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User's Manual

QB-Programmer

Programming GUI

Operation

[MEMO]

MINICUBE is a registered trademark of NEC Electronics Corporation in Japan and Germany.

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.

INTRODUCTION

Target Readers   This manual is intended for users who use the QB-Programmer 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 QB-Programmer.

Organization   This manual includes the following sections.
- Overview
- Software installation
- Software usage
- Troubleshooting

How to Read This Manual   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.

To understand the overall operation of the QB-Programmer
→ Read this manual according to the **CONTENTS**.

To know the basic specifications, usages, and usage examples of hardware
→ See the **QB-MINI2 User's Manual (U18371E).**

Conventions

Note:	Footnote for item marked with **Note** in the text
Caution:	Information requiring particular attention
Remark:	Supplementary information
Numeric representation:	Binary ... xxxx or xxxxB
	Decimal ... xxxx
	Hexadecimal ... xxxxH

Prefix indicating power of 2 (address space, memory capacity):
K (kilo): 2^{10} = 1,024
M (mega): 2^{20} = $1,024^2$

User's Manual U18527EJ1V0UM

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

Term	Meaning
MINICUBE2	General name of QB-MINI2, on-chip debug emulator with programming function
QBP	Abbreviation of programming GUI QB-Programmer
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
Target board	Target board for MINICUBE2, on which NEC Electronics on-chip flash memory microcontroller is mounted
FA adapter	Conversion adapter to write programs to NEC Electronics on-chip flash memory microcontroller[Note]

Note   The FA adapter (FA-xxxx) 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: +81-42-750-4172

Related Documents   Please use the following documents in combination with this manual.
The related documents listed below may include preliminary versions. However, preliminary versions are not marked as such.

O Documents Related to Development Tools (User's Manuals)

Document Name	Document Number
QB-Programmer Programming GUI Operation	This document
QB-MINI2 On-Chip Debug Emulator with Programming Function	U18371E

**Caution   The related documents listed above are subject to change without notice.
Be sure to use the latest version of each document for designing, etc.**

O Documents Related to Development Tools (Documents except User's Manuals)

Document Name	Document Number
MINICUBE2 Diagnostic Tool	ZUD-CD-06-0044

**Caution   The related documents listed above are subject to change without notice.
Be sure to use the latest version of each document for designing, etc.**

CONTENTS

CHAPTER 1 OVERVIEW

The programming GUI "QB-Programmer" (QBP) is a software tool that is used to erase, write, and verify programs on the target system or FA adapter, on which an NEC Electronics single-power-supply on-chip flash memory microcontroller is mounted, by using the on-chip debug emulator with programming function QB-MINI2 (MINICUBE2), via a 16-pin target cable (target cable). The QBP can also be used to perform self-testing and firmware updates using the MINICUBE2 diagnostic tool.

1.1 Features

The programming function has the following features when the QBP is used together with MINICUBE2.

- Supports single-power-supply on-chip flash memory microcontrollers
- Compact and lightweight
- Supports USB interface as a host interface
- Supports UART and CSI-H/S as a target device interface
- Reads device-specific parameters required for programming from the parameter file (*.PRM)
- Can supply 3 or 5 V power to the target device (max. 100 mA)
- Can supply 4, 8, or 16 MHz clock to the target device
- Can perform self-testing and firmware updates using the MINICUBE2 diagnostic tool

1.2 Writing Quality

Thoroughly confirm, verify and evaluate the following points before using the QBP, in order to improve the writing quality.

- Design circuits as described in the user's manuals for the device and MINICUBE2.
- Use the device, QBP and MINICUBE2 as described in the user's manual for each product.
- The power supplied to the target system is stable.

1.3 Supported Devices

For devices supported by the QBP, see the following document or website.

- Document: QB-MINI2 Operating Precautions
- URL: http://www.necel.com/micro/english/product/sc/allflash/minicube2.html

1.4 System Configuration

The system configuration for flash programming is as follows.

Figure 1-1. System Configuration for Flash Programming
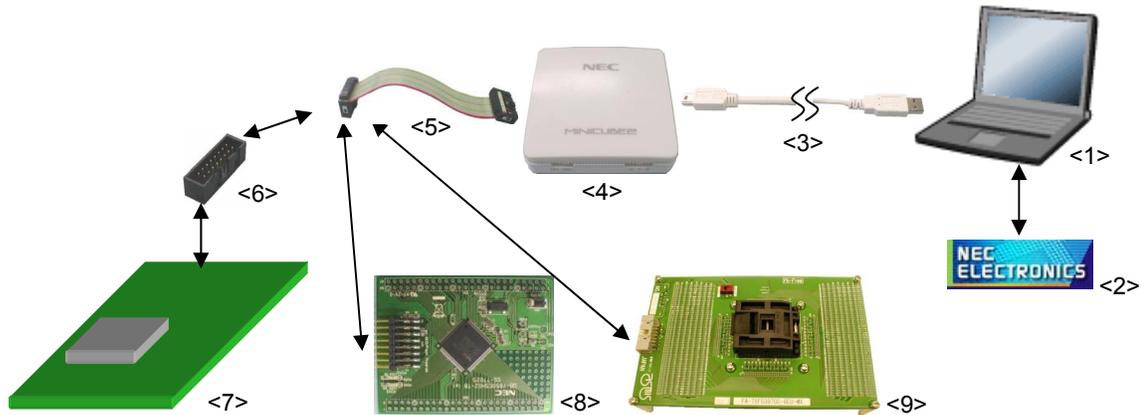
<1> Host machine

   Those which are equipped with USB ports

<2> Software

   QB-Programmer, USB driver, MINICUBE2 diagnostic tool, parameter file, etc.

<3> USB cable (supplied with MINICUBE2)

<4> MINICUBE2

<5> 16-pin target cable (supplied with MINICUBE2)

<6> Target connector (sold separately)

<7> Target system

<8> Target board QB-xxxx-TB (sold separately)

<9> FA adapter FA-xxxx (sold separately; a product of Naito Densei Machida Mfg. Co., Ltd.)

1.5 Operating Environment

This section explains the following items with respect to the operating environment.

- Hardware environment
- Software environment

1.5.1 Hardware environment

(1) Host machines
- PC98-NX series, IBM PC/AT^{TM} compatible
- USB 2.0 (compatible with 1.1)

(2) Supported hardware tool
- QB-MINI2

1.5.2 Software environment

(1) OS (any of the following)
- Windows 98
- Windows Me
- Windows 2000
- Windows XP

   Caution Installing the latest Service Pack for the OS used is recommended.

(2) Parameter file (separately available)
- Parameter file for the target device used

   Reference Download the parameter file from the following NEC Electronics website (ODS).
                  URL: http://www.necel.com/micro/ods/eng/

   Remark To search for the parameter file based on the device name, search the name under the [Each Device Series] menu.

(3) Program files
- Motorola HEX format
- Intel HEX format

CHAPTER 2   SOFTWARE INSTALLATION

This chapter explains the following items for QBP installation.
- Obtaining software
- Installation
- Uninstallation
- Updating firmware
- MINICUBE2 diagnostic tool

2.1 Obtaining Software

Download the QBP, USB driver, MINICUBE2 diagnostic tool, and parameter file from the following NEC Electronics website (ODS).

<QBP, USB driver, MINICUBE2 diagnostic tool>
URL: http://www.necel.com/micro/ods/eng/tool/MINICUBE2_Software/list.html

<Parameter file>
URL: http://www.necel.com/micro/ods/eng/

Remark   To search for the parameter file based on the device name, search for the name under the [Each Device Series] menu.

Caution   Use of the latest version of software is recommended. If you wish to receive an upgrade notification, complete the registration for the upgrade notification service, found on the ODS home page.

2.2 Installation

This section explains how to install the QBP, USB driver, MINICUBE2 diagnostic tool, and parameter file.

Table 2-1. Installation

Item	Method
QBP	Run the downloaded executable file and complete installation following the directions on the installer screen.
USB driver	
MINICUBE2 diagnostic tool	The MINICUBE2 diagnostic tool is included in the MINICUBE utilities.
Parameter file (*.PRM)	Run the downloaded self-extracting file. A *.PRM file is decompressed in a folder. Copy the decompressed parameter file to an arbitrary folder.

The folder configuration after installation is as follows.

```
C:\
  └─ \Program Files                    ⎫
        └─ \NEC Electronics Tools      ⎬ Folder for which installation is specified
              └─ \QBP                  ⎭
                    └─ \V1.00
                          └─ \BIN  ◄──── Folder in which QBP is stored
                                [qbp.exe]
                                [qbp.dll]
                                [qbp.ini] ◄──── File containing QBP settings
                          └─ \DOC  ◄──── Folder in which QBP documents are stored
                    └─ \V2.00
                          ⋮
              └─ \MQB2ALL  ◄──── Folder in which USB driver is stored
                          [mqb2all.sys]
                          [mqb2all.inf]
              └─ \MINICUBE Utilities
                    └─ \V1.00
                          └─ \BIN  ◄──── Folder in which MINICUBE2 diagnostic tool is stored
                                [mqb2utl.exe]
                                [ieocdutl.exe]
                          └─ \DOC  ◄──── Folder in which MINICUBE2 diagnostic tool documents are stored
                    └─ \V1.10
                          ⋮
```

2.3 Uninstallation

This section explains how to uninstall the QBP, USB driver, MINICUBE2 diagnostic tool, and parameter file.

