To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

Send any inquiries to http://www.renesas.com/inquiry.

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: “Standard”, “High Quality”, and “Specific”. The recommended applications for each Renesas Electronics product depends on the product’s quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as “Specific” without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as “Specific” or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is “Standard” unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.

   “Standard”: Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots.

   “High Quality”: Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; safety equipment; and medical equipment not specifically designed for life support.

   “Specific”: Aircraft; aerospace equipment; submersible repeaters; nuclear reactor control systems; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) “Renesas Electronics” as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

RENESAS

User's Manual

PG-FPL

Flash Memory Programmer

Document No. U17788EJ1V0UM00 (1st edition)
Date Published September 2005 NS CP(K)

[MEMO]

IECUBE is a trademark of NEC Electronics Corporation.

Windows is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

PC/AT is a trademark of International Business Machines Corporation.

Pentium is a trademark of Intel Corporation.

- **The information in this document is current as of September, 2005. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.**
- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC Electronics products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of a customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".

  The "Specific" quality grade applies only to NEC Electronics products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics product before using it in a particular application.

  "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.

  "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).

  "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

(1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.

(2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

M8E 02. 11-1

GENERAL PRECAUTIONS FOR HANDLING THIS PRODUCT

1. Circumstances not covered by product guarantee

- If the product was disassembled, altered, or repaired by the customer
- If it was dropped, broken, or given another strong shock
- Use at over voltage, use outside guaranteed temperature range, storing outside guaranteed temperature range
- If power was turned on while the USB cable or target system connection was in an unsatisfactory state
- If the USB cable, target cable, or the like was bent or pulled excessively
- If the product got wet
- If the product and target system were connected while a potential difference existed between the GND of the product and the GND of the target system
- If an excessive load was placed on a connector or socket

2. Safety precautions

- Be careful of electrical shock. There is a danger of electrical shock if the product is used as described above in **1. Circumstances not covered by product guarantee**.

Phase-out/Discontinued

Regional Information

Some information contained in this document may vary from country to country. Before using any NEC Electronics product in your application, please contact the NEC Electronics office in your country to obtain a list of authorized representatives and distributors. They will verify:

- 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

In addition, trademarks, registered trademarks, export restrictions, and other legal issues may also vary from country to country.

[GLOBAL SUPPORT]
http://www.necel.com/en/support/support.html

NEC Electronics America, Inc. (U.S.)
Santa Clara, California
Tel: 408-588-6000
800-366-9782

NEC Electronics (Europe) GmbH
Duesseldorf, Germany
Tel: 0211-65030

- **Sucursal en España**
  Madrid, Spain
  Tel: 091-504 27 87
- **Succursale Française**
  Vélizy-Villacoublay, France
  Tel: 01-30-67 58 00
- **Filiale Italiana**
  Milano, Italy
  Tel: 02-66 75 41
- **Branch The Netherlands**
  Eindhoven, The Netherlands
  Tel: 040-265 40 10
- **Tyskland Filial**
  Taeby, Sweden
  Tel: 08-63 87 200
- **United Kingdom Branch**
  Milton Keynes, UK
  Tel: 01908-691-133

NEC Electronics Hong Kong Ltd.
Hong Kong
Tel: 2886-9318

NEC Electronics Hong Kong Ltd.
Seoul Branch
Seoul, Korea
Tel: 02-558-3737

NEC Electronics Shanghai Ltd.
Shanghai, P.R. China
Tel: 021-5888-5400

NEC Electronics Taiwan Ltd.
Taipei, Taiwan
Tel: 02-2719-2377

NEC Electronics Singapore Pte. Ltd.
Novena Square, Singapore
Tel: 6253-8311

J05.6

PREFACE

Target Readers

This manual is intended for users who use the PG-FPL 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-FPL.
By using the PG-FPL, 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
- Operation using GUI software
- Usage examples
- Connectors and cables
- Notes on target system
- Circuit diagrams
- Troubleshooting

How to Read This Manual

To understand the overall functions and usage of the PG-FPL, read this manual in the order of the CONTENTS.
Be sure to read **CHAPTER 4 OPERATION USING GUI SOFTWARE** because this chapter presents important information for using the PG-FPL.
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 98, 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 … ××××B 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
FPL	Abbreviation of flash memory programmer PG-FPL
GUI software	Windows application to operate PG-FPL 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
FP4 connector	Abbreviation of PG-FP4 target connector (type A)
FA adapter	Adapter board to write programs to NEC Electronics on-chip flash memory microcontroller[Note]
IECUBE™	General name of NEC Electronics high-performance/compact in-circuit emulator

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

CHAPTER 1 OVERVIEW 10

1.1 Features 10

CHAPTER 2 HARDWARE INSTALLATION 11

2.1 System Requirements 11
2.2 Package Contents 11
2.3 System Configuration and Components 12
2.3.1 FPL display specifications, connector, and MODE switch settings 12
2.3.2 FPL-FA connector 14
2.3.3 Target system 14
2.3.4 USB connector 14
2.3.5 Target cable 14
2.3.6 Connection procedure 15
2.3.7 Disconnection procedure 17

CHAPTER 3 SOFTWARE INSTALLATION 18

3.1 GUI Software Installation 18
3.2 Driver Installation 23
3.2.1 Installation in Windows 98/Me 23
3.2.2 Installation in Windows 2000 26
3.2.3 Installation in Windows XP 32
3.3 Confirmation of USB Driver Installation 36
3.4 Uninstallation 37
3.4.1 Driver uninstallation 37
3.4.2 GUI software uninstallation 38

CHAPTER 4 OPERATION USING GUI SOFTWARE 40

4.1 Introduction 40
4.2 Starting up GUI Software 40
4.3 Toolbar 41
4.4 Menus 41
4.4.1 [File] menu 41
4.4.2 [Device] menu 43
4.4.3 [View] menu 53
4.4.4 [Help] menu 54
4.5 Programmer Parameter Window 55

CHAPTER 5 USAGE EXAMPLE 56

CHAPTER 6 CONNECTORS AND CABLES 63

6.1 USB Connector (FPL) 63
6.2 Target Cable Connector (FPL) 64

6.3 Target Cable Specifications 64
6.4 Target Connector (FPL-FA) 65
6.5 FP4 Connector (FPL-FA) 65
6.6 List of Interface Connections 66

CHAPTER 7 NOTES ON TARGET SYSTEMS 67

CHAPTER 8 CIRCUIT DIAGRAMS 70

CHAPTER 9 TROUBLESHOOTING 72

9.1 Trouble During Setup 72
9.2 Trouble During Operation (Main Unit) 73
9.3 Trouble During Operation (Communication) 74

APPENDIX A PRODUCT SPECIFICATIONS 76

A.1 Hardware Specifications 76
A.2 Dimensions 77

APPENDIX B WARRANTY AND SUPPORT 80

B.1 Warranty 80
B.2 Support 80

CHAPTER 1 OVERVIEW

The FPL is a tool that erases, writes, and verifies programs on an NEC Electronics on-chip flash memory microcontroller on the target board.

1.1 Features

- The PG-FPL is a compact flash memory programmer for an on-chip flash memory microcontroller, and is designed for development.
- The USB interface is available for connection with the host.
- The PG-FPL allows on-board programming without removing the target device from the target system.
- Only UART interface is supported for data transfer to the target device.
- Device-specific parameters required for writing are read from a parameter file (PRM file).

CHAPTER 2 HARDWARE INSTALLATION

2.1 System Requirements

OS	A PC supporting Windows 98, Windows Me, Windows 2000, or Windows XP is needed. About 2 MB of free hard disk space is required to install the GUI software.
Host machine	IBM PC/AT™ or compatible CPU: Pentium™ 100 MHz or more RAM: 32 MB or more
Host interface	USB interface that enables communication based on USB (Ver. 1.1 or later).
File formats	Program files can be used in Motorola HEX file format or Intel HEX file format.

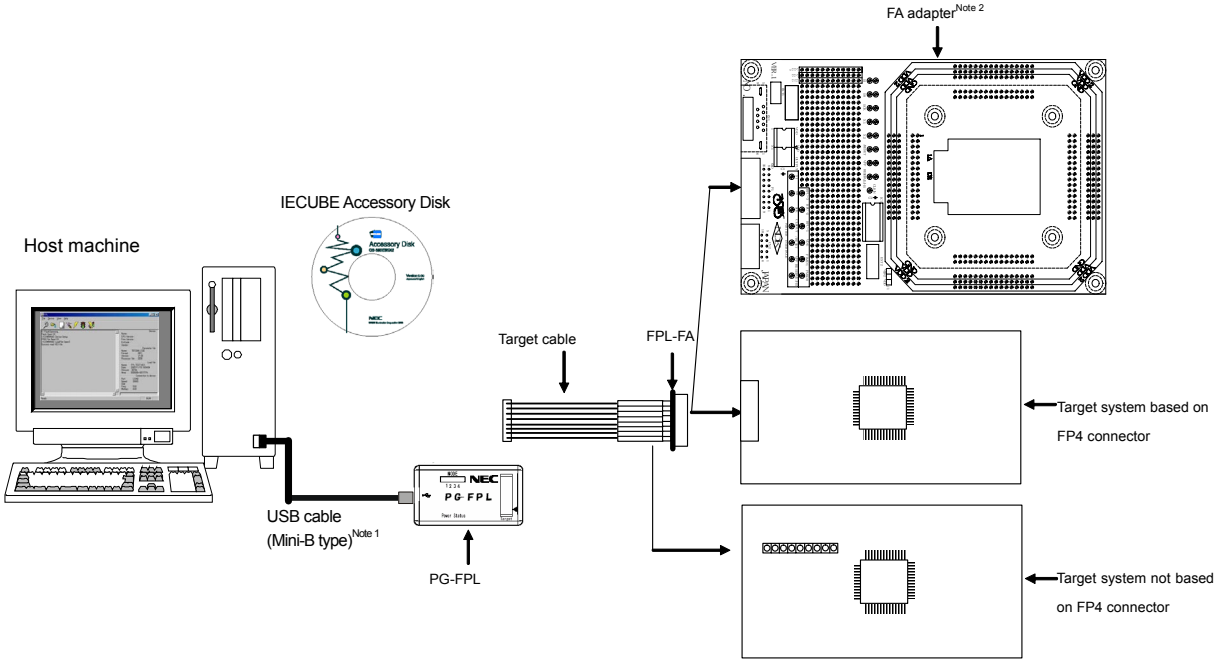
2.2 Package Contents

Please verify that you have received all the parts listed in the package contents list included with the FPL 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 FPL system configuration is as given in the diagram below.

Figure 2-1. FPL System Configuration



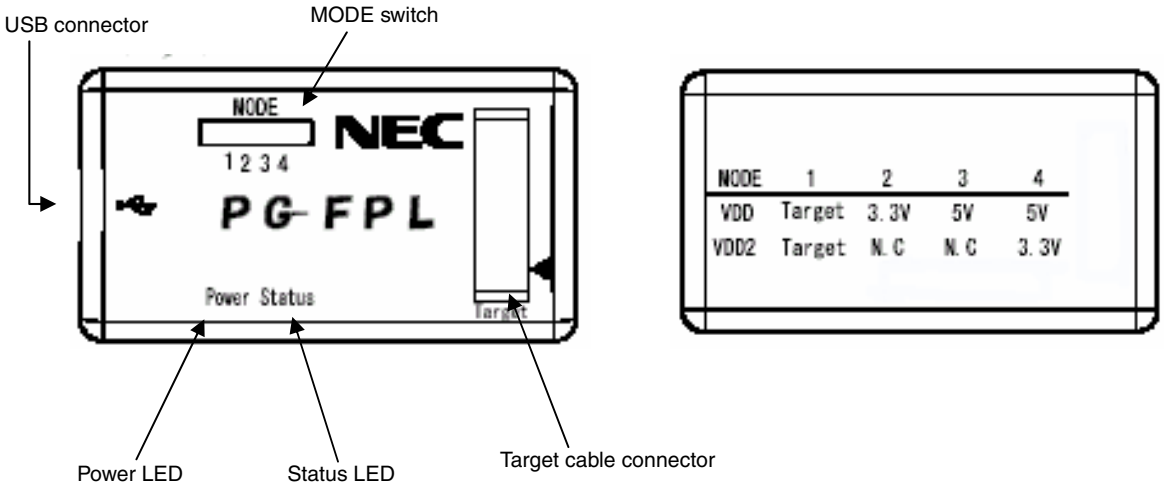
Notes 1. Use the USB cable (Mini-B type) included with the IECUBE.

2. The FA adapter board is a product of Naito Densei Machida Mfg. Co., Ltd.

The FPL is connected to the host machine via the USB cable (Mini-B type). The FPL is connected to the user system via the target cable. For the detailed specifications of the target cable and connector, refer to **CHAPTER 6 CONNECTORS AND CABLES**.

2.3.1 FPL display specifications, connector, and MODE switch settings

Figure 2-2. Layout Drawing of Connectors and LEDs



Target cable connector: Used to connect the connector of the target cable.
USB connector: Used to connect the USB cable to be connected to the host machine.
Power LED: Turned on in green when the FPL is connected to the host machine.
Status LED: Blinks in red when the FPL is communicating with the target device.

Caution When the Status LED is blinking, communication with the target device is in progress. Do not disconnect the target cable and USB cable.

MODE switch: Switches power to be supplied to the target system.

Table 2-1. MODE Switch Setting Table

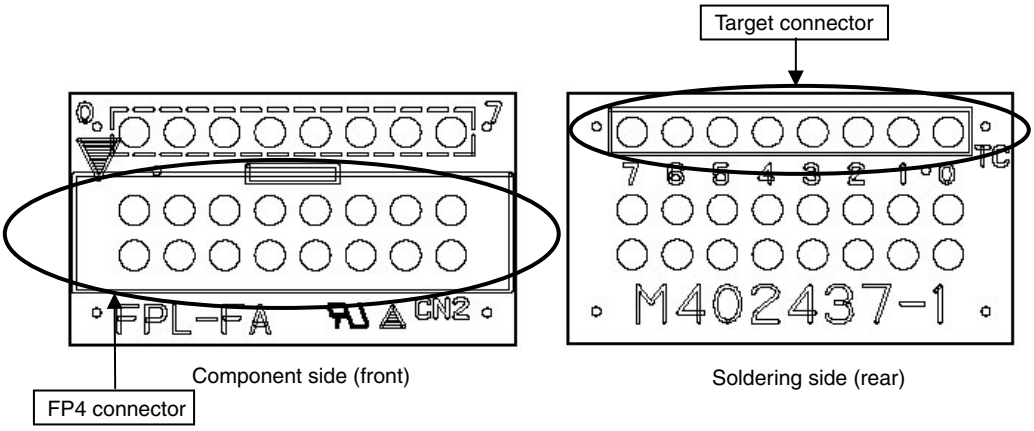
MODE	1	2	3	4
VDD	Target	3.3 V	5 V	5 V
VDD2	Target	N.C.	N.C.	3.3 V

[MODE switch setting]

MODE1: Used when VDD/VDD2 is supplied from the target system.
MODE2: Used when the FPL supplies power to a target system with 3.3-V VDD.
(The VDD2 pin is placed in the high-impedance state.)
MODE3: Used when the FPL supplies power to a target system with 5-V VDD.
(The VDD2 pin is placed in the high-impedance state.)
MODE4 : Used when the FPL supplies power to a target system with 5-V VDD and 3.3-V VDD2.

2.3.2 FPL-FA connector

Figure 2-3. Layout Drawing of FPL-FA Connectors



Target connector: Used to connect the tip of the target cable.

FP4 connector: Used to connect the FA adapter board or target system.

2.3.3 Target system

The target system must be equipped with a device interface that complies with the target cable specifications. Refer to **CHAPTER 6 CONNECTORS AND CABLES** for details.

2.3.4 USB connector

The shape of the USB connector is a Mini-B type.

Refer to **CHAPTER 6 CONNECTORS AND CABLES** for details.

2.3.5 Target cable

The tip of the target cable can be connected to the header pin that is 0.635 mm by 0.635 mm.

Refer to **CHAPTER 6 CONNECTORS AND CABLES** for details.

2.3.6 Connection procedure

The procedure for connecting the FPL is described below.

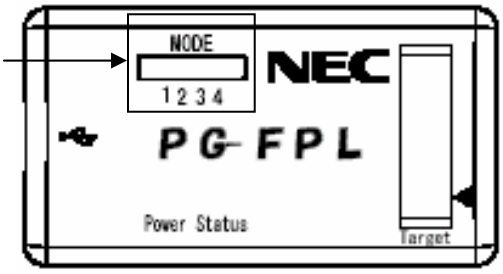
Caution Be sure to install the software (GUI software driver) before making connections.

(1) Set the MODE switch according to the power supply of the target system.

Caution Be sure to set the MODE switch before making connections with the host machine and target system. If connections are made based on an incorrect setting, the FPL and target system may be damaged.

Figure 2-4. MODE Switch Setting

Set the MODE switch.
1: Target/Target
2: 3.3 V/N.C.
3: 5 V/N.C.
4: 5 V/3.3 V



(2) Connect the host machine with the FPL via the USB cable. (Check that the Power LED is turned on in green.)

Cautions 1. Be sure to perform this step before making a connection with the target system. If connections are made in an incorrect order, the FPL and target system may be damaged.
2. If the MODE switch is set to MODE2, MODE3, or MODE4 (power is supplied from the FPL), the voltage set on the VDD/VDD2 pin is output when the FPL is connected with the host machine.

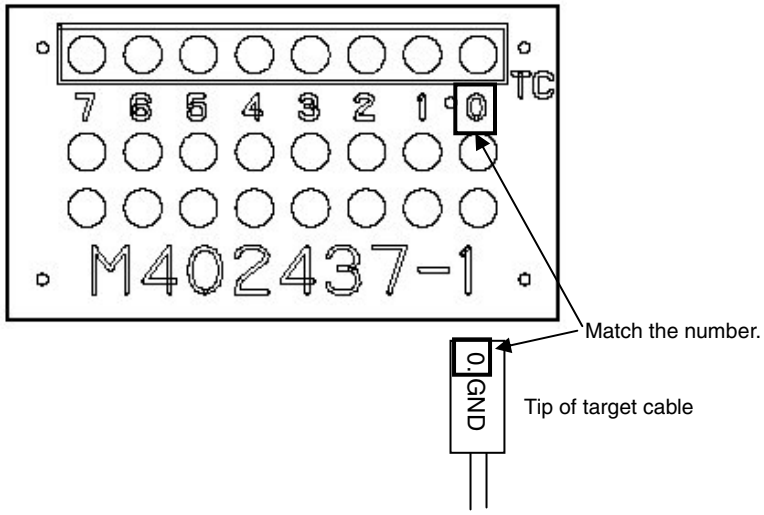
(3) Connect the target system with the FPL (follow either setting (a) or (b)).

(a) When FPL is connected with a target system that has a 16-pin connector usable with the FP4 connector

<1> Connect the tip of the target cable with the target connector of the FPL-FA.
Connect the tip of the target cable with the target connector of the FPL-FA so that the number marked on the tip of the target cable matches to the number marked on the FPL-FA board.

Remark The FPL-FA is connected with the target cable at shipment.

Figure 2-5. Connecting Target Cable with FPL-FA



<2> Make sure that the power to the target system is not turned on.

Caution Make sure that the power to the target system is not turned on before connecting the target cable. If the target cable is connected after the power to the target system is turned on, the FPL may be damaged.

<3> Connect the FP4 connector with the connector installed in the target system.

Caution When MODE2, MODE3, or MODE4 is set, VDD/VDD2 is output from the FP4 connector. Before inserting or removing a device on the target system, be sure to detach the FP4 connector.

<4> Be sure to turn on the power to the target system.
(When MODE2, MODE3, or MODE4 is set, power is supplied from the FPL, so that this step is not required.)

(b) When the FPL is connected with the target system without using the FPL-FA

<1> Disconnect the FPL-FA from the target cable.
<2> Make sure that the power to the target system is not turned on.

Caution Make sure that the power to the target system is not turned on before connecting the target cable. If the target cable is connected after the power to the target system is turned on, the FPL may be damaged.

<3> Connect the tip of the target cable marked “0.GND” to GND of the target system.

Caution Be sure to connect “0.GND” at the beginning. If connections are made in an incorrect order, the FPL and target system may be damaged.

<4> Make sure that the power to the target system is not turned on.

<5> Connect the tip of the target cable marked “1.VDD” to V_{DD} of the target system.

