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Panasonic®

MICROCOMPUTER

AM13L-STK2
Installation Manual

Pub.No. 1174602-012E

- When you install each device after unpacking, please read this manual as a first step.
- This manual describes about unpacking, setting of each device, assembly, connection and startup. Please refer to other manual for the particular methods.

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About This Manual

This manual is intended for engineers who will evaluate MN101LR05D using AM13L-STK2, which is a starter kit of microcomputer MN101LR05D with built-in ReRAM, and describes the installation method.

■ Organization

This manual mainly consists of four chapters of overview, software, hardware and appendix.

The overview chapter describes a product outline and hardware functions of AM13L-STK2.
The software chapter describes how to install the USB driver for connecting AM13L-STK2 with a host computer and how to install the debugger for AM13L-STK2(DebugFactory Builder for MN101_STK2).
The hardware chapter describes details of each part and how to connect and how to customize the board.
The appendix chapter shows a circuit diagram, a part list, and a dimensional drawing.

■ Related Manuals

We prepare the following manuals other than this manual about the product concerned.

- "MN101LR05D LSI User's Manual"

  Describes characteristics and the control method of MN101LR05D.

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Table of Contents

Chapter 1 Overview

1

1.1 Product overview

This product is the starter kit for evaluating microcomputer MN101LR05D with built-in ReRAM. You can evaluate microcomputer MN101LR05D with built-in ReRAM easily by connecting it with the USB port of the host computer directly and using the debugger for AM13L-STK2 (DebugFactory Builder for MN101_STK2).

1.1.1 Hardware Functions

This section describes hardware functions of AM13L-STK2.

- Operating Voltage

  +4.7 V to +5.25 V

  Supplied from an USB bus power or an USB type AC adapter.

  +1.8 V to +3.6 V

  Supplied directly from an extension terminal of AM13L-STK2 to a microcomputer (a setting change on the board is needed).

- Mounted Microcomputer

  MN101LR05D

- Reset

  RC reset (the reset period is 500ms)

- Controllable Functions

  I/O port: 35 pins (all are dual purpose terminals.)

  LED (high-power) drive dual purpose terminal: 35 pins (2 pins are assigned to the LEDs on AM13L-STK2.)

  A/D input dual purpose terminal: 4 pins

  Timer input/output dual purpose terminal: 3 pins

  External interrupt dual purpose terminal: 6 pins

  Serial port dual purpose terminal: 5 pins (UART: 3 pin, I2C: 2 pin, both serves as synchronous serial ports.)

  LCD control terminal: 30 pins (4COM/26SEG)

- External Supply Voltage

  The voltage of +3.3 V and +5.0 V can be supplied from extension terminals of AM13L-STK2 to an external extension board.

  The total supply current is a maximum of 500 mA (current consumption of AM13L-STK2 is included.)

Chapter 2 Software

2

2.1 Installation

2.1.1 Checking Operating Environment

■ Host Computer Specifications

Table 2.1.1 Host Computer Specifications

OS (Except virtual environment)	Windows XP (after SP2) (32bit OS only)	Windows Vista (32bit OS only) Windows 7 (32bit / 64bit OS)
CPU	Intel Pentium III 450 MHz or higher *including compatible CPU (Pentium III 1 GHz or higher recommended)	Intel Pentium III 1GHz or higher *including compatible CPU
Memory	256 MB minimum (512 MB or more recommended)	1GB or more
Available hard disk space	400 MB minimum (1 GB or more recommended)	
Others	with USB1.1/2.0 interface	

Note :The memory required depends on the size of the program to create.

2.1.2 Download of Software

When developing and debugging software of AM13L-STK2, it is necessary to install the debugger for AM13L-STK2 (DebugFactory Builder for MN101_STK2).

On the support page of Panasonic Microcomputer Technical Support <http://www.semicon.panasonic.co.jp/e-micom/support.html>, select "Starter kit", open the starter kit introduction page, and download the following programs.

- DebugFactory Builder for MN101_STK2 (DFBuilder101_STK2_v4.6.4.1.EXE)

Note :DebugFactory Builder for MN101_STK2 incorporates the product version compiler, assembler and linker. Therefore it is not necessary to install the compiler separately.

2.1.3 Setup of the DebugFactory Builder for MN101_STK2

This section describes procedures of install the debugger for AM13L-STK2 (DebugFactory Builder for MN101_STK2).

Note : - The installation must be done by members of the Administrators group. Users (including Power Users) who do not belong to the Administrators group cannot do this work.
- Do not connect AM13L-STK2 to the host computer when installing DebugFactory Builder for MN101_STK2.

1. Double-click the icon of DebugFactory Builder for MN101_STK2 (DFBuilder101_STK2_v4.6.4.1.EXE) which has been downloaded, and start the DebugFactory Builder for MN101_STK2. (Refer to Figure 2.1.1.)

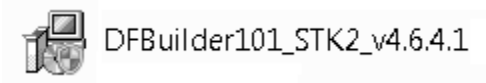

Figure 2.1.1 Icon of DebugFactory Builder for MN101_STK2

2. When an installer program of DebugFactory Builder is executed, a dialog of Figure 2.1.2 appears. Select the language that you use the DebugFactory Builder for MN101_STK2.

