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E30A Emulator R0E00030AKCT00

User's Manual

Supported Devices:
R32C/100 Series

Renesas Electronics
www.renesas.com

Rev.5.01   Mar 2016

Preface

The E30A Emulator (R0E00030AKCT00) is an emulator for MCU of the R32C/100 Series.

All the components of this product are shown in "1.1 Package Components". If you have any questions about this product, contact your local distributor.

This user's manual mainly describes specifications of the E30A Emulator and how to setup it. For details on the related product such as an emulator debugger, refer to each product's user's manual.
The related manuals for using this product are listed below. You can download the latest manuals from the Renesas Tools homepage (http://www.renesas.com/tools).

Related manuals

Item	Manual
Integrated development environment	High-performance Embedded Workshop online help
Emulator debugger	R32C/100 E30A Emulator Debugger online help
C compiler	NC100 C Compiler User's Manual
Assembler	AS100 Assembler User's Manual

Important

Before using this emulator, be sure to read this user's manual carefully.
Keep this user's manual, and refer to it when you have questions about this product.

Emulator:
"Emulator" in this document collectively refers to the E30A Emulator provided by Renesas Electronics Corporation.
"Emulator" herein encompasses neither the customer's user system nor the host machine.

Purpose of use of the emulator:
This emulator is a device to support the development of systems that use the M16C Family R32C/100 Series of Renesas 32-bit single-chip MCUs. It provides support for system development in both software and hardware. This emulator is not guaranteed for use on production lines.
Be sure to use this emulator correctly according to said purpose of use. Please avoid using this emulator other than for its intended purpose of use.

For those who use the emulator:
This emulator can only be used by those who have carefully read the user's manual and know how to use it.
Use of this emulator requires basic knowledge of electric circuits, logical circuits, and MCUs.

When using the emulator:
(1) This emulator is a development-support unit for use in your program development and evaluation stages. When a program you have finished developing is to be incorporated in a mass-produced product, the judgment as to whether it can be put to practical use is entirely your own responsibility, and should be based on evaluation of the device on which it is installed and other experiments.
(2) In no event shall Renesas Electronics Corporation be liable for any consequence arising from the use of this emulator.
(3) Renesas Electronics Corporation strives to provide workarounds for and correct trouble with products malfunctions, with some free and some incurring charges. However, this does not necessarily mean that Renesas Electronics Corporation guarantees the provision of a workaround or correction under any circumstances.
(4) This emulator covered by this document has been developed on the assumption that it will be used for program development and evaluation in laboratories. Therefore, it does not fall within the scope of applicability of the Electrical Appliance and Material Safety Law and protection against electromagnetic interference when used in Japan.
(5) Renesas Electronics Corporation cannot predict all possible situations and possible cases of misuse that carry a potential for danger. Therefore, the warnings in this user's manual and the warning labels attached to this emulator do not necessarily cover all such possible situations and cases. The customer is responsible for correctly and safely using this emulator.
(6) Renesas Electronics Corporation will not assume responsibility of direct or indirect damage caused by an accidental failure or malfunction in this product.

When disposing of this product:
Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

Usage restrictions:

This emulator has been developed as a means of supporting system development by users. Therefore, do not use it as an embedded device in other equipment. Also, do not use it to develop systems or equipment for use in the following fields.

    (1) Transportation and vehicular

    (2) Medical (equipment that has an involvement in human life)

    (3) Aerospace

    (4) Nuclear power control

    (5) Undersea repeaters

If you are considering the use of this emulator for one of the above purposes, please be sure to consult your local distributor.

About product changes:

We are constantly making efforts to improve the design and performance of this emulator. Therefore, the specification or design of this emulator, or this user's manual, may be changed without prior notice.

About rights:

(1) We assume no responsibility for any damage or infringement on patent rights or any other rights arising from the use of any information, products or circuits presented in this user's manual.

(2) The information or data in this user's manual does not implicitly or otherwise grant a license to patent rights or any other rights belonging to Renesas or to a third party.

(3) This user's manual and this emulator are copyrighted, with all rights reserved by Renesas. This user's manual may not be copied, duplicated or reproduced, in whole or part, without prior written consent from Renesas.

About diagrams:

Some diagrams in this user's manual may differ from the objects they represent.

Precautions for Safety

This chapter describes the precautions which should be taken in order to use this product safely and properly. Be sure to read and understand this chapter before using this product.

Contact us if you have any questions about the precautions described here.

 WARNING

WARNING indicates a potentially dangerous situation that will cause death or heavy wound unless it is avoided.

 CAUTION

CAUTION indicates a potentially dangerous situation that will cause a slight injury or a medium-degree injury or property damage unless it is avoided.

To avoid a possible danger, the following diagrammatic symbols are used to call your attention.

△ means WARNING or CAUTION.

Example: CAUTION AGAINST AN ELECTRIC SHOCK

◇ means PROHIBITION.

Example: DISASSEMBLY PROHIBITED

● means A FORCIBLE ACTION.

Example: UNPLUG THE POWER CABLE FROM THE RECEPTACLE.

⚠ WARNING

Warnings for AC Power Supply:

If the included AC power cable does not fit the receptacle, do not alter the AC power cable and do not plug it forcibly. Failure to comply may cause electric shock and/or fire.

The included AC power cable complies with American UL Standard. Use an AC power cable which complies with the safety standard of the country where this emulator is used.

The rated voltage for this cable is 125 volts. When you connect to a power supply of more than 125V, use an appropriate cable for the voltage.

Do not touch the plug of the AC power cable when your hands are wet. This may cause electric shock.

This emulator is connected signal ground with frame ground. If your developing product is transformless (not having isolation transformer of AC power), this may cause electric shock. Also, this may give an un-repairable damage to this emulator and your developing product.
While developing, connect AC power of the product to commercial power through isolation transformer in order to avoid these dangers.

If other equipment is connected to the same branch circuit, care should be taken not to overload the circuit.