Caution Be sure to make connections in the order from “0.GND” to “1.VDD” to “other signals”. If connections are made in an incorrect order, the FPL and target system may be damaged.

<6> Connect the tip of the target cable marked "2.VDD2" to VDD2 of the target system.

Caution Be sure to make connections in the order from "0.GND" to "1.VDD" to "2.VDD2" to "other signals". If connections are made in an incorrect order, this product and target system can be damaged.

<7> Connect the tips of other target cables to the target system.

<8> Turn on the power to the target system.
(When MODE2, MODE3, or MODE4 is set, power is supplied from the FPL, so that this step is not required.)

2.3.7 Disconnection procedure

(1) When communication with the target system ends, terminate the GUI software.

(2) Disconnect the FPL from the target system. Follow either procedure (a) or (b) according to the connection method.

(a) When the FPL is connected with the target system by using the FPL-FA

<1> Turn off the power to the target system.
(When MODE2, MODE3, or MODE4 is set, power is supplied from the FPL, so that this step is not required.)

<2> Disconnect the FPL-FA from the target system.

Caution When MODE2, MODE3, or MODE4 is set, the FPL outputs power at all times. Before disconnecting the target device, be sure to disconnect the FP4 connector from the target system.

(b) When the FPL is connected with the target system without using the FPL-FA

<1> Turn off the power to the target system.
(When MODE2, MODE3, or MODE4 is set, power is supplied from the FPL, so that this step is not required.)

<2> Disconnect the tips of the target cables marked “3./RESET”, “4.TXD”, “5.RXD”, and “6.FLMD0” from the target system.

Caution Be sure to disconnect the target cables in the following order (<3> and <4> and <5>). If the target cables are disconnected in an incorrect order, the target system or the FPL may be damaged.

<3> Disconnect the tip of the target cable marked "2.VDD2" from the target system.

<4> Disconnect the tip of the target cable marked “1.VDD” from the target system.

<5> Disconnect the tip of the target cable marked “0.GND” from the target system.

(3) Disconnect the USB cable from the host machine. (Make sure that the Power LED is turned off.)

(4) Disconnect the USB cable from the FPL.

CHAPTER 3 SOFTWARE INSTALLATION

3.1 GUI Software Installation

The GUI software allows easy and comfortable access to all features of the FPL flash programmer.

The installation program is contained in the CD-ROM (IECUBE Accessory Disk) included with the IECUBE package.

Execute the following steps to install the GUI software.

(1) When using Windows XP, log on as the computer administrator. When using Windows 2000, log on as the Administrator.

(2) Insert the CD-ROM (IECUBE Accessory Disk) included with the IECUBE package into the CD-ROM drive.

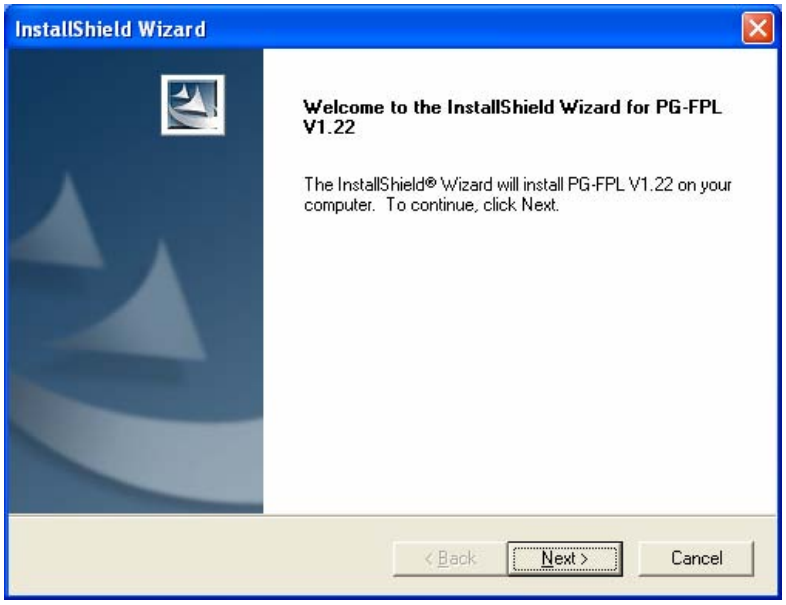
(3) Double-click “My Computer”, “CD-ROM”, “PG-FPL”, and “SETUP” in that order. Double-click “setup.exe” in the SETUP folder.

(4) Select a language to be used for installation (“English” in this example), then click OK.

Figure 3-1. Setup Language Selection

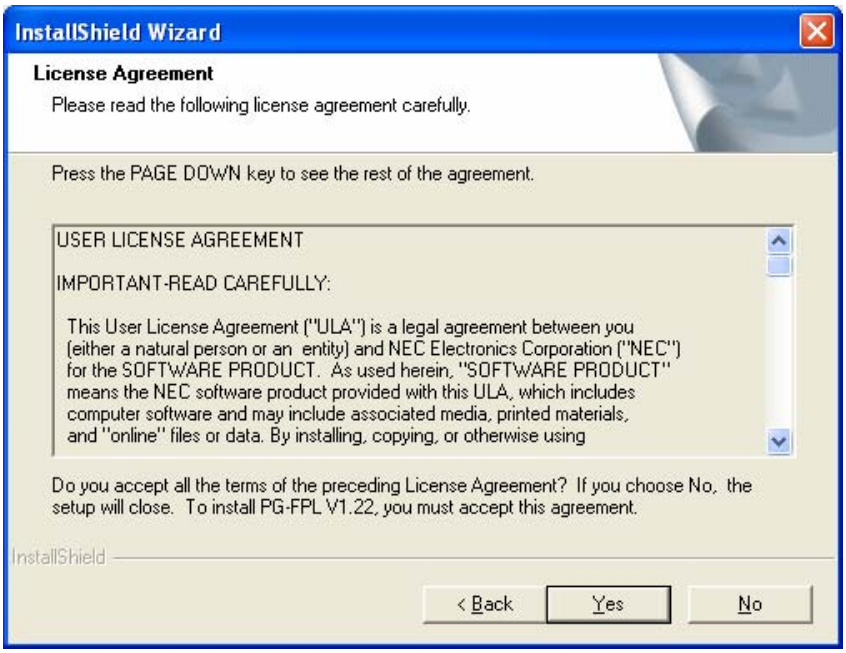
(5) After selecting the language, the window shown below is displayed.
Click Next > to continue installation.

Figure 3-2. Installation Start



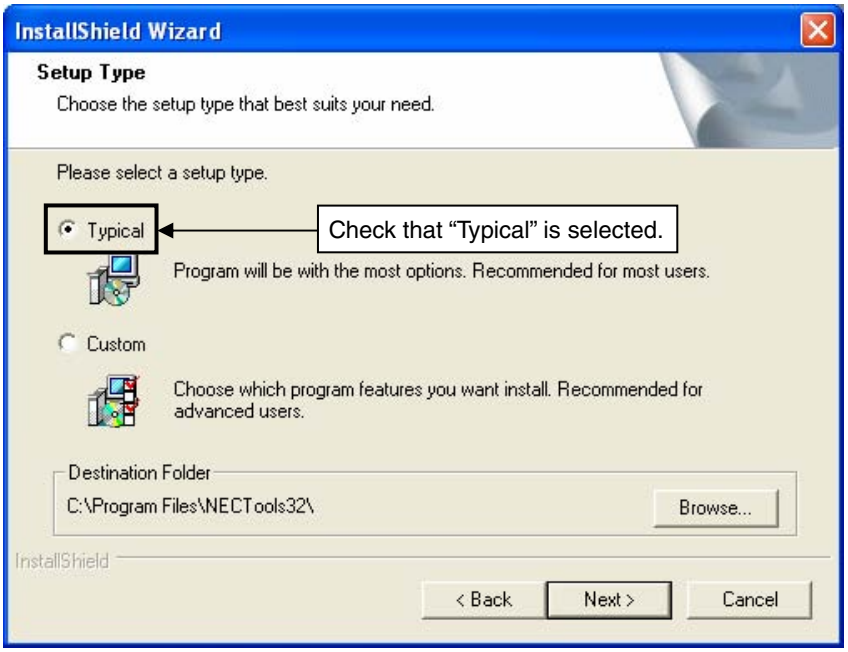
(6) The software License Agreement window appears. Read the displayed license agreement carefully, then click Yes if you accept the agreement. You need to accept the agreement before using the PG-FPL. If you do not accept the agreement, click No to terminate the installation of the software.

Figure 3-3. License Agreement Window



(7) Check that “Typical” is selected, then click Next >.

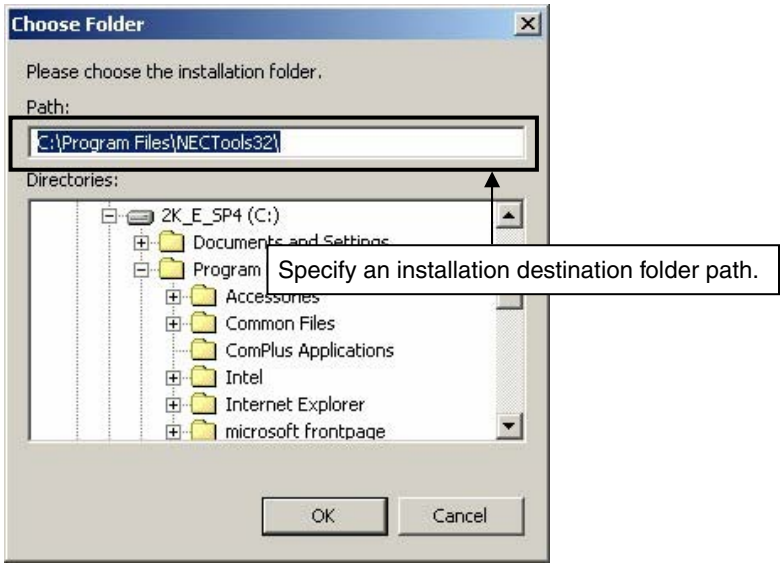
Figure 3-4. Setup Type



Remark By selecting Custom, only the GUI software or document can be installed. The GUI software installation destination can be changed by clicking Browse... . This manual assumes the default installation folder.

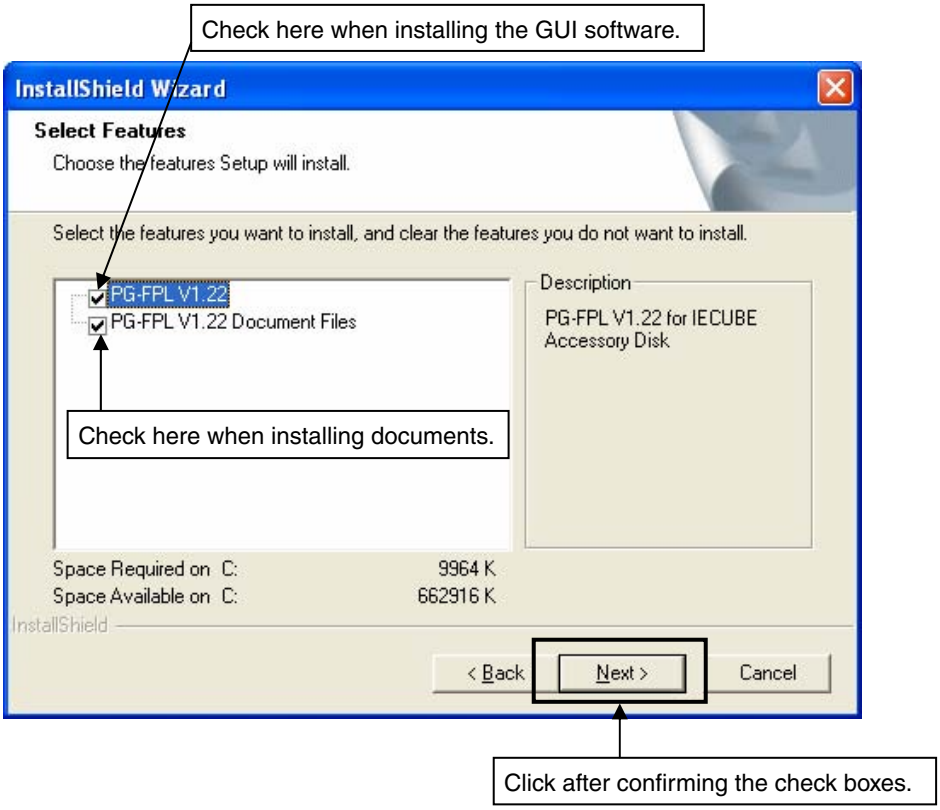
- When Browse... is clicked
  The directory selection window is displayed. Specify the path for the installation folder and then click OK.

Figure 3-5. Changing Installation Folder



- When Custom is clicked
  Select the check box of the item to be installed and then click Next >.

Figure 3-6. Custom Installation

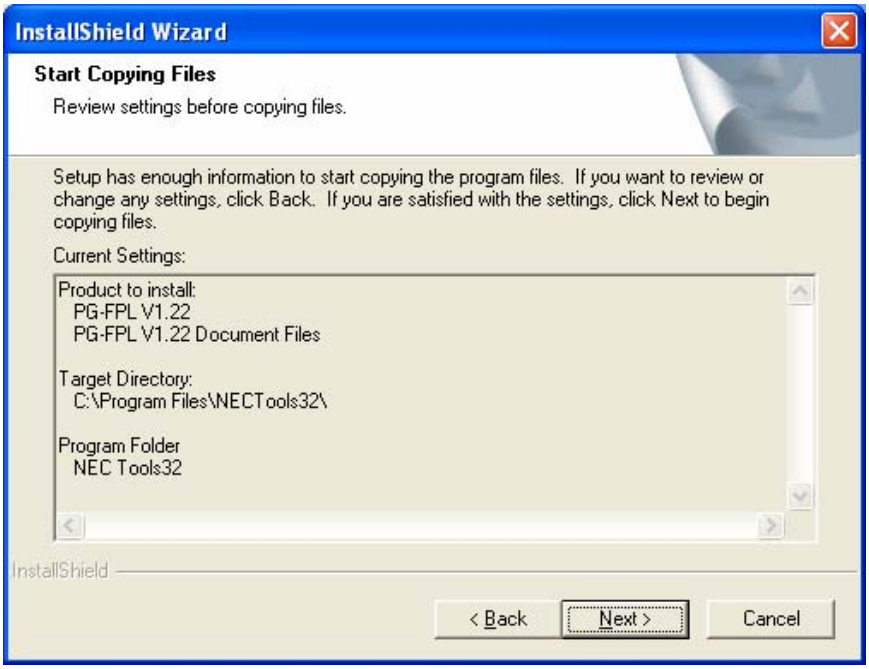


(8) Specify or select the program folder and then click Next >.

Figure 3-7. Program Folder Selection

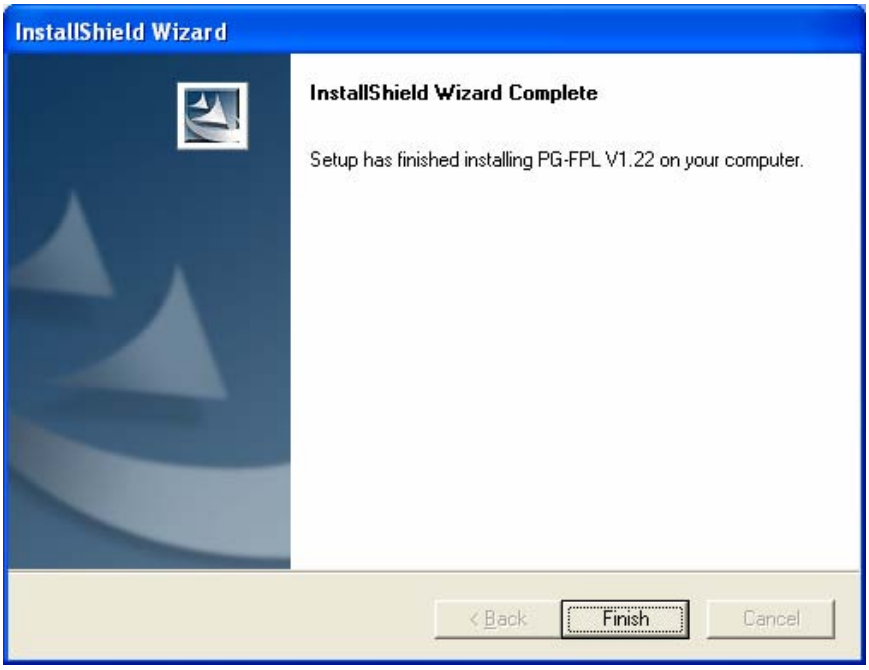
(9) Confirm the current setting and then click Next >. (Program installation starts.)

Figure 3-8. Start of File Copy Operation



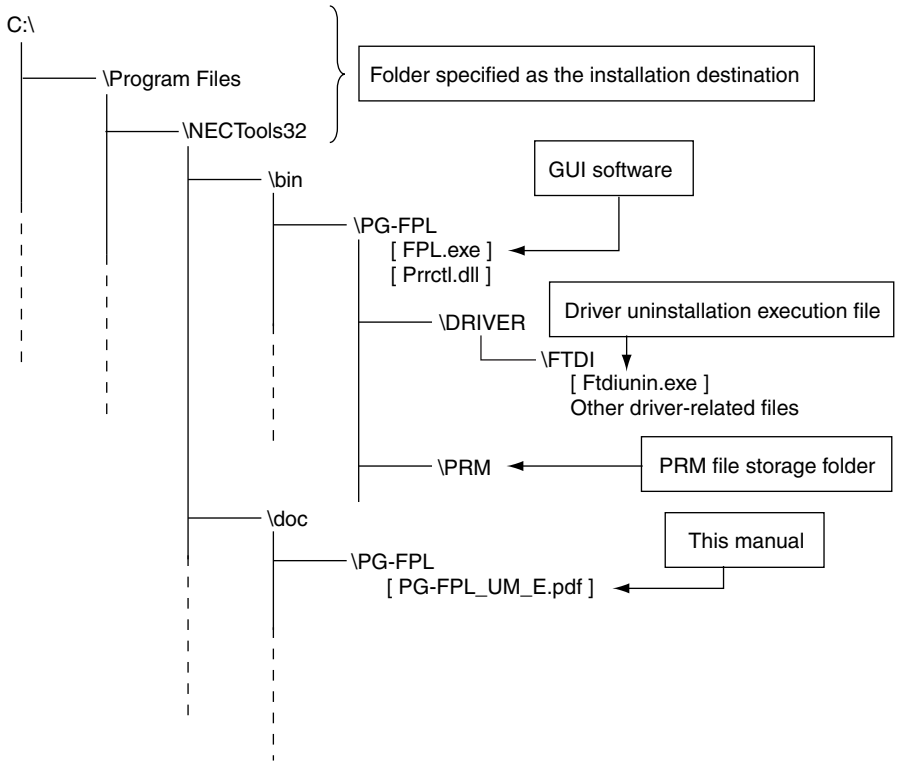
(10) When installation of the GUI software is complete, the screen shown below appears. Click Finish to terminate the installer.

Figure 3-9. Completion of Installation



(11) The following folders are created upon completion of installation.

Figure 3-10. Folder Configuration After Installation



3.2 Driver Installation

The driver needs to be installed in the host machine before using the FPL. Install the driver according to the following procedure.

