

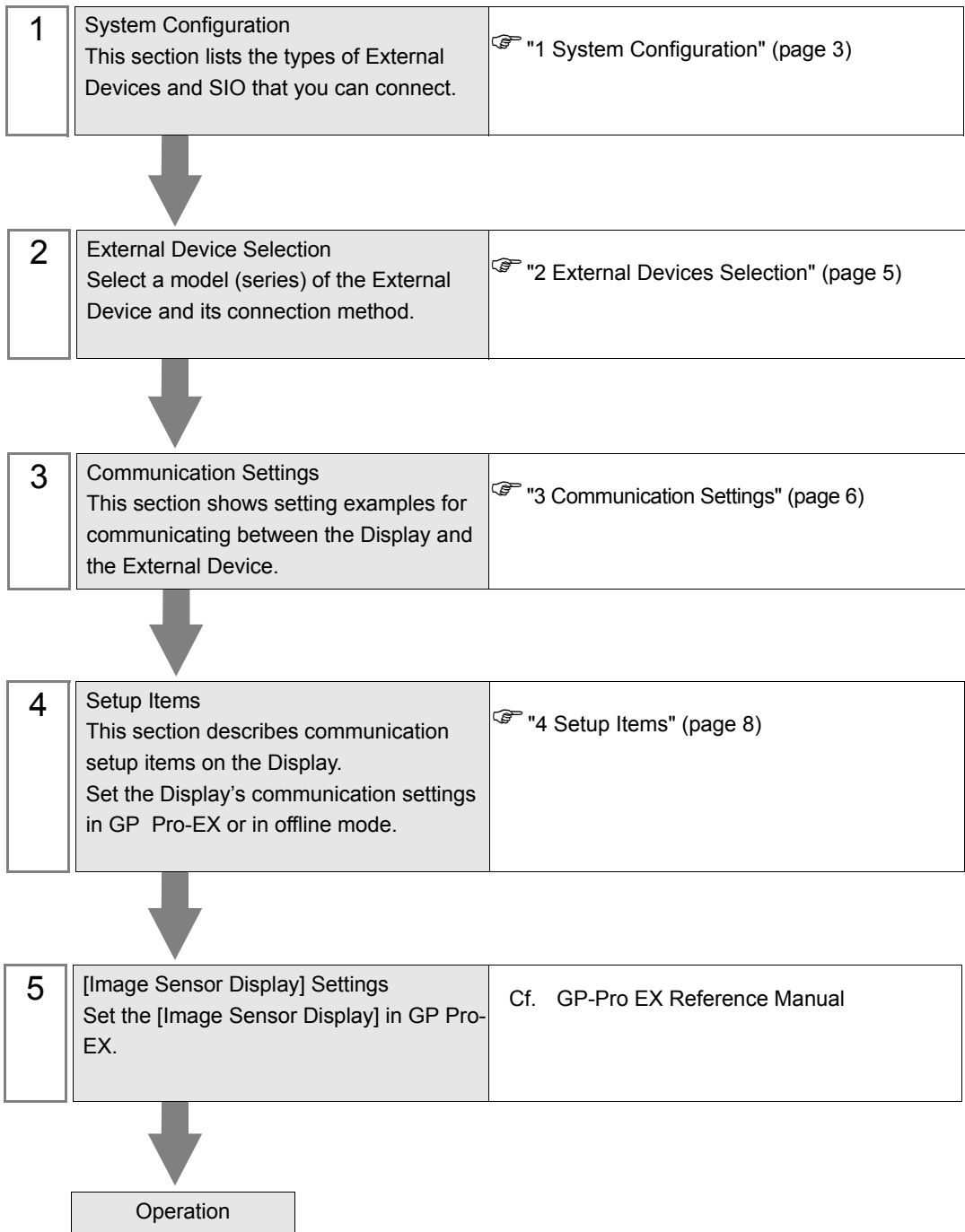
In-Sight Vision Systems Driver

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Introduction

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

In this manual, connection procedures are described in the sections identified below.



