
Phoenix Contact Company	AI0.34-6TQ(AWG22)
	AI0.5-6WH(AWG20)

VT3-W4TA/W4MA/W4GA

■ Serial I/F (PORT2) for connecting PLC, Megalink, Multilink and peripherals

Item	Specification
Applicable standard	EIA RS-422A/RS-485 compliant
Synchro mode	RS-422A: Start-stop Full duplex; RS-485: Start-stop Half duplex
Communication distance	RS-422A : 500m, RS-485 : 1000m
Data length	7/8 bits
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bit/s

Pin No.	Signal name	Name
1	TXDA	RS-422A : Send data A/RS-485: A
2	RXDB	RS-422A : Send data B/RS-485: B
3	RXDA	RS-422A : Receive data A/RS-485: A
4	RXDB	RS-422A : Receive data B/RS-485: B
5	S.G.	Signal Ground
6	RTSA	RS-422A : Send request A
7	RTSB	RS-422A : Send request B
8	CTSA	RS-422A : Send enable A
9	CTSB	RS-422A : Send enable B

```
1  [   ]  TXDA
2  [   ]  TXDB
3  [   ]  RXDA
4  [   ]  RXDB
5  [   ]  SG
6  [   ]  RTSA
7  [   ]  RTSB
8  [   ]  CTSA
9  [   ]  CTSB
```
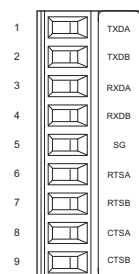
*   Please use TXDA-RXDA and TXDB-RXDB after external circuit-shorted respectively when communication via RS-485.

● Terminal specifications

Item	Description
Wire size*¶	AWG14-30
Cable sheath length	7mm
Fastening torque	0.22 to 0.45N•m
Recommended tool	Blade 0.4 x 2.5mm

*   When 2 wires are connected to one terminal, 2 conductors with the following cross sections must be used.
· Single wire $0.08 \times 0.5mm^2$
· Stranded wire $0.08 \times 0.75mm^2$

● Cable used for terminal block

(1) When twisted cable or single cable is processed directly
(a) Confirm the end of the twisted cable is not exposed.
(b) Cannot galvanize for the end of cable.

Approx. 7mm

(2) When rod terminal with insulating sleeve is used
The cable may be not easy to insert into the insulating sleeve due to different thicknesses of cable sheath, then please select proper cable according to the outline dimension diagram.

Insulating sleeve

Contact

2 to 2.5mm

6mm

10.5 to 12mm

Maker	Type name
Phoenix Contact Company	AI0.25-6BU(AWG24)
	AI0.34-6TQ(AWG22)
	AI0.5-6WH(AWG20)

2

● **Mega-link**

Items	Specification
Specification	RS-485
Synchro mode	Start-stop Half duplex
Baud rate	19200, 115200bit/s
connection mode	Multi-drop (branches not allowed)
Max. number of connected units	15 units

1	TXDA
2	TXDB
3	RXDA
4	RXDB
5	SG
6	RTSA
7	RTSB
8	CTSA
9	CTSB

Communication Distance

Baudrate	Max. Extension distance (m)
19200	1000
115200	1000

Terminal block specification

Terminal Name	Description
TXDA/RXDA	Mega-link communications line A
TXDB/RXDB	Mega-link communication line B
SG	Mega-link communications line SG
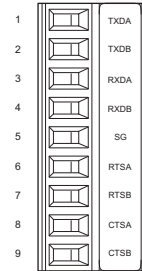
● **VT2 Multi-link connection**

Items	Specification
Baud rate	19200, 115200bit/s

1	TXDA
2	TXDB
3	RXDA
4	RXDB
5	SG
6	RTSA
7	RTSB
8	CTSA
9	CTSB

Terminal block specification

Terminal Name	Description
TXD/RXDA	VT2 Multi-link communications line A
TXDB/RXDB	VT2 Multi-link communications line A
SG	VT2 Multi-link communications line SG
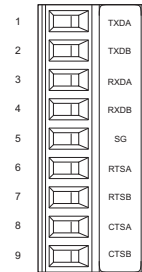
● **Multi-link**

Items	Specification
Applicable standard	RS-485
Synchro mode	Start-stop Half duplex
Communication Distance	within 500 m (when extended)
Baud rate	19200, 38400, 57600, 115200bit/s

1	TXDA
2	TXDB
3	RXDA
4	RXDB
5	SG
6	RTSA
7	RTSB
8	CTSA
9	CTSB

Terminal block specification

Terminal Name	Description
TXDA/RXDA	Multi-link communication line A
TXDB/RXDB	Multi-link communication line A
SG	Multi-link communication line SG

2
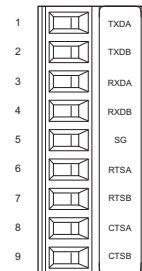
VT3-V7R

■ **Connectors at back side: RS-232C/RS-422A/RS-485**
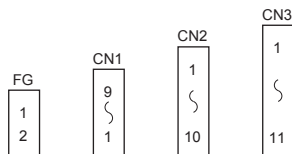
Connectors		Signal Name	Description	Cable Color
Connector No.	Signal Name			
FG	**1**	FG	FG	Shielded wire
	2	NC	Not connected	-
CN1	**1**	24V	Power supply (DC24V)	Brown
	2	NC	Not connected	-
	3	GND	Ground	Blue
	4	NC	Not connected	-
	5	KEY1	Cross key: Up	Black
	6	KEY2	Cross key: Right	White
	7	KEY3	Cross key: Down	Gray
	8	KEY4	Cross key: Left	Orange
	9	KEYCOM	Cross key: Output common	orange/black
CN2	**1**	TXD (SD)	RS-232C: Send data	Red
	2	RXD (RD)	RS-232C: Receive data	Red/white
	3	RTS (RS)	RS-232C: Send request	Green
	4	CTS (CS)	RS-232C: Send enable	Green/white
	5	DSR (DR)	RS-232C: Data Send Ready	Yellow
	6	DTR (ER)	RS-232C: Data Terminal Ready	Yellow/black
	7	A	RS-485: signal A	Gray/black
	8	B	RS485: signal B	White/black
	9	SG	Signal Ground	Light blue
	10	SG	Signal Ground	-
CN3	**1**	TXDA	RS-422A: Send data A	Red
	2	TXDB	RS-422A: Send data B	Red/white
	3	RTSA	RS-422A: Send request A	Yellow
	4	RTSB	RS-422A: Send request B	Yellow/black
	5	RXDA	RS-422A: Receive data A	Green
	6	RXDB	RS-422A: Receive data B	Green/white
	7	CTSA	RS-422A: Send enable A	Gray/black
	8	CTSB	RS-422A: Send enable B	White/black
	9	SG	Signal Ground	Light blue
	10	SG	Signal Ground	-
	11	DSR (DR)	RS-232C: Data Send Ready	Light blue/black

✎ **Point** **To extend the power cable and ground cable, please use 2-core shielded cables.**
For details, please see 📖 "3-3 Connection of Power Supply".

■ **Cross key**

Item	VT3-V7R
Control Output	4x NPN open-collector outputs (1 for common use) max.100mA (below 40V); Residual voltage below 1V[*1]
Protection Circuit	Over-voltage absorption

*1 The values marked on the rear connector.

Cross key (Up): kKEY1(Cable Color: black)

Cross key (Right): KEY2(Cable Color: white)

Cross key (Down): KEY3 (Cable Color: grey)

Cross key (Left): KEY4 (Cable Color: orange)

Cross key (Common)
：KEYCOM(Cable Color: orange/black)

Internal Circuit

2

SPECIFICATIONS

2
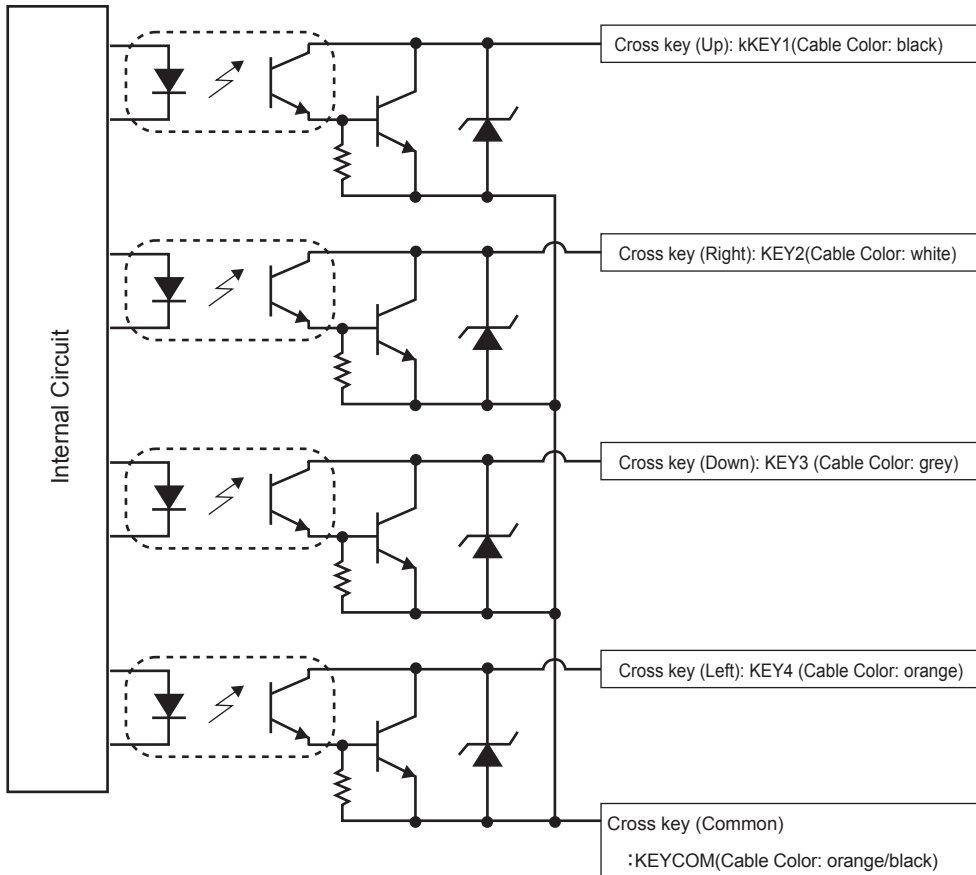
Specification of Expansion Units/Peripherals

■ 4ch/1ch Video Input Unit VT3- VD4/VD1

● General Specification

Item	VT3-VD4			VT3-VD1	
Rated voltage	DC5V±5%				
Current consumption	1,080mA or less			470mA or less	
Noise resistance	1500 Vp-p or more; Pulse width: 1μ sec (based on noise simulator)				
Withstand voltage	1500 VAC for 1 minute (between power supply terminal and housing)				
Insulating resistance	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)				
Vibrating resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans:
		Frequency	Acceleration	One-end amplitude	X, Y, and Z axis 10 times for each direction (100 minutes)
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous Vibration			
		Frequency	Acceleration	One-end amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operating atmosphere	Without from severe dust and corrosive gas				
Operating ambient temperature[*1]	0 to +50°C				
Operating ambient humidity	35 to 85%RH (without condensation)				
Storage ambient temperature	-10 to +60°C(without icing)				
Storage ambient humidity	35 to 85%RH (without condensation)				
Weight	approx. 230g			approx. 160g	

*1   The operating temperature of VT3 series must be observed.

● Performance Specification

Video input

Item	VT3-VD4	VT3-VD1
Color	Color: 260,000 colors; Monochromatic: 256 tones	
Signal Mode	NTSC composite video signal	
Display size (WxH, in pixel)	640x480, 480x360, 320x240, 160x120 600x480, 500x400, 400x320, 300x240	
Number of input channels	4 channels	1 channel

RGB input

Item	VT3-VD4
Color	color: 260,000 colors
Signal Mode	Analog RGB
Horizontal synchronizing frequency	VGA: 31.4 to 43.3kHz SVGA: 35.1 to 46.9kHz XGA:48.4kHz
Vertical synchronizing frequency	VGA: 59.0 to 85.1Hz SVGA: 56.0 to 85.0Hz XGA:60.0Hz
Display size (WxH, in pixel)	VGA : 640x480, 480x360, 320x240, 160x120 SVGA : 800x600, 600x450, 400x300, 200x150 XGA : 1024x768, 768x576, 512x384, 256x192
Number of input channels	1 channel

Pin Assignments (RGB input)

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1	R	6	R_GND	11	NC
2	G	7	G_GND	12	NC
3	B	8	B_GND	13	H_SYNC
4	NC	9	NC	14	V_SYNC
5	GND	10	GND	15	NC
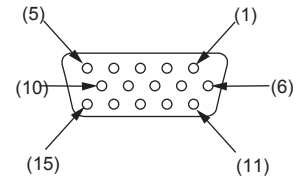
D-Sub15 Connector

* External view of VT3-VD4

2

SPECIFICATIONS

■ Video Capture Trigger

● Internal circuits

4.3kΩ

TRIG

Internal Circuit

N.C.

Optical coupler insulation

C

DC12 to 24V

● Timing Chart

Min.10ms

ON

TRIG

OFF

Min.20s
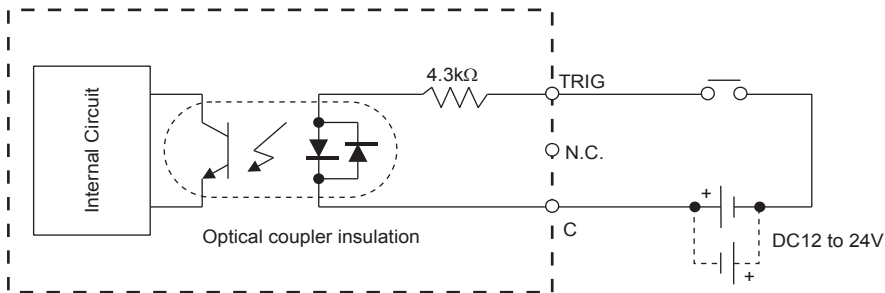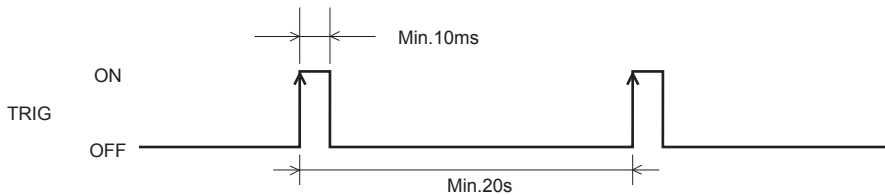
• Set trigger input ON at a minimum 10 ms. Video images displayed by VT3 are loaded from trigger input during a maximum period of 500 ms.
• It takes about 20 seconds per 1ch to write data into the memory card.
• When two successive trigger inputs are enabled, the second trigger is saved in the buffer area until the writing of the initial captured images to the memory card ends. Upon the end of the writing, the saved trigger input becomes enabled. The successive trigger inputs become disabled when a trigger input is saved in the buffer area.
• When the video capture output destination is set to "Printer", the printing time depends on print types.

📖 "Video Capfure", page 6-12

📖 "12-4 VT Setup of VT System", *VT3 Series Reference Manual*

✎ Point	**Even if the following trigger is input during video capture processing, video images after writing to memory card completed are captured.**

● Terminal Block Specification

Item	Description
Wire gage	AWG28-16
Stripped length	5.5mm
Wire type	Stranded wire
Rated temperature	60°C
Tightening torque	0.3N•m (3.1kgf•cm)
Wire material	Copper

2

■ **RGB Output Unit VT3-R1 Specification**

● **General Specification**

Items	VT3-R1			
Rated voltage	DC5V ±5%			
Current consumption	max. 80mA			
Noise proof	1500 Vp-p pulse width 1μs (based on noise simulator)			
Withstand voltage	1500 VAC for 1 minute (between power terminal and housing)			
Insulation resistance	5 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)			
Shockproof	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans: 10 times each on X-, Y- and Z-axes (for 100 mins.)
		Frequency	Acceleration	Full amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		continuous Vibration			
		Frequency	Acceleration	Full amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operating atmosphere	Without from severe dust and corrosive gas			
Operating ambient temperature*1	0 to +50°C			
Operating ambient humidity	35 to 85%RH (without condensation)			
Storage ambient temperature	-10 to +60°C (wirhout icing)			
Storage ambient humidity	35 to 85%RH (without condensation)			
Weight	approx. 150g			

*   Please ensure operating ambient temperature of the VT3 series not being exceeded.

● **Performance Specification**

RGB output

Items	VT3-R1		
Signal mode	Analog RGB		
Horizontal synchronization frequency	VGA : 31.5kHz	SVGA : 37.9kHz	XGA : 48kHz
Vertical synchronization frequency	VGA : 59.9Hz	SVGA : 60.3Hz	XGA : 59.9Hz
Display size (W x H dots)	VGA : 640 x 480	SVGA : 800 x 600	XGA : 1024 x 768
Number of output channels	1 channel		

Pin Assignments

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1	R	6	R_GND	11	NC
2	G	7	G_GND	12	NC
3	B	8	B_GND	13	H_SYNC
4	NC	9	NC	14	V_SYNC
5	GND	10	GND	15	NC
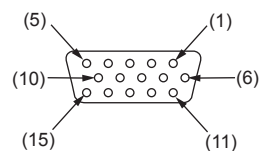
D-sub 15-pin connector

* External view from VT3-R1

■ Ethernet Unit VT2-E1/E2/VT3-E3/Printer Unit VT2-P1/P2

● General Specification

Item	VT2-E1	VT2-P1	VT2-E2	VT2-P2	VT3-E3
Rated voltage	DC5V ± 5%				
Current consumption	max. 200mA		max. 400mA		max. 200mA
Noise resistance	1500 Vp-p pulse width 1μ sec (based on noise simulator)				
Withstand voltage	1500 VAC for 1 minute (between power terminal and housing)				
Insulating resistance	5 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)				
Vibrating resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans: X, Y, and Z axis 10 times for each direction (100 minutes)
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		continuous Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operating atmosphere	Without from severe dust and corrosive gas				
Ambient operating temperature*	0 to +50°C				
Operating ambient humidity	35 to 85%RH (without condensation)				
Storage ambient temperature	-10 to +60°C (without icing)				
Storage ambient humidity	35 to 85%RH (without condensation)				
Weight	approx 135g	approx 125g	approx 150g	approx 140g	approx 130g

* Please ensure operating ambient temperature of the VT3 series not being exceeded.

● Performance Specification

Printer Output (VT2-E1/P1)

Item	Printer Type	VT2-E1/P1
Color printer	ESC/P Raster 2	Seiko Epson: PM-930C/940C/870C PM-3700C/4000PX
	ESC/P Raster	Seiko Epson: PM-950C/890C/840C/830C/740C/730C PM-3500C/2200C
	LIPS IV Raster	Canon: LIPS IV-compatible color/monochro laser printer
Thermal printer	Thermal printer	CITIZEN SYSTEMS: CBM-293/CT-P293

Pin Assignment (Printer output)

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1	nStrobe	10	NC	19	GND
2	Data1	11	Busy	20	GND
3	Data2	12	NC	21	GND
4	Data3	13	NC	22	GND
5	Data4	14	NC	23	GND
6	Data5	15	NC	24	GND
7	Data6	16	NC	25	GND
8	Data7	17	NC		
9	Data8	18	GND		

(13)   (1)

(25)   (14)
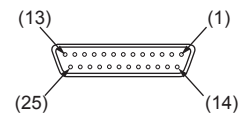
D-Sub25 Connector

* External view of VT2-E1/P1

Printer Output (VT2-E2/P2)

Item	Printer Type	VT2-E2/P2	
PictBridge-compatible Printer	PictBridge	Seiko Epson	PM-A650/A700/A750/A850/A870/A890/A900/A950/ PM-D600/D750/D770/D800/D1000
		Canon	PIXUS 80i/455i/560i/860i/960i/ 990i/iP90/iP3100/iP8600

Ethernet

Item	VT2-E1/E2/VT3-E3	
	10Base-T	**100Base-TX**
Applicable standard	IEEE802.3	
Baud rate	10Mbit/s	100Mbit/s
Transmission medium[1]	STP of (Cat.3 or higher) or UTP	STP of (Cat.5) or higher or UTP
Max. cable length	100m	
Max. number of hub connections	4	2
Max. number of connections	PC application[2]: 3 FTP: 4	

[1]   STP: Shielded Twisted Pair cable, UTP: Unshielded Twisted Pair cable

[2]   PC applications include VT STUDIO and DATA BUILDER.

Pin Assignment (Ethernet)

Pin No.	MIDI signal name	Function
1	TD+	Send data (+)
2	TD-	Send data (-)
3	RD+	Receive data (+)
4	-	-
5	-	-
6	RD-	Receive data (-)
7	-	-
8	-	-

(8)   (1)
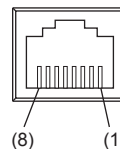
RJ-45 modular connector

* External view of VT2-E1/E2/VT3-E3

Printer output (VT2-E1/E2, VT3-E3)

Item	Printer type	Connection method
Color printer	ESC/P-R Ethernet	Ethernet
	ESC/Page Ethernet	

> **Point**   **The VT3 System Program must be in Ver. 4.81 or above.**

■ External Memory Card slot VT2-D2
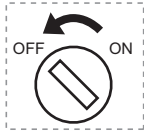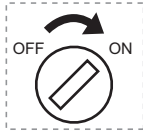
Item	VT2-D2
Vibrating resistance	10 to 55 Hz amplitude width 1.5 mm, for 2 hours in each of X, Y and Z directions
Operating atmosphere	Without excessive dust/dirt and corrosive gases
Ambient operating temperature	0 to +50°C
Operating ambient humidity	35 to 85%RH (without condensation)
Storage ambient temperature	-10 to +60°C (without icing)
Storage ambient humidity	35 to 85%RH (without condensation)
Weight	approx.170g

■ Puggable connection unit VT-T1

● General specification

Item	VT-T1
Rated voltage	DC24V±10%
Current consumption	VT-T1: below 50mA VT3-V6H(G)+VT-T1: below 430mA VT3-V6H/Q5H(G)+VT-T1: below 300mA
Noise resistance	1500 Vp-p or more; Pulse width: 1μs, (based on noise simulator)
Withstand voltage	1500 V AC for 1 minute (between power supply terminal and housing)
Insulation impedance	50 MΩ or more (with DC 500 V mega meter between power supply terminal and housing)

Vibration resistance	In compliance with JIS B 3502 IEC61131-2	Intermittent vibration			Scan times
		Frequency	Acceleration	Half amplitude	X, Y, Z in each direction 10 respectively (100 minutes)
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Continuous vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	

Item	VT-T1
Grounding	D-type ground
Structure	Flush type (only available for the fron part, and dustproof and anti-splash structure equivalent to IP65f should be ensured when connecting with connectors) and DIN installation
Operation environment	Without heavy dust, corrosive gas etc
Ambient temperature	0 to +50°C
Ambient humidity	35 to 85%RH (without condensation)
Storage temperature	-10 to +60°C (without icing)
Storage humidity	35 to 85%RH (without condensation)
Overvoltage category	I
Degree of pollution	3
Weight	Approx. 410g

● Performance specification

Item	VT-T1
Enable/disable emergency-stop button switch	Enable/disable Emergency-stop button switch with key-switch
Power supply ON/OFF	Power VT3 handy series ON/OFF with key-switch
Cable wiring terminal block conversion	Convert cable wiring to terminal block

Status	OFF	ON
Key-switch		
VT3 handy series	Power OFF	Power ON
Emergency-stop button switch	Switch disabled (not in emergency stop status even if VT3 handy series is removed. [*1])	Switch enabled (in emergency stop status if VT3 handy series is removed. [*1])

*1   Only available when the power supply of VT-T1 is ON

⚠ WARNING
- **In case the power supply of VT-T1 is ON, VT3 handy series must be removed when VT-T1's key switch is OFF.**
- **In case VT-T1 is equipped, and VT3 handy series can be used to operate the equipment in multiple positions, the circuit must enable to operate only at one position.**

● **I/O specification**

<Terminal block>

PB1B	PB2B	TPBM	EN1B	EN2B	KSW2	
PB1A	PB2A	TPAM	EN1A	EN2A	KSW1	KSWC

Terminal Name	Signal Name	
PB1A	Emergency-stop button switch 1A (N.C.)	Load
PB1B	Emergency-stop button switch 1B (N.C.)	
PB2A	Emergency-stop button switch 2A (N.C.)	Load
PB2B	Emergency-stop button switch 2B (N.C.)	
TPAM	Emergency-stop button switch monitor A (N.O.)	Load
TPBM	Emergency-stop button switch monitor B (N.O.)	
EN1A	Enable switch 1A (N.O.)	Load
EN1B	Enable switch 1B (N.O.)	
EN2A	Enable switch 2A (N.O.)	Load
EN2B	Enable switch 2B (N.O.)	
KSW1	Key switch 1 (left)	Load
KSW2	Key switch 2 (right)	Load
KSWC	Key switch common	

TKBM	FSW2	FSW6	A	B	FG	
TKAM	FSW1	FSW5	FSWC	G	+24V	0V

Terminal Name	Signal Name	
TKAM	Key switch monitor A Key switch monitor A	Load
TKBM	Key switch monitor B	
FSW1	Function switch 1	Load
FSW2	Function switch 2	Load
FSW5	Function switch 5	Load
FSW6	Function switch 6	Load
FSWC	Function switch common	
A	RS-485 communication signal A	
B	RS-485 communication signal B	
G	RS-485 communication signal G	
+24V	Power supply input(24V)	
0V	Power supply input (0V)	
FG	Frame ground	

* RS-485 terminal resistor must be equipped at VT3-V6H(G)/Q5H(G) side.

<Emergency-stop button switch monitor (TPAM/TPBM)>

Item		VT-T1
Rated voltage		DC30V
Rated current		1A (resistive load)
Contact type		1 A contact
Service life	**Mechanical**	50,000,000 cycles or more
	Electrical	100,000 cycles or more

NOTICE	In case the power supply of VT-T1 is ON, the monitor will be ON when the Emergency-stop button switch is pressed. Otherwise, it will be OFF. (It will operate the same as PBAM/PBBM only in power ON status.)

<Key switch monitor (TKAM/TKBM)>

Item		VT-T1
Rated voltage		DC 30 V
Rated current		1A (resistive load)
Contact type		1 A contact
Service life	Mechanical	20,000,000 cycles or more
	Electrical	100,000 cycles or more

NOTICE	**In case the power supply of VT-T1 is ON, the monitor will be ON when VT-T1 ís key switch is ON. Otherwises, it will be OFF.**

<MegaLink (A/B/G)>

Item	Specification
Applicable standard	RS-485
Synchro mode	Synchronous demodulation/half duplex
Baud rate	19200, 115200, 0.5M, 1M, 2Mbit/s
Connection mode	Multi-drop (branches not allowed)
Max. number of connected units	15 units

Communication Distance

Baudrate	Max. Extension distance (m)[1]
19200	1000
115200	1000
0.5M	500
1M	200
2M	100

[1] Cable length between VT3-V6H(G)/Q5H(G) and VT-T1 is also included in the maximum extension distance.

<VT2 multi-link (A/B/G)>

Item	Specification
Applicable standard	RS-485
Synchro mode	Synchronous demodulation/half duplex
Communication distance	within 500 m (when extended)[1]
Baud rate	19200, 115200, 0.5M, 1Mbit/s

[1] Cable length between VT3-V6H(G)/Q5H(G) and VT-T1 is also included in the maximum extension distance.

Communication Distance

Baudrate	Max. Extension distance (m)[1]
115200 below	500
0.5M	100
1M	50

[1] Cable length between VT3-V6H(G)/Q5H(G) and VT-T1 is also included in the maximum extension distance.

<Multi-link (A/B/G)>

Item	Specification
Applicable standard	RS-485
Synchro mode	Synchronous demodulation/half duplex
Communication distance	within 500 m (when extended)[1]
Baud rate	19200, 38400, 57600, 115200 bit/s

[1] Cable length between VT3-V6H(G)/Q5H(G) and VT-T1 is also included in the maximum extension distance.

2

<PLC communication cable connector>

Item	Specification
Applicable standard	EIA RS-232C/RS-422
Synchro mode	Start-stop Full duplex
Communication distance[1]	15m (RS-232C)/500m (RS-422)
Data length	7/8 bit
Parity	Even/Odd/None
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bit/s
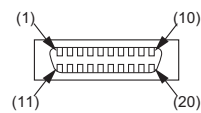
(1) (10)
(11) (20)
20-pin half-pitch connector
* the view observed from outside of the unit

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	NC	Not connected	11	TXDA	RS422: Send data A
2	TXD(SD)	RS-232C: Send data	12	TXDB	RS422: Send data B
3	RXD(RD)	RS-232C: Receive data	13	RXDA	RS-422: Receive data A
4	RTS(RS)	RS-232C: Send request	14	RXDB	RS-422: Receive data B
5	CTS(CS)	RS-232C: Send enable	15	RTSA	RS-422: Send request A
6	DSR(DR)	RS-232C: Data send ready	16	RTSB	RS422: Send requestB
7	SG	Signal ground	17	CTSA	RS-422: Send enable A
8	N.C.[2]	not connected	18	CTSB	RS-422: Send enable B
9	N.C.[2]		19	N.C.[2]	not connected
10	DTR(ER)	RS-232C: Data terminal ready	20	N.C.[2]	

[1]   Cable length between VT3-V6H(G)/Q5H(G) and VT-T1 is also included in the maximum extension distance.

[2]   Terminal resistor (TMC1/TMC2/TMR1/TMR2) is not connected.

It must be set with terminal resistor switch of VT3-V6H(G)/Q5H(G).

✎ **Point** | **TXD/TXDA, RXD/RXDA, RTS/RTSA, CTS/CTSA, DSR/CTSB, and DTR/RTSB are common inside.**

<Connector>

Item	10BASE-T	100BASE-TX
Applicable standard	IEEE802.3	
Baud rate	10.0Mbit/s	100.0Mbit/s
Transmission Medium[1]	STP (Cat.3 or more) or UTP	STP (Cat.5 or more) or UTP
Max. cable length	100m[2]	
Max. number of hub connections	4	2
Max. number of connected units	PC application software[3]: 3 FTP: 4	

[1]   STP: shielded twisted pair cable

UTP: unshield twisted pair cable

[2]   Cable length between VT3-V6H(G)/Q5H(G) and VT-T1 is also included in the maximum extension distance.

[3]   PC application software refers to VT STUDIO/DATA BUILDER.

Pin No.	MDI signal	Signal Function
1	TD+	Send data (+)
2	TD-	Send data (-)
3	RD+	Receive data (+)
4	-	-
5	-	-
6	RD-	Receive data (-)
7	-	-
8	-	-
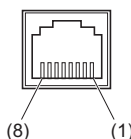
(8) (1)
RJ-45 connector modules
* External view from VT-T1

■ **Emergency-Stop Switch Unit VT3-SW1**

● **General Specification**

Item	Emergency stop switch unit				
Voltage	DC24V ± 10%				
Current	Below 1A (resistive load)				
Vibrating resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans:
		Frequency	Acceleration	Half amplitude	X, Y, and Z axis 10 times for each direction (100 minutes)
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Intermittent Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Enclosure rating	IP65 rating,dust and splash-proof				
Operating atmosphere	Without excessive dust, direct and corrosive gases allowed				
Ambient operating temperature	0 to +50°C				
Operating ambient humidity	35 to 85%RH (without condensation)				
Storage ambient temperature	-10 to +60°C (without icing)				
Storage ambient humidity	35 to 85%RH (without condensation)				
Weight	approx. 140g				

● **Performance Specification**

Item		Emergency stop switch unit
Switch	Type	Emergency-stop button switch (push-lock, pull or push to reset, 2b)
	Service life	Mechanical type: 250,000 cycles or more /Electric type: 100,000 cycles or more
Voltage[*1] Current[*1]	N.C. (DC only)	DC24V below 1A (resistive load)

*1   For cable connection, please see 📖 "6-7 VT3-V7R Specific Emergency-Stop Switch Unit".

■ **4-position switch Unit VT3-SW4/6-position switch Unit VT3-SW6**

● **General Specification**

Item	VT3-SW4				VT3-SW6
Ground	D-type ground				
Vibrating resistance	Compliant with JIS B 3502 IEC61131-2	Intermittent Vibration			Number of scans:
		Frequency	Acceleration	Half amplitude	X, Y, and Z axis 10 times for each direction (100 minutes)
		5 to 9Hz	-	3.5mm	
		9 to 150Hz	9.8m/s^2	-	
		Contunious Vibration			
		Frequency	Acceleration	Half amplitude	
		5 to 9Hz	-	1.75mm	
		9 to 150Hz	4.9m/s^2	-	
Operating atmosphere	Without excessive dust, direct and corrosive gases allowed				
Ambient operating temperature	0 to +50°C				
Operating ambient humidity	35 to 85%RH (without condensation)				
Storage ambient temperature	-10 to +60°C (without icing)				
Storage ambient humidity	35 to 85%RH (without condensation)				
Weight	approx. 360g (excluding cable)				approx. 380g (excluding cable)

2

SPECIFICATIONS

● **Performance Specification**

Item			VT3-SW4	VT3-SW6
Switch	Type	Emergency-stop button (push-lock, pull or push to reset, 2b)	1	
		Illuminated push button (instantaneous, 1a)	3	5
	Service life	Emergency-stop button	250,000 cycles or more (mechanical) 100,000 cycles or more (electric)	
		Illuminated Push Button	1,000,000 cycles (mechanical) 100,000 cycles (electric)	
Emergency Stop Switch	Voltage *1 Current *1	N.C. (AC/DC only)	Below AC220V/DC24V 1A (resistive load)	
		N.C. (DC only)	Below DC24V 1A (resistive load)	
Illuminated type switch	Switch	Voltage *1 Current *1	Light color (green/red)	Below AC220V/DC24V 1A (resistive load)	
			Light color (white)	DC24V	
				Below 1A (resistive loads)	Total 3 switches below 1A (resistive loads)
	Lamp	Nominal Voltage*1 Current consumption*1	LED built in resistor (green, red, yellow)	DC24V ± 5%, 1, when 13mA lamp is used.	

*1   For cable connection, please see 📖 "6-8 VT3-V7R Specific Switch Unit".

2-3 **Dimensions**

This section shows the external dimensions of the VT3 series.

Body

■ **VT3-X15(D)**

Fixture (enclosed) installation

Rear view

```
20    383
71

396
304.1
(Effective display part)
295  228.1
     (Effective)
282
6    58
     (3)

41.7    103.4
13    49.6
26    90.4
P7.62×3=22.86    128.3
167    211.2
```

```
171.5    171.5
Thickness of panel    Fixture
2.0 to 4.0mm    Mounting
             screws
305
(Fixture)
406
(Fixture)
```

Panel cutout

```
282.5 +1 -0
383.5 +1 -0
```

in: mm

■ **VT3-S12(D)**

Fixture (enclosed) installation

Rear view

```
301
170
55

314
246
(Effective display part)
240  184.5
     (Effective
     display part)
227
6    48

125.8
107.9
54.8    76.8
13
26
107.9    P7.62×3=22.86
145.8
```

```
131    131
Thickness of panel    Fixture
1.6 to 4.0mm    Mounting
             screws
250
(Fixture)
```

Panel cutout

```
227.5 +1 -0
301.5 +1 -0
```

in: mm

2

■ **VT3-S10/V10(D)**

Fixture (enclosed) installation

295
168
55
306
211.2
(Effective display part)
6
48
228
158.4
(Effective display part)
217

Rear view
124.5
106.6
53.6
75.6
13
26
P7.62×3=22.86
101
139.1

Thickness of panel
1.6 to 4.0mm
Fixture
Mounting screws
129.5
129.5
240
(Fixture)

Panel cutout
217.5^{+1}_{0}
295.5^{+1}_{0}

in: mm

■ **VT3-V8**

Fixture (enclosed) installation

226
133
50
237
170.9
(Effective display part)
6
43
178
128.2
(Effective display part)
167

108.3
87.4
Rear view
53.5
29.3
P7.62×3=22.86
7.62
15.24
109.5
153.5

Thickness of panel
1.6 to 4.0mm
Fixture
Mounting screws
99
99
190
(Fixture)

Panel cutout
167.5^{+1}_{0}
226.5^{+1}_{0}

in: mm

■ **VT3-V7**

206.5
124
50

Fixture (enclosed) installation

218
151.7
(Effective display part)
6
43
113.8
(Effective display part)
176
164.5

Thickness of panel
1.6 to 4.0mm
Fixture
Mounting screws

87.5 87.5
188
(Fixture)

98.2
77.5
Rear view

53.5
7.62
15.24
29.3
99.5
143.5
P7.62X3=22.86

Panel cutout

165 $^{+1}_{0}$

207 $^{+1}_{0}$

in: mm

2
SPECIFICATIONS

■ **VT3-V6H(G)/Q5H(G)**

USB port Memory card slot

36.2 34.8

A B

When key operated switch unit is mounted

8 Key

27

36 E (Effective display part) 36

25.2

C

F (Effective display part)

G

(30°)

D

When button switch unit is mounted

When button switch protector is mounted

22 99

21

H

When start switch is provided (only VT3-V6HG/Q5HG)

Cable protector

(32)

(84)

6.5 60

in: mm

113

12

45

22

4-M4 depth 10

120

Model	VT3-V6H(G)	VT3-Q5H(G)
A	91	80
B	114.3	103.3
C	196	180
D	246	224
E	134.3	115.2
F	101	86.4
G	35	33.8
H	(100)	(84)

● **OP-87176 (Wall mounts)**

To install body

140

8-R3

6

73

164.3 75 162

42.4

25

75 12°

190

4-M4 screw tap

102

Wall installation components

in: mm

2
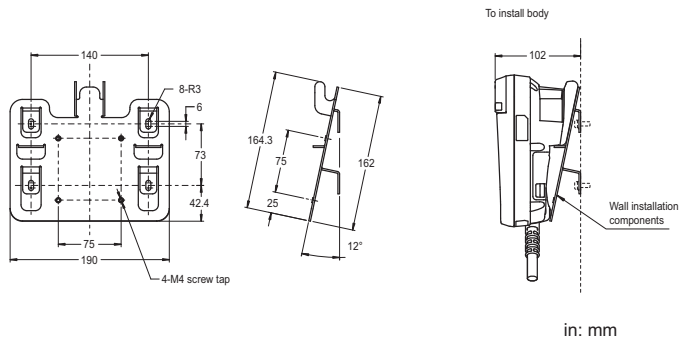
● **OP-87177 (VESA mounts components)**

in: mm

■ **VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**

in: mm

SPECIFICATIONS
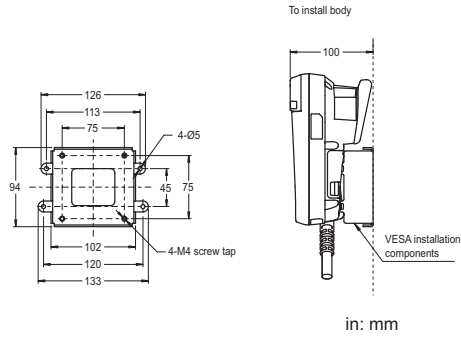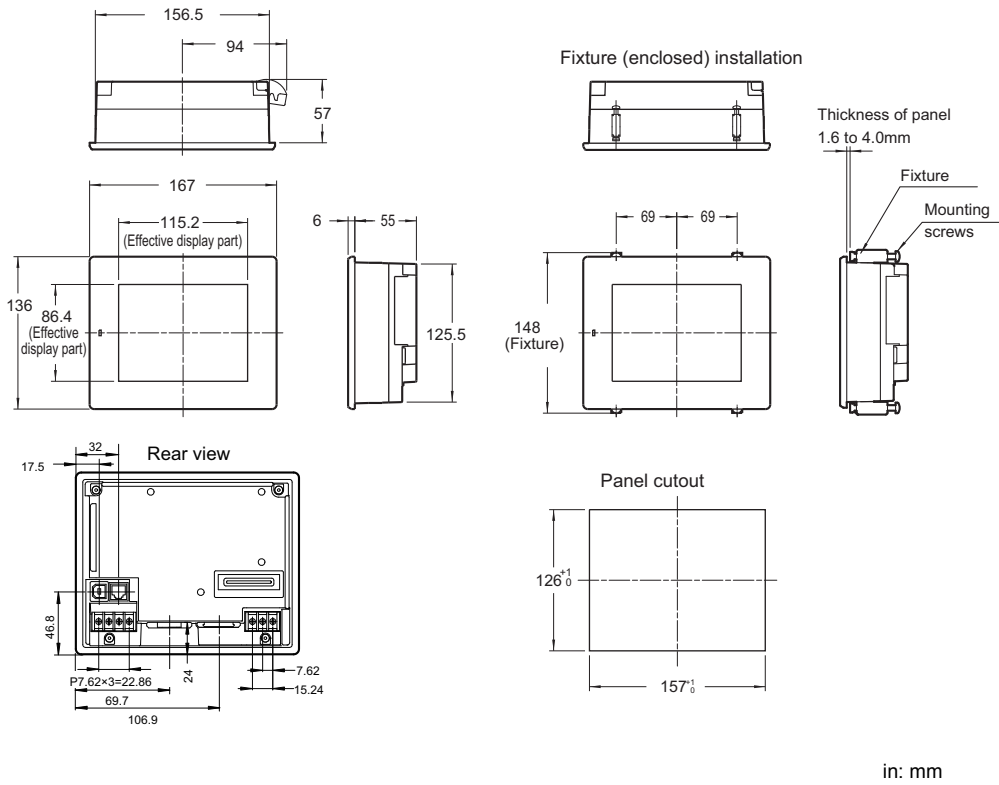
■ **VT3-W4T(A)**
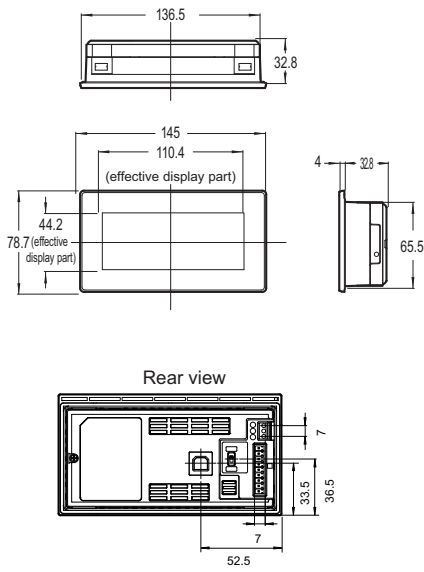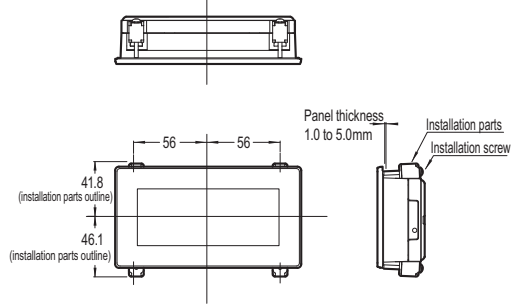
When installation parts (accessories) are available
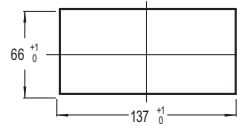
in: mm

■ **VT3-W4M(A)/W4G(A)**
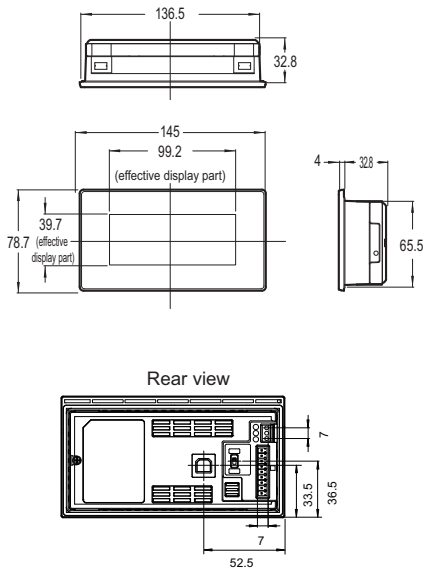
When installation parts (accessories) are available

in: mm

2

■ **VT3-V7R**

● **Without Fixture**

282.5
151.7(Effective display part)
57
113.8 (Effective display part)
192
1
(50)
Cable protector
Ø11.1 Cable diameter

4-M4 Depth 5
149
76

in: mm

2

● **Including wall mount A**

50

200
(Fixture
Dimensions)

60.5
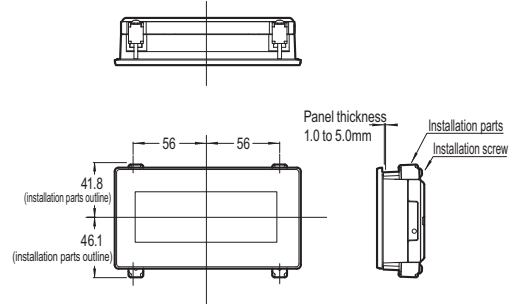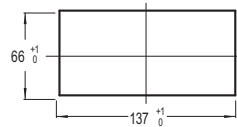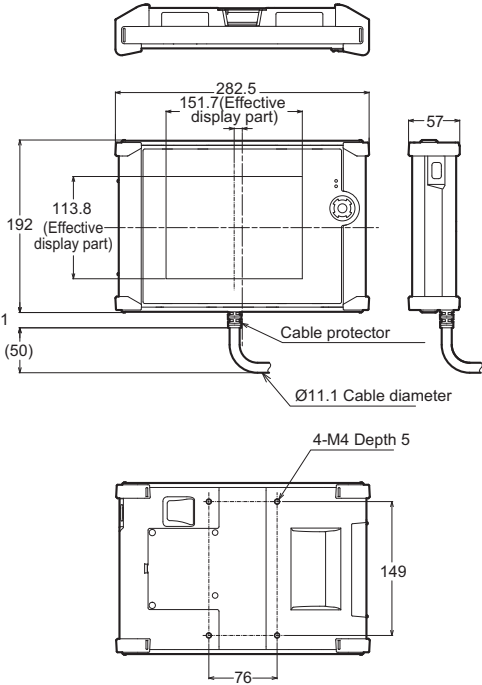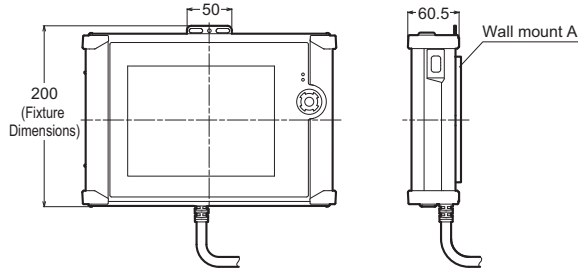
Wall mount A

in: mm

● **Including wall mount A+B+C**

(50)

208
(Fixture
Dimensions)

(50)

64.5

Wall mount
A+B+C
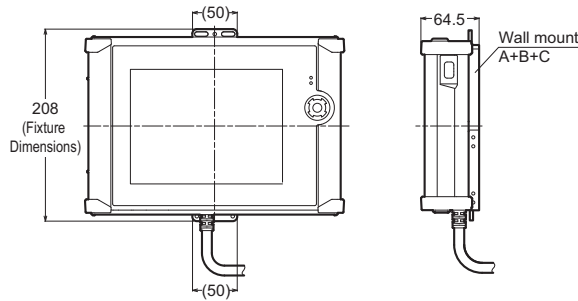
in: mm

● **Including rod fixture**
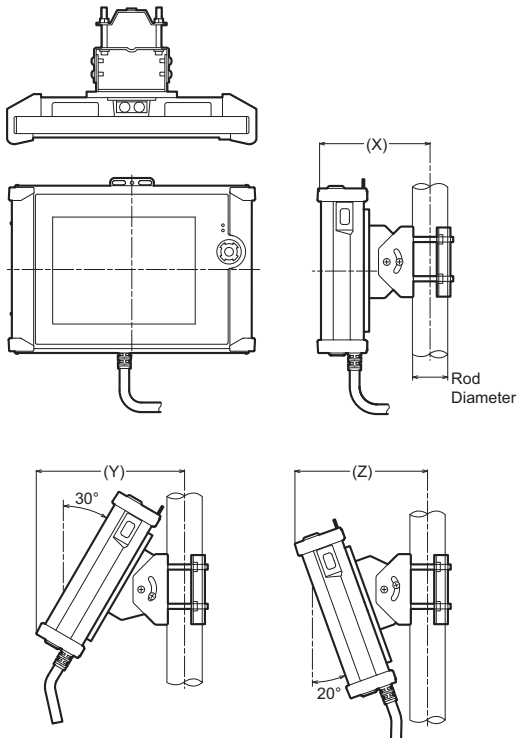
Reference Dimensions(mm)

Rod Diameter	X	Y	Z
Ø20	118	158	140
Ø30	124	164	147
Ø40	130	170	153
Ø50	135	175	158
20 x 20 square	120	160	148
30 x 30 square	125	165	143

(X)

Rod
Diameter

(Y)

30°

(Z)

20°

in: mm

2

● **Installed on the top of VT3-SW6(4) (without a fixture)**
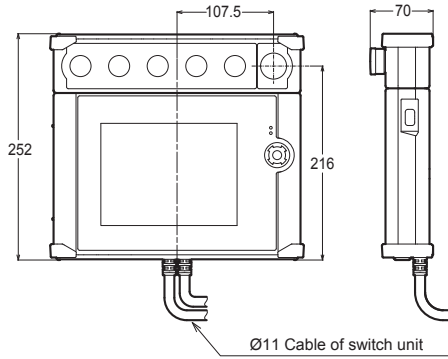
In the following case, VT3-SW6 is used.

Ø11 Cable of switch unit

in: mm

● **Installed on the top of VT3-SW6(4) (with wall mount A+B+C)**

In the following case, VT3-SW6 is used.

Wall mount
A+B+C
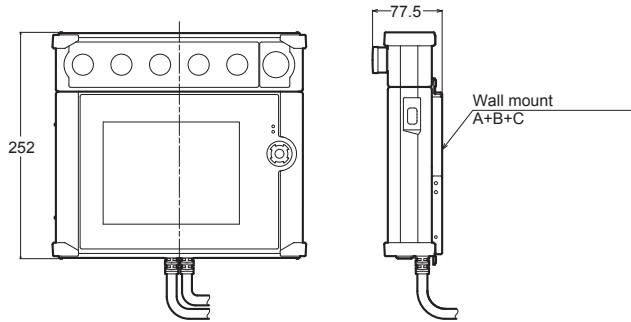
in: mm

● **Installed on the top of VT3-SW6(4) (with the rod fixture)**

In the following case, VT3-SW6 is used.

Rod
Diameter
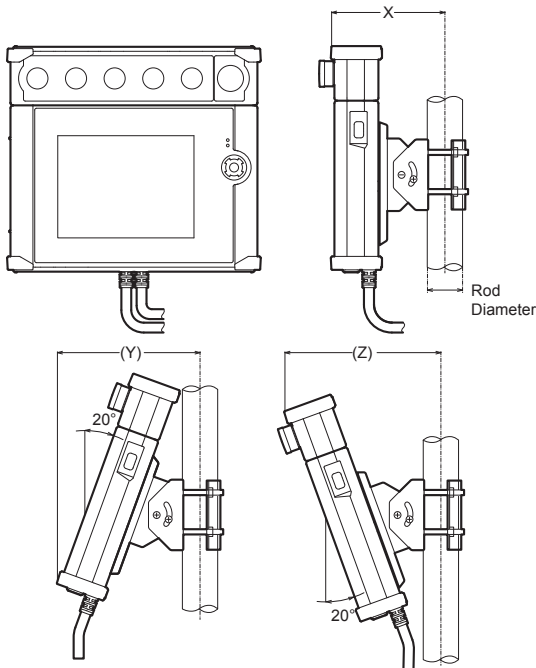
Reference Dimensions(mm)

Rod Diameter	X	Y	Z
Ø20	120	148	161
Ø30	126	154	167
Ø40	132	160	173
Ø50	137	165	178
20 x 20 square	122	150	163
30 x 30 square	127	155	168

in: mm

2

● **Installed at the bottom of VT3-SW6(4) (without a fixture)**

In the following case, VT3-SW6 is used.
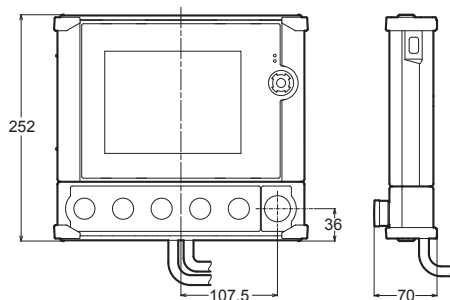
in: mm

● **Installed at the bottom of VT3-SW6(4) (with wall mount A+B+C)**

In the following case, VT3-SW6 is used.
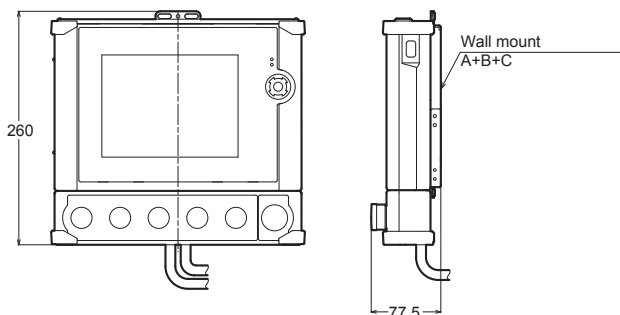
in: mm

● **Installed at the bottom of VT3-SW6(4) (with the rod fixture)**

In the following case, VT3-SW6 is used.
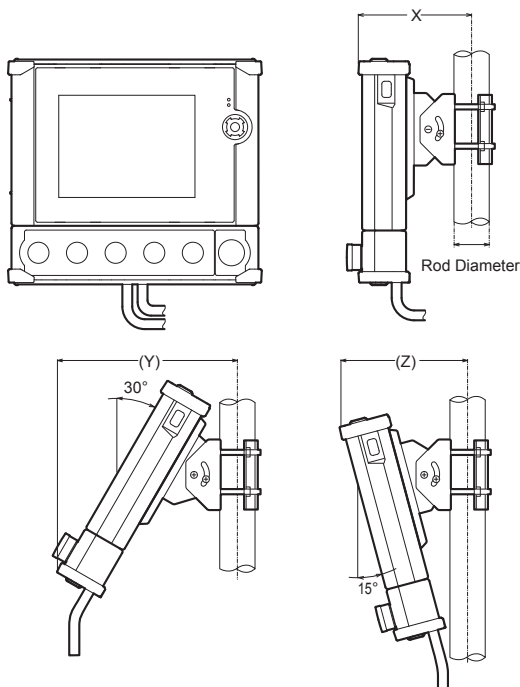
Reference Dimensions(mm)

Rod Diameter	X	Y	Z
Ø20	120	191	135
Ø30	126	197	141
Ø40	132	203	147
Ø50	137	208	152
20 x 20 square	122	193	137
30 x 30 square	127	198	142

in: mm

2

SPECIFICATIONS

- **VT3-SW1 Installation (without a fixture)**

92.5

75

240

212
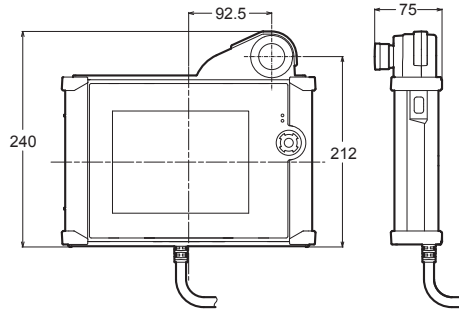
in: mm

- **VT3-SW1 Installation (with wall mount A+B+C)**

82.5

Wall mount
A+B+C

248
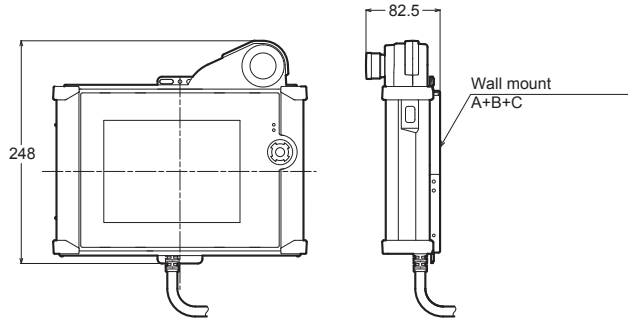
in: mm

- **VT3-SW1 Installation (with the rod fixture)**

X

Rod
Diameter
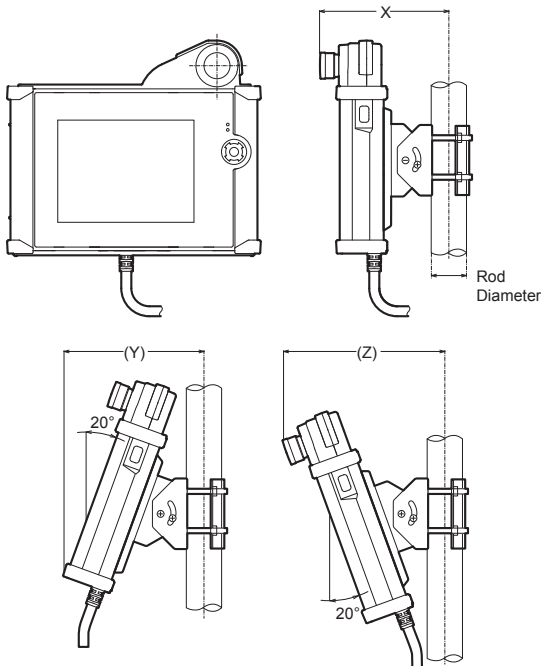
Reference Dimensions(mm)

Rod Diameter	X	Y	Z
Ø20	120	148	156
Ø30	126	154	162
Ø40	132	160	168
Ø50	137	165	173
20 x 20 square	122	150	158
30 x 30 square	127	155	163

(Y)

(Z)

20°

20°

in: mm

■ **VT3-SW1**

58

259

68

in: mm

■ **VT3-SW4**

275

30 ← P43x2=86 → 129

65

60

30

2.5

Ø11 Cable diameter

in: mm

■ **VT3-SW6**

275

30 ← P43x4=172 → 43

65

60

30

2.5

Ø11 Cable diameter

in: mm

■ **Wall Mount A, B+C**

103.2

112

32

50
40
20

φ4.3
4-R2.5   5

58
50
40

6-M4

4-φ4.3
(98.3)

4-φ5.3

149 55

(98.3)

59

194

4-φ4.3

41   6

207.5
256

55
76

t=1.6

t=2

60

(A)

(B+C)

in: mm

2
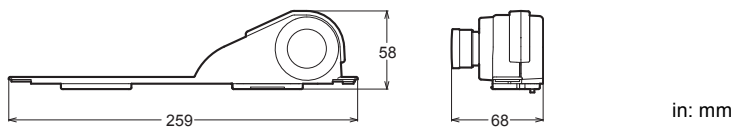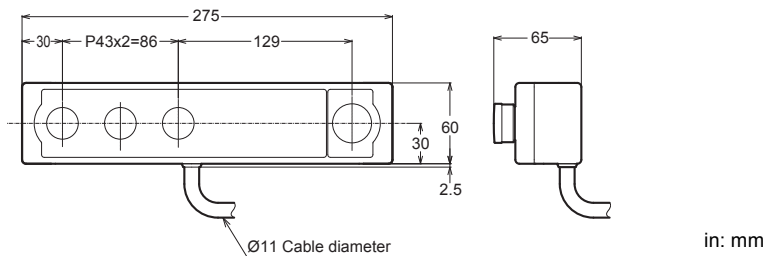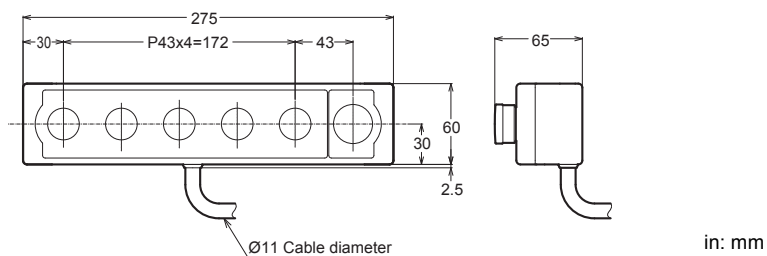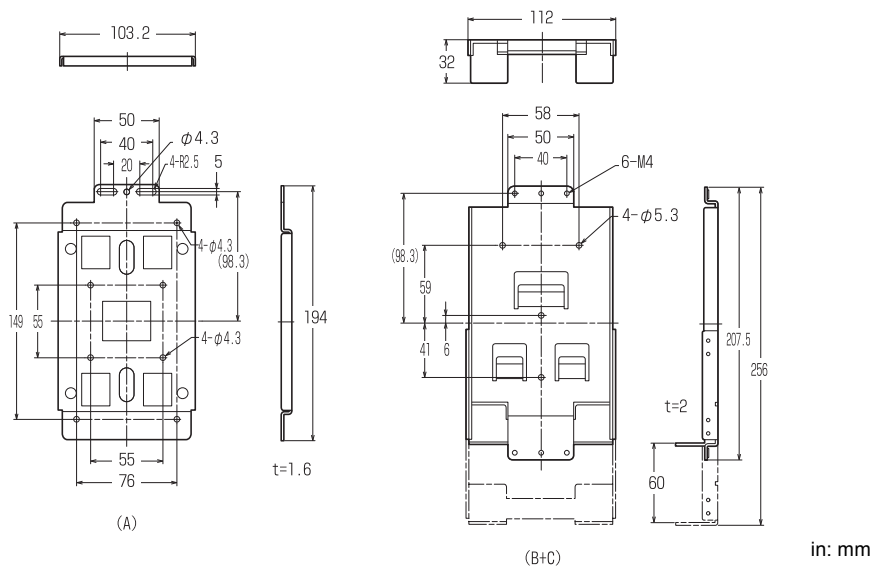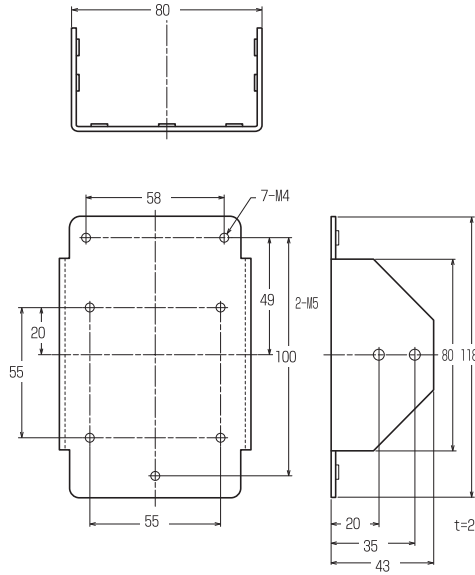
■ **Rod Fixture A**

in: mm

■ **Rod Fixture B**
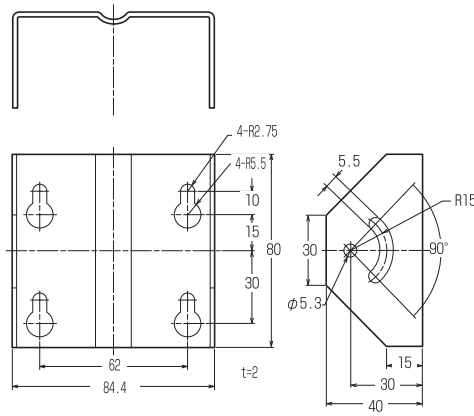
in: mm

■ **Rod Fixture C**

in: mm

2
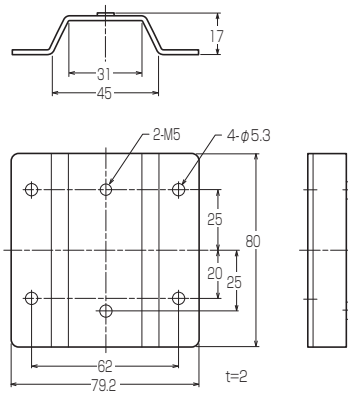
Expansion Units/Peripherals

■VT3-VD4

(in:mm)

■VT3-VD1

(in:mm)

■VT3-R1

(in:mm)

■VT2-E1/P1

(in:mm)

■VT2-E2/P2, VT3-E3

(in:mm)
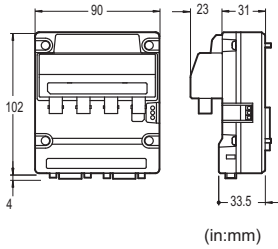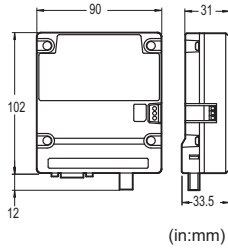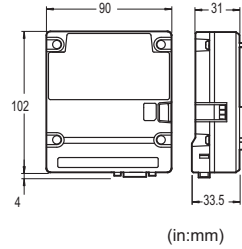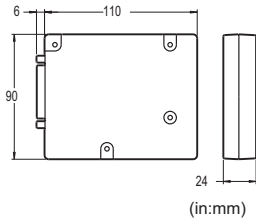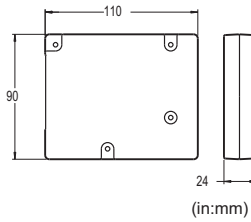
Mounting position of body
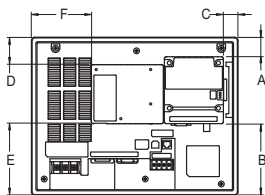
Model	X15(D)	S12(D)	S10/V10(D)	V8	V7	Q5T(W)/Q5S(W)/Q5T(W)A	Q5M(W)/Q5M(W)A/W4T(A)/W4M(A)/W4G(A)
A	10.5	29.0	18.5	9.0	-	-	-
B	182.5	108.5	107.5	67.0	-	-	-
C	52.0	21.5	20.5	17.5	-	-	-
D	22.5	41.0	30.5	21.0	19.0	7.0	-
E	182.5	108.5	107.5	67.0	67.0	39.0	-
F	143.0	90.5	84.0	18.0	19.0	48.5	-

(in:mm)

■VT2-D2

Fixture (enclosed) installation

Mounting screws

Fixture

Thickness of panel 1.2 to 4.0mm

Panel cutout

VT2-D2 (Connected with VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7)

VT3

VT2-D2 (Connected with VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A)
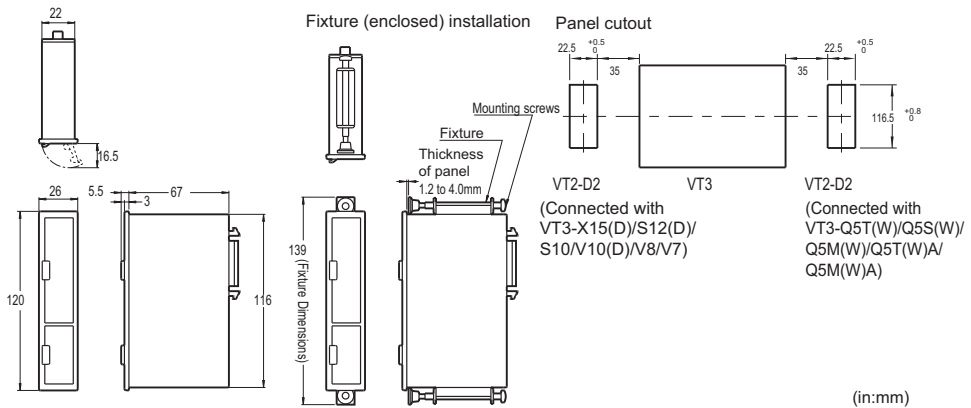
(in:mm)

■ VT-T1

Panel shear dimension

When the cover is open

(28)

80
68 +1 0
4-Ø5
68 +1 0
80

111.5
80
4.4
20.2
4-M4 depth 10
35.9
19.9
80
144
59.3
90.6
3.5
(100)
To install cable

To install key
12
52
45.5
(60)

25
21.6
30.5
60.3

in: mm

2
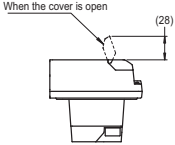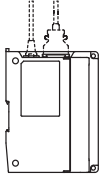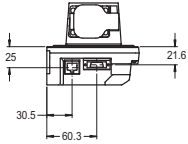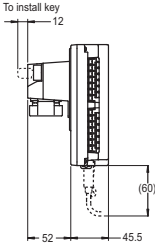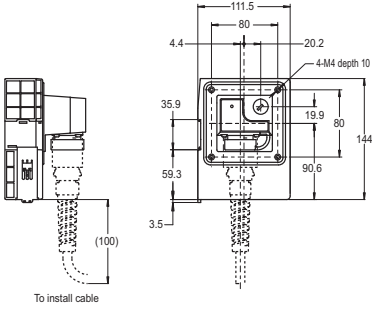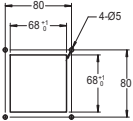
SPECIFICATIONS

Weather-proof Cover

■ **VT2-B12**   ■ **VT2-B10**
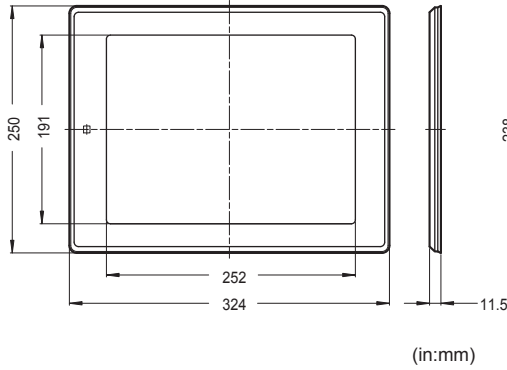
(in:mm)   (in:mm)

■ **VT2-B8**   ■ **VT2-B7**

(in:mm)   (in:mm)

■ **VT3-B5**   ■ **VT3-B4**

in:mm

3
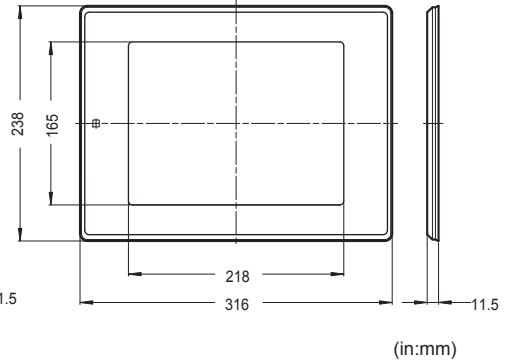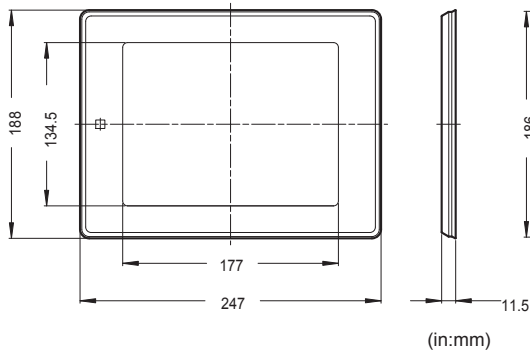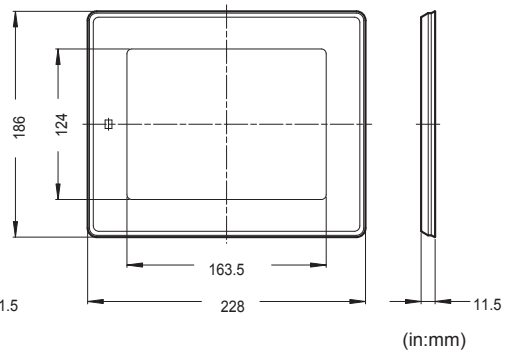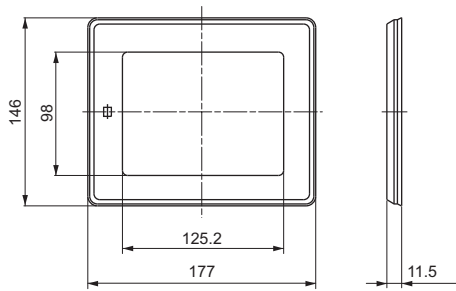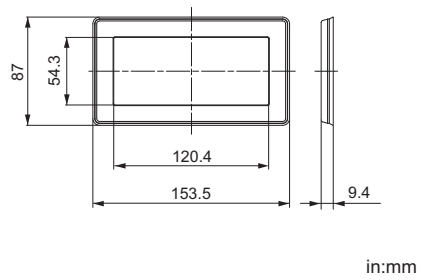
INSTALLATION

This chapter describes the precautions when setting up the VT3 Series.
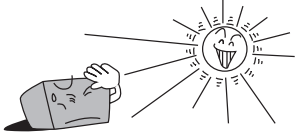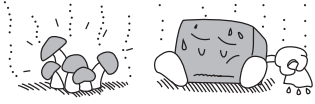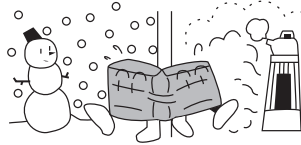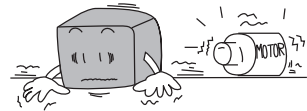
This section describes how to install (panel mounting) the VT3, installation cautions and cautions upon use.

Operating Environment

The following describes the installation environment, mounting position and cautions when wiring the VT3.

■ Installation location

Do not install the VT3 in the following places.

Exposed to direct sunlight	The ambient temperature is outside the 0-50 ºC range.	The ambient humidity is outside the 35-85% range.
Locations where dewing happens due to a dramatic change in temperature	Locations where corrosive or flammable gas stays	Locations exposed to heavy dust, salt, chip, chip, and smoke.
Locations that are subject to vibration or impact	Locations that are exposed to spraying water, oil, medicine, etc.	Exposed to strong magnetic and electric fields.

NOTICE	Install the VT3 as far away as possible from locations where radios, etc. are located. Radio waves emitted by the VT3 may cause noise to occur on the radio.

■ Ambient temperature/humidity precautions

Pay attention to the following points when installing the VT3 inside a control panel.

- When the ambient temperature is higher than 40°C, please use it at a maximum absolute humidity of 85% RH at 40°C.
- Do not install the VT3 in a location where the ambient temperature exceeds the 0 to 50°C, or the ambient humidity exceeds the 35 to 85%RH range.
- If the ambient temperature exceeds the above range, install a forced air cooling fan or air conditioner to keep the ambient temperature within this range.
- Allow as much space as possible between the VT3 and surrounding structures and other components to improve maintainability, operability and ventilation.
- Do not mount the VT3 directly above equipment (e.g. heaters, transformers, inverters and equipment with large resistance) that generate lots of heat.
- Do not use PORT1 (USB) in locations that are subject to vibration or impact. The USB connector is not provided with a locking function, so the USB cable may become loose or disconnected, and disrupt communications.

■ Measures for improving noise resistance

- Do not mount the VT3 inside industrial control panels in which high-voltage devices are also located.
- Mount the VT3 as far away as possible from power lines.
- Mount the VT3 as far away as possible when it must be mounted next to devices (e.g. solenoids, choppers) that generate strong magnetic and electrical fields.
- Do not include the VT3's I/O leads in the same ducts as power lines and highvoltage lines. Wire the I/O leads in separate ducts. Noise from power lines and high-voltage lines may cause malfunction on the VT3.
- On VT3 models that are provided with a protective earth terminal and shielded lead, provide a D-type grounding (maximum resistance of 100 Ohms).
  - 📖 "3-3 Connection of Power Supply"
  - 📖 "3-4 Grounding Precautions"

Precautions for CE Marking

Keyence Corporation has confirmed that VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A)/V7R and VT-T1 complies with the essential requirements of the applicable EU Directive(s), based on the following specifications. Be sure to consider the following specifications when using VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/ W4T(A)/W4M(A)/W4G(A)/V7R and VT-T1 in the Member States of European Union.

- When installing the VT3 Series, be sure to install it in an electro-conductive enclosure (e.g. an industrial control panel).

■ EMC Directive

NOTICE	VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/ Q5M(W)A/W4T(A)/W4M(A)/W4G(A)/V7R and VT-T1 is a Class A device (for general industrial use). If VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T/Q5S/Q5M/W4T(A)/W4M(A)/ W4G(A)/V7R and VT-T1 is used in domestic environments, it may cause electromagnetic interference.

✎ Point	These specifications do not give any guarantee that the end-product with VT3 Series incorporated complies with the essential requirements of EMC Directive. The manufacturer of the end-product is solely responsible for the compliance on the end-product itself according to EMC Directive.

● Applicable ferrite core

Excluding the power lead, all ferrite cores should be inserted at a position within 100 mm from ports and connectors.

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Port/Connector	Ferrite Core	Number of Turns	Cable/Equipment
Power supply terminal block	📖 "3-3 Connection of Power Supply"		
PORT1:SERIAL[1]	None		OP-26487
PORT1:USB	Made by TDK Corporation, ZCAT3035-1330	2	OP-35331
PORT2		3	Shielded cable
PORT3		2	BL-80RK/210RK/TL-30K/RF-500/550 other
PORT4	Made by TDK Corporation, ZCAT2035-0930	1	OP-30591/30592

[1]   A ferrite core (ZCAT2235-1030 made by TDK) is needed when using VT2-D2 .

3

INSTALLATION

3

INSTALLATION

VT3-VD4/VD1, VT3-R1, VT2-E1/E2/P1/P2, VT3-E3

Port/Connector	Ferrite Core	Number of Turns	Cable/Equipment
CH1 to CH4 video input	Made by TDK Corporation, ZCAT3035-1330	2	Shielded video cable
Console output			OP-42290
RGB input	Made by TDK Corporation, ZCAT2235-1030	1	Co-axial cable 75Ω RGB cable with ferrite core
RGB output	-	-	OP-66842
Ethernet I/F	Made by TDK Corporation, ZCAT3035-1330	2	Shielded cable
Printer I/F			62Ω compatible printer cable
Printer I/F (USB)	-	-	OP-35331

● **Precautions**

• When VT-T1 is used, EtherNet cable and connection cable of terminal block must be shielded cable.

■ **Low-voltage Directive**

> ⚠ **Point**
>
> • **The following shows the details evaluated for VT3-X15/S12/S10/V10 only internally by Keyence Corporation, and do not guarantee compliance with Low-voltage Directive for machinery devices. VT3-X15/S12/S10/V10 The user must judge compliance with Low-voltage Directive for machinery devices.**
> • **For more information about installation or wiring, please see** 📖 **"3-2 Mounting"**

● **Precautions**

VT3-X15/S12/S10/V10

Please use in the following environments.
• Overvoltage category II
• Pollution Degree 2

VT3-X15/S12/S10/V10 is designed as a Class I equipment. Be sure to connect the protective earthing terminal on the VT3-X15/S12/S10/V10 to the protective earthing conductor in the building installation.

When installing the VT3-X15/S12/S10/V10, be sure to provide a switch or circuit breaker complying with EN60947-1 and EN60947-3 as the disconnecting device. A switch or circuit breaker shall be in the building installation close to this equipment, and within easy reach of the operator.

VT3-X15D/S12D/V10D/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/ W4M(A)/W4G(A)/V7R and VT-T1

Devices subject to Low-voltage Directive are devices having an input or output of 50 to 1000 VAC or 75 to 1500 VDC. As the VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/ W4T(A)/W4M(A)/W4G(A)/V7R and VT-T1 has only inputs or outputs of less than 75 VDC, these devices are not subject to Low-voltage Directive.

■ **Machinery Directive (2006/42/EC)**

✎ Point	**Products subject to Machinery Directive are VT3-V6H(G)/Q5H(G) and VT-T1 only.**

- Applicable standard
  - EN60204-1
  - EN50178
  - EN ISO 13849-1
- Refer to 📖 "PL (Performance Level) and Category", page 3-34 for the PL and Category related to the safety functions of the enabling switch provided on VT3-V6HG/Q5HG or the safety functions when the emergency stop push button switch unit is connected to the VT3-V6H(G)/Q5H(G).
- VT-T1 must be installed with an enclosure with IP54 or higher.
- Use the KEYENCE optional cables for wiring to VT3-V6H(G)/Q5H(G) or between VT3-V6H(G)/Q5H(G) and VT-T1.
- VT3-V6H(G)/Q5H(G) and VT-T1 are Ⅲ Class III equipment.
- Use this product at the altitude of 2000m or less.

3

INSTALLATION

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Precautions for UL Certificate

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A), VT3-VD1/VD4, VT3-R1, VT3-E3, VT2-P1/P2, VT2-E1/E2 are UL/C-UL Listed products.
• UL File No.E207185, UL Category NRAQ/NRAQ7

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■ Be sure to follow the specification below

- For wiring to the power supply terminal block of VT3-X15(D)/S12(D)/S10/V10(D), use a stranded copper wire with a gauge of AWG #8 to #20 and a temperature rating of 60°C or higher. Tightening torque must be 1.4 N•m (12 lbf•in).
- For wiring to the power supply terminal block of VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A, use a stranded copper wire with a gauge of AWG #14 to #20 and a temperature rating of 60°C or higher. Tightening torque must be 0.5 N•m (4.3 lbf•in).
- For wiring to the power supply terminal block of VT3-W4T(A)/W4M(A)/W4G(A), use a stranded or single copper wire with a gauge of AWG #16 to #26 and a temperature rating of 60°C or higher. Tightening torque must be 0.19 N•m (1.7 lbf•in).
- For wiring to the serial I/F terminal block (PORT2) of VT3-W4T(A)/W4M(A)/W4G(A), use a stranded copper wire with a gauge of AWG #16 to #26 and a temperature rating of 60°C or higher. Tightening torque must be 0.22 to 0.45 N•m (2 to 4 lbf•in).
- For wiring to PORT4 of the VT3 series, use a stranded copper wire with a gauge of AWG #14 to #20 and a temperature rating of 60°C or higher. Tightening torque must be 0.5 N•m (4.3 lbf•in).
- The VT3 series is for use on a flat surface of a Type 1 enclosure.
- The VT3 series is for use in pollution degree 2 environment.
- When using the VT3-X15D/S12D/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A use one of the following power supplies.
  - A UL/CSA certified power supply that has been evaluated as a Class 2 output as defined in the NFPA70 (NEC: National Electrical Code), and CEC (Canadian Electrical Code).
  - A UL/CSA certified power supply that has been evaluated as a Limited-energy circuit as defined in UL61010-1 and CAN/CSA-C22.2 No.61010-1.

CSA Certificate

VT3-V6H(G)/Q5H(G) and VT-T1 comply with the following CSA Standards and UL Standards, and has been certified by CSA. Be sure to consider the following specifications when using this product as a product certified by CSA.

* Applicable specifications:CAN/CSA-C22.2 No.61010-1

    Safety Requirements for Electrical Equipment for Measurement, Control and

    Laboratory Use

    UL61010-1

    Safety Requirements for Electrical Equipment for Measurement, Control and

    Laboratory Use

* Use the power supply with Class 2 output defined in CEC(Canadian Electrical Code) and NEC (National Electrical Code) for the power supplied to VT3-V6H(G)/Q5H(G) and VT-T1.
* VT-T1 must be installed with an enclosure with IP54 or higher.
* Use the KEYENCE optional cables for wiring to VT3-V6H(G)/Q5H(G) or between VT3-V6H(G)/Q5H(G) and VT-T1.
* Overvoltage category Ⅰ
* Use this product under pollution degree 1 to 3.
* Use this product at the altitude of 2000m or less.
* Indoor use only.

3

INSTALLATION

3-2 Mounting

This section describes how to mount the VT3 and other precautions.

VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A)

■ Mounting Precautions

● Mounting angle

Mounting angle depends on ambient temperature and Back Light adjustment.
Adjust the mounting angle to suit the mounting circumstances.
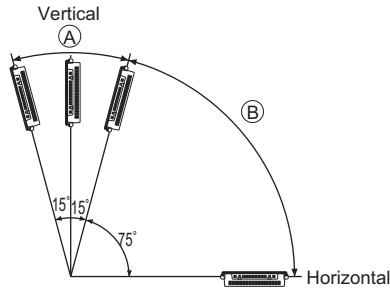
Type	Ambient operating temperature	
	Range A	Range B
VT3-X15(D)	0 to 50°C(★★★)*1	0 to 40°C(★★★)
VT3-S12(D)	0 to 50°C(★★★)	
VT3-S10		
VT3-V10(D)		
VT3-V8	0 to 50°C(★★★)*2	0 to 50°C(★★★)*3
VT3-V7	0 to 40°C(★★★), 0 to 50°C(★★)*4	0 to 50°C(★★)*5
VT3-Q5T(W)	0 to 50°C(★★★)	0 to 40°C(★★★), 0 to 50°C(★★)
VT3-Q5T(W)A		
VT3-Q5S(W)		0 to 50°C(★★★)
VT3-Q5M(W)		
VT3-Q5M(W)A		
VT3-W4T(A)	0 to 50°C(8)	
VT3-W4M(A)		
VT3-W4G(A)		

★ indicates the "Backlight Adjustment" setting in the System mode.

📖 "Backlight Power", page 5-9

*1   0 to 45°C(★★★) for longitudinal picture display.
*2   If expansion connectors 1 and 2 are used simultaneously, 0 to 40°C(★★★) ; if either expansion connector 1 or 2 is used alone, 0 to 50°C(★)
*3   Both expansion connector 1 and 2 can only use 1 port. 0 to 40°C(★).
*4   When expansion connector 1 is used, 0 to 50°C(★).
*5   When expansion connector 1 is used, 0 to 40°C(★).

● **Panel thickness**
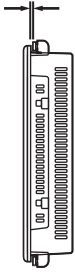
Panel thickness requirement

Type	Panel thickness
VT3-X15(D)	2.0mm to 4.0mm
VT3-S12(D)/S10/V10(D)/ V8/V7/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/ Q5M(W)A	1.6 to 4.0 mm
VT3-W4T(A)/ W4M(A)/W4G(A)	1.0mm to 5.0mm

Point **VT3-V6H(G)/Q5H(G)/V7R cannot be mounted in the panel.**

■ **Panel installation**

Describe how to mount the front side of the VT3 Series
Mounting fixtures are required for mounting.

1 **Cut open a mounting space at the size shown below for fitting the VT3 into.**

Horizontal installation   Longitudinal installation
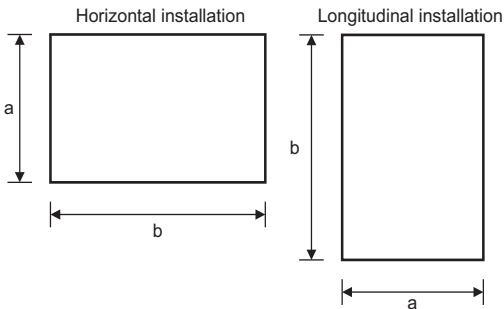
Model	a	b
VT3-X15(D)	282.5 $^{+1}_{-0}$	383.5 $^{+1}_{-0}$
VT3-S12(D)	227.5 $^{+1}_{-0}$	301.5 $^{+1}_{-0}$
VT3-S10/V10(D)	217.5 $^{+1}_{-0}$	295.5 $^{+1}_{-0}$
VT3-V8	167.5 $^{+1}_{-0}$	226.5 $^{+1}_{-0}$
VT3-V7	165.0 $^{+1}_{-0}$	207.0 $^{+1}_{-0}$
VT3-Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/ Q5M(W)A	126.0 $^{+1}_{-0}$	157.0 $^{+1}_{-0}$
VT3-W4T(A)/ W4M(A)/W4G(A)	66.0 $^{+1}_{-0}$	137.0 $^{+1}_{-0}$

Unit: mm

2 **Insert the VT3 into the opening of the industrial control panel for mounting.**
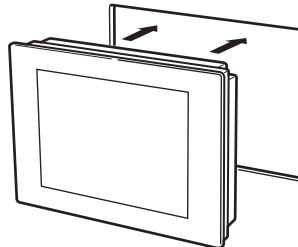
3 **Fix the VT3 onto the panel using the mounting fixtures.**
Fixtures are mounted on the sides of the VT3 Series

Horizontal installation

VT3-X15(D) VT3-S12(D)/S10/V10(D) VT3-V8/V7/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A VT3-W4T(A)/W4M(A)/W4G(A)

Power terminal

Longitudinal installation

VT3-X15(D) VT3-S12(D)/S10/V10(D) VT3-V8/V7/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A VT3-W4T(A)/W4M(A)/W4G(A)

Power terminal
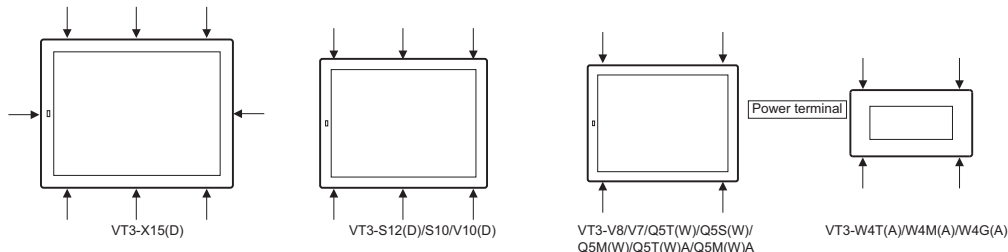
4 **Tighten the screws on the mounting fixtures.**

* Please confirm the mounting tool is next to the front side (backside of VT) before tightening.
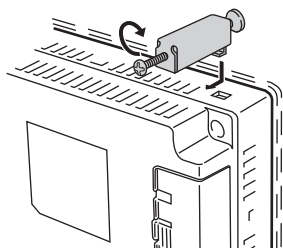
**when VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/
Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**
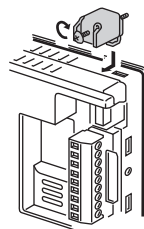
when VT3-W4T(A)/W4M(A)/W4G(A)

Type	Tightening torque
VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A	0.3 to 0.5N•m (3 to 5.1kg•Ecm)
VT3-W4T(A)/W4M(A)/W4G(A)	0.2 to 0.35N•m (2 to 3.5kg•Ecm)

NOTICE	• **When mounting vertically, install the unit so that the POWER indicator (power terminal at VT3-W4T(A)/W4M(A)/W4G(A)) is facing down.** • **The number of mounting fixtures depends on specific machine types.** **Please ensure to use all the enclosed fixtures for the installation.**

Type	Number of fixtures
VT3-X15(D)	8
VT3-S12(D)/S10/V10(D)	6
VT3-V8/V7/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A/ W4T(A)/W4M(A)/W4G(A)	4

• **In the case that only one of the short sides of the host unit is mounted or no sufficient number of fixtures are used, Protection IP65f cannot be guaranteed.**
• **In the case that the specified tightening torque is exceeded, "wrinkles" or "hollows" may appear on the display are of the panel.**

VT3-V6H(G)/Q5H(G)

■ Method of use

VT3-V6H(G)/Q5H(G) can be used in the following ways.

● Hold by the whole wrist
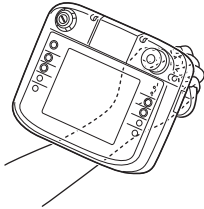
1 **The thumb passes through the hole of the hand grip with the palm facing up.**

2 **The remaining fingers hold the hand grip.**

3 **Place the body bottom on the wrist to support the body.**

* Both left and right hands can be used, but if an enable switch is used in VT3-V6H(G)/Q5H(G), please grasp the hand grip with left hand.

✎ Point	• **Attach a cushion to the hollow part of the hand grip to facilitate grasp. (only VT3-V6H/Q5H)** • **Grasp is easier if index finger does not contact the hollow part of the hand grip or the enable switch.**
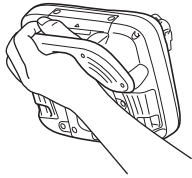
● Hold the body side
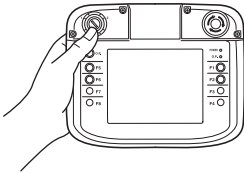
Easy to grasp when index finger hooks up upper part of the hand grip on both sides.
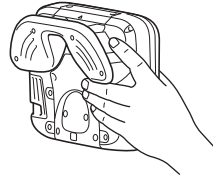
● Lay falt
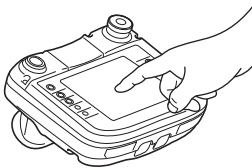
Place it on a table to maintain stability in case of using for a long time.

● Hang up
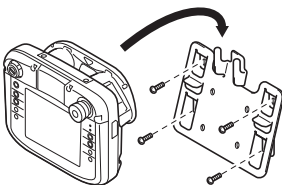
Hang up the panel with wall mounting accessories if it is not used, or used for a long time. Wall mounting accessories can also be installed on VESA arm (VESA75 supported).

3

INSTALLATION
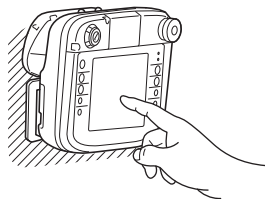
● **Fixed**

VESA mounting accessories can also be installed on VESA arm (VESA75 supported) and the panel.

■ **Wall mounting/VESA mounting**

For wall mounting, VT3-V6H(G)/Q5H(G) is not fixed on the wall, but in a removal manner. Wall mounting accessories (OP-87176) can be used.

1 **Use four attached screws (M5, 15mm long*) to fix the wall mounting accessories onto the wall.**
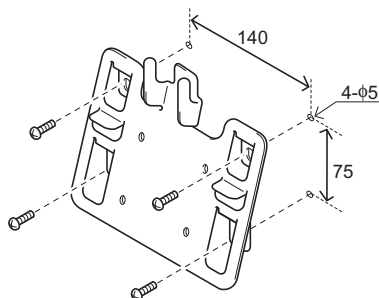
* For VESA mounting, attached 10mm long screws must be used.

2 **Hang the hole of the hand grip onto the bulged part of wall mounting accessories.**
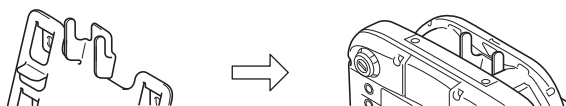
■ **Direct mounting/VESA mounting**

Use VESA mounting accessories (OP-87177).

1 **Use four attached screws (M4, 10mm long) to mount the VESA mounting accessories onto VT3-V6H(G)/ Q5H(G) body.**
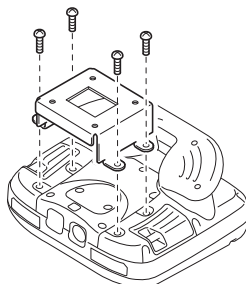
2 **Use four attached screws (M4, 10mm long) for fastening.**
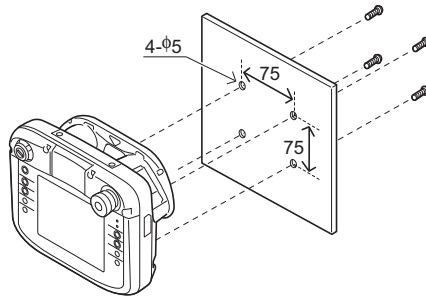
■ **Emergency stop button switch/key switch**

Install emergency stop button switch (OP-87171/87172/87173) and key switch (OP-87174) on VT3-V6H(G)/Q5H(G)

1 **Remove the two screws (M2.5, 8mm long) on the switch cover of VT3 handy Series body.**
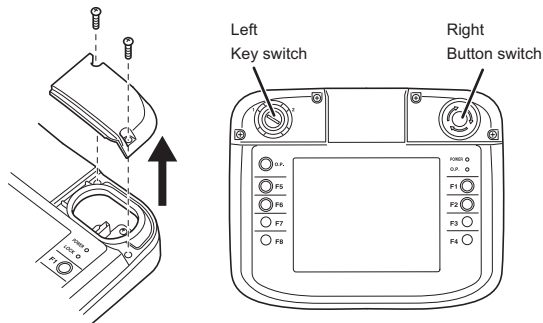
2 **Connect the body and switch cable while paying attention to the connector direction.**

•Emergency stop button switch (right): CN5

•Key switch (left): CN4
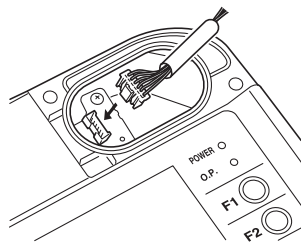
Point	**Place the VT body in vertical direction (mounting end downward), and grasp the upper and lower ends of the connector for easy mounting.**

3

INSTALLATION

3 Fix the screws after the switch is installed on the body. (Tightening torque: 3~4kgf•cm)
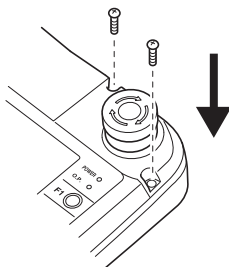
■ **Button switch protector**

⬊ Point	Button switch protector (OP-87175) may be installed on (emergency stop) button switch (OP-87171/87172/87173). Should not be installed on key operated switch (OP-87174).