Installation in Windows 98/Me: See **3.2.1 Installation in Windows 98/Me**
Installation in Windows 2000: See **3.2.2 Installation in Windows 2000**
Installation in Windows XP: See **3.2.3 Installation in Windows XP**

3.2.1 Installation in Windows 98/Me

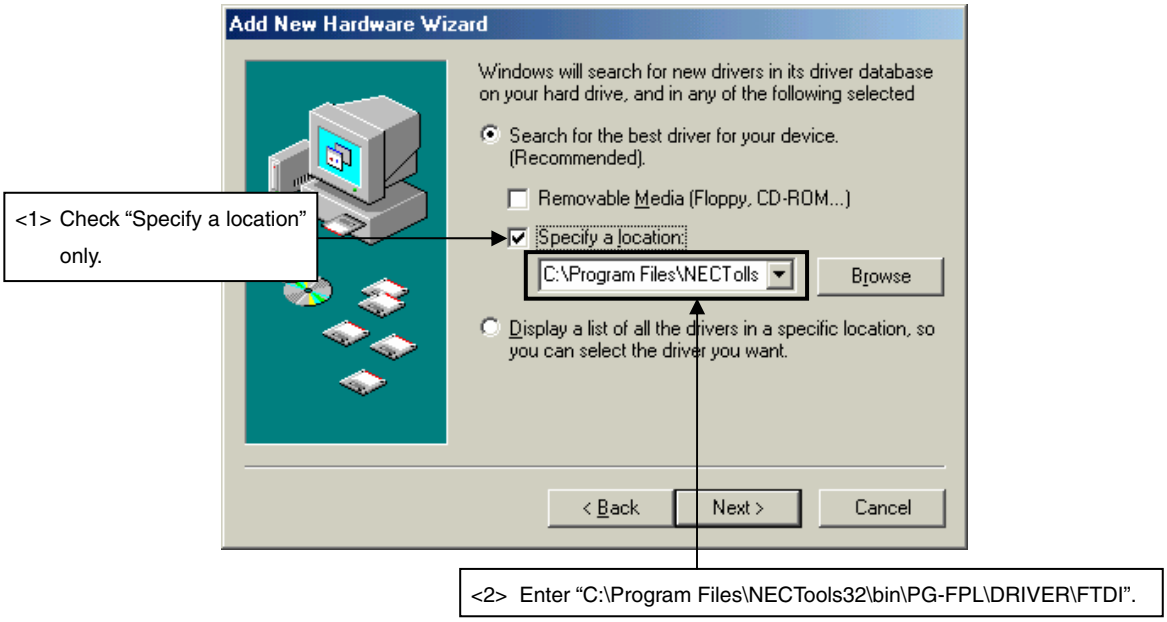
(1) When the FPL is connected with the host machine, the FPL is recognized by Plug and Play, and the wizard for adding new hardware is started.

(2) The window below is displayed. Check that “Specify the location ...” is selected, then click Next >.

Figure 3-11. Search Method (Windows Me)

(3) Check the “Specify a location” check box only and enter “C:\Program Files\NECTools32\bin\PG-FPL\DRIVER\FTDI” in the address bar, then click Next >.

Figure 3-12. Search Location Specification (Windows Me)



Remark If the installation destination folder is changed for GUI software installation, enter “*new-folder*\bin\PG-FPL\DRIVER\FTDI”.

(4) The window below is displayed. Confirm the contents and click Next >.

Figure 3-13. Checking Driver to Be Installed (Windows Me)

(5) When installation of the USB driver is complete, the screen shown below appears. Click Finish. Subsequently the installation of the USB Serial Port driver is automatically performed.

Figure 3-14. Completion of Installation (Windows Me)

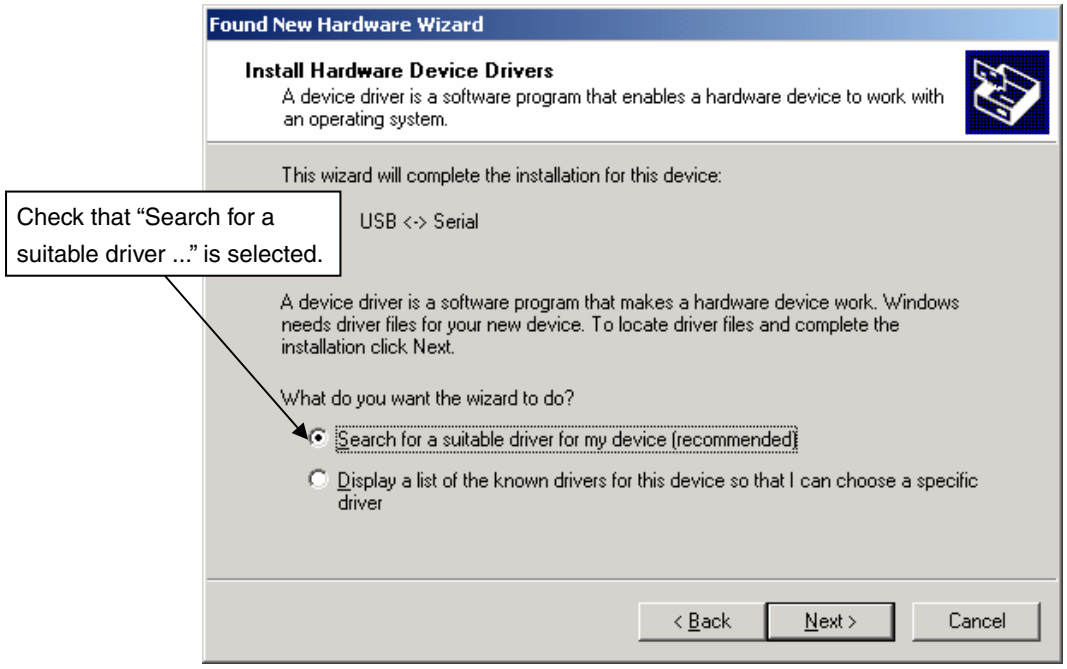
3.2.2 Installation in Windows 2000

(1) When the FPL is connected with the host machine, the FPL is recognized by Plug and Play, and the wizard for finding new hardware is started. Click Next >.

Figure 3-15. Found New Hardware Wizard (Windows 2000)

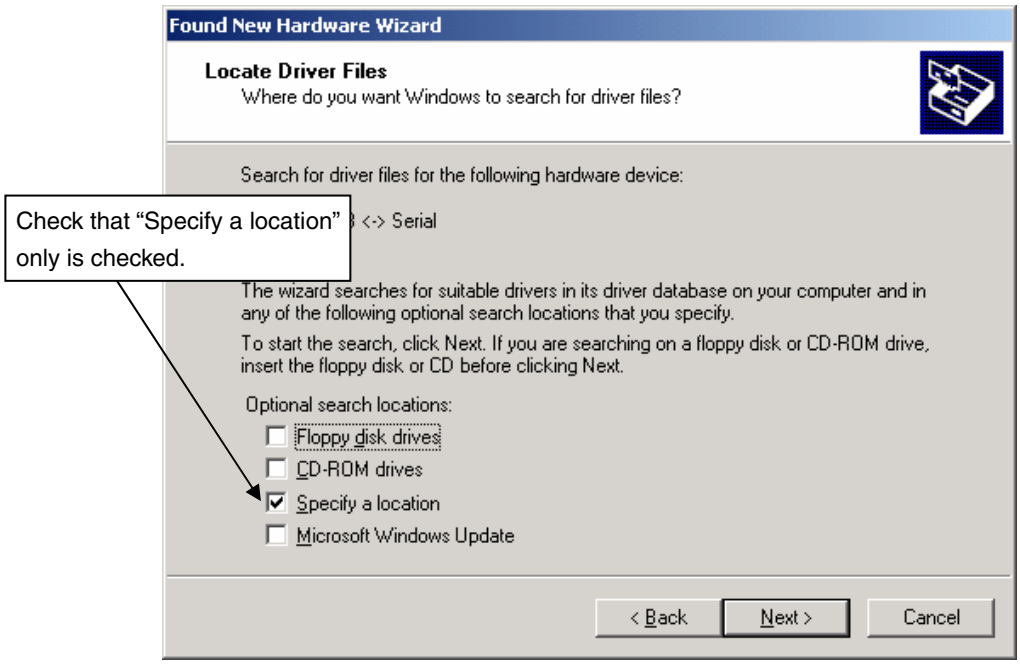
(2) The window below is displayed. Check that “Search for a suitable driver ...” is selected, then click Next >.

Figure 3-16. Search Method (Windows 2000)



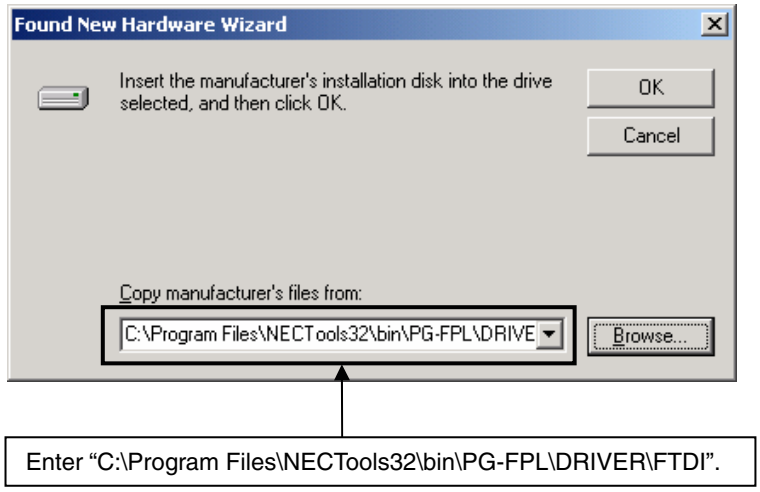
(3) Check the “Specify a location” check box only, then click Next >.

Figure 3-17. Driver File Location (Windows 2000)



(4) Enter “C:\Program Files\NECTools32\bin\PG-FPL\DRIVER\FTDI” in the address bar, then click OK.

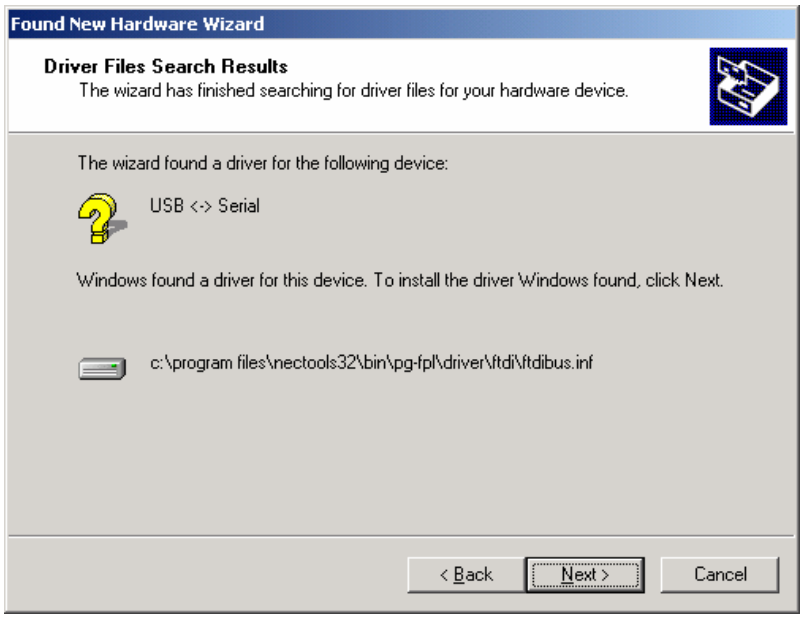
Figure 3-18. Address Specification (Windows 2000)



Remark If the installation destination folder is changed for GUI software installation, enter “*new-folder*\bin\PG-FPL\DRIVER\FTDI”.

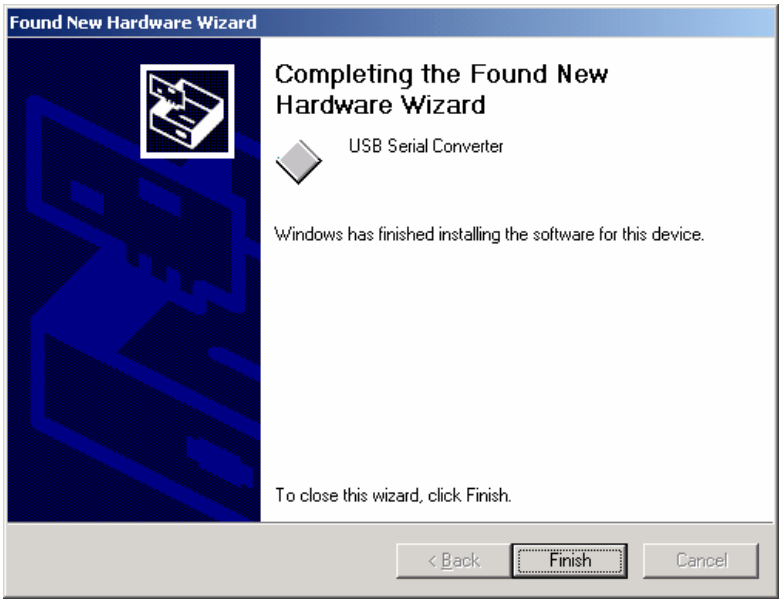
(5) The driver file is searched and the window below is displayed. Click Next >.

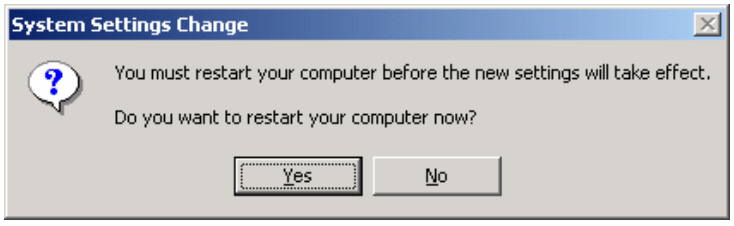
Figure 3-19. Driver File Search (Windows 2000)



(6) When installation of the USB driver is complete, the screen shown below appears. Click Finish to complete installation. When installation is complete, restart the computer following the instructions as restart is requested.

Figure 3-20. USB Driver Installation Completion (Windows 2000)



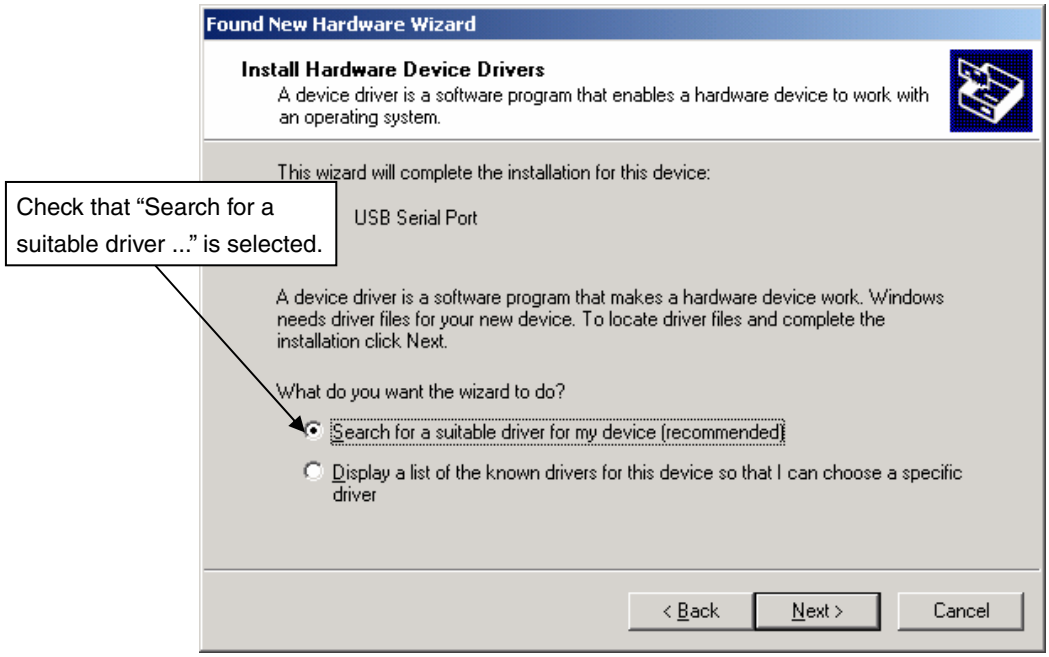


(7) Subsequently the installation of the USB Serial Port driver is started. Click Next >.

Figure 3-21. Found New Hardware Wizard 2 (Windows 2000)

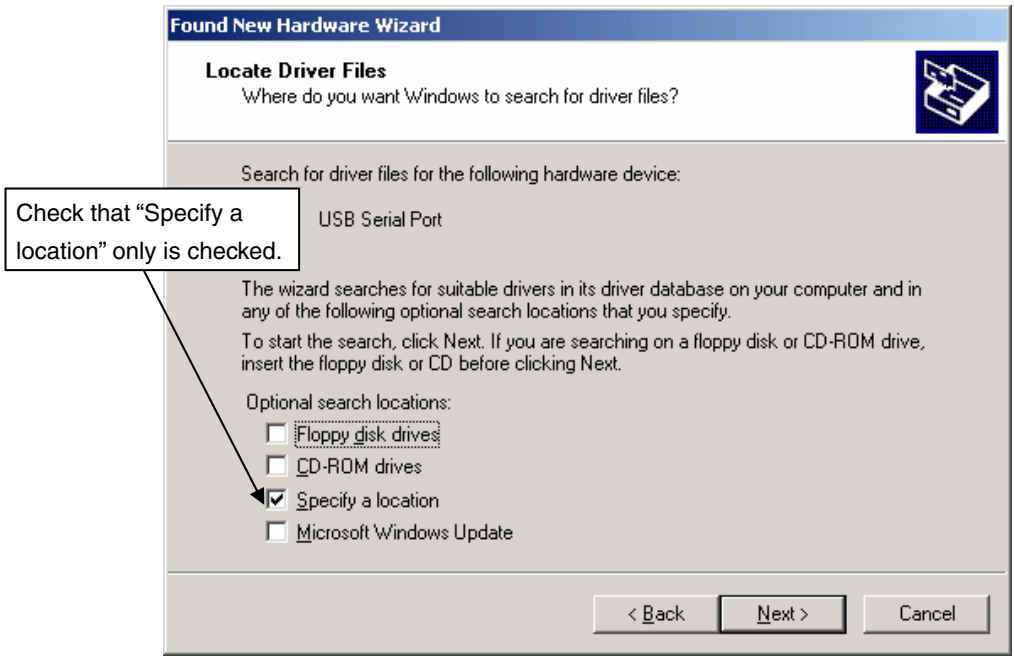
(8) The window below is displayed. Check that “Search for a suitable driver ...” is selected, then click Next >.

Figure 3-22. Search Method 2 (Windows 2000)



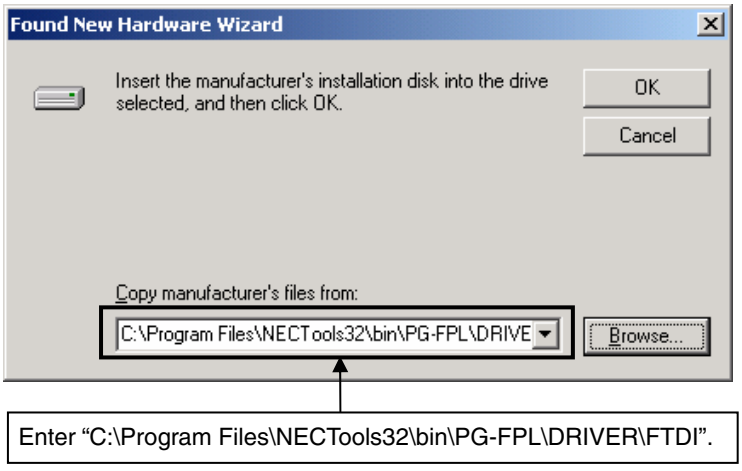
(9) Check the “Specify a location” check box only, then click Next >.

Figure 3-23. Driver File Location 2 (Windows 2000)



(10) Enter “C:\Program Files\NECTools32\bin\PG-FPL\DRIVER\FTDI” in the address bar, then click OK.

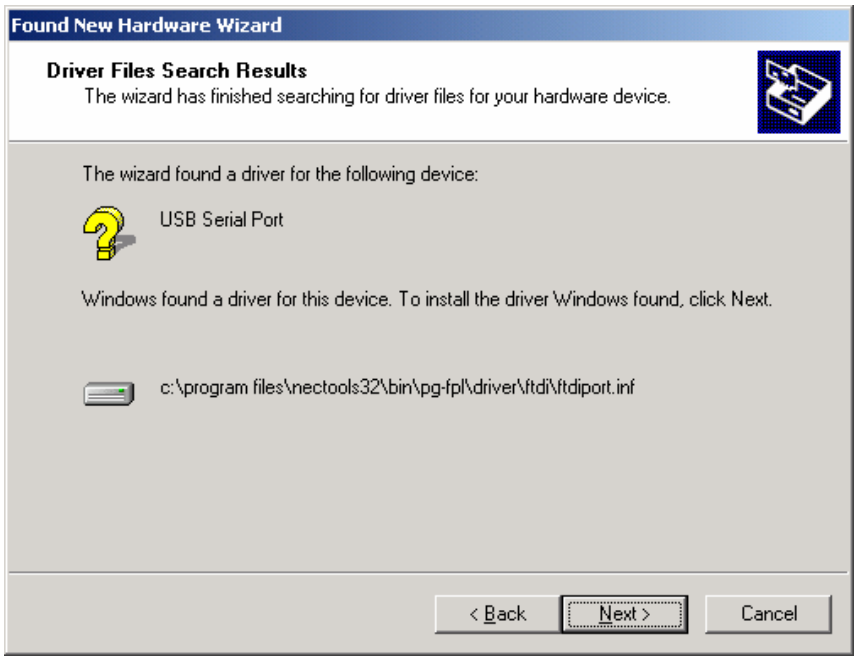
Figure 3-24. Address Specification 2 (Windows 2000)



Remark If the installation destination folder is changed for GUI software installation, enter “*new-folder*\bin\PG-FPL\DRIVER\FTDI”.

