FP6 Gang Programmer V1.02

User's Manual

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General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

How to Use This Manual

Purposes and Target Readers

The purpose of this manual is to give users an understanding of the basic specifications and correct use of the PG-FP6 gang programming software. This manual is intended for users who are using the flash programmer in designing and developing a system that employs a Renesas Electronics microcontroller equipped with on-chip flash memory.

It is assumed that the readers of this manual have a basic knowledge of microcontrollers and Windows, and some knowledge of electrical and logic circuits.

Use this software after sufficiently confirming the manual of the microcontroller in use.

Conventions

- Note: Footnote for item marked with "Note" in the text.
- Caution: Information requiring particular attention
- Remark: Supplementary information
- Numeral representations:　　　Binary ... xxxx or xxxxB

　　　　　　　　　　　　　　　　　Decimal ... xxxx

　　　　　　　　　　　　　　　　　Hexadecimal ... 0xXXXX or xxxxH
- "　": Any character or item on the screen that can be selected or input
- ☐ : Name of a button
- [　]: Name of a command, dialog box, tabbed page, option, or area on the screen

RENESAS

Table of Contents

1.   Overview

This user's manual describes the specifications of the PG-FP6 gang programming software (hereafter referred to as the GFP).

The GFP is a software product that is used to operate multiple PG-FP6 (hereafter referred to as the FP6) units for erasing, writing, and verifying programs in multiple flash memory units at the same time.

Be sure to read this user's manual along with the latest user's manual for the FP6.

1.1   Features

The following describes the features of the GFP.

- Writing programs at the same time by controlling up to 12 FP6 units from a PC
- Bundled downloading of a set of setting files and files for programming to each connected FP6
- Display of the states of operation of each FP6 unit and the numbers of passes or errors

1.2   GFP System Configuration
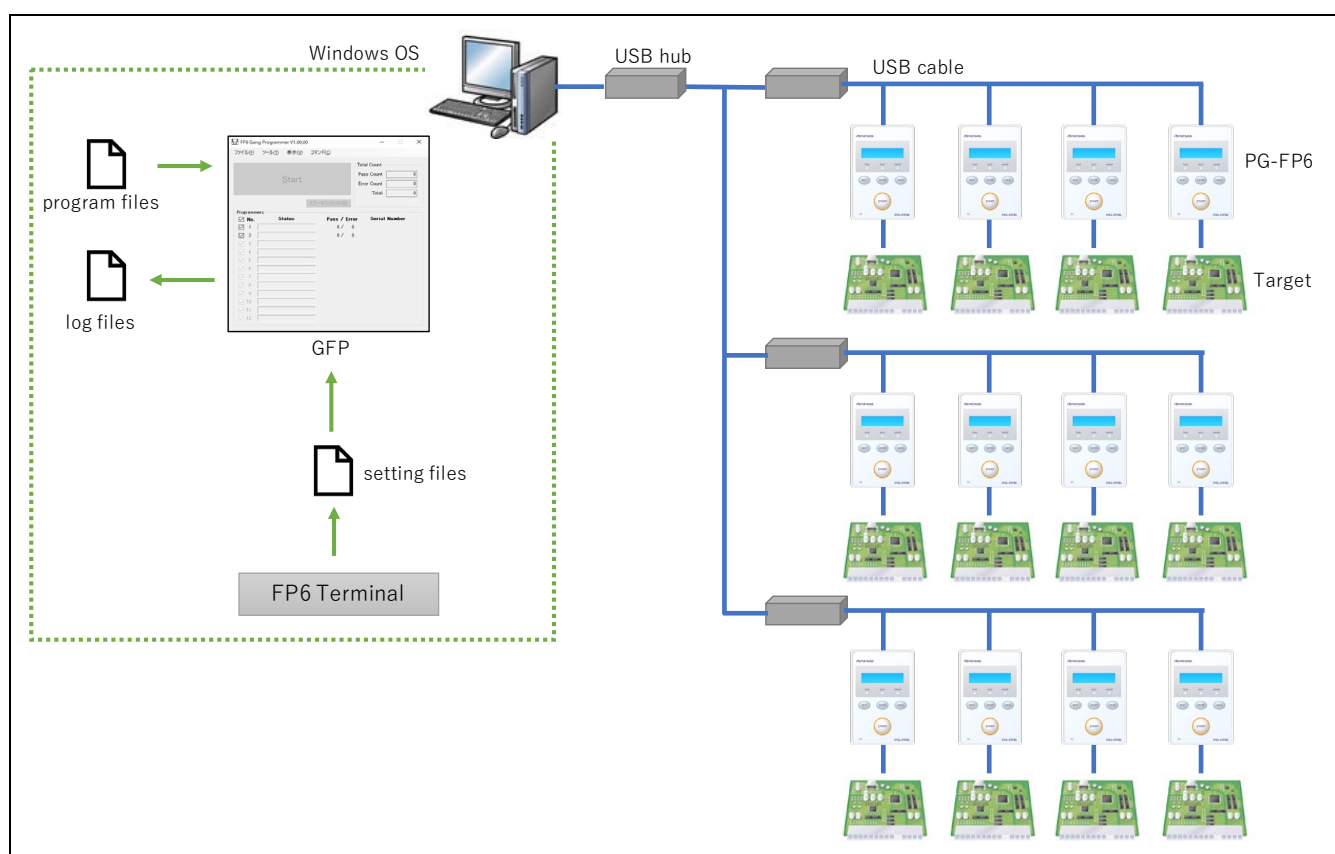
The system configuration of the GFP is shown below.

