KEYENCE Corporation

Visual KV Series CPU Direct Driver

Introduction

This manual describes how to connect the Display and the External Device (target PLC).

In this manual, the connection procedure will be described by following the sections below:

| 1 | System Configuration
This section shows the types of External Devices which can be connected and SIO type. | ☞ "1 System Configuration" (page 3) |

| 2 | Selection of External Device
Select the model (series) of the External Device to be connected and its connection method. | ☞ "2 Selection of External Device" (page 4) |

| 3 | Example of Communication Settings
This section shows setting examples for communicating between the Display and the External Device. | ☞ "3 Example of Communication Setting" (page 5) |

| 4 | Setup Items
This section describes communication setup items on the Display.
Set the communication settings of the Display with GP-Pro EX or in off-line mode. | ☞ "4 Setup Items" (page 6) |

| 5 | Cable Diagram
This section shows cables and adapters for connecting the Display and the External Device. | ☞ "5 Cable Diagram" (page 9) |

Operation

1 System Configuration

The following shows the system configuration where the External Device of KEYENCE Corporation and the Display are connected.

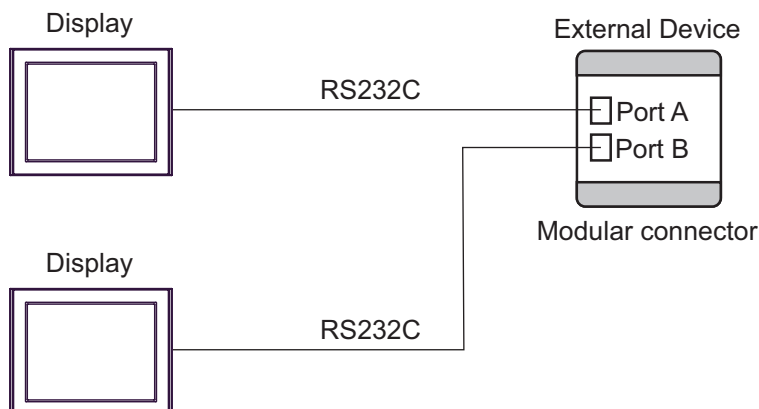| Series	CPU	Link I/F	SIO Type	Setting Example	Cable Diagram
Visual KV Series	KV-10 KV-16 KV-24 KV-40	-	RS232C	Setting Example 1 (page 5)	Cable Diagram 1 (page 9)

■ Connection Configuration

• 1:1 Connection
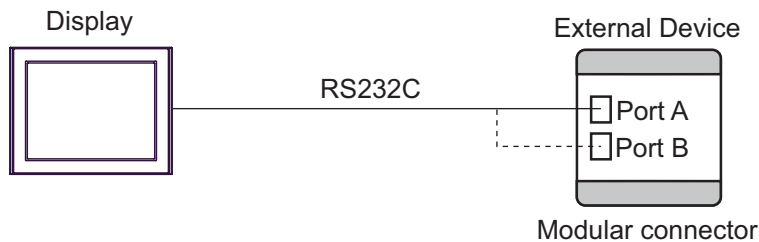
NOTE
- For 1:1 connection, connect to either port A or port B.
- KV-10 has only one communication port.
- This driver cannot use IPC and PC/AT for Display.
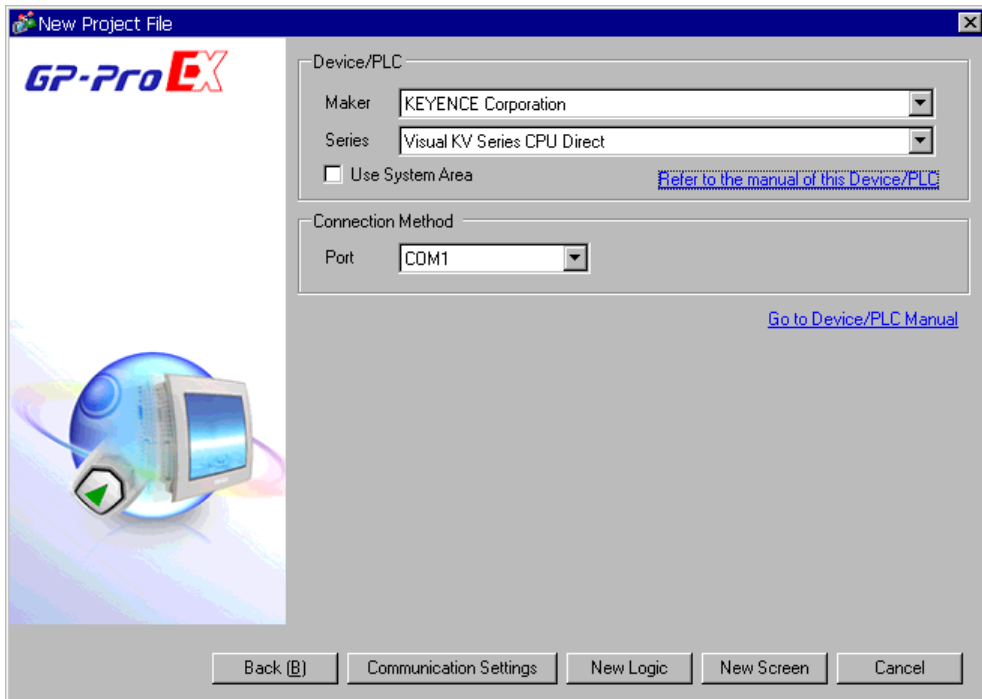
• Simultaneous Port Connection

