

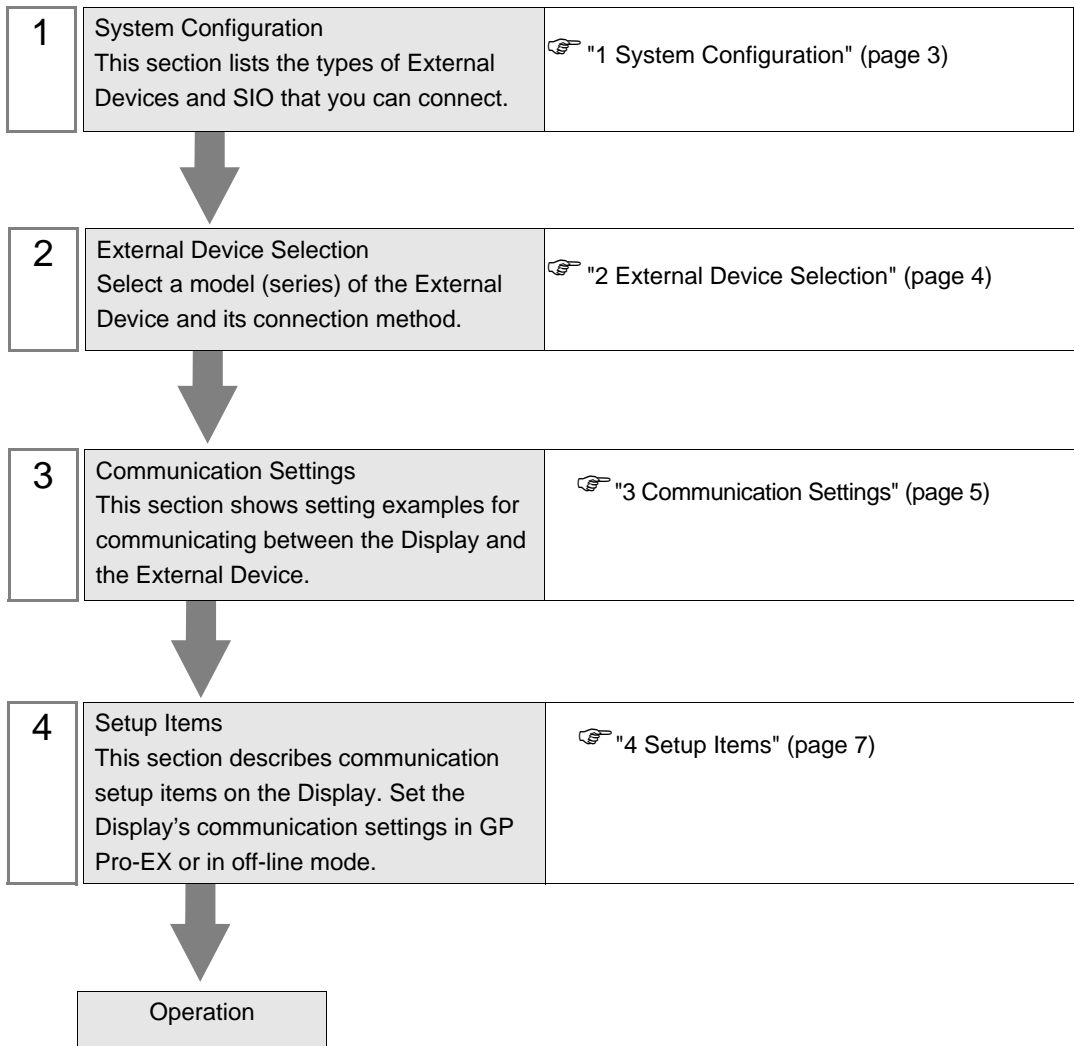
# High Speed Ethernet Server Driver

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## Introduction

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

In this manual, the connection procedure will be described in the sections identified below:



# 1 System Configuration

The system configuration in the case when the External Device of Yaskawa Electric Corporation and the Display are connected is shown.

Series	CPU	Link I/F	SIO Type	Setting Example
DX100	DX100	LAN port on the controller	Ethernet (UDP)	"Setting Example 1" (page 5)
FS100	FS100	Ethernet port on the controller	Ethernet (UDP)	"Setting Example 1" (page 5)
DX200	DX200	LAN port on the controller	Ethernet (UDP)	"Setting Example 1" (page 5)
FS100L	FS100L	Ethernet port on the controller	Ethernet (UDP)	"Setting Example 1" (page 5)

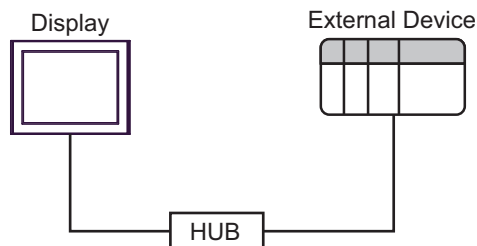
## NOTE

- Available Classes vary depending on the software version of the External Device. Please contact the Yaskawa Electric Corporation for the more information.