1 System Configuration

The following section shows system configurations for connecting Cognex Corporation External Device and the Display.

Series	CPU	Link I/F	SIO Type	Setting Example
In-Sight 7000 Series Vision Systems		Ethernet port on the External Device	Ethernet (TCP)	"Setting Example 1" (page 6)
In-Sight 5000 Series Vision Systems		Ethernet port on the External Device	Ethernet (TCP)	"Setting Example 1" (page 6)
In-Sight Micro Vision Systems		Ethernet port on the External Device	Ethernet (TCP)	"Setting Example 1" (page 6)

NOTE

- This driver does not support GP-4100 series and LT3000 series.
- Among GP-3000 Series units, you can use this driver with GP-3300/3400/3500/3600 series Rev 4 or later units (excluding multi-media class).
- Depending on the image size (resolution) used with your External Device, set up the maximum number of image sensor display parts on one screen as follows.

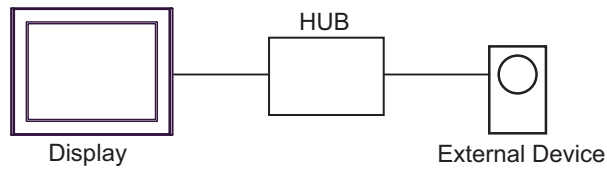
Display	Maximum image size is 640 x 480	Maximum image size is 800 x 600	Maximum image size is 1280 x 1024
GP3000 GP-4*01TM	3	2	N/A
GP4000*1 LT-4*01TM SP5000 IPC PC/AT	3	3	1

*1 Except GP-4100 series and GP-4*01TM

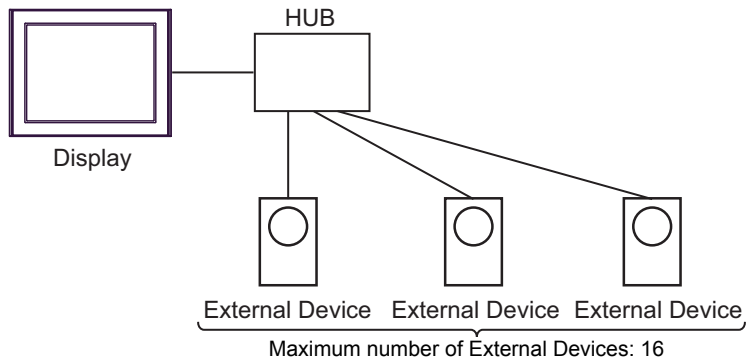
- With high-resolution or color images that require large amounts of data, the image refresh rate becomes slower. You can speed up the screen refresh rate by reducing the image display size from the Individual Device Settings dialog box's [Resolution] field, or the device address's IMAGE/Downscale feature.
- This driver only supports External Devices that can use In-Sight Explorer.
- The firmware version for the External Device should be version 4.9 or later.
If the firmware version is not version 4.9 or later, the image may display as either noise (snow) or become blacked out. Additionally, if the External Device becomes disabled while the image is displayed or communication is interrupted, the image may display as either noise (snow) or become blacked out.
If the image displays as noise (snow) or become blacked out, check the firmware version and cable connection.