Table 2-2. Uninstallation

Item	Method
QBP	Open [Add/Remove Programs] (or [Add or Remove Programs]) on the Control Panel and uninstall these items.
USB driver	
MINICUBE2 diagnostic tool	
Parameter file (*.PRM)	Delete the parameter file (*.PRM).

2.4 Updating Firmware

Firmware is a program that is embedded in the device for controlling MINICUBE2. Updating the firmware enables the following.
- Addition of newly supported devices
- Removal of restrictions

For version confirmation of firmware, system configuration and update procedure, refer to the **MINICUBE2 Diagnostic Tool User's Manual**.

Cautions 1. Use of the latest version of software is recommended. If you wish to receive an upgrade notification, complete the registration for the upgrade notification service, found on the ODS home page.

2. If update of firmware is improperly performed, MINICUBE2 may no longer operate. Be sure to refer to the MINICUBE2 Diagnostic Tool User's Manual when updating firmware.

2.5 MINICUBE2 Diagnostic Tool

The MINICUBE2 diagnostic tool can be used to find if the reason that the QBP does not operate normally derives from a MINICUBE2 defect or from other hardware. For the usage, refer to the **MINICUBE2 Diagnostic Tool User's Manual**.

CHAPTER 3 SOFTWARE USAGE

This chapter explains functional details on windows and dialog boxes of the QBP.

Cautions 1. For the specifications, settings, connection, startup procedure and examples for basic usages of MINICUBE2, refer to the QB-MINI2 User's Manual.

2. Be sure to remove the 78K0-OCD board.

3. Terminate the debugger, MINICUBE2 diagnostic tool, and MINICUBE OCD Checker before starting the QBP.

3.1 Main Window

In the Start menu, point to "All programs", "NEC Electronics Tools", "Latest Version", and then choose "QB-Programmer VX.XX" to start the QBP. When the QBP is started normally, the following screen appears.

Figure 3-1. Main Window
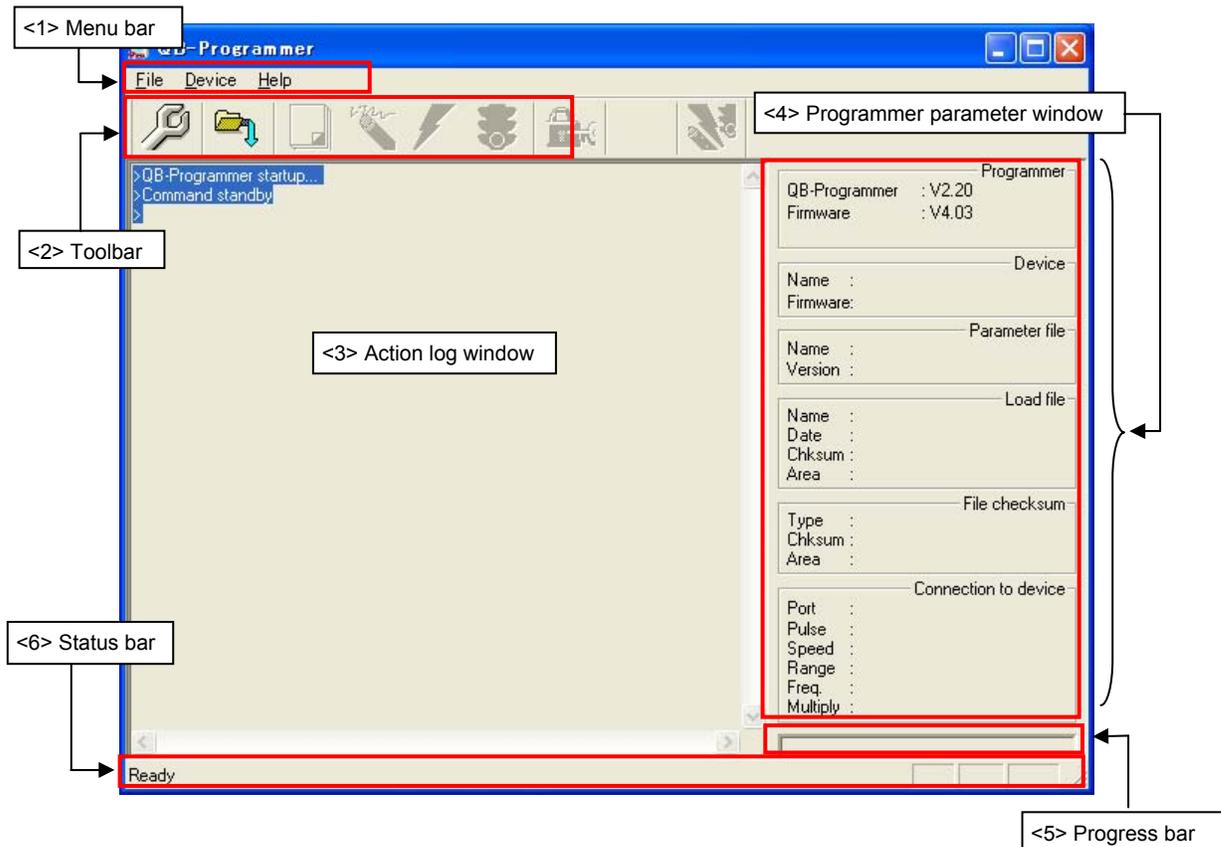
The main window consists of the following areas.

	Name	Displayed Items	Refer to:
<1>	Menu bar	Menu items executable by the QBP	3.2
<2>	Toolbar	Frequently used commands, as button.	3.3
<3>	Action log window	A QBP action log	3.4
<4>	Programmer parameter window	Programming parameter settings.	3.5
<5>	Progress bar	Command progress shown as a percentage or with message	3.6
<6>	Status bar	Hints for commands and toolbar	3.7

3.2 Menu Bar

The menu bar displays the commands that are available for the QBP. Some commands may be unavailable depending on the parameter selected, or when the QBP is started for the first time.

Caution During command execution do not execute another command or terminate the QBP.

3.2.1 [File] menu
The following pull-down menu appears by clicking the [File] menu.
This menu includes commands related to file operation.

Figure 3-2. [File] Menu
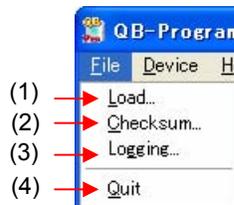
(1) [Load] command

The [Load] command selects a program file. When this command is executed, the program file select dialog box appears. Browse the relevant folder and select the target program file in the folder. The selected program file will be written to the flash memory in the target device, by executing the [Program] or [Autoprocedure (EPV)] command.

Remark   In the program file select dialog box, the folder from which a program file was selected the last time is displayed.

Figure 3-3. Program File Select Dialog Box
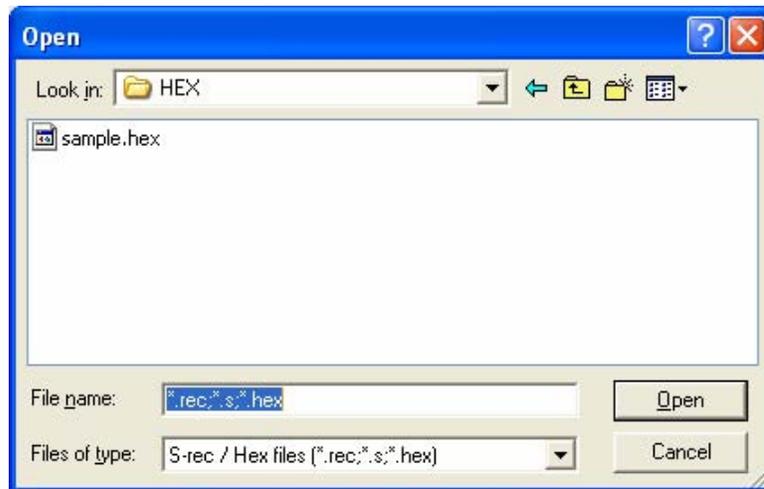
After the program file is selected, the QBP calculates the checksum and displays the result in the [Load file] area in the programmer parameter window. The checksum is calculated as follows.

Method: Subtraction (16-bit arithmetic)

Range: From start to end of the program file

Open button

Selects the specified program file as a program to be written to the flash memory in the target device.

Cancel button

Closes the window without selecting a program.

(2) [Checksum] command

The [Checksum] command calculates the checksum of the selected program file and displays the result. When this command is executed, the Checksum dialog box appears. Select the optional calculation method and the target address range, and click the OK button. The result will then be displayed in the [File Checksum] area in the action log window and programmer parameter window. This command can be executed after the [Setup] and [Load] command are executed. If the [Setup] or [Load] commands is executed again after the [Checksum] command is executed, the result displayed in the [File Checksum] area in the programmer parameter window will be cleared.

Figure 3-4. Checksum Dialog Box
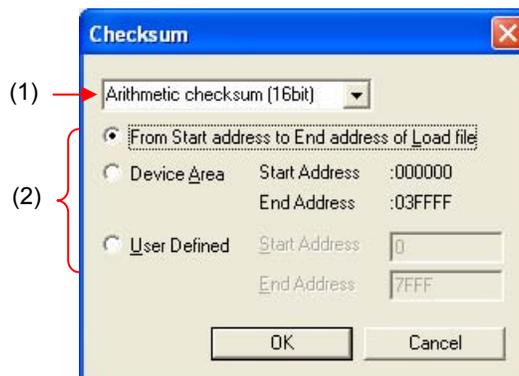
<1> Checksum calculation mode selection

    Select the mode for calculating checksum of the selected program file.