NOTE
- Simultaneous port connection is not available to KV-10 with only one communication port.
- This driver cannot use IPC and PC/AT for Display.

2 Selection of External Device

Select the External Device to be connected to the Display.

Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "KEYENCE Corporation".
Series	Select the model (series) of the External Device to be connected and its connection method. Select "Visual KV Series CPU Direct". Check the External Device that can be connected in "Visual KV Series CPU Direct" in system configuration. ☞ "1 System Configuration" (page 3)
Use System Area	Check this option to synchronize the system data area of the Display and the device (memory) of the External Device. When they are synchronized, you can use the ladder program of the External Device to switch the display or to display the window on the Display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)" This can also be set with GP-Pro EX or in off-line mode of the Display. Cf. GP-Pro EX Reference Manual "5.14.6 Setting Guide of [System Setting Window], Setting Guide of [Main Unit Settings], System Area Setting" Cf. Maintenance/Troubleshooting Manual "2.14.1 Common to the Display", Setting Guide of [Main Unit Settings], System Area Setting
Port	Select the port of the Display to be connected to the External Device.

3 Example of Communication Setting

The following shows examples of communication settings of the Display and the External Device, which are recommended by Pro-face.

3.1 Setting Example 1

■ Settings of GP-Pro EX

◆ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

■ Setting of External Device

The External Device does not require communication settings.

Baud rate transmission speed is automatically changed within the range of "9600 to 57600" according to the setting on the Display.

4　　　Setup Items

Set the communication settings of the Display with GP-Pro Ex or in off-line mode of the Display.

The setting of each parameter must be identical to that of the External Device.

)"3 Example of Communication Setting" (page 5)

4.1　　　Setup Items in GP-Pro EX

■ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Setup Items	Setup Description
SIO Type	Select the SIO type for communicating with the External Device.
Speed	Select the communication speed between the External Device and the Display.
Data Length	Displays data length.
Parity	Displays how to check parity.
Stop Bit	Displays stop bit length.
Flow Control	Displays the communication control method to prevent overflow of transmission and reception data.
Timeout	Enter the time (s) for which the Display waits for the response from the External Device, from "1 to 127".
Retry	In case of no response from the External Device, enter how many times the Display retransmits the command, from "0 to 255".
Wait To Send	Enter the standby time (ms) from when the Display receives packets until it transmits the next command, from "0 to 255".
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for the SIO type. To connect to the IPC, you need to use the IPC selector switch to switch RI/5V. Please refer to the manual of the IPC for details.

4.2　　　　Setup Items in Off-line Mode

NOTE

　• Please refer to the Maintenance/Troubleshooting manual for more information on how to enter off-line mode or about the operation.

　　Cf.　　Maintenance/Troubleshooting Manual "2.2 Off-line Mode"

■ Communication Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Equipment Settings] in off-line mode.
Touch the External Device you want to set from the list that appears.

Setup Items	Setup Description
SIO Type	Select the SIO type for communicating with the External Device.
Speed	Select the communication speed between the External Device and the Display.
Data Length	Displays data length.
Parity	Displays how to check parity.
Stop Bit	Displays stop bit length.
Flow Control	Displays the communication control method to prevent overflow of transmission and reception data.
Timeout	Enter the time (s) for which the Display waits for the response from the External Device, from "1 to 127".
Retry	In case of no response from the External Device, enter how many times the Display retransmits the command, from "0 to 255".
Wait To Send	Enter the standby time (ms) from when the Display receives packets until it transmits the next command, from "0 to 255".

■ Option Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Equipment Settings]. Touch the External Device you want to set from the list that appears, and touch [Option].

Comm.	Option			

Visual KV Series CPU Direct   [COM1]   Page 1/1

RI / VCC   ◉ RI   ○ VCC
In the case of RS232C, you can select
the 9th pin to RI(Input) or VCC(5V
Power Supply). If you use the Digital's
RS232C Isolation Unit, please select
it to VCC.

| | Exit | | Back | 2007/10/17 09:58:32 |

| Setup Items	Setup Description
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for the SIO type. To connect to the IPC, you need to use the IPC selector switch to switch RI/5V. Please refer to the manual of the IPC for details.

5   Cable Diagram

The following cable diagram may be different from that recommended by KEYENCE Corporation. Please be assured, however, there is no operational problem in applying the cable diagram shown in this manual.