Figure 1   Image of GFP Connection

1.3   Operating Environments

1.3.1   Hardware environment

- Host PC
  - Processor: At least 1 GHz
  - Main memory: At least 2 GB is required. We recommend at least 4 GB.
  - Display: Resolution should be at least 1024 x 768.
  - Interface: USB 2.0 or serial interface (RS-232C)

1.3.2   Software environment

- Operating Systems Supported
  - Windows 10 (32-bit edition, 64-bit edition)
  - Windows 11

2.   Example of Operations with the GFP

This chapter describes a series of examples of the use of the GFP in basic operations with two FP6 units connected. For details on the functionality, refer to chapter 3, Description of Functionality.

For points of caution regarding operations, be sure to read the user's manual for the FP6.

The operation steps described in this chapter are as follows.

2.1 Creating a Setting File

2.2 Connecting the FP6 Units to the Host PC and the Target Systems

2.3 Starting the GFP

2.4 Setting the [Programmer Setup] Dialog Box

2.5 Executing Commands

2.6 System Shutdown

2.1   Creating a Setting File

Use the FP6 Terminal to create a setting file for storing setting information on the method of connection with the target MCU. Regarding how to create a setting file, refer to the user's manual for the FP6. After creating the setting file, close the FP6 Terminal.

2.2   Connecting the FP6 Units to the Host PC and the Target Systems

Connect the two FP6 units which are to be used to the host PC. After that, connect the FP6 units to the target systems.

2.3   Starting the GFP

Click on the [Start] menu and select [PG-FP6 Gang Programmer] to start the GFP.

2.4   Setting the [Programmer Setup] Dialog Box

After the GFP is started and the [Programmer Setup] dialog box is opened, make the settings in steps 1 to 5 below. When you start the GFP the second and subsequent times, the [Programmer Setup] dialog box may not automatically open. If the settings are changed, select [Setup] from the tool menu.

1. Specify "2" as the number of FP6 units to be connected for (A) [Connections] in the [Connection] group box.
2. Click on (B) the [Connect] button to connect the GFP to the FP6 units.
3. Click on (C) the [Download] button in the [All Programmer Operation] group box to open the [Download] dialog box.
4. Specify (D) the setting file and (E) program file on the [Download] dialog box and click on (F) the [Download] button.
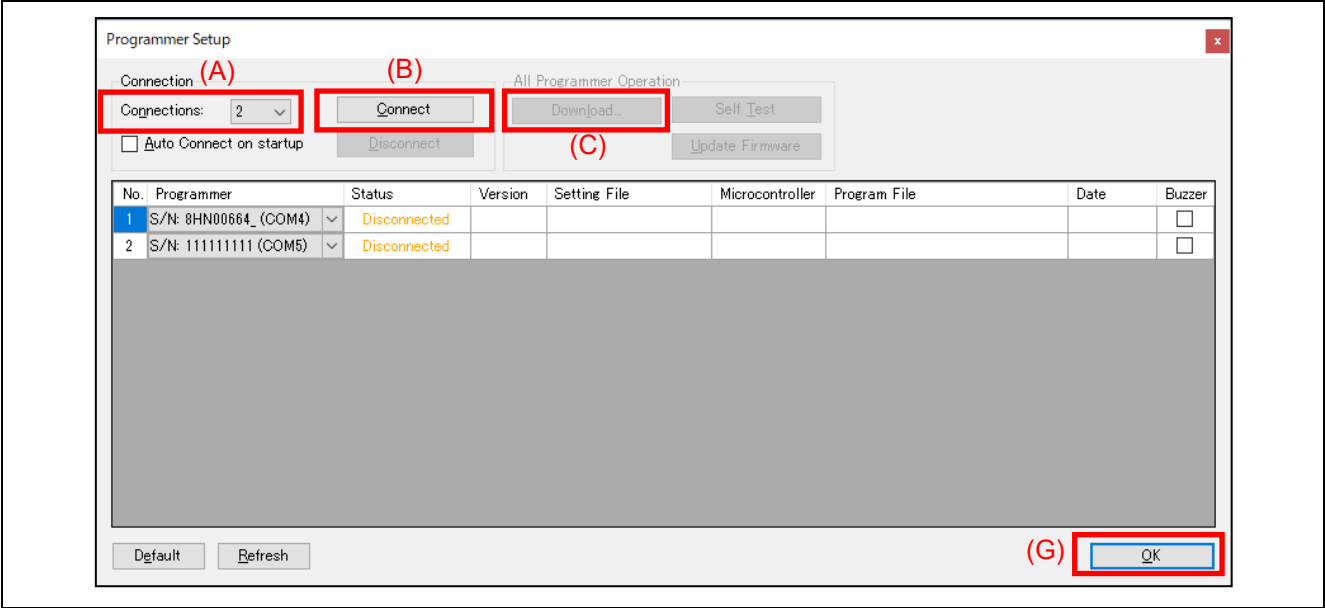5. Click on (G) the [OK] button in the [Programmer Setup] dialog box.