1 Install the emergency stop button switch onto VT3 handy Series body according to steps 1 and 2 on "Emergency stop button switch/key switch", page 3-13.

2 Install the button switch protector on the emergency stop button switch, and use two screws (M2.5, 20mm long) for fixing. * Screw length should be longer than the screw of switch. (Tightening torque: 3~4kgf•cm).
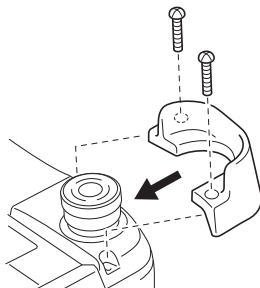
NOTICE	Using button switch protector (OP-87175) on the emergency stop button switch unit (OP-87171) is not in accordance with safety requirement. According to IEC60204-1, the emergency stop switch should be accessed easily in case of denger, so protector should not be installed on the emergency stop switch.

■ **Connecting cable**

Open the cable cover on the back of VT3-V6H(G)/Q5H(G) body, and install various connecting cables.

1 Loosen 7 screws on cable cover of VT3 handy Series body to remove the cable cover. (screws should not be separated completely, so as to avoid drop)

* It is unnecessary to loosen the small screw with rubber.
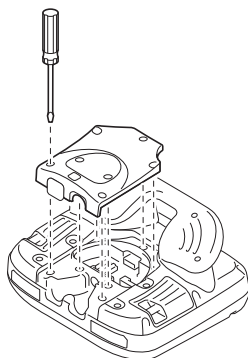
2 Connect the connector in the middle (CN1) with the body while paying attention to the connector direction.
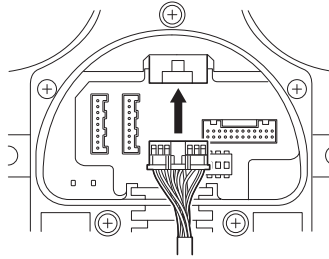
3 Connect the connector on the right (CN3) with the body while paying attention to the connector direction.
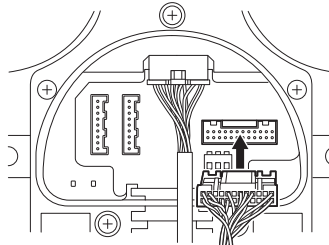
4 Connect the connector (CN2A [left]: RS-232C or CN2B [right]: RS-422) on the left with the body while paying attention to the connector direction.

✎ Point	**Not connect since CN2 is unavailable in the Ethernet connecting cable.**

* Termination resistance selector switch
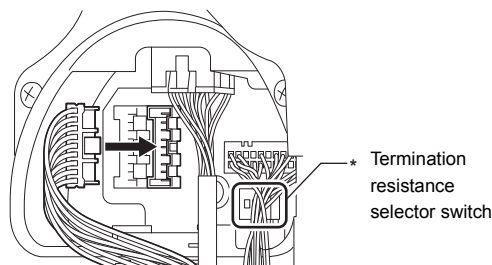
* When using RS-422/485, see VT5 Series/VT3 Series/DT Series PLC Connection Manual to set the terminating resistor switch.

5 Insert the cable sleeve into the slot of VT3 handy Series body.
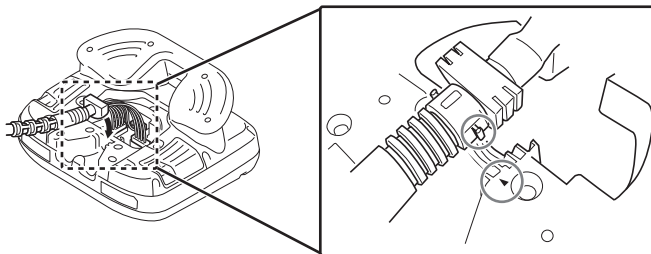
✎ Point	• When inserting, the groove (▲) on the lower of the body should be aligned with the bulged part above the cable protector.
	• After insertion, the sleeve in the slot should be slightly floating.

3

6 Insert the cable protector into the guide bar according to the cable outgoing direction.
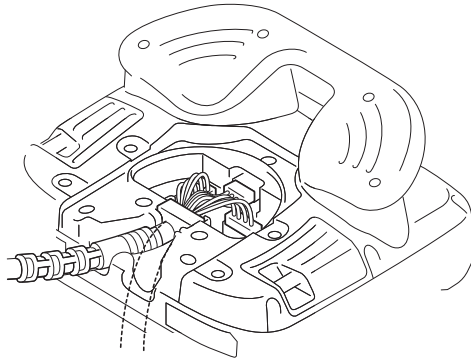
7 Install the protector cover to the non-outgoing end on the cable cover, close the cover, and fix with screws. (tightening torque: 4~5kgf•cm)
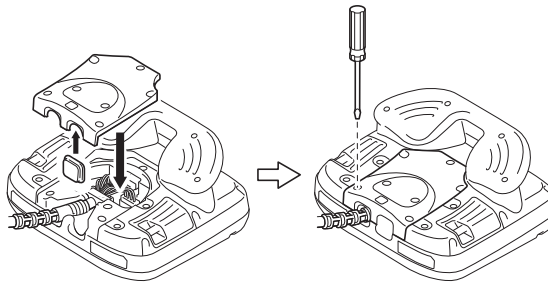
VT-T1

■ Panel mounting

1 Open four holes (68mm) and screw fixing holes (φ5mm) on the panel.

Unit: [mm]

80

80
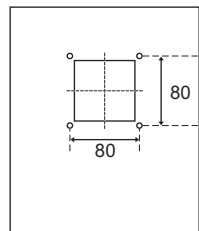
2 Insert VT-T1 in the panel from inner side.
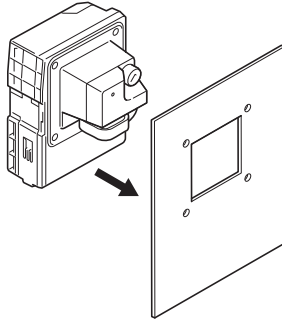
3 Use four attached screws (M4, 10mm long) for fastening from the front of the panel. (tightening torque: 5~7kgf•cm)
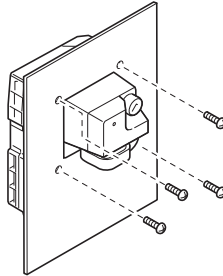
■ **DIN rail mounting**

Use the claw on the top of VT-T1 to hook the upper of the DIN rail. Press the DIN rail until the sound of "click" is heard.
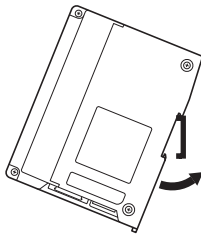
* Removing the unit

Use straight screwdriver or other tools to pull down the claw on the lower of VT-T1 from the front to remove it from the DIN rail.

■ **Connecting cable**

● **How to Install Cable**

1 Remove VT-T1 and the connector cover with removable connector cable.
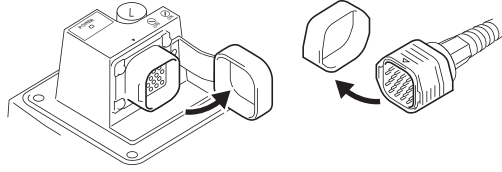
2 Insert VT-T1 connector with "▲" on cable connector surface visable, until the sound of "click" is heard.
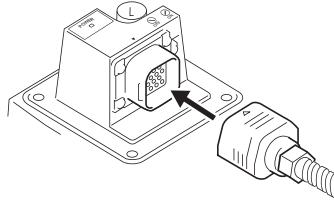
● **How to Remove Cable**

1 Remove the cable in the form that the connector side with removable connector cable departs from the cable outgoing direction.
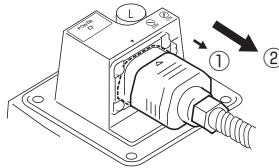
VT3-V7R

■ **Mounting Precautions**

Relation of the mounting angle with the operating temperature is shown in the following table.
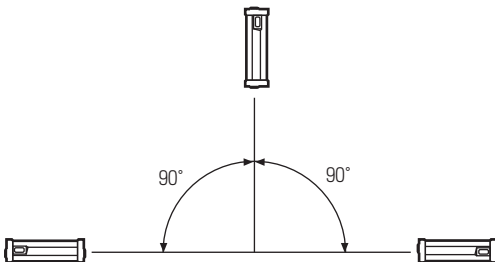
Type	Ambient temperature (the entire range)
VT3-V7R	
VT3-V7R+VT3-SW1	0 to 50°C
VT3-V7R+VT3-SW4	
VT3-V7R+VT3-SW6	

■ **Direct Mounting**

Use the mounting holes on the back of the host unit to directly mount the same.
Dimensions (depth of the holes) of the mounting holes are as follows (tightening torque below 0.58Nm [6kgf/cm])).

4-M4, deep 5

149

76

Unit：mm
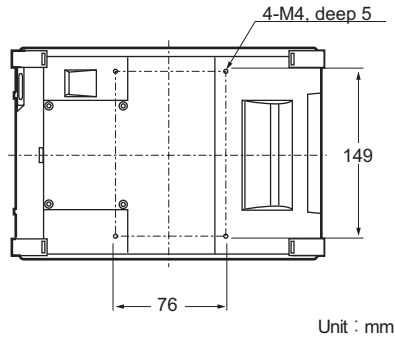
■ **Wall-Mounting**

Wall-mounting allows the VT3-V7R to be removable since it is not fixed on the wall.
Wall-mounting fixture A+B

Wall-mounting fixture B+C

Wall-mounting fixture A
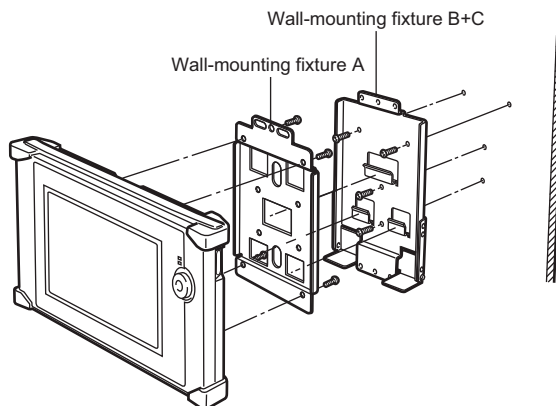
1 **Use the 4 enclosed screws (M4x8) to fix wall-mounting fixture A on the VT3-V7R (tightening torque below 0.58Nm).**

3

INSTALLATION
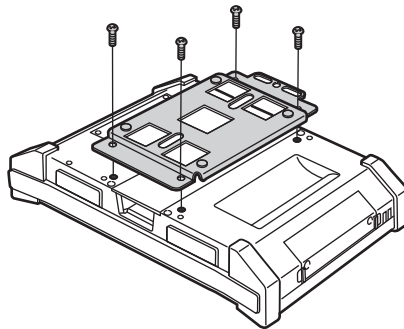
2 **Use 4 screws (M5) to attach the fixture to the wall.**
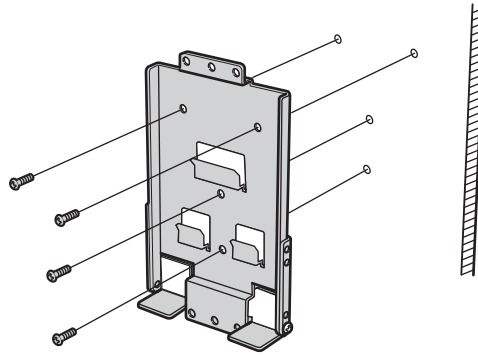
| Point | **These 4 screws(M5) should be prepared by users.** |

3 **Put the openings of the wall-mounting fixture A respectively around the hangers of the wall-mounting fixture B.**
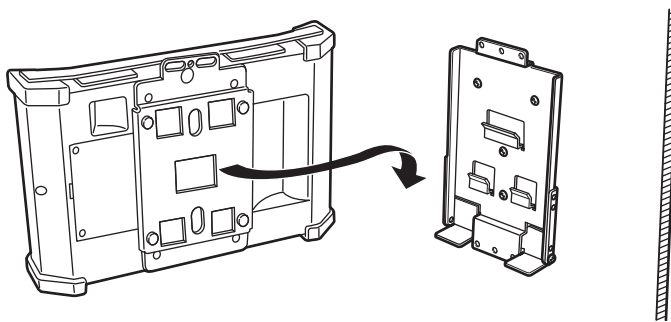
4 **If screws are used to attach fixture A to B, then the unit can be attached to the wall.**

Position of the switch unit: top

Position of the switch unit: bottom

Insert the 2 enclosed
screws into these two
holes to attach the unit

Attach with screws

Insert 1 enclosed screw
(M4X8) into the holes to
attach the unit

Attach with screws
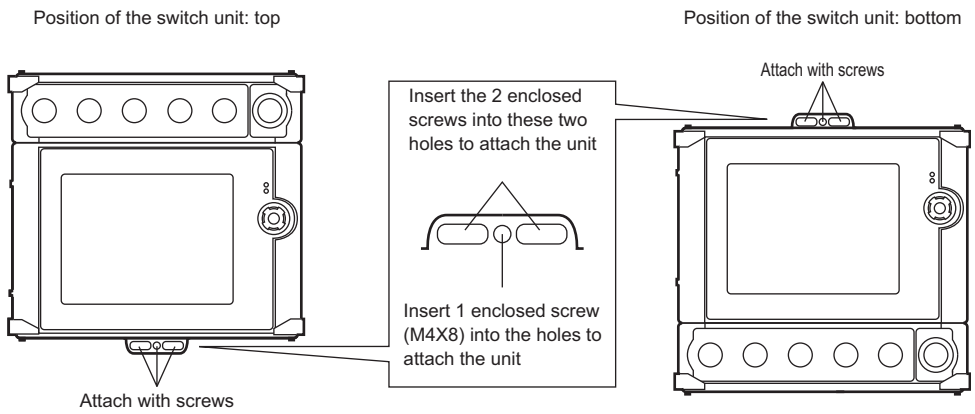
| Point | When the switch unit (VT3-SW4/SW6) is mounted at the bottom of the unit, the screws on the side of wall-mounting fixture C should be used to adjust the height. |

Screws to adjust the height
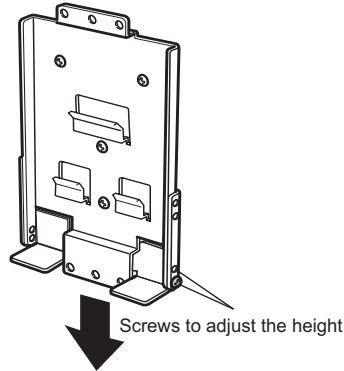
■ Pole-Mounting

When attached to a vertical or horizontal pole, the angle can be adjusted.

Item		Description
Pole Type	**Round poles**	Ø20 to Ø50
	Edged poles	20mm to 30mm

Attaching to a vertical pole

Use wall-mounting fixture A and pole-mounting fixture A, B, and C. This style of mounting allows adjustment up and down.

Pole-mounting fixture A+B

Pole-mounting fixture C

Wall-mounting fixture A
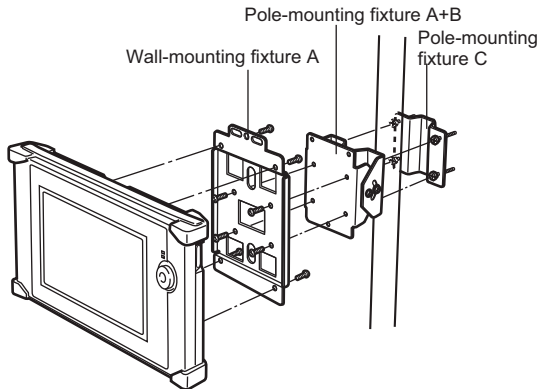
Attaching to a horizontal pole

Use wall-mounting fixture A and pole-mounting fixture A, B, and C. This style of mounting allows adjustment right and left.

Pole-mounting fixture A+B
Pole-mounting fixture C
Wall-mounting fixture A
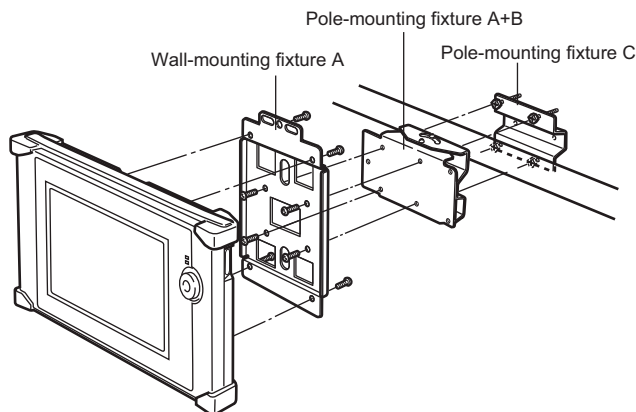
● **Mounting procedure**

1 Use 4 enclosed screws (M5x10) to combine A and B together.

Pole fixture A

Pole fxture B
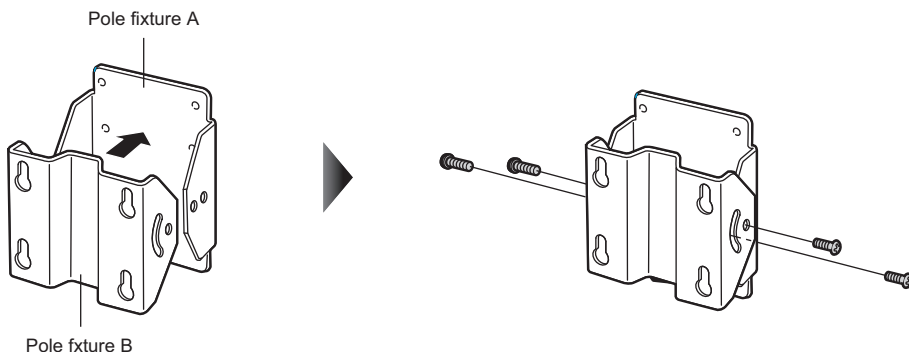
2 Use 4 enclosed screws (M4x8) to attach pole-mounting fixture A+B to wall-mounting fixture A.

Keep an eye on the screw hole at the lower part of fixture A.
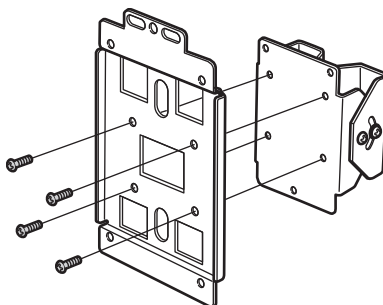
3 Use 4 enclosed screws (M4X8) to attach the combination of pole-mounting fixtures A+B+wall-mounting fixture A made in Step 2 to the back of the VT3-V7R (tightening torque below 0.58Nm).
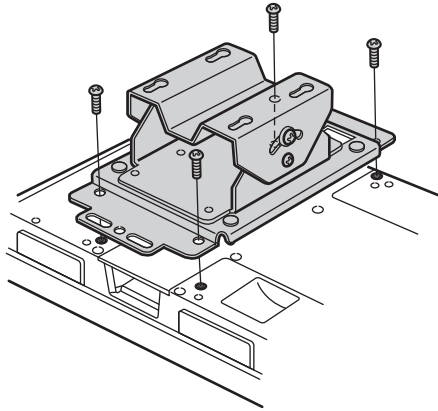
4 Securely attach pole-mounting fixtures A+B and pole-mounting fixture C around the pole with 4 enclosed screws[*].

* 4 X M5x30 and 4 X M5x50 are attached; follow actual their installation radius to use respectively.

Rear view

Pole fixture C

Pole fixture A＋B
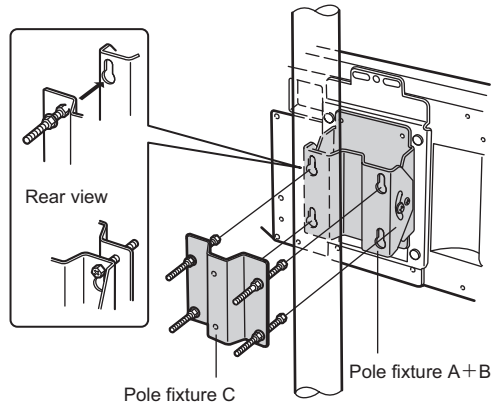
5 The angle of the VT3-V7R can be adjusted using the screw on the side of pole-mounting fixtures A+B.

VT3-V7R

3

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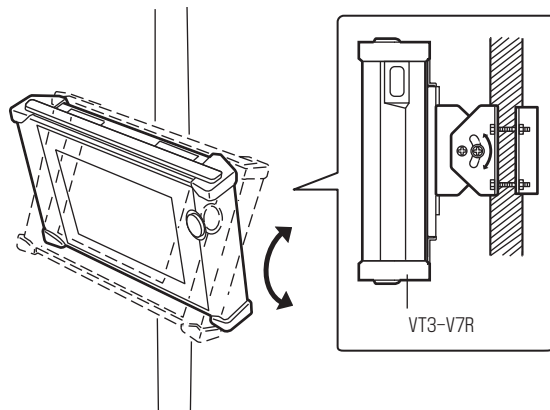
■ **The Connectors on the Back of the VT3-V7R unit**

To connect VT3-V7R with PLC, connectors and magnetic switch are needed.
Please see the rear of the unit.
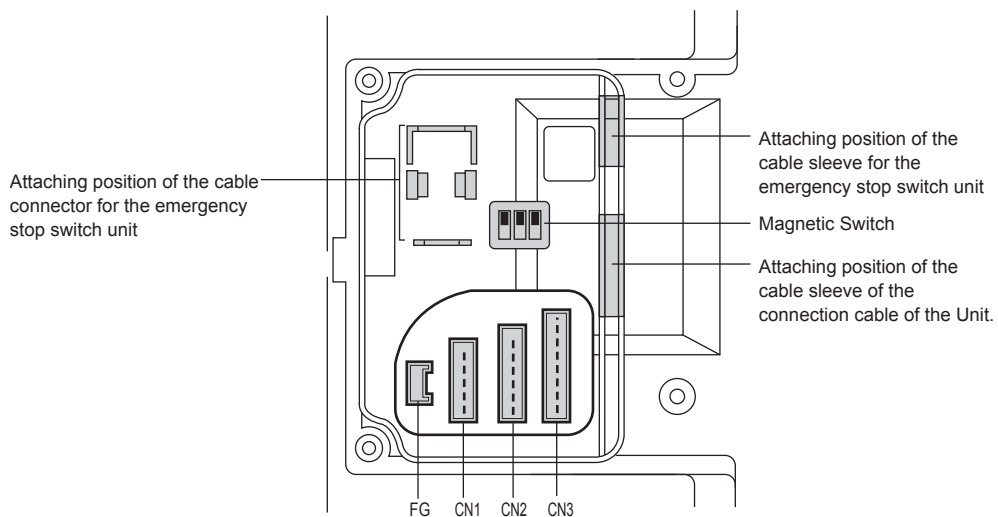
● **Connectors and Terminal Blocks**

Name	Connector Type	Connected Object
FG	2-pin connectors	FG
CN1	9-pin connectors	Power/cross key
CN2	10-pin connectors	RS-232C, RS-485
CN3	11-pin connectors	RS-422A

> ✎ **Point**
> • **FG, CN1, CN2, and CN3 are marked on the back cover.**
> • **Depending on the connected PLC (connection cable), only CN2 or CN3 can be used.**

● **Dip switch (for the setup of the termination resistor)**

Dip switch that are used to set up the termination resistors for the RS-422A or RS-485 (for the connection of mega-links and multi-links) communication with PLCs.

For dip switch settings, see 📖 the schematics for each PLC in VT5 Series/VT3 Series/DT Series PLC Connection Manual .
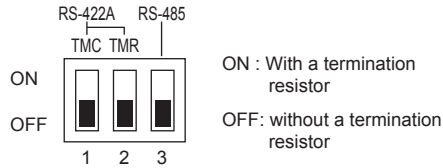
Switch NO	Content
1	The termination resistor between CTSA and CTSB for the RS-422A connection
2	The termination resistor between RXDA and RXDB for the RS-422A connection
3	The termination resistor between A and B for the RS-485 connection

* They are all set to ON at factory.

● **Connection of the unit Cable**

(1) RS-232C or RS-485 communication
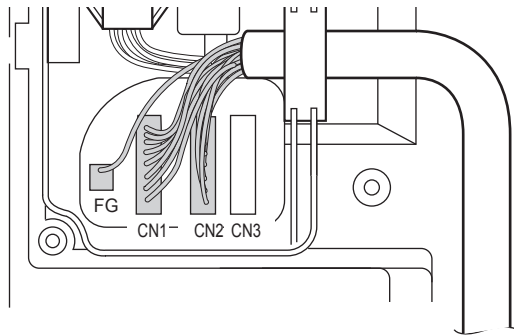
(2) RS-422A communication
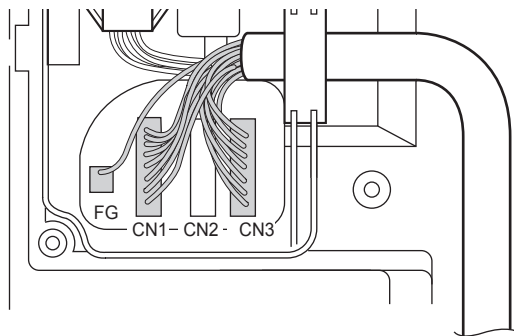
✎ Point   **To ensure protection IP65f, please do not remove the cable sleeve (VT3-SW1) when the emergency stop switch is not used. In addition, please ensure the cable slave correctly fits the slot on the back of the unit.**

3

■ **Cable Guard**

To ensure the tensile strength of the unit cable in the connection, the cable guard must be used.

1 **Use a plus(+) driver to remove the screws (4) on the back cover of the VT3-V7R unit.**
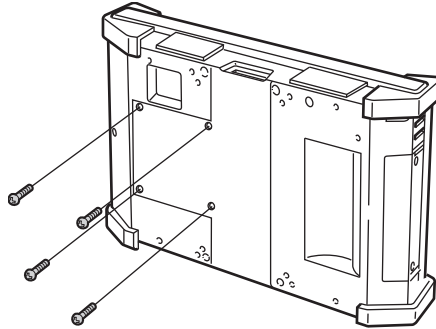
2 **Remove the back cover from the VT3-V7R unit.**
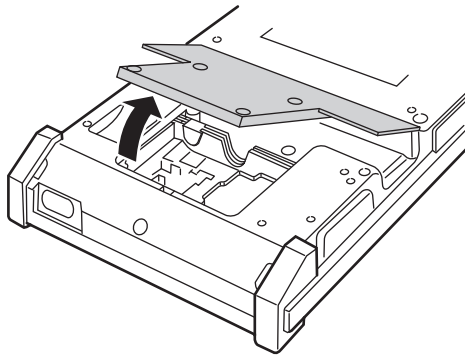
3 **Connect the unit cable to the VT3-V7R unit.**

NOTICE	**About the connectors connected with the unit cable and setup of the magnetic switch, please see the 📖 "The Connectors on the Back of the VT3-V7R unit", page 3-24.**

4 **Assemble Cable Guard A and B.**

Cable protector B
(Attached connecting cables)

Cable protector A
(Attached connecting cables)

Connecting cables
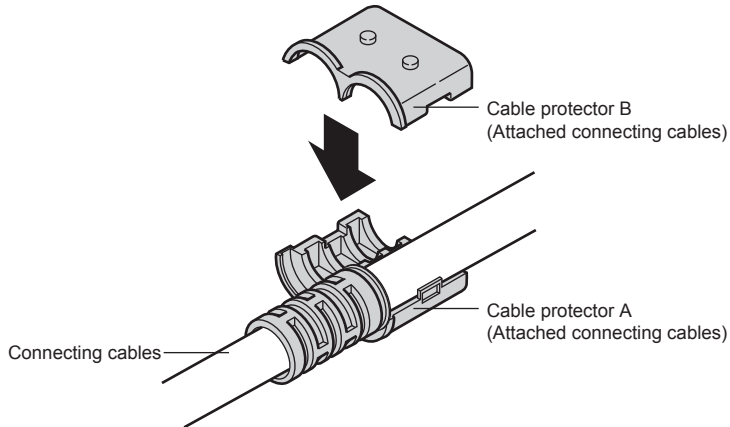
5 **Align the cable guard with the cable guard mounting position on the back of the unit and use 2 enclosed screws to attach the cable guard with the fixture (the tightening torque below 0.49N·m).**

> ✎ **Point** **The cable guard mounting positions are located on the upper and lower part of the unit respectively. Please choose one based on the cable run direction.**

The fixture to attach the cable guard

Cable Guard A+B
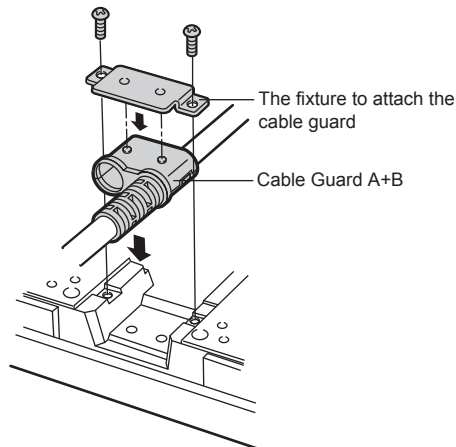
6 **Attach the back cover removed in Step 2, and attach it to the unit with 4 screws (with a tightening torque below 0.49N·m).**

> **NOTICE** **To ensure protection, before attaching the back cover after wiring and fixing, please fix the enclosed part of a cable and sleeve with screws.**

■ **Power supply terminal block (VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/ Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A)**

For the terminal block of the host unit, VT3-X15(D)/S12(D)/S10/V10(D) use M4, and VT3-V8/V7/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A use M3.

When wiring the power supply using crimped terminals, use crimped terminals that match the following dimensions.
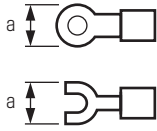
VT3-X15(D)/S12(D)/S10/V10(D)	VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A
a : 8.0mm Max	a : 6.0mm Max

● **Terminal block specification**

Item	VT3-X15(D)/S12(D)/S10/V10(D)	VT3-V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A
Wire gage	AWG8-20	AWG14-20
Tightening torque	1.4N•m (12lbf•in)	0.5N•m (5.1kgf•cm)
Wire material	Copper	
Lead type	Stranded wire	
Rated temperature	60°C	

■ **Power supply terminal block (VT3-W4T (A)/W4M (A)/W4G (A))**

● **Cable used for terminal block**

(1) When twisted cable or single cable is processed directly

(a) Confirm the end of the twisted cable is not exposed.

(b) Cannot galvanize for the end of cable.

5 to 7mm

(2) When rod terminal with insulating sleeve is used

The cable may be not easy to insert into the insulating sleeve due to different thicknesses of cable sheath, then please select proper cable according to the outline dimension diagram.

Insulating sleeve

Contact

2 to 2.5mm   6mm

10.5 to 12mm
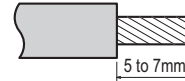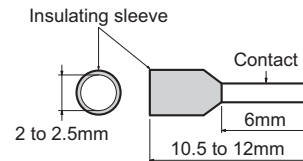
Maker	Type name
Phoenix Contact Company	AI0.25-6BU(AWG24)
	AI0.34-6TQ(AWG22)

● **Terminal block specification**

Item	Contents
Wire gage	AWG16-26
Tightening torque	1.7lbf•in(0.19N•m)
Wire material	Copper
Wire type	Stranded wire
Rated temperature	60°C

■ **Wiring**

● **Wiring of VT3-X15**

Connect the 100 to 240 VAC±10% (50/60 Hz) power supply to the power supply terminal block as follows:
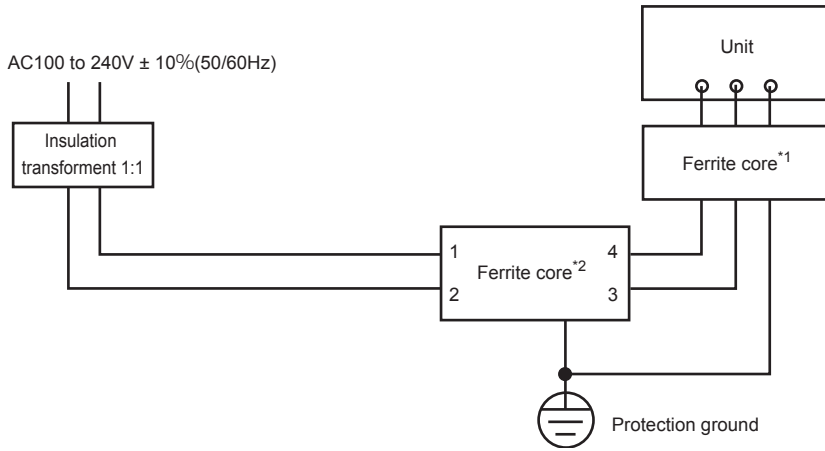
✎ Point	The metal base of the noise filter should be grounded.
	Where direct grounding is not practical, please ground the FG terminal of the noise filter with a metal wire with a length less than 50cm.

*1 Made by TDK, ZCAT3035-1330 (Number of Turns:2)
*2 Made by TDK, ZRAC2206-11

● **Wiring of VT3-S12/S10/V10**

Connect the 100 to 240 VAC±10% (50/60 Hz) power supply to the power supply terminal block as follows:
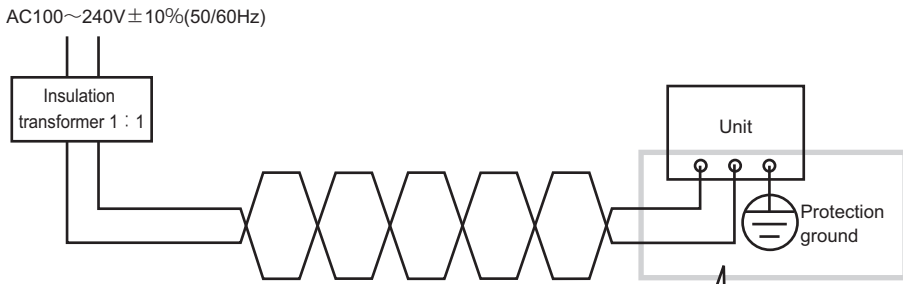
TOKIN corporation

Item	Model No.	Number of Turns
A	ESD-R-16C	3
B	ESD-R-26S	2
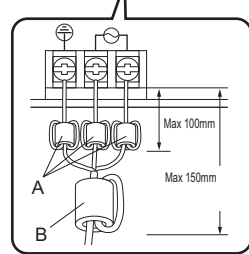
✎ Point	Use a cable of nominal cross-section of 2mm^2 or thicker to prevent voltage drops.
	Wire using twisted lead.

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● **Wiring of VT3-X15D/S12D/V10D/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/ W4T(A)/W4M(A)/W4G(A)**

Connect the DC24V±10% power supply to the power supply input terminal as follows:
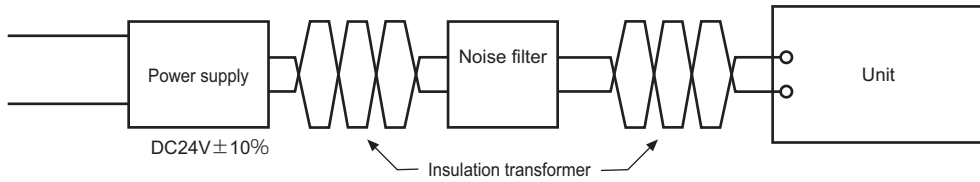
Please wind the power cable around the ferrite core 3 turns at a position of 100mm from the terminal block (ZCAT3035-1330 made by TDK).

● **Wiring of VT3-V7R**

The connection between the host cable and the power DC24V±10% is as follows.

When the power cable is extended, please use shielded 2-core cable to reduce noise. Among the cables connected with the host, the power cable uses the shielded 2-core cable.

Ensure to ground the shielded cable at the FG terminal of the power (D-type grounding (third grounding)).
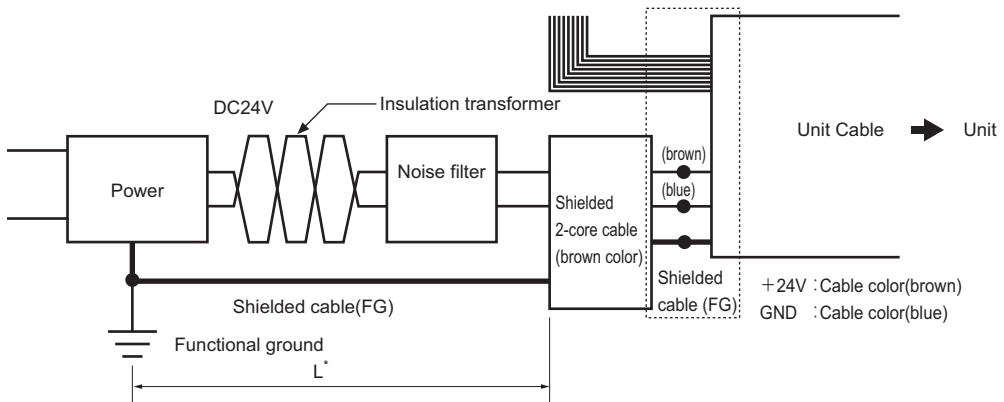
* The length of L should be as short as possible (less than 10cm).

L: the length of the shielded cable from the front end of the 2-core cable to the FG terminal of the power supply.

Typical shielded 2-core cable
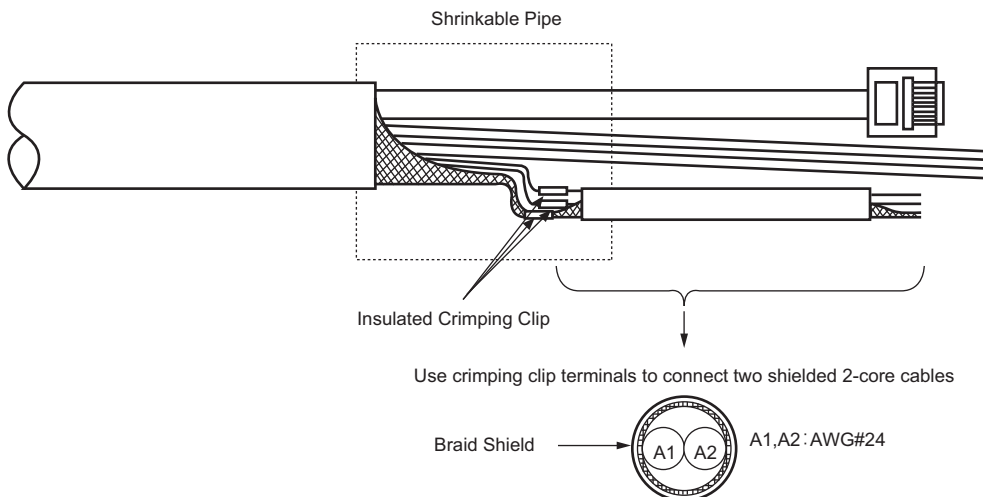
3-4 Grounding Precautions

This section describes the precautions to observe during grounding.

- The ground terminal of VT3-X15/S12/S10/V10 and shielding wire of the VT3-V6H(G)/Q5H(G), VT-T1, VT3-V7R switch unit (VT3-SW4/SW6) should be separately grounded. D-type grounding (third grounding) is used, with a grounding resistance below 100Ω.
- If an exclusive ground cannot be obtained, share the ground with another device.

D-type grounding (third grounding)
Grounding Resistance 100Ω

A=B
D-type grounding (third grounding)
Grounding Resistance 100 Ω

A>B
A<B
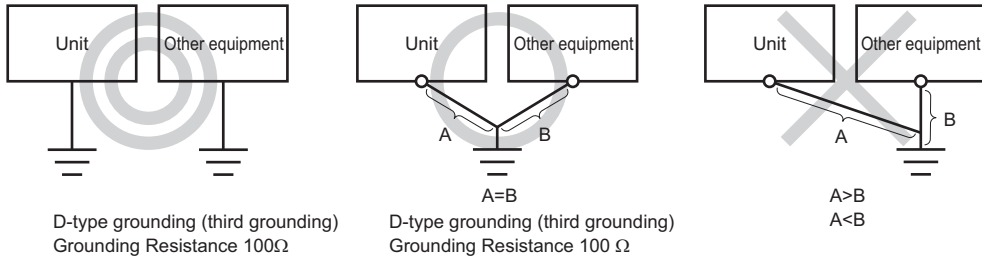
- Use a cable of nominal cross-section 2mm^2 or thicker as the grounding cable.
- Keep the grounding point as close as possible to the VT3, and keep the ground lead as short as possible.
- If the ground lead must be extended, use thick insulating cable and pass the ground lead through a duct before grounding.
- In VT3-V6H(G)/Q5H(G), if FG1 (power panel shielding) and FG2 (RS-232/422 shielding) exist on the connecting cable, grounding must be made separately.
- In VT-T1, shielding wire must be used on the terminal block (button switch/start switch/functional switch connection) and Ethernet port, and must be grounded.
- The shielding wire of the VT3-V7R Main Unit cable should be grounded at the power FG terminal.

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The emergency stop button switch unit (OP-87171) connected on VT3-V6H(G)/Q5H(G) should be emergency stop switch in compliance with IEC60947-5-5, have safety lock structure, direct open circuit operation structure.

To use emergency stop button switch unit (OP-87171), risk assessment must be performed for the mechanical equipment to be connected with VT3-V6H(G)/Q5H(G), and the user must consider installation safety of this equipment. According to the risk assessment result, the user must verify whether the emergency stop button switch unit could serve as protection countermeasures of this equipment.

In addition, fault detection function of start switch is not installed in VT3-V6H(G)/Q5H(G). Therefore, the circuit connected on 2 outputs of the start switch must be able to detect state inconsistency (for example, safety relay unit etc).

Attention should be paid to the following content for emergency stop switch of industrial equipment during installation and wiring according to the IEC60204-1.

• For the installation and wiring of emergency stop switch, one of the following operations must work: for mechanical equipment that might cause dangerous state, cut off power supply of the actuator immediately (stop category 0), or control power suppl of the actuator y (stop category 1), so as to stop the dangerous running as soon as possible.

• When emergency stop switch is pressed, emergency stop must have priority over other functions, and all operating modes.

• The emergency stop switch should be installed and wired such that it will not automatically return (restarted) even if it is reset.

• The emergency stop switch should be set up and wired such that operators have the easiest access to it in case of emergency.

The emergency stop switch used by the switch unit of VT3-V7R is compliant with ISO13850, as well as compliant with EN954-1, Category 4. This switch features 2 outputs, thus meeting the requirements of Category 4.

3-6 Start Switch

Start switch on the VT3-V6H(G)/Q5H(G) should be 3-position start switch in compliance with IEC60947-5-8.

To use start switch, risk assessment must be conducted for the mechanical equipment to be connected with VT3-V6H(G)/Q5H(G) in advance, the user must consider installation safety of this equipment. According to the risk assessment result, the user must verify whether start switch may serve as protection countermeasures for this equipment.

In addition, fault detection function of start switch is not installed in VT3-V6H(G)/Q5H(G). Therefore, the circuit connected on 2 outputs of the start switch must be able to detect state inconsistency (for example, safety relay unit etc).

For start switch on industrial equipment, the following points must be considered in the installation and wiring according to IEC60204-1.

• Start switch may operate only in one position (mid position), mechanical stop or no start in other positions.

• For installation of mechanical equipment and wiring, always ensure that this equipment will not start unexpectedly. (for example, use start interlock function)

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PL (Performance Level) and Category

■ Based on the PL and category in EN ISO13849-1: 2008

PL (performance level), category supported by Touch Panel Display VT3 Hand-Held Series are determined by whether emergency stop button switch (OP-87171), start switch, and relay terminal block unit with removable function (VT-T1) etc optional parts are used for safety function. For example, in VT3-V6H(G)/Q5H(G), when emergency stop button switch, relay terminal block unit with removable function and controls (SC Series) etc are combined to constitute safety function, PL e, Category 4.
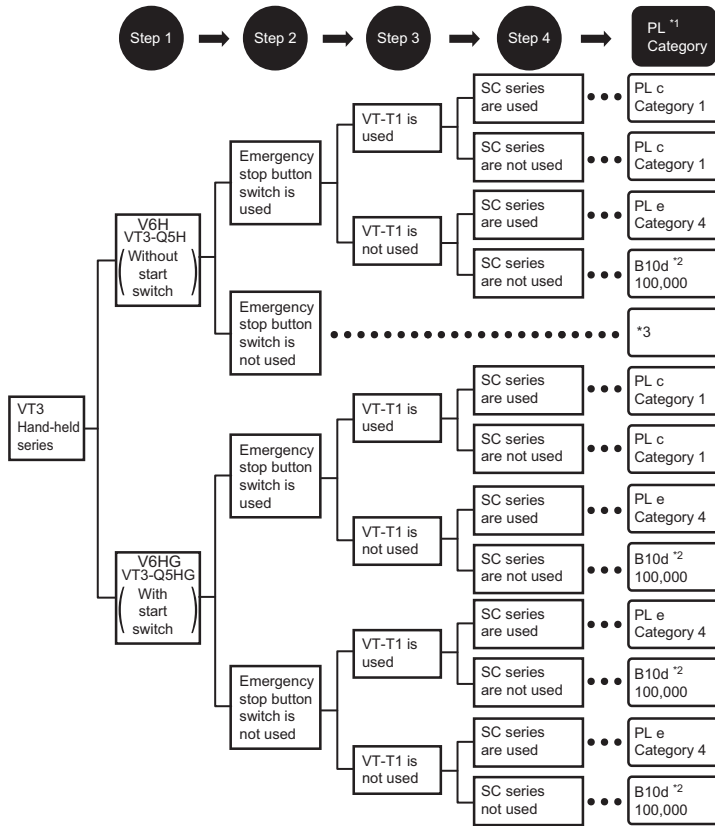
*1   PL of emergency stop button switch is judged as per operation times twice per day, 220 workdays per year. PL of start switch is judged as per operation times of 8 times per day, 220 workdays per year.

*2   B10d of emergency stop button switch, start switch is specified if VT-T1 and SC series are not used. For b10d, please refer to EN ISO13849-1.

*3   Emergency stop button switch, start switch are not used, so not specified.

■ **PL judgment**

EN ISO13849-1: according to Annex D of 2008, MTTFd may be calculated from the following expression when emergency stop button switch/start switch and VT-T1, SC series are used in combinations.

Judge PL according to the MTTFd value calculated from the above-mentioned expression and Table 7 in EN ISO13849-1.

• Definition of equipment's MTTFd is as follows:

$MTTFd_{PB}$: MTTFd of emergency stop button switch

$MTTFd_{EN}$: MTTFd of enable switch

$MTTFd_{VT-T1}$: MTTFd of VT-T1

$MTTFd_{SC\,Series}$: MTTFd of SC Series

$MTTFd_{VT3}$: MTTFd of VT3 handy Series

• In case of combination of VT3 handy Series and SC Series, the formula of MTTFd is as follows.

$$MTTFd = \left(\frac{1}{MTTFd_{VT3}} + \frac{1}{MTTFd_{SC\,Series}} \right)^{-1}$$

(1) In case of emergency stop switch unit (OP-87171) and VT-T1 forming the safety function of VT3 handy Series, the formula of $MTTFd_{VT3}$ is as follows.

$$MTTFd_{VT3} = \left(\frac{1}{MTTFd_{PB}} + \frac{1}{MTTFd_{VT-T1}} \right)^{-1}$$

(2) In case of only emergency stop switch unit (OP-87171) forming the safety function of VT3 handy Series, the formula of $MTTFd_{VT3}$ is as follows.

$$MTTFd_{VT3} = \left(\frac{1}{MTTFd_{PB}} \right)^{-1}$$

(3) In case of VT3-V6H(G)/Q5H(G) enable switch forming the safety function of VT3 handy Series, the formula of $MTTFd_{VT3}$ is as follows.

$$MTTFd_{VT3} = \left(\frac{1}{MTTFd_{EN}} \right)^{-1}$$

*1   According to EN ISO13849-1, VT3 handy Series should be in accordance with the requirement of "input", and SC Series should be in accordance with the requirement of "logic/processing". Max value of MTTFd is 100 years according to EN ISO13849-1. Therefore, $MTTFd_{VT3}$ should be taken as 100 in case the calculated result is more than 100.

*2   In case of emergency stop switch unit (OP-87171) and VT3-V6H(G)/Q5H(G) enable switch together forming the safety function of VT3 handy Series, since the safety functions of each switch are independent, $MTTFd_{VT3}$ should be calculated separately.

*3   When evaluating the PL of the overall system, besides the above mentioned, the MTTFd of solenoid switch and other units connected should also be considered.

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OPERATION & UNIT FUNCTIONS

This chapter describes VT3 operation procedures and unit functions.

4-1 Functions of VT3 Series

This section describes the main functions of the VT3 unit.

Touch Panel

■ Number of Touch Switches

The following table shows the max. number of touch switches that can be placed in a single screen.

Model No.	H x V = Max. Number of Touch Switches	Number of Display Panel Pixel
VT3-X15(D)	64 x 48 = 3072	1024 x 768 pixels
VT3-S12(D)/S10	50 x 38 = 1900	800 x 600 pixels
VT3-V10(D)/V8/V7/V7R	40 x 30 = 1200	640 x 480 pixels
VT3-V6H(G)	80 x 60 = 4800	640 x 480 pixels
VT3-Q5H(G)	40 x 30 = 1200	320 x 240 pixels
VT3-Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A	20 x 15 = 300	320 x 240 pixels
VT3-W4T(A)/W4M(A)/W4G(A)	40 x 16 = 640	320 x 128 pixels
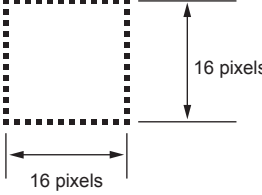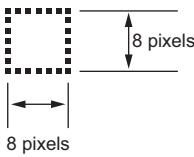
> **✎ Point** **The above number of touch switches sometimes cannot be placed in a single screen due to screen restrictions.**
> 📖 "2-2 Restrictions on Creating a Screen", *VT3 Series Manual*

■ Size of Touch Switches

The mesh size of each touch switch changes with model.

Type	Mesh size of touch switch
VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/ Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/ Q5M(W)A	16 pixels 16 pixels Touch switches can be set to any size of integer multiples taking the above touch switch as the base size.
VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/ W4G(A)	8 pixels 8 pixels The size of each touch switch in diagram above is the min. size, and the size can be changed as per 2 points vertically and transversely.

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OPERATION & UNIT FUNCTIONS

● **When the Number of Display Area Pixels is 800 x 600**

16x16 pixels

800 pixels=16 x 50 pixels

600 pixels=16 x 37 pixels + 8 pixels
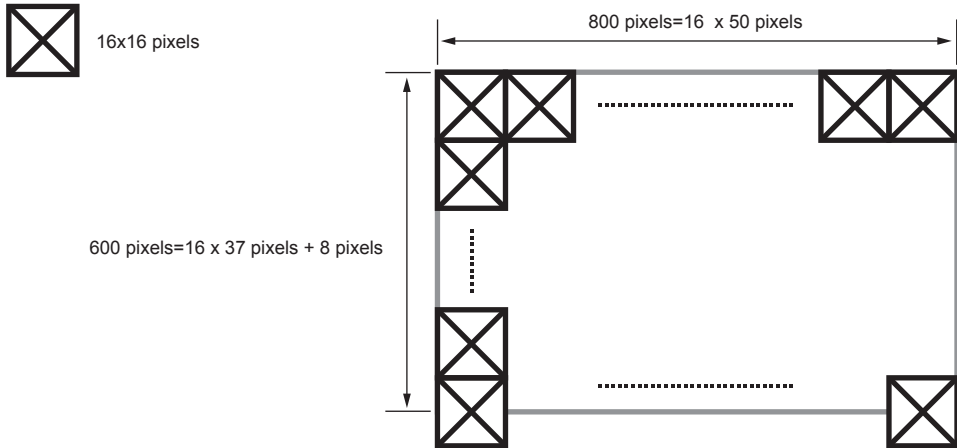
Though half of the touch switch protrudes outside of the switch area on its lower side of the screen, the switch area is valid. So for models with a resolution of 800 x 600 pixels, the max. number of touch switches that can be arranged in a single screen is

50 x38 =1900 switches

■ **Concurrent Touch Switch Execution**

You can set whether concurrent touching of two touch switches as both having been touched will be recognized by the system or not.

📖 "2-Touch Switch", page 5-19

✎ Point | **This mode cannot be set up with VT3-X15(D)/V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A).**

■ **When Two Switches or More are Touched Simultaneously**

When "2-Touch Switch" is set to disabled, do not touch two or more touch switches simultaneously, and when "2-Touch Switch" is set to enabled, do not touch three or more switches simultaneously. Which switches are recognized is not fixed.

📖 "2-Touch Switch", page 5-19

Screen Data

• The data displayed in VT3 is created with VT STUDIO.
• A single file of screen data can be saved on the VT3. Multiple screen settings, alarm messages and other resource data are covered in each file.
• Screen data can be sent to VT3 from a PC or memory card*. Screen data saved on VT3 can also be read to a PC or memory card.
* Memory card can not be used for VT3-W4T(A)/W4M(A)/W4G(A).

NOTICE | **When re-transmit menu data from already saved status of menu data, previous menu data will be lost. When all data are transmtted, all SRAM data (alarm historical record, trend chart, XY diagram, PLC data folder and operation log) will be lost. When modify setup data of the systems for different transmission, SRAM data will be lost. VT STUDIO or memory card should be used to read in advance, as required.**
📖 "13-5 VT-PC Data Receive", *VT3 Series Manual*
📖 "5-11 Memory Card"

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OPERATION & UNIT FUNCTIONS

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System Program

In addition to screen data, a system program is required for the VT3, which is the data that activates the screen data or sets the VT3 itself. The latest version of the system program is provided with the VT3 when it is shipped.

When VT STUDIO BUILDER is upgraded or when the system must be restored, send the system program from the PC or memory card. The system program cannot be read from the VT3.

Type	System Program
VT3-X15(D)/S12(D)/S10/V10/V10D/V8/ V7/V7R/V6H(G)	VT3L_***.vp3
VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A	VT3S_***.vp3
VT3-W4T(A)/W4M(A)/W4G(A)	VT3C_***.vp3

(***:version numbers of the system program)

📖 "13-3 VT-PC Data Transmit", *VT3 Series Manual*

NOTICE	**When transmitting system programs, all screen data, saved alarm log data, trend chart data (real-time), XY trend chart data (real-time), data in PLC folders, recorded operation data and setup data of the unit in the system mode are deleted.**

VT3-V6H(G)/Q5H(G) Body Function

This section describes body function, operating method suitable for VT3-V6H(G)/Q5H(G).

Console switch

Functional switch
（F5 ~ F8）

Operation indicator lamp

Functional switch
（F1~F4）
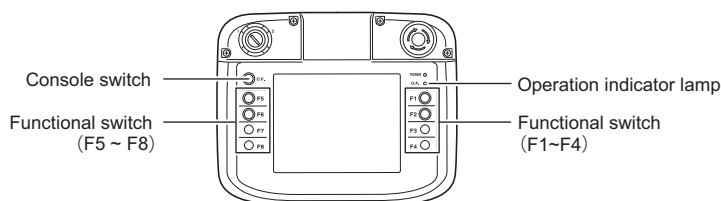
■ Functional Switches

VT3-V6H(G)/Q5H(G) is provided with 8 functional switches (F1 - F8), switch function may be set separately. Wherein, 4 external outputs(F1/F2/F5/F6) are available.
For specific content of the external output and cable color, please refer to 📖 "VT3-V6H(G)/Q5H(G)", page 2-31.

● Distribution of Switch Function

Functional switch may be set to one kind as a whole (global functional switch), irrelevant to menu display. Or set according to pages separately (functional switch). If two kinds are set, the functional switch setup on each page has priority.
Several functions may be distributed to each functional switch as the switch on menu.
For detailed content of the switch function, please refer to 📖 *VT3 series Reference Manual*, "8-8 Setup of Functional Switch", "12-14 Global Functional Switch (Only Hand-Held)".

✎ Point	**After switch functions are distributed in the functional switch, please pay attention that external output will also be executed.**

■ Console Switch

Once console switch is pressed, enable/disable of the function switch and touch button will be reversed.

● Operation Setup of Console Switch

The following setup may be executed in VT system setup.
📖 *VT3 Series Reference Manual*, "12-14 Global Functional Switch (Only Hand-Held)"

Setup	Content
Instantaneous OFF	Only when console switch is pressed, could function switch and touch button be active.
Alternate	Once console switch is pressed, enable/disable of function switch and touch button will be reversed.
Out of service	Console switch does not work. LED on upper right of the body illuminates continuously. Functional switch and touch button keeps normally active status.

● **Display Current Status**

Enable/disable status of the functional switch and touch button may be viewed from the LED on upper right of the body. It is active only when the LED is ON (green).

VT3-V7R Body Function

This section describes body function, operating method suitable for VT3-V7R.

■ Cross Key

Functions and the use of the cross key.

For more information about the output circuits and wire colors, please see ☐ "VT3-V7R", page 2-38.
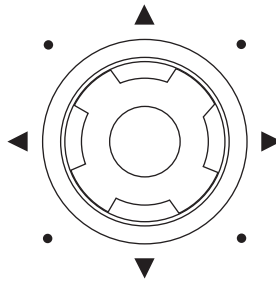
● **Functions of Cross Key**

Two methods of use for the cross key are available, "Function Configuration" and "Direct Output".

✎ Point	**Please remember that even the "Function Configuration" method is used, outputs are also possible.**

● **Function Configuration of the Switch**

The following setups are possible with the 4 ends of the switch.

(1) Any function can be configured with the cross switch.

(2) Separate functions can be configured for each screen.

(3) Multiple functions can be configured with it.

✎ Point	**For more information about function configurations, please see ☐ "8-7 Configuration of Cross Switch", *VT3 Series Manual*.**

● **External Output (NPN Open Collector)**

Item	Content
Control Output	NPN open-collector output x4 points (for common use) One each max 100mA (below 40V). Residual voltage below 1V[1]
Protection Circuit	Over-voltage absorption

*1 The values marked on the rear connector of the unit.

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OPERATION & UNIT FUNCTIONS

● **Precautions When Using the Cross Key**

- Pressing the cross switch in a 45-degree direction, the 2 end keys on both side of this pressing direction are enabled. (Example: pressing in the upper-right direction, the upper and right keys are enabled.)
  When more than one end key of the cross key is pressed simultaneously, only the pressed keys function.
- The use of the cross switch is not affected by the setup of "Touch 2 Points Simultaneously: Enabled/Disabled" in the VT system and the setup of "Simultaneous Touching Not Allowed" of the touch switches.
- When the "locking switch" is set to "Instantaneous" or "Intermittent" in the VT system, the cross switch doesnít work.
- Restrictions on creating a screen also include the "Setup of Switching Function" of the cross key.
- Restrictions on the configuration of multiple functions are the same as those on the configuration of the touch switches.
- Additional functions (interlock, ON delay, OFF delay, touching 2 switches at one time, simultaneous touching not allowed) that can be set up for the touch switches cannot be set up with the cross key.
- External outputs are disabled in the short moment after power on or under modes other than the system modes.

● **When Multi-links and Mega-links are Key-locked or the Back Light of PLC is OFF**

- The switching function of the cross key is disabled.
- The external output of the cross key is enabled.

● **Cross Key Seal (enclosed)**

A label or paper tape should be first pasted in the frame before using it.

A label or paper tape should be pasted before using the enclosed protective film. The seal can be pasted on the upper-right part of the VT3-V7R unit.
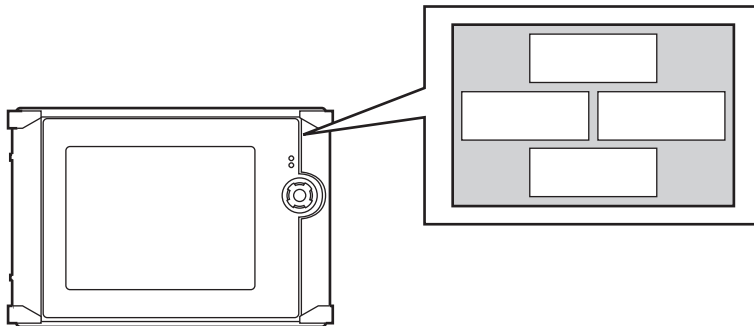
■ **Alarming Beeper**

VT3-V7R has an inbuilt alarming beeper which generates a beep sound that is different from the beep sound signaling a power-on status or a touching action.

● **Set Up the Alarming Beeper**

- Set the "Alarming Beeper" option in the "VT System Setup" menu to "Yes". When the position 1 in the System Storage Area (VT mode) is set to "1 (ON)", the alarming beeper sounds. For more information, please see the 📖 "Chapter 14 System Storage Area", *VT3 Series Manual*
- The sound volume can not be changed.

> ✎ **Point**   **The "Beeper Volume" option in the "VT System Setup" menu is used to adjust the volume of the beep sound signaling a power-on status or a touching action. And this option cannot be used to set up volume of the alarming beeper.**

■ Grip Switch

The functions and the use of the grip switch on the right side of the unit will be described in the following.
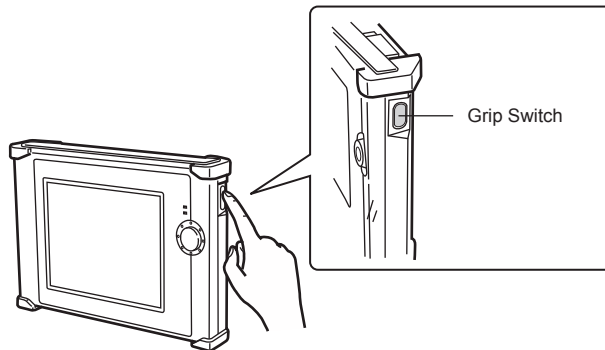
Grip Switch

● Functions of Grip Switch

The grip switch is used to control the enable/disable status of the cross key and touching button.

● LOCK Status

The cross key and touching button can be disabled via using the grip switch, which is called "LOCK status". Under the "LOCK status", the switching function and external output assigned to the cross key are all disabled. In addition, the touching switch is also disabled.

✎ Point

When the "grip switch" in the VT system is set to "Instantaneous" or "Intermittent".
- **When the disabled (LOCK status) touch switch and cross key that has been set up with the switching function, are pressed, the message "Being locked" is displayed at the lower-left part of the screen.**
  When the cross key is not set up with the switching function, however, this message is not displayed even if it is pressed.
- **When an unlocked running screen is changed to the system mode screen, then returns to the running screen, the status becomes the LOCK status.**
- **When the the VT3-V7R unit is OFF under the UNLOCK status and turned on again, the status of the running screen becomes the LOCK status.**

● Current status

The GRIP indicator on the front side of the unit indicates the enable/disable state of the cross key and touch switch. The indicator signals the Enable status when it lights (green).

● Set Up the Grip Switch

The following setups are possible in the VT System Setup.

Setup	Content
Instantaneous	The cross key and touch switch are enabled only when the grip switch is pressed.
Intermittent	The Enable/Disable status of the cross key and touch switch is inverted each time the grip switch is pressed.
Not Used	The grip switch cannot be used. The GRIP indicator on the front side of the unit keeps lighting. The cross key and touch switch keep the Enable status.

📖 "Chapter 5 SYSTEM MODE"

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OPERATION & UNIT FUNCTIONS

● **Precautions When Changing the LOCK Status**

(1) When the touch switch is already pressed, the status is changed to the LOCK status.
The touch switch is forcibly changed to the OFF status. For example, the status will change to the LOCK status while the controlled object is OFF.

(2) When the touch switch is pressed and held on under the LOCK status, it is unlocked.
The touch switch is enabled only when your finger leaves the touch switch.

(3) When the cross key is already pressed, the status is changed to the LOCK status.
The external output of the cross key is forcibly changed to OFF. The switching function that is assigned to the cross key is also forcibly changed to OFF.

(4) When the cross key is pressed and held on under the LOCK status, it is unlocked
The external output of the cross key is changed to ON.
The switching function of the cross key is changed to ON only when the button is OFF.

MultiTalk Function

■ What is MultiTalk

MultiTalk means that VT3*, with its multiple ports, communicates with 2 peripherals such as PLCs or thermoregulators simultaneously.
When 2 PLCs are being communicated simultaneously, all the data of these 2 PLCs can be displayed in one screen at the same time.
*VT3-W4T(A)/W4M(A)/W4G(A), VT3-V7R and MultiTalk functions can not be used.
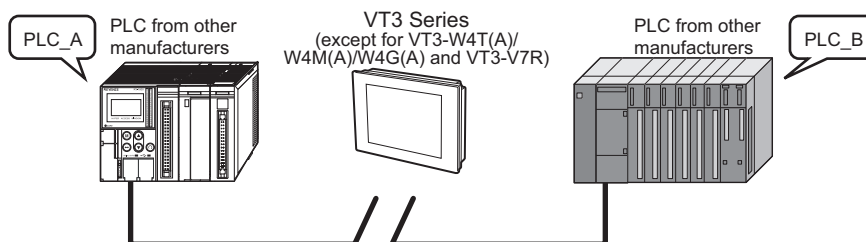
■ VT3 Connection Modes

● VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Connection Modes	PLCs from those manufacturers, peripherals, serial communication				Barcode readers	KL
	PORT2	PORT3*	PORT4*	Ethernet		
1	◎	◎	-	-	-	○
2	-	◎	◎	-	-	-
3	-	-	◎	◎	○	-
4	◎	-	◎	-	○	-
5	◎	-	-	◎	○	○
6	-	◎	-	◎	-	○

PORT2: RS-232C,RS422A(20P)

PORT3: RS-232C(9P)

PORT4: RS-485, KL, Mega-links, multi-links (terminal block)

* Limited to PLC models that can connect to PORT3/PORT4. For details, see 📖 VT5 Series/VT3 Series/DT Series PLC Connection Manual.

● **VT3-V6H(G)/Q5H(G)**

Connection type	RS-232C/422	RS-485/mega-link/multilink	Ethernet
1	◎	◎	-
2	◎	-	◎
3	-	◎	◎

✎ **Point** **For connection of Multitalk function via VT3-V6H(G)/Q5H(G), RS-232C/422/485•Ethernet connecting cable (OP-87191/87192/87193) or relay terminal block unit with removable function (VT-T1) + cable with removable connector (OP-87194/87195/87196) should be used.**

■ **Precautions When Using the MultiTalk Function**

• In the case that any one of these 2 connected PLCs fails, a communication failure may occur to VT3.
• The multi-link and VT2 multi-link connection cannot be used.
• Mulitalk can be used with the mega-link connection.
• 3 or above products (except bar code readers and KL machines) cannot be connect.
• When it comes to the setup of PLC models, different functions can be set up for PLC-A and PLC-B.

Name of Function	PLC_A	PLC_B
2-port function	○	x
Direct communication via DT	○	○
Direct communication via VT	○	x
Remote COM port tool	○*	x
DB gateway	○	x
Monitoring equipment and units using special means	○	x

* When PLCs are connected to PORT4 of VT3, the remote COM port tool cannot be used.

• PLC-A/PLC-B cannot be used for the following setups.
 (1) Common serial (ASCII mode, binary mode (Ethernet))/common serial (ASCII mode, binary mode, binary mode (Ethernet))
 (2) Ethernet-enabled PLCs/Ethernet-enabled PLCs

✎ **Point** **The MultiTalk function cannot be used for VT3-W4T(A)/W4M(A)/W4G(A) and VT3-V7R.**

📖 **Reference** For devices that can be connected to VT3 Series ports, see 📖 VT5 Series/VT3 Series/DT Series PLC Connection Manual.

2-port Function

■ What is the "2-port function"?

The VT3 Series is mounted with 2 port functions for use with Keyence PLC KV Series*.

The 2 port functions can transfer ladder or monitor KV Series from a PC (KV STUDIO/KV BUILDER) connected to VT3 Series via communication between KV Series and VT3 Series, even without a PC directly connected to KV Series.

The transmission cable does not need to be reconnected when sending and receiving either screen programming data or ladder data.

* KV Series products that support 2-port function are KV-7000 Series, KV-5000/3000 Series, KV-1000/700, and KV Nano Series.
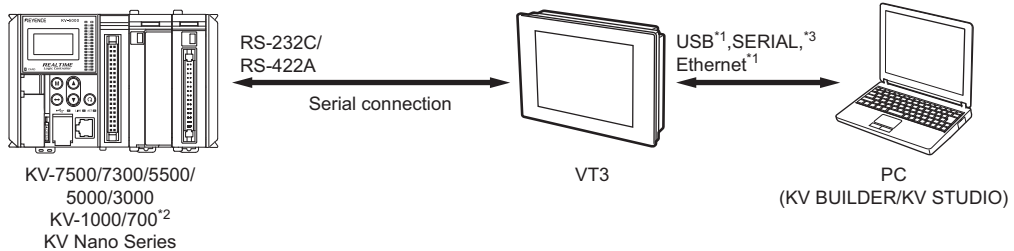
*1 USB and Ethernet connection are not supported when KV-1000/700 is used.

*2 2-port function can not be used for KV-1000/700+VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R.
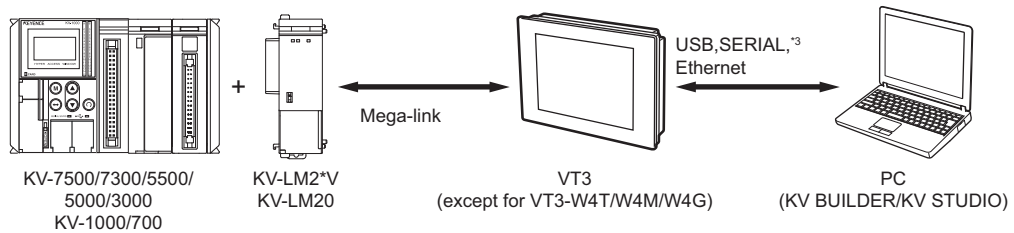
*3 When VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R is used, serial port connection is impossible.

■ Precautions When Using the 2-port Function

• When VT3 Series (except for VT3-W4T(A)/W4M(A)/W4G(A)) and KV-7000 Series, KV-5000/3000 Series, and KV-1000/700 are connected via Megalink*, 2-port function can also be used with a PC and VT3 Series connected by USB, serial or Ethernet(serial excludes VT-V6H (G) /Q5H (G)). In such a case, 2-port function can be used with either VT3.

• Failed to use 2-port function when series connecting KV-1000/700 and VT3-W4T/W4M/W4G.

• When PLC and VT3 series are connected via using the multi-link, the 2-port function cannot be used.

• When using the VT2 multi-link, the 2-port function can be used only in the master station.

• When the Mega-link is not used between the VT3 series and KV-1000/700, the 2-port function can be used only when the serial communication is used between the PC and VT3 series.

• When the MultiTalk function is used, the 2-port function can be used only in the PLCs that are connected to PLC-A.

• Communications with PC take place either by VT3 Series or KV Series.
When monitoring KV Series on KV STUDIO/KV BUILDER screen programming data cannot be sent to VT3 Series in VT STUDIO.

• When KV Series is not communicating with VT3 Series (a communication error has occurred, the system mode is Communication with PLC: Do Not Communicate, or during startup of VT3 Series Simulator), KV STUDIO/KV BUILDER and KV Series cannot communicate.

• When ladder transfer or high-speed time chart monitoring is in use, VT3 Series and KV-1000/700 are not communicating.

• To use 2-port function of a VT3 connected to KV-7000 Series, KV-5000/3000 Series or KV Nano Series, select Via VT/DT (2-Port Function in Communication Settings of each application.

* When the VT2 series are used in the VTs with an Mega-link, the 2-port function cannot be used in all the VT3s.

Direct Communication Via DT

■ What is Direct Communication Via DT

Direct Communication Via DT can be enabled via using DT series, the data collection devices, for the communication between the VT3 series and PLC.

VT3 series can be added without using connecting equipment such as a link unit if the DT series are used.

Direct communication function

Serial connection   Serial connection
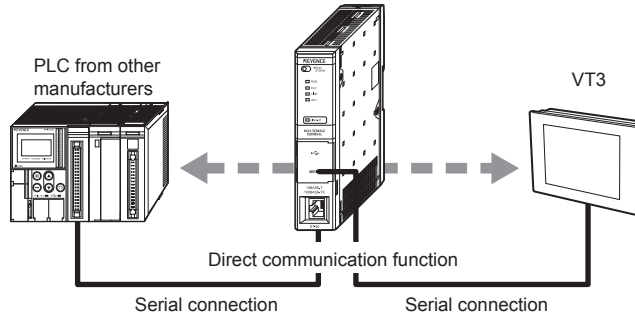
Direct Communication Via VT

■ What is Direct Communication Via VT

The direct communication via VT can be enabled in DT STUDIO or DT BUILDER (Ver.2 or above) via using the VT3 series (VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R excluded) for the communication between the DT series and PLC.

Direct communication function

Serial connection   Serial connection
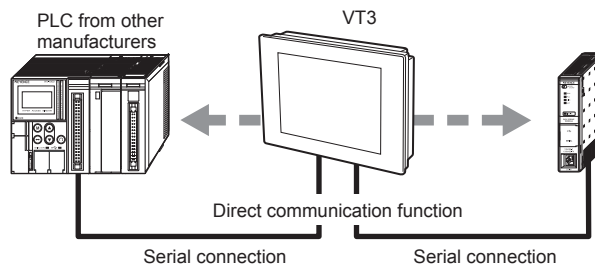
> ✎ **Point**
> - **When the MultiTalk function used in VT3, the target PLC should be connected to PLC-A. The direct communication function cannot be used in PLC-B .**
> - **VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R cannot be used for this function.**

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OPERATION & UNIT FUNCTIONS

Remote COM Port Tool

■ What is Remote COM Port Tool

Debugging can be performed via creating a virtual COM port on the remote COM port destination device (VT3 series or DT series), just like PLC is directly connected with the PC via the serial port.

> ⚠ **Point** When the MultiTalk function is used, only the PLC that is connected to PLC_A can use the remote COM port tool.

● When the Remote COM Port Tool is Used Via Ethernet

When VT3 is connected with PC via Ethernet, you can use any PC in the network to debug the ladder program of the PLC[*] connected with VT3.
Now with the remote COM port tool, there is no need to carry a notebook PC to the field to change a PLC program via connecting a communication cable to the PLC. It is much easier now.

VT3 series

The PLC port on the remote COM destination device is a virtual port on the PC

Remote COM destination device

The ladder program tool from other manufacturers

Ethernet connection

Serial connection

PLC from other manufacturers

You can use any PC in the network to debug the PLC connected with the remote COM destination device
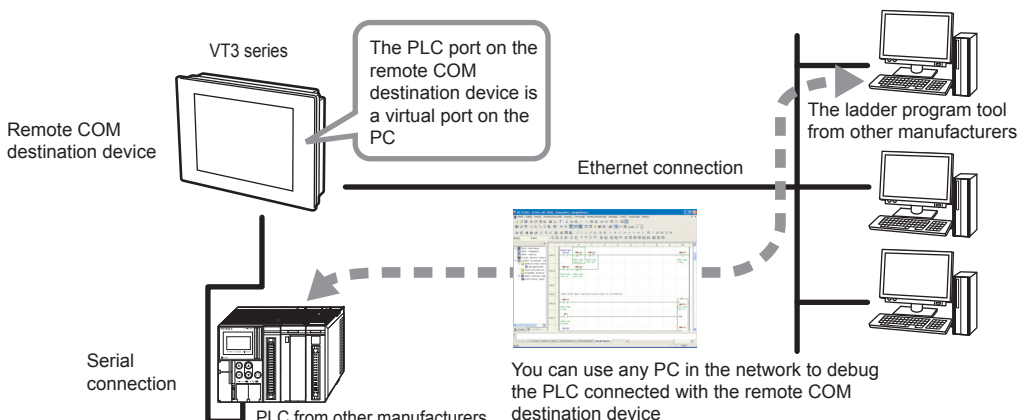
* For the PLC products that can use the remote COM port tool, please see the *Remote COM Tool Use's Manual* (only PDF).

> ⚠ **Point** Ethernet connection is impossible for VT3-W4T (A)/W4M (A)/W4G (A)/V7R.

● When Remote COM Port Tool is Used Via USB/Serial

In addition, the remote COM tool can also be used via the USB/serial connection, thus eliminating the needs to connect new cables to debug even if all the PLC ports are used.

VT series

USB connection
Serial connection

PORT1

PORT2,3

Serial connection

The ladder program tool from other manufacturers

You can debug a PL connected to the remote COM destination device from any PC in the network.
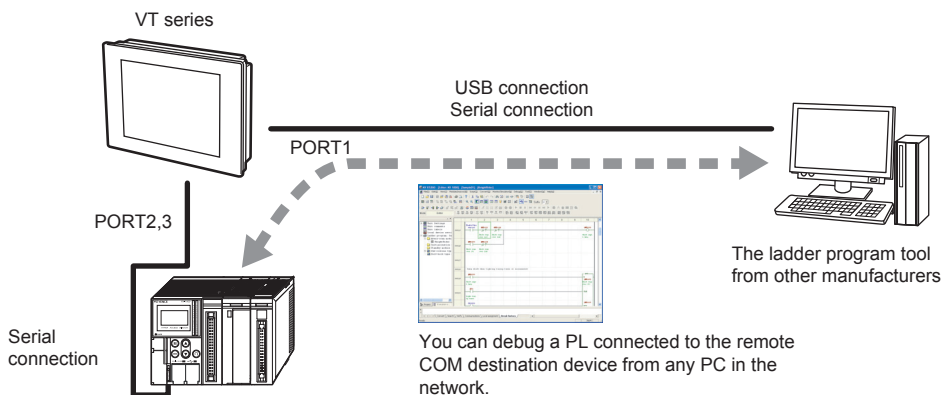
> ✎ **Point** • When the VT3 series are connected with PLC via the Mbps-link, multi-link and Ethernet, the remote COM tool cannot be used.
> • Only USB connection is supported in VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R.

DB Gateway Function

■ What is DB Gateway Function

When collecting PLC data with our proprietary "data collection, transmission, and monitoring software", the Ethernet serial conversion or protocol conversion can be provided by the VT3 series. The DATA BUILDER gateway can be used even when the VT3 series are engaged in data communications.

● When DATA BUILDER is Used With the Ethernet Connection
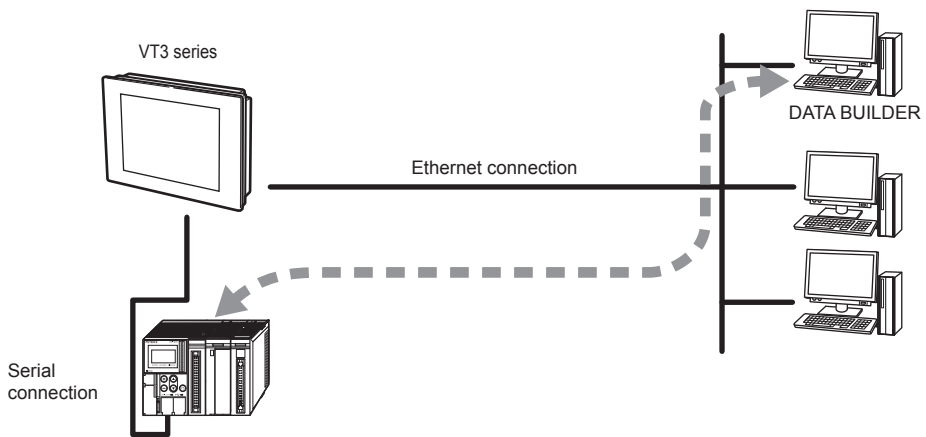
> ✎ **Point** Ethernet connection is impossible for VT3-W4T(A)/W4M(A)/W4G(A)/V7R.

● When DATA BUILDER is Used With the USB/Serial Connection
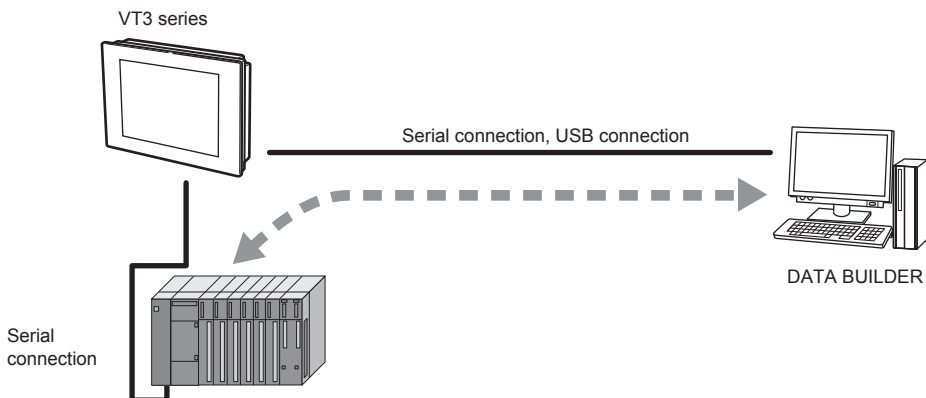
> ✎ **Point** • When the MultiTalk is used, please connect the PLC to PLC_A. If connected to PLC_B, the DB gateway function cannot be used in the PLC.
> • Only USB connection is supported in VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R.

4

OPERATION & UNIT FUNCTIONS

Analog RGB Output

■ What is Analog RGB Output

Used to display the VT3-X15(D) data on the PC monitor.

VT3-X15(D)   RGB cable
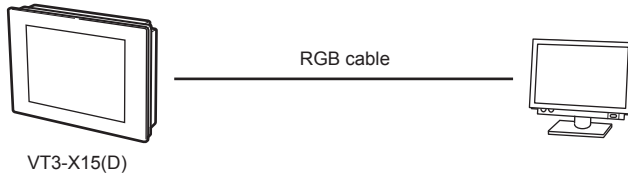
＼ Point	**Please perform analog RGB output via VT3-R1 for models other than VT3-X15(D).**

5

SYSTEM MODE

This chapter describes the System mode, the mode for making the basic setup.

What is System Mode?

With the system mode, various settings associated with VT3 can be made.
To enter the system mode, please see ☐ "9-1 System Mode Screen".

System Mode Screen

■ VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A

Switch display language

| System Mode VT3-X15/S12/S10/V10/V8/V7/V7R/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A Ver 4.00 | Japanese |

Option Setup	Viewer
VT System Setup	Self-Check
Communication Requirements Setup	Monitoring
Comm. With PLC Enable	Memory Card
Memory Clear	PLC Data Folder
Data Transmission	Run Mode

■ VT3-W4T(A)/W4M(A)/W4G(A)

System mode (1/2)   VT3-W4T(A)/W4M(A)/W4G(A)   Ver 4.00   Next Page

Option Setup	English
VT System Setup	Communication Setup
Data Transmission	Run Mode

Switches display language

System mode (2/2)   VT3-W4T(A)/W4M(A)/W4G(A)   Ver 4.00   Next Page

Comm. with PLC Enable	Monitoring
Memory Clear	Self Check
	Run Mode

Switch Display Language (Japanese/English) `All Models`

This item is for switching the display language in the System mode menu and errors displayed in the Run Mode.

	Setting Item	Default
English	Displays menus in the System mode in English. (Menus are displayed in Japanese before this button is touched.)	○
Japanese	Displays menus in the System mode in Japanese. (Menus are displayed in English before this button is touched.)	

Settable Items

The items that can be set vary according to the model of VT3. Check which items can be set in each model in the following table. Please refer to the following table.

■ English

Setup Name			Applicable Models (blank: all models)
Option Setup	Clock Adjustment		
	Back Light Power		
	LCD Contrast		Only for Q5S(W)/Q5M(W)/Q5M(W)A/W4M(A)/W4G(A)
	System Protect		
	Page Switching		
	Ethernet Setup		Except Q5M(W)/Q5M(W)A/W4T(A)/W4M(A)/W4G(A)/V7R
	Video Adjust	NTSC	Only for X15(D)/S12(D)/S10/V10(D)/V8
		RGB Position	
		RGB Quality	
	Multi Link		Except W4T(A)/W4M(A)/W4G(A)
	LCD Reverse Disp		Only for Q5M(W)/Q5M(W)A/W4M(A)/W4G(A)
VT System Setup	Initial Page No.		Except W4T(A)/W4M(A)/W4G(A)
	Page No. Specify Format		Except W4T(A)/W4M(A)/W4G(A)
	System Startup Delay		
	Back Light OFF Start Time		
	Buzzer Volume		
	2-Touch Switch		Except X15(D)/V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)
	Alarm Buzzer		Only for V7R
	Grip Switch		
	Read Protect		
	Warning Message Setup	Display "Changing Page"	
		Display "Cannot Change Page"	
		Display "Interlocking"	
	Internal Device Backup		Except W4T(A)/W4M(A)/W4G(A)
	Blink Setup		Except W4T(A)/W4M(A)/W4G(A)
	Barcode Setup		Except W4T(A)/W4M(A)/W4G(A)/V7R
	Video Setup		Only for X15(D)/S12(D)/S10/V10(D)/V8
	KL Setup		Except W4T(A)/W4M(A)/W4G(A)/V7R
	DATA BUILDER Timeout		Except W4T(A)/W4M(A)/W4G(A)
	Operation Switch Setup		Only V6H(G)/Q5H(G)

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SYSTEM MODE

Setup Name			Applicable Models (blank: all models)
VT System Setup	Printer Type		Except V6H(G)/Q5H(G)/Q5M(W)/ Q5M(W)A/W4T(A)/W4M(A)/W4G(A)/V7R
	Auto Cut		
	Printout Timeout		
	Default Print Mode		
	Hard Copy Setup		
	Default Disp Lang ID		Except W4T(A)/W4M(A)/W4G(A)
	Date and Time Format	Format	Except W4T(A)/W4M(A)/W4G(A)
		Separator	
		Display "Jan/Feb/..."	
		Display "AM/PM"	
	Multi Func SW		Except W4T(A)/W4M(A)/W4G(A)
	Change Passwords	Enter your password	
		Target Level	
		Enter new password	
		Enter again	
Communication Setup	PLC_A/PLC_B		When only MultiTalk is used W4T(A)/ W4M(A)/W4G(A)/V7R
	PLC No.		Only when the Ethernet connection is not selected only the target PLC model
	VT No.		
	PLC I/F		
	Baud Rate		
	Data Bit		
	Stop Bit		
	Parity		
	Flow Control		
	CR		
	LF		
	CheckSum		
	Special Setup		
	Highly Setup		
	No.0		Only when the Ethernet connection is selected only the target PLC model
	No.1		
	No.2		
	No.3		
	No.4		
	No.5		
	No.6		
	No.7		
	No.8		
	No.9		
	No.10		
	No.11		
	No.12		
	No.13		
	No.14		
	No.15		
	Timeout		
	Send Wait		
	Retry		
	Port No.		
	Special Setup		
Communicate with PLC			

Setup Name			Applicable Models (blank: all models)
Memory Clear	Trend Graph		
	Alarm Log		
	Internal Free Device		
	Operation Log		
Data Transmission			
Viewer	Page Viewer		Except W4T(A)/W4M(A)/W4G(A)
	Operation Log Viewer		
Self Check	LCD Graphic Check		
	Kanji Font Check		
	Screen Data Check	VT STUDIO	
		File	
		Date	
	SRAM Data Check		
	Switch Check		
	Point Correction		Only for X15(D)/V6H(G)/Q5H(G)/W4T(A)/ W4M(A)/W4G(A)
	Hard Switch		Only for V6H(G)/Q5H(G)/V7R
	Alarm Buzzer		Only for V7R
	Battery		
	Printer I/F(ESC/P Raster)		Except Q5M(W)/Q5M(W)A/W4T(A)/ W4M(A)/W4G(A)/V7R
	Video	NTSC	Only for X15(D)/S12(D)/S10/V10(D)/V8
		RGB	
	Memory card	Empty capacity	Except W4T(A)/W4M(A)/W4G(A)
		Auto Load File	
Monitoring	PLC_A/PLC_B		When only MultiTalk is used
	Bit Device		
	Word Device		
	Unit Monitoring		Except Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/ Q5M(W)A/W4T(A)/W4M(A)/W4G(A)
	Ladder Monitoring		
	Sensor Setup Backup		
	Sensor Setup Restore		
	Sensor Monitoring		
Memory Card	Screen Data Check	MemoryCard->VT	Except W4T(A)/W4M(A)/W4G(A)
		VT->MemoryCard	
		Delete File	
	Image Files	Hard Copy Image	
		Video Image	
	Log Data	Alarm Log	
		Trend Graph	
		Operation Log	
	System Program	MemoryCard->VT	

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Setup Name			Applicable Models (blank: all models)
PLC Data Folder	PLC_A/PLC_B		When only MultiTalk is used
	Access PLC	VT->PLC	Except W4T(A)/W4M(A)/W4G(A)
		PLC->VT	
		Verify	
	File Manager	Edit File	
		Copy, Delete File	
Run Mode			

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About Numeric Keypad Operations

The following describes the numeric keypad that is used in the System mode.

Some numeric keypads cannot be moved depending on the setup screen.
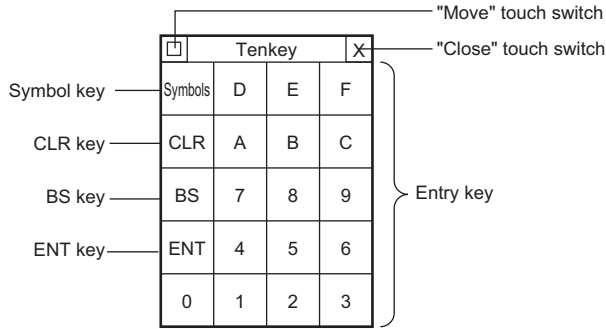
Entry key   : Enter values

Symbol key : Change the symbol. (Only used in Word Device Monitor)

CLR key   : Clear entered values.

BS key   : Delete entered values.

ENT key   : Validate your entry.

"Move" touch switch   : Move the display position of the keypad.

"Close" touch switch   : Close the keypad.

Moving the numeric keypad

You can move windows by touching the ▢ (move) touch switch and touching the move destination.
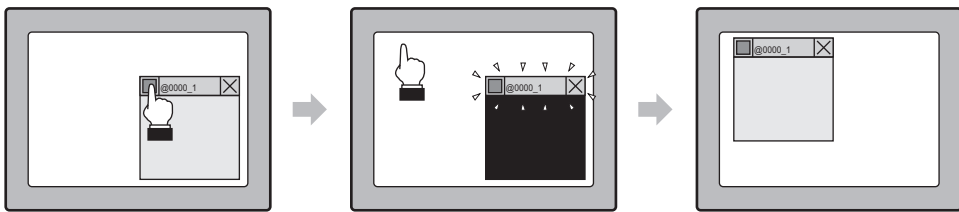
Press the "Move" touch switch, the title bar flickers.

While the title bar flickers, at destination, press this touch switch again.

The window moves there.

Closing the numeric keypad

You can close windows (turn display OFF) by touching the ☒ (close) touch switch.
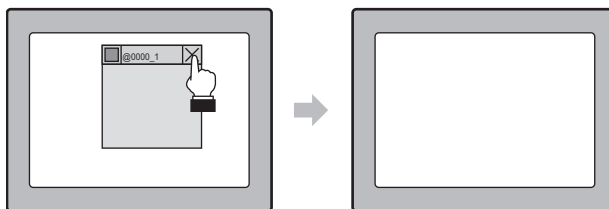
Press the "Close" touch switch.

The window closes.

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5-2 Option Setup

This section describes how to set up the items under the Option Setup menu item.

■ VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)

Option Setup (1/2)		OK
Clock Adjustment		Cancel
Backlight Power	★★★	Next Page
System Protect	No Protect	
Page Switching	PLC and Switch	
Ethernet Setup		
Video Adjust	NTSC	
	RGB Position	
	RGB Quality	

Option Setup (2/2)			OK
Multi-link	Disabled	Setup	Cancel
			Next Page

are only the setting items for VT3-X15(D)/S12(D)/S10/V10(D)/V8.

are only the setting items for VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G).

■ VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Option Setup (1/2)		OK
Clock Adjustment		Cancel
Backlight Power	★★★	Next Page
LCD Reverse Disp.	Disabled	
Contrast	8 - +	

Option Setup (2/2)			OK
System Protect	Disabled		Cancel
Page Switching	PLC and SW		Next Page
Ethernet Setup			
Multi-link	Enabled	Setup	
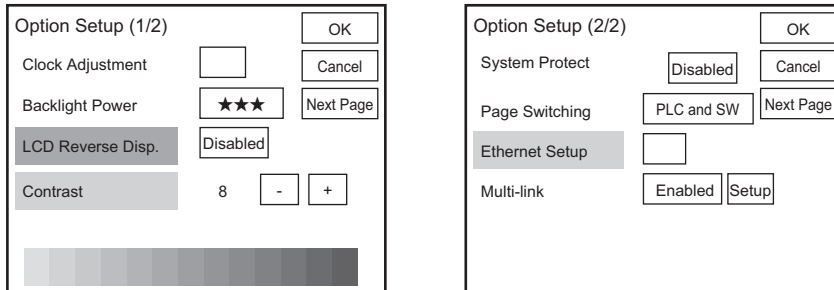
are only the setting items for VT3-Q5S(W)/Q5M(W)/Q5M(W)A.   are only the setting items for VT3-V6H(G)/Q5T(W)/Q5S(W)/Q5T(W)A.

are only the setting items for Q5M(W)/Q5M(W)A.

■ VT3-W4T(A)/W4M(A)/W4G(A)
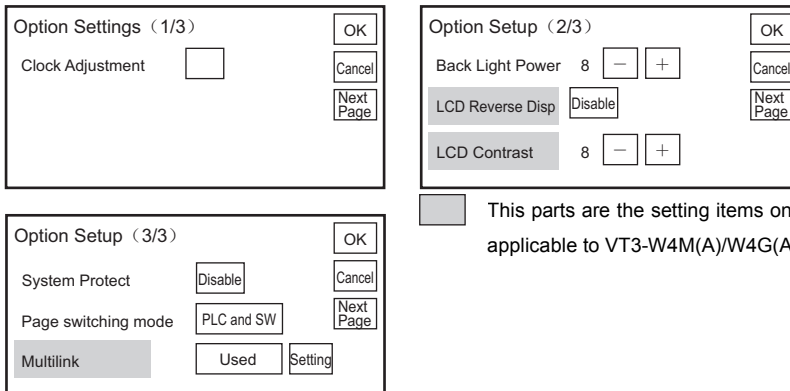
Option Settings（1/3）		OK
Clock Adjustment		Cancel
		Next Page

Option Setup（2/3）		OK
Back Light Power	8 − +	Cancel
LCD Reverse Disp	Disable	Next Page
LCD Contrast	8 − +	

This parts are the setting items only applicable to VT3-W4M(A)/W4G(A).

Option Setup（3/3）		OK
System Protect	Disable	Cancel
Page switching mode	PLC and SW	Next Page
Multilink	Used	Setting

This parts are the setting items only applicable to VT3-W4M(A)/W4G(A).