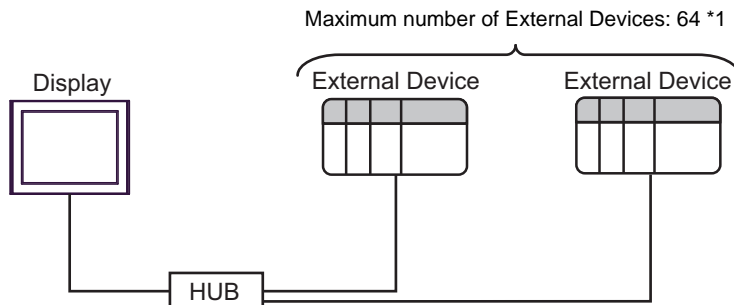
YASKAWA Electric Corporation  
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## ■ Connection Configuration

- 1:1 Connection



- 1:n Connection

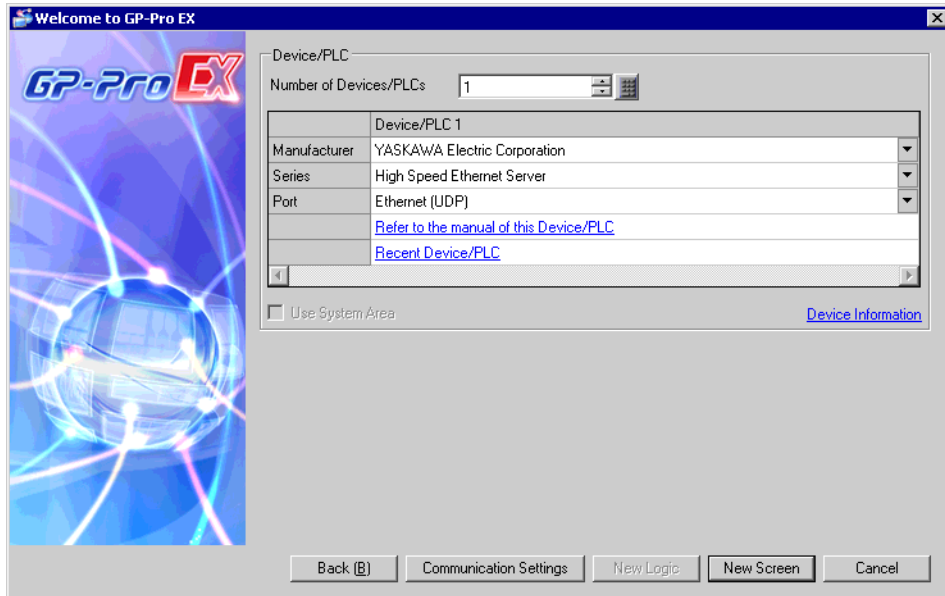


\*1 When 33 or more External Devices are connected, it is necessary to check [Increase allowable number of Devices/PLCs].

☞ "4.1 Setup Items in GP-Pro EX" (page 7)

## 2 External Device Selection

Select the External Device to be connected to the Display.



Setup Items	Setup Description
Number of Devices/PLCs	Use an integer from 1 to 4 to enter the number of Devices/PLCs to connect to the display.
Manufacturer	Select the manufacturer of the External Device to be connected. Select "YASKAWA Electric Corporation".
Series	Select a model (series) of the External Device to be connected and connection method. Select "High Speed Ethernet Server". Check the External Device which can be connected in "High Speed Ethernet Server" in system configuration. ☞ "1 System Configuration" (page 3)
Port	Select the Display port to be connected to the External Device. Select "Ethernet (UDP)".
Use System Area	Not available in this driver.

## 3 Communication Settings

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

##### ◆ Communication Settings

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


The screenshot displays the 'Device/PLC 1' configuration window. It is divided into several sections:
 

- Summary:** Manufacturer: YASKAWA Electric Corporation, Series: High Speed Ethernet Server, Port: Ethernet (UDP). A 'Change Device/PLC' link is visible.
- Text Data Mode:** Set to 4, with a 'Change' link.
- Communication Settings:** Port No.: 1024 (with 'Auto' checked), Timeout: 20 (sec), Retry: 2, Wait To Send: 0 (ms). A 'Default' button is present.
- Device-Specific Settings:** Allowable Number of Devices/PLCs: 32. Links for 'Add Device' and 'Increase Allowable Number of Devices/PLCs' are provided.
- Device List:** A table with columns 'No.', 'Device Name', and 'Settings'. It contains one entry: '1', 'PLC1', and 'IP Address=192.168.255.001,Port No.=10040,Use Mu'. There is an 'Add Indirect Device' button on the right.

#### NOTE

- Because it may take some time for file operation processing, "20" (sec.) is specified for a default of "Timeout."  
Even if the External Device does not respond, therefore, it takes 20 seconds until the Timeout is detected.  
Adjust the Timeout value while checking the actual communication status.

## ◆ 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.



### NOTE

- Default IP address of the External Device is as follows.  
DX100 series: 192.168.255.1  
FS100 series: 10.0.0.2
- Check with a network administrator about IP address.
- Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

## ■ Settings of External Device

Please contact the Yaskawa Electric Corporation for the communication settings of the External Device.