      Arithmetic checksum (16bit): 16-bit arithmetic (subtraction)

      CRC sum (32bit):   32-bit CRC

<2> Address range selection

    Select the range for calculating checksum of the selected program file. If there is no program file data in the specified range, the specified range is filled with FFh for calculation.

      From Start address to End address of Load file:

                From the start to end addresses of the selected program file

      Device Area: From the start to end addresses of the device, which are contained in the selected parameter file

      User Defined: Any range can be specified by inputting the addresses to the [Start Address] and [End Address] text boxes

OK button

Displays the calculation result in the [File Checksum] area in the action log window and programmer parameter window.

Cancel button

Closes the dialog box without saving the settings made in the Checksum dialog box.

Figure 3-5. Checksum Result
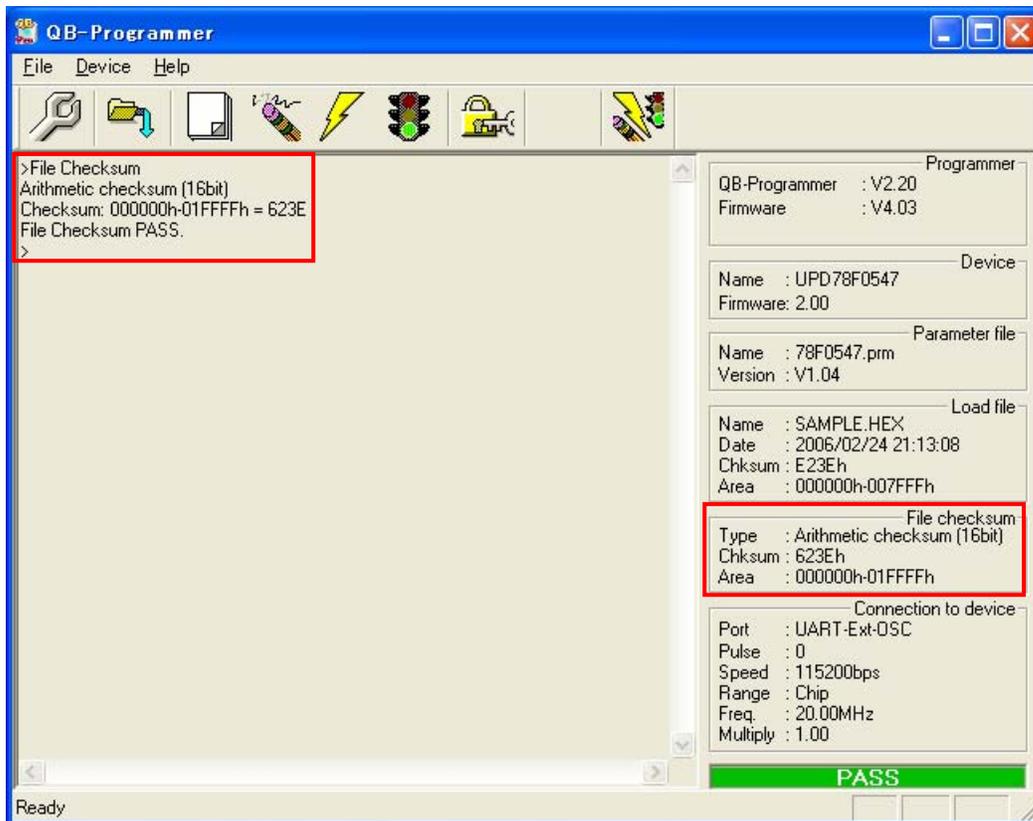
(3) [Logging] command

The [Logging] command saves information displayed in the action log window in the log file. When this command is executed, the log file save dialog box appears. Move to an arbitrary folder, select the log file in the File name text box, and the click the ⌷Save⌷ button. The log file will then be saved. The [Logging] command on the menu bar will be checked. The check mark will be cleared by clicking the [Logging] command again and saving of the log file will be stopped.

Remark In the log file save dialog box, the log file that was saved the last time is displayed.

Figure 3-6. Log File Save Dialog Box
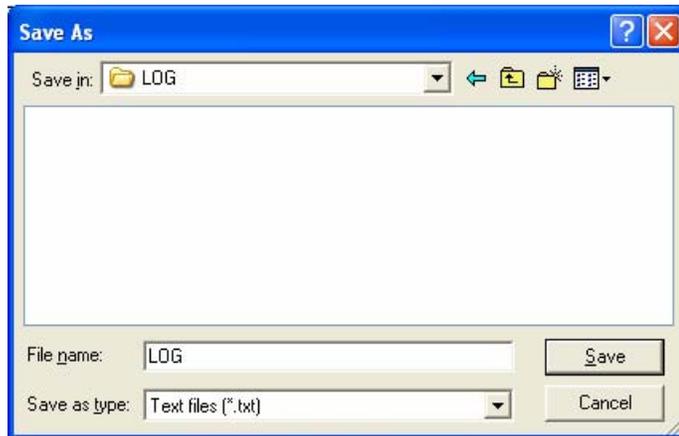
⌷Save⌷ button
Saves the specified log file.

⌷Cancel⌷ button
Closes the dialog box without saving the log file.

(4) [Quit] command

The [Quit] command terminates the QBP. The QBP can also be terminated by clicking the ⌷×⌷ button on the right end of the title bar in the Main window. When the QBP is terminated, various settings are saved in the *qbp.ini* file, and these settings are loaded when the QBP is started the next time. The settings include the settings made in the Device Setup dialog box and the program file selected. The *qbp.ini* file is created in a folder where the QBP was installed.

3.2.2 [Device] menu

The following pull-down menu appears by clicking the [Device] menu.

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

Figure 3-7. [Device] Menu
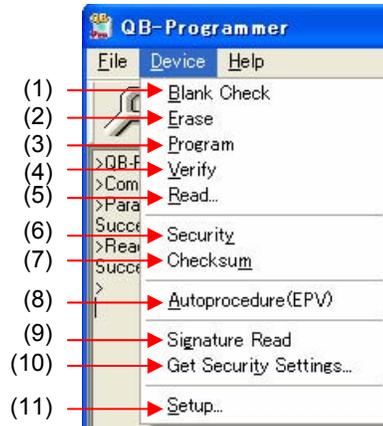
(1) [Blank Check] command

The [Blank Check] command performs blank check for the flash memory in the target device. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. If the flash memory has already been erased, "Blank Check PASS" is displayed in the action log window. If the flash memory has not yet been erased, "Blank Check ERROR (E2008): Not Blank." is displayed. If this error is displayed, erase the entire area of the flash memory before starting programming.

(2) [Erase] command

The [Erase] command erases the flash memory in the target device and initializes the security functions. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. While erasing the flash memory is in progress, the progress status is displayed in the action log window. When execution of this command is completed, the QBP displays the command execution result in the target device. Whether to perform the [Blank Check] command before executing this command depends on the [Blank check before Erase] check box setting in the [Command options] area on the [Advanced] tab in the Device Setup dialog box. If the [Erase] command is executed for the flash memory that has already been erased with the [Blank check before Erase] check box selected, "Blank check Chip: PASS. Erase skipped." is displayed in the action log window and erasure is not performed.

(3) [Program] command

The [Program] command transmits the program file selected with the [Load] command to the target device and writes programs to the flash memory. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. The progress status of this command is displayed as a percentage in the action log window. When execution of this command is completed, the QBP displays the command execution result in the target device. Each command option after execution of this command depends on the settings of the [Read verify after Program], [Security flag after Program] and [Checksum after Program] check boxes in the [Command options] area on the [Advanced] tab in the Device Setup dialog box. For details on the check boxes, refer to **3.2.2 (11) (b) <1> [Command options] area**.

(4) [Verify] command

The [Verify] command transmits the program file selected with the [Load] command to the target device and verifies the data written to the flash memory in the target device. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. The progress status of this command is displayed as a percentage in the action log window. When execution of this command is completed, the QBP displays the command execution result in the target device.

(5) [Read] command

The [Read] command loads data on the flash memory in the target device and saves it to a file. When this command is executed, the program data save dialog box appears. Input an arbitrary file name into the [File name] text box, move to an arbitrary folder, and then click the Save button. The loaded program data will then be saved. Select from the [Save as type] drop-down list either "Intel Hex files (*.hex)" or "Motorola S-rec files (*.rec,*.s)" for the save format.

Remark In the program data save dialog box, the folder in which program data was saved the last time is displayed.