Clock Adjustment

This item is for setting the date, day of the week and time of the internal clock.

■ **VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/ V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A/V7R**

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

Setting Item		Setting Range
Date (Now)	Displays the current date in order year (lower two digits)/month/day and "day of the week".	-
Time (Now)	Displays the current time in the 24-hour clock in order hours and minutes.	-
Date (Set)	Change the "year".	00 to 99
	Change the "month".	01 to 12
	Change the "day".	01 to 31
	Change the "day of week." The display changes successively (Sun, Mon, Tue, and so forth).	-
Time (Set)	Sets "time" in the 24-hour clock.	00 to 23
	Sets "minutes" in the 24-hour clock.	00 to 59
Time (Adjust)	Correct the timing values. Display the total corrected values (seconds) for one month.	-497 to +497

Backlight Power

■ **VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A/V7R**

This item is for adjusting the brightness of the VT3's back light. Each press of the key ★★★ changes the brightness in three steps.

(Only VT3-S12(D) is 2-level adjustment (★★★, ★★)).

Setting Item		Default
★★★	Light intensity = Light	○
★★	Light intensity = Medium	
★	Light intensity = Dark	

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

Brightness of backlight can be adjusted in 8 levels from 1 to 8. Please adjust it to the level mostly applicable to view.

Setting range	Default
1 to 8	8

LCD Contrast   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T **Q5S** **Q5M** **W4*** V7R

<div align="right">* Only VT3-W4M(A)/W4G(A)</div>

This item is for adjusting the contrast on STN type VT3 displays in 16 steps within the range 1 to 16. Please choose a position that is most visually comfortable.

Setting Range	Default
1 to 16	8

System Protect   All Models

This item is for disabling moving to the System mode from the Run mode.

Setting Item		Default
Protect	Disables moving to the System mode from the Run mode.	
No protect	Enables moving to the System mode from the Run mode.	○

✎ **Point**
- **To enable moving to the System mode, move to the System Mode menu after turning the power ON, and set this item to "No Protect" (moving to the System mode enabled during operation).**
   📖 "5-1 What is System Mode?"
- **The System mode cannot be moved to when screen data is transferred from VT STUDIO in the Run mode when moving to the System mode is disabled. Either set to screen data transfer standby, or enable the System mode.**
   📖 "5-7 Data Transmission"

Page Switching (only in MT mode)   All Models

This item is for setting page switching by PLC operation or touching touch switches on the VT3.

Setting Item		Default
PLC and Switch (PLC and SW)	Enables switching of pages between both the PLC and the touch switches.	○
PLC or Switch (PLC and SW)	Enables switching of pages by one of PLC or touch switch depending on the content of the system memory area.	

✎ **Point**   **This item is enabled only when the system memory area is set to the MT mode, and is disabled when the system memory area is set to the VT mode.**
This item is disabled under the "VT Mode".
   📖 "Chapter 14-1 About the System Memory Area",VT3 Series Reference Manual

Ethernet Setup X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item is for setting Ethernet communications for VT3. VT3 Ethernet settings can be set only in the System mode.

Setting Item	Description	Setting Range	Default
Baud rate	Sets the data communications speed at VT2-E1/E2, VT3-E3 and the hub.	100/10 Mbps Auto, 10 Mbps	100/10 Mbps Auto
IP Address	Sets the IP address to be assigned to VT2-E1/E2, VT3-E3.	0.0.0.1 to 255.255.255.255	-
Subnet Mask	Sets the subnet mask of the network to which VT2-E1/E2, VT3-E3 belongs.	Divided Subnets 0 to 255	255.255. 255.0
Default Gateway	Sets the IP address of the device (router, server, etc.) that is to be the default gateway in the LAN.	Divided Subnets 0 to 255	0.0.0.0
MAC Address[1]	This is the ID No. unique to VT2-E1/E2, VT3-E3. This setting cannot be changed.	-	-
Port no.	Please set the port No. for communicating with a PC application such as VT STUDIO as required. Please avoid using a port No. being used in PLC communication.	1 to 65535[2]	8500
Time-out	Sets the permissible cancelation time during communications on the VT2-E1/E2, VT3-E3.	10 to 59 (sec.)	10 (sec.)
Keep Alive	Sets the time that investigation, as to whether or not a normal connection with connections tablished peer devices can be held, is performed at fixed time intervals. When set to "0", the keep alive function is disabled.	0 to 65535 (sec.)	600(sec.)
FTP Setup	Set this to use FTP server functions.	Enabled, Disabled	Disabled
Password	Set the password when FTP server functions are used to make a connection. Displayed when FTP is set to "Valid".	8 English characters. [3] (half-width upper case)	Not set
Routing	Set this when there is a communications peer device other than the VT2-E1/E2, VT3-E3 default gateway. A total of four sets can be set.	Enabled, Disabled	Disabled

*1 "00.00.....00" is displayed if Ethernet settings are not correctly set.
*2 Do not use Nos. 0 to 1023.
*3 If you set empty as password, you can connect by entering your user name for log-in.

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Video Adjust 〔X15〕〔S12〕〔S10〕〔V10〕〔V8〕 〔V7〕〔V6H〕〔Q5H〕〔Q5T〕〔Q5S〕〔Q5M〕〔W4〕〔V7R〕

This item is for adjusting the video display. Adjust the display to the position that you feel is easiest to view.
In this example, the video display is adjusted on CH1.

■ NTSC

Setting Item	Description	Default
Video input mode	Specifies the video input mode. Interlace : Input image signals from external CCD cameras or VTRs, our image sensor CV series (except CV-300/100). CV-300/100 : Inputs video signals output from a Keyence image sensor CV-300/100.	Interlace
Color/Gray selection	Specifies either of color or gray scale as the display color.	Color
Brightness	Adjusts the brightness.The position can be adjusted within the range -128 to 127 .	0
LCD Contrast	Adjusts the contrast.The position can be adjusted within the range -128 to 12 .	0
Hue	Adjusts the hue. Can be adjusted -128 to +127.	0
Menu off	Temporarily turns menu display OFF, and makes image adjustment easier. After menu display is turned OFF, the menu can be displayed again by touching any part of the screen.	-
Channel *	Change the input channel.	CH1

Color Signal Gain	Setup the color signal gain.
	        Auto: auto adjustment
	        Manual: -8 to 7
		Auto

Brightness Signal Gain	Setup the brightness signal gain.
	        Auto: auto adjustment
	        Manual: -8 to 7
		Auto

Vertical Offset	Adjusts the position of the display. Phase can be adjusted within the range -8 to 7.	0

* Displayed only when VT3-VD4 is used.

■ **RGB Position**
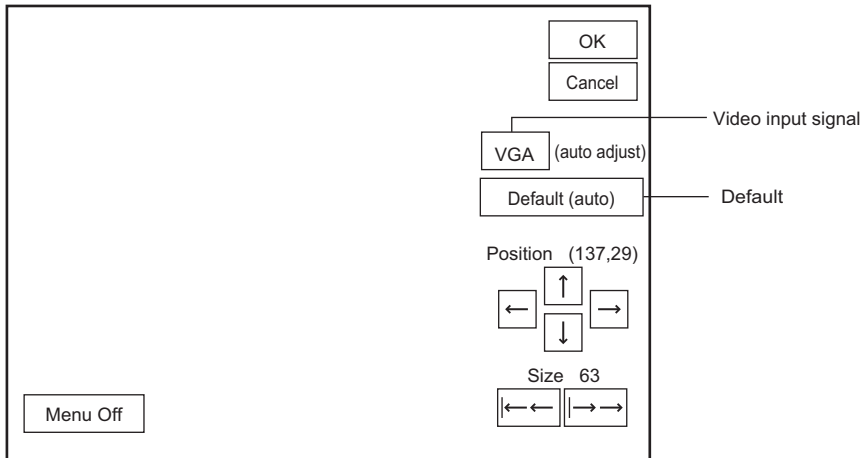
Setting Item	Description	Default
Video input signal	Specifies the signal (resolution) to input: VGA : 640 x 480 dots SVGA[*1] : 800 x 600 dots XGA[*2] :1024 x 768 dots	VGA
Default	Restores the position adjustment and phase to their defaults. Fixed values are pre-set to defaults 0 to 5. All values that are changed from their defaults become user-custom settings.	Default 0
Position	Adjusts the position of the display. The position can be adjusted within the range 0 to 255.	Default 0
Size	Adjusts the horizontal width size. The position can be adjusted within the range 0 to 767.	Default 0
Menu off	Temporarily turns menu display OFF, and makes image adjustment easier. After menu display is turned OFF, the menu can be displayed again by touching any part of the screen.	-

*1 For VT3-V10(D)/V8, the actual resolution is lower.

*2 For VT3-S12(D)/S10/V10(D)/V8, the actual resolution is lower.

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SYSTEM MODE

System Mode

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VT System Setup

PLC Communication Setup

Communicate With PLC

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Run Mode

■ **RGB Quality**
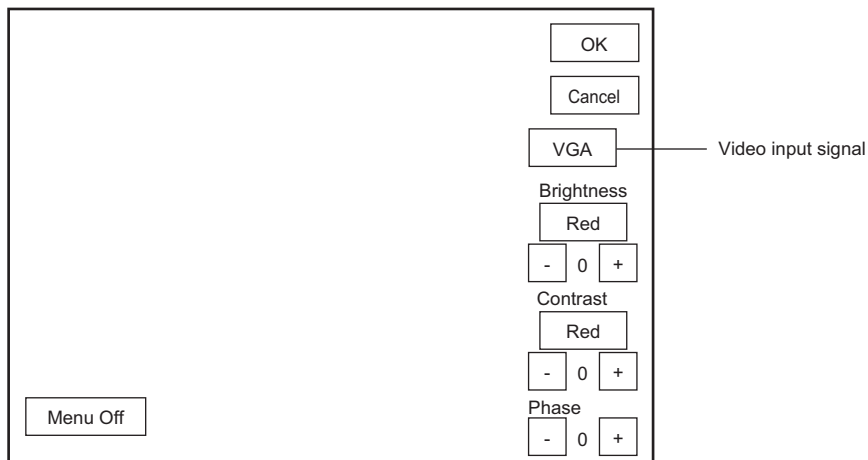
```
                                    ┌──────────┐
                                    │    OK    │
                                    └──────────┘

                                    ┌──────────┐
                                    │  Cancel  │
                                    └──────────┘

                                    ┌──────────┐
                                    │   VGA    │ ──────── Video input signal
                                    └──────────┘

                                     Brightness
                                    ┌──────────┐
                                    │   Red    │
                                    └──────────┘
                                    ┌───┬───┬───┐
                                    │ - │ 0 │ + │
                                    └───┴───┴───┘
                                     Contrast
                                    ┌──────────┐
                                    │   Red    │
                                    └──────────┘
                                    ┌───┬───┬───┐
                                    │ - │ 0 │ + │
                                    └───┴───┴───┘
  ┌───────────┐                      Phase
  │ Menu Off  │                     ┌───┬───┬───┐
  └───────────┘                     │ - │ 0 │ + │
                                    └───┴───┴───┘
```

Setting Item	Description	Default
Video input signal	Specifies the signal (resolution) to input: VGA : 640 x 480 dots SVGA[*1] : 800 x 600 dots XGA[*2] :1024 x 768 dots	VGA
Brightness	Adjusts the brightness. Brightness can be adjusted within the range -31 to +32.	0
LCD Contrast	Adjusts the contrast. Brightness can be adjusted within the range -31 to +32.	0
Phase	Adjusts dot shift. Phase can be adjusted within the range -16 to +15.	0
Menu off	Temporarily turns menu display OFF, and makes image adjustment easier. After menu display is turned OFF, the menu can be displayed again by touching any part of the screen.	-

*1   For VT3-V10(D)/V8, the actual resolution is lower.

*2   For VT3-S12(D)/S10/V10(D)/V8, the actual resolution is lower.

Multi Link ⟨X15⟩ ⟨S12⟩ ⟨S10⟩ ⟨V10⟩ ⟨V8⟩ ⟨V7⟩ ⟨V6H⟩ ⟨Q5H⟩ ⟨Q5T⟩ ⟨Q5S⟩ ⟨Q5M⟩ ⟨W4*⟩ ⟨V7R⟩

* Only VT3-W4TA/W4MA/W4GA

When the VT2 Multi Link is used, press Setup that is displayed when "Multi Link" is set to "Enable", and set the following items.

📖 "Chapter 20 VT2 Multilink", VT5 Series/VT3 Series/DT Series PLC Connection Manual

✎ Point	**When MultiTalk is used, the VT2 Multi-link cannot be used.**

Setting Item	Description	Default
VT No.	Sets the "VT No." Set the master to "0" and slave to "1 to 15" (1 to 3 in the case of "Connections: 4")	0
Baud Rate	Sets the "baud rate." The same baud rate must be set to the master and all slave .	115200bit/s
Message display	Sets display message ON/OFF. When "ON" is set, messages for the VT2 Multi Link are displayed. Messages are not displayed when "Display message: OFF" is set.	ON
Retry[1]	Sets the "Retry" in communications between the master and slave (master only). Normally, use at the default setting "3".	3
Number of connected units[1]	Sets the number of connected units. Set either "4" or "16" (master only).This number includes all master and slave VT3s. Set "4" when there are less than four connected units. As only station No. 0 to 3 are recognized, communications faster than those with "16" set is possible.	4

[1] VT3-W4TA/W4MA/W4GA (not displayed) can not be set.

LCD Reverse Disp. ⟨X15⟩ ⟨S12⟩ ⟨S10⟩ ⟨V10⟩ ⟨V8⟩ ⟨V7⟩ ⟨V6H⟩ ⟨Q5H⟩ ⟨Q5T⟩ ⟨Q5S⟩ ⟨Q5M⟩ ⟨W4*⟩ ⟨V7R⟩

* Only VT3-W4M(A)/W4G(A)

Display of black-and-white product is black-and-white reversed.

Setting Item	Description			Default
	VT3-Q5M(W)/Q5M(W)A	VT3-W4M(A)	VT3-W4G(A)	
ON	Background color = white, text/picture color = blue	Background color = white, text/picture color = black	Background color = green, text/picture color = black	
OFF	Background color = blue, text/picture color = white	Background color = black, text/picture color = white	Background color = black, text/picture color = green	○

✎ Point	**When the 32-level gray scale is used with VT3-Q5M(W)/Q5M(W)A, the settings of Reverse Display are not reflected in the Run Mode.** **Reverse Display setting is not reflected in the Run Mode of VT3-W4M(A)/W4G(A).**

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5-3 VT System Setup

This section describes how to set up the items under the VT System Setup menu item.

■ **VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)**

VT System Setup (1/6)			
			OK
			Cancel
Initial Page No.	0	Page	Next Page
Page No. Specify Format	Binary		
System Startup Delay	0	Second	
Backlight OFF Start time	0	Minute	
Buzzer Volume	Medium		
2 touch switch	-		

VT System Setup (2/6)		
		OK
Alarm Buzzer	Yes	Next page
Grip Switch	Instantaneous	
Read Protect	Disabled	
Warning Message Setup		
Display "Changing Page"	ON	
Display "Cannot Change Page"	ON	
Display "Interlocking"	OFF	
Internal device backup	Clear	

VT System Setup (3/6)			
			OK
			Cancel
Blink setup			Next page
Barcode Setup			
Video Setup	-		
KL Setup	Not Used		
DATA BUILDER Timeout	Defaulted Setup	4	Second

VT System Setup (4/6)			
			OK
			Cancel
Printer Type	ESC/P Raster		Next page
Auto Cut	One point residual		
Printout Timeout	Default	-	Second
Defaulted Print Mode	TIFF		
Hard Copy Setup			
Defaulted Display ID	0		

VT System Setup (5/6)		
		OK
		Cancel
Date and Time Format		Next Page
Format	Year/Month/Day	
Separator	/	
Display "Jan/Feb/…"	Disabled	
Display "AM/PM"	Disabled	
Mult Func SW	Optimize	

VT System Setup (6/6)		
		OK
		Cancel
Change Passwords		Next Page
Enter Your Password	-	Level
Target Level		
Enter New Password		
Enter again		

are only the setting items for VT3-V7R.

are only the setting items for VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7.

are only the setting items for VT3-X15(D)/S12(D)/S10/V10(D)/V8.

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■ **VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**

VT System Setup (1/6) | Next Page | Cancel | OK

Initial Display Page No.	0	Page
Page No. Specify Format	Binary	
System Startup Delay	0	Second
Backlight OFF Start time	0	Minute
Buzzer Volume	Medium	
2 touch switch	Yes	

VT System Setup (2/6) | Next Page | Cancel | OK

Read Protection	Disabled
Warning Message Setup	
Display "Changing Page"	Enabled
Display "Cannot Change Page"	Enabled
Display "Interlocking"	Disabled
Internal device backup	Disabled

VT System Setup (3/6) | Next Page | Cancel | OK

Blink setup	
Blink setup	
KL	Used	Setup
DATA BUILDER Timeout	Defaulted Setup	4	Second
Operation Switch Setup	Out of service

VT System Setup (4/6) | Next Page | Cancel | OK

Printer Type	ESC/P Raster
Auto Cut	1 point residual
Printout Timeout	Default	-	Second
Defaulted Print Mode	TIFF
Hard Copy Setup	
Defaulted Display ID	0	Japanese

VT System Setup (5/6) | Next Page | Cancel | OK

Date and Time Format	
Format	Year/Month/Day
Separator	/
Display "Jan/Feb/…"	Disabled
Display "AM/PM"	Disabled
Mult Func SW	Optimize

VT System Setup (6/6) | Next Page | Cancel | OK

Change Passwords	
Enter Your Password	———	Level
Target Level	
Enter New Password	
Enter again	

■ are only the setting items for VT3-Q5T(W)/Q5S(W)/Q5T(W)A.
□ are only the setting items for VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A.

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

VT System Setup (1/4) | Next Page | Cancel | OK

System Startup Delay	0	Second
Back Light OFF Start Time	0	Minute
Buzzer Volume	None

VT System Setup (2/4) | Next Page | Cancel | OK

Read Protect	Disable
Warning Message Setup	
Display 'Changing Page'	ON

VT System Setup (3/4) | Next Page | Cancel | OK

Warning Message Setup	
Display 'Cannot Change Page'	ON
Interlock display	Disable

VT System Setup (4/4) | Next Page | Cancel | OK

Enter your password	———	Level
Target Level	
Change Passwords	

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## Initial Page No.   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item is for setting the page number of the screen that is initially displayed after the power is turned ON.

Setting Range	Default
Page 0 to 8999	0

✎ **Point**   **Page numbers that have not be prepared and transmitted in VT STUDIO cannot be set.**

Page No. Specify Format   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

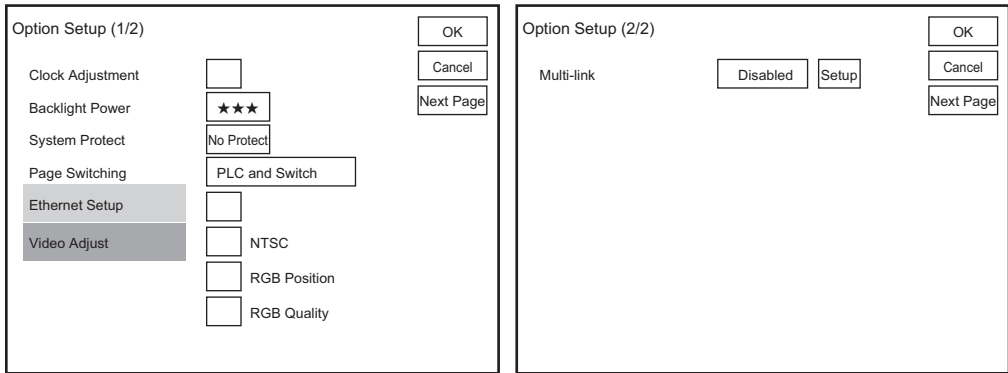This item is for specifying the data format of the page number to be displayed when the page is switched or the interrupt window is displayed by PLC operation.

Setting Item	Description	Default
Binary	Handles data on the PLC in decimal format.	○
BCD	Handles data on the PLC in BCD format.	

System Startup Delay   All Models

This item is for setting the time until the VT3 enters the Run mode after the power is turned ON. Set this item when the PLC is to be started before the VT3.

Setting Range	Default
0 to 120 sec.	0

Back Light OFF Start Time   All Models

This item is for automatically turning the LCD and backlight OFF when no operations or control have been performed for a fixed period of time on the VT3. "When no operations or control have been performed" includes all of the following instances:

• A touch switch is not pressed.
• The screen is not switched (page switching, window display ON/OFF).
• Display of interrupt window is not executed.
• The status of the alarm device is not executed.

To restore the backlight from an OFF status, execute one of the above operations or controls.

When a fixed period of time has elapsed since the last operation or control after the back light is restored, the LCD and backlight turn OFF again.

Setting Range	Default
0 to 120 min.	0

✎ **Point**   **The backlight is not turned OFF in the following cases even if the set time is reached:**
   • **When the set time is set to "0"**
   • **When an operation or control is performed within the set time**

Reference   To turn off the LCD and backlight from the PLC, please use the Display ON/OFF in the system memory screen or the control Bit 0 "Backlight OFF (Bit: ON)".
   📖 "Chapter 14-1 About the System Memory Area", VT3 Series Reference Manual
   This can be used jointly with backlight OFF control from the PLC, however, control from the PLC is given priority.
   When the backlight is turned ON (Bit: OFF) from the PLC, the OFF time of this backlight is counted from 0 anew.
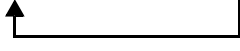
Buzzer Volume

All Models

This item is for adjusting the volume of the VT3 internal buzzer. Each touch of this switch changes the setting as follows. The buzzer sounds when a touch switch is operated after the power is turned ON.

Setting Range	Default
Not Used → Low* → Medium* → High	High

* "Low" or "Medium" cannot not be selected for VT3-W4T(A)/W4M(A)/W4G(A).

2-Touch Switch

X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item is for setting whether or not to identify that two touch switches have been touched simultaneously.

Setting Item	Description	Default
Impossible	Recognizes that only one of the two switches is touched.(The earlier of the two switches that is pressed is recognized.)	
Enable	Recognizes that both of the two switches are touched.	○

Alarm Buzzer

X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

ON/OFF setup for the big buzzer inside VT3-V7R.

Setting Item	Description	Default
ON	When ON is set up in the system memory area, the buzzer sounds.	
None	The alarming buzzer sounds.	○

Grip Switch

X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

The locking switch is used to set up the Valid/Invalid option for the cross switch and touch panel.

Setting Item	Description	Default
Instantaneous	The cross key and touch switch are enabled only when the locking switch is pressed.	
Reverse	Pressing the rising edge of the locking switch, the Valid/Invalid options for the cross switch and touch panel is selected.	
OFF	The locking switch cannot be used.	○

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Read Protect

All Models

This item is for protecting reading and comparison of screen data from an external source.

Setting Item		Default
Protect	Enables read protection.	
No Protect	Disabled read protection.	○

▶ Important

When read protect is set, screen data stored on VT3 cannot be read from then on (VT→PC, VT→Memory Card). To cancel memory read, the screen data must be transferred again. Be sure to backup screen data before executing a transfer.
Note, however, that when "Read Protect: ON (w/ password)" is set on VT STUDIO, screen data can be read and compared by entering the password on VT STUDIO.
Password functions cannot be set by VT→Memory Card.

📖 "12-4 VT Series System Settings", VT 3 Series Reference Manual

✎ Point
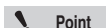
PLC data folder data can be read (VT→PC, VT→Memory Card) even if read protection is set. PLC data folder Excel add-in can also be read.

Warning Message Setup

All Models

Setting Item		Description	Default
Display 'Changing Page'	ON	Displays the messages "Page being switched..." or "Global window being switched...".	○
	Disable	Does not display the messages "Page being switched..." or "Global window being switched...".	
Display 'Cannot Change Page'[*1]	ON	Displays the message "Page switching stopped by switches".	○
	Disable	Does not display the message "Page switching stopped by switches".	
Display Interlocking	ON	The message "Interlocked" is displayed at the lower-left hand of the screen.	
	Disable	Not display the message "Interlocked".	○

*1   Enabled only when set to the "MT mode"

Internal Device Backup

X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Sets whether or not to hold internal free device values when the VT3 is powered OFF.

Setting Item	Description	Default
Clear	When the VT3 is turned OFF, the values of internal free devices (MW0100 to MW0FFF) are not held.When the power is next turned ON, all internal free devices are initialized to "0".	○
All Blk	Even the power of VT3 is turned off, values of the internal free devices (MW0100 to MW0FFF) are still retained.	
Lo Blk	Even the power of VT3 is turned off, values of the internal free devices in the lower-level program blocks (MW0100 to MW07FF) are still retained.	
Hi Blk	Even the power of VT3 is turned off, values of the internal free devices in the higher-level program blocks (MW0800 to MW0FFF) are still retained.	

✎ Point

Internal devices are cleared at the following timings regardless of backup setting:
*   **After the system program is transferred from VT STUDIO (including "all data" transfer)**
*   **When P->CVT send data is executed after the system parameter settings are changed in VT STUDIO (including "PC->VT Send screen data differences")**
*   **When "Internal Device Backup" settings are changed in the VT3 System mode**
*   **When "Memory Clear" is executed to initialize internal free devices in the VT3 System mode**

Blink Setup   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

■ System Blink

This item sets the blink speed in system blinks. A "system blink" is blinking when key entered parts are in the active mode, blinking of the cursor during entry, and blinking of VT3 error messages.

Setting Range	Default
100 ms to 2500 ms (100 ms increments)	400 ms

■ Blink (Except VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A)

This item sets the blink speed in hardware blinks. Speeds 1 and 2 other than standard (fixed at 400 ms) can be set. A "hardware blink" is blinking (color-inverted blinking) control in color setting BLK for each part and graphic attribute control.

Setting Item	Setting Range	Default
Speed 1	100 ms to 2500 ms (100 ms increments)	200 ms
Speed 2		100 ms

■ Blink control

This item sets the blink speed in software blinks. Speeds 1 and 2 other than standard (fixed at 1000 ms) can be set. A "software blink" is blinking (display/hide blinking, color-swapped blinking) in blink control in graphic attribute control.

Setting Item	Setting Range	Default
Speed 1	400 ms to 2500 ms (100 ms increments)	400 ms
Speed 2		2000 ms

Barcode Setup   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Setting Item	Setting Range	Default
5V Power Supply	ON,OFF	ON
Baud Rate	9600/19200/38400/57600/115200bit/s	9600 bit/s
Data Bit	7/8bit	7bit
Stop Bit	1/2bit	1bit
Parity	None/Even/Odd	Even
Read Mode	Auto [*1]/Manual [*2]	Auto
Header	None/STX/ESC	None
Delimiter	CR/LF/CR+LF/ETX	CR
CheckSum	Disabled/TL-30K/RF-500	Disabled

*1 To continuously read, please check the actually used machine with the actual barcode input interval.
In addition, please ensure to set the checksum on the barcode side to "None".

*2 Continuous read can be enabled.

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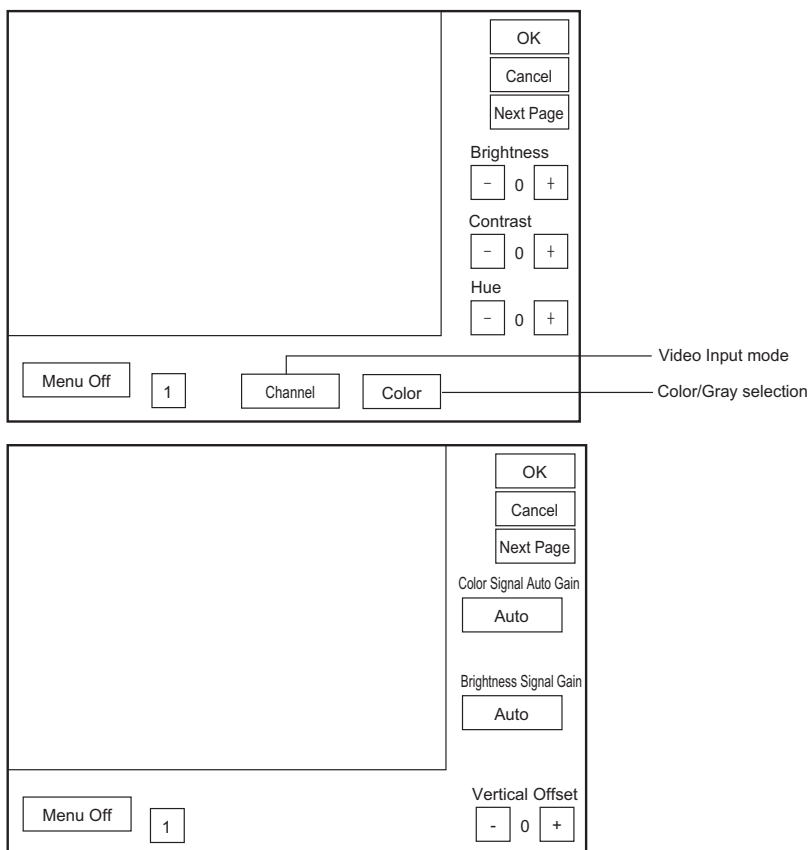Memory Card
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Video Setup $\boxed{\text{X15}}$ $\boxed{\text{S12}}$ $\boxed{\text{S10}}$ $\boxed{\text{V10}}$ $\boxed{\text{V8}}$ $\boxed{\text{V7}}$ $\boxed{\text{V6H}}$ $\boxed{\text{Q5H}}$ $\boxed{\text{Q5T}}$ $\boxed{\text{Q5S}}$ $\boxed{\text{Q5M}}$ $\boxed{\text{W4}}$ $\boxed{\text{V7R}}$

Setting Item	Setting Range	Default
Capture Mode	Display Size/Initial Size	Display size
Display date	Enabled/Disabled	Disabled
Overlap parts	Enabled/Disabled	Disabled
Capture target	Specify internally/specify externally (settings cannot be changed *)	-
channel1	Enabled/Disabled	Disabled
channel2	Enabled/Disabled	Disabled
channel3	Enabled/Disabled	Disabled
channel4	Enabled/Disabled	Disabled
RGB	Enabled/Disabled	Disabled

* To specify a channel in a different way, please do it with VT STUDIO.

KL Setup $\boxed{\text{X15}}$ $\boxed{\text{S12}}$ $\boxed{\text{S10}}$ $\boxed{\text{V10}}$ $\boxed{\text{V8}}$ $\boxed{\text{V7}}$ $\boxed{\text{V6H}}$ $\boxed{\text{Q5H}}$ $\boxed{\text{Q5T}}$ $\boxed{\text{Q5S}}$ $\boxed{\text{Q5M}}$ $\boxed{\text{W4}}$ $\boxed{\text{V7R}}$

This item is for setting the KL address of VT3. VT3 is treated as a master unit.

Set the unit configuration on the KL Series Address Setup Software, and set according to calculated values.

📖 "Chapter 7 KL LINK"

Setting Item	Description	Default
Send address	Communications address at which data transmission is started to the output unit Specify within the range 00H to FEH (Hex) in evennumber units.	00H
Number of send addresses	Sets how many addresses are to be sent from the target address. 0Specify within the range 00H to 100H (Hex) in evennumber units.	000H
Receive Address	Communications address at which data reception from an input unit is started. Specify within the range 00H to FEH (Hex) in evennumber units.	00H
Number of receive addresses	Sets how many addresses are to be received from the receive address. 0Specify within the range 00H to 100H (Hex) in evennumber units.	000H
Baud rate	Specify the transmission speed (baud rate) from 5 Mbit/s, 2.5 Mbit/s, 625 kbit/s or 156 kbit/s. Select one of 5 Mbit/s, 2.5 Mbit/s, 625 Kbit/s, and 156 Kbit/s.	2.5Mbit/s
FINAL	Specifies the final address to be communicated to. Set to the unit having the largest send address. Set to Unit.	OFF
ERR HOLD	Specifies the data status of the receive area at a broken line error. ON : Retain data OFF : Force to reset	OFF

DATA BUILDER $\boxed{\text{X15}}$ $\boxed{\text{S12}}$ $\boxed{\text{S10}}$ $\boxed{\text{V10}}$ $\boxed{\text{V8}}$ $\boxed{\text{V7}}$ $\boxed{\text{V6H}}$ $\boxed{\text{Q5H}}$ $\boxed{\text{Q5T}}$ $\boxed{\text{Q5S}}$ $\boxed{\text{Q5M}}$ $\boxed{\text{W4}}$ $\boxed{\text{V7R}}$

When DB gateway function is used, set DATA BUILDER communication timeout value.

Setting Item	Description	Default
DATA BUILDER Communication timeout	Default is set to 4 s. When communication load is large, time must be extended. (4 to 30 s)	Default setup (4 s)

Operation switch Setup [X15] [S12] [S10] [V10] [V8] [V7] **[V6H]** **[Q5H]** [Q5T] [Q5S] [Q5M] [W4] [V7R]

Use operation switch to set enable/disable of the function switch and touch panel.

Setting Item	Description	Default
Instantaneous power off	Only when operation switch is pressed, could functional switch, touch panel be active.	
Alternating	When operation switch is pressed for start, reverse enable/disable of the functional switch, touch panel.	
Out of service	Operation switch does not work. Functional switch, touch panel are always active.	○

Printer Type [X15] [S12] [S10] [V10] [V8] [V7] [V6H] [Q5H] [Q5T] [Q5S] [Q5M] [W4] [V7R]

Select the hard copy output target for the displayed screen or from screen.

Setting Item		Description	Default
(Printer)		Set the printer type in VT STUDIO.	○
	ESC/P Raster	Prints a hard copy (color/gray scale) of the currently displayed screen and printer form screen on a Seiko Epson ESC/P Raster printer.	
	ESC/P Raster2		
	LIPS IV raster	Prints a hard copy (color/gray scale) of the currently displayed screen and printer form screen on a LIPS IV Raster printer, a Canon Inc. laser printer.	
	PictBridge[1]	Prints a hard copy (color/gray scale) of the currently displayed screen and printer form screen on a PictBridge compatible printer.	
	Thermal printer	Prints the printer form screen and alarm logs on a CITIZEN SYSTEMS CBM-293/CT-P293 printer.	
	ESC/P-R Ethernet [2]	Prints a hard copy (color/gray scale) of the currently displayed screen and printer form screen on a Seiko Epson ESC/P-R printer.	
	ESC/Page Ethernet [2]	Prints a hard copy (color/gray scale) of the currently displayed screen and printer form screen on a Seiko Epson ESC/Page printer.	
Save to memory card		Saves the currently displayed run screen and form screen to memory card in the BMP or JPEG format.	
Printer [3]**, memory card**		Prints a hard copy (color/gray scale) of the currently displayed screen and form screen and saves the data to memory card in the BMP or JPEG format.	

[1]   Requires the VT2-P2 or VT2-E2.

[2]   Can only be used on the VT2-E1/E2, VT3-E3 when they are connected to the Ethernet.

In addition, the VT3 System Program must be in Ver. 4.81 or above.

[3]   Set the printer type in VT STUDIO.

Reference

- When the "PrinterMemory Card" option is selected, the (1) Printer output and (2) Save to Memory Card are executed in that order.
- In the Memory log, the (1) "printer output results" and (2) "Memory Card saving results" are loged as one piece of message.
- The end notification bit is ON when the memory card saving is completed.

■ Auto Cut

Set up the Auto Cut function for the selected printer type "Thermal Printer".

📖 "12-4 VT Series System Settings", VT 3 Series Reference Manual

Setting Item	Description	Default
Leave a small part	When cutting the paper, the small part in the paper center is left.	○
Cut off	The paper is completely cut off.	

■ Printout Timeout

Sets the time-out. This can be set up when VT2-E1/P is used.

Setting Item	Description	Default
Printoutput Timeout	Default (5 seconds) Self-defined (1 to 999 seconds)	Default (5 seconds)

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■ **Default Print Mode**

Set up the format of the data that is sent to the printer when the printer type is set to "PictBridge".

Setting Item	Description	Default
TIFF	Send data to the printer in the TIFF format.	○
JPEG	Send data to the printer in the JPEG format.	

> **Reference** Set up when the output data is not correctly printed out. This is not necessary when the connection of the printer has been confirmed.
> 📖 "6-6 Printer Unit"

■ **Hard Copy Setup**

Make the following settings when the printer type is set to "ESC/P Raster", "ESC/P Raster 2", "LIPS IV Raster", "ESC/P-R" or "ESC/Page".
📖 "12-4 VT Series System Settings", VT 3 Series Reference Manual

Setting Item	Description	Setting Range	Default
Printer Paper Size [*1]	Sets the printer paper size.	A4, A5, B5	A4
Printing Direction	Sets the print direction of the printer paper.	Portrait, Landscape	Vertical
Scale [*2]	Sets the print size (print scale).	1/2 (SVGA) 3/4(SVGA) 1 (SVGA) 3/2(SVGA) 2(SVGA)	1/2 (SVGA) 1 (VGA)
Margin	Sets margins. Sets the margins on the top and left edge.	*3	*3
Printer Color Mode	Selects the printer color mode (color or gray scale) on an ESC/P Raster system printer.	Color, Gray scale	Color
Reverse Printer Tones	When the "Black-and-White Gray Scale" option is selected, select whether to reverse the black and white gray scale.	OFF, ON	Disable
Print Quality [*4]	Sets the print quality. This is valid when "Printer color mode: color" is selected.	Normal, Draft	Standard

*1 Use VT SUDIO for the setup when making the from picture.

*2 The setting range and default change according to the VT3 model.

*3 The setting range and default change according to the model.

*4 Cannot be set up in the LIPS IV raster.

For how to set up the printer type to "PictBridge",see
📖 "12-4 Set up the VT Series System", VT3 Series Reference Manual

Setting Item	Description	Setting Range	Default
Printer Paper Size [*1]	Sets the printer paper size.	A4	A4
Print Direction [*2]	Sets the print direction of the printer paper.	Portrait, Landscape	Vertical
Print Size	Sets the print size (print scale).	1X	1X
Margin [*3]	Sets margins. Sets the margins on the top and left edge.	Top: 5 to 999mm	5
		Left: 5 to 999mm	5
Printer Color Mode	Selects the printer color mode (color or gray scale) on an ESC/P Raster system printer.	Color, Gray scale	Color
Reverse Printer Tones	Selects whether or not to reverse gray scale when printing in gray scale on an ESC/P Raster system printer.	OFF, ON	Disable
Print Quality [*4]	-	-	-

*1 Use VT SUDIO for the setup when making the from picture.

*2 For VT3-X15(D)/S12(D)/S10, the print direction for a horizontal picture can only be the horizontal direction whereas for a vertical picture, the print direction can only be the vertical direction.

*3 Depending on printer models, the margins of the printouts are, sometimes, different from the set margins.

*4 This cannot be set up when the printer type is set to "PictBridge".

Default Disp Lang ID   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Sets the display text string ID to be displayed when the VT3 is turned ON when the display text string switching function is used.

Setting Range	Default
0 to 7	0

📖 "11-5 Set up the Character String Display", *VT3 Series Reference Manual*

Date and Time Format   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item selects the format of the date and time that are displayed on VT 3.

Setting Item		Description	Default
Format	Y/M/D	Sets the date display order to year/ month/day.	○
	M/D/Y	Sets the date display order to month/ day/year.	
	D/M/Y	Sets the date display order to day/month/year.	
	Y/D/M	Sets the date display order to year/day/month.	
Separator	/	Sets the date display delimiter to "/".(e.g. 02/04/18)	○
	.	Sets the date display delimiter to ".".(e.g. 02.04.18)	
	-	Sets the date display delimiter to "-".(e.g. 02/04/18)	
	" " (Space)	Sets the date display delimiter to " " (space).(e.g. 02 04 18)	
Display "Jan/Feb/ ...	Disable	Displays the month in the date display as a number.e.g. 18.4.02	○
	ON	Displays the month in the date display as a character.e.g. 18.Apr.02	
Display "AM/PM"	Disable	Displays the time display in the 24-hour clock.e.g. 23:59:00	○
	ON	Displays the time display in the 12-hour clock. (e.g. AM11:59:00)	

Multi Func SW   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Sets the processing order the multiple function switches.

Setting Item	Description	Default
Optimize	Processes the multiple function switches in the optimum order.	○
Setup Order	Processes the multiple function switches in the preset function order.	

✎ **Point**   **When "Optimize" is selected, pay sufficient attention to operation on the actual working unit.**

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Change Passwords

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Passwords set on VT STUDIO can be changed.

Enter your password (by person changing password)
The person changing the password must enter the password using up to eight numbers 0 to 9. If the entered password matches the preset password, the security level of the person changing the password is displayed. If the entered password does not match, "-" is displayed.

Target Level
This item selects the security level for changing the password. The security level can be set within the range 1 (high) to 5 (low).

Setting Range	Default
5 (high) to 1 (low)*1	-*2

*1 Only the same or lower security level of the person changing the password can be selected.

*2 The security level of the person changing the password that matched in password entry is displayed.

Enter new password
Enter the new password using up to eight numbers 0 to 9.

Enter again
To confirm that the new password has been correctly entered, enter the same password as the password entered at "Enter new password" again. If the password matches, "OK" will be displayed. If it does not match, "NG" will be displayed. Try again from entry at "Enter new password".

> ✎ Point
> • **Save or store the newly set password in a safe place. If you lose the password, you may not be able to switch to pages or display windows preset with a password.**
> • **The password is set up using VT STUDIO.**
>   **When a password is not set, new passwords cannot be created or changed in this "Change Passwords" screen.**
> • **If screen data is received by VT -> PC Receive data on VT STUDIO or screen data is read by VT -> Memory Card in System mode "Memory Card," the password set on VT STUDIO can be confirmed. Note, however, that when read protect is set to "ON", the screen data cannot be read, and so the preset password cannot be confirmed.**

PLC Communication Setup

This section describes the PLC communications conditions.

> ✎ **Point**
>
> **The screens are different when the VT3 is connected the PLC over Ethernet.**
> 📖 "Ethernet connection", page 5-29

Settings for the conditions of PLC communication can be changed within the setting range of the PLC selected in VT STUDIO. For details of settings that can be changed, refer to 📖 "Setting Range of Communication Conditions and Initial Values for each PLC" in VT5 Series/VT3 Series/DT Series PLC Connection Manual.

■ VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)

```
PLC Communication Conditions(1/2)          [ OK ]
 Keyence                          PLC_A      [ Cancel ]
 KV-5000/3000, KV-L20V           (PORT2)
                                             [ Next Page ]
  PLC No.          None    ——
  VT No.           None    ——
  PLC Serial I/F   RS-232C
  Baud Rate        57600   bit/s
  Data Bits        8bit
  Stop Bit         1bit
  Parity           Even
```

```
PLC Communication Conditions(2/2)          [ OK ]
 Keyence                          PLC_A      [ Cancel ]
 KV-5000/3000, KV-L20V           (PORT2)
                                             [ Next Page ]
  Control          ER Control
  CR               ——
  LF               ——
  Checksum         ——
  Special Setup    □
  Highly Setup     □
```

■ VT3-Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

```
PLC Communication Conditions (1/3)   [ OK ]
 Keyence                  PLC_A       [ Cancel ]
 KV-5000/3000, KV-L20V   (PORT2)
                                      [ Next Page ]
  PLC No.         None    —
  VT No.          None    —
  PLC Serial I/F  RS-232C
  Baud Rate       57600   bit/s
```

```
PLC Communication Conditions (2/3)   [ OK ]
 Keyence                  PLC_A       [ Cancel ]
 KV-5000/3000, KV-L20V   (PORT2)
                                      [ Next Page ]
  Data Bits       8bit
  Stop Bit        1bit
  Parity          Even
  Control         ER Control
```

```
PLC Communication Conditions (3/3)   [ OK ]
 Keyence                  PLC_A       [ Cancel ]
 KV-5000/3000, KV-L20V   (PORT2)
                                      [ Next Page ]
  CR              —
  LF              —
  Checksum        —
  Special Setup   □
  Highly Setup    □
```

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■ **VT3-W4T(A)/W4M(A)/W4G(A)**

PLC communication condition (1/4)	OK
KEYENCE KV-5000/3000, KV-L20V	Cancel
	Next Page
PLC serial I/F RS-232C	

PLC communication condition (2/4)	OK
Station No. Disable ————	Cancel
VT No. Disable ————	Next Page
Baud Rate 115200 bit/s	

PLC communication condition (3/4)	OK
Data Bits 8bit	Cancel
Stop bits 1bit Parity Even	Next Page
CR ———— LF ————	

PLC communication condition (4/4)	OK
Control mode ER control	Cancel
Checksum ————	Next Page
Special Setup Advanced settings 02.93	

PLC Communication Conditions   [All Models]

Setting Item	Setting Range
PLC No.	For setting the No. to the same number as the one that is set on the link unit at the PLC.
VT No.	Sset only when a Multi-link unit is connected and VT-Command ASCII/ Binary mode (RS-485 interface connection) are to be performed. Otherwise, this item cannot be set.
PLCSeriall/F	RS-232C/RS-422:2-wire/RS-422:4-wire/RS-485
Baud Rate	1200/2400/4800/9600/19200/38400/57600/115200bit/s
Data Bit	7bits/ 8 bits
Stop Bit	1 bit/2 bits
Parity	None/Odd/Even
Flow Control	ER Control/XON/XOFF Cntl.
CR	ON, OFF
LF	ON, OFF
CheckSum	ON, OFF
Special Setup	This item must sometimes be set up depending on the type ofPLC. Normally, set this value to "0".

*   Can be selected only if PLC model is set to "KV-7000 Series (KV-LM2*V)", "KV-5500/5000/3000 (KV-LM2*V)", or "KV-1000/700 (KV-LM20 */21V)". (Excludes VT3-W4T (A)/W4M (A)/W4G (A).)

Highly Setup   [All Models]

Setting Item	Description	Default
Timeout Communication	Sets the time-out. Set a long time-out when the communications load on the network is large.	Default
Send Wait	Sets the send wait time. Set a long time-out when the communications load on the network is large.	0msec
Retry	Sets the number of retries. Increase the number of retries when the unit is used in an environment with a lot of noise.	Default
Num of Monitoring Dev	Please do not change the "default" value.	Default

Ethernet connection　X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Set the communications conditions when connecting with a PLC over Ethernet.

```
Communication Setup (1/3)                    OK
   Keyence
   KV-1000/700 (Ethernet)            PLC_A   Cancel
           Used
No. 0        Setup    No. 4   Setup           Next Page
No. 1        Setup    No. 5   Setup
No. 2        Setup    No. 6   Setup
No. 3        Setup    No. 7   Setup
```

```
Communication Setup (2/3)                    OK
   Keyence
   KV-1000/700 (Ethernet)            PLC_A   Cancel
No. 8        Setup    No. 12  Setup           Next Page
No. 9        Setup    No. 13  Setup
No. 10       Setup    No. 14  Setup
No. 11       Setup    No. 15  Setup
```

```
Communication Setup (3/3)                    OK
   Keyence
   KV-1000/700 (Ethernet)            PLC_A   Cancel
Timeout          5    Second                  Next Page
Send Wait        0    msec.
Retry            3    Times
Port No.         8502
Special Setup
```

Setting Item	Description	Default
No. 0 to 15	Sets the details of the PLC to be connected.	○
Timeout	Sets the time-out. Set a long time-out when the communications load on the network is large.	5 seconds
Send Wait	Sets the send wait time. Set a long time-out when the communications load on the network is large.	0msec
Retry	Sets the number of retries. Increase the number of retries when the unit is used in an environment . Please increase the retry times.	3 times
Port no.	Sets the port No. to be used for communications with the PLC.	8502
Special Setup [1]	Normally, this does not need to be set. However, it sometimes must be set depending on the PLC.	-

*1　For details, check 📖 the Precautions listed for PLC models to connect in VT5 Series/VT3 Series/DT Series PLC Connection Manual.

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■ **About setting of station Nos. 0 to 15**

Sets the details of the PLC to be connected.

This setting is required for the number of PLCs to be connected. The setup method for each station No. is the same.

```
PLC Communication Conditions                    [ OK ]

  Keyence                                        [ Cancel ]
  KV-1000/700 (Ethernet)

  PLC 0              [ Used ]                    [ Next Page ]

  IP Address         [ 192 ] . [ 168 ] . [ 0 ] . [ 10 ]

  Port No.           [ 8502 ]
```

Setting Item	Description	Default
PLC No. 0 to 15	Set "Use/Not use" for this station No. When "Not use" is set, the "IP Address" and "Port No." settings that are set for this station No. are invalid.	Not used
IP Address	Sets the IP addressed assigned to the PLC to be connected.	192.168.0.10
Port no.	Sets the port No. to be used for communications with the PLC to be connected.	8502

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5-5 Communicate With PLC

This section describes communications with a PLC.

Communicate with PLC   All Models

This item is for setting whether or not to disconnect communications with the PLC to perform operations on the VT3 as a standalone unit.

Setting Item		Setting Range
Enable	Communications is performed with the PLC. Set to "Enable" when the VT3is controlled by the PLC.	○
Disable	Communications is not performed with the PLC. Set to "Disable" when the display is to be confirmed on the VT3 as a standalone device.	

✎ **Point** | **If a communications error or other cause prevents communications with a PLC when "Comm with PLC" is set to Enable, on-screen numerical values, nameplates for lamp switches, etc. are not displayed as they are determined by device values on the PLC. Confirm display by communicating with the PLC or VT3 Simulator.**

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This section describes the initialization of the loged data.

Memory Clear

All Models

All the trend graph data, alarm log data and internal free devices currently stored to the VT3's internal memory are cleared.

```
┌─────────────────────────────────────────────────────┐
│  Memory clear                              ┌────────┐ │
│                                            │ Return │ │
│                                            └────────┘ │
│                                                       │
│        Trend Graph              ┌──────┐              │
│                                 │      │              │
│                                 └──────┘              │
│        Alarm Log                ┌──────┐              │
│                                 │      │              │
│                                 └──────┘              │
│        Internal Free Device     ┌──────┐              │
│                                 │      │              │
│                                 └──────┘              │
│        Operation Log            ┌──────┐              │
│                                 │      │              │
│                                 └──────┘              │
│                                                       │
│                                                       │
│                                                       │
└─────────────────────────────────────────────────────┘
```

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This section describes how to transmit the screen data.

Data Transmission   All Models

The Data Transmission mode is set when the screens prepared on VT STUDIO are transmitted to the VT3 .

```
                                                              End of action



        Waiting for transmission
```
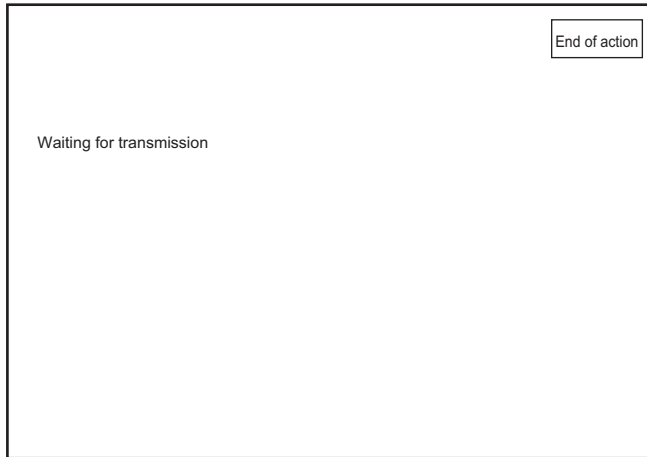
Even when this mode is not set, this screen is automatically displayed when screen data is transmitted from VT STUDIO in the Run mode. When transmitting screen data, move to this mode from the System mode and then transmit the data if the screen data transmit screen is not moved to due to a communications error with the PLC.

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This section describes the information about the viewer.

Page Viewer X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Screens send from VT STUDIO can be viewed on VT3.

[Example] 4-area split screen (1/4)

Page No.
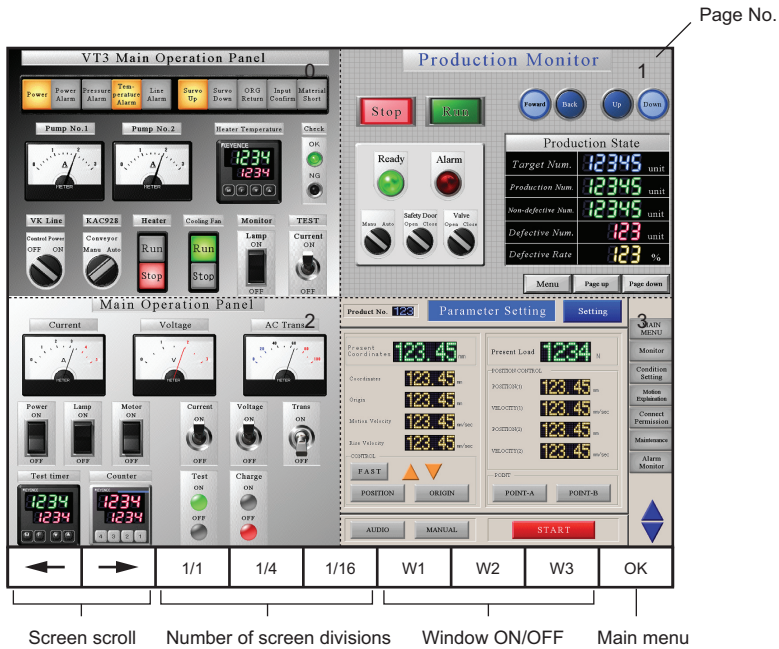
Screen scroll   Number of screen divisions   Window ON/OFF   Main menu

Switch Name	Description
Screen scroll buttons	Scrolls the screen. When the screen is displayed divided, the screen is scrolled in blocks.
Number of screen divisions	Selects the number of pages to be viewed in the Page Viewer. Select one of three patterns: 1, 4 or 16 divisions.
Window ON/OFF	Switches between hide/display for windows 1 to 3.
Main menu	Returns to the main menu.

✎ Point   **The parts that are used to switch display character strings are displayed in the ID character string set up from "Default Display Character String ID".**

Operation log Viewer   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Display the operation logs of VT3.

Operation Log Viewer

Page: None

Window: None

Operation Log No. ── 0001 / 0129

No Screen ── Preview

Operation Log ──

Date	Time	Item	Description
2006/08/22	13:01:20	Operation record start	
2006/08/22	13:01:22	Run mode transfer	
2006/08/22	13:01:22	Current Page	Page No. [0]
2006/08/22	13:03:43	Page Change Request	Success Page No. [6]
2006/08/22	13:03:58	Current Page	Page No. [6]
2006/08/22	13:04:17	Page Change Request	Success Page No. [3]
2006/08/22	13:04:31	Current Page	Page No. [3]
2006/08/22	13:35:47	Bit Write Issue	Write Value [ON]
2006/08/22	13:35:47	Bit Write Issue	Write Value [OFF]
2006/08/22	13:36:06	Page Change Request	Success Page No. [0]

Top
Prev
Next
End
Back

Item		Description
Operation Log No.		Enter the operation log No.
Preview		Display the preview page corresponding to the operation log No. When a part is being manipulated, its frame flickers.
Operation		List the operation logs.
Log	**Date** *	Display the operation date.
	Time	Display the operation time.
	Item	Display the operation items.
	Details *	Displays the currently selected cell.
Top		Display the oldest operation logs.
Prev		Display the previous log.
Next		Display the next log.
End		Display the newest operation logs.
Back		End the operation log viewer.

* Not displayed on VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A.

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5-9 **Self Check**

This section describes the items under the Self Check menu item.
The self checks are executed to self-diagnose any problems on the VT3 hardware.

■ **VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)**

```
Self-Check (1/2)                          OK

                                       Next Page
   LCD Graphic Check          □

   Chinese characters ROM Standard  □  Checksum  —

┌ Point Correction ┐         □
└ ─ ─ ─ ─ ─ ─ ─ ─ ┘
   Screen Data Check          □  —

       VT STUDIO:   —

       File :       —

       Date :       —

   SRAM Data Check            □  —
```

```
Self-Check (2/2)                          OK

    Switch Check              □        Next Page
┌ ─ ─ ─ ─ ─ ─ ─ ─ ┐
┊ Point Correction ┊         □
└ ─ ─ ─ ─ ─ ─ ─ ─ ┘
  │ Hard Switch    │         □

    Warning Buzzer           □

    Battery                  □  —

    Printer I/F (ESC/P Raster)  □  —

    Video                    □  NTSC □ RGB

    Memory Card              □  —

       Empty Capacity :   —
       Auto Load File :   —
```

■ (light gray) are only the setting items for VT3-X15(D)/S12(D)/S10/V10(D)/V8.

■ (gray) are only the setting items for VT3-V7R.

■ (dark gray) are only the setting items for VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V6H(G).

⌐ (dashed) are only the setting items for VT3-X15(D)/V6H(G).

⌐ (dash-dot) are only the setting items for VT3-V6H(G).

■ **VT3-Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**

```
Self-Check (1/2)                 OK

                              Next Page
  LCD Graph Check          □

  Chinese characters ROM Standard  □  Checksum —

  Screen Data              □  —
      VT STUDIO:    —
      File :        —
      Date :        —
  Built-in memory          □  —
```

```
Self-Check (2/2)                 OK
┌ Calibration ┐          □     Next Page
└ ─ ─ ─ ─ ─ ─ ┘
│ Hardware switch │      □
  Switch Check          □  —
  Battery               □  —
  Printer I/F (ESC/P)   □  —
  Memory Card           □  —
      Empty Capacity :  —
      Auto Load File :  —
```

■ (gray) are only the setting items for VT3-Q5T(W)/Q5S(W)/Q5T(W)A/Q5H(G).

⌐ (dashed) are only the setting items for VT3-V6H(G)/Q5H(G).

■ **VT3-W4T(A)/W4M(A)/W4G(A)**

```
Self Check (1/3)                 OK

  LCD Graphic Check        □     Next
                                 Page
  Calibration              □

  Chinese characters ROM Standard │ Checksum │  —
```

```
Self Check (2/3)                 OK

  Picture data        □  —       Next
                                 Page
     VT STUDIO    :   —
     File Name    :   —
     Transfer time :  —
```

```
Self Check (3/3)                 OK

  SRAM Data Check     □  —       Next
                                 Page
  Switch Check        □

  Battery             □  —
```

LCD Graphic Check

All Models

This item checks whether or not graphic display is performed normally. Visually check for any abnormalities such as non-displayed dots on the LCD.

Kanji Font Check

X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item is for displaying the content of the VT3 Kanji font ROM on screen.

Execute this check when Kanji fonts are not displayed normally.

If Kanji characters are not displayed correctly in this screen, contact your agent.
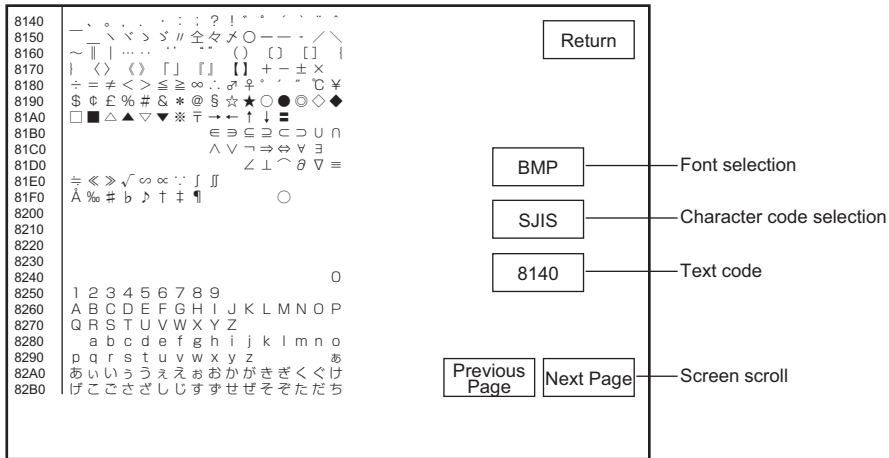
Switch Name	Description
Font selection	Selects between bitmap fonts (BMP) and stroke fonts (STK).
Character code selection	Selects between SJIS codes and Unicode. (Only SJIS codes)
Text Codes	Enters the leading code to be displayed.
Screen scroll buttons	Scroll the screen.

Checksum

All Models

To check if there is wrong Kanji in screen data of VT3.

The result will be displayed at the right of the switch upon completion of check.

OK : No screen data error is found.

NG : Screen data error is found.

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Screen Data check `X15` `S12` `S10` `V10` `V8` `V7` `V6H` `Q5H` `Q5T` `Q5S` `Q5M` `W4` `V7R`

This item is for checking whether or not the screen data stored in the VT3 Flash ROM contains any errors.

Results are displayed on the right side of the switch when the checking is over.

OK : No screen data errors were found.

NG : Screen data errors were found.

The following is displayed when OK.

* VT STUDIO

The version of VT STUDIO used to create screen data.

* File Name

The file name of the screen data

* Transmission Date and Time

The date and time when the screen data is transmitted (written).

If the result of the check is NG (No Good), re-transmit the saved screen data or new screen data from the VT STUDIO or memory card. If an NG result persists, contact your agent.

SRAM Data Check `All Models`

Check to ensure that the internal memory where log data (trend chart data, alarm log, PLC data folders, operation logs, and internal free devices) is stored works properly.

When this check ends, a message is displayed on screen.

OK   : SRAM data is normal.

NG   : SRAM data is abnormal.

If the result of the check is NG (No Good), initialize the log data. Please execute the log data initialization.

📖 "5-6 Memory Clear"

If "NG" is repeatedly displayed, contact your agent.

Switch Check `All Models`

This item is for checking whether or not entry on the touch panel is correct. Execute this check when touch panel operation is abnormal. If there is a switch area that does not react(If VT3-V6H(G)/Q5H(G)/W4 series is used, there is no reaction when pressing ■ in the middle of the screen), contact your agent..

Pressing the key ED at the bottom right of the screen redisplays the Self Check screen.

Point Correction `X15` `S12` `S10` `V10` `V8` `V7` `V6H` `Q5H` `Q5T` `Q5S` `Q5M` `W4` `V7R`

Correct the offsets of the configuration position and input position of the switches.

Please press the points following onscreen instructions.

Hard Switch `X15` `S12` `S10` `V10` `V8` `V7` `V6H` `Q5H` `Q5T` `Q5S` `Q5M` `W4` `V7R`

Check whether operation switch/functional switch (VT3-V6H(G)/Q5H(G)), cross key/clip switch (VT3-V7R) work normally.

✎ Point | **VT body will check whether to identify each hardware switch, not check whether external output is performed normally.**

Alarm Buzzer X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Check to ensure the alarming buzzer works properly.

Battery All Models

This item is for checking whether or not the voltage of the battery used for backing up the date and time, and SRAM data is normal.

If "NG" is displayed, contact your agent.

OK : Battery is in proper condition.

NG : Battery is in improper condition.

Printer I/F X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item is for checking whether or not data is being printed correctly on the currently connected printer.Before you execute this check, make sure that the printer is already connected to the VT3 by a printer cable, and set the operation mode matched to the printer.

📖 "5-3 VT System Setup"

Message	Description
OK	Printing was performed normally.
Printer Connection Error	The following are probable causes of this error: • The printer is not connected. • The printer is OFF. • Either the wrong printer cable is connected, or cable is broken.

■ Test print results

Hard Copy
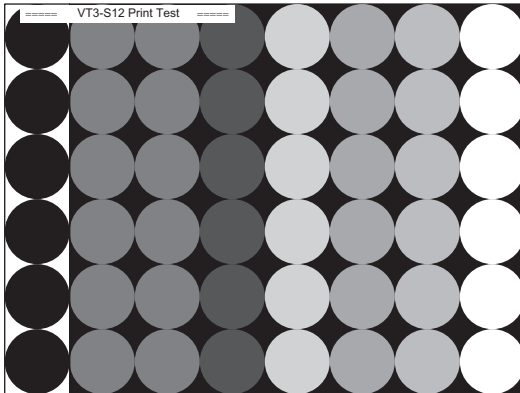
Print Test

===== VT** テストプリント =====
0123456789!#$%&'()*+,-./:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ
　０１２３４５あいうえお

> ✎ Point
> • **If the VT3 is connected to a PC for use before you connect to the VT3, turn the printer OFF then ON again before you connect to the VT3.**
> • **Text printing is dependent on the VT system setup.**
> • **Do not remove or insert the printer cable after the power is turned ON. Doing so might prevent normal printing.**

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<table>
<tr><td></td></tr>
</table>

Video	X15	S12	S10	V10	V8	V7	V6H	Q5H	Q5T	Q5S	Q5M	W4	V7R

This item is for testing and displaying images from the external camera (CCD camera, VTR, etc.) or PC (RGB).

> **Point**
> • **On a laptop PC, RGB external output is sometimes not performed if switching of the display is not set.**
> **For details, refer to the items dealing with connection to a display (CRT) in the manual supplied with your laptop.**
> • **Do not insert or remove the RGB cable after the power is turned ON. The display may be disrupted.**

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■ **NTSC**

Setting Item	Description	Default
Video input mode	Specifies the video input mode. Interlace : Input image signals from external CCD cameras or VTRs, our image sensor CV series (except CV- 300/100). CV-300/100 : Inputs video signals output from a Keyence image sensor CV-300/100.	Interlace
1ch/4ch display selection	Sets either of 1ch (full screen) display or 4ch (4-division) display.	1ch
Specified channel	When 1ch display is selected, specifies the channel to be displayed from 1ch to 4ch.	1
Display size	Specifies the size to be displayed. The display ranges are as follows: VGA : 640x480, 480x360, 320x240, 160x120	640 to 480
Color/Gray selection	Specifies either of color or grayscale as the display color.	Color
Active/Freeze selection	Switches between active and freeze images.	Video image
Menu off	Temporarily turns menu display OFF, and makes image adjustment easier. After menu display is turned OFF, the menu can be displayed again by touching any part of the screen.	-

■ **RGB**

( ) SVGA

Setting Item	Description	Default
Video input signal	Specifies the signal (resolution) to input: VGA : 640x480 SVGA : 800x600 XGA : 1024x768	VGA
Display size	Specifies the size to be displayed. The display ranges are as follows: VGA : 640x480, 480x360, 320x240, 160x120 SVGA : 800x600[*1], 600x450, 400x300, 200x150 XGA : 1024x768[*2], 768x576[*1], 512x384, 256x192	640x480
Active/Freeze selection	Switches between active and freeze images.	Video image
Menu off	Temporarily turns menu display OFF, and makes image adjustment easier. After menu display is turned OFF, the menu can be displayed again by touching any part of the screen.	-

*1   Only for VT3-S12(D)/S10.

*2   Only for XT3-X15(D).

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What is the "Monitoring?"

Use the monitor to supervise bit device, word device current status of the connection target PLC.
status of CPU, unit, sensor may also be monitored even when not connected with any computer.

```
Monitoring                                    [ Return ]
    Keyence                           [ PLC_A ]
    KV-5000/3000, KV-L20V
    [    Bit Device    ]        [  Sensor Setup Backup  ]

    [   Word Device   ]         [  Sensor Setup Backup  ]

    [  Unit Monitoring ]        [     Sensor monitor     ]

    [  Ladder monitor  ]
```

> ✎ **Point**
> • **This item is enabled when "Comm with PLC" is "Enabled" in the Monitoring. This item must be executed with communications with the PLC in an enabled status.**
> 📖 **"5-5 Communicate With PLC"**
> • **Unit monitor function can only be used if the connected PLC is KV-7000 Series, KV-5000/3000 Series, or KV-1000/700.**
> • **The Unit Monitor/Ladder Monitor function cannot be used by VT3-V6H(G)/Q5H(G)/Q5T(W)/ Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A).**
> • **Ladder monitor function can be used only when ladder monitor data is saved in an internal memory (ROM) or a memory card.**

About Forced Writing

The Device Monitor function allows you to not only monitor devices on the PLC but also forcibly turn relays ON and OFF and change the numerical values of data memory.
Note, however, that when values are written to devices at all times from the ladder program with the PLC in a run status, priority is given to the ladder program. For this reason, values cannot be written from the Device Monitor. To write values from the Device Monitor, first set the PLC to a STOP status.

Switch PLC Modes

When the MultiTalk function is used, you can switch to the PLC to be monitored.
Display the bit device/word device/Unit Monitor. The information about the specified PLC is displayed here.

```
Monitoring                                    [ Return ]
    Keyence                           [ PLC_A ]———— Information about the
    KV-5000/3000, KV-L20V                              currently displayed
    [  Bit Device Monitor  ]    [  Sensor setup backup  ]  PLC can be monitored.

    [  Word Device Monitor ]    [  Restore sensor setup ]

    [    Unit Monitor     ]     [   Sensor monitoring   ]

    [   Ladder monitor    ]
```
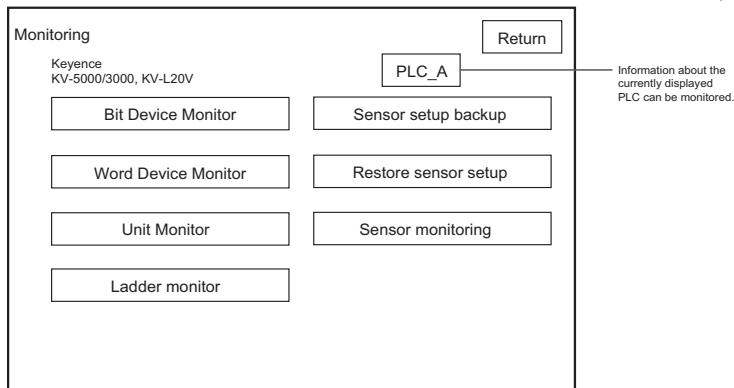
> ✎ **Point**
> • **Failed to use MultiTalk function for VT3-W4T(A)/W4M(A)/W4G(A).**
> • **Ladder monitor function can't be used for PLC_B.**

About the CONT Switch

CONT No. When the CONT switch is touched, the device Nos. on other lines are continuously assigned.

✎ Point **With the continuous number function, device Nos. are assigned in number order. Numbers are not assigned in the order of devices currently in use by the ladder program on the PLC.**

■ In Display mode (inactive mode)

If none of the device Nos. on a line is not in the Active mode (blinking) and the, CONT No. switch is touched, the device No. at the topmost row is assigned continuously from the top down to the bottommost row.

Bit Devices

B-Dev. Monitor   CONT TEN END

Device Name		0	1	2	3	4	5	6	7
M	1000								
X	008								
X	010								
X	018								
Y	020								
Y	028								
Y	030								
Y	038								

→

B-Dev. Monitor   CONT TEN END

Device Name		0	1	2	3	4	5	6	7
M	1000								
M	1008								
M	1016								
M	1024								
M	1032								
M	1040								
M	1048								
M	1056								

Word Device

W-Dev. Monitor   CONT TEN END

Device Name		Device Value					
D	0000	7081	1+	W	0013	23765	1+
W	0001	12EA	1H	W	0014	4A6	1H
W	0002	-470896	2+/-	W	0015	-2147483648	2+/-
W	0004	6543224	2+	W	0100	777219	2+
W	0006	999	2H	W	0102	A4CC13	2H
W	0008	1001800742	2+	W	0103	-6	1+/-
W	0010	509E28B	2H	W	0104	84DE	1H
W	0012	FFFFFFEF	2H	W	0105	34	1+

→

W-Dev. Monitor   CONT TEN END

Device Name		Device Value					
D	0000	7081	1+	D	0008	3800	1+
D	0001	5263	1+	D	0009	19000	1+
D	0002	4882	1+	D	0010	19000	1+
D	0003	15	1+	D	0011	19000	1+
D	0004	30315	1+	D	0012	10	1+
D	0005	226	1+	D	0013	12	1+
D	0006	1800	1+	D	0014	13	1+
D	0007	5200	1+	D	0015	20	1+

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

5

SYSTEM MODE

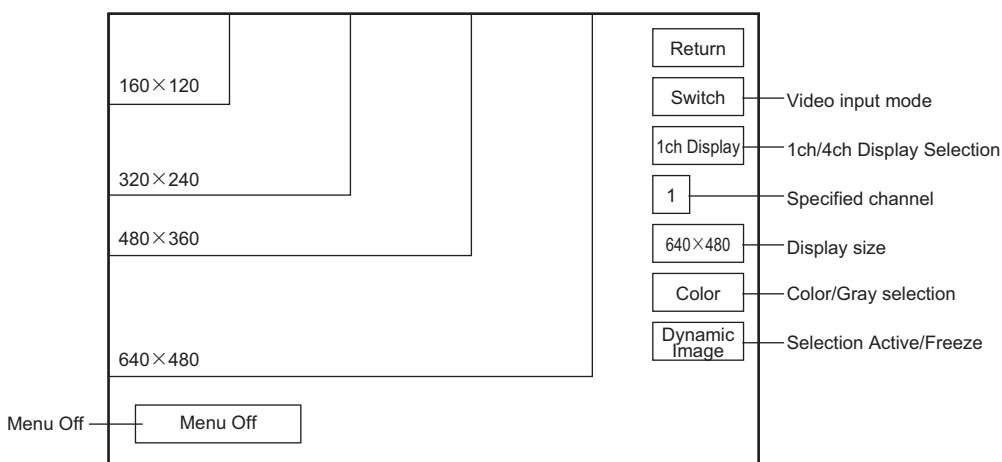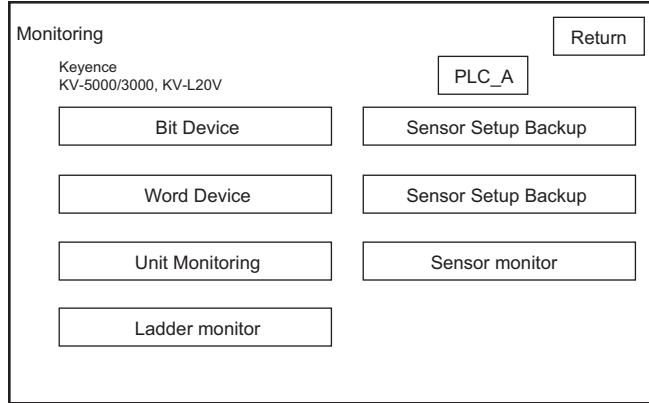## ■ In the Active mode

If one of the device Nos. is touched, the mode changes to the Active mode (blinking). If you touch the CONT No. switch in this case, that device No. is assigned continuously from the top down to the bottommost row.

Bit Devices

B-Dev. Monitor | CONT | TEN | END

Device Name		0	1	2	3	4	5	6	7
M	1000								
X	008								
X	010								
X	018								
M	0000								
Y	028								
Y	030								
Y	038								

B-Dev. Monitor | CONT | TEN | END

Device Name		0	1	2	3	4	5	6	7
M	1000								
X	008								
X	010								
X	018								
M	0000								
M	0008								
M	0016								
M	0024								

Word Device

W-Dev. Monitor | CONT | TEN | END

Device Name		Device Value					Device Value		
D	0000	7081	1 +/-	W	0013	23765	1 +
W	0001	12EA	1 H	W	0014	4A6	1 H
W	0002	-470896	2 +/-	W	0015	-2147483648	2 +/-
W	0004	6543224	2 +	W	0100	777219	2 +
D	0100	452	1 +	W	0102	A4CC13	2 H
W	0008	1001800742	2 +	W	0103	-6	1 +/-
W	0010	509E28B	2 H	W	0104	84DE	1 H
W	0012	FFFFFFEF	2 H	W	0105	34	1 +

W-Dev. Monitor | CONT | TEN | END

Device Name		Device Value						
D	0000	7081	1 +/-	D	0104	13	1 +
W	0001	12EA	1 H	D	0105	5700	1 +
W	0002	-470896	2 +/-	D	0106	48000	1 +
W	0004	6543224	2 +	D	0107	13500	1 +
D	0100	452	1 +	D	0108	800	1 +
D	0101	1255	1 +	D	0109	2900	1 +
D	0102	568	1 +	D	0110	1200	1 +
D	0103	412	1 +	D	0111	20	1 +

B-Dev. Monitor

All Models

■ VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)
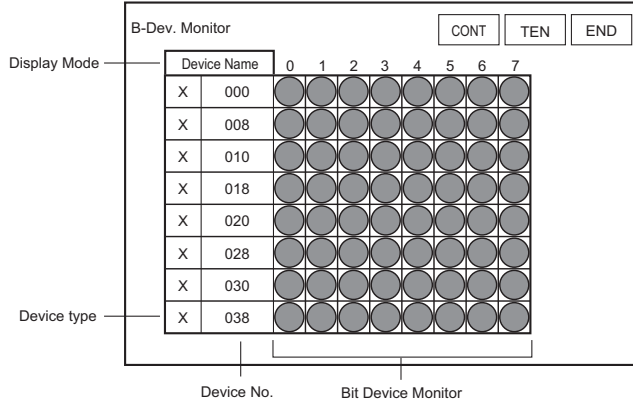
■ VT3-Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A
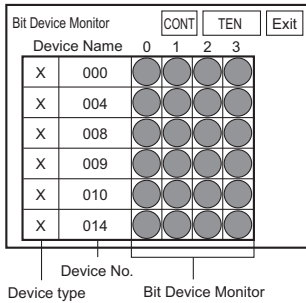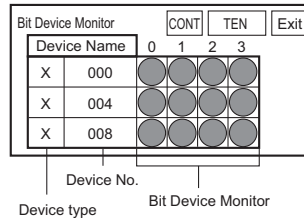
■ VT3-W4T(A)/W4M(A)/W4G(A)

Switch Name	Description
Display mode	Switch the display mode to the targeted devices (device No.) or device comments.[1]
Device type	Selects the bit device type.
Device No.	Enter the bit device start number.
B-Dev. Monitor	Displays eight bits of current monitor [2] values from the start number at "Device No.".

[1] Valid only when the following targeted PLCs are selected.
- KV-7000 Series(serial)
- KV-7000 Series(KV-LM2*V)
- KV-7000 Series(Ethernet)
- KV-5500/5000/3000/L2*V
- KV-5500/5000/3000 (KV-LM2*V)
- KV-5500/5000/3000 (Ethernet)
- KV-1000/700,KV-L20*/L21V
- KV-1000/700 (KV-LM20*/21V)
- KV-1000/700 (Ethernet)
- KV-7000 Series(serial)<XYM>
- KV-7000 Series(KV-LM2*V)<XYM>
- KV-7000 Series(Ethernet)<XYM>
- KV-5500/5000/3000/L2*V<XYM>
- KV-5500/5000/3000 (KV-LM2*V)<XYM>
- KV-5500/5000/3000 (Ethernet)<XYM>
- KV-1000,KV-L20*/L21V<XYM>
- KV-1000 (KV-LM20*/21V)<XYM>
- KV-1000 (Ethernet)<XYM>

[2] A 4-digit currently monitored value can be displayed by VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A).

Point
- **Device comments can be displayed with half-width 16 characters at the most.**
- **When VT3 is used as the sub-unit of the VT2 multi-link, device comments cannot be displayed.**

Reference
- When the device comment is displayed, you can change the device by touching it.
- For a device that is not written into the device comment, the device No. is not displayed even if the device comment is displayed.

5 SYSTEM MODE

System Mode / Option Setup / VT System Setup / PLC Communication Setup / Communicate With PLC / Memory Clear / Data Transmission / Viewer / Self Check / Monitoring / Memory Card / PLC Data Folder / Run Mode

[Example] The following describes an example where internal relays M1000 to M1003 on the MITSUBISHI MELSEC A Series are monitored.

1 **Repeatedly touch the Device type switch until internal relay "M" is displayed.**
Touching the left side of the switch changes the relay forwards, and touching the right side of the switch changes the relay backwards. When the target device is displayed, touch the switch ENT **and fix the selection.**

M Internal Relay	ENT

Clockwise   Counterclockwise
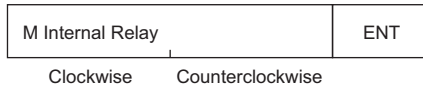
2 **Touch the Device No. switch to enter the Active mode, and display the numeric keypad.**
Enter the leading No. of the bit device to be monitored using the numeric keypad.
In this example, enter "1000".
📖 "About Numeric Keypad Operations", page 5-7

3 **The current value of the leading eight or four bits of relay M1000 can be monitored in the bit device monitor.**
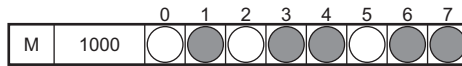
Indicates that M1000, M1002, and M1005 are ON.

The same procedure can be used to register and monitor devices in other lines.You can also forcibly switch the status of each bit ON and OFF by touching the switch for each bit.
📖 "About Forced Writing", page 5-42

■ **About the station No. setup for the Ethernet connection (except VT3-V7R/ Q5M(W)/Q5M(W)A/W4T(A)/W4M(A)/W4G(A))**
Set the PLC No. of the target PLC when VT3 is connected over Ethernet.

PLC No. Setup

Display the PLC No.

-01+

-01+

The PLC No. is reduced by 1 each time the left side on the central line of the switch is pressed.

The PLC No. is increased by 1 each time the right side on the central line of the switch is pressed.

An unused station No.cannot be displayed.

W-Dev. Monitor

All Models

■ VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)

Display Mode —

Device type —

Device No. —

W-Dev. Monitor			CONT	TEN	END

Device Name		Device Value	
D	0000	708	1 +
D	0001	12EA	1 H
D	0002	-470896	2 +/-
D	0004	6543224	2 +
D	0006	999	2 H
D	0008	1001800742	2 +
D	0010	509E28B	2 H
D	0012	FFFFFFEF	2 H

D	0014	23765	1 +
D	0015	4A6	1 H
D	0016	-2147483648	2 +/-
D	0100	777219	2 +
D	0102	A4CC13	2 H
D	0104	-6	1 +/-
D	0105	84DE	1 H
D	0106	34	1 +

Word Device Monitor   Display

■ VT3-Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

Word Device Monitor			CONT	TEN	Exit

Device Name		Device Value	
D	0000	708	1 +
D	0001	12EA	1 H
D	0002	-470896	2 +/-
D	0004	6543224	2 +
D	0006	999	2 H
D	0008	1001800742	2 +

Device type   Device No.   Word Device Monitor   Display format

■ VT3-W4T(A)/W4M(A)/W4G(A)

Word Device Monitor			CONT	TEN	Exit

Device Name		Device Value	
DM	0000	708	1 +
DM	0001	12EA	1 H
DM	0002	-470896	2 +/-

Device type   Device No.   Word Device Monitor   Display format

Switch Name	Description
Display mode	Switch the display mode to the targeted devices (device No.) or device comments.[1]
Device type	Select the word device type.
Device No.	Enter the word device number.
W-Dev. Monitor	Display the current monitor value of the word device.
Display format	Switch the display format of the monitor value. 1+ : 1-word unsigned decimal 1+/- : 1-word signed decimal 1H : 1-word Hex 2+ : 2-word unsigned decimal 2+/- : 2-word signed decimal 2H : 2-word Hex

*1   Valid only when the following targeted PLCs are selected.

- KV-7000 Series (serial)
- KV-7000 Series (KV-LM2*V)
- KV-7000 Series (Ethernet)
- KV-5500/5000/3000/L2*V
- KV-5500/5000/3000 (KV-LM2*V)
- KV-5500/5000/3000 (Ethernet)
- KV-1000/700, KV-L20*/L21V
- KV-1000/700 (KV-LM20*/21V)
- KV-1000/700 (Ethernet)

- KV-7000 Series (serial)<XYM>
- KV-7000 Series (KV-LM2*V)<XYM>
- KV-7000 Series (Ethernet)<XYM>
- KV-5500/5000/3000/L2*V<XYM>
- KV-5500/5000/3000 (KV-LM2*V)<XYM>
- KV-5500/5000/3000 (Ethernet)<XYM>
- KV-1000, KV-L20*/L21V<XYM>
- KV-1000 (KV-LM20*/21V)<XYM>
- KV-1000 (Ethernet)<XYM>

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

[Example] The following describes an example where link register W100 on the MITSUBISHI MELSEC A Series
are monitored.

1 **Repeatedly touch the Device type switch until link register "W" is displayed.**
Touching the left side of the switch changes the relay forwards, and touching the right side of the switch
changes the relay backwards. When the target device is displayed, touch the switch ENT **and fix the**
selection.

W Link Register	ENT

        Clockwise   Counterclockwise
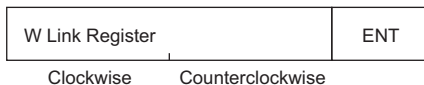
2 **Touch the Device No. switch to enter the Active mode, and display the numeric keypad.**
Enter the leading No. of the bit device to be monitored using the numeric keypad.
In this example, enter "100".
"About Numeric Keypad Operations", page 5-7

3 **The current value of W100 can be monitored in the word device monitor. The default display is a 1-word**
unsigned decimal value.

W	100	45000	1 +
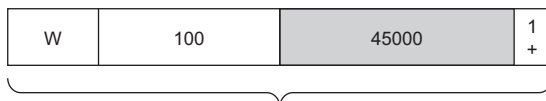
Indicates that the numeric value stored
in W100 (1 word) is the decimal "45000".

The same procedure can be used to register and monitor devices in other lines. You can also touch the word
device monitor field, and change device values using the numeric keypad in the same way as in step 2.

◼ **About display format**

Each touch of this switch switches how target devices are handled as follows. (The default display is a 1-word unsigned decimal value.)
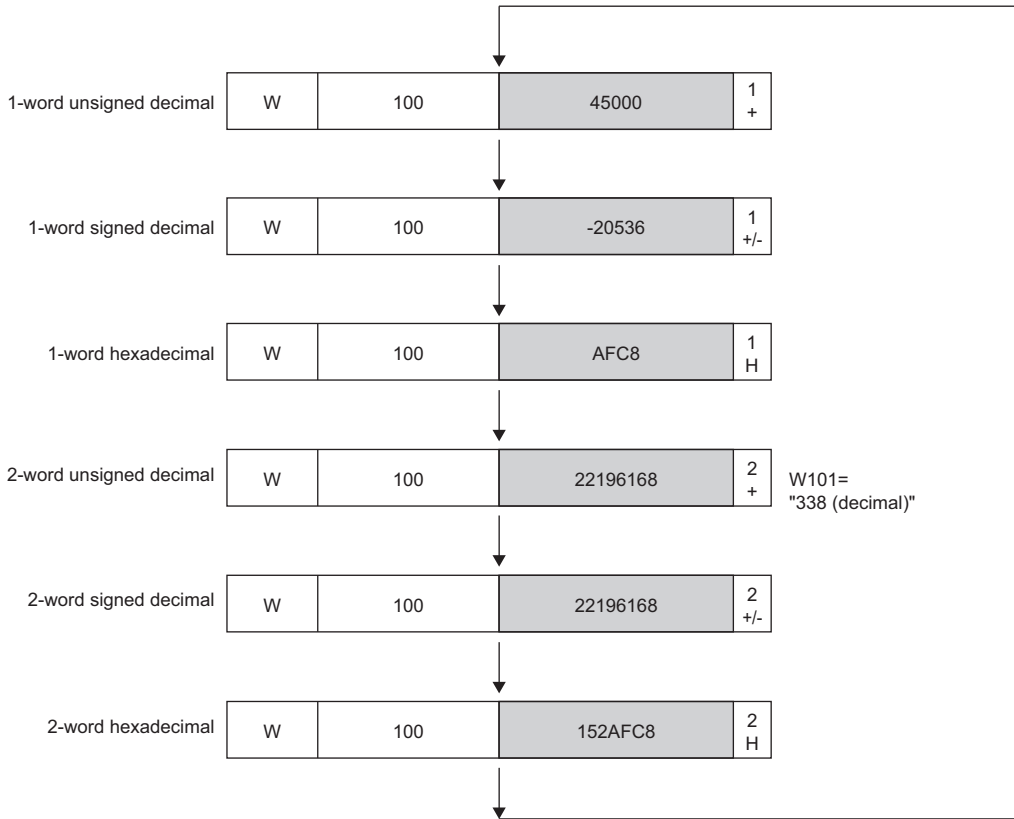
1-word unsigned decimal	W	100	45000	1 +
1-word signed decimal	W	100	-20536	1 +/-
1-word hexadecimal	W	100	AFC8	1 H
2-word unsigned decimal	W	100	22196168	2 +
2-word signed decimal	W	100	22196168	2 +/-
2-word hexadecimal	W	100	152AFC8	2 H

W101= "338 (decimal)"

◼ **About the station No. setup for the Ethernet connection (except VT3-V7R/ Q5M(W)/Q5M(W)A/W4T(A)/W4M(A)/W4G(A))**

Set the PLC No. of the target PLC when VT3 is connected over Ethernet.

W-Dev. Monitor   -01+ CONT TEN END

Device Name		Device Value					
D	0000	708	1 +	D	0014	23765	1 +
D	0001	12EA	1 H	D	0015	4A6	1 H
D	0002	-470896	2 +/-	D	0016	-2147483648	2 +/-
D	0004	6543224	2 +	D	0100	777219	2 +
D	0006	999	2 H	D	0102	A4CC13	2 H
D	0008	1001800742	2 +	D	0104	-6	1 +/-
D	0010	509E28B	2 H	D	0105	84DE	1 H
D	0012	FFFFFFEF	2 H	D	0106	34	1 +

PLC No. Switch

Display the PLC No.

-01+

-01+

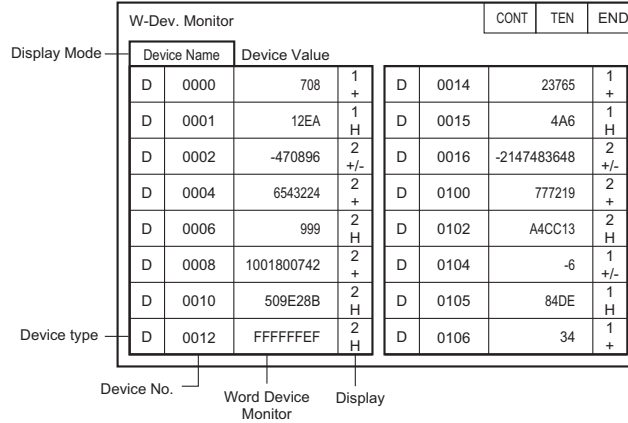The PLC No. is reduced by 1 each time the left side on the central line of the switch is pressed.

The PLC No. is increased by 1 each time the right side on the central line of the switch is pressed.

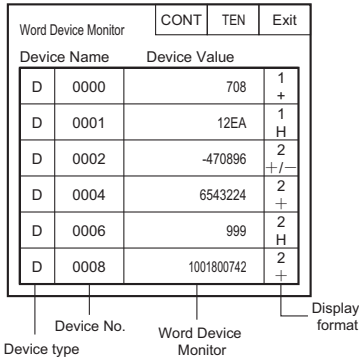An unused station No. cannot be displayed.

5 SYSTEM MODE

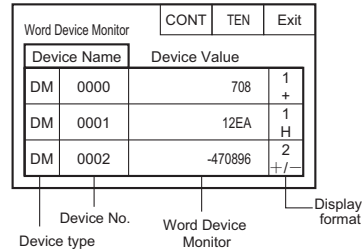System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

Unit Monitoring   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Unit Monitoring

A:Unit Monitor Unit Structure   End

Unit Monitoring

CPU menu ——— KV-1000

Project name
VT3ProjectNAME001A ——————————————— Displays the project name of the PLC.

1	2	3	4	5	6	7	8
KV-LE20A	KV-C32X*	KV-C32T*	MV-L40	KV-AD40G	KV-DA40	KV-H20G	KV-SC20

Display unit switching

9	10
KV-C32T*	KV-L20R

Page switching ——— [Prev] [Next]   -1-
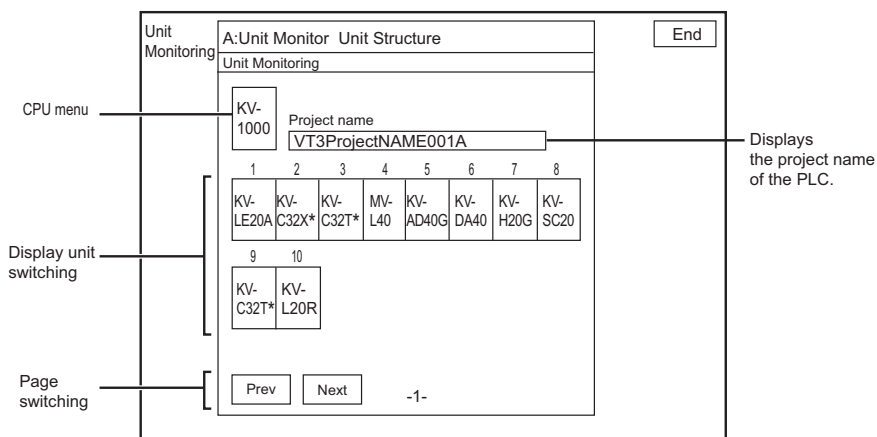
Switch Name	Description
CPU menu	Move to the CPU special function selection screen.
Display unit switching	Select the extended and special units to be displayed.
Page switching	When the number of units is over 16 or KV-EB1 is used to configure individual units, multiple pages are displayed.
END	Move to the initial device monitoring picture.

✎ **Point**
- **Unit monitors called by use of a special operation from the active screen display PLC_A unit information.**
- **Multiple unit monitor screens cannot be opened at the same time.**

■ CPU Monitor

The special PLC (CPU) functions are monitored.

Display the CPU name

Unit Monitor   KV-1000 ———————————————— End

Unit Switching ——— Change Unit

CPU MENU

Display the special functions ———

Internal I/O	Interrupt
Positioning	High-freq Counter
Set Freq	Freq Counter
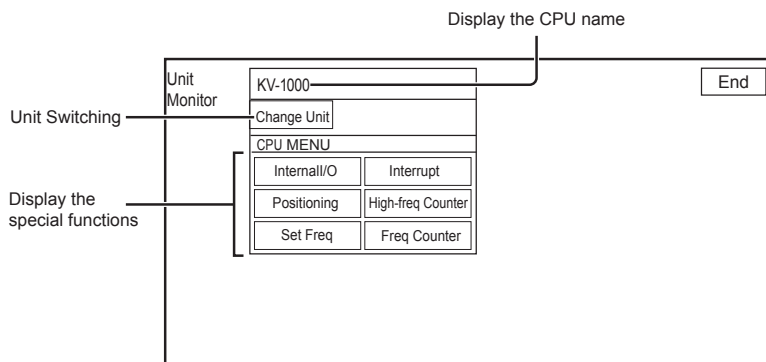
Switch Name	Description
Change Unit	Return to the unit structure screen.
Internal I/O	Display the internal I/O bit device monitor.
Interrupt	Display the monitoring screen for the CPU interrupt function.
Positioning	Display the monitoring screen for the CPU positioning function.
High-freq Counter	Display the monitoring screen for the CPU high-Frequency counter.
Set Freq	Display the monitoring screen for the specified CPU frequency output.
Freq Counter	Display the monitoring screen for the CPU frequency counter.

5

SYSTEM MODE

[Example] The components of the CPU screen is described one by one with KV-1000 as the PLC connected with VT3.