Check the set IP address in the next procedure.

- 1 Change the security mode to "management mode".
- 2 Select [NETWORK SERVICE] from [SYSTEM INFO] of main menu.

## 4 Setup Items

Set up the Display's communication settings in GP Pro-EX or in the Display's off-line mode.

The setting of each parameter must match that of the External Device.

☞ "3 Communication Settings" (page 5)

### NOTE

- Set the Display's IP address in off-line mode.

Cf. Maintenance/Troubleshooting Guide "Ethernet Settings"

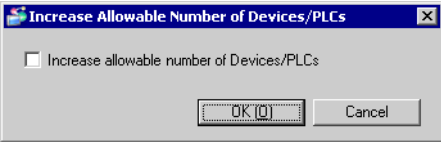
### 4.1 Setup Items in GP-Pro EX

#### ■ Communication Settings

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

The screenshot shows the 'Device/PLC 1' configuration window. It is divided into several sections:

- Summary:** Manufacturer: YASKAWA Electric Corporation, Series: High Speed Ethernet Server, Port: Ethernet (UDP). There is a 'Change Device/PLC' link.
- Text Data Mode:** Set to 4, with a 'Change' link.
- Communication Settings:** Port No. (1024), Timeout (20 sec), Retry (2), and Wait To Send (0 ms). There is an 'Auto' checkbox checked and a 'Default' button.
- Device-Specific Settings:** Allowable Number of Devices/PLCs: 32. There are links for 'Add Device', 'Increase Allowable Number of Devices/PLCs', and 'Add Indirect Device'.
- Table:** A table with columns 'No.', 'Device Name', and 'Settings'. It contains one entry: No. 1, Device Name 'PLC1', and Settings 'IP Address=192.168.255.001,Port No.=10040,Use Mu'.


Setup Items	Setup Description
Port No.	Enter a port number of the Display, using 1024 to 65535. Check into [Auto], and a port number is set automatically.
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.
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.
Increase Allowable Number of Devices/PLCs	When clicked, the [Increase Allowable Number of Devices/PLCs] dialog box is displayed. When you check [Increase allowable number of Devices/PLCs], the settings for [Allowable Number of Devices/PLCs] can be extended to "64". 

### 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 IP address of the External Device. <b>NOTE</b> <ul style="list-style-type: none"> <li>Check with a network administrator about IP address. Do not set the duplicate IP address.</li> </ul>
Port No.	Enter a port number of the External Device, using 1024 to 65534.
Use Multiple Read / Write Command	If read / write to the multiple points at the same time, select the [Use Multiple Read / Write Command] check box.

- Enter a check in the box of [Use Multiple Read/Write Command], and the following changes are made.

**NOTE**

- When a check is removed, only the class ID is changed. The device that was changed to "undefined" by entering a check stays "undefined" even if the check is removed.

Class Name	Class ID		Instance	Attribute		Bit	
	Before the change (Single Read / Write)	After the change (Multiple Read / Write)		Before the change	After the change	Before the change	After the change
I/O data	0x078	0x300	No change	00 - 63	0	00 - 07	No change
						More than 08	undefined
Register data	0x079	0x301	No change	00 - 63	0	00 - 07	No change
						More than 08	undefined
B	0x07A	0x302	No change	00 - 63	0	00 - 15	No change
						More than 16	undefined
I	0x07B	0x303	No change	00 - 63	0	00 - 15	No change
						More than 16	undefined



Class Name	Class ID		Instance	Attribute		Bit	
	Before the change (Single Read / Write)	After the change (Multiple Read / Write)		Before the change	After the change	Before the change	After the change
D	0x07C	0x304	No change	00 - 63	0	No change	
R	0x07D	0x305	No change	00 - 63	0	No change	
S	0x07E	0x306	No change	0	1	No change	
				1 - 4	No change		
				More than 5	undefined		
P	0x07F	0x307	No change	0	1	No change	
				1 - 13	No change		
				More than 14	undefined		
BP	0x080	0x308	No change	0	1	No change	
				1 - 9	No change		
				More than 10	undefined		
EX	0x081	0x309	No change	0	1	No change	
				1 - 9	No change		
				More than 10	undefined		

## 4.2 Setup Items in Offline Mode

### NOTE

- Please refer to Maintenance/Troubleshooting Guide for more information on how to enter offline mode or about operation.  
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, touch [Device/PLC Settings] from [Peripheral Settings] in offline mode. Touch the External Device you want to set from the displayed list.

Comm.	Device			
High Speed Ethernet Server			[UDP]	Page 1/1
Port No.	<input type="radio"/> Fixed <input checked="" type="radio"/> Auto		1024	▼ ▲
Timeout(s)			3	▼ ▲
Retry			2	▼ ▲
Wait To Send(ms)			0	▼ ▲
	Exit		Back	2012/05/15 13:16:37

Setup Items	Setup Description
Port No.	Enter a port number of the Display, using 1024 to 65535. Check into [Auto], and a port number is set automatically.
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.
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.