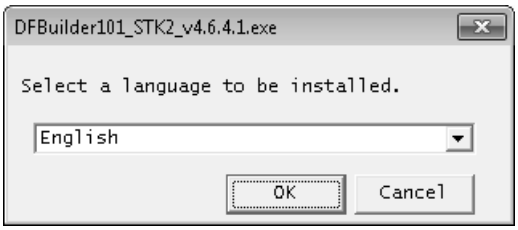

Figure 2.1.2 Selecting the language

3. After Setup program is started, the dialog shown in Figure 2.1.3 appears. Click <Next>.

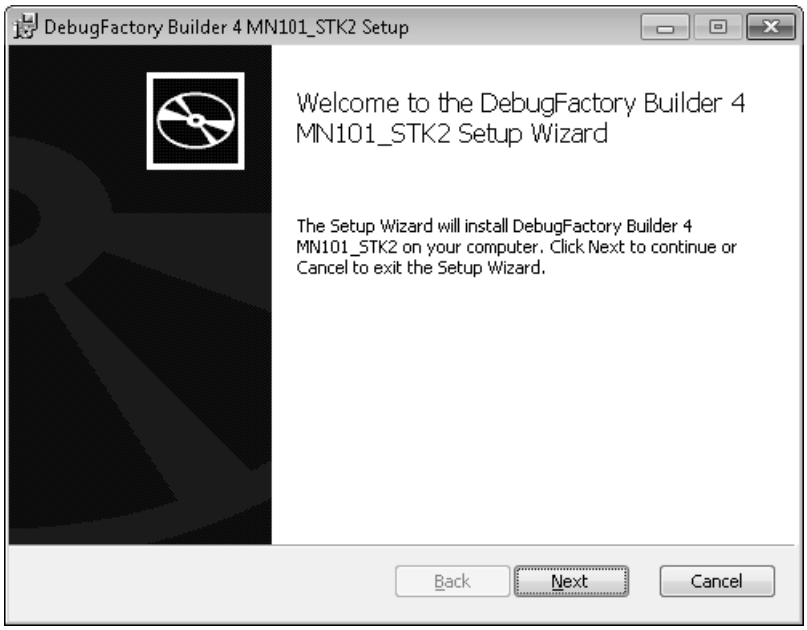

Figure 2.1.3 Starting of setting up DebugFactory Builder for MN101_STK2

4. The dialog shown in Figure 2.1.4 appears. Confirm the software license agreement, and click <Next>.

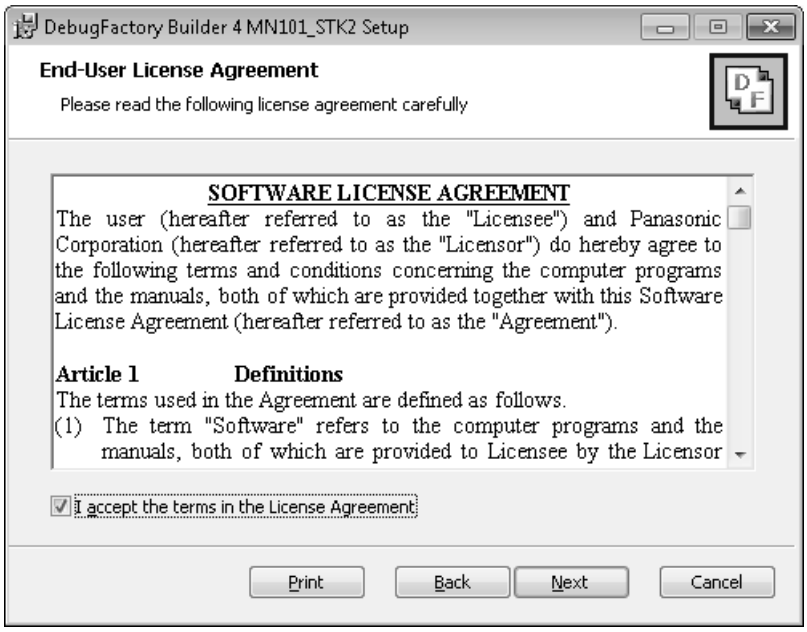

Figure 2.1.4 Licence agreement of AM13L_STK2

5. The dialog shown in Figure 2.1.5 appears. Confirm the destination folder where the software tools will be installed, then click <Next>. If you want to install in a different folder, click <Change...> to specify the folder.