- The FG pin on the External Device must be D-class grounded. Please refer to the manual of the External Device for details.
- The SG and FG are connected inside the Display. If you connect the External Device to the SG, do not form any short-circuit loop in the system design.
- If the communication is not stable due to noise or other factors, connect an isolation unit.

Cable Diagram 1

Display (Connection Port)		Cable	Remarks
GP (COM1)	A	Conversion connector by KEYENCE Corporation OP-26486 + Connection cable by KEYENCE Corporation OP-26487	-

A.When using the conversion connector (OP-26486) and the connection cable (OP-26487) by KEYENCE Corporation
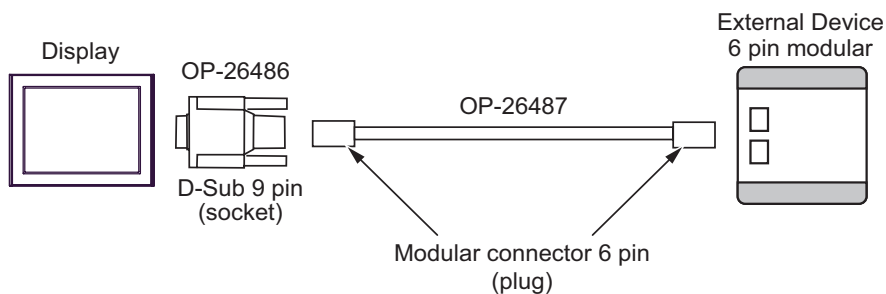
6   Supported Devices

The following table shows the range of supported device addresses. Note that the actually supported range varies depending on the External Device to be used. Please check the actual range in the manual of your External Device.

[▭▭▭] : This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Remarks
I/O Relay	00000 - 00915	000 - 009		
	07000 - 17915	070 - 179		
Internal Auxiliary Relay	01000 - 01915	010 - 019		
	03000 - 06915	030 - 069		
Special Auxiliary Relay	02000 - 02915	020 - 029		
Timer (Contact)	T000 - T249	-----		
Counter (Contact)	C000 - C249	-----		
High-speed Counter Comparator (Contact)	CTC0 - CTC3	-----		*1
Timer (Current Value)	-----	TC000 - TC249		
Timer (Setting Value)	-----	TS000 - TS249	[L / H]	
Counter (Current Value)	-----	CC000 - CC249		
Counter (Setting Value)	-----	CS000 - CS249		
Data Memory	-----	DM0000 - DM1999		[Bit 15]
Temporary Data Memory	-----	TM00 - TM31		[Bit 15]
Digital Trimmer	-----	AT0 - AT1		*1
High-speed Counter (Current Value)	-----	CTH0 - CTH1		
High-speed Counter Comparator (Setting Value)	-----	CTC0 - CTC3		

*1   Write disable

NOTE

• Please refer to the GP-Pro EX Reference Manual for system data area.

Cf.   GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)"

• Please refer to the precautions on manual notation for icons in the table.

) "Manual Symbols and Terminology"

7   Device Code and Address Code

Use device code and address code when you select "Device Type & Address" for the address type of the data display or other devices.

Device	Device Name	Device Code (HEX)	Address Code
I/O Relay	-----	0080	Word Address
Internal Auxiliary Relay			
Special Auxiliary Relay			
Timer (Current Value)	TC	0060	Word Address
Timer (Setting Value)	TS	0062	Word Address
Counter (Current Value)	CC	0061	Word Address
Counter (Setting Value)	CS	0063	Word Address
Data Memory	DM	0000	Word Address
Temporary Data Memory	TM	0001	Word Address
Digital Trimmer	AT	0067	Word Address
High-speed Counter (Current Value)	CTH	0065	Word Address
High-speed Counter Comparator (Setting Value)	CTC	0066	Word Address

8   Error Messages

Error messages are displayed on the Display screen as follows: "No.: Device Name: Error Message (Error Occurrence Area)". Each description is shown below.

Item	Description
No.	Error No.
Device Name	Name of the External Device where an error has occurred. Device name is the title of the External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays messages related to an error that has occurred.
Error Occurrence Area	Displays the IP address or device address of the External Device where an error has occurred, or error codes received from the External Device. **NOTE** • IP address is displayed as "IP address (Decimal): MAC address (Hex)". • Device address is displayed as "Address: Device address". • Received error codes are displayed as "Decimal [Hex]".

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 2[02H])"

NOTE
• Please refer to "When an error is displayed (Error Code List)" in "Maintenance/ Troubleshooting manual" for details on the error messages common to the driver.

■ Error Code List of External Device

Error Code (HEX)	Error Description
04	Accessed the device not defined as device in the External Device.[1]

*1   When you write to Timer (Contact/Current Value/Setting Value), Counter (Contact/Current Value/ Setting Value), High-speed Counter and High-speed Counter Comparator (Setting Value), the settings in the ladder program is necessary in advance.