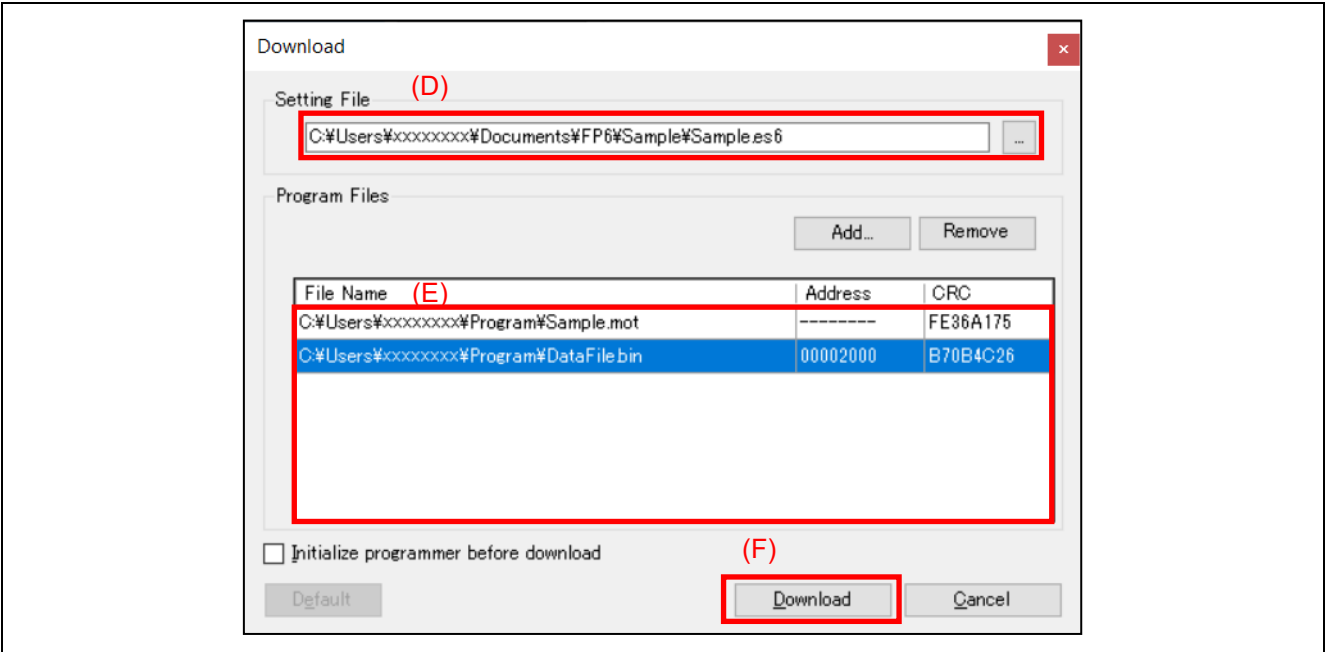**Figure 2   [Programmer Setup] Dialog Box (Example of Operating the GFP)**

Figure 3   [Download] Dialog Box (Example of Operating the GFP)

2.5   Executing Commands

Click on the [Start] button in the main window to execute commands. After you have clicked on the [Start] button, commands specified in the setting file for the target MCU will be executed. For details on the main window, refer to section 3.1, Main Window.

When commands are successfully executed, "Pass" is shown under (A) [Status] in the [Programmers] group box. In (B) the [Total Count] group box, the total number of commands that have successfully been executed is shown against [Pass], and the sum of [Pass] and [Error] is shown against [Total].
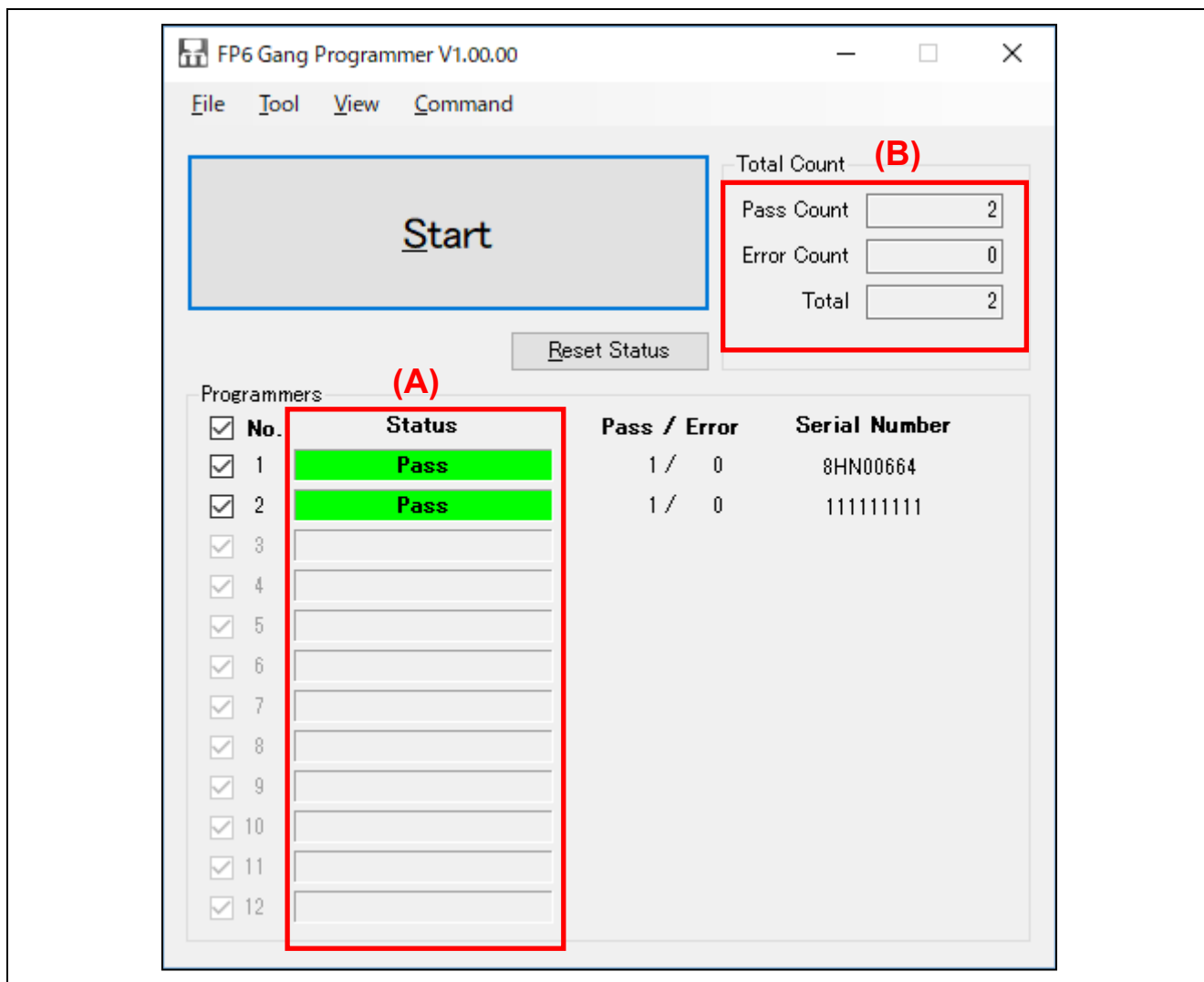