Figure 3-8. Program Data Save Dialog Box
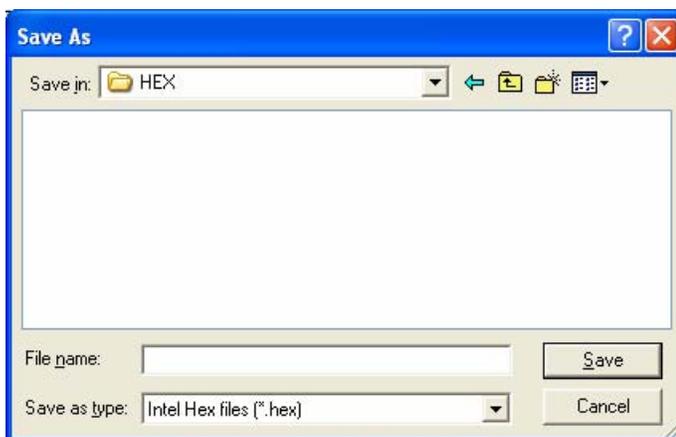
Save button
Saves the program data into a file and closes the dialog box.

Cancel button
Closes the program data save dialog box without saving the program data into a file.

(6) [Security] command

The [Security] command sets the security functions for the target device and sets the boot area. These settings can be made in the [Security flag settings] area on the [Advanced] tab in the Device Setup dialog box. For details on the security function, refer to **3.2.2 (11) (b) <2> [Security flag settings] area**.

(7) [Checksum] command

The [Checksum] command reads the checksum calculated in the target device and displays it in the action log window. When using a 78K0S microcontroller, this command also displays the checksum of the program file and compares both.

Caution   **The checksum read by this command differs from the one displayed in the [Load file] area in
the programmer parameter window.**

The checksum is calculated as follows.

<When using a microcontroller other than 78K0S>
    Method: Subtraction (16-bit arithmetic)
    Range: Area set in the [Operation Mode] area on the [Advanced] tab in the Device Setup dialog box

**Figure 3-9. Action Log Window After [Checksum] Command Execution
<with Microcontroller Other Than 78K0S>**

```
>Checksum
Checksum: 0x623E
Checksum PASS
>
```

<When using a 78K0S microcontroller>
    Method: Division (original)
    Range: Area set in the [Operation Mode] area on the [Advanced] tab in the Device Setup dialog box

Figure 3-10. Action Log Window After [Checksum] Command Execution <with 78K0S Microcontroller>
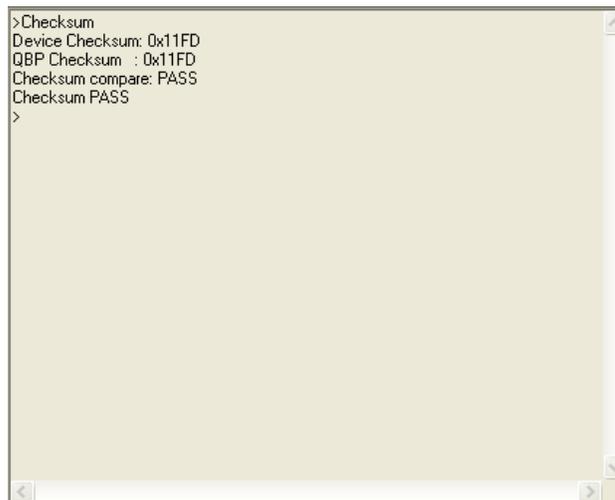
```
>Checksum
Device Checksum: 0x11FD
QBP Checksum   : 0x11FD
Checksum compare: PASS
Checksum PASS
>
```

(8) [Autoprocedure (EPV)] command

The [Autoprocedure (EPV)] command continuously executes the [Erase] and [Program] commands. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box.

The progress status of this command is displayed in the action log window. When execution of this command is completed, the QBP displays the command execution result in the target device. Each command option after execution of this command depends on the settings of the [Blank check before Erase], [Read verify after Program], [Security flag after Program], and [Checksum after Program] check boxes in the [Command options] area on the [Advanced] tab in the Device Setup dialog box. For details on the check boxes, refer to **3.2.2 (11) (b) <1> [Command options] area**.

Figure 3-11. Action Log Window After [Autoprocedure (EPV)] Command Execution

```
>AutoProcedure(Epv)
Blank check Chip: Not blank, Erase need.
Erasing...
Erase Chip : PASS
Program Chip:
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
PASS
AutoProcedure(Epv) PASS
>
```

(9) [Signature Read] command

The [Signature Read] command reads signature information of the target device, such as the device name, flash memory information, and so on.

The read result is displayed in the [Device] area in the action log window and programmer parameter window.

(10) [Get Security Settings] command

The [Get Security Settings] command reads the settings for the security functions for the target device and the boot area and displays the result in the [Security flag settings] area on the [Advanced] tab in the Device Setup dialog box. When execution of this command is enabled, execute this command before the [Security] command, check the settings for the security functions or the boot area, and then add the security settings. For details on the security functions, refer to **3.2.2 (11) (b) <2> [Security flag settings] area**.

Figure 3-12. [Get Security Settings] Command
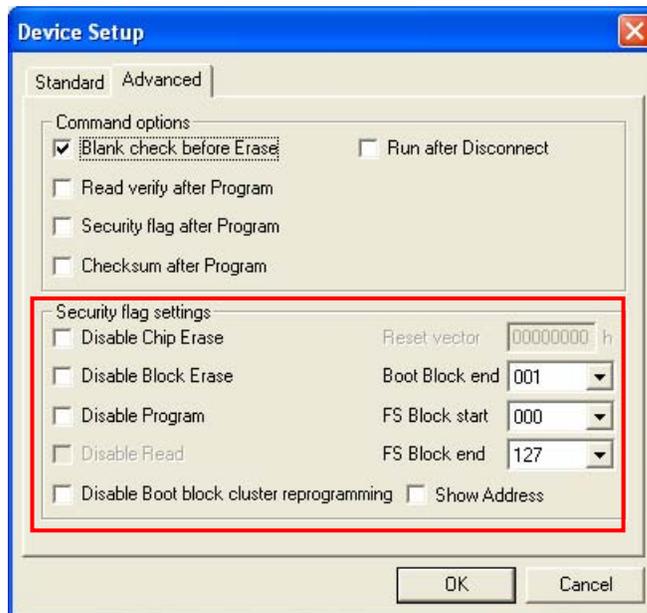
(11) [Setup] command

When the [Setup] command is executed, the Device Setup dialog box appears. In this dialog box, perform the settings in accordance with the user environment for flash memory programming, and set command options and security settings. Each time the QBP is started, the QBP loads the parameter file (.PRM) that was used last and displays the settings. Settings for the items not dimmed can be changed in accordance with the user environment. Switch the [Standard] and [Advanced] tabs for setting.

Figure 3-13. Device Setup Dialog Box

(a) [Standard] tab in Device Setup dialog box

On the [Standard] tab, set the programming environment of the flash memory in the target device.

This tab consists of the [Parameter File], [Target Device Connection], [Supply Oscillator], and [Operation Mode] areas. The overall basic settings that are made in accordance with the user environment and target device are available. The mode for communication with the target device, operating clocks, or the like that can be set vary depending on the device used, so refer to the manual for each device.

Figure 3-14. [Standard] Tab in Device Setup Dialog Box
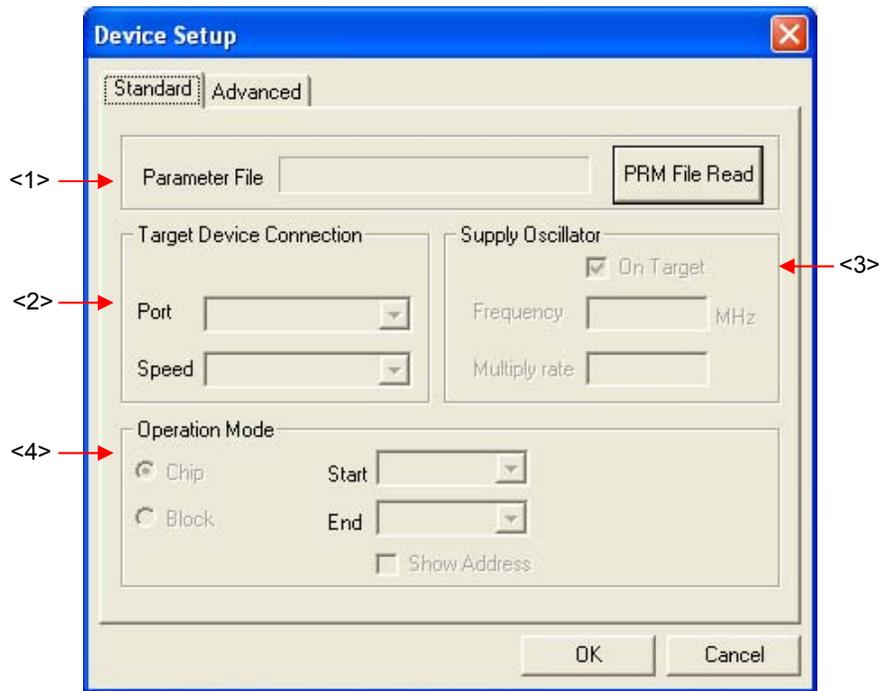
OK button

Saves the settings made on the [Standard] and [Advanced] tabs and closes the Device Setup dialog box.

Cancel button

Closes the Device Setup dialog box without saving the settings made on the [Standard] and [Advanced] tabs.

<1> [Parameter File] area

Select the parameter file in this area. The selected parameter file name is displayed in this area.

Figure 3-15. [Parameter File] Area

PRM File Read button

Clicking this button opens the parameter file select dialog box, so select the parameter file that has been copied in an arbitrary folder.

