**User's Manual**

**NEC**

# PG-FP4

## Flash Memory Programmer

**[MEMO]**

# CE
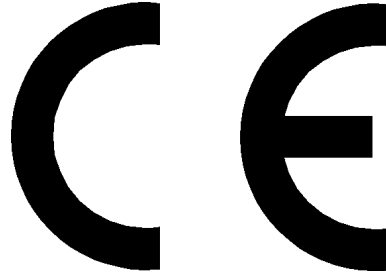
PG-FP4 complies with the EMC protection requirements

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**WARNING**

This is a 'Class A' (EN 55022: 1998) equipment.  This equipment can cause radio frequency noise when used in the residential area.  In such cases, the user/operator of the equipment may be required to take appropriate countermeasures under their own responsibility.

EEDT-ST-001-11

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**CAUTION**

This equipment should be handled like a CMOS semiconductor device.  The user must take all precautions to avoid build-up of static electricity while working with this equipment.  All test and measurement tool including the workbench must be grounded.  The user/operator must be grounded using the wrist strap.  The connectors and/or device pins should not be touched with bare hands.

EEDT-ST-004-10

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- Device availability

- Ordering information

- Product release schedule

- Availability of related technical literature

- Development environment specifications (for example, specifications for third-party tools and components, host computers, power plugs, AC supply voltages, and so forth)

- Network requirements

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**J02.11**

## MAJOR REVISIONS IN THIS EDITION (1/2)

| Page | Contents |
|---|---|
| Throughout | Change of URL of NEC Electronics Corporation. |
| pp.18 to 21 | **CHAPTER 2 HARDWARE INSTALLATION**<br>● Addition of operating software Windouws 2000 and Windows XP |
| p.18 | **2.1 System Requirements**<br>● Change from "PC-9821 series" to "PC-9800 series" |
| p.20 | **2.3.2 PG-FP4 control panel and connectors**<br>● Change of status LED color from yellow to orange |
| pp.22 to 23 | Addition of **2.3.9 I²C adapter** |
| pp.27, 31 to 33 | **3.1.1 GUI software installation**<br>● Change of **Figure 3-6 Software License Agreement Window**<br>● Change of **Figure 3-12 Setup Is Complete Window**<br>● Change of name of file to be installed. |
| p.33 | Addition of **3.1.2 USB driver installation** |
| p.38 | **3.1.3 GUI software uninstallation**<br>● Addition of **(**2) uninstallation using "Add/Remove Programs" |
| p.39 | **3.2 Firmware and GUI Software Update Installation**<br>● Addition of **procedures to update firmware** |
| p.43 | Change of **Figure 4-3 GUI Software Main Window** |
| p.44 | Addition of [Programmer] − [Select Programming area…] button to **Table 4-1 Toolbar Buttons** |
| pp.52 to 54 | **4.4.2 [Programmer] menu**<br>● Addition of icon to (3) [Select Programming area…] menu<br>● Addition of (5) [Update Firmware] menu |
| pp.55 to 71 | **4.4.3 [Device] menu**<br>● Change of **Figure 4-19 [Device] menu**<br>● **(**2) to (7) Addition and change of description<br>● **(**9) (b) to (c) Addition and change of description |
| p.70 | Change of **Figure 4-32 About Window** |
| pp.72 to 81 | **CHAPTER 5 SAMPLE PROGRAMMING SESSION USING GUI SOFTWARE**<br>● **(**4) to (8) Addition and change of description |
| pp.83, 84, 89 | **CHAPTER 6 PG-FP4 OPERATION IN STANDALONE MODE**<br>● Change of status LED color from yellow to orange<br>● **6.1.1 [Commands] menu** Addition to Note and addition of Note 3<br>● **6.1.5 [Utilitiy/Misc.] menu** Addition of [PRM File Version] and [HEX File Name] |
| pp.90 to 94 | **CHAPTER 7 CONNECTORS AND CABLES**<br>● Addition of description about power supply connector, HD-Sub 9 serial host connector, HD-Sub 15 target interface connector and HD-Sub 25 parallel host connector.<br>● Change of **7.4 Target Cable Specifications** |
| pp.97 to 100 | **CHAPTER 8 NOTES ON TARGET SYSTEMS**<br>● Change of example of correct connection regarding RESET signal<br>● Addition of description about $V_{PP}$<br>● Addition of examples of UART and SIO interface circuits |

**The mark ★ shows major revised points.**

**MAJOR  REVISIONS  IN  THIS  EDITION  (2/2)**

| Page | Contents |
|---|---|
| pp.101 to 105 | **CHAPTER 9 TARGET SYSTEM INTERFACE CIRCUITS**<br>• Change of **9.1 SO/TxD and RESET**<br>• Addition of **9.2 SCK**<br>• Change of **Figure 9-3 SI/RxD and HS Pins**<br>• Addition of **9.6 $V_{DD}$, $V_{DD2}$**<br>• Addition of **9.7 $V_{PP}$** |
| pp.108 to 115 | **CHAPTER 10 ERROR MESSAGES**<br>• **10.2 GUI Software Fatal Error Messages** Addition of F129, F410, F411, F412 and F413<br>• **10.3 GUI Software Error Messages** Addition of E201, E307, E316, E317, E805, E901, E903, E907 and E908<br>• **10.4 GUI Software Information Messages** Addition of I202, I805, I905, I906, I907, I911, I912, I913, I914, I915, I916, I917 and I918 |
| p.116 | Addition of **APPENDIX A REVISION HISTORY** |

**The mark ★ shows major revised points.**

# PREFACE

**Target Readers**     This manual is intended for users who use the PG-FP4 when designing and developing a system using an NEC Electronics on-chip flash memory microcontroller.

**Purpose**        This manual is intended to give users an understanding of the basic specifications and correct use of the PG-FP4.

By using the PG-FP4, programs can be easily erased from or written to the flash memory of an NEC Electronics on-chip flash memory microcontroller, or can be verified on Windows™ screens, while the microcontroller is mounted on the user board.

**Organization**      This manual includes the following sections.

- Overview
- Hardware installation
- Software installation
- PG-FP4 operation using GUI software
- Sample programming session using GUI software
- PG-FP4 operation in standalone mode
- Connectors and cables
- Notes on target system
- Target system interface circuits
- Error messages

**How to Read This Manual**  To understand the overall functions and usage of the PG-FP4, read this manual in the order of the CONTENTS.

Be sure to read **CHAPTER 4 PG-FP4 OPERATION USING GUI SOFTWARE** because this chapter presents important information for using the PG-FP4.

It is assumed that the readers of this manual have general knowledge of electricity, logic circuits, and microcontrollers.

In the explanations of the operation of the applications, it is also assumed that the readers have sufficient knowledge of Windows.

For the usage and terminology of Windows 95, Windows 98, Windows NT™, Windows Me, Windows 2000, and Windows XP, refer to each Windows manual.

**Conventions**      **Note**:  Footnote for item marked with **Note** in the text.
            **Caution**: Information requiring particular attention
            **Remark**: Supplementary information
            Numeral representation: Binary … ×××× or ××××B
                          Decimal … ××××
                          Hexadecimal … 0××××H or ××××H
            " ":   Any character or item on screen
            OK :  Name of button
            []:   Menu
            < >:  Dialog box name

**Terminology**    The meanings of the terms used in this manual are as follows.

| Term | Meaning |
|---|---|
| FP4 | Abbreviation of flash memory programmer PG-FP4 |
| GUI software | Windows application to operate PG-FP4 using GUI software |
| Target device | NEC Electronics on-chip flash memory microcontroller |
| Target system | User-designed board on which NEC Electronics on-chip flash memory microcontroller is mounted |
| FA adapter | Adapter board to write programs to NEC Electronics on-chip flash memory microcontroller[Note] |

**Note**   The FA adapter board is a product of Naito Densei Machida Mfg. Co., Ltd.
If you have any questions about the FA adapter board, contact:
Naito Densei Machida Mfg. Co., Ltd.   Tel: +81-45-475-4191

# CONTENTS

**LIST OF FIGURES (1/3)**

# LIST OF TABLES

# CHAPTER 1  OVERVIEW

The PG-FP4 is a tool that erases, writes, and verifies programs on an NEC Electronics on-chip flash memory single-chip microcontroller on the target board or FA adapter board.  This product can be used in graphical user interface (GUI) mode using a host computer or in standalone mode.

## 1.1  Features

- The PG-FP4 allows on-board programming without removing the target device from the target system.
- The user program is stored in the internal 2 MB flash memory of the PG-FP4 and parameters for programming are stored in 8 KB EEPROM™, so that the target device can be rewritten in the standalone mode, without having to connect the PG-FP4 to a host.
- Serial interface connection (RS-232C) to host systems, parallel interface for optional fast program download and a USB interface are available.
- CSI, CSI+HS, UART, I$^2$C and PORT interfaces are supported for data transfer to the target device.
- Programming voltage V$_{PP}$ can be selected from between 0 and 12 V.
- The PG-FP4 can supply 0 to 6 V on the V$_{DD}$ line (200 mA max.).

## 1.2  PG-FP4 Configuration in Graphical User Interface (GUI) Mode

The configuration of the PG-FP4 in GUI software mode is shown in the diagram below.

**Figure 1-1.  PG-FP4 Configuration in GUI Software Mode**
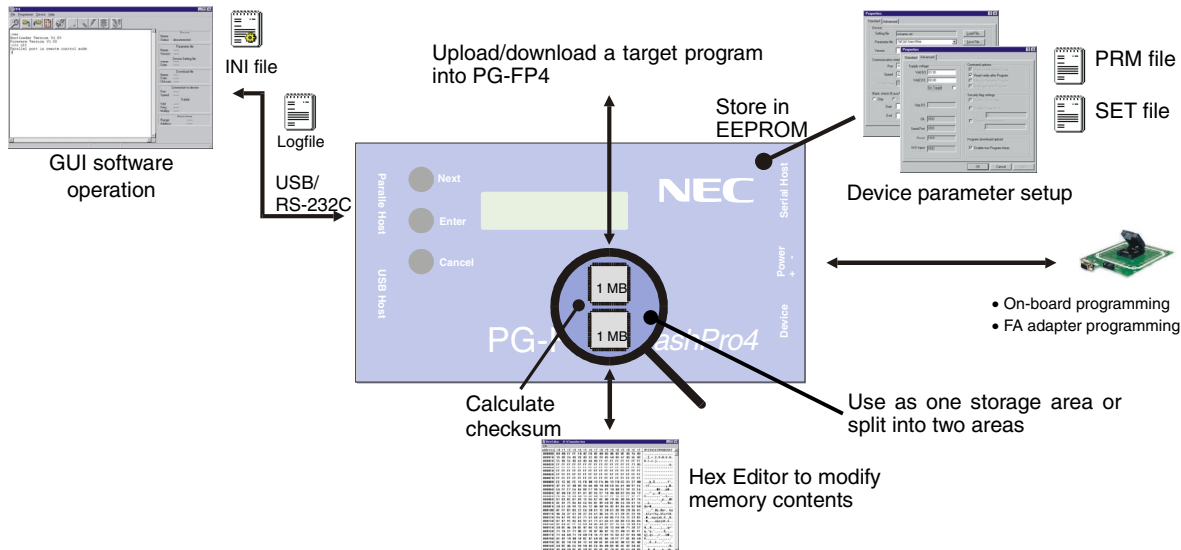
The graphical user interface (GUI) of the PG-FP4 supports the device commands necessary for downloading and uploading user programs, setting parameters necessary for writing the device, setting and selecting a writing environment by the user, changing the user program downloaded to the PG-FP4, and calculating and rewriting the memory checksum.

The parameters necessary for writing the device are saved to a parameter file (PRM file) and the setting of the user's writing environment is saved to a customized setup file (SET file).  These files are downloaded to the PG-FP4 and stored in the internal EEPROM, so that the downloaded data can be used even in the standalone mode.  The GUI software is executed using the parameters that have been set last.  Changed settings are saved to an INI file. Communication between the GUI software and the PG-FP4 is recorded in an ASCII file.

The internal memory of the PG-FP4 is configured as a 2 MB flash memory and holds the user program that is written to the target device.  This memory's area (progarea) can be divided into two 1 MB memory areas.  Therefore, the PG-FP4 can download two different user programs and select either of them as the valid user program.

# CHAPTER 2 HARDWARE INSTALLATION

## 2.1 System Requirements

| | | |
|---|---|---|
| **Host PC** ★ | A PC supporting Windows 95, Windows 98, Windows NT 4.0, Windows Me, Windows 2000, or Windows XP is required to run the PG-FP4 in the graphical user interface (GUI) mode. About 8 MB of free hard disk space is required to install the GUI software. | |

**Host PC** ★

A PC supporting Windows 95, Windows 98, Windows NT 4.0, Windows Me, Windows 2000, or Windows XP is required to run the PG-FP4 in the graphical user interface (GUI) mode.

About 8 MB of free hard disk space is required to install the GUI software.

**Host machine** ★

Any of the following can be used:
- PC-9800 series
- PC-98NX series
- IBM PC/AT$^{TM}$ or compatible

CPU

Pentium$^{TM}$ 100 MHz or more

RAM

32 MB or more

**Host interface**

Serial interface (RS-232C) capable of handling communication at 9,600 (minimum) baud up to 115,200 baud.

A parallel port may be used in addition to the serial interface to enable fast data download to the PG-FP4.

Alternatively, a USB port (Rev 1.1) is available.

**File formats**

Program files can be used in Motorola S file format or Intel HEX file format.

## 2.2 Package Contents

Please verify that you have received all the parts listed in the package contents list included with the PG-FP4 package. If any part is missing or seems to be damaged, please contact an NEC Electronics sales representative or distributor.

## 2.3 System Configuration and Components

The PG-FP4 system configuration is as given in the diagram below.

**Figure 2-1. PG-FP4 System Configuration**
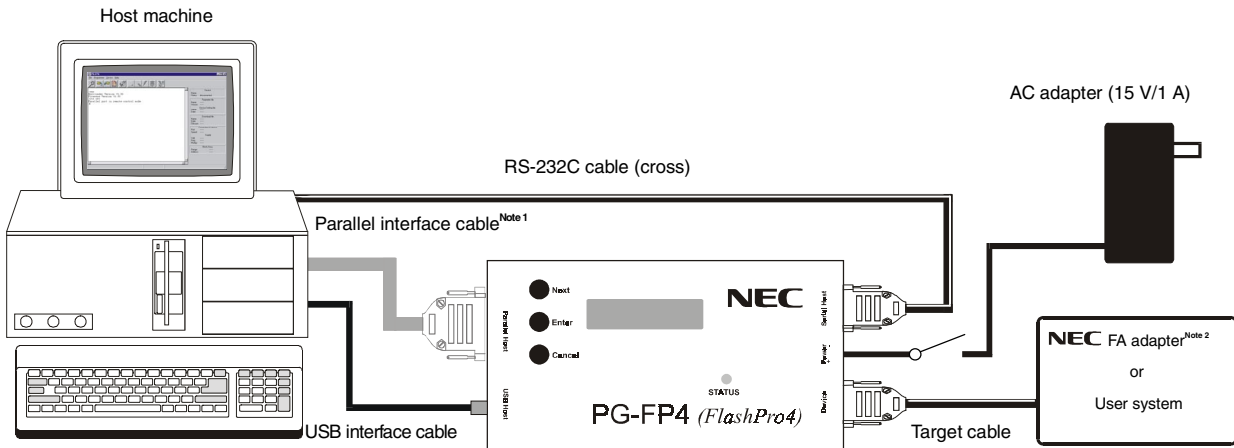


**Notes 1.** The parallel interface cable is not included in the PG-FP4 package.
  **2.** The FA adapter board is a product of Naito Densei Machida Mfg. Co., Ltd.

The PG-FP4 is connected to the host system via an RS-232C serial interface cable or a USB interface cable. By using the serial interface in combination with the optional parallel interface, the user program can be quickly downloaded to the PG-FP4.

The PG-FP4 is connected to the user system by the target cable. For the detailed specifications of the target cable, refer to **CHAPTER 7  CONNECTORS AND CABLES**.

### 2.3.1 Host computer

A PC is used to communicate with the PG-FP4. Windows 95, Windows 98, Windows NT, Windows Me, Windows 2000, or Windows XP is required for GUI software operation of the PG-FP4.

It also must be equipped with a serial interface or a USB port. An optional parallel interface may be used for fast program download to the PG-FP4.

**Remark**   USB support is not available on Windows 95 and Windows NT.

### 2.3.2 PG-FP4 control panel and connectors

**Figure 2-2. PG-FP4 Top View**



Parallel host connector

USB port

Control buttons

Message display

Status LED

Serial host connector

Power connector

Target interface connector
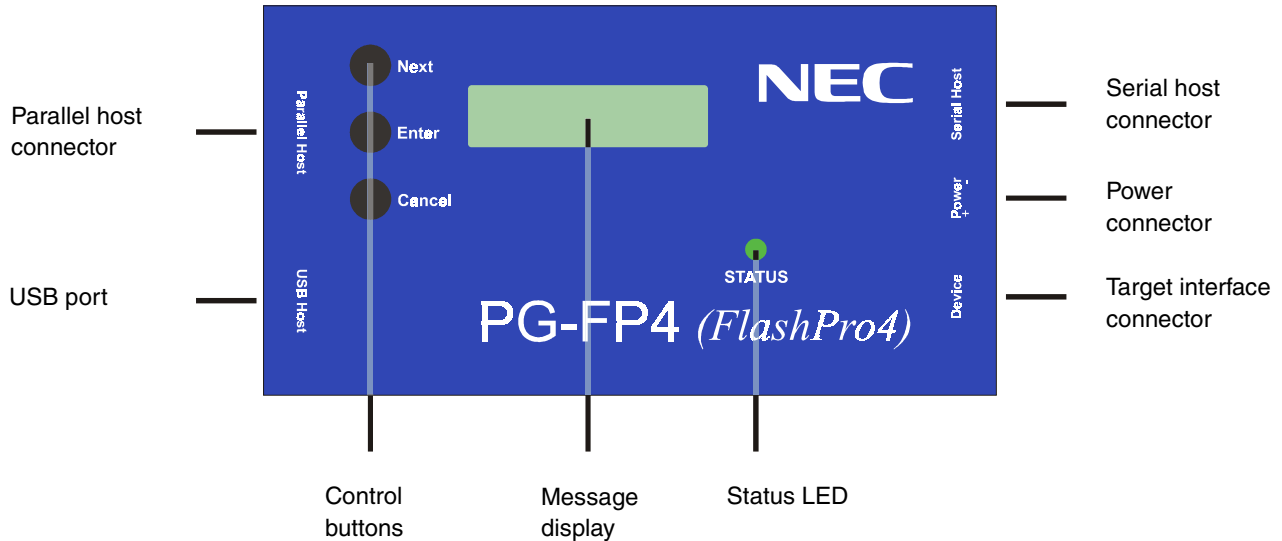
The control buttons are used in the standalone mode of the PG-FP4.

| | |
|---|---|
| **Next** button | Proceeds to the next menu item in sequence. |
| **Enter** button | Selects the item shown in the message display. |
| **Cancel** button | Cancels the current selection and returns to the previous menu item. |
| Message display | A 16 × 2-character LCD display indicates the operating mode. It is mainly used for the PG-FP4's standalone mode. |
| Status LED | The LED shows the PG-FP4 operating status, indicated by the colors green for **OK**, red for **Error** or orange for **Operating**. |

★

**(1) PG-FP4 connectors**

The serial host connector, the target interface connector and the power connector are located on the right side of the PG-FP4.

**Figure 2-3. PG-FP4 Target Interface/Power/Serial Host Connectors**

**<Right side of PG-FP4>**
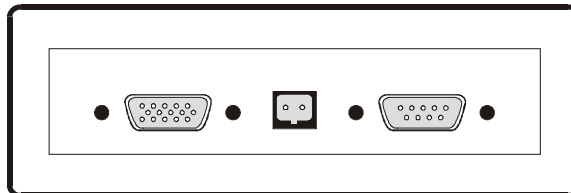
The parallel host connector and USB port are located on the left side of the PG-FP4. The parallel host connector can be used for high-speed downloading of a program as a Centronics interface.

**Figure 2-4.  PG-FP4 Parallel Host Connector/USB Port Interface**

**<Left side of PG-FP4>**
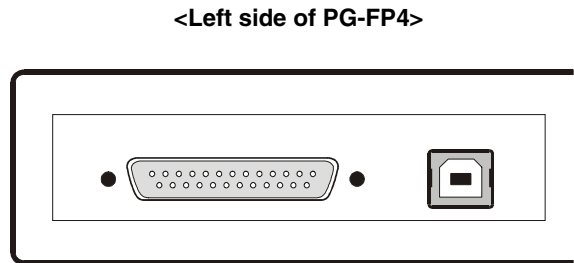


### 2.3.3  Target system
The target system must be equipped with a device interface that complies with the target cable specifications. For details, refer to **CHAPTER 7  CONNECTORS AND CABLES**.

### 2.3.4  Power supply
The power supply FW7207/15 is equipped with a 2.1 $\times$ 55 $\times$ 14 DC plug and may be connected to the mains using one of the AC plugs available in Europe, the UK, the USA and Japan.

For the power supply specifications, refer to **CHAPTER 7  CONNECTORS AND CABLES**.

**Caution   Do not use any other AC adapter.  Connect only the provided AC adapter to the power supply jack.**

### 2.3.5  RS-232C host connection
The RS-232C host interface enables communication to the PG-FP4. Windows 95, Windows 98, Windows NT 4.0, Windows Me, Windows 2000, or Windows XP may be used to operate the PG-FP4, which is connected to the serial port. The RS-232C data transfer conditions are 9,600 baud, 8 data bits, 1 stop bit, no parity and selectable hardware handshake.
The baud rate may be selected from 9,600 bps (default), 19,200 bps, 38,400 bps, 57,600 bps or 115,200 bps.
For detailed specifications of the host interface, refer to **CHAPTER 7  CONNECTORS AND CABLES**.

### 2.3.6  Parallel host connector
The parallel host connector may be configured as follows.

**Centronics interface configuration**
Program data can be downloaded to the PG-FP4 via a high-speed parallel port from the host system.
For detailed specifications of the parallel interface, refer to **CHAPTER 7  CONNECTORS AND CABLES**.

### 2.3.7 USB port

The USB port conforms to Rev 1.1. It supports a communication speed of 12 Mbps on a USB type B connector.

**Caution USB support is not available on Windows 95 and Windows NT.**

### 2.3.8 Target cable

The target cable is compatible with the FA adapters of Naito Densei Machida Mfg. Co., Ltd.
For detailed specifications of the target cable, refer to **CHAPTER 7 CONNECTORS AND CABLES**.

★ **2.3.9 I$^2$C adapter**

The SI and SO pins of the PG-FP4 must be shorted on the target board when the I$^2$C communication mode is used.

**Figure 2-5. Connection Diagram**
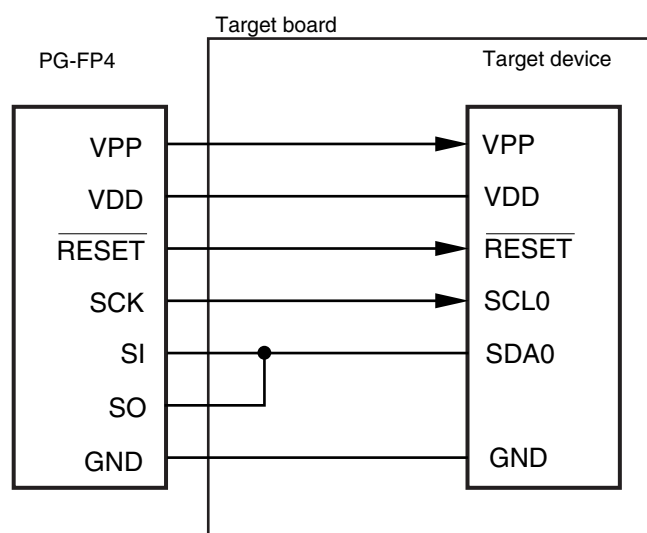


When using an I$^2$C adapter, the SI and SO pins do not have to be shorted on the target board.

**Figure 2-6. I$^2$C Adapter**



CN2 (16 pins) Pins 3 to 5 shorted

CN1 (10 pins) Pins 3 to 5 shorted
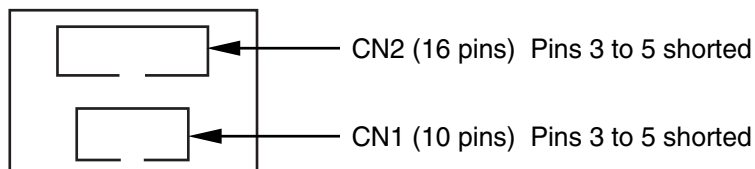
**Figure 2-7.  Connection Diagram When Using I$^2$C Adapter**



**<Usage when writing two-power-supply flash memory microcontroller>**
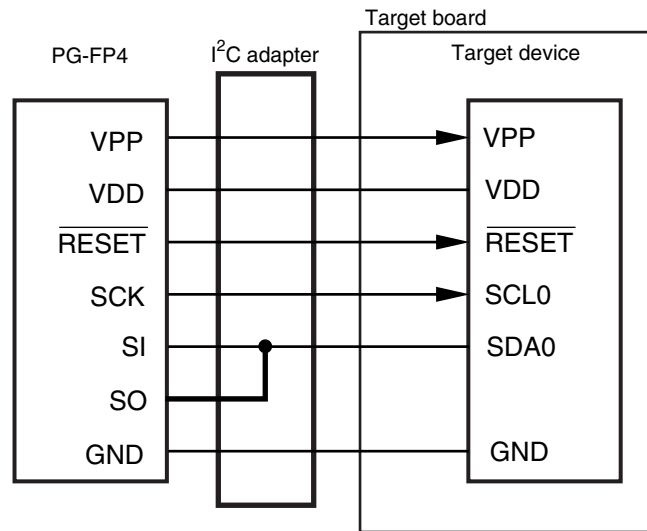
<1>  Connect the FA adapter and the type B target connector of the target cable (10 pins).

<2>  Connect the type A target connector (16 pins) and the I$^2$C adapter (CN2) of the target cable.

**<Usage when writing single-power-supply flash memory microcontroller>**

<1>  Connect the FA adapter and the type A target connector of the target cable (16 pins).

<2>  Connect the type B target connector (10 pins) and the I$^2$C adapter (CN1) of the target cable.

# CHAPTER 3  SOFTWARE  INSTALLATION

## 3.1    Graphical User Interface

The graphical user interface (GUI) software allows easy and comfortable access to all features of the PG-FP4 flash programmer.

### 3.1.1    GUI software installation

The installation program is located on the CD-ROM delivered with the PG-FP4 package.

To install the GUI software, execute the following steps:

First, insert the CD-ROM into your CD-ROM drive. A setup screen opens as follows.

**Figure 3-1.  Initial Status of Setup Screen**
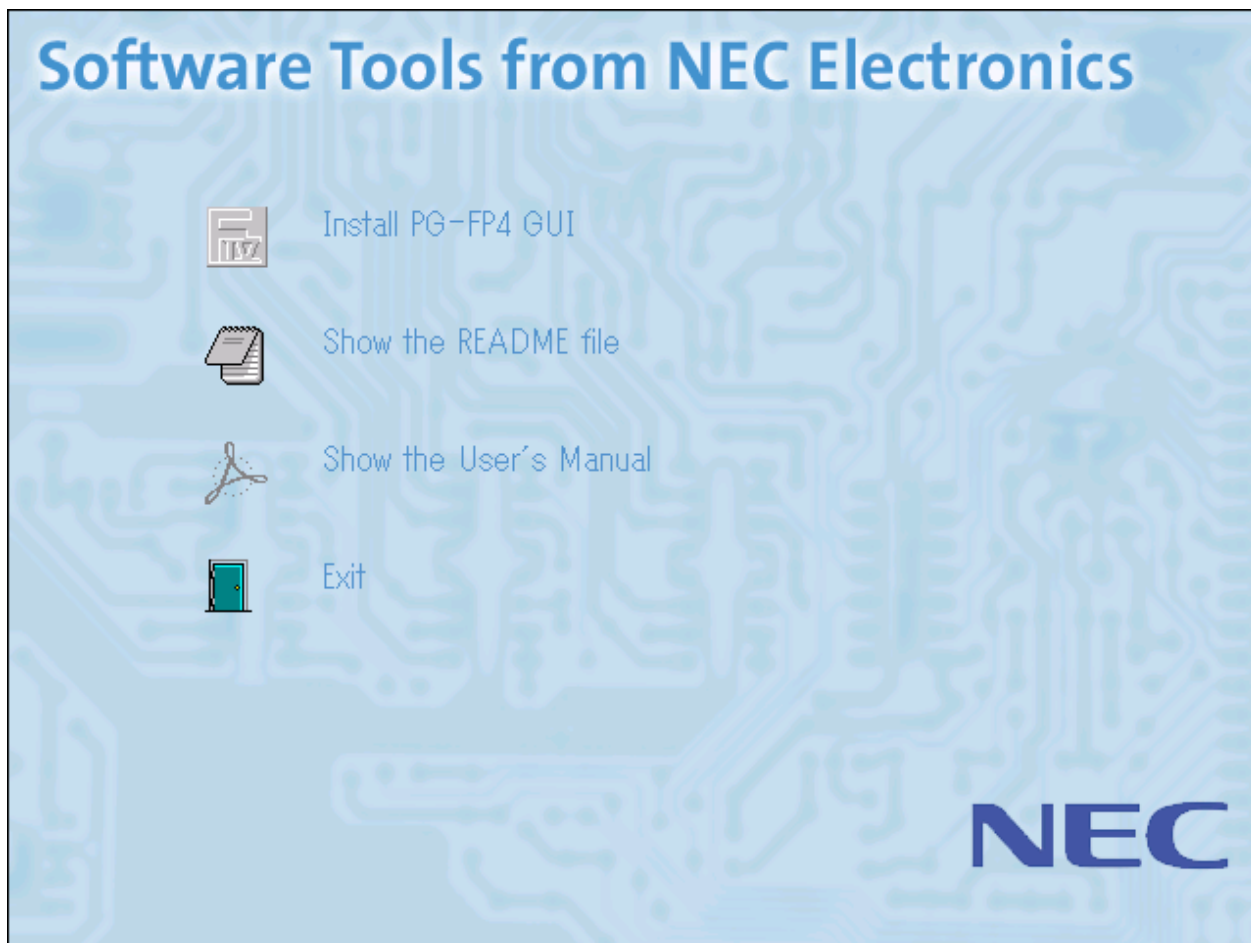


| | |
|---|---|
| **Install PG-FP4 GUI** | Runs SETUP.EXE from the SETUP directory. |
| **Show the README file** | Opens Notepad to show the README file. |
| | (Japanese and English are selectable.  Refer to **Figure 3-2**.) |
| **Show the User's Manual** | Opens Acrobat Reader to show the User's Manual. |
| | (Japanese and English are selectable.  Refer to **Figure 3-2**.) |
| **Exit** | Exits from the initial screen. |

**Figure 3-2. <Japanese/English Selection> Dialog Box**



When Install PG-FP4 GUI is clicked, the setup program will be executed. During initialization of the setup program a progress bar like that shown in Figure 3-3 appears to indicate the progress.

