

To our customers,

Old Company Name in Catalogs and Other Documents

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

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

April 1st, 2010
Renesas Electronics Corporation

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

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

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: “Standard”, “High Quality”, and “Specific”. The recommended applications for each Renesas Electronics product depends on the product’s quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as “Specific” without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as “Specific” or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is “Standard” unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.
 - “Standard”: Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots.
 - “High Quality”: Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; safety equipment; and medical equipment not specifically designed for life support.
 - “Specific”: Aircraft; aerospace equipment; submersible repeaters; nuclear reactor control systems; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

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

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

USER'S MANUAL

Phase-out/Discontinued

EP-75068CU-R

USER'S MANUAL

NEC

Phase-out/Discontinued

EP-75068CU-R

Phase-out/Discontinued

The information in this document is subject to change without notice.

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.

NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or of others.

Phase-out/Discontinued

PREFACE

Intended Readership

This manual is intended for users who wish to perform uPD75068CU series debugging using the IE-75001-R^{*1} + IE-75000-R-EM or EVAKIT-75X^{*2} and EP-75068CU-R.

*1: The IE-75001-R is a product obtained by removing the IE-75000-R-EM removed from the IE-75000-R.

The IE-75000-R can be used instead of the IE-75001-R.

2: Discontinued model (can no longer be purchased)

Purpose

The purpose of this manual is to give users an understanding of the method of connecting the EP-75068CU-R to the IE-75001-R + IE-75000-R-EM or EVAKIT-75X, and the method of setting mask options.

Organization

This manual is broadly organized as follows:

General Description

Connection Method

Mask Option Setting Method

Using this Manual

Before reading this manual, users are requested to read the IE-75001-R, IE-75000-R-EM and EVAKIT-75X manuals for an understanding of the debugging system configuration and functions.

If the IE-75000-R* is used, "IE-75001-R" should be read as "IE-75000-R" throughout this manual (see Chapter 1 "General Description"). Unless otherwise noted, "IE-75001-R" in this manual denotes "IE-75001-R + IE-75000-R-EM".

*: Maintenance product

- For a general outline of the functions and method of connecting the EP-75068CU-R
 - ☞ Read the manual in accordance with the Contents.
- For a description of the operating environment, configuration, and target devices
 - ☞ Read Chapter 1 "General Description".
- For details of the connection method.
 - ☞ Read Chapter 2 "Connection".
- For a description of the mask option setting method
 - ☞ Read Chapter 3 "Mask Option Settings".

Legend

- * : Explanation of item marked with an asterisk in the text
- NOTE : Item to be especially noted
- Remarks: Supplementary information

Related Documentation

- IE-75000-R User's Manual (Document No. EEU-669)
- IE-75001-R User's Manual (Document No. EEU-846)
- IE-75000-R-EM User's Manual (Document No. EEU-673)
- EVAKIT-75X User's Manual (Document No. EEU-619)

Check of Component Items

The following items are included in the EP-75068CU-R package - please check that nothing is missing. If an item is missing, please contact your NEC sales representative or special agent.

● Emulation probe	1
● Adapter board	1
● User's Manual (this manual)	1
● Spacer (with 2 screws)*1	1
● Fixing screws*2	2

*1: Used to connect the adapter board to the IE-75000-R-EM.

2: Used to connect the emulation probe to the IE-75001-R.

CONTENTS

CHAPTER 1. GENERAL DESCRIPTION	1
1.1 Operating Environment	1
1.2 Configuration	2
1.3 Target Devices	4
CHAPTER 2. CONNECTION	5
2.1 Connecting IE-75001-R to Target System	6
2.2 Connecting EVAKIT-75X to Target System	13
2.3 Powering-on and Powering-off Sequence	19
2.4 Removing Emulation Probe from Target System	20
CHAPTER 3. MASK OPTION SETTINGS	21
APPENDIX. 42-PIN SHRINK DIP EMULATION PROBE PIN CORRESPONDENCE TABLE	22

CHAPTER 1. GENERAL DESCRIPTION

This chapter gives a general description of the EP-75068CU-R.