Remark   In the parameter file select dialog box, the folder from which a parameter file was selected the last time is displayed.

Figure 3-16. Parameter File Select Dialog Box
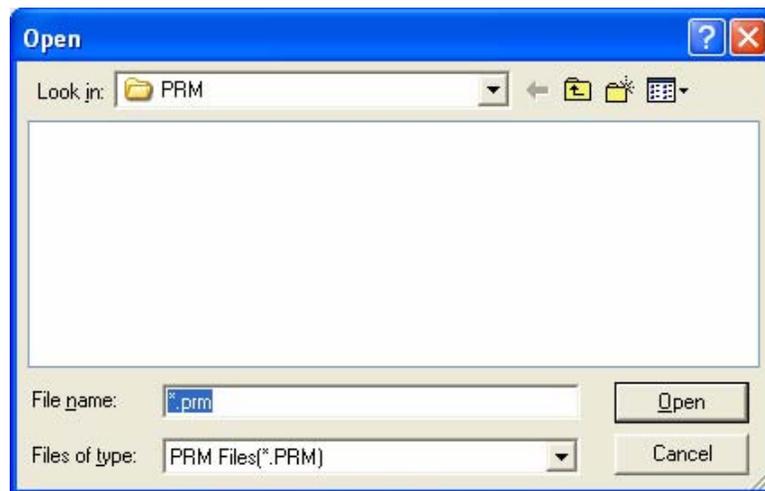
Open button

Selects the specified parameter file as a file to be written to the flash memory in the target device.

Cancel button

Closes this dialog box without selecting a parameter file.

Remark   A parameter file contains timing data and parameters required for programming the flash memory in the target device. Data in a parameter file affects the reliability of the programmed data, so do not change the data. A parameter file is protected by the checksum; if the checksum result is invalid, the QBP will not accept the parameter file.

<2> [Target Device Connection] area
Select the communication channel between MINICUBE2 and the target device.

Figure 3-17. [Target Device Connection] Area

[Port] drop-down list box
Select the mode for communication between MINICUBE2 and the target device.
<When using a V850 microcontroller>
• UART-ch0
• SIO-H/S

<When using a 78K0 microcontroller (All Flash)>
• UART-Ext-OSC (with external resonator used)
• UART-Ext-QB2CLK (with MINICUBE2 clock used)

<When using a 78K0 (other than All Flash), 78K0S, or 78K0R microcontroller>
• UART-ch0
• UART-INT-OSC (with internal high-speed oscillation clock used) **Note**

Note Support of UART-INT-OSC is different with a device.
For the presence or absence of support, refer to the user's manual for each device.

[Speed] drop-down list box
Select a communication rate for the channel specified.
<When selecting UART>
• 9600 bps
• 19200 bps
• 31250 bps
• 38400 bps
• 57600 bps
• 76800 bps
• 115200 bps
• 128000 bps
• 153600 bps
• 250000 bps
• 500000 bps
• 1000000 bps

Remark For the selectable speed, refer to the user's manual for the device used.

<When selecting SIO-H/S>

• 250 KHz

• 500 KHz

• 1 MHz

• 2 MHz

Remark For the selectable speed, refer to the user's manual for the device used.

<3> [Supply Oscillator] area
Set the clock supplied to the target device.

Figure 3-18. [Supply Oscillator] Area

[On Target] check box
Specify which clock is supplied to the target device: a clock mounted on the target system, or a clock on the MINICUBE2 side. If this check box is selected, the clock mounted on the target system will be used. If this check box is cleared, clock on the MINICUBE2 side will be used.

[Frequency] text box
Set the oscillation frequency of the clock supplied to the target device. When using the clock mounted on the target system ([On Target] check box selected), input its oscillation frequency. When using the clock on the MINICUBE2 side ([On Target] check box cleared), input one of the following.

• 4 MHz

• 8 MHz

• 16 MHz

Remark For the selectable frequency, refer to the user's manual for the device used.

[Multiply rate] text box
Set the division ratio or multiplication ratio of the clock supplied to the target device. If the target device includes the PLL circuit, input the division ratio or multiplication ratio in accordance with the environment used. If the target device does not include the PLL circuit, input "1.0". In the initial screen, the default setting that is loaded from the parameter file is displayed.

Remark For the selectable multiply rate, refer to the user's manual for the device used.

<4> [Operation Mode] area
Switch the operation mode: whether to execute commands, such as flash memory programming, for the entire flash memory area, or in the block units. The settings made here are valid for the [Blank Check], [Erase], [Program], [Verify], [Read], [Checksum], and [Autoprocedure (EPV)] commands. Modes unavailable in the target device cannot be selected.

Figure 3-19. [Operation Mode] Area

If [Chip] is selected:
The entire flash memory area of the target device is subject to command processing, such as programming.

If [Block] is selected:
Specify the block range subject to the command processing, using the [Start] and [End] drop-down list boxes. These lists show the block numbers where the flash memory in the target device is configured.

[Show Address] check box
Specify the display format in the [Start] and [End] drop-down list boxes. If this check box is selected, the block address will be displayed. If this check box is cleared, the block number will be displayed.

(b) [Advanced] tab in Device Setup dialog box

On the [Advanced] tab, set the command options to be added to a programming command and set the security settings. This tab consists of the [Command options] and [Security flag settings] areas.

Figure 3-20. [Advanced] Tab in Device Setup Dialog Box
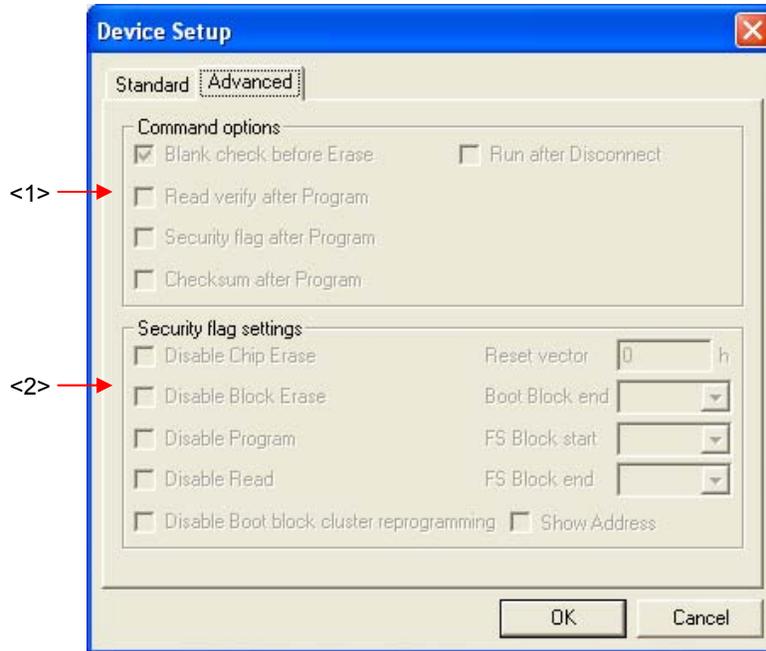
<1> [Command options] area

Set command options to be added to the [Erase], [Program], or [Autoprocedure (EPV)] command.

Figure 3-21. [Command options] Area
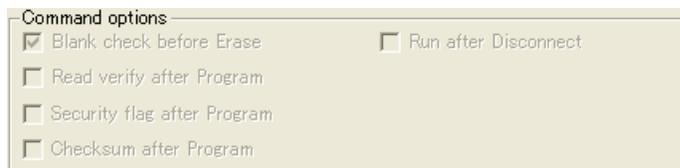
[Blank check before Erase] check box

If this check box is selected, the [Blank Check] command is automatically executed before the [Erase] and [Autoprocedure (EPV)] commands are executed.

[Read verify after Program] check box

If this check box is selected, the [Verify] command is automatically executed after the [Program] and [Autoprocedure (EPV)] commands are executed.

[Security flag after Program] check box

If this check box is selected, the [Security] command is automatically executed after the [Program] and [Autoprocedure (EPV)] commands are executed.

[Checksum after Program] check box

If this check box is selected, the [Checksum] command is automatically executed after the [Program] and [Autoprocedure (EPV)] commands are executed.

[Run after Disconnect] check box

If this check box is not selected, RESET signal is changed to low level after each command.

If this check box is selected, RESET signal is changed from low level to Hi-Z after each command.

<2> [Security flag settings] area

Specify the security functions to be enabled. When execution of the [Get Securi<u>t</u>y Settings] command is enabled, execute it before the [Securi<u>t</u>y] command, check the settings for the security functions or the boot area, and then add the security settings.

Caution   If the security functions are set and the [Securi<u>t</u>y] command is executed with a 78K0S microcontroller used, the security functions are set to the target device but not enabled unless VDD of the target device is turned off. To enable the security function settings, refer to the system shutdown procedure described in the flash programming chapter in the QB-MINI2 User's Manual (U18371E) and shut down the power supply to the target system.

Figure 3-22. [Security flag settings] Area

[Disable Chip Erase] check box

If this check box is selected, the [<u>E</u>rase] command will be disabled for the entire area of the flash memory in the target device. If this check box is selected, the following dialog box appears.

Figure 3-23. [Disable Chip Erase] Warning Dialog Box

$\boxed{\text{OK}}$ button

The [Disable Chip Erase] check box is selected.