**Figure 3-3. Setup Preparation**
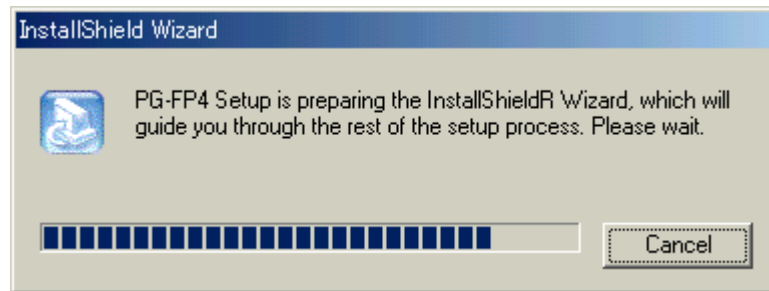


The welcome screen appears a short while after initialization.

**Figure 3-4. Welcome Window**
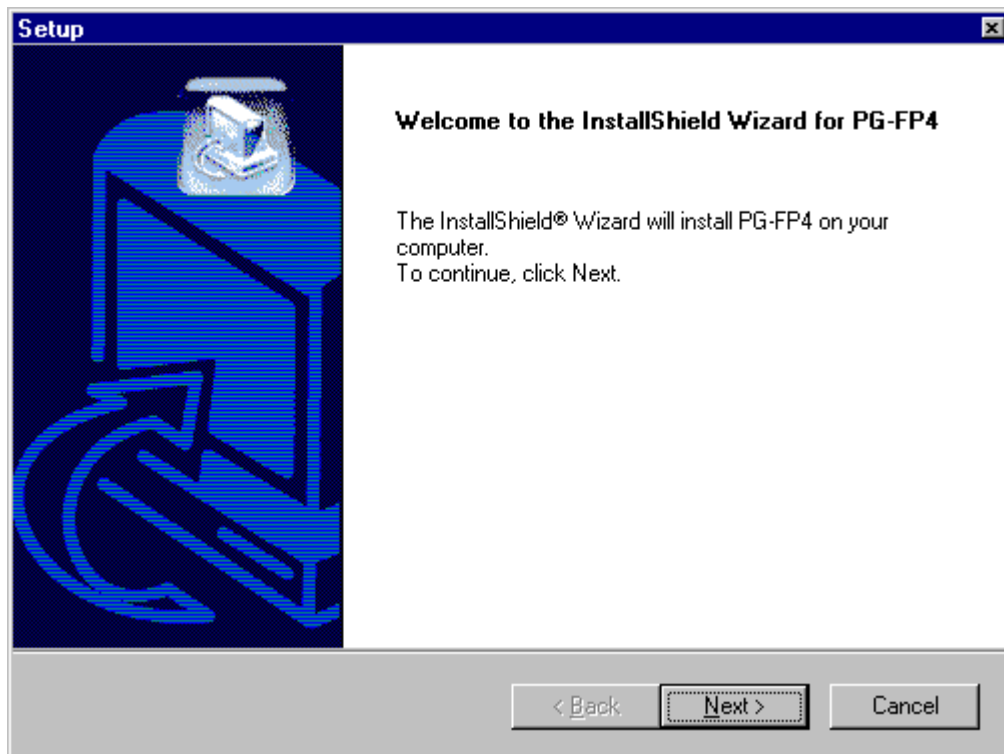


Click Next > to continue the installation.

Next, a window for selecting a setup type will be opened.

**Figure 3-5.  Setup Type Selection Window**
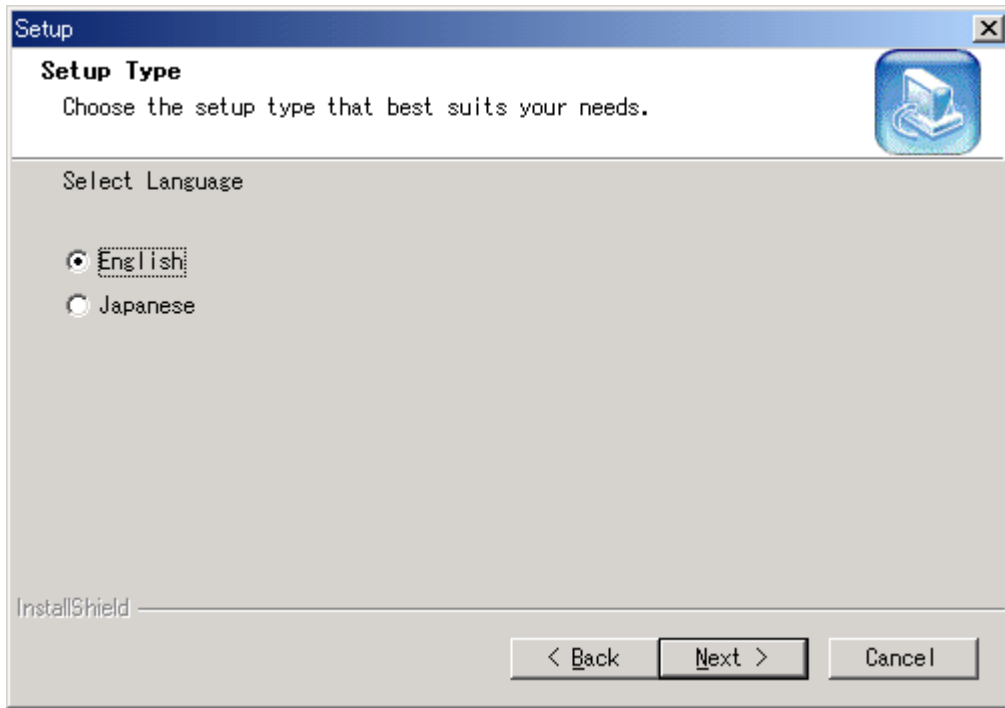


Select "English" or "Japanese" and click  Next > .

The software License Agreement window appears.

★                       **Figure 3-6.  Software License Agreement Window**



Click ⌞Accepted⌟ to continue the installation.
If you click ⌞Not accepted⌟ the installation procedure will terminate.

The installation start window appears.

**Figure 3-7. Installation Start Window**
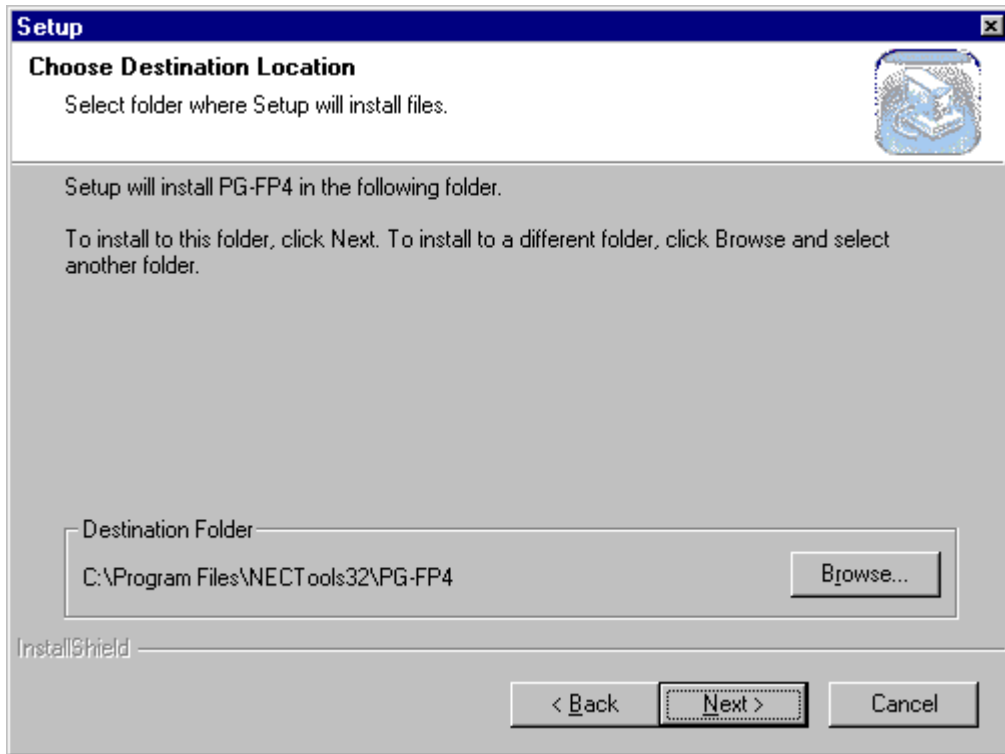


You can exit the installation by clicking the ☐ Cancel ☐ button.

Click the ☐ Browse… ☐ button to change the installation destination path.

Click the ☐ Next > ☐ button to proceed to the Setup Program Folder selection.

When the ☐ Browse… ☐ button is clicked, the Choose Folder window appears.

**Figure 3-8. Choose Folder Window**
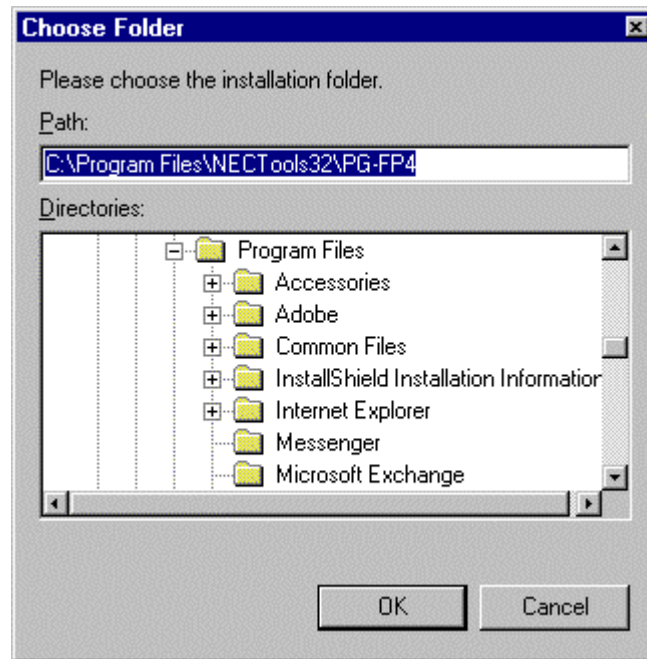


Here you can change the destination path. Click ⌑OK⌑ to accept the changes or click ⌑Cancel⌑ to undo the changes. You will return to the Installation start window (refer to **Figure 3-7**).

When the folder window is closed, click the ⌑Next >⌑ button in the installation start window.

The setup procedure opens the Select Program Folder window. By default, the program group NEC Tools32 will be created for the PG-FP4 program folder. You may change the folder name by selecting one of the existing folders or by typing a new folder name in the edit field.

**Figure 3-9. Select Program Folder Window**
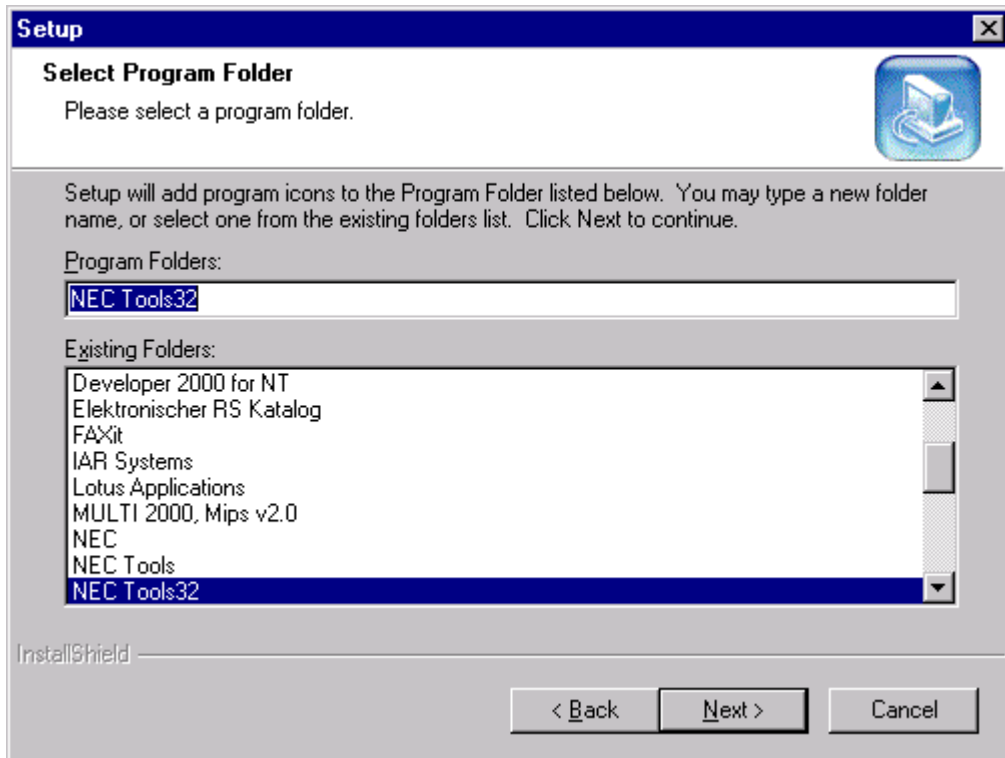


Select the correct folder and click the ⟦ Next > ⟧ button to show a summary of the selected folder.

**Figure 3-10. Start Copying Files Window**
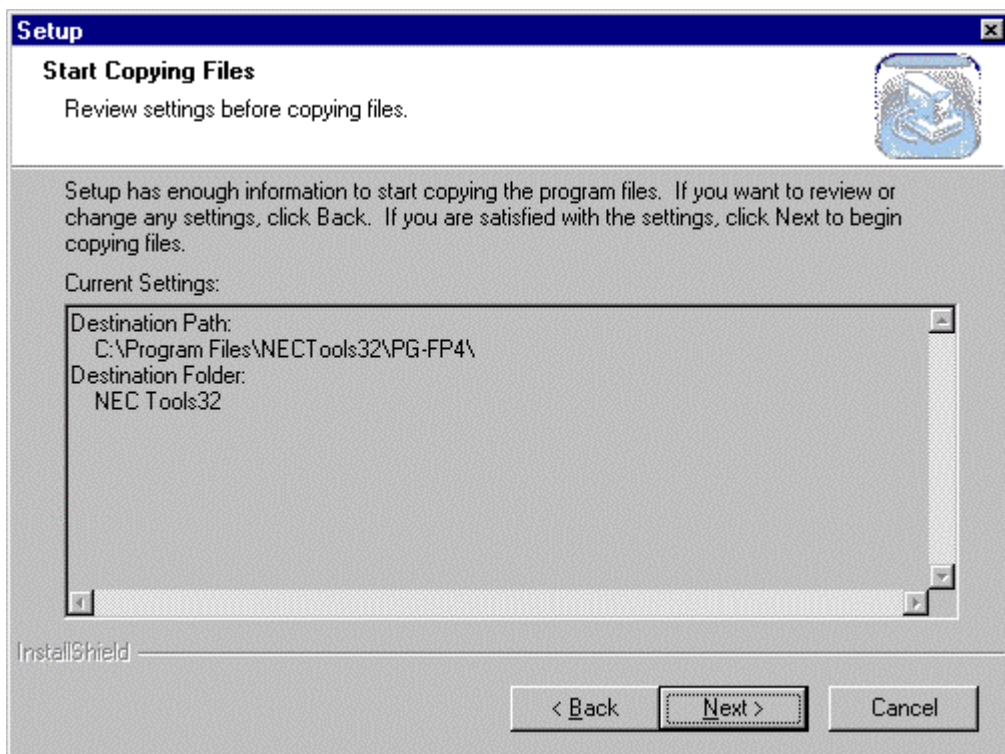


Click the ⟦ Next > ⟧ button to start the copy process.

You can follow the installation on the installation progress window. You will be prompted to change the floppy disk if the GUI software is distributed on more than one floppy disk.

**Figure 3-11. Installation Progress Window**
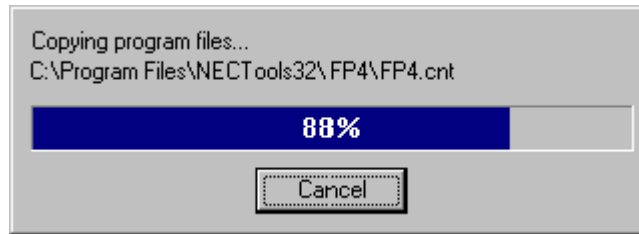


You can always abort the installation with the  Cancel  button.

When installation is complete, the following message window appears.

★                                         **Figure 3-12. Setup Is Complete Window**
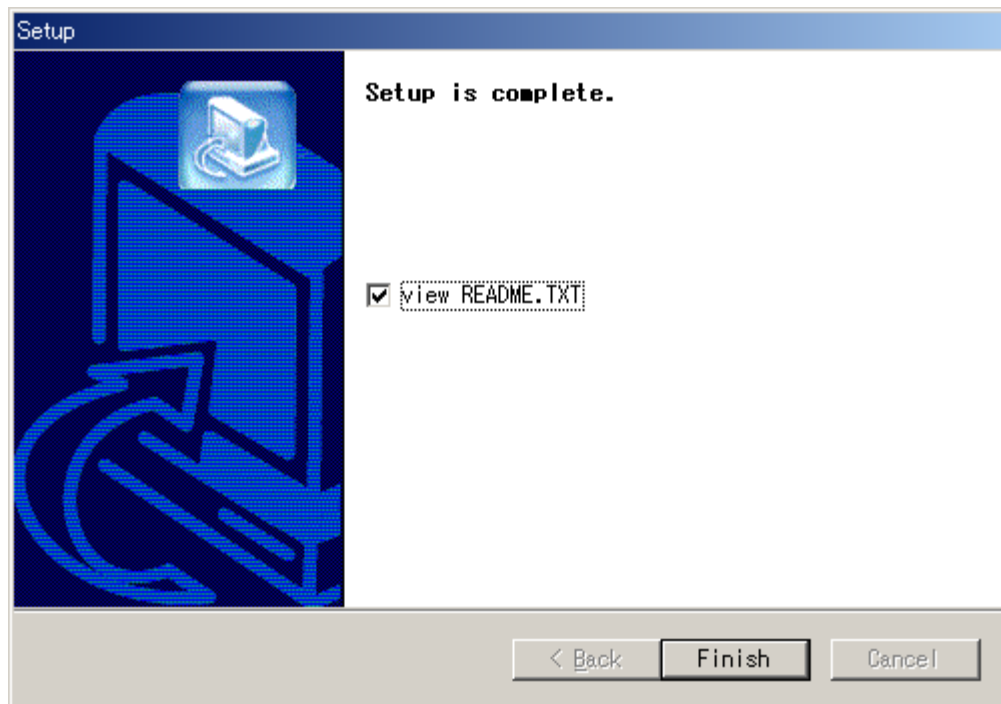


The program has been installed successfully and an entry has been made in the program menu to start the GUI software. Select the view README.TXT checkbox to start Notepad to show you the README.TXT file. Since this file is copied into your PG-FP4 directory anyway you may review it anytime.

Click the  Finish  button to exit installation.

The installation process is now complete and the setup utility has installed a new program folder which holds the GUI software and a "PG-FP4 unInst" icon which allows you to delete the GUI software and this software if they are not used anymore.

**Figure 3-13. Program Folder After Installation**
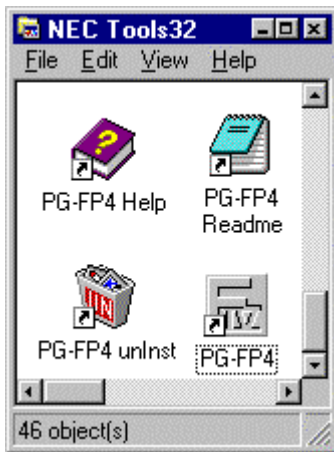
Opens the README file for the PG-FP4

Starts the PG-FP4 GUI software

Starts the PG-FP4 online help

Uninstalls the PG-FP4 from the computer

The setup program installs following files on your hard disk.

★        `C:\...\NECTools32\PG-FP4`

        `README.TXT`                                Latest information
        `FP4.EXE`                                   GUI software
        `FP4.HLP`                                   Online help file
        `FP4.CNT`                                   Online help contents file
        `FP4COM.DLL`                                Communication DLL


    `C:\...\NECTools32\PG-FP4\drivers`
★            `USBIOWIZ.INF`                            Setup information file for OS
        `USBIO.SYS`                                 USB driver


    `C:\...\NECTools32\PG-FP4\prm`
        `<empty>`                                   Storage place for parameter file for target device


    `C:\...\NECTools32\PG-FP4\set`
        `<empty>`                                   Storage place for customized setup files.

**Caution   The parameter file for the target device must be downloaded separately from the NEC Electronics
Website at http://www.necl.com/micro/ods/eng/index.html.**


★     **3.1.2   USB driver installation**
When the PG-FP4 is connected via the USB interface for the first time, Windows 98, Windows Me, Windows 2000,
and Windows XP automatically detect the PG-FP4.  Then the wizard for searching the new hardware will start.

**Caution   USB support is not available on Windows 95 and Windows NT.**

**Figure 3-14.  When Connection of PG-FP4 to USB Port Is Detected**
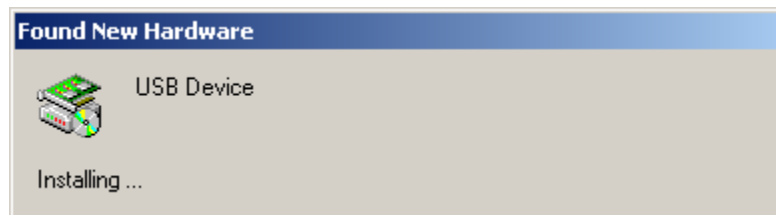
**Figure 3-15. Welcome to the Found New Hardware Wizard Window**



You can exit the installation by clicking the $\boxed{\text{Cancel}}$ button.

Click the $\boxed{\text{Next>}}$ button to install a USB driver.

Next, the Install New Hardware Wizard window will be opened.

**Figure 3-16. Install New Hardware Wizard Window**



Select "Search for a suitable driver for my device [recommended]" under "What do you want the wizard to do?" and click the $\boxed{\text{Next >}}$ button. The Locate Driver Files window will be displayed.

**Figure 3-17.  Locate Driver Files Window**
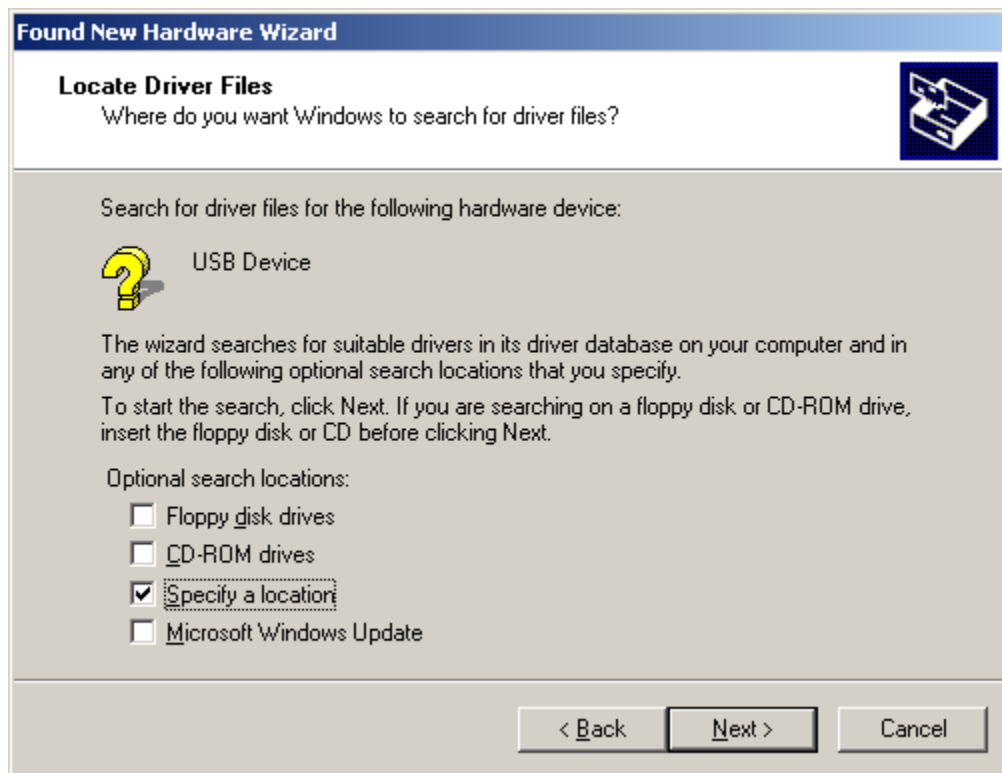


Check "Specify a location" and click the Next > button.
The window for specifying the USB driver files to be copied will be opened.

**Figure 3-18.  Window for Specifying Driver Files to Be Copied 1**
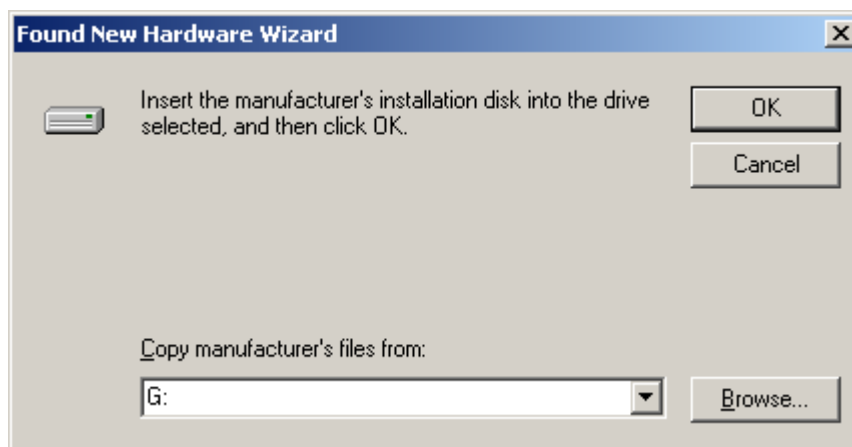


Specify the directory where the driver exists and click OK .
You can specify the directory from the Locate File window after clicking Browse… .

**Figure 3-19. Locate File Window**
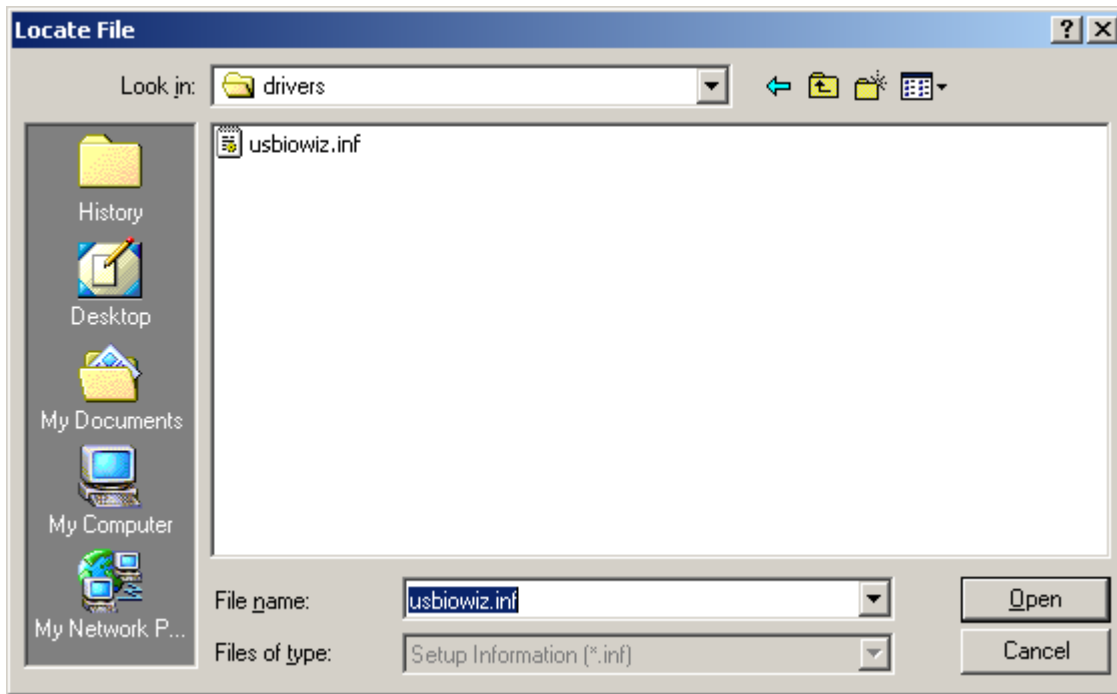


Select usbiowiz.inf in the drivers directory created under the PG-FP4 install directory and click ⟨Open⟩.
The specified location is shown in the window used to specify the copy source of the USB driver file.

**Figure 3-20. Window for Specifying Driver Files to Be Copied 2**
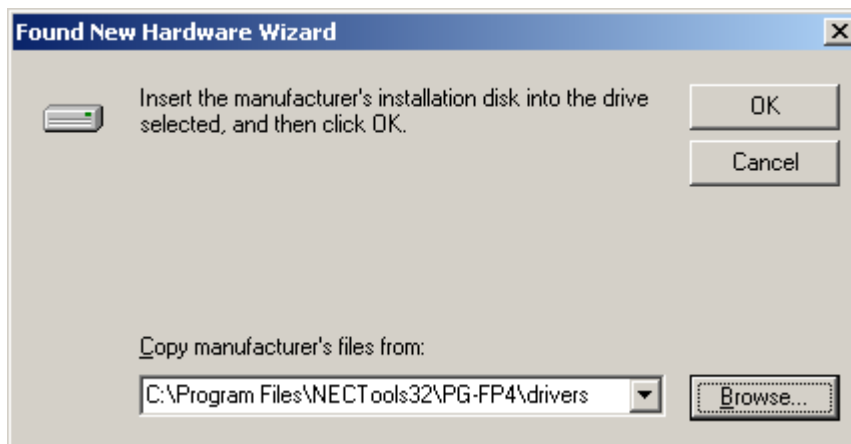


When you click ⟨OK⟩, the driver file will be searched.
The driver file search window is displayed.

