



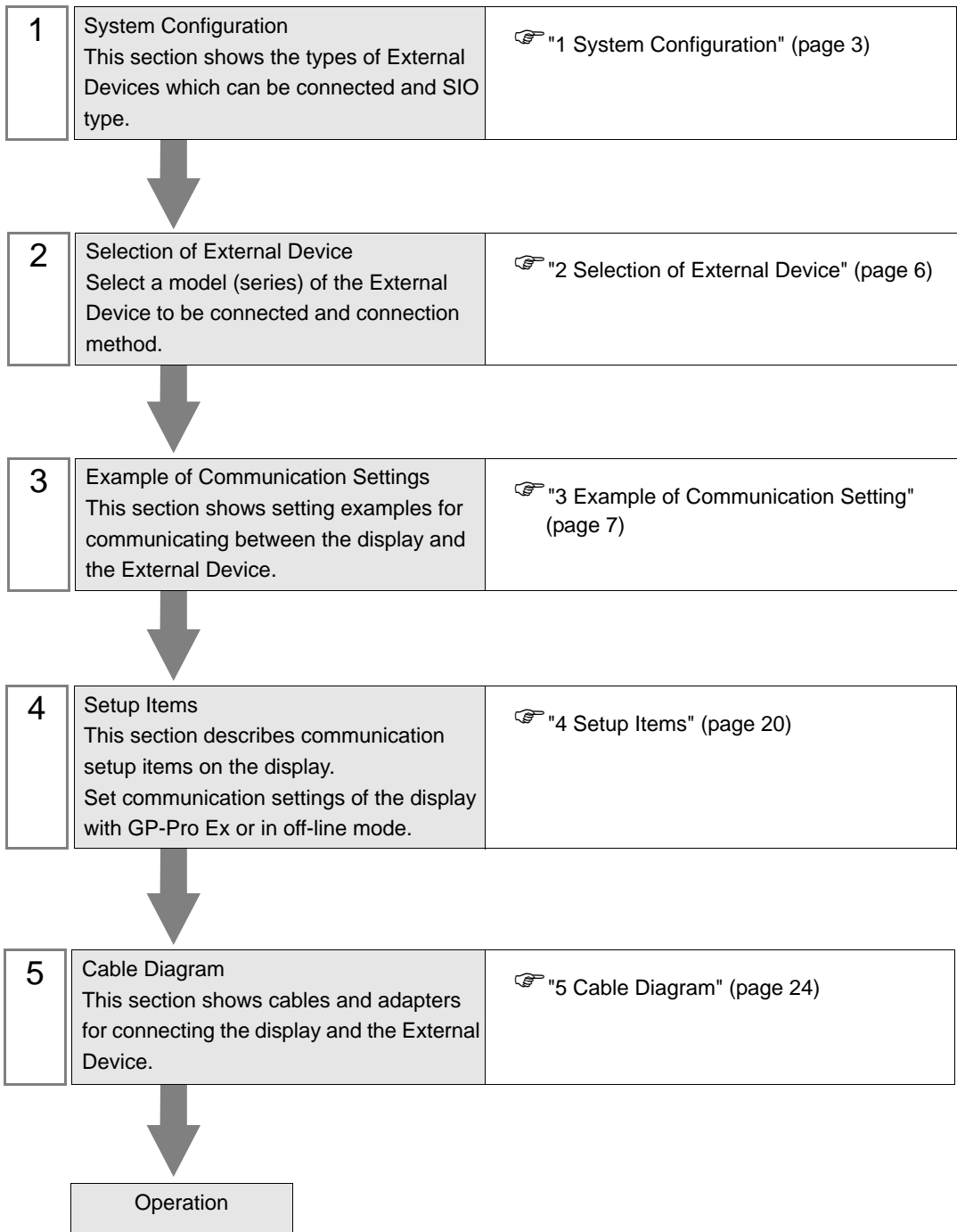
KV-700/1000 Series CPU Direct Driver

| | | |
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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 below sections:



1 System Configuration

The system configuration in the case when the External Device of KEYENCE Corporation and the display are connected is shown.

| Series | CPU | Link I/F | SIO Type | Setting Example | Cable Diagram | | |
|---------------------------------------|-----------------------------|----------------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---------------------------|
| KV-700 Series | KV-700 | CPU Direct *1 | RS232C | Setting Example 1 (page 7) | Cable Diagram 1 (page 24) | | |
| | | KV-L20 | RS232C (Port 1 connection) | Setting Example 2 (page 8) | Cable Diagram 2 (page 25) | | |
| | | | RS232C (Port 2 connection) | Setting Example 4 (page 12) | Cable Diagram 3 (page 26) | | |
| | | | RS422/485 (4wire) (Port 2 connection) | Setting Example 6 (page 16) | Cable Diagram 4 (page 27) | | |
| | | KV-L20R | RS232C (Port 1 connection) | Setting Example 3 (page 10) | Cable Diagram 2 (page 25) | | |
| | | | RS232C (Port 2 connection) | Setting Example 5 (page 14) | Cable Diagram 3 (page 26) | | |
| | | | RS422/485 (4wire) (Port 2 connection) | Setting Example 7 (page 18) | Cable Diagram 4 (page 27) | | |
| | | KV-1000 Series | KV-1000 | CPU Direct *1 | RS232C | Setting Example 1 (page 7) | Cable Diagram 1 (page 24) |
| | | | | KV-L20R | RS232C (Port 1 connection) | Setting Example 3 (page 10) | Cable Diagram 2 (page 25) |
| RS232C (Port 2 connection) | Setting Example 5 (page 14) | | | | Cable Diagram 3 (page 26) | | |
| RS422/485 (4wire) (Port 2 connection) | Setting Example 7 (page 18) | | | | Cable Diagram 4 (page 27) | | |

*1 Using modular connector on CPU

■ COM Port of IPC

When connecting IPC with External Device, the COM port which can be used changes with series and SIO type. Please refer to the manual of IPC for details.