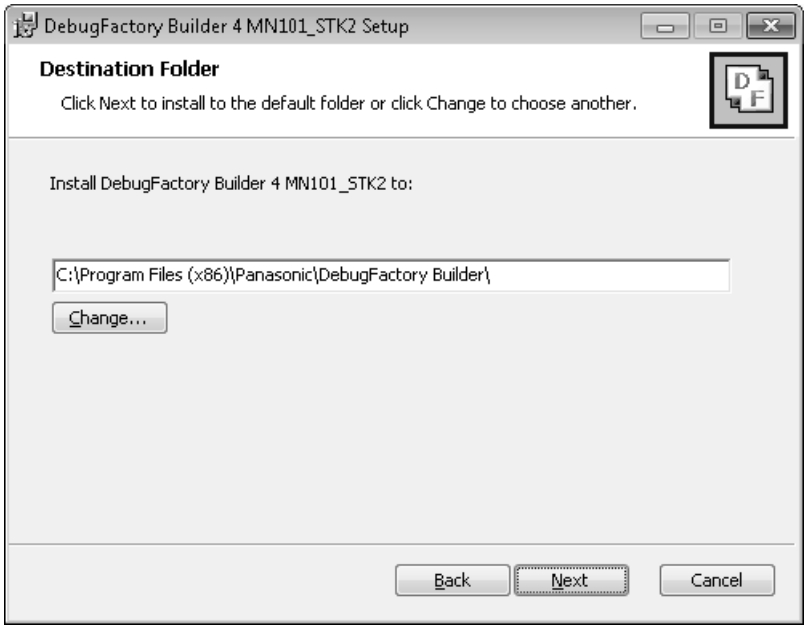

Figure 2.1.5 Choose Destination Folder

6. The dialog shown in Figure 2.1.6 appears. Click <Install>.

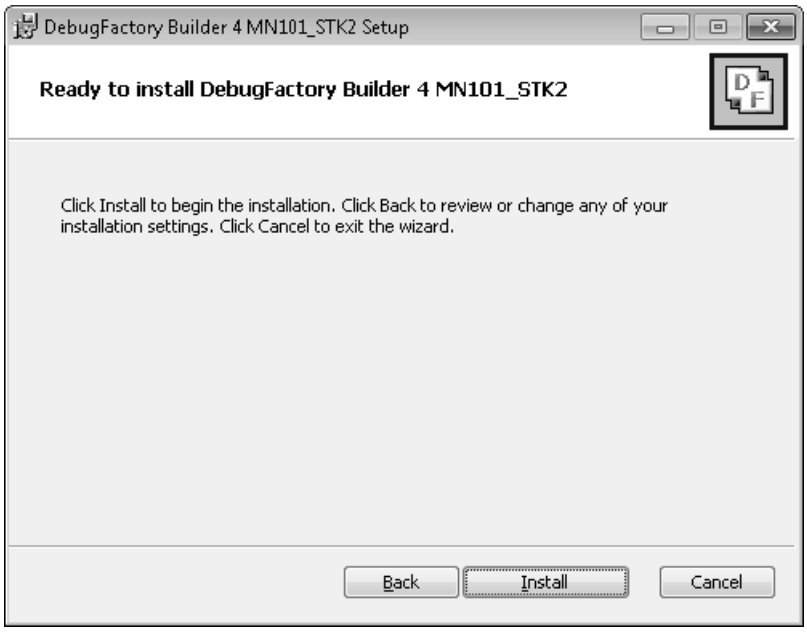

Figure 2.1.6 Start Installation

7. The dialog shown in Figure 2.1.7 appears. Wait while DebugFactory Builder for MN101_STK2 installs.

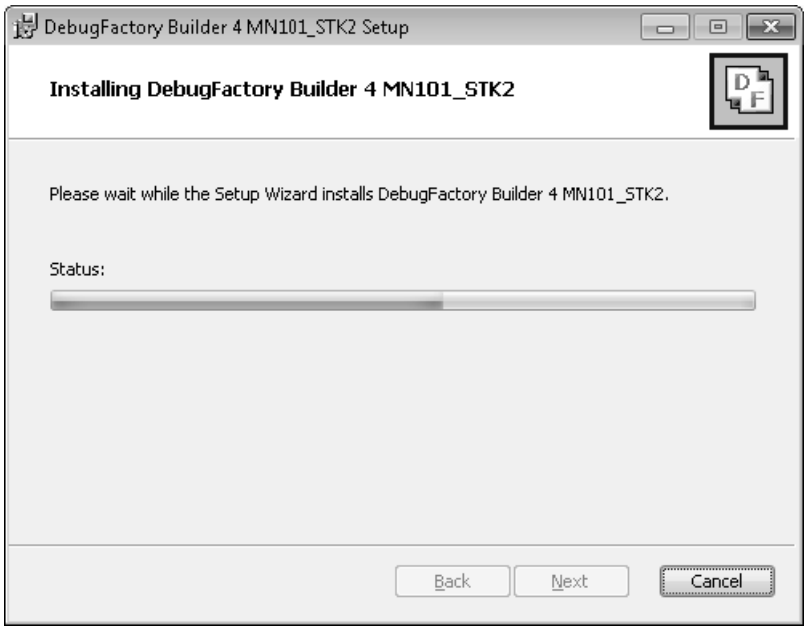

Figure 2.1.7 During installing of DebugFactory Builder for MN101_STK2

8. The dialog shown in Figure 2.1.8 appears. Click <Finish>.

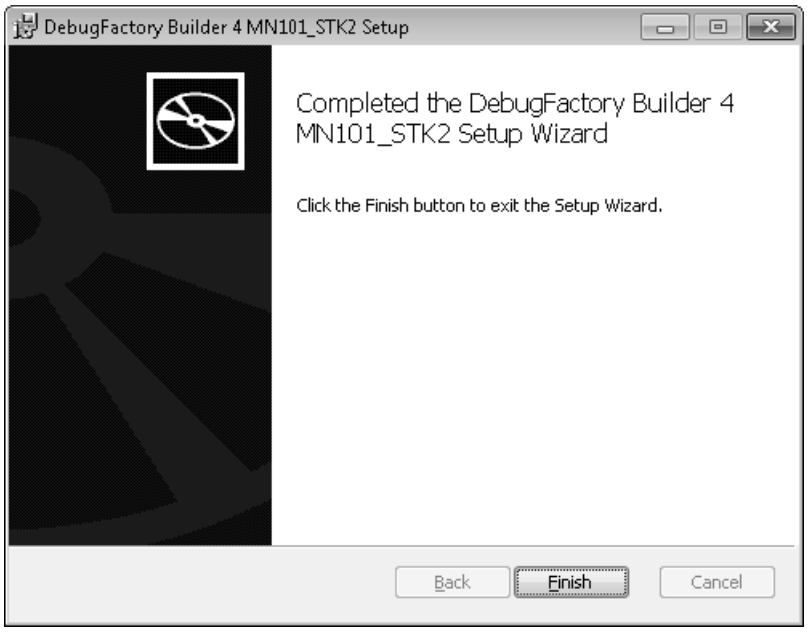

Figure 2.1.8 Setup Completed

9. After the installation is completed, [Panasonic DebugFactory Builder 4]-[MN101_STK2] group is registered in [All Programs] on the menu [Start]. Figure 2.1.9 shows the shortcut just registered.

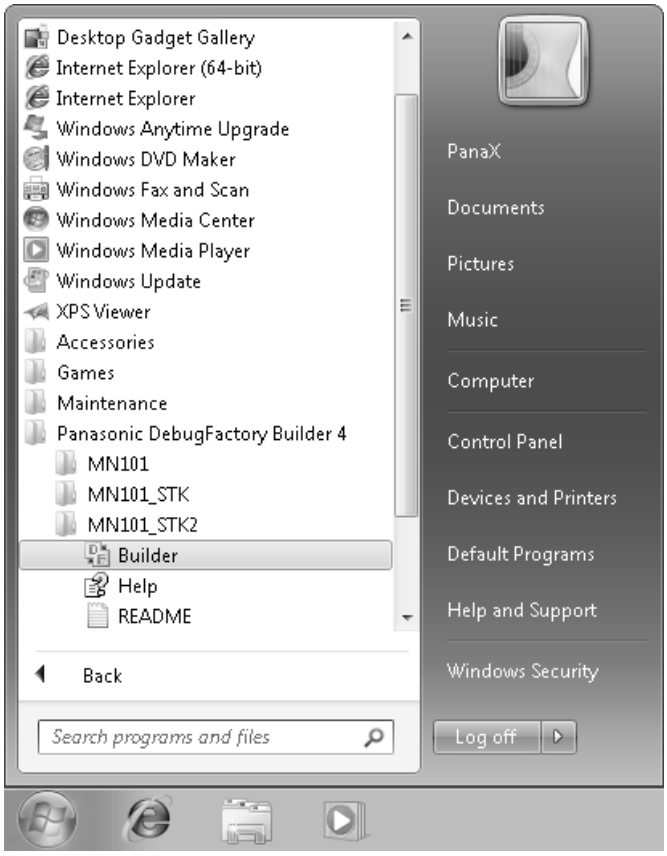

Figure 2.1.9 Registered [Panasonic DebugFactory Builder 4]-[MN101_STK2] Group

Table 2.1.2 Registered [Panasonic DebugFactory Builder 4]-[MN101_STK2] Group

Shortcut name	Description
Builder	Run the DebugFactory Builder for MN101_STK2.
README	Displays additional information and cautions not included in the manual.
Help	Displays Help of the DebugFactory Builder for MN101_STK2.

2.2 Installation of USB Driver

Connect the AM13L-STK2 to the host computer as shown in Figure 2.2.1.