Figure 4   Main Window (Example of Operating the GFP)

2.6   System Shutdown

Remove the target system from the target cable.

Caution: When Vcc is supplied from the target system, turn the power off before removing the target system.

Execute the [Exit] command from the [File] menu to close the GFP.

3.   Description of Functionality

This chapter describes the configuration of the windows, dialog boxes, and other facilities of the GFP.

3.1   Main Window

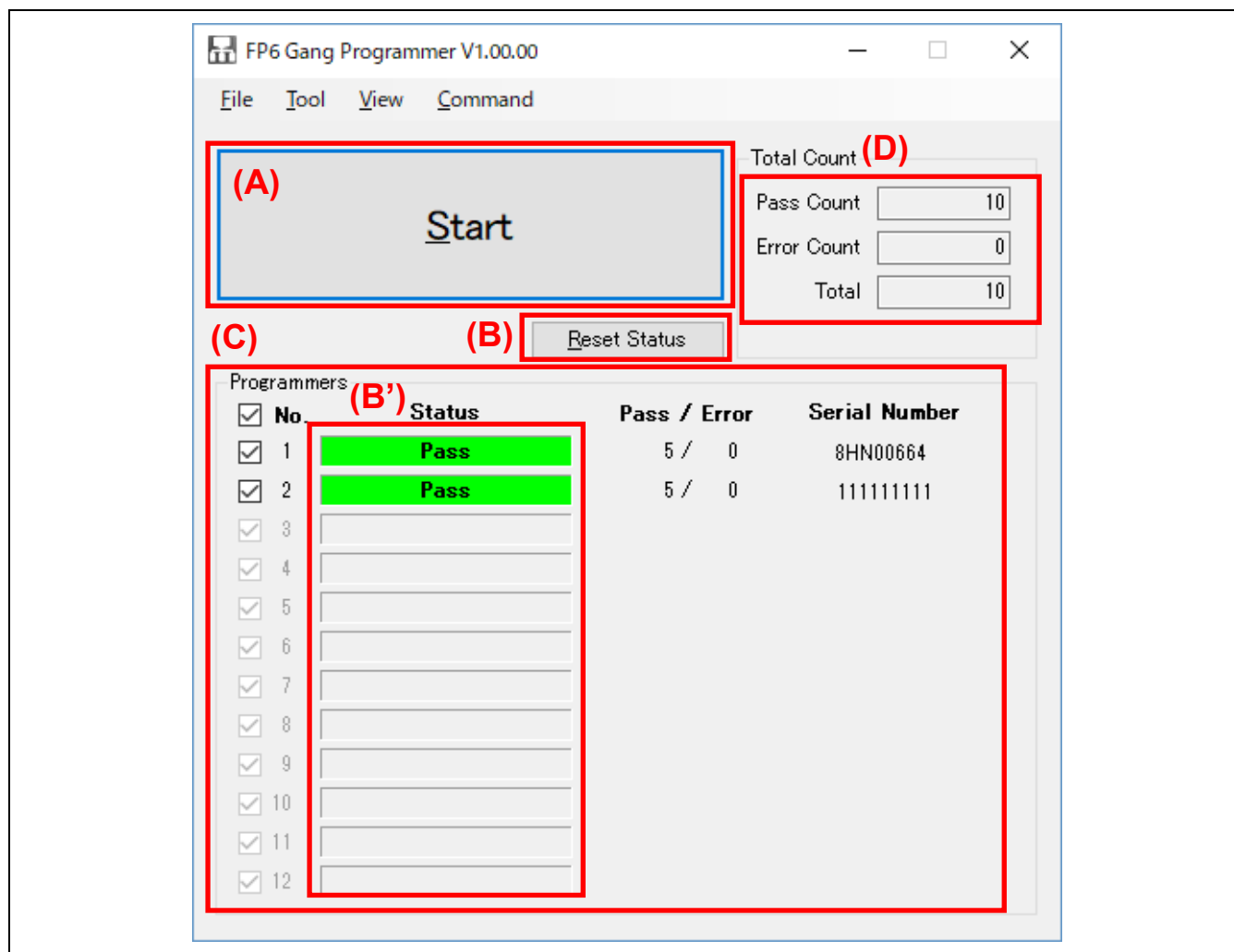The main window of the GFP that has been started up is shown below.

Figure 5   Main Window

3.1.1   (A) [Start] button

Execute a command that has been specified with the FP6 Terminal for the selected FP6.

The operation of the [Start] button is switchable by [Command] in the menu bar.

The [Start] button is not available in the following cases.