Usable port

| Series | Usable port | | |
|------------------------------------|--|----------------------|----------------------|
| | RS-232C | RS-422/485(4 wire) | RS-422/485(2 wire) |
| PS-2000B | COM1 ^{*1} , COM2, COM3 ^{*1} , COM4 | - | - |
| PS-3450A, PS-3451A | COM1, COM2 ^{*1*2} | COM2 ^{*1*2} | COM2 ^{*1*2} |
| PS-3650A, PS-3651A | COM1 ^{*1} | - | - |
| PS-3700A (Pentium®4-M) PS-3710A | COM1 ^{*1} , COM2 ^{*1} , COM3 ^{*2} , COM4 | COM3 ^{*2} | COM3 ^{*2} |
| PS-3711A | COM1 ^{*1} , COM2 ^{*2} | COM2 ^{*2} | COM2 ^{*2} |
| PL-3000B | COM1 ^{*1*2} , COM2 ^{*1} , COM3, COM4 | COM1 ^{*1*2} | COM1 ^{*1*2} |

*1 The RI/5V can be switched. Please switch with the change switch of IPC.

*2 It is necessary to set up the SIO type with the Dip switch. Please set up as follows according to SIO type to be used.

Dip switch setting: RS-232C

| Dip switch | Setting | Description |
|------------|-------------------|--|
| 1 | OFF ^{*1} | Reserve (always OFF) |
| 2 | OFF | SIO type: RS-232C |
| 3 | OFF | |
| 4 | OFF | Output mode of SD (TXD) data: Always output |
| 5 | OFF | Terminal resistance (220Ω) insertion to SD (TXD): None |
| 6 | OFF | Terminal resistance (220Ω) insertion to RD (RXD): None |
| 7 | OFF | Short-circuit of SDA (TXA) and RDA (RXA): Does not Exist |
| 8 | OFF | Short-circuit of SDB (TXB) and RDB (RXB): Does not Exist |
| 9 | OFF | RS (RTS) Auto control mode: Disable |
| 10 | OFF | |

*1 It is necessary to turn ON the set value, only when using PS-3450A and PS-3451A.

Dip switch setting: RS-422/485 (4 wire)

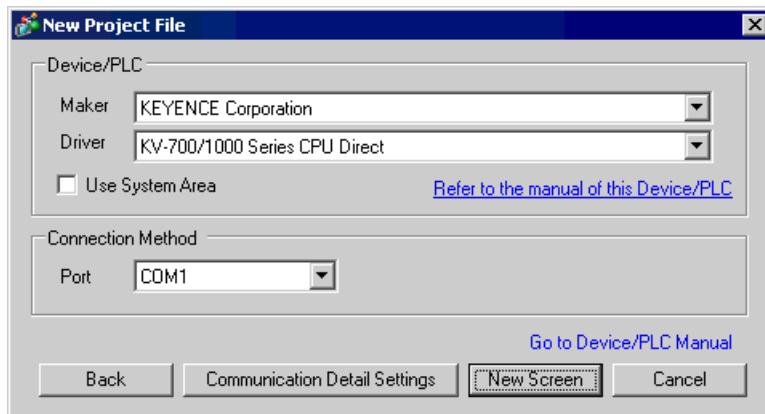
| Dip switch | Setting | Description |
|------------|---------|--|
| 1 | OFF | Reserve (always OFF) |
| 2 | ON | SIO type: RS-422/485 |
| 3 | ON | |
| 4 | OFF | Output mode of SD (TXD) data: Always output |
| 5 | OFF | Terminal resistance (220Ω) insertion to SD (TXD): None |
| 6 | OFF | Terminal resistance (220Ω) insertion to RD (RXD): None |
| 7 | OFF | Short-circuit of SDA (TXA) and RDA (RXA): Does not Exist |
| 8 | OFF | Short-circuit of SDB (TXB) and RDB (RXB): Does not Exist |
| 9 | OFF | RS (RTS) Auto control mode: Disable |
| 10 | OFF | |

Dip switch setting: RS-422/485 (2 wire)

| Dip switch | Setting | Description |
|------------|---------|--|
| 1 | OFF | Reserve (always OFF) |
| 2 | ON | SIO type: RS-422/485 |
| 3 | ON | |
| 4 | OFF | Output mode of SD (TXD) data: Always output |
| 5 | OFF | Terminal resistance (220Ω) insertion to SD (TXD): None |
| 6 | OFF | Terminal resistance (220Ω) insertion to RD (RXD): None |
| 7 | ON | Short-circuit of SDA (TXA) and RDA (RXA): Exist |
| 8 | ON | Short-circuit of SDB (TXB) and RDB (RXB): Exist |
| 9 | ON | RS (RTS) Auto control mode: Enable |
| 10 | ON | |

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 a model (series) of the External Device to be connected and connection method. Select "KV-700/1000 Series CPU Direct". Check the External Device which can be connected in "KV-700/1000 Series CPU Direct" in system configuration. ☞ "1 System Configuration" (page 3) |
| Use System Area | Check this option when you synchronize the system data area of Display and the device (memory) of External Device. When synchronized, you can use the ladder program of External Device to switch the display or display the window on the display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)" This can be also set with GP-Pro EX or in off-line mode of Display. Cf. GP-Pro EX Reference Manual " 5.14.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. Maintenance/Troubleshooting "2.14.1 Settings common to all Display models ◆System Area Settings" |
| Port | Select the display port to be connected to the External Device. |

3 Example of Communication Setting

Examples of communication settings of the display and the External Device, recommended by Pro-face, are shown.

3.1 Setting Example 1

■ Settings of GP-Pro EX

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

Device/PLC 1

Summary [Change Device/PLC](#)

Maker Series Port

Text Data Mode [Change](#)

Communication Settings

SID Type RS232C RS422/485(2wire) RS422/485(4wire)

Speed

Data Length 7 8

Parity NONE EVEN ODD

Stop Bit 1 2

Flow Control NONE ER(DTR/CTS) XON/XOFF

Timeout (sec)

Retry

Wait To Send (ms)

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.