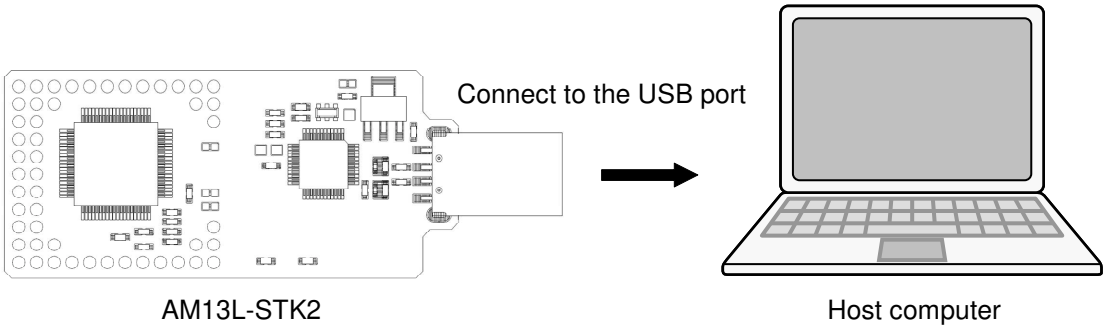

Figure 2.2.1 Connecting AM13L-STK2 and the host computer

If the USB driver is not installed in the host computer, after the AM13L-STK2 is connected, installation of the USB driver starts.

Note : - Install DebugFactory Builder for MN101_STK2 before connecting the AM13L-STK2 to the host computer. For details about installation of DebugFactory Builder for MN101_STK2, refer to "2.1.3 Setup of the DebugFactory Builder for MN101_STK2 (p.11)".
- The installation of USB driver must be done by members of the Administrators group.

1. The balloon hint is displayed at the lower right of the screen as shown in Figure 2.2.2.

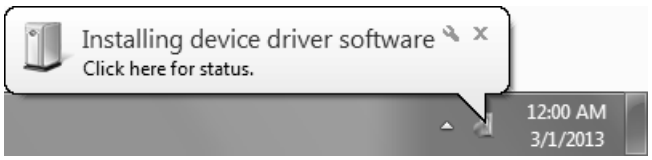

Figure 2.2.2 Installing device driver software

After a while, the balloon hint is shown in Figure 2.2.3.

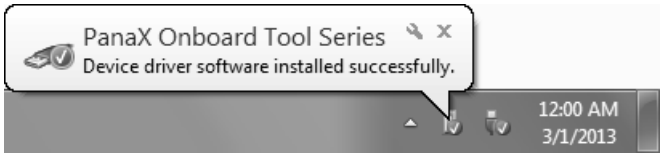

Figure 2.2.3 Complete Installing Device Driver Software

2. When dialog box of Figure 2.2.4 is displayed after driver installation completion, restart of the host computer is necessary.

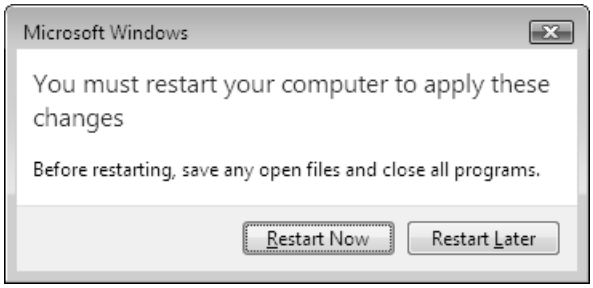

Figure 2.2.4 Restart of the host computer

3. From the [Start] menu, select [Control Panel], and click [System and Security], and click [Device Manager] to display the [Device Manager] window shown in Figure 2.2.5.
   Verify that "PanaX Onboard Tool Series" is listed in the "PanaXSeries" column. If it is not listed in the column, the USB driver might not have been installed properly.

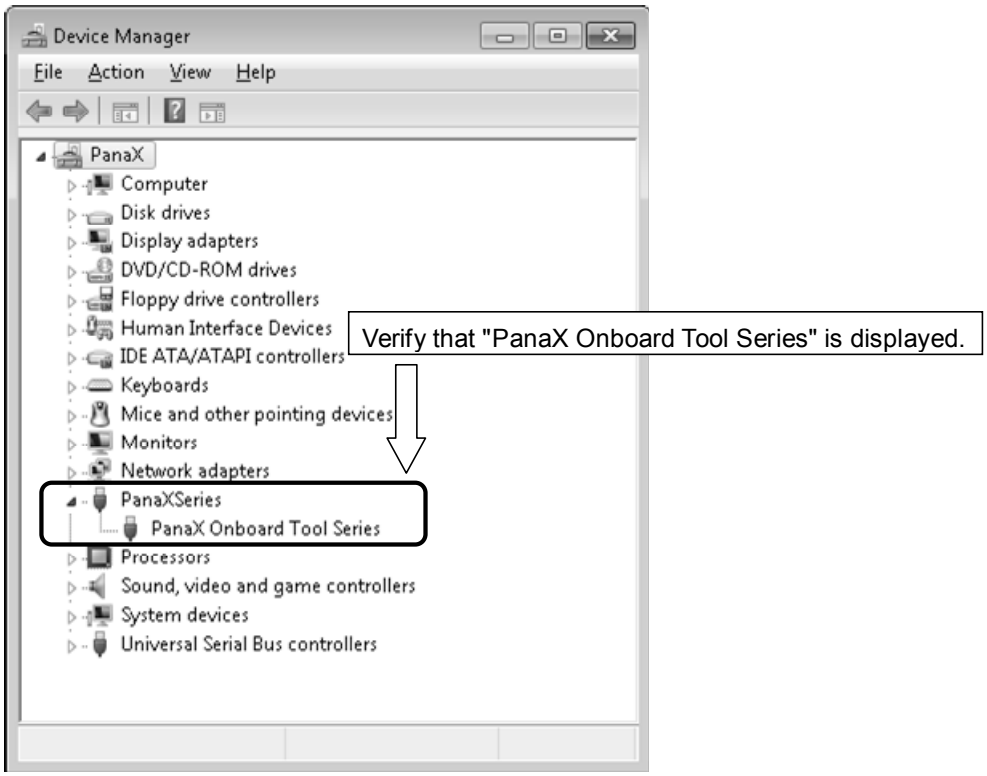

Figure 2.2.5 Device Manager

Note : - Connecting the AM13L-STK2 to another USB port of the host computer or connecting other AM13L-STK2 to the USB port requires new installation of the USB driver.
- Reinstalling the DebugFactory Builder for MN101_STK2 may require installation of the USB driver.

2.3 Safely Removing Hardware

This section describes how to remove the AM13L-STK2 connected to the host computer.