## ■ 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			
High Speed Ethernet Server		[UDP]	Page 1/1	
Device/PLC Name		PLC1		
IP Address		0	0	0
Port No.		10040		
Multiple Read/Write		ON		
Exit		Back		2012/05/15 13:16:42

Setup Items	Setup Description
IP Address	Set IP address of the External Device. <b>NOTE</b> <ul style="list-style-type: none"> <li>Check with a network administrator about IP address. Do not set the duplicate IP address.</li> </ul>
Port No.	Enter a port number of the External Device, using 1024 to 65534.
Multiple Read / Write	Display whether perform the Multiple Read / Write.

## 5 Supported Devices

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 connecting equipment.

Enter the External Device address in the dialog box below.

- For word addresses

Class (Command number)	Select the class of the object to send messages. If [Direct Input] is selected, input a class code of "0000 - FFFF" (hexadecimal).
Instance (Data array number)	Input the instance number (a decimal from 00000 - 16383) that defines which class instance receives the message.
Attribute (Data element number)	Input the value (a decimal from 00 - 63) that defines which attribute of the instance is accessed.
Control Address	Depending on the class, a control address will be needed that instructs the data target for expansion, etc. In such an event, input the foremost position of the control address with a decimal from 0000 - 4095. Only the user area can be designated For classes that do not require control addresses, this value is ignored.

### NOTE

- If "Set as Default Value" is checked, when a new address is input the configured value will be displayed as the default value.

- For bit addresses

Class (Command number)	Select the class of the object to send messages. If [Direct Input] is selected, input a class code of "0000 - FFFF" (hexadecimal).
Instance (Data array number)	Input the instance number (a decimal from 00000 - 16383) that defines which class instance receives the message.
Attribute (Data element number)	Input the value (a decimal from 00 - 63) that defines which attribute of the instance is accessed.
Control Address	Depending on the class, a control address will be needed that instructs the data target for expansion, etc. In such an event, input the foremost position of the control address with a decimal from 0000 - 4095. Only the user area can be designated For classes that do not require control addresses, this value is ignored.
Bit Number	Input the bit position you want to get / write via a decimal (00 - 31) from the word data designated to the attribute.

**NOTE**

- If "Set as Default Value" is checked, when a new address is input the configured value will be displayed as the default value.

Device	Bit address	Word address	32 bits	Comments
Class Instance Attribute Control Bit	Class: 0000h - FFFFh Instance: 00000 - 16383 Attribute: 00 - 63 Control address: 0000 - 4095 Bit: 0 - 31	Class: 0000h - FFFFh Instance: 00000 - 16383 Attribute: 00 - 63 Control address: 0000 - 4095	<div style="border: 1px solid black; padding: 2px; display: inline-block;">L/H</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block;">H/L</div> *1	*2

- \*1 The high and low relationship of the stored data varies depending on the External Device. Refer to your External Device manual for details.
- \*2 The usable system area designation on the connection device is only the load area size. The usable size for the load area differs depending on the object designated.

**NOTE**

- Please refer to the manual of the External Device for more details of the device. The device name notation differs in the manual of the GP-Pro EX and the External Device.

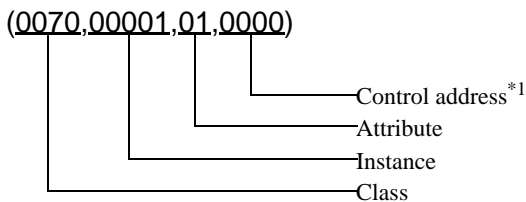
GP-Pro EX	External Device
Class	Command No.
Instance	Instance
Attribute	Attribute

- Not supported in sequential address designation / indirect address designation / offset address designation. Data behavior, when designated, is indeterminate. (The address increment and changed portion is reflected in Control)
- Please refer to the precautions on manual notation for icons in the table.

☞ "Manual Symbols and Terminology"

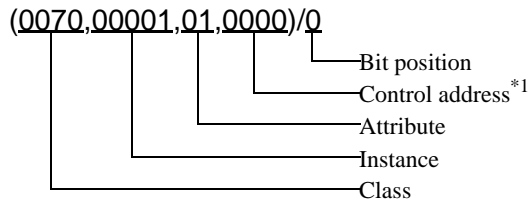
The address input area is shown below.

- For word addresses



\*1 Not used if the command type is robot control (Class other than 0x04C0 to 0x04C3). (0000: reserved)

- For bit addresses



\*1 Not used if the command type is robot control (Class other than 0x04C0 to 0x04C3). (0000: reserved)

## ■ File Control Commands

File control command are commands for sending and receiving with a robot controller in file units.

Designate the following classes and execute.

Process	Class	Data direction
File read	0x4C0	External Device → Display
File write	0x4C1	Display → External Device
File list	0x4C2	External Device → Display
File delete	0x4C3	Display → External Device

### NOTE

- Class 0x4C0 to 0x4C3 is Virtual Class. The class of corresponding External Device is 0x0.
- File control commands can only execute D script.
- The control address of the file control command can specify only USR area. (USR0000 - USR4095)

### • File Read

Loads the designated file from the robotic controller into Display.