■ Connection Configuration

◆ 1:1 Connection



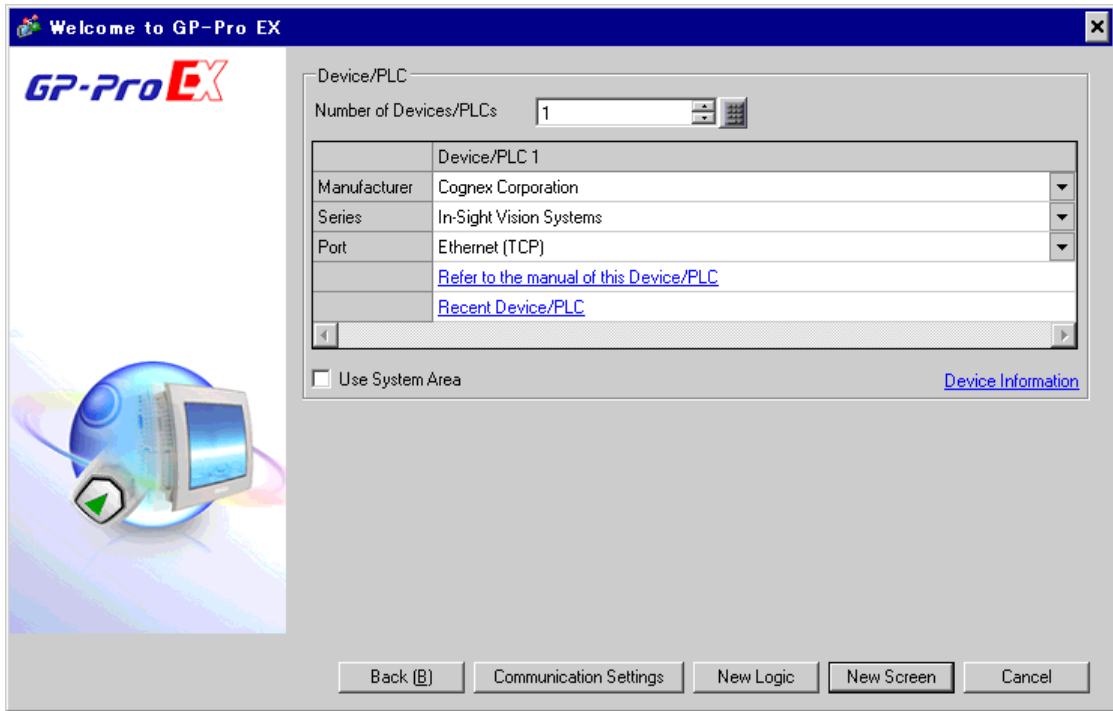
◆ 1:n Connection

**NOTE**

- Two or more Displays cannot be connected to one External Device.
- You cannot use Cognex Corporation configuration tools such as In-Sight Connection Manager or In-Sight Explorer to connect the External Device and Display.

2 External Devices Selection

Select the External Device to be connected to the Display.



Setup Items	Setup Description
Number of Devices/PLCs	Enter an integer from 1 to 4 to define the number of Devices/PLCs to connect to the display.
Manufacturer	Select the manufacturer of the External Device to connect. Select "Cognex Corporation".
Series	Select the External Device model (series) and the connection method. Select "In-Sight Vision Systems". In System configuration, make sure the External Device you are connecting is supported by "In-Sight Vision Systems". ☞ "1 System Configuration" (page 3)
Port	Select the Display port to connect to the External Device.
Use System Area	Check this option to synchronize the system data area of the Display and the device (memory) of the External Device. When synchronized, you can use the External Device's ladder program to switch the display or display the window on the Display. Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)" This feature can also be set in GP-Pro EX or in the Display's offline mode. Cf. GP-Pro EX Reference Manual "System Settings [Display Unit] - [System Area] Settings Guide" Cf. Maintenance/Troubleshooting Guide "Main Unit - System Area Settings"

3 Communication Settings

This section provides communication setting examples recommended by Pro-face for communications between the Display and the External Device.

3.1 Setting Example 1

■ GP-Pro EX Settings

◆ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].

Device/PLC 1

Summary [Change Device/PLC](#)

Manufacturer Series Port

Text Data Mode [Change](#)

Communication Settings

Timeout (sec)

Retry

Wait To Send (ms)

Device-Specific Settings

Allowable Number of Devices/PLCs [Add Device](#)

No.	Device Name	Settings
1	PLC1	IP Address=192.168.000.001,Telnet Port=23,Data Ch

◆ Device Setting

To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] . To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

Individual Device Settings

PLC1

Equipment Configuration | Image

IP Address

Telnet Port

User Name

Password

Data Channel Port

Individual Device Settings

PLC1

Equipment Configuration | Image

Offset X Y

Zoom

Down Scale

■ External Device Settings

The In-Sight Explorer tool configures the External Device's communication settings.

