

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.

Phase-out/Discontinued

EP-75108CW-R

USER'S MANUAL

NEC

Phase-out/Discontinued

EP-75108CW-R

Phase-out/Discontinued

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.

Main revisions in this edition



Page	Description
P.7	Addition of explanation to 2.1 (1)

PREFACE

Target: This manual is intended for the user who uses IE-75000-R or EVAKIT-75X and EP-75108CW-R to debug the uPD751xxCW series.

Purpose: The purpose of the manual is for the user to understand the connection method of EP-75108CW-R to IE-75000-R or EVAKIT-75X and the mask option setting method.

Composition: The manual contains the following information:

General description of EP-75208CW-R
Connection method of EP-75108CW-R
Mask option setting method

Use: Before reading this manual, read the IE-75000-R or EVAKIT-75X manual to understand the debug system configuration and function.

o To understand the EP-75108CW-R function and connection method in a general way

→ Read the manual according to the table of contents.

o To understand the operation environment, configuration, and target devices

→ Read Chapter 1.

o To understand the specific connection method

→ Read Chapter 2.

o To understand the mask option setting method

→ Read Chapter 3.

Legend:

- Note : Explanation of (Note) in the text
- Caution: Caution to which you should pay attention
- Remarks: Supplementary explanation to the text

Relevant documents:

- o IE-75000-R user's manual (document No. EEU-669)
- o IE-75000-R-EM user's manual (document No. EEU-673)
- o EVAKIT-75X user's manual (document No. EEU-619)

Check: Check the names and quantity of the EP-75108CW-R accessories against the following: (If the accessories are not complete, call the NEC sales person or agency.)

- | | | |
|------------------------------------|------------|--------------------------|
| o Emulation probe | One | <input type="checkbox"/> |
| o Adapter board | One | |
| o User's manual (present manual) | One | |
| o Spacer (with two screws)(Note 1) | One set | |
| o Mounting screws(Note 2) | Two pieces | |

Note 1: Use the spacer to connect the adapter board and IE-75000-R-EM.

Note 2: Use the mounting screws to connect the emulation probe and IE-75000-R.

CONTENTS

	<u>Page</u>
CHAPTER 1 GENERAL DESCRIPTION.....	1
1.1 Operation Environment.....	1
1.2 Configuration.....	2
1.3 Target Devices.....	4
CHAPTER 2 CONNECTION.....	5
2.1 Connection of IE-75000-R and Target System.....	6
2.2 Connection of EVAKIT-75X and Target System.....	14
2.3 Power On and Off Sequence.....	20
2.4 Removal of Emulation Probe from Target System.....	21
CHAPTER 3 MASK OPTION SETTING.....	22
APPENDIX 64-PIN SHRINKED-DUAL-IN-LINE PACKAGE EMULATION PROBE PIN CORRESPONDENCE TABLE.....	23

Phase-out/Discontinued

CHAPTER 1 GENERAL DESCRIPTION

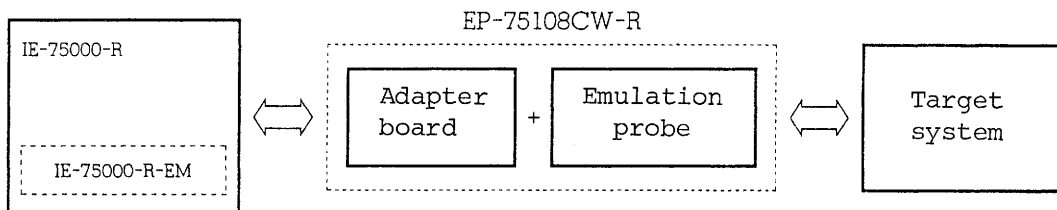
This chapter outlines the EP-75108CW-R.