● **Internal I/O**
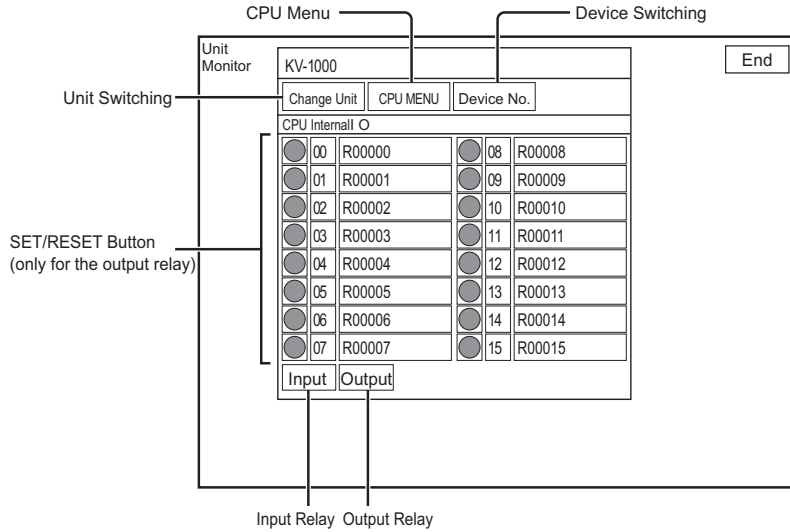
Switch Name	Description
Change Unit	Return to the unit structure screen.
CPU menu	Move to the CPU special function selection screen.
Device Switching	Switches between the text display and image display.
SET/RESET button	Internal input and output bit devices which are equipped with the lamp switch function[*].
Input relay	The monitored device is switched to R00000.
Output relay	The monitored device is switched to R00500.

* The lamp switches that are assigned to the internal input bit devices cannot be used a switch.

| Reference | The following lamp switch statuss are displayed in the Unit Switching. |

⬤ The lamp switch OFF status :   the device is OFF when this is displayed. When the switch is pressed, the device is turned to ON.

◯ The lamp switch ON status :   the device is ON when this is displayed. Switch
When the switch is pressed, the device is turned to OFF and the light turns off.

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

● Interrupt

```
           CPU MENU                          Page Switching

  Unit     ┌─────────────────────────────────────────────┐  ┌─────┐
  Monitor  │ KV-1000                                      │  │ End │
           │                                              │  └─────┘
Unit       │ ┌──────────┐┌──────────┐┌──────┐             │
Switching  │ │Change Unit││ CPU MENU ││ Next │  (1/2)      │
           │ └──────────┘└──────────┘└──────┘             │
           │ CPU Interrupt                                │
           │ ┌────────┬────────┬──────────┬─────────────┐ │
           │ │Device  │        │Data      │Information   │ │
           │ │CR2600  │CR2601  │Rising Edge│INT R00000 Interrupt Polarity│
           │ │CR2602  │CR2603  │Rising Edge│INT R00001 Interrupt Polarity│
           │ │CR2604  │CR2605  │Rising Edge│INT R00002 Interrupt Polarity│
           │ │CR2606  │CR2607  │Rising Edge│INT R00003 Interrupt Polarity│
           │ │CR2608  │CR2609  │Rising Edge│INT R00004 Interrupt Polarity│
           │ │CR2610  │CR2611  │Rising Edge│INT R00005 Interrupt Polarity│
           │ │CR2612  │CR2613  │Rising Edge│INT R00006 Interrupt Polarity│
           │ │CR2614  │CR2615  │Rising Edge│INT R00007 Interrupt Polarity│
           │ │CR2700  │CR2701  │Rising Edge│INT R00008 Interrupt Polarity│
           │ │CR2702  │CR2703  │Rising Edge│INT R00009 Interrupt Polarity│
           │ └────────┴────────┴──────────┴─────────────┘ │
           │                                              │
           └─────────────────────────────────────────────┘
```

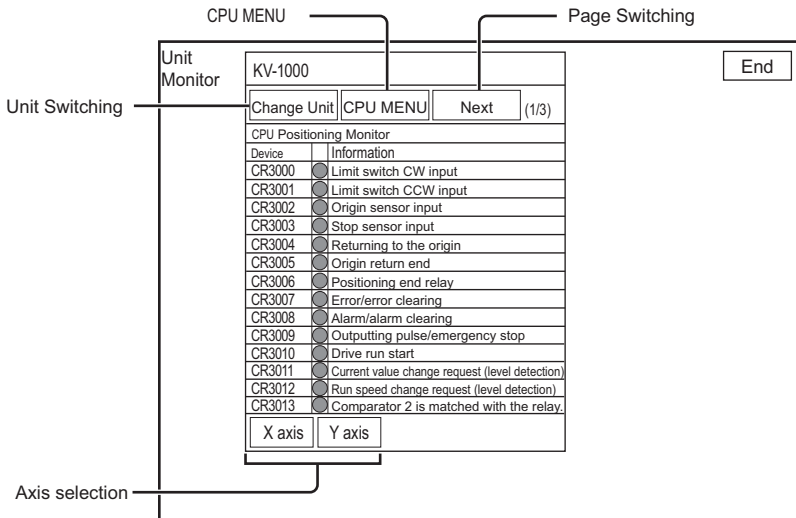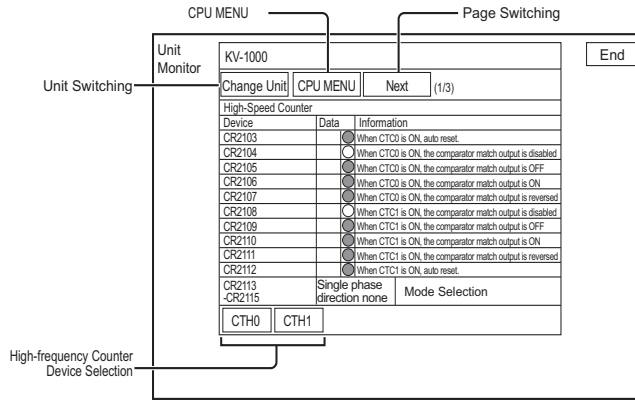| Switch Name	Description
Change Unit	Return to the unit structure screen.
CPU menu	Move to the CPU special function selection screen.
Page switching	Display the next monitoring page

● Positioning

```
           CPU MENU                          Page Switching

  Unit     ┌─────────────────────────────────────────────┐  ┌─────┐
  Monitor  │ KV-1000                                      │  │ End │
           │                                              │  └─────┘
Unit       │ ┌──────────┐┌──────────┐┌──────┐             │
Switching  │ │Change Unit││CPU MENU ││ Next │  (1/3)      │
           │ └──────────┘└──────────┘└──────┘             │
           │ CPU Positioning Monitor                      │
           │ ┌───────┬──────────────────────────────────┐ │
           │ │Device │Information                        │ │
           │ │CR3000 │○ Limit switch CW input            │ │
           │ │CR3001 │○ Limit switch CCW input           │ │
           │ │CR3002 │○ Origin sensor input              │ │
           │ │CR3003 │○ Stop sensor input                │ │
           │ │CR3004 │○ Returning to the origin          │ │
           │ │CR3005 │○ Origin return end                │ │
           │ │CR3006 │○ Positioning end relay            │ │
           │ │CR3007 │○ Error/error clearing             │ │
           │ │CR3008 │○ Alarm/alarm clearing             │ │
           │ │CR3009 │○ Outputting pulse/emergency stop  │ │
           │ │CR3010 │○ Drive run start                  │ │
           │ │CR3011 │○ Current value change request (level detection)│ │
           │ │CR3012 │○ Run speed change request (level detection)│ │
           │ │CR3013 │○ Comparator 2 is matched with the relay.│ │
           │ └───────┴──────────────────────────────────┘ │
           │ ┌────────┐ ┌────────┐                        │
           │ │ X axis │ │ Y axis │                        │
           │ └────────┘ └────────┘                        │
           └─────────────────────────────────────────────┘
              Axis selection
```

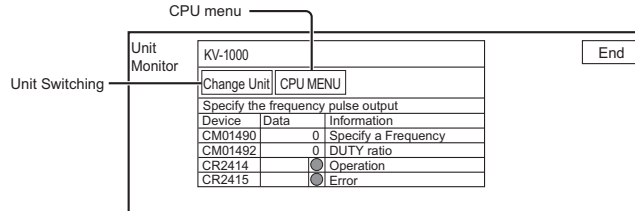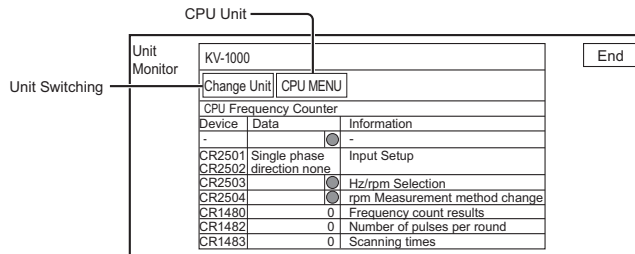| Switch Name	Description
Change Unit	Return to the unit structure screen.
CPU menu	Move to the CPU special function selection screen.
Page switching	Display the next monitoring page
Axis selection	Select the axis to be monitored.

● **High-frequency Counter**

Switch Name	Description
Change Unit	Return to the unit structure screen.
CPU menu	Move to the CPU special function selection screen.
Page switching	Display the next monitoring page
High-frequency counter device selection	Select a high-speed counter device.

● **Specify Frequency**

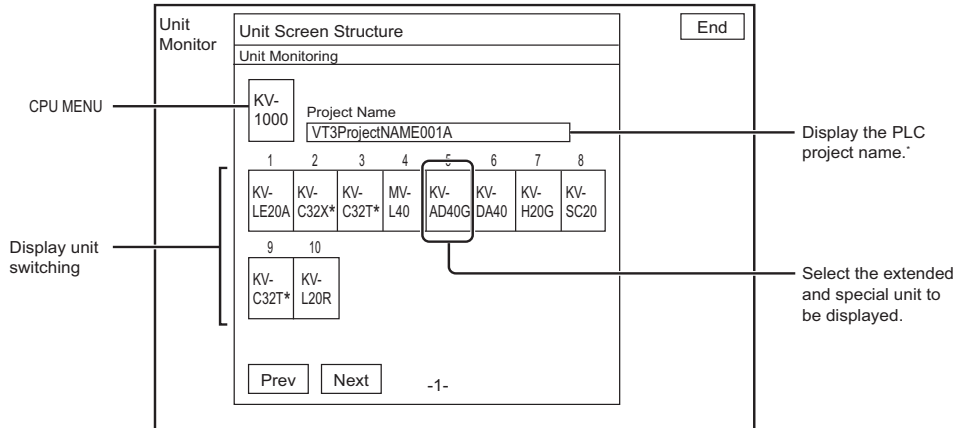| Switch Name	Description
Change Unit	Return to the unit structure screen.
CPU menu	Move to the CPU special function selection screen.

● **Frequency Counter**

Switch Name	Description
Change Unit	Return to the unit structure screen.
CPU menu	Move to the CPU special function selection screen.

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SYSTEM MODE

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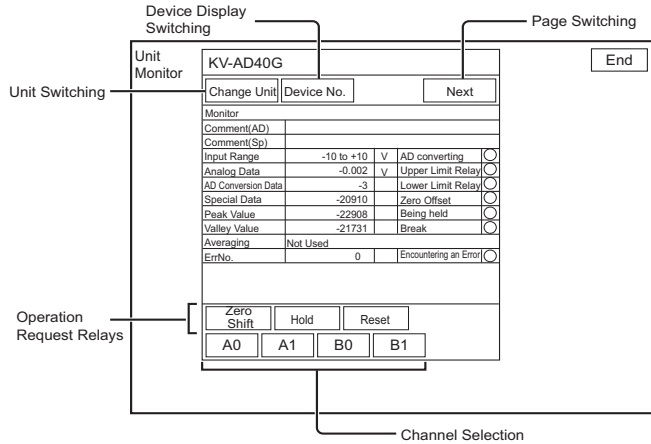■ **Extended/Special Unit Monitor**

Monitor the extended and special units connected with the PLC.

[Example] Take KV-AD40G, one of the special PLC units connected with VT3, as an example to explain the elements in the unit monitoring screen.

* When KV-700 is the connected PLC, the project name is not displayed.

● **Unit Monitoring for KV-AD40G**

Device Display Switching — Page Switching

Unit Monitor

| Unit Switching → | KV-AD40G | | | End |

Change Unit | Device No. | Next

Monitor			
Comment(AD)			
Comment(Sp)			
Input Range	-10 to +10	V	AD converting ○
Analog Data	-0.002	V	Upper Limit Relay ○
AD Conversion Data	-3		Lower Limit Relay ○
Special Data	-20910		Zero Offset ○
Peak Value	-22908		Being held ○
Valley Value	-21731		Break ○
Averaging	Not Used		
ErrNo.	0		Encountering an Error ○

Operation Request Relays →

| Zero Shift | Hold | Reset |
| A0 | A1 | B0 | B1 |

— Channel Selection

Switch Name	Description
Change Unit	Return to the unit structure screen.
Device Display Switching	Device No. display <=> Item name display switching
Page Switching	When multiple pages need to be monitored, this is used to switch the pages.
Operation Request Relays * — **Zero Shift**	Set up the zero offset request relay for the current channel. It is reset when this button is pressed again.
Hold	Set up the hold request relay for the current channel. It is reset when this button is pressed again.
Reset Relay	Set up the comparator request relay for the current channel. It is reset when this button is pressed again.
Switch channel	Switch to another channel to be monitored.

* For more information about the operation request relays, please refer to 📖 "AD/DA Conversion Units KV-AD40□/ DA40□/AM40V User's Manual".
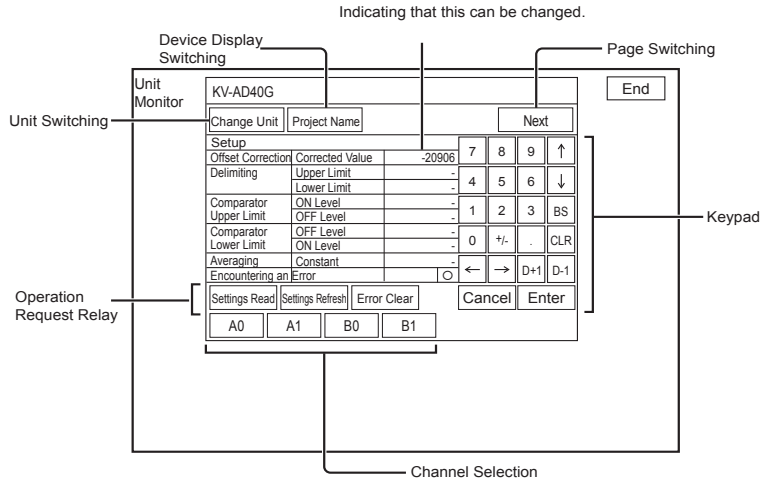
Reference | The lamp statuss displayed in the unit monitor is as follows.

◉ The lamp OFF status : the device is OFF when this is displayed.

○ The lamp OFF status : the device is ON when this is displayed.

◑ Lamp Disabled : when this is displayed, the corresponding option cannot be displayed.

* All of them cannot be assigned to the switch function.

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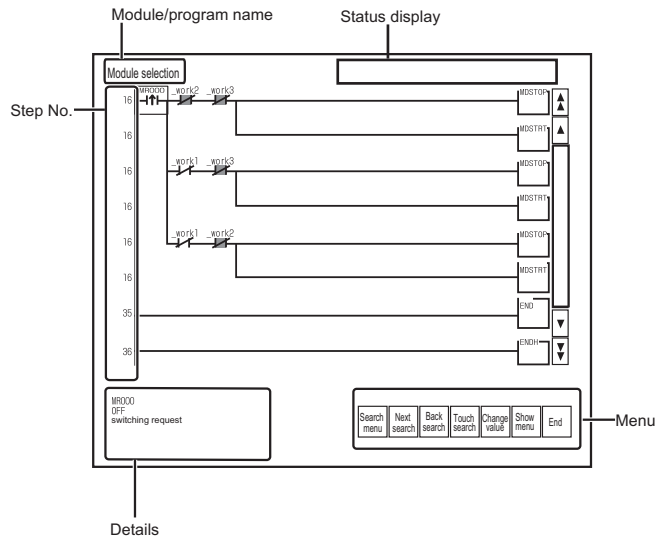| Switch Name		Description
Change Unit		Return to the unit structure screen.
Device Display Switching		Device No. display <=> Item name display switching
Page Switching		When multiple pages need to be monitored, this is used to switch the pages.
Operation Request Relays *	**Settings Read**	Set up the Setup Read request relay to read the unit settings. When reading is over, set up the Setup Read request relay again.
	Settings Refresh	Set up the Setup Write request relay to write the settings in the Unit Monitoring into the unit. When writing is over, set up the Setup Write request relay again.
	Error Clear	Set up the Error Clearing relay for the current channel. It is reset when this button is pressed again.
Switch channel		Switch to another channel to be monitored.
Keypad		This is used when the numeric value needs to be changed in the indicated line. To change the setting, please enter a value when the line becomes active.

* For more information about the operation request relays, please refer to ☐ "AD/DA Conversion Units KV-AD40☐/ DA40☐/AM40V User's Manual".

Ladder Monitoring   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

■ Module/program selection

To select the module/program to be monitored.

Ladder monitor	Module selection	
Module name	Comment	Steps No.
Module selection	Main module for module control	37
work1		12
work2		11
work3		11

Internal ROM   Memory card   End

Item	Description
Module/Program name	To display the name of module/program.
Comment/Title text	To display the text of comment/title of module/program.
Step No.	To display the number of steps of each module/program.
Internal ROM	To refer to the ladder monitor data in internal memory (ROM).
Memory card	To refer to the ladder monitor data in memory card.
End	To switch to the starting screen of device monitor.

Reference   For the ladder program displayed in the module/program selection screen once, when ladder monitor is started next time, the ladder monitor is restarted at the position ladder program displayed last time without displaying the module/program selection screen.

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■ Ladder monitor

● **VT3-X15(D)/S12(D)/S10**

Module/program name Status display Details

Step No.

Menu

● **VT3-V10(D)/V8/V7/V7R/V6H(G)**

Module/program name Status display

Step No.

Menu

Details

5

SYSTEM MODE

Item			Description
Module/program name			To display the name of module/program.
Step No.			To display the step No. of ladder program.
▲▼			To scroll ladder program row by row.
▼▲ ▼▲			To scroll ladder program page by page.
Details			To display the operand/device value/device comments of command selected with cursor except in search. To display the information or search status of object device during search.
Menu	Next search		To continue search downwards along ladder program according to the same conditions after executing each search.
	Back search		To continue search upwards along ladder program according to the same conditions after executing each search.
	Touch search		To search the coil or contact of the same device when touching the coil or contact in ladder after enabled.
	(Search menu) *1	Contact search	To search the position where specified device uses contact. "Search next/Search previous" switch can be used for continuous search. Other module/program also can be searched.
		Coil search	To search the position where specified device uses coil. "Search next/Search previous" switch can be used for continuous search. Other module/program also can be searched.
		Device search	To execute search after specifying device No.."Search next/Search previous" switch can be used for continuous search. Other module/program also can be searched.
		Step No.	To execute jump after specifying step No..
		Top	To jump to the leading row of module/program currently in monitor status.
		Bottom	To jump to the last row of module/program currently in monitor status.
	(Search menu)*1	Without/With dev Cmnt	Display/hide device comments.
		Without/With statusment	Display/hide row comments.
		Without/With dev value	Display/hide device value.
		Value of DEC/HEX	To switch the display format of device value between DEC and HEX.
	Change value		To start device monitor when the device included in the command selected with cursor is registered.
	End		To switch to module/program selection screen.
Status display*2			To display the difference search result of the ladder monitor data of VT3 and the ladder program of PLC, the circuit block of ladder extending out of screen, or other information.

*1 Only displayed for VT3-V10(D)/V8/V7/V7R/V6H(G).

*2 The messages displayed in status display are as follow.

Message	Description
The circuit connected outside screen	Part of circuit block is out of screen.
The ladder program has been updated.	The ladder monitor data of VT3 is different from the ladder program of PLC.
Without CF	Ladder monitor can't be executed since no memory card is inserted or the cover is opening.
The PLC model is different	Ladder monitor data is different from PLC model of screen data.
The version of program is different	The versions of system program and screen data are different.
Over 400 devices are used.	More than 400 devices are in one displayed screen.

■ **Search across module/program**

During search, whether to search the next module/program or not can be selected when searching to the start or end of a module/program.

Search becomes end when going back to the start of search. In addition, other module/program doesn't be searched when searching local label.

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■ **Touch search**

"Touch search" switch is ON by pressing the switch. During touch search, coil is searched when touching the contact in the ladder; while contact is searched when touching the coil in the ladder. Other search function cannot be used during touch search. Touch search becomes end by pressing "the touch search" switch.

■ Restrictions

● **Common**

- Monitor display is unavailable for text string.
- Part of device value will not be displayed when more than 400 devices are in the ladder (one screen in display).
- Default register is not executed for the operand of floating display/local device/local label when device value is changed in selected status with cursor.
- Touch search cannot be started when command other than coil and contact is seleted.
- Ladder software is inconsistent with the result of ladder monitor sometimes since the boundary of cell or return position is different.
- The floating-point number is displayed in the form of exponent.
- The value of local device or local label not supported by ladder monitor cannot be changed.
- Do not remove memory card or open the cover during ladder monitor with memory card. Please re-execute ladder monitor or press the "memory card" switch on the module/program selection screen to re-recognize memory card.
- For the device value of operand not displayed completely in two cells, ".." will be displayed at the end.
- The situations that the operand of command selected with cursor can't be input automatically are as follow:
  - Device value change: local device/local label not supporting device monitor, floating type or text string type
  - Device search: device which cannot be input in search window

● **For KV-5500/5000/3000 Series and KV NanoSeries**

- Module system device (@CR2007/@CR2008) cannot be searched.
- The program of macro cannot be displayed.
- KV script is displayed as unfolded status of auto-generated ladder.
- Bookmark function not supported. Displayed as common row comments.
- Row No. isn't displayed. Only step No. is displayed.
- The device comments of index modifying or indirect specifying is not displayed.
- The device value of local device/local label isn't displayed when difference exists between the ladder monitor data of VT3 and the ladder program of PLC.
- Device value isn't displayed when the specified range of index modifying/indirect specifying.
- When creating ladder monitor data of XYM mark, PLC model should be set to XYM mark type or XYM mark should be set in option setting of KV STUDIO before generating ladder monitor data.
- Ladder monitor data with read protection can't be generated. For the ladder monitor data set with read protection after generated in read protection release status, monitor is available although differences exist.
- Label name can't be input directly for search. Please open each search window in selected status with cursor.
- The local label of constant can't be searched.
- With the KV Nano Series, a password protected module cannot be monitored.
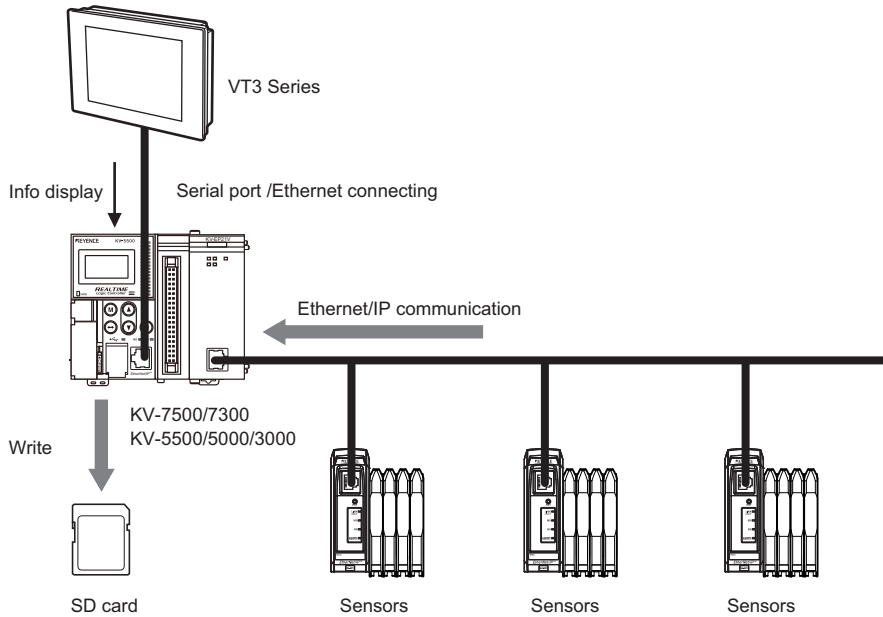
● **For MELSEC Q series**

- It will be detected as different point when the program not existing in project is remained in CPU unit.
- Monitor display is unavailable for SFC program.
- ST program/function block is displayed as the converted ladder program.
- Local device value can't be monitored. The value of global device is displayed.
- The device value of index modifying or indirect specifying can be monitored.
- Conductivity display is unavailable for MC/MCR bus.
- The size of displayed ladder program is the total value of steps of ladder program and "the written safe steps during run".
- The value of float with double precision isn't displayed.
- Error will occur in ladder software when program is read/written/verified with ladder software during ladder monitor.

Sensor Setup Backup X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Sensor setup backup function is to save the setup of each sensor connected on PLC via EtherNet/IP uniformly, when used together with sensor setup restore function, failed sensor may be replaced easily, or several equipments may be started simultaneously.

VT3 Series

Info display   Serial port /Ethernet connecting

Ethernet/IP communication

KV-7500/7300
KV-5500/5000/3000

Write

SD card   Sensors   Sensors   Sensors

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✎ **Point**   **When sensor setup backup function is used, VT3 system program must be above Ver.4.0.**

■ **Sensor setup backup function**

- Switch PLC station number
- Switch EtherNet/IP unit
- Display/multi-choice/select all backup object
- Backup sensor setup of the selected object
- Switch type/notes display
- Display the saved file No.
- Continue to run/stop switching in case of error

■ **Backup object sensor selection menu**

Select the sensor to be backed up. Touch the check box of object type, select the check box, select backup object.
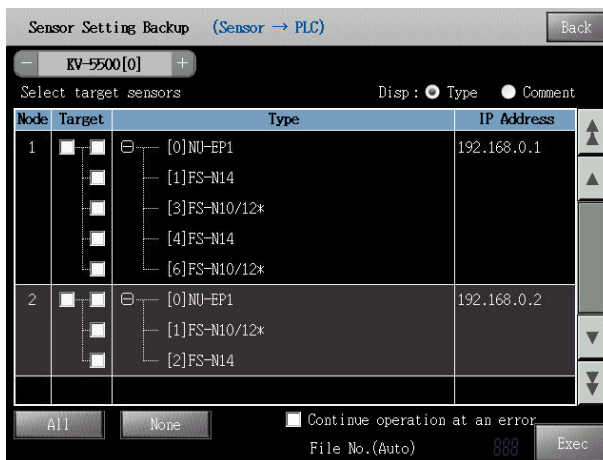
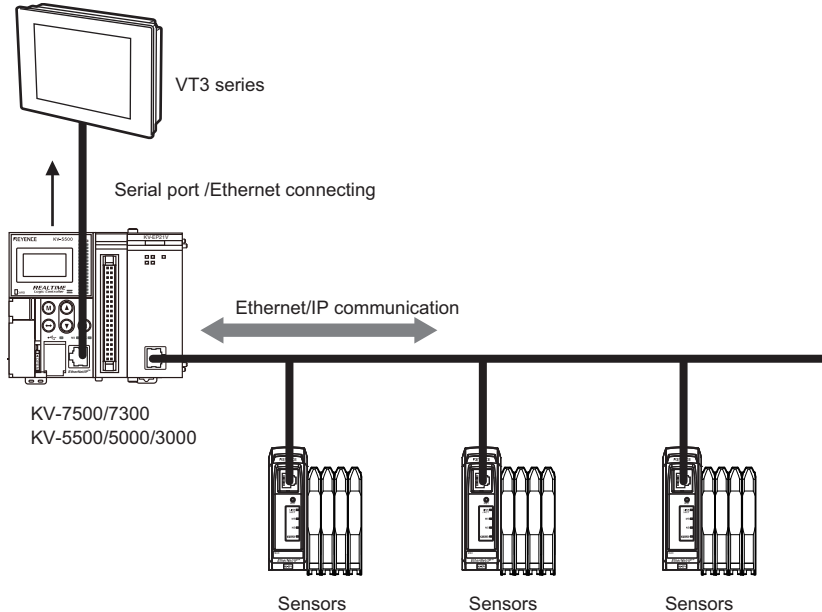| Item	Description
Switch station number	Switch PLC station No. To be monitored. Display is available only when several station No.s exist.
Return	In the system mode, when calling monitor TOP menu, running system menu, return to the page where switch is available.
Unit switching	Switch the EtherNet/IP unit to be monitored.
Switch type/notes display	Switch type/notes display of each sensor.
Node	Display the node No. Connected with adapter.
Object	Select the object to be backed up. The selected typep will become backup object.
Type	Display type and status of the adapters, sensor amplifiers. If actual connection is unavailable, when compatibility check error occures, it is changed to "✖(red)". For sensor connected on the adapter, switch its display status via ⊞ ⊟.
IP address	Display the IP address distributed on each adapter/sensor.
Select all	Select all adapters, sensor amplifiers as backup objects.
Cancel all	Cancel all selected adapters, sensor amplifiers, not as backup objects.
Operation switching in case of error	If error occurs when executing several objects, switch to select whether proceed the next object.
File No.	When file No. Is set to "designated in execution", designate the file No. To be backed up.
Execute	Begin to execute backup.

Restore sensor setup	X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Sensor setup restore function is to send the sensor setup saved in advance to each sensor connected on PLC via EtherNet/IP, when used together with sensor setup backup function, failed sensor may be replaced easily, or several equipments may be started simultaneously.

VT3 series

Info display   Serial port /Ethernet connecting

Ethernet/IP communication

KV-7500/7300
KV-5500/5000/3000

Read

SD card   Sensors   Sensors   Sensors
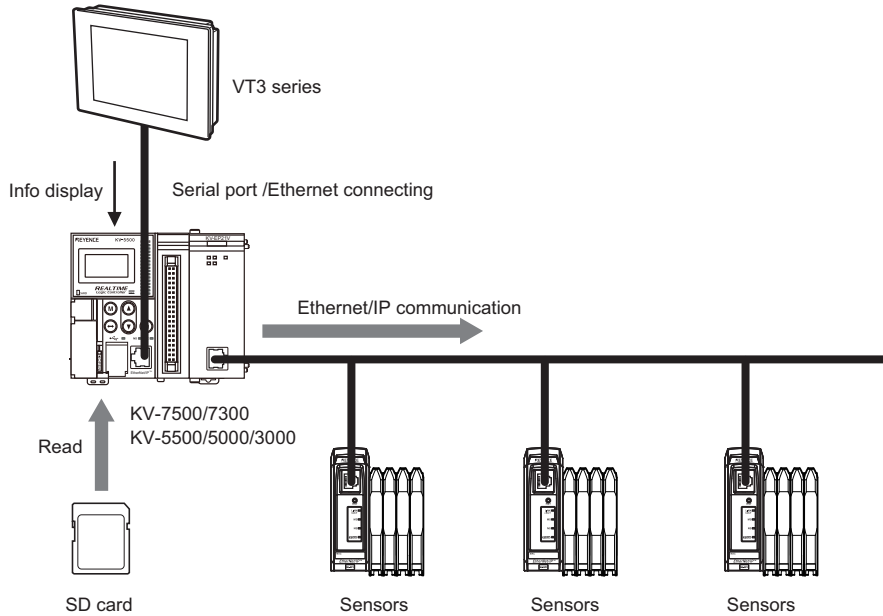
✎ **Point**   **When sensor setup restore function is used, VT3 system program must be above Ver.4.0.**

■ Sensor setup restore function

- Switch PLC station number
- Switch EtherNet/IP unit
- Display/select to restore the object file
- Select the sensor to be restored
- Restore the selected file
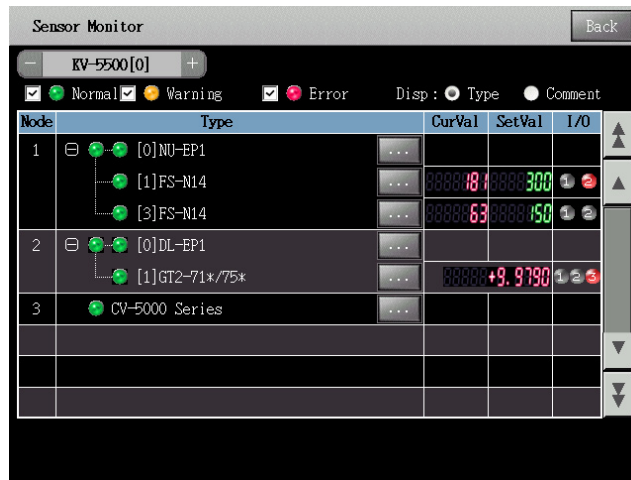- Continue to run/stop switching in case of error

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■ **Restore object file selection menu**

Select the file to be restored. Touch object file name, switch to restore object sensor selection menu.
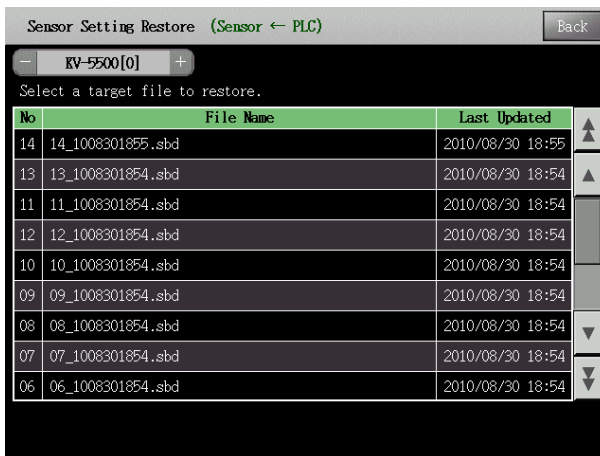
Item	Description
Switch station number	Switch PLC station No to be restored. Display is available only when several station No.s exist.
Return	In the system mode, when calling monitor TOP menu, running system menu, return to the page where switch is available.
Unit switching	Switch the EtherNet/IP unit to be restored.
File No.	Display backup file No. Saved in the SD card.
File name	List of backup files saved in the SD card. Please select the file to be restored.
Update time	Display the creation time of each file.

■ **Restore object sensor selection menu**

Just like the backup object sensor selection menu, select the object to be restored. Touch the check box of object type, select the check box, select restore object.
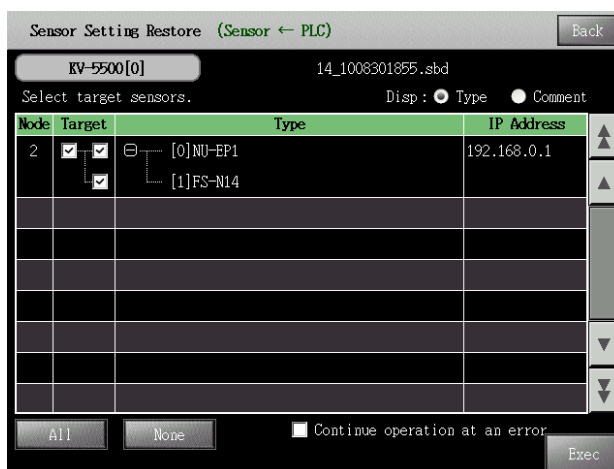
Sensor Monitoring   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Sensor monitoring function is used to monitor status of each sensor connected on PLC via EtherNet/IP through VT system menu.

VT3 series

Serial port /Ethernet connecting

Ethernet/IP communication

KV-7500/7300
KV-5500/5000/3000

Sensors   Sensors   Sensors

✎ **Point**   **When sensor monitoring function is used, VT3 system program must be above Ver.4.0.**

■ **Sensor monitoring function**

- Switch PLC station number
- Unit switching
- Display the sensor information (current value/set value/IP address etc)
- Check warning status of each sensor
- Set warning function of each sensor
- Check and clear error status of the sensors

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■ Sensor list menu

This menu may monitor the connected sensor via listing.

Item	Description
Switch station number	Switch the monitored PLC station number.
Return	In the system mode, when calling monitor TOP menu, running system menu, return to the page where switch is available.
Unit switching	Switch the EtherNet/IP unit to be monitored.
Normal/warning/error	select the conditions for display items.
Switch type/notes display	Switch type/notes display of each sensor.
Node	Display the node No. Connected with adapter.
Type	Display type and status of the adapters, sensor amplifiers. ● (green): normal ● (yellow): warning ● (red): error If actual connection is unavailable, when compatibility check error occures, it is changed to "✕(red)". For sensor connected on the adapter, switch its display status via ⊞ ⊟.
Detailed[*1]	Switch detailed display menu of the sensors.
Current value[*1]	Display current value.
Set value [*1]	Display the set value.
I/O[*1]	Display I/O status of the sensors.

*1   Display items vary with the connected sensors. For detailed content, please refer to user manual or operating instructions of each sensor.

5-11 Memory Card

VT3 data can be written, read, and deleted using Memory Card (OP-42254) (sold separately). The following five data types can be handled in "Memory Card" in the System mode:

• Screen Data
• System Program
• Image data captured by an external camera (Only for VT3-X15(D)/S12(D)/S10/V10(D)/V8) and hard copy data in a Run screen.
• Alarm logs, trend charts, and operation logs

✎ Point	**Failed to use memory card for VT3-W4T(A)/W4M(A)/W4G(A).**

■ VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)
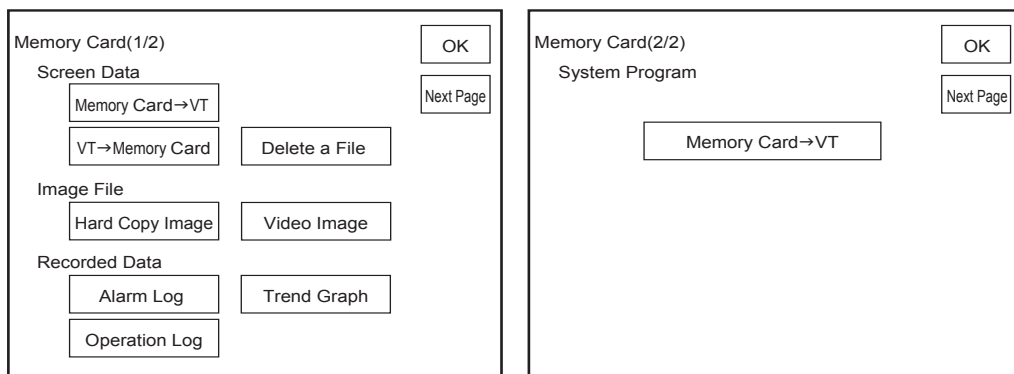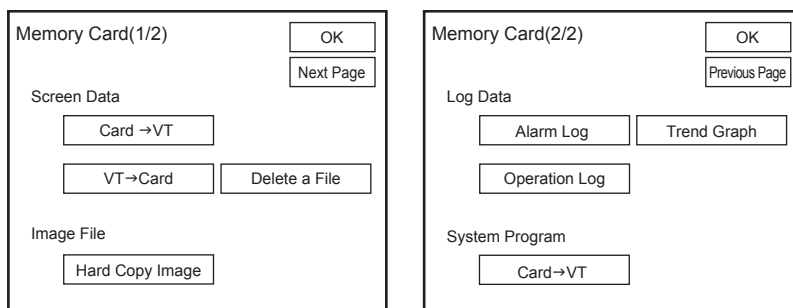
```
Memory Card(1/2)                    [ OK ]
  Screen Data                       [ Next Page ]
    [ Memory Card→VT ]
    [ VT→Memory Card ]  [ Delete a File ]
  Image File
    [ Hard Copy Image ]  [ Video Image ]
  Recorded Data
    [ Alarm Log ]  [ Trend Graph ]
    [ Operation Log ]
```

```
Memory Card(2/2)                    [ OK ]
  System Program                    [ Next Page ]

          [ Memory Card→VT ]
```

■ VT3-V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A

```
Memory Card(1/2)          [ OK ]
                          [ Next Page ]
  Screen Data
        [ Card →VT ]
    [ VT→Card ]  [ Delete a File ]
  Image File
    [ Hard Copy Image ]
```

```
Memory Card(2/2)          [ OK ]
                          [ Previous Page ]
  Log Data
    [ Alarm Log ]  [ Trend Graph ]
    [ Operation Log ]
  System Program
        [ Card→VT ]
```

NOTICE	**Be sure to use the Memory Card with the Memory Card slot cover closed. If the cover is open, the Memory Card cannot be accessed.**

✎ Point	• **Be sure to use the Keyence OP-42254 Memory Card.** • **When this menu item is executed, the Memory Card must be inserted in the VT3 and the Memory Card cover must be closed.** 　📖 **"6-1 Memory Card"** • **When the Memory Card is in use, be sure to insert and remove the Memory Card after the System mode menu screen (top screen) is displayed.**

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Screen Data ⟨X15⟩ ⟨S12⟩ ⟨S10⟩ ⟨V10⟩ ⟨V8⟩ ⟨V7⟩ ⟨V6H⟩ ⟨Q5H⟩ ⟨Q5T⟩ ⟨Q5S⟩ ⟨Q5M⟩ ⟨W4⟩ ⟨V7R⟩

With this menu item, screen data can be read using the Memory Card (from the Memory Card to the VT) and written (from the VT to the Memory Card), and saved screen data can be deleted from the Memory Card.

> ✎ Point **Number of files that can be saved on Memory Card and file names**
> 📖 "6-1 Memory Card"

■ Memory Card -> VT

The following data can be selected when reading screen data or PLC data folder data from Memory Card:
- All data (screen data + PLC data folder data)
- Only the screen data

Prepare the screen data to be saved to Memory Card on VT STUDIO BUILDER.
📖 "3-1 File Management", VT3 Series Reference Manual

> | NOTICE | **When screen data or PLC data folder data has been read from Memory Card, screen data or PLC data folder data that was on VT3 until then will be lost. In addition, the alarm logging data, trend chart data (real-time), XY chart data (real-time), data in operation logs are also lost.** |

Memory Card   Screen Data   [Memory Card → VT] | OK |

    File :   VTEDT0.ms4 | Execute |
              Untitled.vs4

    Select Data :   [✓] Screen Data
              [ ] PLC Folder Data

[VTEDT0.ms4]
[VTEDT3.ms4]
[VTEDT6.ms4]
[VTEDT8.ms4]
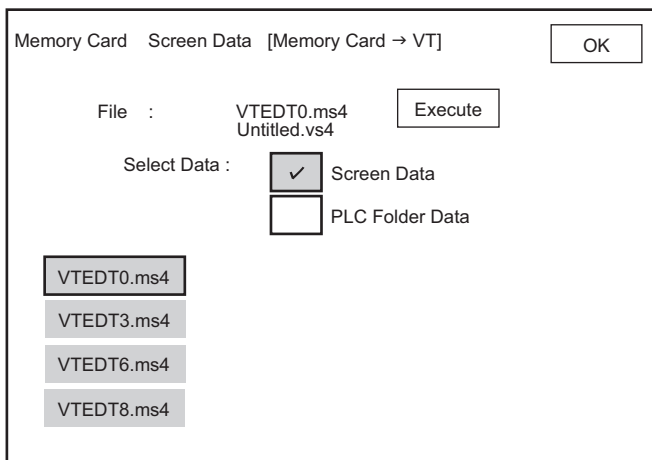
[✓] : Data Selected
[ ] : Data Not Selected

| VTEDT0.ms4 | : Files Selected
| VTEDT3.ms4 | : Existing Files

● **When there is no PLC data folder data on VT3 but and there is data on Memory Card**

Only screen data cannot be transmitted to VT3. Also, transmit PLC data folders at the same time.

● **When there is PLC data folder data on VT3 and there is no data on Memory Card**

The PLC data folder on the VT3 must be discarded. Delete the PLC data according to the on-screen instructions, and then transmit the screen data.

■ **VT -> Memory Card (write)**

This item is for writing all VT3 data (screen data + PLC data folder data) to Memory Card.

Data that is written to Memory Card can be read and edited on VT STUDIO.

"3-1 File Management", VT3 Series Reference Manual

This operation is not possible when "Read Protect" is set to ON under "VT System Settings" in the System mode.

"Read Protect", page 5-20

"12-4 Set up the VT Series System", VT3 Series Reference Manual

Memory Card   Screen Data   [VT → Memory Card]   OK

File   :   VTEDT0.ms4   Execute
                  Untitled.vs4

VTEDT0.ms4   VTEDT4.ms4   VTEDT8.ms4
VTEDT1.ms4   VTEDT5.ms4   VTEDT9.ms4
VTEDT2.ms4   VTEDT6.ms4
VTEDT3.ms4   VTEDT7.ms4
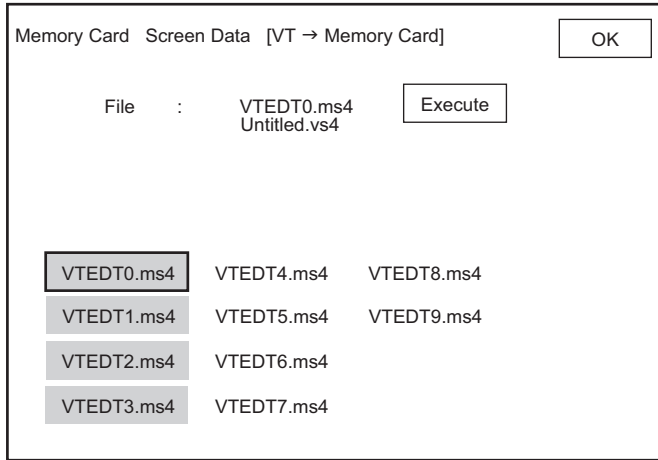
VTEDT0.ms4 : Files Selected

VTEDT1.ms4 : Existing Files

VTEDT4.ms4 : Files Not Used

■ **Delete File**

This item is for deleting files saved on Memory Card.
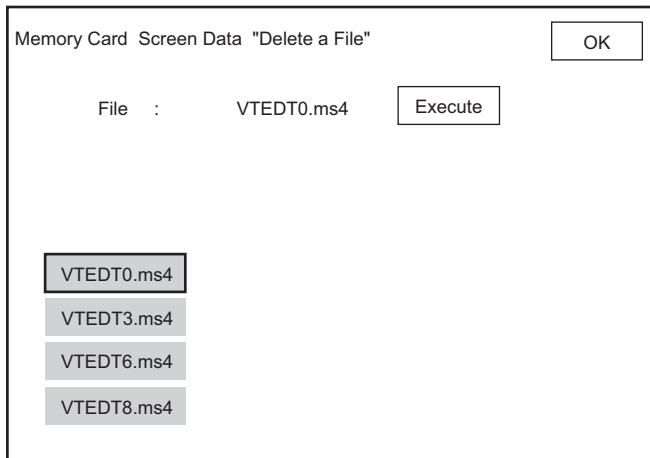
Memory Card   Screen Data   "Delete a File"   OK

File   :   VTEDT0.ms4   Execute

VTEDT0.ms4
VTEDT3.ms4
VTEDT6.ms4
VTEDT8.ms4

VTEDT0.ms4 : Files Selected

VTEDT3.ms4 : Existing Files

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

Image Files X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item allows you to view and delete hard copy data or video captured data saved on Memory Card.

✎ Point	**Number of files and file names for hard copy data and video captured data that can be saved on Memory Card** 📖 **"6-1 Memory Card"**

■ Hard Copy Image

This item is for managing hard copy image files of the Run screen stored on Memory Card.

With hard copies by Memory Card, switches can be saved from the PLC by setting "Save to Memory Card" in the printer settings.

📖 "Printer Type", page 5-23

📖 "12-4 Set up the VT Series System", VT3 Series Reference Manual

```
Memory Card   Image File "Hard Copy":              [ OK ]
                                                    [ Prev Page ]
   File      : VTIMG01.bmp
               06/02/17 01:23:45                    [ Next Page ]
   File Number:    [ 00 ]    [ Viewer ] [ Delete ]  ─── Delete
   [ 《 Start ]                          [ Tail 》 ]
   VTIMG00.bmp   VTIMG05.bmp   VTIMG10.bmp
   VTIMG01.bmp   VTIMG06.bmp                          [ VTIMG01.bmp ]  :Files Selected
   VTIMG02.bmp   VTIMG07.bmp                          [ VTIMG02.bmp ]  :Existing Files
   VTIMG03.bmp   VTIMG08.bmp                         You can use the
   VTIMG04.bmp   VTIMG09.bmp                          [ Prev Page ] [ Next Page ]
                                                     buttons to find a file when its number is not displayed.
```

Reference	Except BMP, hard copy images can also be saved in the BMP format. The file format is set up with VT STUDIO.

■ Video Image (Only for VT3-X15(D)/S12(D)/S10/V10(D)/V8)

This item is for managing video images stored on Memory Card.

📖 "Video Capfure", page 6-12

```
Memory Card   Image File "Video Capture"           [ OK ]
   Select:    [ 0 ] ch RGB ─────────────            [ Prev Page ]
   File : VTCPT00.bmp                                [ Next Page ]
   Number:    [ 00 ]    [ Viewer ] [ Delete ]  ─── Video CH Selection
   [ 《 Start ]                          [ Tail 》 ]
   VTCPT00.bmp   VTCPT05.bmp   VTCPT10.bmp
   VTCPT01.bmp   VTCPT06.bmp                          [ VTCPT00.bmp ]  :Files Selected
   VTCPT02.bmp   VTCPT07.bmp                          [ VTCPT01.bmp ]  :Existing Files
   VTCPT03.bmp   VTCPT08.bmp                         You can use the
   VTCPT04.bmp   VTCPT09.bmp                          [ Prev Page ] [ Next Page ]
                                                     buttons to find a file when its number is not
                                                     displayed.
```

Setting Item	Description
Delete	Deletes image files saved to Memory Card. Select the desired file to delete from among the files on the Memory Card and touch [Delete] .
Video CH Selection	Selects the video channel (0 to 4). Switches the list of files captured on each channel.

5 SYSTEM MODE

■ Viewer

This item is for viewing image files saved on Memory Card.

←	→	1/1	1/4	DEL	OK

Screen Scroll　　　Number of Screens divisions　　Delete File　　Main Menu

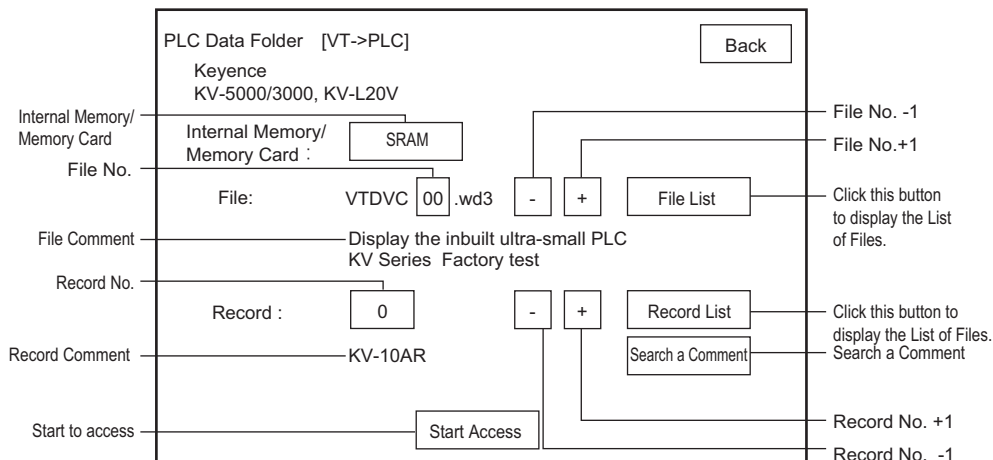| Switch Name	Description
Screen scroll buttons	Scroll the screen. When the screen is displayed divided, the screen is scrolled in blocks.
Number of screen divisions	Select the number of files that can be viewed. Select from 1 or 4 divisions.
Delete File	Deletes the image file. When 1 screen is displayed: the displayed files When 4 screen is displayed: the displayed files in the upper-left hand
Main menu	Returns to the main menu

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

Log Data X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

Save the alarm log data, trend chart data, and operation log data on VT3 into Memory Card in the CSV or TXT format "UNICODE". Files saved on Memory Card can also be deleted.

Data can also be saved by controlling from the PLC while the Run screen is displayed.

📖 "9-7 Controls Set up with the Devices", VT3 Series Reference Manual

📖 "12-7 Global Function Control", VT3 Series Reference Manual

---

✎ Point | **The number and name of the alarm log, trend chart, and operation log files that can be saved in Memory Card are limited.**
📖 "6-1 Memory Card"

■ Alarm Log

Select a file format

Memory Card   Log Data (Alarm Log)

			OK
Alarm ID:	0	File:	CSV	Prev Page
				Next Page

Alarm ID selection

File : VTALM106.csv

Number : | 00 | Save   Delete

Specify a file No.

《〈Head   Tail 〉》

VTALM000.csv	VTALM004.csv	VTALM008.csv	VTALM012.csv
VTALM001.csv	VTALM005.csv	VTALM009.csv	VTALM013.csv
VTALM002.csv	VTALM006.csv	VTALM010csv	VTALM014.csv
VTALM003.csv	VTALM007.csv	VTALM011.csv	VTALM015.csv

VTALM000.csv :Files Selected

VTALM001.csv :Existing Files

VTALM003.csv :Files Not Used

Switch Name	Description
Alarm ID	Specify an Alarm ID(0 to 3).
File	Specify a file format (CSV, TXT(UNICODE)).
Number	Display the page where the file No. (00000 to 65535) is specified.
Save	Save the alarm log in the currently selected file name.
Delete	Delete an existing file in Memory Card.
Previous page	Display the list of files in the previous page.
Next page	Display the list of files in the next page.
<<Head	Display the start page.
Tail>>	Display the end page.

■ **Trend Graph**

Trend 1 selected

```
Memory Card    Log Data (Trend Graph)                    [ OK ]
        Trend ID   :    [ 0 ]  Data Format: unsigned binary   [ Prev Page ]
        File       :    VTTRD000.csv                          [ Next Page ]
        Number     :    [ 00 ]    Save      Delete
```

Specify a File No.

```
 《 Head                                    Tail 》

  [ VTTRD000.csv ]   VTTRD004.csv    VTTRD008.csv    VTTRD012.csv
    VTTRD001.csv     VTTRD005.csv    VTTRD009.csv    VTTRD013.csv
    VTTRD002.csv     VTTRD006.csv    VTTRD010.csv    VTTRD014.csv
    VTTRD003.csv     VTTRD007.csv    VTTRD011.csv    VTTRD015.csv
```

[VTTRD000.csv]	: Files Selected
VTTRD001.csv	: Existing Files
VTTRD003.csv	: Files Not Used

Switch Name	Description
Trend ID	Select the trend ID (0 to 3).
Number	Display the page where the file No. (00000 to 65535) is specified.
Save	Save the trend chart in the currently selected file name.
Delete	Delete an existing file in Memory Card.
Previous page	Display the list of files in the previous page.
Next page	Display the list of files in the next page.
<<Head	Display the start page.
Tail>>	Display the end page.

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
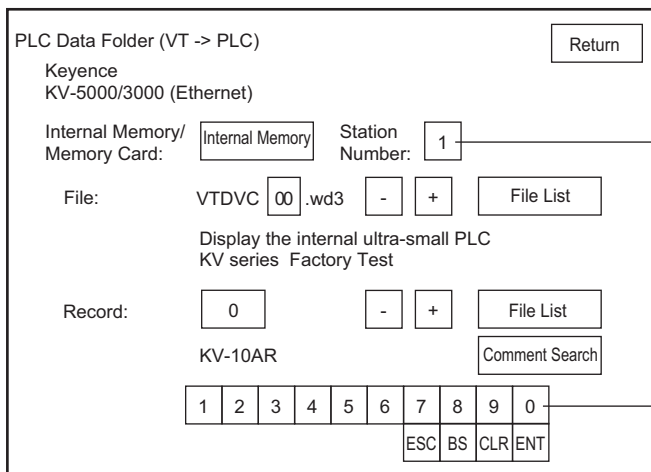Memory Card
PLC Data Folder
Run Mode

■ **Operation Log**

Switch Name	Description
File format	Specify a file format (CSV, TXT(UNICODE)).
Number	Display the page where the file No. (00000 to 65535) is specified.
Save	Save the operation log in the currently selected file name.
Delete	Delete an existing file in Memory Card.
Previous page	Display the list of files in the previous page.
Next page	Display the list of files in the next page.
<<Head	Display the start page.
Tail>>	Display the end page.

System Program   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

This item transmits the latest system program currently saved on Memory Card to the VT3 unit.

📖 "System Program", page 4-4

📖 "3-1 File Management", VT3 Series Reference Manual

NOTICE	• When screen data or PLC data folder data has been read from Memory Card, screen data or PLC data folder data that was on VT3 until then will be lost. In addition, the alarm logging data, trend chart data (real-time), XY chart data (real-time), data in operation logs are also lost.

Point	The system program is upwardly compatible. The system program on the unit need not be transmitted if it is a newer version than that on the Memory Card.

The following data editing operations are possible by communicating with the VT3:

- Read/write/verification of device information between the PLC and SRAM on the VT3 unit
- Read/write/verification of PLC device information between the PLC and Memory Card OP-42254
- Management of device information files

✎ Point	**Failed to use PLC data folder for VT3-W4T(A)/W4M(A)/W4G(A).**

Create PLC data folders in VT STUDIO.

📖 "Chapter 15 PLC Data File", VT3 Series Reference Manual

```
PLC Data Folder                          Return
  Keyence
  KV-5000/3000, KV-L20V              PLC_A
  Access PLC

          VT->PLC

          PLC->VT                     Verify

  File Management

          Edit                    Copy / Delete a File
```
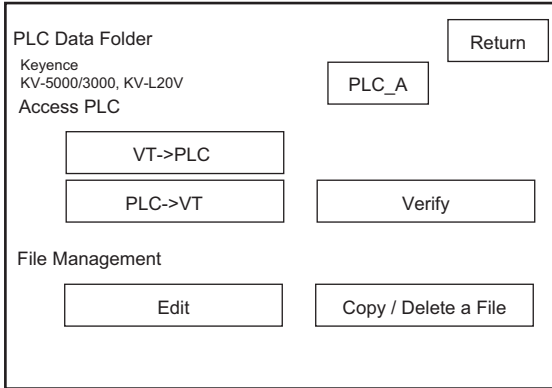
✎ Point	• $\boxed{VT\rightarrow PLC}$ $\boxed{PLC\rightarrow VT}$ $\boxed{VERIFY}$ and can be operated when "Communicate with PLC" is set to **"Enable" in the System mode.**

  📖 "5-5 Communicate With PLC", page 5-31
- **When the Memory Card is in use, be sure to insert and remove the Memory Card after the System mode menu screen (top screen) is displayed.**
- **When the Memory Card is in use, it sometimes takes time to search for existing logs.**
- **When the Memory Card is in use, creation of search information sometimes starts automatically. Normally, this ends in about several seconds. "Search information" is the information required for searching log Nos. and log comments when PLC data folder data is operated on the Memory Card.**

About Keyboard Operations

Log comments can be entered on the keyboard.

Each touch of the selector switch on the keyboard switches the keyboard display between alphanumerics and symbols. The default is the alphanumeric keyboard.

Half-width Japanese keyboard

ア	カ	サ	タ	ナ	ハ	マ	ラ	ヤ	-
イ	キ	シ	チ	ニ	ヒ	ミ	リ	ユ	゛
ウ	ク	ス	ツ	ヌ	フ	ム	ル	ヨ	゜
エ	ケ	セ	テ	ネ	ヘ	メ	レ	ワ	BS
オ	コ	ソ	ト	ノ	ホ	モ	ロ	ン	SP

Symbol keyboard

1	2	3	4	5	6	7	8	9	0
ァ	ィ	ゥ	ェ	ォ	ャ	ュ	ョ	ッ	ヲ
、	。	・	!	?	$	%	&	\	CLR
:	;	^	"	'	`	-	_	|	BS
「	」	[	]	{	}	<	>	@	SP

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

Access PLC   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

■ VT -> PLC (read)

This item is for transferring all data of devices (bit devices, word devices) currently saved in VT3 internal memory or on Memory Card. When this item is executed, all devices on the specified PLC are overwritten, and previous information is lost.

Item	Description
SRAM/Memory Card	Selects the file storage location between internal memory and Memory Card.
File No.	Enter a file No. within the range 00 to 99. (Non-existent file Nos. cannot be entered.)
File No. -1	Decrements the file No. by 1. (Non-existent files are skipped.)
File No. +1	Increments the file No. by 1. (Non-existent files are skipped.)
File list display	Displays a list of files saved on internal memory or Memory Card.
File Comment	Displays the comment of the currently selected file No.
Record No.	Enter a log No. within the range 00 to 65534. (Non-existent log Nos. cannot be entered.)
Record No. -1	Decrements the log No. by 1. (Non-existent logs are skipped.)
Record No. +1	Increments the log No. by 1. (Non-existent logs are skipped.)
Record list display	Displays a list of logs to save to the currently selected file No.
Record Comment	Displays the comment of the currently selected log No.
Search	Moves to the screen for searching log Nos. from log comments.
Start Access	Starts reading.

● **File list**

```
PLC Data Folder  File List
    Keyence  KV-5000/3000, KV-L20V                    ┌──────────┐
Internal Memory  ┌────────────────┐                   │    OK    │
/Memory Card:    │ Internal Memory │                   ├──────────┤
File:            VTDVC00.wd3                           │ Prev Page │
                 Display the internal ultra-small      ├──────────┤
                 KV series  Factory Test               │ Next Page │
  ┌────────────┐  Display the internal ultra-small PLC └──────────┘
  │ VTDVC00.wd3 │  KV series  Factory Test
  └────────────┘  Single-handle sensor link system
  │ VTDVC01.wd3 │  QL series  Factory Test
  │ VTDVC02.wd3 │  Ultra-small PLC
                  KZ series  Factory Test
  │ VTDVC03.wd3 │  Free plane figure wiring I/O
                   KL series  Factory Test
  │ VTDVC04.wd3 │  High-quality touch display
                  VT series  Factory Test
```

VTDVC**.wd3 : Files Selected

VTDVC**.wd3 : Existing Files

(**:00 to 99)

· Select a Log No. and press [OK] And this will direct you to the previous menu.

· You can use the [Prev Page] [Next Page] to find a record when its number is not displayed.

● **Record list**

```
PLC Data Folder  List of Record Comments              ┌──────────┐
File:          VTDVC00.wd3                             │    OK    │
                                                       ├──────────┤
               Display the internal ultra-small PLC    │ Prev Page │
               KV series  Factory Test                 ├──────────┤
Record:        0                                       │ Next Page │
                                                       └──────────┘

  ┌───┐                    ┌───┐
  │ 0 │  KV-10AR           │ 5 │  KV-16AT
  └───┘                    └───┘
  │ 1 │  KV-10AT           │ 6 │  KV-16DR

  │ 2 │  KV-10DR           │ 7 │  KV-16DT

  │ 3 │  KV-10DT           │ 8 │  KV-24AR

  │ 4 │  KV-16AR           │ 9 │  KV-24AT
```

[*] :Selected Record

[*] :Existing Record

(*:0 to 65534)

· Select a record number and press [OK] and this will direct you to the previous menu.

· You can use the [Prev Page] [Next page] to find a record when its number is not displayed.

● **Comment search**

```
PLC Data Folder  Search a Record Comment          ┌────────┐
                                                   │   OK   │
File:        VTDVC00.wd3   Record:      0          └────────┘
Comment Input:  KV-10AR

        ┌───────────────┐              ┌────────┐
        │ Start to Search│              │  Kana  │
        └───────────────┘              └────────┘
  1   2   3   4   5   6   7   8   9   0
  A   B   C   D   E   F   G   H   I   CA
                                      PS
  J   K   L   M   N   O   P   Q   R   CLR
  S   T   U   V   W   X   Y   Z   #   BS
  +   -   *   /   =   (   )   ,   .   SP
```

· After entering a record comment, press [Start to find] [find] to display the target record No.

· After this, press [OK] And this will direct you to the previous menu.

· A record number can be found only when the record comment is fully consistent with it.

· When no record that contains the entered record comment is found during the search, the display
of the record number becomes "NG".

● **About the station No. setup for the Ethernet connection (except VT3-V7R/Q5M(W)/Q5M(W)A)**

Set the PLC No. of the target PLC when VT3 is connected over Ethernet.

```
PLC Data Folder (VT -> PLC)                    ┌────────┐
                                               │ Return │
  Keyence                                      └────────┘
  KV-5000/3000 (Ethernet)

  Internal Memory/   ┌──────────────┐  Station   ┌───┐    ── Station No. setup switch
  Memory Card:       │Internal Memory│  Number:  │ 1 │       Press the switch to display the
                     └──────────────┘            └───┘       cross key. setup station No.
   File:      VTDVC [00] .wd3  [-] [+]  ┌──────────┐
                                        │ File List │
                                        └──────────┘
   Display the internal ultra-small PLC
   KV series  Factory Test

   Record:     [  0  ]        [-] [+]  ┌──────────┐
                                       │ File List │
                                       └──────────┘
   KV-10AR                             ┌──────────────┐
                                       │Comment Search │
                                       └──────────────┘
        1  2  3  4  5  6  7  8  9  0   ── Numeric key
                        ESC BS CLR ENT
```

■ **PLC -> VT (write)**

This item is for sending all current data of the PLC internal device to a selected log in VT3 internal memory or Memory Card.

PLC Data Folder (PLC -> VT)   back

   Keyence
   KV-5000/3000, KV-L20V

Internal Memory/   File No. -1
Memory Card   Internal Memory/   File No. +1
                     Memory Card: Internal Memory
   File No.

                     File: VTDVC 00 .wd3   -   +   Record List   Click this key
                                                                           to display the List
File Comment   Display the inbuilt ultra-small PLC   of Files.
                                  KV series Factory Test

Log No.

                     Record: 0   -   +   Record List   Click this button to
                                                                           display the List of
Log Comment   KV-10AR   Files.

Enter   Enter   Log No. +1

                                                                           Log No. -1

PLC Data Folder (PLC -> VT)

   File :   VTDVC00.wd3   Record: 0   Cancel   — Cancel

   Enter a Comment :   KV-10AR

                      Start to Access   Kana   — Access start
                                                                          — Switch keypad
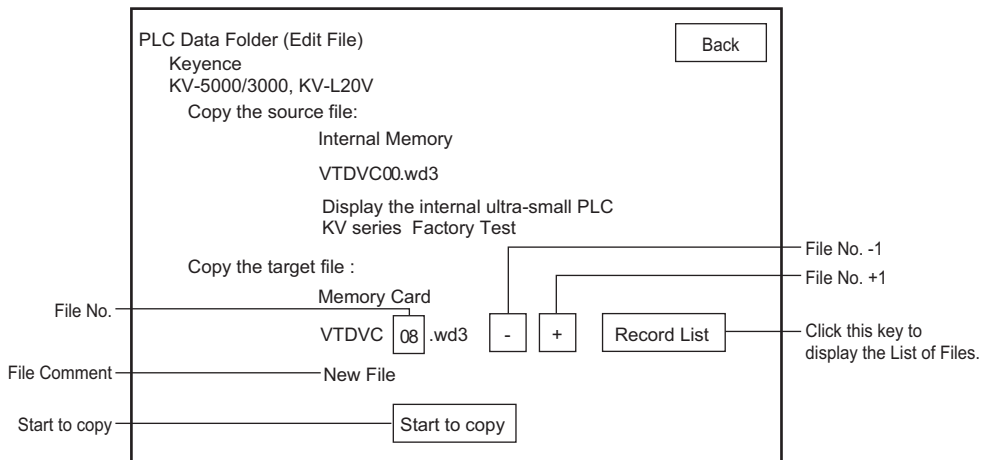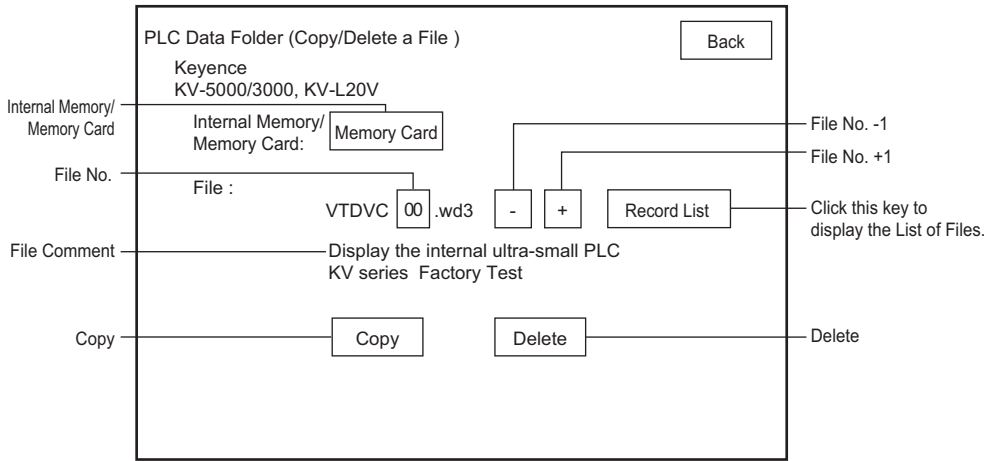
         1   2   3   4   5   6   7   8   9   0

         A   B   C   D   E   F   G   H   I   CA
                                             PS

         J   K   L   M   N   O   P   Q   R   CLR

         S   T   U   V   W   X   Y   Z   #   BS

         +   -   *   /   =   (   )   ,   .   SP

5

SYSTEM MODE

System
Mode

Option
Setup

VT System
Setup

PLC Communication
Setup

Communicate
With PLC

Memory
Clear

Data
Transmission

Viewer

Self Check

Monitoring

Memory
Card

PLC Data
Folder

Run Mode

Item	Description
SRAM/Memory Card	Selects the file storage location between internal memory and Memory Card.
File No.	Enter a file No. within the range 00 to 99. (Non-existent file Nos. cannot be entered.)
File No. -1	Decrements the file No. by 1. (Non-existent files are skipped.)
File No. +1	Increments the file No. by 1. (Non-existent files are skipped.)
File list display	Displays a list of files saved on internal memory or Memory Card.
Comment	Displays the comment of the currently selected file No.
Record No.	Enter a log No. within the range 00 to 65534. (Non-existent log Nos. cannot be entered.)
Record No. -1	Decrements the log No. by 1. (Non-existent logs are skipped.)
Record No. +1	Increments the log No. by 1. (Non-existent logs are skipped.)
Record list display	Displays a list of logs in the currently selected file No. including new logs (unused logs).
Record Comment	Displays the comment of the currently selected log No.
Apply	Moves to the screen for executing writing after editing of log comments.
Start Access	Executes writing.
Cancel	Returns to the previous screen.
Switch Keyboard	Selects entry on the keyboard between alphanumerics to symbols.

● **File list**

```
PLC Data Folder  File list
    Keyence  KV-5000/3000, KV-L20V               ┌─────────┐
                                                 │   OK    │
Internal Memory/     ┌──────────────────┐        └─────────┘
Memory Card:         │ Internal Memory  │        ┌─────────┐
                     └──────────────────┘        │Prev Page│
File:            VTDVC00.wd3                      └─────────┘
                 Display the internal ultra-small PLC  ┌─────────┐
                 KV series  Factory Test          │Next Page│
                                                  └─────────┘
  ┌────────────┐  Display the internal ultra-small PLC
  │VTDVC00.wd3 │   KV series  Factory Test
  └────────────┘
  ┌────────────┐  Single-handle sensor link system
  │VTDVC01.wd3 │  QL series  Factory Test
  └────────────┘
  ┌────────────┐  Ultra-small PLC
  │VTDVC02.wd3 │  KZ series  Factory Test
  └────────────┘
  ┌────────────┐  Free plane figure wiring I/O
  │VTDVC03.wd3 │  KL series  Factory Test
  └────────────┘
  ┌────────────┐  High-quality touch display
  │VTDVC04.wd3 │  VT series  Factory Test
  └────────────┘
```

┌────────────┐
│VTDVC**.wd3 │ : Files Selected
└────────────┘

┌────────────┐
│VTDVC**.wd3 │ : Existing Files
└────────────┘

(**: 0 to 99)

· Select a record number and press [OK] And this will direct you to the previous menu.

· You can use the [Prev page] [Next page] to find a record when its number is not displayed.

■ Verify

This item is for verifying whether or not the contents of the selected log in VT internal memory or Memory Card matches the current information of PLC internal devices.

Item	Description
SRAM/Memory Card	Selects the file storage location between internal memory and Memory Card.
File No.	Enter a file No. within the range 00 to 99. (Non-existent file Nos. cannot be entered.)
File No. -1	Decrements the file No. by 1. (Non-existent files are skipped.)
File No. +1	Increments the file No. by 1. (Non-existent files are skipped.)
File list display	Displays a list of files saved on internal memory or Memory Card.
Record Comment	Displays the comment of the currently selected file No.
Record No.	Enter a log No. within the range 00 to 65534. (Non-existent log Nos. cannot be entered.)
Record No. -1	Decrements the log No. by 1. (Non-existent logs are skipped.)
Record No. +1	Increments the log No. by 1. (Non-existent logs are skipped.)
Record list display	Displays a list of logs to save to the currently selected file No.
Record Comment	Displays the comment of the currently selected log No.
Search	Moves to the screen for searching log Nos. from log comments.
Access start	Executes verification.

SYSTEM MODE

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● **File list**

```
PLC Data Folder  File List                          ┌──────────────┐
     Keyence                                         │      OK      │
     KV-5000/3000, KV-L20V                           ├──────────────┤
                                                     │  Prev Page   │
                                                     ├──────────────┤
   File:              VTDVC00.wd3                    │  Next Page   │
                      Display the internal ultra-small PLC
                      KV series  Factory Test
     ┌──────────────┐  Display the internal ultra-small PLC
     │ VTDVC00.wd3  │  KV series  Factory Test
     ├──────────────┤  Single-handle sensor link system
     │ VTDVC01.wd3  │  QL series  Factory Test
     ├──────────────┤  Ultra-small PLC
     │ VTDVC02.wd3  │  KZ series  Factory Test
     ├──────────────┤  Free plane figure wiring
     │ VTDVC03.wd3  │  KL series  Factory Test
     ├──────────────┤  High-quality touch display
     │ VTDVC04.wd3  │  VT series  Factory Test
     └──────────────┘
```

┌──────────────┐
│ VTDVC**.wd3 │ : Files Selected
└──────────────┘

│ VTDVC**.wd3 │ : Existing Files

(**: 00 to 99)

· Select a log No. and press │ OK │ . And this will direct you to the previous menu.

· You can use the │ Prev page │ │ Next page │ to find a log when its No. is not displayed.

● **Record list**

```
PLC Data Folder   List of Record Comments           ┌──────────────┐
   File:              VTDVC00.wd3                    │      OK      │
                      Display the internal ultra-small PLC ├──────────────┤
                      KV series  Factory Test        │  Prev Page   │
   Record:            0                              ├──────────────┤
                                                     │  Next Page   │

     ┌───┐                        ┌───┐
     │ 0 │  KV-10AR               │ 5 │  KV-16AT
     └───┘                        └───┘
     ┌───┐                        ┌───┐
     │ 1 │  KV-10AT               │ 6 │  KV-16DR
     └───┘                        └───┘
     ┌───┐                        ┌───┐
     │ 2 │  KV-10DR               │ 7 │  KV-16DT
     └───┘                        └───┘
     ┌───┐                        ┌───┐
     │ 3 │  KV-10DT               │ 8 │  KV-24AR
     └───┘                        └───┘
     ┌───┐                        ┌───┐
     │ 4 │  KV-16AR               │ 9 │  KV-24AT
     └───┘                        └───┘
```

┌───┐
│ * │ : Selected Record
└───┘

│ * │ : Existing Record

(*: 0 to 65534)

· Select a log No. and press │ OK │ . And this will direct you to the previous menu.

· You can use the │ Prev page │ │ Next page │ to find a log when its No. is not displayed.

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SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

● **Comment Search**

```
PLC Data Folder   Search a Record Comment
File:          VTDVC00.wd3      Record:        0           [ OK ]
Enter a Comment:   KV-10AR
             [ Start to Search ]                    [ Kana ]

  1    2    3    4    5    6    7    8    9    0
  A    B    C    D    E    F    G    H    I    CA
                                              PS
  J    K    L    M    N    O    P    Q    R    CLR
  S    T    U    V    W    X    Y    Z    #    BS
  +    -    *    /    =    (    )    ,    .    SP
```
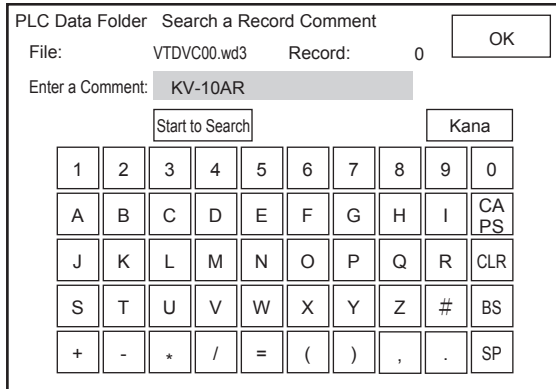
· After entering a log comment, press [Start Search] [Search] to display the target log No.

· After this, press [OK] . And this will direct you to the previous menu.

· A log No. can be found only when the log comment is fully consistent with it

· When multiple identical comments are present, the displayed log No. is unstable.

· When no log that contains the entered log comment is found during the search, the display of

the log No. becomes "NG".

● **About the station No. setup for the Ethernet connection (except VT3-V7R/Q5M(W)/ Q5M(W)A)**

Set the PLC No. of the target PLC when VT3 is connected over Ethernet.
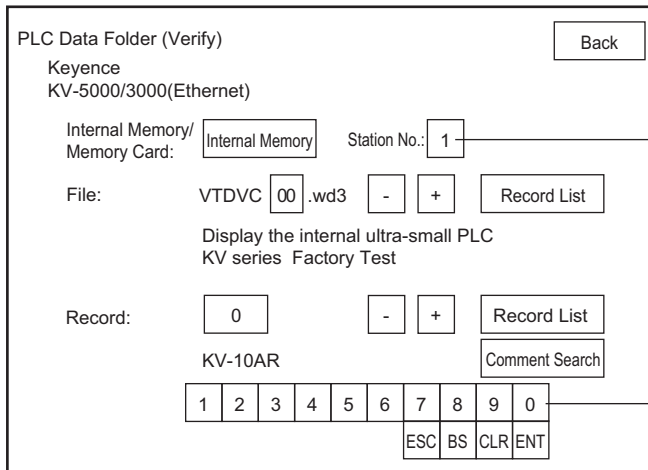
```
PLC Data Folder (Verify)                              [ Back ]
   Keyence
   KV-5000/3000(Ethernet)

   Internal Memory/  [ Internal Memory ]  Station No.:  1 ──────── Station No. setting switch
   Memory Card:                                                    Press the switch to display the
                                                                   numeric key. Setup station No.
   File:         VTDVC [00] .wd3   [ - ] [ + ]   [ Record List ]

                 Display the internal ultra-small PLC
                 KV series  Factory Test

   Record:         [ 0 ]          [ - ] [ + ]   [ Record List ]

                 KV-10AR                        [ Comment Search ]

                 1   2   3   4   5   6   7   8   9   0  ──────── Numeric key
                                         ESC  BS  CLR ENT
```

File Manager   X15 S12 S10 V10 V8 V7 V6H Q5H Q5T Q5S Q5M W4 V7R

■ Edit File

This item executes copying and deletion of logs, and editing of log comments.

```
PLC Data Folder (Edit File)                              [ Back ]

    Keyence
    KV-5000/3000, KV-L20V

    Internal Memory/                                          File No. -1
    Memory Card:     [Internal Memory]
                                                              File No. +1
    File:        VTDVC [00] .wd3    [ - ] [ + ]  [ Record List ]
                                                              Click this key to
                                                              display the List of Files.
    Display the inbuilt ultra-small PLC
    KV Series   Factory test
                                                              Record No.+1
                                                              Record No.-1
    Record:         [    0    ]     [ - ] [ + ]  [ Record List ]
                                                              Click this key to
                                                              display the List of Files.
    KV-10AR

    [ Copy a Record ] [ Delete a Record ] [ Edit a Comment ]  Edit a record comment
```

Internal Memory/Memory Card — Internal Memory/Memory Card
File No. — File No.
File Comment — File Comment
Record No. — Record No.
Log comments — Log comments
Delete a log — Delete a log
Copy a Record — Copy a Record

Item	Description
SRAM/Memory Card	Selects the file storage location between internal memory and Memory Card.
File No.	Enter a file No. within the range 00 to 99. (Non-existent file Nos. cannot be entered.)
File No. -1	Decrements the file No. by 1. (Non-existent files are skipped.)
File No. +1	Increments the file No. by 1. (Non-existent files are skipped.)
File list display	Displays a list of files saved on internal memory or Memory Card.
File Comment	Displays the comment of the currently selected file No.
Record No.	Enter a log No. within the range 00 to 65534. (Non-existent log Nos. cannot be entered.)
Record No. -1	Decrements the log No. by 1. (Non-existent logs are skipped.)
Record No. +1	Increments the log No. by 1. (Non-existent logs are skipped.)
Record list display	Displays a list of logs to save to the currently selected file No.
Record Comment	Displays the comment of the currently selected log No.
Edit Record comments	Moves to the screen for editing the comment of the currently selected log No.
Copy Record	Moves to the screen for copying the currently selected log.
Delete a Record	Deletes the currently selected log.

5

SYSTEM MODE

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

● **Record**

```
PLC Data Folder  Copy a Record              [ Back ]
   Keyence
   KV-5000/3000, KV-L20V
   Internal Memory/   Internal Memory
   Memory Card:
   File:          VTDVC00.wd3
                  Display the internal ultra-small PLC
                  KV series  Factory Test
   Copy a Source
   Record:              0
   Copy a Target   KV-10AR
   Record:          [ 20 ]   [ - ] [ + ]  [ Record List ]
                          [ Enter ]
```

```
PLC Data Folder  Execute Record Copy            [ Cancel ]
   File:         VTDVC00.wd3    Record:    20
   Enter a Comment :   KV-10AR-2
      [ Start to Copy ]                    [ Kana ]
   1  2  3  4  5  6  7  8  9  0
   A  B  C  D  E  F  G  H  I  CA PS
   J  K  L  M  N  O  P  Q  R  CLR
   S  T  U  V  W  X  Y  Z  #  BS
   +  -  *  /  =  (  )  ,  .  SP
```

· Enter the target record No. to be copied, and press [Apply] . This will direct you to the screen where you execute the copy.

· Enter the record comment from the keyboard, and press [Start Copy] [Copy] to execute the copy.

● **Record comments**

```
PLC Data Folder  Edit Record Comments       [ OK ]
   File:        VTDVC00.wd3   Record:0       [ Cancel ]
   Enter a comment:   KV-10AR
                                    [ Kana ]
   1  2  3  4  5  6  7  8  9  0
   A  B  C  D  E  F  G  H  I  CA PS
   J  K  L  M  N  O  P  Q  R  CLR
   S  T  U  V  W  X  Y  Z  #  BS
   +  -  *  /  =  (  )  ,  .  SP
```

· Pressing [OK] , the record comment is changed. And you return to the previous menu.

· Pressing [Canel] , the record comment is not changed. And you return to the previous menu.

· Up to 31 half-width characters can be entered for a log comment.

■ Copy, Delete File

This item is for copying or deleting a file.

```
┌────────────────────────────────────────────────────────────────────┐
│ PLC Data Folder (Copy/Delete a File )                    ┌────────┐  │
│                                                          │  Back  │  │
│    Keyence                                               └────────┘  │
│    KV-5000/3000, KV-L20V                                             │
│    Internal Memory/   ┌──────────────┐                               │
│    Memory Card:       │ Memory Card  │                               │
│                       └──────────────┘                               │
│    File :                                                            │
│                       ┌────┐  ┌───┐ ┌───┐  ┌──────────────┐          │
│              VTDVC    │ 00 │.wd3│ - │ │ + │  │  Record List │        │
│                       └────┘  └───┘ └───┘  └──────────────┘          │
│    Display the internal ultra-small PLC                              │
│    KV series  Factory Test                                           │
│                                                                      │
│              ┌────────────┐         ┌────────────┐                   │
│              │    Copy    │         │   Delete   │                   │
│              └────────────┘         └────────────┘                   │
└────────────────────────────────────────────────────────────────────┘
```

Internal Memory/ Memory Card — Internal Memory/ Memory Card:
File No. — File :
File No. -1
File No. +1
Click this key to display the List of Files.
File Comment
Copy — Copy
Delete — Delete

```
┌────────────────────────────────────────────────────────────────────┐
│ PLC Data Folder (Edit File)                              ┌────────┐  │
│                                                          │  Back  │  │
│    Keyence                                               └────────┘  │
│    KV-5000/3000, KV-L20V                                             │
│      Copy the source file:                                           │
│          Internal Memory                                             │
│          VTDVC00.wd3                                                 │
│          Display the internal ultra-small PLC                        │
│          KV series  Factory Test                                     │
│      Copy the target file :                                          │
│          Memory Card                                                 │
│                       ┌────┐  ┌───┐ ┌───┐  ┌──────────────┐          │
│          VTDVC        │ 08 │.wd3│ - │ │ + │  │  Record List │        │
│                       └────┘  └───┘ └───┘  └──────────────┘          │
│          New File                                                    │
│                       ┌──────────────┐                               │
│                       │ Start to copy│                               │
│                       └──────────────┘                               │
└────────────────────────────────────────────────────────────────────┘
```

File No.
File Comment
Start to copy — Start to copy
File No. -1
File No. +1
Click this key to display the List of Files.

System Mode
Option Setup
VT System Setup
PLC Communication Setup
Communicate With PLC
Memory Clear
Data Transmission
Viewer
Self Check
Monitoring
Memory Card
PLC Data Folder
Run Mode

Item	Description
SRAM/Memory Card	Selects the file storage location between internal memory and Memory Card.
File No.	Enter a file No. within the range 00 to 99. (Non-existent file Nos. cannot be entered.)
File No. -1	Decrements the file No. by 1. (Files that do not exist are skipped when selecting the copy source file.)
File No. +1	Increments the file No. by 1. (Files that do not exist are skipped when selecting the copy source file.)
File list display	Displays a list of files saved on internal memory or Memory Card.
File Comment	Displays the comment of the currently selected file No.
Copy	Moves to the screen for setting the copy destination.
Delete	Executes deletion. This item cannot be executed when SRAM is selected.
Start Copy	Executes copying.

● **File list**

```
PLC Data Folder    File List
     Keyence
     KV-5000/3000, KV-L20V                    OK

  Internal Memory/                          Prev Page
  Memory Card :    Internal Memory
                                            Next Page
  File :           VTDVC00.wd3
                   Display the internal ultra-small PLC
                   KV series  Factory Test
          VTDVC00.wd3    Display the internal ultra-small PLC
                         KV series  Factory Test
          VTDVC01.wd3    Single-handle sensor link system
                         QL series  Factory Test
          VTDVC02.wd3    Ultra-small PLC
                         KZ series  Factory Test
          VTDVC03.wd3    Free plane figure wiring
                         KL series  Factory Test
          VTDVC04.wd3    High-quality touch display
                         VT series  Factory Test
```

VTDVC**.wd3 : Files Selected

VTDVC**.wd3 : Existing Files

(**:00 to 99)
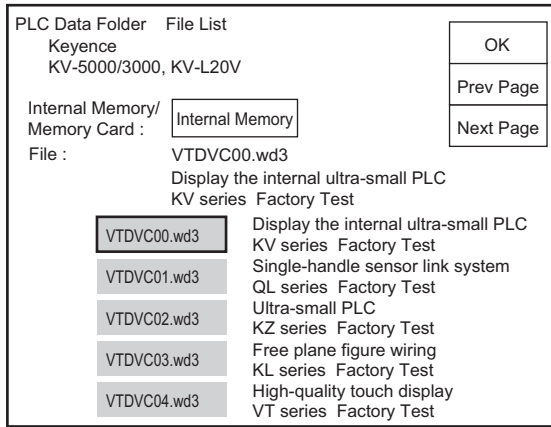
· Select a file No. and press   OK   . And this will direct you to the previous menu.

· You can use the   Prev page   Next page   to find a file when its No. is not displayed.

5-13 Run Mode

This section describes how to move to the Run mode.

Run Mode

Select the Run Mode menu item to move to the Run mode. The screen below is displayed for several seconds while the system is moving to the Run mode.

Saving system data
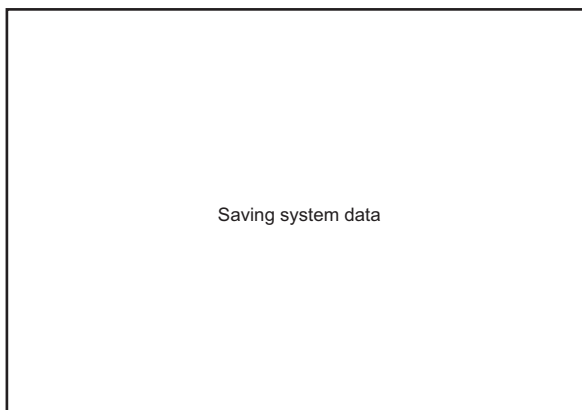
✎ Point   **When this screen is displayed, this means that the changes made to the data in the System mode are currently being saved. Do not turn the power OFF while the data is being saved.**

MEMO

5

SYSTEM MODE

6

PERIPHERALS

This chapter describes the equipments connected with VT3 series.

6-1 Memory Card

This section describes the memory card (OP-42254) that can be used on the VT 3 series.

> ✎ **Point**   **Memory card cannot be used for VT3-W4T(A)/W4M(A)/W4G(A).**

Overview

With the memory card, the following data can be written into the memory card (OP-42254) or read from the memory card to VT3.

- Screen data
- System program
- Hard copy data
- Form screen data
- BMP file replacement data
- Video capture data (only for VT3-X15(D)/S12(D)/S10/V10(D)/V8)
- Alarm log data
- Trend chart data
- PLC data folder data
- Worksheet data
- Operation log

With the memory card, you can read and write data on VT3 even without VT STUDIO, which makes it easier for remote control and data transfer between the workshop and office.

Specifications of Memory Card (OP-42254)
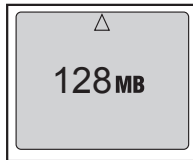
Front

Type	Compact flash memory
Storage cell	EEPROM
Memory capacity	128 Mbytes
Number of rewrites	100,000 times
Operating temperature	0 to +60°C
Storage temperature	-20 to +65°C

Memory Card Adapter (C-A1)

The memory card adapter C-A1 is used when the memory card (OP-42254) is to be inserted into the PC card slot on a PC. When the memory card adapter C-A1 is used, the memory card can be handled as a PCMCIA2.1/JEIDA4.2-compliant PC card (Type II).

■ Inserting the Memory Card into the Memory Card Adapter

When inserting the memory card (OP-42254) into memory card adapter C-A1, make sure that the triangular marks on the card and adapter are aligned with each other.

C-A1

Front

OP-42254
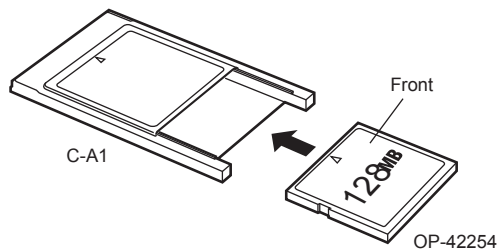
> **NOTICE**   **Pins on the card or adapter will be damaged if the memory card is inserted incorrectly.**

Insert to and Remove from VT3

> ▶ **Important** Be sure to remove and insert memory cards when they are not being accessed. Otherwise, the data on the memory card may be corrupted. Memory cards can be removed or inserted only when the System mode menu screen is displayed, or when the "Memory card accessing in progress" or "PLC data folder being executed" bits in system memory area are OFF.

> ✎ **Point** • Memory card cannot be accessed when the memory card slot cover of VT3 is open. Be sure to close the memory card slot cover before use.
> • For an on-going access to the memory card, the access will continue until it is completed when the memory card slot cover is open during this time.
> • In the following steps, we will take the VT3-S12(D) on the back of the memory card slot as an example.
> • For VT3-V7R, the cover shoud be closed and screwed after the memory card is removed for a better protection (IP65f).

■ **VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A**

● **Installation of memory card**

1 Slide the memory card slot cover towards you and open it (1), then insert memory card into the slot(2).
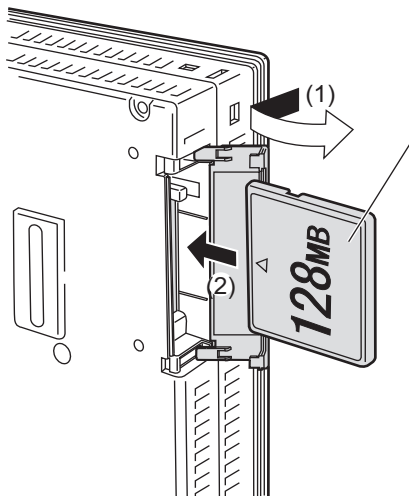
> ✎ **Point** The front side of the memory card shoud be towards the rear side of the VT3 unit when insert.

2 Close the cover by sliding the cover until you hear a "click" sound.
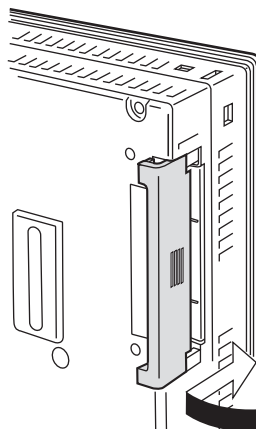
6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

● **Removing memory card**

1 Slide the memory card slot cover towards you and open it (1), then keep on pressing the EJECT button until you unplug the memory card (2).

EJECT button

(1)

(2)

128MB
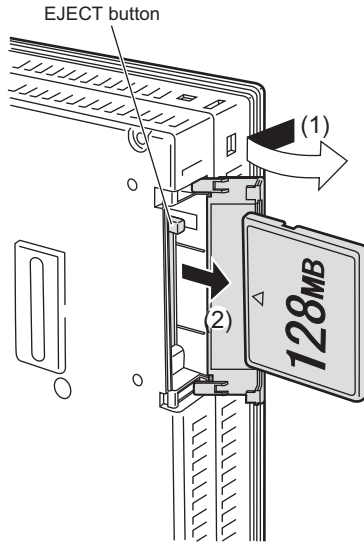
2 Close the cover by sliding the cover until you hear a "click" sound.
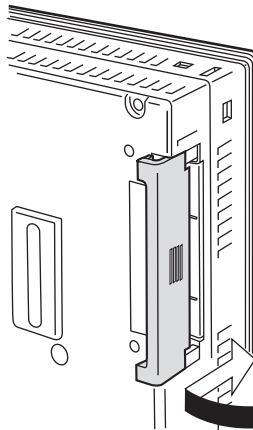
■ **VT3-V6H(G)/Q5H(G)**

1 Loosen two screws on the cover of memory card slot of VT3 handy series. (Do not remove the screws completely, so as to avoid missing).
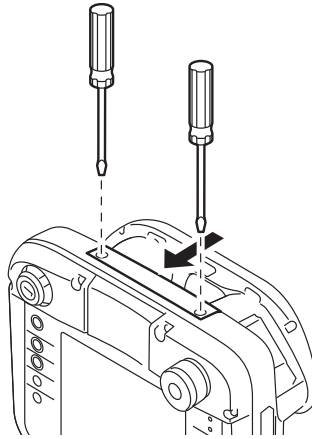
2 Lift the cover in the arrow direction (back) and remove it.

NOTICE	Be careful not to bend the bulge indicating memory card inserted.

3 Remove/insert the memory card.

USB port

Back
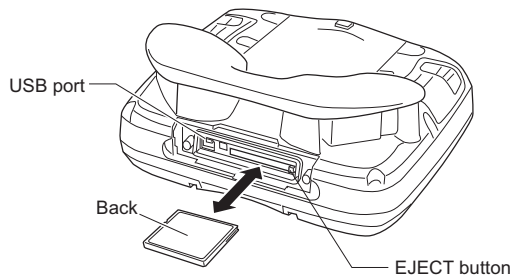
EJECT button

* Press the EJECT button to remove the memory card.