When installing this equipment, insure that a reliable ground connection is maintained.

If you smell a strange odor, hear an unusual sound, or see smoke coming from this product, then disconnect power immediately by unplugging the AC power cable from the outlet.
Do not use this as it is because of the danger of electric shock and/or fire. In this case, contact your local distributor.

Before setting up this emulator and connecting it to other devices, turn off power or remove a power cable to prevent injury or product damage.

Warning for Modification:

Do not modify this emulator. Personal injury due to electric shock may occur if this emulator is modified. Modifying the emulator will void your warranty.

Warnings for Installation:

Do not set this product in water or areas of high humidity. Make sure that the product does not get wet. Spilling water or some other liquid into the product may cause un-repairable damage.

Make sure nothing falls into the cooling fan on the top panel, especially liquids, metal objects, or anything combustible.

Warning for Use temperature:

This equipment is to be used in an environment with a maximum ambient temperature of 35°C. Care should be taken that this temperature is not exceeded.

⚠ CAUTION

Cautions to Be Taken for the AC Adapter:

Use only the AC adapter included in this product. Do not use the AC adapter for other equipment.

The DC plug of the included AC adapter has the below polarity.

⊕—●—⊖

Cautions to Be Taken for Turning On the Power:

Turn ON/OFF the power of the emulator and user system as simultaneously as possible. If you cannot turn on the powers simultaneously, turn on the emulator first and then the user system.

When turning on the power again after shutting off the power, wait about 10 seconds.

Cautions to Be Taken for Handling This Product:

Use caution when handling the product. Be careful not to apply a mechanical shock.

Do not touch the connector pins of the emulator main unit and the target MCU connector pins directly. Static electricity may damage the internal circuits.

When attaching and removing the cable, hold the plug of the cable and do not touch the cable. When installing the emulator, do not flex the cable excessively or pull the emulator or the board by the cable connected to it. The cable may cause a break.

Do not tape the flexible cable or apply adhesives to secure the cable. The shielding material on the surface of the cable may come off.

Caution to Be Taken for System Malfunctions:

If the emulator malfunctions because of interference like external noise, do the following to remedy the trouble.
  (1) Exit the emulator debugger, and shut OFF the emulator and the user system.
  (2) When turning the power ON again, wait more than 10 seconds. Then start up the emulator debugger.

Caution to Be Taken for Disposal:

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

European Union regulatory notices:

Renesas development tools and products are directly covered by the European Union's Waste Electrical and Electronic Equipment, (WEEE), Directive 2012/19/EU. As a result, this equipment, including all accessories, must not be disposed of as household waste but through your locally recognized recycling or disposal schemes. As part of our commitment to environmental responsibility Renesas also offers to take back the equipment and has implemented a Tools Product Recycling Program for customers in Europe. This allows you to return equipment to Renesas for disposal through our approved Producer Compliance Scheme. To register for the program, click here "http://www.renesas.com/weee".

Contents

User Registration

When you install debugger software, a text file for user registration is created on your PC. Fill it in and email it to your local distributor. If you have replaced an emulator main unit or emulation probe, rewrite an emulator name and serial number in the text file you filled in earlier to register your new hardware products.

Your registered information is used for only after-sale services, and not for any other purposes. Without user registration, you will not be able to receive maintenance services such as a notification of field changes or trouble information. So be sure to carry out the user registration.

For more information about user registration, please contact your local distributor.

Terminology

Some specific words used in this user's manual are defined below:

Integrated development environment: High-performance Embedded Workshop

This tool provides powerful support for the development of embedded applications for Renesas microcomputers. It has an emulator debugger function allowing the emulator to be controlled from the host machine via an interface. Furthermore, it permits a range of operations from editing a project to building and debugging it to be performed within the same application. In addition, it supports version management.

Emulator debugger

This means a software tool that is started up from the High-performance Embedded Workshop, and controls the emulator and enables debugging.

Firmware

This means a control program stored in the emulator. This analyzes the contents of communications with the emulator debugger and controls the emulator hardware. To upgrade the firmware, download the program from the emulator debugger.

Host machine

This means a personal computer used to control the emulator.

Target MCU

This means the MCU to be debugged.

User system

This means a user's application system in which the MCU to be debugged is used.

User program

This means the program to be debugged.

#

This symbol indicates that a signal is active-low (e.g. RESET#).

1. Outline

This chapter describes the package components, the system configuration, and the specifications of the emulator functions and operating environment.

1.1 Package Components

The R0E00030AKCT00 package consists of the following items. After you have unpacked the box, check if your R0E00030AKCT00 contains all of these items. Table 1.1 lists the package components.

Table 1.1 Package components

Item	Quantity
E30A emulator main unit (R0E00030AKCT00)	1
AC adapter (AC input 100 - 240 V, 50/60Hz, DC output 12V 3A)	1
AC power cable (1.5m, UL/PSE qualified)	1
USB I/F cable (A plug -- mini-B plug, 1.8 m long, compliant with high-speed standard)	1
Target I/F cable (50Ω coaxial cable (gray), 1.8 m long)	1
Coaxial connector (HRM-300-126B(40) (Hirose Electric))	1
Coaxial converter board (R0E00030ACKZ00, coaxial connector and 3-pin connector (premounted))	1
Connector for coaxial converter board (PIC-FS03-G+R (Honda Tsushin Kogyo), 2.54mm pitch 3-pin socket)	1
Option I/F cable (10-pin flat cable, 20cm long)	1
Option board (R0E00030ACKZ10, 10-pin connector and 3-pin socket (premounted))	1
Option board connector - FFC-8LAMEP1B (Honda Tsushin Kogyo), 2.54mm pitch 8-pin right angle - PIC-MSA08-2G (Honda Tsushin Kogyo), 2.54mm pitch 8-pin straight - PIC-FS08-G+R (Honda Tsushin Kogyo), 2.54mm pitch 8-pin socket	1 1 1
CD-ROM - Integrated development environment High-performance Embedded Workshop - R32C/100 E30A Emulator Debugger - E30A Emulator user's manual	1

Note:

* Please keep the R0E00030AKCT00's packing box and cushioning materials at hand for later reuse in sending the product for repairs or for other purposes. Always use the original packing box and cushioning material when transporting the R0E00030AKCT00.