Refer to your External Device manual for communication setting details.

- 1 Start up the In-Sight Explorer tool.
- 2 Select [Add Sensor/Device to Network] from [System] menu to display [Add Sensor/Device to Network] dialog box.
- 3 Select the External Device from the list in the left.
- 4 Select "Use the Following Network Settings", and define the items as follows.


Setup Item	Setting Value
IP Address	192.168.0.1
Subnet Mask	255.255.255.0
Default Gateway	Optional
DNS Server	Optional
Domain Name	Optional

- 5 Click [Apply].

4 Setup Items

Set up the Display's communication settings in GP-Pro Ex or in the Display's offline mode.

Each parameter setting must match the External Device's settings.

 "3 Communication Settings" (page 6)

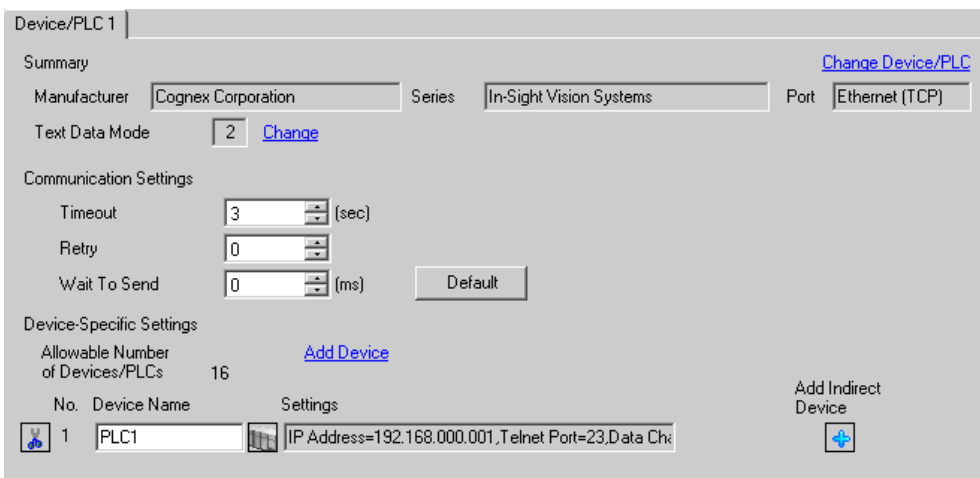
NOTE

- You need to set IP address on the Display in the offline mode of the Display.
Cf. Maintenance/Troubleshooting Guide "Ethernet Settings"

4.1 Setup Items in GP-Pro EX

■ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].




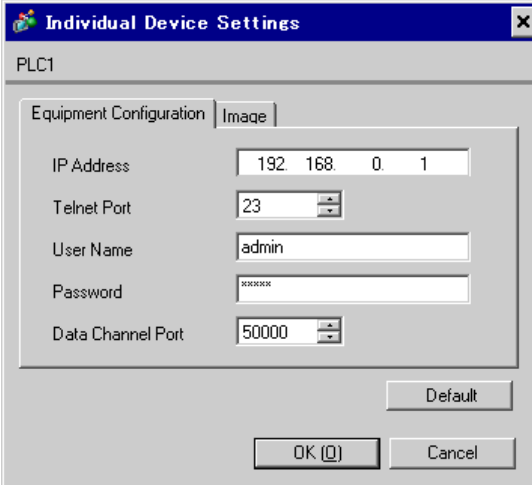
Setup Items	Setup Description
Timeout	Enter the time (seconds) for which the Display waits for the response from the External Device, from "1 to 127".
Retry	In case of no response from the External Device, enter how many times the Display retransmits the command, from "0 to 255".
Wait To Send	Enter the standby time (milliseconds) from when the Display receives packets until it transmits the next command, from "0 to 255".