- The GFP is disconnected from the FP6.
- The FP6 that is the target for the operation is not selected.
- The operation is prohibited due to a specified option limiting the available operations.
  For specifying options, refer to section 3.5, [Options] Dialog Box.

3.1.2   (B) [Reset Status] button

Clear the results of execution shown in (B') [Status].

3.1.3   (C) [Programmers] group box

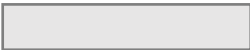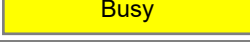The following describes items in the [Programmers] group box.
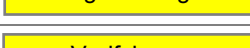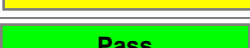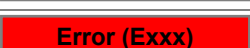
Table 1   [Programmers] Group Box

Item	Description
Suspend check boxes	Specifies each FP6 unit to operate in response to the [Start] button. • Selected: This FP6 is to be used (default). • Cleared: This FP6 is suspended.
No.	Number assigned by the GFP to each FP6 unit. These numbers match those in the [Programmer Setup] dialog box.
State	Shows the state of each FP6 unit. Clicking on this item causes the LCD of the given FP6 to blink, but this is only supported if the version of the FP6 firmware is V1.03.00 or later.
Pass	Shows the total number of commands that have successfully been executed in response to clicking on the [Start] button. These counters are cleared when the GFP is closed.
Error	Shows the total number of commands have unsuccessfully been executed by the given FP6 in response to clicking on the [Start] button. These counters are cleared when the GFP is closed.
Serial Number	Shows the serial number of each FP6 unit that is connected.

3.1.3.1   [Status]

The following describes the items under [Status].

Table 2   Items in [Status]

Status	Description
	The initial state, unused state, or state after selecting [Disconnect] from the [Tool] menu.
Connecting...	The GFP is being connected to the FP6.
Ready	The GFP has been connected to the FP6 and is in the ready state.
Busy	Processing is in progress.
Erasing...	The erasing command is being executed.
Programming...	The programming command is being executed.
Verifying...	The verifying command is being executed.
Pass	Processing was successfully completed after execution of the commands.
Error (Exxx)	Processing failed after execution of the commands.
Communication Error	A communications error between the GFP and the FP6 was generated. Re-connect the FP6.
Suspended	The suspend check box for the given FP6 is deselected so the unit is suspended.

3.1.4   (D) [Total Count] group box

This group box shows the total numbers of passes and errors.

3.2   Menu Bar

3.2.1   File Menu

The following describes the items under [File].

Table 3   File Menu

Item	Description
View Log File	Shows the contents of a log file. This item is only available if logging is enabled.
Exit	Closes the GFP.

3.2.2   Tool Menu

The following describes the items under [Tool].

Table 4   Tool Menu

Item	Description
Setup…	Shows the [Programmer Setup] dialog box. This dialog box is used for finding the FP6 units, managing the connections, and configuring operations applicable to all of the connected FP6 units.
Connect	Connect the FP6 units.
Disconnect	Disconnect the FP6 units.
Options…	Shows the [Options] dialog box. The operation of the GFP as a whole can be specified in the dialog box produced by selecting this item.

3.2.3   View Menu

The following describes the items under [View].

Table 5   View Menu

Item	Description
Output Window	Shows the [Output] window. In this window, details of communications with the FP6 units which are currently connected can be confirmed.
Reset Count and Status	Clears the results of execution by the [Start] button and resets the counters for passes and errors.

3.2.4   Command Menu

The following describes the items under [Command].

Table 6   Command Menu

Item	Description
Start	The selected command can be executed with the [Start] button in the main window.
Erase	
Verify	

3.3   [Programmer Setup] Dialog Box

This section describes the [Programmer Setup] dialog box. This dialog box is used for finding the FP6 units, managing the connections, and configuring operations applicable to all of the connected FP6 units.
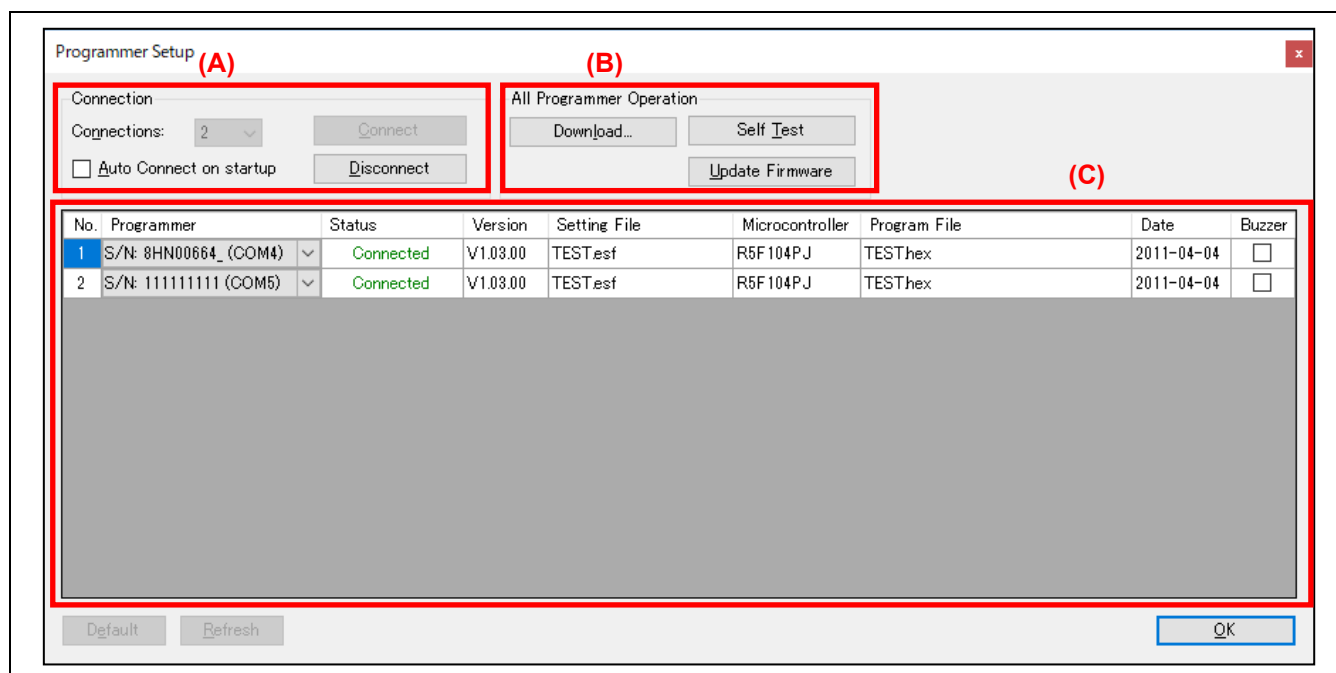