**Figure 3-21. Driver Files Search Results Window**
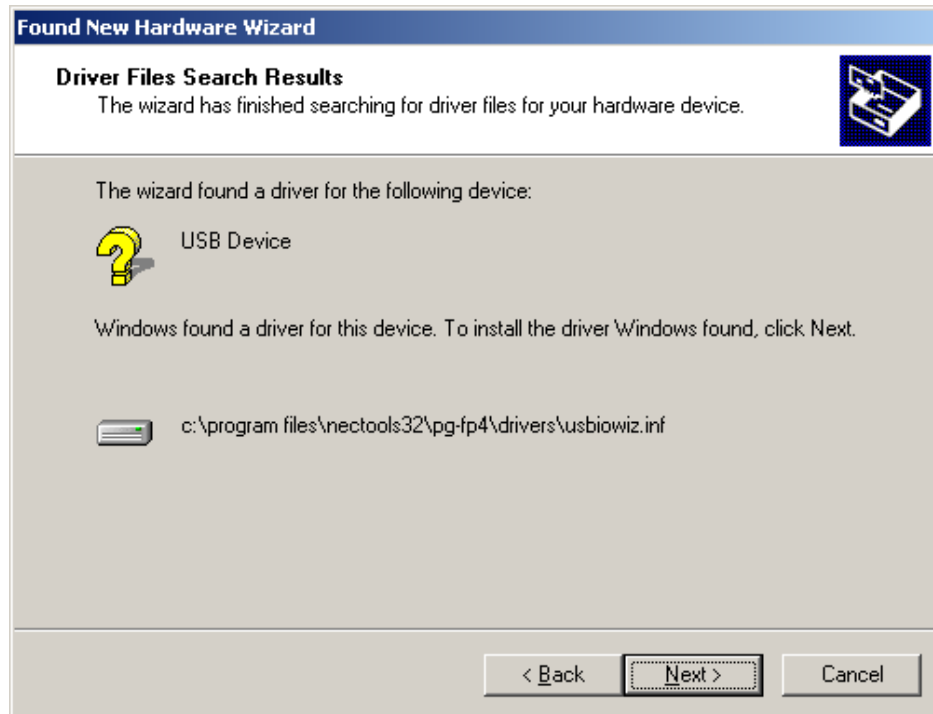


Click Next > , to start installation.

When the installation is complete, the following window will be displayed.

**Figure 3-22. Completing the Found New Hardware Wizard Window**



Now that the USB driver has been installed, the PG-FP4 is ready to communicate using the USB port.

To complete the installation, click Finish .

### 3.1.3 GUI software uninstallation

**(1) Uninstallation using "PG-FP4 unInst" icon**

After all components of the GUI software have been installed, clicking the "PG-FP4 unInst" icon will start the uninstallation procedure.



All files installed during setup will be removed from your hard disk except the parameter files (.PRM) and customized setup files (.SET).

★ **(2) Uninstallation using "Add/Remove Programs".**

Start "Add/Remove Programs" in the Windows Control Panel.



Select "PG-FP4" in "Change or Remove Programs", then click ⌧Change/Remove⌧ to start uninstallation.

**Figure 3-23. Add/Remove Programs Window**
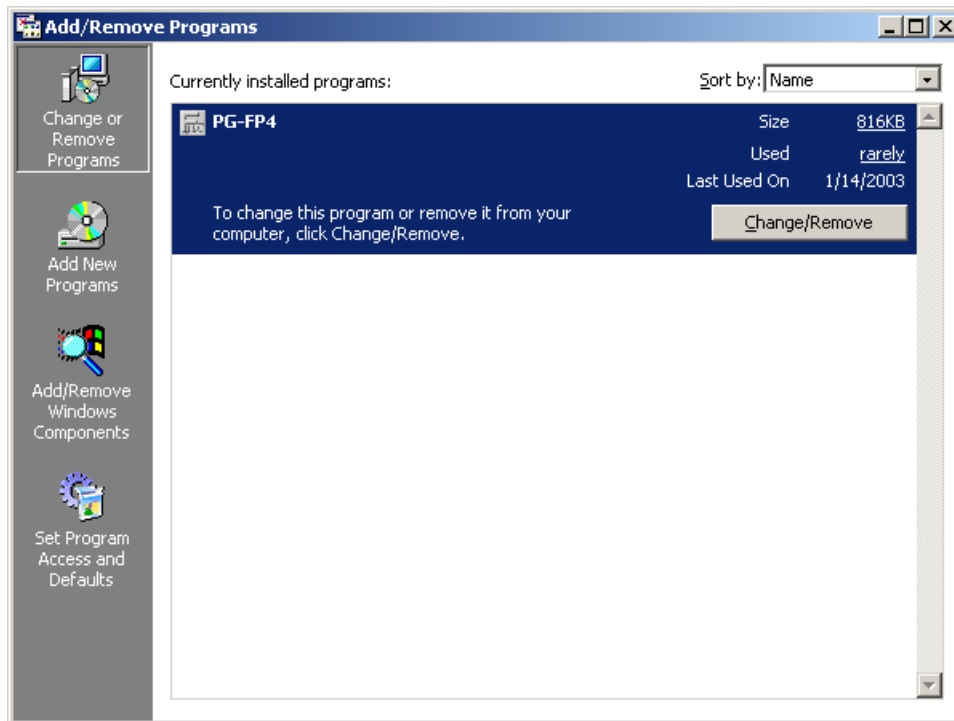


All files installed during setup will be removed from your hard disk except the parameter files (.PRM) and customized setup files (.SET).

### 3.2  Firmware and GUI Software Update Installation

In order to guarantee proper operation of the PG-FP4 programmer, it is mandatory that the correct firmware version be available in the programmer's internal memory.

★      Be sure to follow the procedure below when updating the firmware.

       <Procedure>

       (1)  Upgrade the GUI software.

       (2)  Update the firmware using the new GUI software.

The GUI software will perform a crosscheck of software versions between the installed GUI software and the firmware in the PG-FP4.  If the GUI software is not the latest, the following a warning message will appear.

**Figure 3-24.  Warning About Old GUI Software Version**



If the firmware is not the latest, the following warning message will be displayed.

**Figure 3-25.  Warning About Old Firmware Version**



In both cases, update the software to the latest version.

Check the NEC Electronics Website at http://www.necel.com/micro/ods/eng/index.html and download the necessary software update packages.

### 3.2.1 Firmware update installation

The new firmware can be installed using the GUI software. Before this process starts, download the new firmware onto the hard disk of the PC from the NEC Electronics Website.

A typical name of the firmware program file is `FP4_VUP_xxxx.REC`, where `xxxx` is the version number of this firmware.

**(1) Firmware update from warning message**

The firmware update procedure starts when you click the Yes button in the firmware update error message (refer to **Figure 3-25**). From the <File open> dialog box that appears, select the firmware update program file `FP4_VUP_xxxx.REC`. Several commands will be sent to the PG-FP4 and a progress indicator will inform you of the download progress.

As soon as the firmware update is complete, a message will appear.

**Figure 3-26. Firmware Update Complete Message**
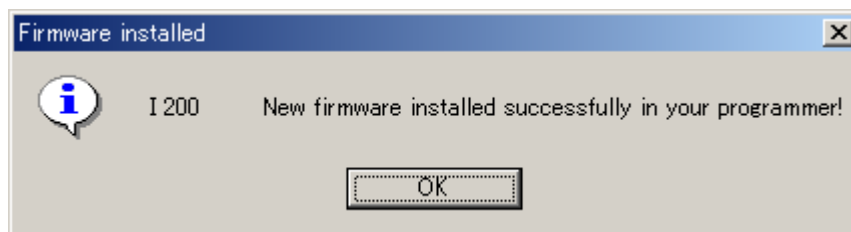


**(2) Firmware update from menu bar**

The <Update Firmware> dialog box shown in Figure 3-25 is opened by selecting [Update Firmware] from [Programmer] on the menu bar. Hereafter, follow the procedure in the **(1) Firmware update installation from warning message** above.

**Figure 3-27. [Update Firmware] Menu**
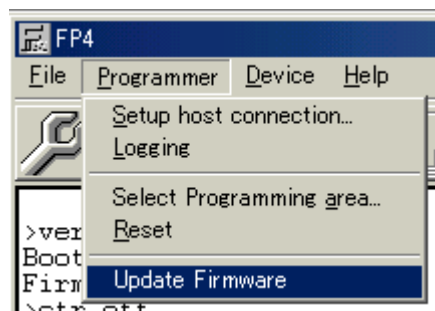


The PG-FP4 is now ready for operation.

# CHAPTER 4  PG-FP4  OPERATION  USING  GUI  SOFTWARE

## 4.1  Introduction

Before you start using the PG-FP4, download the parameter file for the target device (.PRM) to the PRM folder.

<Downloading the parameter file>
The PRM file is not part of the PG-FP4 software package.
It has to be downloaded from the NEC Electronics Website at http://www.necel.com/micro/ods/eng/index.html.

The PRM file downloaded from the NEC Electronics Website must be copied into the sub-directory <PG-FP4 install path>\PRM which was created during GUI software setup (see **CHAPTER 3  SOFTWARE INSTALLATION**).  If no PRM file has been installed before, the GUI software will report a fatal error and it will not startup.

**Figure 4-1.  Fatal Error: No Parameter File Installed**
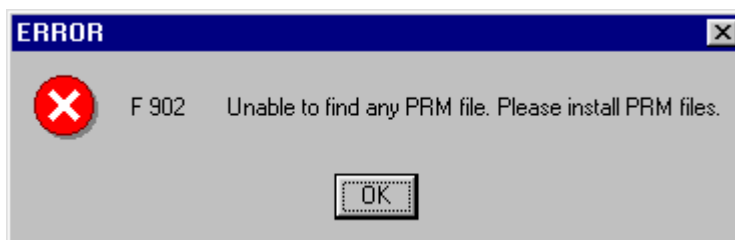
## 4.2 Starting up the GUI Software

- System connection

  After installing the parameter file, connect the supplied RS-232C cable or USB cable to the computer in which the PG-FP4 is used. After connecting the cable, switch the PG-FP4 on. When it is started up correctly, the message display shows the 'Commands >' prompt, and the status LED is switched off.

  If the above does not happen, the PG-FP4 may be faulty. In this case, contact an NEC Electronics sales representative or distributor.

- GUI software startup

  To start the PG-FP4 GUI software, select FP4.EXE or double-click the shortcut if it has been created. The PG-FP4 starts communicating using the most recently used communication parameters stored in its internal EEPROM. The default communication speed is 9,600 bps.

  The GUI software establishes a connection with the PG-FP4 using the [GUI] section parameters in the FP4.INI file, HostConnectionSpeed, HostConnectionPort, and HostDownloadPort. When no FP4.INI file exists (this is the case when starting the GUI software for the first time), the GUI software scans the connection via COM1 to COM6 in each port at 9,600 bps, 19,200 bps, 38,400 bps, 57,600 bps, and 115,200 bps to establish communication with the PG-FP4 using the USB.

**Figure 4-2. Port Scanning at Startup of GUI Software**



You may interrupt this operation by clicking ABORT and select the correct communication parameters from the [Programmer] → [Setup host connection...] menu.

As soon as communication is established and the GUI software is started correctly, the following screen appears.

★ **Figure 4-3. GUI Software Main Window**
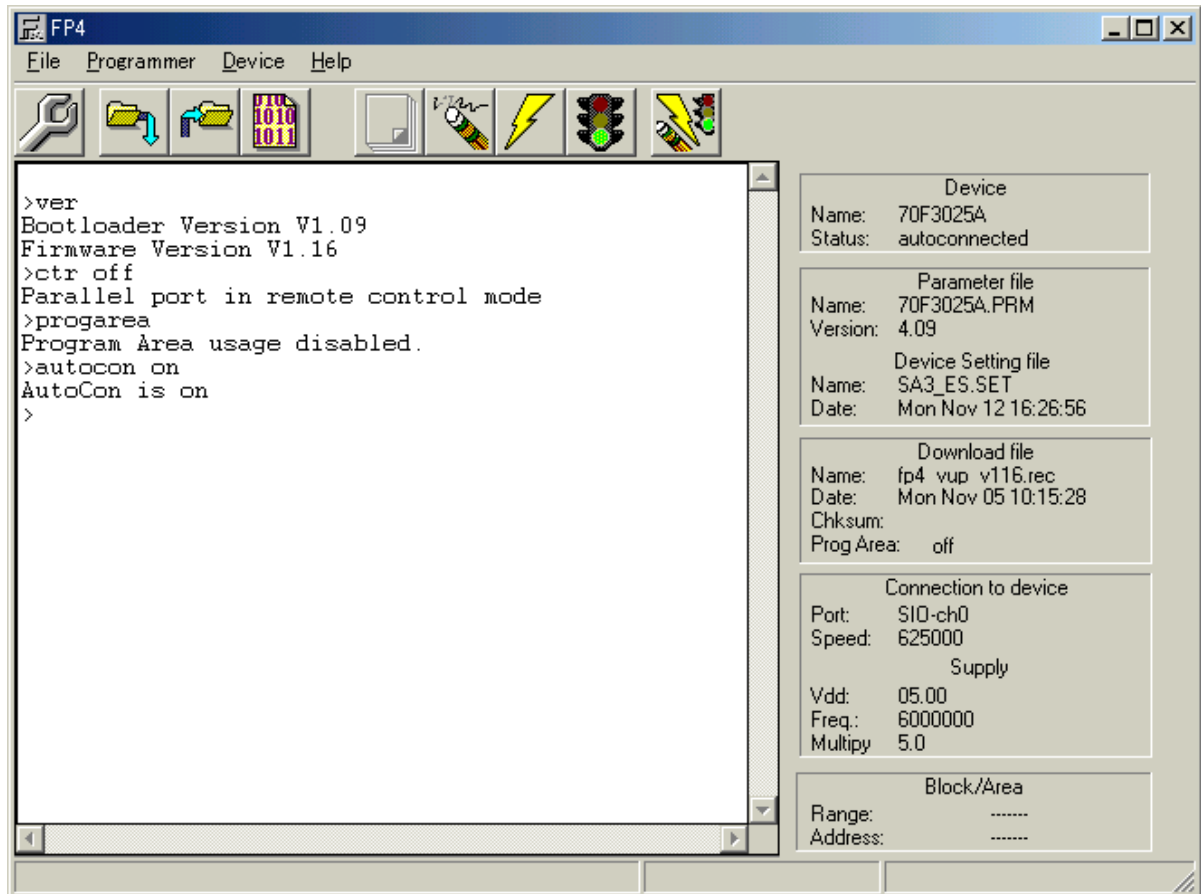


This window consists of the following items.

- Menu bar (displayed on top):  Displays executable menus of the PG-FP4
- Toolbar (displayed below the menu):  Displays frequently used commands as icons
- Communication log window (displayed below the toolbar):

  Displays all commands transmitted to the PG-FP4 and messages returned from the PG-FP4
- Programmer parameter window (displayed on the right side of the communication log window):

  Displays programming parameter settings

### 4.3 Toolbar

The toolbar contains buttons to start the most important procedures of the PG-FP4.

**Table 4-1. Toolbar Buttons**

| | | | |
|---|---|---|---|
|  | [Device] – [Setup…] button |  | [Device] – [Erase] button |
|  | [File] – [Download…] button |  | [Device] – [Program] button |
|  | [File] – [Upload…] button |  | [Device] – [Verify] button |
|  | [Hex Editor …] button |  | Device Erase → Program → Verify (Autoprocedure (EPV)) button |
| ★  | [Device] – [Blank check] button[Note] |  | [Programmer] – [Select Programming area…] button |

**Note** Enabled only for single-power-supply flash memory microcontrollers.

### 4.4 Menus

Depending on the actual device status or device type, some menu items may be enabled or disabled. For example, the [Device] – [Blank check] button is enabled only for single-power-supply flash memory microcontrollers.

#### 4.4.1 [File] menu

After clicking the [File] menu, the following pull-down menu is displayed.
Commands related to file operation appear here.

**Figure 4-4. [File] Menu**
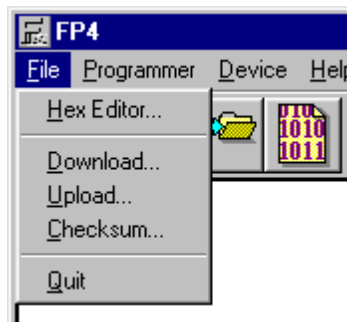
**(1) [Hex Editor…] menu**

The [Hex Editor…] menu allows you to edit a program file in Intel HEX file format or Motorola S-Record format. A HEX Editor window opens and the file to be edited can be specified in a "file open" dialog box.

**Figure 4-5. HEX Editor File Open Window**
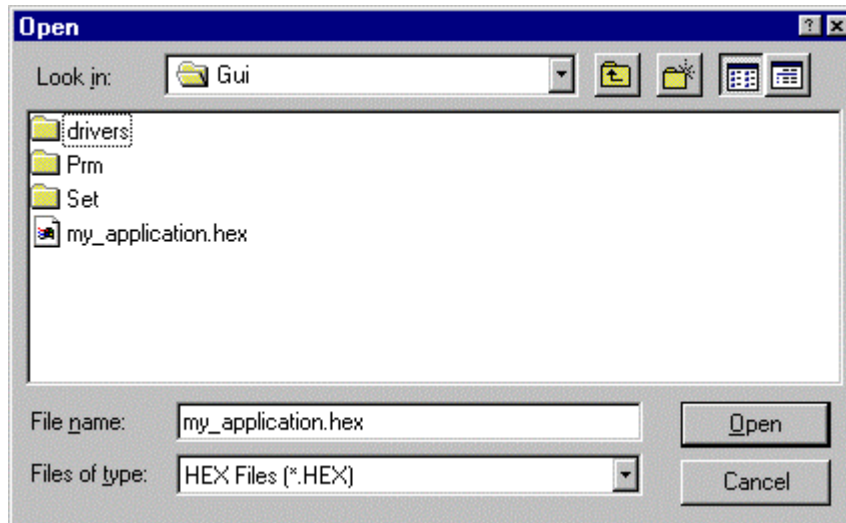


HEX Files or SREC Files may be selected from the Files of type list box.

After selecting a file to open, the HEX Editor main window loads the file and displays its contents as follows.

**Figure 4-6.  HEX Editor Main Window**
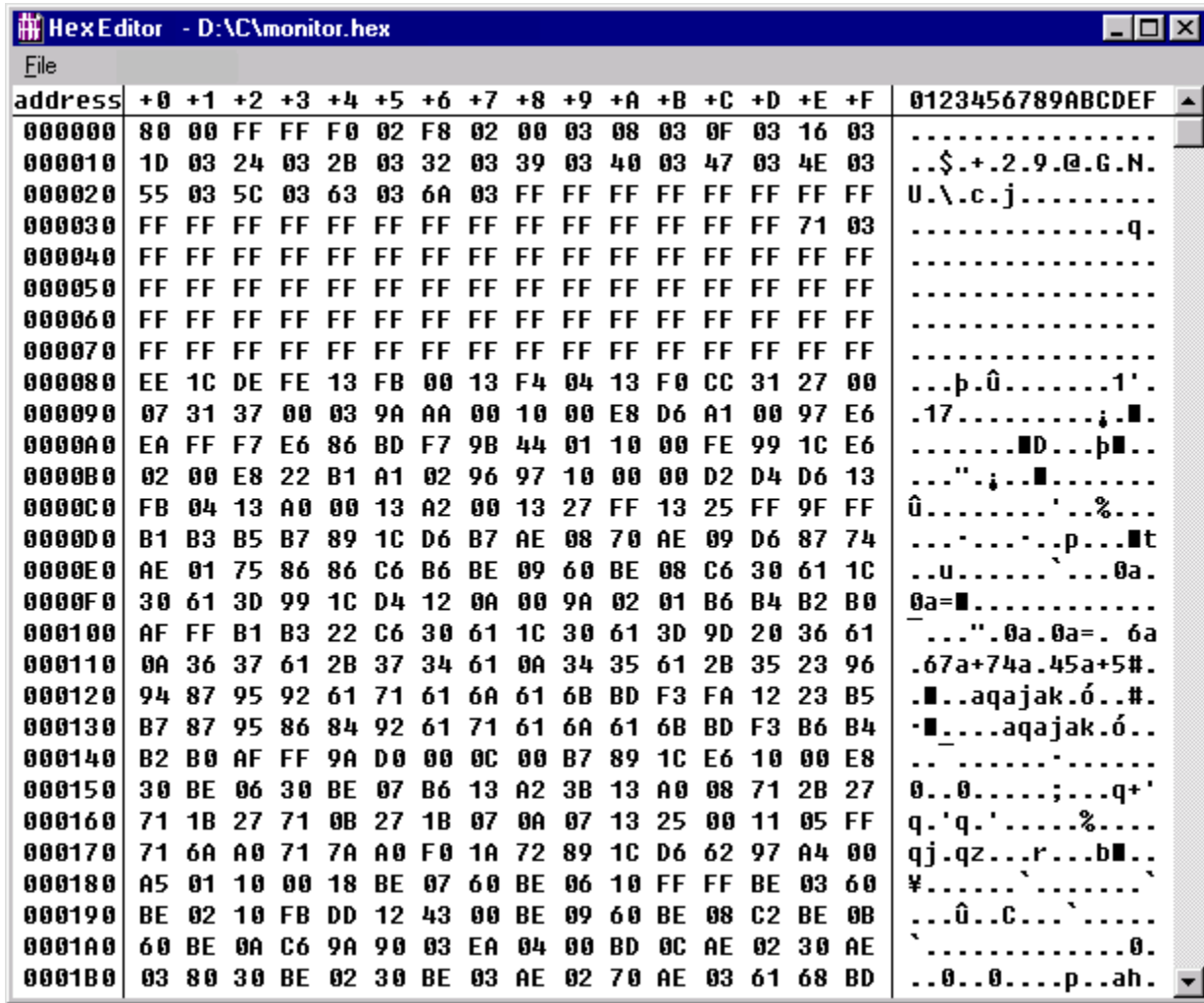


The displayed file can be modified by placing the mouse cursor inside the HEX Editor main window.  Data input via the keyboard is accepted for all shown memory locations.

The HEX Editor accepts data only in hexadecimal format, i.e. figures 0 - 9 and letters A - F.  Any other data will be rejected.

The ASCII representation, if any, is shown at the right side of the main window.  This area is for reference only. Data input is not possible in the ASCII window.

Use the scroll bar to move another address range into the visible area of the HEX Editor.

The address space shown in the HEX Editor window is limited to 4 MB.

The following keys can be input using the keyboard.

**Table 4-2. Key Functions That Can Be Input in HEX Editor Window**

| Key | Function |
|---|---|
| 0 - 9, A - F | Data input |
| → | Move cursor in right direction |
| ← | Move cursor in left direction |
| ↑ | Move cursor in up direction |
| ↓ | Move cursor in down direction |
| Tab | Move cursor to next input field |

If any changes have been made to the edited file, the HEX Editor [File] → [Save] and [File] → [Save As…] menu items will be enabled to save the modified data.

**Figure 4-7. HEX Editor <Save As...> Dialog Box**
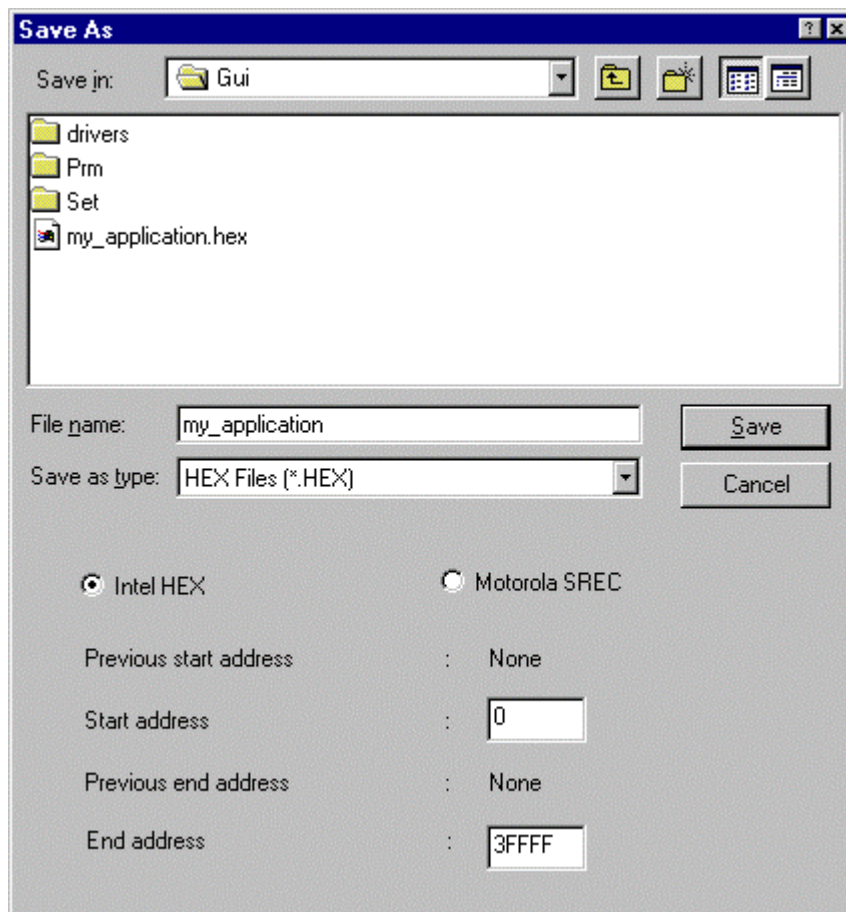


Besides the file name and directory location, <Save As…> allows selection of a different start address and a different end address for the new file. The original start address and end address are offered as the default selection. Click the file format button of the format in which to save the data. The file format cannot be changed with this selection.

**(2) [Download] menu**

The [Download] menu allows you to select and download a program file into the PG-FP4 flash memory. The downloaded program file may be programmed into the device's flash memory by executing the Program command or EPV command.

**Figure 4-8. File Selection Window for Program Download**
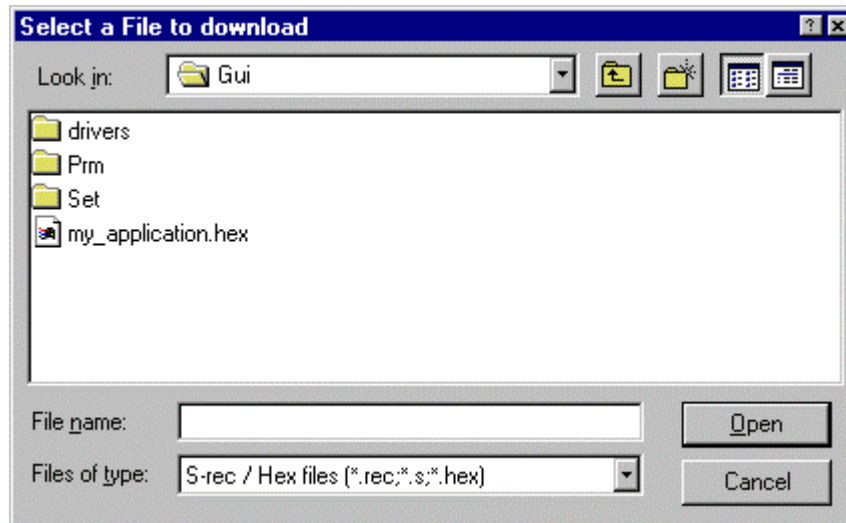


The most recently used directory from which a file has been downloaded will be offered in this window as the default selection.

After downloading the user program, the checksum in the flash memory area of the PG-FP4 valid in Progarea is calculated and the result is displayed in the programmer parameter window and communication log window.

**[ Open  button]**

Downloads the selected user program to the flash memory of the PG-FP4.

Checksum data of the downloaded data is saved in the FileDownCrcSum key in the [Programmer] section in the FP4.INI file. This saved checksum data is used for comparison with the PG-FP4 memory contents before executing the EPV command.

The downloaded user program is retained even after the power of the PG-FP4 is switched off.

**[ Cancel  button]**

Closes the window without downloading the selected user program.

The directory names are saved in the FileDownloadDirectory key in the [Programmer] section in the FP4.INI file. The downloaded file names are saved in the FileDownFileName key in the [Programmer] section in the FP4.INI file.

**(3) [Upload] menu**

The [Upload] menu allows you to specify and upload a program file from the PG-FP4 flash memory to the host machine.

**Figure 4-9. File Selection Window for Program Upload**
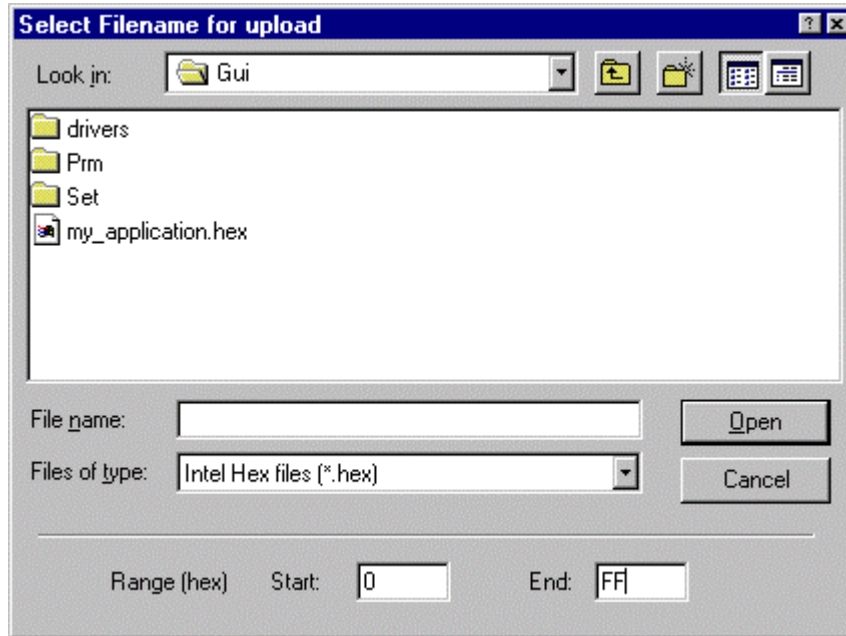


In the appearing window you can:
- Select a program file for upload
- Select the upload file format (Intel HEX or Motorola S-Record format)
- Select the memory start and end addresses to upload

The most recently used directory from which a file has been uploaded will be shown in the [Upload…] menu.

**[ Open  button]**
Starts uploading

**[ Cancel  button]**
Closes the window without uploading the program.

**(4) [Checksum…] menu**

The [Checksum…] menu may be used to verify that the PG-FP4's flash memory area contains the correct download file.

**Figure 4-10. Checksum Dialog Box**
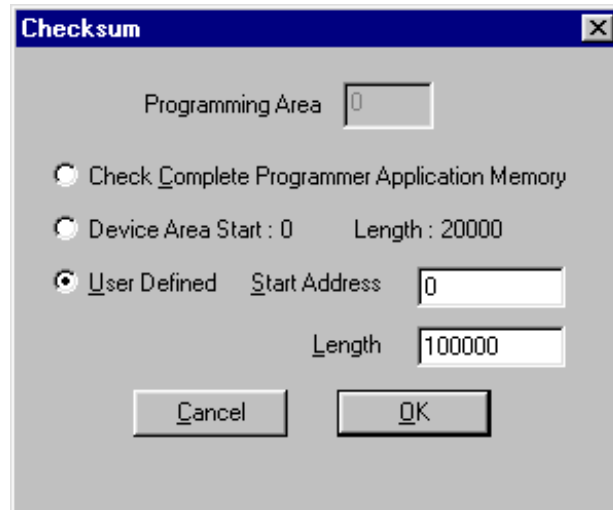


All the programming memory area (2 MB) or "Check Complete Programmer Application Memory", in which 32-bit CRC calculations are performed in the PG-FP4 programming memory area selected using the [Programmer] > [Select Programming area…] menu, is selected by default. The currently selected programming memory area is displayed in the "Programming Area" for reference.