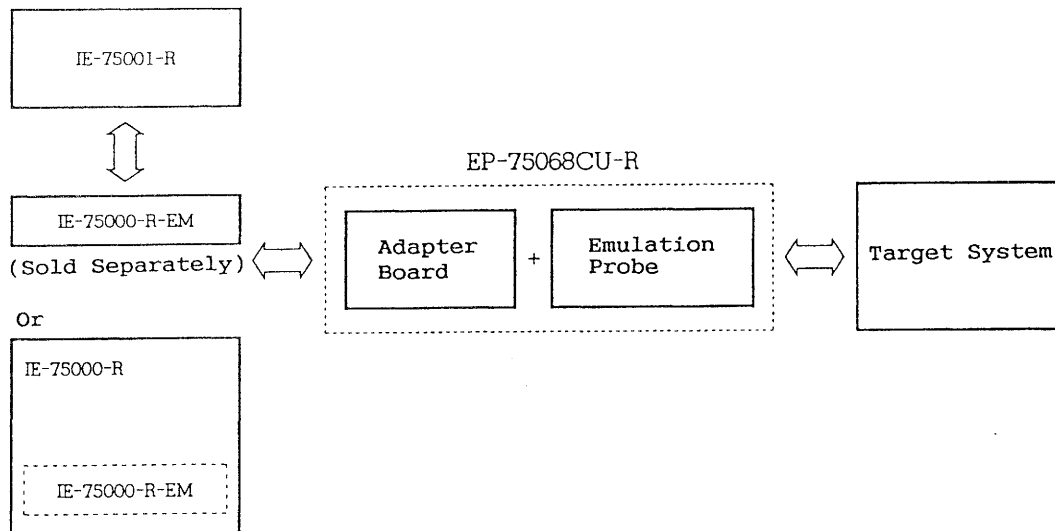
1.1 OPERATING ENVIRONMENT

The EP-75068CU-R is probe set for connecting an IE-75001-R + IE-75000-R-EM to the target system, or an EVAKIT-75X to the target system. Using the EP-75068CU-R for the connection enables the uPD75068CU series debugging environment to be established, and overall target system hardware and software debugging to be performed.

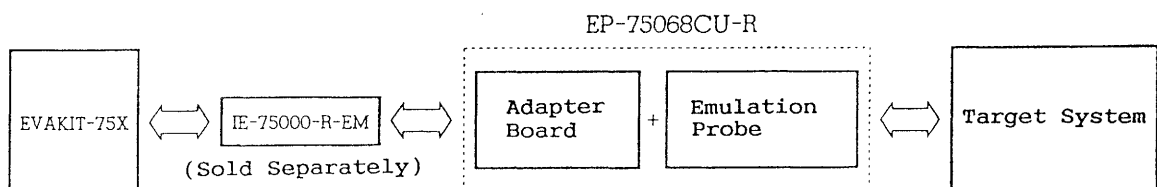
Please refer to Chapter 2 "Connection" for details of the connection method.

Figure 1-1 Operating Environment

(a) Connection of IE-75001-R to target system



(b) Connection of EVAKIT-75X to target system



1.2 CONFIGURATION

The EP-75068CU-R consists of an emulation probe and an adapter board.

(1) Emulation probe

The emulation probe comprises the following three items.

☐ 42-pin shrink DIP probe

Connects the IE-75001-R + IE-75000-R-EM to the target system, or the EVAKIT-75X to the target system.

☐ Earth clip

Connected to the target system GND. The GND potential of the IE-75001-R and the target system is thus made the same, providing greater resistance to static electricity and noise.

☐ External sense clips

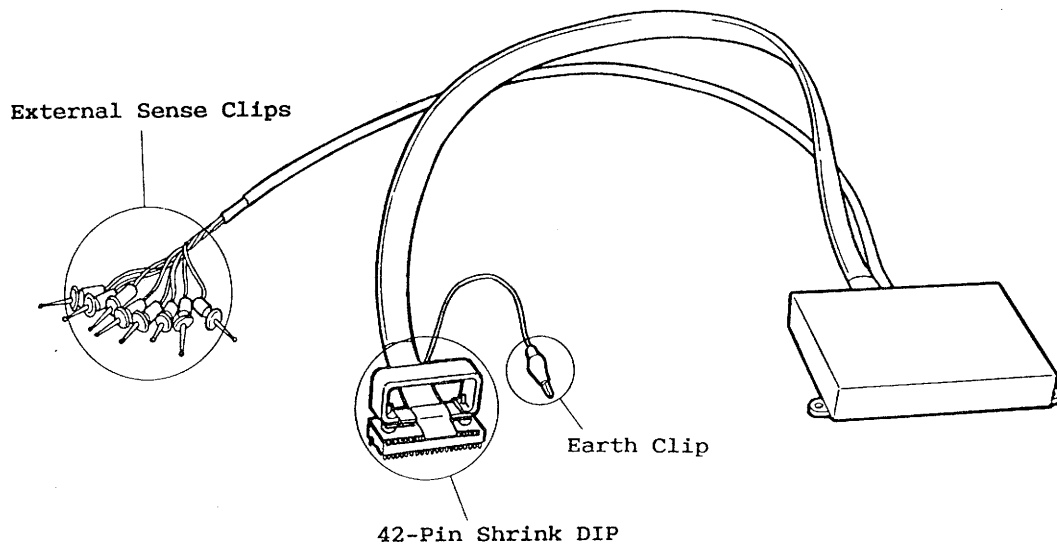
There are 8 sense clips, used to sense the level of pins on an IC mounted on the target system.