Device-Specific Settings

Allowable No. of Device/PLCs 1 Unit(s)

| No. | Device Name | Settings |
|-----|-------------|----------|
| 1 | PLC1 | |

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

There is no setting on the External Device. The speed automatically switches according to the display setting.

3.2 Setting Example 2

■ Settings of GP-Pro EX

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

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

- (1) Execute [New Project] from [File] on the menu bar of the ladder software "KV STUDIO".
- (2) Enter the optional project name in the [New Project] dialog box. Check that [Support Model] shows the External Device, and click [OK].
- (3) The project is created, and you are asked if you set the unit configuration or not. Click [Yes].
- (4) The [Unit Editor] window is displayed. Click the [Unit Selection (2)] tab on the right of the window. Select "KV-L20" from the displayed unit list, and drag & drop it to the unit placement area on the left of the window.

- (5) Double-click KV-L20, the External Device in the unit placement area. The [Unit Settings (3)] tab on the right of the window is displayed. The setting list of KV-L20 is displayed. Perform the communication settings as below.

| Setup Items | | Setup Description |
|-------------|--------------------|-------------------|
| Port 1 | Operation Mode | KV-BUILDER Mode |
| | Interface | RS-232C |
| | Baud rate | Auto |
| | Data Bit Length | 8 bits |
| | Start Bit | 1 bit |
| | Stop Bit | 1 bit |
| | Parity | Even |
| | Check Sum | None |
| | RS/CS Flow Control | Disable |

- (6) Next, execute [Relay/DM Auto Assign] from [Convert] on the menu bar.
- (7) Execute [Save and Exit] from [File] on the menu bar.

3.3 Setting Example 3

■ Settings of GP-Pro EX

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

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

- (1) Execute [New Project] from [File] on the menu bar of the ladder software "KV STUDIO".
- (2) Enter the optional project name in the [New Project] dialog box. Check that [Support Model] shows the External Device, and click [OK].
- (3) The project is created, and you are asked if you set the unit configuration or not. Click [Yes].
- (4) The [Unit Editor] window is displayed. Click the [Unit Selection (2)] tab on the right of the window. Select "KV-L20R" from the displayed unit list, and drag & drop it to the unit placement area on the left of the window.

- (5) Double-click KV-L20R, the External Device in the unit placement area. The [Unit Settings (3)] tab on the right of the window is displayed. The setting list of KV-L20R is displayed. Perform the communication settings as below.

| Setup Items | | Setup Description |
|-----------------|--------------------|-----------------------------|
| Port 1 | Operation Mode | KV-BUILDER / KV-STUDIO Mode |
| | Interface | RS-232C |
| | Baud Rate | Auto |
| | Data Bit Length | 8 bits |
| | Start Bit | 1 bit |
| | Stop Bit | 1 bit |
| | Parity | Even |
| | Check Sum | None |
| | RS/CS Flow Control | Disable |
| Station No. | Station No. | 0 |
| Detail Settings | Transfer Timeout | 3 |

- (6) Next, execute [Relay/DM Auto Assign] from [Convert] on the menu bar.
- (7) Execute [Save and Exit] from [File] on the menu bar.

3.4 Setting Example 4

■ Settings of GP-Pro EX

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

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

- (1) Execute [New Project] from [File] on the menu bar of the ladder software "KV STUDIO".
- (2) Enter the optional project name in the [New Project] dialog box. Check that [Support Model] shows the External Device, and click [OK].
- (3) The project is created, and you are asked if you set the unit configuration or not. Click [Yes].
- (4) The [Unit Editor] window is displayed. Click the [Unit Selection (2)] tab on the right of the window. Select "KV-L20" from the displayed unit list, and drag & drop it to the unit placement area on the left of the window.

- (5) Double-click KV-L20, the External Device in the unit placement area. The [Unit Settings (3)] tab on the right of the window is displayed. The setting list of KV-L20 is displayed. Perform the communication settings as below.

| Setup Items | | Setup Description |
|-------------|-----------------|-------------------|
| Port 2 | Operation Mode | KV-BUILDER Mode |
| | Interface | RS-232C |
| | Station No. | 0 |
| | Baud Rate | Auto |
| | Data Bit Length | 8 bits |
| | Start Bit | 1 bit |
| | Stop Bit | 1 bit |
| | Parity | Even |
| | Check Sum | None |

- (6) Next, execute [Relay/DM Auto Assign] from [Convert] on the menu bar.
- (7) Execute [Save and Exit] from [File] on the menu bar.

3.5 Setting Example 5

■ Settings of GP-Pro EX

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

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

- (1) Execute [New Project] from [File] on the menu bar of the ladder software "KV STUDIO".
- (2) Enter the optional project name in the [New Project] dialog box. Check that [Support Model] shows the External Device, and click [OK].
- (3) The project is created, and you are asked if you set the unit configuration or not. Click [Yes].
- (4) The [Unit Editor] window is displayed. Click the [Unit Selection (2)] tab on the right of the window. Select "KV-L20R" from the displayed unit list, and drag & drop it to the unit placement area on the left of the window.

- (5) Double-click KV-L20R, the External Device in the unit placement area. The [Unit Settings (3)] tab on the right of the window is displayed. The setting list of KV-L20R is displayed. Perform the communication settings as below.

| Setup Items | | Setup Description |
|-----------------|------------------|-----------------------------|
| Port 2 | Operation Mode | KV-BUILDER / KV-STUDIO Mode |
| | Interface | RS-232C |
| | Baud Rate | Auto |
| | Data Bit Length | 8 bits |
| | Start Bit | 1 bit |
| | Stop Bit | 1 bit |
| | Parity | Even |
| | Check Sum | None |
| Station No. | Station No. | 0 |
| Detail Settings | Transfer Timeout | 3 |

- (6) Next, execute [Relay/DM Auto Assign] from [Convert] on the menu bar.
- (7) Execute [Save and Exit] from [File] on the menu bar.