Figure 6   [Programmer Setup] Dialog Box

3.3.1   (A) [Connection Settings] group box

The following describes the items in the [Connection Settings] group box.

Table 7   [Connection] Group Box

Item	Description
Connections	Specify the number (1 to 12) of FP6 units to be connected.
Auto Connection on startup	Selecting this check box causes automatic connection of the FP6 units when the GFP is started.
Connect	Connect the FP6.
Disconnect	Disconnect the FP6.

3.3.2   (B) [All Programmer Operation] group box

The following describes the items in the [All Programmer Operation] group box. These items are only available in the connected state.

Table 8   [All Programmer Operation] Group Box

Item	Description
Download	Shows the [Download] dialog box. In this dialog box, setting files and files for programming can be downloaded for the FP6 units that are connected.
Self Test	Runs a self-test of the connected FP6 units.
Update Firmware	Updates the firmware of the connected FP6 units.

3.3.3   (C) [Programmer] list

This list shows the connection state of the FP6 which can be changed if the state is "Disconnected". The following describes the items in the [Programmer] list.

Table 9   [Programmer] List

Item	Description
No.	Shows sequential numbers for each of the FP6 units, starting from 1.
Programmer	Selects the FP6 to be connected. To show actual COM ports rather than only serial-through-USB connections, select [Allow COM port connection] in the [Options] dialog box.
Status	Shows the state in terms of connection.
Version	Shows information on the FP6 if it is connected.
Setting File	
Microcontroller	
Program File	
Date	
Buzzer	Specifies whether the buzzer of the given FP6 if it is connected is on or off. • Selected: The buzzer is used. • Cleared: The buzzer is not used.

3.3.4   [Default] button

This button is used to restore the settings of the [Programmer Setup] dialog box to the state when the GFP was started.

3.3.5   [Refresh] button

This button is used to find the FP6 units again and re-assign the [Programmer] list.

3.4   [Download] Dialog Box

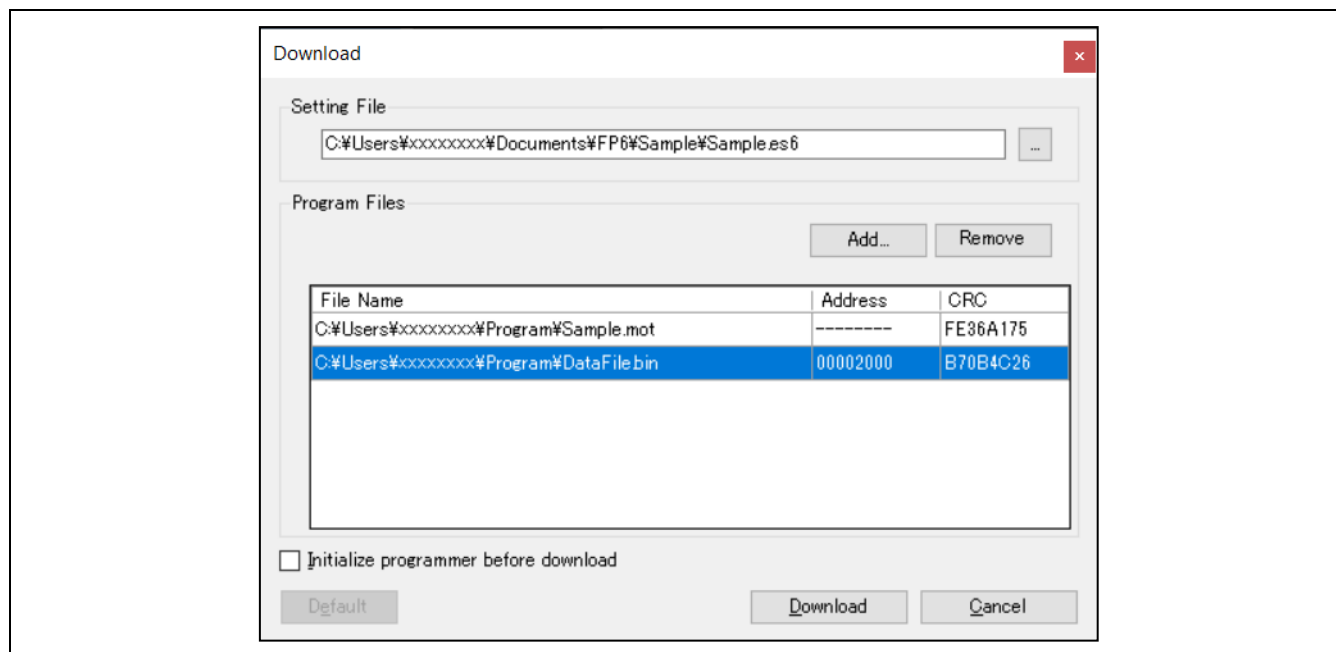This dialog box is used to download a setting file and files for programming to the FP6 units.