The loaded file data is either saved on a external storage or stored in a Display internal device.

### File Type and Structure

The following are the types of files for loading.

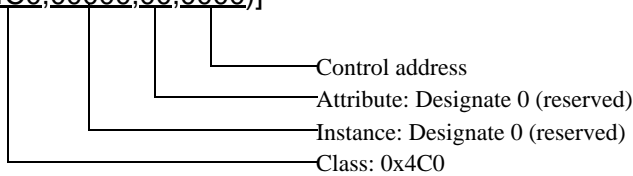
File Type	Data to read
Job program files (*JBI)	Extracts the "NOP" - "END" range from the job program file that is read out.
Tool info files (TOOL.CND)	Extracts information about Tool 0 - Tool 63. Tool data is read out for the 15 items of TOOL Name and Data0 - Data13 for each Tool number.
IO comment files (IONAME.DAT)	Reads out comments in 4-bit units.
Text files (*PRM,*LST)	Saves data that is read out in an as-is format. The starting read line and the number of read lines can be designated. (Up to CRLF is counted as 1 line)
Binary files	Saves data that is read out in an as-is format. Cannot designate the starting read line and the number of read lines.
One time data backup (CMOSBK.BIN)	Saves data that is read out in an as-is format.



## File Read Command

Inputs commands directly from D script.

[w:[PLC1](04C0,00000,00,0000)]



## Control address

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location <sup>*1*2</sup>	0: Memory, 1: CF/SD, 3: USB
+0003	File type	1: Job program, 2: Tool info file, 3: IO comment file, 4: Text file, 5: Binary file, 6: One time data backup
+0004	Starting address	USER area address for the output destination
+0005	Starting line <sup>*3</sup>	File list output starting line 0 - 4999 If a line is designated where no data exists, the output result will be filled with 0x00.
+0006	Character count	Maximum number of characters on each line Filled with 0x00 during overflow. Excess is truncated.
+0007	Number of output lines	Number of output file names 1 - 5000 If a line is designated where no data exists, the output result will be filled with 0x00.
+0008 - +0025	File name	Load file name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count. Also used as the file name when saving to CF
+0026	Folder name	Path name of save location (Max. 64 characters) Variable length Set 0x00 at the end of the character string. Designated when saving to CF or loading from CF into controller. (There is no concept of the directory in the load target controller.)

\*1 The usable external storage varies depending on the Display. Refer to the Display manual for details.

\*2 Saving to external storage is available only select [Binary file] or [One time data backup] in the [File type]. Unable to save in other file types. In addition, [One time data backup] will not be able to save on memory.

\*3 Starting line: Designate the file starting line number (0 - ) when storing in GP internal memory.

\* The CRLF in the file is used as the line delimiter.

However, the line numbers when Tool info is selected in [Type] are as follows.

Tool info: Tool number designation (0 - 63)

0001 - 0015: Tool number 0

0001: Tool Name (Text data 20 bytes)

0002: Data0 (2 words [float 32-bit])

:

0015: Data13 (2 words [float 32-bit])

0101 - 0115: Tool number 1

0201 - 0215: Tool number 2

:

0301 - 0315: Tool number 3

6301 - 6315: Tool number 63

**NOTE**

- When displaying Data0 -, a [Signed Float 32-bit] is necessary.

Settings by file type

Job file (memory)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location	0: Memory
+0003	File type	1: Job program
+0004	Starting address	USER area address for the output destination
+0005	Starting line	Ignored (0 reserved)
+0006	Character count	Maximum number of characters on each line Filled with 0x00 during overflow. Excess is truncated
+0007	Number of output lines	Ignored (0 reserved)
+0008 - +0025	File name	File name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count.
+0026	Folder name	Ignored

## Tool info file (memory)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location	0: Memory
+0003	File type	2: Tool info file
+0004	Starting address	USER area address for the output destination
+0005	Starting line	Starting Tool number 0 - 63 If a number is designated where no data exists, the output result will be filled with 0x00.
+0006	Character count	Ignored (20-byte reserved) If a number is designated where no data exists, the output result will be filled with 0x00. Overflow Excess is truncated.
+0007	Number of output lines	Number of tools to load 1 - 64 If a number is designated where no data exists, the output result will be filled with 0x00.
+0008 - +0025	File name	Ignored (TOOL.CND reserved)
+0026	Folder name	Ignored

## IO comment file (Memory)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location	0: Memory
+0003	File type	3: IO comment file
+0004	Starting address	USER area address for the output destination
+0005	Starting line	Comment number 0 - (4bit/1unit) (Ex: IN#1 is in Line No.0 , IN#5 is in Line No.1) If a number is designated where no data exists, the output result will be filled with 0x00.
+0006	Character count	Maximum number of characters on each comment. If a number is designated where no data exists, the output result will be filled with 0x00. Overflow Excess is truncated.
+0007	Number of output lines	Load comment number 1 - (4bit/1unit) If a number is designated where no data exists, the output result will be filled with 0x00.
+0008 - +0025	File name	File name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count. (Ex: IONAME.DAT)
+0026	Folder name	Ignored