(2) Adapter board

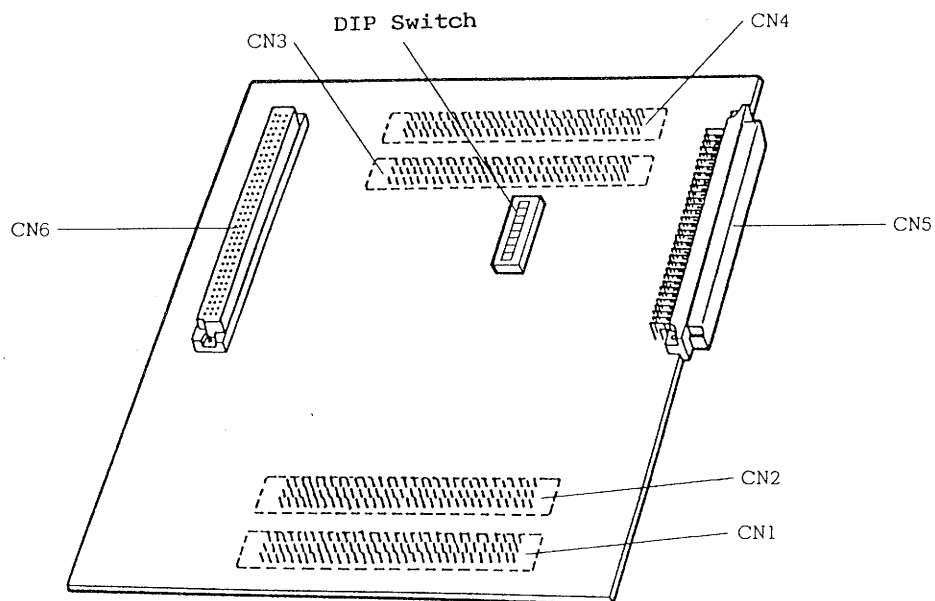
The adapter board is used to connect the emulation board (IE-75000-R-EM) to the emulation probe. The adapter board has a function for performing mask option settings. See Chapter 3 "Mask Option Settings" for details.

Figure 1-2 EP-75068CU-R

Emulation Probe



Adapter Board



1.3 TARGET DEVICES

The EP-75068CU-R is used for emulation of the following target devices.

- uPD75064CU (under development)
- uPD75066CU (under development)
- uPD75068CU (under development)
- uPD75P068CU (under development)

CHAPTER 2. CONNECTION

This chapter describes the EP-75068CU-R connection method, powering-on and power-off sequence, and the procedure for removing the emulation probe from the target system.

Separate descriptions are given for the connection method according to the debugger to be connected, as shown below. The appropriate description should be read in accordance with the use of the EP-75068CU-R.

- 2.1 Connecting IE-75001-R to Target System
- 2.2 Connecting EVAKIT-75X to Target System

2.1 CONNECTING IE-75001-R TO TARGET SYSTEM

The connection procedure is outlined below.

(1) Connection of adapter board to IE-75000-R-EM

- ① Turn off the IE-75001-R power.
- ② Connect the adapter board to the IE-75000-R-EM.
- ③ Install the IE-75000-R-EM (with the adapter board) in the IE-75001-R.

(2) Connection of emulation probe to IE-75001-R

(3) Connection of emulation probe to target system

- ① Turn off the target system power.
- ② Solder the IC socket (commercially available) to the target system.
- ③ Plug the end of the emulation probe into the IC socket.

(4) Connection of external sense clips (when external clips are used)

(5) Power on

The detailed connection procedure for each item is described next.

(1) Connection of adapter board to IE-75000-R-EM

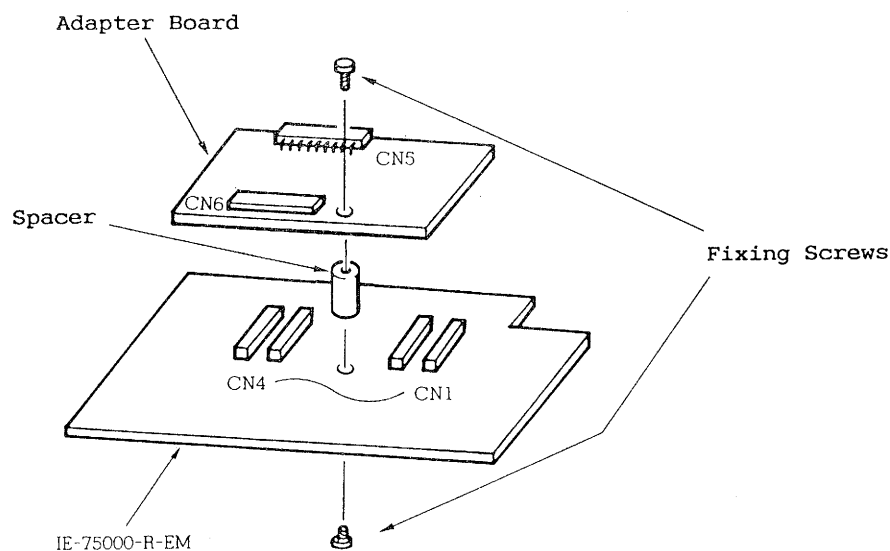
Connect the adapter board to the IE-75000-R-EM.

- ① Position the spacer between the IE-75000-R-EM and the adapter board, and connect CN1 through CN4 on the IE-75000-R-EM to CN1 through CN4 on the adapter board.