1.2 System Configuration

The E30A emulator is used connecting the target MCU that mounted on the user system. Figure 1.1 shows a configuration of the E30A emulator.
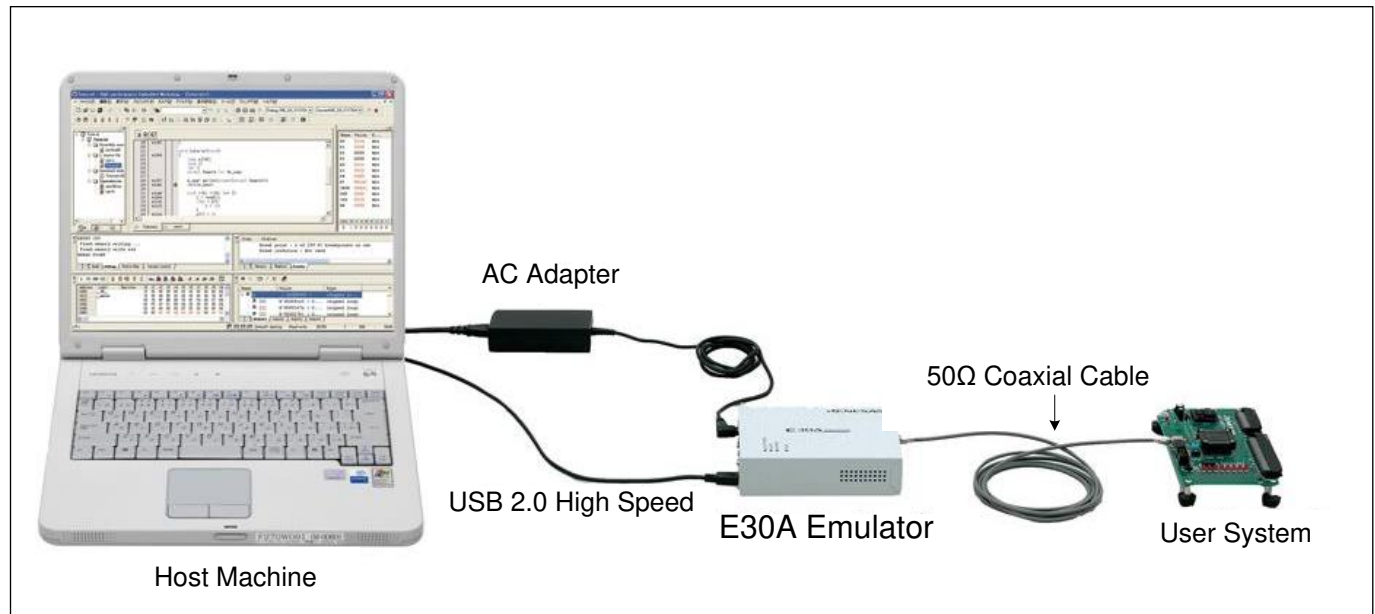
Figure 1.1 E30A emulator system configuration

(1) E30A Emulator (this product)

(2) AC adapter (included)

(3) USB 2.0 high-speed cable (included)

(4) 50 Ω coaxial cable (included)

(5) User system:

This is your application system using the MCU to be debugged. The emulator cannot supply power to the user system. Get a power supply separately.

(6) Host machine:

This is a personal computer to control the emulator by USB interface.

1.3 Operating Environment
-   IBM PC/AT compatibles (Windows® 7 64-bit editions *[1], Windows® 7 32-bit editions *[1],
    Windows Vista® 32-bit editions *[1] *[2], Windows® XP 32-bit editions *[1] *[2], Windows® 2000 *[1])
 *1: Windows and Windows Vista are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
 *2: The 64-bit editions of Windows Vista® and the 64-bit editions of Windows® XP are not supported.

1.4 PC Interface
-   USB interface *[1]
    USB 2.0 high-speed (also connectable to the USB 1.1-compatible host machine)
 *1: Operation with all combinations of host machine, USB device and USB hub is not guaranteed for the USB interface.

1.5 Specifications

1.5.1 Product specifications

Table 1.2 lists the product specifications of the E30A emulator.

Table 1.2 Product specifications of the E30A emulator

Item	Description						
Applicable MCU	M16C Family R32C/100 Series						
Available MCU mode	Single-chip mode Memory expansion mode						
Maximum operating frequency	100MHz (CPU clock)						
Emulation memory	Not available (internal flash ROM used as emulation memory)						
Software break	Maximum 256 points (implemented by instruction replacement)						
Execution address break	Maximum 8 points (execution address/data access)						
Hardware break	- Shared with trace event/time measurement event - Only address and R/W attribute specifiable for data access break - One data comparison breakpoint specifiable in software						
Combinatorial break point	OR/status transition (in forward direction)						
Trace mode	Trace priority/MCU execution priority specifiable						
Trace capacity	8M events (Trace priority) /512 events (MCU execution priority)						
Trace contents	Branch source and branch destination/conditional branch/data access						
Trace event	Maximum 8 points/4 area (prefetch address/data access) - Shared with break event/time measurement event - Start/end/extraction event specifiable						
Time measurement	Execution time (between Go-Stop, 32-bit CPU clock counter in MCU) Section time, 3 points (between data access, 40-bit counter in E30A)						
RAM monitor	Specifiable in byte or word units - pseudo-RAM monitor realized by software (one event used)						
Coverage	Not available						
Simultaneously usable functions by operation mode	Break				Trace	Time Measurement	RAM Monitor
	Execution Address	Data Access	Address Range	Data Comparison			
Trace: Trace priority	Yes	Yes	-	-	Yes	-	-
Trace: MCU execution priority	Yes	Yes	-	Yes	Yes	-	-
Time Measurement	Yes	Yes	-	-	-	Yes	-
RAM Monitor	Yes	Yes	Yes	-	-	-	Yes
Writer	-	-	-	-	-	-	-
Host machine I/F	USB 2.0 (High Speed)						
Target I/F	2-pin (50Ω coaxial cable) 3-pin (via coaxial converter board) 8-pin (via option board)						
Target I/F signal	NSD, GND (When using coaxial cable/coaxial converter board) NSD, GND, Vcc1, Vcc2, RESET# (When using option board)						
Targetless debugging	Not available						
Emulator power supply	Supplied from the included AC adapter						
Target MCU power supply	Supplied from a user system						
Outside dimension	Width: 136.3 mm, depth: 104.0 mm, height: 36.8 mm (except the protruding part)						
Weight	Approx. 300g						
Operating environment	Temperature: 5°C to 35°C (no condensation)						
Storage environment	Temperature: -10°C to 60°C (no condensation)						
Overseas standard	European EN Standard (EN55022 Class A, EN55024) American FCC Standard (FCC part 15 Class A)						