4 Install the cover on the VT3 handy series, and tighten it with the screws (tightening torque: 4 to 5kgf·cm)

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PERIPHERALS

■ VT3-V7R

● Installation of memory card

1 Unscrew the cover on the left side of the unit, and remove the cover.
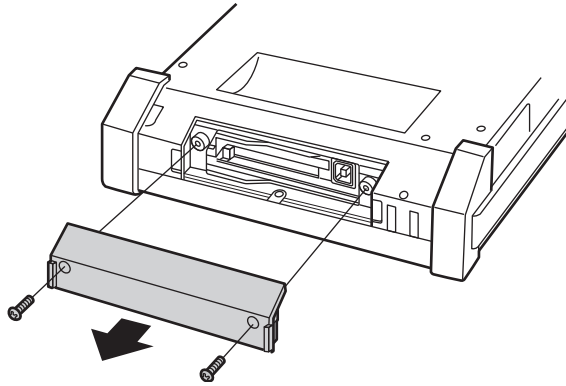
2 Insert memory card into the slot in the arrow head direction.

Back side
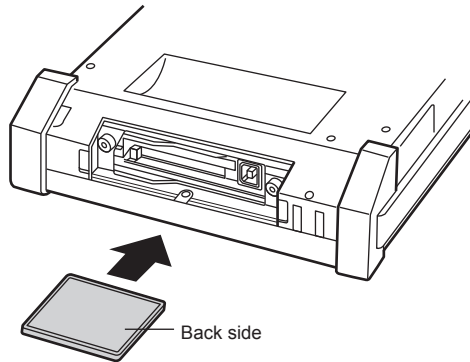
3 Put back the cover removed in Step 1 and screw it (with a tightening torque below 0.49N·m).
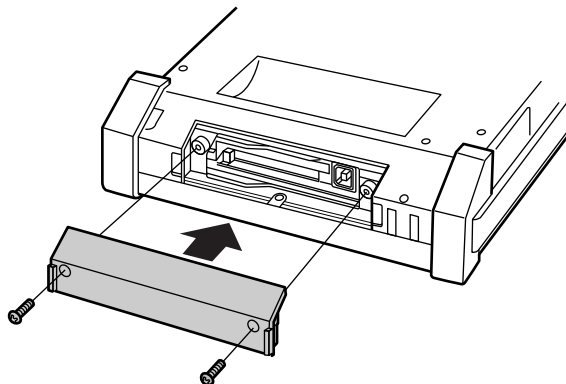
● **Removing memory card**

1 Unscrew the cover on the left side of the unit, and remove the cover.
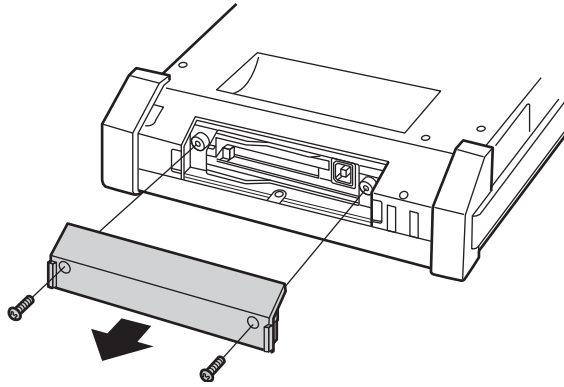
2 Press the EJECT button of VT3-V7R and unplug memory card.
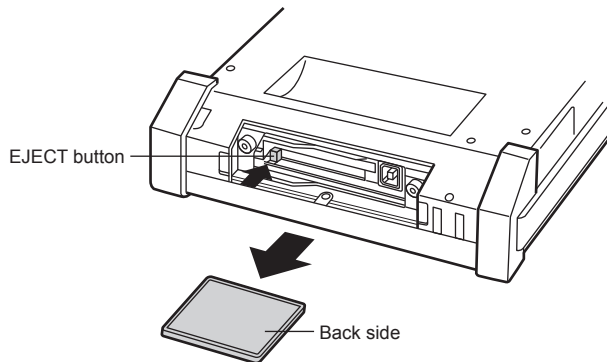
EJECT button

Back side

3 Put back the cover removed in Step 1 and screw it (with a tightening torque below 0.49N·m)
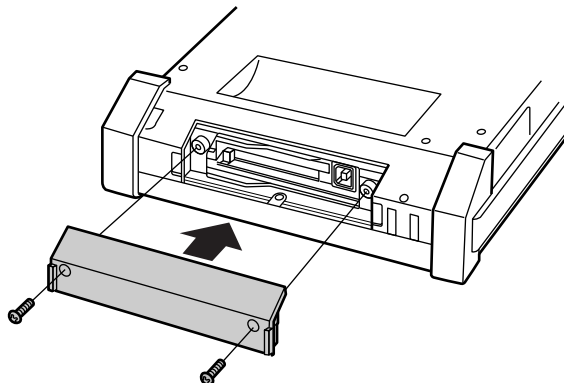
Functions of Memory Card

To use memory card on VT3, you can select the VT3 mode or VT2 compatible mode.

You can change the mode with VT STUDIO.

📖 "12-4 Memory Card", *VT3 Series Reference Manual*

■ Screen Data

Different from the screen data in VT STUDIO, the data is used for memory card screen.

Item	Description
File name	VTEDT*.ms4(*:0 to 9)
Number of files to be saved	10 files

Reference	For the VT3 mode or VT2 compatible mode, the file name and number of saved files are always the same.

NOTICE	When the screen data is read from memory card, the screen data saved in VT3 will be lost. In addition, the alarm logging data, trend data (real-time), XY graphic chart data (real-time), and recorded operation log will also be lost. You can save the data into VT STUDIO or memory card as required.

● VT -> Memory Card (Write)

1 From the "Memory Card" in the System mode, write the screen data of memory card to memory card.

📖 "Screen Data check", page 5-38

2 Read the screen data of memory card from memory card with VT STUDIO, and edit it.

📖 "3-1 File Manager", *VT3 Series Reference Manual*

● Memory Card -> VT (Read)

1 Write the screen data of memory card to memory card with VT STUDIO.

📖 "3-1 File Manager", *VT3 Series Reference Manual*

2 Read the screen data of memory card from memory card by "Memory Card" in the System mode.

📖 "Screen Data check", page 5-38

■ **System Program**

Please use the files common to all the VT3 series.

System programs can only be read from memory card. The system programs in the VT3 series cannot be written to memory card.

Item	Description
File name[1]	VT3C_***.vp3 VT3S_***.vp3 VT3L_***.vp3

*1   "***" indicates the version number of the system program

NOTICE	• **After the system program is transmitted, all the saved alarm logging data, trend chart data (real-time), XY graphic chart data (real-time), data in PLC folders, recorded work data, and setting data of the main unit in the System mode will be deleted.** • **When the version of the system program of the VT main unit is Ver.4.5 or above, it is not possible to transfer the system program of below Ver.4.5.**

Point	**The system program is upwardly compatible. The system program on the unit needs not be transmitted if it is a newer version than that on the memory card.**

● **Memory Card -> VT (Read)**

1 Write the system program and screen data of memory card to memory card with VT STUDIO.

2 Read the system program from memory card in the System mode.

3 In Step 2, the screen data and PLC data folders are all lost.
Read the screen data of memory card from memory card in the System mode.

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

■ **Hard Copy**

You can hard-copy the operation screen on VT3, and save them in BMP/JPG formats.

To write hard copy data to memory card, set "Printer Type: Memory Card."

📖 "12-4 Setup of VT Series System", *VT3 Series Reference Manual*

📖 "Printer Type", page 5-23

● **VT3 Mode**

Item	Description
Directory name	\VTIMG \00000_00999 to 65000_65535
File name[*1]	IMG*****.bmp/jpg(*****: 00000 to 65535)
Number of files to be saved	65,536 files (a record contains 1,000 files)

*1   ***** indicates min. free space value within 00000 to 65535 in memory card. File No. can not be specified. If a hard copy is made after all file Nos. have been used, an error occurs.

● **VT2 Compatible Mode**

Item	Description
Directory name	\VTIMG
File name[*1]	VTIMG**.bmp/jpg(**:F00 to 99)
Number of files to be saved	100 files

*1   "**" indicates min. free space value within 0 to 99 in memory card. File No. can not be specified. If a hard copy is made after all file Nos. have been used, an error occurs.

● **VT** -> **Memory Card (Write)**

Hard copies can be made by the following operations:

• How to use the switch

📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*

• Use device function controls

📖 "9-7 Function Control Setting of Devices", *VT3 Series Reference Manual*

• Use the System Storage Area

📖 "Chapter 14 System Storage Area", *VT3 Series Reference Manual*

● **Memory Card -> VT (Read)**

View using the Browser in the System mode.

📖 "Viewer", page 5-71

■ **Form Printing**

You can hard-copy the form screen on VT3, and save them in BMP/JPG formats.
To write form data to memory card, set "Printer Type: Memory Card".
   📖 "12-4 Setup of VT Unit System", *VT3 Series Reference Manual*
   📖 "Printer Type", page 5-23

● **VT3 Mode**

Item	Description
Directory name	\VTRPT \No0 to NoF \00000_00999 to 65000_65535
Filename[1]	RPT*****.bmp/jpg(*****:00000 to 65535+(any character string)
Number of files to be saved	65,536 files per page No. (total 1,048,576 files)

*1   "*****" indicates min. free space value within 00000 to 65535 in memory card. File No. can not be specified. If a form screen is printed after all file Nos. have been used, an error occurs.

● **VT2 Compatible Mode**

Item	Description
Directory name	\VTRPT
File name[1]	VTRPT#**.bmp/jpg #: 0 to F Form screen page No. (P00 to P15) **:00 to 99 File No.
Number of files to be saved	100 files

*1   "**" indicates min. free space value within 0 to 99 in memory card. File No. can not be specified. If a form screen is printed after all file Nos. have been used, an error occurs.

● **VT ->Memory Card (Write)**

Printing of form screens is started by print trigger bit devices set in the screen attribute settings of the form screen.
   📖 "11-4 Form Printing", *VT3 Series Reference Manual*

■ **BMP File Replacement**

Multiple image files pre-stored in memory card can be switched to operation screen by the BMP file replacement parts set up from the screen.

● **VT3 Mode**

Item	Description
Directory name	\VTBMP \00000_00999 to 65000_65535
File name	BMP*****.bmp/jpg(*****: 00000 to 65535+(any character string)
Number of files to be saved	65536 files

● **VT2 Compatible Mode**

Item	Description
Directory name	\VTBMP
File name	VTBMP ***.bmp/jpg(***: 000 to 999)
Number of files to be saved	1000 files

● **Memory Card -> VT (Read)**

1 **Write the bitmap file to memory card.**

Files saved in the "\VTCPT" and "\VTIMG" directories can also be switched and displayed.

2 **Display bit maps based on the file No.s specified in the bit map file replacement parts.**

   📖 "9-8 Set up the BMP File Replacement", *VT3 Series Reference Manual*

6

PERIPHERALS

Memory
Card
Expansion
memory
Barcode
Reader
Video Unit
ETHERNET
Switch Unit
Printer Unit
Emergency-Stop
Switch Unit
Switch Unit
External Memory
Card Slot
Specific
Panel Mounts

■ **Video Capfure**

Capture the video display screens and save them in the BMP/JPG format.

● **VT3 Mode**

Item	Description
Directory name	\VTCPT \RGB,CH1 to CH4 \00000_00999 to 65000_65535
File name[1]	CPT*****.bmp/jpg(*****:00000 to 65535+(any character string)
Number of files to be saved	65,536 files per channel (total 327,680 files)

[1] ***** indicates min. free space value within 00000 to 65535 in memory card. File No. can not be specified. If a video screen is captured by switch after all file Nos. have been used, an error occurs.

● **VT2 Compatible Mode**

Item	Description
Directory name	\VTCPT
File name[1]	VTCPT#**.bmp/jpg #:0 RGB input #:1 to 4 Video input CH1 to CH4 **:00 to 99 File No.
Number of files to be saved	100 files per channel (total 500 files)

[1] For switches, "**" indicates min. free space value within 0 to 99 in memory card. File No. can not be specified. If a video screen is captured by switch after all file Nos. have been used, an error occurs.
File No.s can be specified when using device function controls.

✎ **Point**   **When a video display screen is not displayed in the VT3 screen, it cannot be captured.**

● **VT -> Memory Card (Write)**

Video can be captured by the following operations:
- Use the switch
- Use devic function controls
- Video capture trigger input (CH1 or RGB)

● **Memory Card -> VT (Read)**

View using the browser in the System mode.

6

PERIPHERALS

■ **Alarm Log**

Alarm log data can be saved in the CSV/UNICODE (TXT) format.

Alarm log data can only be written to memory card and cannot be read from memory card to VT3.

● **VT3 Mode**

Item	Description
Directory name	\VTALM \ID0 to ID3 \00000_00999 to 65000_65535
File name	ALM*****.csv/txt(*****:00000 to 65535+(any character string)
Number of files to be saved	65,536 files per alarm ID (total 262,144 files)

● **VT2 Compatible Mode**

Item	Description
Directory name	\VTALM
File name	VTALM#**.csv/txt #:0 to 3 Alarm ID **:00 to 99 File No.
Number of files to be saved	100 files per alarm ID (total 400 files)

● **VT -> Memory Card (Write)**

Alarm log data can be saved by the following operation:

• Use "Memory Card" in the System mode

  📖 "Log Data", page 5-72

  📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*

• Use device function controls

  📖 "9-7 Set up Device Function Controls", *VT3 Series Reference Manual*

Example: alarm log in CSV file

■ Trend Chart

Trend charts can be saved in the CSV format.

Trend data can only be written to memory card and cannot be read from memory card to VT3.

● VT3 Mode

Item	Description
Directory name	\VTTRD \ID0 to ID3 \00000_00999 to 65000_65535
File name	TRD*****.csv(*****:00000 to 65535+(any character string)
Number of files to be saved	65,536 files per trend ID (total 262,144 files)

● VT2 Compatible Mode

Item	Description
Directory name	\VTTRD
File name	VTTRD#**.csv #:0 to 3 Trend ID **:00 to 99 File No.
Number of files to be saved	100 files per trend ID (total 400 files)

● VT -> Memory Card (Write)

Trend data can be saved by the following operation:

• Use "Memory Card" in the System mode

　📖 "Log Data", page 5-72

　📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*

• Use device function control

　📖 "9-7 Set up Device Function Controls", *VT3 Series Reference Manual*

Example: real-time trend chart in CSV file

```
TREND ID         0           DATA1-7
DATE      2006/4/18    15:56:56

No        DATE       TIME     DATA1   DATA2   DATA3   DATA4   DATA5   DATA6   DATA7
      0  2006/4/18   15:56:56  1105    1658     368     884     111    5525    2542
      1  2006/4/18   15:56:56  1105    1658     368     884     111    5525    2542
      2  2006/4/18   15:56:56  1202    1803     401     962     120    6010    2765
      3  2006/4/18   15:56:56  1015    1523     338     812     102    5075    2335
      4  2006/4/18   15:56:55   458     687     153     366      46    2290    1053
      5  2006/4/18   15:56:55  1628    2442     543    1302     163    8140    3744
      6  2006/4/18   15:56:55  2393    3590     798    1914     239   11965    5504
      7  2006/4/18   15:56:55   684    1026     228     547      68    3420    1573
      8  2006/4/18   15:56:54  2205    3308     735    1764     221   11025    5072
      9  2006/4/18   15:56:54  4095    6143    1365    3276     410   20475    9419
     10  2006/4/18   15:56:54  3521    5282    1174    2817     352   17605    8098
     11  2006/4/18   15:56:54  4089    6134    1363    3271     409   20445    9405
     12  2006/4/18   15:56:54  4095    6143    1365    3276     410   20475    9419
     13  2006/4/18   15:56:53  3138    4707    1046    2510     314   15690    7217
     14  2006/4/18   15:56:53  4095    6143    1365    3276     410   20475    9419
     15  2006/4/18   15:56:53  4095    6143    1365    3276     410   20475    9419
     16  2006/4/18   15:56:53  1826    2739     609    1461     183    9130    4200
     17  2006/4/18   15:56:53   590     885     197     472      59    2950    1357
     18  2006/4/18   15:56:52  2970    4455     990    2376     297   14850    6831
     19  2006/4/18   15:56:52  4095    6143    1365    3276     410   20475    9419
     20  2006/4/18   15:56:52  3915    5873    1305    3132     392   19575    9005
     21  2006/4/18   15:56:52  1977    2966     659    1582     198    9885    4547
     22  2006/4/18   15:56:51  1051    1577     350     841     105    5255    2417
     23  2006/4/18   15:56:51   699    1049     233     559      70    3495    1608
     24  2006/4/18   15:56:51  3673    5510    1224    2938     367   18365    8448
     25  2006/4/18   15:56:51   231     347      77     185      23    1155     531
     26  2006/4/18   15:56:51  3263    4895    1088    2610     326   16315    7505
     27  2006/4/18   15:56:50    37      56      12      30       4     185      85
     28  2006/4/18   15:56:50  1474    2211     491    1179     147    7370    3390
     29  2006/4/18   15:56:50  3278    4917    1093    2622     328   16390    7539
     30  2006/4/18   15:56:50  2087    3131     696    1670     209   10435    4800
     31  2006/4/18   15:56:49     1       2       0       1       0       5       2
     32  2006/4/18   15:56:49     1       2       0       1       0       5       2
```

6 PERIPHERALS

■ **PLC Data Folder**

It is saved as PLC data folder data on memory card, not as part of screen data in internal memory.

Item	Description
Directory name	\VTDVC
File name	VTDVC**.wd3(**: 00 to 99)
Number of files to be saved	100 files

> | Reference | For the VT3 mode or VT2 compatible mode, the file names and number of saved files are always the same. |

> | NOTICE | **When the same file is overwritten, all device values saved so far will be lost.** **Please use the PLC data folder editing tool or memory card to save device values as necessary.** |

● **Write methods**

PC -> Memory Card

Writes (saves) PLC data folder data to memory card by setting the saving destination as memory card with the editing tool of PLC data folder.

☐ "Chapter 15 PLC Data Folder", *VT3 Series Reference Manual*

Internal Memory -> Memory Card

Writes PLC data folder data as a file copy by "PLC Data Folder" in the System mode.

The copy methods include Internal Memory->memory card (file No.s) or memory card -> Internal Memory (file No.s).

☐ "File Manager", page 5-85

● **Read methods**

Memory Card -> PC

Reads (opens) PLC data folder data from memory card with the memory card as the open destination in the PLC data folder editing tool

☐ "Chapter 15 PLC Data Folder", *VT3 Series Reference Manual*

Memory Card -> Memory Card

Read PLC data folder data as a file copy by "PLC Data Folder" in the System mode, and write to a different file on memory card.

There is only one copy method: memory card (file No.) -> memory card (file No.).

☐ "File Manager", page 5-85

> | Point | **Devices that can be saved are within the range of devices that can be used on each PLC.** ☐ "VT5 Series/VT3 Series/DT Series PLC Connection Manual" |

6

PERIPHERALS

■ **Worksheet**

Worksheet data can be saved in the CSV/UNICODE (TXT) format.

Worksheet data can only be written to memory card and cannot be read from memory card to VT3.

● **VT3 Mode**

Item	Description
Directory name	\VTWS \ID0 to ID3 \00000_00999 to 65000_65535
File name	WS*****.csv/txt(*****:00000 to 65535+(any character string)
Number of files to be saved	65,536 files per worksheet ID (total 262,144 files)

● **VT2 Compatible Mode**

Item	Description
Directory name	\VTWS
File name	VTWS#**.csv/txt #:0 to 3 Worksheet ID **:00 to 99 File No.
Number of files to be saved	100 files per worksheet ID (total 400 files)

● **VT -> Memory Card (Write)**

The worksheet data can be written(saved) through device function controls.

📖 "9-7 Set up Device Function Controlsl", *VT3 Series Reference Manual*

■ **Operation Log Screen Data**

The screen data used to save work records.

Item	Description
Directory name	\VTOPL
File name	VTOPL0.ms4
Number of files to be saved	1 file

■ **Operation log**

The operation data can be saved in the CSV/UNICODE "TXT" format.

The operation data can only be written to memory card, and cannot be read from memory card to VT3.

● **VT3 Mode/VT2 Compatible Mode**

Item	Description
Directory name	\VTOPL\00000_00999 to 65000_65535
File name[1]	OPL*****.csv/txt(*****:00000 to 65535+(any character string)
Number of files to be saved	65,536 files (a record contains 1,000 files)

[1]   File No. can be specified automatically. "*****" indicates min. free space value within 00000 to 65535 in memory card.

Folder Structure of Memory Card

Different data is used by memory card for the VT3 mode and VT2 compatible mode, which is saved in the following folder structures respectively.

● **VT3 Mode**

Directory of Memory Card	File Type	File Name	R/W
Root Directory	Screen Data System Program	VTEDT*.ms4 (*: 0~9) VT3C_***.vp3/ VT3S_***.vp3/ VT3L_***.vp3 (***: Version number)	R/W R
AUTOLOAD	Screen Data System Program	AUTOLOAD.ms4 VT3C_***.vp3/ VT3S_***.vp3/ VT3L_***.vp3 (***: Version number)	
VTALM → ID0 → 00000_00999 ... 65000_65535 ID3 → 00000_00999 ... 65000_65535	Alarm Log	ALM***** (Character string).csv/ ALM***** (Character string).txt (*****: 00000~65535)	W
VTBMP → 00000_00999 ... 65000_65535	BMP File Replacement	BMP***** (Character string).bmp/ BMP***** (Character string).jpg (*****: 00000~65535)	R
VTCPT → RGB → 00000_00999 ... 65000_65535 CH1 → 00000_00999 ... 65000_65535 CH4 → 00000_00999 ... 65000_65535	Video Capture	CPT***** (Character string).bmp/ CPT***** (Character string).jpg (*****: 00000~65535)	R/W
VTDVC	PLC Data Folder	VTDVC·*.wd3 (*: 00~99)	R/W
VTIMG → 00000_00999 ... 65000_65535	Hard Copy	IMG*****.bmp/ IMG*****.jpg (*****: 00000~65535)	R/W

(continue)

* • Character string in " ( ) " is any character string specified with VT STUDIO.
    • About R/W
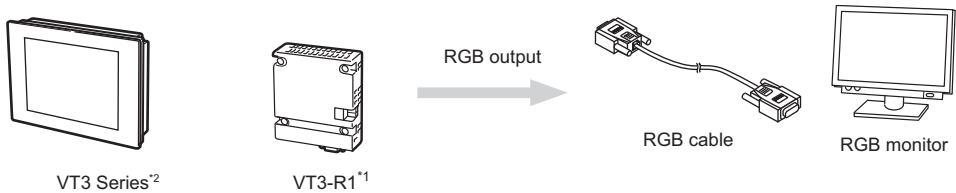   R : Memory Card->VT   W : VT->Memory Card

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

Directory of Memory Card	File Type	File Name	R/W

(continued)

VTRPT — No0 — 00000_00999 ... 65000_65535 / NoF — 00000_00999 ... 65000_65535

Form Screen — RPT***** (Character string).bmp/ RPT***** (Character string).jpg (*****: 00000~65535) — W

VTTRD — ID0 — 00000_00999 ... 65000_65535 / ID3 — 00000_00999 ... 65000_65535

Trend Chart — TRD***** (Character string).csv (*****: 00000~65535) — W

VTWS — ID0 — 00000_00999 ... 65000_65535 / ID3 — 00000_00999 ... 65000_65535

Worksheet — WS***** (Character string).csv/ WS***** (Character string).txt (*****: 00000~65535) — W

VTOPL —

Screen Data for Operation Log — VTOPL0.ms4

VTOPL — 00000_00999 ... 65000_65535

Opoeration Log — OPL***** (Character string).csv/ OPL***** (Character string).txt (*****: 00000~65535)

* • Character string in " ( ) " is any character string specified with VT STUDIO.
   • About R/W
     R : Memory Card ->VT   W : VT->Memory Card

6

PERIPHERALS

● **VT2 Compatible Mode**

Directory of Memory Card	File Type	File Name
Root Directory	Screen Data System Program	VTEDT*.ms4(*: 0~9) VT3C_**.vp3/ VT3S_**.vp3/ VT3L_**.vp3 (**: Version number)
AUTOLOAD	Screen Data System Program	AUTOLOAD.ms4 VT3C_**.vp3/ VT3S_**.vp3/ VT3L_**.vp3 (**: Version number)
VTALM	Alarm Log	VTALM#*.csv/ VTALM#*.txt (#: 0~3, *: 00~99)
VTBMP	BMP File Replacement	VTBMP**.bmp/ VTBMP**.jpg (**: 000~999)
VTCPT	Video Capture	VTCPT#*.bmp/ VTCPT#*.jpg (#: 0~4, *: 00~99)
VTDVC	PLC Data Folder	VTDVC*.wd3 (*: 00~99)
VTIMG	Hard Copy	VTIMG*.bmp/ VTIMG*.jpg (*: 00~99)
VTRPT	Form Screen	VTRPT#*.bmp/ VTRPT#*.jpg (#: 0~F, *: 00~99)
VTTRD	Trend Chart	VTTRD#*.csv (#: 0~3, *: 00~99)
VTWS	Worksheet	VTWS#*.csv/ VTWS#*.txt (# : 0~3, *: 00~99)
VTOPL	Screen Data for Operation Log	VTOPL0.ms4
00000_00999	Operation Log	OPL*****(Character string).csv/ OPL*****(Character string).txt (****: 00000~65535)
65000_65535		

Precautions

- Only OP-42254 memory card can be used. Otherwise, normal operation can not be ensured.
- The capacity (128 MB) of memory card cannot be exceeded. Otherwise, files cannot be saved.
- Please do not execute multiple accesses to memory card at one time. Make sure that the bits in "Memory card accessing in progress" or "PLC data folder being executed" in system memory area are OFF, and execute these procedure one at a time.

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

6-2 Expansion Memory

This section describes how to mount Expansion memory (OP-42253).

Expansion Memory (only for VT3-X15(D)/S12(D)/S10/V10(D))

28MB memory is available for VT3-X15(D) as standard, and 12MB memory available for VT3-S12(D)/S10/V10(D). When excessive data needs to be processed, however, it is necessary to add the expansion memory (16Mbytes).

⚠ WARNING	To prevent from electric shocking, please ensure power off before you install expansion memory.

■ **Installing Steps**

1 Turn VT3 off, and remove all the power cables, communication cables, and expansion units.
If there is a memory card, remove it, and check to ensure the EJECT button is pressed down to the bottom. If there is a short bar installed, remove it too.

2 Remove screws on the covers of unit housing (11 screws for VT3-X15(D), and 8 screws for VT3-S12(D)/S10/V10(D)), and remove the covers.

Plastic Screw: 2
Metal Screw: 9

Metal Screw: 8

<VT3-X15(D)>   <VT3-S12(D)/S10/V10(D)>
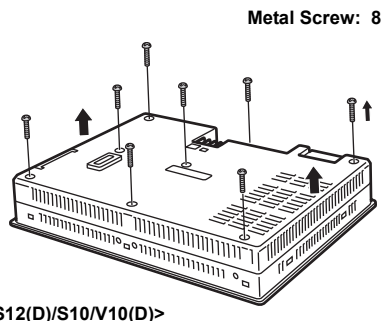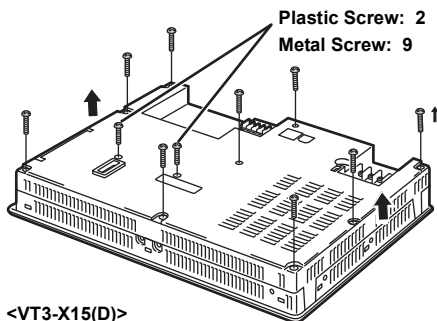
3 Align the pole of expansion memory and with that of the expansion memory connector, and insert it with the back end tilted upward and then press down.

heat sink   heat sink

<VT3-X15(D)>   <VT3-S12(D)/S10/V10(D)>
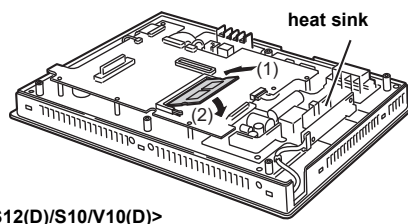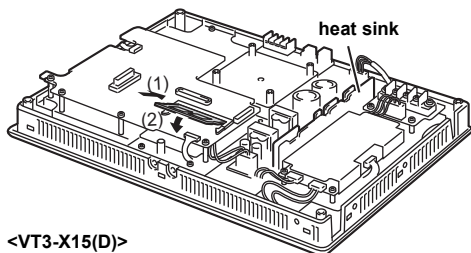
⚠ WARNING	The heat sink maybe very hot after operation. Please do not touch it.

4 When it is correctly inserted, you can hear a "click" sound. Make sure that it has been correctly inserted.

5 After installing expansion memory, put back the covers of unit housing and screw it. (refer to Step 2)

Screw	Tightening torque
Metal Screw	0.5N•m(5.1kgf•cm)
Plastic Screw	0.15N•m(1.5kgf•cm)

6 Install memory card and short bar just as before.
So does the installation of the expansion units, communication cables, power cables etc. (Refer to Step1)

■ **Removing Steps**

1 Turn VT3 off, and remove all the power cables, communication cables, and expansion units.
If there is a memory card inserted, remove it, and check to ensure the EJECT button is pressed down to the bottom. If there is a short bar installed, remove it too.

2 Remove screws on the covers of unit housing (11 screws for VT3-X15(D), and 8 screws for VT3-S12(D)/S10/V10(D), and remove the covers.

Plastic Screw: 2
Metal Screw: 9

Metal Screw: 8

<VT3-X15(D)>

<VT3-S12(D)/S10/V10(D)>
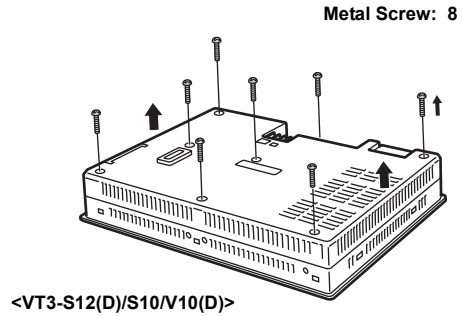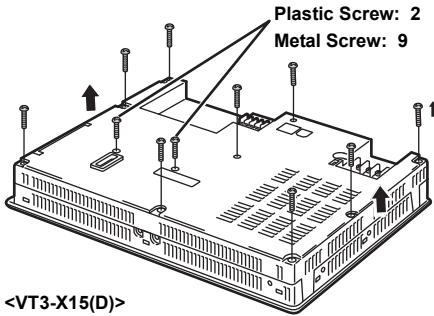
3 Put outward the fixing device of expansion memory

heat sink

heat sink

<VT3-X15(D)>

<VT3-S12(D)/S10/V10(D)>
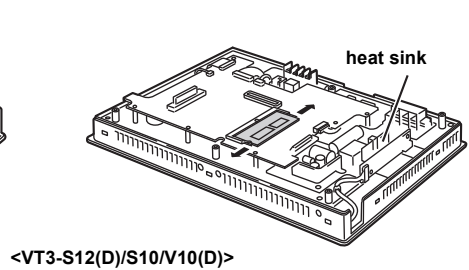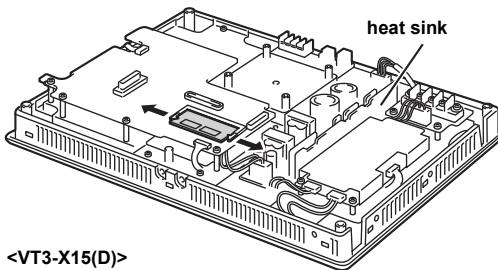
⚠ WARNING **The heat sink maybe very hot after operation. Please do not touch it.**

4 Expansion memory is then released. Please unplug it slowly to prevent from scratching.

<VT3-X15(D)>

<VT3-S12(D)/S10/V10(D)>
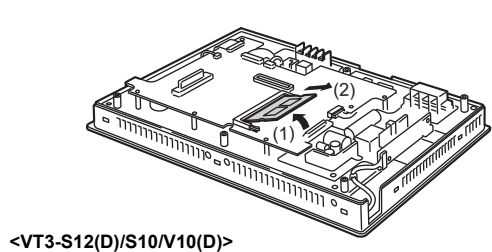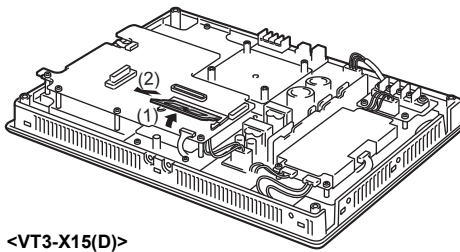
5 After removing expansion memory, put back the covers and screw it. (refer to Step 2)

Screw	Tightening torque
Metal Screw	0.5N•m(5.1kgf•cm)
Plastic Screw	0.15N•m(1.5kgf•cm)

6 Install memory card and short bar just as before.
So does the installation of the expansion units, communication cables, power cables etc. (Refer to Step1)

✎ Point **After removing expansion memory, be sure to transmit the screen data set to "w/o expansion memory".**
📖 "3-6 File Management", *VT3 Series Reference Manual*

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

Barcode Reader

Barcode Reader

Connect the VT3 series (except VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R) with our barcode readers, and directly display the read barcode data in the form of characters which can be saved in the destination word devices.

RFID
RF-500(550)

Barcode

Barcode reader
BL-80RK/210RK,HR-40RK/50RK,TL-30K

PORT3

VT3 Series
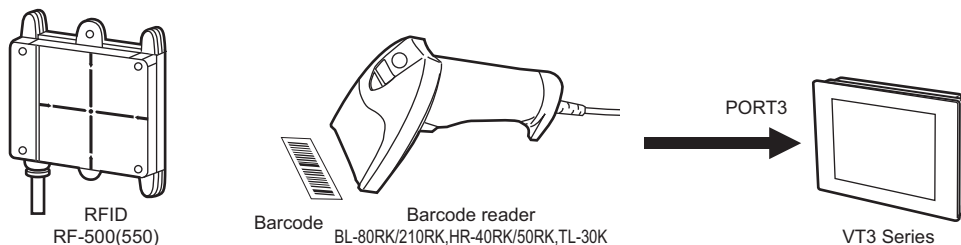
> ✎ **Point**   **Barcode reader cannot be connected for VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R.**

● Connectable Barcode Readers

Model	Type	Power Suply
BL-80RK	CCD hand-held	VT3 is used as the power unit
BL-210RK	Laser hand-held	
HR-40RK/50RK	Laser hand-held	
TL-30K	CCD hand-held (2-dimensional)	Special AC adapter
RF-500(550)	High performance RFID head	BL-U2 is used as the power unit

■ Set up the Communication Conditions

Set up the conditions of communication between the barcode readers and VT3.
For more information, please refer to the instruction manuals of the barcode readers.

Item		Description	Default
Reading Mode		Auto, Manual	Auto
Heading[*1]		STX, ESC, None	-
Delimiter[*1]		ETX, CR, LF, CR+LF	-
Checksum[*1]		Disabled, valid(TL-30K), valid(RF-500)	-
Communication Setting	**Baud Rate**	9600, 19200, 38400, 57600, 115200bit/s	9600 bit/s
	Data length	7 bit, 8 bits	7 bits
	Parity	Even, Odd, None	Even
	Stop bit	1 bit, 2 bits	1 bit
	Operation mode	Non-procedure	Non-procedure

*1　　Heading, delimiter and checksum can only be set up when the reading mode is "Manual".

■ Supply Power to barcode

For the barcode readers connected to PORT3 of VT3, 5V power should be supplied.

Item	Description	Default
Supply Power to barcode	Supply DC5V power to the barcode readers through Pin 9 on the D-sub 9-pin connector.	Available

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PERIPHERALS

■ **Connect with BL-80RK/210RK, HR-40RK/50RK**

The following describes how to connect VT3 series (except VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R) with our barcode readers BL-80RK/210RK or HR-40RK/50RK.

● **Communication settings**

From VT STUDIO, select "Resources(R)" -> "Set up the VT unit System(S)" -> "Barcode(B)" step by step.
In "Setup Barcode" screen, verify the "Barcode" and set up communication conditions.

Item	Set val.
Baud Rate	9600 bit/s
Data bit	7 bits
Stop bit	1bit
Parity	Even
Reading Mode	Auto
Heading[*]	(None)
Delimiter [*]	(CR)
Non-procedure [*]	(disabled)
Operation mode	Non-procedure mode

* Can be set only when "Manual" is selected under the reading mode.

> **Point** When the reading mode is set to "Auto", the reading interval of the barcode should be confirmed with the actually used machine.
> It is necessary to set the reading mode to "Manual", including the heading, delimiter and checksum, if reading barcode continuously.

● **Power Suply**

☑ Supply power to barcode
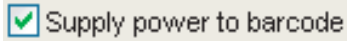
Check the "Supply Power to barcode" option.

● **Connection**

For the connection with VT3, please refer to the following before connecting with PORT3.

Pin No.	Signal name	Description
1	NC	Not connected
2	TXD	Send Data
3	RXD	Receive Data
4	NC	Not connected
5	SG	Signal Ground
6	NC	Not connected
7	CTS	Send Enable
8	RTS	Send Request
9	Vcc(5V)	Power supply (5 VDC) for Barcode Reader
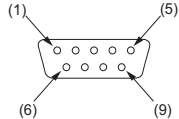
(1)　(5)
(6)　(9)

> **NOTICE** Please turn off the power of VT3 before connecting with the barcode readers.

> **Reference** Please use the No.4-40 UNC imperial thread screws.

6 PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

■ **Connect with TL-30K**

The following describes how to connect VT3 series (VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R excluded) with our barcode reader TL-30K.

● **Communication settings**

From VT STUDIO, select "Resources(R)" -> "Set up the VT unit System(S)" -> "Barcode(B)" step by step.
In "Setup Barcode" screen, select "Barcode" and set up communication conditions.

Item		Set val.
Baud Rate		9600 bit/s
Data bit		7 bits
Stop bit		1 bit
Parity		Even
Reading Mode		Auto
	Heading[*]	(None)
	Delimiter [*]	(CR)
	Non-procedure mode[*]	(disabled)
Operation mode		Non-procedure mode

* Can be set only when "Manual" is selected under the reading mode.

Point	• **When the reading mode is set to "Auto", the reading interval of the barcode should be confirmed with the actually used machine.**
	• **It is necessary to set the reading mode to "Manual", including the heading, delimiter and checksum, if reading barcode continuously.**
	• **When the reading mode is set to "Auto", please set the checksum (BCC transmission) of TL-30K to "Disabled".**
	• **When the QR code is used to read full-width characters, please set the bit length to 8 bits.**

● **Power Suply**

End the check on "Supply Power to barcode" option.

☐ Supply power to barcode
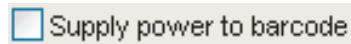
NOTICE	**To connect with TL-30K, the check must be stopped, and use a special adapter to supply power. Otherwise, damage may happen.**

● **Connection**

For the connection with VT3, please refer to the following before connecting with PORT3.

special adapter
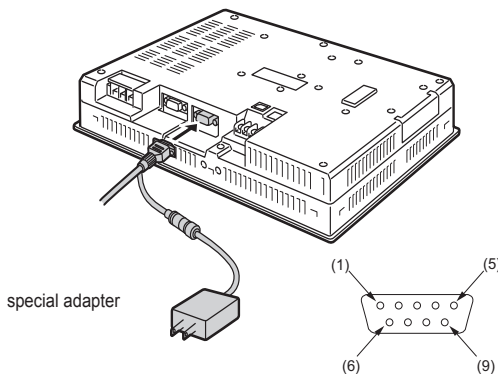
Pin No.	Signal name	Description
1	NC	Not connected
2	TXD	Send Data
3	RXD	Receive Data
4	NC	Not connected
5	SG	Signal Ground
6	NC	Not connected
7	CTS	Send Enable
8	RTS	Send Request
9	NC	Not connected

NOTICE	**Please turn off the power of VT3 before connecting with the barcode readers.**

Reference	Please use the No.4-40 UNC imperial thread screws.

■ **Connect with RF-500(550)**

The following describes how to connect VT3 series (VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R excluded) with our high-performance RFID head RF-500(550).

● **Set up the communication of VT3**

From VT STUDIO, select "Resources(R)" -> "Set up the VT System(S)" -> "Barcode(B)" step by step.
In "Setup Barcode" screen, select "Barcode" and set up communication conditions.

Item	Set val.
Baud Rate	9600 bit/s
Data bit	8 bits
Stop bit	1 bit
Parity	None
Reading Mode	Auto
Heading[*1]	(None)
Delimite[*1]	(CR)
Checksum [*1]	(disabled)
Operating Mode[*2]	Non-procedure mode

*1 Can be set only when Manual is selected under the reading mode.

*2 The operating mode should be always the non-procedure mode. This cannot be set.

> ✎ **Point** — When the reading mode is set to "Auto", the reading interval of the barcode should be confirmed with the actually used machine.
> It is necessary to set the reading mode to "Manual", including the heading, delimiter and checksum, if reading barcode continuously.

Power Suply

End the check on "Supply Power to barcode" option.

☐ Supply power to barcode
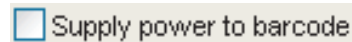
> **NOTICE** — To connect with RF-500(550), the check must be cancelled, and use the power unit BL-U2 to provide power. Otherwise, damage may happen.

● **Set up the RF-500(550) communication**

From the "Project table" on the left of Auto ID Navigator, register RF-500. Select the registered RF-500 and set up the following items from the "Data Output Settings" table on the right.
For more information, please refer to the *User's Manual of RF-500 Series* .

Item	Description	Default
Data Add-on (processing time)	Set up the data add-on processing time.	Disabled
Data Add-on (retry times)	Set up the data add-on retry times.	Disabled
Heading	Select the heading from None/STX/ESC	None
Terminator	Select the terminator from CR/CRLF/EXT	CR
CheckSum	Select the checksum.	Disabled
Send waiting time	Set the wait time.	0

Select the "RS-232C Communication Settings" table, and set up the following items.

| Item	Description	Default
Baud Rate	Select the baud rate.	9600bit/s
Parity	Select even or odd parity.	None
Data length	Select the data length.	8bit
Stop bit	Select the stop bit.	1bit
Protocol	Select the protocol.	Non-procedure
ID No.	Disabled when the protocol is set to the multi-drop.	-
RTS/CTS Protocol	This is used when protocols other than the multi-branch protocol are set up.	Disabled

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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

● **System Configuration**
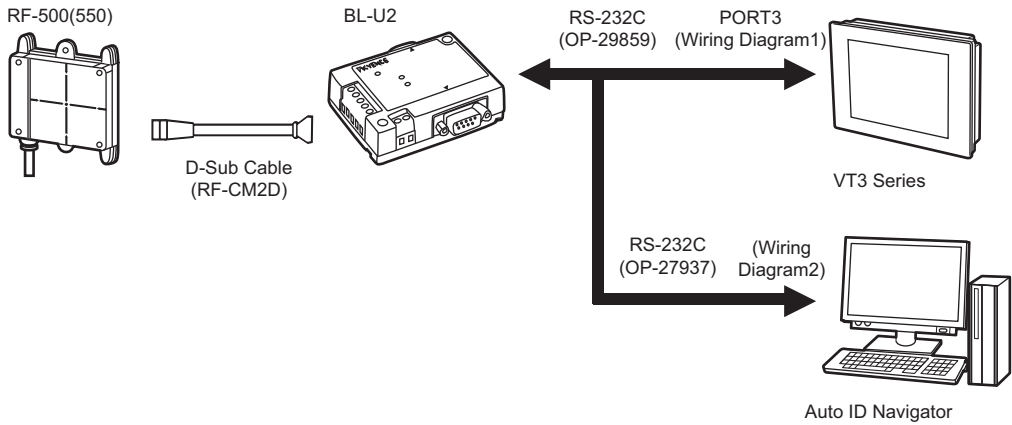
● **Wiring Diagrams**

Wiring Diagrams 1
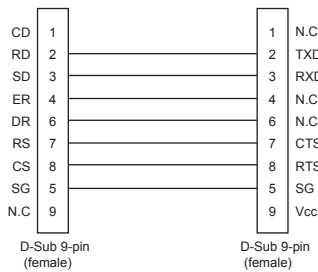
Wiring Diagrams 2
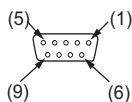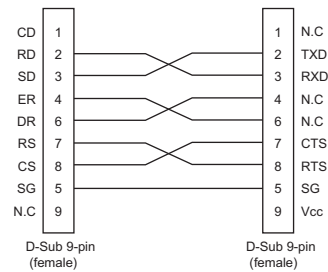
PinNo.	Signal name	Description
1	NC	Not Connected
2	TXD	Send Data
3	RXD	Receive Data
4	NC	Not Connected
5	SG	Signal Ground
6	NC	Not Connected
7	CTS	Send Enable
8	RTS	Send Request
9	NC	Not Connected

NOTICE	**Please turn off the power of VT3 before connecting with the barcode readers.**

Reference	Please use the No.4-40 UNC imperial thread screws.

■ **About the Character Display**

About the character display of the barcode data

"9-2 Set up the Character Display", *VT3 Series Reference Manual*

■ **About the Link Devices**

The data captured from the barcode(LNW) is stored in the link devices.

"6-6 About the Devices", *VT3 Series Reference Manual*

6

PERIPHERALS

6-4 Video Unit

With Video Unit, images on external CCD cameras, VTRs and PCs can be displayed in the screens on VT3.

✎ **Point** **Video Unit cannot be connected to VT3-V7/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/ Q5M(W)A/W4T(A)/W4M(A)/W4G(A)/V7R.**

Names of Parts

■ 4ch/1ch Video Capture Unit: VT3-VD4/VD1

4ch Video Capture Unit VT3-VD4
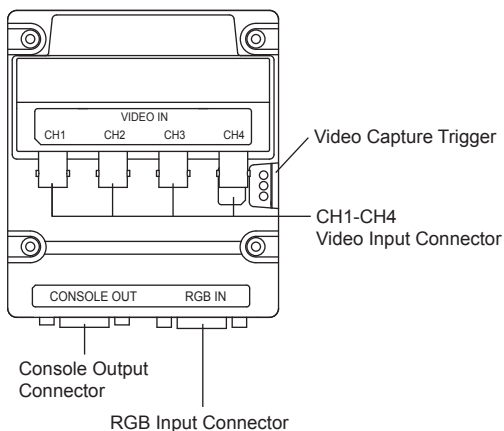
1ch Video Capture Unit VT3-VD1
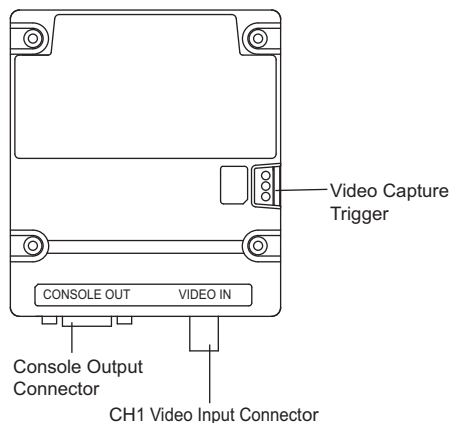
Name	Function
Video input connector (BNC)	Used for connecting to devices having an NTSC composite video signal output
RGB input connector	Used for connecting to devices having an analog RGB output
Console output connector	Used for connecting to the CV Series made by KEYENCE Corporation
Video capture trigger	Image data input via the video input connectors or RGB input connectors is saved to memory card. Images whose video capture output destination is set to "Printer" are printed on PictBridge, ESC/P-R or ESC/Page compatible printers.

■ RGB Output Unit: VT3-R1

RGB output connector
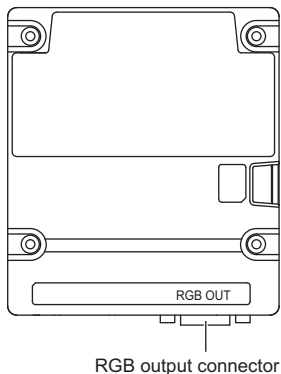
Name	Function
RGB output connector	Used for connecting to devices having an analog RGB output.

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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

Configuration

■ 4ch/1ch Video Input Unit: VT3-VD4/VD1

VT3 Series

VT3-VD4[*1]

VT3-VD1[*1]

Video input

External cameras

RGB input

RGB cable

Image Sensor

Console output

Console cable

*1 Either of VT3-VD4/VD1 can be installed in VT3.
VT3-VD1 has not RGB input.

■ RGB Output Unit: VT3-R1

VT3 Series[*2]

VT3-R1[*1]

RGB output

RGB cable

RGB monitor
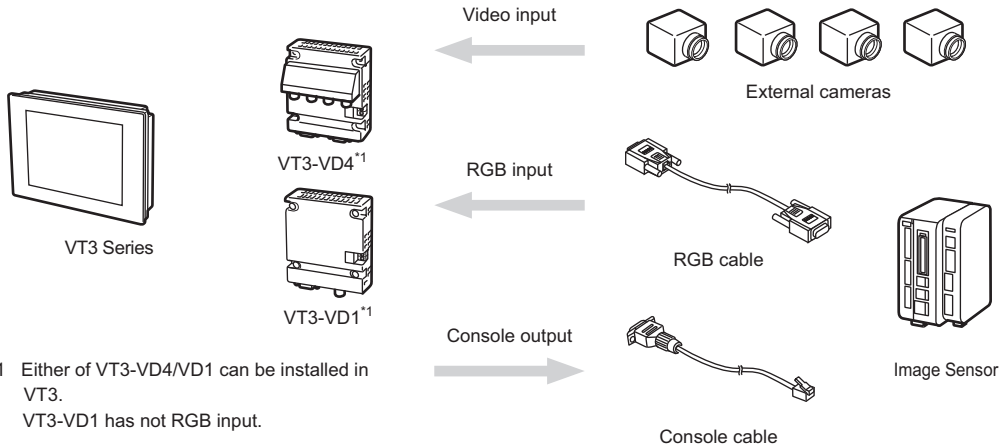
*1 Only one of VT3-VD4/VD1 and VT3-R1 can be mounted to VT3.
*2 RGB output from VT3-X15(D) and VT3-R1 are the same when connecting VT3-R1 to VT3-X15(D).

Mounting

Here, we'll take VT3-VD1 as an example.

NOTICE	**Before you install the expansion unit, please ensure to cut off the power of VT3.** **Also, make sure that screws are firmly secured before using the VT3 again.**

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PERIPHERALS

1 **Remove the seal strip from Expansion Connector 2 on the back of VT3.**
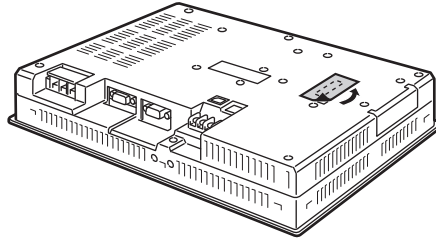
2 **As shown in the figure, slowly insert the video unit into Expansion Connector 2 on VT3.**

3 **Secure the video unit onto VT3 with 4 screws.**

Tightening torque
0.4N•m

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts
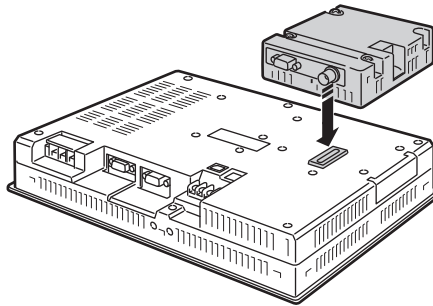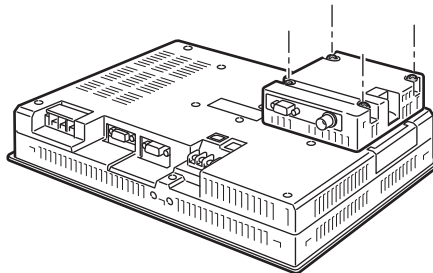
� **Point** **Firmly insert the video cable when connecting the cable to the video connector.**

Video Functions (VT3-VD4/VD1)

■ Video Display

Video images from a VTR or a PC can be displayed in the operation screen or System mode screen.

Display in operation screen
Configure "video display" parts in the screen.
📖 "9-5 Set up the Video Display", *VT3 Series Reference Manual*

Display in System mode
Mark the video display checkbox in the System mode.
📖 "5-2 Option Setup"
📖 "5-9 Self Check"

> ✎ **Point**
> - **For the RGB inputs (only for VT3-VD4), display cannot be made correctly without a synchronizing frequency. Please confirm the RGB output specifications of the connected equipments.**
> - **For the RGB inputs (only for VT3-VD4), VGA/SVGA/XGA cannot be switched automatically. So VGA and SVGA shoud be setted according to the input signals When displaying video on the operation screen or in the System mode.**
> - **For the RGB inputs (only for VT3-VD4), the corresponding resolutions and synchronizing frequencies are as follows.**

Resolution	Default	Synchronizing Frequency
VGA	Default0 (Manual)	60Hz
	Default1 (Manual)	70Hz
	Default2 (Manual)	72Hz
	Default3 (Manual)	75Hz
	Default4 (Manual)	85Hz
	Default5 (Manual)*	60Hz
	Default6 (Manual)	85Hz
SVGA	Default0 (Manual)	60Hz
	Default1 (Manual)	70Hz
	Default2 (Manual)	72Hz
	Default3 (Manual)	75Hz
	Default4 (Manual)	56Hz
	Default5 (Manual)*	60Hz
	Default6 (Manual)	85Hz
	Default7 (Manual)	60Hz
	Default8 (Manual)	56Hz
	Default9 (Manual)*	60Hz
XGA	Default0 (Manual)	60Hz

* VT2-R1 specific setting item.

■ Switching between Video Animation and Static Image

Video images currently displayed on the operation screen can be temporarily paused (turned into a still image).

📖 "8-2 Set up the Switches", "9-7 Set up Device Function Controls", *VT3 Series Reference Manual*

■ Video Capture

Video images currently displayed on the operation screen can be saved to memory card.

📖 "6-1 Memory Card"

The video screens that can be displayed in the active printer output screen. In such case, they're not saved to memory card.

📖 "12-4 Setup of VT unit System", *VT3 Series Reference Manual*

There are three ways to capture video:
- Use the switch
  📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*
- By use of device function controls
  📖 "9-7 Function Control Setting of Devices", *VT3 Series Reference Manual*
- Input from Video Capture Trigger
  📖 "Video Capture Trigger", page 2-41

> ✎ **Point**   **When a video display screen is not displayed in the VT3 screen, it cannot be captured.**

■ Video Capture Trigger

Use European type terminals as the terminals for the video capture trigger.

📖 "Video Capture Trigger", page 2-41

Pin termianls   **Manufacturer: Japan Solderless Terminal MFG Co., Ltd.**

Connection with Image Sensor (VT3-VD4/VD1)

■ Console Functions

The touch panel of VT3 can be used as the console to control the image sensor.
The console parts which are configured from the directory of VT STUDIO are displayed in the screen.

VT3-VD4

VT3-VD1

Console
OUT

Console
IN

Dedicated cable
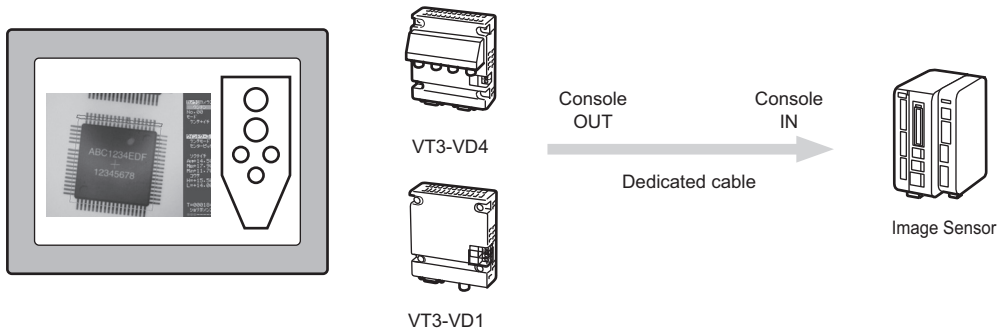
Image Sensor

Applicable Image Sensor		Dedicated cable
Keyence	**CV series**[*]	OP-42290
OMRON	**F160**	Wiring diagram 1
Matsushita Denko	**A110, A210**	Wiring diagram 2

[*] To connect with the CV-700 series, please use our CV-700 series from Feb 15, 2005.

✎ Point   **The CV switches to the Run mode from the Setup mode in the following instances:**
- **When the "RUN" button on the console is pressed**
- **VT3 changes from System mode to RUN mode**

● Wiring Diagram 1

The wiring diagram between Image Sensor F160 made by OMRON and Video Unit VT3-VD1/VD4 is as follows.
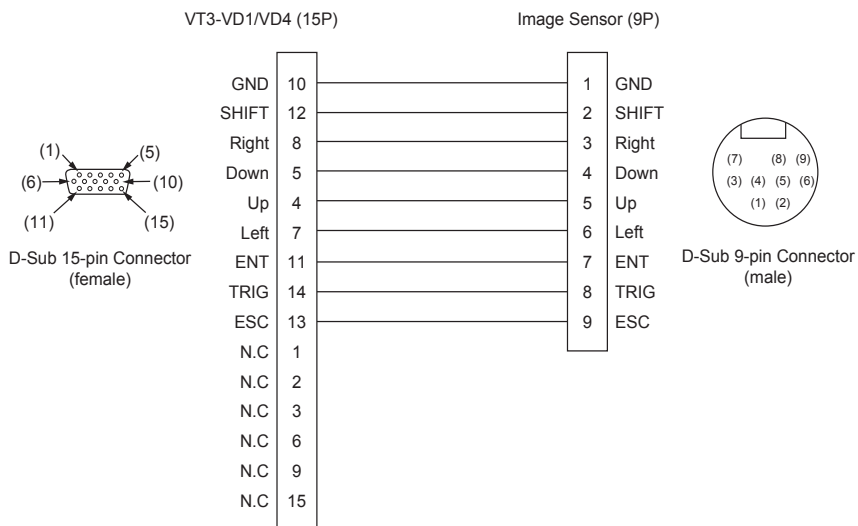
VT3-VD1/VD4 (15P)   Image Sensor (9P)

VT3-VD1/VD4				Image Sensor
GND	10	—	1	GND
SHIFT	12	—	2	SHIFT
Right	8	—	3	Right
Down	5	—	4	Down
Up	4	—	5	Up
Left	7	—	6	Left
ENT	11	—	7	ENT
TRIG	14	—	8	TRIG
ESC	13	—	9	ESC
N.C	1			
N.C	2			
N.C	3			
N.C	6			
N.C	9			
N.C	15			

(1)   (5)
(6)   (10)
(11)   (15)

D-Sub 15-pin Connector
(female)

(7)   (8)   (9)
(3)   (4)   (5)   (6)
(1)   (2)

D-Sub 9-pin Connector
(male)

✎ Point
- **Please use 9-core cable UL2464SB-10P or equivalent.**
- **The max length of the cable is 3m (excluding the connector).**
- **The shielded part is set to Not Connected..**

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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

● **Wiring Diagram2**

The wiring diagram between Image Sensor A110/A210 made by Matsushita Denko and Video Unit VT3-VD1/VD4 is as follows.
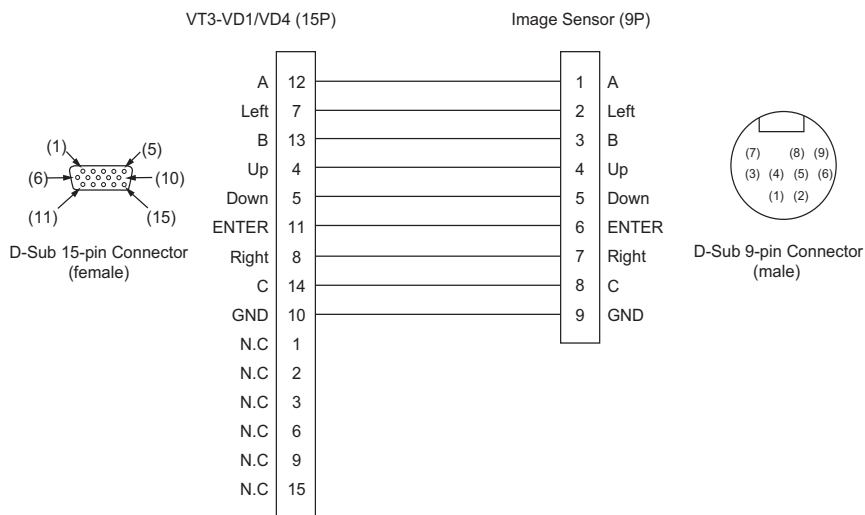
VT3-VD1/VD4 (15P)   Image Sensor (9P)

	VT3-VD1/VD4		Image Sensor	
A	12	—	1	A
Left	7	—	2	Left
B	13	—	3	B
Up	4	—	4	Up
Down	5	—	5	Down
ENTER	11	—	6	ENTER
Right	8	—	7	Right
C	14	—	8	C
GND	10	—	9	GND
N.C	1			
N.C	2			
N.C	3			
N.C	6			
N.C	9			
N.C	15			

(1) (5)
(6)   (10)
(11)   (15)

D-Sub 15-pin Connector
(female)

(7)   (8) (9)
(3) (4) (5) (6)
(1) (2)

D-Sub 9-pin Connector
(male)

> ✎ **Point**
> • **Please use 9-core cable UL2464SB-10Por equivalent.**
> • **The max length of the cable is 3m (excluding the connector).**
> • **The shielded part is set to Not Connected.**

■ XG-8000/XG-7000/CV-5000/CV-3000 Series

The connection between VT3-VD4 and the XG-8000/XG-7000/CV-5000/CV-3000 series should use the dedicated RGB cable. Images captured by the controller of the image sensor can be displayed on VT3.

Console OUT   Console IN

The special cable

RGB IN   RGB OUT

VT3-VD4   XG-8000/7000/CV-5000/3000 Series
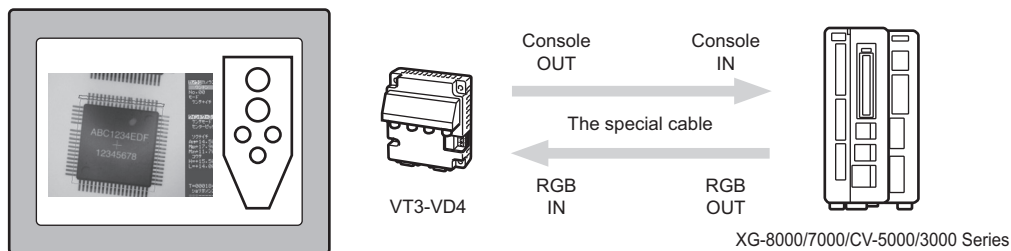
Function	Dedicated cable
Console Connetion	OP-42290
RGB Connection	OP-66842[*]

> ✎ **Point**   *** Please ensure to use the dedicated cable. Otherwise, no guarantee can be given.**

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PERIPHERALS

RGB Output (VT3-R1)

This item allows you to display video screens currently displayed by VT3 on an external RGB monitor.

VT3 Series*   VT3-R1   RGB monitor
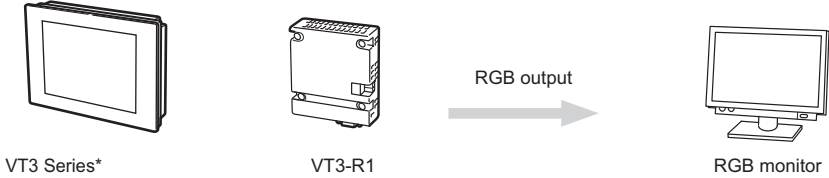
*   RGB output from VT3-X15(D) and VT3-R1 are the
     same when connecting VT3-R1 to VT3-X15(D).

✎ Point	* VT3 can output RUN screen via RGB even if the backlight is ON.

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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

With the Ethernet unit, you can use VT3 over Ethernet.

📖 "Chapter 8 ETHERNET"

In addition, you can also use Ethernet units VT2-E1/E2 or VT3-E3 to print data.

📖 "6-6 Printer Unit"

✎ Point	**Failed to connect Ethernet unit for VT3-V6H(G)/Q5H(G)/Q5M(W)A/W4T(A)/W4M(A)/W4G(A).**

Names of Parts

Ethernet unit   VT2-E1   **VT2-E2**   **VT3-E3**

Printer I/F   Printer link LED   Printer I/F (USB)   Indicators   Ethernet I/F
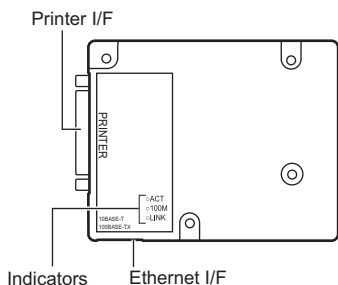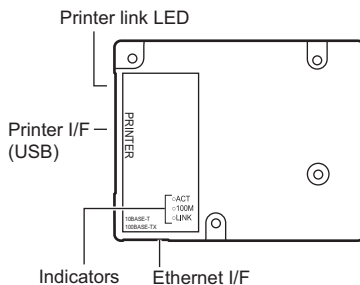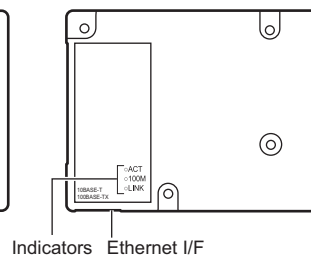
Name	Function

Operation indicators[*1]	ACT : Blinks when transmitting/receiving data.[*4]
	100M : Displays data transmission rate.
	    On: 100Mbps
	    Off: 100Mbps
	LINK : ON when being linked with the target equipment.[*4]

Ethernet I/F[*1]	Used for connecting to Ethernet For both 10Base-T and 100Base-TX.
Printer I/F[*2]	Used for connecting to a printer For both color printers and thermal printers.
Printer I/F(USB)[*3]	Used for connecting with the PictBridge printer.
Printer Link LED[*3]	ON when the connection with the PictBridge printer is established OFF when the connection with the PictBridge printer is not established. Blinks when an alarm or error occurs in the printer.

*1 Only VT2-E1/E2 and VT3-E3.

*2 Only VT2-E1/P1.

*3 Only VT2-E2/P2.

*4 VT3-E3 with "A" or a following letter (A, B, C etc.) as the last letter of the serial number listed on the back of the main unit (the connector side) are not equipped with ACTLED.

The ACT LED function is included in the LINK LED function.

LINK LED status: No LINK established → Off

　　　　　　　LINK established, communicating → Flashes

　　　　　　　LINK established, communication error → Turns off once every 5 seconds

✎ Point	• **After installing Ethernet Unit, "Ethernet communication is not set up yet. Please press the touch switch" is displayed when you turn the power ON for the first time. Please set up Ethernet by touching the options in the System mode on the screen.** 📖 "Ethernet Setup", page 5-11 **After this, please go to the Screen Data Transmission Wait mode.** 📖 "Data Transmission", page 5-33 • **VT3-E3 with "A" or a following letter as the last letter of the serial number requires that the VT3 system program be Ver. 4.51 or later.** • **VT3-E3 with "A" or a following letter as the last letter of the serial number supports MDI/MDI-X automatic switching function.**

6

PERIPHERALS

Mounting

NOTICE	Before you install the expansion unit, please ensure to cut off the power of VT3. Also, make sure that screws are firmly secured before using the VT3 again.

1 Remove the seal strip on Extended Connector 1 on the back of VT3.
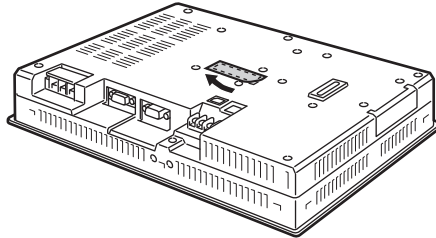
2 Combine the pictures of VT3 series and Ethernet units and then insert into the position of Expansion Connector 1 vertically.
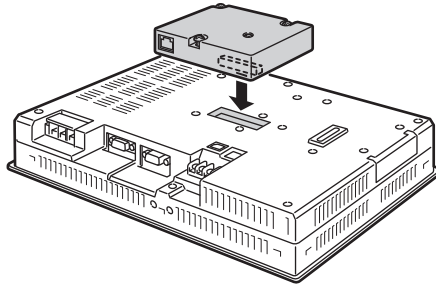
3 Secure the Ethernet unit onto VT3 with 4 screws.
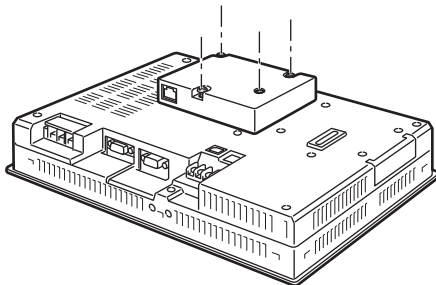
Tightening torque
0.4N•m

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

6-6   Printer Unit

Printer Unit is used to print data on VT3.

Ethernet units VT2-E1/E2, VT3-E3, VT3-V6H(G)/Q5H(G) (Ethernet connected) will also allow you to print data.

> **Point**   **Printer unit connot be connected for VT3-V7/V6H(G)/Q5H(G)/Q5M(W)/Q5M(W)A/W4T(A)/ W4M(A)/W4G(A)/V7R.**

Names of Parts
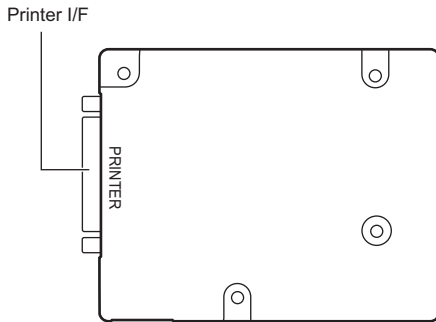
Printer Unit   VT2-P1   **VT2-P2**
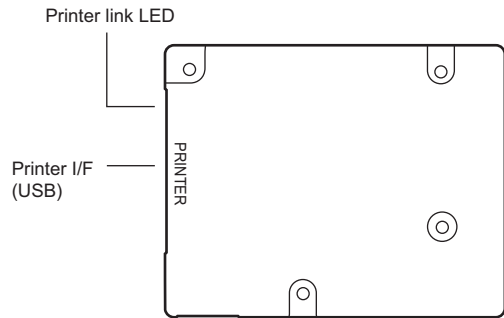
Name	Function
Printer I/F	Used for connecting to a printer. For both color printers and thermal printers.
Printer I/F(USB)	Used for connecting with the PictBridge printer.
Printer Link	ON when the connection with the PictBridge printer is established OFF lighting when the connection with the PictBridge printer is not established. Blinks when an alarm or error occurs to the printer.

> **Point**   • **The printer should not be used in the locations subject to strong vibration or impact. Since the USB connector is not equipped with locking mechanism, the cable may fall off or encounter a communication failure.**
> • **Please do not use the USB cable to connect VT2-P2 with the PC.**

Configuration

■ Color Printer

Use a printer cable for a IBM PC compatible (D-Sub 25-pin) recommended in the manual for the printer.
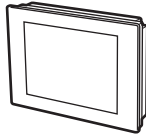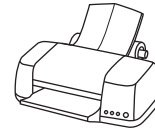
| VT3 | VT2-P1 VT2-E1 | Printer cable | Color printer |

The USB cable used to connect the PrictBridge printer should use OP-35331.
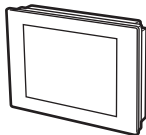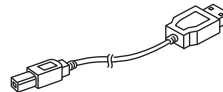
| VT3 | VT2-P2 VT2-E2 | OP-35331 | PIctBridge printer |
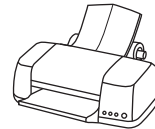
> ✎ **Point** **The USB hub cannot be used.**

Connect to a printer and VT3 Series connected to the network.
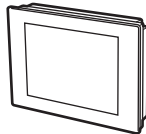
| VT3*1 | VT2-E1/E2 VT3-E3 | VT3-V6H(G)/Q5H(G) | Color printer |
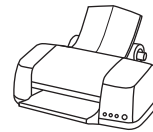
*1 The VT3-V6H (G), Q5H(G), Q5M (W), Q5M(W)A, W4T(A), W4M (A), W4G(A) or V7R cannot be connected to an Ethernet unit.

> ✎ **Point** • **Ethernet connection is possible when the "ESC/P-R Ethernet" and "ESC/Page Ethernet" printers are selected.**
> • **The VT3 System Program must be in Ver. 4.81 or above to allow use of the "ESC/P-R Ethernet" and ESC/Page Ethernet printers.**

■ Thermal Printer

Wire a third-party D-Sub 25-pin connector to the printer cable supplied with the thermal printer.
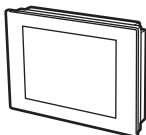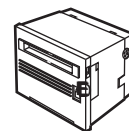
| VT3 | VT2-P1 VT2-E1 | Printer cable | Thermal printer |

> ✎ **Point** **Only the CBM-293/CT-P293 thermal printer made by the CITIZEN SYSTEMS company can be connected with VT2-P1 and VT2-E1.**

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
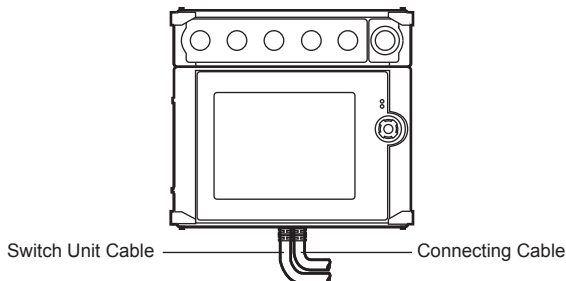External Memory Card Slot
Specific Panel Mounts

Mounting

| NOTICE | Before you install the expansion unit, please ensure to cut off the power of VT3. Also, make sure that screws are firmly secured before using the VT3 again. |

1 Remove the seal strip on Extended Connector 1 on the back of VT3.
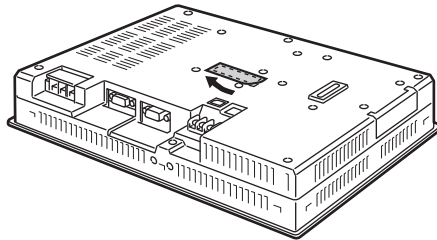
2 Combine the pictures of VT3 series and Ethernet units and then insert into the position of Expansion Connector 1 vertically.
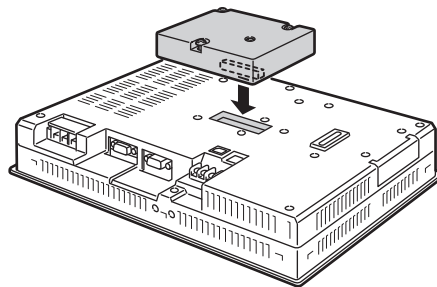
3 Secure the video unit onto VT3 with 4 screws.
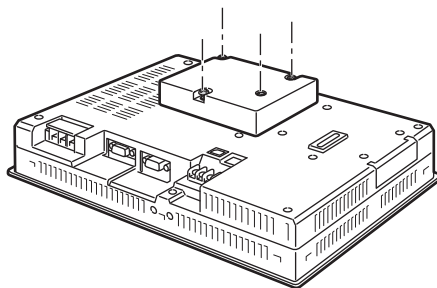
Tightening torque
0.4N•m

Color Printer

Used to print hard copies of operation screens or form screens on VT3.

To use a color printer, please set the "Printer Type" to "ESC/P Raster", "ESC/P Raster 2", "LIPS IV Raster", "PrictBridge", "ESC/P-R" and "ESC/Page".

📖 "12-4 Setup of VT Unit System", *VT3 Series Reference Manual*

📖 "Printer Type", page 5-23

✎ Point	• **After working with a PC, please restart the printer before connecting it with VT3.** • **After the power is turned on, please do not remove the printer cable. Doing so might prevent normal printing.**

■ Print

● Hard Copy

There are three ways to start printing hard copies:

• Use the switch

   📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*

• By use of device function controls

   📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*

• Use the System Storage Area

   📖 "Chapter 14 System Storage Area", *VT3 Series Reference Manual*

● Form screen

Printing of form screens is started by print trigger bit devices set in the screen attribute settings of the form screen.

📖 "11-4 Form Screen", *VT3 Series Reference Manual*

■ Printer types and compatible printers

The following printer type can be connected with VT3.

Item	Printer Type	VT2-E1/P1	
Color printer	ESC/P Raster 2	Seiko Epson	PM-930C/940C/870C PM-3700C/4000PX
	ESC/P Raster	Seiko Epson	PM-950C/890C/840C/830C/740C/730C PM-3500C/2200C
	LIPS IV Raster	Canon LIPS IV Color/black and white laser printer	
Thermal printer	Thermal printer	CITIZEN SYSTEMS CBM-293-48J100 CT-P293ALJ-WH-AT	

✎ Point	To make a LIPS IV color/black and white laser printer work properly, please check the following settings. (settings of the port group) • **Ports to be selected** **Auto or parallel ports (Centronics)** • **BUSY-ACK of parallel port (Centronics)** **A-B-A or A-B** (operation mode setting) • **The operating modes to be selected** **Auto or LIPS** • **Auto Switch-LIPS** **Yes**

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

Item	Printer Type	VT2-E2/P2	
PictBridge Printer	PictBridge	Seiko Epson	PM-A650/A700/A750/A850/A870/A890/A900/A950 PM-D600/D750/D770/D800/D1000
		Canon	PIXUS 80i/455i/560i/860i/960i/990i/iP90/iP3100/iP8600

Point
- **To use the PictBridge standard, the printer needs to be set up. For more information, please see the data sheet of the printer.**
- **The printing time varies depending on the settings of the printer (paper type, printing quality, etc.)**
- **Please do not connect the PictBridge printer with a PC.**

Reference
Can also be connected with E-100/E-150/E-200 made by Seiko Epson. When printing a smaller screen, however, the marginal part cannot be printed due to the settings of the printer.

Item	Printer Type	VT2-E1/E2, VT3-E3, VT3-V6H(G)/Q5H(G) Ethernet connection
Color printer	ESC/P-R Ethernet	Seiko Epson ESC/P-R and ESC/Page compatible color/monochrome printers
	ESC/Page Ethernet	

Point
- **Can only be used on the VT3 Series and printer connected to the Ethernet.**
- **The VT3 System Program must be in Ver. 4.81 or above.**

Reference
- Printer control code "ESC/P-R and ESC/Page refers to the printer control code used by Seiko Epson printers.
- Inquiries regarding VT3 Series connections or error messages displayed by the VT3 should be addressed to your KEYENCE office.

6

PERIPHERALS

Thermal Printer

Form screens and alarm logs can be printed on the thermal printer.
To print to the thermal printer, set "Printer Type: Thermal Printer".
📖 "12-4 Setup of VT Unit System", *VT3 Series Reference Manual*
📖 "Printer Type", page 5-23

■ Wiring diagram of printer cable

Wire a third-party D-Sub 25-pin connector to the printer cable supplied with the thermal printer for use as the printer cable.

✎ Point	Only the CBM-293/CT-P293 thermal printer made by the CITIZEN SYSTEMS company can be connected with VT2-P1 and VT2-E1.

● Wiring to CBM-293
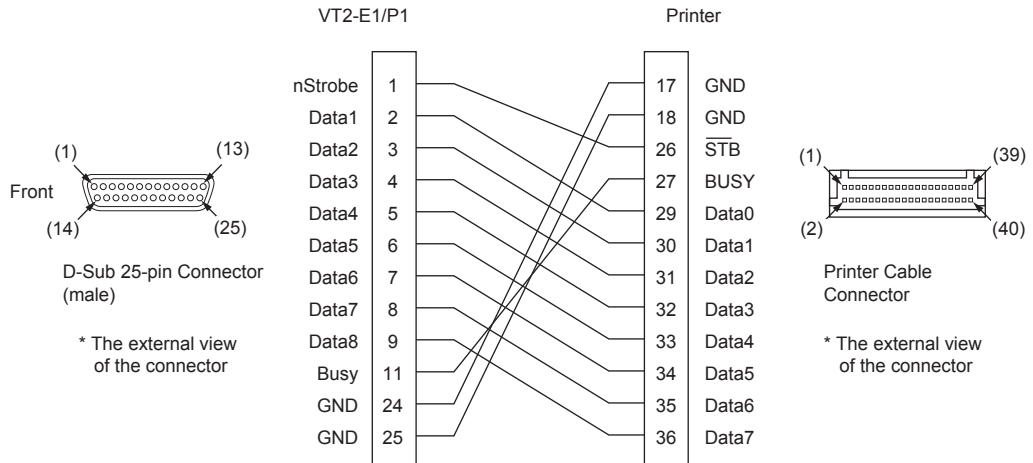

```
VT2-E1/P1                          Printer

nStrobe   1                    17   GND
Data1     2                    18   GND
Data2     3                    26   STB
Data3     4                    27   BUSY
Data4     5                    29   Data0
Data5     6                    30   Data1
Data6     7                    31   Data2
Data7     8                    32   Data3
Data8     9                    33   Data4
Busy      11                   34   Data5
GND       24                   35   Data6
GND       25                   36   Data7
```

Front (1) ... (13) / (14) ... (25)
D-Sub 25-pin Connector (male)
* The external view of the connector

Printer Cable Connector (1) ... (39) / (2) ... (40)
* The external view of the connector

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

● **Connection with CT-P293**

VT2-E1/P1   Printer

VT2-E1/P1			Printer
nStrobe	1	4	GND
Data1	2	6	GND
Data2	3	26	STB
Data3	4	27	BUSY
Data4	5	29	Data0
Data5	6	30	Data1
Data6	7	31	Data2
Data7	8	32	Data3
Data8	9	33	Data4
Busy	11	34	Data5
GND	24	35	Data6
GND	25	36	Data7

Front

D-Sub 25-pin Connector (male)

* The external view of the connector

Printer Cable Connector

* The external view of the connector
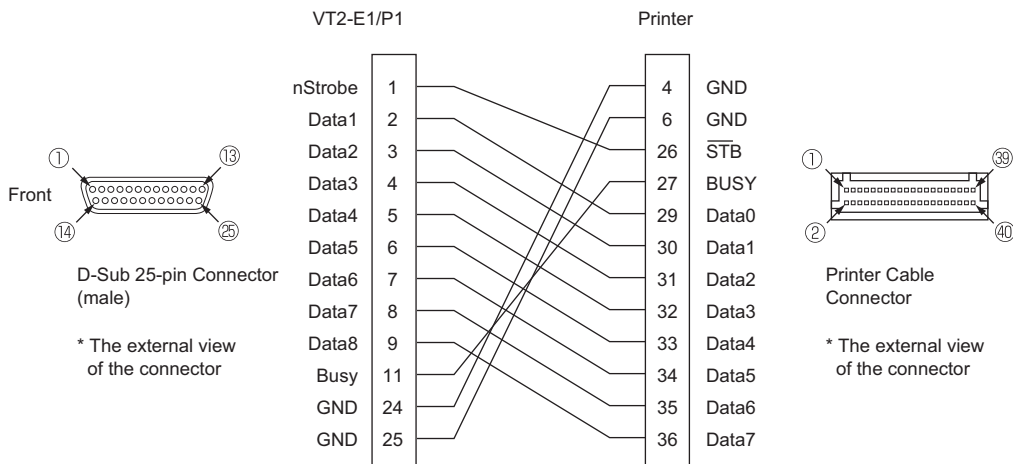
> ✎ **Point**
> • Since pin 7 to 18 of printer terminal are power terminal, they should be wired to power supply separately.

Printer I/F

D-Sub25 pin

Printer Cable Connector

Thermal printer

7-18 pin
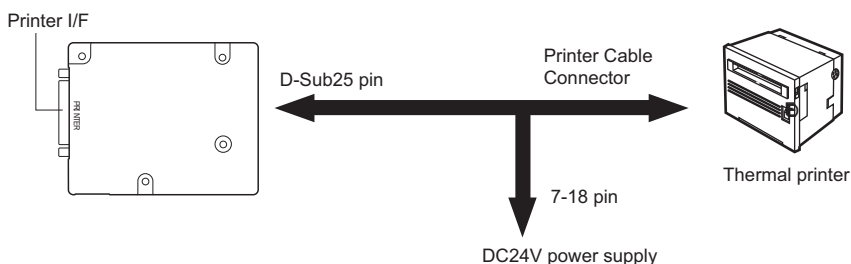
DC24V power supply

• **If AT type wiring cable is provided for printer, connector and power supply are also provided.**
If NN type wiring cable is provided, power supply and wiring should be provided. Please see printer manual.

■ **Print**

● **Form screen**

Printing of form screens is started by print trigger bit devices set in the screen attribute settings of the form screen.
📖 "11-4 Form Screen", *VT3 Series Reference Manual*

● **Alarm Log**

To print the alarm log data, please follow the below steps.
• Use the switch
📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*
• By use of device function controls
📖 "8-2 Set up the Switches", *VT3 Series Reference Manual*
• Use the System Storage Area
📖 "Chapter 14 System Storage Area", *VT3 Series Reference Manual*

■ **Set up CBM-293/CT-P293 from CITIZEN SYSTEMS company**

To set up, use the DIP switch on the back of CBM-293/CT-P293. Normally, the CBM-293 can be used at the default settings.
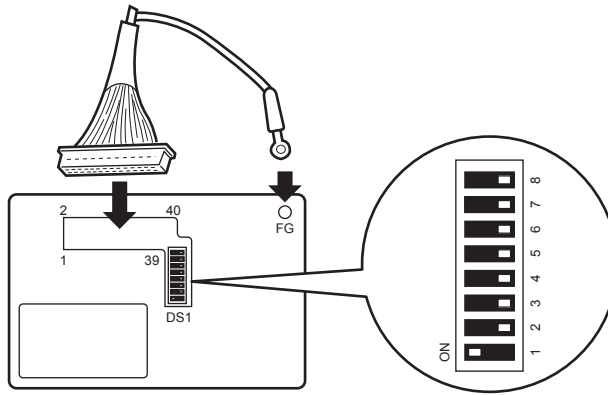
■ **Sample printout (alarm log)**

6

PERIPHERALS

Memory
Card

Expansion
memory

Barcode
Reader

Video Unit

ETHERNET
Switch Unit

Printer Unit

Emergency-Stop
Switch Unit

Switch Unit

External Memory
Card Slot

Specific
Panel Mounts

- VT3 Series Hardware Manual - **6-43**

Emergency-stop switch unit can only be installed on the top of VT3-V7R.

> ✎ Point
> • **Cannot be used with Switch Unit (VT3-SW4/SW6).**
> • **Emergency-stop switch unit can only be used with the DC24V power (cannot use AC)**
>   **For more information, please see** 📖 **"Emergency-Stop Switch Unit VT3-SW1", page 2-49.**
> • **To use Emergency-stop switch unit (VT3-SW1), please see** 📖 **"3-5 About the Emergency Stop Switch"**

Emergency-Stop Switch Unit (VT3-SW1)

■ Names of Parts

Emergency Stop Button
(push-lock, or pull reset 2b)
Direct Circuit Operation
Safe Lock
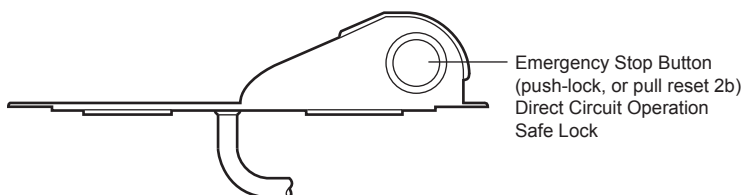
■ Installation Precautions

Emergency-stop switch unit (VT3-SW1) can only be installed on the top of VT3-V7R.
The unit cable can be stretched out either from the top or from the bottom.

Cable entry at bottom   **Cable entry at top**
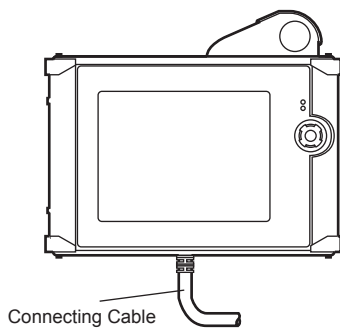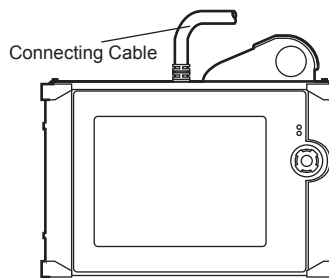
Connecting Cable

Connecting Cable

Lock/Unlock the Emergency-Stop Switch

(1) Lock   : press Emergency-Stop Button until you hear a "click" sound.
(2) Unlock   : turn Emergency-Stop Button right.

(2)

(1)
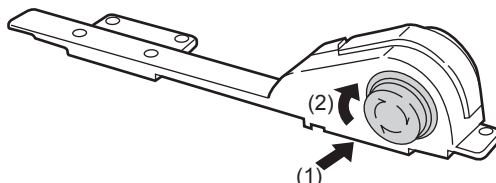
Installing Procedure of Emergency-stop switch unit

1 **Cut off the power of the VT3-V7R unit, and remove the guard on the top of the VT3-V7R.**
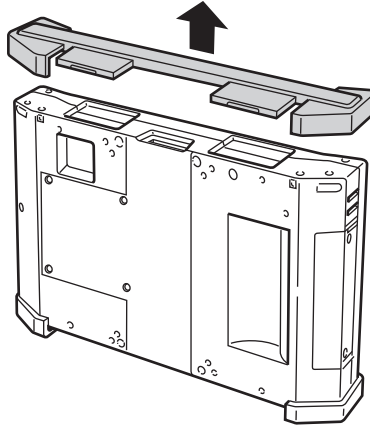
2 **Unscrew the cover on the back of VT3-V7VR (4 screws)**
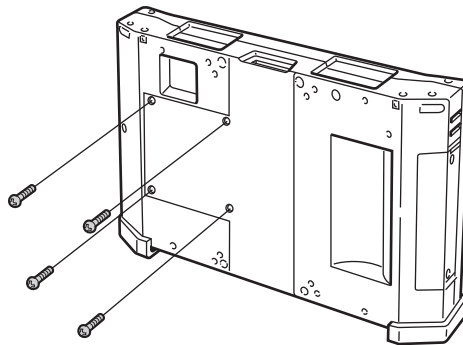
3 **Remove the back cover from the VT3-V7R unit.**
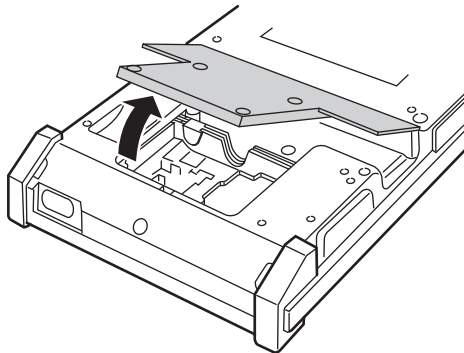
6

PERIPHERALS

| Memory Card |
| Expansion memory |
| Barcode Reader |
| Video Unit |
| ETHERNET Switch Unit |
| Printer Unit |
| Emergency-Stop Switch Unit |
| Switch Unit |
| External Memory Card Slot |
| Specific Panel Mounts |

4 Install the enclosed Emergency-stop switch unit guard on the top of VT3-V7R.

Install Emergency-stop switch unit on the top of the Emergency-stop switch unit guard and secure it with 7(M3x8) enclosed screws. (with a tightening torque below 0.49 N·m)
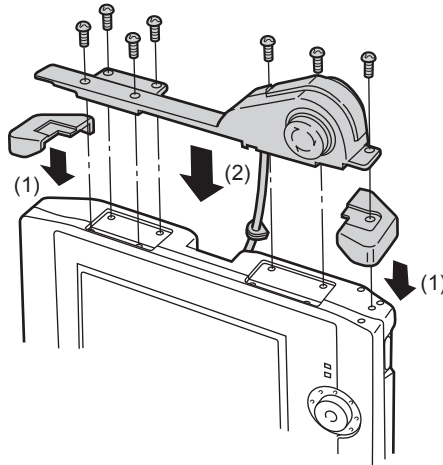
5 Remove the nominal cable sleeve attached on the Emergency-stop switch unit cable sleeve fixing position.
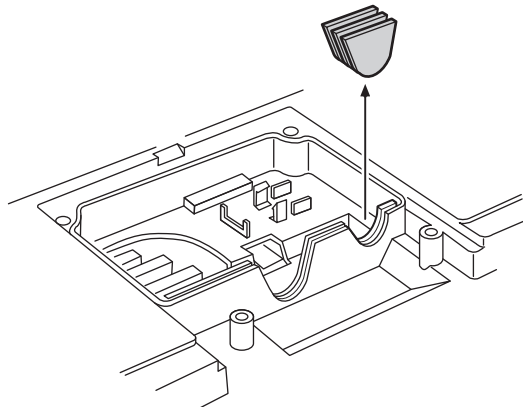
> ✎ **Point** To ensure protection (IP65f), please do not remove the nominal cable sleeve when the emergency-stop switch is not used.

6 Insert the Emergency-stop switch unit cable connector into the unit cable connector.

Emergency-stop switch unit cable connector

Unit cable connector
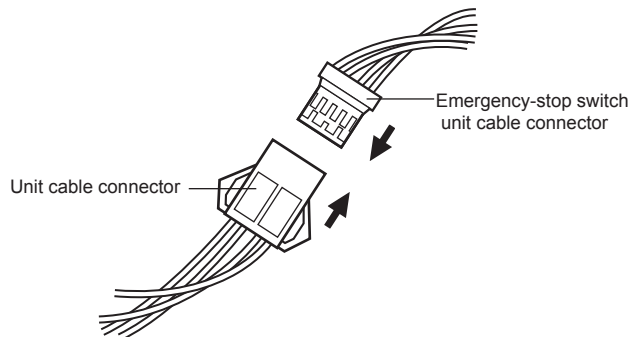
7 **Attach the combined connectors in Step 6 to the Emergency-stop switch unit cable connector fixing position (attach in place the connector sleeve).**

Cable Sleeve

(1)

(2)

8 **Connect the unit cable to the VT3-V7R unit.**

Emergency-stop switch unit cable

Cable Sleeve
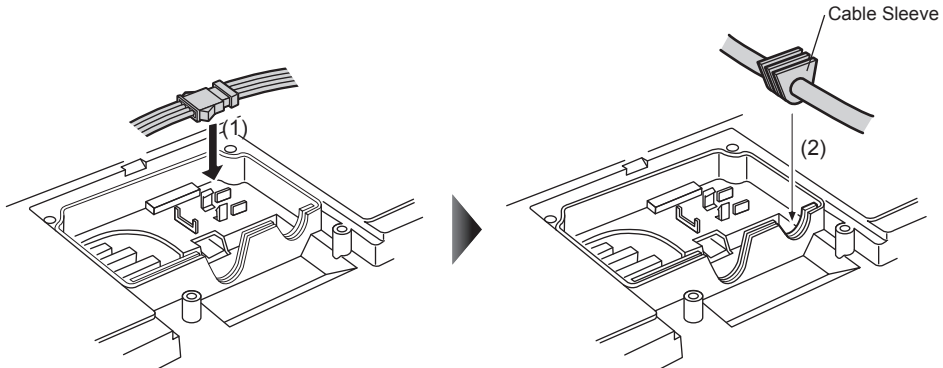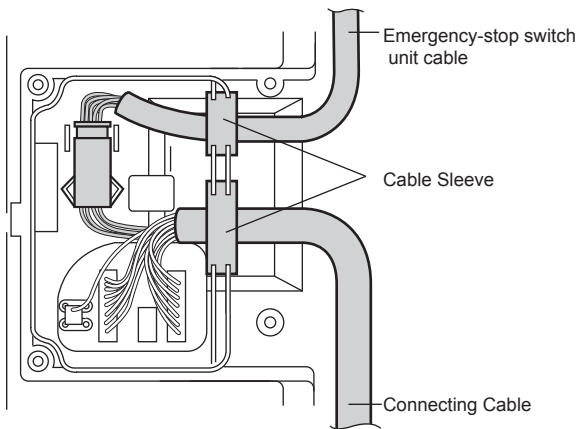
Connecting Cable

Colors of the connecting cable

Connectors		Name	Color
Connector No.	Pin No.		
VT3-SW1 Connectors	1	Emergency-Stop Switch Unit (SW1)	pink/ black
	2	Emergency-Stop Switch Unit (SW1)	pink
	3	Emergency-Stop Switch Unit (SW2)	purple /white
	4	Emergency-Stop Switch Unit (SW2)	Purple

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

> ✎ Point
> • **About the connectors connected with the unit cable and setup of the DIP switch, please see 📖 "The Connectors on the Back of the VT3-V7R unit", page 3-24.**
> • **To ensure protection (IP65f), please correctly install in place the sleeves.**

9 **Assemble Cable Guard A and B**
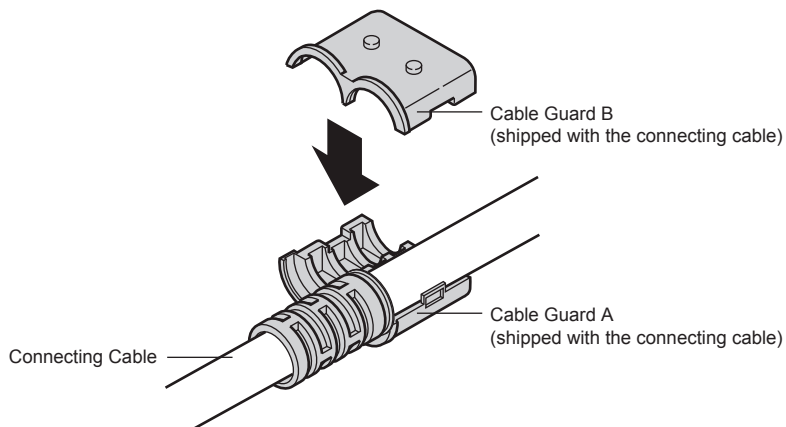
Cable Guard B
(shipped with the connecting cable)

Cable Guard A
(shipped with the connecting cable)

Connecting Cable

10 Align the cable guard with the cable guard mounting position on the back of the main unit and use 2 (M3x8) enclosed screws to attach the cable guard with the fixture (the tightening torque below 0.49 N·m).