- ② Secure the spacer positioned between the IE-75000-R-EM and the adapter board using the spacer fixing screws.
- ③ Turn off the IE-75001-R power.
- ④ Remove the 6 screws in the top of the IE-75001-R, and remove the cover.
- ⑤ Pull the card puller at each side of the board forward, and remove the IE-75000-R-BK*.
- ⑥ Screw together the IE-75000-R-EM and IE-75000-R-BK.
- ⑦ Replace the IE-75000-R-BK with the IE-75000-R-EM in its original position in the IE-75001-R.

*: In the IE-75000-R, the IE-75000-R-EM and IE-75000-R-BK are installed screwed together: therefore, remove the IE-75000-R-BK from the IE-75001-R following steps ③, ④, ⑤ in that order. Undo the screws and remove the IE-75000-R-EM and follow steps ①, ②, ⑥, ⑦ in that order.

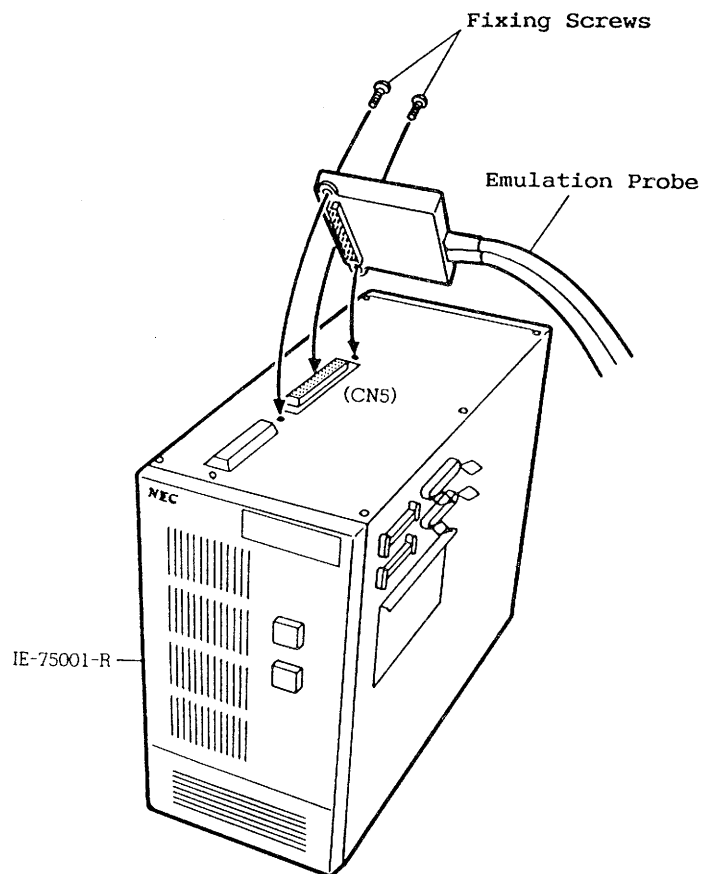
Figure 2-1 Connection of Adapter Board to IE-75000-R-EM



(2) Connection of emulation probe to IE-75001-R

- ① Connect the emulation probe to the DIN connector for the emulation probe (CN5 on the adapter board) at the top of the IE-75001-R.
- ② After connecting the emulation probe, be sure to secure it to the IE-75001-R with the fixing screws.

Figure 2-2 Connection of Emulation Probe to IE-75001-R



(3) Connection of emulation probe to target system

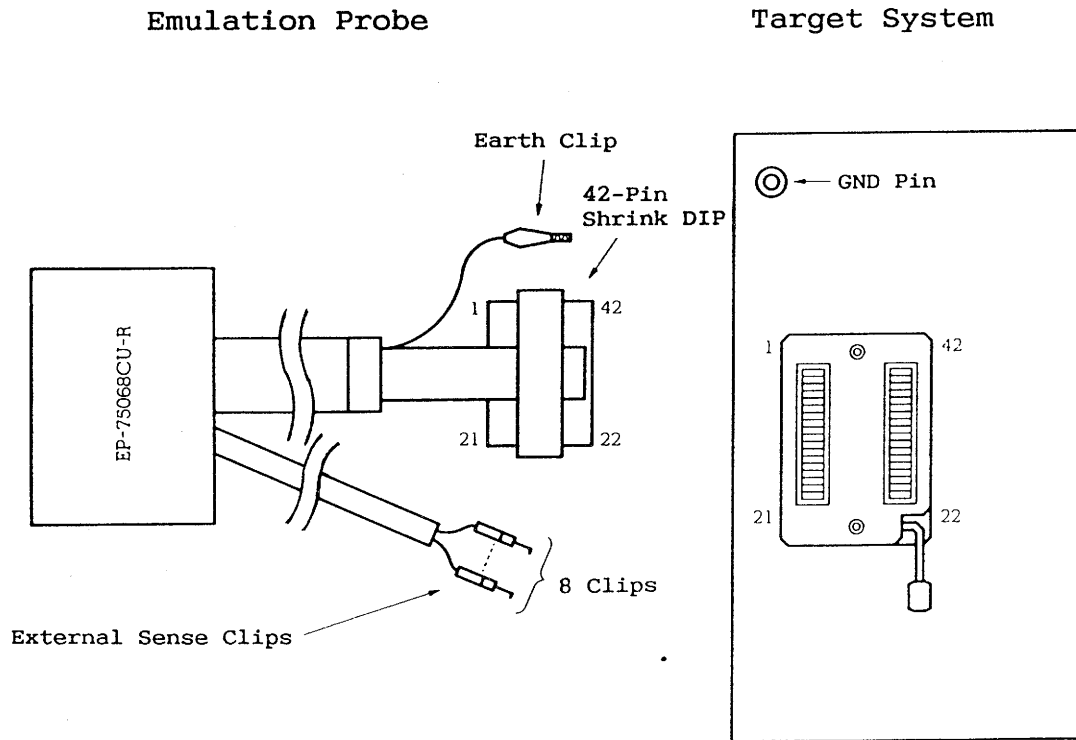
The following procedure is used to connect the emulation probe to the target system.