Select the "Device Area" to calculate the checksum of the flash memory area of the target device.

The target memory area accords with the information of the currently downloaded parameter file.

Select "User Defined" to calculate the checksum of any memory area. In this case, specify the "Start Address" and "Length".

★ The checksum is displayed in the communication log window.

**(5) [Quit] menu**

Terminates the PG-FP4 GUI software. Clicking the ⎡X⎤ button on the right side of the task bar also terminates the PG-FP4 GUI software.

User settings are saved in the FP4.INI file so that the GUI software will start up next time with the same settings.

### 4.4.2 [Programmer] menu

Clicking the [Programmer] menu displays the following pull-down menu.

This pull-down menu consists of program setting commands.

**Figure 4-11. [Programmer] Menu**
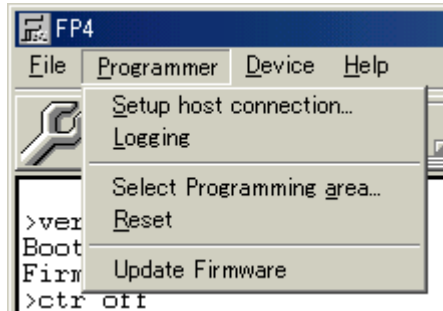


**(1) [Setup Host Connection…] menu**

The channel for communicating between the PG-FP4 and PC can be selected and set in this dialog box.

**Figure 4-12. <Host Connection> Dialog Box**
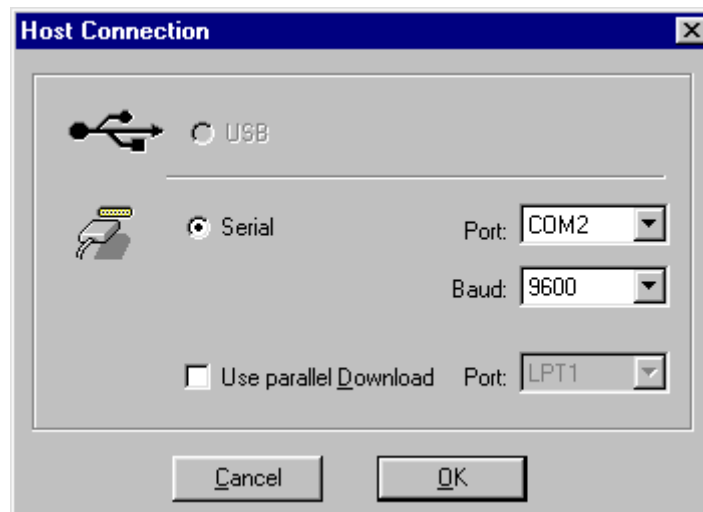


You may select USB as the communication channel, if USB is supported on your PC.

If "**Serial**" is selected, the port and baud rate may be selected from the drop-down list boxes.

"**Use parallel Download**" can be selected in addition to the serial port. If parallel download is selected, data download to the PG-FP4 is performed via the selected parallel interface.

**Caution** **The parallel interface cable is not part of the PG-FP4 package.**

**Check that the LPTx port is not used before using the parallel port.**

**USB communication is not supported on Windows 95 or Windows NT.**

**[ OK button]**

The software tries to establish a connection between the PG-FP4 and the PC using the selected communication parameters.

**[ Cancel button]**

Closes the window without making any changes.

**(2) [Logging] menu**

The [Logging] menu opens the log file dialog box to select the log file name.  The log file will store the communication between the PC and the PG-FP4 (data in the communication log window).

**Figure 4-13.  <Log File> Dialog Box**
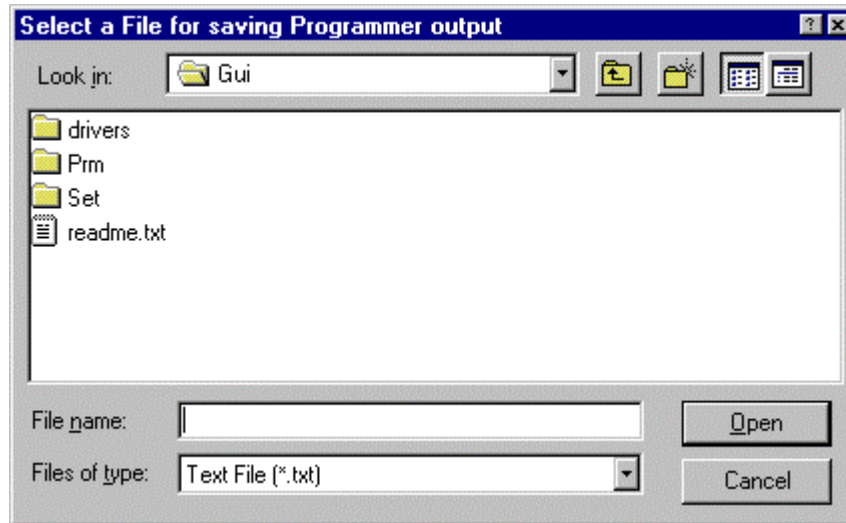


Once logging is enabled, a check mark in the [Logging] menu indicates that logging is active.

Selecting the menu again will close the log file and stop any further communication logging.

**(3) [Select Programming area…] menu**

★   This menu item allows selection of one out of two different programming areas of the PG-FP4 (1 MB each).  This menu is valid when "Enable two Program Areas" on the Advanced tab of [Device] > [Setup] menu is checked.

**Figure 4-14.  Programming Area Selection**
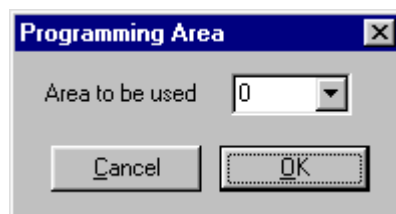


The PG-FP4 internal memory area is split into two independent memory areas of 1 MB, each of which may hold two different application programs for flash programming.  When opening this dialog box, the current programming area selection will be displayed.

**(4) [Reset] menu**

By clicking this menu item, you can execute a software reset of the programmer.  The communication window will show the current version of the PG-FP4 firmware after the reset.

★          **(5) [Update Firmware] menu**
Clicking this menu item updates the PG-FP4.  Before starting the update, download the necessary upgrade data from the NEC Electronics Website at http://www.necel.com/micro/ods/eng/index.html.

When the firmware update is started, the following confirmation message is displayed first.

**Figure 4-15.  Firmware Update Window**
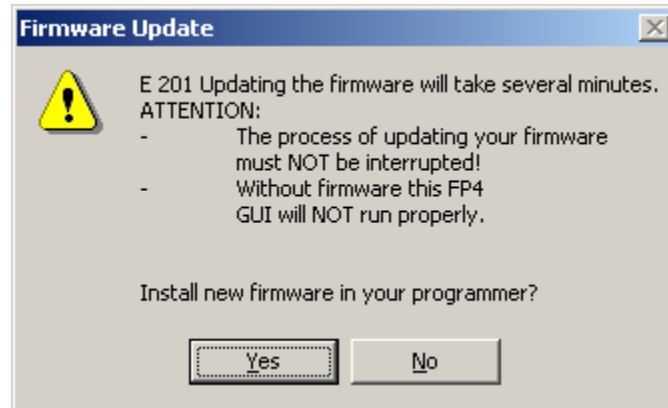


To continue the firmware update, click Yes .
When No is clicked, the firmware update is canceled.
When Yes is clicked, <Select a File to download> will be displayed.

**Figure 4-16.  Select a File to Download Window**
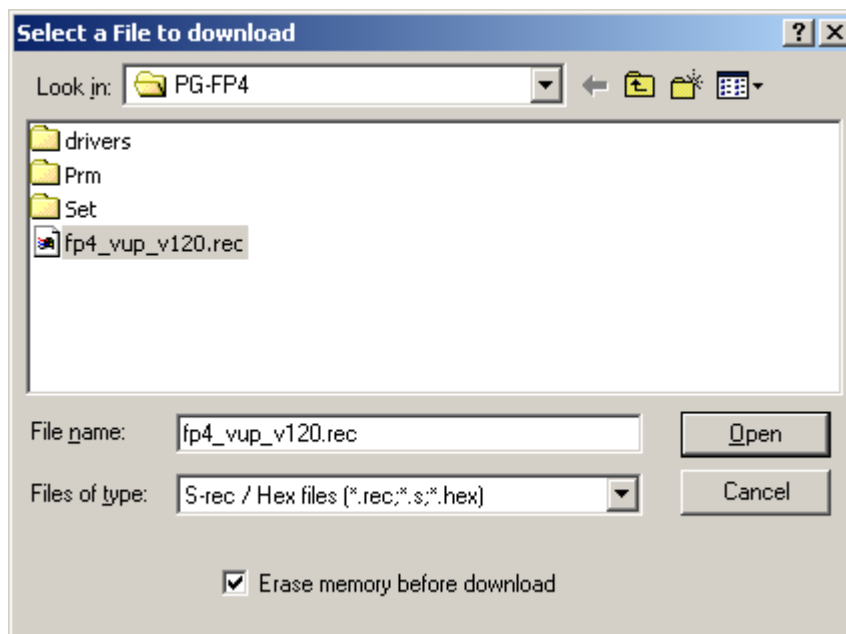


Select the firmware update program file "FP4_VUP_xxx.REC" and then click Open .
Some commands will be transferred to the PG-FP4 and the update progress status will be displayed in the progress status display window.

**Figure 4-17.  Progress Status Display Window**
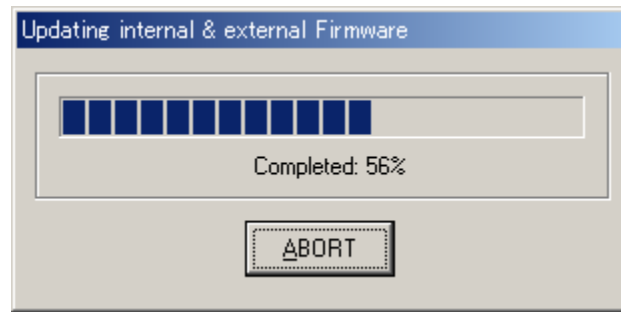


When the firmware update is complete, the following message will be displayed.

**Figure 4-18.  Firmware Update Complete Message**
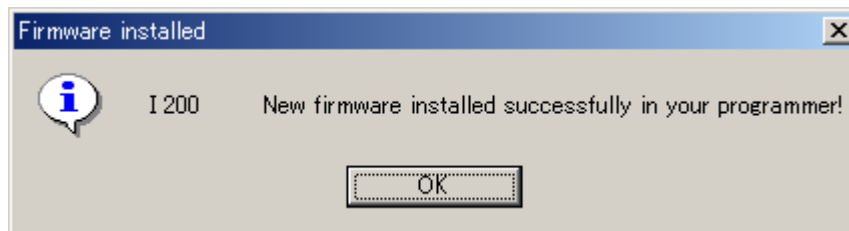
### 4.4.3 [Device] menu

Clicking the [Device] menu displays the following pull-down menu.

This pull-down menu mainly consists of commands for programming the target device, such as erase, program, and verify.

★

**Figure 4-19. [Device] Menu**
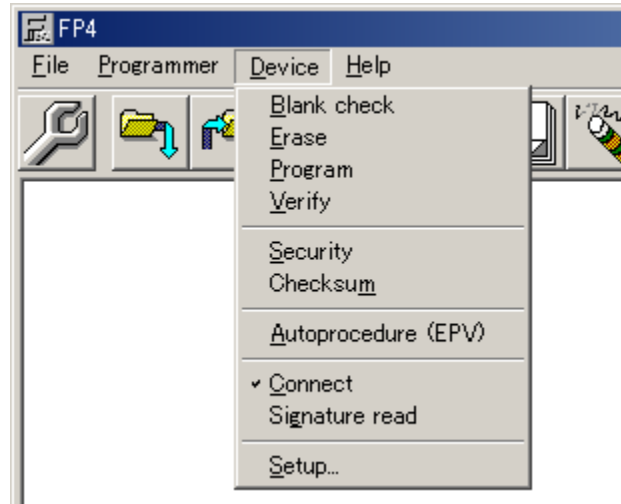


**(1) [Blank Check] menu**

The Blank Check command initiates a blank check of the target device connected to the PG-FP4. If the flash memory of the target device is erased, the blank check terminates successfully. If the flash memory is not completely erased, an error message is displayed. Therefore, the flash memory has to be erased first before programming can start.

**Caution The Blank Check command is available only for single-power-supply flash memory microcontrollers.**

★ **(2) [Erase] menu**

The Erase command initiates the erase procedure for the target device connected to the PG-FP4.

While erasing the contents in the flash memory is in progress, the progress is displayed in the communication log window, indicating the operation of the programmer.

When a two-power-supply flash memory microcontroller is used, check the target device with the Blank Check command before executing the Erase command. If the device is already blank, the Erase command is not executed.

When a single-power-supply flash memory microcontroller is used, the Blank Check command that is executed before the Erase command is executed in accordance with the setting of 'Command options' on the Advanced tab of the [Device] > [Setup…] menu.

You may abort the erase procedure by pressing the Cancel button on the PG-FP4.

After completing the Erase command, the GUI software displays the target device command execution result.

★ **(3) [Program] menu**

The Program command transmits the memory contents (user program) in the active programming area (0 or 1) of the PG-FP4 and writes them to the flash memory. In addition, it also executes verification to check if the write level is secured after the user program has been written.

After execution of the Program command, Verify, which detects a communication error of the user program while it is being transmitted from the PG-FP4 to the target device, is executed in accordance with the setting of 'Command options' on the Advanced tab of the [D̲evice] > [S̲etup…] menu.

While programming is in progress, the progress is displayed in the communication log window, indicating the operation of the programmer. This progress indicates the progress of programming the target device as a percentage.

You may abort the programming procedure by pressing the Cancel button on the PG-FP4.

After completing the Program command, the GUI software displays the target device command execution result.

★ **(4) [V̲erify] menu**

The Verify command transmits the memory contents in the active programming area (0 or 1) of the PG-FP4 to the target device connected to the PG-FP4 and verifies these contents against the data written to the flash memory of the target device.

This command does not check the write level. Use it to check if data communication between the PG-FP4 and target device has been correctly performed.

While the Verify command is being executed, the progress is displayed in the communication log window, indicating the operation of the programmer. This progress indicates the progress of verifying the target device as a percentage.

You may abort the verification procedure by pressing the Cancel button on the PG-FP4.

After completing the Verify command, the GUI software displays the target device command execution result.

★ **(5) [S̲ecurity] menu**

The Security command initiates the programming of the security flag of the target device connected to the PG-FP4. Setting of the security flag is specified by Security flag settings on the Advanced tab of the [Device] > [Setup] menu.

**Caution   The security command can be specified only when a single-power-supply flash memory microcontroller is used.**

★ **(6) [Checksu̲m] menu**

The Checksum command initiates the reading of the checksum value of the target device connected to the PG-FP4. The checksum value in the flash memory area selected in Operation Mode on the Standard tab of the [Device] > [Setup] menu is read.

**Caution   The Checksum command is available only when using a single-power-supply flash memory microcontroller or two-power-supply flash memory microcontroller that supports the Checksum command.**

★    **(7) [Autoprocedure [EPV]] menu**

The EPV command compares the checksum value when the user program is downloaded with the checksum value in the user program area of the PG-FP4 subject to EPV.  If the two values are the same, it sequentially executes the Erase and Program commands explained above.

When the Program command is executed, whether the write level is secured is verified after the program has been written.  Note, however, that this verification does not detect a communication error of the user program that is transmitted from the PG-FP4 to the target device.

To transmit the memory contents of the PG-FP4 to the target device to compare them with the data written to the flash memory of the target device because a communication error of the user program was detected, specify automatic execution of the Verify command after execution of the Program command, by using the Command options on the Advanced tab of the [Device] > [Setup…] menu.

During EVP, the progress is displayed in the communication log window, indicating the operation of the programmer.  For the selected command, and its execution operation and message, refer to **CHAPTER 5 SAMPLE PROGRAMMING SESSION USING GUI SOFTWARE**.

You may abort the EPV procedure by pressing the Cancel button on the PG-FP4.

After completing the EPV command, the GUI software displays the target device command execution result.

**(8) [Signature read] menu**

The Signature Read command is used to read the signature information of the target device (such as the device name and flash memory information).

**(9) [Setup…] menu**

The [Setup…] menu is used to perform flash memory writing settings in accordance with the user environment, and command option settings.  Each time the GUI software is started, the parameter file (.PRM) and customized setup file (.SET) that were used last are read, and their setting contents are displayed.  On the [Setup…] menu, settings can be changed in accordance with the user environment, except for the parameters that are dimmed.  In addition, new settings can be saved to the customized setup file (the data of the parameter file cannot be changed).

**(a) Parameter file and customized setup file**

The parameter file and customized setup file have the setting information necessary for rewriting the flash memory of the target device.

- Parameter file

  This file stores the timing and parameter data necessary for rewriting the flash memory of the target device.  Do not change the data of the parameter file as it guarantees the rewrite data.

  The parameter file is protected by a checksum.  If the checksum is illegal, the PG-FP4 does not accept the parameter file.

- Customized setup file

  Save the values of settings that have been made in accordance with the user environment to the customized setup file after downloading the parameter file.  The customized setup file saves the settings of the [Setup...] menu, including the corresponding parameter file name, so that a new environment can be set by downloading the customized setup file when the environment is started next time.

★    **(b) Standard setup**

This menu is used to set the rewriting environment of the target device's flash memory.

The mode of communication with the target device and the operating clock of the device differ depending on the device used.  For details, refer to the manual of the device used.

The following window opens.

**Figure 4-20. Device Setup Window – Standard Menu**
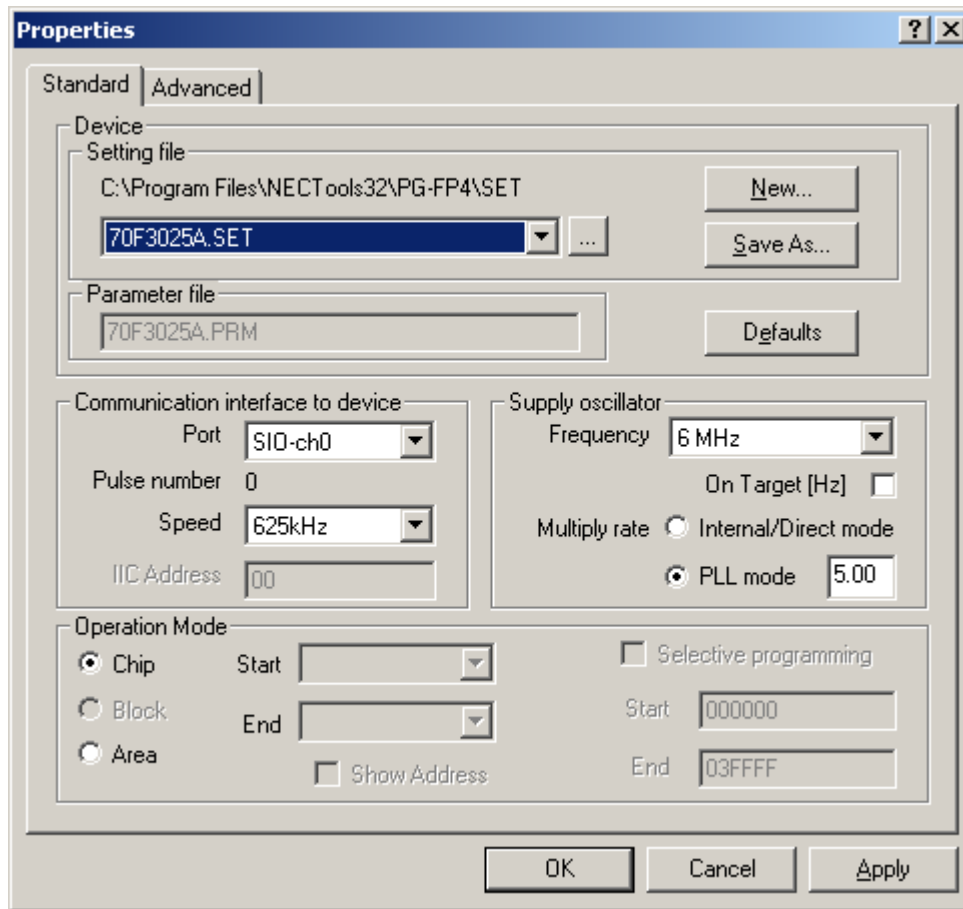


This window shows all basic options that can be set in accordance with the user environment and target device.

**[OK button]**
Clicking the OK button saves the setting contents on the Standard and Advanced menus to the customized setup file (.SET) and downloads them to the PG-FP4 with a specified parameter file (.PRM).

**[Apply button]**
This button is valid if settings have changed on the Standard or Advanced menu.
Clicking the Apply button saves the contents of new setting to the customized setup file (.SET). Note that this button only saves the settings to the file; it does not download them to the PG-FP4.

**[Cancel button]**
When the Cancel button is clicked, the contents set on the Standard and Advanced menus are not downloaded to the PG-FP4, nor are they saved to the customized setup file; the current dialog box is just closed.
However, the settings that have already been saved to the customized setup file and downloaded to the PG-FP4 are not reset by this button.

**<1> Device**

The parameter file holds the set values of the basic parameters necessary for rewriting the flash memory of the target device. This file is downloaded along with the customized setup file that saves changes in settings in accordance with the user environment.

**Figure 4-21. Setup Window – Device Selection**
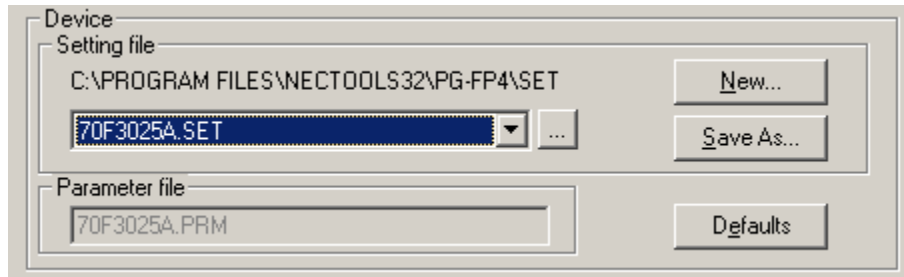


**[Setting file list box]**

Displays the customized setup file saved to <PG-FP4 install path>\SET.

When using a saved customized setup file, select it here.

**[ … button]**

Click this button to specify a customized setup file saved to other than <PG-FP4 install path>\SET.

Clicking this opens a window for specifying a customized setup file. Specify the file and then click the Open button.

**[ Save as… button]**

Displays a window in which to overwrite the current settings on the device setup window to the existing customized setup file or save them as a new file.

**[ Defaults button]**

Returns all the displayed settings to the default values of the data in the parameter file (.PRM).

**[ New… button]**

Creates a new customized setup file.

A window to create a new customized setup file appears.

**Figure 4-22. Create New Customized Setup File Window**
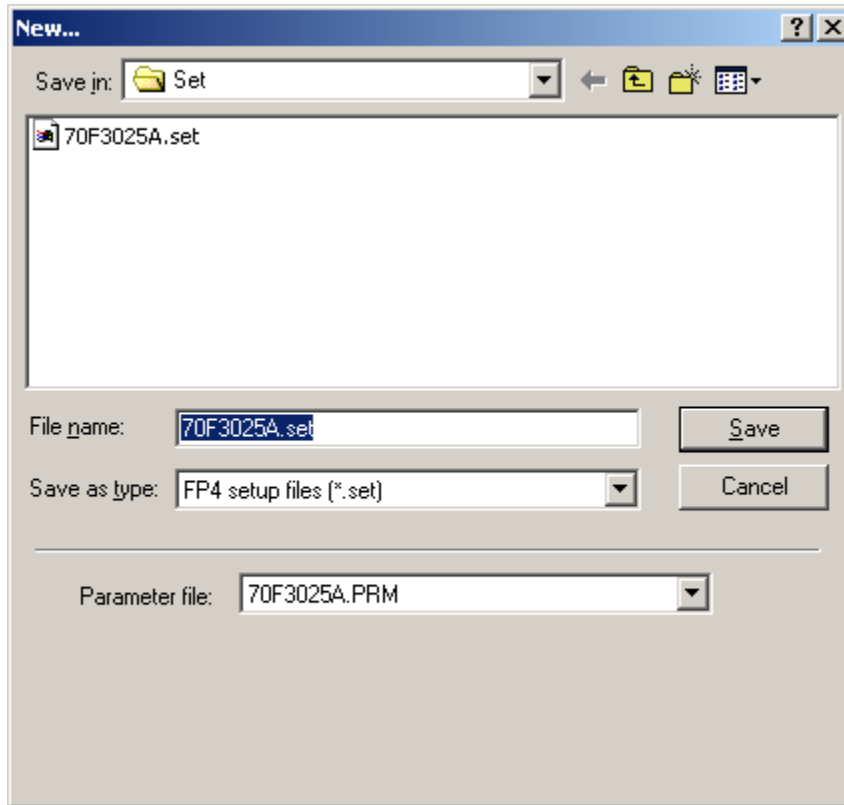


Parameter files saved to <PG-FP4 install path>\PRM are shown in the parameter file list box. Select a parameter file for the target device.

After selecting the parameter file, enter the name of the customized setup file that is newly created, and then click the Save button.

**<2> Communication interface to device**

"Communication interface to device" selects the channel for communication between the PG-FP4 and target device. For the communication port and communication rate that can be selected, refer to the user's manual of the device used.

**Figure 4-23. Setup Window – Communication Interface to Device**
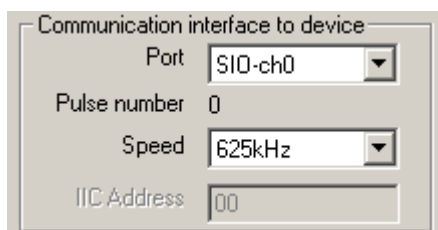


**[Port list box]**

Select the mode of communication between the PG-FP4 and target device from the following.

The communication mode is determined by the number of $V_{PP}$ or FLMD0[Note] pulses output by the PG-FP4.

The selectable communication mode differs depending on the target device. Refer to the user's manual of the target device used and select a mode. With some devices, the number starts from ch1. In this case, ch0 of the parameter on the screen equals ch1 of the device, and the displayed channel number must be shifted accordingly.

**Note** When using a single-power-supply flash memory microcontroller.

| Item on Screen | Description |
| --- | --- |
| SIO-ch0 | SIO (3-wire clocked communication port) channel 0 |
| SIO-ch1 | SIO (3-wire clocked communication port) channel 1 |
| SIO-ch2 | SIO (3-wire clocked communication port) channel 2 |
| SIO-H/S | SIO (3-wire clocked communication port, with handshake) |
| IIC-ch0 | $I^2C$ channel 0 |
| IIC-ch1 | $I^2C$ channel 1 |
| IIC-ch2 | $I^2C$ channel 2 |
| IIC-ch3 | $I^2C$ channel 3 |
| UART-ch0 | UART (asynchronous communication port) channel 0 |
| UART-ch1 | UART (asynchronous communication port) channel 1 |
| UART-ch2 | UART (asynchronous communication port) channel 2 |
| UART-ch3 | UART (asynchronous communication port) channel 3 |
| Port-ch0 | Port (pseudo 3-wire) A |
| Port-ch1 | Port (pseudo 3-wire) B |
| Port-ch2 | Port (pseudo 3-wire) C |

**[Pulse number]**
Displays the number of $V_{PP}$ or FLMD0 pulses corresponding to the selected communication mode.

**[Speed list box]**
Select the communication rate of the selected communication channel from the following.

    <When SIO-ch0, SIO-ch1, SIO-ch2, or SIO-H/S is selected>
        2.4 kHz
        9.8 kHz
        39 kHz
        156 kHz
        625 kHz
        2,500 kHz

    <When IIC-ch0, IIC-ch1, IIC-ch2, or IIC-ch3 is selected>
        10 k baud
        20 k baud
        50 k baud
        100 k baud

    <When UART-ch0, UART-ch1, UART-ch2, or UART-ch3 is selected>
        9,600 baud
        19,200 baud
        31,250 baud
        38,400 baud
        76,800 baud
        153,600 baud

    <When Port-ch0, Port-ch1, or Port-ch2 is selected>
        100 Hz
        200 Hz
        300 Hz
        400 Hz
        500 Hz
        600 Hz
        800 Hz
        1,000 Hz
        1,200 Hz
        1,500 Hz

**[IIC Address]**
If $I^2C$ is selected as the programming channel, input a slave address as a hexadecimal number. The valid range of input is 8 to 77H. Do not input a unit.
The slave address can be any value in the above range but must not be the same as the slave address of another device on the $I^2C$.
This field cannot be accessed if the $I^2C$ port is not selected.

**<3> Supply oscillator**

"Supply oscillator" selects the oscillator that determines the programming, data transfer, and transfer rates.

**Figure 4-24. Setup Window – Supply Oscillator**
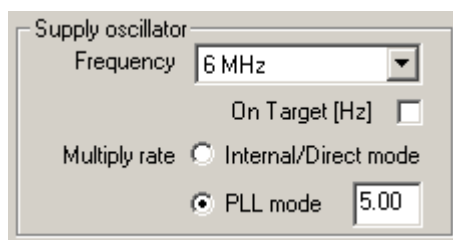


**[On Target check box]**

Specifies whether the clock signal is supplied from the PG-FP4 or target device.

If this is checked, the clock of the target system is used.

If it is not checked, the clock of the PG-FP4 is supplied to the target.

**[Frequency list box]**

Sets the oscillation frequency for signal generation.

When using the clock of the target system (when the On Target check box is checked), input the frequency to be used.

When using the clock of the PG-FP4 (when the On Target check box is not checked), select a frequency from the following:

- 1 MHz
- 2 MHz
- 4 MHz
- 5 MHz
- 6 MHz
- 8 MHz
- 10 MHz
- 12 MHz
- 16 MHz
- 20 MHz

Note that the frequency range in which a device can operate differs depending on the device. Check the specifications of the device before setting the frequency.

**[Multiply rate]**

Specifies the division rate or multiplication rate of the target device.

If the target device has a PLL circuit, select the PLL mode and enter a division rate or multiplication rate in accordance with the environment used.

The selectable division rate or multiplication rate differs depending on the device. Confirm the specifications of the device before setting them.

If the target device does not have a PLL circuit, select the Internal/Direct mode.

In the initial screen, the default settings set by the parameter file are displayed.

**<4> Operation Mode**

Operation Mode may divide the flash memory of the target device into blocks or areas.

This menu is used to select the operation mode of the flash memory. Some devices do not have either or both division modes Block and Area. In this case, a mode that is not available cannot be selected.

**Figure 4-25. Setup Window – Operation Mode**



**[When Chip is selected]**

The entire flash memory area of the target device is subject to rewrite processing.

**[When Block is selected]**

Specify the Block number range subject to rewrite processing by using Start/End.

The Start/End list boxes display the Block number where the flash memory of the target device is configured.