1. Right-click the [Safely Remove Hardware] icon in the notification area at the far right of the taskbar (the lower right of the screen). If the icon is not found, click the [Show hidden icons] button.

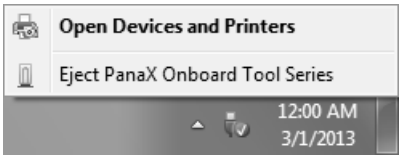

Figure 2.3.1 Eject PanaX Onboard Tool Series

2. Select [Eject PanaX Onboard Tool Series], and verify that the message "The 'PanaX Onboard Tool Series' device can now be safely removed from the computer" is displayed as shown in Figure 2.3.2.

Figure 2.3.2 Safe To Remove Hardware

3. Remove the AM13L-STK2 from the host computer as shown in Figure 2.3.3.

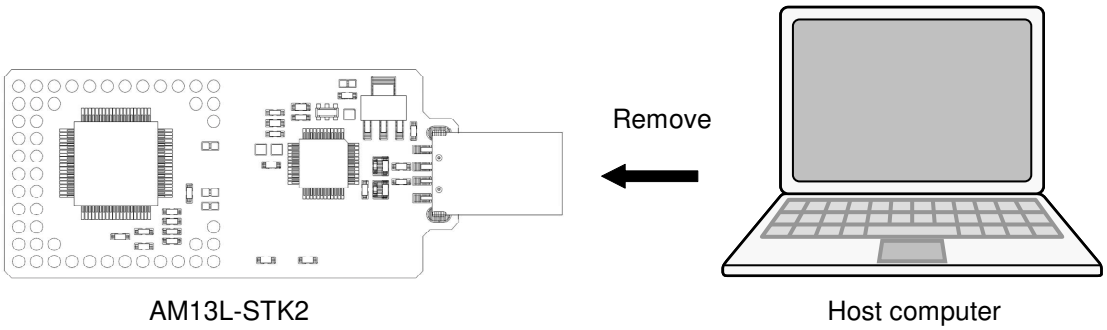

Figure 2.3.3 Removing the AM13L-STK2 from the host computer

2.4 Firmware Update Procedure

With DebugFactory Builder, when the error message "Please update the firmware because the firmware version is older. (Version: X.X.X)" appeared, it is necessary to update the firmware by following the procedures below.

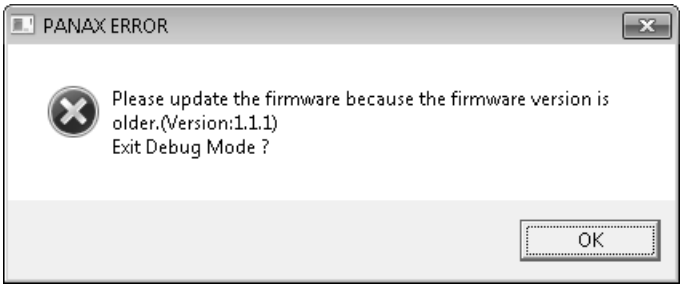

Figure 2.4.1 Firmware Version Error

Note :Once updating the firmware, you can not back to the previous state.

1. The dialog shown in Figure 2.4.2 appears. Click <Yes>.

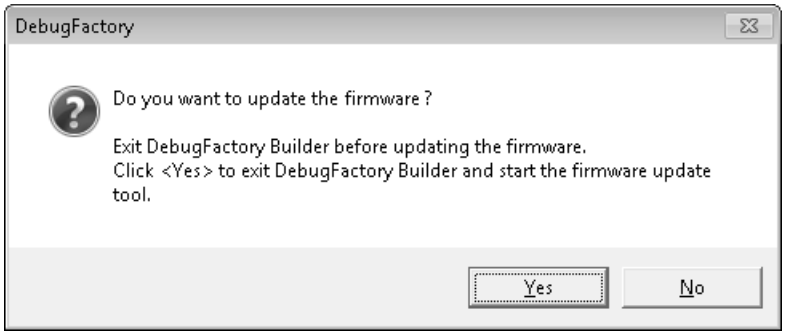

Figure 2.4.2 Firmware Update Start Check

2. The dialog shown in Figure 2.4.3 appears. Click <OK>.

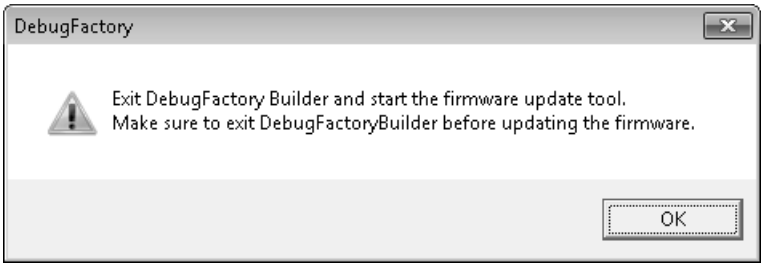

Figure 2.4.3 Firmware Update Tool Start Check

Note : - Do not connect multiple AM13L-STK2 to one host computer when updating the firmware.
- Never remove the AM13L-STK2 from the host computer during updating the firmware.

3. The dialog shown in Figure 2.4.4 appears. Click <Update>. Click <Exit> to exit the update tool without updating the firmware.

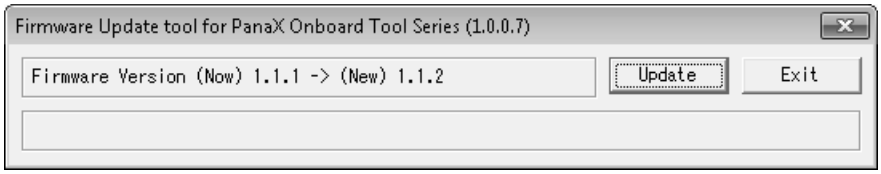

Figure 2.4.4 Startup Window of Firmware Update Tool

4. When <Update> is clicked, the display changes as shown in Figure 2.4.5. Wait until the firmware update has been completed.

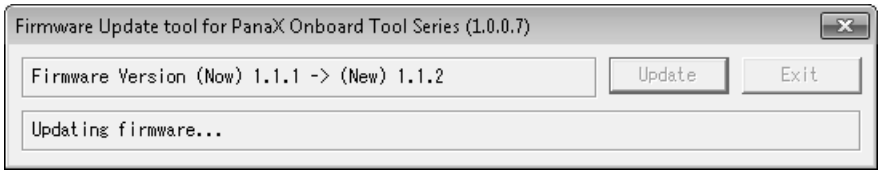

Figure 2.4.5 Firmware Update Tool Updating Screen

5. When the dialog shown in Figure 2.4.6 appears, the update has been completed.
   When the dialog shown in Figure 2.4.6 doesn't appear after 2 minutes or more, the firmware update has been failed.