NOTE 1: Before connecting the probe to the target system, ensure that the earth clip is connected to the end. If the earth clip is not connected, the IE-75001-R may be damaged by static electricity, etc.

2: Ensure that the pins are correctly oriented when making the connection. If the connection is made incorrectly the IE-75001-R may be damaged.

- ① Turn off the target system power.
- ② Solder the IC socket to the target system.
- ③ Connect the emulation probe earth clip to the target system ground (GND).
- ④ Align pin 1 of the 42-pin shrink DIP at the end of the emulation probe with pin 1 of the IC socket soldered onto the target system in ②, and plug the emulation probe into the socket.

Figure 2-3 42-Pin Shrink DIP Emulation Probe
Connection Diagram



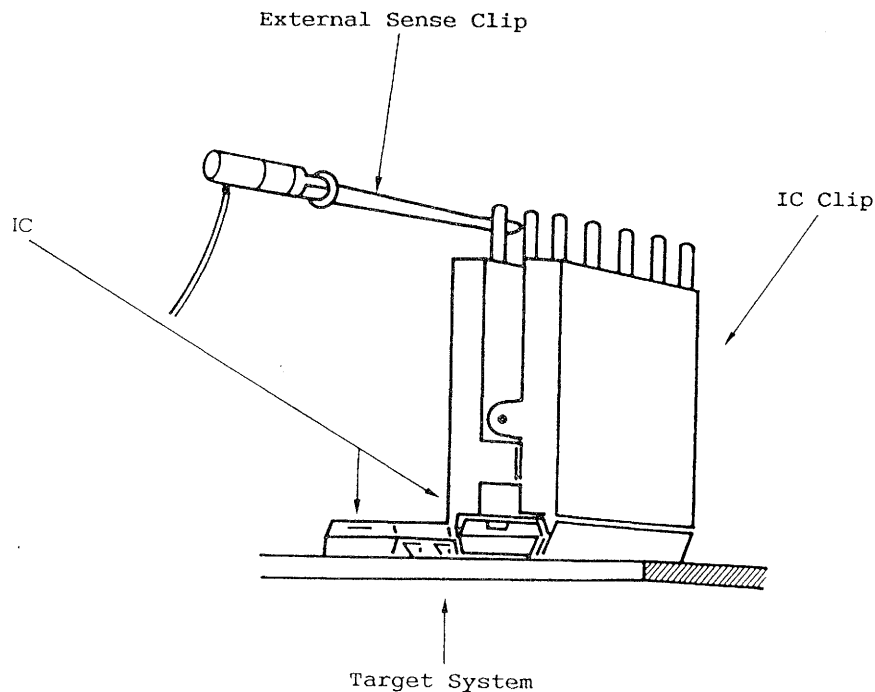
(4) Connection of external sense clips

When the external sense clips are used, the following procedure is used to connect them.

NOTE: External sense clips must only be connected to a TTL level signal line. If connected to a signal line other than a TTL signal line, correct high and low level detection is not possible. Also, depending on the voltage level, the IE-75001-R sensors may be damaged.

- ① Turn off the target system and IE-75001-R power, in that order.
- ② Fit an IC clip (commercially available) on the IC on which a trace is to be executed on the target system.
- ③ Connected an external sense clip to the fitted IC clip.
- ④ Turn on the IE-75001-R and target system power, in that order.

Figure 2-4 External Sense Clip Connection



- Remarks 1: When external sense clips are connected, an IC clip should be used as far as possible. This helps prevent incorrect connection and improves operability.
- 2: If the EVAKIT-75X is used, external sense clips cannot be used.

2.2 CONNECTING EVAKIT-75X TO TARGET SYSTEM

The connection procedure is outlined below.

(1) Connection of adapter board to IE-75000-R-EM

- ① Turn off the EVAKIT-75X power.
- ② Connect the adapter board to the IE-75000-R-EM.

(2) Connection of IE-75000-R-EM to EVAKIT-75X

(3) Connection of emulation probe to adapter board

(4) Connection of emulation probe to target system

- ① Turn off the target system power.
- ② Solder the IC socket (commercially available) to the target system.
- ③ Plug the end of the emulation probe into the IC socket.