1.1 Operation Environment

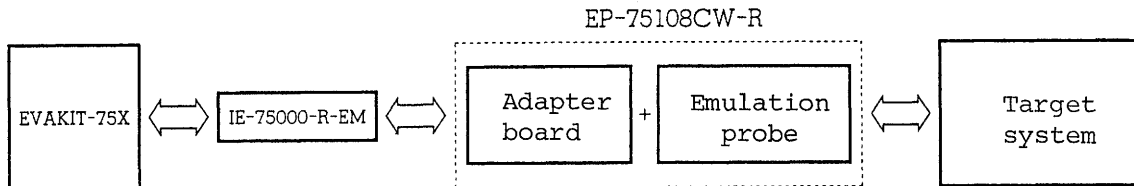
The EP-75108CW-R is a probe set to connect IE-75000-R or EVAKIT-75X and a target system. When they are connected by the EP-75108CW-R, a uPD751xxCW series debug environment is provided and the target system hardware and software can be debugged totally. See Chapter 2 for the specific connection method.

Fig. 1-1 Operation Environment

(a) Connection of IE-75000-R and target system □



(b) Connection of EVAKIT-75X and target system □



1.2 Configuration

The EP-75108CW-R is a set of an emulation probe and adapter board.

(1) Emulation probe

The emulation probe consists of the following three:

64-pin shrinked-dual-in-line package probe
Connects IE-75000-R or EVAKIT-75X and target system.

Ground clip
Is connected to target system GND. IE-75000-R and target system GND potentials become the same and resistance to static electricity and noise is provided.

External sense clips
These eight sense clips are used to see the levels of the IC pin mounted on the target system.

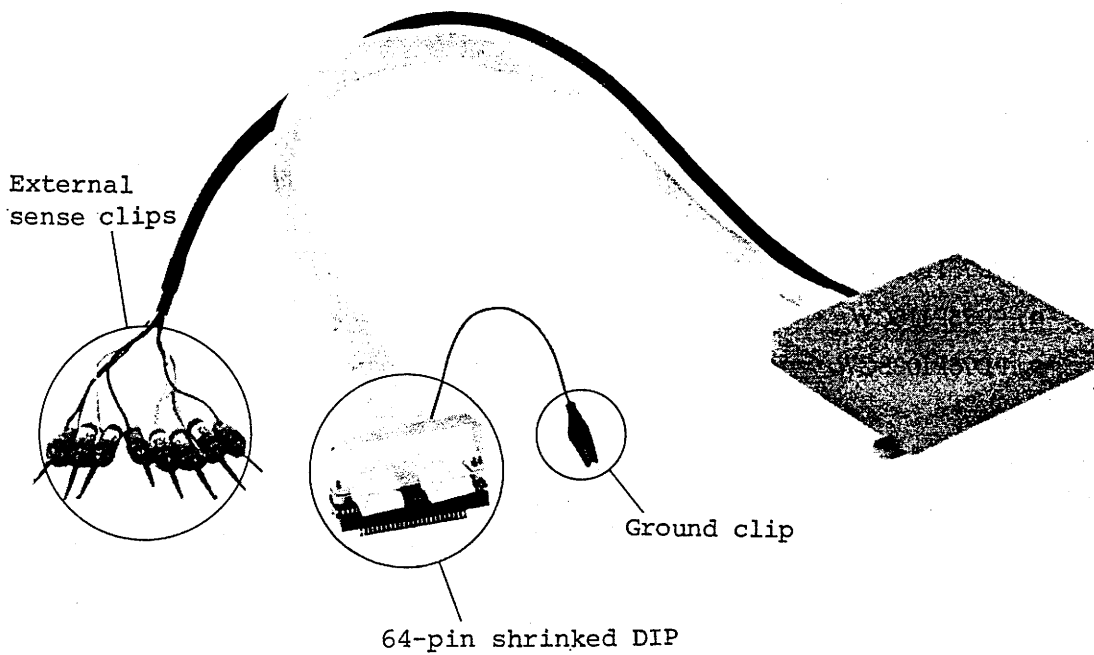
(2) Adapter board

The adapter board is a board to connect the emulation board (IE-75000-R-EM) and emulation probe. The adapter board also contains the mask option setting function. See Chapter 3 for details.