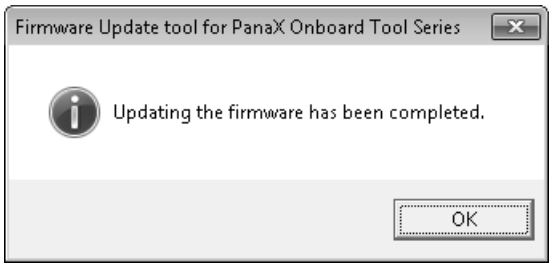

Figure 2.4.6 Completing Firmware Update

Note : In case that the firmware update is failed, remove the AM13L-STK2 from the host computer immediately and contact to inquiries appears at the end of this manual.

2.5 Checking Operations of DebugFactory Builder for MN101_STK2

This section describes procedures for environment setting and checking operations of DebugFactory Builder for MN101_STK2.

■ Startup

From the menu [Start], select [All Program]-[Panasonic DebugFactory Builder 4]-[MN101_STK2], then click [Builder] contained in the [MN101_STK2] group to start up the DebugFactory Builder. (See "Registered [Panasonic DebugFactory Builder 4]-[MN101_STK2] Group" Figure 2.1.9(p.14).) If the software tools have been successfully installed, the startup window in Figure 2.5.1 appears.

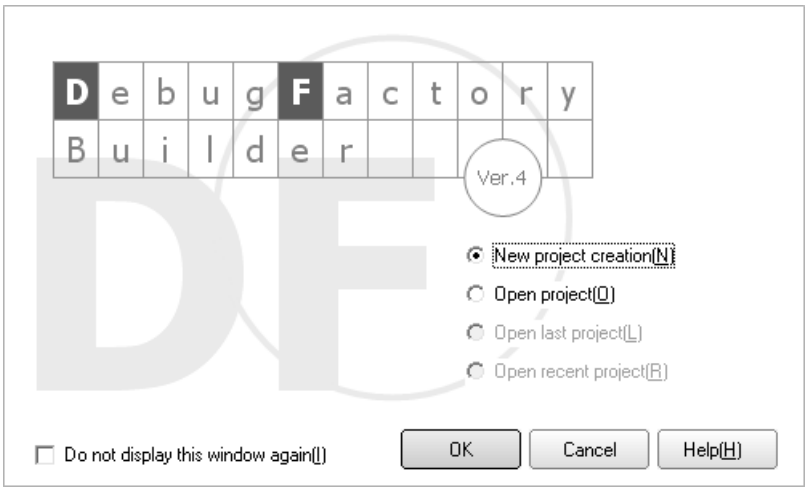

Figure 2.5.1 Startup Window

Create the project and configure the settings to start DebugFactory Builder for MN101_STK2. Those can be easily performed through the [Project creation wizard] dialog.

Select [New project creation] and click <OK> in [Startup window] shown in Figure 2.5.1, and the dialog shown in Figure 2.5.2 appears. Select [Standard], and click <Next>.

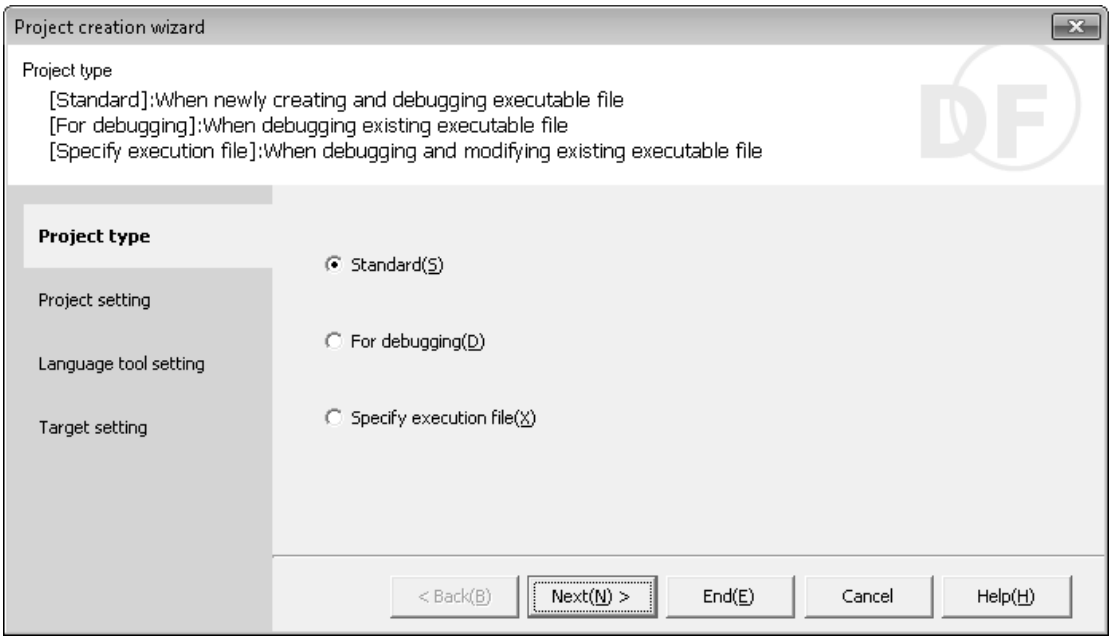

Figure 2.5.2 Project creation wizard

In this wizard, configure the settings for a project to be newly created. Here, configure only project settings to check operations, and use default settings for other items.

Project name:	Specify a project file name.
Folder to save:	Specify a destination folder.
Source file to be added automatically:	Check both [Startup assembler] and [Sample source file].