(5) Power on

The detailed connection procedure for each item is described next.

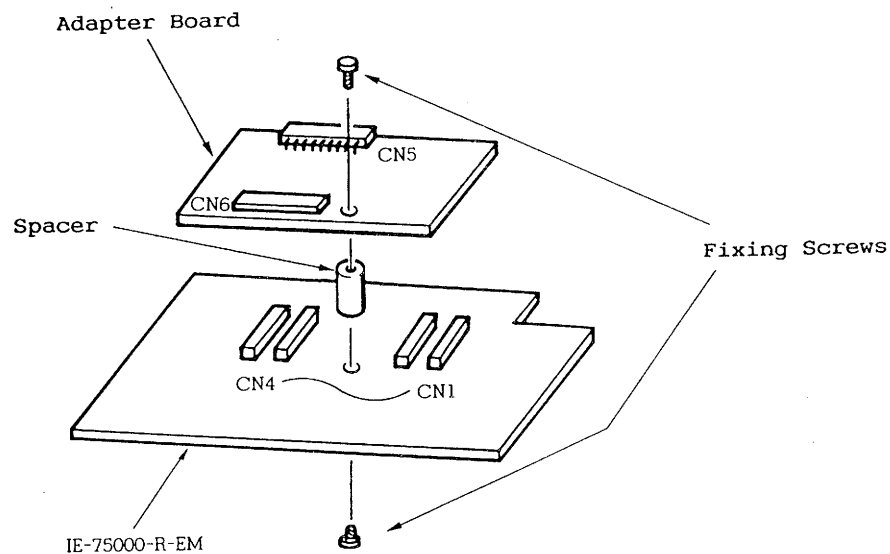
(1) Connection of adapter board to IE-75000-R-EM

Connect the adapter board to the IE-75000-R-EM
(sold separately).

First prepare the IE-75000-R-EM.

- ① Position the spacer between the IE-75000-R-EM and the adapter board, and connect CN1 through CN4 on the IE-75000-R-EM to CN1 through CN4 on the adapter board.
- ② Secure the spacer positioned between the IE-75000-R-EM and the adapter board using the spacer fixing screws.

Figure 2-5 Connection of Adapter Board to IE-75000-R-EM



(2) Connection of IE-75000-R-EM to EVAKIT-75X

Use the following procedure to connect the IE-75000-R-EM to which the adapter board was connected in (1) to the EVAKIT-75X.

- ① Turn off the EVAKIT-75X power.
- ② Connect the IE-75000-R-EM to the EVAKIT-75X using the two spacers and the connection joint provided with the EVAKIT-75X.

Remarks: Refer to the IE-75000-R-EM User's Manual for details of the method of connecting the IE-75000-R-EM to the EVAKIT-75X.

(3) Connection of emulation probe to adapter board

Connect the emulation probe to the connector (CN6) on the top of the adapter board connected to the IE-75000-R-EM.

Figure 2-6 Connection of Emulation Probe to Adapter Board

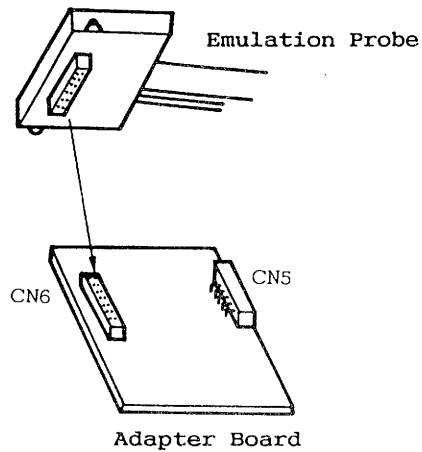
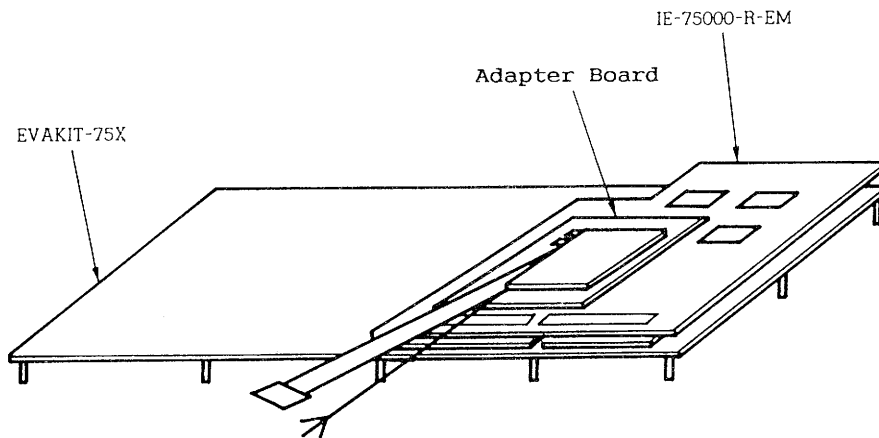