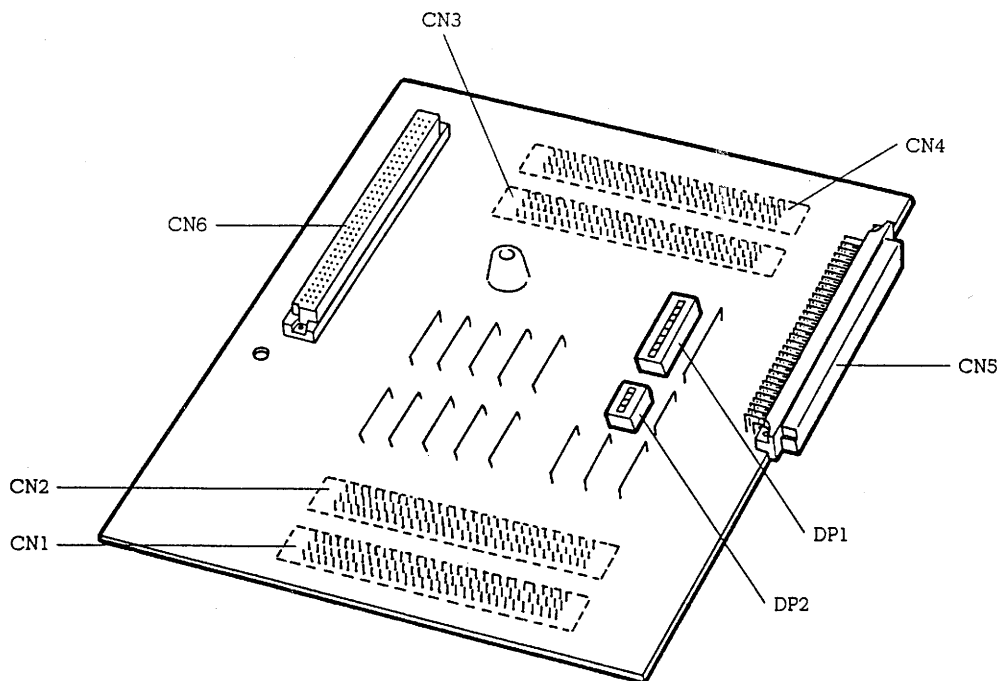
Fig. 1-2 EP-75108CW-R



Emulation probe



Adapter board



1.3 Target Devices

The EP-75108CW-R is used to emulate the following target devices:

- o uPD75104CW
- o uPD75106CW
- o uPD75108CW
- o uPD75P108CW
- o uPD75112CW
- o uPD75116CW
- o uPD75P116CW
- o uPD75P108BCW



CHAPTER 2 CONNECTION

This chapter explains the EP-75108CW-R connection method, power on and off sequence, and emulation probe removal method from the emulation system.

The connection method is explained for each debugger to be connected. Read the appropriate section according to the EP-75108CW-R application.

- o 2.1 Connection of IE-75000-R and target system
- o 2.2 Connection of EVAKIT-75X and target system

2.1 Connection of IE-75000-R and Target System

The connection procedure is outlined below:

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

- ① Turn off the IE-75000-R power.
- ② Draw out IE-75000-R-EM from IE-75000-R.
- ③ Connect IE-75000-R-EM and the adapter board.
- ④ Install IE-75000-R-EM (with the adapter board) on IE-75000-R.

(2) Connection of IE-75000-R and emulation probe

(3) Connection of target probe and emulation system

- ① Turn off the target system power.
- ② Solder a commercially available IC socket on the target system.
- ③ Insert the emulation probe tip in the IC socket.

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

(5) Power on

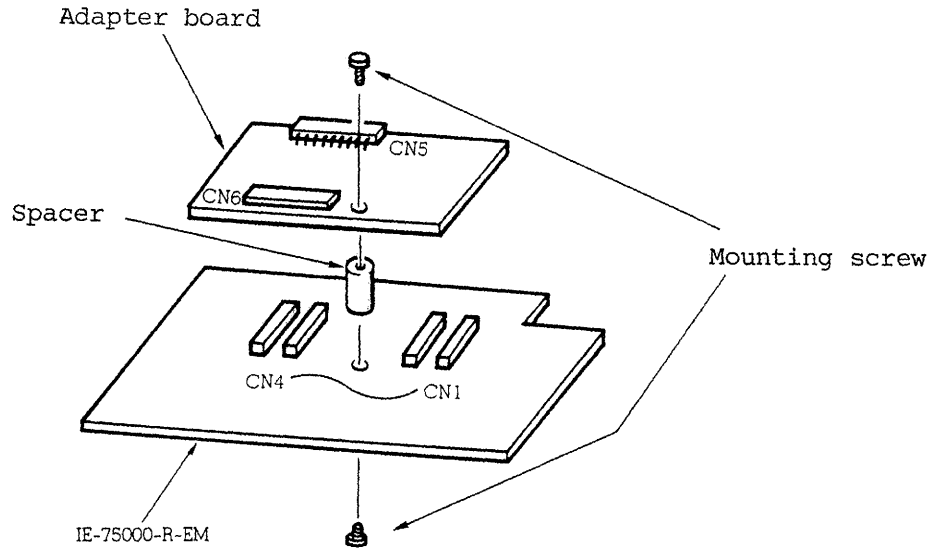
Next, these connection procedures are explained in detail.