## Text file (memory)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location	0: Memory
+0003	File type	4: Text file
+0004	Starting address	USER area address for the output destination
+0005	Starting line	File list output starting line 0 - 4999 If a line is designated where no data exists, the output result will be filled with 0x00.
+0006	Character count	Maximum number of characters on each line Filled with 0x00 during overflow. Excess is truncated.
+0007	Number of output lines	Number of output file names 1 - 5000 If a line is designated where no data exists, the output result will be filled with 0x00.
+0008 - +0025	File name	File name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count.
+0026	Folder name	Ignored

## Binary file (memory)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location	0: Memory
+0003	File type	5: Binary file
+0004	Starting address	USER area address for the output destination
+0005	Starting line	Ignored (0 reserved)
+0006	Character count	Ignored (0 reserved)
+0007	Number of output lines	Ignored (0 reserved)
+0008 - +0025	File name	Load file name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count. Also used as the file name when saving to CF.
+0026	Folder name	Ignored

## Binary file (CF/SD/USB)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	Number of lines in the obtained file Protocol is updated after send is complete.
+0002	Save location	1: CF/SD, 3: USB
+0003	File type	5: Binary file
+0004	Starting address	Ignored (0 reserved)
+0005	Starting line	Ignored (0 reserved)
+0006	Character count	Ignored (0 reserved)
+0007	Number of output lines	Ignored (0 reserved)
+0008 - +0025	File name	Load file name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count. Also used as the file name when saving to CF.
+0026	Folder name	Path name of save location (Max. 64 characters) Variable length Set 0x00 at the end of the character string.

## One time data backup (CF/SD/USB)

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	Line count	File Size in kBytes (Max 64MB)
+0002	Save location	1: CF/SD, 3: USB
+0003	File type	6: One Time Data Backup
+0004	Starting address	Ignored (0 reserved)
+0005	Starting line	Ignored (0 reserved)
+0006	Character count	Ignored (0 reserved)
+0007	Number of output lines	Ignored (0 reserved)
+0008 - +0025	File name	Ignored (CMOSBK.BIN reserved)
+0026 -	Folder name	Path name of save location (Max. 64 characters) Variable length Set 0x00 at the end of the character string.

**NOTE**

- It may take some time to run the [One time data backup]. Please note that other tasks can not be performed because in [One time data backup].

### Example of D script execution

Read Job file (ABC.JBI) from controller and save to the root folder of CF card

```
[w:[#INTERNAL]USR01002]=1          // Save location : CF
[w:[#INTERNAL]USR01003]=1          // File type : JOB program

                                     // File name
[w:[#INTERNAL]USR01008]=0x4241     // AB
[w:[#INTERNAL]USR01009]=0x2E43     // C.
[w:[#INTERNAL]USR01010]=0x424A     // JB
[w:[#INTERNAL]USR01011]=0x0049     // I

                                     // Folder name
[w:[#INTERNAL]USR01026]=0x0000     // (NULL=root)

[w:[#INTERNAL]USR01000]=1          // Status : Run instruction

[t:0000]= [w:[PLC1](04C0,00000,00,1000)]#[t:0001]
```

- [t:0000] is a temporary address required to perform the file access. (Undefined value is set.)
- Set up the [t:0001] to "0".

- File Write

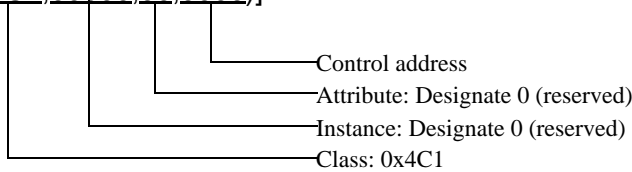
Writes the designated file to the robotic controller.

Designates the file data to be written and the file being stored in the CF card.

#### File Write command

Inputs commands directly from D script.

[w:[PLC1](04C1,00000,00,0000)]



#### Control address

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001 - +0018	File name	File name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count.
+0019	Folder name	Path name (Max. 64 characters) Variable length Set 0x00 at the end of the character string.

#### Example of D script execution

Read Job (\123\ABC.JBI) from CF card and write controller.

```
[t:0000]=[w:[PLC1](04C1,0000,00,1000)]#[t:0001]

                                     // File name
[w:[#INTERNAL]USR01001]=0x4241      // AB
[w:[#INTERNAL]USR01002]=0x2E43      // C.
[w:[#INTERNAL]USR01003]=0x424A      // JB
[w:[#INTERNAL]USR01004]=0x0049      // I

                                     // Folder name
[w:[#INTERNAL]USR01019]=0x3231      // 12
[w:[#INTERNAL]USR01020]=0x0033      // 3

[w:[#INTERNAL]USR01000]=1           // Status : Run instruction
[t:0000]=[w:[PLC1](04C1,0000,00,1000)]#[t:0001]
```

- [t:0000] is a temporary address required to perform the file access. (Undefined value is set.)
- Set up the [t:0001] to "0".