NOTE

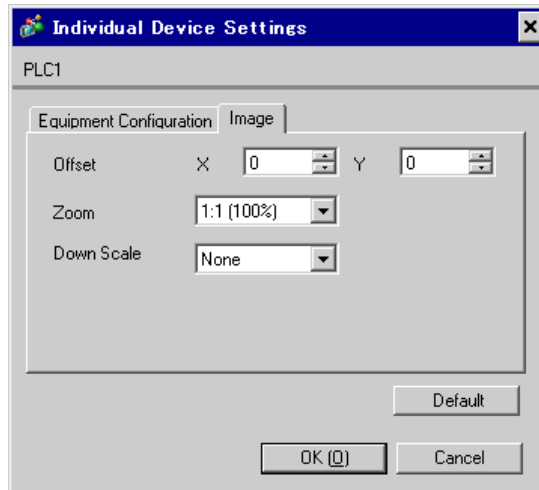
- Refer to the GP-Pro EX Reference Manual for Indirect Device.
Cf. GP-Pro EX Reference Manual "Changing the Device/PLC at Runtime (Indirect Device)"

■ Device Setting

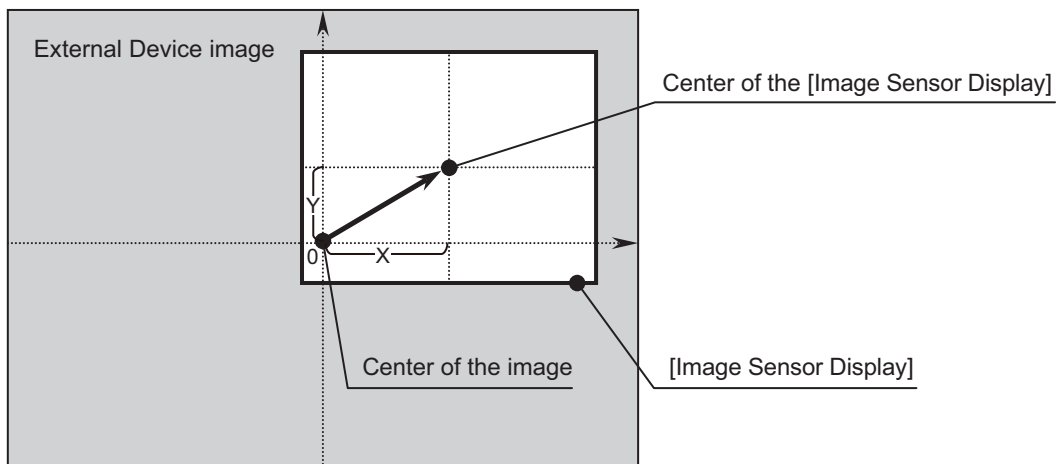
To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] . To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.



Setup Items	Setup Description
IP Address	Set the External Device's IP address. NOTE <ul style="list-style-type: none"> • Check with a network administrator for IP addresses. • Do not set duplicate IP addresses on the same network.
Telnet Port	Enter the port No. of the External Device from 1 to 65535.
User Name	Input the user name consisting of up to 15 one-byte characters to connect the External Device.
Password	Input the password consisting of up to 15 one-byte characters to connect the External Device.
Data Channel Port	Enter the port No. of the data channel from 1 to 65535.



Setup Items		Setup Description
Offset	X	Input a lateral offset value. The offset value is added to the External Device image center becoming the center of [Image Sensor Display]. When the image is smaller than the window, the set value becomes invalid.
	Y	Input a longitudinal offset value. The longitudinal value is added to the External Device image center becoming the center of [Image Sensor Display]. When the image is smaller than the window, the set value becomes invalid.
Zoom		Select an image zoom value to be displayed.
Down Scale		Select an image resolution.