1.5.2 Specifications of the AC Adapter

Table 1.3 lists the specifications of the included AC adapter.

Table 1.3 Specifications of the included AC adapter

Item	Description
AC input voltage range	AC 100 - 240 V, 50/60Hz single phase
Output power	36 W
DC output voltage, current	12.0 V, 3.0 A
DC output polarity	EIAJ TYPE IV, inner side plus/outer side minus
Outside dimension	Width: 99.5 mm, depth: 49.5 mm, height: 25.5 mm (except the protruding part)
Weight	Approx. 200g

1.6 Regulatory Compliance Notices

1.6.1 European Union regulatory notices

This product complies with the following EU Directives. (These directives are only valid in the European Union.)

CE Certifications:
・Electromagnetic Compatibility (EMC) Directive 2014/30/EU
         EN 55022 Class A

WARNING: This is a Class A product. This equipment can cause radio frequency noise when used in the residential area. In such cases, the ser/operator of the equipment may be required to take appropriate countermeasures under his responsibility.

         EN 55024

・Information for traceability
   ・Authorised representative
         Name :   Renesas Electronics Corporation
         Address :   Toyosu Foresia, 3-2-24, Toyosu, Koto-ku, Tokyo 135-0061, Japan
   ・Manufacturer
         Name :   Renesas System Design Co., Ltd.
         Address :   5-20-1, Josuihon-cho, Kodaira-shi, Tokyo 187-8588, Japan
   ・Person responsible for placing on the market
         Name :   Renesas Electronics Europe GmbH
         Address :   Arcadiastrasse 10, 40472 Dusseldorf, Germany
   ・Trademark and Type name
         Trademark :   Renesas
         Product name :   E30A Emulator
         Type name :   R0E00030AKCT00

Environmental Compliance and Certifications:
 ・Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU

1.6.2 United States Regulatory notices on Electromagnetic compatibility

This product complies with the following EMC regulation. (This is only valid in the United States.)

FCC Certifications:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION :   Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1.7 Names and Functions of Each Part of the Emulator

Figure 1.2 shows the names and functions of each part of the emulator. The connector followed by "*" (the differential connector) is prepared for future expansion. It cannot be used because of not working now.
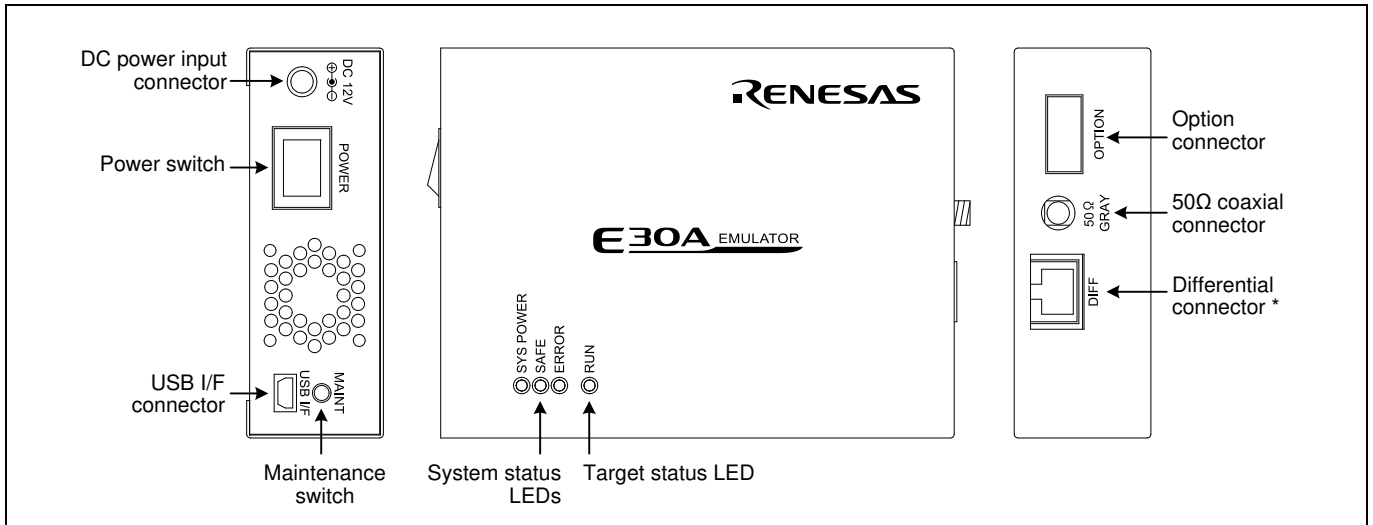
Figure 1.2 Names and functions of each part of the emulator

1.7.1 System Status LEDs

The system status LEDs indicate the emulator main unit's operating status. Tables 1.4 and 1.5 list the definition of the system status LEDs.