- File List

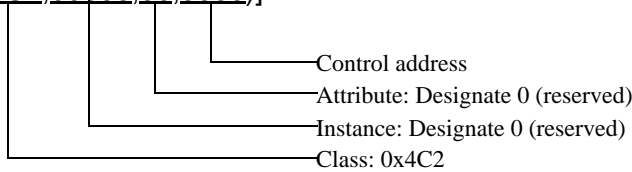
Loads a list of files stored in the robotic controller.

The loaded file list is stored in the designated address.

#### File List command

Inputs commands directly from D script.

[w:[PLC1](04C2,00000,00,0000)]



#### Control address

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001	List count	The number of obtained lists Number of files of the file type unit that was read out. (Not the number of outputs.)
+0002	File type	0: *.* 1: *.JBI      JBI file list 2: *.DAT      DAT file list 4: *.PRM      PRM file list 5: *.SYS      SYS file list 6: *.LST      LST file list
+0003	Starting address	USER area address for the output destination
+0004	Starting line	File list output starting line 0 - 4999 If a line is designated where no data exists, the output result will be filled with 0x00.
+0005	Character count	Maximum number of characters on each line Filled with 0x00 during overflow. Excess is truncated.
+0006	Output count	Number of output file names 1 - 5000 If a number of lines are designated where no data exists, the output result will be filled with 0x00.

#### Example of D script execution

Load 3 places from the 7th position, and store in USR10000 . with a file name of maximum 12 characters

```
[w:[#INTERNAL]USR01002]=1      // File type : JOB program
[w:[#INTERNAL]USR01003]=10000    // Starting address : JOB program
[w:[#INTERNAL]USR01004]=6       // Starting line
[w:[#INTERNAL]USR01005]=12      // Character count
[w:[#INTERNAL]USR01006]=3       // Output count
```

```
[w:[#INTERNAL]USR01000]=1       // Status : Run instruction
```

```
[t:0000]=[w:[PLC1](04C2,00000,00,1000)]#[t:0001]
```

- [t:0000] is a temporary address required to perform the file access. (Undefined value is set.)
- Set up the [t:0001] to "0".

When the file present is one of the following

ABC.JBI  
 ABCDE.JBI  
 ABCDEF.JBI  
 ABCDEFG.JBI  
 ABCDEFGH.JBI  
 ABCDEFGHI.JBI  
 123456.JBI  
 AA.JBI

Execution results

Address (USR)	0		1		2		3		4		5	
10000	2	1	4	3	6	5	J	.	I	B	0x0	0x0
10006	A	A	J	.	I	B	0x0	0x0	0x0	0x0	0x0	0x0
10012	0x0	0x0	0x0	0x0	0x0	0x0	0x0	0x0	0x0	0x0	0x0	0x0

- Data with a "0x" is a numerical value, and without is ASCII.

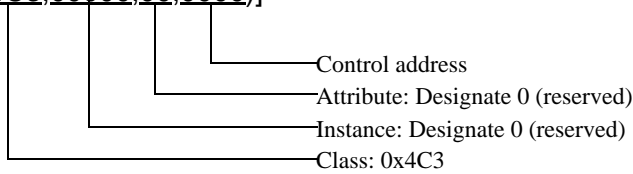
- File Delete

Deletes the file stored in the robotic controller.

#### File Delete command

Inputs commands directly from D script.

[w:[PLC1](04C3,00000,00,0000)]



#### Control address

Address	Item	Details
+0000	Status	0: Initial value, 1: Run instruction, 16: In-process, 256: Normal completion, 4096: Error
+0001 - +0018	File name	File name (Max. 32 characters + extension) 18 Word is reserved. Overflow digits (Byte units) are filled with 0x00, or 0x00 unnecessary when inputting maximum character count.

#### Example of D script execution

When deleting the file (ABC.JBI) designated with D script

```
// File name
[w:[#INTERNAL]USR01001]=0x4241 // AB
[w:[#INTERNAL]USR01002]=0x2E43 // C.
[w:[#INTERNAL]USR01003]=0x424A // JB
[w:[#INTERNAL]USR01004]=0x0049 // I

[w:[#INTERNAL]USR01000]=1 // Status : Run instruction

[t:0000]=[w:[PLC1](04C3,00000,00,1000)]#[t:0001]
```

- [t:0000] is a temporary address required to perform the file access. (Undefined value is set.)
- Set up the [t:0001] to "0".

## 6 Device Code and Address Code

Use device code and address code when you select "Device Type & Address" for the address type in data displays.