(Block cannot be selected with a two-power-supply flash memory microcontroller.)

**[When Area is selected]**

Specify the Area number range subject to rewrite processing by using Start/End.

The Start/End list boxes display the Area number where the flash memory of the target device is configured.

(Area cannot be selected with a single-power-supply flash memory microcontroller.)

**[Show Address check box]**

Specifies whether numbers or addresses are displayed in the Start/End list boxes.

If this check box is checked, addresses are displayed.

If it is not checked, numbers are displayed.

**[Selective programming]**

This cannot be used.

★ **(c) Advanced setup**

Advanced setup is used to specify the programming voltage for programming the target device, command options, and security flag setting.

When Advanced is clicked, the following window is displayed.

**Figure 4-26. Device Setup Window – Advanced**
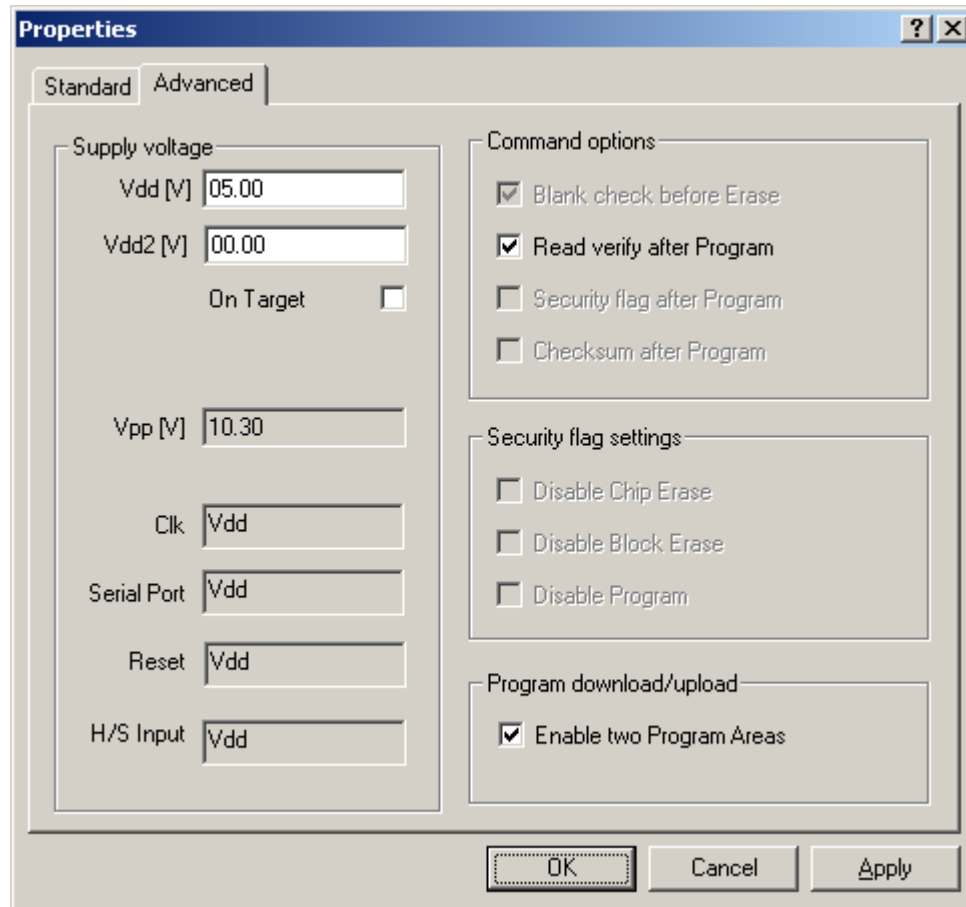


**<1> Supply voltage**

The supply voltage section allows you to specify the voltage levels for target device programming. Depending on the target device type, one ($V_{DD}$) or two ($V_{DD}$ and $V_{DD2}$) voltage levels need to be specified.

In general, $V_{DD}/V_{DD2}$ voltages that are supplied when the target device is programmed should be supplied by the target system. Although they can be supplied by the PG-FP4, the current flow is not large enough to operate the whole target system (maximum of 200 mA). Therefore, supply voltage via the PG-FP4 only when a dedicated writing adapter such as an FA adapter is used.

**Figure 4-27. Setup Window – Supply Voltage**



**[Vdd [V]]**
Displays the default Vdd level set by the parameter file in volts (V).
This Vdd level can be changed by input.

**[Vdd2 [V]]**
Displays the default Vdd2 level set by the parameter file in volts (V).
If the specifications of the target device require two types of Vdd for writing the flash memory, Vdd2 specifies
a low-level signal voltage. This voltage level can also be changed by input.

**[On Target check box]**
Check On Target if the $V_{DD}/V_{DD2}$ voltages are supplied from the target system.

**Caution  Set the values of the $V_{DD}/V_{DD2}$ voltages supplied by the target system as Vdd [V] and Vdd2
         [V] before checking On Target. The target system may be damaged if proper values are not
         set.**

**[Vpp, Clk, Serial Port, Reset, H/S Input]**
Display the default level of each pin set by the parameter file in volts (V).
The signal levels cannot be changed.

**<2> Command options**

This dialog box is used to specify the options of the PG-FP4 flash processing commands.

**Figure 4-28. Setup Window – Command Options**
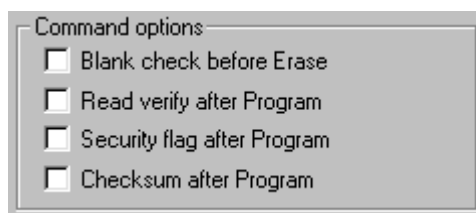


**[Blank check before Erase check box]**

If this check box is checked, a blank check is performed before execution of the Erase and EPV commands.

If the result of the blank check is OK, erase processing is not executed.

This option can be specified only when a single-power-supply flash memory microcontroller is used.

**[Read verify after Program check box]**

If this check box is checked, write data is transmitted from the programmer after execution of the Program and EPV commands, and verified against the data written to the flash memory.

**[Security flag after Program check box]**

If this check box is checked, automatic programming of the selected security flag is executed after execution of the Program and EPV commands.

This option can be specified only when a single-power-supply flash memory microcontroller is used.

**[Checksum after Program check box]**

If this check box is checked, the flash memory checksum value of the target device is read from the target device and displayed on the programmer after execution of the Program and EPV commands.

This option can be specified only when a single-power-supply flash memory microcontroller or a two-power-supply flash memory microcontroller that supports the Checksum command is used.

**<3> Security flag settings**

The <Security flag settings> dialog box is used to specify which security function is valid.

This function is valid only when a single-power-supply flash memory microcontroller is used.

**Figure 4-29. Setup Window – Security Flag Settings**
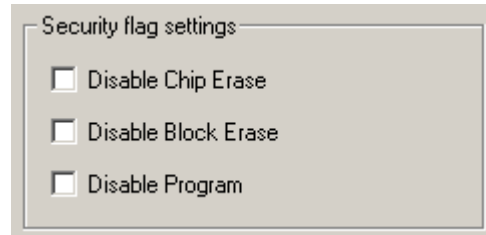


**[Disable Chip Erase check box]**

If this check box is checked, the Erase command becomes invalid in the entire flash memory area of the target device.

A warning message "I907 Caution: When 'Chip Erase' is disabled, chips can no longer be erased or programmed!" is displayed when OK is clicked in the Device Setup Window after checking this box.

---

**Caution    Be aware that if the security flag is set in the target device, neither erasing nor writing[Note] to the device can be enabled afterward.**

---

**[Disable Block Erase check box]**

If this check box is checked, the Erase command becomes invalid in all the blocks of the flash memory selected under Operation Mode in the Standard Setup menu.

This setting is cleared by the Erase command when Chip was selected under Operation Mode.

**[Disable Program check box]**

If this check box is checked, the Program command becomes invalid, as does the Erase command in all the blocks of the flash memory selected under Operation Mode in the Standard Setup menu.

The Erase command for the entire flash memory area is valid.

This setting is cleared by the Erase command when Chip was selected under the Operation Mode.

The following is the correspondence between the Erase and Program commands when the security functions of a single-power-supply flash memory microcontroller are valid.

|  | Erase Command for the Entire Flash Memory Area | Erase Command for Selected Flash Memory Blocks | Program Command |
|---|---|---|---|
| Disable Chip Erase | Invalid | Invalid | Valid[Note] |
| Disable Block Erase | Valid | Invalid | Valid |
| Disable Program | Valid | Invalid | Invalid |

**Note**   Since the Erase command is invalid, the data that differs from the data already written in the flash memory cannot be written.

**<4> Program download/upload**

The PG-FP4 has 2 MB of flash memory as a user program area.

This memory area can be used as a single 2 MB area, or as two independent 1 MB areas (Area 0 and Area 1).

Different user programs can be downloaded to Area 0 and Area 1, and it can be selected which of the programs is to be written to the target device.

**Figure 4-30.  Setup Window – Program Download/Upload**
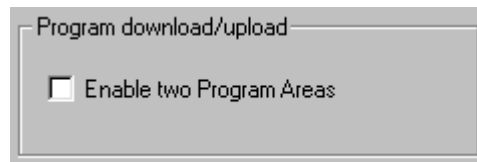


**[Enable two Program Areas check box]**

If this check box is not checked, one 2 MB memory area is used as the user program area.

If it is checked, one of two independent 1 MB memory areas (Area 0 and Area 1) are used as the user program area.  For which area is to be used, refer to the [Programmer] → [Select Programming area…] menu.

### 4.4.4 [Help] menu

Clicking the | Help | menu displays the following pull-down menu.

**Figure 4-31. [Help] Menu**



**(1) [Contents…] menu**

The [Contents…] menu starts the Windows Help engine and opens the contents dialog box of the PG-FP4 help file.

**(2) [About] menu**

The [About] menu opens the following program entry window.

The version displayed below the PG-FP4 indicates the version of the GUI software.

By clicking this window, the display can be exited.

★                                            **Figure 4-32. About Window**
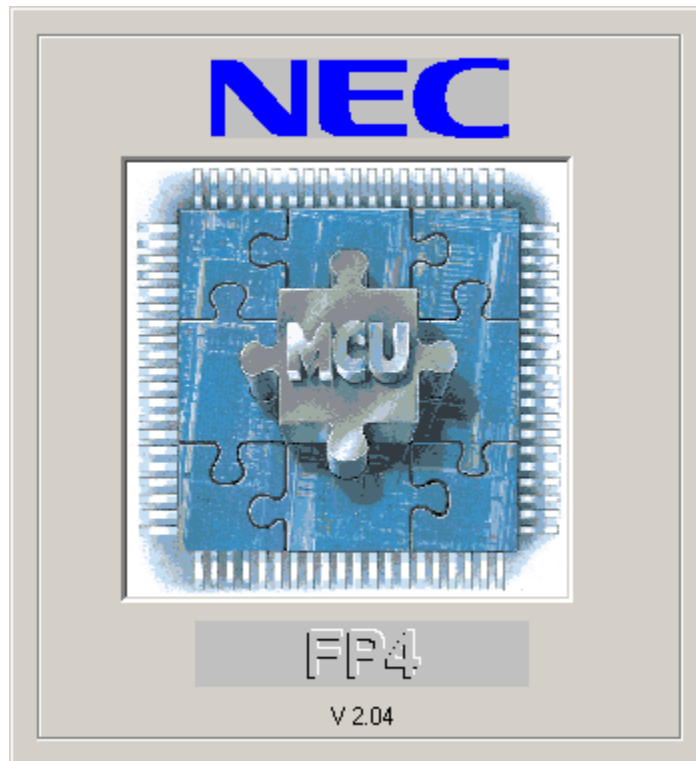
# CHAPTER 5  SAMPLE PROGRAMMING SESSION USING GUI SOFTWARE

This chapter explains a series of basic operations of the PG-FP4 with the GUI software, taking a case where the $\mu$PD70F3025A is used as the target device as an example.  This chapter covers how to start the system, execute the EPV command, and program the target device.

For the other commands and applications, refer to **CHAPTER 4  PG-FP4 OPERATION USING GUI SOFTWARE**.

- Series of operations described in this chapter

Here are the operation conditions of this chapter:

| | |
|---|---|
| HOST interface: | RS-232C interface |
| Target: | $\mu$PD70F3025A (with FA adapter) |
| Communication interface: | SIO H/S 625 kHz |
| Supply oscillator: | In PG-FP4, 6 MHz, multiplied by 5 |
| Operation mode: | Chip |
| Supply voltage: | Supplied by PG-FP4 |
| Command options: | Read verify after Program check |
| | (Verification is executed after program command.) |
| Program download/upload: | No check (with user program 1 code only) |

1. **Installing GUI software**
   Install the PG-FP4 GUI software in the PC you are using by referring to **CHAPTER 3   SOFTWARE INSTALLATION** (if the software has not been installed yet).

2. **Installing parameter file**
   Copy the parameter file for the $\mu$PD70F3025A to the hard disk and install it in <FP4 install path>\PRM.
   Download the parameter file from the following:
   http://www.necel.com/micro/ods/eng/index.html

3. **Connecting system**
   <1> Connect the PG-FP4 to the computer with the supplied RS-232C cable.
   <2> Select an appropriate AC plug from those supplied with the PG-FP4 (Europe, the UK, the USA and Japan) and connect it to the AC adapter to configure a PG-FP4 power supply unit.
   <3> Connect the PG-FP4 power supply unit to the PG-FP4 and the main power supply.

★  **4.  Starting system**

<1> Turn on the switch of the power supply unit cable.  Do not connect the FA adapter before turning on the switch.

Confirm that the Status LED of the PG-FP4 remains dark and that 'Commands >' is displayed on the LCD, indicating that the PG-FP4 is ready for operation.

If this does not happen, the chances are the PG-FP4 is faulty.  Consult an NEC Electronics sales representative or distributor.

<2> Connect the PG-FP4 to the FA adapter[Note] with the target cable.

<3> Start the GUI software.

The GUI software tries to establish a connection with the PG-FP4 at 9,600 bps, using COM1.

If it is not successful, it scans other communication rates and ports.

In this example, it is assumed that the PG-FP4 is connected to COM1.

**Figure 5-1.  Connection Between GUI Software and PG-FP4**



<4> You may click the ABORT button and select the communication port from the [Programmer] → [Setup host connection…] menu directly.

**Figure 5-2.  [Setup host connection…] Menu**
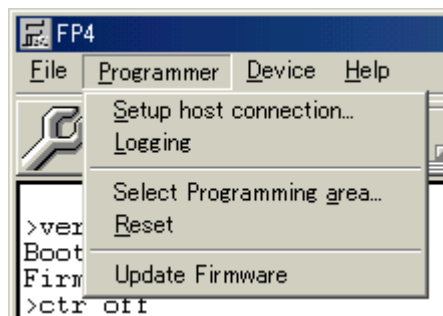


<5> Select the appropriate port number to which the PG-FP4 was connected.

The initial communication speed is set to 9,600 bps (factory setting of the PG-FP4).

**Note**   This is a product of Naito Densei Machida Mfg. Co., Ltd.

**Figure 5-3. Setup Communication Parameters**
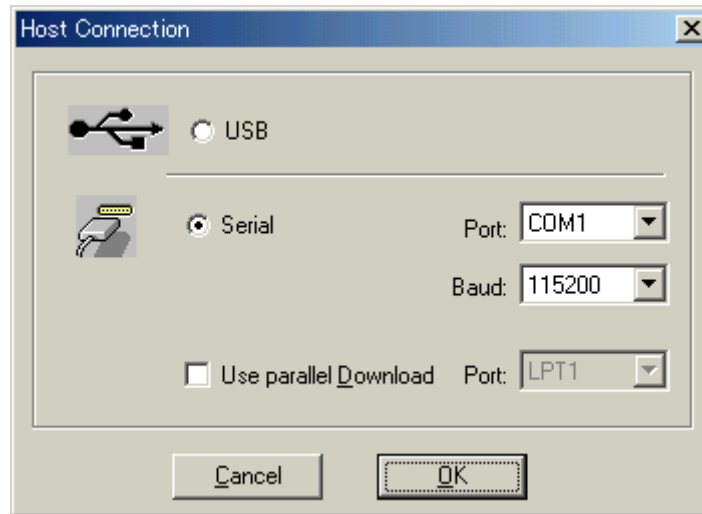


<6> Select [OK] to activate the new port settings.

If the GUI software has been correctly started, the following screen is displayed.

**Figure 5-4. GUI Software Initial Screen**
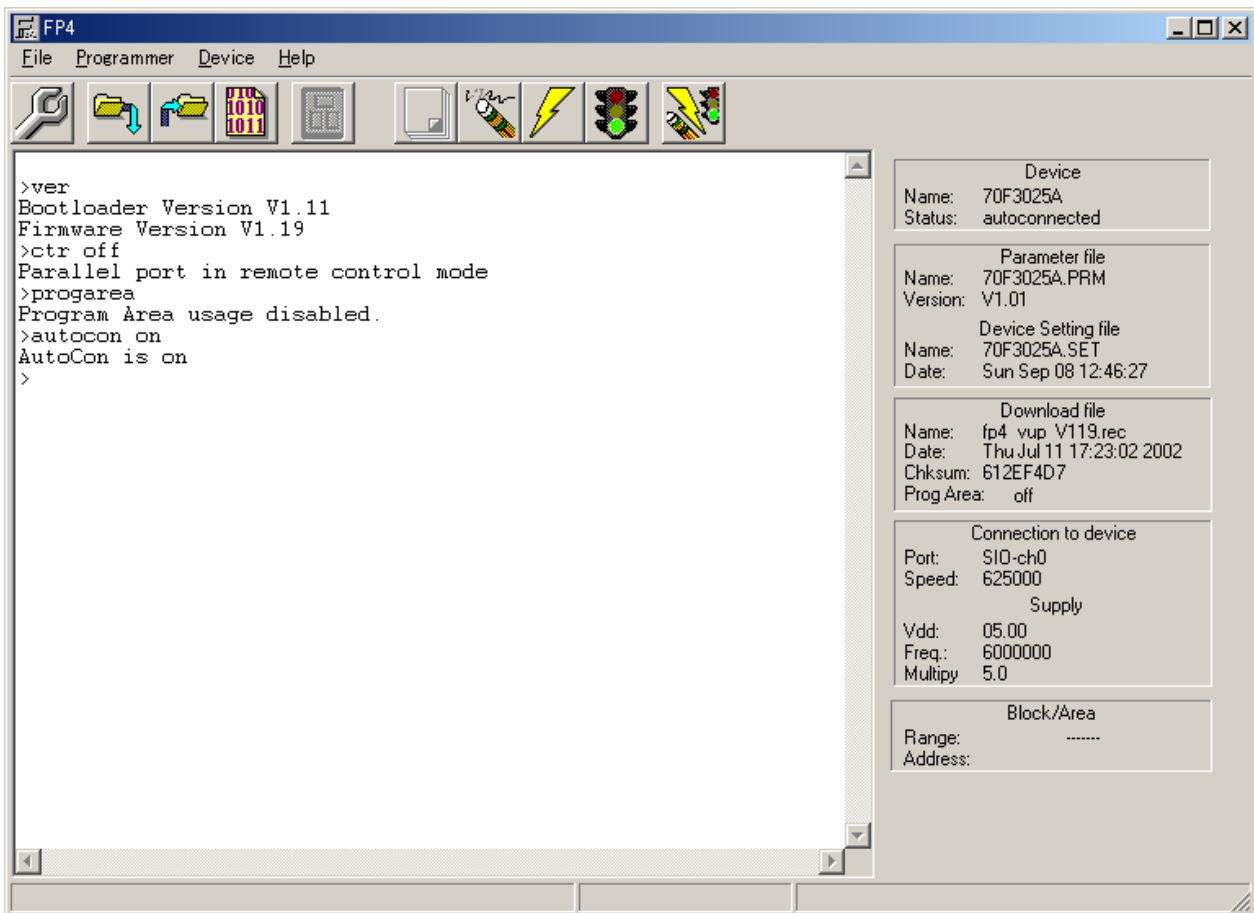
★ **5. Programming environment setting**

    <1> Select the menu item [Device] → [Setup…] from the menu bar.

**Figure 5-5. [Device] → [Setup…] Menu**
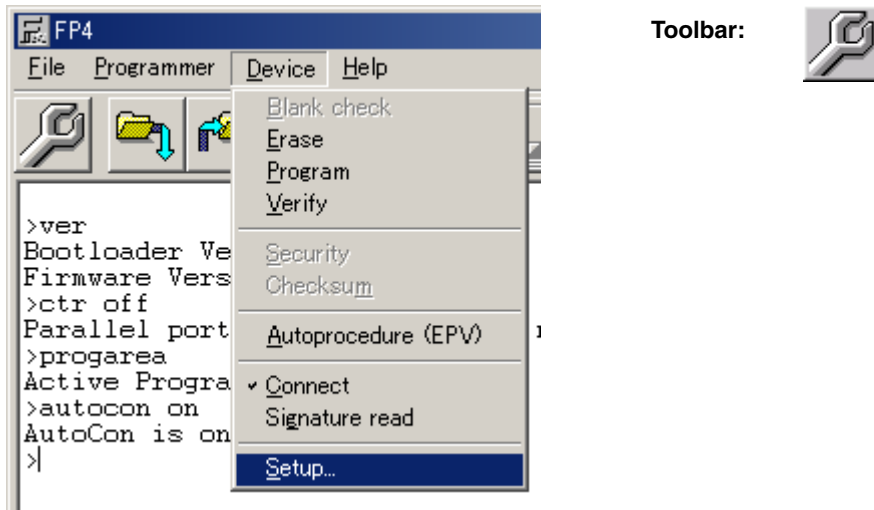


    <2> The dialog box for standard device setup will be activated.

**Figure 5-6. <Standard Device Setup> Dialog Box**
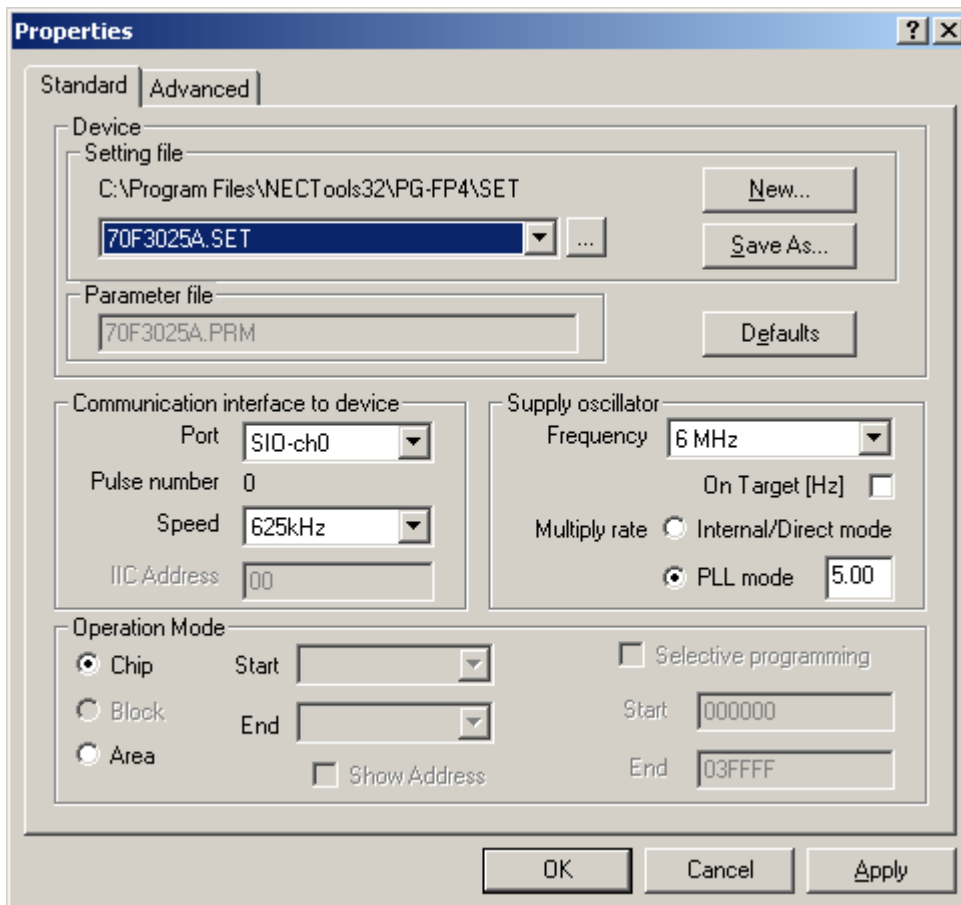
<3> Click the New... button to create a new customized setup file for the µPD70F3025A.

**Figure 5-7. Creating New Customized Setup File**
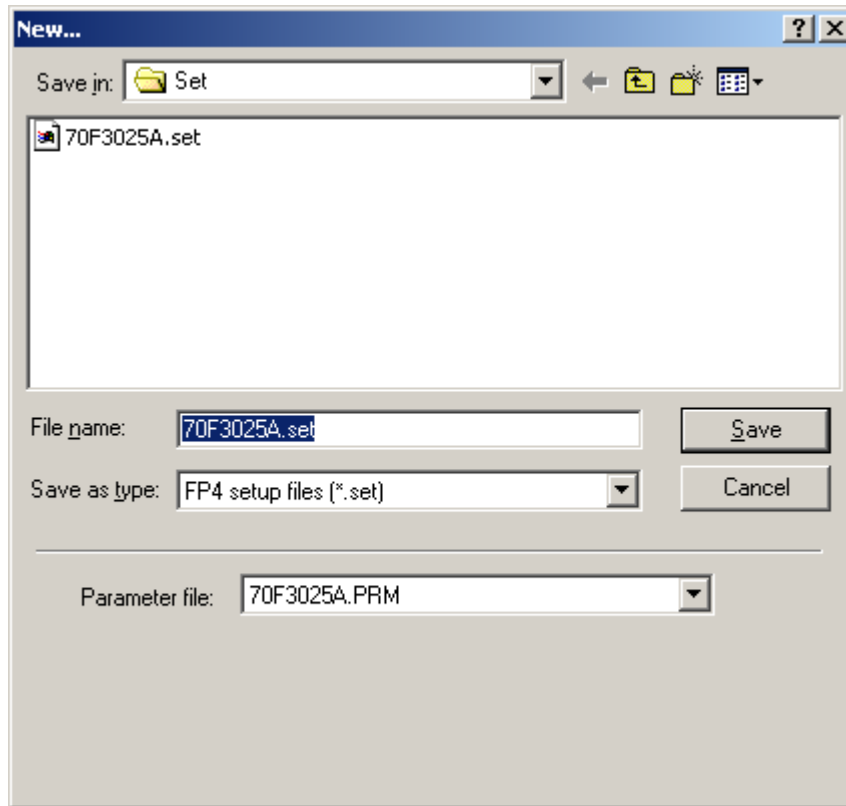


<4> Select 70F3025A.PRM from the "Parameter file" pull-down list.

**Figure 5-8. Selecting Parameter File**
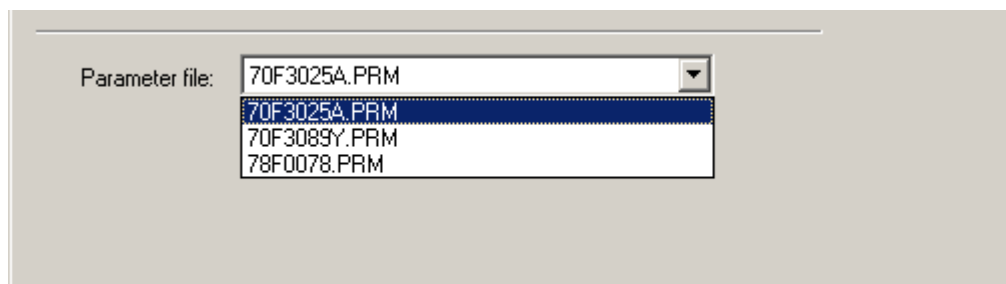


<5> Enter the name of the newly created customized setup file and click the Save button.

**Figure 5-9. Saving Customized Setup File**
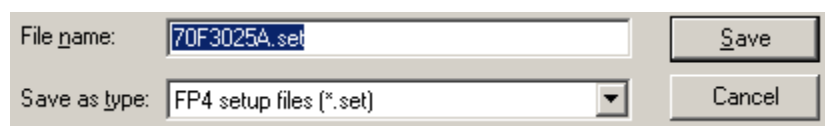
<6> Set the other items in accordance with your programming environment. Especially, set Communication interface to device and Supply oscillator in accordance with the specifications of the device selected. Specify a flash memory range to be manipulated as Operation Mode (the flash memory range that can be set is defined by the parameter file in accordance with the specifications of the device).

In this example, it is assumed that the following settings are made.
<Communication interface to device>
    Port:           SIO-H/S
    Speed:          625 kHz
<Supply oscillator>
    On Target:      Not checked (The clock of the PG-FP4 is supplied to the target.)
    Frequency:      6 MHz
    Multiply rate:  5
<Operation Mode>
    Chip

<7> Next, display the Advanced dialog box.

**Figure 5-10.  <Advanced Device Setting> Dialog Box**
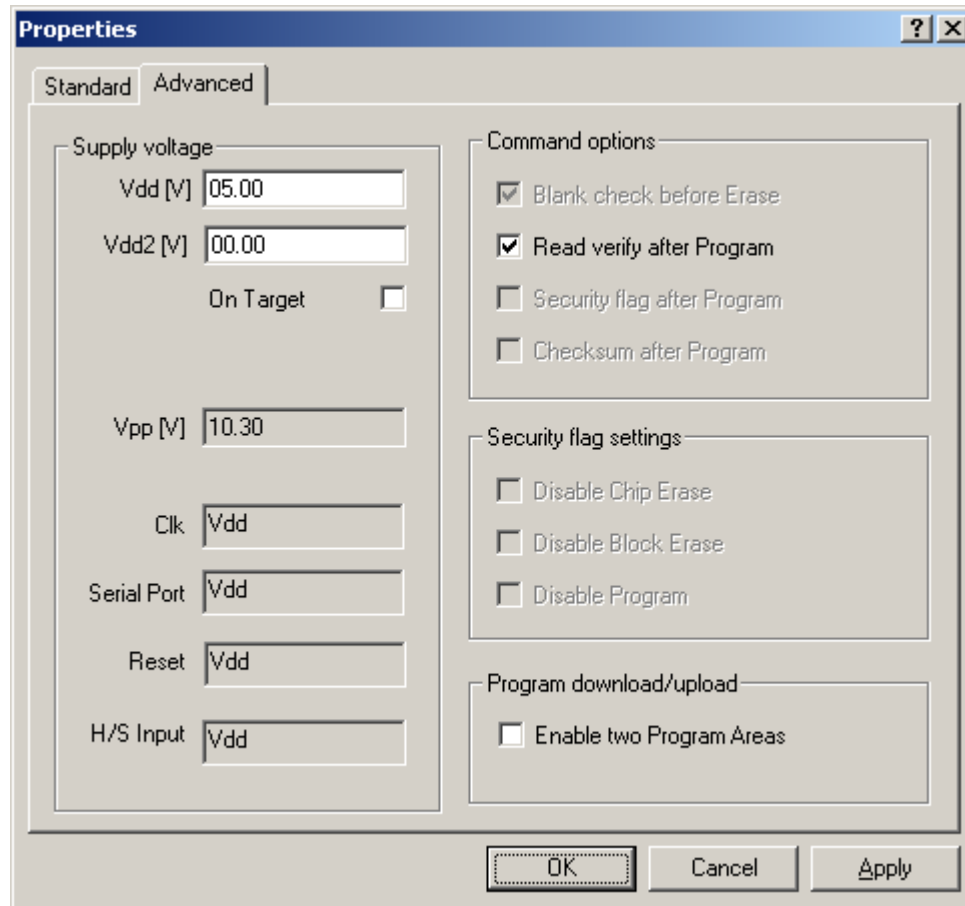


Check the information of Supply voltage to confirm that the settings are in accordance with your programming environment.