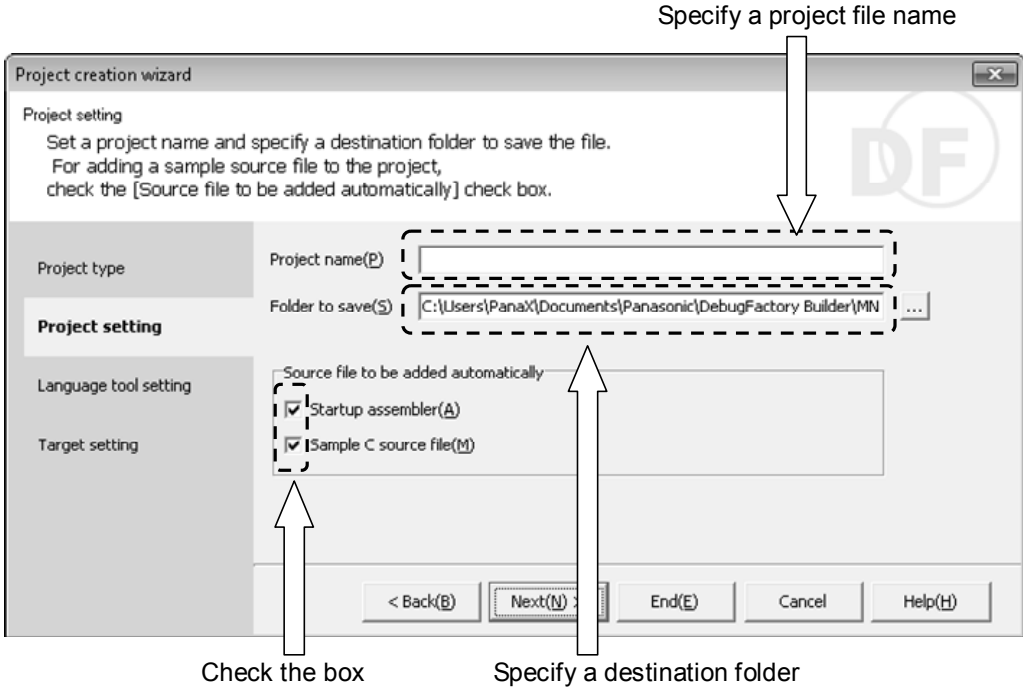

Figure 2.5.3 Project setting

In the Language tool setting, set "Use the built-in language tool" which is an initial value. If other language tools are used, set "Use a following language tool".

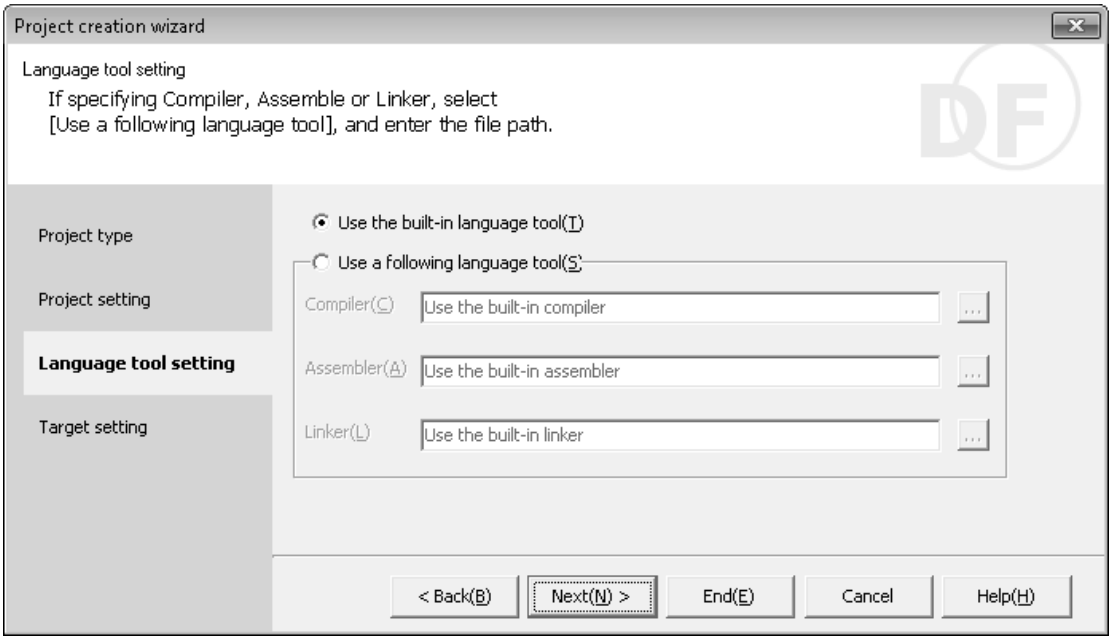

Figure 2.5.4 Language tool setting

The dialog shown in Figure 2.5.5 appears. Click the <Set> button.

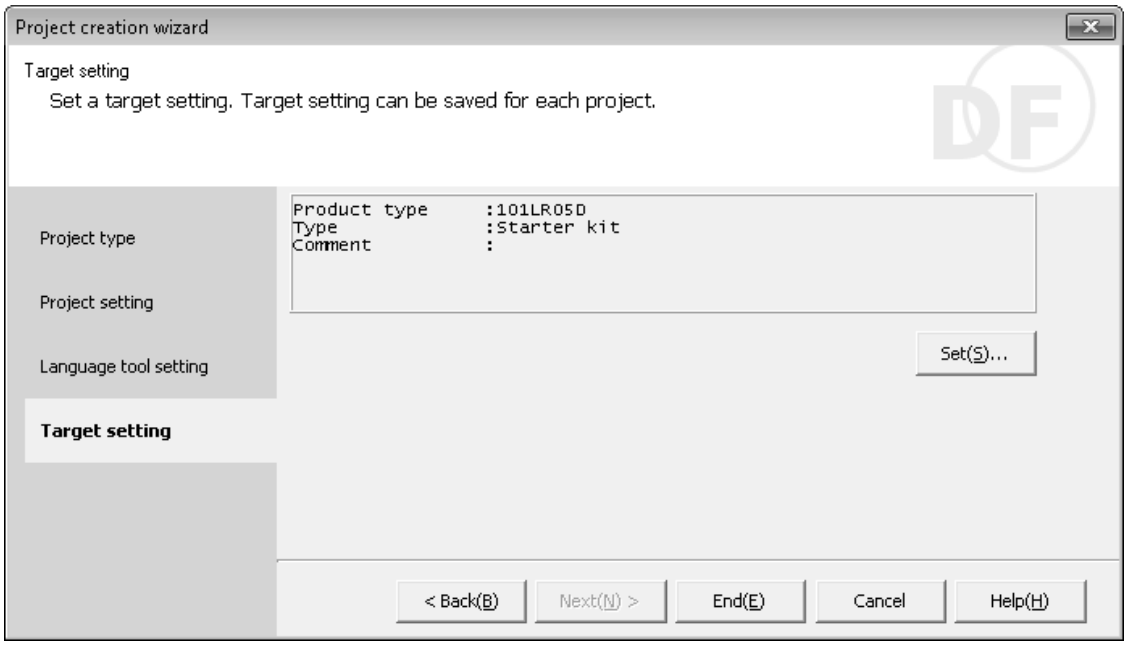

Figure 2.5.5 Target setting

Figure 2.5.6 appears in the <Set> button click.