3.6 Setting Example 6

■ Settings of GP-Pro EX

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

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

- (1) Execute [New Project] from [File] on the menu bar of the ladder software "KV STUDIO".
- (2) Enter the optional project name in the [New Project] dialog box. Check that [Support Model] shows the External Device, and click [OK].
- (3) The project is created, and you are asked if you set the unit configuration or not. Click [Yes].
- (4) The [Unit Editor] window is displayed. Click the [Unit Selection (2)] tab on the right of the window. Select "KV-L20" from the displayed unit list, and drag & drop it to the unit placement area on the left of the window.

- (5) Double-click KV-L20, the External Device in the unit placement area. The [Unit Settings (3)] tab on the right of the window is displayed. The setting list of KV-L20 is displayed. Perform the communication settings as below.

| Setup Items | | Setup Description |
|-------------|-----------------|-------------------|
| Port 2 | Operation Mode | KV-BUILDER Mode |
| | Interface | RS-422A |
| | Station No. | 0 |
| | Baud Rate | Auto |
| | Data Bit Length | 8 bits |
| | Start Bit | 1 bit |
| | Stop Bit | 1 bit |
| | Parity | Even |
| | Check Sum | None |

- (6) Next, execute [Relay/DM Auto Assign] from [Convert] on the menu bar.
- (7) Execute [Save and Exit] from [File] on the menu bar.

3.7 Setting Example 7

■ Settings of GP-Pro EX

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

NOTE • You can set the speed to 9600-57600 for KV-700 Series, 9600-115200 for KV-1000 Series.

■ Settings of External Device

- (1) Execute [New Project] from [File] on the menu bar of the ladder software "KV STUDIO".
- (2) Enter the optional project name in the [New Project] dialog box. Check that [Support Model] shows the External Device, and click [OK].
- (3) The project is created, and you are asked if you set the unit configuration or not. Click [Yes].
- (4) The [Unit Editor] window is displayed. Click the [Unit Selection (2)] tab on the right of the window. Select "KV-L20R" from the displayed unit list, and drag & drop it to the unit placement area on the left of the window.

- (5) Double-click KV-L20R, the External Device in the unit placement area. The [Unit Settings (3)] tab on the right of the window is displayed. The setting list of KV-L20R is displayed. Perform the communication settings as below.


| Setup Items | | Setup Description |
|-----------------|------------------|-----------------------------|
| Port 2 | Operation Mode | KV-BUILDER / KV-STUDIO Mode |
| | Interface | RS-422A/485 (4 wire) |
| | Baud Rate | Auto |
| | Data Bit Length | 8 bits |
| | Start Bit | 1 bit |
| | Stop Bit | 1 bit |
| | Parity | Even |
| | Check Sum | None |
| Station No. | Station No. | 0 |
| Detail Settings | Transfer Timeout | 3 |

- (6) Next, execute [Relay/DM Auto Assign] from [Convert] on the menu bar.
- (7) Execute [Save and Exit] from [File] on the menu bar.

4 Setup Items

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

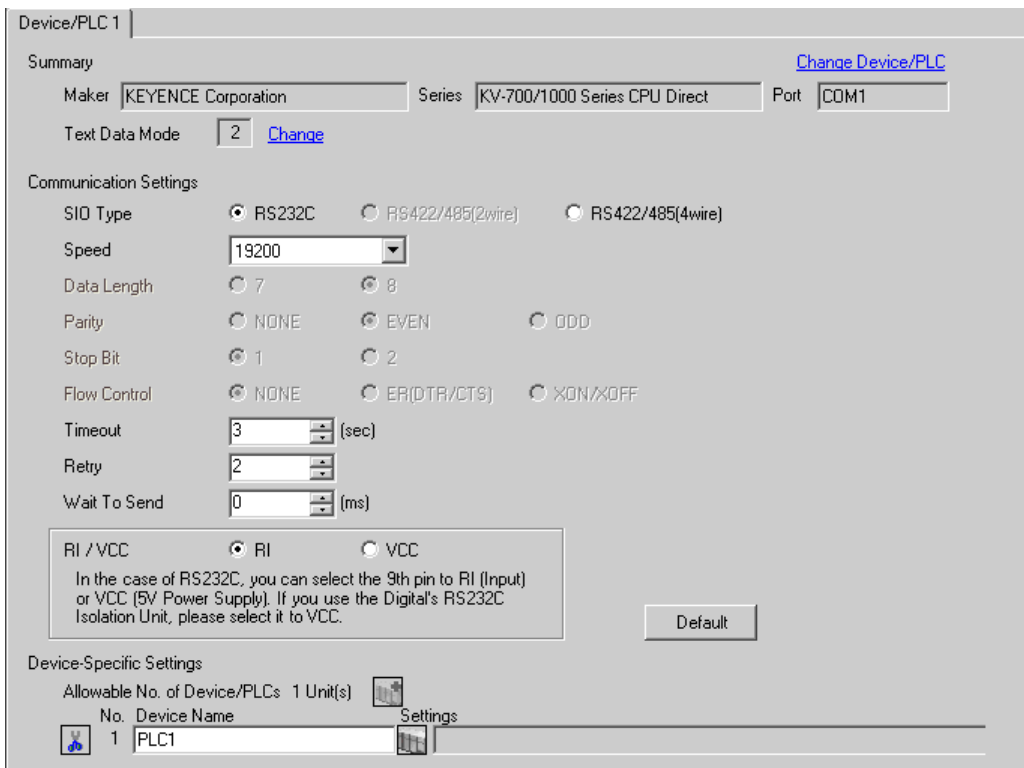
The setting of each parameter must be identical to that of External Device.

 "3 Example of Communication Setting" (page 7)

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.