Device		Device Name	Device Code (HEX)	Address Code
Alarm data reading		0x70	Class code value	(Instance*0x40000) + (Attribute*0x1000) + (Control) value
Alarm history reading		0x71		
Alarm data reading (for applying the sub code character strings)		0x30A		
Alarm history reading (for applying the sub code character strings)		0x30B		
Status information reading		0x72		
Executing job information reading		0x73		
Axis configuration information reading		0x74		
Robot position data reading		0x75		
Position error reading		0x76		
Torque data reading		0x77		
I/O data reading / writing <sup>*1</sup>	Single Read / Write	0x78		
	Multiple Read / Write <sup>*2</sup>	0x300		
Register data reading / writing <sup>*3</sup>	Single Read / Write	0x79		
	Multiple Read / Write <sup>*2</sup>	0x301		
Byte variable (B) reading / writing <sup>*1</sup>	Single Read / Write	0x7A		
	Multiple Read / Write <sup>*2</sup>	0x302		
Integer type variable (I) reading / writing <sup>*3</sup>	Single Read / Write	0x7B		
	Multiple Read / Write <sup>*2</sup>	0x303		
Double precision integer type variable (D) reading / writing	Single Read / Write	0x7C		
	Multiple Read / Write <sup>*2</sup>	0x304		
Real type variable (R) reading / writing	Single Read / Write	0x7D		
	Multiple Read / Write <sup>*2</sup>	0x305		

Device		Device Name	Device Code (HEX)	Address Code
Character type variable (S) reading /writing (16 bytes) *4 *5 *6	Single Read / Write	0x7E	Class code value	(Instance*0x40000) + (Attribute*0x1000) + (Control) value
	Multiple Read / Write	0x306		
Character type variable (S) reading /writing (32 bytes) *4 *5 *7	Single Read / Write	0x8C		
	Multiple Read / Write	0x30C		
Robot position type variable (P) reading / writing *4 *8	Single Read / Write	0x7F		
	Multiple Read / Write	0x307		
Base position type variable (BP) reading / writing *4 *8	Single Read / Write	0x80		
	Multiple Read / Write	0x308		
External axis type variable (EX) reading / writing *4 *8	Single Read / Write	0x81		
	Multiple Read / Write	0x309		
Alarm reset / error cancel		0x82		
HOLD / servo ON/OFF		0x83		
Step / cycle / continuous switching		0x84		
Character string display command to the programming pendant		0x85		
Start-up (job START)		0x86		
Job select		0x87		
Management time acquiring		0x88		
System information acquiring		0x89		
Move instruction command (Type Cartesian coordinates)		0x8A		
Move instruction command (Type Pulse)		0x8B		
File Read		0x4C0		
File Write		0x4C1		
File List		0x4C2		
File Delete		0x4C3		

\*1 The Display is 32 bit data, but the External Device is 8 bit data. Therefore, only low 8 bit data is valid. In the case that data is read from the External Device, data except for low 8 bits becomes zero.  
3 or more odd-numbered points cannot be written at once by Multiple Write. Split the odd-numbered points to be written into even-numbered points + 1 point to write.

- \*2 When entering a check in the box of [Use Multiple Read/Write Command] in the [Individual Device Settings], it corresponds to the device monitor. Other classes and cases where a check has not been entered do not correspond to the device monitor.
- \*3 The Display is 32 bit data, but the External Device is 16 bit data. Therefore, only low 16 bit data is valid. In the case that data is read from the External Device, data except for low 16 bits becomes zero.
- \*4 If multiple points writing the S device, the P device, the BP device and the EX device, please use the memcpy command.  
The points can be specified are as follows.  
S device: Multiples of 16 (Example: 16 points, 32 points, 48 points, etc.)  
P device: 13 points  
BP device: 9 points  
EX device: 9 points
- \*5 The Multiple Read/Write attribute of the External Device is fixed to zero. To specify with the Display, set to "1".
- \*6 Can be used for the External Devices except for DX200 series.
- \*7 Can be used for DX200 series only.
- \*8 When the [Use Multiple Read/Write Command] is selected, set the same attribute as the Single Read/Write of the same device.  
Refer to the External Device Manual for the content of the attribute.

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**NOTE**

- When using a class that is not supported by the driver, no error occurs with the GP-Pro EX. If project transfer to the Display and restart are conducted, an improper device error occurs.
-

## 7 Error Messages

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

Item	Description
No.	Error No.
Device Name	Name of External Device where error occurs. Device name is a title of External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays messages related to the error which occurs.
Error Occurrence Area	Displays IP address or device address of External Device where error occurs, or error codes received from External Device. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"><b>NOTE</b></div> <ul style="list-style-type: none"> <li>• IP address is displayed such as "IP address (Decimal): MAC address (Hex)".</li> <li>• Device address is displayed such as "Address: Device address".</li> <li>• Received error codes are displayed such as "Decimal [Hex]".</li> </ul>

Display 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
RHxx130	(Connection device name): Error response received on a read out request (General status: [Hex] Extended status [Hex])	Error status received from the device on a load command
RHxx131	(Connection device name): Error response received on a write request (General status: [(Hex)] Extended status [(Hex)])	Error status received from the device on a write command

**NOTE**

- If the general status code is 0x1f, it is a vendor-specific error.
- If the general status code is anything other than 0x1f, it is an error defined in the ODVA documentation.