To supply the target $V_{DD}$, enter the value of the target $V_{DD}$ in Vdd [V] and Vdd2 [V], and check the On Target check box.

It is assumed that the following settings are made in this example.

<Supply voltage>

   Vdd [V]:    5.00 V (in accordance with the set value of the parameter file)

   Vdd2 [V]:   0.00 V (not used: in accordance with the set value of the parameter file)

   On Target:  Not checked (Vdd is supplied from the PG-FP4 to the target.)

<Command options>

   Blank check before Erase:  Checked (fixed to default)

   Read verify after Program:  Checked

<Security flag settings>

   Not used

<Program download/upload>

   Enable two Program Areas:   Not checked

<8> Click the OK button. The GUI software will load the parameter settings to the PG-FP4. When the settings have been completed, the next screen is displayed.

**Figure 5-11. Completion of Parameter Settings**
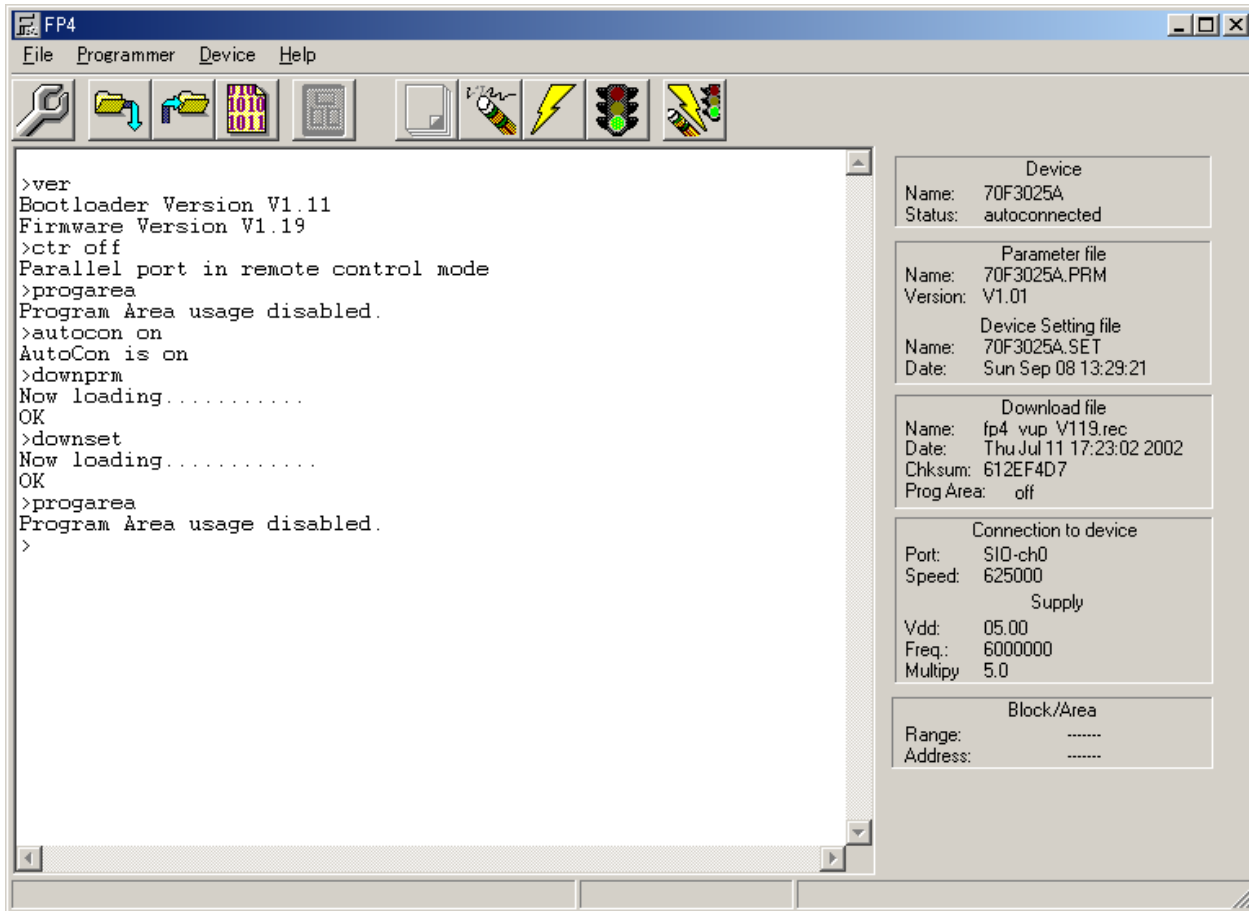
★ **6. Downloading user program**
   - Select [File] → [Download…].

**Figure 5-12. Opening Program File to Be Downloaded**
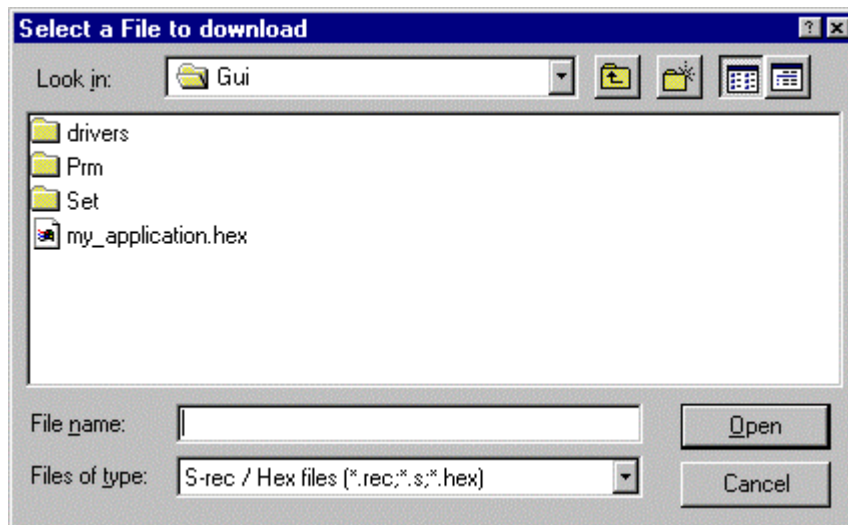
Toolbar:

<1> Select the name of the file to be downloaded, and click  Open  to start the downloading sequence. While the program is being downloaded, a window indicating the progress is displayed.
When downloading is complete, the following screen is displayed.

**Figure 5-13. Completion of Downloading**
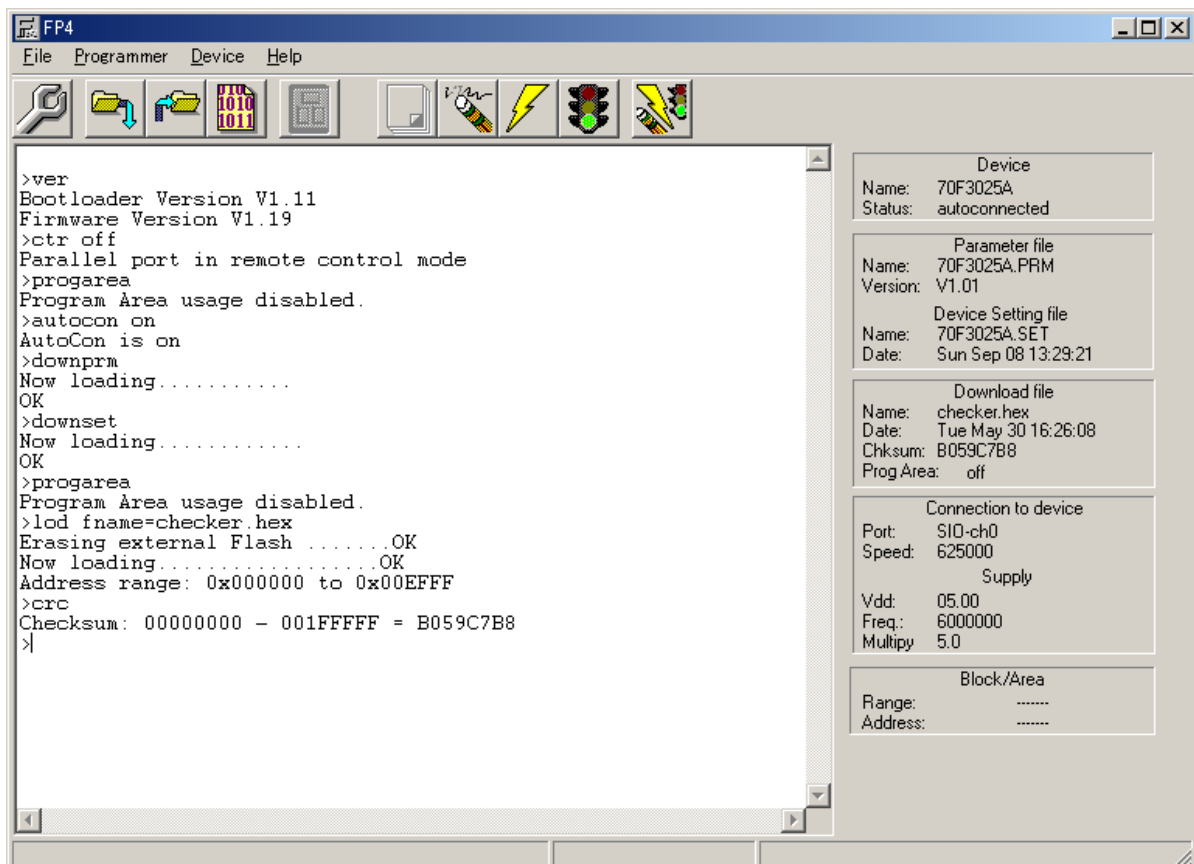
★ **7. Executing EPV command**
   Select [Device] → [Autoprocedure (EPV)].

**Figure 5-14. Erase>Program>Verify (EPV) Menu**
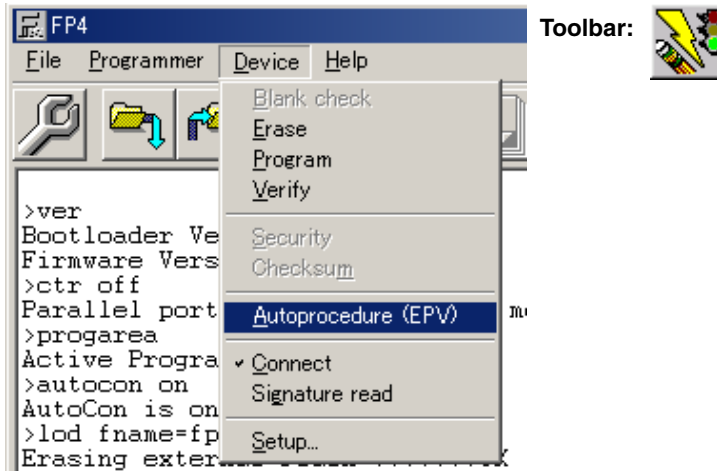


When the EPV command is executed, checking the checksum value of the user program, Blank check, Erase, Program, and Verify[Note] are executed in that order on the μPD70F3025A (if necessary, insert the device to be newly written in the FA adapter, and execute step 7). In this example, since Read verify after Program is checked whether the data communication between the PG-FP4 and target device has been correctly performed after executing the EPV command is checked.

**Note** When the Program command is executed, whether the write level is secured is verified after the user program has been written. Note, however, that this verification does not detect a communication error of the user program that is transmitted from the PG-FP4 to the target device. For details of this command, refer to **4.4.3 [Device] menu**.

**8. Terminating system**

&lt;1&gt; If it is not necessary to program other devices, select [File] → [Quit] and terminate the GUI software.
All the settings made so far have been saved, so that they can be reused when the GUI software is restarted (all the settings are also saved to the internal EEPROM of the PG-FP4).

★ &lt;2&gt; Remove the FA adaptor (target system) from the target cable.

&lt;3&gt; Turn off the switch of the power supply unit.

&lt;4&gt; Remove the power supply unit and either the RS-232C cable or USB cable from PG-FP4.

**Caution    If the "E501 Operation failed" error occurs, check the following points.**

- Check the wiring of the pins used for writing the target device on the target board and the processing of the other pins, by referring to the user's manual of the target device.
- Check if the following set values match the actual writing environment, by selecting the [Device] → [Setup…] menu.
  Clock supply source
  $V_{DD}$ supply source
  Communication mode to be used
  Parameter file, etc.
- Check to see if the CPU clock and communication clock are within the range of the specifications of the target device.
- When UART is used, communication may not be synchronized due to a baud rate error of the target device. In this case, change the CPU clock or baud rate, or change the communication mode to SIO.

# CHAPTER 6  PG-FP4 OPERATION IN STANDALONE MODE

The PG-FP4 has a standalone mode in which the PG-FP4 itself can execute the Erase, Program, and Verify commands without a host.  This mode is useful for using the PG-FP4 on the production line during mass production and for upgrading the version at a customer's site.

In the standalone mode, the PG-FP4 uses the flash programming parameters stored in the internal EEPROM area. Therefore, a new device cannot be selected for flash programming, nor can the programming parameters be changed. Programming can be done only in the environment set last in the GUI software operation mode.

In the standalone mode, select and execute the command menu by using the control buttons "Next", "Enter", and "Cancel" at the upper part of the main unit of the PG-FP4.

The command menu is displayed on the message display, and the result of executing a command is indicated by the message display and status LED.

The command menu consists of two levels of menus: a main menu and sub-menu.

The Next button is used to display the next menu of the same level.  The Enter button selects or executes the menu item currently displayed.  The Cancel button aborts the command under execution and restores the previous menu level.

**Figure 6-1.  Menu Status Transition by Key Input**
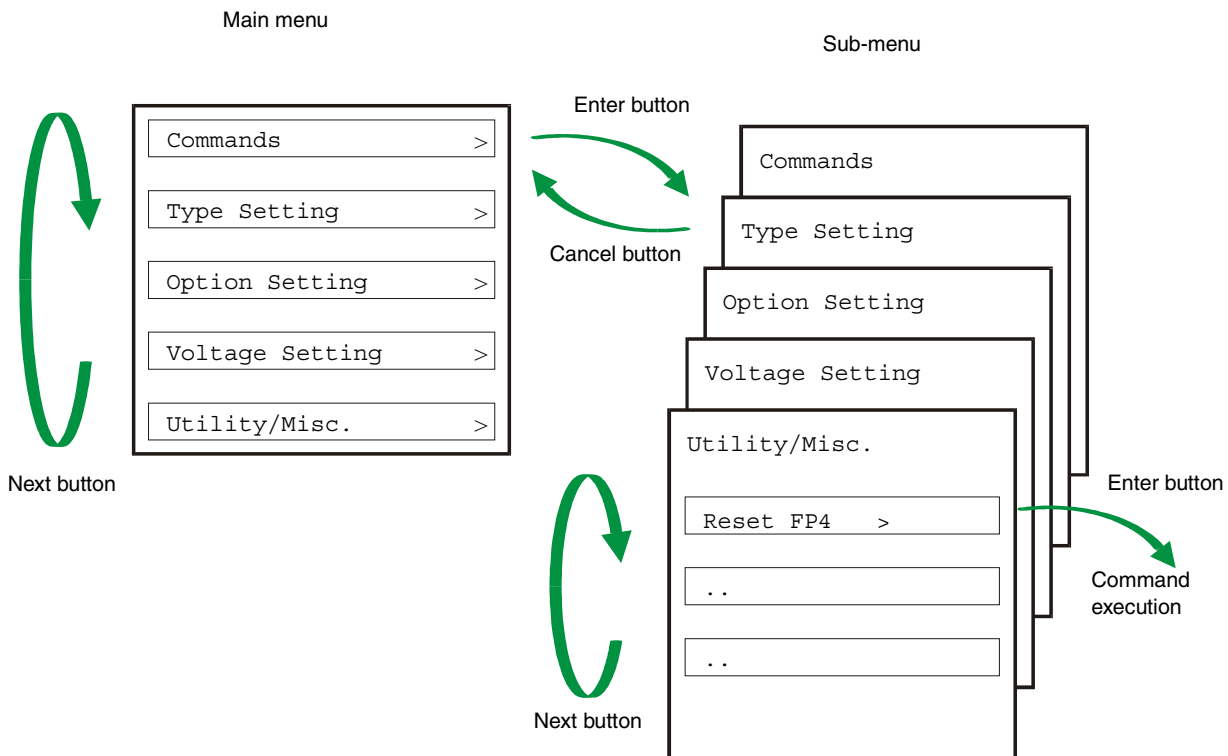


On the main menu level, the PG-FP4 will show the menu items that can be selected.

On the sub-menu level, the first line in the message display shows the menu item and the second line shows the response from the PG-FP4, if any.

A command prompt '>' displayed at the end of a menu line indicates that the menu can be selected by the Enter button, or that the menu (command) can be executed.

If the command prompt '>' is not displayed at the end of a menu line, it means that the function is only displayed.

When power to the PG-FP4 is turned on, the following message is displayed on the message display with the status LED remaining dark.

'Commands >'

The status LED indicates the status of communication with the device and the result of execution, as follows.

| Status LED | Status |
|---|---|
| ★    ⬡ <br> Orange | The selected command is under execution. <br> The details of the execution status will be displayed on the message display. |
| Ⓖ <br> Green | The selected command has been executed correctly. <br> The command that has been correctly executed will be displayed on the message display. |
| Ⓡ <br> Red | The selected command has been terminated by an error. <br> The details of the error will be displayed on the message display. |

## 6.1 PG-FP4 Operation Menu

In the standalone mode, the writing environment of the target device can be checked and rewritten by using the commands explained in this section.

### 6.1.1 [Commands] menu

The [Commands] menu offers various commands necessary for rewriting the target device. Select a command from this menu and press the Enter button. The PG-FP4 will then execute the command to the target device.

For the details of command execution, refer to **4.4.3 [Device] menu**.

**[Commands >]**
- Pressing the Next button displays the Type Setting menu.
- Pressing the Enter button displays the next command of the [Commands] menu that can be executed.
- The Cancel button is invalid.

[E.P.V >]               When the Enter button is pressed next, the target device connected to the PG-FP4 is erased, programmed, and verified[Note].

    ↓ Next button

★    **Note**   Download a user program in advance in the GUI software mode.

        This is valid for the programming area (Chip, Block and Area) currently set for the PG-FP4.

[Program >]    When the Enter button is pressed next, the target device connected to the PG-FP4 is programmed[Notes 1, 3].

　　↓ Next button

[Erase >]    When the Enter button is pressed next, the target device connected to the PG-FP4 is erased[Note 3].

　　↓ Next button

[Verify >]    When the Enter button is pressed next, the target device connected to the PG-FP4 is verified[Notes 1, 3].

　　↓ Next button

[Security >]    When the Enter button is pressed next, the security flag of the target device connected to the PG-FP4 is programmed[Note 2].

　　↓ Next button

[Checksum >]    When the Enter button is pressed next, the checksum value (entire flash memory area of the target device) of the target device connected to the PG-FP4 is read.  The read checksum value will be displayed on the message display[Notes 2, 3].

　　↓ Next button

[Blank check >]    When the Enter button is pressed next, blank check of the target device connected to the PG-FP4 is executed[Note 3].

　　↓ Next button

[Signature >]    When the Enter button is pressed next, the signature of the target device connected to the PG-FP4 is read.  The device name is displayed on the message display.

　　　　Display example

　　　　　Signature:

　　　　　D70F3025A

　　↓ Next button

[Prog Area >]    When the Enter button is pressed next, the valid memory area (Area 0 or Area 1) is changed if the 2 MB user program area is used as two independent 1 MB memory areas (Area 0 and Area 1).

　　　　　• Display example (when Enter button is pressed)

　　　　　　Commands

　　　　　　Prog Area now: 0 (The valid memory area is changed from Area 1 to Area 0.)

　　　　If the 2 MB area is used as one user program area, the valid memory area cannot be changed by using this menu.

　　　　　• Display example (when Enter button is pressed)

　　　　　　Commands

　　　　　　Prog Area (dis.) (The valid memory area cannot be changed.)

　　　　Check the memory area currently selected, by using Prog Area of Option Setting.

**Notes 1.** Download the user program in advance in the GUI software mode.

　　　**2.** This command is valid only with a single-power-supply flash memory microcontroller.  If any other microcontroller is used, this command is not displayed.

★　　　**3.** This is valid for the programming area (Chip, Block and Area) currently set for the PG-FP4.

### 6.1.2 [Type Setting] menu

The [Type Setting] menu is used to check the target device rewrite environment currently set for the PG-FP4. All the values displayed were set during the last programming session.

The setting cannot be changed by this menu.

**[Type Setting >]**

- Pressing the Next key displays the [Option Setting] menu.
- Pressing the Enter key displays the following commands that can be executed from the [Type Setting] menu.
- Pressing the Cancel key displays the [Commands] menu again.

| | |
|---|---|
| [Device Port] | Device Port displays any of the following to indicate what is selected as an interface between the target device and the PG-FP4.<br>SIO 0, SIO1, SIO 2, SIO H/S, IIC 0, IIC 1, IIC 2, IIC 3,<br>UART 0, UART 1, UART 2, UART 3, PORT 0, PORT 1, PORT 2 |

↓ Next button

| | |
|---|---|
| [Multiply Rate] | Multiply Rate displays the multiplication rate of the operating clock of the target device. |

↓ Next button

| | |
|---|---|
| [Serial CLK] | Serial CLK displays the serial clock rate in Hz that is used to interface the target device and PG-FP4. |

↓ Next button

| | |
|---|---|
| [CLK source] | CLK source indicates either of the following as a source to supply the operation clock to the target device.<br>Programmer: Clock is supplied from the PG-FP4.<br>Target:　　　Clock is supplied on the user system. |

↓ Next button

| | |
|---|---|
| [PG CPU CLK] | PG CPU CLK indicates the frequency of the clock supplied by the PG-FP4 in MHz. |

↓ Next button

| | |
|---|---|
| [Target CPU CLK] | Target CPU CLK indicates the frequency of the clock on the user system that is supplied to the target device, in MHz. |

↓ Next button

| | |
|---|---|
| [Mode] | Mode indicates any of the following operation modes when the Blank Check, Erase, Program, Verify, or EPV command is executed.<br>chip, area, block<br>Display example<br>　Mode<br>　BEPV: chip |

↓ Next button

| | |
|---|---|
| [PRG Area] | PRG Area indicates which of the areas of the target device connected to the PG-FP4 is to be programmed. This menu is valid only when the operation mode is other than chip (only when area or block is displayed in the above mode).<br>Display example<br>　PRG　Area<br>　0 to 1<br>*In the chip mode, the display is always as follows:<br>　PRG　Area<br>　0 to 0 |

### 6.1.3 [Option Setting] menu

The [Option Setting] menu is used to check the command option and security flag currently set for the PG-FP4. All the displayed values were set during the last programming session.

The setting cannot be changed on this menu.

**[Option Setting >]**

- Pressing the Next button displays the [Voltage Setting] menu.
- Pressing the Enter button displays the following commands that can be executed on the [Option Setting] menu.
- Pressing the Cancel button displays the [Commands] menu again.

[BLN before ERS]  Displays the set status of the command option Blank check before Erase as either of the following.

on:  Blank check is executed before execution of the Erase and EPV commands.
If the result of the blank check is OK, erasure processing is not executed.

off:  Blank check is not executed before execution of the Erase and EPV commands.

↓ Next button

[VRF after PRG]  Displays the set status of the command option Verify after Program as either of the following.

on:  After execution of the Program and EPV commands, the write data is transmitted from the programmer and verified against the data written to the flash memory.

off:  After execution of the Program and EPV commands, the data transmitted from the programmer is not verified against the data written to the flash memory.

↓ Next button

[SCF after PRG]  Displays the set status of the command option Security flag after Program as either of the following[Note].

on:  After execution of the Program and EPV commands, the security flag selected by Security flag settings is automatically set.

off:  After execution of the Program and EPV commands, the security flag is not automatically set.

↓ Next button

[SUM after PRG]  Displays the set status of the command option Checksum after Program as either of the following[Note].

on:  After execution of the Program and EPV commands, the flash memory checksum value of the target device is read from the target device and displayed on the programmer.

off:  After execution of the Program and EPV command, the flash memory checksum value of the target device is neither read nor displayed.

↓ Next button

(continued on next page)

**Note**  This menu is displayed only when a single-power-supply flash memory microcontroller is used.

[Prog Area]     Displays the valid memory area specified in the 2 MB user program area of the PG-FP4 as either of the following.

       on (0): User program Area 0 (0x00000000 to 0x000FFFFF) is specified.

       on (1): User program Area 1 (0x00100000 to 0x001FFFFF) is specified.

       off:     Entire 2 MB user program area is specified.

       Display example

         Prog Area

         on (0)

↓ Next button

[Chip ERS dis.]   Displays the set status of Disable Chip Erase of Security flag settings as either of the following[Note].

       on:  The Erase command is invalidated on the entire flash memory area of the target device.

       off:  The Erase command is executable.

↓ Next button

[Block ERS dis.]  Displays the set status of Disable Erase block of Security flag settings as either of the following[Note].

       on:  The Erase command is invalidated for a selected block in the flash memory of the target device.

       off:  The Erase command is executable.

↓ Next button

[Block PRG dis.]  Displays the set status of Disable Program Block of Security settings as either of the following[Note].

       on:  The Program command is invalidated for a selected block in the flash memory of the target device.

       off:  The Program command is executable.

↓ Next button

[dis. PRG Blk >]  When the Enter button is pressed next, all the blocks prohibited from being programmed are listed[Note].

       Display example

         00, 01, 02, 04, 05 (Blocks 0, 1, 2, 4, and 5 are prohibited from being programmed.)

↓ Next button

[dis. ERS Blk >]  When the Enter button is pressed next, all the blocks prohibited from being erased are listed[Note].

       Display example

         00, 01, 02, 04, 05 (Blocks 0, 1, 2, 4, and 5 are prohibited from being erased.)

**Note** This menu is displayed only when a single-power-supply flash memory microcontroller is used.

### 6.1.4  [Voltage Setting] menu

The [Voltage Setting] menu is used to check the voltage level setting when programming the target device currently connected to the PG-FP4.  All the displayed values were set by the parameter file during the last programming session.

This menu cannot be used to change the settings.

**[Voltage Setting >]**

- Pressing the Next button displays the Utility/Misc. menu.
- Pressing the Enter button displays the following commands that can be executed from the [Voltage Setting] menu.
- Pressing the Cancel button displays the [Commands] menu again.

[Vdd]               Vdd displays the value of $V_{DD}$ supplied to the target device connected to the PG-FP4 in volts.

    ↓ Next button

[Vdd2]              Vdd2 displays the value of $V_{DD2}$ supplied to the target device connected to the PG-FP4 in volts.

    ↓ Next button

[Vdd Source]        Vdd Source indicates the source of $V_{DD}$ supplied by the target device as either of the following.

        $V_{DD}$ from PG:      $V_{DD}$ is supplied from the PG-FP4.

        $V_{DD}$ from device:  $V_{DD}$ is supplied on the user system.

    ↓ Next button

[Clk Level]         Clk Level indicates the voltage level of the clock signal as either of the following.

        $V_{DD}$
        $V_{DD2}$

    ↓ Next button

[Ser Level]         Ser Level indicates the voltage level of the serial communication signal.  The high level of the serial communication signal is indicated as either of the following.

        $V_{DD}$
        $V_{DD2}$

    ↓ Next button

[Res Level]         Res Level indicates the voltage level of the reset signal.  The high level of the reset signal is indicated as either of the following.

        $V_{DD}$
        $V_{DD2}$

    ↓ Next button

[HS Level]          HS Level indicates the voltage level of the handshake signal.  The high level of the handshake signal is indicated as either of the following:

        $V_{DD}$
        $V_{DD2}$

    ↓ Next button

[Vpp]               Vpp indicates the value of $V_{PP}$ supplied to the target device connected to the PG-FP4 in volts.

### 6.1.5 [Utility/Misc.] menu

The [Utility/Misc.] menu is used to check the F/W version of the PG-FP4 and the version of the parameter file downloaded. It is also used to execute RESET of the PG-FP4.

This menu cannot be used to change settings.

**[Utility/Misc. >]**

- Pressing the Next button displays the [Commands] menu.
- Pressing the Enter button displays the following commands that can be executed on the [Utility/Misc.] menu.
- Pressing the Cancel button displays the [Commands] menu.

| | |
|---|---|
| [Reset PG-FP4 >] | When the Enter button is pressed next, the programmer is reset. |
| ↓ Next button | |
| [PG-FP4 F/W Version] | PG-FP4 F/W Version displays the firmware version number of the PG-FP4. |
| | Display example |
| | PG-FP4 F/W Version |
| | V1.16 |
| ↓ Next button | |
| [PRM Name] | PRM Name displays the file name of the parameter file stored in the PG-FP4. |
| | Display example |
| | PRM Name |
| | 70F3025A |
| ↓ Next button | |
| ★ [PRM File Version] | PRM File Version displays the version of the parameter file stored in the PG-FP4. |
| ↓ Next button | |
| ★ [HEX File Name] | HEX File Name displays the name of the downloaded file stored in the specified valid memory area in the user program area of the PG-FP4. |
| | It displays "n.a." if the downloaded file is invalid. |
| | The file name is displayed after either of the following steps are executed. |
| | 1. After downloading a user program into the user program area that is specified as a single memory area, use the user program as two independent memory areas (Area 0 and Area 1). |
| | 2. After downloading a user program into either Area 0 or Area 1, switch the valid memory area to the other memory area. |
| ↓ Next button | |
| [CRC Sum (PG-FP4)] | CRC Sum (PG-FP4) calculates and displays the checksum value of the valid memory area specified in the 2 MB user program area of the PG-FP4. |
| | Display example |
| | CRC Sum (PG-FP4) |
| | 6AEDF4F4 |

# CHAPTER 7 CONNECTORS AND CABLES

## 7.1 Power Supply Connector

The power supply connector is located on the right side of the PG-FP4.