✎ Point	The cable guard mounting positions are located on the upper and lower part of the unit respectively. Please choose one based on the cable outlet.

The fixture to attach the cable guard

Cable Guard A+B

11 Put back the back cover removed in Step 2, and attach it to the unit with 4 screws (with a tightening torque below 0.49 N·m).

NOTICE	• To ensure protection (IP65f), before putting back the back cover after wiring and fixing, please fix the enclosed part of a cable and sleeve with screws. • To ensure the tensile strength of the Emergency-stop switch unit (VT3-SW1) cable, the cable guards must be used.

■ Cable Guards

To ensure the tensile strength of the Emergency-stop switch unit (VT3-SW1) cable, the cable guards must be used.

Cable Guard A*   **Cable Guard B**

(shipped with the connecting cable)   **(shipped with the unit cable)**

*Attached to the cable at factory.

Change of Emergency-stop switch unit

Do not change the Emergency-stop switch unit.

NOTICE	Protection (IP65) cannot be guaranteed if Emergency-stop switch unit (VT3-SW1) is removed. Never remove the Emergency-stop switch unit.

6-8 VT3-V7R Specific Switch Unit

Switch Unit (VT3-SW4/VT3-SW6) can be installed either on the top or bottom of VT3-V7R.

> **Point**
> • **Only one Switch Unit (VT3-SW4/VT3-SW6) can be installed.**
> • **It cannot be used with Emergency-stop switch unit (VT3-SW1). In addition, the installation varies depending on the cable outlet.**
>   **For more information, please see "Installation Precautions", page 6-50.**
> • **To use Emergency-stop switch unit, please see "3-5 About the Emergency Stop Switch".**

Names of the Components of Switch Unit (VT3-SW4/VT3-SW6)

■ Names of Parts

● 4-Position Switch Unit (VT3-SW4)
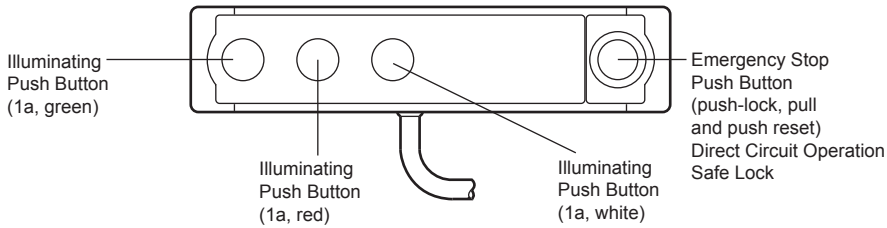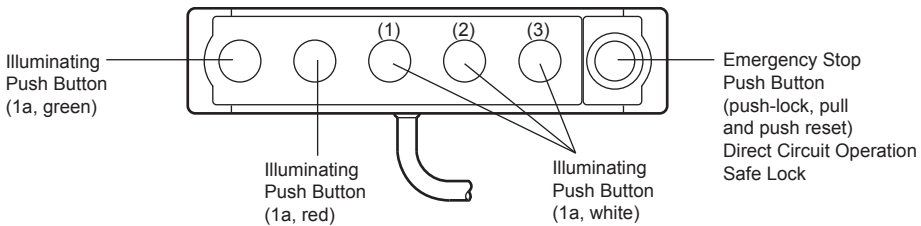
Illuminating Push Button (1a, green)

Illuminating Push Button (1a, red)

Illuminating Push Button (1a, white)

Emergency Stop Push Button (push-lock, pull and push reset) Direct Circuit Operation Safe Lock

● 6-Position Switch Unit (VT3-SW6)

Illuminating Push Button (1a, green)

Illuminating Push Button (1a, red)

(1) (2) (3)

Illuminating Push Button (1a, white)

Emergency Stop Push Button (push-lock, pull and push reset) Direct Circuit Operation Safe Lock

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

■ Installation Precautions

To mount Switch Unit VT3-SW4/VT3-SW6 onto VT3-V7R, you can select the following mounting positions and cable outlet.

4 choices are available for the installation of Switch Unit (VT3-SW4/VT3-SW6).

(1). Switch Unit Mounting Position: top; Cable Outlet: top
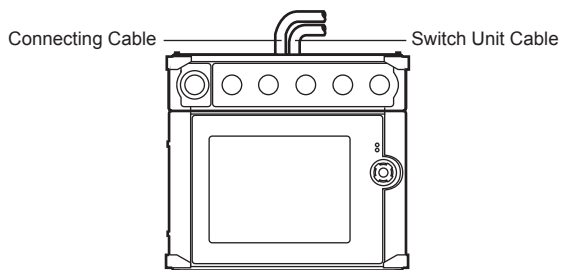
Connecting Cable ————— ————— Switch Unit Cable

(2). Switch Unit Mounting Position: top; Cable Outlet: bottom

Switch Unit Cable ————— ————— Connecting Cable

(3). Switch Unit Mounting Position: bottom; Cable Outlet: top

Switch Unit Cable ————— ————— Connecting Cable

(4). Switch Unit Mounting Position: bottom; Cable Outlet: bottom

Switch Unit Cable ————— ————— Connecting Cable
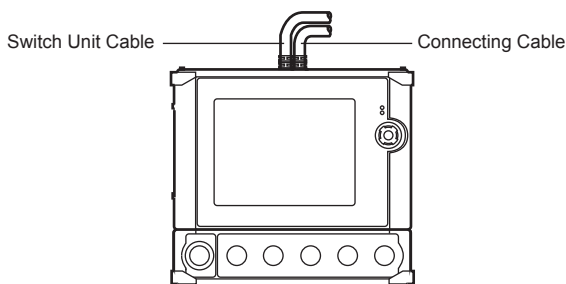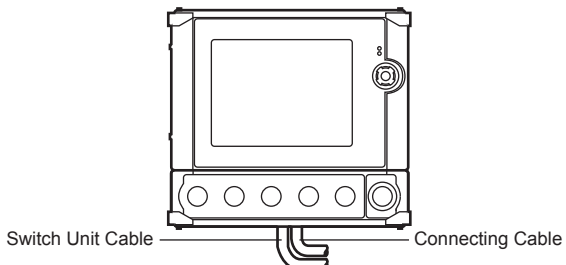
| Point | **The position of Emergency-Stop button switch should be considered when installing Switch Unit (VT3-SW4/SW6).** |

6

PERIPHERALS

■ **Switches (Standard)**

The manufacturers and models of the switches are as follows

Item		Manufacturer	Model
Switch	Emergency-Stop	IDEC Corporation	XA1E-BV302RH
	Illuminating	NIHON KAIHEIKI IND. CO., Ltd.	LB-15CKS1
Illuminating Switch	White		AT-4164-N
	Red		AT-4164-R
	Green		AT-4164-M
LED (inbuilt resistor)	Yellow		AT-627-Y24
	Red		AT-627-R24
	Green		AT-627-M24

■ **Wiring of Switch Unit**

Specifications of the switch unit wires are as follows.

Color of Wire	Wiring				AWG
Purple/white	Emergency-Stop switch	1	(11)	DC24V below 1A (resistive load)	AWG24
Purple			(12)		
Pink/black		2	(21)	DC24V below 1A (resistive load)	
Pink			(22)		
Light blue/black	Switch (green)			DC24V below 1A (resistive load)	AWG18
Light blue					
Orange/black	Switch (red)			DC24V below 1A (resistive load)	
Orange					
Green/white	Lamp (green)			Lamp current 13mA	AWG24
Red/white	Lamp (red)			Lamp current 13mA	
Yellow/black	Lamp (white1)			Lamp current 13mA	
Grey/black[*1]	Lamp (white2)			Lamp current 13mA	
White/black [*1]	Lamp (white3)			Lamp current 13mA	
Brown	Switch (+Common)			Lamp voltage DC24V±5%, Lamp current 65mA	
Yellow	Switch (white1: +)			Only DC24V, below 1A (resistive load) [*2]	
Grey[*1]	Switch (white2: +)			Only DC24V, below 1A (resistive load) [*2]	
white[*1]	Switch (white3: +)			Only DC24V, below 1A (resistive load) [*2]	
Brown/black	Switch (white: -Common)			Only DC24V, switch white (1+2+3), total below 1A (resistive load)	

*1   Cannot be used by VT3-SW4.

*2   In VT3-SW6, please set switch to White (1+2+3)(resistive loads)

> ✎ Point   **D-type grounding for the shielded cable. For more information, please refer to**
> 📖 **"Grounding Precautions", page 3-31**

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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

■ **Dimensions of Nameplate of Switch Unit**

Please refer to the following figure.
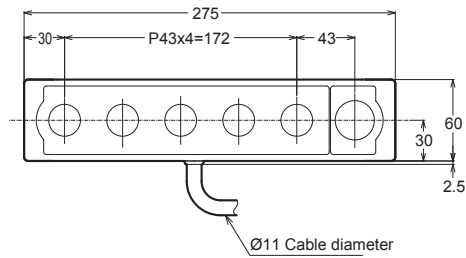
Ø11 Cable diameter

Lock/Unlock the Emergency-Stop Switch

(1).Lock : press Emergency-Stop Button until you hear a "click" sound.

(2).Unlock : turn Emergency-Stop Button right.
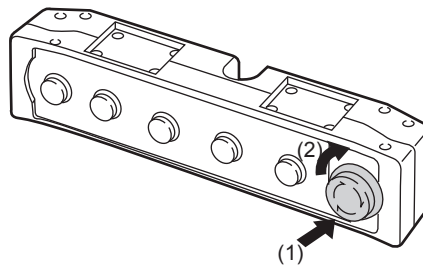
Installing Steps of Switch Unit

We'll take "Switch Unit Mounting Position: bottom. Cable outlet: bottom" under the "Installation Precautions" as an example. 📖 "Installation Precautions", page 6-50.

1 **Cut off the power of the VT3-V7R unit, and remove the guard at the bottom of the VT3-V7R unit.**
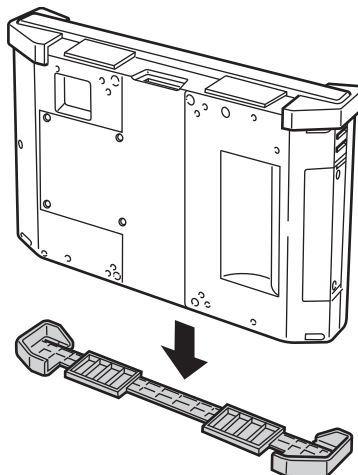
2 Unscrew the cover on the back of VT3-V7R (4 screws)
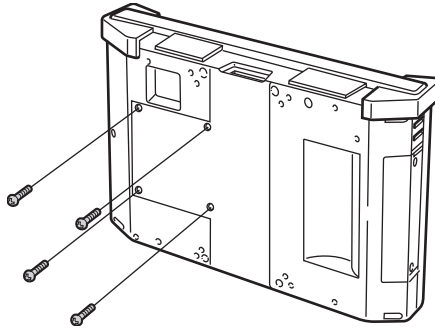
3 Remove the back cover from the VT3-V7R unit.
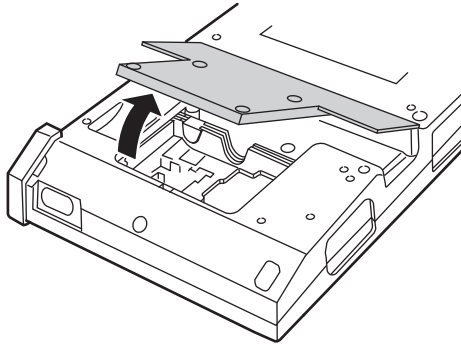
4 Attach the enclosed mats to the bottom of the VT3-V7R unit. Attach Switch Unit to the bottom of the mats and secure it with 8 (M3x65) enclosed screws (with a tightening torque below 0.49 N·m). Attach the guard removed in Step 1 to the bottom of Switch Unit.

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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts
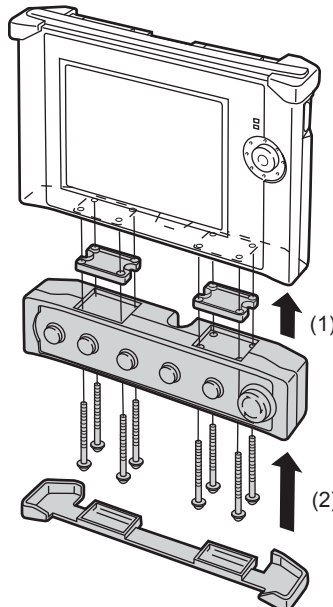
✎ **Point**   **To ensure protection, please ensure to use the guard.**

5 **Connect the unit cable to the VT3-V7R unit.**
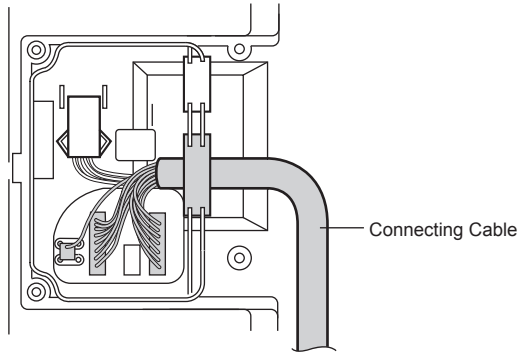
Connecting Cable

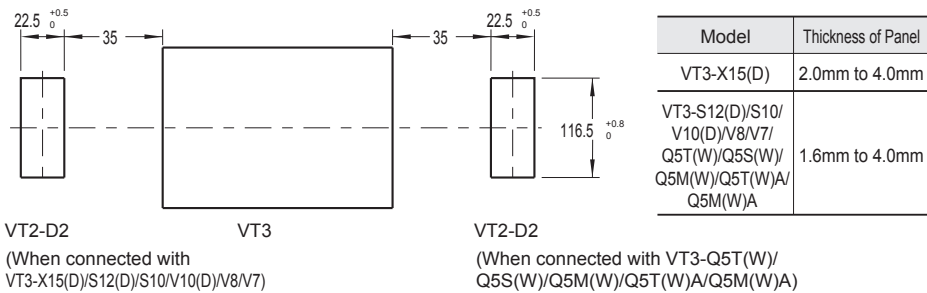> ✎ **Point** About the connectors connected with the unit cable and setup of the DIP switch, please see
> 📖 **"The Connectors on the Back of the VT3-V7R unit", page 3-24.**

6 **Secure in place the cable sleeve.**

Cable Sleeve

Unit Cable
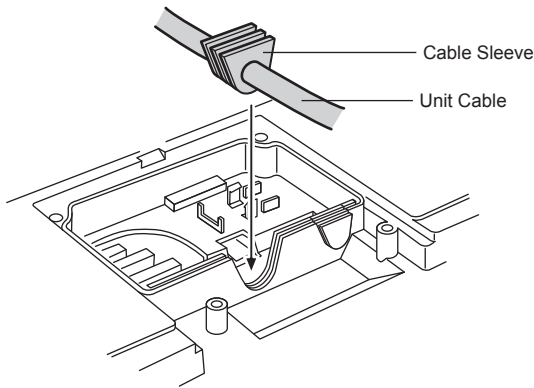
> ✎ **Point** To ensure protection (IP65f), please correctly install the sleeves.

7 **Assemble Cable Guard A and B.**

Cable Guard C has been pre-attached to the cable of Switch Unit. Please remove it.

Remove from Switch Unit

Cable Guard C
(shipped with Switch Unit)

Cable Guard B
(shipped with the host unit cable)

Cable Guard A
(shipped with the host unit cable)
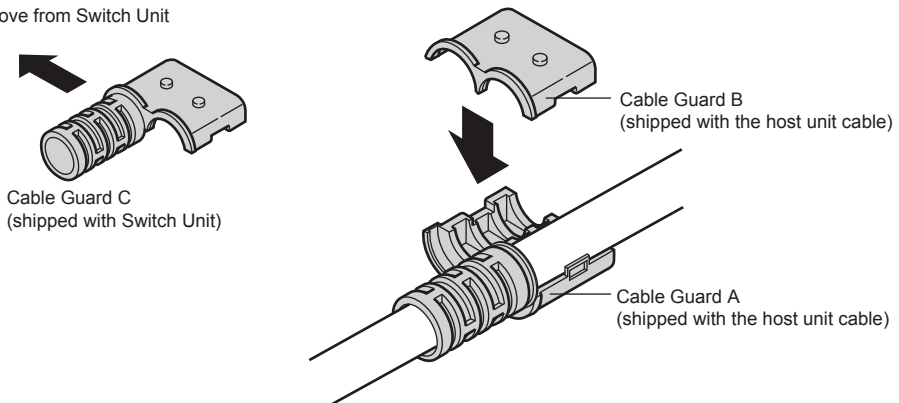
> ✎ **Point** The mounting position and cable outlet varies depending on the cable guards to be used. For
> more information about the mounting position and cable outlet of Switch Unit, please see
> 📖 **"Installation Precautions", page 6-50,** 📖 **"Cable Guards", page 6-55.**

8 Align the cable guard with the cable guard mounting position on the back of the unit and use 2 (M3x8) enclosed screws to attach the cable guard with the fixture (the tightening torque below 0.49 N·m).

> ✎ **Point** The cable guard mounting positions are located on the upper and lower part of the unit respectively. Please choose one based on the cable outlet.

The fixture to attach the cable guard

Cable Guard A+B
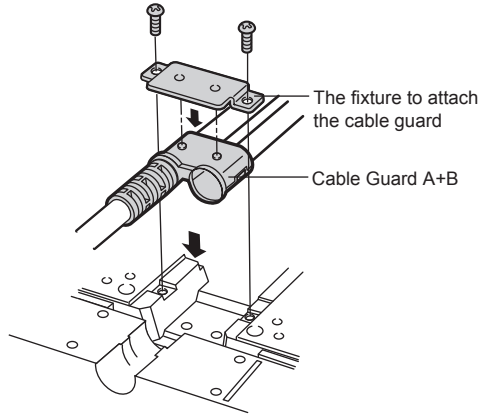
9 Put back the back cover removed in Step 3, and attach it to the unit with 4 screws (with a tightening torque below 0.49 N·m).

> **NOTICE**
> • To ensure protection (IP65f), before putting back the back cover after wiring and fixing, please fix the enclosed part of a cable and sleeve with screws.
> • To ensure the tensile strength of the Emergency-stop switch unit (VT3-SW4/VT3-SW6) cable, the cable guards must be used.

■ Cable Guards

To ensure the tensile strength of the Emergency-stop switch unit cable, the cable guards must be used.
3 types of cable guards are available.

Cable Guard A*
(shipped with the unit cable)
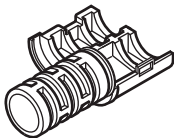
Cable Guard B
(shipped with the unit cable)

Cable Guard C*
(shipped with Switch Unit)
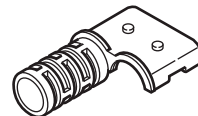
* Attached to the cable at factory.

The mounting position and cable outlet varies depending on the cable guards to be used. The mounting position and cable outlet varies depending on the cable guards to be used. For more information about the mounting position and cable outlet of Switch Unit, please see 📖 "Installation Precautions", page 6-50.

State	The Cable Guards to be Used
Mounting position of Switch Unit : top **Cable outlet : top**	For Cable Guard A+B
Mounting position of Switch Unit : top **Cable outlet : lower**	For Cable Guard A+C
Mounting position of Switch Unit : top **Cable outlet : top**	For Cable Guard A+C
Mounting position of Switch Unit : lower **Cable outlet : lower**	For Cable Guard A+B

● **For Cable Guard A+B**

Please refer to 📖 "Installing Steps of Switch Unit", Step 7 and 8 under page 6-54, page 6-55.

● **For Cable Guard A+C**

1 **Assemble Cable Guard A and C.**
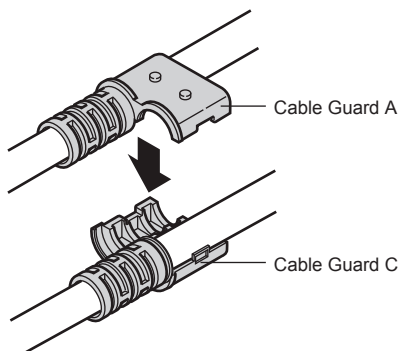
Cable Guard A

Cable Guard C

✎ **Point**   **The cable guard mounting positions are located on the upper and lower part of the unit respectively. Please choose one based on the cable outlet.**

2 **Align the cable guard with the cable guard mounting position on the back of the unit and use 2 (M3x8) enclosed screws to attach the cable guard with the fixture (the tightening torque below 0.49 N·m).**

Fixture to attach the cable guard

Cable Guard A+C
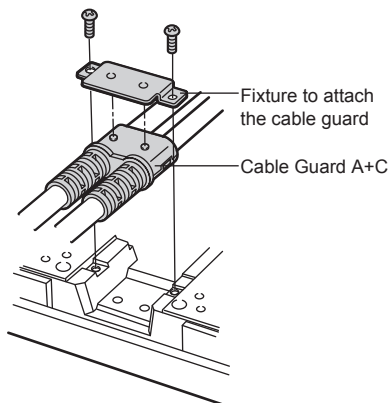
Switches

Giving out the wiring details about Emergency-Stop Switch and the lamp switches (VT3-SW4/VT3-SW6).

■ Emergency-Stop Switch Unit
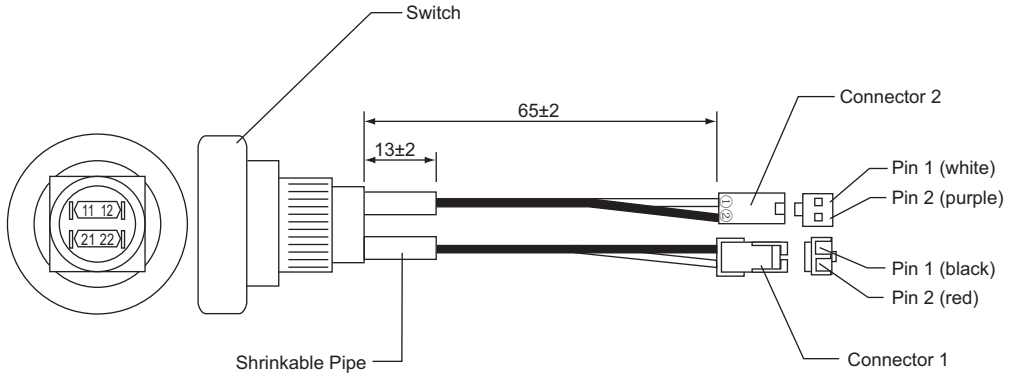
Switch	Wire Color	Connector 1	Switch	Wire Color	Pin2
21	Black	Pin 1	11	White	Pin 1
22	Red	Pin 2	12	Purple	Pin 2

Metal Wire gage   : AWG#18 UL-Style NO.1007 (black, red)

                             : AWG#18 UL-Style NO.1007 (white, purple)

Rating   : 80°C 3A above

Connector 1 Casing   : SLP-02V

             Contact   : SSF-21T-P1.4 (JST)

Connector 2 Casing   : DF1B-2S-2.5R (Hirose)

             Contact   : DF1B-2428SC (Hirose)

■ Wires of Lamp Switches (Red, Green)
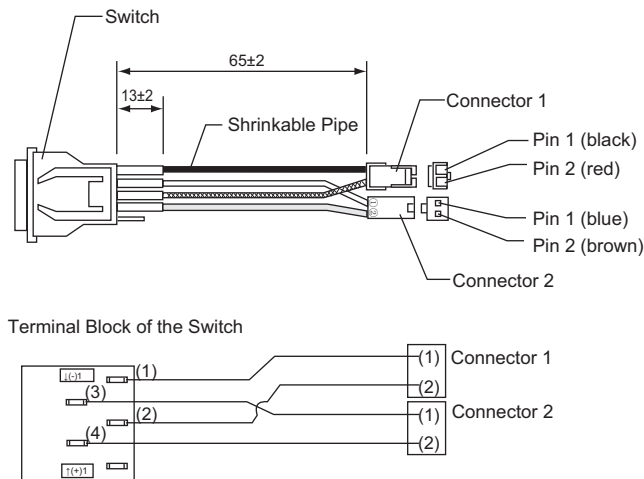
Terminal Block of the Switch

Metal Wire gage	: AWG#18 UL-Style NO.1061 (red,black)
	: AWG#24 UL-Style NO.1061 (brown, green)
Rating	: 105°C 3A above
Switch	: LB-15CKS1 (Nikkai)
Illuminating Button (red, green)	: red/AT-4164-R, green/AT-4164-M (Nikkai)
LED(red, green)	: red /AT-627-R24, green/AT-627-M24 (Nikkai)
Connector 1 Casing	: SLP-02V (JST)
Contact	: SSF-21T-P1.4 (JST)
Connector 2 Casing	: DF1B-2S-2.5R (Hirose)
Contact	: DF1B-2428SC (Hirose)

■ **Wires of Lamp Switch (White)**
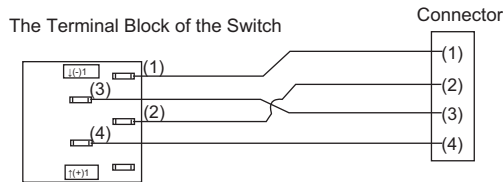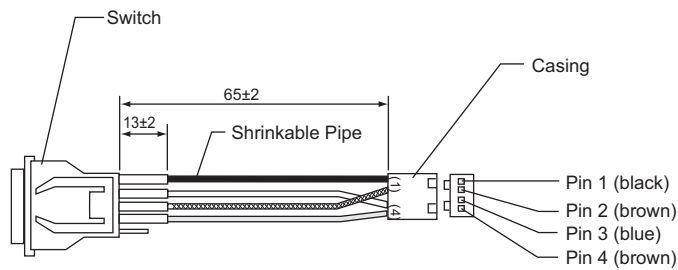
Metal Wire gage	: AWG#24 UL-Style NO.1061 (red,black,brown,green)
Rating	: 105°C 3A above
Switch	: LB-15CKS1 (Nikkai)
Illuminating Button(White)	: AT-4164-N (Nikkai)
LED(yellow)	: AT-627-Y24 (Nikkai)
Connector Casing	: DF1B-4S-2.5R (Hirose)
Contact	: DF1B-2428SC (Hirose)

Secification of Switch Unit Cable (OP-35433)

● **Dimensions**
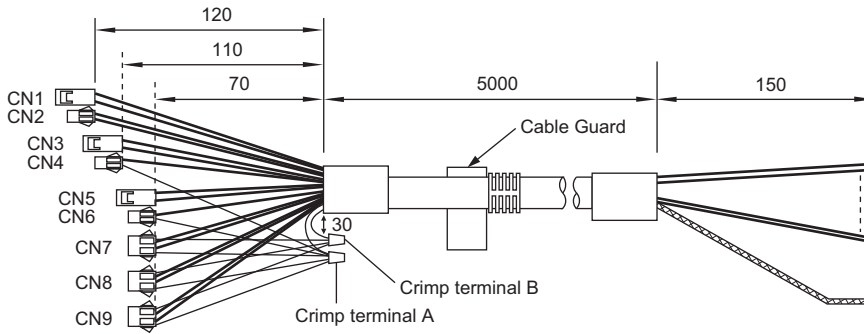
● **Wiring Table**

Connector No.		Wire	Color of Wire	Wiring	AWG
CN1	1	A1	pink/black	Emergency-Stop Switch Unit	AWG18
	2	A2	pink		
CN2	1	B1	Purple/white		AWG24
	2	B2	Purple		
CN3	1	A3	light blue/black	Switch (green)	AWG18
	2	A4	light blue		
CN4	1	B7	Green/white	Lamp (green)	AWG24
	2	Crimp terminal A	Brown	Switch (+Common)	
CN5	1	A5	Orange /black	Switch (red)	AWG18
	2	A6	Orange		
CN6	1	B8	Red/white	Lamp (red)	AWG24
	2	Crimp terminal A	Brown	Switch (+Common)	
CN7	1	Crimp terminal B	Brown/black	Switch (white: -Common)	
	2	B3	Yellow	Switch (white1: +)	
	3	B9	yellow/black	Lamp (white1)	
	4	Crimp terminal A	Brown	Switch (+Common)	
CN8	1	Crimp terminal B	Brown/black	Switch (white: -Common)	
	2	B5	Gray	Switch (white2: +)	
	3	B10	Grey/black	Lamp (white2)	
	4	Crimp terminal A	Brown	Switch (+Common)	
CN9	1	Crimp terminal B	Brown/black	Switch (white: -Common)	
	2	B6	White	Switch (white3: +)	
	3	B11	White/black	Lamp (white3)	
	4	Crimp terminal A	Brown	Switch (+Common)	
Crimp terminal A		B12	Brown	Switch (+Common)	
Crimp terminal B		B4	Brown/black	Switch (white: -Common)	

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PERIPHERALS

Memory Card

Expansion memory

Barcode Reader

Video Unit

ETHERNET Switch Unit

Printer Unit

Emergency-Stop Switch Unit

Switch Unit

External Memory Card Slot

Specific Panel Mounts

● **Connector Models and Manufacturers**

Connector	Casing	Contact
CN1, CN3, CN5	SLR-02VF (JST)	SSF-21T-P1.4(JST)
CN2, CN4, CN6	DF1BA-2EP-2.5RC (Hirose)	DF1B-2428PC(Hirose)
CN7, CN8, CN9	DF1BA-4EP-2.5RC(Hirose)	DF1B-2428PC(Hirose)

Shielded Cable

The following describes how to deal with the shielded cable when the cable is cut short.

● **Cross-section of cables (OP-35433)**

Cross-section
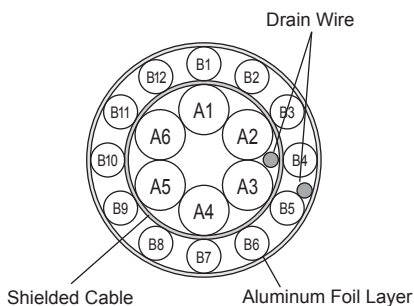
Cables	Color of Wire	Cables	Color of Wire	Cables	Color of Wire
A1	pink/black	**B1**	Purple/white	**B7**	Green/white
A2	pink	**B2**	Purple	**B8**	Red/white
A3	light blue/black	**B3**	Yellow	**B9**	yellow/black
A4	light blue	**B4**	Brown/black	**B10**	Grey/black
A5	Orange /black	**B5**	Gray	**B11**	White/black
A6	Orange	**B6**	White	**B12**	Brown

■ **Prepare the Cable**

1 **Determine the desired length of the cable.**
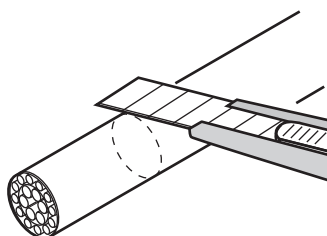
2 **Be careful not to damage the aluminum foil layer, and remove the coat of the cable.**
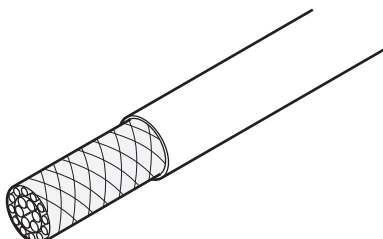
3 **Cut off the cable with pliers.**

Please keep an eye on the drain wire (outer side)

Drain Wire (outer side)
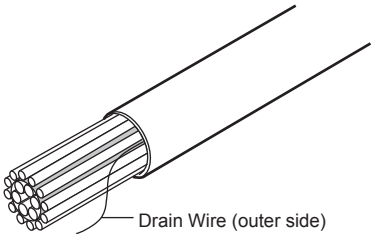
4 **Determine a proper length of the shielded cable, then cut off the rest with pliers. Now the left shielded cable is shown as follows.**

Please keep an eye on the drain wire (inner side).

Shielded Cable

Drain Wire (outer side)

Drain Wire (inner side)
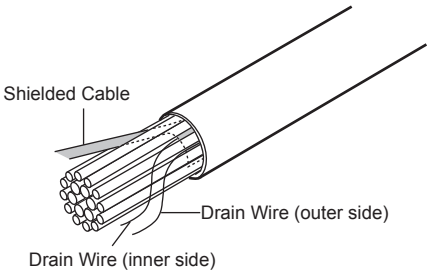
5 **Tie together the shielded cable and 2 drain wires left in Step 4.**

Shielded Cable

Drain Cable
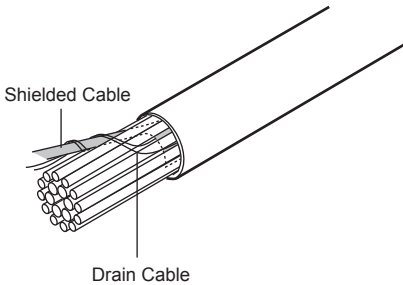
6 **Wrap the exposed aluminum foil layer with insulated tape or use the shrinkable pipe.**
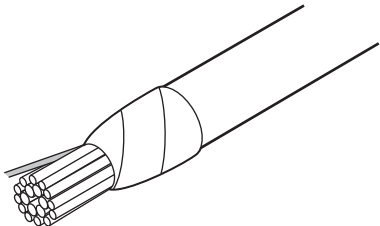
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PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

Adjustor

To use the enclosed Adjustors, you need a φ16 or φ19 switch.

> ✎ **Point**
> • **To use other switches, necessary changes need to be made to Switch Unit, Adjustors, or cable.If changed or modified, performance of our products are not guaranteed.So for the use of the Adjustors, the decision is yours.**
> • **For the fourth switch from the left side of VT3-SW6, a hollow is design for the cable. So you cannot use the Adjustor to regulate this switch.**

Cannot use the adjustors.

■ Install the Adjustors

Nut

Adjustor B

Adjustor A

Align
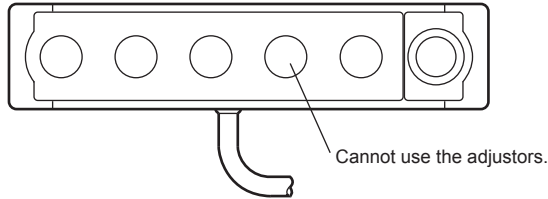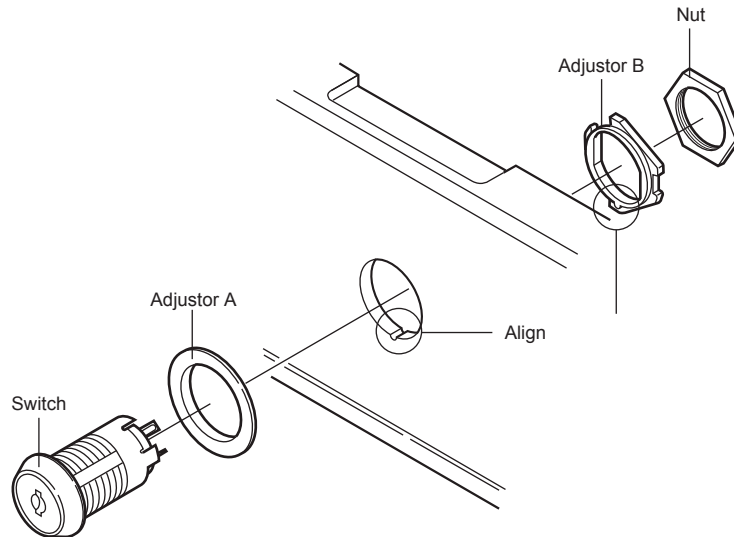
Switch

1 **Inset Adjustor A into the switch hole in the housing from the front and Adjustor B from the back.**
Insert the front part of Adjustor B into the recess in the housing.

> ✎ **Point**
> **Depending the switch and housing to be used, it is necessary to make change to the housing or Adjustors.**

2 **Now, insert the switch from the front and use the enclosed nut to secure the Adjustors from the back.**

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PERIPHERALS

The switches and indicators to be used are listed in the following table.

Item	Manufacturer	Model No.	The Adjustors
Indicator (round)	NIHON KAIHEIKI IND. CO., Ltd.	YB series[1]	For φ16
Indicator (square)			
Indicator (rectangle)			
Illuminating Switch (round)			
Illuminating Switch (square)			
Illuminating Switch (rectangle)			
Key-lock Switch[2]		CK series (M model)	For φ16
		CK series (L model)	For φ19

*1 Please use the models that are secured with screws. Do not use the placement models.

*2 Special attention should be paid to the position of the holes and keys on the Adjustors.

✎ Point　**For the specifications and use of the switches and lamps, please refer to the data sheets of other manufacturers.**

External Memory Card Slot

This section describes the external memory card slot VT2-D2.

Memory card slot is on one side of the body of VT3. The external memory card slot is used for inserting the memory card (OP-42254) from the front of the panel. It is also equipped with a serial port, so screen data and PLC data folder data can be read or written from the front of the panel.

> ✎ **Point** **External memory card slot VT2-D2 can not be used for VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/ W4G(A)/V7R.**

Names of Parts

External Memory Card Slot VT2-D2

Front   Back

Memory Card
Slot Cover   Cable Connector

                                         PORT A
Port Cover   (the side
                                         PORT on VT3)

Inside the cover

Memory Card Slot

EJECT Button
                    Access LED
Serial Port

6

PERIPHERALS
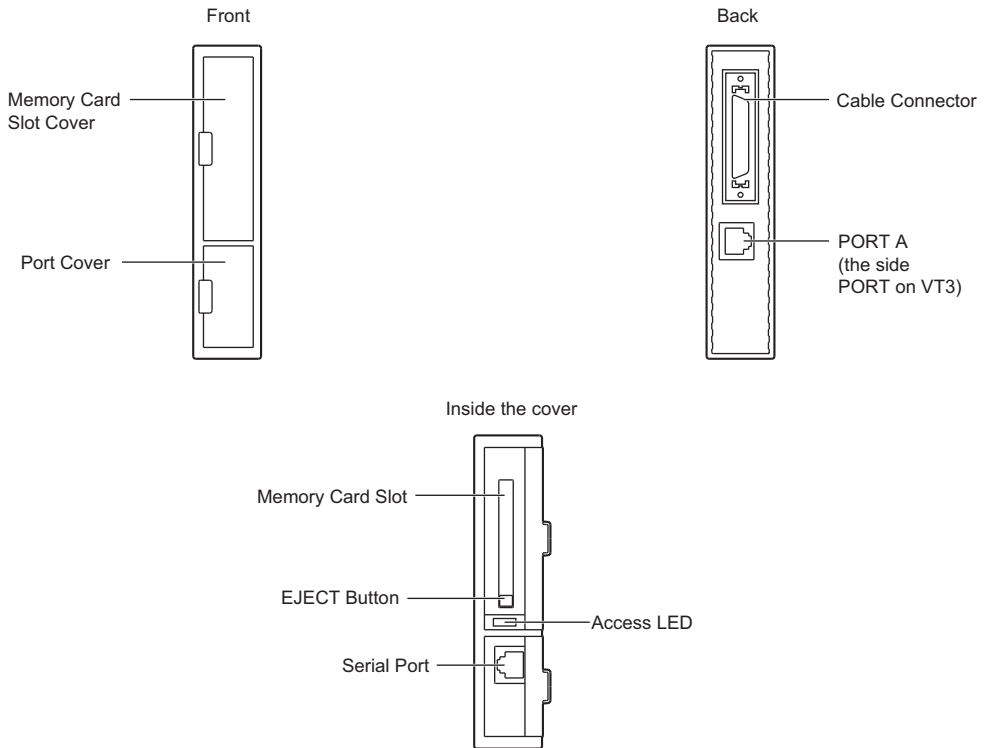
Mounting Precautions

Be sure to mount the VT2-D2 as described below. If the VT2-D2 is mounted incorrectly, data may not be read from or written to the memory card correctly.

■ Mounting Position

Since external memory card slot is installed in memory card slot, it is located on the left side of VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7when you look into the front of the unit body. The card slot cannot be mounted on the opposite side.VT3 Please note that the position of memory card slot varies depending on VT3 models.

The length of the connector cable is limited.VT3Please install external memory card slot by aligning its central line with that of the body of VT3.
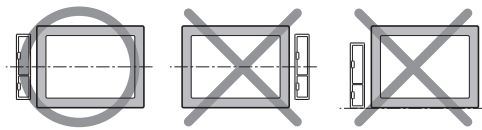
For VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7   For VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A
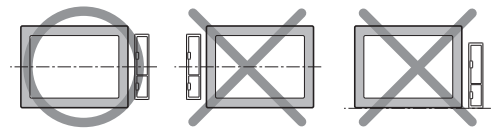
■ Surroundings and Spacings

Maintain 200 mm of space from the panel surface inside the panel to lead in the connector cables.

As shown in the following figure, external memory card slot is mounted on the left side of VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7.

View from the top

200mm

VT2-D2   VT3   Panel plane
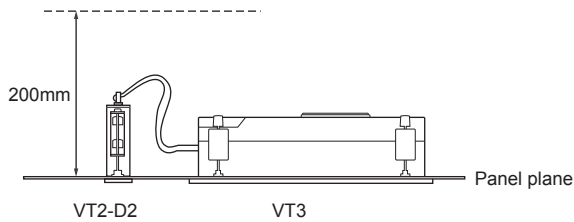
> ✎ **Point** **When external memory card slot is mounted in the environments subject to large noise, VT3 is reset. Do not use the external memory card slot in these kinds of environments.**

Mounting

The following describes how to mount the external memory card slot. Mounting fixtures are required for mounting.
About the Installation of VT3.

📖 "Chapter 3 INSTALLATION"

NOTICE	• To safeguard data corruption, please ensure to cut off the power before you install external memory card slot. • When Access LED on external memory card slot lights, please do not unplug the memory card (OP-42254) or cables. Doing so might damage the data.

✎ Point	Since external memory card slot is installed in memory card slot of VT3, please ensure to find the position of memory card slot. Please note that the position of memory card slot varies depending on VT3 models. For VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7, it is mounted on the left side. For VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A, on the right side.

1 **From the mounting panel, make an opening with the following dimensions.**

$22.5 \ ^{+0.5}_{0}$ 35   35 $22.5 \ ^{+0.5}_{0}$

$116.5 \ ^{+0.8}_{0}$

Model	Thickness of Panel
VT3-X15(D)	2.0mm to 4.0mm
VT3-S12(D)/S10/ V10(D)/V8/V7/ Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/ Q5M(W)A	1.6mm to 4.0mm

VT2-D2
(When connected with
VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7)

VT3

VT2-D2
(When connected with VT3-Q5T(W)/
Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A)

2 **Cut off the power of VT3, find the position and insert the cable into memory card slot of VT3.**
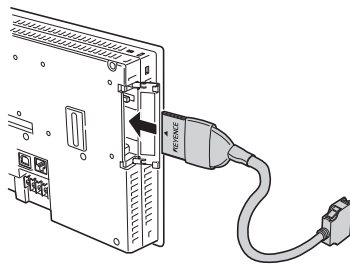
(For VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7)

NOTICE	In the case that the cable is not correctly inserted, damage may happen to the cable and memory card slot of VT3.

3 **Insert external memory card slot into the mounting opening in the front panel.**
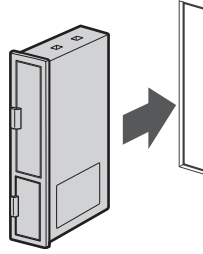
4 **Securely attach the enclosed fixtures to external memory card slot from both the top and bottom, and attach it to the panel.**

Tightening torque
0.3N•m
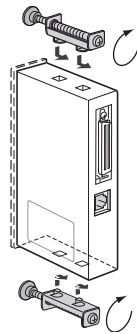
> **Point** As shown in Figure 5 and 6, external memory card slot is mounted on the left side of VT3-X15(D)/S12(D)/S10/V10(D)/V8/V7. For VT3-Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A, it is mounted on the right side.

5 **Insert the cable into external memory card slot until it is locked in place.**
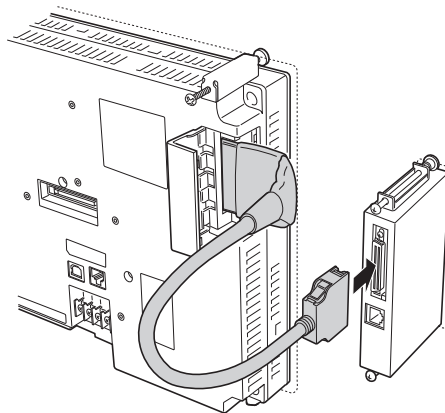
NOTICE	Do not connect the connector cable while exerting unnecessary force with the cable inserted in the wrong direction. Doing so might damage the connector cable or the external memory card slot.

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

6 When using the serial port on external memory card slot to transmit screen data and data in PLC data folders, plug the enclosed module cable into PORT1 on VT3 and PORT A on external memory card slot.
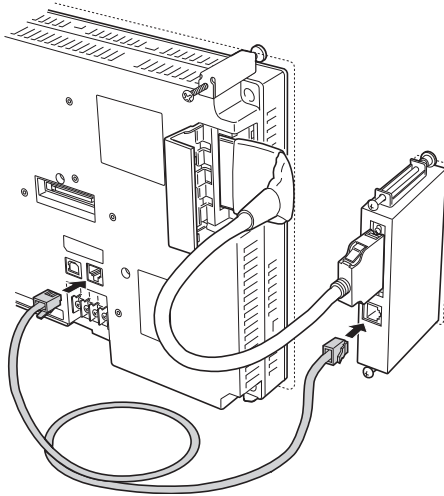
NOTICE	**The serial port can only be used by VT3. Do not connect the serial port to KZ, KV series or other device using PORT A on the external memory card slot. Doing so might damage the external memory card slot or the connected device.**

Install and Remove the Memory Card

■ Insert the memory card into external memory card slot

Insert memory card (OP-42254) into external memory card slot in the arrow direction. After inserting the memory card, be sure close the memory card slot cover.

Front
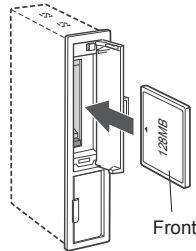
NOTICE	Do not insert the memory card while exerting unnecessary force with the memory card inserted in the wrong direction. Doing so might damage the memory card or the external memory card slot.

■ Remove Memory Card from External Memory Card Slot

Make sure that the access LED is OFF, and then extract the memory card straight with the EJECT button on the external memory card slot pressed in. After ejecting the memory card, be sure to close the memory card slot cover.

(1)   (2)

NOTICE	Before inserting or ejecting the memory card (OP-42254), make sure that the LED is OFF. Otherwise, the data on the memory card may be corrupted. Insert or eject the memory card when the menu screen in the System mode is displayed or the "Accessing Memory Card" bit or "PLC data folder currently being executed" bit in the system area is OFF.

✎ Point	• Compared with memory card slot of VT3, accessing memory card inserted in external memory card slot needs a longer time.
	• Except plugging/unplugging memory card, please always keep the cover of the slot closed.
	• VT3 cannot access memory card when the cover of memory card slot is open. Be sure to close the memory card slot cover before use.
	• For an on-going access to the memory card, the access will continue until it is completed when the memory card slot cover is open during this time.

6

PERIPHERALS

| Memory Card |
| Expansion memory |
| Barcode Reader |
| Video Unit |
| ETHERNET Switch Unit |
| Printer Unit |
| Emergency-Stop Switch Unit |
| Switch Unit |
| External Memory Card Slot |
| Specific Panel Mounts |

6-10 VT3-X15 (D) Specific Panel Mounts

This section describes how to use X15(D), Specific panel mounts (OP-80930).

VT3-X15(D) is equipped with a specific panel mount, making it easier to operate the panel.

The panel mount (OP-80930) is composed of 2 parts. 1 screw is enclosed for each mount.

NOTICE	• **Do not hold one side of the mount to lift up the unit.** • **It is not enough to only use the mount to mount the panel.**

■ Mounting procedure

1 Put VT3-X15(D) face down on a smooth surface.

✎ Point	**Be careful not to damage the face of VT3-X15(D) by placing it on a soft surface like a cloth. In addition, check to ensure the surface is smooth.**
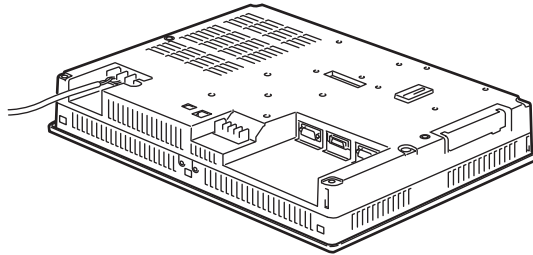
2 Align and insert the mounting claw into the "mount hole" at the bottom of VT3-X15(D) body.

The 2 mounts (OP-80930) are identical. The 2 mounts are identical. Their mounting position is exchangeable.

Mounting Hole

Special Panel Mount

Mounting Hole

Mounting Claw
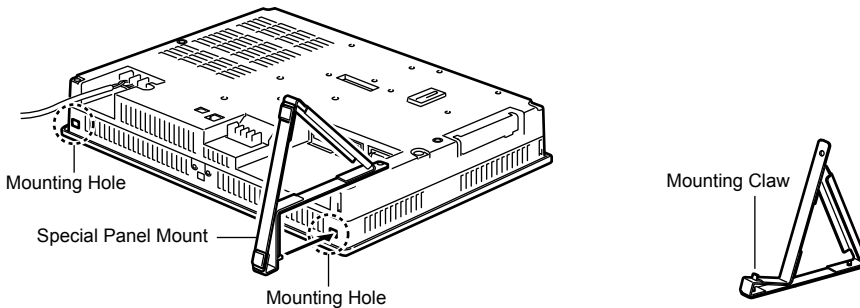
3 Screw the mounts onto the body of VT3-X15(D).

All the 2 mounts must be mounted.

Screw
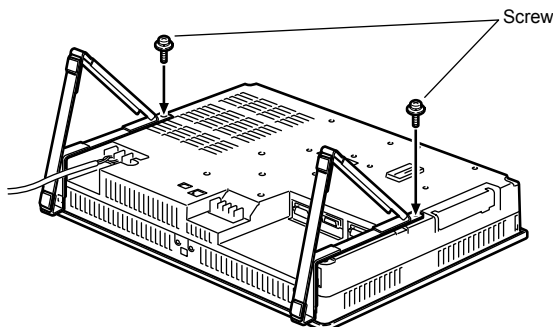
Tightening torque
0.5N•m

4 **Use you both hands to hold VT3-X15(D) and make it stand on the mounts.**
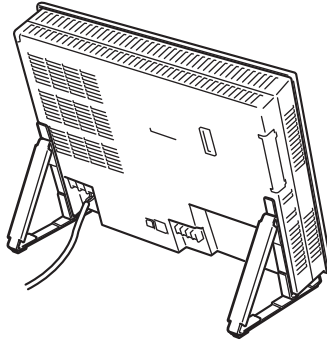
In addition, to disassembly it, do the opposite to the above said.

6

PERIPHERALS

Memory Card
Expansion memory
Barcode Reader
Video Unit
ETHERNET Switch Unit
Printer Unit
Emergency-Stop Switch Unit
Switch Unit
External Memory Card Slot
Specific Panel Mounts

MEMO

7

KL LINK

This chapter describes the KL Link method in the VT3 series.

✎ Point	**KL link cannot be used for VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R.**

What is KL Link

KL Link of VT3

With the VT3 KL Link, VT3 receives and sends data from and to the units of the KL Series. As a ladder program on the PLC is not required, VT2 KL Link can be used as a direct input/output function on the touch panel.

Data is transmitted from the touch screen of VT3 to the KL slave nodes through the VT3 internal link devices. And input of the KL slave nodes is indicated with the lamps on VT3. In addition, analog signals, among others, can also be displayed on VT3 with values or graphic charts and saved in the Memory Card.
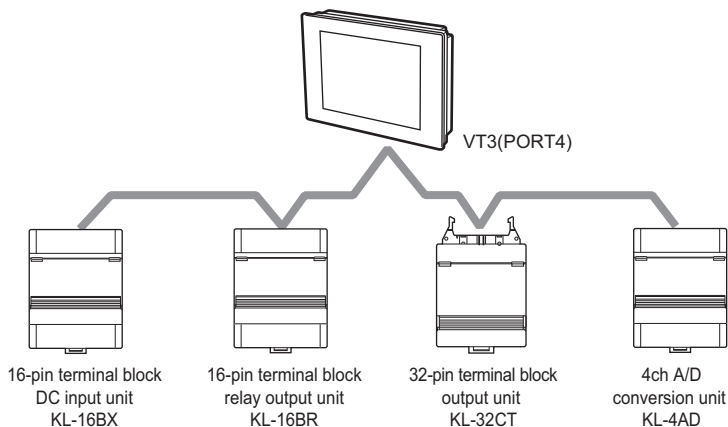
VT3(PORT4)

| 16-pin terminal block DC input unit KL-16BX | 16-pin terminal block relay output unit KL-16BR | 32-pin terminal block output unit KL-32CT | 4ch A/D conversion unit KL-4AD |

| NOTICE | Communications with other KL units cannot happen when the power of VT3 is turned off or the System Mode screen (including the communications with the PC such as the picture transfer) is displayed. When the device currently connected to a KL unit is running, either stop operation of the device or set an error hold. |

| ✎ Point | • The KL Link cannot be used together with Multi-link, VT2 Multi-link, and Mega-link simultaneously. • PLC communication and KL Link are run independently from each other. VT3's communication with the KL units can be still enabled even if its communication with PLC is not undertaken. • For details on KL slave node settings, refer to the manual for the respective model. • VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)/V7R cannot use the KL Link. |

Precautions on KL Link

As the direct input and output, KL Link is only used to send data to and receive data from VT3. And strict response time cannot be controlled. As a sequence, KL Link cannot be used under the following circumstances.

• Time-critical touch controls
• Communications with other KL master units
• Send VT3's KL data to PLC

7-2 Connections and Wirings

Connection Cables

Be sure to use the exclusive cables shown in the following table for both the trunk and branches. Operation using cables other than the exclusive cables cannot be guaranteed.

Company Name	Product Name	Consultation
KEYENCE CORPORATION	OP-30591 (20 m) OP-30592 (100m) Conductor cross-section area 0.75mm^2	The nearest office Please see the list of offices on the back cover of this manual
FURUKAWA ELECTRIC CO., LTD.	KPEV-SB (1P) (with 2-core twisted shielded cable) * Conductor cross-section area 0.5 to 1.25 mm^2	FURUKAWA ELECTRIC CO., LTD.
Nihon Electric Wire & Cable Co., Ltd.	KNPEV-SB (1P) (with 2-core twisted shielded cable) * Conductor cross-section area 0.5 to 1.25 mm^2	Nihon Electric Wire & Cable CO., LTD.
TATSUTA ELECTRIC WIRE & CABLE CO., LTD.	Cable model PCPEV-SB (1P) (KPEV-SB or equivalent) 0.5 to 1.25mm^2 X1P	Tatsuta Electric Wire & Cable CO., LTD.

> **Point** **Use 1 cable having the same conductor cross-section area for all trunks and branches in the system.**

Cable Lengths and Number of Connected Units

The cable length and number of connected units for the connection of the KL series to VT3.
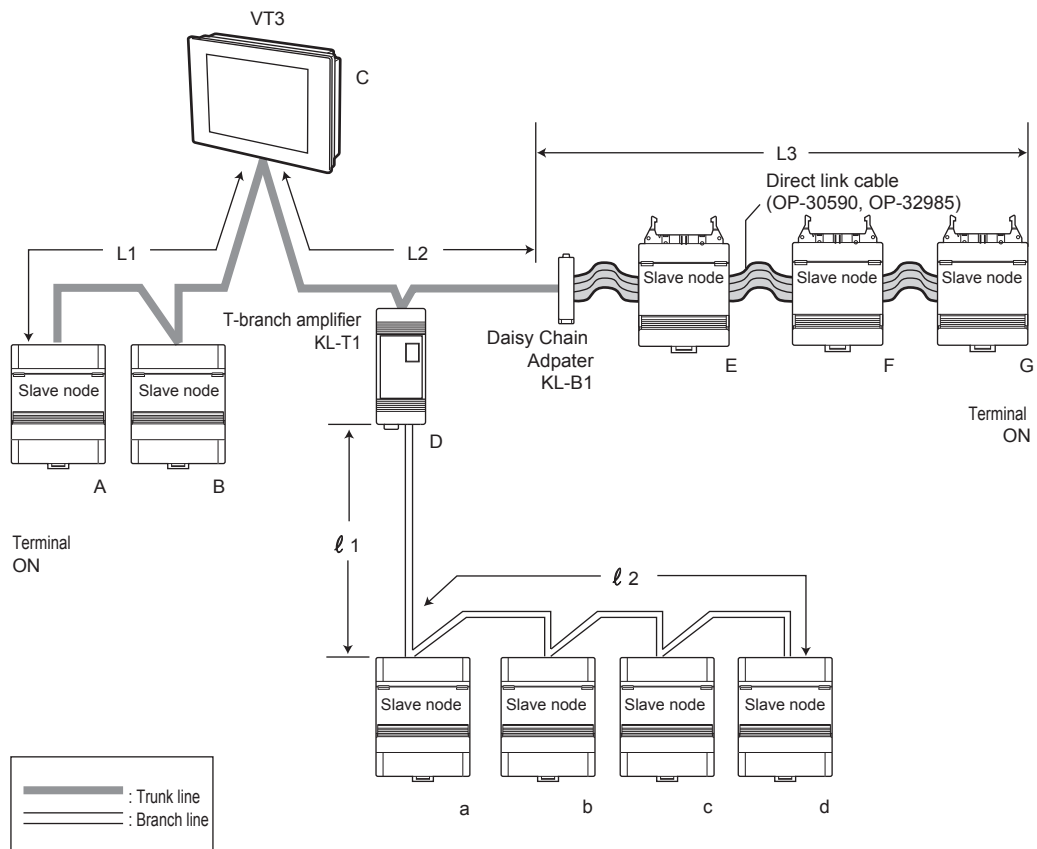
■ Cable lengths

Use exclusive cables on both the trunk and branches.

The following tables show the restrictions that are applied to cable lengths.

📖 "Connection Cables", page 7-3

📖 "Connection Methods", page 7-5

Conductor cross-section area(mm²)	Max. Extension Distance (m)
0.5	1000
0.75	1200
0.9	1200
1.25	1200

Baud Rate	Max. trunk length (m) L1+L2+L3	Max. Branch Length (m) $\ell 1+ \ell 2$	Max. slave node connection range(m) $\ell 2$
5Mbit/s	50	20	0.25
2.5Mbit/s	120	40	1.10
625kbit/s	500	150	2.90
156kbit/s	1200	350	2.90

✎ **Point**
- **The total length of the used trunk line should meet the requirements of both the max extension distance and max trunk length.**
- **The max trunk length, max branch length, and max connected slave node distance include the length of the straight line cable.**
- **The max branch length is the connected wire length of one KL-T1 unit.**
- **The max connected slave node distance ($\ell 2$) is the distance between two adjacent slave nodes.**

■ Number of connected units

The following tables show the restrictions that are applied to the number of connected units.

📖 "Connection Methods", page 7-5

Baud Rate	Max. number of units connected to trunk A to G	The max number of branch units (units) a to d	Max. number of connected units
5Mbit/s	33	3(2)	97
2.5Mbit/s	100	10(7)	129
625kbit/s	100	25(18)	129
156kbit/s	100	25(18)	129

✎ **Point**
- **The T- branch amplifier KL-T1 contains the number of the trunk units. Up to 32 KL-T1 units can be used.**
- **The maximum number of connected units is the total number of master and slave nodes on the entire communications line including the trunk and branches (excluding KL-T1 and KL-B1).**
- **The max number of branch units is the number of units that can be connected by the KL-T1 branch line.**
- **When the straight line cable OP-32985 is used, the max number of branch units is the number in the brackets.**

Connection Methods

■ Connecting to terminal block units

The VT3 series should be series-connected with KL.
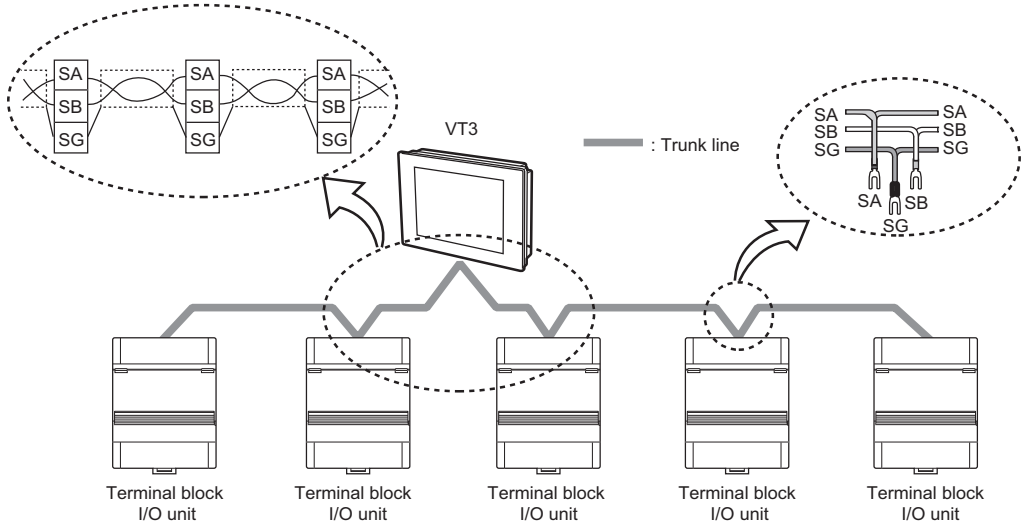
■ Connecting to connector type units

VT3 cannot be directly linked to the connector-type unit. Connect a Daisychain Cable Adapter KL-B1 or terminal block unit between the VT3 and the connector type unit.
KL-B1 can be used on both trunk and branches.
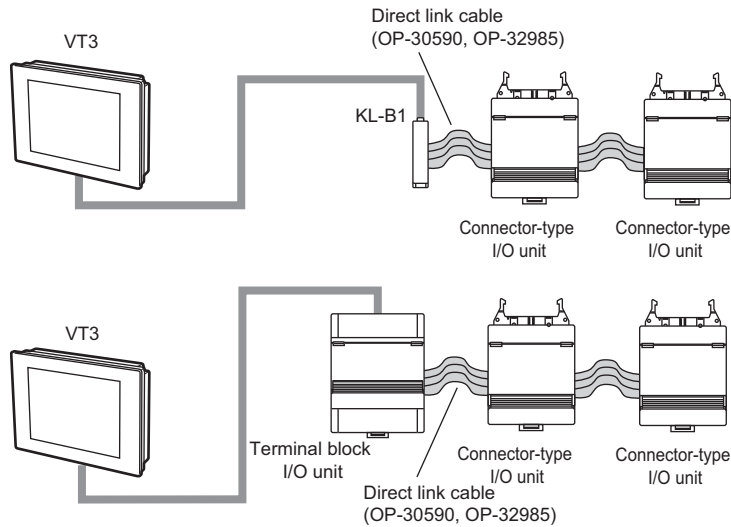
> ✎ **Point**
>
> • **When using a daisy-chain cable on a trunk, up to five slave nodes can be daisy-chained at a single location. When the daisy-chain cable is connected from the KL-B1, the KL-B1 is not included in these five units. However, when a daisy-chain cable is used for the connection from a terminal block unit, the terminal block unit is included in these five units.**
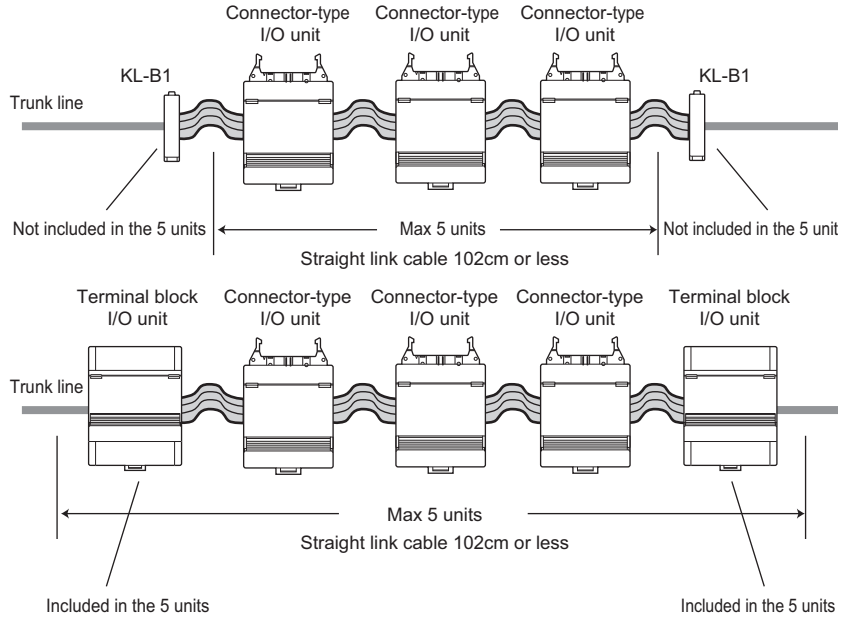
• **When multiple KL-B1 are used, please use the KPEV-SB(1P) cable with a length of 25cm above to connect the KL-B1 unit one after another.**
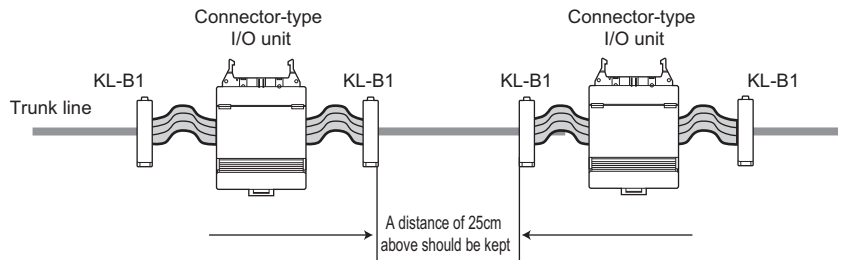
■ **Making branches using the T-branch Booster KL-T1**

When making a branch from the trunk, be sure to use the T-branch Booster KL-T1.
The maximum number of connected KL-T1 units is 32.

	Point	• **KL-T1 cannot be used by the branch line.**
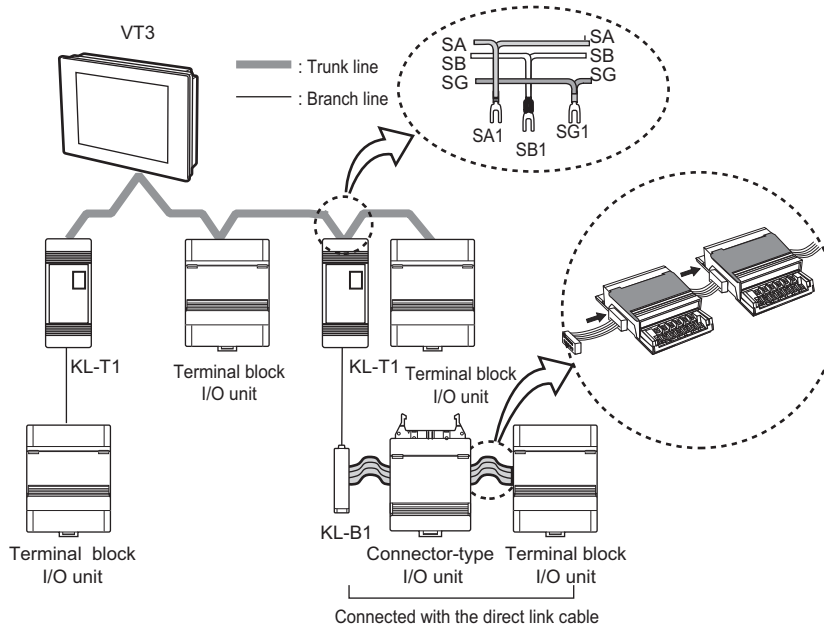
• **KL-T1 cannot be used by the branch line.**
• **When connecting the KL-T1 to the end of a trunk, set the terminator on the KL-T1 to ON. Set the terminator on the slave nodes at the end of the branch to OFF.**
📖 "KL Series I/O Unit User's Manual"

Reference	When the KL-T1 is connected to one end of the trunk, install slave nodes at the position "maximum trunk length + maximum branch length."

7

KL LINK

Terminal Connections

M3.0 terminal screws are used for VT3 (PORT4) and KL slave nodes.

If you are connecting using crimped terminals, make sure that they conform to the following specifications. (unit: mm)

Max. 6.0   Max. 6.0

Pay attention to the following points when connecting terminals.

■ Cable terminals
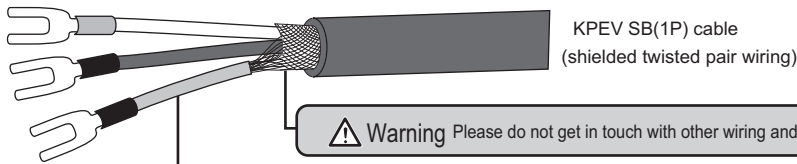
KPEV SB(1P) cable
(shielded twisted pair wiring)

⚠ **Warning** Please do not get in touch with other wiring and equipment.

⚠ **Warning** Please ensure to insulate the shielded wire with insulated rubber or shrinkable rubber. In addition, the length should be below 10cm.

■ Cable branches
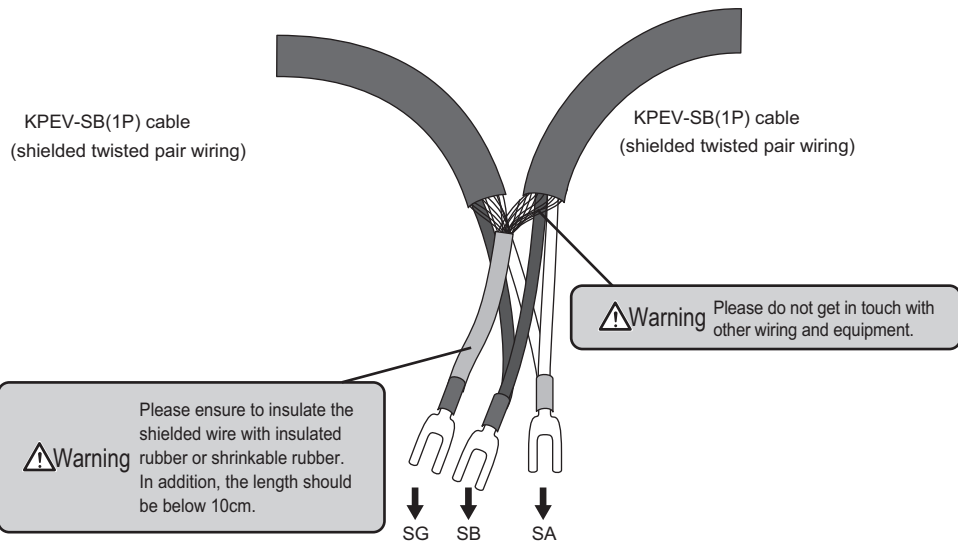
KPEV-SB(1P) cable
(shielded twisted pair wiring)

KPEV-SB(1P) cable
(shielded twisted pair wiring)

⚠Warning Please do not get in touch with other wiring and equipment.

⚠Warning Please ensure to insulate the shielded wire with insulated rubber or shrinkable rubber. In addition, the length should be below 10cm.

SG   SB   SA

Wiring Precautions

Do not make branches in the wiring on the trunk. Either wire in series, or use the T-branch Booster KL-T1 to make a branch.

VT3

VT3

VT3

T - branch
amplifier
KL-T1

Terminal block
I/O Unit

Terminal block
I/O Unit

Terminal block
I/O Unit

Terminal block
I/O Unit

Terminal block
I/O Unit

Terminal block
I/O Unit

Terminal bloc
I/O Unit

Terminal block
I/O Unit
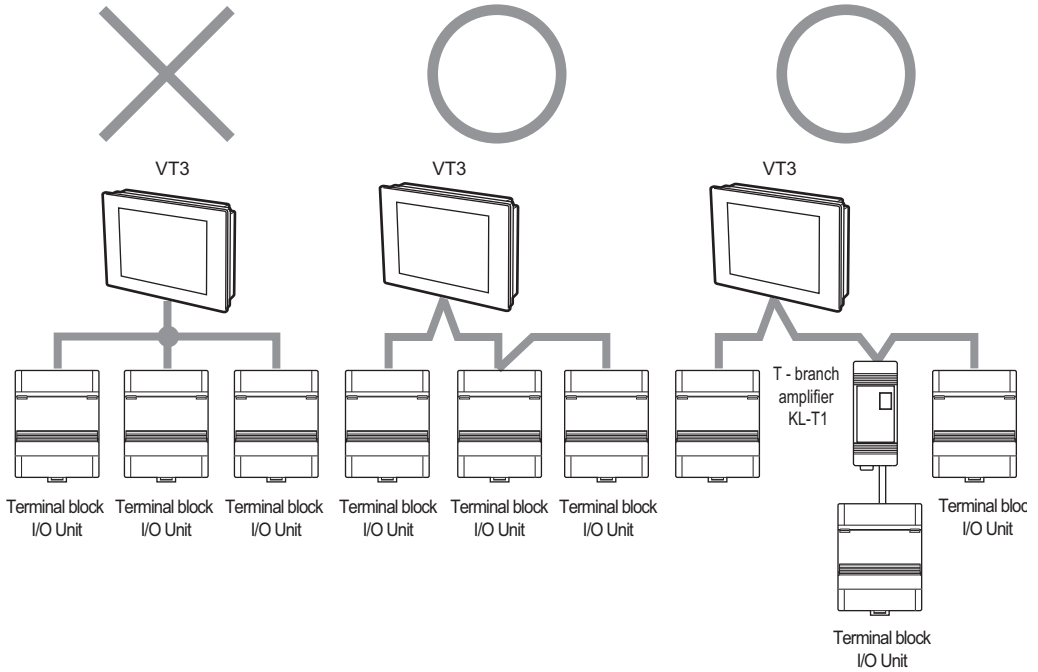
The communications cable cannot be daisy-chained using Day-chain Adapter KL-B1.

Terminal block
I/O unit

Daisy
chain adapter
KL-B1

Terminal block
I/O unit

Terminal block
I/O unit

Daisy
chain adapter
KL-B1

Connector-type
I/O unit

Connector-type
I/O unit

7
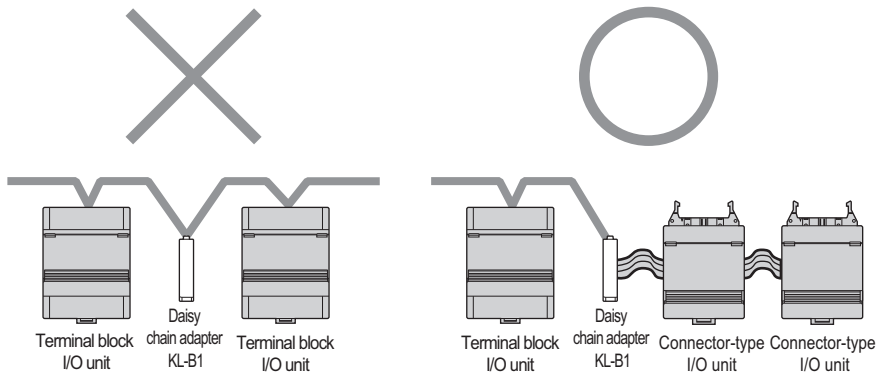
KL LINK

Set up the VT3 terminal

When KL Link is used, please turn the terminals on the VT3 unit or KL unit that is on both ends of the trunk line to ON.
The following describes how to set the terminator on the VT3 series.
For details on KL slave node settings, refer to the manual for the respective model.

VT3 (the terminal ON)

Slave   Slave   Slave   Slave
(the terminal ON)
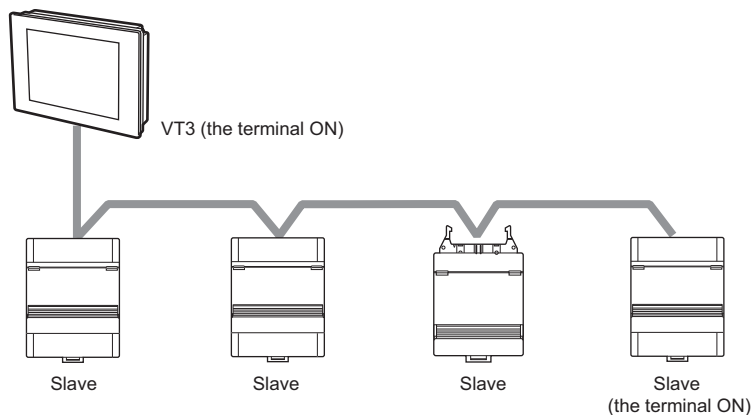
To turn the VT3 terminal ON, insert the enclosed short bar across the TERM terminals ("B" and the ".") of PORT4. When the VT3 series is shipped, the short bar is inserted to turn the terminator ON.
To turn the terminator OFF, remove the short bar from PORT4.

✎ Point	**When the short bar is removed, please keep it in a safe place. Don't lose it.**

Short bar (enchosed)
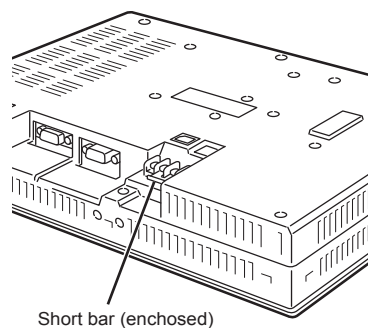
Grounding Precautions

Noise countermeasures have already been implemented on the KL series. Normally, the KL series can be used in a non-grounded state. However, the KL series must be grounded if the KL series is used in environments subject to a lot of noise. When grounding the KL series, pay attention to the following points:

• Provide a D-type grounding for the SG terminal on the KL series separate from other devices. Provide a D-type grounding (maximum resistance of 100 Ohms) for the grounded device.
• When separate grounding is not practical, use the common grounding. Note, however, that in this case the FG leads must of the same length.

SG Terminal   Other Equipment

D-type grounding
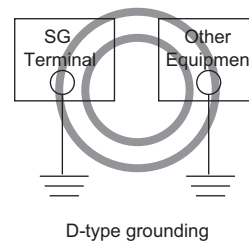
KL Series Communications Methods

The KL series can communicate 00H to FFH (128 words: 8 bits) of information.

KL series units are divided into two types of units for a single communications address, units to send from and units to receive at. Units that have a send address send data to units having the receive address of the same No., and units that have a receive address send data to units having the send address of the same No.

Communications are enabled by assigning these communication addresses to the master and slave units respectively.

In addition, the internal link devices of VT3 are used for the KL Link communications. One link device is assigned in a fixed pair with one communications address.

	Address		
Lamp ON (receiving)	00H	0 1 0 1 0 1 0 1	Input Signal
	01H	1 0 1 0 1 0 1 0	16-point Input Unit (the send unit)

VT3

	Address		
Touch Switch ON (Sending)	02H	0 0 0 0 0 0 0 1	Output Signal
	03H	0 0 0 0 0 0 0 0	16-point Output Unit (the receive unit)
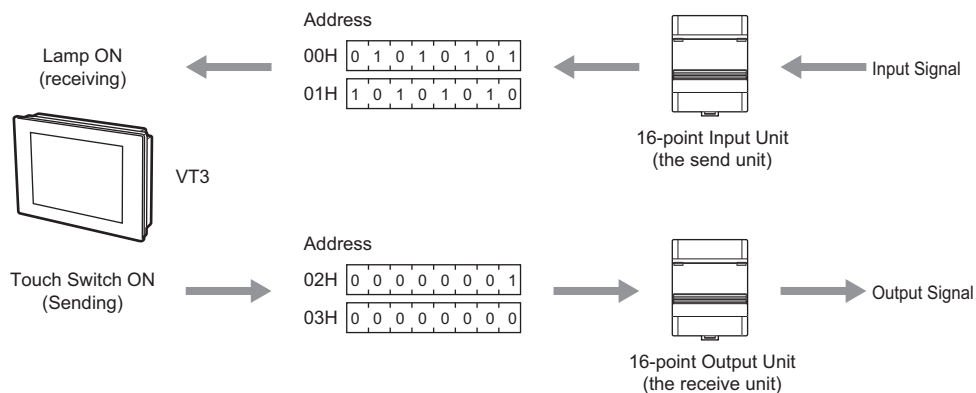
Reference	The VT3 KL Link and KV-5000/3000/1000/700 series use the PLC Link mode of the KL master unit KV-N20V to enable the same communications.

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KL LINK

Communications Area

The communication areas are assigned to the VT3 internal link devices by the ratio 1:1.

The slave units (input units) send information which is mapped to the receiving addresses of the VT3 link devices. The VT3 link devices that are assigned to the sending addresses send information to the slave units (output units).

The communications data monitor 00H to FFH (8-bit units) is assigned to all link devices LNW0000 to 007F (16-bit units). The information of addresses not directly sent and received by the master unit can also be monitored.

📖 "6-6 About the Devices", VT3 Series Reference Manual

NOTICE	• **Communications with other KL units cannot happen when the power of VT3 is turned off or the System Mode screen (including the communications with the PC such as the screen transfer) is displayed.** **When the device currently connected to a KL unit is running, either stop operation of the device or set an error hold.** • **To clear all the link devices (become 0), turn off the power of the VT3 unit or send the screen data to the VT3 unit.**

List of link devices

Device No.		Description	R/W Attribute
LNW0000 to 007F		Communications data monitor area (128 words)	R or R/W
LNW0080 to 008F		Connection information	R
LNW0090	0(LNB00900)	Break line error	R
	1(LNB00901)	Send lamp	R
	2(LNB00902)	Receive lamp	R
	3 to F (LNB00903 to 0090F)	Reserved	R
LNW0091 to 00BF		Reserved	-
LNW00C0		Bar code data reading length	R
LNW00C1	0(LNB00C10)	Bar code read completion notification bit	R/W
LNW00C2 to 10C1		Bar code data storage area	R
LNW10C2 to 10FF		Reserved	-

✎ Point	• **The link device areas cannot be changed.** • **Reserved areas cannot be used by the user.**

About R/W attributes

"R or R/W"   : R .... Can only read from the KL input units.

   R/W .... Can read from and write into the KL input units.

"R"   : Can only read data.

■ Communications data monitor area (LNW0000 to LNW007F)

Communications data monitor area is assigned to all 00H to FFH communications addresses.
The data for two communications addresses is stored to a single link device.

Communications address	Link Device
00H•01H	LNW0000
02H•03H	LNW0001
⋮	⋮
FCH•FDH	LNW007E
FEH•FFH	LNW007F

■ Connection information (LNW0080 to LNW008F)

The communications addresses that are currently being used in communications are stored to these devices. These devices are constantly updated.
Set the address bits of the input devices connected by the communication lines, the communication addresses of the output units covered by VT3 transmissions which return receive responses, the communication addresses in other master units which return receive responses, and the addresses covered by the transmissions of other master units to ON.

> ✎ **Point**
> **The bits of communications addresses in question are turned ON even if data from units outside of the receive address range are received.**

[Example] In this example, let's assume that an I/O unit is connected to communications addresses 00H to 07H and 12H to 17H.

LNW0080 (Address)

Bit	Address
Bit0	00H
Bit1	01H
Bit2	02H
Bit3	03H
Bit4	04H (ON)
Bit5	05H
Bit6	06H
Bit7	07H
Bit8	08H
Bit9	09H
Bit10	0AH
Bit11	0BH (OFF)
Bit12	0CH
Bit13	0DH
Bit14	0EH
Bit15	0FH

Data Memory	Address (hexadecimal)
LNW0080	00H to 0FH
LNW0081	10H to 1FH
:	:
:	:
LNW008E	E0H to EFH
LNW008F	F0H to FFH

LNW0081 (Address)

Bit	Address
Bit0	10H
Bit1	11H
Bit2	12H
Bit3	13H
Bit4	14H (ON)
Bit5	15H
Bit6	16H
Bit7	17H
Bit8	18H
Bit9	19H
Bit10	1AH
Bit11	1BH (OFF)
Bit12	1CH
Bit13	1DH
Bit14	1EH
Bit15	1FH

LNW008F (Address)

Bit	Address
Bit0	F0H
Bit1	F1H
Bit2	F2H
Bit3	F3H
Bit4	F4H
Bit5	F5H
Bit6	F6H
Bit7	F7H
Bit8	F8H (OFF)
Bit9	F9H
Bit10	FAH
Bit11	FBH
Bit12	FCH
Bit13	FDH
Bit14	FEH
Bit15	FFH (ON)

> ✎ **Point**
> **The connection information for 16 communications addresses is stored to a single link device.**
> **When FINAL is set to ON in the input unit rather than in VT3, the bit corresponding to the address FFH is ON even if the total number of addresses is less than FFH.**

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KL LINK

■ Break line error (LNW0090-bit0, LNB00900)

This device turns ON when a break line error occurs.

> | Reference | In the KL master units rather than VT3 units, error codes are stored in the data memory (one word) in the binary format.
> The error message on VT3 is only limited to the break line error.

■ Send lamp (LNW0090-bit1, LNB00901)

This indicator blinks when data or a response is being received.
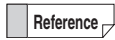
> | Reference | In the KL series units (excluding the VT3 units), this corresponds to the communication status indicator.

■ Receive lamp (LNW0090-bit2, LNB00902)

This indicator blinks when data or a response is being sent.

> | Reference | In the KL series units (excluding the VT3 units), this corresponds to the communication status indicator.

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KL LINK

Communications Address Setup

The "KL series address setup software" is used for the communication address setups of all the KL units (including the master unit). When the system structure is selected in the address setup software, the communication addresses of the individual units are calculated automatically. Based on these results, the communication addresses of the individual units can be set up.

Here, we'll detail the settings for VT3. The communication addresses of VT3 can be set up in VT STUDIO or System Mode.

📖 "12-4 Set up the VT series System", VT3 Series Reference Manual

📖 "KL Setup", page 5-22

■ Send start address

This is the communications address where data transmission to output units is started.

This address can be specified as an even number within the range 00H to FEH (Hex).

This communications address is assigned to the output relay start address.

■ Number of send addresses

Sets how many addresses are to be sent from the target address.

This address can be specified as an even number within the range 00H to 100H (Hex).

| Reference | Transmission is not performed when the number of send addresses is set to 00H. |

■ Receive start address

Communications address at which data reception from an input unit is started.

This address can be specified as an even number within the range 00H to FEH (Hex).

This communications address is assigned to the input relay start address.

■ Number of receive addresses

Set how many addresses are to be received (i.e. responses are to be sent) from the receive address.

This address can be specified as an even number within the range 00H to 100H (Hex).

| Reference | This setting doesn't include VT3's KL Link which receives all the communication addresses. Responses are not sent to communications addresses outside of this range. |

■ Baud Rate

Specify the transmission speed (baud rate) from 5 Mbit/s, 2.5 Mbit/s, 625kbit/s or 156kbit/s. The baud rate is limited by the length of the communications path and the number of connected units. The same baud rate must be set to all units connected on the communications path.

📖 "Cable Lengths and Number of Connected Units", page 7-3

■ FINAL

Set this item to specify the final address used in communications. For this reason, set the unit (master unit or input unit) having the largest send address.

Communications cannot be performed if this item is not set. Also, note that this item is set to only one unit in a single system. If it is set to two or more units, communications cannot be performed normally.

📖 "FINAL setting", page 7-35

■ Error hold

When this item is set to ON, the data of the receive area is held when a broken line error occurs. When it is set to OFF, the input relay is forcibly turned OFF when a broken line error occurs.

Address Setup Tool Overview

This section describes actual examples of how to connect the KL series.

Detailed Settings

When the system structures of VT3 or the individual KL slave nodes are selected in the "KL Series address setup software", communication addresses are calculated automatically. Based on these results, the communication addresses of the individual units can be set up.
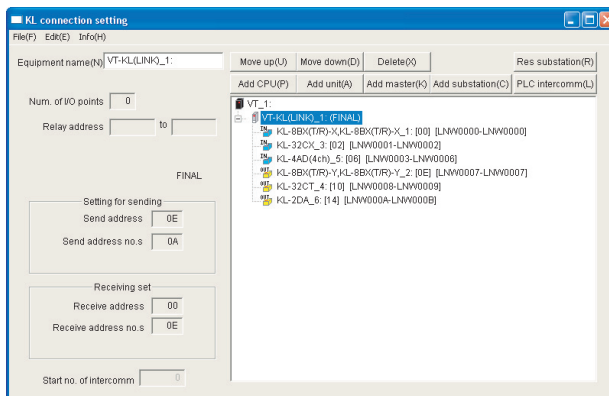
Steps to Follow

The complete steps to set up the KL series which use the address setup software are as follows.

1 Start the "KL Series address setup software" option from VT STUDIO.

2 Set the master unit to VT3.

3 Set up the models and number of the KL slave units.

4 Based on the calculation results, set up the communication addresses of the individual units.

5 Set up the communication speed and error hold etc.

> ✎ **Point** **Please ensure to start the "KL Series address setup software" option from VT STUDIO before you set up VT3 ís KL Link.**

Start the address setup software

To start address setup software from VT STUDIO, take the following steps.

1 **Display the KL screen with either of the following methods.**

* Select "Resources(R)" -> "VT System Settings(S)" -> "KL(K)" from the menu.
* Select "VT System Settings" -> "KL" from the "System Settings" in the work space.
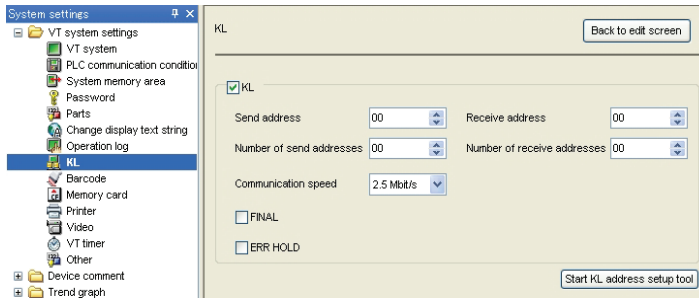
2 **Check the "KL" checkbox.**

> ✎ Point | When RS-485 is set up for the multi-link or general serial communication, KL cannot be used.

3 **Click the "Start KL address setup tool" button to start the "KL Series address setup software".**

End Address Setup Software

To end address setup software, take the following steps.

1 **Select "Files(F)" -> "Terminate Application Program (X)" from the menu to end.**
The "KL Series address setup software".

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KL LINK
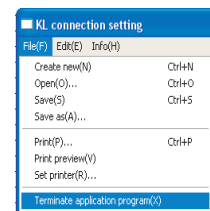
7-5 Use the Address Setup Software

The use of the address setup software "KL Series address setup software" is introduced as follows.

Unit Settings

1 **When "KL Series address setup tool" is started, the following dialog box is displayed.**
Select the "VT" option from "PLC Type", and click "Next".
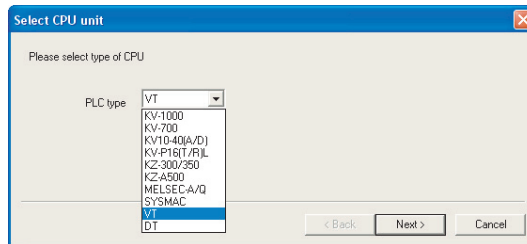
2 **Select the subtation node and number of units from the drop-down list, then click the "Next" button.**
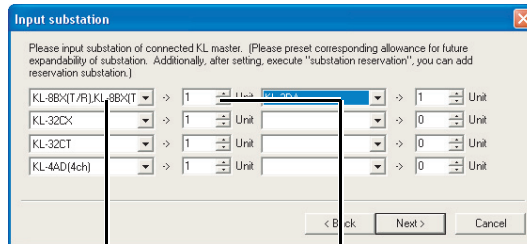
Select the Slave node to be connected.   Select the number of units.

3 **Click the "Finish" button.**
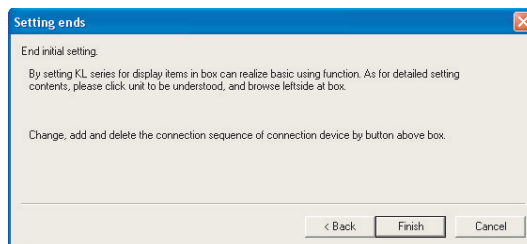
7

KL LINK

Names and functions of the connection setup dialog boxes

In the individual dialog boxes, unit names and number of units are displayed in the settings display window.

From the "KL Connection Setup" dialog box, you can set up the communication addresses of the individual units, and confirm and change the connections of the individual units.

Unit Name Display Window
The reversed unit name is displayed in Setup Display Window. In addition, unit names can be changed.

Setup Change Buttons
The settings in the individual setup dialog boxes can be changed.

Setup Information Display Window
Display the number of input/output and communication address of the highlighted unit in the Setup Display Window.

Setup Display Window
The settings in the individual setup dialog boxes are displayed here.

Send/Receive Display Window
Display the send/ receive address.

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KL LINK

Master

Set up FINAL in this unit.

Slave

Unit Type
Input Unit (blue)   ...
Output Unit (yellow) ...

Unit Name

Address No.

The input sequence is displayed in the "Slave Input" dialog box.