Figure 7   [Download] Dialog Box

3.4.1   (A) Setting file

Specify the setting file for downloading to the FP6 units. Click on the browse button to select the file.

3.4.2   (B) List of files

Displays a list of files to be written to the flash memory of the target device. Files can be added to the list by clicking on the [Add] button or by dragging and dropping.

Caution: Before selecting and downloading an RPE file, set the password for the RPE file to be sent to the FP6 main unit through the dialog box produced by the [Programmer Setting] menu item of the FP6 Terminal.

Remarks:
1. If a binary file or user key file is selected, [Address] displays the start address specified in the [Offset Address] dialog box.
2. [CRC] displays the checksum (CRC-32) of the selected file. This checksum is calculated from the entire file including a linefeed code. Therefore, it does not match the checksum acquired from the target device.
3. Multiple DDI, HCUHEX, or RPE files cannot be selected.

3.4.3   [Add] button

This opens a dialog box for opening a file to be added to the list of files. If a binary file or user key file is selected in this dialog box, the [Offset Address] dialog box opens to allow specifying the programming start address.

Remarks:
1. The DLM key, OEM root public key, and certificate files cannot be selected. Specify these files at the time of creating a setting file in the FP6 Terminal.
2. Specify the endian when a setting file is to be created in the FP6 Terminal.
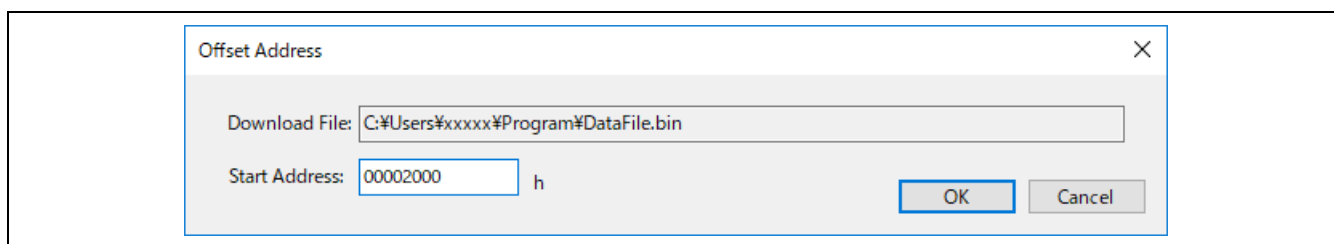
Figure 8   [Offset Address] Dialog Box

3.4.4   (D) [Remove] button

The selected files in the list of files are removed from the list.

3.4.5   (E) [Initialize programmer before download] check box

When this check box is selected, the FP6 is initialized before downloading proceeds.

3.4.6   (F) [Default] button

The setting of this dialog box is restored to the state when the GFP was started.

3.4.7   (G) [Download] button

Downloading to the FP6 units proceeds. When downloading has been successful, the contents of the dialog box are saved and it is closed.

3.5   [Options] Dialog Box

This dialog box is selected from the [Tool] menu and is used to set options for GFP operations.

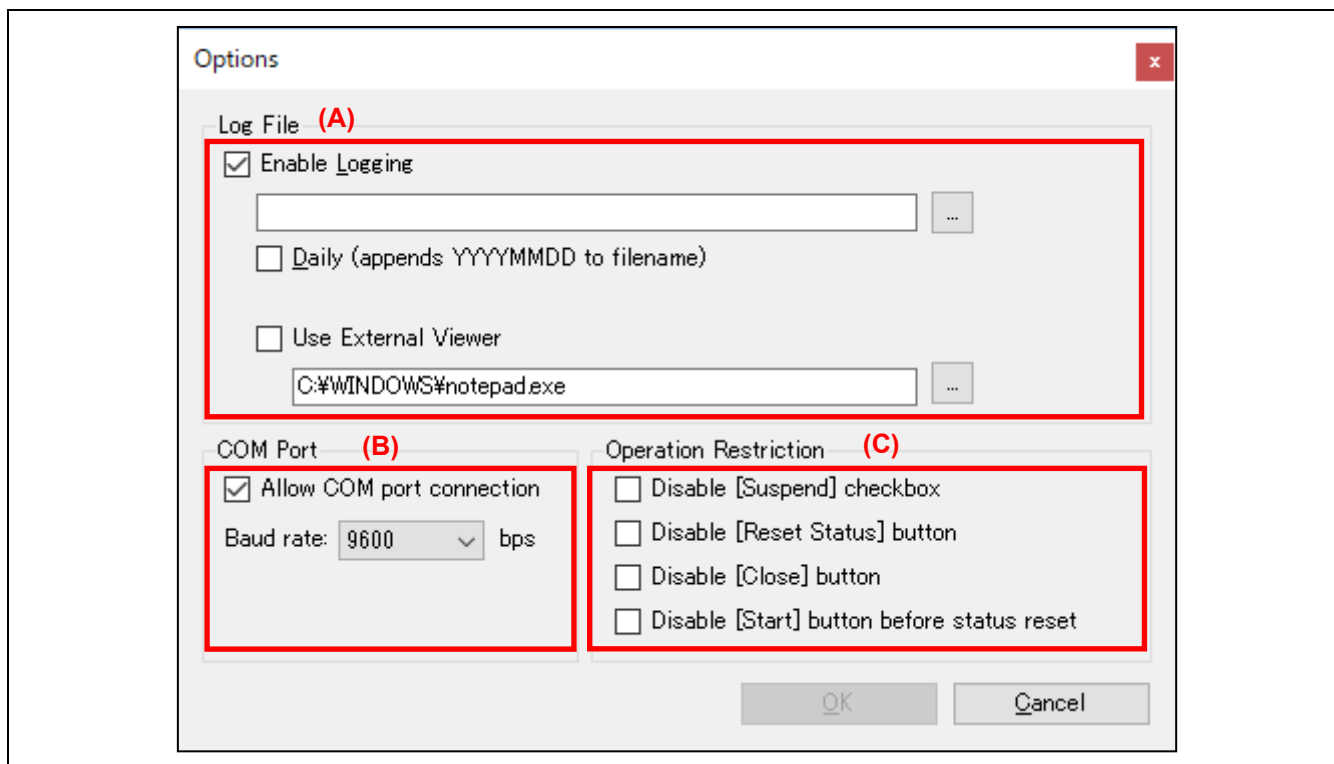The following describes the items in the [Options] dialog box.