(11) The driver file is searched and the window below is displayed. Click Next >.

Figure 3-25. Driver File Search 2 (Windows 2000)



(12) When installation of the USB driver is complete, the screen shown below appears. Click Finish to complete installation.

Figure 3-26. USB Driver Installation Completion 2 (Windows 2000)

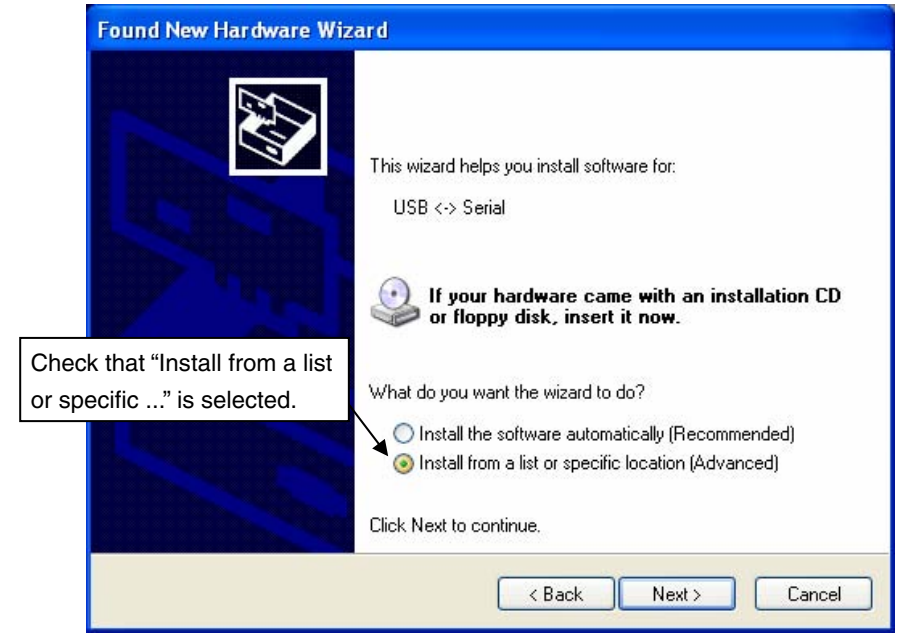
3.2.3 Installation in Windows XP

(1) When the FPL is connected with the host machine, the FPL is recognized by Plug and Play, and the wizard for finding new hardware is started. Check that “No, not this time” is selected, then click Next >.

Figure 3-27. Found New Hardware Wizard (Windows XP)

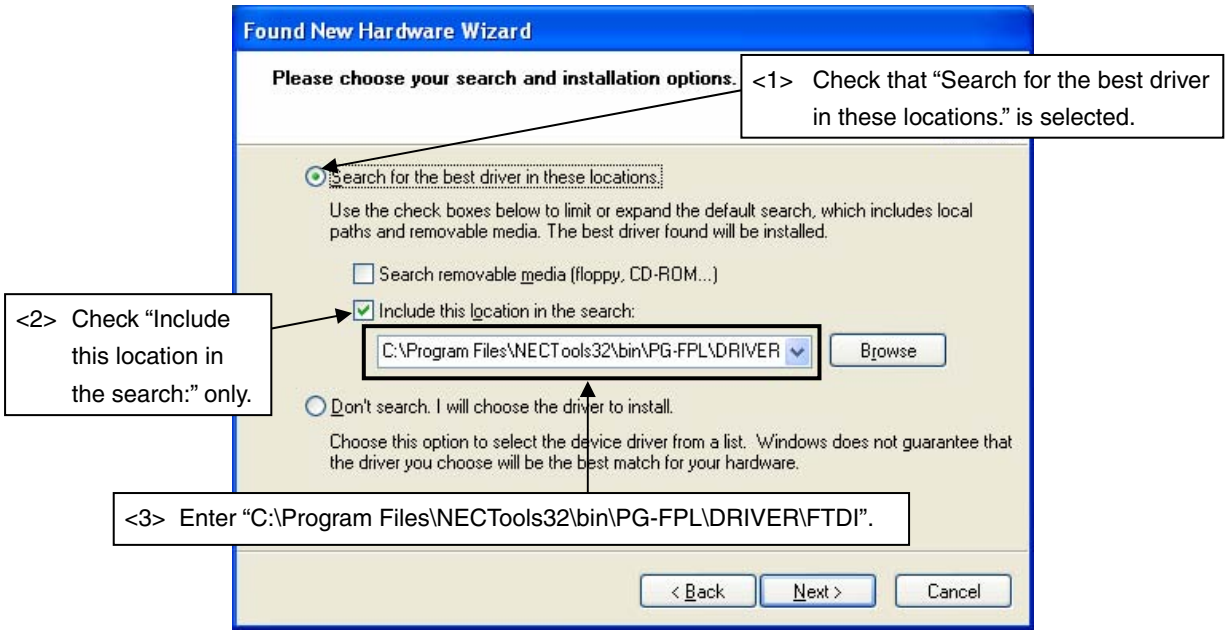
(2) Check that “Install from a list or specific …” is selected, then click Next >.

Figure 3-28. Installation Method Selection (Windows XP)



(3) Check that “Search for the best driver in these locations.” is selected. Check the “Include this location in the search:” check box and enter “C:\Program Files\NECTools32\bin\PG-FPL\DRIVER\FTDI” in the address bar, then click Next >.

Figure 3-29. Search Method (Windows XP)



Remark If the installation destination folder is changed for GUI software installation, enter “*new-folder*\bin\PG-FPL\DRIVER\FTDI”.

(4) When installation of the USB driver is complete, the screen shown below appears. Click Finish to complete installation.

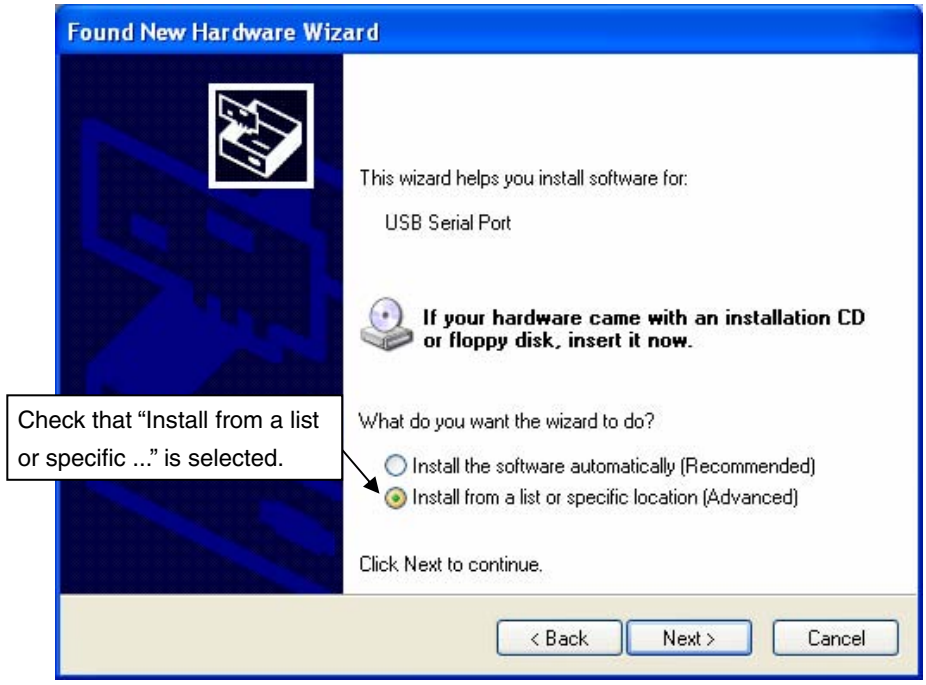
Figure 3-30. USB Driver Installation Completion (Windows XP)

(5) Subsequently the installation of the USB Serial Port driver is started.
The wizard for finding new hardware is started. Check that “No, not this time” is selected, then click Next >.

Figure 3-31. Found New Hardware Wizard 2 (Windows XP)

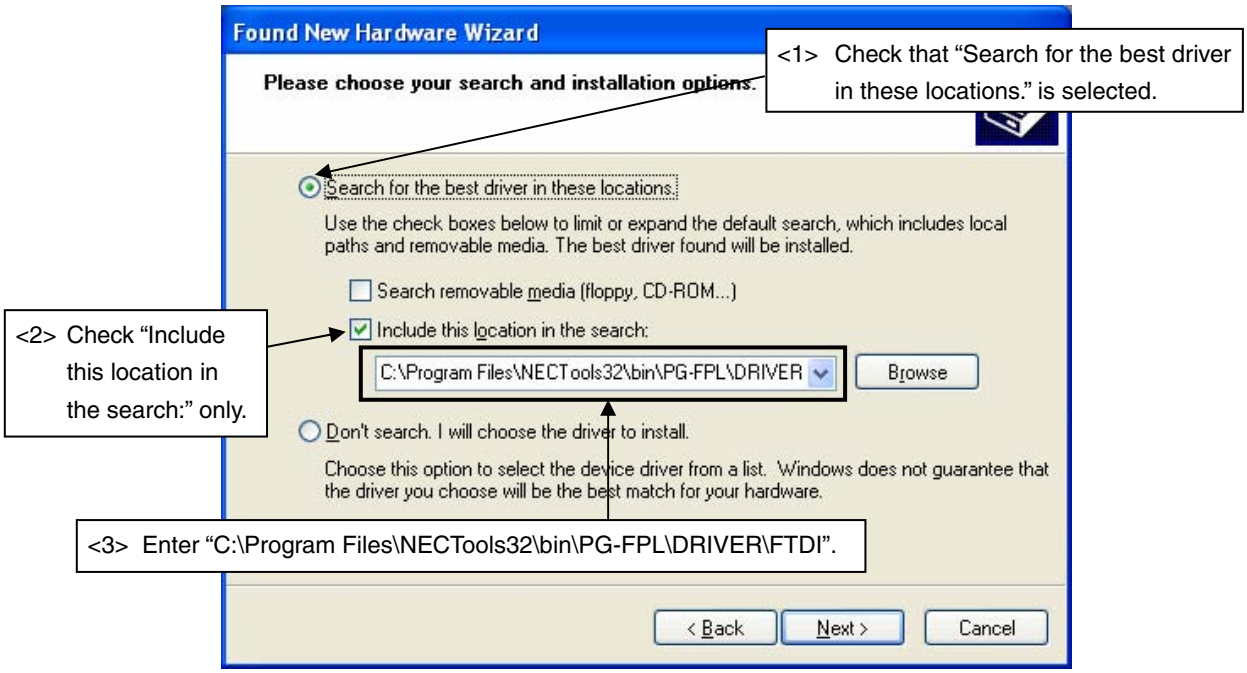
(6) Check that “Install from a list or specific …” is selected, then click Next >.

Figure 3-32. Installation Method Selection (Windows XP)



(7) Check that “Search for the best driver in these locations.” is selected. Check the “Include this location in the search:” check box and enter “C:\Program Files\NECTools32\bin\PG-FPL\DRIVER\FTDI” in the address bar, then click Next >.

Figure 3-33. Search Method 2 (Windows XP)



Remark If the installation destination folder is changed for GUI software installation, enter “*new-folder*\bin\PG-FPL\DRIVER\FTDI”.

(8) When installation of the USB driver is complete, the screen shown below appears. Click Finish to complete installation.

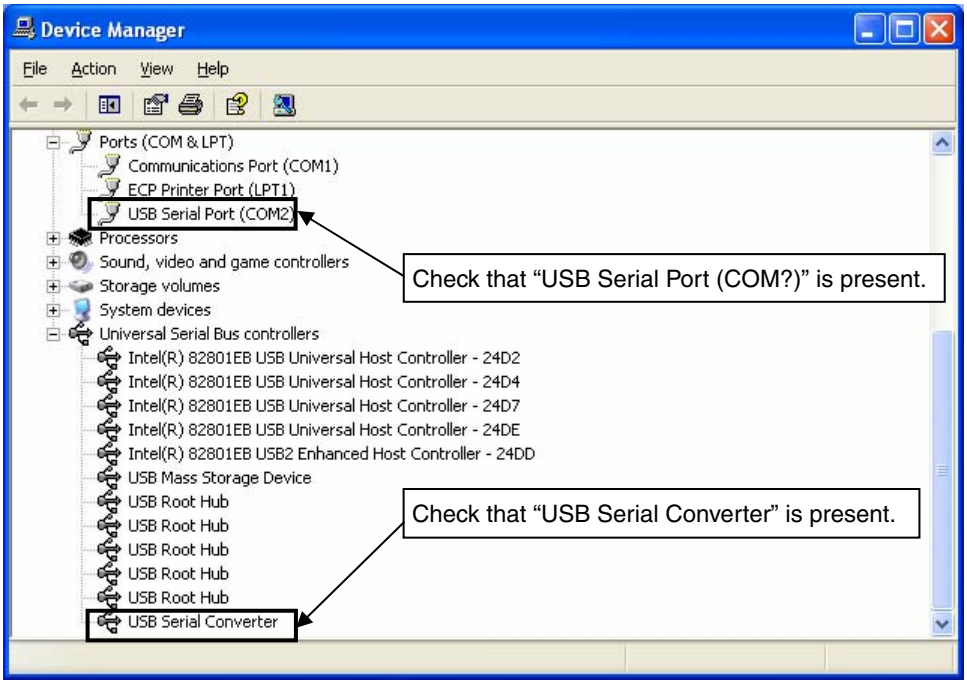
Figure 3-34. USB Serial Port Driver Installation Completion (Windows XP)

3.3 Confirmation of USB Driver Installation

After installing the two types of drivers, check that the drivers have been installed normally, according to the procedure below. When using the FPL, the information to be checked here is needed.

Click the “Device Manager” tab and check that the drivers are installed normally.

Figure 3-35. Device Manager



Cautions 1. When using the FPL in Windows 98/Me, do not select Refresh or Remove when communicating with the target device.

2. When using the FPL in Windows 2000/XP, do not perform “Scan for hardware changes” when communicating with the target device.

Remarks 1. Select the same communication port as COM? for the USB Serial Port (COM?) in the GUI Port list box.

2. If the drivers above are not displayed, or the mark “×” or “!” is prefixed, refer to **CHAPTER 9 TROUBLESHOOTING**.

3.4 Uninstallation

3.4.1 Driver uninstallation

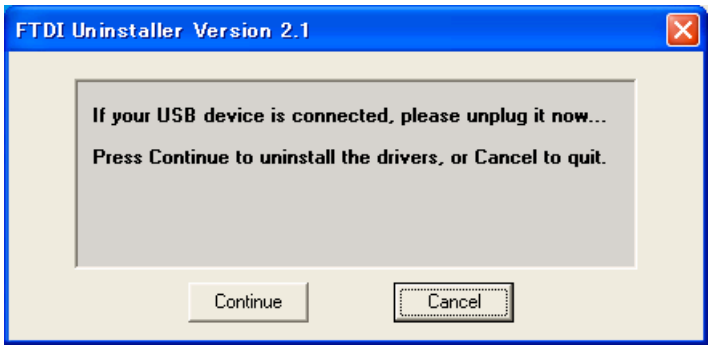
The uninstallation program for the driver is installed in the host machine when the GUI software is installed. Use the procedure below for driver uninstallation.

(1) When using Windows XP, log on as the computer administrator. When using Windows 2000, log on as the Administrator.

(2) Double-click “My Computer”, “(C:)”, “Program Files”, “NECTools32”, “bin”, “PG-FPL”, “DRIVER”, and “FTDI” in that order. Double-click “Ftdiunin.exe” in the FTDI folder.

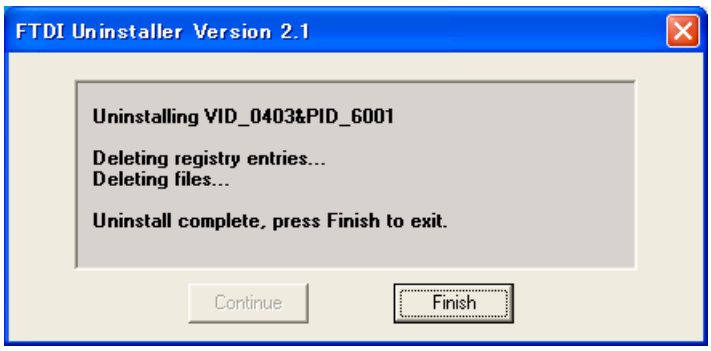
(3) Uninstaller starts, so click Continue.

Figure 3-36. Driver Uninstaller



(4) When uninstallation of the USB driver is complete, the screen shown below appears. Click Finish to complete uninstallation of the driver.

Figure 3-37. Driver Uninstallation Completion



Caution When the GUI software is uninstalled first, “Ftdiunin.exe” is deleted with it. At this time, manually delete “USB Serial Port (COM?)” and “USB Serial Converter” from the Device Manager.

3.4.2 GUI software uninstallation

The uninstallation program is contained in the CD-ROM (IECUBE Accessory Disk) included with the IECUBE package (this program is used commonly as the installer). Use the procedure below for GUI software uninstallation.

(1) When using Windows XP, log on as the computer administrator. When using Windows 2000, log on as the Administrator.

(2) Insert the CD-ROM (IECUBE Accessory Disk) included with the IECUBE package into the CD-ROM drive.

(3) Double-click “My Computer”, “CD-ROM”, “PG-FPL”, and “SETUP” in that order. Double-click “setup.exe” in the SETUP folder.

(4) Select a language to be used for installation (“English” in this example), then click OK.

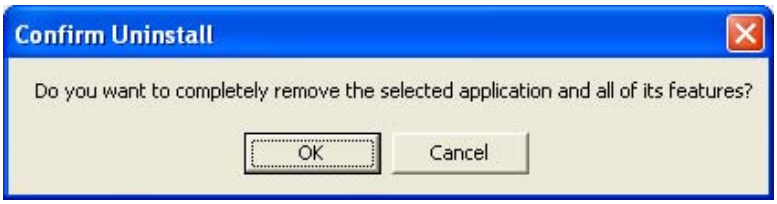
Figure 3-38. Setup Language Selection

(5) Select “Remove”, then click Next >.

Figure 3-39. Program Modification

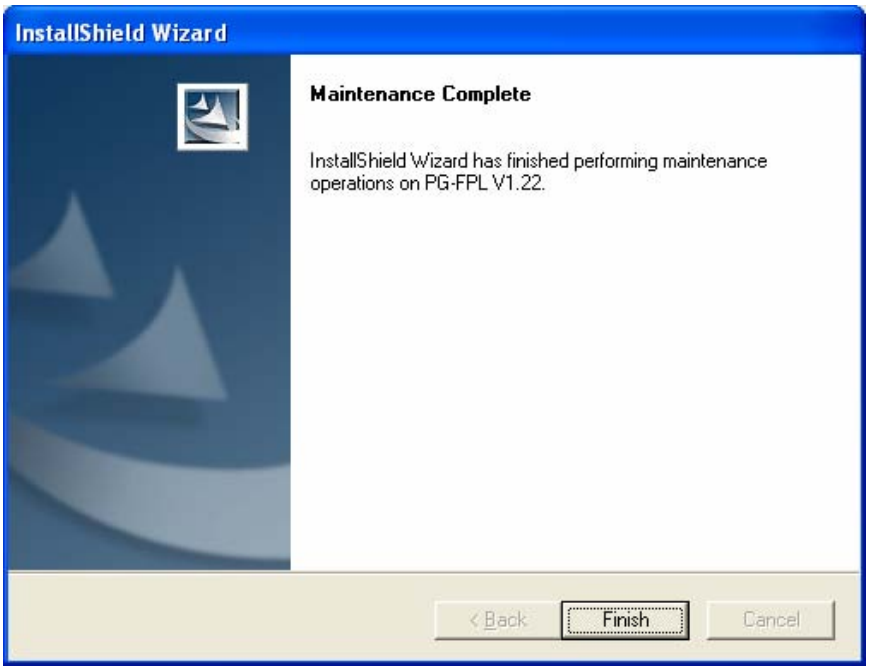
(6) Click OK to start uninstallation.