Table 1.4 Definitions of the system status LEDs (SYS POWER)

Name/Status		Meaning
SYS POWER (Orange)	ON	Power is supplied to the emulator.
	OFF	Power is not supplied to the emulator.

Table 1.5 Definitions of the system status LEDs (SAFE and ERROR)

Name/Status		Meaning
SAFE (Green)	ERROR (Red)	
ON	OFF	Emulator system has started normally.
ON	Blinking	Firmware is being downloaded.
Blinking	OFF	Emulator is in maintenance mode.
OFF	ON	Emulator system is not operating normally.
OFF	Blinking	Firmware download is not operating normally.

1.7.2 Target Status LED

The target status LED indicates the target MCU's operating status. Table 1.6 lists the definition of the target status LED.

Table 1.6 Definitions of the target status LED

Name/Status		Meaning
RUN (Green)	ON	User program is being executed.
	OFF	User program is not being executed.

1.7.3 DC Power Input Connector

This connector connects the included AC adapter DC output cable to supply DC 12.0 V.

1.7.4 Power Switch

This is a power switch of the E30A emulator. Before turning on the power again after shutting off the power, wait about 10 seconds.

1.7.5 USB I/F Connector

This is a USB interface connector for connecting the host machine to this emulator. For details on connecting the emulator and host machine, refer to "2.5 Connecting the E30A Emulator and the Host Machine".

1.7.6 Maintenance Switch

If this switch is pressed within 2 seconds after turning on the power, the SAFE LED blinks and the emulator switches to maintenance mode for downloading firmware. In maintenance mode you can download firmware forcibly. For details, refer to "2.10 Downloading Firmware".

1.7.7 50Ω Coaxial Connector

This included 50Ω coaxial cable (gray) connects this emulator to the user system. For details on connecting the emulator and user system, refer to "2.6 Connecting the E30A Emulator and the User System".

1.7.8 Option Connector

This connector is provided for connecting to the user system via an option board using the 10-pin flat cable included with the product. For details on connecting to the user system, refer to "2.6 Connecting the E30A Emulator and the User System".

1.8 Operating Environment

Be sure to use this emulator with the operating environment of the emulator and host machine listed in Table 1.7.

Table 1.7 Operating environmental conditions

Item	Description
Operating temperature	5 to 35°C (no condensation)
Storage temperature	-10 to 60°C (no condensation)

2. Setup

2.1 Flowchart of Starting Debugging

The procedure for starting the debugging is shown in Figure 2.1. For details, refer to each section hereafter.

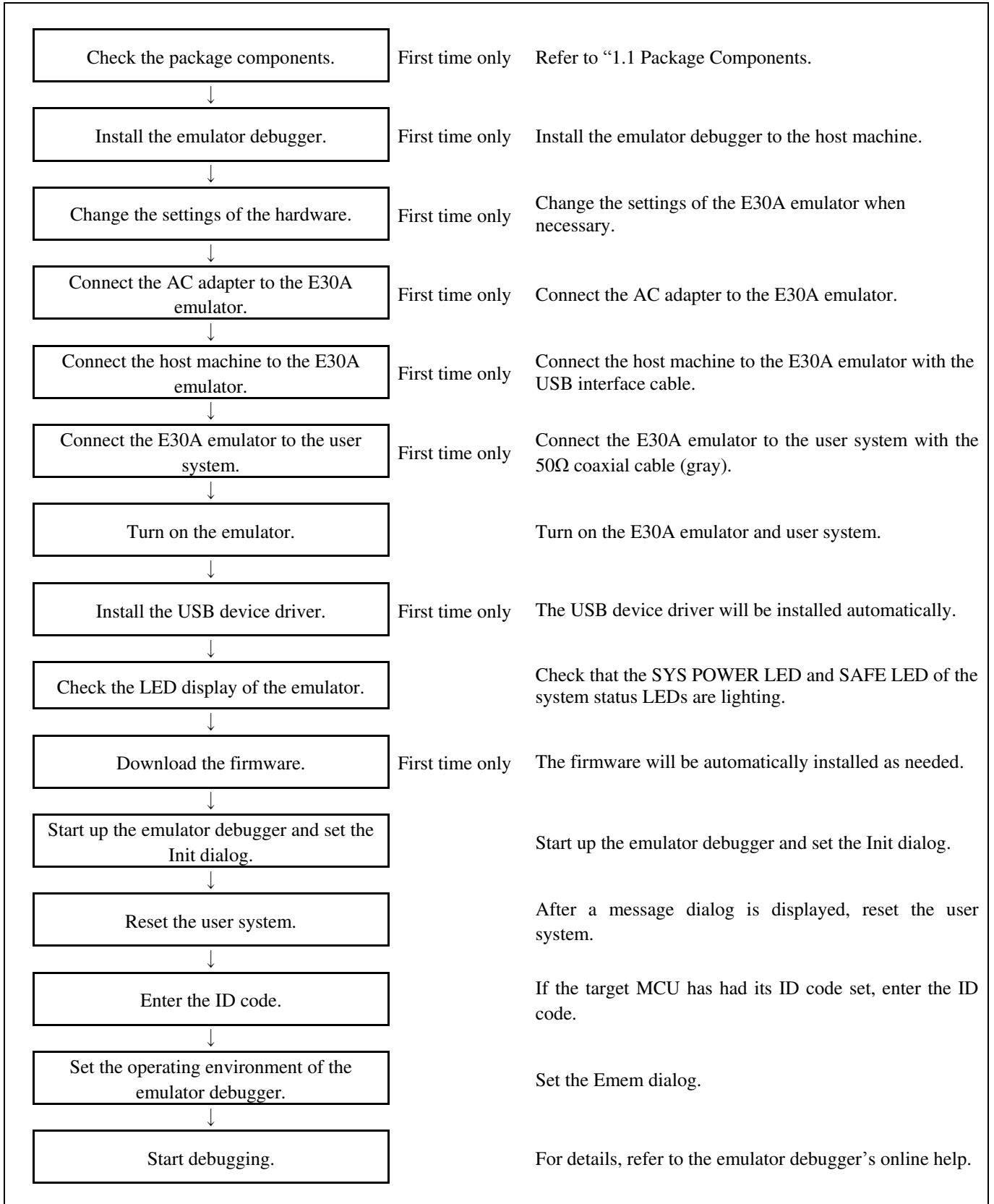|		
Check the package components.	First time only	Refer to "1.1 Package Components.
↓		
Install the emulator debugger.	First time only	Install the emulator debugger to the host machine.
↓		
Change the settings of the hardware.	First time only	Change the settings of the E30A emulator when necessary.
↓		
Connect the AC adapter to the E30A emulator.	First time only	Connect the AC adapter to the E30A emulator.
↓		
Connect the host machine to the E30A emulator.	First time only	Connect the host machine to the E30A emulator with the USB interface cable.
↓		
Connect the E30A emulator to the user system.	First time only	Connect the E30A emulator to the user system with the 50Ω coaxial cable (gray).
↓		
Turn on the emulator.		Turn on the E30A emulator and user system.
↓		
Install the USB device driver.	First time only	The USB device driver will be installed automatically.
↓		
Check the LED display of the emulator.		Check that the SYS POWER LED and SAFE LED of the system status LEDs are lighting.
↓		
Download the firmware.	First time only	The firmware will be automatically installed as needed.
↓		
Start up the emulator debugger and set the Init dialog.		Start up the emulator debugger and set the Init dialog.
↓		
Reset the user system.		After a message dialog is displayed, reset the user system.
↓		
Enter the ID code.		If the target MCU has had its ID code set, enter the ID code.
↓		
Set the operating environment of the emulator debugger.		Set the Emem dialog.
↓		
Start debugging.		For details, refer to the emulator debugger's online help.