**NOTE**

- Set the image size to be displayed on the Display in [Image Sensor Display]. Refer to the GP Pro-EX Reference Manual for details.
- Use IMAGE/OffsetX and IMAGE/OffsetY to change the display position during system operation.

"5 Supported Devices" (page 13)

4.2 Setup Items in Offline Mode

NOTE

- Refer to the Maintenance/Troubleshooting guide for information on how to enter offline mode and how to operate offline mode.

Cf. Maintenance/Troubleshooting Guide "Offline Mode"

- The number of the setup items to be displayed for 1 page in the offline mode depends on the Display in use. Please refer to the Reference manual for details.

■ Communication Settings

To display the setting screen, from [Peripheral Settings] in offline mode, touch [Device/PLC Settings]. Touch the External Device you want to set from the display list.

Comm.	Device			
In-Sight Vision Systems			[TCP]	Page 1/1
Timeout(s)			3	▼ ▲
Retry			0	▼ ▲
Wait To Send(ms)			0	▼ ▲
	Exit		Back	2011/03/03 04:59:14

Setup Items	Setup Description
Timeout	Enter the time (seconds) 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 (milliseconds) from when the Display receives packets until it transmits the next command, from "0 to 255".

■ Device Setting

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 [Device].

Comm.	Device			
In-Sight Vision Systems		[TCP]	Page 1/1	
Device/PLC Name	[PLC1]			
IP Address	[192 168 0 1]			
Telnet Port	[23]			
User Name	[admin]			
Password	[admin]			
Data Channel	[50000]			
Exit		Back		2011/03/03 04:59:23

Setup Items	Setup Description
IP Address	Set the External Device's IP Address. NOTE <ul style="list-style-type: none"> • Check with a network administrator about IP address. • Do not set the duplicate IP address in the same network.
Telnet Port	Enter the port No. of the External Device from 1 to 65535.
User Name	Input the user name consisting of up to 15 one-byte characters to connect the External Device.
Password	Input the password consisting of up to 15 one-byte characters to connect the External Device.
Data Channel	Enter the port No. of the data channel from 1 to 65535.

5 Supported Devices

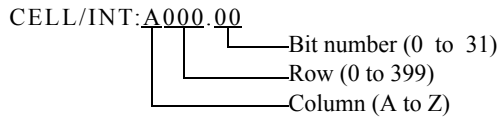
The following table shows the supported range of device addresses. Please note, the supported device address ranges depend on your External Device. Please check your External Device's manual for the correct device address ranges.

 : This address can be specified as system data area.

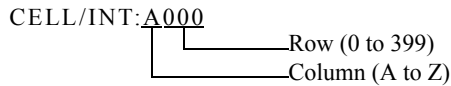
Device	Bit Address	Word Address	32 bits	Notes
IMAGE	IMAGE/SoftPause IMAGE/HardPause IMAGE/ImageKnown IMAGE/CommunicationGood	-	-	
	-	IMAGE/OffsetX IMAGE/OffsetY IMAGE/ZoomIn IMAGE/ZoomOut IMAGE/SaveVolume IMAGE/SaveIndex IMAGE/Downscale	-	
CELL/INT	CELL/INT:A000.00 - CELL/INT:Z399.31	CELL/INT:A000 - CELL/INT:Z399	L/H *1	
CELL/FLOAT CELL/STR	-	CELL/FLOAT:A000 - CELL/FLOAT:Z399 CELL/STR:A000 - CELL/STR:Z399	L/H *1	
SYSTEM	SYSTEM/Online SYSTEM/Live SYSTEM/SetEvent0 SYSTEM/SetEvent1 SYSTEM/SetEvent2 SYSTEM/SetEvent3 SYSTEM/SetEvent4 SYSTEM/SetEvent5 SYSTEM/SetEvent6 SYSTEM/SetEvent7 SYSTEM/SetEvent8	-	-	
	-	SYSTEM/JobFileName SYSTEM/StoreJobFile SYSTEM/StartupJobFile SYSTEM/ReturnCode	-	

*1 Contents of address are shown below.