★ **Figure 7-1. Power Supply Connector**

**Figure 7-2. Pin Configuration of Power Supply Connector**
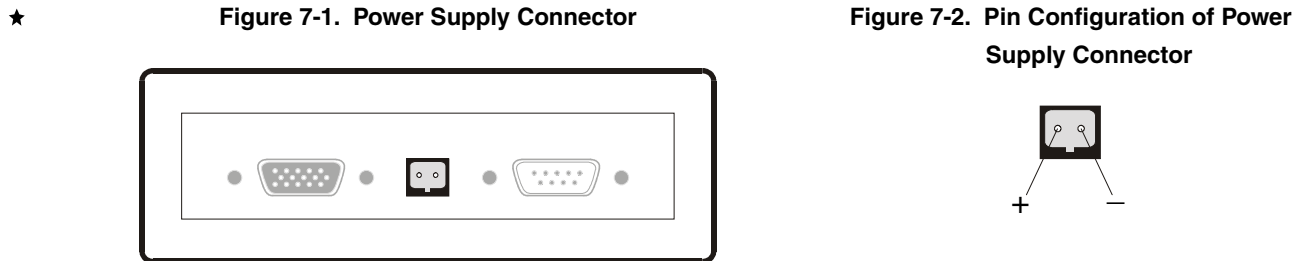


The specifications of the power supply are:

AC input range:       100 V to 240 V, 47 Hz to 63 Hz
DC output:            15 V
Current consumption:  0.8 A max.

**Caution    Connect only the provided AC adapter to the power supply jack of the PG-FP4.**

## 7.2 HD-Sub 9 Serial Host Connector

The serial host connector is located on the right side of the PG-FP4.

★ **Figure 7-3. HD-Sub 9 Serial Host Connector**     **Figure 7-4. Pin Configuration of HD-Sub 9 Serial Host Connector**
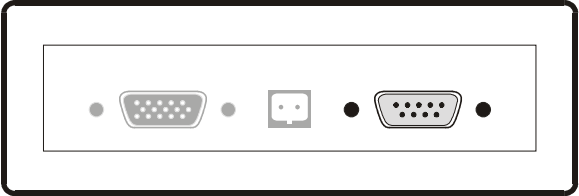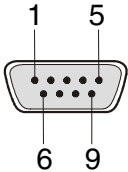
**Table 7-1. Pin Configuration of HD-Sub 9 Serial Host Connector**

| Serial Host | Signal Name of PG-FP4 |
|:-----------:|-----------------------|
| 1 | NC |
| 2 | RxD |
| 3 | TxD |
| 4 | NC |
| 5 | $V_{SS}$ |
| 6 | NC |
| 7 | RTS |
| 8 | CTS |
| 9 | NC |

### 7.2.1 RS-232C cable (crossed)

The host cable is a standard shielded RS-232C cable of 2-meter or 3-meter length. The connectors on both sides are D-SUB 9 pin female. Figure 7-3 shows the connection.

**Figure 7-5. Host Cable Connections**
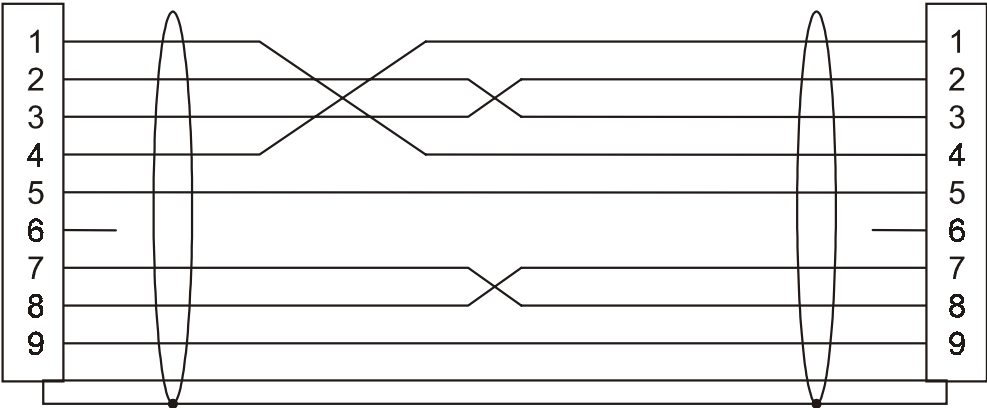
## 7.3 HD-Sub 15 Target Interface Connector

The target interface connector is located on the right side of the PG-FP4.

★ **Figure 7-6. HD-Sub 15 Target Interface Connector**
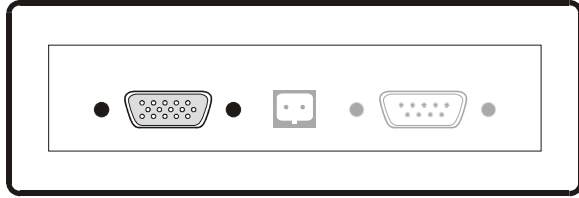
**Figure 7-7. Pin Configuration of HD-Sub 15 Target Interface Connector**
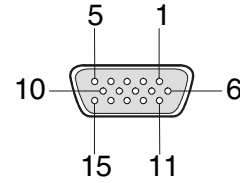
**Table 7-2. Pin Configuration of HD-Sub 15 Target Interface Connector**

| PF-FP4 HD-Sub 15 | Signal Name of PG-FP4 |
|---|---|
| 1 | SO/TxD |
| 2 | SI/RxD |
| 3 | SCK |
| 4 | /RESET |
| 5 | $V_{DD2}$ |
| 6 | FLMD1 |
| 7 | H/S |
| 8 | $V_{DD}$ |
| 9 | $V_{DD}$ |
| 10 | RFU-1 |
| 11 | $V_{PP}$ |
| 12 | FLMD0 |
| 13 | VDE |
| 14 | CLK |
| 15 | GND |

★ HD-Sub 15 connector part number: HT1566G3 (PROVERTHA Steckverbinder GmbH)

## 7.4 Target Cable Specifications

The target cable is equipped with two connectors for the FA adapter.

**Figure 7-8. Target Cable Outline**



HD-SUB 15 (male)                                                Type A    Type B

**Figure 7-9. Pin Configuration of HD-SUB 15**
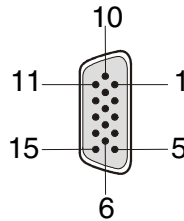


**Figure 7-10. Target Connector Outline (View from Solder Side)**
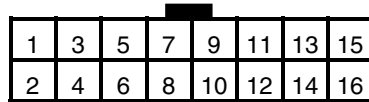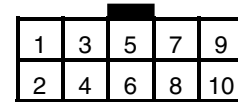


Type A                                          Type B

**Table 7-3. Pin Configuration of Target Connector**

| Pin Number | HD-SUB 15 | Type A: Signal (16 Pins) | Type B: Signal (10 Pins) |
|---|---|---|---|
| 1 | SO/TxD | GND | GND |
| 2 | SI/RxD | /RESET | /RESET |
| 3 | SCK | SI/RxD | SI/RxD |
| 4 | /RESET | $V_{DD}$ | $V_{DD}$ |
| 5 | $V_{DD2}$ | SO/TxD | SO/TxD |
| 6 | FLMD1 | $V_{PP}$ | $V_{PP}$ |
| 7 | H/S | SCK | SCK |
| 8 | $V_{DD}$ | H/S | H/S |
| 9 | $V_{DD}$ | CLK | CLK |
| 10 | Not used | VDE | VDE |
| 11 | $V_{PP}$ | $V_{DD2}$ | |
| 12 | FLMD0 | FLMD1 | |
| 13 | VDE | RFU-1 | |
| 14 | CLK | FLMD0 | |
| 15 | GND | Not used | |
| 16 | | Not used | |

**Remark** The pin numbers differ from those of the target cable supplied with the PG-FP3 but the pin configuration is the same.

Connecting the following connectors as target connectors (type A and type B) is recommended.

Type A (16-pin):   7616-5002SC (Sumitomo 3M Limited)

Type B (10-pin):   FAP-10-08#2-0BF (Yamaichi Electronics Co., Ltd.)

When using a self-made cable because the supplied cable cannot be used due to the specifications of the target, the cable length should be the same or shorter than the supplied cable.  Also, the frequency characteristics of the cable material should be the same or higher than those of the supplied cable.

Note that communication may be performed at high speed according to the communication settings.  Therefore, when a cable other than the supplied cable is used the system may not operate normally due to communication errors.

## 7.5 Parallel Host Connector

The parallel host connector can be configured as a centronics interface or as remote control port. Depending on the selection, one of the following signal settings is available.

★ **Figure 7-11. HD-Sub 25 Parallel Host Connector**   **Figure 7-12. Pin Configuration of HD-Sub 25 Parallel Host Connector**
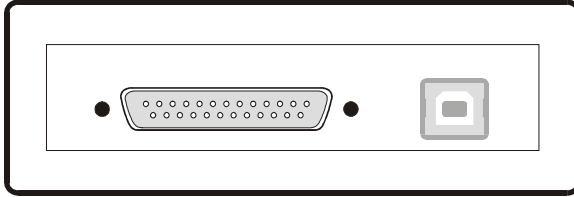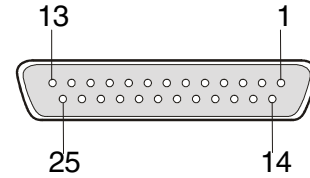




**Table 7-4. Pin Configuration of HD-Sub 25 Parallel Host Connector**

| Pin Number | Signal | Centronics Mode | |
|---|---|---|---|
| 1 | IO3-0 | /Strobe | In |
| 2 | IO1-0 | D0 | IO |
| 3 | IO1-1 | D1 | IO |
| 4 | IO1-2 | D2 | IO |
| 5 | IO1-3 | D3 | IO |
| 6 | IO2-0 | D4 | IO |
| 7 | IO2-1 | D5 | IO |
| 8 | IO2-2 | D6 | IO |
| 9 | IO2-3 | D7 | IO |
| 10 | IO3-2 | /Ack | Out |
| 11 | IO3-1 | Busy | Out |
| 12 | $V_{SS}$ | | |
| 13 | Pull-up | | |
| 14 | Pull-up | | |
| 15 | Pull-up | | |
| 16 | IO3-3 | Not used | In |
| 17 | Pull-up | | |
| 18 | $V_{SS}$ | | |
| 19 | $V_{SS}$ | | |
| 20 | $V_{SS}$ | | |
| 21 | $V_{SS}$ | | |
| 22 | $V_{SS}$ | | |
| 23 | $V_{SS}$ | | |
| 24 | $V_{SS}$ | | |
| 25 | $V_{SS}$ | | |

## 7.6    USB Port
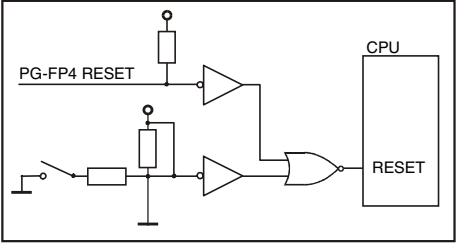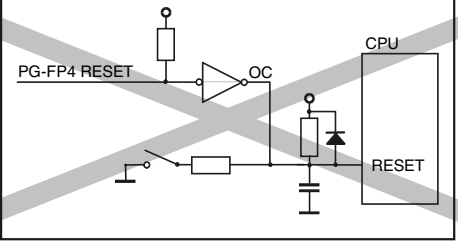
The USB port connection (Rev. 1.1) allows data transmission up to 12 Mbps on a USB type B connector.
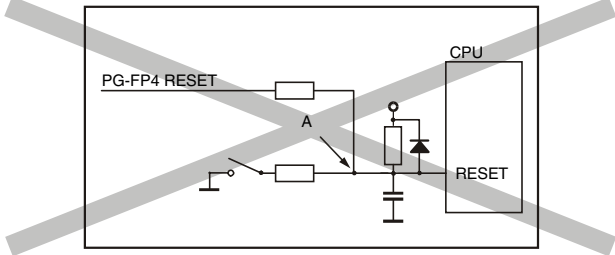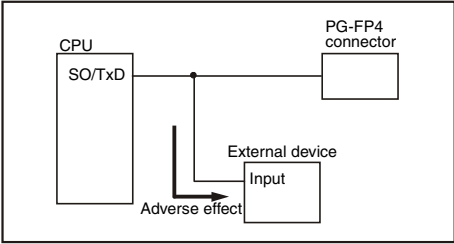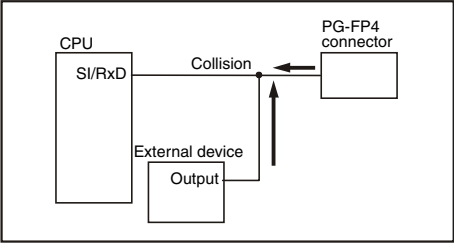
**Figure 7-13.  USB Port Connector**
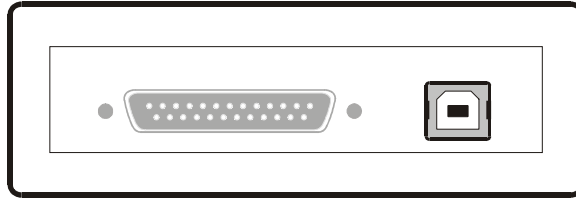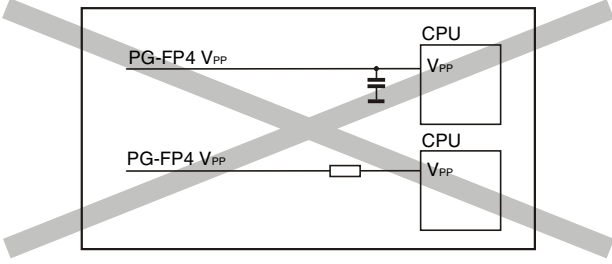
# CHAPTER 8  NOTES ON TARGET SYSTEMS

This chapter explains the basic notes on the target system for rewriting the flash memory in the microcontroller using the PG-FP4.

| CPU Pin | Design Proposal |
| --- | --- |
| RESET | Do not connect the RESET signal generator on the target system to the RESET signal of the PG-FP4. Otherwise, a signal conflict will occur. To avoid the conflict, isolate the RESET signal generator from the RESET signal of the PG-FP4.<br>Do not generate RESET while the PG-FP4 is connected. This must be especially noted in a system that uses an external watchdog timer. |
| | Connect the RESET signal of the PG-FP4 at a point where the status of the programmer RESET signal and that of the CPU RESET pin are the same.<br><br>**Correct connection:**<br><br>Avoid the following RESET signal connection.<br>• Connection to a point where the target CPU RESET rise time is slower than the PG-FP4 RESET rise time.<br><br>**Incorrect connection:**<br><br>It takes time for the CPU RESET pin to go high after the PG-FP4 RESET level goes from low to high. |

★

| CPU Pin | Design Proposal |
|---|---|
| RESET | • Connection to a point where the target CPU RESET pin cannot be driven to low level by the PG-FP4 RESET signal.<br><br>**Incorrect connection:**<br><br><br><br>When the PG-FP4 RESET is driven low, the level of the voltage at point A does not fall. |
| Serial interface pin | When the CPU port used by the PG-FP4 is also connected to the input of an external device, and if that device malfunctions, disconnect the external device or make it output high impedance.<br><br>**Example:**<br><br><br><br>While the CPU port used by the PG-FP4 is also connected to the output of an external device, and if a signal collision occurs, disconnect the external device.<br><br>**Example:**<br><br> |

| CPU Pin | Design Proposal |
|---------|-----------------|
| V$_{PP}$ | Keep the wiring between the PG-FP4 connector and the CPU V$_{PP}$ pin as thick and as short as possible.<br>Insert neither capacitors nor resistors into the V$_{PP}$ line unless otherwise stated.<br>Note that when pull-down resistors are needed due to the specifications of the target, the <u>resistor value must be 470 Ω or higher</u>.<br><br>**Incorrect circuit:**<br> |
| Others | For the unused pins, refer to the user's manual of the device.<br>Some devices have pins that must be processed differently.  For these pins also, refer to the user's manual of the device.<br><br>  **Example of pins processed differently:**<br>    MODE<br>    CKSEL<br>    REGOUT<br>    REGIN, etc. |

★ The following show examples of the interface circuits of UART (asynchronous communication port) and SIO (3-wire clocked communication port).

Refer to the above design proposal for the pin processing of the device to be used.

**Figure 8-1. UART Interface Circuit Example**
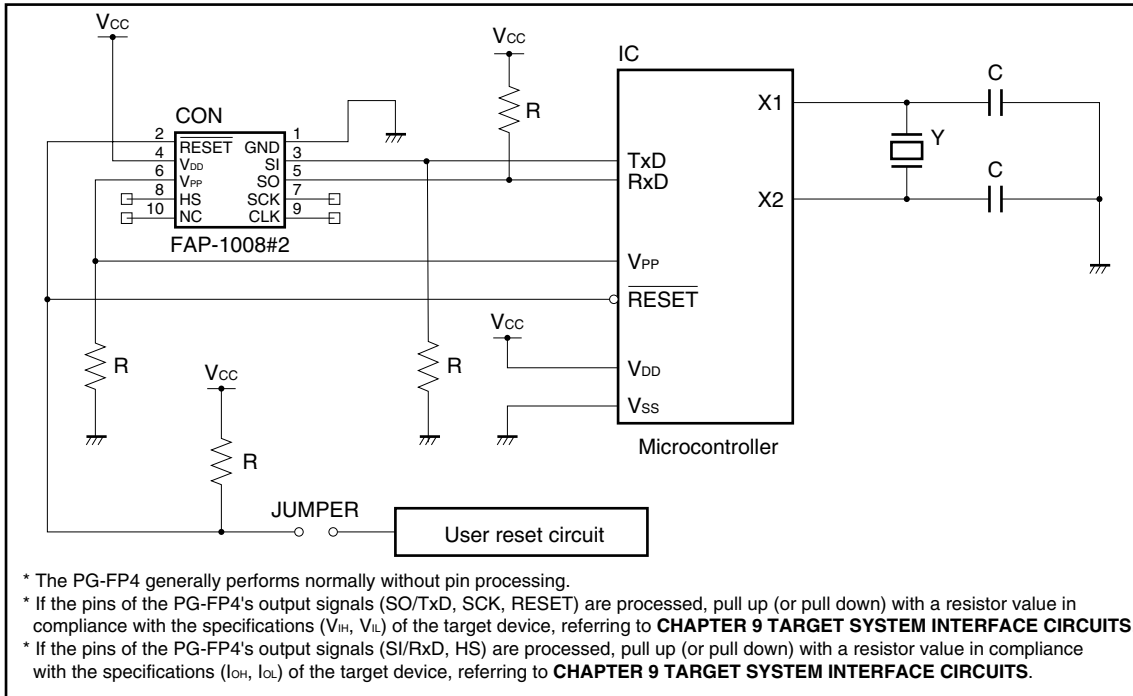


* The PG-FP4 generally performs normally without pin processing.
* If the pins of the PG-FP4's output signals (SO/TxD, SCK, RESET) are processed, pull up (or pull down) with a resistor value in compliance with the specifications ($V_{IH}$, $V_{IL}$) of the target device, referring to **CHAPTER 9 TARGET SYSTEM INTERFACE CIRCUITS**.
* If the pins of the PG-FP4's output signals (SI/RxD, HS) are processed, pull up (or pull down) with a resistor value in compliance with the specifications ($I_{OH}$, $I_{OL}$) of the target device, referring to **CHAPTER 9 TARGET SYSTEM INTERFACE CIRCUITS**.

**Caution** **Insert neither capacitors nor resistors into the $V_{PP}$ line unless otherwise stated. When pull-down resistors are inserted into the $V_{PP}$ line, the resistor value must be 470 Ω or higher.**

**Figure 8-2. SIO Interface Circuit Example**
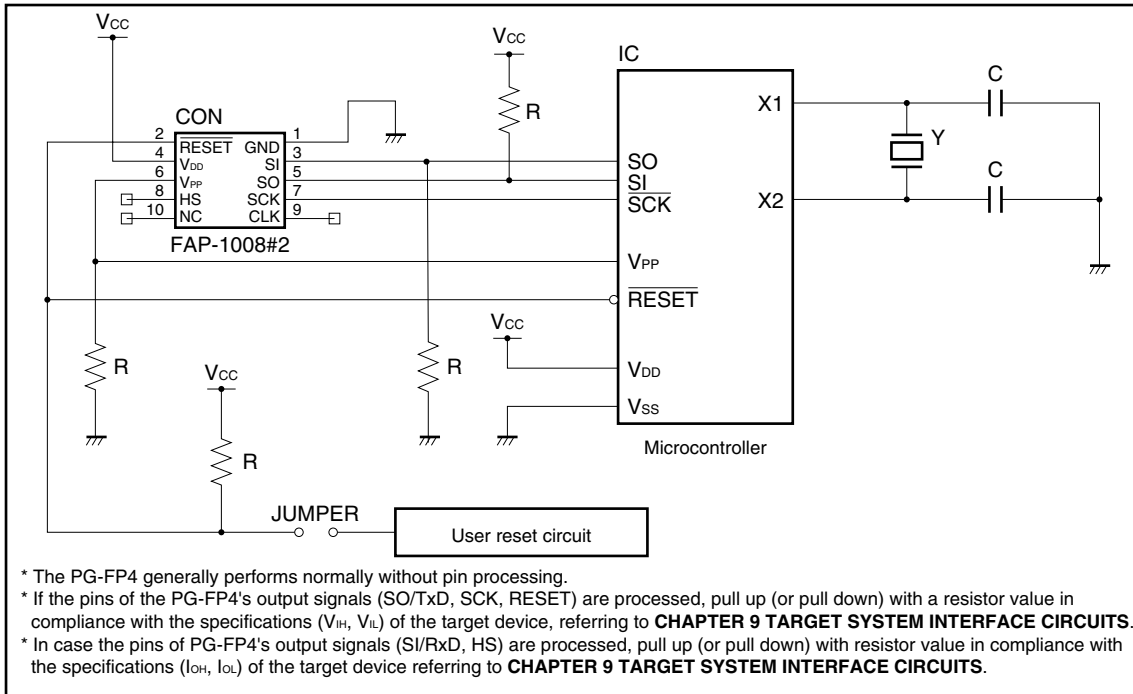


* The PG-FP4 generally performs normally without pin processing.
* If the pins of the PG-FP4's output signals (SO/TxD, SCK, RESET) are processed, pull up (or pull down) with a resistor value in compliance with the specifications ($V_{IH}$, $V_{IL}$) of the target device, referring to **CHAPTER 9 TARGET SYSTEM INTERFACE CIRCUITS**.
* In case the pins of PG-FP4's output signals (SI/RxD, HS) are processed, pull up (or pull down) with resistor value in compliance with the specifications ($I_{OH}$, $I_{OL}$) of the target device referring to **CHAPTER 9 TARGET SYSTEM INTERFACE CIRCUITS**.

**Caution** **Insert neither capacitors nor resistors into the $V_{PP}$ line unless otherwise stated. When pull-down resistors are inserted into the $V_{PP}$ line, the resistor value must be 470 Ω or higher.**

# CHAPTER 9  TARGET SYSTEM INTERFACE CIRCUITS

This chapter describes the target system interface circuits of the PG-FP4 (TTL level).

★  ## 9.1  SO/TxD, RESET

For programming flash memory devices, $V_{DD}$ and $V_{DD2}$ may be supplied by the PG-FP4.

When $V_{DD}$ and $V_{DD2}$ are supplied by the target system, the PG-FP4 internal voltage regulator is protected so that user $V_{DD}$ and $V_{DD2}$ will not affect the signal lines SO/TxD and RESET.

In either case, the signal lines SO/TxD and RESET will have TTL-level voltage.

**Figure 9-1.  SO/TxD and RESET Pins**
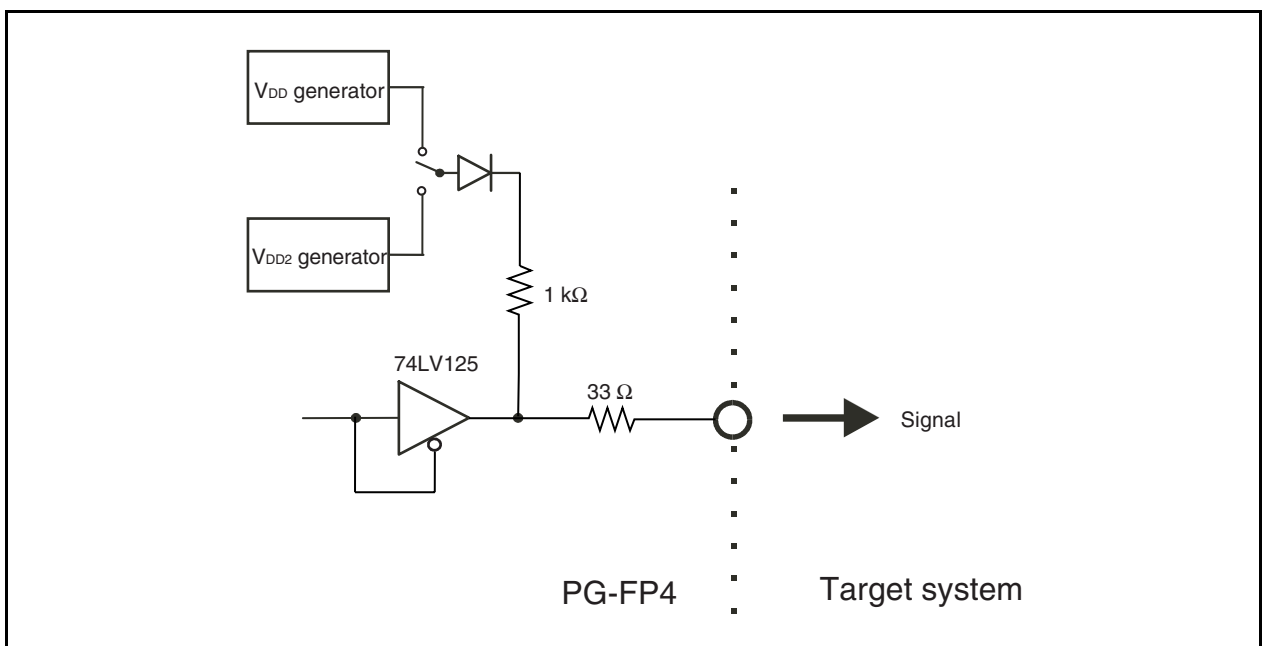
★ ## 9.2 SCK

For programming flash memory devices, $V_{DD}$ and $V_{DD2}$ may be supplied by the PG-FP4.

When $V_{DD}$ and $V_{DD2}$ are supplied by the target system, the PG-FP4 internal voltage regulator is protected so that user $V_{DD}$ and $V_{DD2}$ will not affect the signal line SCK.

In either case, the signal line SCK will have TTL-level voltage.

**Figure 9-2. SCK Pin**
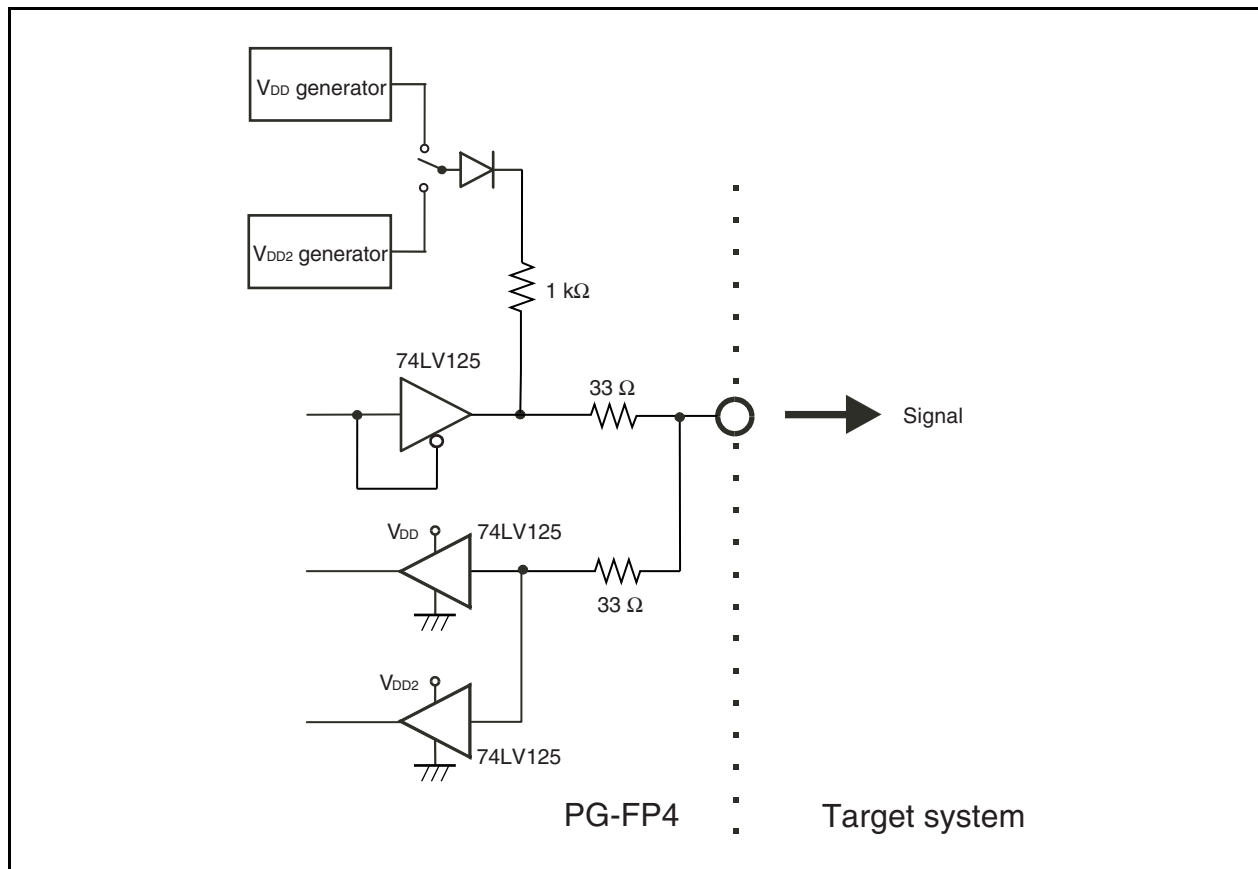
## 9.3 SI/RxD, HS

The SI/RxD input signal must not exceed TTL-level voltage.