$\boxed{\text{Cancel}}$ button

The [Disable Chip Erase] check box is not selected.

Caution   If the [Disable Chip Erase] function is enabled, erasure for the device can no longer be possible, moreover, the [Disable Chip Erase] function can no longer be disabled.

[Disable Block Erase] check box

If the [Securi<u>t</u>y] command is executed with this check box selected, the [<u>E</u>rase] command is disabled for all the selected blocks in the flash memory selected with the [Block] option button in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. This setting is cleared if the [<u>E</u>rase] command is executed with the [Chip] option button selected in the [Operation Mode] area.

[Disable Program] check box
If the [Security] command is executed with this check box selected, the [Erase] command for all the selected blocks in the flash memory selected with the [Block] option button in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box and the [Program] command is disabled. The [Erase] command is enabled when the [Chip] option button selected. This setting is cleared if the [Erase] command is executed with the [Chip] option button selected in the [Operation Mode] area.

[Disable Read] check box
If the [Security] command is executed with this check box selected, the [Read] command is disabled. The [Erase] command is enabled when the [Chip] option button selected. This setting is cleared if the [Erase] command is executed with the [Chip] option button selected in the [Operation Mode] area.

[Disable Boot block cluster reprogramming] check box
If the [Security] command is executed with this item selected, the boot block set in the [Boot Block end] drop-down list is regarded as the last block and then the boot area is set. If this item is selected, the following dialog box appears.

Figure 3-24. [Disable Boot block cluster reprogramming] Warning Dialog Box

OK button
The [Disable Boot block cluster reprogramming] check box is selected.

Cancel button
The [Disable Boot block cluster reprogramming] check box is not selected.

Caution If the [Disable Boot block cluster reprogramming] function is enabled, rewriting of the boot area and execution the [Erase] command with the [Chip] option button selected in the [Operation Mode] area can no longer be performed for the device, and the [Disable Chip Erase] function can no longer be disabled.

[Reset vector] text box
If an address value is input in this text box and then the [Security] command is executed, the reset vector is changed to the specified address. This setting is cleared if the [Erase] command is executed with the [Chip] option button selected in the [Operation Mode] area. The initial value is 000000h.

[Boot Block end] drop-down list box
Specify the block number. This list shows the block numbers where the flash memory in the target device is configured.

[FS Block start] and [FS Block end] drop-down list boxes

Specify the block number. This is a function to prevent the areas out of the specified range from being written to during flash self programming. This list shows the block numbers where the flash memory in the target device is configured.

[Show Address] check box

Specify the display format in the [Boot Block end], [FS Block start] and [FS Block end] drop-down list boxes. If this check box is selected, the block address is displayed. If this check box is cleared, the block number is displayed.

The following table shows whether the [Erase], [Program], and [Read] commands are enabled when each security function is set.

Command Security Function	[Erase] Command with [Chip] Selected	[Erase] Command with [Block] Selected	[Program] Command	[Read] Command
Disable Chip Erase			Enabled[Note 1]	Enabled
Disable Block Erase	Enabled		Enabled	Enabled
Disable Program	Enabled			Enabled
Disable Read	Enabled	Enabled[Note 2]	Enabled	
Disable Boot block cluster reprogramming		Enabled[Note 3]	Enabled[Note 3]	Enabled

Notes 1. Since the [Erase] command is disabled, data different from that already written to the flash memory cannot be written.

2. The [Erase] command with the [Block] option button selected is disabled if the [Disable Read] function is enabled in the device. For details, refer to the user's manual for the device used.

3. Enabled only for areas other than those specified as the boot area.

Remark The security functions other than [Disable Chip Erase] and [Disable Boot block cluster reprogramming] are cleared if the [Erase] command is executed with the [Chip] option button selected in the [Operation Mode] area.

3.2.3 [Help] menu

The following pull-down menu appears by clicking the [Help] menu.

Figure 3-25. [Help] Menu

(1) [About QB-Programmer] command

This command opens the following dialog box and shows the versions of the QBP and MINICUBE2 firmware.
Clicking the OK button closes this dialog box.

Figure 3-26. [About QB-Programmer] Dialog Box

3.3 Toolbar

The commands frequently used with the QBP are displayed on the toolbar. A command can be executed just by clicking the relevant button. Some commands may be unavailable depending on the parameter selected, or when the QBP is started for the first time. By pointing to a button with the pointer, the hint for the button is displayed on the status bar.

Table 3-1. Toolbar Buttons

	Opens the Device Setup dialog box. The same action is taken as selecting the [Setup] command on the [Device] menu.
	Opens the program file select dialog box. The same action is taken as selecting the [Load] command on the [File] menu.
	Executes the [Blank Check] command. The same action is taken as selecting the [Blank Check] command on the [Device] menu.
	Executes the [Erase] command. The same action is taken as selecting the [Erase] command on the [Device] menu.
	Executes the [Program] command. The same action is taken as selecting the [Program] command on the [Device] menu.
	Executes the [Verify] command. The same action is taken as selecting the [Verify] command on the [Device] menu.
	Executes the [Security] command. The same action is taken as selecting the [Security] command on the [Device] menu.
	Executes the [Autoprocedure (EPV)] command. The same action is taken as selecting the [Autoprocedure (EPV)] command on the [Device] menu.

3.4 Action Log Window

This window displays the log for the QBP actions.

Figure 3-27. Action Log Window

```
>AutoProcedure(Epv)
Blank check Chip: Not blank, Erase need.
Erasing...
Erase Chip : PASS
Program Chip:
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
PASS
AutoProcedure(Epv) PASS
>
```
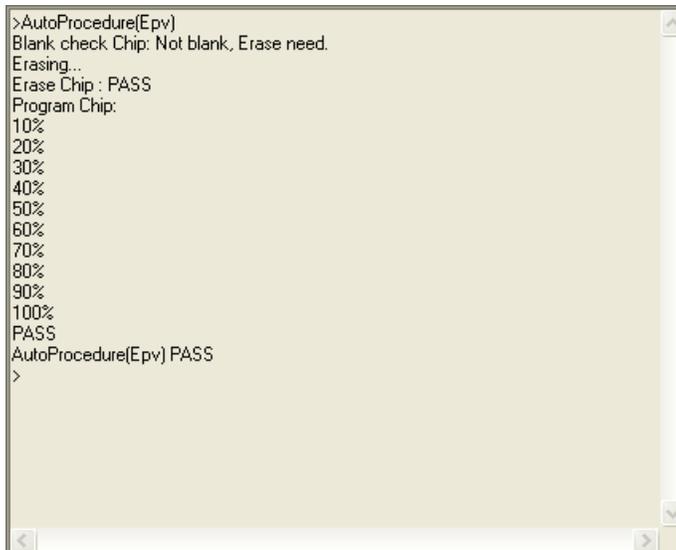
3.5 Programmer Parameter Window

This window displays the programming parameter settings.

Figure 3-28. Programmer Parameter Window

[Programmer] area
Displays the versions of the QBP and MINICUBE2 firmware.

[Device] area
Updated after communication with the target device and displays information on the target device.

[Parameter file] area
Updated after execution of the [Setup] command and displays information on the parameter file selected.

[Load file] area
Updated after execution of the [Load] command and displays information on the program file selected.
The program file checksum result is displayed in the [Chksum] column. The checksum is calculated as follows.
  Method: Subtraction (16-bit arithmetic)
  Range: From start to end of the program file

[File checksum] area
The checksum result is displayed after execution of the [Checksum] command.

[Connection to device] area
Updated after execution of the [Setup] command and displays the settings made on the [Standard] tab in the Device Setup dialog box.
The number of FLMD0 pulses is displayed in the [Pulse] column.

3.6 Progress Bar

The progress bar shows the progress as a percentage or with a message, when a parameter file or program file is selected or a command is executed for the target device.

Figure 3-29. Progress Bar
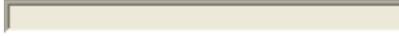
When execution of a command for the target device is completed, the progress bar indicates the result as shown below.

Table 3-2. Progress Bar Display

	Immediately after the QBP is started
	A command execution is in progress or a parameter file or program file is being selected
	A command execution or selection of a parameter file or program file is completed normally
	A command execution or selection of a parameter file or program file is ended abnormally

3.7 Status Bar

By pointing to a command on the menu bar or a button with the pointer, the hint for the command or button is displayed on the status bar.