Example 1: Bit address



• Example 2: Word address



NOTE

- You can only set the Read Area Size for the system area available to use in the External Device. Please refer to the GP Pro-EX Reference Manual for Read Area Size.
Cf. GP Pro-EX Reference Manual "LS Area (Direct Access Method Area)"
- Refer to the precautions on manual notation for icons in the table.
 "Manual Symbols and Terminology"

Register

- IMAGE Device

Bit Register

Register Name	Range	Read/Write	Notes
IMAGE/SoftPause	0 to 1	Read/Write	0: Display 1: Soft Pause
IMAGE/HardPause	0 to 1	Read/Write	0: Display 1: Hard Pause Executing a hard pause closes the connection with the External Device.
IMAGE/ImageKnown	0 to 1	Read/Write	0: Not received 1: Received When an image is received, "1" is set.
IMAGE/CommunicationGood	0 to 1	Read	0: Connection with the External Device is closed. 1: Connection with the External Device is open.

Word Register

Register Name	Range	Read/Write	Notes
IMAGE/OffsetX	16-bit signed integer	Read/Write	Write: Lateral offset setting value Read: Lateral offset current value The offset value is added to the External Device image center becoming the center of [Image Sensor Display]. When the image is smaller than the window, the set value becomes invalid.
IMAGE/OffsetY	16-bit signed integer	Read/Write	Write: Longitudinal offset setting value Read: Longitudinal offset current value The longitudinal value is added to the External Device image center becoming the center of [Image Sensor Display]. When the image is smaller than the window, the set value becomes invalid.

Register Name	Range	Read/Write	Notes
IMAGE/ZoomIn	1 to 32	Read/Write	Magnification for zooming in. This is valid only when the IMAGE/ZoomOut is "1".
IMAGE/ZoomOut	1 to 4	Read/Write	1: Use IMAGE/ZoomIn 2: 3:4 (75%) 3: 1:2 (50%) 4: 1:4 (25%)
IMAGE/SaveVolume	0 to 2	Read/Write	0: The image is not saved. 1: The image is saved in the CF card. 2: The image is saved in the USB device. Setting is "0", after saving the image. If set the value other than 0 to 2, setting is "0".
IMAGE/SaveToIndex	16-bit unsigned integer	Read/Write	Integer is added to end of the file name. Set before saving the image. Example: CG00025.bmp
IMAGE/Downscale	0 to 2	Read/Write	0: The image is not reduced. 1: The image is reduced to the gray scale (1:2 (50%)). 2: The image is reduced to the gray scale (1:4 (25%)).

- CELL Register
Word Register

Register Name	Range	Notes
CELL/INT	-9,999,999 to 9,999,999	To write to cell, EditInt, Checkbox or ListBox control must be included in job file cell.
CELL/FLOAT	-9,999,999.000 to 9,999,999.000	To write to cell, EditFloat control must be included in job file cell.
CELL/STR	1 to 255 one-byte characters	To write to cell, EditString control must be included in job file cell.

- SYSTEM Device

Register Name	Type	Range	Read/Write	Notes
SYSTEM/Online	bit	0 to 1	Read/Write	0: External Device is switched to the offline mode. 1: External Device is switched to the on-line mode.
SYSTEM/Live	bit	0 to 1	Write	0: External Device live mode is turned off. 1: External Device live mode is turned on.
SYSTEM/SetEvent0 to SYSTEM/SetEvent8	bit	1	Write	SetEvent0 to SetEvent7: Pertinent software 0 to 7 is executed. Writing is disabled when the External Device is in the off-line mode. SetEvent8: An image is taken in to update the spread sheet.