Figure 2.1 Flowchart of starting the debug

2.2 Installing the Emulator Debugger

Install the R32C/100 E30A emulator debugger from the included CD-ROM as follows. This installation must be executed by a user with administrator rights. Be aware that users without administrator rights cannot complete the installation.

(1) When inserting the included CD-ROM, the Readme Web page will be displayed. Click "Install" to open the folder where the Installation program is stored. Execute "R32cE30ADebuggerVxxxRxx.exe".

(2) The install manager starts. Click "Standard Install (Recommended)".

(3) In the page to select an installation product, click "Install" to start installing.

(4) When the installation finishes, a dialog box will be displayed indicating that the setup has been completed.

2.3 Changing Hardware Settings

2.3.1 Selecting Clock Supply

You need to choose the X_{IN} clock supplied to the target MCU on the user system. Table 2.1 shows the clock supply to the MCU.

For normal use, select "Generated" in the Emulator tab of the Init dialog box of the emulator debugger and specify a frequency you like to use for this clock supplied to an MCU.

You can change a frequency between 2.0 and 32.0 MHz by 0.1 MHz.

Table 2.1 Clock supply to the MCU

Clock	Emulator debugger display	Description
X_{IN}-X_{OUT}	Generated	Internal generator circuit (2.0 to 32.0 MHz)
	Internal	Oscillator circuit board (OSC-3 or OSC-2)

2.3.2 Using the Oscillator Circuit Board

Even when you have selected "Internal" on the Emulator tab of the emulator debugger's Init dialog box to specify an oscillator circuit board, you need to enter a clock frequency.

With this emulator, no oscillator circuit board has been mounted when shipped from the factory. If you use a special frequency, attach the oscillator circuit board following the procedure described below.

(1) Unscrew the five screws securing the E30A emulator, and remove the upper cover.
(2) The connector J1 for connecting an oscillator circuit board is in the corner of the board (around the DC power input connector).
(3) Unscrew the screw which is used for securing an oscillator circuit board.
(4) Attach the oscillator circuit board you like to use, and secure the oscillator circuit board with the screw.
(5) Attach the upper cover and secure it with the five screws.

⚠ CAUTION

Note on Replacing the Oscillator Circuit Board:

When removing the upper cover or replacing the oscillator circuit boards, be sure to shut OFF the power supply. Otherwise the internal circuit may cause a break.

Note on Using the Oscillator Circuit Board:

This product was inspected for the qualification of CE marking under factory shipment conditions (with no oscillator circuit boards mounted in place). When using an oscillator circuit board for this product, please be aware that depending on the oscillation frequency of the oscillator circuit board used, radiation EMI standards (EN55022 Class A and FCC part 15 Class A) may be exceeded.