Figure 3-40. Confirmation of File Deletion



(7) When uninstallation of the GUI software is complete, the screen shown below appears. Click Finish to complete uninstallation.

Figure 3-41. Completion of Maintenance



CHAPTER 4 OPERATION USING GUI SOFTWARE

4.1 Introduction

Before you start using the FPL, 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 FPL software package.
It has to be downloaded from the following NEC Electronics website.

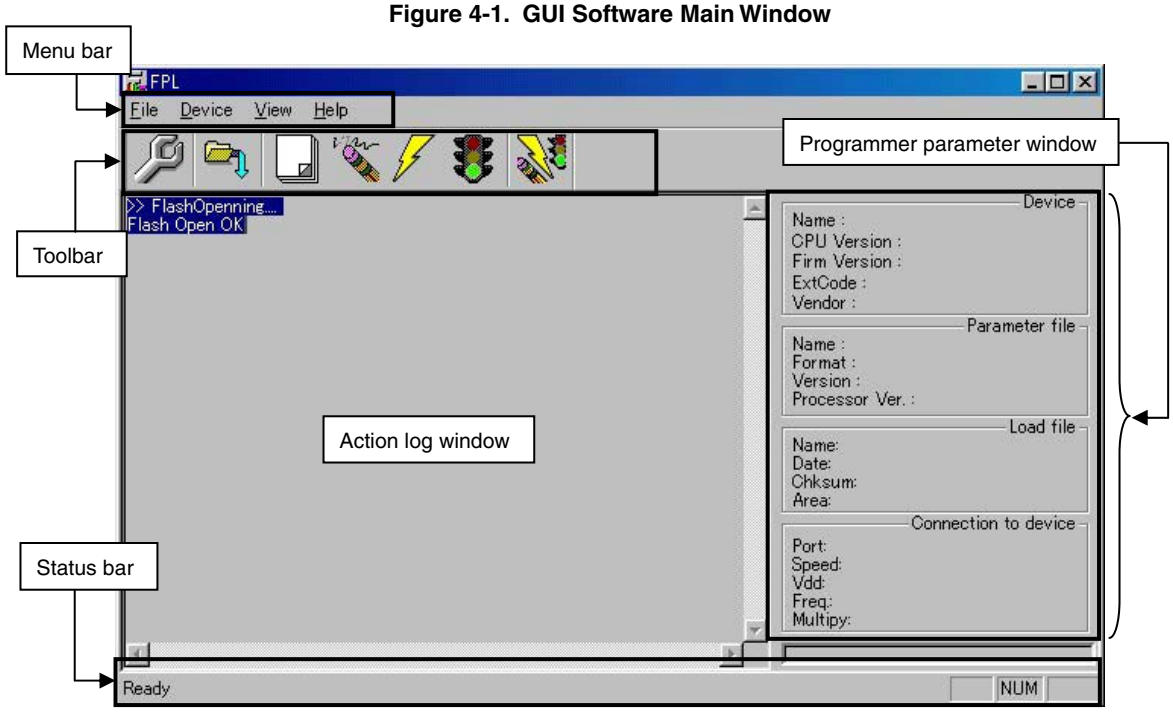
http://www.necel.com/micro/ods/eng/index.html (website in English)
http://www.necel.com/micro/ods/jpn/index.html (website in Japanese)

The PRM file downloaded from the NEC Electronics website must be copied into the sub-directory <*FPL.EXE-installation-path*>\PRM which was created during GUI software setup (see **CHAPTER 3 SOFTWARE INSTALLATION**).

4.2 Starting up GUI Software

- GUI software startup
  Select FPL.EXE in the Start menu to start the FPL GUI software.
  When the GUI software is started normally, the following screen appears.

Figure 4-1. GUI Software Main Window



This window consists of the following items.

Name	Description of Display
Menu bar (displayed at the top)	Displays menu items executable by the FPL.
Toolbar (displayed under the menu bar)	Displays frequently used commands as icons.
Action log window (displayed under the toolbar)	Displays an FPL action log.
Programmer parameter window (displayed to the right of the action log window)	Displays programming parameter settings.
Status bar	Displays status.

4.3 Toolbar

The toolbar contains buttons to start the most important procedures of the FPL.

Table 4-1. Toolbar Buttons

	[Device] – [Setup…] button
	[File] – [Load…] button
	[Device] – [Blank check] button
	[Device] – [Erase] button
	[Device] – [Program] button
	[Device] – [Verify] button
	[Device] – [Autoprocedure (EPV)] button

4.4 Menus

Depending on the actual device status or device type, some menu items may be enabled or disabled.

4.4.1 [File] menu

After clicking the [File] menu, the following pull-down menu is displayed.

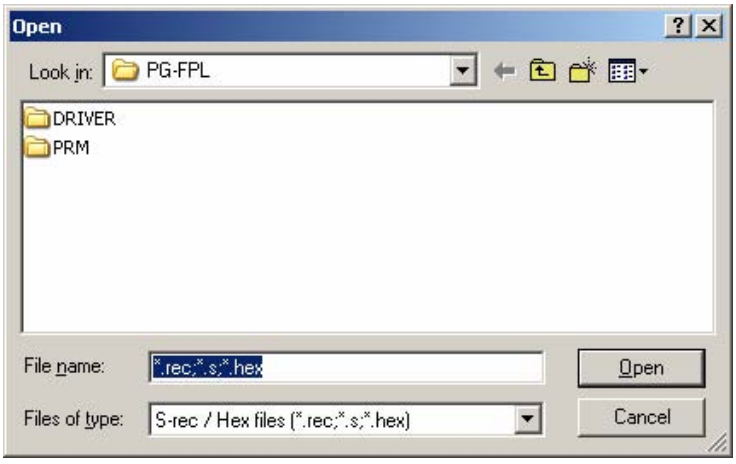
Commands related to file operation appear here.

Figure 4-2. [File] Menu

(1) [Load] command

The [Load] command allows you to select a program file. The selected program file will be programmed into the device's flash memory by executing the [Program] command or [Autoprocedure (EPV)] command.

Figure 4-3. HEX File Selection Window



The most recently used directory from which a file has been loaded will be offered in this window as the default selection. After loading the user program, the checksum is calculated and the result is displayed in the programmer parameter window. The checksum is Arithmetic checksum (subtraction). It calculates the program file from START to END.

[Open button]

Selects a user program as a program to be written to the target device.

[Cancel button]

Closes the window without selecting a program.

(2) [Quit] command

The [Quit] command terminates the FPL GUI software. Clicking the X button on the right side of the task bar also terminates the FPL GUI software.

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

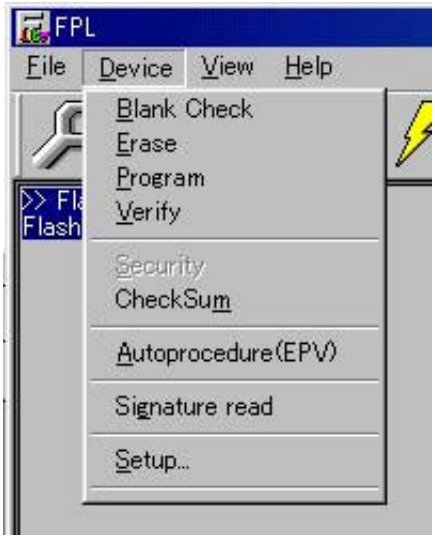
Note FPL.INI is created in the Windows folder when Windows 98, Windows Me, or Windows XP is used. When Windows 2000 is used, FPL.INI is created in the Winnt folder.

4.4.2 [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 4-4. [Device] Menu



(1) [Blank Check] command

The [Blank Check] command initiates a blank check of the target device connected to the FPL. If the flash memory of the target device is erased, the blank check terminates successfully. If the flash memory is not completely erased, “not blank” is displayed. Erase the flash memory of the target device before starting programming.

(2) [Erase] command

The [Erase] command initiates the erase procedure for the target device connected to the FPL.

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

The [Blank Check] command that is executed before the [Erase] command is executed in accordance with the setting of ‘Command options’ on the Advance tab of the [Device] > [Setup…] menu.

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

Caution During an erase operation, the Status LED is not turned on. Do not disconnect the target cable and USB cable until the GUI software displays “Erase finished”. Otherwise, the target device may be damaged.

(3) [Program] command

The [Program] command transmits the specified user program to the target device and writes them to the flash memory.

After execution of the [Program] command, verification to detect a communication error of the user program from the FPL to the target device is executed in accordance with the setting of 'Command options' on the Advance tab of the [Device] > [Setup…] menu.

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

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

(4) [Verify] command

The [Verify] command transmits the specified user program to the target device connected to the FPL and verifies the data written to the flash memory of the target device.

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

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

(5) [Security] command

This command is not supported.

(6) [CheckSum] command

The [CheckSum] command initiates the reading of the checksum values of the target device connected to the FPL. The checksum is Arithmetic checksum (subtraction). The checksum value in the flash memory area selected in Operation Mode on the Standard tab of the [Device] > [Setup…] menu is read. This value differs from the value displayed in the parameter window in the main window.

(7) [Autoprocedure (EPV)] menu

The [Autoprocedure (EPV)] command sequentially executes the [Erase] and [Program] commands explained above.

After execution of the [Autoprocedure (EPV)] command, to verify the checksum values of the data written to the flash memory of the target device and the program file to detect a communication error of the user program while it is being transmitted, specify automatic execution of the [Verify] command after execution of the [Program] command, using the Command options on the Advance tab of the [Device] > [Setup…] menu.

During EPV, the progress status of the programmer operation is displayed in the action log window. Refer to **CHAPTER 5 USAGE EXAMPLE** for the selected command, and its execution operation and message.

After completing the [Autoprocedure (EPV)] command, the GUI software displays the target device command execution result.

(8) [Signature read] command

The [Signature read] command reads the target signature information (such as device name and flash memory information).

(9) [Setup…] command

The [Setup] menu allows you to make settings related to flash memory rewriting according to the user environment and to set command options. Each time the GUI software is started, the most recently used parameter file (.PRM) is read and the settings are displayed. The [Setup] menu allows you to modify the settings of items other than those items consisting of shadowed characters according to the user environment.

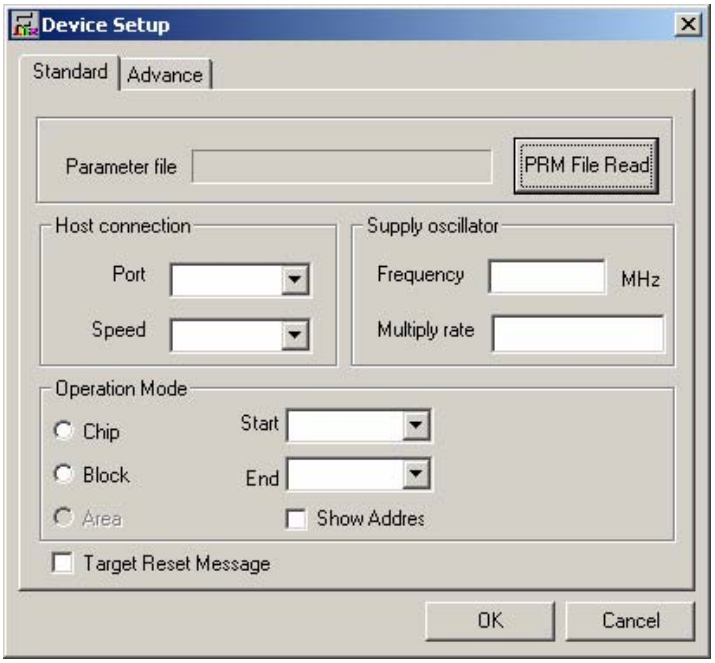
(a) Standard setup

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. Refer to the manual of the device used for details.

The following window opens.

Figure 4-5. Device Setup Window – Standard Tab



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

[OK button]

Saves the settings in the Standard and Advance tabs and closes the window.

[Cancel button]

Closes the window without saving the settings in the Standard and Advance tabs.

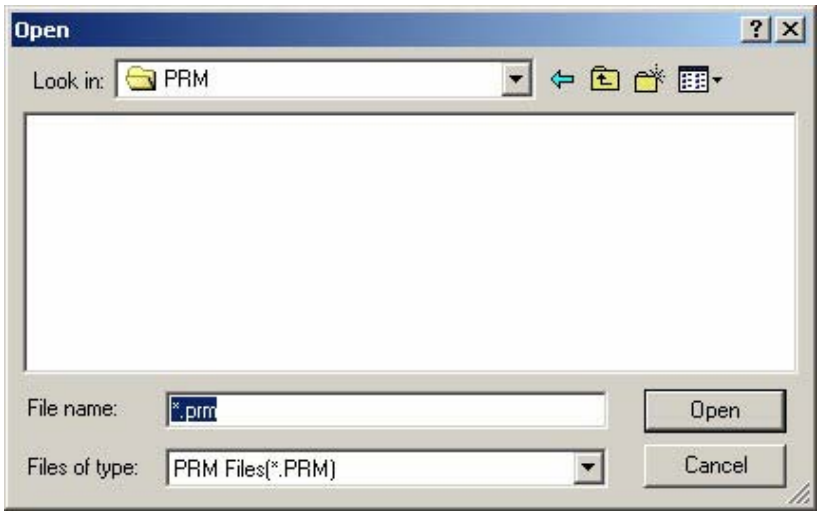
<1> Parameter file

This file holds parameters and timing data required to rewrite the flash memory of the target device. Do not modify the data in the parameter file because the data is related to the guarantee of rewrite data.

The parameter file is protected by the checksum function. If the checksum result indicates an error, the FPL does not accept the parameter file.

Figure 4-6. Device Setup Window – Parameter File Selection

Figure 4-7. Parameter File Selection Window



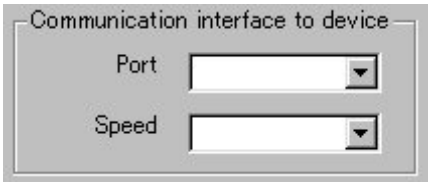
[PRM File Read button]

A window for specifying a parameter file is displayed. Specify the target file and click Open.

<2> Communication interface to device

"Communication interface to device" is used to select a channel for communication between the FPL and host machine.

Figure 4-8. Setup Window - Communication interface to device



[Port box]

Select a channel for communication between the FPL and host machine.

- COM1 to COM256

Remark Selectable ports can be checked using Device Manager. For details, refer to 3.3 **Confirmation of USB Driver Installation.**

[Speed box]

Select a communication rate for the selected communication channel from the following:

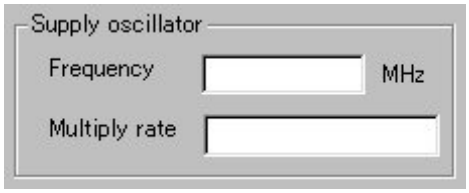
- 9600 bps
- 19200 bps
- 38400 bps

Remark For selectable communication rates, refer to the user's manual of the device used.

<3> Supply oscillator

Select the clock that determines the programming, data transfer, and transfer rates, in this area.

Figure 4-9. Device Setup Window – Supply Oscillator



[Frequency box]

Sets the clock frequency of the target system.

The range of operating frequency varies from one device to another. So, check the specifications of the device used before making a setting.

[Multiply rate]

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

If the target device includes the PLL circuit, input the division rate or multiplication rate depending on the environment used.

Since the division rate or multiplication rate varies depending on the device, set it by checking the device specifications.

If the target device does not include the PLL circuit, select “1.0”.

The default setting is displayed by the parameter file in the initial screen.

<4> Operation Mode

The flash memory may be divided into blocks or areas depending on the target device.

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 4-10. Device Setup Window – Operation Mode Selection

[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.

[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.

[Show Address check box]

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

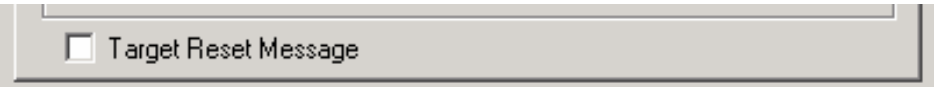
If this check box is checked, addresses are displayed.

If it is not checked, numbers are displayed.

<5> Target Reset Message

By checking the Target Reset Message check box, the window promoting the reset operation manually is displayed even when the reset signal cannot be connected to the target cable.

Figure 4-11. Device Setup Window – Target Reset Message



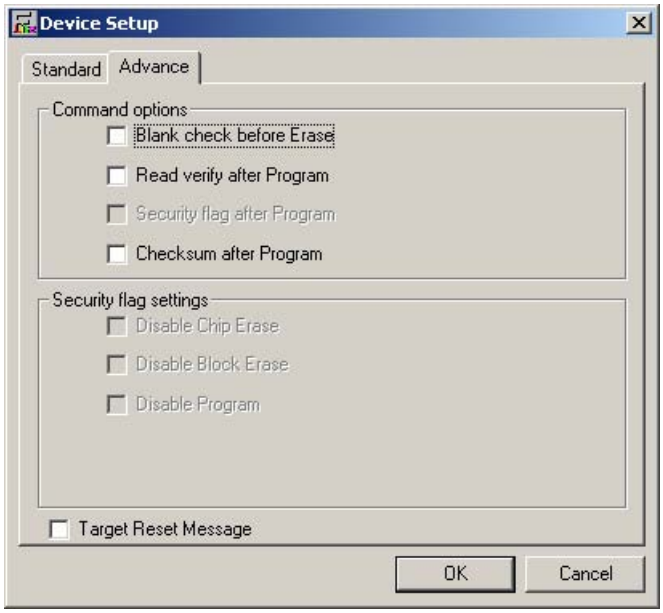
Remark The Target Reset Message check box is common to Standard and Advance tabs.

(b) Advance setup

This menu is used to specify command options and security flag setting.

The Advance tab is displayed by clicking Advance.

Figure 4-12. Device Setup Window – Advance Tab



<1> Command options

Specify the options for the FPL flash processing commands in this area.

Figure 4-13. Device 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 [Autoprocedure (EPV)] commands. If the result of the blank check is OK, erase processing is not executed.

[Read verify after Program check box]

If this check box is checked, the written data is transmitted from the programmer, and verification is executed with the data written to the flash memory after execution of the [Program] and [Autoprocedure (EPV)] commands.

[Security flag after Program check box]

Not usable

[Checksum after Program check box]

If this check box is checked, the flash memory checksum values of the target device are read from the target device after execution of the [Program] and [Autoprocedure (EPV)] commands.

This value differs from the value displayed in the parameter window in the main window.

<2> Security flag settings

Not usable

4.4.3 [View] menu

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

This menu consists of commands for setting whether to display the toolbar and status bar.

Figure 4-14. [View] Menu

(1) [Toolbar] command

Checking the [Toolbar] command displays the toolbar. Unchecking the command hides the toolbar.

(2) [Status Bar] command

Checking the [Status Bar] command displays the status bar. Unchecking the command hides the status bar.

4.4.4 [Help] menu

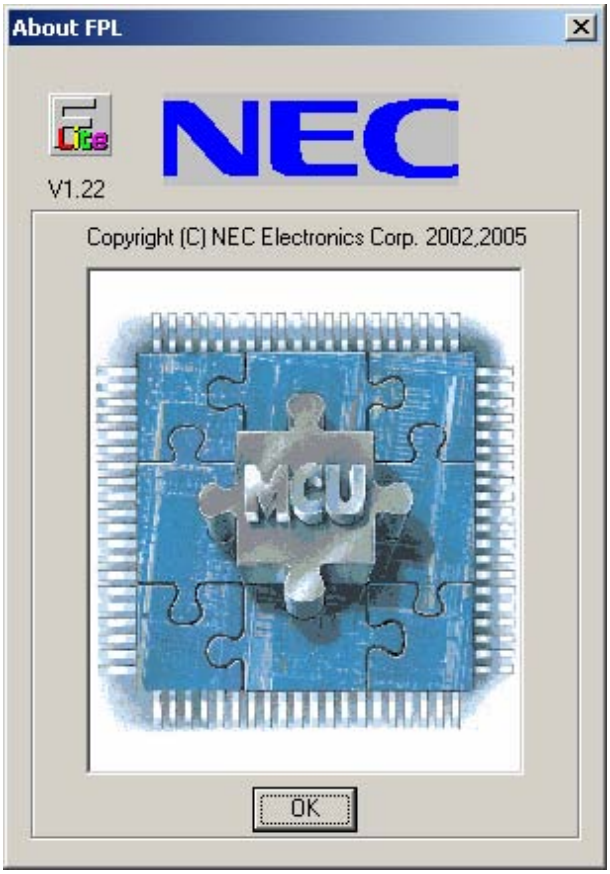
Clicking the [Help] menu displays the following pull-down menu.