Relay No.
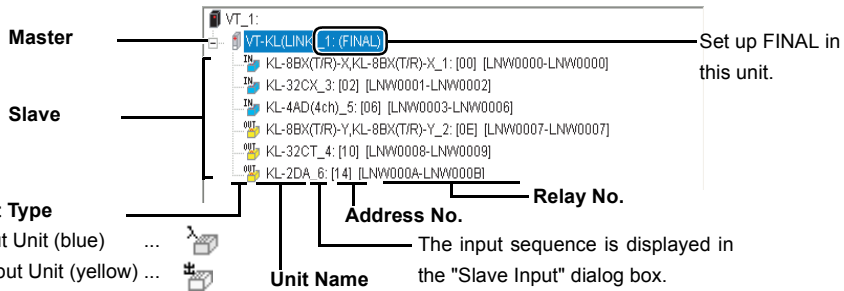
* The details and settings of the individual units, printing was performed view table.

■ Set up the communication addresses of the individual units

Set up the communication addresses of the individual units.

1 **From "Setup Display" Window, select the unit to be set up.**

The information about the selected unit is displayed in Setup Information Display Window.

2 **Set up the communication address of the unit.**

Address No.
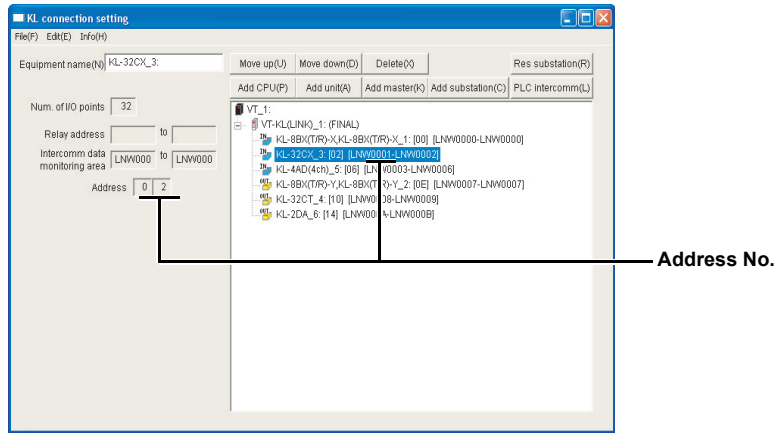
Add a Slave

To add a slave node.

1 **From Setup Display Window, select the master node (select VT).**

2 **Select "Edit(E)" -> "Add Connection Device (A)" -> "Add Slave (C)" to display the "Input Slave" dialog box.**
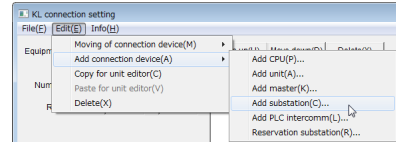
| Reference | You can also add Slave by clicking the "Add a Slave (C)" in the Setup Change Buttons area. |

3 **Select the Slave and number of units from the drop-down list, then click the "Next" button.**

Now the Slave in question is registered.
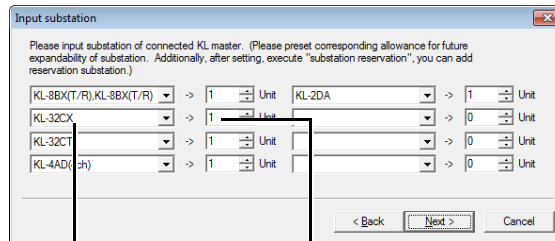
Select the Slave to be connected.   Select the No. of units.

Delete a Slave

To delete a Slave.

1 **Select the Slave to be deleted.**

2 **Click "Edit(E)" -> "Delete(X)" to delete the selected Slave.**
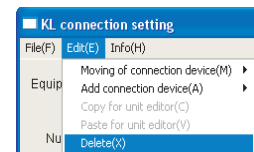
| Reference | You can also delete a slave by clicking the "Delete(X)" button in the Setup Change Buttons area. |

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KL LINK
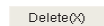
Pre-select a Slave

A Slave with up to 16 points can be pre-selected.

> **Reference** When setting up slave nodes, it is recommended that you keep the future expansion room for slave nodes. In addition, the relay number errors of the actual slave units can be prevented when adding and changing slave units.

1 **From Setup Display Window, select the master node connected with the node to be pre-selected (select VT).**

2 **Select "Edit(E)" -> "Add Connection device (A)" -> "Pre-select a Slave Node(R)" to display the "Reservation Slave" dialog box.**
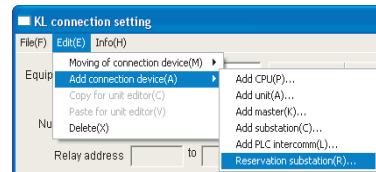
> **Reference** You can also add a slave node by clicking the "Res Slave(R)" button in the Setup Change Buttons area.

3 **Set up the category and number of relay points of the Slave, then click the "Insert" button.**
Now the Slave is pre-selected.

Select the type of the connected slave.
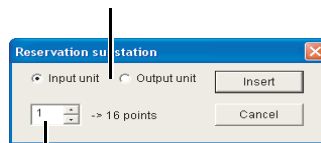
Enter the number of replays.

Move a Slave

To move an added slave.

1 **Select the slave to be moved.**

2 **Click in the order "Edit(E)" -> "Moving of connection device(M) -> "Move Up(U)" or "Move Down(D)" to change the connection sequence of the Slave.**
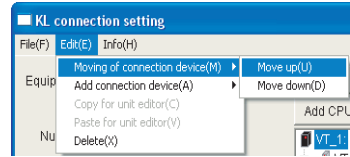
> | Reference | You can also change the connection sequence by click the "Move Up(U)" or "Move Down(D)" button in the Setup Change Buttons area.
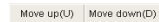
Edit a Comment

1 **Select the unit to add a comment.**
The name and comment of the unit is displayed in Unit Name Display Window.
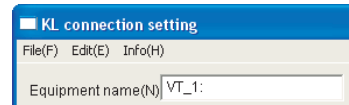
2 **Enter the comment in Unit Name Display Window.**
The entered comment is instantly displayed.
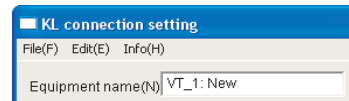
> | Point | **Up to 32 half-width characters can be entered for the comment.**

Save the Settings

Save the settings made by KL Address Setup Tool such as unit information.

1 **Click in the order "Files(P)" -> "Save as(A)" to** display the ìName and Saveî dialog box.
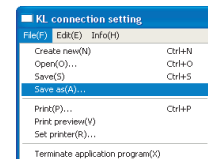
2 **Enter the name, and click "Save(S)" to** save the settings.
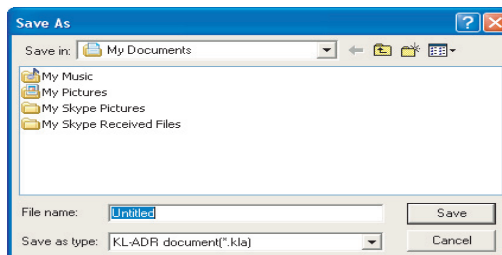
Overwrite and Save the Settings

Overwrite and save the settings made by KL Address Setup Software such as unit information.

1 **Click in the order "Files(P)" -> "Save(S)" to**

Overwrite and save to the currently manipulated file.

> | Reference | For a new file that has not never been saved, the "Name and Save" dialog box is displayed.
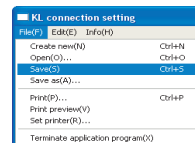
2 **Enter the file name, and click "Save(s)".**
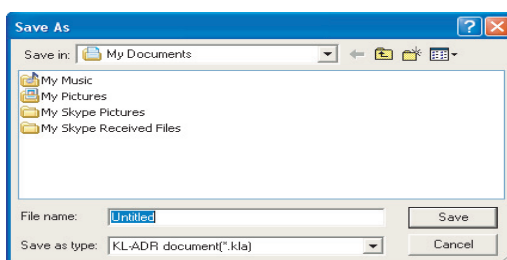
Read the Saved Settings

Read the settings saved by KL Address Setup Software, such as unit information.

1 **Click in the order "Files(P)" -> "Open(O)" to**

display the "Open" dialog box.
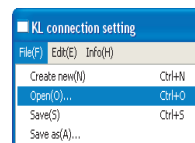
2 **Select you desired file and click the "Open(O)" button.**
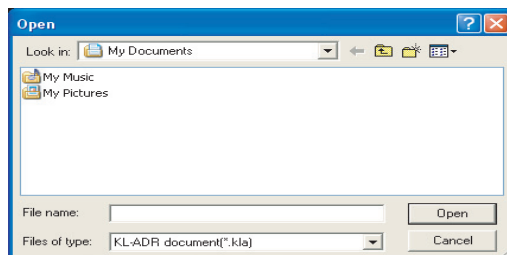
> | Point | **When opening a file, please ensure to use the "KL Address Setup Software" started from VT STUDIO.**
> **When the address setup software (KL-H1WB) is installed, you can not directly open it from the Windows browser.**

Print

The selected file is printed.

1 **Click in the order "Files(F)" -> "Print(P)" to** display the "Print" dialog box.
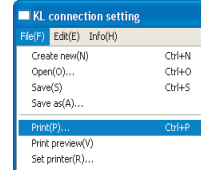
2 **Click the "OK" button.**
The selected file is printed.
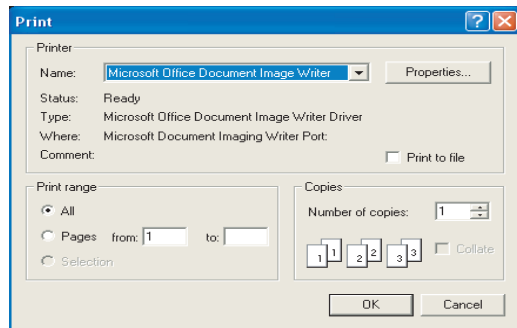
■ **Example**

The printout is shown as follows.
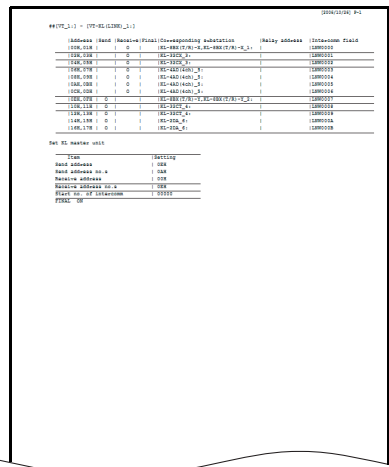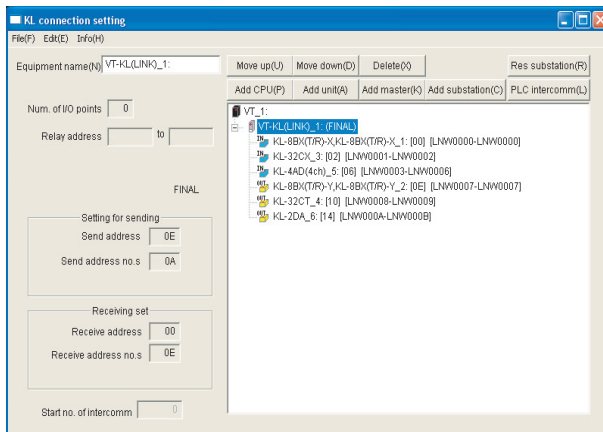
Connection Example

This section describes actual examples of how to connect the KL series.

Detailed Settings

VT3

FINAL

KL-32CX KL-32CT

Terminal block ON

T-branch amplifier KL-T1

Address	02H	Address	10H
Link Device	LNW0001 LNW0002	Link Device	LNW0008 LNW0009

8-pin Output Unit

KL-8BXT

Setting Device	IN00H	OUT0EH
Link Device	LNB00000 to LNB00007	LNB00070 to LNB00077

KL-4AD

Setting Device	06H
Link Device	LNW0003 to LNW0006

8-pin Output Unit

KL-8BXR

Terminal block ON

Address	IN01H	OUT0FH
Link Device	LNB00008 to LNB0000F	LNB00078 to LNB0007F

KL-2DA

Address	14H
Link Device	LNW000A LNW000B

:Trunk line
:Branch line

Address Mapping

VT3
Link Device   Communication Address

Slave Unit
Communication Address

	VT3 Link Device	VT3 Communication Address	Slave Unit Communication Address	
Receive Start Address:00H	LNW0000	00H, 01H	00H, 01H	KL-8BXT(input),KL-8BXR(input)
Number of receive addresses:0EH	LNW0001	02H, 03H	02H, 03H	KL-32CX(lower level)
	LNW0002	04H, 05H	04H, 05H	KL-32CX(higher level)
	LNW0003	06H, 07H	06H, 07H	KL-4AD(0ch)
	LNW0004	08H, 09H	08H, 09H	KL-4AD(1ch)
	LNW0005	0AH, 0BH	0AH, 0BH	KL-4AD(2ch)
	LNW0006	0CH, 0DH	0CH, 0DH	KL-4AD(3ch)
Send Start Address:0EH	LNW0007	0EH, 0FH	0EH, 0FH	KL-8BXT(output),KL-8BXR(output)
Number of Send Addresses:0AH	LNW0008	10H, 11H	10H, 11H	KL-32CT(lower level)
	LNW0009	12H, 13H	12H, 13H	KL-32CT(higher level)
	LNW000A	14H, 15H	14H, 15H	KL-2DA(0ch)
	LNW000B	16H, 17H	16H, 17H	KL-2DA(1ch)

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KL LINK

7-7 Troubleshooting

This section describes how to remedy troubles that may occur.

The following symptoms might occur if a nonconformity occurs in communications settings, for example, on the KL series. If this happens, check the settings and other information.

- The SD/RD green lamp of the input/output slave node doesnít light.
- The line break error "LNB00900" ON in VT3.
- The slave error indicator lights.
- Error input/output from the input/output unit. Or, relay Nos. different from the actual relays turn ON and OFF.
- ON/OFF when monitoring from VT3 but not ON/OFF on the actual units.

Check 1: Connection Cables

■ Point to check

Are the cables in use KPEV-SB (1P)?
Other cables cannot be used.

Point	Even if KPEV cables are in use, communications is sometimes unstable of cables with leads having different conductor cross-sectional area are used on the communications path. Be sure to use cables having the same conductor cross-sectional area.

Check 2: Terminator Setting

■ Point to check

Two terminators, one each at both ends of the trunk, must be set.

■ Check method and procedure

1 Turn off the power of the whole system including VT3.

2 Measure the resistance between PORT4 SA-SB of VT3.

Resistance	Description
< 35Ω	Terminator at three or more locations ON
35 to 40Ω	Two terminators are set. Visually check that terminators are set on both ends.
> 40Ω	One terminator or no terminators are set on the trunk. Is a terminator set on a branch?

If you changed the terminator settings, be sure to turn the power back ON again.

Point	If the terminator on a branch is ON, this is not reflected in the resistance values measured above. Make sure that the terminators on branches are not ON. If they are ON, turn them OFF.

Check 3: FINAL Setting

■ Point to check

FINAL must be set at one location in systems that use a KL series unit.

■ Check method and procedure

1 **Turn off the power of the whole system including KL.**

2 **Turn off the FINAL switch of ON.**

3 **After making changes, turn on the power again.**

4 **From VT3 and all the slave nodes, check to ensure SD/RD (on VT3, LNB00901 and 00902 are OFF) turn out.**
If you changed the terminator settings, be sure to turn the power back ON again.

SD/RD OFF on all units   : The FINAL switch is set at one location.
SD/RD ON on some units   : The FINAL switch is also set to ON at other units.

Check 4: Slave Unit Settings

■ Point to check

• Are the address setup trimmers correctly set?
• Check to ensure all the slide switches are correctly set up.

■ Checking the address setup trimmers

1 **Visually check the arrow direction.**
On connector type units, pay attention to the positional relationship of the setup trimmers.
Turn the trimmers a further turn and make sure that they are properly aligned.

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KL LINK

■ **Checking the setup slide switch settings**

- Check to ensure the baud rate of all the units including VT3 is identical.
- Check to ensure the settings of the output slave node "ANS OFF" are correct.
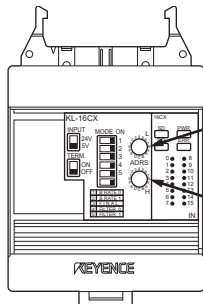
Make sure to understand the positions of the communication address setting switches H and L on the connector-type unit.

If you changed the terminator settings, be sure to turn the power back ON again.

Check 5: Restrictions

■ **Point to check**

- Check to ensure the number of connected units and cable length are correct when using OP-30590/32985.
- Are connectors firmly inserted.
- Check to ensure the length of the trunk line is correct.
- Check to ensure the No. of connected units and cable length in the branch line are correct.

■ **Checking conformity with trunk restrictions**

Refer to the following regarding the OP cable.

📖 "Cable Lengths and Number of Connected Units", page 7-3

OP-30590/32985
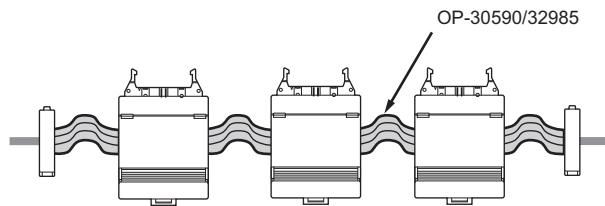
✎ Point	• **Up to 5 units can be straight-line-connected at one place.**
	• **The total length of the straight line cable should be lower than 102cm.**

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KL LINK

The KL address setup of VT3 can be made with "KL Address Setup Software". And the results can be used to set up the addresses of the individual units. Accordingly, there is no need to understand the concept behind addresses in detail. However, read the following for more understanding regarding installation.

Assigning Communications Addresses

■ Assigning KL slave addresses

The address assigned as the address of the slave unit becomes the start address of that unit.

The number of addresses is assigned automatically by the number of units. As one address consists of eight bits, two addresses are assigned for a 16-pin unit, and four addresses are assigned for a 32-pin unit.

Input slave

The addresses assigned to input slaves are send addresses. Send the external input information to the units (VT3 output slave nodes) with the same receive address No..

Taking the address set on the rotary switch as the start address, two addresses are occupied for 16-pin units, four addresses are occupied for 32-pin units, and eight addresses are occupied for the A/D Conversion Unit (KL-4AD) (four addresses are occupied in the 2ch mode).
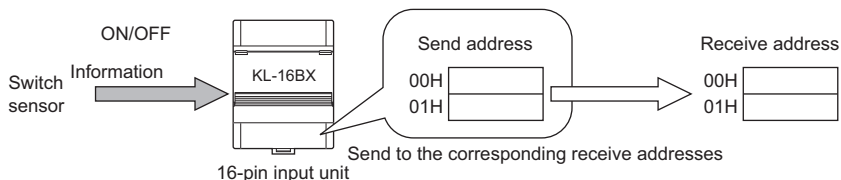
Output slave

The addresses assigned to output slaves are receive addresses. Receive the information sent from the units (VT3 slave nodes) with the same send address NO. and output the same.

Taking the address set on the rotary switch as the start address, two addresses are occupied for 16-point units, four addresses are occupied for 32-point units, and four addresses are occupied for the D/A Conversion Unit (KL-2DA).
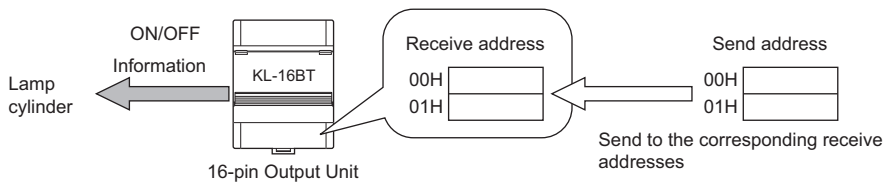
■ **Configure the address of the master unit (VT3)**

Both send and receive addresses are configured for the master unit (VT3).
Set up the receive and send areas from VT STUDIO or System Mode.

[Example] When four KL-16BX units and four KL-16BR units are connected

Receive start address

Receive area	00H
	01H
	02H
	03H
	04H
	05H
	06H
	07H

Receive addresses No. 08H

Send start address

Send area	08H
	09H
	0AH
	0BH
	0CH
	ODH
	0EH
	0FH

Send Addresses No. 08H
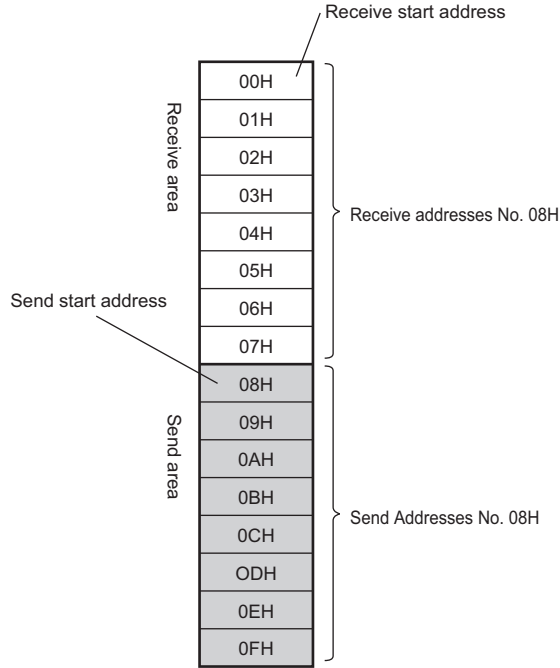
Receive the information sent from the units (VT3 slave nodes) with the same send address numbers and save the same into the VT3 link devices.
The send addresses are used to send the information stored in the VT3 link devices to the units with the same receive addresses.

Receive from the corresponding
send addresses

	Receive address		Send address
VT3 Link Device LNW0000	00H		00H
	01H		01H

	Send address		Receive address
VT3 Link Device LNW0001	02H		02H
	03H		03H

Send to the corresponding
receive addresses

VT3
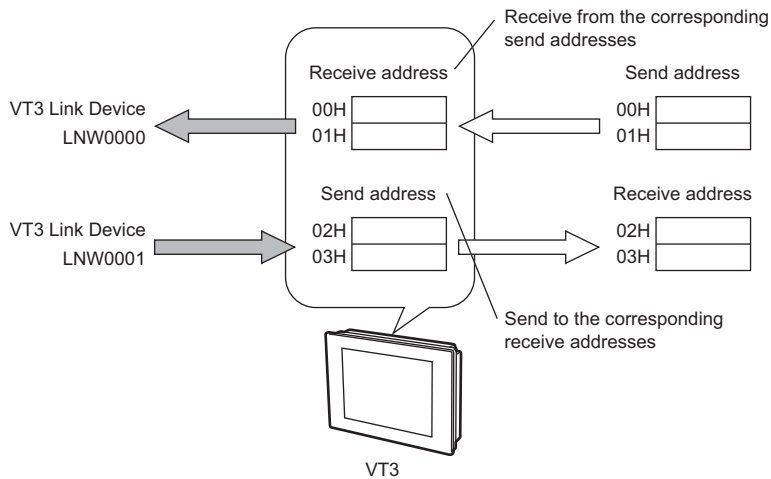
Communication Address Rules

■ One receive address corresponds to one send address.

The information of the send address is sent to the receive address having the same address No.
The receive address is assigned in a 1:1 pair with the send address. In principle, 1:N or N:1 cannot be assigned.

• Same address Nos. are assigned in a 1:1 pair for the send address and the receive address that are to communicate data to each other.

• A single send address cannot be assigned to multiple receive addresses, and multiple send addresses cannot be assigned to a single receive address.
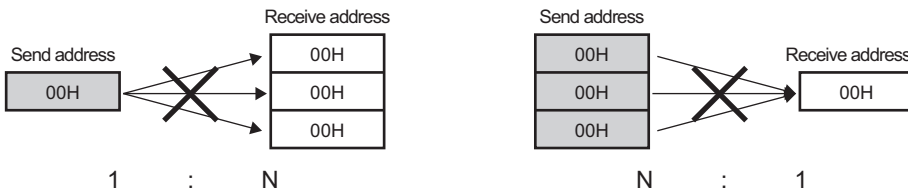
Reference | 1: N communications
The same address can be assigned and the same data can be sent to multiple output units by setting Ans.OFF on the output unit to ON. Set Ans.OFF to ON excluding one unit.
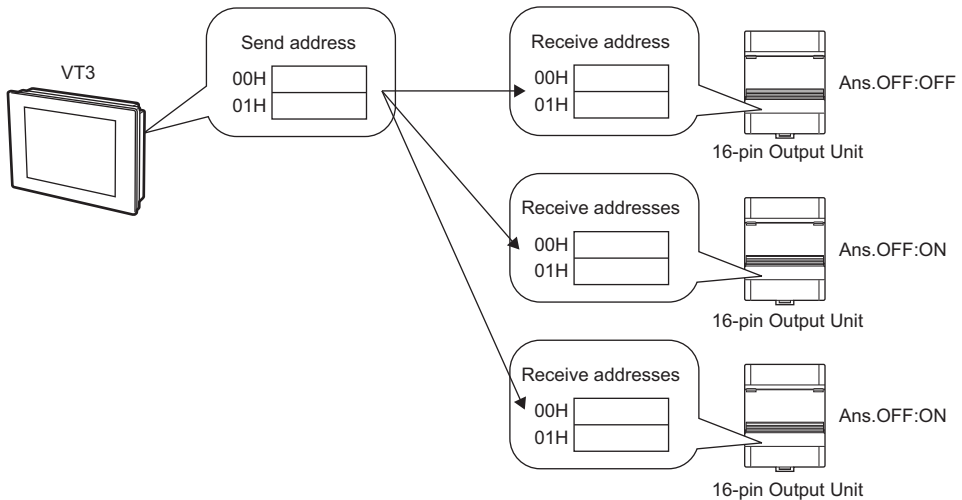
When receiving data from the corresponding send addresses, the units (VT3 output units) with the receive addresses return to these units with "responses (answers)".
When multiple units (VT3 output units) with the same receive address number are available, these units send the "responses (answers)" together. These repeated "responses (answers)" may result in an send error. As a result, communications is no longer established.

Point | **Ans.OFF can be set on only output units. Cannot be set up in VT3.**

■ **Occupying only continuous address Nos.**

Both send addresses and receive addresses are assigned to units by continuous Nos. Non-continuous numbers cannot be configured.

Slave units

Address Nos. are assigned automatically taking the No. set on the rotary switch as the first address.
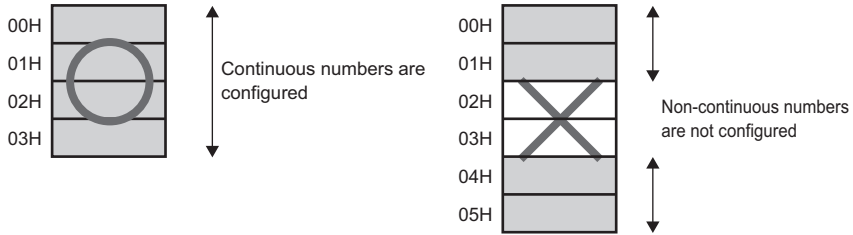
For the master node (VT3)

Configuration is made based on the send start address, number of send addresses, receive start address, and number of receive addresses set up in VT STUDIO or System Mode.

The send address area and receive address area need not be continuous.

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KL LINK
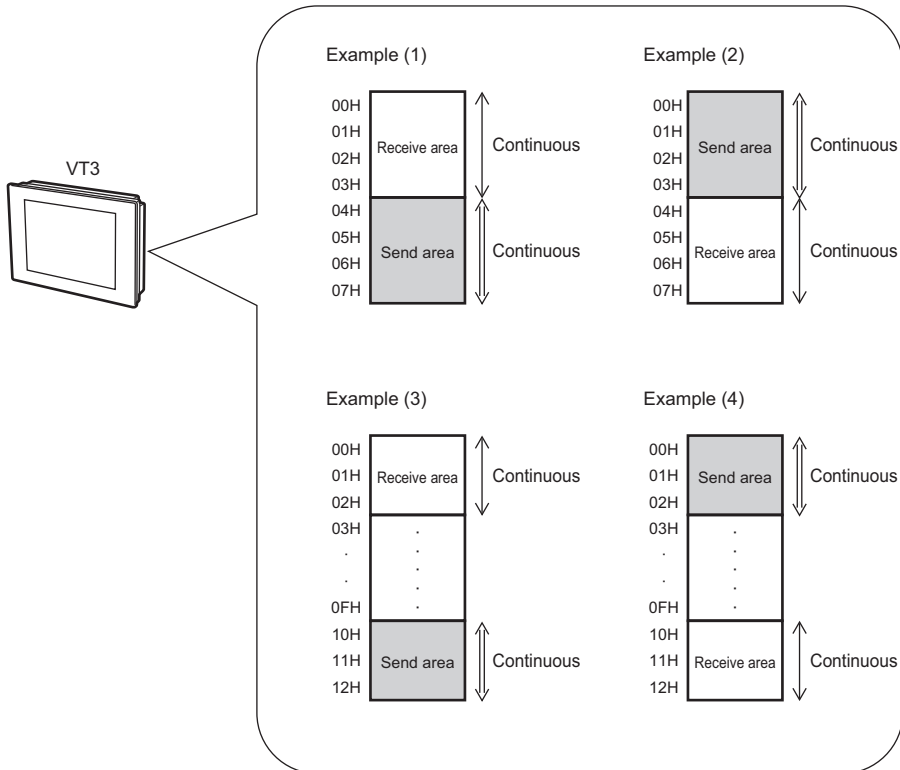
The following type of setup is not possible.
• Set up non-continuous receive address numbers
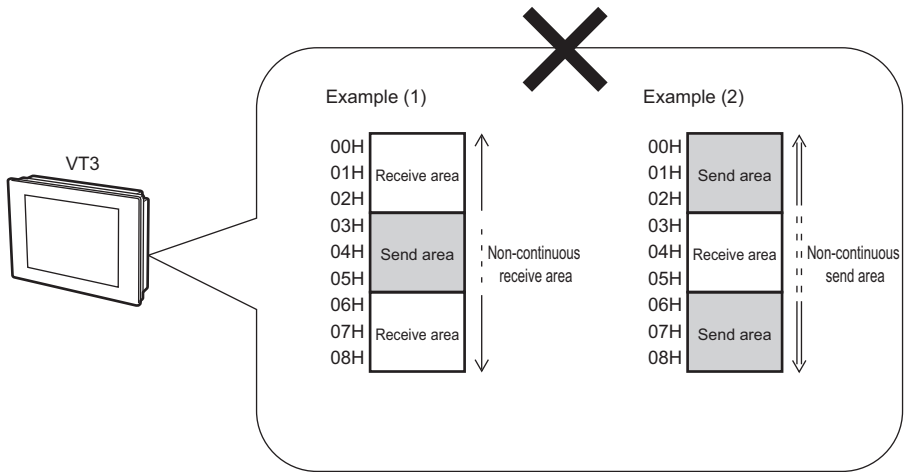
• When repeated settings are made in the receive address area and send address area.
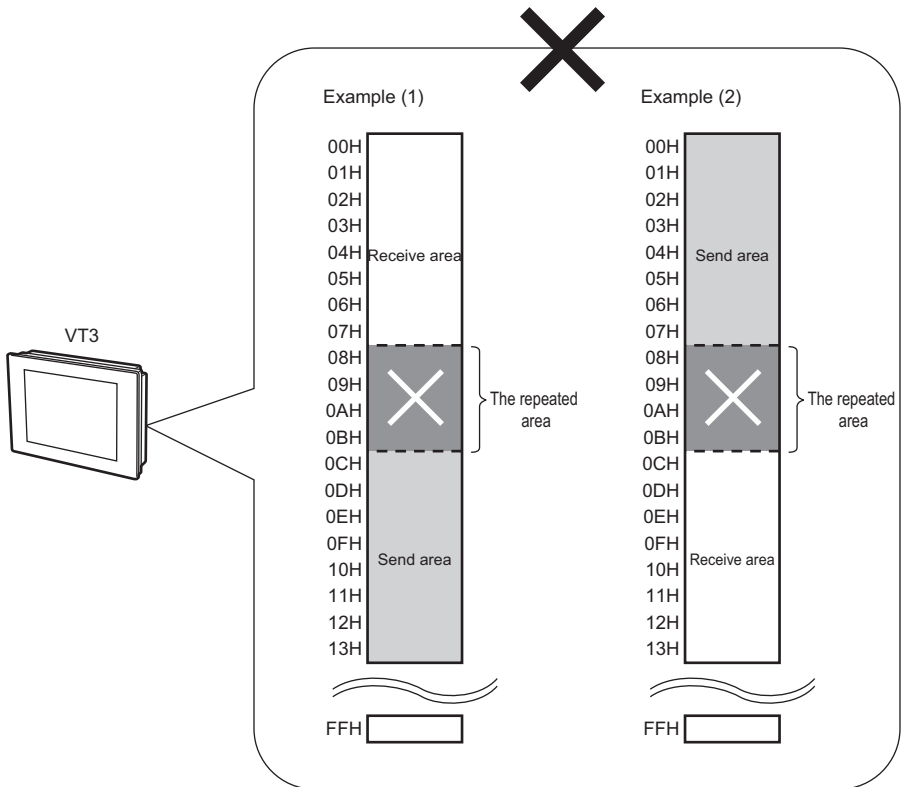
■ **FINAL setting**

FINAL must be set to establish communications. Specify the final address used for communication by setting FINAL. Communications is not possible unless FINAL is set.

Set FINAL on the unit having the largest send address. Set only one FINAL within a single system. Communications cannot be performed normally if two or more FINALs are set.

• In this case, the largest send address is made with the master node (VT3). FINAL is set for the master node.

VT3

Send start address	04H
Send Addresses No.	04H
Receive start address	00H
Receive addresses No.	04H

16-pin
Input Unit

KL-16BX

00H

16-pin
Output Unit

KL-16BT

04H

16-pin
Input Unit

KL-16CX

02H

16-pin
Output Unit

KL-16BR

06H

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KL LINK

VT3

00H, 01H
02H, 03H
04H, 05H
06H, 07H

FINAL ON

00H, 01H → KL-16BX

02H, 03H → KL-16CX

04H, 05H → KL-16BT

06H, 07H → KL-16BR
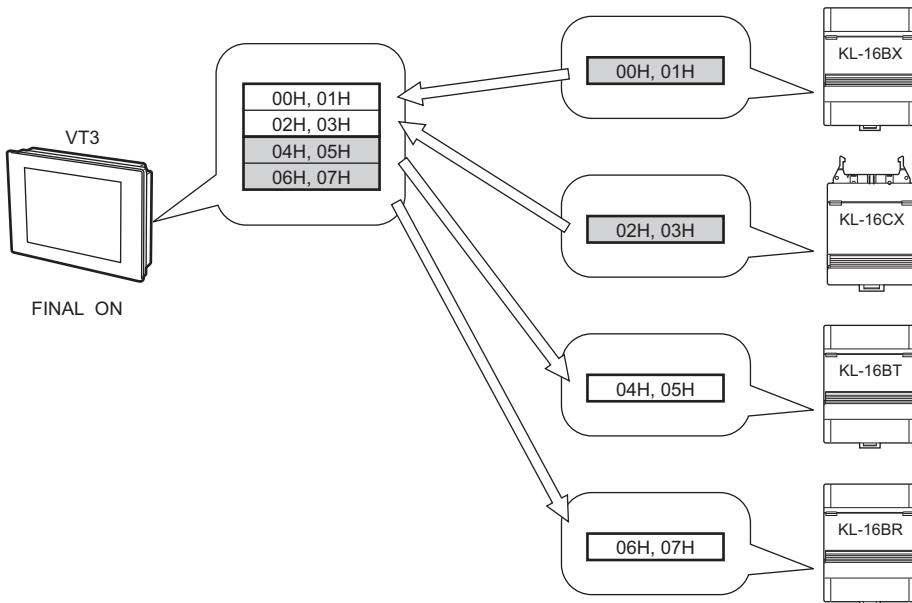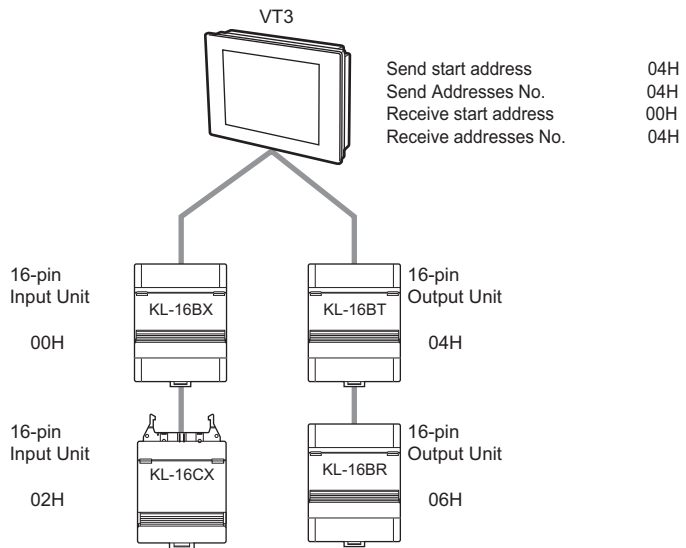
• In this connection example, set FINAL on KL-16CX as the KL-16CX has the largest send address.

VT3

Send start address	00H
Send Addresses No.	04H
Receive start address	04H
Receive addresses No.	04H

16-pin
Input Unit

KL-16BX

04H

16-pin
Output Unit

KL-16BT

00H

16-pin
Input Unit

KL-16CX

06H

16-pin
Output Unit

KL-16BR

02H

VT3

| 00H, 01H |
| 02H, 03H |
| 04H, 05H |
| 06H, 07H |

00H, 01H → KL-16BT

02H, 03H → KL-16BR

04H, 07H → KL-16BX

06H, 07H → KL-16CX   FINAL ON

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KL LINK

8
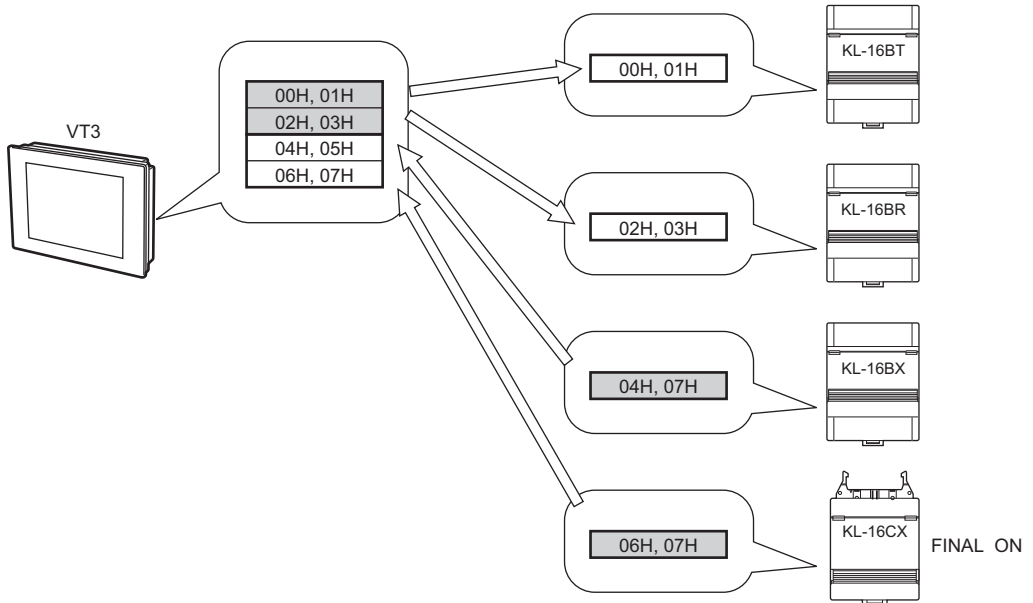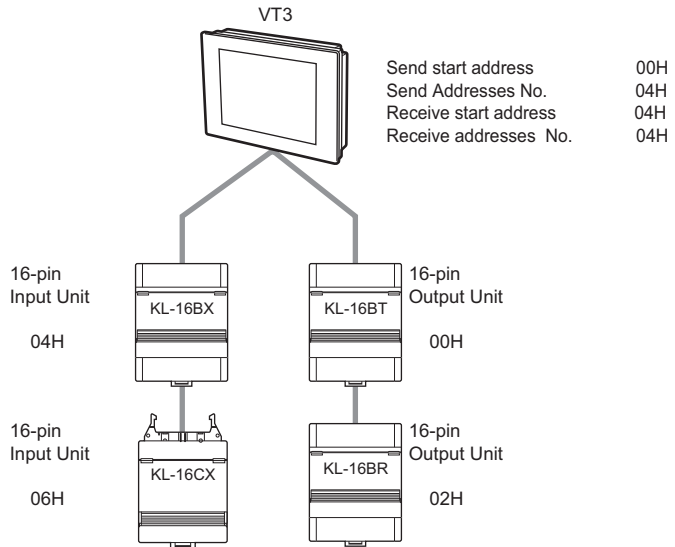
ETHERNET

This chapter describes how to use built-in Ethernet function of VT2-E1/E2, VT3-E3, VT3 handy series to connect VT3 onto the network, function, setup and fault solution.

✎ **Point**
- **Ethernet cannot be connected for VT3-Q5M(W)/Q5M(W)A/W4T(A)/ W4M(A)/W4G(A)/V7R.**
- **VT3 handy series has built-in Ethernet function, therefore, VT2-E1/ E2, VT3-E3 are not used.**

✎ Point **VT3 handy series has built-in Ethernet function just like VT3-E3, so refer to the following VT3-E3 description.**

Ethernet-compatible Communications Unit

The VT2-E1/E2, VT3-E3 communications units complies with the Ethernet standard, and achieves various communications between the VT3 and the PLC connected on the same Ethernet network.

The VT2-E1/E2, VT3-E3 supports 10Base-T/100Base-TX. It enables you to easily build a network, and send and receive data at high speed.For example, if the factory line and the production control department are connected by Ethernet, VT3 remote maintenance, data collection and other control operations can be performed from locations away from the production site.

Remote Control

Data Collection
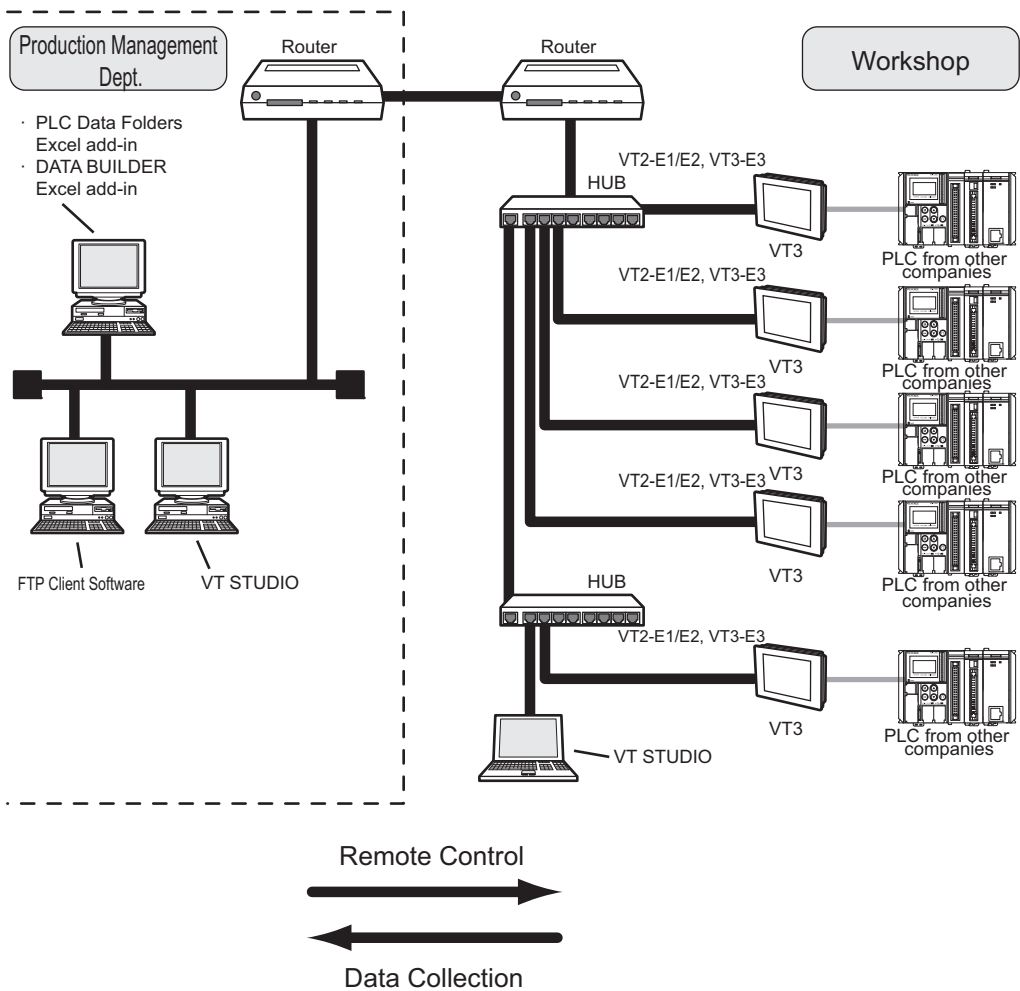
Connecting the VT3 and PLC Over Ethernet

Communications between the VT3 and the PLC can be performed over Ethernet by using the VT2-E1/E2, VT3-E3 in addition to communications between a PC and a VT3.
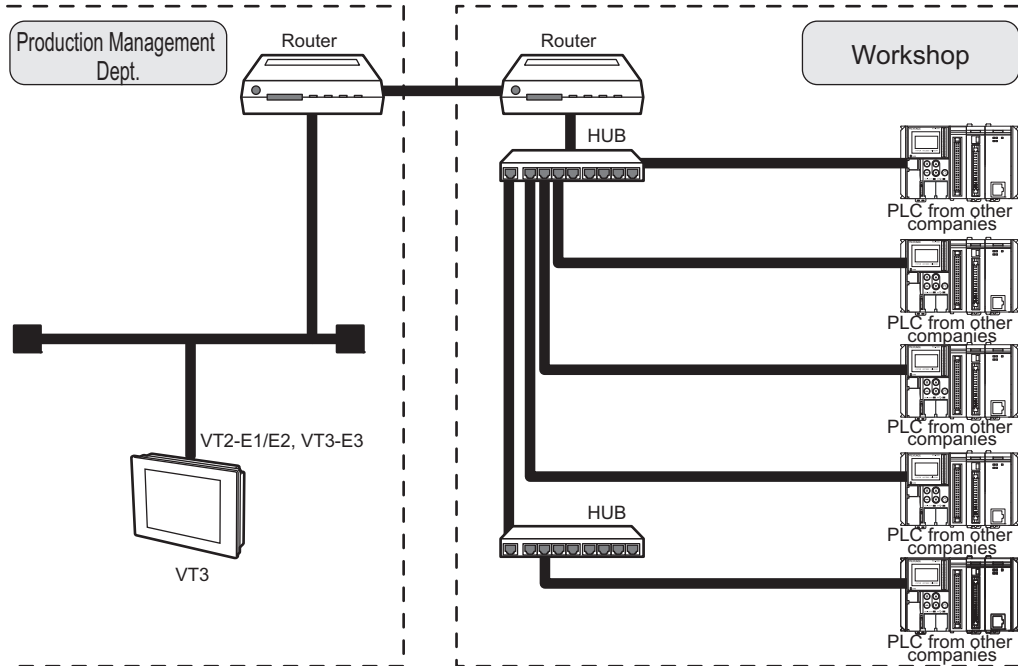
VT2-E1/E2, VT3-E3 Communications Functions

The following briefly describes VT2-E1/E2, VT3-E3 communications functions.

■ DATA BUILDER Excel add-in (data collection software)

When the DATA BUILDER Excel add-in (sold separately) is used, the data of PLCs that are communicating with the VT 3 can be collected, and devices can be read and written on the PLC connected on the Ethernet network. Data can be collected easily and devices can be written as if you are using Excel's features.

Collected data can also be further processed in a number of ways and edited by using Excel's spreadsheet and graphic features.

📖 "DATA BUILDER User's Manual"
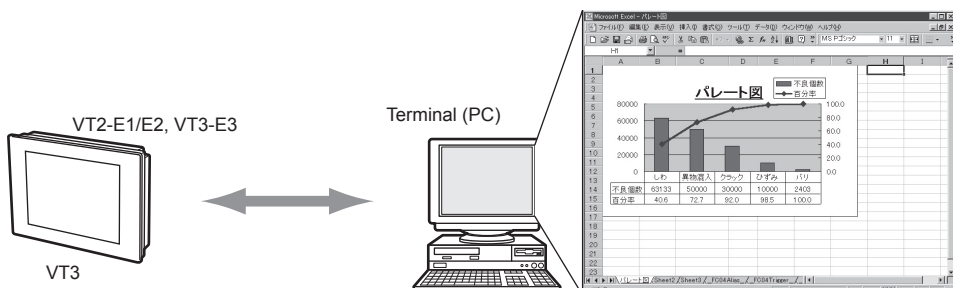
■ **Simulator and Sending/Receiving Screen Data**

The following can be achieved over a network on a PC by connecting a PC (VT STUDIO) preinstalled with VT STUDIO to Ethernet:

• Transmission/reception of screen data
• Communications with Simulator
• Transmission/reception of PLC Data Folder Data

Up till now, when screen data had to be rewritten, the PC had to be connected directly with the VT3 at the site in a 1:1 connection. However, the above operations are now possible over a network without the need to actually visit the site.Even if multiple VT3 are connected on the Ethernet network, they can be managed on a single PC.

📖 "8-4 Simulator and Sending/Receiving Screen Data"
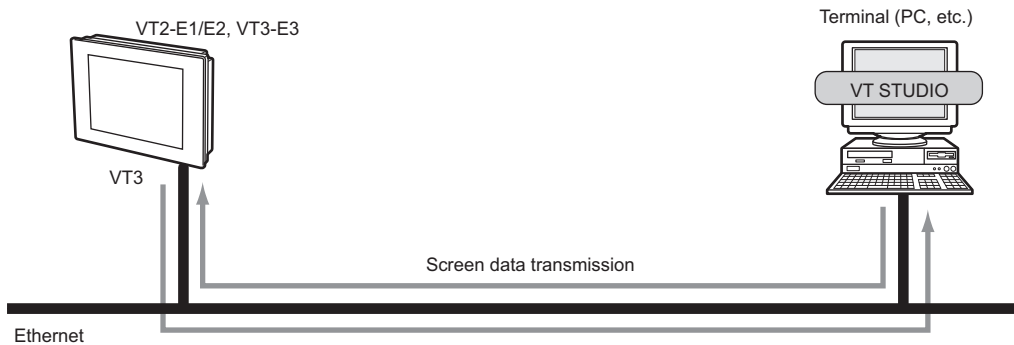
■ **FTP Server Functions**

FTP server functions allow you to read and write data to Memory Card (OP-42254) installed on the VT3, and read VT3 internal memory (alarm log data, real time trend graph data) over the network.

FTP server functions can be simply operated either by executing FTP commands from the command prompt or by using FTP client software.

📖 "8-5 FTP Server Functions"
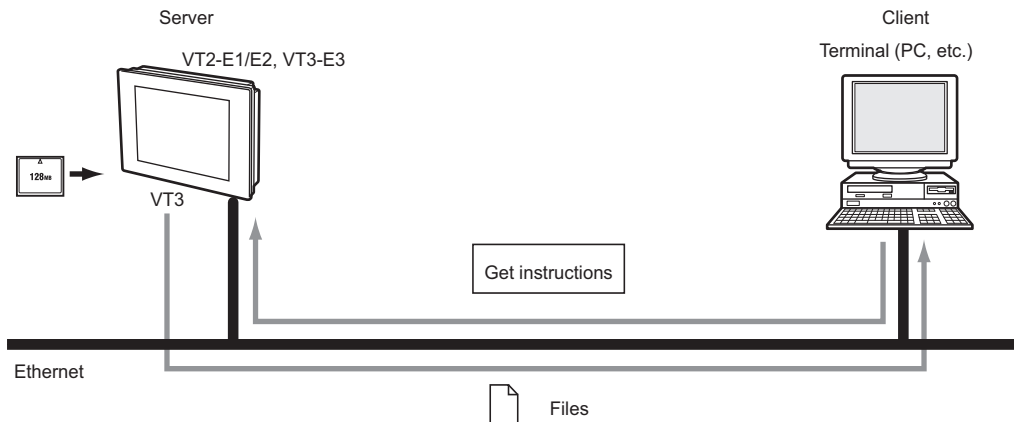
8-2 Build and Connect a Network

Network Configuration

The figure below shows an example of how to build a network using 10Base-T and 100Base-TX.
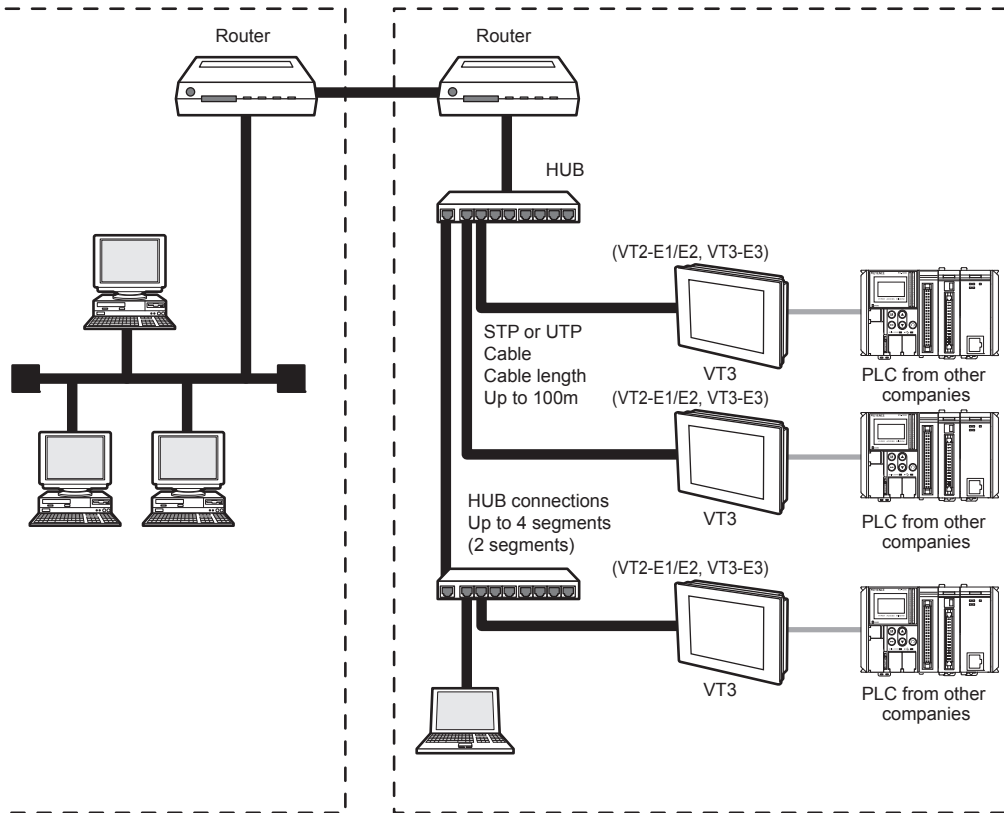
10BASE-T(100BASE-TX) Network Setup

 * Text in "( )" for the 100BASE connections.

✎ Point	In communications via a remote access server or the Internet, the user's network environment or network settings must sometimes be taken into consideration. Before performing communi-cations on such a route, carry out sufficient test in advance.

Connector Cables

The following describes the cables used for connecting VT3 series to Ethernet. The cables used when building Ethernet with 10Base-T differ from those when building by 100Base-TX.

When building Ethernet with 10 Base-T
When building Ethernet with 10Base-T, use type 3 or higher shielded twisted pair cable (simply called "STP" from here on) or unshielded twisted pair cable (simply called "UTP" from here on).

When building Ethernet with 100Base-TX
When building Ethernet with 100Base-TX, use Category 5 STP cable or UTP cable. Do not use Category 3 or 4 UTP cable.
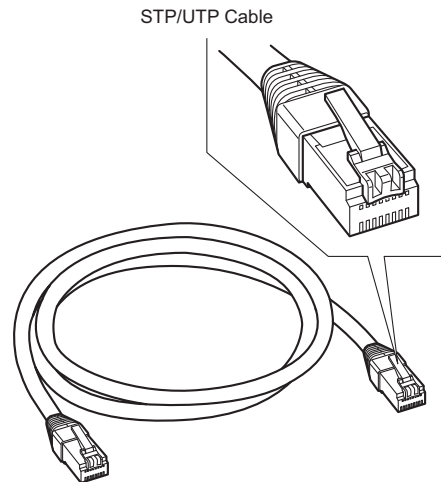
STP/UTP Cable

Reference	• A VT3-E3 for which the last letter of the serial number is "A" supports MDI/MDI-X automatic switching function. To use a VT3-E3 with a serial number whose last letter is not "A" to connect directly to a PLC, use a STP/UTP cross cable.
	• When building Ethernet by a type (10Base-2, 10Base-5, etc.) other than 10Base- T and 100Base-TX, take appropriate measures. For example, use a hub provided with an AUI (MAU) connector or BNC connector, or use a media converter (10Base5 -> 10Base-T or 10Base2 -> 10Base-T).

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ETHERNET

Connecting to Ethernet

■ VT2-E1/E2 VT3-E3

The following describes the procedure for connecting VT2-E1/E2, VT3-E3 to Ethernet.

1 **Turn the VT3 OFF.**

2 **Attach the VT2-E1/E2, VT3-E3 to the VT3.**
📖 "6-5 Ethernet Unit"

3 **Connect the modular jack on one end of the STP/UTP cable to the 10Base-T/100Base-TX port of the hub to be used.**

Insert the modular jack until you hear it click in place. The modular jack and connector are now locked in place.

✎ **Point** • **To use a VT3-E3 for which the last letter of the serial number is "A" requires VT3 system program Ver. 4.51 or later.**
• **Be sure to use an STP/UTP cable of 100 m or less length.**
• **When connecting the VT2-E1/E2, VT3-E3 to a hub, thoroughly check the state of the hub connector (port). There are various types of hubs. Some hubs have connectors different in shape from the RJ-45 (AUI connector, BNC connector, etc.), while others have connectors (simply called "cascade ports") that are used when connecting two hubs.**

---

4 **Connect the modular jack on the other end of the STP/UTP cable to the connector on the VT2-E1/E2, VT3-E3.**

Insert the modular jack until you hear it click in place. The modular jack and connector are now locked in place.

Connector

Module-based connector (female)

STP/UTP Cable

8
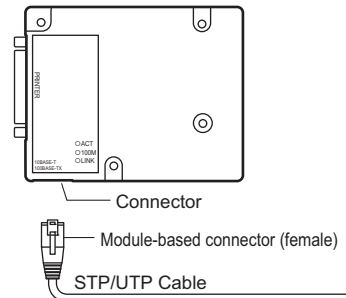
ETHERNET

■ VT3-V6H(G)/Q5H(G)

Connection steps for VT3-V6H(G)/Q5H(G) to the Ethernet is described.

1 **Install Ethernet connecting cable (OP-87188/87189/87190) or RS-232C/422/485/Ethernet connecting cable (OP-87191/87192/87193) to the cable connector on back of VT3-V6H(G)/Q5H(G) body.**

2 **Connect modular socket of the cable to the hub or equipment Ethernet port.**
Insert until "click" sound is heard. Modular socket and connector are locked.

3 **Turn on power supply of VT3-V6H(G)/Q5H(G), confirm that green operating indicator lamp LINK illuminates in the cable cover on back of the body.**
Several seconds will elapse before the lamp illuminates.
If abnormity occurs, please refer to 📖 "8-6 Troubleshooting".

■ **VT-T1**

Connection steps of VT-T1 to the Ethernet is described.

1 **Use a cable with removable connector (OP-87194-87195-87196) to connect VT-T1 and VT3-V6H(G)/Q5H(G).**

2 **Connect modular socket of STP/UTP cable on VT-T1 Ethernet connector.**

3 **Turn on the power supply of VT3-V6H(G)/Q5H(G), confirm that green operating indicator lamp LINK illuminates in the cable cover on back of the body.**

Several seconds will elapse before the lamp illuminates.

If abnormity occurs, please refer to 📖 "8-6 Troubleshooting".

✎ Point	**Length of the STP/UTP cable must be less than 90m.**

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ETHERNET

Communication Setup and Test

Communications Settings

Relevant setup items of Ethernet are described here. Ethernet is set in the system mode.

The top part of the System Mode screen

System Mode VT3-X15/S12/S10/V10/V8/V7/V7R/V6H(G)/Q5H(G)/Q5T/Q5S   Ver 4.00   English

Options Setup		Viewer
VT System Setup		Self-check
Communication Requirements Setup		Device Monito
Comm With PLC Enable		Memory Card
Memory Clear		PLC Data
Data Transmission		Move to RUN

Options Setup(1/2)   OK

Clock Adjustment   Cancel

Backlight Power   ★★★   Next

System proptect   No Protect

Page Switching   PLC and Switch

Ethernet Setup

Video Adjustment   NTSC

                                          RGB Position

                                          RGB Picture Quality

> ✎ **Point**
> • **To set VT2-E1/E2, VT3-E3 communication, always connect VT2-E1/E2, VT3-E3 to VT3 body in advance.**
> • **At the same time, communication port must be set for VT STUDIO, simulator, PLC data folder Excel plug-in.**
> • **VT STUDIO**
>   📖 "13-2 Communications Setup", VT3 Series Reference Manual
> • **Simulator**
>   📖 "13-7 Simulator", VT3 Series Reference Manual
> • **PLC data folder Excel add-in**
>   📖 '15-3 PLC Data Folder Editing Tool (Excel add-in)", VT3 Series Reference Manual

■ Baud rate

Set the data communications speed between VT3 series and the hub.

Setting Item	Description	Default
100/10 Mbps Auto	Recognizes operation speed on hub when the Ethernet connection is established, and sets the corresponding speed.	○
10Mbps	Fixed to 10 Mbps	

> 📖 **Reference**   If communications at 100 Mbps is unstable, fix the baud rate to 10 Mbps.

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■ **IP Address**

Sets the IP address to be assigned to VT3 series.
The "IP address" is a 32-bit ID number that is
assigned to each individual device participating in a
network. In TCP/IP-based communications, all
data is sent based upon this address.

IP addresses are expressed in four delimited
portions of eight bits each as follows:

Setting Range	Default
0.0.0.1 to 255.255.255.255	-

192.168.0.11 (decimal)
Set the IP address to be assigned to the VT3 series as instructed by the network administrator.

> ✎ Point **Be sure to set only unique IP addresses to each device within the LAN.**

■ **Subnet Mask**

Set the subnet mask of the network to which the
VT3 series belongs.
Set the subnet mask to be assigned to the VT2-E1/E2,
VT3-E3 as instructed by the network administrator.

Setting Range	Default
0.0.0.0 to 255.255.255.255	255.255.255.0

> ✎ Point **Set the same subnet mask within the same subnet. Communications is not possible if a different subnet mask is set.**

■ **Default Gateway**

Sets the IP address of the device   (router, server,
etc.) that is to be the default gateway in the LAN.
The "default gateway" refers to the node that
performs routing when an attempt is made to
transfer data to a different LAN from inside the
LAN.
When "0.0.0.0" (IP address not set) is set, LANs
having a different network ID cannot be accessed.
To configure the default gateway for VT2-E1/E2,
VT3-E3, please consult your network administrator.

Setting Range	Default
0.0.0.0 to 255.255.255.255	0.0.0.0

■ **Port no.**

The port No. that is used to communicate with the
VT3 series by VT STUDIO BUILDER or DATA
BUILDER can be changed. Basically, there is no
need to change the keep alive setting.

Setting Range	Default
1 to 65535	8500

> ✎ Point **When changing the port No., do not use numbers 0 to 1023 as the new port No.Also, take care not to use another port No. that is already in use.**

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ETHERNET

■ **Timeout**

When VT STUDIO, DATA BUILDER or FTP-based communications is being executed between the PC and VT3 series, sometimes communications is temporarily broken depending on the status of the communications path. In particular, communications is more likely to be broken when communications passes via a remote access server or the Internet.

The maximum permissible time that communications may be

Setting Range	Default
10 to 59 (sec.)	10 (sec.)

discontinued on the VT3 series can be changed on VT3 series according to the status of Ethernet. Basically, there is no need to change the keep alive setting.

■ **Keep Alive**

"Keep alive" is a function for investigating at fixed time intervals whether or not a connection with a peer device can be kept alive after the connection has been established. The connection state is automatically updated when an error on the communications destination has been detected.

This function is disabled when it is set to "0". Basically, there is no need to change the keep alive setting.

Setting Range	Default
0 to 65535 (sec.)	600 (sec.)

■ **FTP Setup**

Set this item to use FTP server functions.

Setting Range	Default
Enabled/Disabled	Disabled

● **Password**

Set the password when FTP server functions are used to make a connection.

When FTP server functions are used, the client (PC) must receive authentication from the server (VT3 series). Authentication is the action of permitting a connection when a user name and password entered in response to a request for entry of the "user name" and "password" at FTP connection are judged to be correct. The user name is fixed at "VT" (uppercase 1-byte characters).

Use the "VTIE" user name (uppercase 1-byte characters) only when Microsoft Internet Explorer is used to execute FTP. If "VT" (uppercase 1-byte characters) is entered as the user name in the same software, functions cannot be used correctly due to software restrictions.

The password is common even if "VT" or "VTIE" is used as the user name.

Setting Range	Description	Default
Password	8 alphanumeric characters (1-byte uppercase characters) When this item is left blank, the connection can be made by entering only the user name at authentication.	Not set

📖 "8-5 FTP Server Functions"

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■ **Routing**

Routing settings must be made when a communications peer device exists on a different network, and that network is ahead of a router (excluding default gateway).

Up to four sets (0 to 3) of destination IP address, destination subnet mask and router IP address can be set as the routing settings.

Setting Range	Default
Enabled/Disabled	Disabled

● **Destination IP address**

Enter the IP address of the terminal (node) to communicate with.

Setting Range	Default
0.0.0.1 to 255.255.255.255	0.0.0.0

● **Destination subnet mask**

Enter the subnet mask of the network that the destination terminal (node) belongs to.

Setting Range	Default
0.0.0.1 to 255.255.255.255	0.0.0.0

● **Router IP address**

Enter the IP address of the router that data is to pass through during communications.

Setting Range	Default
0.0.0.1 to 255.255.255.255	0.0.0.0

Normally, when the VT3 series tries to send data to a terminal on a LAN different from the one that the VT3 Series itself belongs to, the data is sent to the default gateway (default router), and is sent to the intended terminal after passing through that default gateway.

Note, however, that in a LAN configuration such as that shown below, the data will no longer arrive at the peer destination even if it is sent from the VT3 series when the connection at the peer destination terminal is set not to allow data to pass through the default gateway. In such an instance, the router for passing though to reach the destination LAN must be specified. For details, contact your network administrator.

When no routes are selected, data is transmitted via the default gateway.

When no routes are selected, data is transmitted via the specified router.

Router A (default gateway)

Router B

(VT2-E1/E2, VT3-E3)

VT3

Communications Target
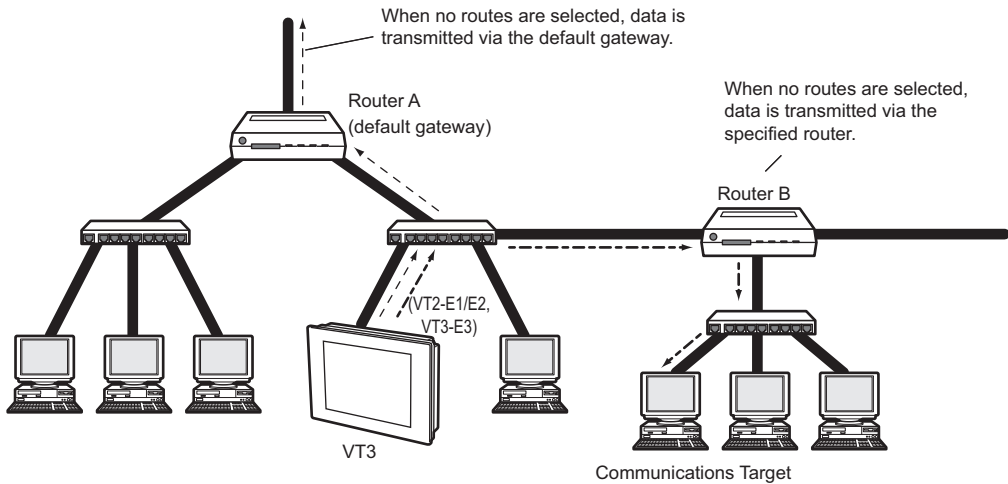
Communications Test

When the Ethernet connection and settings in the System mode are completed, conduct a communications test to see whether or not the VT2-E1 is correctly recognized as a network terminal (node).

There are two types of communications test: one that uses the ping command executed on the Windows command prompt, and one that uses the Connection Confirmation Tool provided with VT STUDIO and DATA BUILDER.

The following describes how to check communications using the ping command. For details on the Connection Confirmation Tool, refer to the PDF Manual for the Connection Confirmation Tool.

■ How to check using the ping command

"ping" is the command for investigating whether or not communications with a peer destination is possible and how long it will take for the data to reach that destination on an Ethernet network. The ping command uses an echo request message and echo response message in a protocol called ICMP (Internet Control Message Protocol). When the ICMP echo request message is sent to the peer node with which you want to check that communications is possible, the node that received the message stores the reception time to the response message, and returns the response message to the sender.

The sender can judge whether or not communications is possible with this peer node and calculate the time required for the data to arrive based upon the presence of this response message and the time stored to the response message.
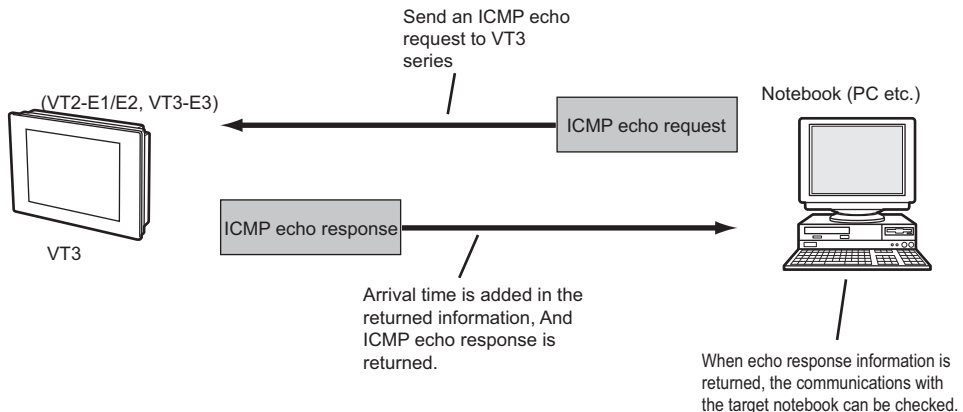
● Executing the ping command

The ping command is executed at the command prompt.Follow the procedure below to execute the ping command from the PC connected to the network.

1 **Select "Programs" -> "Accessory" -> "Command Prompt" from the Start menu in that order.**

This activates the command prompt.
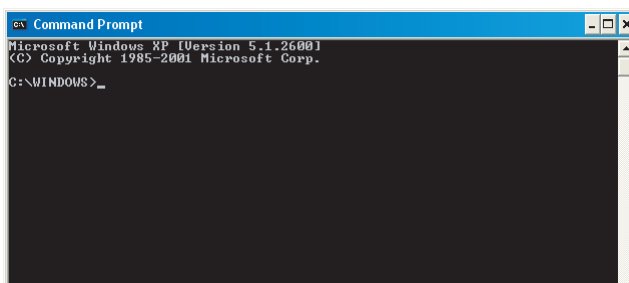
2 Enter "ping" followed by one space and then enter the IP address of the VT3 series.

[Example]   When the IP address is "192.168.10.11"
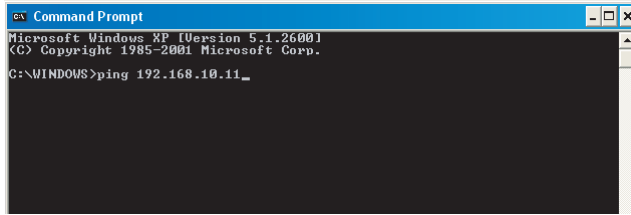
3 Press the ↵ key.

When the following is displayed, this indicates that the VT3 series is correctly connected to the network and is recognized as a node.

This indicates that 32 bytes of data was sent to the node at IP address 192.168.10.11.

This indicates that a response was returned. The same inquiry was repeated four times.

This indicates that the packet was sent four times and that a normal response was not returned in response to each of these four transmissions.

If the following screen is displayed, this indicates that the VT3 series is not recognized as a node.
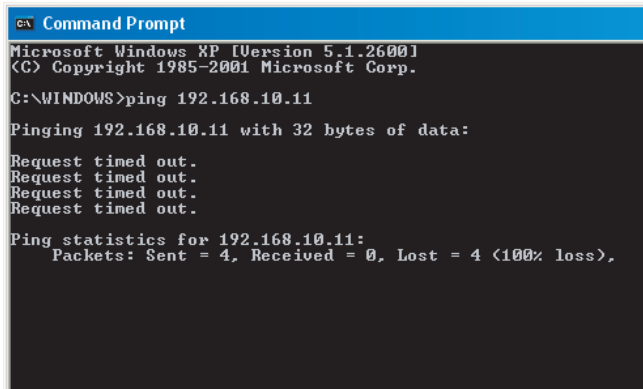
If the VT3 series is not recognized, check the following points again:

• Are the VT3 series and hub connected correctly by the connection cable?
• Is the power of VT3 turned on?
• Is the hub ON?
• Does the IP address set to the VT3 series match the IP address specified in the ping command?

For details, please refer to 📖 "8-6 Troubleshooting"

Reference	• The ping command can be executed with options specified to add on functions or apply restrictions. • A list of options that you can specify for the ping command is displayed by entering "ping/?" at the command prompt.

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Simulator and Sending/Receiving Screen Data

The following can be achieved by an Ethernet connection between VT3 and the PC:

• Transmission/ reception of screen data

• Communications with Simulator

• Transmission/reception of PLC Data Folder Data

✎ **Point**   • **Even when either a PORT1 (SERIAL/USB) connection or an Ethernet connection is used, only one of the following types of communications can be executed on a single VT3:**
• **Transmission/ reception of screen data**
• **Transmission/reception of PLC Data Folder Data**
• **Simulator transmission/reception**
Also, do not execute Ethernet communications using FTP server functions on a VT3 that is currently sending or receiving these data.

■ VT STUDIO and Simulator Setup

To receive/send screen data or PLC folder data and communicate with the simulator over Ethernet, please set up the ports for VT STUDIO and the simulator.

Select "Communications" -> "Communications port settings" from Menu in that order, and then select "Ethernet".
Make sure that "Ethernet" is selected, and set the "IP address" and "Port No.".
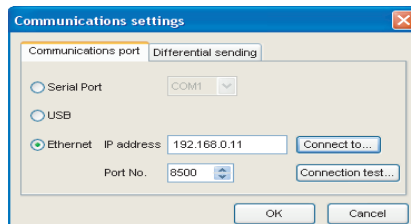
Outline of FTP Server Functions

FTP server functions allow you to read and write data to Memory Card (OP-42254) installed on the VT3, and read VT3 internal memory (alarm log data, real time trend graph data) over the network.

FTP server functions can be simply operated either by executing FTP commands from the command prompt or by using FTP client software.

FTP server functions can be used to achieve the following:

■ Reading and writing Memory Card data

The following ten types of Memory Card data can be read or written using FTP server functions:

📖 "6-1 Memory Card"

• Screen Data
• System Program
• Hard copy data
• Printer form data header
• BMP file switching
• Video capture data (VT3-X15(D)/S12(D)/S10/V10(D)/V8 only)
• Alarm log data
• Trend chart data
• PLC data folder data
• Worksheet data
• Operation log

Up till now Memory Card data had to be written to Memory Card from the VT3, and that Memory Card removed from the VT3, and loaded into the PC using a Memory Card Writer or Memory Card Adapter.

FTP server functions, however, allow you to read or write Memory Card data over a network without removing the Memory Card from the VT3.

■ Reading internal memory (SRAM) data

The following two types of internal memory data can be read by FTP server functions:

• Alarm log data
• Trend chart data

Up till now, to read these data from internal memory, the data had to be written once to Memory Card, the Memory Card removed from the VT3, and the data loaded to the PC.

FTP server functions, however, allow you to read internal memory data directly over the network without the need to use a Memory Card.

The alarm data and trend chart data directly read from the internal memory are the same (CSV files) as that written into Memory Card.

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Specification of FTP server function

■ User name and password

FTP operates by user authentication. FTP cannot be used unless the client enters the correct user name and password when making the connection using FTP server functions.

The VT2-E1/E2, VT3-E3 user name and password are as follows:

User name : VT (uppercase single-byte characters)

Password : 8 characters. (uppercase single-byte characters)

When this item is left blank, the connection can be made by entering only the user name.

📖 "Password", page 8-11

✎ **Point** | **Use the "VTIE" user name (uppercase 1-byte characters) only when Microsoft Internet Explorer is used to execute FTP.If "VT" (uppercase singlebyte characters) is entered as the user name in the same software, some functions cannot be used correctly due to software restrictions.**
📖 "FTP Operations in Internet Explorer", page 8-27

■ Maximum number of FTP connections

The maximum number of simultaneous FTP connections is four.

Note, however, that when you logged in by Internet Explorer, two or more connections are used at once.

■ Restrictions placed on Memory Card

● Restrictions on size of files that can be transferred

When transferring files to Memory Card, the largest file size that can be transferred is the value obtained by subtracting four bytes from the amount of free space on Memory Card.

The amount of free space on Memory Card can be checked by FTP server functions.Insert the Memory Card into VT3, access the server's root directory, and check "CF_Free_nnnnnnKB" (where, nnnnn stands for the amount of free space on Memory Card in Kbytes).

● Restrictions on folders and number of files that can be created

The number of folders and files created in Memory Board varies depending on models.

• VT3 Mode

The upper limit of the number of the folders created in the root directory in Memory Card is 65,535 files.

Each folder can contain up to 100 files.

No limit is on the lower levels under the root directory.

Folders and files can be created as long as there is free space on the Memory Card.

• VT2 Compatible Mode

The total maximum number of folders and files that can be created in the root directory on a Memory Card is 200.

No restrictions are placed on the number of folders and files in leyers under the root directory.

Folders and files can be created as long as there is free space on the Memory Card.

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FTP Functions and How FTP works

■ FTP execution procedure

FTP (File Transfer Protocol) is a protocol for transferring files over a network. The FTP execution procedure is as follows.

(1) The client (user) issues a request for connection to the server (VT3 series).

(2) After a connection is established, the server checks whether it is a connected client or usable client (the server requests the client to output the username and password).

(3) When the user is authenticated, files can be transferred. The user can also acquire file data on the server, and files can be transferred to the server from the user.

(4) The connection is canceled.

■ About connection port

Normally, the FTP server uses two TCP ports, port Nos. 20 and 21, to establish the connection.

First of all, the control connection is established on port No. 21. This connection is used for conducting transactions between the various commands and responses for FTP control. When user authentication ends, the server opens port No. 20 to establish the data connection.Files are actually transferred on this port. The user need not be aware of the port used on the FTP server as this port is automatically specified by the FTP protocol.
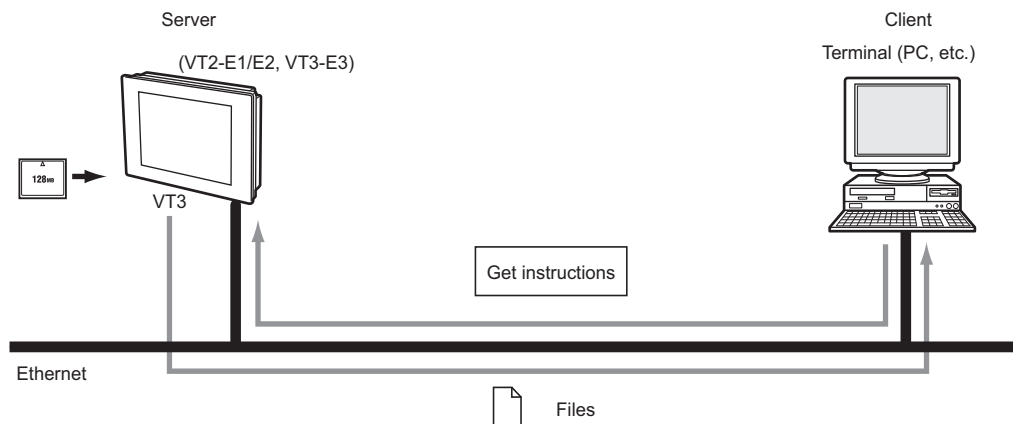
■ Application for using FTP

Generally, FTP client software is used to use FTP. FTP client software allows files to be transferred easily as procedures (e.g. establishment of connection with server, file transfer) are executed automatically.

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Directory Structure

The following illustrates the directory structure on the VT3 to be used as the FTP server:

Directory	Display	Description/File Name
Root Directory	CF_Free_nnnnnnKB	Displayed when Memory Card is inserted into VT3. "nnnnnn" represents the available memory space of the memory card. When the available memory space is below 4kb, files cannot be transferred to the memory card.*
	CF_not_Avalable	Displayed when Memory Card is inserted into VT3.
	Status_Unlock Status_Lock	Only a certain file is displayed depending on the lock state of the memory card.
	To_CF_Lock	FTP Memory cards cannot be accessed. (the memory cards are locked)
	To_CF_Unlock	Non-FTP memory cards are unlocked. (the memory cards are unlocked)
SRAMALM	Alarm Log	SRAMALM*.csv (*:0 to 3)
SRAMTRD	Trend Chart	SRAMTRD*_#.csv (*:0 to 3,#:U/S/B depending on the data in the internal memory.)
CF	Memory card	

The following directory when the memory card is used varies depending on whether the CF mode (the VT3 mode and VT2 compatible mode) in the VT STUDIO is selected.

- VT3mode
  (VT3 mode)

- VT2 Compatible Mode
  (VT2 Compatible Mode)

* "Reading and Writing Memory Card Data", page 8-23

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● **VT3 mode**

Directory				File Category	File Name
CF				Screen Data System Program	VTEDT*.ms4 (*: 0~9) VT3C_**.vp3/ VT3S_**.vp3/ VT3L_**.vp3 (***: Version number)
AUTOLOAD				Screen Data System Program	AUTOLOAD.ms4 VT3C_**.vp3/ VT3S_**.vp3/ VT3L_**.vp3 (***: Version number)
VTALM	ID0	00000_00999		Alarm Log	ALM***** (Character string).csv/ ALM***** (Character string).txt (*****: 00000~65535)
		65000_65535			
	ID3	00000_00999			
		65000_65535			
VTBMP		00000_00999		BMP File Replacement	BMP***** (Character string).bmp/ BMP***** (Character string).jpg (*****: 00000~65535)
		65000_65535			
VTCPT	RGB	00000_00999		Video Capture	CPT***** (Character string).bmp/ CPT***** (Character string).jpg (*****: 00000~65535)
		65000_65535			
	CH1	00000_00999			
		65000_65535			
	CH4	00000_00999			
		65000_65535			
VTDVC				PLC Data Folders	VTDVC·*.wd3 (·*: 00~99)
VTIMG		00000_00999		Hard Copy	IMG*****.bmp/ IMG*****.jpg (*****: 00000~65535)
		65000_65535			

(continue)

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Directory	File Category	File Name

(continued)

| VTRPT → No0 → 00000_00999 ... 65000_65535 ; NoF → 00000_00999 ... 65000_65535 | Trend Chart | RPT***** (Character string).bmp/ RPT***** (Character string).jpg (*****: 00000~65535) |

| VTTRD → ID0 → 00000_00999 ... 65000_65535 ; ID3 → 00000_00999 ... 65000_65535 | Trend Graph | TRD***** (Character string).csv (*****: 00000~65535) |

| VTWS → ID0 → 00000_00999 ... 65000_65535 ; ID3 → 00000_00999 ... 65000_65535 | Worksheet | WS***** (Character string).csv/ WS***** (Character string).txt (*****: 00000~65535) |

| VTOPL | Operation log screen Data | VTOPL0.ms4 |
| 00000_00999 ... 65000_65535 | Operation log | OPL***** (Character string).csv/ OPL***** (Character string).txt (*****: 00000~65535) |

● **VT2 Compatible Mode**

Directory	File Category	File Name
CF	Screen Data System Program	VTEDT*.ms4(*: 0~9) VT3C_**.vp3/ VT3S_**.vp3/ VT3L_**.vp3 (***: Version number)
AUTOLOAD	Screen Data System Program	AUTOLOAD.ms4 VT3C_**.vp3/ VT3S_**.vp3/ VT3L_**.vp3 (***: Version number)
VTALM	Alarm Log	VTALM#·*.csv/ VTALM#·*.txt (#: 0~3, *: 00~99)
VTBMP	BMP File Replacement	VTBMP**.bmp/ VTBMP**.jpg (**: 000~999)
VTCPT	Video Capture	VTCPT#·*.bmp/ VTCPT#·*.jpg (#: 0~4, *: 00~99)
VTDVC	PLC Data Folders	VTDVC·*.wd3 (*: 00~99)
VTIMG	Hard Copy	VTIMG·*.bmp/ VTIMG·*.jpg (*: 00~99)
VTRPT	Form print	VTRPT#·*.bmp/ VTRPT#·*.jpg (#: 0~F, *: 00~99)
VTTRD	Trend Graph	VTTRD#·*.csv (#: 0~3, *: 00~99)
VTWS	Worksheet	VTWS#·*.csv/ VTWS#·*.txt (# : 0~3, *: 00~99)
VTOPL	Operation log screen Data	VTOPL0.ms4
00000_00999	Operation log	OPL***** (Character string).csv/ OPL***** (Character string).txt (****: 00000~65535)
65000_65535		

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Reading and Writing Memory Card Data

NOTICE	Be sure to use the Memory Card with the Memory Card slot cover closed. If the cover is open, the Memory Card cannot be accessed.

■ Memory Card accessing range

If the structure of the Memory Card's directory is as follows, the directory and files that can be accessed (read and written) by the FTP client software are as follows:

● **VT3 mode**
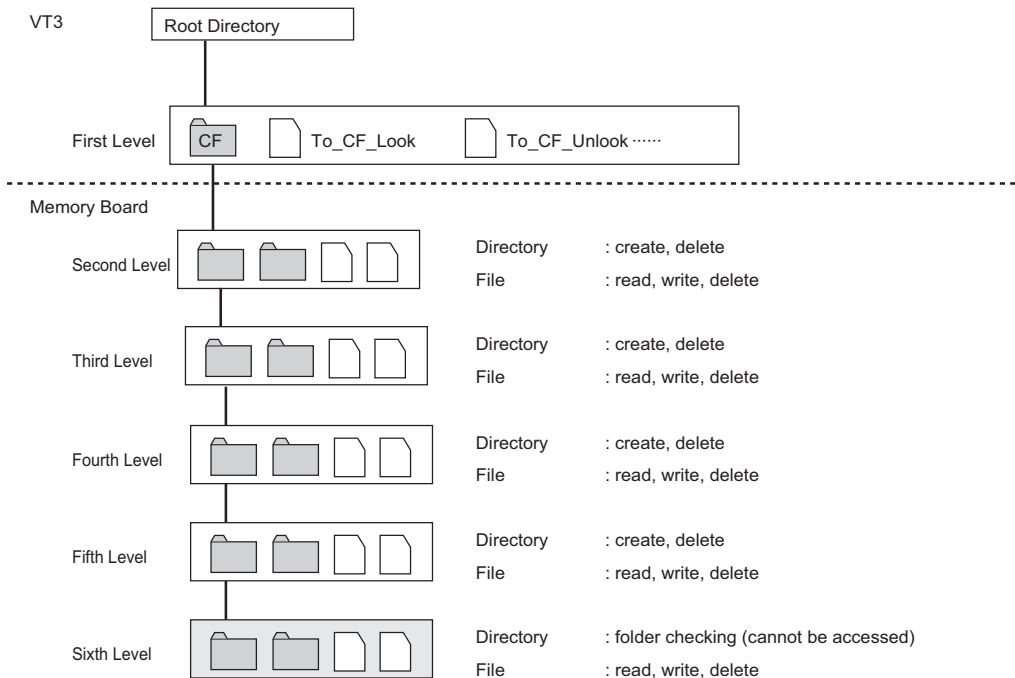
Directory name and file name restrictions
2 or above "." (period) cannot be successively used in a file name and directory.

Symbols that cannot be used
"\", "/", " (Space)", "*", "?", ",", """, ":", ";", "<", ">", "=", "+".

● **VT2 mode**

Directory name and file name restrictions
* In the case of the VT2 compatible mode, only half-width English numeric values should be used, 8 characters + 3 extension characters
* 2 or above "." (period) cannot be successively used in a file name and directory.

The following symbols are not allowed in directory names and file names:
"\", "/", ".", " (Space)", "*", "?", ",", """, ".", ";", "<", ">", "=", "+".

■ **Use the memory card and access from FTP**

The VT3 is accessed by each of its Memory Card functions. For example, hard copy data can be saved during VT3 operation, and screen data can be transferred while the System mode screen is displayed.
The following describes operation when the VT3 is accessed by FTP when the Memory Card is being accessed by Memory Card functions from the VT3 itself.

● **When the Memory Card screen is displayed in the System mode**

When the Memory Card screen is displayed in the System mode, the Memory Card cannot be accessed by FTP.

● **When PLC data folders are being executed by Memory Card**

When a PLC data folder is being executed using data saved to Memory Card, the Memory Card cannot be accessed by FTP.

● **Other than the above**

Even if there is multiple accessing of a single Memory Card, each of these accesses are executed independently. Multiple accessing includes simultaneous accessing by VT3 and FTP, or simultaneous accessing by multiple FTPs. Note, however, that each single access operation might be delayed as each operation is processed after being divided into two or more sections.

> ✎ **Point** **Note, however, that when the same file is accessed simultaneously by multiple FTPs, reading and writing of the file might not be processed correctly.**

Memory Card Lock Function

■ What is memory card lock function

Memory card lock function means that data in the memory card is read and written from the FTP client software by inhibiting the access (excluding FTP) to VT3's memory card.

Memory Card lock can be operated and the lock state can be confirmed by operating the following files.

These files are empty files.

File Name	Description
Status_Unlock	This is displayed when the Memory Card lock function is in an unlocked state.
Status_Lock	This is displayed when the Memory Card lock function is in a locked state.
To_CF_Lock	When a file is read, the state of the Memory Card lock function migrates to a locked state.
To_CF_Unlock	When a file is read, the state of the Memory Card lock function migrates to an unlocked state.When the unlocked state is migrated to, the VT3 screen display is refreshed.

■ Memory Card locked state

The VT3 operates as follows when the Memory Card is in a locked state:
• Accessing by Memory Card functions by the VT3 itself excluding FTP is inhibited.
  (including inhibiting of migration to the Memory Card screen in the System mode)
• "Memory Card locked" is displayed at the bottom left of the VT3 screen
• The "Memory Card accessing bit" in system memory area turns ON (when system memory area is in use)

To cancel a locked state, either read the To_CF_Unlock file, or turn the VT3 OFF then back ON again. As the locked state cannot be canceled by operating the VT3, take care when setting to the locked state for a long period of time or when exiting FTP in a locked state.

The locked state cannot be set from FTP when the Memory Card is being accessed by Memory Card functions by the VT3 itself excluding FTP.

■ Memory Card unlocked state

The VT3 operates as follows when the Memory Card is in a locked state:
• Accessing by Memory Card functions by the VT3 itself excluding FTP is inhibited.
• VT3 screen displays are refreshed. (when the unlocked state is moved to)

When accessing by FTP occurs simultaneously with accessing by Memory Card functions by the VT3 itself excluding FTP, data may be written as incomplete data or Memory Card data may not match FTP data.

When the state of the Memory Card moves from a locked state to an unlocked state, the VT3 screen display is refreshed.

If the data of the currently displayed bitmap file data is rewritten by FTP when BMP file switching parts in VT STUDIO are in use, the display will remain as it is and will not be updated to new bitmaps. Read To_CF_Unlock and refresh the VT3 screen.

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Ethernet-related Special Internal Devices

During Ethernet-based communications, the values of each function are entered to the following internal devices.

Device No.	Description
MW0032 (2 words)	Number of send packets
MW0034 (2 words)	Number of receive packets
MW0036	Number of PC application[1] connection ports (max. 3)
MW0037	Number of FTP connection ports (max. 4)

*1   Here, the PC application means VT STUDIO or DATA BUILDER.

Precautions When Using FTP Server Functions

• When Ethernet settings are changed while an FTP connection is established, the FTP connection is broken. If data was being read or written at this time, the data will remain as incomplete data.

• If the following processes are performed while alarm log data or real time trend graph data in internal memory was being accessed, accessing will be discontinued:
    Transfer of screen data or system program
    Initialization of record data

• To write (write back) PLC data folder data (VTDVC**.WD3) to Memory Card by FTP server functions, also write the multiple files (VTDVCM**.ID3, VTDVID**.ID3) that were also generated at the same time after editing by the PLC data folder editing tool in addition to PLC data folder data (VTDVC**.WD3).
The files that were also formed at the same time after editing are sometimes not displayed depending on the settings of your PC as they are hidden files. If they are not displayed, change the display settings of your PC. Operation is sometimes incorrect if only PLC data folder data (VTDVC**.WD3) is written (written back) to the Memory Card.

• Alarms and trend graph data might change constantly. Differences might occur between the latest data on the VT3 and the data that is read over Ethernet if new data is added or old data is deleted due to space limitations.

• PLC data folder data in internal memory (SRAM) cannot be accessed.

• Differences might occur between the size of files (CSV files) for data read on the PC and files for alarm log data (internal memory) and real time trend graph data (internal memory) on VT3 at the FTP connection.

FTP Operations in Internet Explorer

The following describes the procedure for executing FTP in Internet Explorer.

With Internet Explorer, there is a problem that the latest information sometimes cannot be got depending on the cache or proxy setting. Check this sufficiently before using Internet Explorer.

📖 "FTP function restrictions in Internet Explorer", page 8-29

1 **Start up Internet Explorer on the client PC.**

2 **Input "ftp://" in the "address" input box, continue to input the IP address on VT3 series.**

[Example] When the IP address is "192.168.0.11"
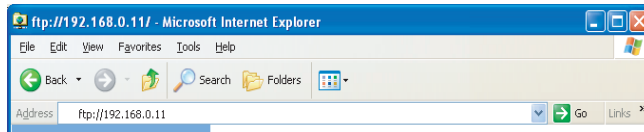
3 **Press the "Return" button.**

The following dialog box is displayed.
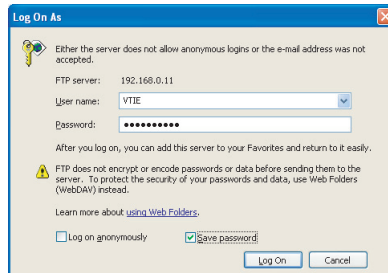
Reference	If you specify the user name and password in addition to the IP address in the "Address" entry box in step 2 above, the above dialog box will not be displayed and the FTP connection can be made.

[Example] For example, to specify IP address "192.168.0.11", user name "VTIE" and password "passwd", enter "ftp://VTIE:passwd@192.168.0.11" in the address entry box.

✎ Point	**FTP operations do not function in Internet Explorer Ver5.0 or earlier.**

Reference	You can also access the FTP server using the command prompts.