2.3.3 Using the Internal Oscillator Circuit Bare Board

To use this product at a frequency you like, build a desired oscillator circuit on the OSC-2 oscillator circuit bare board (not included). Figure 2.2 shows an external view of the OSC-2 oscillator circuit bare board and the connector pin locations. Figure 2.3 shows the circuitry of the oscillator circuit bare board OSC-2. Use the number of oscillator circuits recommended by the oscillator manufacturer.
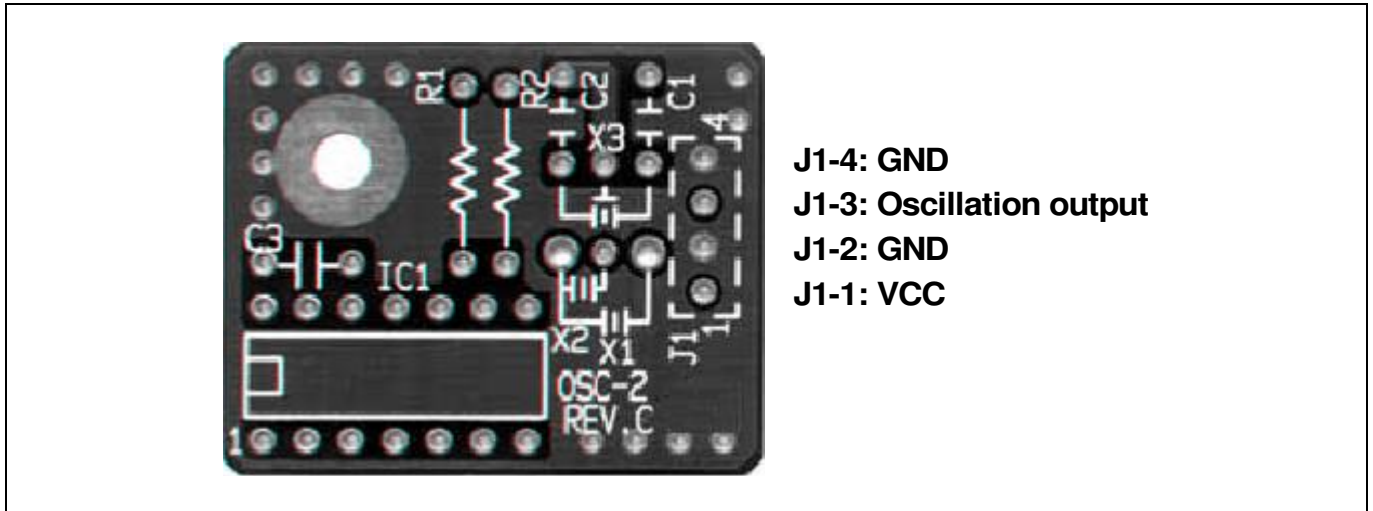

J1-4: GND
J1-3: Oscillation output
J1-2: GND
J1-1: VCC

Figure 2.2 External view of the oscillator circuit board OSC-2 and its connector pin locations

* X1: 5.08mm pitch 2-pin oscillator
  X2: 2.54mm pitch 2-pin oscillator
  X3: 2.54mm pitch 3-pin oscillator
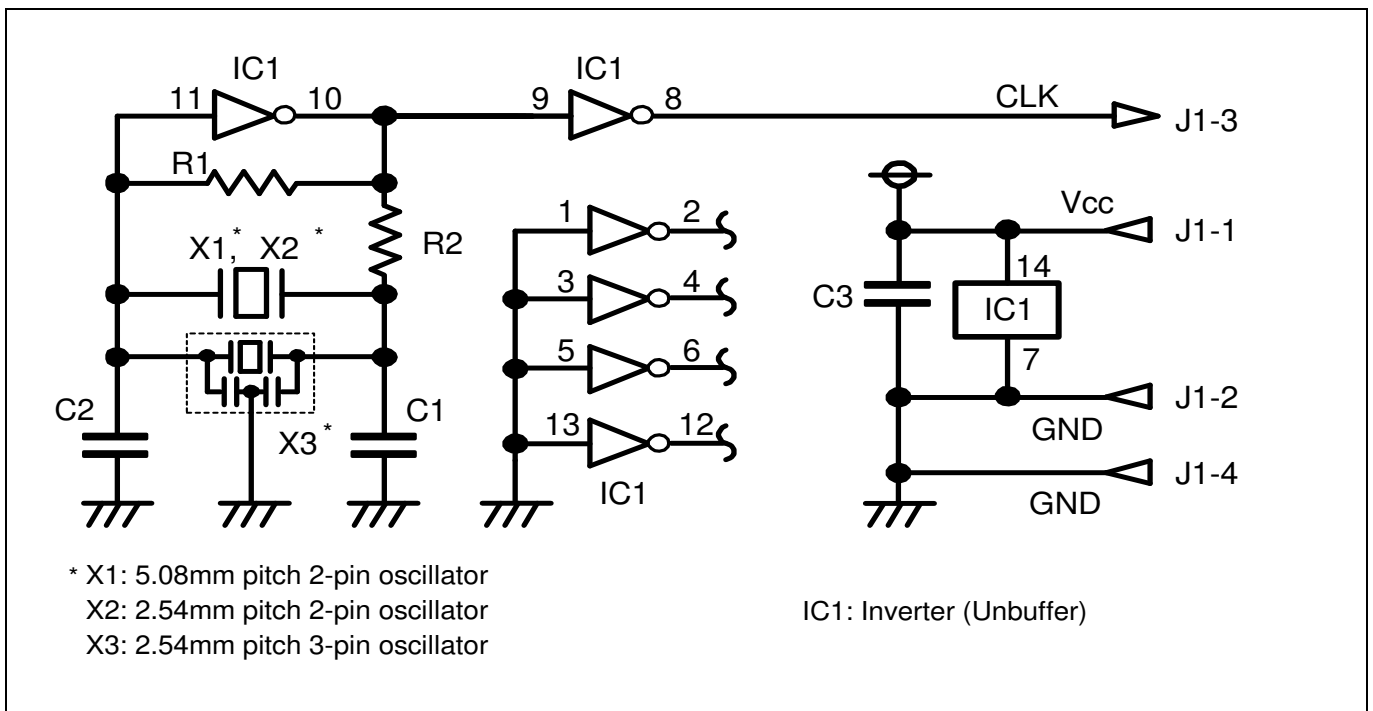
IC1: Inverter (Unbuffer)

Figure 2.3 Circuits of the oscillator circuit bare board OSC-2

2.4 Connecting the AC Adapter to the E30A Emulator

Connect the included AC adapter to the E30A emulator.

(1) Check to see if the E30A emulator power switch is OFF.

(2) Connect the DC output cable of the AC adapter to the DC power input connector of the E30A emulator.

(3) Connect the AC power cable to the AC power input connector of the AC adapter.

(4) Connect the AC power cable to the outlet.

⚠ WARNING

Warning for the AC Power Cable:

If the included AC power cable does not fit the receptacle, do not alter the AC power cable and do not plug it forcibly. Failure to comply may cause electric shock and/or fire.