Figure 4-15. [Help] Menu

(1) [About FPL] command

The [About FPL] command opens the following program entry window and indicates the version. Clicking OK terminates the display.

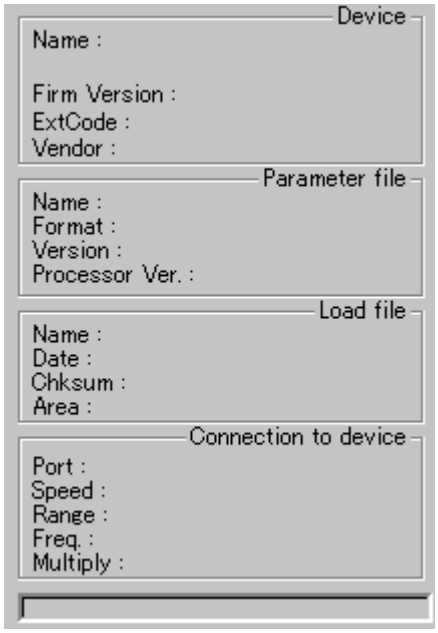
Figure 4-16. About FPL Window



4.5 Programmer Parameter Window

This window displays the settings of the programming parameters.

Figure 4-17. Programmer Parameter Window



[Device]

Updated after communication with the target device to display information about the target device.

[Parameter file]

Updated after [Setup] command execution to display information about a read parameter file.

[Load file]

Updated after [Load] command execution to select information about a selected program file.

[Connection to device]

Updated after [Setup] command execution to display information about the connection with the target device.

CHAPTER 5 USAGE EXAMPLE

This chapter explains a series of basic operations of the FPL with the GUI software, taking a case where the μPD70F3266 is used as the target device as an example. This chapter covers how to start the system, execute the [Autoprocedure (EPV)] command, and program the target device.

Refer to **CHAPTER 4 OPERATION USING GUI SOFTWARE** for the other commands and applications.

The conditions of the series of operations described in this chapter are as follows.

- Target system

Target device:	μPD70F3266
Clock:	5 MHz
Voltage level:	3.3 V
Communication:	UART CH0

- FPL

Parameter file:	70F3266_CSI0.PRM
Clock setting:	5 MHz Multiplied by 4
Port:	COM2 (38,400 bps)
MODE switch:	2 (V_{DD}: 3.3, V_{DD}2: N.C)
Operation mode:	Chip
Write HEX:	FPL_TEST.HEX
Option setting:	Read verify after Program
	Blank check before Erase

(1) Installing the GUI software

Install the FPL GUI software in the host machine you are using, by referring to **CHAPTER 3 SOFTWARE INSTALLATION** (if the software has not been installed yet).

(2) Installing the driver

Install the USB driver in the host machine you are using, by referring to **CHAPTER 3 SOFTWARE INSTALLATION** (if the driver has not been installed yet).

(3) Installing the parameter file

Copy the parameter file for the μPD70F3266 to the hard disk and install it in <*FPL-installation-path*>\PRM.
Download the parameter file from the following:

http://www.necel.com/micro/ods/eng/index.html (website in English)
http://www.necel.com/micro/ods/jpn/index.html (website in Japanese)

(4) Connecting and starting the system

<1> Set the MODE switch to “MODE2”.

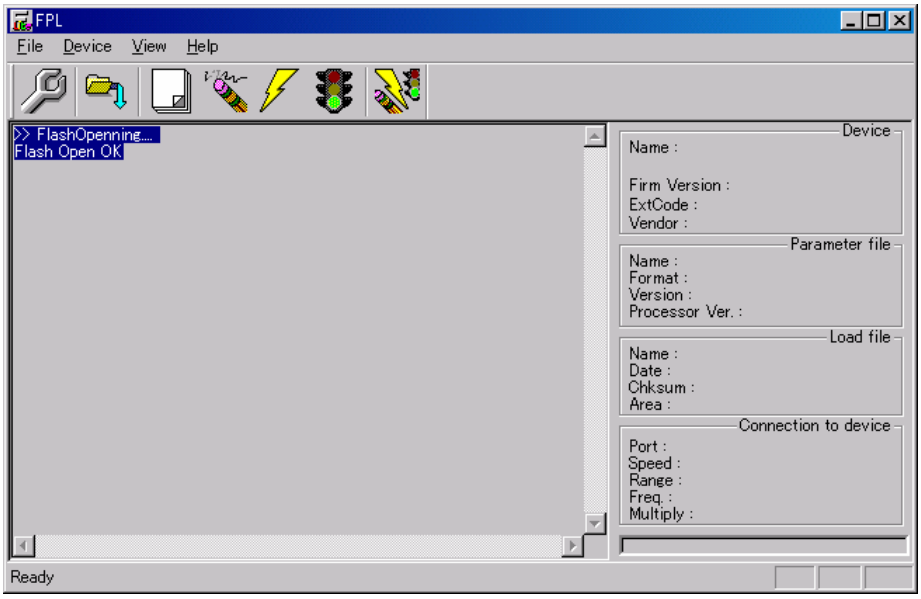
<2> Connect the FPL with the host machine via the USB cable.

<3> Check that the Power LED is turned on.

<4> Check that the power to the target system is not turned on, then connect the FPL with the target system via the target cable.

<5> Start the GUI software.

Figure 5-1. GUI Software Main Window

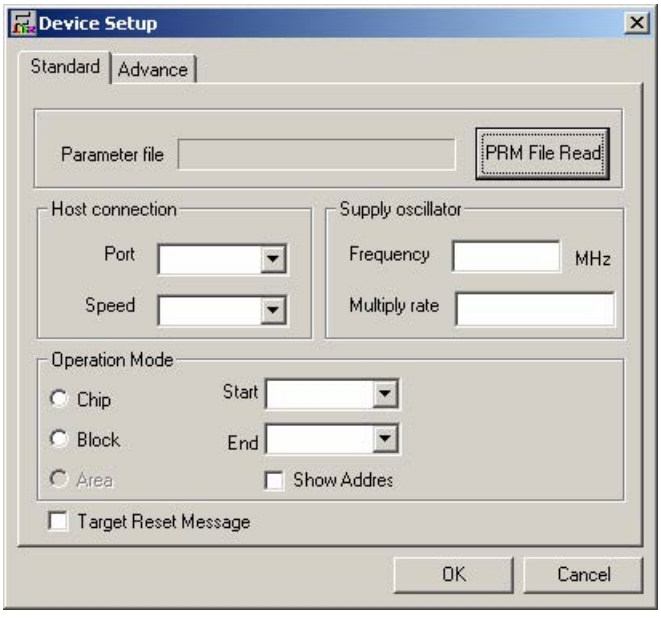


(5) Setting the programming environment

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

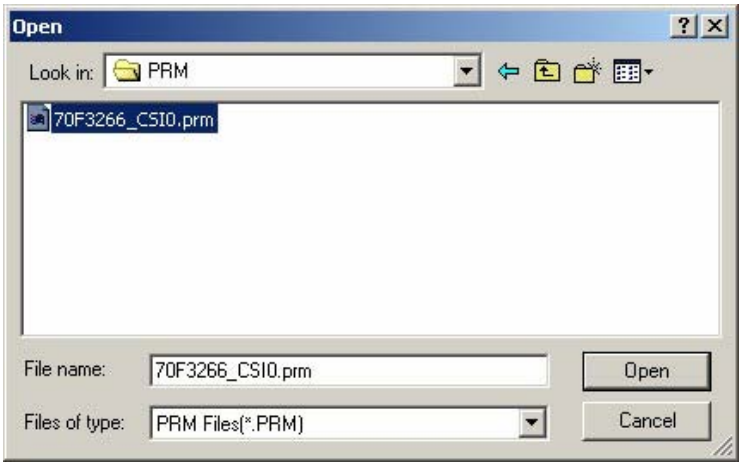
<2> The Standard tab of the Device Setup window for device setup is activated.

Figure 5-2. Device Setup Window – Standard Tab



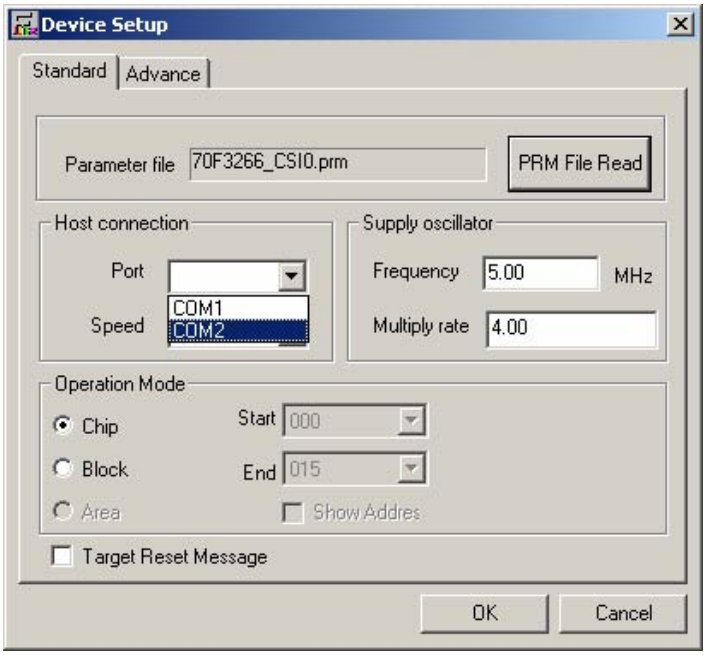
<3> Click PRM File Read to open the parameter file selection window.
In this case, select the parameter file for the μPD70F3266, then click Open.

Figure 5-3. Parameter File Selection



<4> From the Port list box, select the communication port that matches the host machine being used.

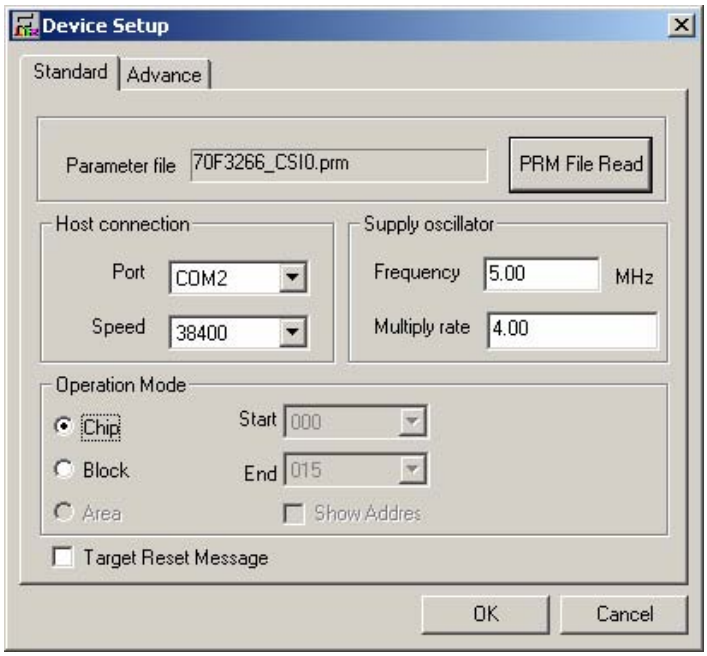
Figure 5-4. Device Setup Window – Standard Tab <After Setting>



Remark The selectable port can be checked with the Device Manager. For details, refer to **3.3 Confirmation of USB Driver Installation**.

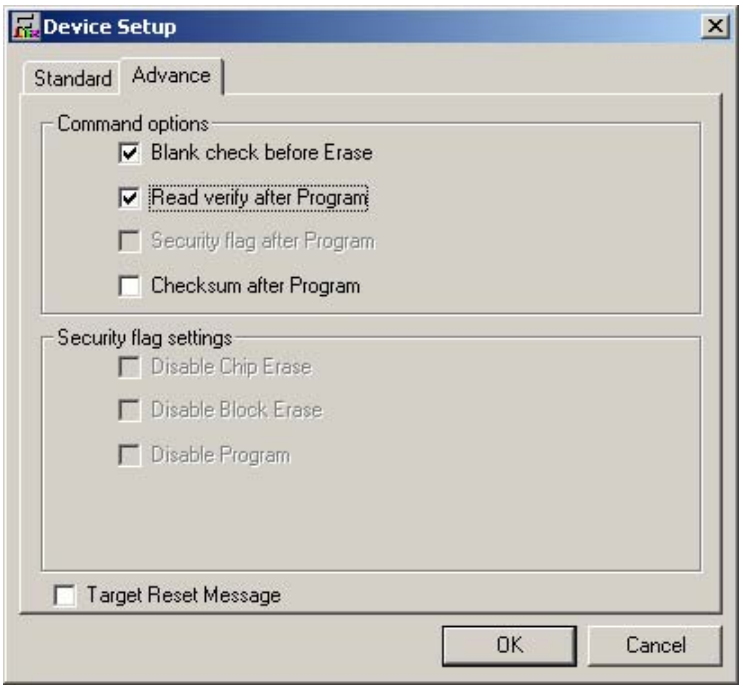
<5> Set the other displayed setting items to match the programming environment being used.
In particular, set "Supply oscillator" according to the specifications of the selected device.
In "Operation Mode", specify a flash memory range subject to operation. Here, the following settings are assumed:

Figure 5-5. Device Setup Window – Advance Tab



<6> Switch to the Advance tab.

Figure 5-6. Device Setup Window – Advance Tab



<Command options>

Blank check before Erase: Checked

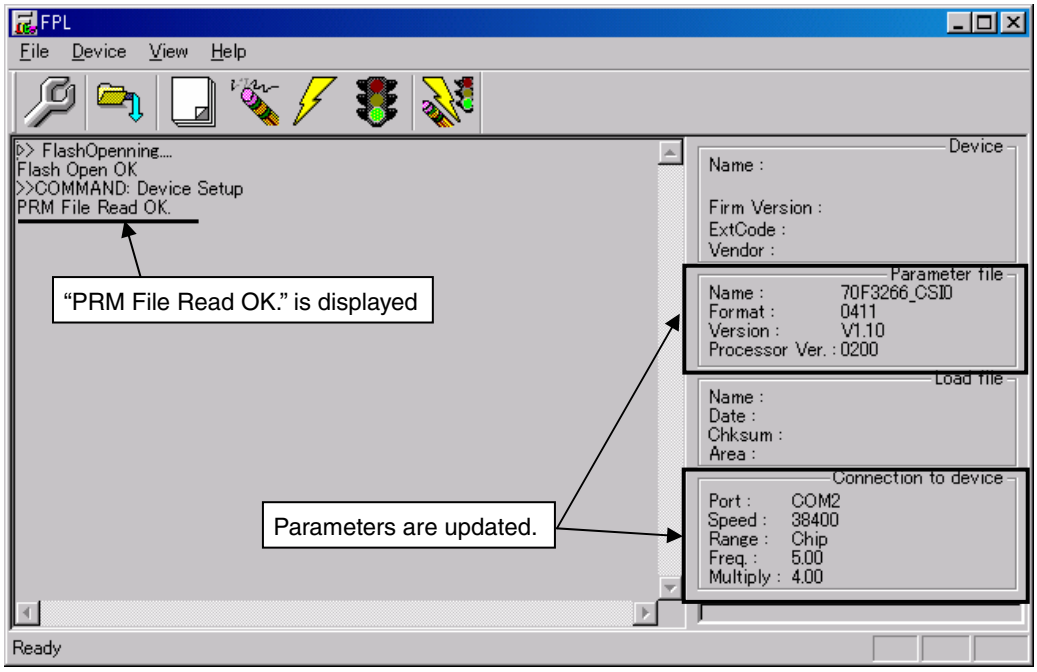
Read verify after Program: Checked

Security flag after Program: Not checked

Checksum after Program: Not checked

<7> Click OK. The GUI software sets the parameters.
When the settings are completed, the following screen is displayed.

Figure 5-7. Completion of Parameter Setting

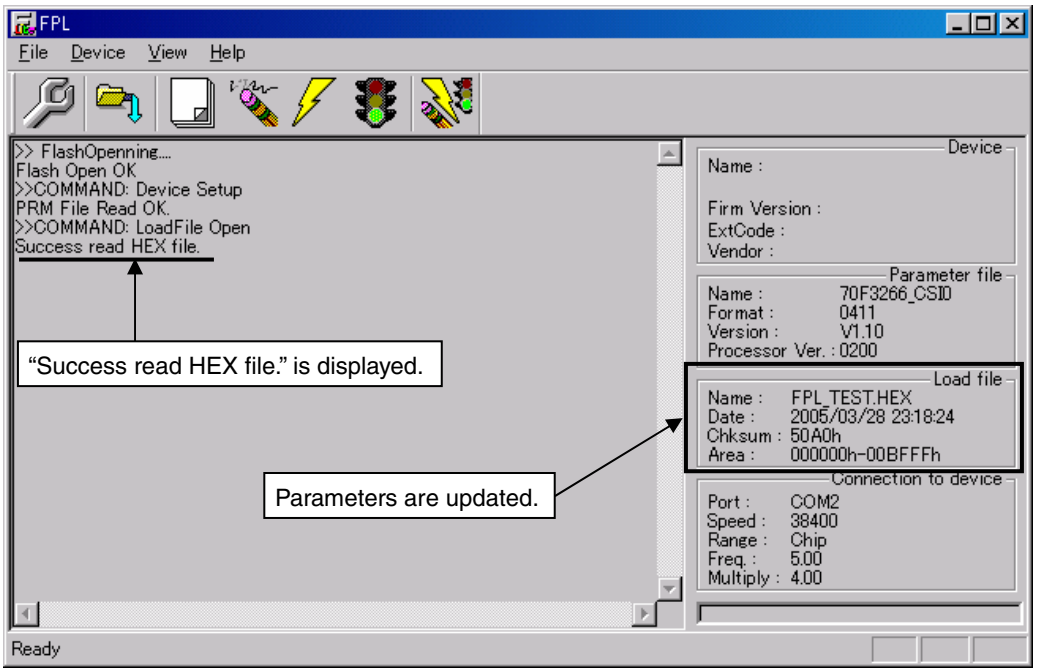


(6) Selecting a user program

<1> Select [File] → [Load].

<2> Select a program file to be written to the target device, then click Open.

Figure 5-8. After Loading File

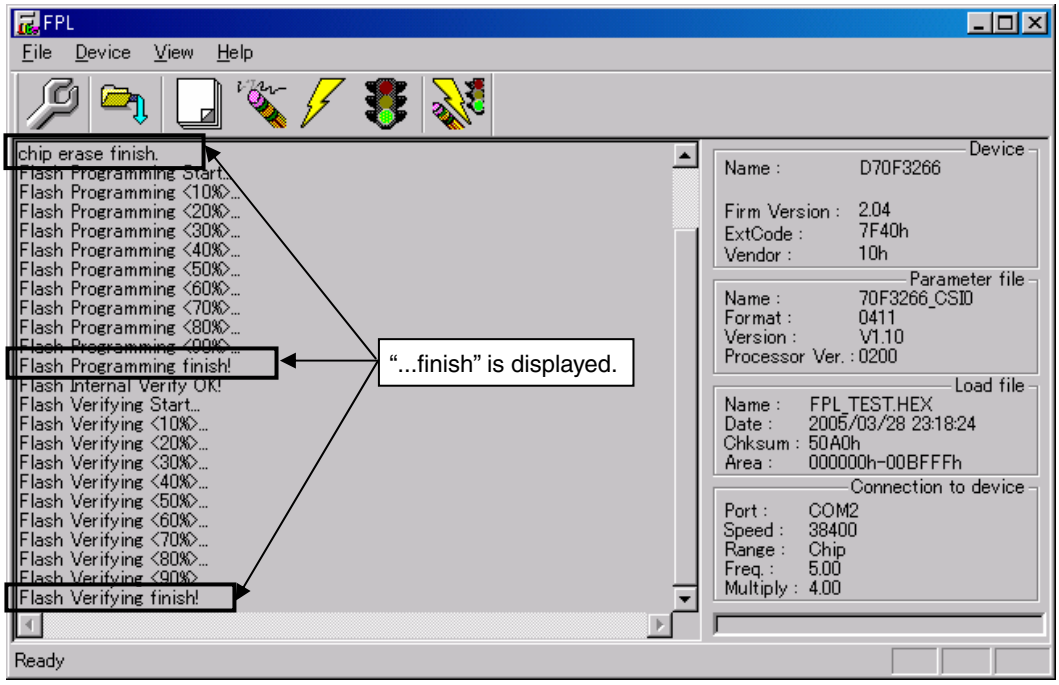


(7) [Autoprocedure (EPV)] command execution

Select [Device] → [Autoprocedure (EPV)] from the menu bar.