Register Name	Type	Range	Read/Write	Notes
SYSTEM/ JobFileName	string	1 to 255 one-byte characters	Read/Write	Write: Active Job is set. Read: Active Job is displayed Writing is disabled when a job file name that is not registered in the External Device is set or the External Device is in the on-line mode.
SYSTEM/ StoreJobFile	string	1 to 255 one-byte characters	Write	The current active job is saved in a flash memory of the External Device using the set job file name. Set the job file name up to the extension (.JOB). Writing is disabled when the External Device is in the on-line mode.
SYSTEM/ StartupJobFile	string	1 to 255 one-byte characters	Read/Write	Write: A job to be loaded at startup is set. The External Device is started in the on-line mode. Read: A job to be loaded at startup is displayed. Set the job file name up to the extension (.JOB). Writing is disabled when the External Device is in the on-line mode.
SYSTEM/ReturnCode	INT16	16-bit signed integer	Read/Write	Stores the return value of the write command to the SYSTEM device executed last. For return values of each command, refer to the configuration tool's online help.

6 Device Code and Address Code

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

Device	Device Name	Device Code (HEX)	Address Code
IMAGE	-	0000	60006 : OffsetX 60007 : OffsetY 60008 : ZoomIn 60009 : ZoomOut 60011 : SaveVolume 60012 : SaveIndex 60013 : Downscale
CELL/INT	-	0040	Value of Column + Row \times 26 ^{*1}
CELL/FLOAT	-	0042	Value of Column + Row \times 26 ^{*1}
CELL/STR	-	0044	Value of Column \times 256 + Row \times 16384 ^{*1}
SYSTEM	-	0050	0 : ReturnCode (integer number) 100 : JobFileName (character string) 300 : StoreJobFile (character string) 500 : StartupJobFile (character string)

*1 The value of column and row is as follows.
Column: A=0, B=1 to Z=25
Row: 0 to 399

7 Error Messages

Error messages appear on the Display in the following format: "No.: Device Name: Error Message (Error Occurrence Area)". Error descriptions are shown below.

Item	Description
No.	Error number
Device Name	Name of the External Device where the error occurred. Device/PLC name is the title of the External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays the error message.
Error Occurrence Area	<p>Displays the IP Address or the External Device's device address where the error occurred; also, may display External Device error codes.</p> <p>NOTE</p> <ul style="list-style-type: none"> • IP addresses display as "IP address (Decimal): MAC address (Hex)". • Error codes display as "Decimal [Hex]". • Device address displays as "Address: Device address".

Examples of Error Messages

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

NOTE

- Refer to your External Device manual for details on received error codes.
- Refer to "Display-related errors" in "Maintenance/Troubleshooting Guide" for details on the error messages common to the driver.

■ Error Messages Unique to External Device

Message ID	Error Message	Description
RHxx128	(Node Name): Login Error: User Name or Password is invalid.	Either the user name or the password set in [Individual Device Settings] does not match the user name or password in the External Device. Change the password or username settings in [Individual Device Settings].
RHxx129	(Node Name): Cell read failed (cell).	The External Device acknowledged the CELL read failure. Check the CELL address that was set in the GP-ProEX.
RHxx130	(Node Name): Cell write failed (cell).	The External Device acknowledged the CELL write failure. Check the setting in the External Device to see if one edit control is included in the CELL and the data type matches.
RHxx131	(Node Name): Write attempt to a read only device failed	The External Device acknowledged the write failure. Check that the register to be written is not read only.

Message ID	Error Message	Description
RHxx132	(Node Name): Read attempt from a write only device failed	The External Device acknowledged the read failure. Check that the register to be read is not write only.
RHxx133	(Node Name): Login failed	The data channel connection exceeds the maximum. Check the number of data channel connection to the External Device.
RHxx134	(Node Name): File name read failed (Device Name).	JobFileName: A job file is not set. Check that the job file is set. StartupJobFile: A job file name with 233 characters or more is set. Change the job file name with 232 characters or less.