Device/PLC 1

Summary [Change Device/PLC](#)

Maker: KEYENCE Corporation Series: KV-700/1000 Series CPU Direct Port: COM1

Text Data Mode: 2 [Change](#)

Communication Settings

SIO Type: RS232C RS422/485(2wire) RS422/485(4wire)

Speed: 19200

Data Length: 7 8

Parity: NONE EVEN ODD

Stop Bit: 1 2

Flow Control: NONE ER(DTR/CTS) XON/XOFF

Timeout: 3 (sec)

Retry: 2

Wait To Send: 0 (ms)

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.

[Default](#)

Device-Specific Settings

Allowable No. of Device/PLCs: 1 Unit(s)

| No. | Device Name | Settings |
|-----|-------------|----------|
| 1 | PLC1 | |

| Setup Items | Setup Description |
|--------------|---|
| SIO Type | Select the SIO type to communicate with the External Device. |
| Speed | Select speed between the communication equipment and the display. |
| Data Length | Select data length. |
| Parity | Select how to check parity. |
| Stop Bit | Select stop bit length. |
| Flow Control | Select the communication control method to prevent overflow of transmission and reception data. |
| Timeout | Use an integer from 1 to 127 to enter the time (s) for which the display waits for the response from the External Device. |

continued to next page

| Setup Items | Setup Description |
|--------------|---|
| Retry | In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the display retransmits the command. |
| Wait To Send | Use an integer from 0 to 255 to enter standby time (ms) for the display from receiving packets to transmitting next commands. |
| RI/VCC | You can switch RI/VCC of the 9th pin when you select RS232C for SIO type. It is necessary to change RI/5V by changeover switch of IPC when connect with IPC. Please refer to the manual of the IPC for more detail. |

4.2 Setup Items in Off-Line Mode

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

Cf. Maintenance/Troubleshooting "2.2 Offline Mode"

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

| Comm. | Option | | | |
|-------------------------------|--------|--------|----------|------------------------|
| KV-700/1000 Series CPU Direct | | [COM1] | Page 1/1 | |
| SIO Type | RS232C | | | |
| Speed | 19200 | | | |
| Data Length | 8 | | | |
| Parity | EVEN | | | |
| Stop Bit | 1 | | | |
| Flow Control | NONE | | | |
| Timeout(s) | | 3 | ▼ | ▲ |
| Retry | | 2 | ▼ | ▲ |
| Wait to Send(ms) | | 0 | ▼ | ▲ |
| Exit | | Back | | 2005/09/02 13:16:12 |

| Setup Items | Setup Description |
|-------------------|--|
| SIO Type | Select the SIO type to communicate with the External Device. IMPORTANT To make the communication settings correctly, confirm the serial interface specifications of Display unit for [SIO Type]. We cannot guarantee the operation if a communication type that the serial interface does not support is specified. For details concerning the serial interface specifications, refer to the manual for Display unit. |
| Speed | Select speed between the communication equipment and the display. |
| Data Length | Data length is displayed. |
| Parity | The parity check method is displayed. |
| Stop Bit | Stop bit length is displayed. |
| Flow Control | The communication control method to prevent overflow of transmission and reception data. |
| Timeout (s) | Use an integer from 1 to 127 to enter the time (s) for which the display waits for the response from the External Device. |
| Retry | In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the display retransmits the command. |
| Wait to Send (ms) | Use an integer from 0 to 255 to enter standby time (ms) for the display from receiving packets to transmitting next commands. |

■ Option

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

| | | | | |
|--|--------|--------|----------|------------------------|
| Comm. | Option | | | |
| | | | | |
| KV-700/1000 Series CPU Direct | | [COM1] | Page 1/1 | |
| RI / VCC <input checked="" type="radio"/> RI <input type="radio"/> 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 | 2005/09/02 13:16:13 |

| Setup Items | Setup Description |
|-------------|---|
| RI/VCC | You can switch RI/VCC of the 9th pin when you select RS232C for SIO type. It is necessary to change RI/5V by changeover switch of IPC when connect with IPC. Please refer to the manual of the IPC for more detail. |

5 Cable Diagram

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

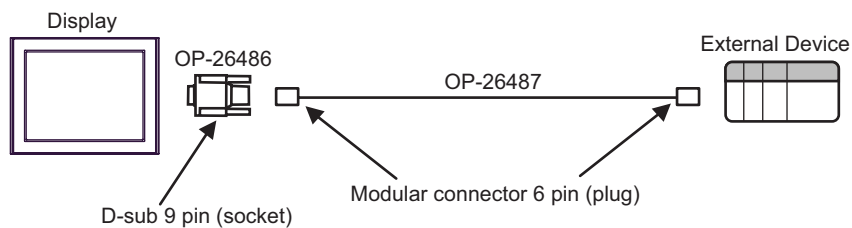
- The FG pin of the main body of the External Device must be D-class grounded. Please refer to the manual of the External Device for more details.
- SG and FG are connected inside the display. When connecting SG to the External Device, design the system not to form short-circuit loop.
- Connect the isolation unit, when communication is not stabilized under the influence of a noise etc..

Cable Diagram 1

| Display (Connection Port) | Cable | Notes |
|------------------------------|---|-------|
| GP (COM1) IPC*1 PC/AT | Modular cable of KEYENCE Corporation OP-26487 (2.5m) + Dsub9Pin of KEYENCE Corporation OP-26486 | |

*1 Only the COM port which can communicate by RS-232C can be used.