Figure 3-30. Status Bar
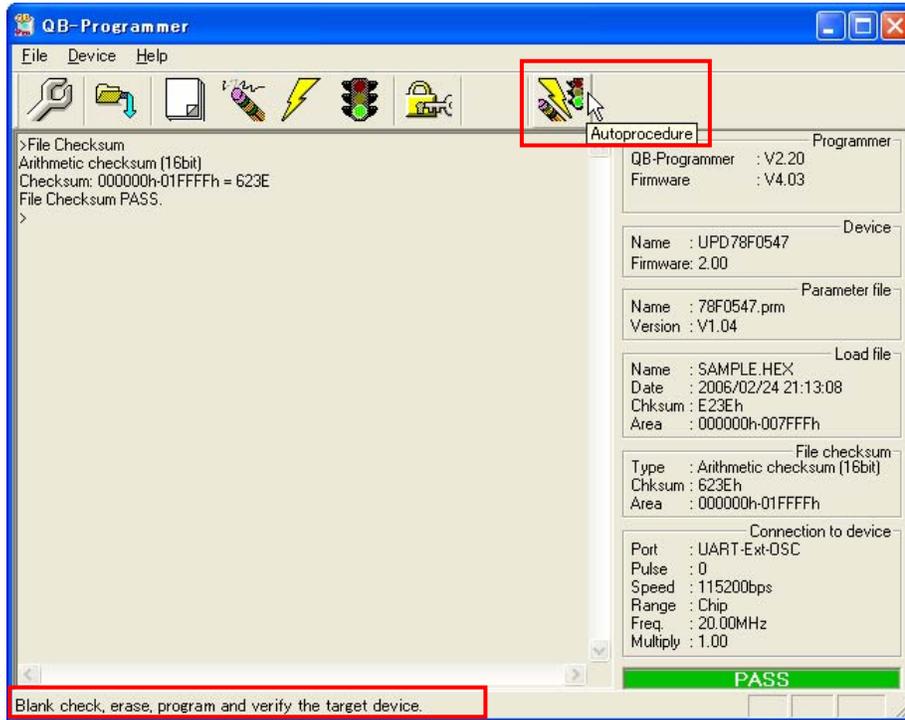
CHAPTER 4 TROUBLESHOOTING

This chapter explains the troubleshooting.

Remark Using the MINICUBE2 diagnostic tool, the user can find out why the QBP does not operate normally, such as a defect in MINICUBE2, or problems in other hardware. For the usage of the tool, refer to the **MINICUBE2 Diagnostic Tool User's Manual**.

4.1 Problems During Startup

This section explains the troubleshooting for problems that may occur from software installation to startup.

(1) When MINICUBE2 is connected to the host machine via a USB interface, the driver is not recognized by Plug and Play.

[Cause]
  The USB connector may not be inserted properly into the USB port of the host machine.

[Action]
  Check that the USB connector is fully inserted into the USB port of the host machine.
  Alternatively, disconnect the USB connector, then insert the USB connector again after a while.

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

[Cause]
  The USB driver may not have been installed normally.

[Action]
  Refer to **CHAPTER 2 SOFTWARE INSTALLATION** and reinstall the USB driver.
  If the file is requested by Plug and Play, specify the following path for the USB driver.
  C:\Program Files\NEC Electronics Tools\MQB2ALL

(3) MINICUBE2 is connected to the host machine but the Power LED on MINICUBE2 is not turned on.

[Cause]
  The USB port of MINICUBE2 or the host machine may have a defect.

[Action]
  Check a defect of MINICUBE2 using the MINICUBE2 diagnostic tool. If a defect is found, consider repair. If there is no defect, try connecting MINICUBE2 to another machine.

(4) The "Add New Hardware Wizard" screen appears when MINICUBE2 is connected with the host machine.

[Cause]
  If the USB connector of MINICUBE2 is not inserted into the USB port during installation but into another USB port, MINICUBE2 may be recognized as a new hardware item.

[Action]
  Select "Search for a suitable driver for my device (recommended)" and install the USB driver.

4.2 Problems During Operation

This section explains the troubleshooting for problems that may occur during operation.

Remark For causes and actions for the messages displayed in the error/warning dialog box and action log window, refer to **APPENDIX A MESSAGES**.

(1) "(E0001): USB host connection failed." is displayed in the action log window.
  [Cause 1]
  The USB cable may not be connected properly or the USB driver may not have been installed normally.
  [Action 1]
  Refer to **4.1 Problems During Startup** and take an appropriate action.

  [Cause 2]
  When "NECPCIF" is expanded in the Device Manager, "NEC Electronics IE-PC Interface [MINICUBE2 USB]" is not displayed. Alternatively, the "!" or "×" is prefixed.
  [Action 2]
  <1> With MINICUBE2 connected to the host machine, right-click the driver marked with the "!" or "×", and then click [Uninstall] on the shortcut menu.
  <2> Execute [Scan for hardware changes] in the Device Manager.
  <3> Reinstall the USB driver by Plug and Play.

  [Cause 3]
  MINICUBE2 may not have been recognized (when connected via USB hub).
  [Action 3]
  Try the following.
  <1> Disconnect the USB cable and then reconnect it.
  <2> Connect the USB connector to another port on the USB hub.
  <3> If the above measures do not resolve the problem, do not use the USB hub but directly connect the USB connector to the USB port of the host machine main unit.

(2) **The following message is displayed in the action log window and the flash memory programming mode cannot be entered.**

(E2001) No response from Target Device. (FLMD) ← When UART is selected

(E2002) No response from Target Device. (RESET) ← When UART is selected

(E2003) No response from Target Device. (FREQ) ← When UART is selected

(E9004) Wait status timeout. ← When SIO-H/S is selected

[Cause 1]

The mode select switch that is used to select the target device may be set incorrectly.

[Action 1]

Confirm the target device and the mode select switch setting.

[Cause 2]

The 78K0-OCD board may be connected.

[Action 2]

Remove the 78K0-OCD board.

[Cause 3]

The connection between the target cable and target system may be wrong.

[Action 3]

<1> Connect the TxD and RxD signals from MINICUBE2 with TxD (SO) and RxD (SI) of the target device so that signal input/output are consistent.

 MINICUBE2   Target device

  TxD ⟍⟍⟍⟍⟍⟍⟍⟍ TxD (SO)

  RxD ⟋⟋⟋⟋⟋⟋⟋⟋ RxD (SI)
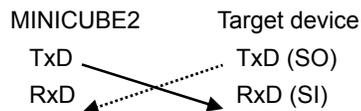
<2> The signal lines used for programming must be isolated from other devices, using jumper switches or the like; otherwise, malfunction may occur.

[Cause 4]

The parameter file selected in the [Parameter file] area on the [Standard] tab in the Device Setup dialog box may not be correct.

[Action 4]

Use the parameter file that supports the target device.

For details on parameter files, refer to **1.3 Supported Devices** and **3.2.2 (11) (a) <1> [Parameter file] area**.

[Cause 5]

No clock may be able to be supplied to the target device.

[Action 5]

<1> Check the settings in the [Supply Oscillator] area on the [Standard] tab in the Device Setup dialog box.

For the correct settings, supplementary for the parameter file.

<2> Check the clock supply on the target system.

[Cause 6]

  Power may not be supplied normally to the target device.

[Action 6]

<1> Check the power select switch setting.

<2> Check that the power is supplied on the target system. If the power select switch is set to "3" or "5", the power supply is 100 mA max., so a power shortage may occur. In such a case, set the power select switch to "T" and then supply power from the target system.

[Cause 7]

  When using a 78K0S microcontroller, a wrong connection procedure may have been implemented.

[Action 7]

  When using a device that uses the program file in which "use the RESET pin as the input-only port (P34)" is set by the option byte, if power is supplied to the target system before the target cable is connected to the target system, the flash memory programming mode cannot be entered. Connect the target cable to the target system in accordance with the procedure and then supply power to the target system.

(3) The following message is displayed in the action log window and normal communication is not performed in the flash memory programming mode.
(E2004) Communication failure or timeout.

[Cause 1]

  The clock or power supply may not be stable.

[Action 1]

  Confirm that the clock or power is stably supplied on the target system.

[Cause 2]

  Communication may not be stable.

[Action 2]

  Confirm that MINICUBE2 and the target system are properly connected. Confirm that unused pins are properly handled. Confirm that the correct clock and communication rate are selected. Stable programming may be achieved by setting a lower value for the clock or communication rate.

APPENDIX A MESSAGES

A.1 Message Format

The message will be output for both the error/warning dialog box and action log window.

Figure A-1. Error/Warning Dialog Box

Figure A-2. Action Log Window

A.2 Messages

No.	Message	Cause	Action
E0001	USB host connection failed. **Note 1**	Possible causes may be: The USB driver is not recognized normally. Communication failed. MINICUBE2 is not connected. The USB driver is not installed normally.	Check if the USB driver has been installed normally. For details, refer to **4.1 Problems During Startup**.
E0002	MINICUBE2 Firmware version too old. **Note 1**	The QBP does not operate normally because the version of MINICUBE2 firmware is old.	Download the latest firmware from the website (ODS) and update it.
E0003	Load File not found. **Note 2**	The program file stored in the *qbp.ini* file cannot be loaded.	Select a program file.
E0004	PRM File not found. **Note 2**	The parameter file stored in the *qbp.ini* file cannot be loaded.	Select a parameter file.
E0005	QBP already started. **Note 1**	An attempt was made to start the QBP for the second time.	The QBP cannot be started while it is running.
E0006	Related software of MINICUBE2 already started. **Note 1**	An attempt was made to start software for MINICUBE2.	The QBP cannot be started while software for MINICUBE2 is running.
E0007	Please remove 78K0-OCD board from MINICUBE2. **Note 1**	The 78K0-OCD board is connected.	Remove the 78K0-OCD board.
E1001	Invalid Parameter File. **Note 2**	An invalid parameter file was selected.	Download the latest parameter file from the website (ODS).
E1002	Not supported Parameter File.	A parameter file with an unsupported file format version was selected.	Download the latest parameter file, QBP, and MINICUBE2 firmware from the website (ODS) and update them.
E1003	Invalid Load File.	An unsupported format or illegal program file was selected.	Select a relevant program file.
E1004	Not specify Parameter File. **Note 2**	No parameter file has been loaded.	Select a parameter file using the [Setup] command.
E1005	Not specify Load File. **Note 2**	No program file has been selected.	Select a program file using the [Load] command.
E1006	Illegal Supply Oscillator setting. **Note 1**	The wrong frequency is set for the clock supplied to the target device.	See the device manual, confirm the selectable frequency, and then set the correct value for frequency and multiply ratio.