The included AC power cable complies with American UL Standard. Use an AC power cable which complies with the safety standard of the country.

The rated voltage for this cable is 125 volts. When you connect to a power supply of more than 125V, use an appropriate cable for the voltage.

Do not touch the plug of the AC power cable when your hands are wet. This may cause electric shock.

2.5 Connecting the E30A Emulator and the Host Machine

Connect the E30A emulator to the host machine with the included USB I/F cable.

(1)   Connect the A-plug of the USB I/F cable to the USB I/F connector of the host machine.

(2)   Connect the mini-B plug of the USB I/F cable to the USB I/F connector of the E30A emulator.

Note on USB I/F Cable:

The USB I/F cable included with the product is compliant with USB 2.0 High Speed standard. Be sure to use the included USB I/F cable for the E30A emulator.

2.6 Connecting the E30A Emulator and the User System

2.6.1 Using the Coaxial Connector

(1) Processing NSD pin

Pull up NSD pin of the target MCU to Vcc1 with a 4.7kΩ resistor. (It cannot be connected directly to Vcc1 and Vcc2.) Furthermore, be sure that the wiring from NSD pin to the connector is shortest possible.

(2) Mounting part in place

Mount the coaxial connector included with the product (HRM-300-126B(40) made by Hirose Electric) on designated position of the user system.

(3) Connection procedure

Plug the 50Ω coaxial cable (gray) included with the product into the E30A emulator and the coaxial connector on the user system.

Although the cable can be connected over a distance, the power supply condition of the user system cannot be monitored. Furthermore, since only a software reset is possible from the E30A emulator, a hardware reset is required when the emulator debugger is started or when a communication error occurs. Figure 2.4 is a connection diagram showing how to connect the E30A emulator and user system using the coaxial connector.
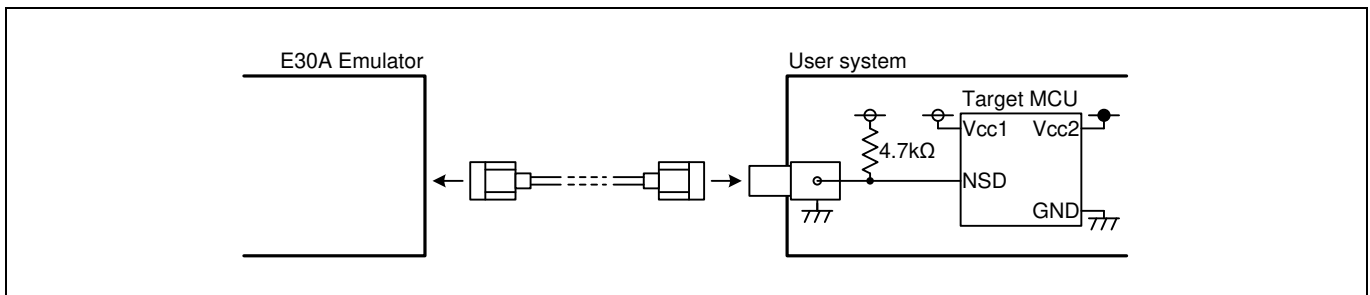

Figure 2.4 Connection diagram when using the coaxial connector

⚠ CAUTION

Caution for Insertion/Removal of the Coaxial Cable:

When inserting or removing the coaxial cable, be aware not to rotate it. The center core of the coaxial cable may be broken.

2.6.2 Using the Coaxial Converter Board R0E00030ACKZ00

(1) Processing NSD pin

Pull up NSD pin of the target MCU to Vcc1 with a 4.7kΩ resistor. (It cannot be connected directly to Vcc1 and Vcc2.) Furthermore, be sure that the wiring from NSD pin to the connector is shortest possible.

(2) Mounting part in place

Mount the 2.54mm pitch 3-pin socket included with the product (PIC-FS03-G+R made by Honda Tsushin Kogyo) on designated position of the user system.

(3) Connection procedure

Plug the 50Ω coaxial cable included with the product (gray) into the E30A emulator and CN1 on coaxial converter board. Fit CN2 on coaxial converter board into the 3-pin socket on user system. It can be turned 180 degrees as it is fitted into place.

Although the cable can be easily removed/inserted and can be connected over a distance, the power supply condition of the user system cannot be monitored. Furthermore, since only a software reset is possible from the E30A emulator, a hardware reset is required when the emulator debugger is started or when a communication error occurs. Figure 2.5 is a connection diagram showing how to connect the E30A emulator and user system using the coaxial converter board.
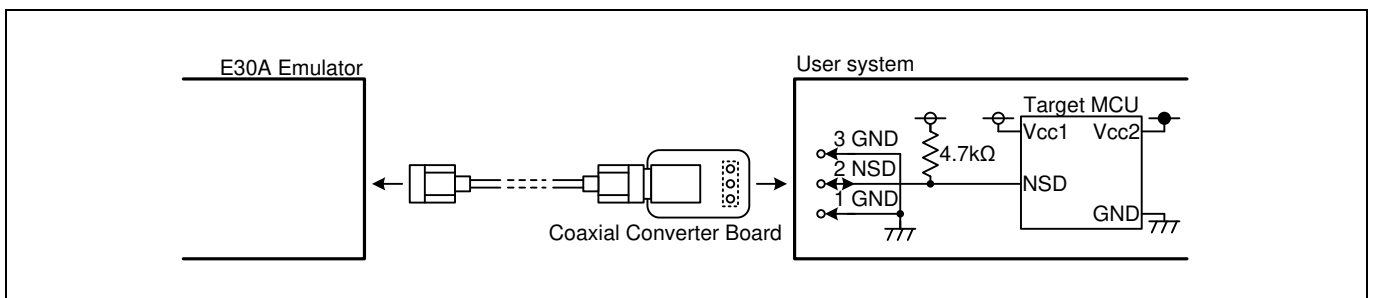

Figure 2.5 Connection diagram when using the coaxial converter board