☞ ■ COM Port of IPC (page 4)

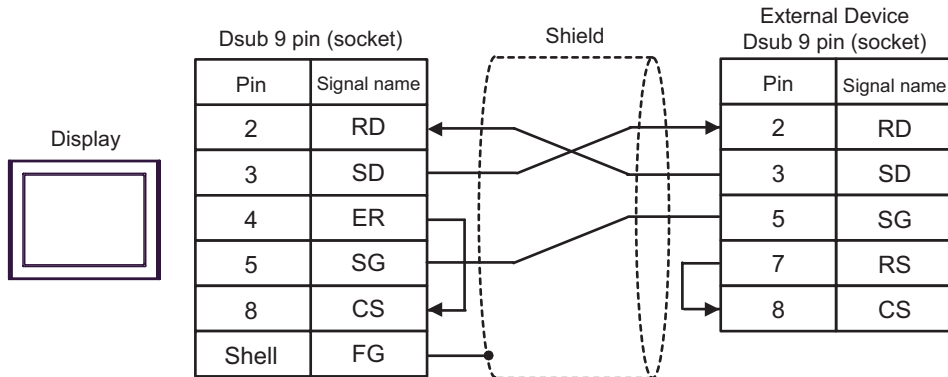


Cable Diagram 2

| Display (Connection Port) | Cable | Notes |
|------------------------------|----------------|---|
| GP (COM1) IPC*1 PC/AT | Your own cable | The cable length must be 15 meters or less. |

*1 Only the COM port which can communicate by RS-232C can be used.


 ■ COM Port of IPC (page 4)



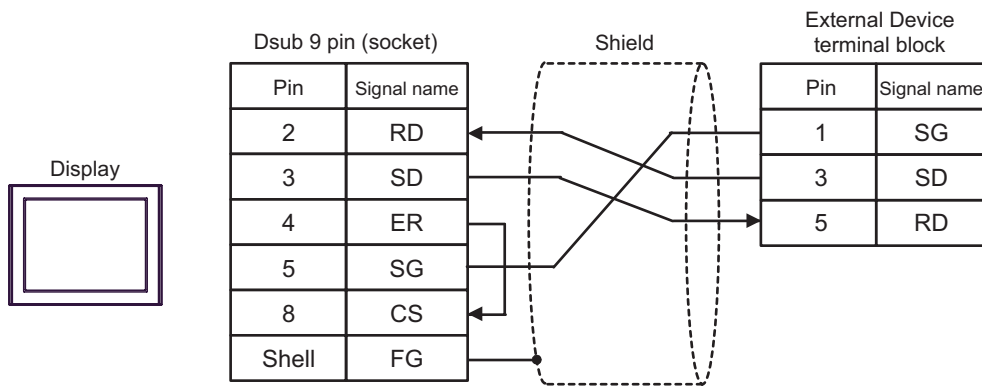
Cable Diagram 3

| Display (Connection Port) | Cable | Notes |
|------------------------------|----------------|---|
| GP (COM1) IPC*1 PC/AT | Your own cable | The cable length must be 15 meters or less. |

*1 Only the COM port which can communicate by RS-232C can be used.

 ■ COM Port of IPC (page 4)

NOTE • Set the PORT2 toggle switch on the External Device to "232C".




Cable Diagram 4

| Display (Connection Port) | Cable | | Notes |
|--|-------|---|---|
| GP* ¹ (COM1) AGP-3302B (COM2) IPC* ² | A | COM port conversion adapter by Pro-face CA3-ADPCOM-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + Your own cable | The cable length must be 500 meters or less. |
| | B | Your own cable | |
| GP* ³ (COM2) | C | Online adapter by Pro-face CA4-ADPONL-01 + Terminal block conversion adapter by Pro-face CA3-ADPTRM-01 + Your own cable | The cable length must be 500 meters or less. |
| | D | Online adapter by Pro-face CA4-ADPONL-01 + Your own cable | |

*1 All GP models except AGP-3302B

*2 Only the COM port which can communicate by RS-422/485 (4 wire) can be used.

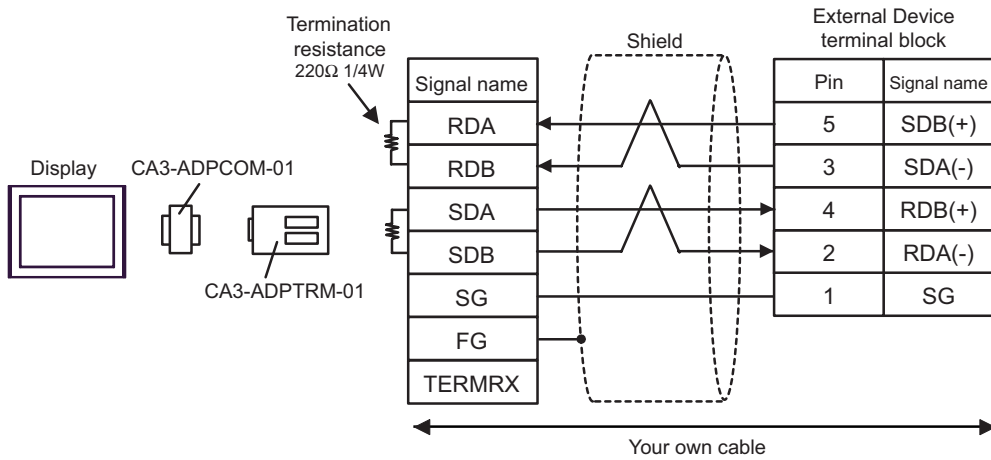
 ■ COM Port of IPC (page 4)