Figure 2-7 EVAKIT-75X with EP-75068CU-R Connected



(4) Connection of emulation probe to target system

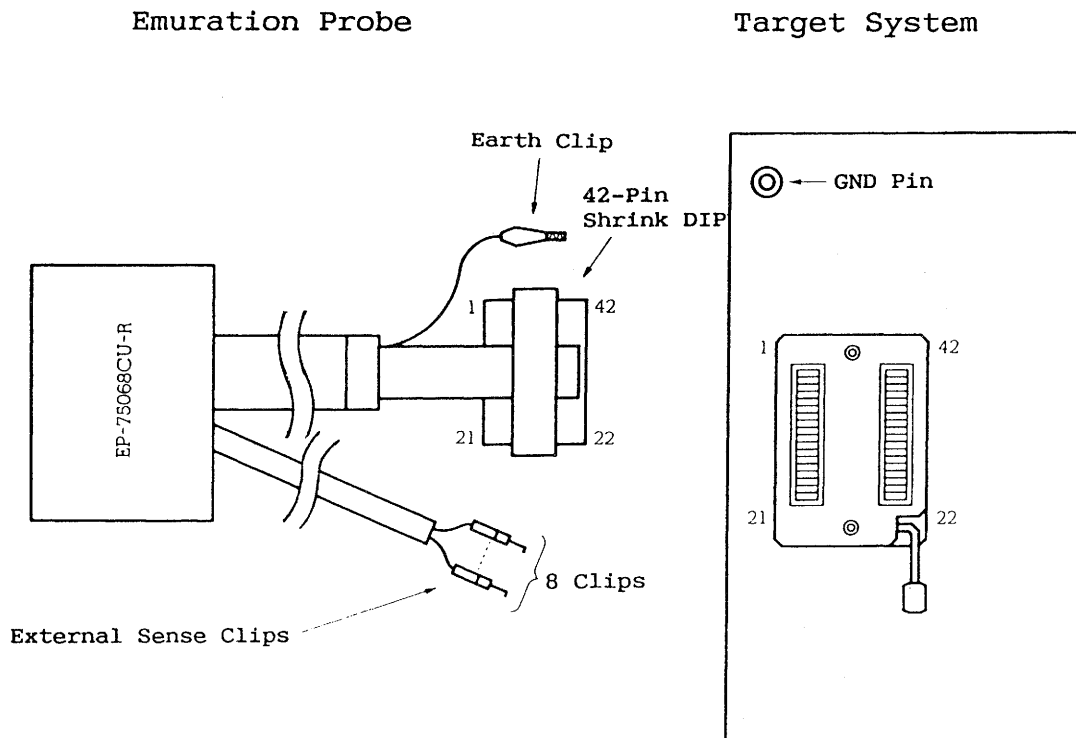
The following procedure is used to connect the emulation probe to the target system.

NOTE 1: Before connecting the probe to the target system, ensure that the earth clip is connected to the end. If the earth clip is not connected, the EVAKIT-75X may be damaged by static electricity, etc.

2: Ensure that the pins are correctly oriented when making the connection. If the connection is made incorrectly the EVAKIT-75X may be damaged.

- ① Turn off the target system power.
- ② Solder the IC socket to the target system.
- ③ Connect the emulation probe earth clip to the target system ground (GND).
- ④ Align pin 1 of the 42-pin shrink DIP at the end of the emulation probe with pin 1 of the IC socket soldered onto the target system in ②, and plug the emulation probe into the socket.

Figure 2-8 42-Pin Shrink DIP Emulation Probe
Connection Diagram



2.3 POWERING-ON AND POWERING-OFF SEQUENCE

After the emulation probe has been connected to the target system, power is next turned on. The powering-on and powering-off sequences are described below.

NOTE: Ensure that the correct powering-on and powering-off sequences are followed. Failure to do so may result in damage to the IE-75001-R or EVAKIT-75X.

(1) When IE-75001-R is connected to target system

◆ Powering-on sequence

- ① Turn on the IE-75001-R power.
- ② Turn on the target system power.

◆ Powering-off sequence

- ① Turn off the target system power.
- ② Turn off the IE-75001-R power.

(2) When EVAKIT-75X is connected to target system

◆ Powering-on sequence

- ① Turn on the EVAKIT-75X power.
- ② Turn on the target system power.