- Target setting dialog box (Target setting)

  Choose a product type to use. Leave the type of debugging tool "Starter kit". Table 2.5.1 shows the details of each setting item.

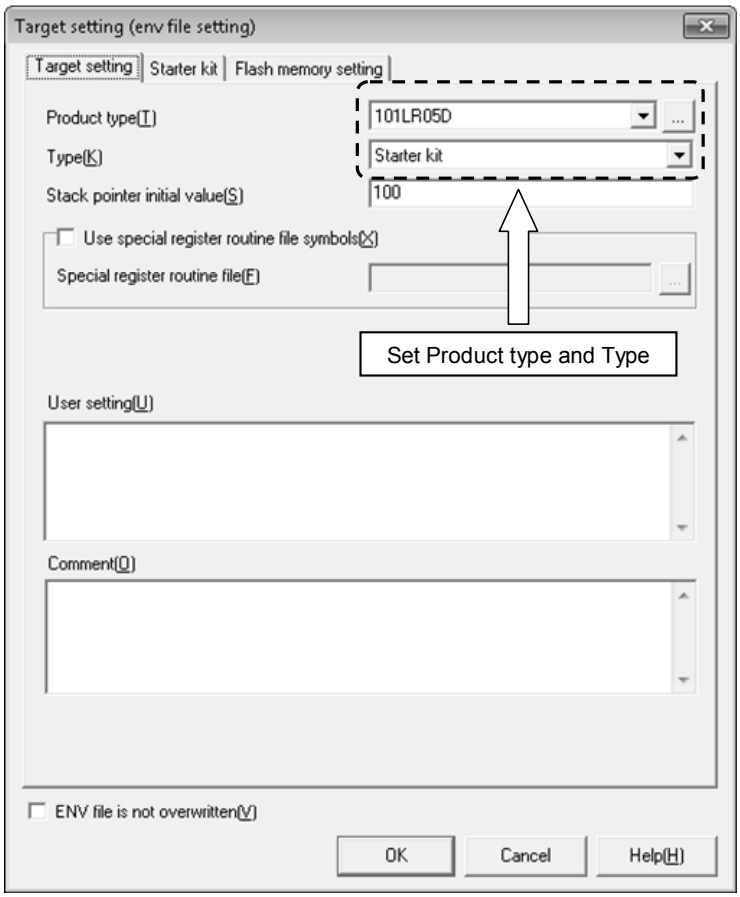

Figure 2.5.6 Target setting dialog box

Table 2.5.1 Target setting dialog (Target setting)

Product type	Select "101LR05D".
Type	Select "Starter kit" as a target type.
Stack pointer initial value	Enters the default stack pointer as a hexadecimal value. If there is no special reason, don't change the setting.
Special register routine file	Special register addresses may be defined as symbols by specifying the file here in some product types. For details, refer to Help on DebugFactory Builder for MN101_STK2.
User setting	Set user original setting that is not included in the target setting dialog. If there is no special reason, it is not necessary to set it.
Comment	Describe comments for the target setting information. If there is no special reason, it is not necessary to set it.

- Target setting dialog box (Starter kit)
  Select [Starter kit] tab sheet. The dialog box changes as shown in Figure 2.5.7.
  If there is no special reason, don't change the setting.

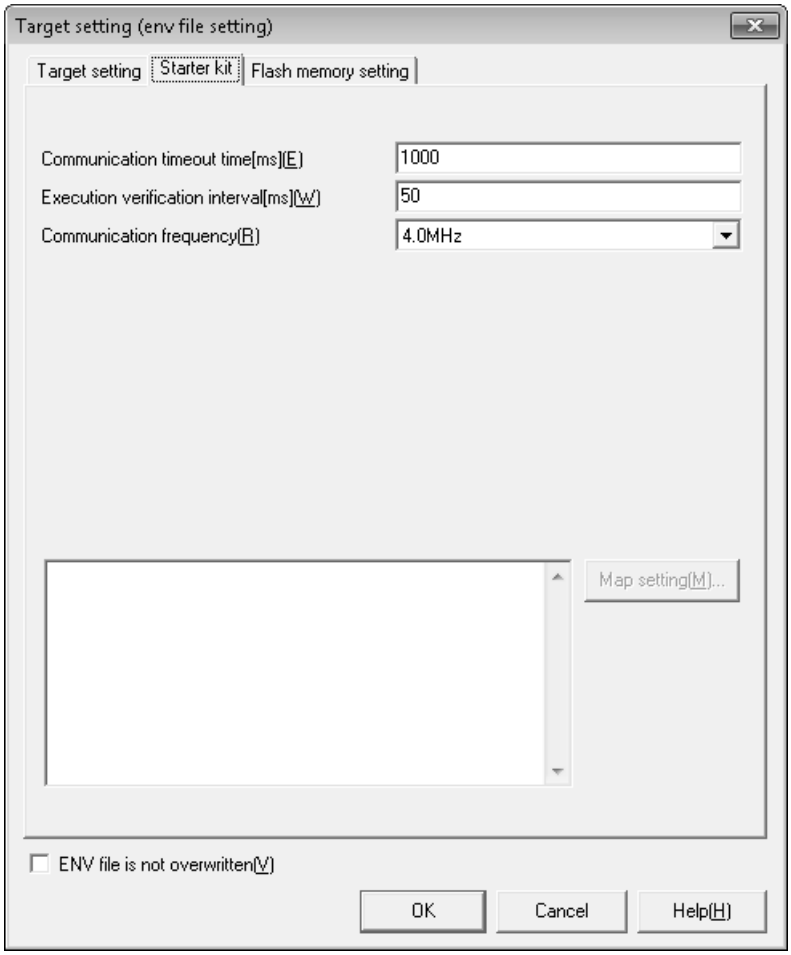

Figure 2.5.7 Starter kit setting

Table 2.5.2 Target Setting Dialog Box (Starter kit)

Communication timeout time	Specify a communication timeout. If there is no special reason, don't change the setting.
Execution verification interval	Specify the interval that the debugger checks states of the microcomputer during program execution. If there is no special reason, don't change the setting.
Communication frequency	Specify the communication frequency of the terminal for exclusive use of the debugging of the AM13L-STK2. If there is no special reason, don't change the setting.