★ **Figure 9-3. SI/RxD and HS Pins**
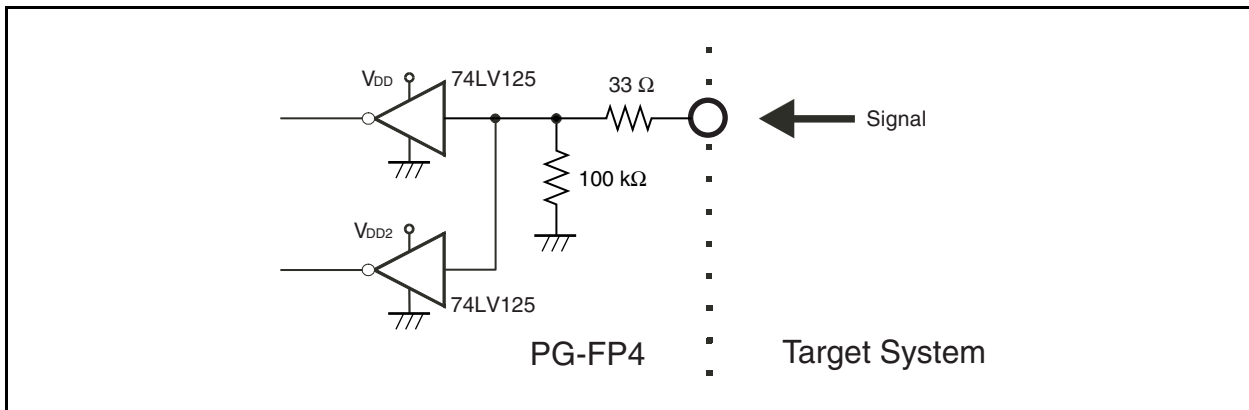


## 9.4 CLK

**Figure 9-4. CLK Pin**
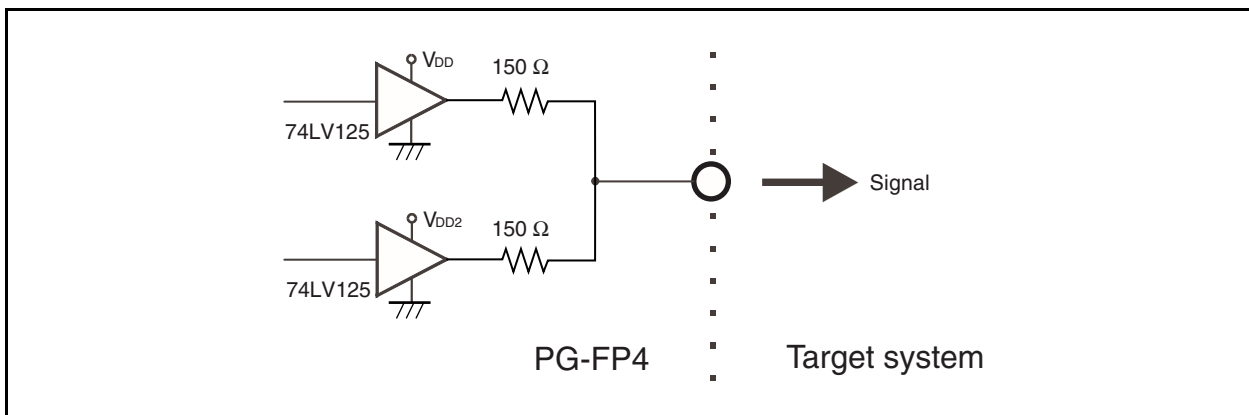
## 9.5 FLMD0, FLMD1

**Figure 9-5. FLMD0 and FLMD1 Pins**
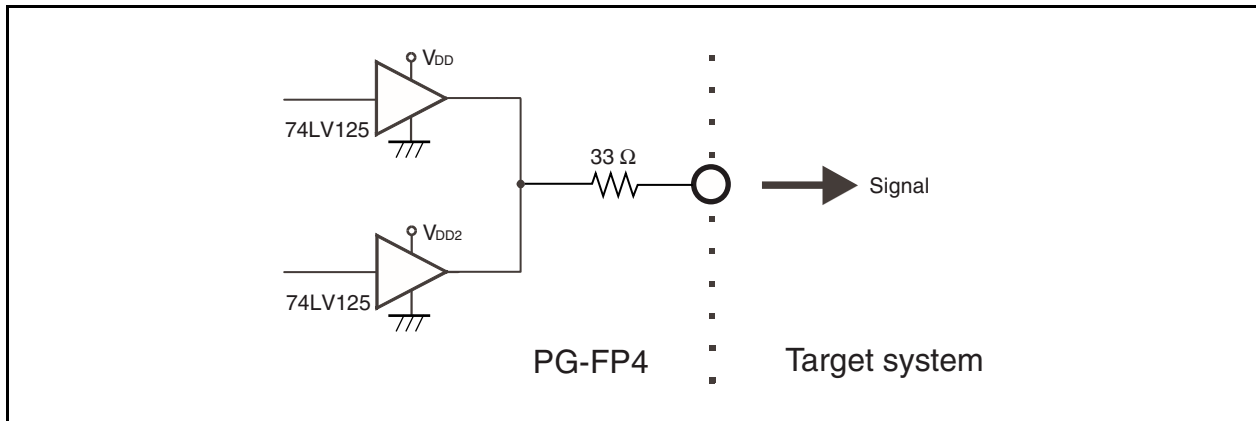


★ ## 9.6 V$_{DD}$, V$_{DD2}$

When V$_{DD}$ and V$_{DD2}$ are supplied from the target system, the PG-FP4 internal voltage regulator is protected.

**Figure 9-6. V$_{DD}$ and V$_{DD2}$ Pins**
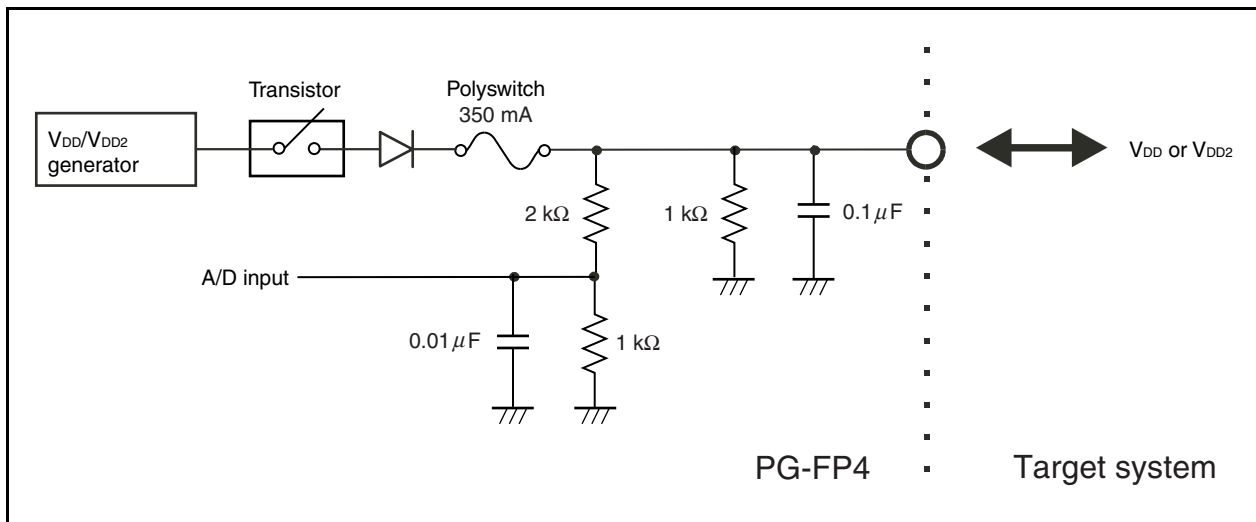
★    **9.7    V$_{PP}$**

**Figure 9-7.  V$_{PP}$ Pin**
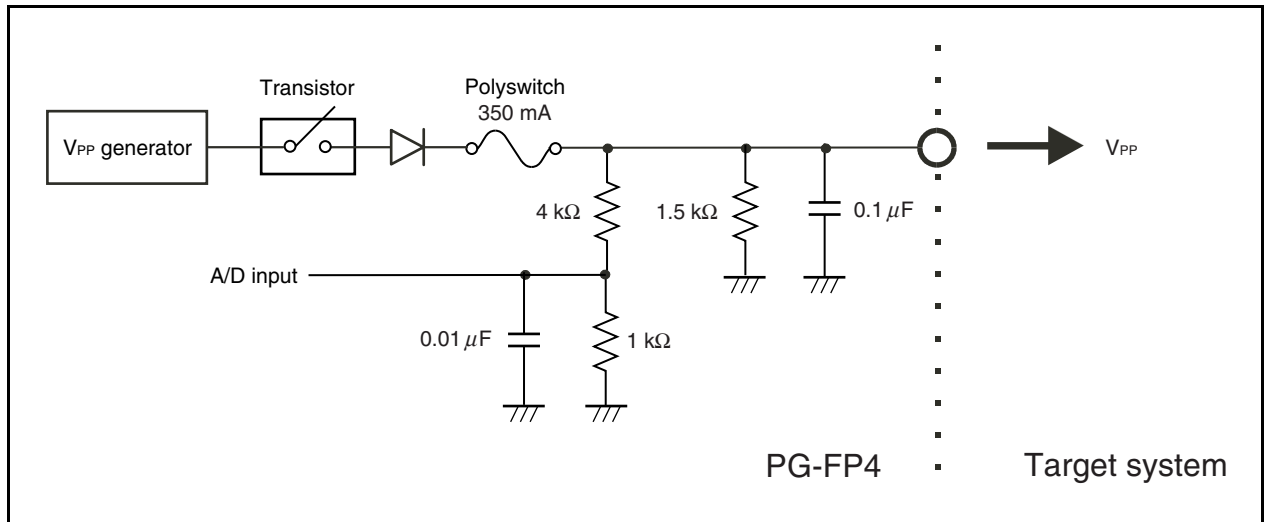
# CHAPTER 10 ERROR MESSAGES

The PG-FP4 error and warning messages are displayed on the message display.

## 10.1 Error Messages of PG-FP4 in Standalone Mode

| No. | Message | Error Condition | Possible Workaround |
|---|---|---|---|
| 001 | Invalid PRM data | PRM data is invalid | The parameter file includes invalid data, or the file is incomplete.<br>Use the parameter file downloaded from the following URL:<br>http://www.necel.com/micro/ods/eng/index.html |
| 005 | Not supported ! | | The command issued is not supported on the device and thus cannot be used. |
| 006 | Command aborted! | Command aborted | – |
| 011 | Read. Sig failed | Reading device signature failed | Check if the correct device is selected. |
| 012 | Check connection | Check connection | The PG-FP4 cannot establish connection to the target device.<br>This might be due to wrong connections between device and the PG-FP4, bad socket contacts or non-working oscillator. |
| 013 | Addr. Range err | Address range error | The address given in the command exceeds the device's address range. |
| 020 | Inv. Sig. ID | Invalid signature ID | Check if the correct device is selected. |
| 021 | Inv. Sig. Code | Invalid signature code | Check if the correct device is selected. |
| 022 | Inv. Sig. func. | Invalid signature function | Check if the correct device is selected. |
| 023 | Inv. Sig. addr. | Invalid signature address | Check if the correct device is selected. |
| 024 | Inv. device name | Invalid device name | Check if the correct device is selected. |
| 025 | Inv. Signature | Invalid signature | Check if the correct device is selected. |
| 030 | Prewrite Timeout | Prewrite timeout | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 032 | Prewr. retry err | Prewrite retry error | – |
| 040 | Erase Timeout | Erase timeout | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 041 | Erase failure | Erase failure | A device defect is most probably causing this error. |
| 042 | Ers time exceed | Erase time exceeded | A device defect is most probably causing this error. |
| 043 | Ers Timeset err | Erase timeset error | The parameter file may contain invalid data.<br>Contact NEC Electronics. |
| 050 | Bln Timeout | Blank check timeout | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 051 | Blankchk failed | Blank check failed | The device connected is not empty. Use the 'erase' command before programming. |
| 060 | Wrb Timeout | Writeback timeout | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 061 | Writeback failed | Writeback failed | A device defect is most probably causing this error. |

| No. | Message | Error Condition | Possible Workaround |
|---|---|---|---|
| 062 | Wrb retry exceed | Writeback retries exceed | A device defect is most probably causing this error. |
| 063 | Wrb Timeset err | Writeback timeset error | The parameter file may contain invalid data. Contact NEC Electronics. |
| 070 | Write timeout | Write timeout | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 071 | Write failed | The write operation failed | Either the device was not blank before writing or a device defect is causing this error. |
| 072 | Write retry err | Write retry error | Either the device was not blank before writing or device defect is causing this error. |
| 073 | Wrt. Timeset err | Write timeset error | The parameter file may contain invalid data. Contact NEC Electronics. |
| 080 | Vrf Timeout | Verify timeout | Communication problem between PG-FP4 and the target device. Try the operation again. |
| 081 | Verify failed | Verify failed | The data in the target device's flash memory is not the same as in the PG-FP4. |
| 090 | IVrf Timeout | Internal verify timeout | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 091 | IVerify failed | Internal verify error | An error has occurred while the write data level is checked. Erase and write the device again. |
| 092 | VGT Comm err | Device communication error | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 093 | SUM Comm err | Device communication error | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 094 | SCF Comm err | Device communication error | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 095 | EXR Comm err | Device communication error | Communication problem between the PG-FP4 and the target device. Try the operation again. |
| 096 | EXW Comm err | Device communication error | Communication problem between the PG-FP4 and the target device. Try the operation again. |

★ **10.2 GUI Software Fatal Error Messages**

   GUI software fatal error messages indicate a severe error that destabilizes the GUI software operation. When the problem persists after restarting the GUI software, please contact NEC Electronics.

| No. | Message | Description |
|---|---|---|
| F 100 | Could not initialize INI-File. | Errors F 100 to F 899 indicate severe internal error situations. |
| F 101 | Registering GUI Windows failed. | |
| F 102 | Loading GUI Main Menu failed. | |
| F 103 | Creating GUI main window failed. | |
| F 104 | Loading keyboard shortcuts failed. | |
| F 105 | Painting GUI main window failed. | |
| F 106 | Starting debug failed. | |
| F 107 | Setting status bar text failed. | |
| F 108 | Creating tool bar failed. | |
| F 109 | Creating Status Bar failed. | |
| F 110 | Creating Client Area failed. | |
| F 111 | Creating Information Window failed. | |
| F 112 | Initialisation of internal GUI status failed. | |
| F 113 | Preparing communication to programmer failed. | |
| F 114 | Could not initialize dialog boxes. | |
| F 115 | Could not initialize window for monitoring communication to the programmer. | |
| F 116 | Determining program path failed. | |
| F 117 | Could not initialize device setup dialog. | |
| F 118 | Could not initialize debug information. | |
| F 119 | Resizing the Status Bar failed. | |
| F 120 | Resizing Monitor Area failed. | |
| F 121 | Moving Info Area failed. | |
| F 122 | Loading tool tip text failed. | |
| F 123 | Setting status bar text failed. | |
| F 124 | Loading menu info text failed. | |
| F 125 | Creating CRC check dialog window failed. | |
| F 126 | Creating communication setup dialog window failed. | |
| F 127 | Creating program area selection dialog window failed. | |
| F 128 | Stopping debug failed. | |
| F 129 | Close Upload_file_handle failed. | |
| F 200 | Invalid start address. | |
| F 201 | Invalid end address. | |
| F 202 | Neither Hex nor SREC specified. | |

| No. | Message | Description |
|---|---|---|
| F 300 | Creating splash screen timer failed. | Errors F 100 to F 899 indicate severe internal error situations. |
| F 301 | Edit control out of space. | |
| F 302 | Determining selected communication port speed failed. | |
| F 303 | Determining selected communication port number failed. | |
| F 304 | Determining selected download port number failed. | |
| F 400 | Creating receive task failed. | |
| F 401 | Setting timeouts failed. | |
| F 402 | Setting buffer size failed. | |
| F 403 | Resetting HS failed. | |
| F 404 | Setting receive event failed. | |
| F 405 | Invalid port index. | |
| F 406 | Terminating receive thread failed. | |
| F 407 | Creating transmit task failed. | |
| F 408 | Creating status dialog window failed. | |
| F 409 | Clearing error in receive task failed. | |
| F 410 | Download failed. | |
| F 411 | Connection between host and programmer is broken. | |
| F 412 | Communication error. | |
| F 413 | Connection between host and programmer is broken. | |
| F 500 | Reading current cursor handle failed. | |
| F 501 | Unknown result of operation. | |
| F 502 | Placing command execution time information in status bar failed. | |
| F 503 | Unknown command (status update). | |
| F 504 | Unknown command (transmit ended with OK). | |
| F 505 | Unknown command (transmit ended with unknown answer). | |
| F 506 | Unknown command (receive timeout). | |
| F 507 | Unknown command (receive error). | |
| F 508 | Unknown command (transmit aborted). | |
| F 600 | Please stop logging communication first. | |
| F 601 | Opening log file failed. | |
| F 602 | Creating edit control for communication window failed. | |
| F 603 | Creating communication window timer failed. | |
| F 604 | Killing monitor timer failed. | |
| F 605 | Creating communication window subclassing procedure failed. | |

| No. | Message | Description |
|-----|---------|-------------|
| F 700 | USB splash screen timer failed. | Errors F 100 to F 899 indicate severe internal error situations. |
| F 750 | Please stop debugging first. | |
| F 751 | Opening debug file failed. | |
| F 752 | Debug information overflow.<br>Discharging actual message. | |
| F 753 | Setting up message box failed. | |
| F 800 | Memory cannot be allocated. | |
| F 801 | Shortage of memory. | |
| F 802 | Temporary file could not be read.<br>abort Save File | |
| F 803 | File save error.<br>abort Save File | |
| F 804 | error line : <line number><br>Data error.<br>abort DATA Check | |
| F 805 | error line : <line number><br>Data Count error.<br>abort "Data Count" Check | |
| F 806 | error line : <line number><br>Check sum error.<br>abort "Check sum" Check | |
| F 807 | cannot open Temporary File<br>abort "Save File" | |
| F 808 | HEX format error. | |
| F 809 | Too large address. | |
| F 810 | Parameter of "Start Address" is invalid. | |
| F 811 | Parameter of "End Address" is invalid. | |
| F 812 | File load error.<br>abort | |
| F 813 | Temporary file could not be created.<br>abort | |
| F 902 | Unable to find any PRM file. Please install PRM files. | The GUI software could not find any PRM file in sub-directory \PRM. Download the PRM file for the target device to the sub-directory PRM. |

★    ## 10.3  GUI Software Error Messages

In addition to the error messages listed below, error messages can be displayed directly from the PG-FP4.

| No. | Message | Description |
|---|---|---|
| E 200 | Opening script file failed. | Opening the specified script file failed.  Script file in use? |
| E 201 | Updating the firmware will take several minutes. ATTENTION:<br>• The process of updating your firmware must NOT be interrupted!<br>• Without firmware this FP4 GUI will NOT run properly.<br>Install new firmware in your programmer? | Check if the [ Update Firmware ] menu has been started. |
| E 202 | Checking address data failed. | Signature command returned unexpected character. |
| E 203 | Evaluating area data failed. | Signature command returned unexpected character. |
| E 204 | Unknown Version of your firmware! The FP4 GUI may not work properly! | Refer to **3.2.1  Firmware update installation** for a description of these messages. |
| E 205 | The firmware you are using requires an update of the GUI! The FP4 GUI may not work properly! | |
| E 206 | Your firmware is not up to date! Updating the firmware will take several minutes. ATTENTION:<br>- The process of updating your firmware must NOT be interrupted!<br>- Without new firmware this FP4 GUI will NOT run properly.<br>Install new firmware in your programmer? | |
| E 207 | Wrong firmware in programmer! The GUI may not work properly! | |
| E 208 | The programmer memory does not contain the most recent downloaded file (different CRC). Please download your user application(s) again. | Before issuing an EPV command, the GUI software verifies proper application file contents by verifying the actual CRC with the one saved after file download to FP4.ini. |
| E 209 | Searching for a port communicating with the programmer failed. Please check the connection. | No communication with the programmer could be established at all.  Sequence of connecting the PG-FP4 on start up of the GUI software:<br>1. Read most recent INI-file settings.  Try opening the most recent PC port and send the `ver` command to the PG.<br>2. If 1. fails, try the following twice:<br>a) Open the USB port and send the `ver` command (on Windows 98 and Windows 2000 only).<br>b) Open COM1 … COM6 with all possible baud rates and send the `ver` command for each of these combinations.<br>As soon as any of the combinations above succeeds the communication port has been found.<br>3. When serial communication is established and most recently the parallel download port has been used (`DownloadPort`-key in INI-file):<br>Try opening the parallel PC port and send the `ctr on` command to the PG |

| No. | Message | Description |
|---|---|---|
| E 210 | Line too long. | Executing a script file might abort with one of these errors. The contents of the line causing the error are also displayed. |
| E 211 | Nested repeat is not supported. | |
| E 212 | Loop number invalid. | |
| E 213 | File too long. | |
| E 214 | Statement 'repeat <num. rep.>' missing. | |
| E 215 | Command not found | |
| E 216 | Download file name missing. | |
| E 217 | Opening download file failed. | |
| E 218 | Upload file name missing. | |
| E 219 | Opening parameter file for upload failed. | |
| E 220 | Opening upload file failed. | |
| E 221 | Command not allowed in script file. | |
| E 222 | Processing a command failed. | |
| E 223 | Command execution failed. | The script syntax was correct and the command has been sent to the PG-FP4, but the command execution itself showed an error (e.g. a verify error on the target device). |
| E 300 | Determining download directory failed. | The selected directory name in the file download dialog box is invalid. |
| E 301 | Determining upload directory failed. | The selected directory name in the file upload dialog box is invalid. |
| E 302 | Trying to open USB port failed. | The processing after setting the Programmer Communication Setup dialog box might fail due to one of these reasons. Please verify proper selection of the port/speed for the programmer. |
| E 303 | Trying to connect Programmer failed. | |
| E 304 | Trying to open serial port failed. | |
| E 305 | Changing the communication speed of the programmer failed. | |
| E 306 | Trying to connect Programmer failed. | |
| E 307 | Trying to open USB failed. | |
| E 316 | Trying to connect Programmer failed. | |
| E 317 | ver command failed. | Executing the ver command failed. |
| E 400 | Port is already open. | Processing after setting the Programmer Communication Setup dialog box failed since the port is already open. Check if programmer ports are set correctly. |
| E 401 | The communication port has not been opened so far. | Sending a command to the PG-FP4 is only possible after the communication channel has been opened. |
| E 500 | Evaluating CRC answer failed. | The PG-FP4 answered with an unexpected string after sending the Checksum command. |
| E 501 | Operation failed. | Executing a command failed (e.g. a verify error occurred for a signal from the target device). |
| E 502 | Programmer is not responding. | Communication between the PC and the PG-FP4 timed out. |
| E 503 | Receiving failed. | Reading the PC port failed. |
| E 600 | Appending information to communication logging file failed. | Writing data to the communication log file failed. |

| No. | Message | Description |
|-----|---------|-------------|
| E 750 | Writing to INI-File failed. | Writing to the FP4.INI file failed. |
| E 800 | Illegal address | The end address entered in the HEX Editor is lower than the start address. |
| E 801 | The file cannot be read. | Processing the selected file in the HEX Editor failed. |
| E 802 | No HEX data. | The file format could not be read in the HEX Editor. |
| E 803 | The file cannot be written. | The Windows write-file function failed in the HEX Editor. |
| E 804 | cannot open <file name> abort | The Windows file-open function failed in the HEX Editor. |
| E 805 | cannot open file | A NULL handle was returned when a file was opened in the HEX Editor. |
| E 806 | Check sum error. Continue ? | The HEX Editor detected a faulty checksum. The checksum will be corrected if continuing. |
| E 808 | Invalid file name. | The specified file could not be found in the HEX Editor. |
| E 809 | <file name> could not be opened. abort | The Windows file-open function failed in the HEX Editor. |
| E 900 | Unable to open last active PRM/SET file. Using most recent settings. | The FP4.INI file does not exist or contains invalid entries for `RecentPrmFile` or `RecentSet-File`. The first PRM file from sub-directory \PRM will be loaded instead. |
| E 901 | Searching for fp4com.dll failed. | Cannot find Communication DLL fp4com.dll. Reinstall PG-FP4 software. |
| E 903 | Unable to find any PRM file. Please install PRM files. | Sub-directory \PRM does not exist or valid PRM file does not exist in the sub-directory \PRM. |
| E 907 | Download of PRM file failed. | An error occurred while attempting to download a PRM file. The PRM file may be invalid. |
| E 908 | Download of SET file failed. | An error occurred while attempting to download a SET file. The SET file may be invalid. |
| E 910 | Checking device name failed. | The parameter file signature differs from the signature read from the device. |
| E 911 | Checking device end address failed. | The parameter file signature differs from the signature read from the device. |

★ **10.4  GUI Software Information Messages**

Informational messages do not need any workaround because they do not indicate an error condition.  The message is sent as information only and does not require any user action in response.

| No. | Message | Description |
|---|---|---|
| I 200 | New firmware installed successfully in your programmer! | Firmware upgrade completed with success. |
| I 201 | Opening parallel download port failed. File download will be done on the serial port. | The Windows internal function to open the parallel port failed (port occupied by other software?) |
| I 202 | Download via parallel port failed. | Communication via the parallel port failed.  Re-download or use a serial port. |
| I 300 | Value out of range. | The value entered in a dialog box is out of the allowable max/min range.  The max/min value or the most recent value will be written into the dialog element. |
| I 301 | Multiple Program Areas are disabled. Please enable Program Areas usage in the Device Setup Dialog. | The menu command [Programmer] → [Select Programming area] can only be used when it has been enabled on the Advanced tab of the device Setup dialog box. |
| I 500 | Operation completed successfully. | Executing a command succeeded. |
| I 501 | This command can only be used for UC2 devices. | The menu entries Device → Write Security and Device Checksum can only be used for UC2 devices. |
| I 502 | Note: To abort a write, erase or verify operation it is necessary to reset the programmer manually. | Aborting device-related commands requires an additional Programmer reset. |
| I 801 | End record not found, created. | The HEX Editor implicitly created an end record when loading a file. |
| I 800 | Buffer is modified. Are you sure to close ? | The HEX Editor indicates that its contents are not yet saved to a disk. |
| I 802 | The file is modified. Save ? | |
| I 804 | The file is modified. Are you sure to quit? | |
| I 805 | This file is not valid. | The HEX Editor is attempting to open an invalid file. |
| I 905 | *.set is not valid.  Using most recent settings. | The SET file format is old. |
| I 906 | *.prm is not valid.  Using most recent settings. | The PRM file format is old. |
| I 907 | Caution: When 'Chip Erase' is disabled, chip cannot be erased and programmed any more! | This is displayed when [Disable Chip Erase] on Advanced tab of the [Device] → [Setup] menu is checked. |
| I 911 | The selection is out of range. | The value of [Speed] on the Standard tab of the [Device] → [Setup] menu exceeds the maximum value. |
| I 912 | The selection is out of range. | The value of [Speed] on the Standard tab of the [Device] → [Setup] menu is smaller than the minimum value. |
| I 913 | Value is out of range. | The value of [Frequency] on the Standard tab of the [Device] → [Setup] menu exceeds the maximum value. |
| I 914 | Value is out of range. | The value of [Frequency] on the Standard tab of the [Device] → [Setup] menu is smaller than the minimum value. |

| No. | Message | Description |
|---|---|---|
| I 915 | The selection is out of range. | The value of Vdd [V] on the Advanced tab of the [Device] → [Setup] menu is out of range. |
| I 916 | The selection is out of range. | The value of Vdd2 [V] on the Advanced tab of the [Device] → [Setup] menu is out of range. |
| I 917 | The selection is out of range. | The end address of Range [hex] on the [File] → [Upload] menu is smaller than the start address of that. |
| I 918 | Input data is out of range. | The value of  [Multiply rate] on the Standard tab of the [Device] → [Setup] menu is out of range. |

★ APPENDIX A REVISION HISTORY

The revision history is shown below.  Applicable Chapter refers to the chapter in each version.

(1/2)

| Version | Revised Points | Applicable Chapter |
|---|---|---|
| Second | **CHAPTER 2** Addition of operating software Windows 2000 and Windows XP | CHAPTER 2 HARDWARE INSTALLATION |
| | **2.1 System Requirements**<br>Change from "PC-9821 series" to "PC-9800 series" | |
| | **2.3.2 PG-FP4 control panel and connectors** Change of status LED color from yellow to orange | |
| | Addition of **2.3.9 I$^2$C adapter** | |
| | **3.1.1 GUI software installation**<br>Change of **Figure 3-6 Software License Agreement Window**<br>Change of **Figure 3-12 Setup Is Complete Window**<br>Change of name of file to be installed. | CHAPTER 3 SOFTWARE INSTALLATION |
| | Addition of **3.1.2 USB driver installation** | |
| | **3.1.3 GUI software uninstallation**<br>Addition of **(2) Uninstallation using "Add/Remove Programs"** | |
| | **3.2 Firmware and GUI Software Update Installation**<br>Addition of **procedures to update firmware** | |
| | Change of **Figure 4-3 GUI Software Main Window** | CHAPTER 4 PG-FP4 OPERATION USING GUI SOFTWARE |
| | Addition of [Programmer] – [Select Programming area…] button to **Table 4-1 Toolbar Buttons** | |
| | **4.4.2 (3)** Addition of an icon to [Select Programming area…] menu<br>**(5)** Addition of [Update Firmware] menu | |
| | Change of **Figure 4-19 [Device] menu** | |
| | **4.4.3 (2)** to **(7)** and **(9) (b)** to **(c)** Addition and change of description | |
| | Change of **Figure 4-32 About Window** | |
| | **CHAPTER 5 (4)** to **(8)** Addition and change of description | CHAPTER 5 SAMPLE PROGRAMMING SESSION USING GUI SOFTWARE |
| | **CHAPTER 6** Change of status LED color from yellow to orange | CHAPTER 6 PG-FP4 OPERATION IN STANDALONE MODE |
| | **6.1.1 [Commands] menu** Addition to Note and addition of Note 3 | |
| | **6.1.5 [Utilitiy/Misc.] menu** Addition of [HEX File Name] | |
| | **CHAPTER 7** Addition of description about power supply connector, HD-Sub 9 serial host connector, HD-Sub 15 target interface connector and HD-Sub 25 parallel host connector. | CHAPTER 7 CONNECTORS AND CABLES |
| | Change of **7.4 Target Cable Specifications** | |
| | **CHAPTER 8** Change of example of correct connection regarding RESET signal<br>Addition of description about V$_{PP}$<br>Addition of examples of UART and SIO interface circuits | CHAPTER 8 NOTES ON TARGET SYSTEMS |

(2/2)

| Version | Revised Points | Applicable Chapter |
|---------|----------------|--------------------|
| Second | Change of **9.1 SO/TxD, RESET** | CHAPTER 9 TARGET SYSTEM INTERFACE CIRCUITS |
| | Addition of **9.2 SCK** | |
| | Change of **Figure 9-3 SI/RxD and HS Pins** | |
| | Change of **Figure 9-4 CLK Pin** | |
| | Addition of **9.6 V$_{DD}$, V$_{DD2}$** | |
| | Addition of **9.7 V$_{PP}$** | |
| | **10.2 GUI Software Fatal Error Messages** Addition of F129, F410, F411, F412 and F413 | CHAPTER 10 ERROR MESSAGES |
| | **10.3 GUI Software Error Messages** Addition of E201, E307, E316, E317, E805, E901, E903, E907 and E908 | |
| | **10.4 GUI Software Information Messages** Addition of I202, I805, I905, I906, I907, I911, I912, I913, I914, I915, I916, I917 and I918 | |