Notes 1. Displayed only in error/warning dialog boxes.
    2. Displayed only in both action log window and error/warning dialog boxes.

No.	Message	Cause	Action
E1007	Caution: When 'Chip Erase' is disable, chip cannot be erased and programmed any more!**Note**	This is a warning output when the security function cannot be disabled if "Chip erase disable" is enabled, because the chip can no longer be erased.	For details, refer to **3.2.2 (11) (b) <2> [Security flag settings] area**.
E1008	Caution: When 'Boot block cluster reprogramming' is disable, boot block cannot be erased and programmed any more!**Note**	This is a warning output when the security function cannot be disabled if "boot block area rewrite disable" is enabled, because the chip can no longer be erased.	For details, refer to **3.2.2 (11) (b) <2> [Security flag settings] area**.
E1009	Invalid Checksum.	An illegal program file was loaded.	Reload the correct program file.
E1010	Parameter File Read Error.**Note**	Loading of the parameter file failed.	The parameter file cannot be accessed due to a reason such as the file is being used by another application. Make accessing to the file possible.
E1011	Can not Open Log File.	Opening of the log file failed.	The log file cannot be accessed due to a reason such as the file is being used by another application. Make accessing to the file possible.
E1013	Value is out of range.**Note**	The wrong frequency is set for the clock supplied to the target device.	See the device manual, confirm the selectable frequency, and then set the correct value for frequency and multiply ratio.
E1014	Can't Upload Read Data.	Saving of the program file failed during execution of the [Read] command.	The program file cannot be accessed due to a reason such as the file is being used by another application. Make accessing to the file possible.
E2001	No response from Target Device. (FLMD)	The flash memory programming mode cannot be entered. Possible causes may be: unstable clock or power supply, error in communication line, or target device defect.	MINICUBE2 may have hung, disconnect the USB interface and reconnect it.
E2002	No response from Target Device. (RESET)		Refer to **4.2 Problems During Operation**.
E2003	No response from Target Device. (FREQ)		See the device manual, confirm the selectable frequency, and then set the correct value.

Note Displayed only in error/warning dialog boxes.

No.	Message	Cause	Action
E2004	Communication failure or timeout.	Normal communication is not performed in the flash memory programming mode. Possible causes may be: unstable clock or power supply, error in communication line, or target device defect.	Refer to **4.2 Problems During Operation**.
E2005	Synchronization failure for baudrate.	A baud rate that is not supported by the device is selected.	See the device manual, confirm the selectable baud rate, and then set the correct value.
E2006	Invalid Signature reading.	The specified parameter file differs from the one specified in the target device.	Select a relevant parameter file.
E2007	Invalid parameter file version.	The versions of the selected parameter file and device differ.	Download the latest parameter file from the website (ODS).
E2008	Not Blank.	The flash memory is not blank.	Before programming, be sure to erase the flash memory and make sure that the flash memory is blank.
E2009	Erasing operation failed.	Erasure may be impossible due to a flash memory defect.	The device may have a defect, so replace it with a non-defective sample.
		With the 78K0S, the specified command may not be enabled because security settings have already been made on the target device.	Some security functions cannot be disabled by executing chip erase. For details, refer to the manual for the target device.
E2010	Programming operation failed.	Programming may be impossible due to a flash memory defect.	The device may have a defect, so replace it with a non-defective sample.
		With the 78K0S, the specified command may not be enabled because security settings have already been made on the target device.	Some security functions cannot be disabled by executing chip erase. For details, refer to the manual for the target device.
E2011	Verifying operation failed.	Data of the program file may differ from that written to the target device.	Reexecute EPV. If the same error occurs again, the device may have a defect, so replace it with a non-defective sample.
E2012	Security flag setting failed.	Security setting may be impossible due to a flash memory defect.	The device may have a defect, so replace it with a non-defective sample.
		Additional security setting may be impossible in some devices.	Refer to the manual for the target device.

No.	Message	Cause	Action
E2013	Protection by security setting.	The specified command may not be executed because security settings have already been enabled on the target device.	Some security functions cannot be disabled by executing chip erase. For details, refer to the manual for the target device.
E2014	Checksum verification failed.	With the 78K0S, the program code written to the target device may differ from that of the program file.	Reexecute EPV. If the same error occurs again, the device may have a defect, so replace it with a non-defective sample.
E2015	Retry status over.	The retry count for the command performed for the device exceeded the upper limit.	The device may have a defect, so replace it with a non-defective sample.
E2016	Illegal status from device.	An illegal status code was returned from the device. The communication line may be unstable due to an external factor.	The device may have hung, so reexecute the command.
E9001	Not Initialized.[Note 2]	Acquisition of work memory at startup failed, or sled processing startup failed.	Start the QBP in another host machine.
E9002	Illegal parameter.	Command parameter error was returned from F/W. The communication line may be unstable due to an external factor.	Check the communication line.
E9003	Control failed. Please restart the MINICUBE2.	An unexpected error code is returned from MINICUBE2.	MINICUBE2 may have hung, disconnect the USB interface and reconnect it.
E9004	Wait status timeout.	Wait of MINICUBE2 for the device timed out. Possible causes may be: incorrect wiring, incorrect clock or power supply, or target device defect.	For details, refer to **4.2 Problems During Operation**.
E9005	Illegal parameter or MINICUBE2 Firmware version too old![Note 1]	Command that MINICUBE2 does not support was executed, or Command Parameter Error was returned from MINICUBE2.	The version of the MINICUBE2 firmware may be old. Please update it to the latest version. Or the communication line may be unstable due to external factor.

Notes 1. Displayed only in error/warning dialog boxes.

2. Displayed only in both action log window and error/warning dialog boxes.

For further information,
please contact:

NEC Electronics Corporation
1753, Shimonumabe, Nakahara-ku,
Kawasaki, Kanagawa 211-8668,
Japan
Tel: 044-435-5111
http://www.necel.com/

[America]

NEC Electronics America, Inc.
2880 Scott Blvd.
Santa Clara, CA 95050-2554, U.S.A.
Tel: 408-588-6000
      800-366-9782
http://www.am.necel.com/

[Europe]

NEC Electronics (Europe) GmbH
Arcadiastrasse 10
40472 Düsseldorf, Germany
Tel: 0211-65030
http://www.eu.necel.com/

    Hanover Office
    Podbielskistrasse 166 B
    30177 Hannover
    Tel: 0 511 33 40 2-0

    Munich Office
    Werner-Eckert-Strasse 9
    81829 München
    Tel: 0 89 92 10 03-0

    Stuttgart Office
    Industriestrasse 3
    70565 Stuttgart
    Tel: 0 711 99 01 0-0

    United Kingdom Branch
    Cygnus House, Sunrise Parkway
    Linford Wood, Milton Keynes
    MK14 6NP, U.K.
    Tel: 01908-691-133

    Succursale Française
    9, rue Paul Dautier, B.P. 52
    78142 Velizy-Villacoublay Cédex
    France
    Tel: 01-3067-5800

    Sucursal en España
    Juan Esplandiu, 15
    28007 Madrid, Spain
    Tel: 091-504-2787

    Tyskland Filial
    Täby Centrum
    Entrance S (7th floor)
    18322 Täby, Sweden
    Tel: 08 638 72 00

    Filiale Italiana
    Via Fabio Filzi, 25/A
    20124 Milano, Italy
    Tel: 02-667541

    Branch The Netherlands
    Steijgerweg 6
    5616 HS Eindhoven
    The Netherlands
    Tel: 040 265 40 10

[Asia & Oceania]

NEC Electronics (China) Co., Ltd
7th Floor, Quantum Plaza, No. 27 ZhiChunLu Haidian
District, Beijing 100083, P.R.China
Tel: 010-8235-1155
http://www.cn.necel.com/

NEC Electronics Shanghai Ltd.
Room 2511-2512, Bank of China Tower,
200 Yincheng Road Central,
Pudong New Area, Shanghai P.R. China P.C:200120
Tel: 021-5888-5400
http://www.cn.necel.com/

NEC Electronics Hong Kong Ltd.
12/F., Cityplaza 4,
12 Taikoo Wan Road, Hong Kong
Tel: 2886-9318
http://www.hk.necel.com/

NEC Electronics Taiwan Ltd.
7F, No. 363 Fu Shing North Road
Taipei, Taiwan, R. O. C.
Tel: 02-8175-9600
http://www.tw.necel.com/

NEC Electronics Singapore Pte. Ltd.
238A Thomson Road,
#12-08 Novena Square,
Singapore 307684
Tel: 6253-8311
http://www.sg.necel.com/

NEC Electronics Korea Ltd.
11F., Samik Lavied'or Bldg., 720-2,
Yeoksam-Dong, Kangnam-Ku,
Seoul, 135-080, Korea
Tel: 02-558-3737
http://www.kr.necel.com/

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