4 **Enter "VTIE" in the "User name" entry box and the FTP password that was set in Unit Editor in the "Password" entry box, and click the "Login" button.**

If the password you entered is correct, the folders and files that can be accessed on VT3 (or Memory Card) are displayed.
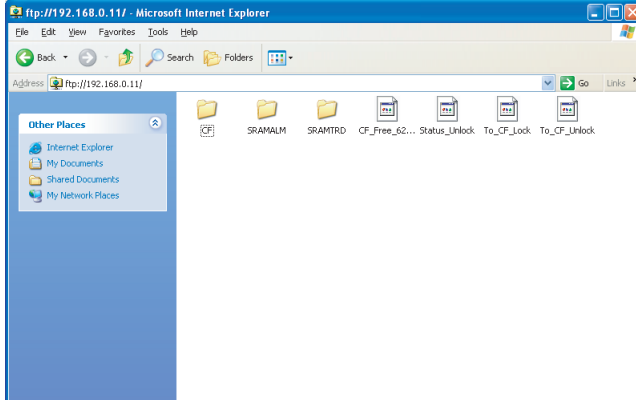
> ✎ **Point** **The user name "VTIE" is used only when Internet Explorer is used. When a command prompt or FTP client software is used, please use "VT" as the username.**

■ **FTP function restrictions in Internet Explorer**

● **Drag and drop**

When OS is Windows95/98/NT, drag and drop operation cannot be executed.

● **About the caching and proxy**

By setting up a cache or proxy server for the file transmission, data stored in the memory cache, rather than the real-time data in the memory card, can be accessed from time to time.

Register proxy server to "Do not use" or "Proxy setting" exceptions.
Open "Control Panel" -> "Internet Options" -> "LAN Settings" in "Connections" tab, and unmark the "Use proxy server" checkbox.
Or, register to "Proxy setting" exceptions.

Set cache to "Do not use" (not required in the case of IE6.0)
"Control Panel" -> "Internet Options" -> "Internet temporary file settings" in the "General" tab, and set "Check at each page display" to ON.

● **Cautions when starting up files**

When a file on the server (VT3) is double-clicked, and the "Open" button is clicked in the dialog box that is displayed, the selected file is sometimes opened in a specific application.
If two or more files are opened in this way, the number of connections sometimes increases or the connections sometimes remain intact even if FTP is quit.For this reason, temporarily copy the files on the server (VT3) to the client (PC), quit FTP, and open the files on the local disk (hard disk) on the PC.

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FTP Operations in Windows Explorer

The following describes the procedure for executing FTP in Windows Explorer.

📖 "FTP function restrictions in Windows Explorer", page 8-31

1 **Start up Windows Explorer on the client PC.**

2 **Input "ftp://" in the "address" input box, continue to input the IP address on VT3 series.**

[Example] When the IP address is "192.168.0.11"
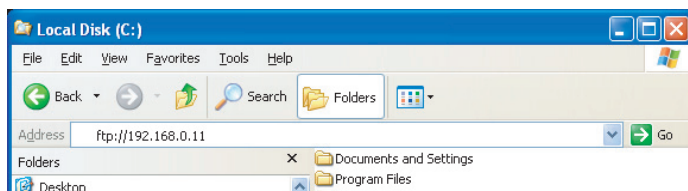
3 **Press the "Return" button.**

The following dialog box is displayed.
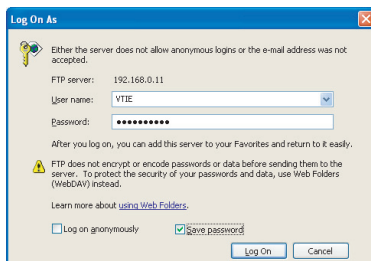
> **Reference** If you specify the user name and password in addition to the IP address in the "Address" entry box in step 2 above, the above dialog box will not be displayed and the FTP connection can be made.

[Example] For example, to specify IP address "192.168.0.11", user name "VT" and password "passwd", enter "ftp://VT:passwd@192.168.0.11" in the address entry box.

4 **Enter "VT" in the "Username" line, and enter the FTP password set up in the unit compiler, and click the "Login" button.**

If the password is correct, the accessible files and folders in VT3 (and Memory Card) are displayed.

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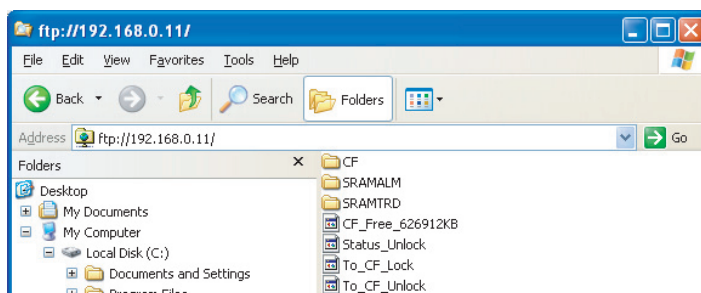
■ **FTP function restrictions in Windows Explorer**

● **Move a Directory**

To use FTP in Windows Explorer, ensure to use the shortcut keys area on the left side.

Left shortcut area: Display the folders or drives.

Right shortcut area: Display the contents of the selected folders in the left shortcut area.
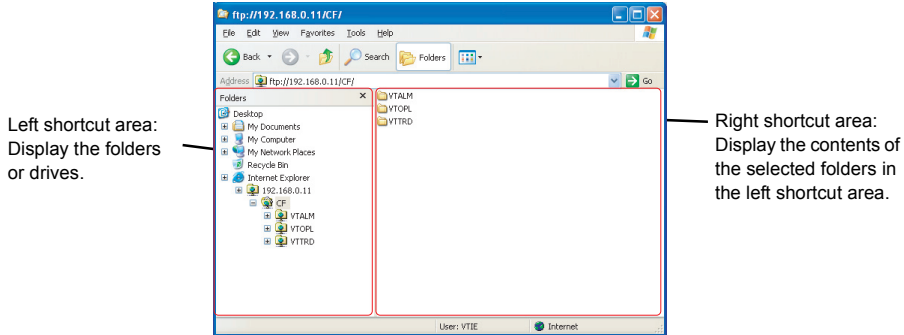
> ✎ **Point** **When operating the FTP server directory in the left shortcut area for many times, the following dialog box is displayed telling you that a folder cannot be opened.**
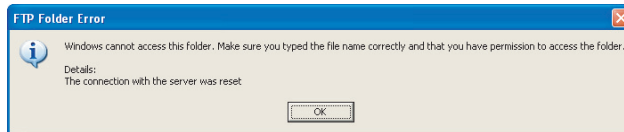
> **In this case, FTP operations can be enabled by turning on the power of the targeted VT3.**

● **Cautions when starting up files**

When a file on the server (VT3) is double-clicked, and the "Open" button is clicked in the dialog box that is displayed, the selected file is sometimes opened in a specific application.

If two or more files are opened in this way, the number of connections sometimes increases or the connections sometimes remain intact even if FTP is quit. For this reason, temporarily copy the files on the server (VT3) to the client (PC), quit FTP, and open the files on the local disk (hard disk) on the PC.

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Ethernet related error messages and treatment methods are described.

Remedying Errors

If an error occurs on the VT3 series while it is connected to a network, contact the network administrator before remedying the error.

NOTICE	Knowledge about safety measures and standards is required for installing Ethernet devices. Please consult your network administrator or a person who knows the network very well. If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.

Authorized Network Devices

The operation of the following network units from KEYENCE has been checked with VT3 Series.

Model No.	Description
NE-Q05 NE-Q05P	EtherNet switch supporting EtherNet/IP

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Cannot Connect to Network

■ Procedure for checking network connection

Refer to the following flowchart to remedy problems, for example, when the VT3 series can no longer be recognized on the network or when devices (including VT3 series) have been added onto the network but cannot be recognized.

✎ Point	The flowchart below is just one example of how to remedy this problem. How network trouble is remedied varies considerably depending on the network configuration, so remedy the problem by following the procedure best suited to the current network configuration.

```
                    ┌─────────────────────────┐
                    │  Start and end           │
                    │  VT3 series related      │
                    │  software                │
                    │  (VT STUDIO etc.).       │
                    └─────────────────────────┘
                              │
                              ▼
                    ◇ Display error messages ◇ ──Yes──► ┌───────────────────────────────────┐
                              │                          │ Confirm the processing methods     │
                              │ No                       │ Please check to ensure correct     │
                              │                          │ actions are taken.                 │
                              │                          │ 📖 "Errors and How to Remedy       │
                              │                          │    Errors", page A-2               │
                              │                          └───────────────────────────────────┘
```

Display error messages — Yes → Confirm the processing methods
Please check to ensure correct actions are taken.
📖 "Errors and How to Remedy Errors", page A-2

No

Check to ensure the cables and their surroundings are correct.
Check to ensure the cables, hubs, routers, etc, work well.
📖 "Checking connection cables", page 8-34

"Ping" Executable commands — No response →

Check the system settings
Check to ensure the system settings are OK.
📖 "Check System Settings", page 8-37

Response
📖 "Executing the ping command", page 8-13

Check to ensure the whole network is correct.
Check to ensure the physical environments and settings of the whole network are correct.
📖 "Checking the entire network", page 8-38

Please confirm operating conditions of the functions related with Ethernet.

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■ **Checking connection cables**

Follow the procedure below to check cables, hubs, routers and other routing devices for malfunction or trouble.

1 **Make sure that the LINK indicators on the VT2-E1/E2, VT3-E3, VT3-V6H(G)/Q5H(G) and hub are lit.**

Check the LINK indicators on the VT2-E1/E2, VT3-E3, VT3-V6H(G)/Q5H(G) and hub shown in the figure below. (The shape and position of the indicators varies according to the hub.) During a normal connection, the LINK indicator on the VT2-E1/E2, VT3-E3, VT3-V6H(G)/Q5H(G) lights (green).

<VT2-E1/E2, VT3-E3>

<VT3-V6H(G)/Q5H(G) back cable connecting part>
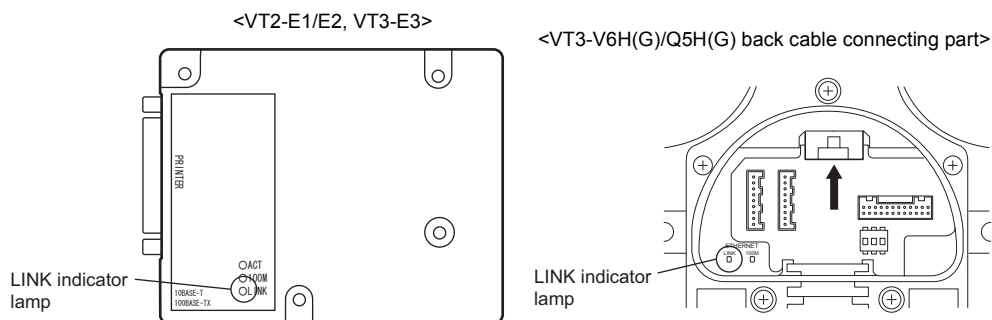
If the LINK indicator is not lit, this means that an electrical connection has not been made between the VT2-E1/E2, VT3-E3, VT3-V6H(G)/Q5H(G) and the hub. In this case, check the following:

• **Is the hub ON?**
• **Are the cable connectors properly connected to the modular jacks on the VT2-E1/E2, VT3-E3, VT3-V6H(G)/ Q5H(G) and the hub?**
  Disconnect the cables and firmly insert them again so that you hear them click into place.
• **Are you using the correct type of connector cables?**
  STP cables must be used. If the Ethernet environment is 10Base-T, Category 3 or higher, UTP cables must be used, and if the Ethernet environment is 100Base-TX, type 5 or higher UTP cables must be used.
• **Is a cross cable used to connect VT2-E1/E2orVT3-E3[*1] to a hub?**
  If so, change the cables to straight cables.

If the above problem cannot be solved by turning the hub ON again and by judging the lit state of the LINK indicator, then try Step 2 below.

*1   VT3-E3 for which the last letter of the serial number is "A" supports MDI/MDI-X automatic switching function.

2 **Confirm that modular socket of each port is free of waste and dust, or cable is not disconnected.**

If defective connections are caused by dust or broken cables, communications sometimes cannot be performed normally even if an electrical connection is made (LINK indicator is lit). Try moving the cable and if the LINK indicator flickers, a probable cause is a defective cable or connector connection. If these symptoms appear to be occurring, remedy by performing the following:

• **Use cotton stick etc to remove smudge on the modular socket of each port. Here, operate carefully to prevent damage of wiring etc in the modular socket.**
• **Replace the cable with the broken leads with new ones.**

NOTICE	**Consult the network administrator or someone else who sufficiently understands networks before checking the cables. If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.**

■ **Checking connections using the ping command**

Execute the ping command to the VT3 series and other devices from the PC on Ethernet, and check whether or not a response is returned.

For details about executing the ping command, see

📖 "Executing the ping command", page 8-13

1 📖 **VT3 series "Executing the ping command", page 8-13.**

Execute the ping command to the IP address set on VT3 series.

2 **Execute the ping command to other terminals (nodes) connected to the same hub.**

If there is no normal response to the ping command executed to the VT3 series, execute the ping command to other terminals (nodes) that are connected to the same hub as the VT3 series and that are operating normally.
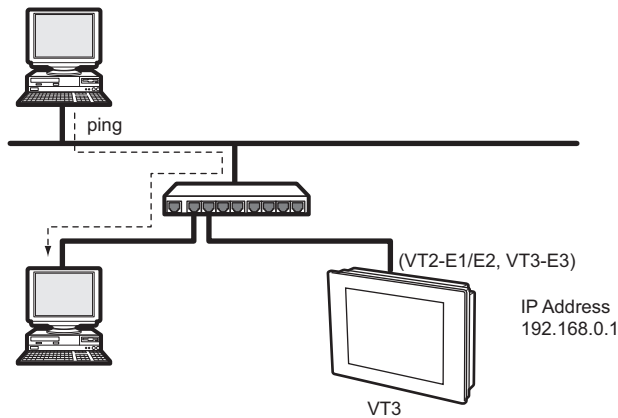
If there was a normal response, a probable cause that the VT3 series IP settings are incorrect (settings made in System mode).

📖 "Check System Settings", page 8-37

If the message "Request timed out." or other messages are displayed even if the ping command is executed to other terminals (nodes) connected to the same hub as the VT2-E1, a probable cause is hub or router trouble or trouble in the network beyond these devices.

📖 "Checking the entire network", page 8-38

3 **Test the communication connections with other terminals (the notebook etc.) without using the VT3 series. Select the "IP Address", "subnet mask", and "default gateway" as the settings for VT3 series and execute ping again.**

IP Address
192.168.0.1

(VT2-E1/E2, VT3-E3)

Replace the VT3 series
with other terminals.

VT3
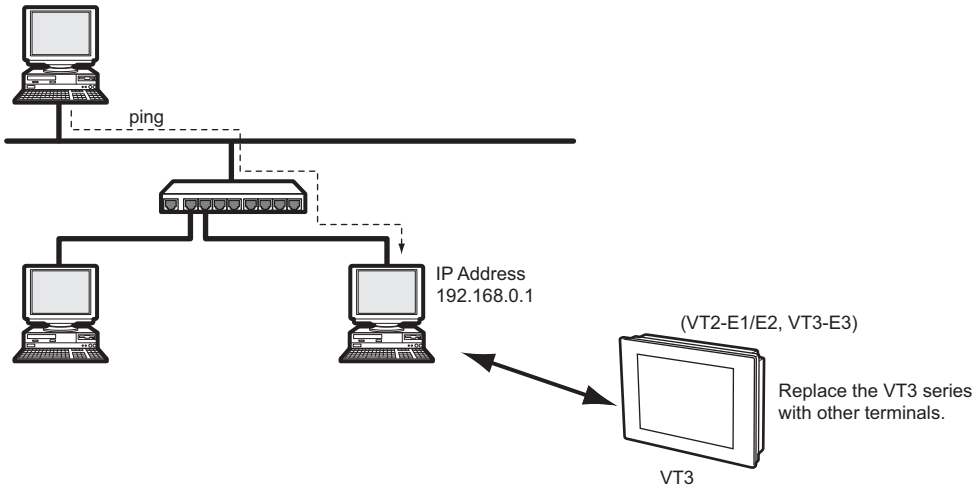
Alternatively, you can connect the VT3 series with the PC and set up the "IP Address", "subnet mask", and "default gateway". Then execute ping.
At this time, set the VT3 series and PC to the same network address.
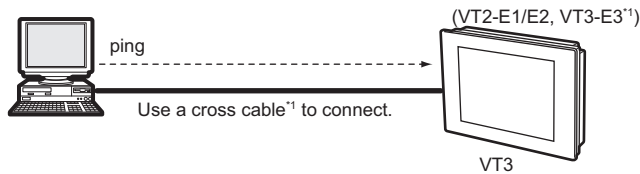
ping

(VT2-E1/E2, VT3-E3[*1])

Use a cross cable[*1] to connect.

VT3

*1   VT3-E3 for which the last letter of the serial number is "A" supports MDI/MDI-X automatic switching function.
If there is no normal response to the ping command executed to the VT3 series, a probable cause is a problem with the VT3 series unit itself. Check the VT3 series settings.

NOTICE	Consult the network administrator or someone else who sufficiently understands networks before checking the network connection by the ping command. If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.

Point	In the case of different IP addresses for the PC and VT3 series and incorrect settings for the routing or IP address, ping responses cannot be received. Please check to ensure their network settings are correct.

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■ **Check System Settings**

Check the following items to make sure that the IP settings of the VT3 series are correct.

NOTICE	Consult the network administrator about the IP address settings.If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.

Setting Item	Description
Is the IP address set correctly?	Make sure that unique IP addresses are set to all devices on the same LAN.
Is the subnet mask set correctly?	Make sure that the subnet mask setting is set the same as other devices on the same LAN.
Is the default gateway set correctly?	Make sure that the gateway's IP address is set correctly.If the IP address is set to "0.0.0.0", the VT3 judges that the default gateway is not set.
Are the routing settings set correctly?	Make sure that the destination IP address, subnet mask and corresponding router IP address are set correctly when routing settings have been made.
Is the FTP server "Enabled/Disabled" setting correct?	Make sure that the FTP server function is set to "Enabled" when in use.

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■ **Checking the entire network**

If communications trouble appears to be occurring also on nodes other than the VT3 series, you must check the physical connection environment and settings of the entire network. The following describes the main points when checking the network environment.

NOTICE	Consult the network administrator about checks to perform on the network and remedies to perform. In the case that the network settings are changed accidentally, new problems or terminal problems (the notebook) may arise depending on the network structure.

● **10Base-T/100Base-TX connection restrictions**

VT3 series conforms to 10Base-T/100Base-TX. The following restrictions apply when building a LAN by 10Base-T or 100Base-TX. If these restrictions are not satisfied, communications cannot be performed normally. Make sure that the LAN environment satisfies the following conditions.

Item	10Base-T	100Base-TX
Used cables	Category 3 or more UTP or STP	type 5 or more UTP or STP
Number of hub cascade stages	4 max	2 max
Cable length limitations	Within 100 m between nodes	Within 100 m between nodesNote, however, that the maximum length is 205 m as the distance between the 1st and 2nd stage hubs in the case of a cascade connection is 5 m max.

The requirements on the length of the cables for the 100BASE-TX cascade connection
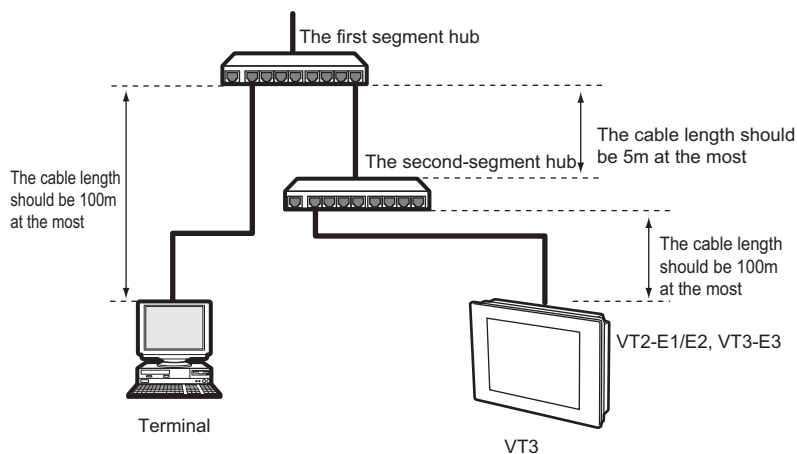
● **Hub cascade connection**

When the hubs are connected with each other and connected with the routers, it is necessary to use the special ports such as the cascade port or use the cross-linked cables to connect the common ports. When connecting two hubs together or when connecting a router to a hub, either the cascade port (MDI) or other exclusive port must be used, or the regular port must be connected by a cascade cable. For more information, please see the manuals of the hubs.

● **Baud rate**

Just like the VT3 series, if a 10/100 Mbps auto-recognition hub or router exists on the same LAN, auto-recognition may not function properly which may result in connection failure depending on the auto-recognition protocol used. If this happens, fix the baud rate of the VT3 series and other devices to 10 Mbps.

Note, however, that the baud rate between devices set to 100 Mbps and devices set to 10 Mbps becomes 10 Mbps.

● **Network device installation environment**

Thermal runaway or other trouble sometimes occurs on network devices such as hubs because of the installation environment. If this happens, either press the reset switch on the hub or turn the power OFF then back ON again. If the trouble frequently occurs, perform measures such as replacing or changing the installation environment. For details on network device specifications, check the User's Manual for the respective device.

● **PC trouble**

When the VT3 series cannot communicate with the PC on Ethernet, other probable causes are that the network settings of the PC itself are incorrectly set, or that some trouble has occurred on the network interface card (NIC). First, use the diagnostics software supplied or other tool to make sure that the NIC is functioning correctly.

If diagnostics software is not supplied, execute the ping command to the self IP address to test whether or not a correct response is returned. If there is no correct response, a probable cause is NIC trouble.

If there is no problem with the NIC, check the network settings (make sure that the IP address, subnet mask and TCP/IP settings are correct).

● **ARP information clear**

VT3 series stores sets of IP addresses (logical addresses) and MAC addresses (physical addresses) of peer devices with which it has communicated for a fixed period of time (about 15 minutes). When the IP address of the PC is changed during communications and communications is performed again, the new IP address will differ from the information stored on the VT3 series, and communications is sometimes not accepted. To execute communications again after changing the IP address of the PC that is being used for communications, wait at least 15 minutes before turning the VT3 series ON again and performing communications.

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When Communications with VT STUDIO or the Simulator Cannot be Performed

■ Remedies when communications is not possible with VT STUDIO or Simulator

If communications with VT STUDIO or Simulator is not possible over Ethernet, follow the procedure below to remedy this problem.

NOTICE	**Consult the network administrator about remedies to perform when trouble occurs on the network. If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.**

1 **Make sure that the VT3 series and the PC at the location transferring the screen data are connected to Ethernet.**

📖 "Cannot Connect to Network", page 8-33

When connection is already made

Try step 2 in the following procedure.

When connection is not made

📖 "Cannot Connect to Network", page 8-33

2 **Make sure that the communications port and peer are correctly set.**

Select "Communications" -> "Communications port settings" from Menu in that order, and then make sure that "Ethernet" is selected.

Make sure that "Ethernet" is selected, and that the "IP address" and "Port No." are correctly set.
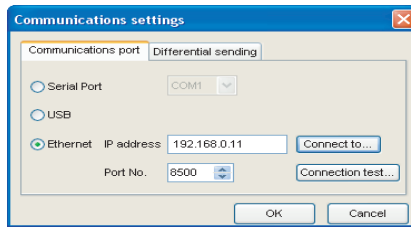
■ Changing the time-out

When VT STUDIO, DATA BUILDER or FTP-based communications is being executed between the PC and VT3 series over Ethernet, sometimes communications is temporarily broken depending on the status of the communications path. In particular, communications is more likely to be broken when communications passes via a remote access server or the Internet.

The maximum permissible time that communications may be discontinued (Timeout) on the VT2-E1/E2, VT3-E3 can be changed on VT3 series in the System Mode. Normally, there is no need to change the time-out setting.

The time set for the time-out on VT STUDIO can be changed by rewriting the content of the setup file.

● Changing the time-out on the VT3 series

Check the "Time-out" setting value in the System mode.

The baud rate might become extremely slow depending on the network of the status. The "Time-out" value can be changed within the range 10 to 59 when a low-speed line is being used via a remote access server or when communications is being performed via the Internet.

📖 "Timeout", page 8-11

▶ Important	**Time-out settings must be changed only by the system administrator or personnel having a detailed knowledge of networks. Other personnel should not change time-out settings.**

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● **Changing the time-out on VT STUDIO**

VT STUDIO's timeout time can be changed by changing the "VTIP.ini" file in the directory "C:\Program Files\KEYENCE\VTS4E" (the defaulted installation position).

As a file for the setup, the "VTIP.ini" file is an important file that is used to start up VT STUDIO. If the content of this file is to be changed, be sure to first make a backup file.

> ✎ **Point** | **Normally, the time-out settings on VT STUDIO need not be changed. Follow the procedure below only when it is absolutely necessary to change the settings due to the Ethernet status.**

1 **Open the "VTIp.ini" file in the Windows accessory WordPad or other tool.**
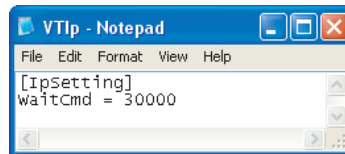
2 **Change the timeout value in the MS unit.**

The default is "30000" (30000 ms = 30s).

3 **Save the new settings, and quit the Notepad.**

> *NOTICE* | **When saving the time-out settings, do not change the file name. The "VTIP.ini" file is used for the startup of VT STUDIO. VT STUDIO cannot be activated normally if this file is not present or it cannot be read normally.**

> ▶ **Important** | **The "VTIp.ini" setup file must be changed only by the system administrator or personnel having a detailed knowledge of networks. Other personnel should not change time-out settings.**

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Cannot Communicate With DATA BUILDER Over Ethernet

■ DATA BUILDER Excel add-in cannot be used

The following describes remedies when the DATA BUILDER Excel add-in cannot be used.

NOTICE	Consult the network administrator about remedies to perform when trouble occurs on the network.If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.

1 **Execute the ping command to the VT3 series on the PC in which the DATA BUILDER Excel add-in is installed.**

"Executing the ping command", page 8-13

When a normal response is returned

The VT3 series is correctly connected to the network, and is recognized as a terminal (node). Check the setup state of the DATA BUILDER Excel add-in.

"DATA BUILDER   User's Manual"

When a normal response is not returned

Connect the VT3 series or PC correctly referring to the description in "Cannot Connect to Network", page 8-33.

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Cannot Use FTP Functions

Refer to the following flowchart to remedy problems when FTP functions cannot be used.

NOTICE	**Consult the network administrator about remedies to perform when trouble occurs on the network. If network settings are changed inadvertently, new troubles may occur or the terminal (node) may malfunction depending on the network configuration.**

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │
                    ◇─────────────◇
                   / Can be connected \      No
                  <  to VT3 series?    >─────────►  (1) Check to ensure the network connections are correct.
                   \                  /                 📖 "Cannot Connect to Network", page 8-33
                    ◇─────────────◇
                           │                       (2) Please check to see if the max number of FTP (up to 4) has
                          Yes                           been reached.
                           │                            📖 "Ethernet-related Special Internal Devices", page 8-26
                           │
                           │                       (3) Please check to ensure FTP is set to "Invalid" for the Ethernet
                           │                            setup in the System Mode.
                           │                            📖 "Ethernet Setup", page 5-11
                    ◇─────────────◇
                   / Can be registered\      No       (1) Check to ensure the username and password are correct
                  <                    >─────────►          The username is VT (VTIE for IE).
                   \                  /                      The password is set up in the System Mode.
                    ◇─────────────◇                         When the password is forgotten, please set up again in the
                           │                                 System Mode.
                          Yes                                📖 "Ethernet Setup", page 5-11
                           │
                    ◇─────────────◇
                   / Can read from or \      No       (1) Please check to ensure the memory card has been inserted into VT3.
                  <  write data to the >─────────►
                   \  memory card     /
                    ◇─────────────◇                   (2) Please check to ensure the memory card cover is closed.
                           │
                          Yes
                           │                          (3) Please check the available memory space of the memory card. Please
                           │                               check the available memory space of the memory card. When the available
                    ┌─────────────┐                        memory space is below 4K bytes, however, writing cannot be performed.
                    │     OK      │
                    └─────────────┘
```

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9

SPECIAL OPERATION SCREEN

This chapter describes how to call system mode screen etc incorporating special operational steps.

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SPECIAL OPERATION SCREEN

System Mode Screen

There are two ways to changeover into system mode for VT3 configuration.

Call System Mode Screen During Operation

■ For VT3-X15(D)/V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A)

Hold the button for more than 3 seconds on any point (enclosed in a square box ⌐⌐⌐⌐) of the screen without touch switch allocated; release your finger and then press the square box ☐ for 1 second (for VT3-X15(D): size 100 x 75 pixels; for VT3-V6H(G)/Q5H(G)/W4T(A)/W4M(A)/W4G(A): size 48 x 48 pixels) at top right of the screen.
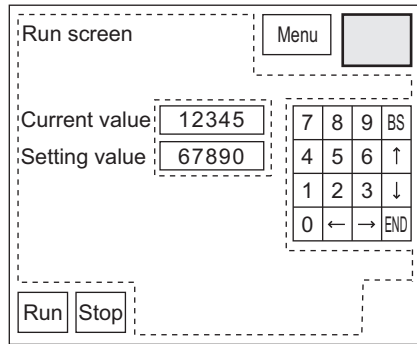
> ✎ **Point**
> • **Bottom right and left areas (for VT3-X15(D): size 100 x 75 pixels; for VT3-V6H(G)/Q5H(G)/ W4T(A)/W4M(A)/W4G(A): size 48 x 48 pixels) on the screen are used for calling other screens. They are disabled during operation on system mode screen.**
> • **When set "Y" on "Disable Changeover" of system mode, above operation cannot be executed.**
> • **Press two points on irrelevant screens of VT3-X15(D)/V6H(G)/Q5H(G)/W4T(A)/W4M(A)/ W4G(A).**

> **Reference** Even there are switches allocated in the access area of system mode on top right of the screen; changeover to system mode is possible because special operation is of higher priority.

■ For VT3-S12(D)/S10/V10(D)/V8/V7/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/V7R

Hold the button for more than 3 seconds on any point (enclosed in a square box ⌐⌐⌐⌐) of the screen without touch switch allocated while pressing the square box ☐ (48x48 pixels) at top right of the screen.
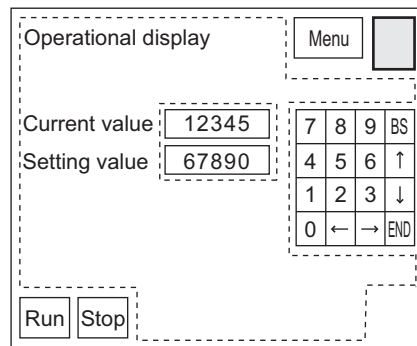
> ✎ **Point**
> • **Bottom right and left areas (48x48 pixels each) on the screen are used for calling other screens. They are disabled during operation on system mode screen.**
> • **When set "Y" on "Disable Changeover" of system mode, above operation cannot be executed.**

> **Reference** Even there are switches allocated in the access area of system mode on top right of the screen; changeover to system mode is possible because special operation is of higher priority.

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SPECIAL OPERATION SCREEN

Call System Mode Screen When Power ON

Press on the square box ☐ on top right of the screen (for VT3-X15(D): size 100 x 75 pixels; for types other than VT3-X15(D): size 48 x 48 pixels) while turning on power for several seconds. Then system mode screen appears.

This operation is possible even if the System Protect setting is set to "Protect".
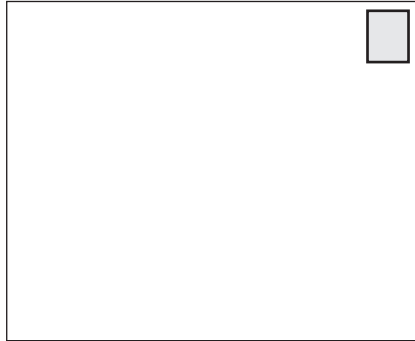
| Point | When the System mode is displayed, communications with the PLC or KL unit, and the Simulator are not carried out. (Except "Device monitor" screen and "PLC data folders" screen) |

> **When the System mode is displayed, communications with the PLC or KL unit, and the Simulator are not carried out. (Except "Device monitor" screen and "PLC data folders" screen)**
> **Therefore following functions are possible.**
> • **Status monitoring of devices for alarm detection (alarm log saving)**
> • **Trend charts (real time), data access (sampling) from XY graphs (real time)**
> • **Update of system memory (write VT -> PLC or PLC -> VT)**
> **The above functions are automatically resumed when the System mode is quit and the Run screen is switched to.**

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SPECIAL OPERATION SCREEN

Monitor Screen

VT3 monitor screen (device monitor/unit monitor/ladder monitor/sensor setup backup/restore/sensor monitor) may be displayed and operated in the Run screen by means of special operations.

As unnecessary to change over to system mode, you can use device monitor screens without interrupting VT3 operation.

> ✎ **Point**
> • **In VT3-Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A), each monitor screen cannot be called by means of special operations.**
> • **When working with MultiTalk function, device monitor screen of PLC-A shall appear.**
> • **When working with system mode screen, special operations are disabled.**
> • **When Simulator is used, monitor screens cannot be called.**
> • **When it is set to "no communication with PLC "in the system mode screen, monitor screens cannot be called.**

How to Call Word Device and Bit Device Monitor Screens During Operation

■ For VT3-X15(D)

Hold the button for more than 3 seconds on any point (enclosed in a square box [⋯⋯]) of the screen without touch switch allocated; release your finger and then press the square box [ ] for 1 second (100x75 pixels) at top right of the screen.
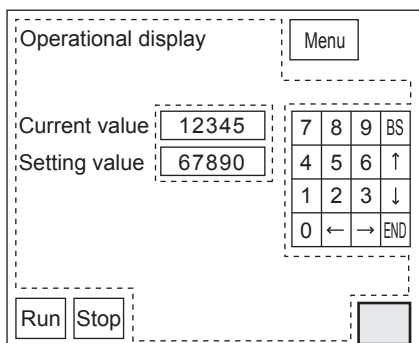
> ✎ **Point**
> • **Bottom left and top right areas (75x100 pixels each) on the screen are for calling other screens. You cannot use these areas when device monitor screen appears to.**
> • **When set "Y" on "Disable Changeover" of system mode, above operation cannot be executed.**
> • **The device monitor screen calld through special steps shall be viewed in full ID7 screen. When simultaneously access other full ID7 screens, the last display calld shall appear.**
> • **Press two points on irrelevant screens of VT3-X15(D).**

■ **For VT3-S12(D)/S10/V10(D)/V8/V7/V7R/V6H(G)**

Hold the button for more than 3 seconds on any point (enclosed in a square box ⌐ ⌐) of the screen without touch switch allocated while pressing the square box ▢ (48x48 pixels) at bottom right of the screen
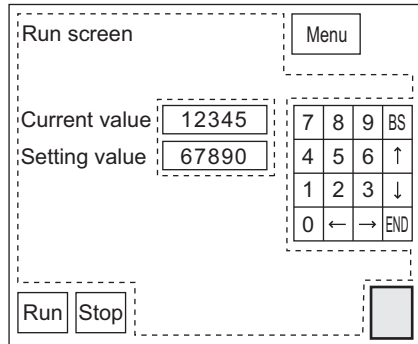
Point	• **Bottom left and top right areas (48x48 pixels each) on the screen are for calling other screens.**
	• **When set "Y" on "Disable Changeover" of system mode, above operation cannot be executed.**
	• **The device monitor screen called through special steps shall be viewed in full ID7 screen. When simultaneously access other full ID7 screens, the last display calld shall appear.**

■ **About word device monitor screen**

During operation, word device monitor calld through special steps shall appear in window. Now you can access the same functions on user display behind word device monitor as usual (such as update of data displayed, light on/off etc.)
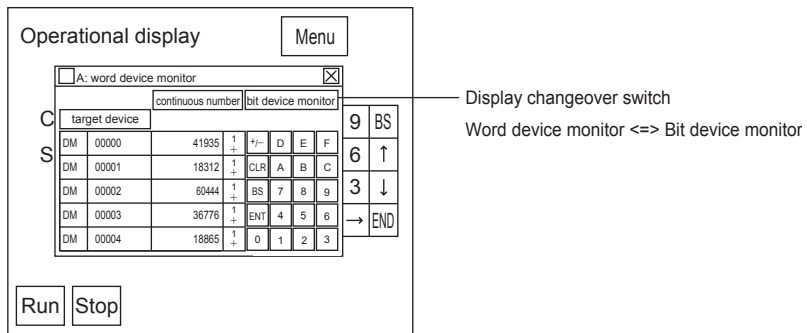
Point	**You cannot display more than one word device monitor windows at the same time.**
	And you cannot display word together with bit device monitor windows simultaneously.

Reference	• See 📖 "5-10 Monitoring" for operational details of word device monitor.
	• You cannot change the position of word device monitor window displayed.
	📖 "Operations on Monitor Window", page 9-8

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SPECIAL OPERATION SCREEN

■ About bit device monitor screen

During operation, use changeover switch through special steps to call bit device monitor.
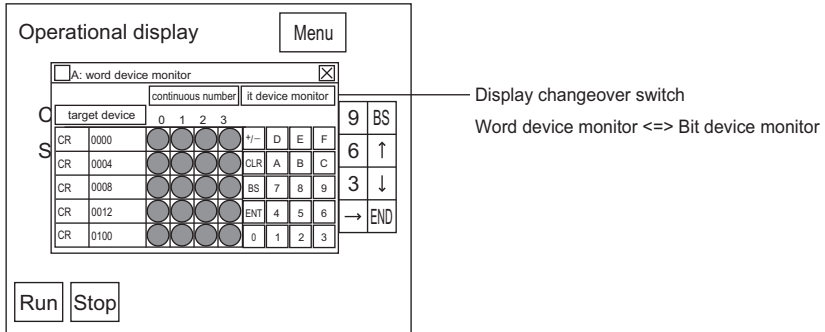
| Point | You cannot display more than one bit device monitor windows at the same time. And you cannot display bit together with word device monitor windows simultaneously. |

| Reference | • See ▢ "5-10 Monitoring" for operational details of bit device monitor. • You cannot change the position of bit device monitor window displayed. ▢ "Operations on Monitor Window", page 9-8 |

How to Call Unit Monitor Screens During Operation

■ For VT3-X15(D)/V6H(G)

Hold the button for more than 3 seconds on any point (enclosed in a square box ⌐ ⌐) of the screen without touch switch allocated; release your finger and then press the square box [ ] for 1 second (100x75 pixels) at top right of the screen.
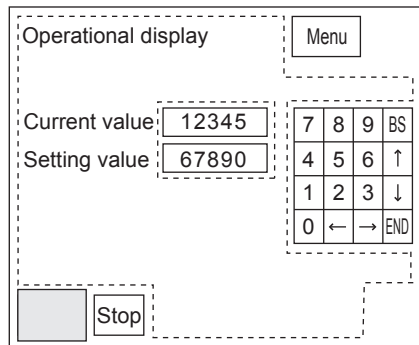
| Point | • Bottom left and top right areas (100x75 pixels) on the screen are for calling other screens.They are disabled during operation on unit monitor screen.
• When set "Y" on "Disable Changeover" of system mode, above operation cannot be executed.
• In following cases except PLC, you cannot use unit monitoring function. |

• KV-7000 Series (serial)	• KV-7000 Series (serial) <XYM>
• KV-7000 Series (KV-LM2*V)	• KV-7000 Series (KV-LM2*V) <XYM>
• KV-7000 Series (Ethernet)	• KV-7000 Series (Ethernet) <XYM>
• KV-5500/5000/3000/L2*V	• KV-5500/5000/3000/L2*V<XYM>
• KV-5500/5000/3000 (KV-LM2*V)	• KV-5500/5000/3000(KV-LM2*V)<XYM>
• KV-5500/5000/3000 (Ethernet)	• KV-5500/5000/3000 (Ethernet)<XYM>
• KV-1000/700,KV-L20*/L21V	• KV-1000,KV-L20*/L21V<XYM>
• KV-1000/700 (KV-LM20*/21V)	• KV-1000 (KV-LM20*/21V)<XYM>
• KV-1000/700 (Ethernet)	• KV-1000 (Ethernet)<XYM>

• VT2 When connected through VT2 multi-link, you cannot use unit monitoring function in slave.
• The unit monitor screen called through special steps shall be viewed in full ID6 screen. When simultaneously access other full ID6 screens, the last screen called shall appear.
• Press two points on irrelevant screens of VT3-X15(D).

■ **For VT3-S12(D)/S10/V10(D)/V8/V7/V7R**

Hold the button for more than 3 seconds on any point (enclosed in a square box [⋯⋯]) of the screen without touch switch allocated while pressing the square box ▢ (48x48 pixels) at bottom right of the screen.
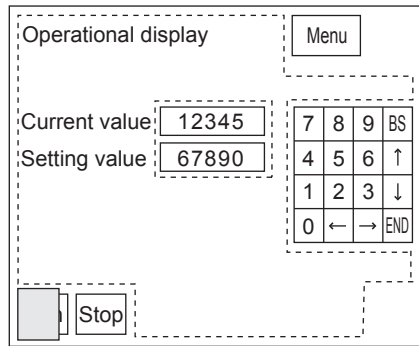
| ✎ Point | • **Bottom right and left areas (48x48 pixels each) on the screen are used for invoking other screens. They are disabled during operation on unit monitor screen. They are disabled during operation on unit monitor screen.**
• **When set "Y" on "Disable Changeover" of system mode, above operation cannot be executed.**
• **In following cases except PLC, you cannot use unit monitoring function.** |

• **KV-7000 Series (serial)**	• **KV-7000 Series (serial)<XYM>**
• **KV-7000 Series (KV-LM2*V)**	• **KV-7000 Series (KV-LM2*V)<XYM>**
• **KV-7000 Series (Ethernet)**	• **KV-7000 Series (Ethernet)<XYM>**
• **KV-5500/5000/3000/L2*V**	• **KV-5500/5000/3000/L2*V<XYM>**
• **KV-5500/5000/3000 (KV-LM2*V)**	• **KV-5500/5000/3000(KV-LM2*V)<XYM>**
• **KV-5500/5000/3000 (Ethernet)**	• **KV-5500/5000/3000 (Ethernet)<XYM>**
• **KV-1000/700,KV-L20*/L21V**	• **KV-1000,KV-L20*/L21V<XYM>**
• **KV-1000/700 (KV-LM20*/21V)**	• **KV-1000 (KV-LM20*/21V)<XYM>**
• **KV-1000/700 (Ethernet)**	• **KV-1000 (Ethernet)<XYM>**

• **When connected through VT2 multiplexer, you cannot use unit monitor function in substations.**
• **The unit monitor screen called through special steps shall be viewed in full ID6 screen. When simultaneously access other full ID6 screens, the last screen calld shall appear.**

■ **About unit monitor screen**

During operation, unit monitoring screen calld through special steps shall display PLC-A unit information.
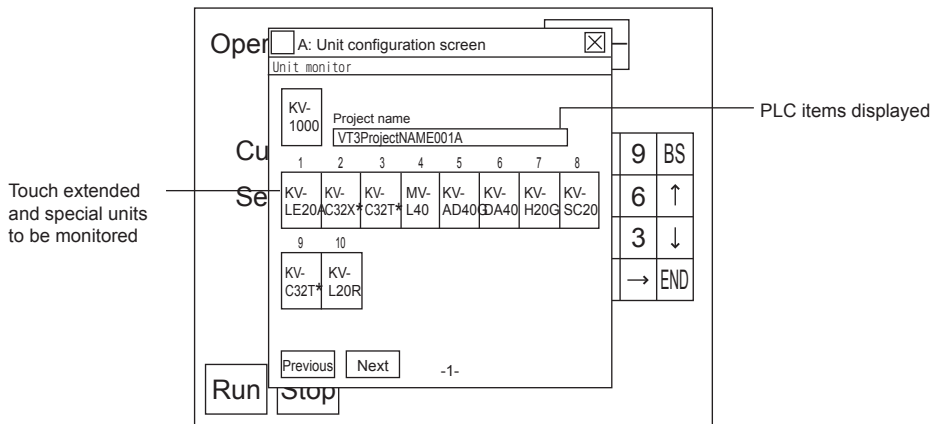
| ✎ Point | **You cannot open more than one unit monitoring screens at the same time.** |

| 📖 Reference | For operational details of unit monitor, see 📖 "5-10 Monitoring" |

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SPECIAL OPERATION SCREEN

Operations on Monitor Window

■ About operations on monitor window

Various monitoring screen are full displayed windows. Therefore user screens behind the windows are the same as in normal operation. Update of screens, switches and lighting still work as usual.

📖 "8-2 Set up the Switches", VT3 Series Reference Manual

* Word/bit device monitor can appear together with unit monitor screen except multiple same windows.
* The word/bit device monitor screens shall be viewed in full ID7 screen whereas unit monitor screen in full ID6 window. When simultaneously access other full ID screens, the last screen calld shall appear.

■ Move monitor windows

Press "Move" touch switch. Then press it again at your destination and the window moves.
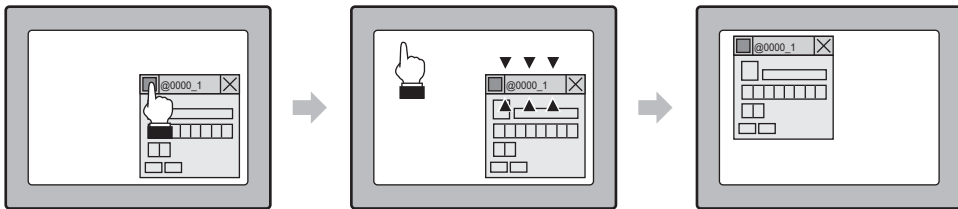
Press "Move" touch switch and title bar begins blinking.

When title bar blinks, then press the touch switch again at your destination

window moves.

■ Close monitor windows

Press "Close" touch switch and close the window (OFF)

Press "Close" touch switch.

The window is closed.

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SPECIAL OPERATION SCREEN

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MAINTENANCE & INSPECTION

This chapter describes maintenance and inspection on the unit, how to replace the LCD backlight and protection sheet, and other useful information.

Maintenance

•   Inspect the VT3 once every six months to one year. Inspect the VT3 at shorter inspection periods if it is used in extremely high-temperature and/or high-humidity or dusty environments.

•   If the display surface or frame becomes dirty, wipe with a soft, dry cloth.

•   If wiping with a soft, dry cloth does not remove the dirt, wipe the display surface or frame with a firmly wrung cloth moistened with watered down neutral detergent.

•   If rubber, vinyl products or adhesive tape are left attached to the VT3 for a long period of time, the VT3 may become stained. Remove any of these during cleaning if attached to the VT3.

•   Do not touch the touch panel or touch switches with a sharp-pointed object such as a pen or screwdriver. Doing so might scratch or damage the touch panel.

NOTICE	**Never wipe the display with paint thinner, organic solvents or chemical treated fabric. Doing so might cause the display surface or frame to deform.**

Routine maintenance (only VT3 handy series)

To start, always confirm the operation according to the following repair items.

(1) Confirm installation conditions

❑ Outside of the cable is not damaged. Not entangled into machine, or pressed, will not cause cable disconnection or short circuit.

❑ Screws of Emergency-stop switch unit (OP-87171) are not loose, operation may be performed correctly.

(2) Operation test in machine operation status

In machine operation status, confirm whether the hazard stops normally. Conduct the operation test after confirming no personnel in the danger zone.

❑ Press emergency-stop switch unit (OP-87171) of VT3 handy series, or enable switch position is position 1, position 3, the hazard will stop.

Periodic Inspection

Inspection Item		Description	
Power supply	**Voltage fluctuation at power terminal**	Must be within allowable range VT3-X15/S12/S10/V10: AC100 to 240V±10%(50/60Hz) VT3-X15D/S12D/V10D/V8/V7/V7R/V6H(G)/Q5H(G)/Q5T(W)/Q5S(W)/ Q5M(W)/Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A): DC24V±10%	
Ambient operating conditions	**Ambient temperature (in-panel temperature)**	Must be within ambient operating temperature*1 VT3-X15(D)/S12(D)/S10/V10(D) :0 to 50°C VT3-V8/V7/Q5H(G)/Q5T(W)/Q5S(W)/Q5M(W)/ Q5T(W)A/Q5M(W)A/W4T(A)/W4M(A)/W4G(A) :0 to 50°C VT3-V6H(G) :0 to 50°C*5 VT3-V7R :0 to 50°C	
	Ambient humidity (in-panel humidity)	Must be within ambient operating humidity :35 to 85%RH*3	
	Dust	Dust must not be collecting.	
Mounting state	**Mounting fixture**	Fixture must not be loose.	
	Loose cable protector (VT3-V6H(G)/Q5H(G)/V7R)	Fixture must not be loose.	
	Connecting parts panel above the body (USB/memory card) (VT3-V6H(G)/Q5H(G))	For IP65f protection, panel screws must be not loose.	
	host right side (modules, memory chips) for normal work(VT3-V7R)	For IP65f protection, panel screws must be not loose.	
	Cables at rear of the unit Panel at connected part (VT3-V6H(G)/Q5H(G)/V7R)	For IP65f protection, panel screws must be not loose.	
	Connector cable Connection State	Connectors must be completely inserted, locked and not loose.	
	Terminal block screws (Except for VT3-V6H(G)/Q5H(G)/V7R)	Fixture must not be loose.	
	External connector cables (Except for VT3-V6H(G)/Q5H(G)/V7R)	Must be free from abnormalities such as almost disconnected connections.	
	State of the connecting cable (VT3-V6H(G)/Q5H(G)/V7R)	Must be free from abnormalities such as almost disconnected connections.	
	Emergency-stop switch unit Status of connection cable of (VT3-SW1) (VT3-V7R)	Must be free from abnormalities such as almost disconnected connections.	
	The screw fixing Emergency-stop button switch and key switch becomes loose (VT3-V6H(G)/Q5H(G))	Fixture must not be loose.	
	Emergency-stop switch unit Any loose screws which fix (VT3-SW1) and switch unit(VT3-SW4/SW6)(VT3-V7R)	Fixture must not be loose.	
Service life	**Brightness of backlight**	Must be sufficiently bright. Service life of backlight*2 : by the time when brightness is reduced by 50% VT3-X15(D) :about 50,000 hours*6 VT3-S12(D)/S10/V10(D) :about 50,000 hours*6 VT3-V8 :about 50,000 hours*6 VT3-V7/V7R :about 54,000 hours VT3-V6H(G)/Q5H(G) :about 50,000 hours VT3-Q5T(W)/Q5S(W)/Q5T(W)A:about 75,000 hours VT3-Q5M(W)/Q5M(W)A:about 54,000 hours VT3-W4T(A)/W4M(A) :about 50,000 hours VT3-W4G(A) :about 40,000/50,000 hours (green/red) (room temperature and humidity, and vertical mounting in each case*4)	The backlight cannot be replaced.*7

*1 Mounting dimensions are subject to restrictions.
    "Mounting Precautions", page 3-8
*2 The service life of parts varies slightly according to the operating environment. (Indicated service life values are average values.)
*3 If ambient temperature is above 40°C, please use this instrument at 40°C and 85% relative humidity or lower.
*4 Vertical direction is not required for VT3-W4T(A)/W4M(A)/W4G(A).
*5 Do backlight adjustment to VT3-V6H(G): at ***, please use the unit under 0 to 40°C environment.
*6 Products with serial numbers that are not underlined are as follows:
    VT3-X15(D)   : about 45,000 hours
    VT3-S12(D)/S10/V10(D)   : about 43,000 hours
    VT3-V8   : about 40,000 hours
*7 The liquid crystal backlight can be replaced only in products with VT3-X15 (D)/S12 (D)/S10/V10 (D)/V8 serial numbers that are not underlined.
    "1-3 Serial Number Label"

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MAINTENANCE & INSPECTION

Cautions during VT3 Replacement

Pay attention to the following points when replacing the VT3:

- Be sure to turn the power OFF before replacing the VT-L16Z.
- After replacing the VT3, check the new VT3 for any abnormalities.
- When repairing the VT3 due to trouble, enter a description of the defect in as much detail as possible, and send the details to your agent.

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MAINTENANCE & INSPECTION

10-2 Replacing the LCD Backlight

Replacing the LCD Backlight (VT3-X15(D))

The following describes how to replace the LCD backlight for the VT3-X15(D).

✎ Point	The liquid crystal backlight can be replaced only in products with serial numbers that are not underlined. Products with underlined serial numbers are white LED backlights that cannot be replaced. 📖 "1-3 Serial Number Label"

LCD backlight for replacing VT3-X15(D): OP-80929

⚠ WARNING	Before replacing the LCD backlight, always turn the power OFF to prevent electric shock. Also, handle the LCD backlight very carefully as it is very fragile. Take great care during handling.

1 First, turn the VT3-X15(D) OFF, and then disconnect all power cables, communications cables and extension units. When inserting memory chips, take out memory chips from package and confirm the eject button on the slot at innermost position. Remove short-circuit bar if installed.

2 Remove the screws (11X) for the unit housing cover with the rear upwards and open the cover.

Plastic Screw: 2
Metal Screw: 9

lock screws LCD backlight connector

lock screws LCD backlight connector
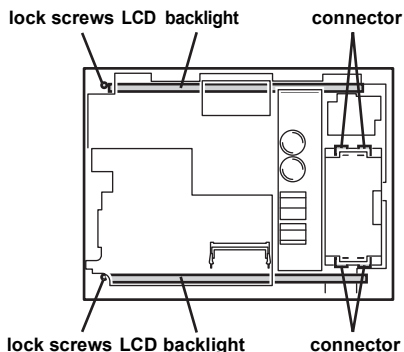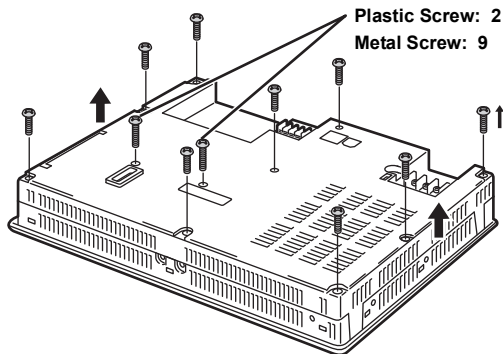
⚠ WARNING	The temperature of the heat sink is high during operation. Keep hands off from the working radiator as it is hot.

✎ Point	Screws are different in size depending on their location. (9 metal screws (M4) and 2 plastic).

3 Remove the LCD backlight connector (1) from the unit, and remove the cable from the clamp (2).
Pull the connector cable guard (3) to one side and remove the cable.
Be careful not to damage the cable while removing it.

(1) connector

(3) Clamps for connector cable card

(2) Clamp

10

MAINTENANCE & INSPECTION
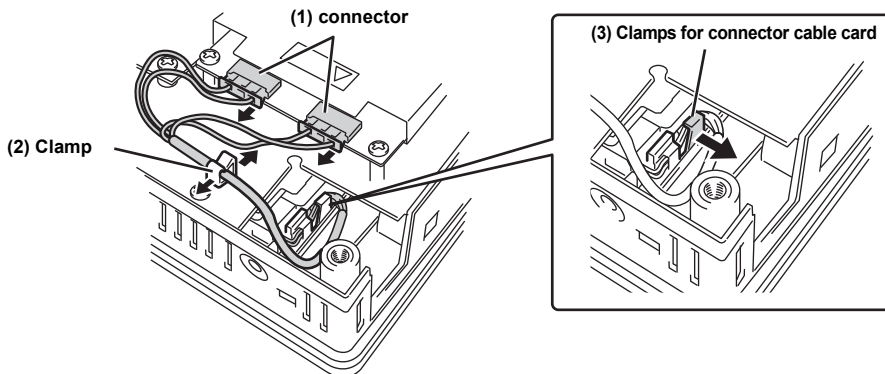
4 Remove fixing screws for LCD backlight, gently put them out while hand holding backlight side and the cable.

(1) lock screws

(2)
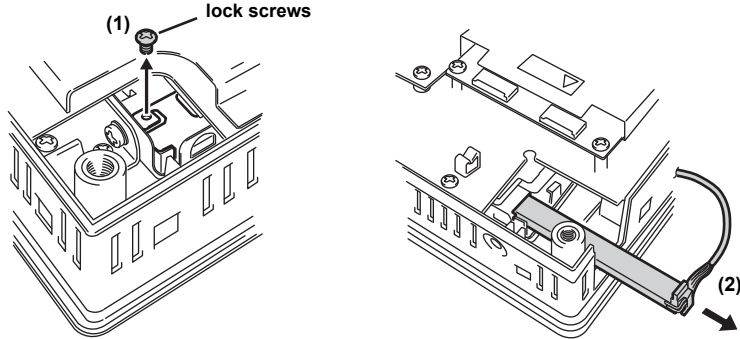
> ✎ **Point**   There is a lock screw on the LCD backlight.

5 Slowly insert new LCD backlight.
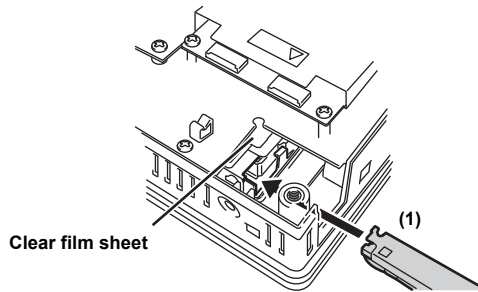
Clear film sheet

(1)

> ✎ **Point**   When inserting LCD backlight, take full care of the clear film sheet.

6 After insertion of the LCD backlight, tighten screws and join with the connector. (refer to Step 4, Step 3)

Tightening torque
0.18N•m

> ✎ **Point**   Ensure full insertion the connector of LCD backlight until screw holes are overlapped.
> Tighten lock screws of LCD backlight.
> After joining the connector, put loose cable of the LCD backlight into host cabinet.

7 After joining the connector, re-place the cover and tighten screws. (refer to Step 2)

Screw	Tightening torque
Plastic Screw	0.15N•m
Metal Screw	0.5N•m

8 Install Memory Card and Short Bar just as before.

Put back expansion unit, communication cable and power cable in reverse order during removal. (refer to Step 1)

MAINTENANCE & INSPECTION

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Replacement of LCD Backlight (VT3-S12(D))

This item describes how to replace the LCD backlight for the VT3-S12(D).

> ✎ **Point** The liquid crystal backlight can be replaced only in products with serial numbers that are not underlined.
> Products with underlined serial numbers are white LED backlights that cannot be replaced.
> 📖 "1-3 Serial Number Label"

VT3-Replacement of LCD backlight for VT3-S12(D):OP-75035

> ⚠ **WARNING** Before replacing the LCD backlight, always turn the power OFF to prevent electric shock. Also, handle the LCD backlight very carefully as it is very fragile. Use great care during handling.

1 Turn off Power to VT3-S12(D); remove power cables, communication cable and expansion unit.

When inserting memory chips, take out memory chips from package and confirm the eject button on the slot at innermost position. Remove short-circuit bar if installed. When the short bar is installed, remove it.

2 Put it backside up and remove (8) screws from mainframe cover; then open the housing.
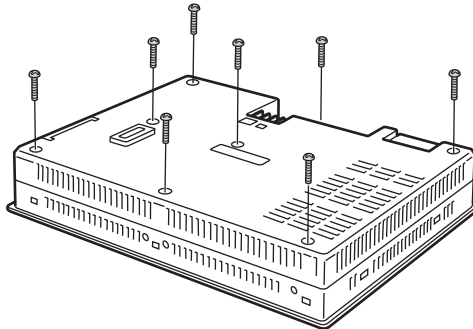
> ⚠ **WARNING** The temperature of the heat sink is high during operation. Please do not touch it.

> ✎ **Point** Screws are different in size depending on their location.(two plastic screws and six metal screws)

3 Remove the connector of LCD backlight from the host and take out cables from clamps.

10

MAINTENANCE & INSPECTION
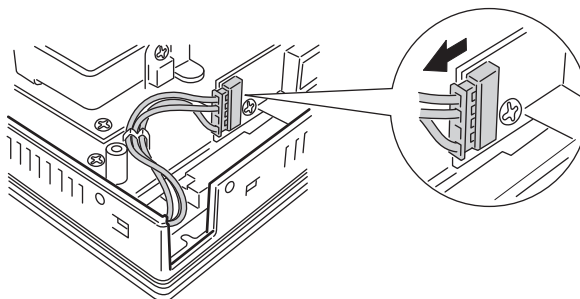
4 Gently pull out cables while pushing snap claws at the bottom of LCD backlight.
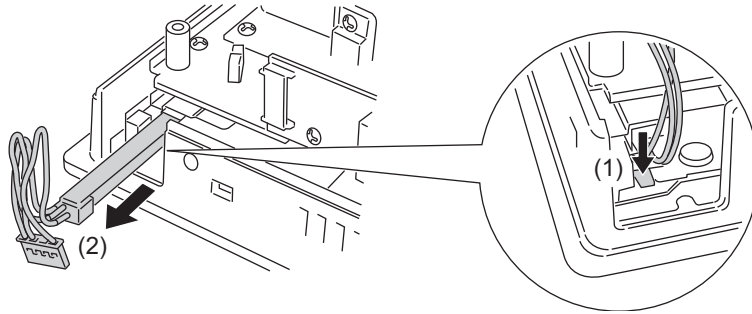
> ✎ **Point** The snap claws are at the bottom of LCD backlight, a confined location.
> Press the snap claw with a screw driver and then slowly pull it out.

5 Slowly insert new LCD backlight while pressing snap claws of it with a screw driver.

> ✎ **Point** When inserting LCD backlight, take full care of the clear film sheet.

6 After insertion of new LCD backlight, join the connector (refer to step 3).

> ✎ **Point** Ensure full insertion the connector of LCD backlight until you hear a clear clack.
> After joining the connector, put loose cable of the LCD backlight into host cabinet.

7 After joining the connector, re-place mainframe cover and tighten screws. (refer to Step 2)

Screw	Tightening torque
Metal Screw	0.5N•m

8 Install Memory Card and Short Bar just as before.

Put back expansion unit, communication cable and power cable in reverse order during removal. (refer to Step 1)

Replacing the LCD Backlight (VT3-S10/V10(D))

Replace LCD backlight of VT3-S10/V10(D) as per following steps.

✎ Point	**The liquid crystal backlight can be replaced only in products with serial numbers that are not underlined.** **Products with underlined serial numbers are white LED backlights that cannot be replaced.** 📖 "1-3 Serial Number Label"

Replacement of LCD backlight of VT3-S10:OP-75036

VT3-Replacement of LCD backlight of VT3-V10(D):OP-42262

⚠ WARNING	**Before replacing the LCD backlight, always turn the power OFF to prevent electric shock. Also, handle the LCD backlight very carefully as it is very fragile. Use great care during installation.**

1 **Turn off Power to VT3-S10/V10(D); remove power cables, communication cable and expansion unit.**
When inserting memory chips, take out memory chips from package and confirm the eject button on the slot at innermost position. Remove short-circuit bar if installed. When the short bar is installed, remove it.

2 **Remove (eight) screws from mainframe cover; then open the case.**
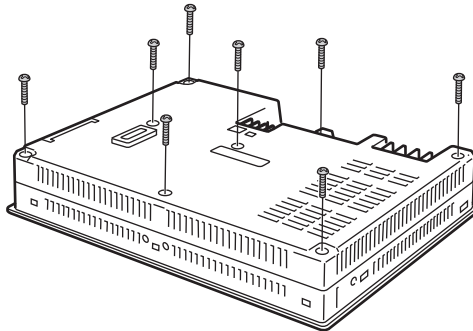
⚠ WARNING	**The temperature of the heat sink is high during operation. Please do not touch it.**

✎ Point	**Screws are different in size depending on their location (two plastic screws and six metal screws)**

3 **Remove the connector of LCD backlight from the host.**

10

MAINTENANCE & INSPECTION
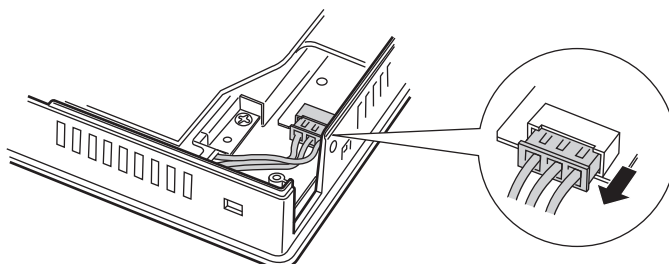
4 Gently hold and extract cables while pushing snap claws of LCD backlight with a screw driver.

> ✎ Point **The snap claws are at the bottom of LCD backlight, a confined location.**
> **Press the snap claw with flat-tip screw driver and then slowly pull it out.**

5 Slowly insert new LCD backlight while pressing snap claws of it with a screw driver.

> ✎ Point **When inserting LCD backlight, take full care of the clear film sheet.**

6 After insertion of new LCD backlight, join the connector (refer to step 3).

> ✎ Point **Ensure full insertion the connector of LCD backlight until you hear a clear clack.**
> **After joining the connector, put loose cable of the LCD backlight into host cabinet.**

7 After joining the connector, re-place mainframe cover and tighten screws. (refer to Step 2)

Screw	Tightening torque
Metal Screw	0.5N•m

8 Install Memory Card and Short Bar just as before.
Put back expansion unit, communication cable and power cable in reverse order during removal. (refer to Step 1)

10 MAINTENANCE & INSPECTION

Replacing the LCD Backlight (VT3-V8)

Replace LCD backlight of VT3-V8 as per following steps.

✎ Point	**The liquid crystal backlight can be replaced only in products with serial numbers that are not underlined.**
	Products with underlined serial numbers are white LED backlights that cannot be replaced.
	📖 "1-3 Serial Number Label"

Replacement of LCD backlight of VT3-V8:OP-75037

⚠ WARNING	**Before replacing the LCD backlight, always turn the power OFF to prevent electric shock. Also, handle the LCD backlight very carefully as it is very fragile. Use great care during installation.**

1 **Turn off Power to VT3-V8; remove power cables, communication cable and expansion unit.**

When inserting memory chips, take out memory chips from package and confirm the eject button on the slot at innermost position. Remove short-circuit bar if installed. When the short bar is installed, remove it.

2 **Remove (five) screws from mainframe cover; then open the case.**
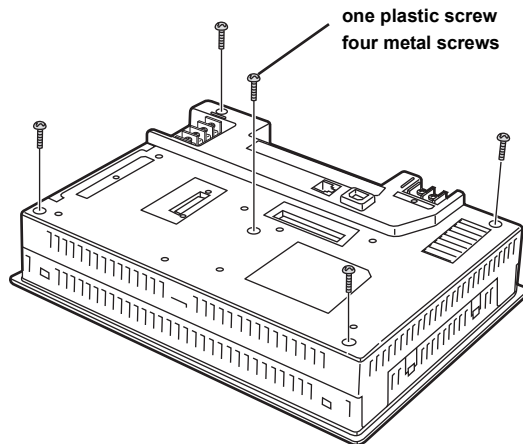
one plastic screw
four metal screws

⚠ WARNING	**The temperature of the heat sink is high during operation. Please do not touch it.**

✎ Point	**Screws are different in size depending on their location. (one plastic screws and four metal screws).**

10

MAINTENANCE & INSPECTION

3 **Remove mainframe cover while pushing downward and upward latches.**
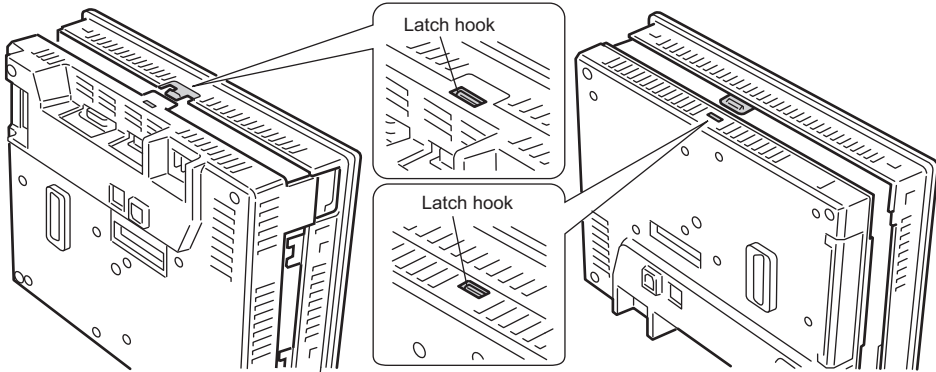
| ✎ Point | Two latch hooks locate at its top and bottom.Push latches with a screw driver for easy removal. |

4 **Take out connectors of LCD backlight from the host (two points), Extract cables from between the base plate and latch hooks.**
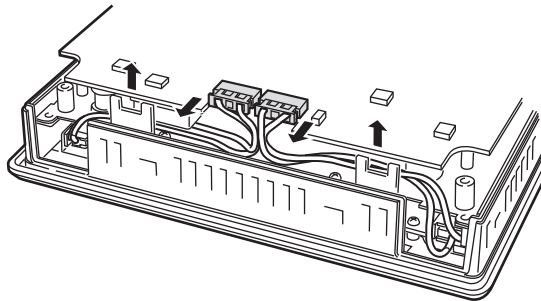
5 **Slowly remove the LCD backlight cable while pressing the snap claws with a screw driver.**
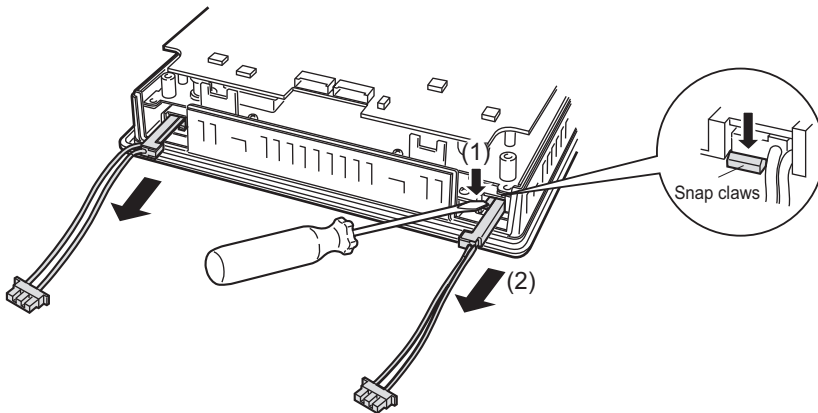
| ✎ Point | The snap claws are at the bottom of LCD backlight, a confined location.
Press the snap claw with flat tip screw driver and then slowly pull it out. |

10

MAINTENANCE & INSPECTION

6 Slowly insert new LCD backlight while pressing snap claws of it with a screw driver.

Clear film sheet
(1)
(2)
Snap claws
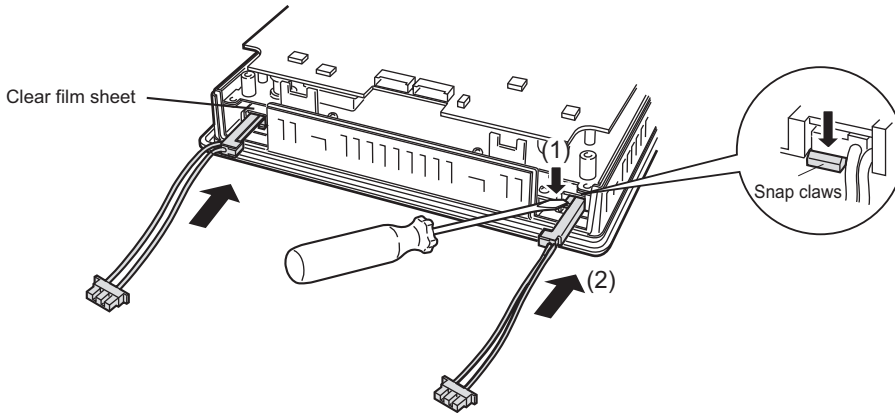
> ✎ **Point** | When inserting LCD backlight, take full care of the clear film sheet.

7 After insertion of new LCD backlight, join the connector and the host. Put loose cable inside of (A).
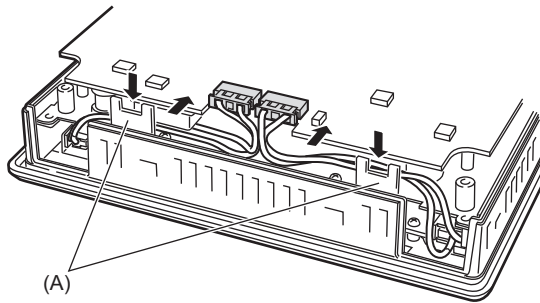
(A)

> ✎ **Point** | Ensure full insertion the connector of LCD backlight until you hear a clear clack.
> After joining the connector, put loose cable of the LCD backlight into host cabinet.

8 Insert cover plate of the host wile pressing downward and upward latches. (refer to Step 3)

9 Tighten five screws on mainframe cover(refer to Step 2)

Screw	Tightening torque
Plastic Screw	0.15N•m
Metal Screw	0.5N•m

10 Install Memory Card and Short Bar just as before. Put back expansion unit, communication cable and power cable in reverse order during removal. (refer to Step 1)

10

MAINTENANCE & INSPECTION

Replacement of Protection Sheet

Use special protection sheet right sized for VT3 unit.
Replace the protection sheet by the following procedure.

1 Peel off stickup protection sheets.

VT3 Series*   VT3-V7R
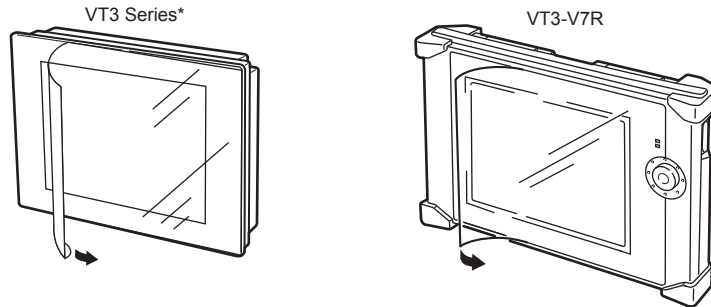
* Protective film is not pasted to VT3 handy series and VT3-W4 series upon delivery.

2 Slightly peel off the edge of the peel-off sheet on the back of the protection sheet, and affix the protection sheet making sure that its corners are aligned with the corners of the touch panel on the left side.

VT3 Series   VT3-V7R
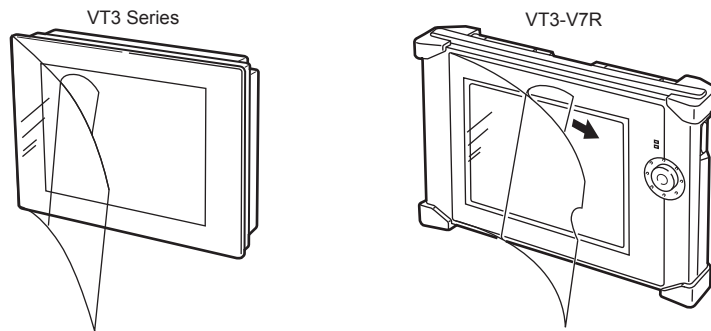
3 Affix the protection sheet while peeling off the peel-off sheet a little at a time making sure that no air is trapped between the protection sheet and the touch panel.

VT3 Series   VT3-V7R
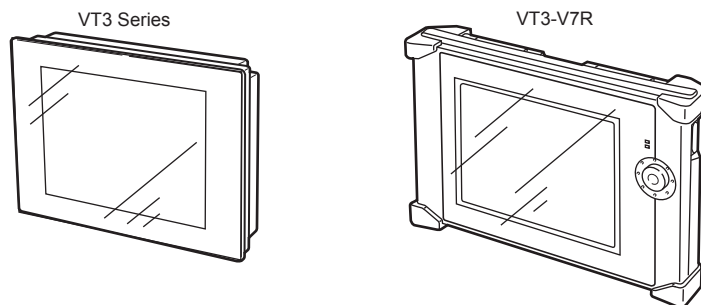
10-4 Installation of Environment-resistant Hood

Use special environment-resistant hood designed for VT3 unit.
Attach the environment-resistant cover by the following procedure:

1 **Remove the packing.**
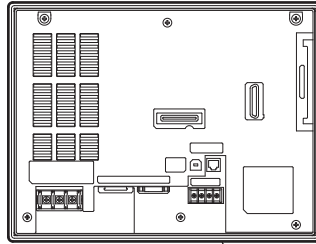
Remove sealing material.

2 **When install upper ends of environment-resistant hood, make host upper ends lap in the center.**

Environment-resistant hood

Mainframe cover
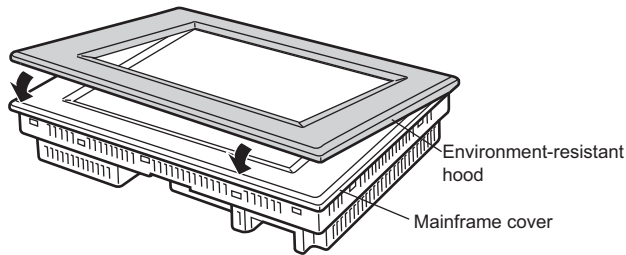
> **Point** **For environment-resistant hood (VT3-B4) used for VT3-W4T(A)/W4M(A)/W4G(A), the side with wider edge section is "upper end" viewing from backside.**
>
>
>
> The side with wider edge section is "upper end"
>
> The side with "C" in angle part of the sheet is "bottom end"
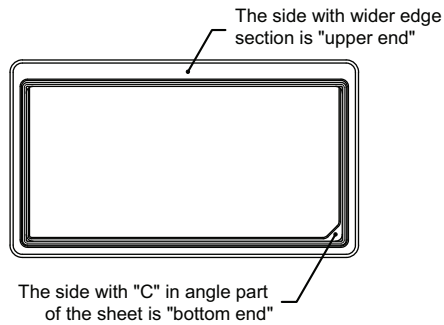
3 **Install environment-resistant hood while pulling its bottom ends outwards until host bottom ends lap in the center.**
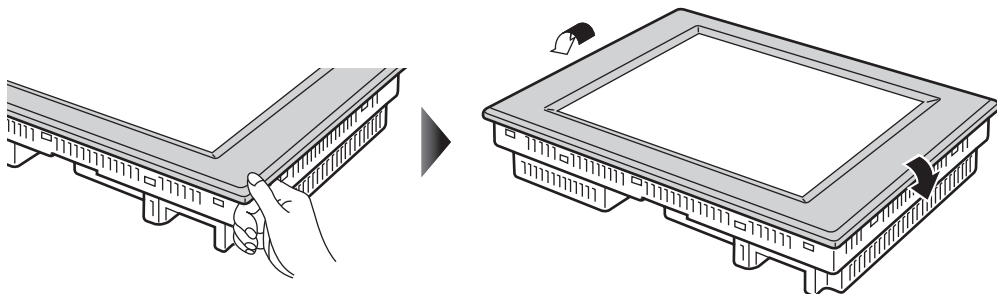
4 **Fully insert the environment-resistant hood in gland-sealed grooves**
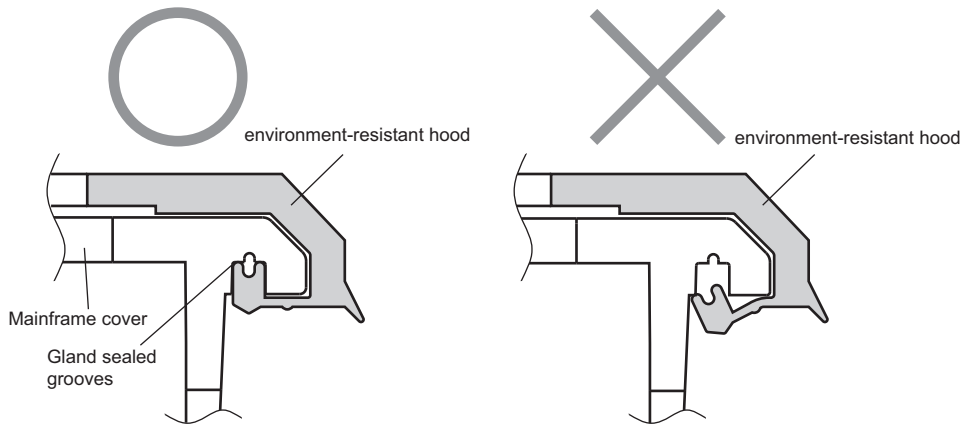
| Point | • **Incomplete insertion of tongues on environment-resistant hood into host casing grooves may deteriorate IP65f.**
• **Environmental resistent cover cannot be installed on VT3-X15(D), VT3 handy Series, and VT3-V7R.** |

APPENDIX

This chapter describes how to remedy trouble that may occur on the VT3 series and errors that are displayed.
Read this chapter if trouble occurs while you are using the VT3 series.
This appendices also provides an index.

APPENDIX

Errors and How to Remedy Errors

This section describes how to remedy errors according to each error message that is displayed.

■ Error messages

Type	Message	Cause	Remedy
At startup	Screen data in error "**"	Part of the transmitted screen data is damaged.	Resend the screen data by VT STUDIO or the Memory Card. If this does not remedy the problem, contact your agent.
	Built-in memory (SRAM) Data exception exists.	Data of built-in memory (SRAM) are damaged. Data in trend chart, alarm historical record, PLC data folder, operation log are damaged. Menu data are free of exception.	Initialize SRAM according to the onscreen instructions. Recorded data cannot be restored. Sample the data again. If this error frequently occurs, contact your agent.
	PLC Data Folder error	Data in the PLC data folder is damaged.	Save the PLC data folder data by VT STUDIO or the Memory Card, and re-transfer the PLC data folder data by VT STUDIO or the Memory Card. If this does not remedy the problem, contact your agent.
	System data error	The power was turned OFF while the "Saving System Data" was displayed. Or, rewriting of the system program failed.	Initialize according to the on-screen instructions. Then, rewrite the system program. If this does not remedy the problem, contact your agent.
	ROM error	Default settings are damaged.	Initialize according to the on-screen instructions. If this does not remedy the problem, contact your agent.
	Empty SRAM data. [menu data are not in the object]	Data of built-in memory (SRAM) are damaged. Remove the data in trend chart, alarm historical record, PLC data folder, operation log. Do not delete menu data.	Initialize internal memory according to the on-screen instructions. If this does not remedy the problem, contact your agent.
	Invalid Stroke Font.	Default data is damaged.	Contact your agent.
	ETHERNET Hardware errors	Hardware fault on Ethernet Unit VT2-E1/E2, VT3-E3	Contact your agent.
	System program errors.	System programs are damaged.	Contact your agent.
When the 2-port function is used	2 port communications error	This message is displayed when an error occurs to the 2-port communication between KV-LM20(V)/LM21V and VT3 via KV-LM20 (V)/LM21V.	Please check the connection and communication setup between KV-LM20(V)/LM21V and VT3. If there is a noise source, please keep it away from KV-LM20 (V)/LM21V and VT3 main unit as far as possible.

Type	Message	Cause	Remedy
During operation	PLC Error[**]	An attempt was made to set a device outside the device setting range.	Set the device settings again within the correct range.
		A non-existent device was set.	
		"**": PLC error code	For details of error codes "**", refer to the User's Manual[1] of the connected PLC.
	Time Out/Unit overtime Error	The cable connection to the PLC to be connected is incorrect.	Try rewiring the cable connection correctly.
		The PLC is OFF.	Turn the PLC ON.
		PLC error or malfunction	Remedy the error or malfunction on the PLC.
		Wrong communications protocol settings	Make sure that the communications protocol is the same between the PLC and VT3.
		Communications influenced by noise.	Check the surrounding area for noise sources. If there are any sources, move the body as far away as possible from the noise source. [2]
	Check Sum Error	Checksum error. Calculation method error.	Review how the checksum is calculated.
		Connector cable connections are not good.	Check the cable for broken and poor connections.
		Wrong communications protocol settings	Make sure that the communications protocol is the same between the PLC and VT3.
		Communications influenced by noise.	Check the surrounding area for noise sources. If there are any sources, move the body as far away as possible from the noise source. [2]
	Parity Error	Parity error occurred during communications with the PLC.	Check the cable for broken and poor connections.
		Connector cable connections are not good.	
		Wrong communications protocol settings	Make sure that the communications protocol is the same between the PLC and VT3.
		Communications influenced by noise.	Check the surrounding area for noise sources. If there are any sources, move the body as far away as possible from the noise source. [2]
	Over Ron Error	The VT3's receive buffer overflowed.	Set the baud rate to a slower speed.
		Connector cable connections are not good. Wrong communications protocol settings	Check the cable for broken and poor connections. Make sure that the communications protocol is the same between the PLC and VT3.
		Communications influenced by noise.	Check the surrounding area for noise sources. If there are any sources, move the body as far away as possible from the noise source. [2] Resend the command.(only during VT-command ASCII/Binary mode)

*1   When connected directly to the KZ and KV series PLC port direct link

   📖 "1-6 Error Messages and Troubleshooting",VT5 Series/VT3 Series/DT Series PLC Connection Manual

*2   📖 "Measures for improving noise resistance", page 3-3

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Type	Message	Cause	Remedy
During operation	Error Framing	The stop bit was not detected during communications with the PLC.	Check the cable for broken and poor connections.
		Connector cable connections are not good.	
		Wrong communications protocol settings	Please use the same protocol for the communication between PLC and VT3.
		Communications influenced by noise.	Check the surrounding area for noise sources. If there are any sources, move the body as far away as possible from the noise source. [2] Resend the command.(only during VT-command ASCII/Binary mode)
	No Ethernet unit	The Ethernet unit VT2-E1/E2 or VT3-E3 is not connected.	Please power off the VT3 main unit, install the VT2-E1/E2 or VT3-E3, then turn on the VT3 main unit again.
	Protocol stack error	Startup processing of the protocol stack is being performed.	Wait a moment.
	Link error	There is a connection error on the Ethernet unit.	Please check whether the cable is connected correctly. Check the VT2-E1/E2, VT3-E3 and VT3 handheld series, and check whether the LINK LED of the connection destination PLC is ON.
	Communication Error	Multiple communication errors are occurring.	See the remedy for the communication error above.
	Found same IP address host	Two or more of the same IP address have been set.	Change the IP address so that each device has a unique IP address.
	Can not open window	Failed to switch the global window.	Reduce the number of global windows displayed in one screen.
	Reference Device Address Error	The indirect reference device is an illegal device.	Set the index device for indirect reference to an appropriate value.
	Calculation Error	BCD conversion failed, floating point upper/lower limit values were exceeded, or other computation error occurred during execution of the computation function.	Either change the screen data or data entered to the formula so that the computation error does not occur.
	Division by Zero	Zero division occurred during execution of the computation function.	Either change the screen data or data entered to the formula so that the Division does not occur.
	Worksheet calculation error WS*[**] Example) WS 2[A2]	Error occurred during Worksheet Related. Either the value entered in the cell is illegal, the argument in the function is illegal, or the cell output value is illegal.	Change the settings or the data entered in the worksheet to prevent worksheet execution errors from occurring.
	Writing buffer overflow	The write buffer overflowed during a continuous write to an indirect reference device or when a momentary switched was pressed.	Provide a sufficient write interval.
	Invalid IP Setup	Ethernet communication settings are not set.	Set Ethernet communication settings.
	No Kanji Dictionary	The mode migrated to the Kanji entry mode without a Kanji conversion dictionary sent to the VT3.	Send a Kanji conversion dictionary.
	Enhanced Commmunication Error	Error occurs when sending/ receiving extension command and analyzing the received command.	Please confirm communication state, communication setup, extension command communication setup with object equipment.
	Enhanced Comm. Buffer overflow	To execute communication of 8 and more extension commands simultaneously.	Please check the number of extension command communications that are executed simultaneously.
	Enhanced Comm. Data is out of range	Error exists in the device value and data format.	Please check extension command communication setup.
	VNC communication error	Error exists in the VNC server setup of menu data.	Please check the VNC server setup of menu data.
		Communication between the VT3 and VNC server is cut off.	Please check the connection, communication state between the VT3 and VNC server.
		Communicating with unsupported VNC server.	The supported VNC server is "ultravnc". (confirm operating conditions via Ver.1.0.5.6)
	Time synchronization error	Error occurs when sending/ receiving the time synchronization command.	Please confirm the communication state and communication setup with the object equipment.
Device Monitoring Unit mode	Read Only	The screen was set to write-inhibited at call of a system screen set by VT STUDIO switches.	Disable write protection.

*2 📖 "Measures for improving noise resistance", page 3-3

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Type	Message	Cause	Remedy
Sensor monitor	Sensor parameters access error	Communication exception occurs between the unit and sensor.	Please check connection, communication setup between the unit and sensor.
	Sensor parameter out-of-range error	The value written in sensor parameter is out of range.	Write values in the setup range into the parameters.
During the operation	No screen data	Either the screen data has not been transmitted or it has been initialized.	Please transmit data in VT STUDIO.
	Screen data is wrong "00"	Either the screen data is damaged, or the screen data created a version of VT STUDIO newer than the VT3 unit has been sent.	Retransfer the screen data and system program. If this does not remedy the problem, contact your agent.
	Screen data is wrong "01"	An error occurred in the checksum on the screen data. This error occurs when screen data transfer is interrupted.	Resend the screen data. If this does not remedy the problem, contact your agent.
	Cannot write to flash ROM.	The flash ROM for saving data is in error.	Resend the screen data. If this does not remedy the problem, contact your agent.
	No initial screen	The page set as the initial page does not exist.	Set the page No. that exists in "Initial display page No." in the VT System Setup.
	Illegal Ethernet Communications settings	KL communications setup error	Set the KL communications setting again.
	ETHERNET Hardware error	Hardware fault on Ethernet Unit VT2-E1/E2, VT3-E3	Contact your agent.
	Invalid KL Communication Setup	The IP address and port No. are duplicated in the System mode - PLC communications conditions.	Set so that the IP address and port No. are not duplicated in the PLC communications conditions.
After data transfer and changes to settings	Cannot write to flash ROM.	The flash ROM for saving data is in error.	Resend the screen data. If this does not remedy the problem, contact your agent.
	Cannot write system program.	System program transfer was aborted midway. Or, an illegal system program was transferred.	Rewrite the system program. If this does not remedy the problem, contact your agent.
	Cannot store screen data	There is no free space in Flash ROM to store the screen data.	Retransfer the screen data.
	No need to update the system. Stopped.	This will occur when the version of the system program stored on the memory card is one that needs not to be modified.	Please write up-to-date system program in the memory card.
After a specific error has occurred	Reset the unit.	An error has occurred that makes it impossible to continue processing.	Retransfer the screen data and system program. If this does not remedy the problem, contact your agent.

APPENDIX

Type	Message	Cause	Remedy
When Memory Card is used	Cannot Read Memory Card	The Memory Card is not properly inserted. Or, the Memory Card is full.	Properly insert the Memory Card, and try accessing the Memory Card again. Prepare another Memory Card with sufficient storage space.
	No Seach Info	There is no search information required for using the PLC data folder comment transfer function.	In the Run mode, execute PLC to VT or VT to PLC on files to be used by the comment transfer function. In the System mode, select the files to be used by the comment transfer function. Search information is created by performing either of the above operations
	No space in Memory	There is not enough space on Memory Card.	Delete unwanted files from Memory Card.
Printer[1]	No printer connected	The printer is not connected.	Connect the printer using the specified cable.
		The printer is off-line.	Set the printer on-line.
		The printer is not ON.	Turn the printer ON.
Printer (VT2-E2/ P2)	No printer connected	The printer is not connected.	Connect the printer using the USB cable.
		The printer is not ON.	Turn the printer ON.
		The connected printer doesnít support PictBridge.	Please ensure the connected printer supports PictBridge.
		The USB cable breaks.	Check the USB cable.
	Printer error (paper)	A printer paper error occurs.	Please feed new paper or fix the paper jam problem.
	Printer error (ink)	A printer ink error occurs.	Please change the ink cartridge.
	Printer error	An error occurs to the printer.	Recover the printer from the error.
		The USB cable is not plugged.	Check the USB cable.
	Printing is terminated	The Pause button is pressed during printing.	Please print again.
	Printer Unit Error	An error occurs to the data processing in VT2-E2/P2.	Please restart the power of the printer.
Barcode Reader	Barcode Reader error	An error occurred during communications with the Barcode Reader.	Check the connection with the Barcode Reader.

*1   When a VT2-E1/P1 is used and ESC/P-R or ESC/Page is selected on a printer type.

■ Status messages

(Not error)

Message	Description
Changing Page ...	Page switching is currently processing. Wait until the display clears. The display can be cleared by the VT System Setup.
Reading image file...	An image file is being read from Memory Card. Wait until the display clears.
Key Protected	For multilink connection, if the key-protected bit device, which is set through "VT system setting" -> "Other" of VT STUDIO, is ON, switch input cannot be enabled. When VT3 handy Series is used, operation switch based function switch/touch panel are disabled.
Printing...	Printout is currently processing. Wait until the display clears.
Capturing video...	Video capture is currently processing. Wait until the display clears.
Cannot change page.	An attempt was made to switch a page by a touch switch when "PLC or Switch" was set in the Option Setup and page switching was set to PLC in system memory area. Either Set the Option Setup setting to "PLC and Switch", or set page switching as a touch switch in system memory area. Page switching is not allowed by the software, or an attempt was made to change the page with the touch switch while a video printing function is executed. Please wait until the executing is over.
Cannot change window.	An attempt was made to display a window by a touch switch when the window display specification was set to PLC in the system memory area. Set the window display specification as a touch switch in the system memory area. Page switching is not allowed by the software, or an attempt was made to change the page with the touch switch while a video printing function is executed. Please wait until the executing is over.
Memory Card locked	The Memory Card is being accessed from FTP. Wait until Memory Card unlock operation is executed from FTP.
Writing to flash ROM...	This message is displayed for the duration that write processing is executed internally by the VT3 immediately after transmission of the screen data is completed. Do not turn the power OFF while this message is displayed.
Sum check in progress...	The checksum of the internal data is currently being calculated during bootup. When memory has been added on, it sometimes takes about ten seconds to calculate the checksum.
Now Waiting...	This message is displayed until operation is started when "System Startup Delay" is set in the VT3 Setup.
Saving to Memory Card...	Recorded data is being saved to Memory Card. Wait until the display clears.
Reading comment...	The record comment of the PLC data folder is being transferred to the comment writing device. Wait until the display clears.
Calculating worksheet...	The worksheet is being executed before the page migrates to the initial page. Wait until the worksheet is executed.
Is fetching information from the unit	A specific data transmission task needs to be performed by the unit monitor before displaying the unit information. Wait until the display clears.
Is updating the unit setup	A specific data transmission task needs to be performed by the unit monitor before updating the unit setup. Wait until the display clears.
Is executing the remote COM	This message is displayed when creating a virtual COM port through the remote COM function.
In the process of communicating	This message is displayed when using the 2-port function to transmit the ladder diagram via KV-LM20(V)/LM21V.

An index of definitions used in this manual. They are arranged in the alphabetical sequence.

APPENDIX

APPENDIX

Revision History

Printing Date	Version	Details of Revision
Feb 2009	Initial version	
Apr 2009	2nd version	
Nov 2009	3rd version	Descriptions about VT3-X15D, VT3-S12D, VT3-V10D added.
Feb 2010	4th version	
Sep 2010	12th version	Descriptions about VT3-Q5H(G) added.
Dec 2010	13th version	Descriptions about VT3-V6H(G) added.
Nov 2011	14th version	
Jan 2013	15th version	
Jun 2013	16th version	
Dec 2013	17th version	
Feb 2014	18th version	
Feb 2015	19th version	Added descriptions detailing support for KV-7000 Series, and edited and added VT3-E3 description.
May 2015	20th version	
August 2015	21st version	
Jun 2016	23rd version	Descriptions about VT3-Q5T(W)A, Q5M(W)A added.

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