When the [Autoprocedure (EPV)] command is executed, Blank Check → Erase → Program → Verify [Note] are executed sequentially for the μPD70F3266. In this example, Read verify after Program is checked. So, after the execution of the [Autoprocedure (EPV)] command, verification is performed to check if communication between the FPL and the target device has been performed normally.

Figure 5-9. After EPV Execution



(8) Terminating the system

<1> If other devices need not be programmed, select [File] → [Quit] to terminate the GUI software.
All settings executed so far are saved in the FPL.INI file, so that those settings can be reused when the GUI software is restarted.

<2> Disconnect the target cable from the target system.

<3> Disconnect the USB cable from the FPL.

(9) Restart

When the system is restarted, the same screen as shown in Figure 5-6 appears.

6.1 USB Connector (FPL)

Figure 6-1. Pin Layout of Power Supply Connector

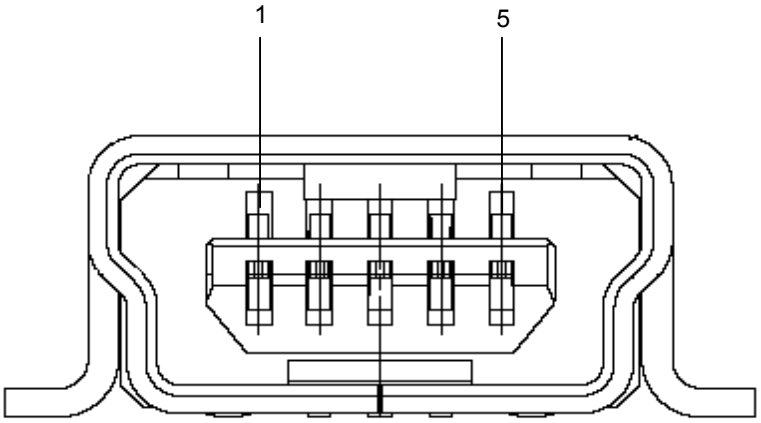


Table 6-1. Pin Assignment of USB Connector

USB Connector	FPL Signal Name
1	VCC_USB
2	USBDM
3	USBDP
4	N.C.
5	GND

Connector part number: UX60A-MB-5ST (made by Hirose Electric)

Remark The recommended USB cable (Mini-B type) for connection with the host machine is the USB cable included with the IECUBE.

6.2 Target Cable Connector (FPL)

Figure 6-2. Pin Layout of Target Connector

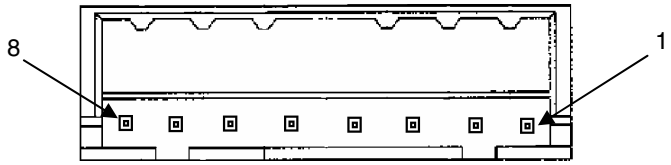


Table 6-2. Pin Assignment of Target Cable Connector

Target Connector	FPL Signal Name
1	GND
2	VDD
3	VDD2
4	/RESET
5	TXD
6	RXD
7	FLMD0
8	FLMD1

Connector part number: DF3A-8P-2DSA (made by Hirose Electric)

6.3 Target Cable Specifications

Figure 6-3. External View of Target Cable

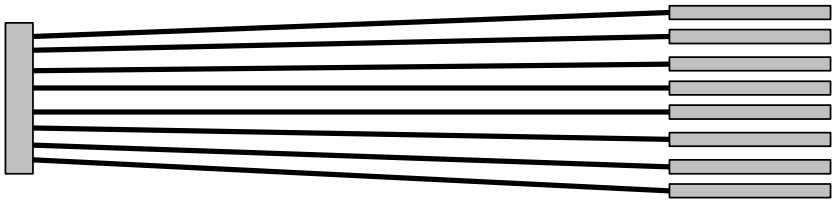


Table 6-3. Pin Assignment of Target Cable

Cable Specification			Display Specification
No. 1	Black	GND	0. GND
No. 2	Brown	VDD	1. VDD
No. 3	Red	VDD2	2. VDD2
No. 4	Orange	/RESET	3. /RESET
No. 5	Yellow	TXD	4. TXD
No. 6	Green	RXD	5. RXD
No. 7	Blue	FLMD0	6. FLMD0
No. 8	Purple	FLMD1	7. FLMD1

Supported header pin specification: 0.635 × 0.635 mm (length: 6 mm)

Remark The recommended header pin that can be used with the target cable is FFC-7AMEP1 (made by Honda Tsushin Kogyo).

6.4 Target Connector (FPL-FA)

Figure 6-4. External View of Target Connector

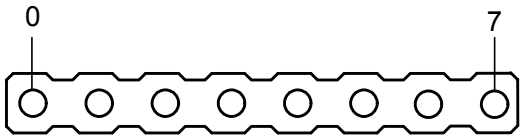


Table 6-4. Pin Assignment of Target Connector

Target Connector	FPL-FA Signal Name
0	GND
1	VDD
2	VDD2
3	/RESET
4	TXD
5	RXD
6	FLMD0
7	FLMD1

Connector part number: FFC-7AMEP1 (made by Honda Tsushin Kogyo)

6.5 FP4 Connector (FPL-FA)

Figure 6-5. External View of FP4 Connector

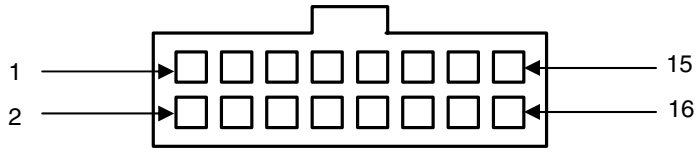


Table 6-5. Pin Assignment of FP4 Connector

FP4 Connector	FPL-FA Signal Name
1	GND
2	/RESET
3	RXD
4	VDD
5	TXD
11	VDD2
12	FLMD1
14	FLMD0
6, 7, 8, 9, 10, 13, 15, 16	N.C.

Connector part number: 8516-4500PL (made by Sumitomo 3M)

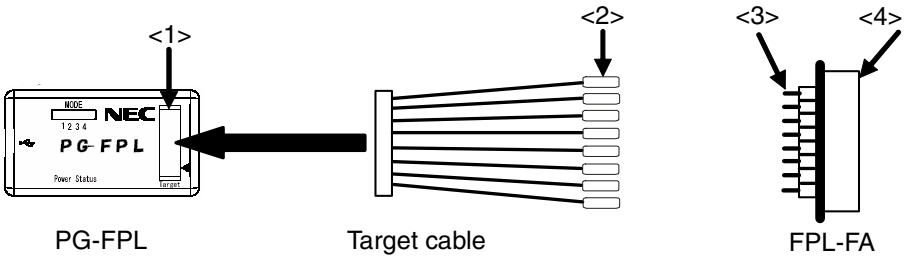
Remark The recommended receptacle connector that can be used with the FP4 connector is 7616-5002PL (made by Sumitomo 3M).

6.6 List of Interface Connections

Table 6-6. List of Interface Connections

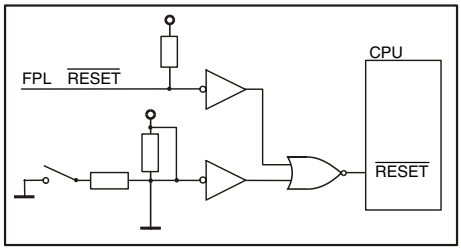
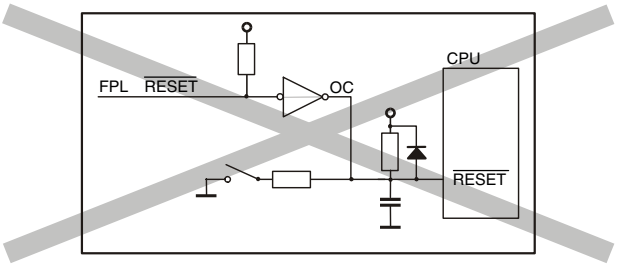
Signal Name	<1> Target Cable Connector	<2> Tip of Target Cable	<3> Target Connector	<4> FP4 Connector
GND	1	0. GND	0	1
VDD	2	1. VDD	1	4
VDD2	3	2. VDD2	2	11
/RESET	4	3. /RESET	3	2
TXD	5	4. TXD	4	5
RXD	6	5. RXD	5	3
FLMD0	7	6. FLMD0	6	14
FLMD1	8	7. FLMD1	7	12

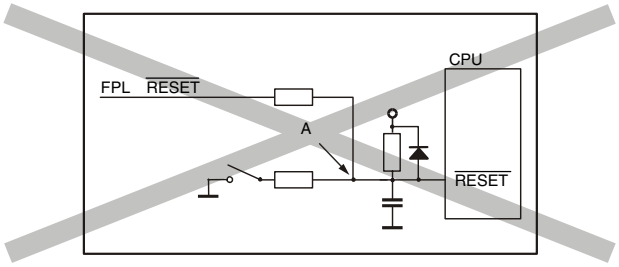
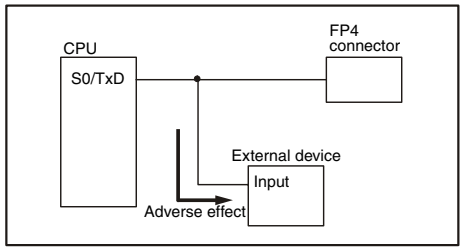
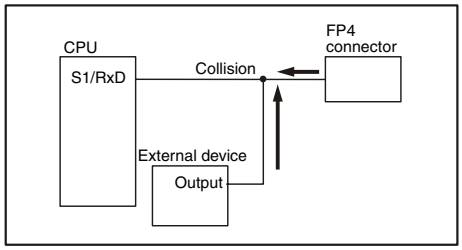
Figure 6-6. Target Interface



CHAPTER 7 NOTES ON TARGET SYSTEMS

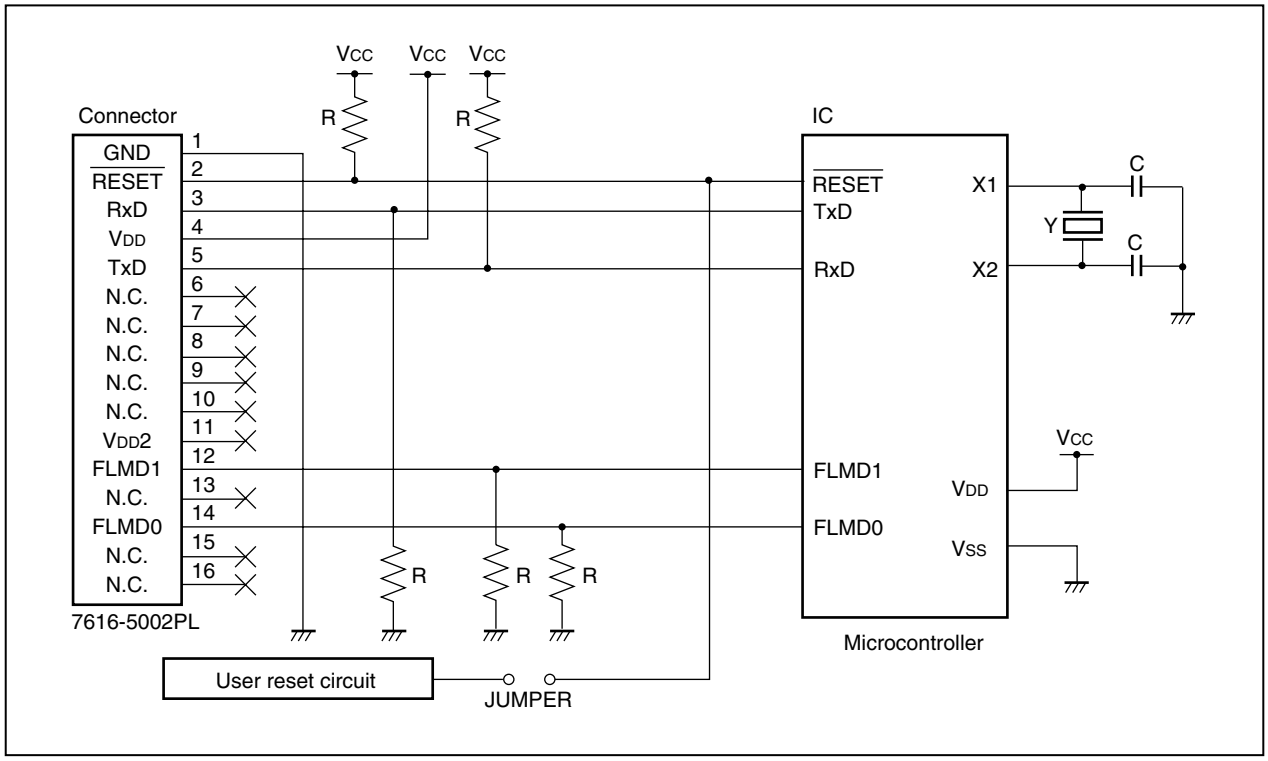
This chapter explains the basic notes on the target system for rewriting the flash memory in the microcontroller using the FPL.

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

CPU Pin	Design Proposal
$\overline{\text{RESET}}$	• Connection to a point where the target CPU $\overline{\text{RESET}}$ pin cannot be driven to low level by the FPL $\overline{\text{RESET}}$ signal. **Incorrect connection:**  When the FPL $\overline{\text{RESET}}$ is driven low, the level of the voltage at point A does not fall.
Serial interface pin	When the CPU port used by the FPL 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. **Example:**  While the CPU port used by the FPL is also connected to the output of an external device, and if a signal collision occurs, disconnect the external device. **Example:** 
Other	For the unused pins, refer to the user's manual of the device. Some devices have pins that must be processed differently. For these pins as well, refer to the user's manual of the device. Example of pins processed differently: MODE CKSEL REGOUT REGIN, etc.

The following show examples of the interface circuits of UART (asynchronous communication port).
Refer to the above design proposal for the pin processing of the device to be used.

Figure 7-1. UART Interface Circuit Example



Remarks 1. The FPL generally performs normally without pin connection.

2. For pin processing of the signals used with the FPL (TxD, $\overline{\text{RESET}}$, RxD, FLMD0, FLMD1), pull up (pull down) according to **CHAPTER 8 CIRCUIT DIAGRAMS**.

CHAPTER 8 CIRCUIT DIAGRAMS

Figure 8-1. Circuit Diagram of FPL Main Unit

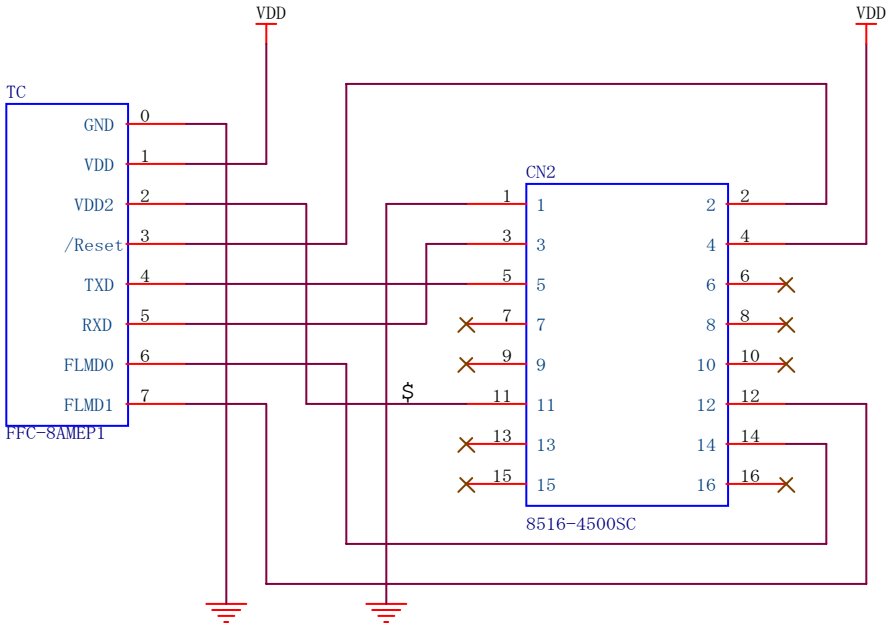


Figure 8-2. Circuit Diagrams of Main FPL Unit (1/3)

(a) USB Power Generator

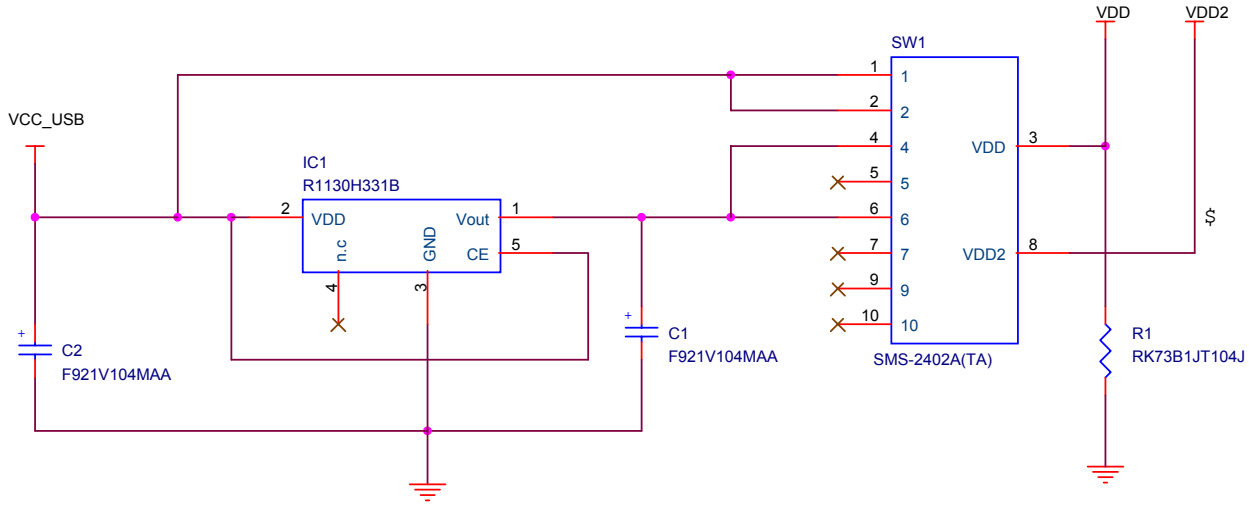


Figure 8-2. Circuit Diagrams of Main FPL Unit (2/3)