Figure 9   [Options] Dialog Box

3.5.1   (A) [Log File] group box

The following describes the items in the [Log File] group box.

Table 10   [Log File] Group Box

Item	Description
Enable Logging	Select whether a log of operations is to be saved.
Path to the log file	Specify the name of the log file.
Daily	Select whether log files are to be newly created by the day.
Use External Viewer	Select this check box if you wish to use an external viewer to display the log file.
Path for a file for executing an external viewer	Shows the path to the file for executing the external viewer.

3.5.2   (B) [COM Port] group box

The following describes the items in the [COM Port] group box.

Table 11   [COM Port] Group Box

Item	Description
Allow COM port connection	Select whether COM port connections for the FP6 units are allowed.
	When this check box is selected, FP6 units that are connected to COM ports rather than through the USB are also targets to be found.
Baud rate	Only available when COM port connection is enabled.
	Specify the bit rate for COM port connection.
	Select the bit rate to suit that of the connected FP6 units.

3.5.3   (C) [Operation Restriction] group box

The following describes the items in the [Operation Restriction] group box.

Table 12   [Operation Restriction] Group Box

Item	Description
Disable [Suspend] checkbox	Disables the [Suspend] check boxes in the main window.
Disable [Reset Status] button	Disables the [Reset Status] button in the main window.
Disable [Close] button	Disables the [Close] button in the upper right corner of the main window. However, the GFP can still be closed by selecting [Exit] from the [File] menu.
Disable [Start] button before state reset	Disables the [Start] button while the results of execution are being displayed. This forces the user to click on the [Reset Status] and [Start] buttons, in that order, to start operations again.

4.   Messages

4.1   Error Messages

Table 13 shows error messages for the GFP.

Table 13   Error Messages for the GFP

Error No.	Message	Handling
E8000001	Not enough memory for this operation.	Processing cannot be continued since there is not enough memory in the host PC.
E0000004	The firmware file for the FP6 was not correct.	Reinstall the GFP.
E0000012	Preparation for downloading the program file failed.	Check whether the document folder already contains a file with the same name as that of the file selected in [Program file 1]. If there is such a file, move it from the folder or permit overwriting it.
E0000015	The format of the selected program file is not supported.	Select the files for programming again.
E0000016	Data overlapped.	This error message will appear when processing to write data to overlapping address ranges is attempted. Confirm that the files for programming do not include data for overlapping address ranges.
E0000017	The RPI, HCUHEX, and DDI formats cannot be selected for program file 2 to 4.	Select the file in the RPI, HCUHEX and DDI format as [Program File 1].
E8000101	A file was not found.	This error code and message are displayed when the specified file cannot be found. Check that the file exists.
E8000102	Cannot open the file.	This error code and message are displayed when the specified file cannot be opened. Check the file.
E8000103	Cannot save the file.	Permit writing to the file.
E8000104	Failed to write to the log file. Setting logging to "disabled".	Open the [Options] dialog box and confirm that there is no problem with the directory where the log file is to be saved.
E8000105	Please update the firmware to download this file.	Please update the firmware to download this file.
E8000202	Cannot connect to the programmer.	Confirm the connection with the FP6.
E8000204	An error occurred while communicating with the programmer.	Confirm the connection with the FP6.
E8000301	Failed to acquire programmer information.	Confirm the connection with the FP6.
E8000302	Failed to execute the programmer command.	Confirm the connection with the FP6.
E8000303	Failed to execute the self-test.	Confirm the following items. • If the target and remote connectors are connected to the MCU or device, disconnect them. • The FP6 may have a fault. Use the FP6 Terminal to execute a self-test.

Error No.	Message	Handling
E8000306	Failed to update the firmware.	Confirm the following items. • Is the FP6 actually connected? • The firmware file may be damaged. Reinstall the GFP. • The COM port number that has been assigned on the host PC may have been changed so that reconnection failed when the FP6 was restarted after updating of the firmware. Check that the LCD panel of the FP6 is not indicating an error.
E8000308	Failed to download the files.	Confirm that the specified setting file and files for programming are correct.

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Revision History			FP6 Gang Programmer V1.02 User's Manual	
Rev.	**Date**		**Description**	
		Page	**Summary**	
1.00	Oct.01.23	—	The following items were updated on the basis of the contents of document No. "R20UT4470EJ0101".	
		7	Descriptions of section 1.3, Operating Environments, were modified.	
		9	Figure 3, [Download] Dialog Box, was modified.	
		16	Descriptions of section 3.4, [Download] Dialog Box, were modified.	

FP6 Gang Programmer V1.02

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