*3 All GP models except GP-3200 series and AGP-3302B

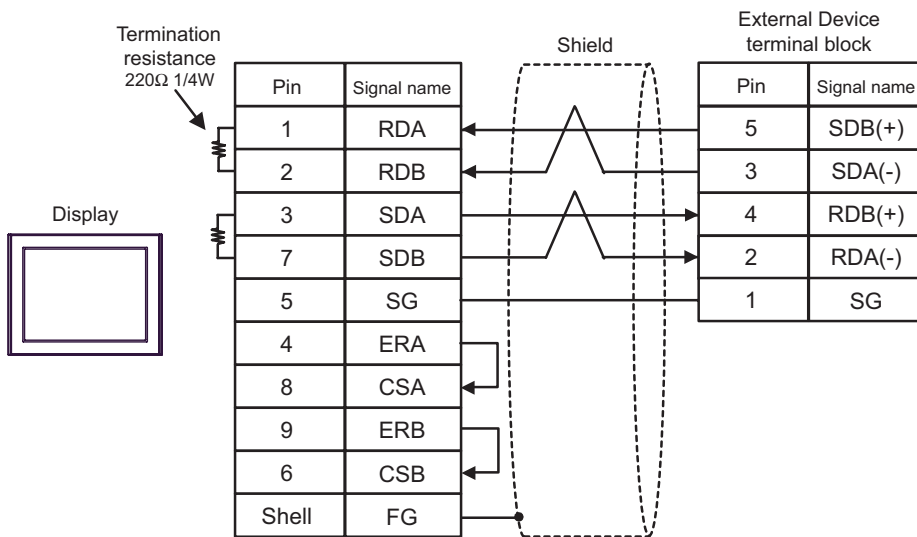
NOTE

- Set the PORT2 toggle switch on the External Device to "422A 485(4)". Also, turn ON the switch of the terminator.
- Pay attention that pole A and pole B are reversely named for the display and the External Device.

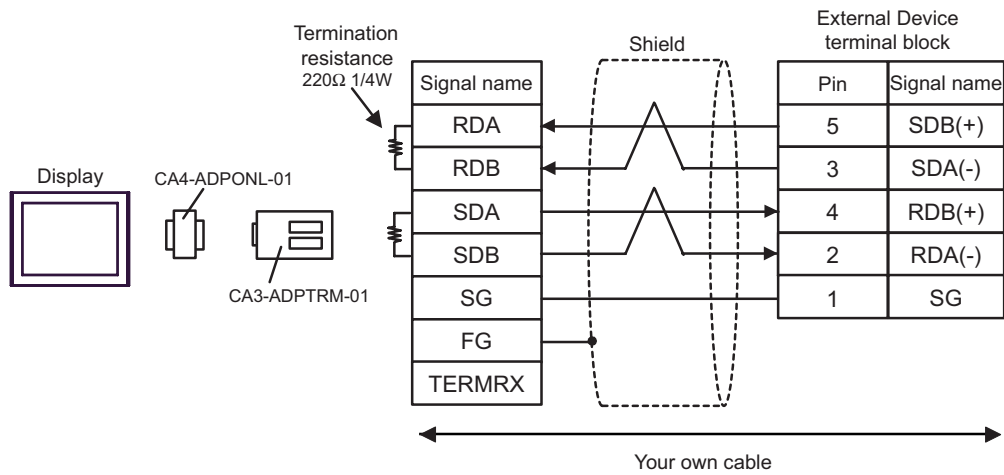
- A) When using the COM port conversion adapter (CA3-ADPCOM-01), the terminal block conversion adapter (CA3-ADPTRM-01) by Pro-face, and your own cable..



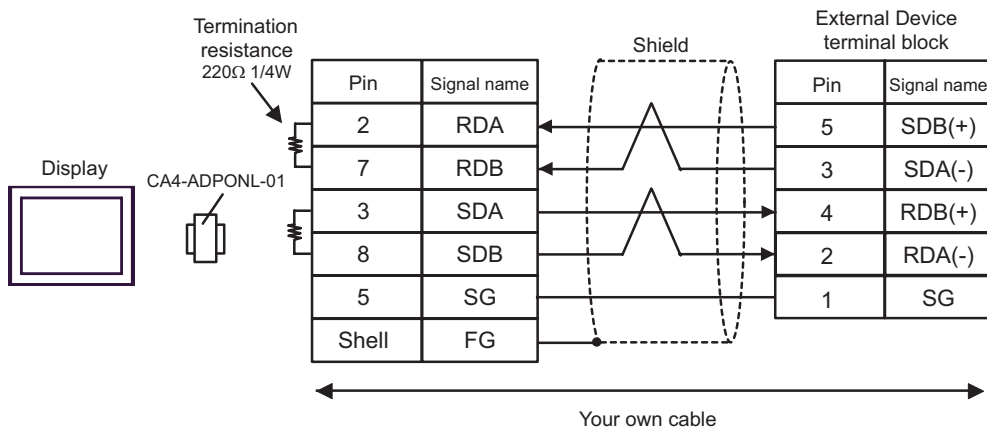
- B) When using your own cable



C) When using the online adapter (CA4-ADPONL-01), the terminal block conversion adapter (CA3-ADPTRM-01) by Pro-face, and your own cable.



D) When using the online adapter (CA4-ADPONL-01) by Pro-face and your own cable



6 Supported Device

Range of supported device address is shown in the table below. Please note that the actually supported range of the devices varies depending on the External Device to be used. Please check the actual range in the manual of your External Device.

6.1 KV-700 Series

 This address can be specified as system data area.

| Device | Bit Address | Word Address | 32 bit | Notes |
|---|-----------------|-------------------|---|---|
| Input Relay | 00000 - 59915 | 000 - 599 | L/H | |
| Output Relay | | | | |
| Internal Auxiliary Relay | | | | |
| Control Relay | CR0000 - CR3915 | CR00 - CR39 | | |
| Timer (Contact) | T000 - T511 | ----- | | |
| Counter (Contact) | C000 - C511 | ----- | | |
| High-speed Counter Comparator (Contact) | CTC0 - CTC3 | ----- | | *1 |
| Timer (Setting Value) | ----- | TS000 - TS511 | | *2 |
| Counter (Setting Value) | ----- | CS000 - CS511 | | |
| Timer (Current Value) | ----- | TC000 - TC511 | | |
| Counter (Current Value) | ----- | CC000 - CC511 | | |
| Data Memory | ----- | DM00000 - DM39999 | | |
| Temporary Memory | ----- | TM000 - TM511 | | B1:15 |
| Control Memory | ----- | CM0000 - CM3999 | | |
| Digital Trimming Machine | ----- | TRM0 - TRM7 | | |
| High-speed Counter (Current Value) | ----- | CTH0 - CTH1 | *2 | |
| High-speed Counter Comparator (Setting Value) | ----- | CTC0 - CTC3 | | |


*1 Write disable

*2 32-bit device


IMPORTANT

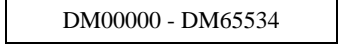


- When connecting KV-700 Series, use within the above range of device address.
- When you try to access the device address supported only by KV-1000 Series, error messages of "Error has been responded for device read command (Error Code: (02)[(0x02)]" or "Error has been responded for device write command (Error Code: (02)[(0x02)]" are displayed.