◆ Powering-off sequence

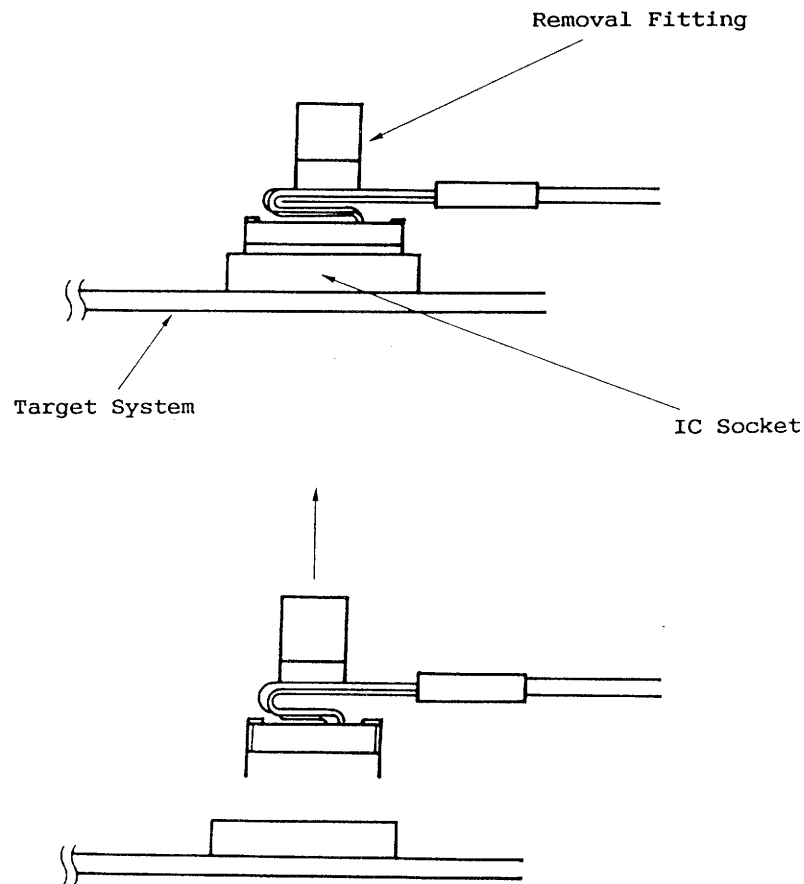
- ① Turn off the target system power.
- ② Turn off the EVAKIT-75X power.

2.4 REMOVING EMULATION PROBE FROM TARGET SYSTEM

The following procedure is used to remove the emulation probe from the target system.

- ① Turn off the target system power.
- ② Turn off the IE-75001-R or EVAKIT-75X power.
- ③ Pull the removal fitting at the end of the emulation probe straight upward, and detach the emulation probe from the IC socket.

Figure 2-9 Removal of Emulation Probe

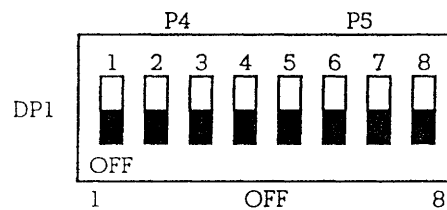


CHAPTER 3. MASK OPTION SETTINGS

DIP switch DP1 on the adapter board is used to set mask options for port 4 and port 5. When these switches are set to ON, a pull-up resistor (68 k Ω) is connected.

The factory setting for all DIP switches is OFF.

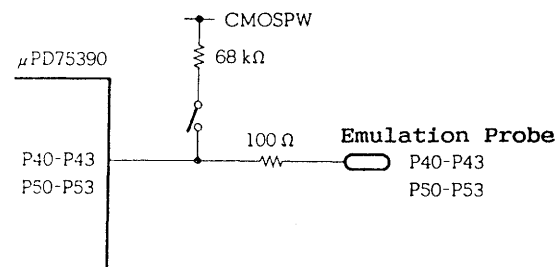
Figure 3-1 DIP Switch



SW·bit	Signal Name	SW·bit	Signal Name
--------	-------------	--------	-------------

DP1-1	→ P40	DP1-5	→ P50
-2	→ P41	-6	→ P51
-3	→ P42	-7	→ P52
-4	→ P43	-8	→ P53

Pin Processing



APPENDIX. 42-PIN SHRINK DIP EMULATION PROBE PIN
CORRESPONDENCE TABLE

CN5/CN6 Pin No.	Emulation Probe	CN5/CN6 Pin No.	Emulation Probe	CN5/CN6 Pin No.	Emulation Probe	CN5/CN6 Pin No.	Emulation Probe
1	GND	25	NC	49	7	73	NC
2		26		50	8	74	11
3	EXT0	27		51	9	75	12
4	EXT1	28		52	10	76	13
5	EXT2	29		53	NC	77	14
6	EXT3	30		54		78	15
7	EXT4	31		55		79	16
8	EXT5	32	32	56		80	17
9	EXT6	33	33	57		81	18
10	EXT7	34	34	58		82	19
11	NC	35	35	59		83	20
12		36	36	60		84	21
13		37	37	61		85	22
14		38	38	62		86	23
15		39	39	63		87	24
16		40	40	64		88	25
17		41	41	65		89	26
18		42	42	66		90	27
19		43	1	67		91	28
20		44	2	68		92	29
21		45	3	69		93	30
22		46	4	70		94	31
23		47	5	71		95	GND
24		48	6	72		96	

Remarks 1: CN5/CN6 are connectors to be used in the following cases.

CN5: Connector for connection of emulation probe when IE-75001-R is used.

CN6: Connector for connection of emulation probe when EVAKIT-75X is used.

2: The meaning of the symbols or number in the Emulation Probe column is as follows:

GND : Earth clip (GND)

EXT0 to EXT7 : External sense clips

1 to 42 : Pin number of 42-pin shrink DIP
at end of emulation probe

NC : No Connection

Phase-out/Discontinued

Phase-out/Discontinued