(b) Main Unit

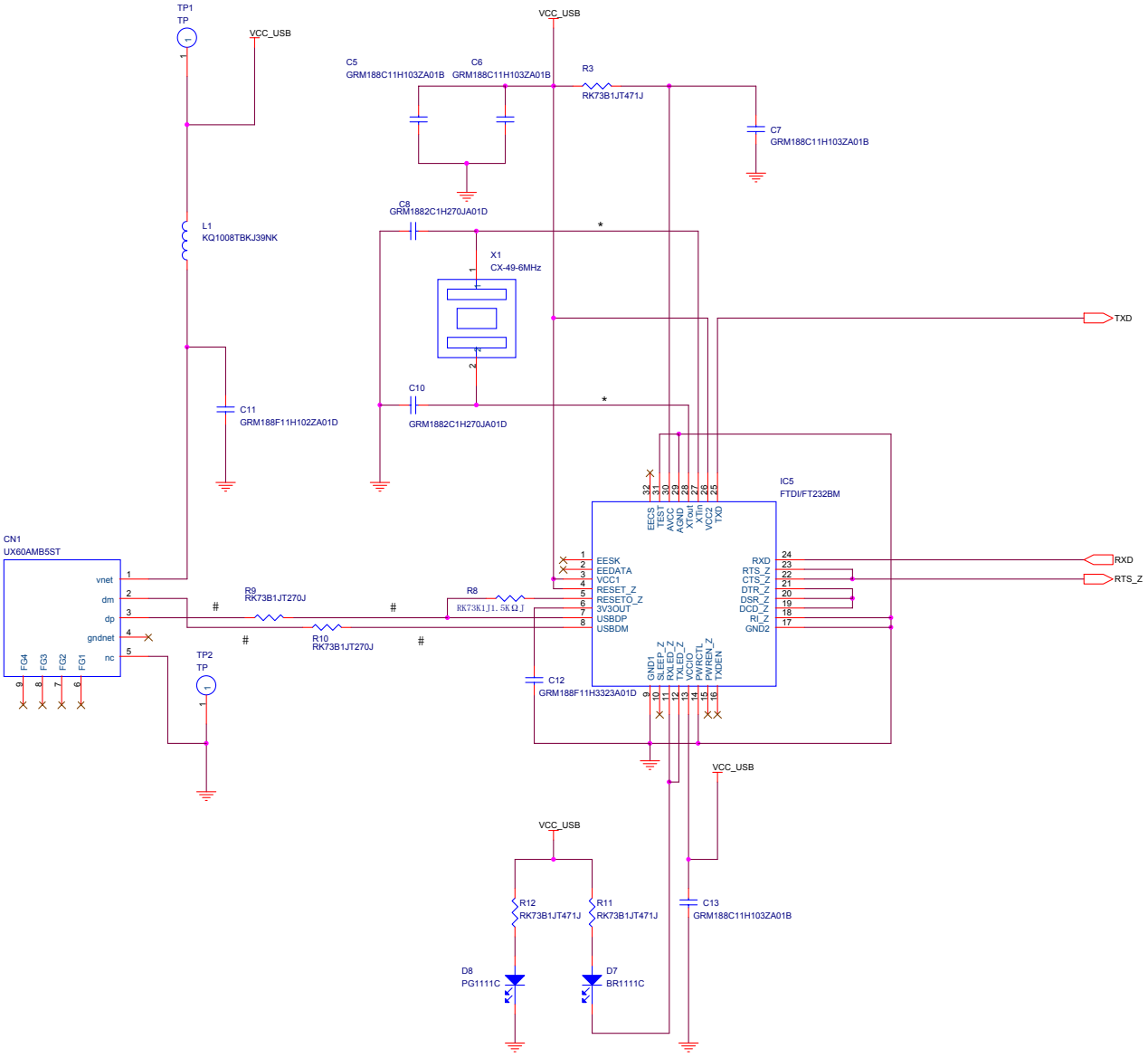
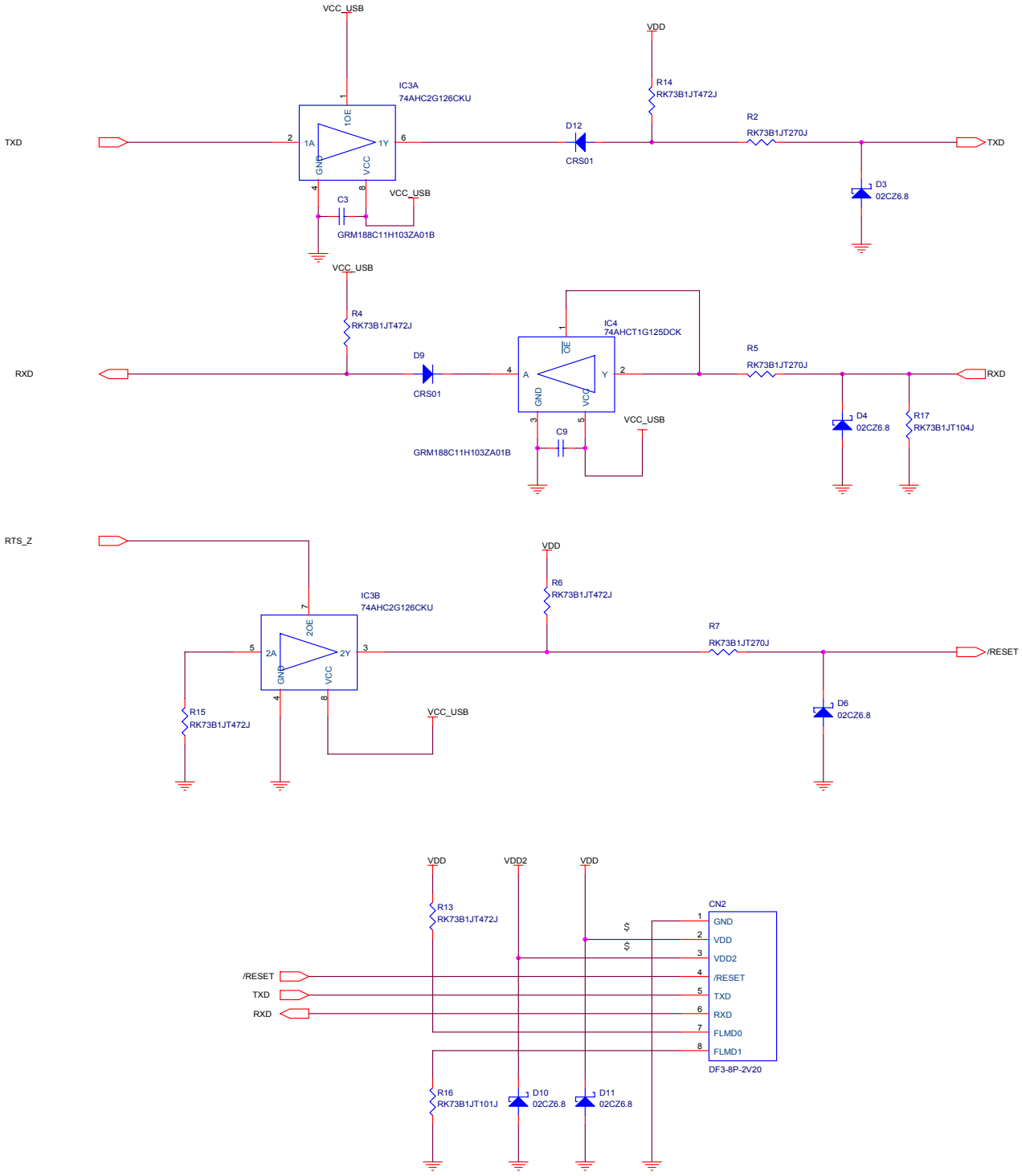


Figure 8-2. Circuit Diagrams of Main FPL Unit (3/3)

(c) Target Interface Section



CHAPTER 9 TROUBLESHOOTING

9.1 Trouble During Setup

(1) When installing the driver, the driver is not recognized by Plug and Play.

Cause:

The USB connector may not be inserted normally into the USB port of the personal computer.

Action:

Check that the USB connector is inserted fully into the USB port of the personal computer.

Alternatively, disconnect the USB connector, then insert the USB connector again after a while.

(2) The driver file cannot be found at a specified location.

Cause:

The GUI software of the FPL may not be installed correctly.

Action:

Install the GUI software again by referring to **3.1 GUI Software Installation**.

(3) "USB Serial Port" or "USB Serial Converter" is not displayed in the Device Manager. Alternatively, the "!" or "×" is prefixed.

Cause:

The USB connector may not be inserted normally into the USB port of the personal computer.

Action:

Check that the USB connector is inserted fully into the USB port of the personal computer.

Alternatively, disconnect the USB connector, then insert the USB connector again after a while.

Cause:

The driver may not be installed correctly.

Action:

<1> Right-click the driver marked with "!" or "×" when the FPL is connected to the personal computer and select Remove in the right-click menu.

<2> Execute [Hardware Modification Scan] in the Device Manager.

<3> Install the driver again with Plug and Play.

Cause:

The device may not be recognized (in the case of connection with the USB hub).

Action:

Try the following:

- Disconnect the USB connector, then insert the USB connector again.
- Connect the USB connector to another port of the USB hub.

  If the same symptom occurs, do not use the USB hub, but directly connect the connector to the USB port of the personal computer.

9.2 Trouble During Operation (Main Unit)

(1) When the FPL is connected to the personal computer but the Power LED is not turned on.

Cause**:**

The FPL or the USB port of the personal computer may be damaged.

Action**:**

Try a connection to another personal computer.

(2) The Status LED is turned on when the FPL is not communicating with the target device.

In accordance with the specifications of the FPL, the Status LED may turn on even if the FPL is not communicating with the target device.

The Status LED is designated to blink during communication with the target device.

(3) The “Add New Hardware Wizard” screen is displayed when the FPL is connected with a personal computer.

Cause**:**

If the USB connector of the FPL is not inserted into the USB port during installation but into another USB port, the FPL may be recognized as a new hardware item.

Action**:**

Install the driver by referring to **3.2 Driver Installation**.

9.3 Trouble During Operation (Communication)

(1) Communication with the target device is not possible.

Cause**:**

The driver may not be installed correctly.

Action**:**

Check if “USB Serial Port” and “USB Serial Converter” are installed correctly by referring to **3.3 Confirmation of USB Driver Installation**.

Cause:

The port list box may not be set correctly.

Action:

Set the port confirmed with the Device Manager.

Cause**:**

There may be an incorrect connection between the target cable and target system.

Action**:**

Check if the connection is correct.

Pay special attention to the following connections because the connections are confusing:

Connect TXD of the target cable to RXD of target device

Connect RXD of the target cable to TXD of target device

Cause**:**

The power may not be supplied to the target device correctly.

Action**:**

<1> Check that the clock is supplied in the target system.

<2> Check that the power is supplied in the target system.

If the power or clock is supplied from the FPL, check if the setting of the MODE switch is correct.

Cause**:**

The PRM file selected in the Device Setup window may be incorrect.

Action**:**

Use a PRM file that matches the target device.

Refer to **CHAPTER 4 OPERATION USING GUI SOFTWARE** for information about PRM files.

Remark A parameter file (.prc) for FlashPro3 is unusable.

Cause:

The supply oscillator setting selected in the Device Setup window may be incorrect.

Action:

Set the supply oscillator that matches the target device specifications and environment used.

Cause:

The speed list box setting selected in the Device Setup window may be incorrect.

Action:

Set the speed list box correctly by checking the user’s manual for the target device.

Cause:

The power supply capacity of the USB port of the personal computer may be low (when the MODE switch is set to MODE2, MODE3, or MODE4).

Action:

Try using another personal computer or supply power from the target system by setting the MODE switch to MODE1.

Cause:

Security may be set.

Action:

Check that security is not set.

(2) The Status LED does not blink during erase operation.

In accordance with the specifications of the FPL, the Status LED may not blink during erase operation.
To confirm the erasure status, check the following message in the action log window of the GUI software.

Message during erase operation: “Flash Erasing...”
Message for completion of erasure: “chip erase finish.” or “all block erase finish.”

Cause:

The power supply capacity of the USB port of the personal computer may be low (when the MODE switch is set to MODE2, MODE3, or MODE4).

Action:

Try using another personal computer or supply power from the target system by setting the MODE switch to MODE1.

APPENDIX A PRODUCT SPECIFICATIONS

A.1 Hardware Specifications

Table A-1. Specifications of Main Unit

	MIN.	TYP.	MAX.
Operating supply voltage (VDD_USB)	4.4 V	5.0 V	5.25 V
Supply current (VDD_USB)			500 mA
Current consumption of the main unit		35 mA	
5.0-V output[Note]	4.2 V	4.8 V	5.05 V
3.3-V output	3.0 V	3.3 V	3.6 V
Target VDD voltage	2.7 V		5.5 V
VDD output current			200 mA
VDD2 output current			200 mA

Note The 5 V output of the FPL depends on the USB port of the host machine. If the supply power of the USB port is unstable or does not satisfy the specifications of the target device, set the MODE switch to MODE1 to use the power supplied from the target system.

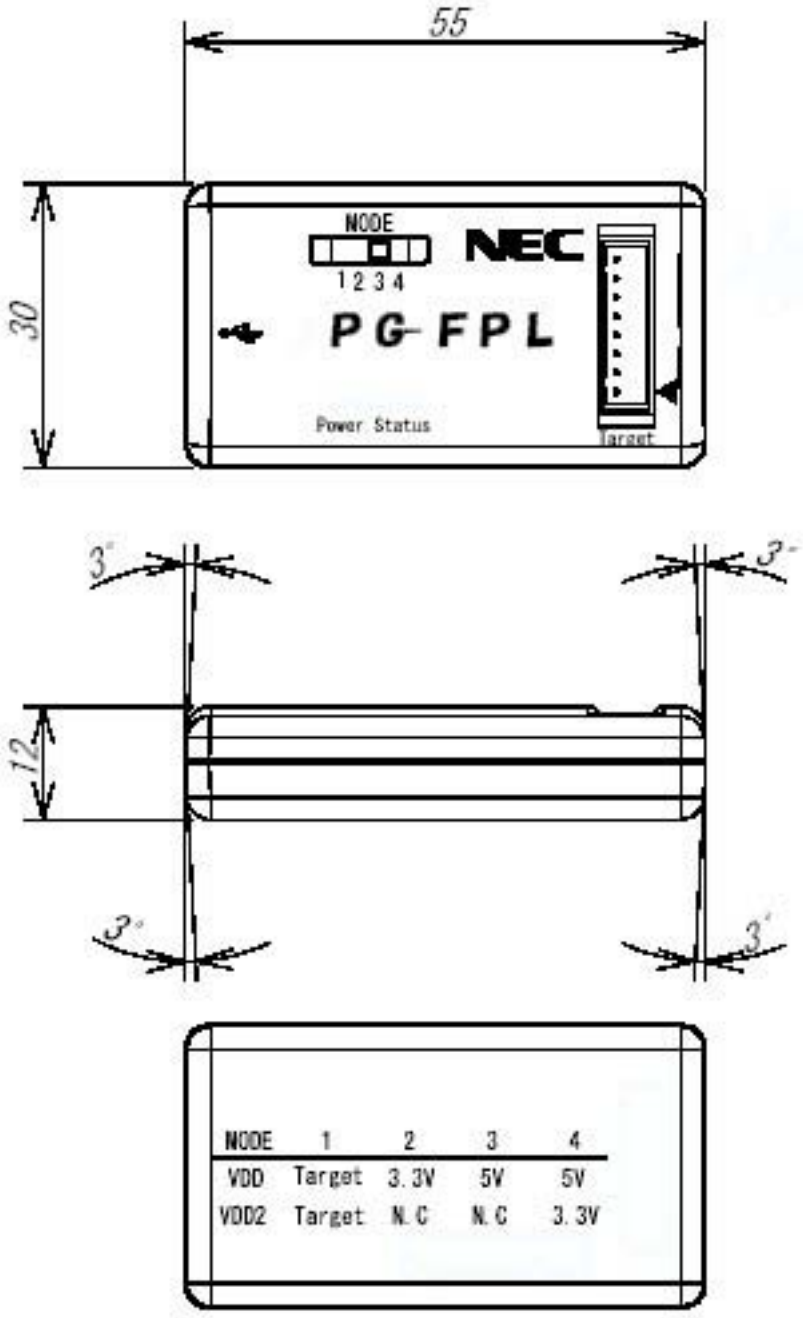
Table A-2. Temperature Range

Operating temperature range	0 to 40°C (no condensation)
Storage temperature range	−15 to 60°C (no condensation)

A.2 Dimensions

(1) PG-FPL

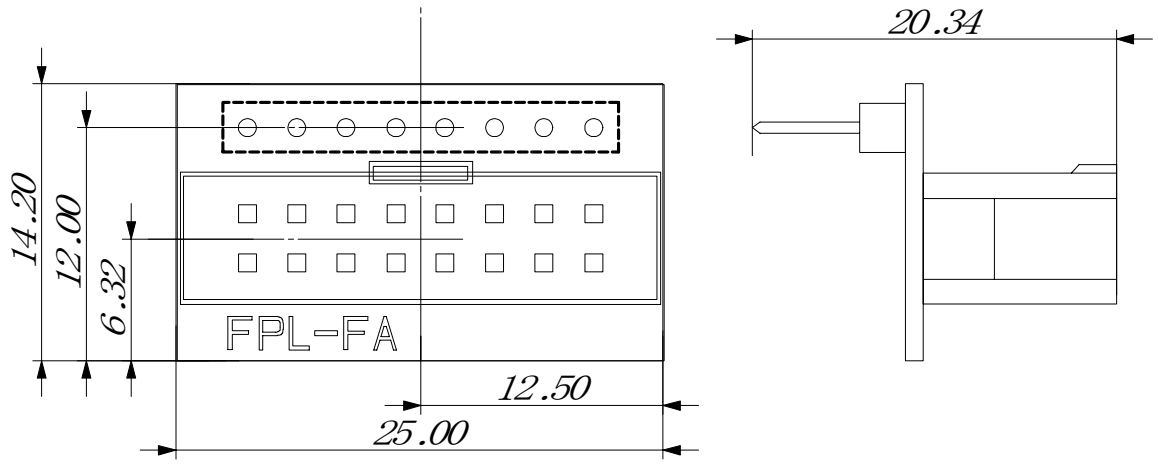
Figure A-1. Dimensions of FPL Main Unit



Unit: mm

(2) FPL-FA

Figure A-2. Dimensions of FPL-FA Main Unit



Unit: mm

(3) Target cable

Figure A-3. Dimensions of Target Cable

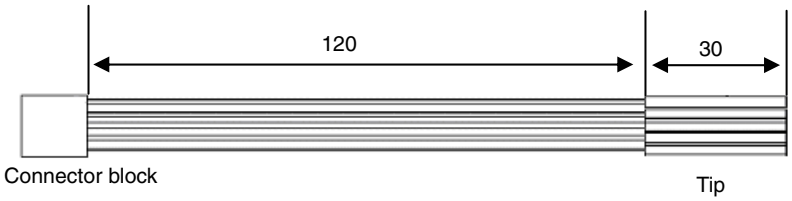
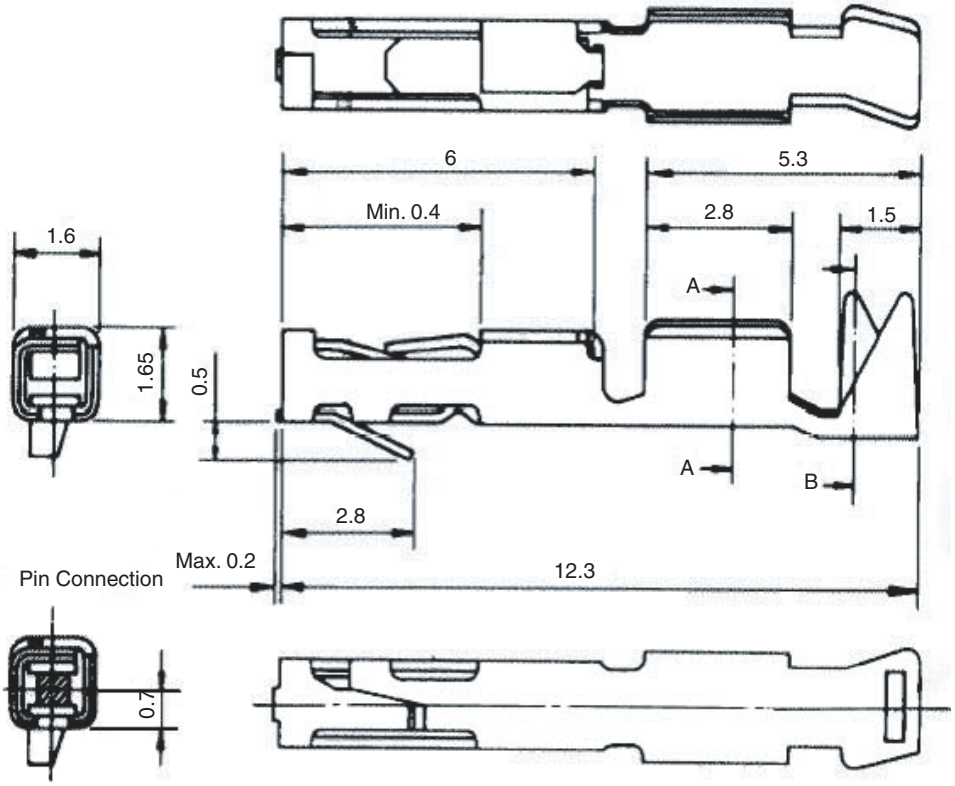


Figure A-4. Dimensions of Tip of Target Cable



Unit: mm

Connector part number: PS-SF-C2-1 (manufactured by JAE)

APPENDIX B WARRANTY AND SUPPORT

B.1 Warranty

The PG-FPL (including hardware and software) can be exchanged with a new product for free only when it has an initial failure.

NEC Electronics' warranty does not cover any other failure.

B.2 Support

NEC Electronics will not provide any support for the PG-FPL.

For initial failures, consult a distributor or dealer.

The latest information concerning the PG-FPL and the supported parameter file are available on the following webpages.

Site: http://www.necel.com/micro/ods/jpn/index.html (Japanese)
http://www.necel.com/micro/ods/eng/index.html (English)