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"

6.2 KV-1000 Series

 This address can be specified as system data area.

| Device | Bit Address | Word Address | 32 bits | Notes |
|---|-------------------|--|--|---|
| Input Relay | 00000 - 59915 | 000 - 599 | L/H | *1 |
| Output Relay | | | | |
| Internal Auxiliary Relay | MR00000 - MR99915 | MR000 - MR999 | | |
| Latch Relay | LR00000 - LR99915 | LR000 - LR999 | | |
| Control Relay | CR0000 - CR3915 | CR00 - CR39 | | |
| Timer (Contact) | T0000 - T3999 | ----- | | |
| Counter (Contact) | C0000 - C3999 | ----- | | |
| High-speed Counter Comparator (Contact) | CTC0 - CTC3 | ----- | | *2 |
| Timer (Setting Value) | ----- | TS0000 - TS3999 | | *3 |
| Counter (Setting Value) | ----- | CS0000 - CS3999 | | |
| Timer (Current Value) | ----- | TC0000 - TC3999 | | |
| Counter (Current Value) | ----- | CC0000 - CC3999 | | |
| Data Memory | ----- |  DM00000 - DM65534 | | |
| Extension Data Memory EM | ----- | EM00000 - EM65534 | | |
| Extension Data Memory FM | ----- | FM00000 - FM32766 | |  |
| Temporary Data Memory | ----- | TM000 - TM511 | | |
| Control Memory | ----- | CM00000 - CM11998 | | |
| Index Register | ----- | Z01 - Z12 |  *4 | |
| Digital Trimming Machine | ----- | TRM0 - TRM7 | | |
| High-speed Counter (Current Value) | ----- | CTH0 - CTH1 | *3 | |
| High-speed Counter Comparator (Setting Value) | ----- | CTC0 - CTC3 | | |


*1 R000 to R599 (R00000 to R59915) are shown in KV-1000, but 000 to 599 (00000 to 59915) in GP-Pro EX.

*2 Write disable

*3 32-bit device

*4 Do not write in Z11 and Z12. They are used in the system of the External Device.

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 in data displays.

7.1 KV-700 Series

| Device | Device Name | Device Code (HEX) | Address Code |
|---|-------------|-------------------|---------------------|
| Input Relay | ----- | 0080 | Word Address |
| Output Relay | | | |
| Internal Auxiliary Relay | | | |
| Control Relay | CR | 008A | Word Address |
| Timer (Setting Value) | TS | 0062 | Double Word Address |
| Counter (Setting Value) | CS | 0063 | Double Word Address |
| Timer (Current Value) | TC | 0060 | Double Word Address |
| Counter (Current Value) | CC | 0061 | Double Word Address |
| Data Memory | DM | 0000 | Word Address |
| Temporary Data Memory | TM | 0001 | Word Address |
| Control Memory | CM | 0002 | Word Address |
| Digital Trimming Machine | TRM | 0064 | Double Word Address |
| High-speed Counter (Current Value) | CTH | 0065 | Double Word Address |
| High-speed Counter Comparator (Setting Value) | CTC | 0066 | Double Word Address |

7.2 KV-1000 Series

| Device | Device Name | Device Code (HEX) | Address Code |
|---|-------------|-------------------|---------------------|
| Input Relay | ----- | 0080 | Word Address |
| Output Relay | | | |
| Internal Auxiliary Relay | MR | 0082 | Word Address |
| Latch Relay | LR | 0084 | Word Address |
| Control Relay | CR | 008A | Word Address |
| Timer (Setting Value) | TS | 0062 | Double Word Address |
| Counter (Setting Value) | CS | 0063 | Double Word Address |
| Timer (Current Value) | TC | 0060 | Double Word Address |
| Counter (Current Value) | CC | 0061 | Double Word Address |
| Data Memory | DM | 0000 | Word Address |
| Extension Data Memory EM | EM | 0010 | Word Address |
| Extension Data Memory FM | FM | 0011 | Word Address |
| Temporary Data Memory | TM | 0001 | Word Address |
| Control Memory | CM | 0002 | Word Address |
| Index Register | Z | 0003 | Word Address |
| Digital Trimming Machine | TRM | 0064 | Double Word Address |
| High-speed Counter (Current Value) | CTH | 0065 | Double Word Address |
| High-speed Counter Comparator (Setting Value) | CTC | 0066 | Double 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 error occurs. Nodename is a title of the External Device set with GP-Pro EX. (Initial value [PLC1]) |
| Error Message | Displays messages related to the error which occurs. |
| Error Occurrence Area | <p>Displays IP address or device address of the External Device where error occurs, or error codes received from the External Device.</p> <p>NOTE</p> <ul style="list-style-type: none"> • IP address is displayed such as "IP address(Decimal): MAC address(Hex)". • Device address is displayed such as "Address: Device address". • Received error codes are displayed such as "Decimal[Hex]". |

Display Examples of Error Messages

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

NOTE

- Please refer to the manual of External Device for more detail of received error codes.
- Please refer to "When an error message is displayed (Error code list)" of "Maintenance/Troubleshooting" for a common error message to the driver.

◆ Error Code List of External Device

| Error Code (HEX) | Error Description |
|------------------|---|
| 02 | Executed illegal access. <ul style="list-style-type: none"> •Wrote in the write disable device. •Accessed the nonexistent device or address. |
| 04 | Tried to communicate in the communication baud rate not supported by the External Device. |
| 31 | Accessed the device not defined as device in the External Device. *1 |
| 0B | Performed monitor read with the monitor unregistered. |

*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.