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

Connect the adapter board to IE-75000-R-EM. IE-75000-R-EM
is screwed with IE-75000-R-BK and installed in the
IE-75000-R main unit.

- ① First, turn off the IE-75000-R power.
- ② Unscrew six screws on the top of the IE-75000-R main unit and open the main unit top cover.
- ③ Pull the card pullers at both ends of the board toward you and draw out IE-75000-R-EM and IE-75000-R-BK together. (These two boards are screwed as a unit.)
- ④ Unscrew IE-75000-R-EM and IE-75000-R-BK.
- ⑤ Inserting a given spacer between IE-75000-R-EM and the adapter board, connect IE-75000-R-EM CN1-CN4 and adapter board CN1-CN4 respectively.
- ⑥ Fix the spacer mounted between IE-75000-R-EM and the adapter board with spacer mounting screws.
- ⑦ Again screw IE-75000-R-EM and IE-75000-R-BK.
- ⑧ Upon completion of the connection, restore IE-75000-R-EM and IE-75000-R-BK to the former positions in the IE-75000-R main unit.

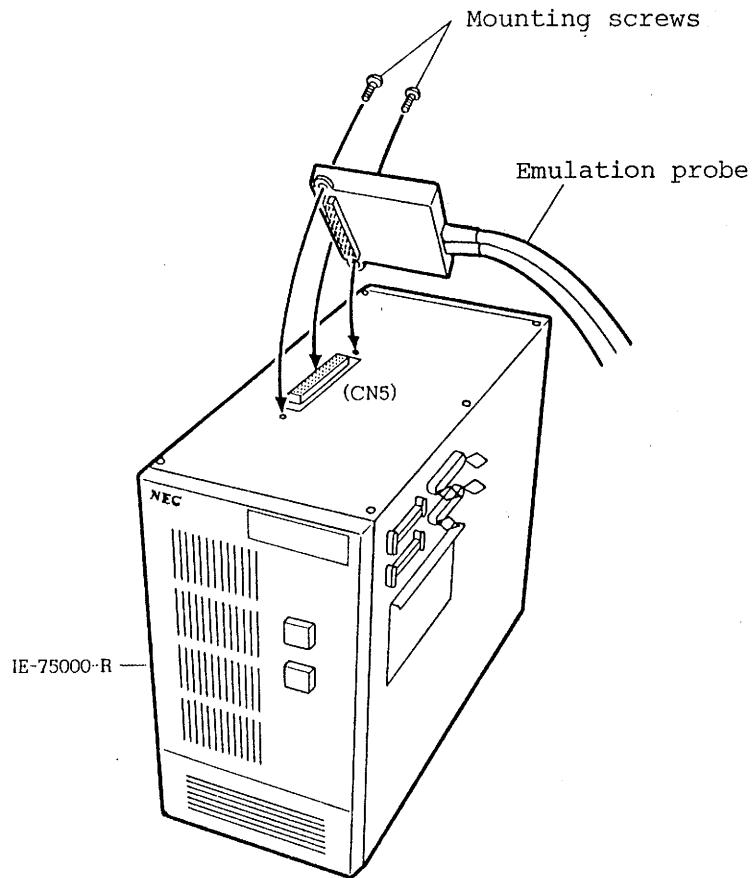
Fig. 2-1 Connection of IE-75000-R-EM and Adapter Board



(2) Connection of IE-75000-R and emulation probe

- ① Connect the emulation probe to the emulation probe connection DIN connector on the IE-75000-R top (adapter board CN5).
- ② After connection, be sure to fix the emulation probe and IE-75000-R with mounting screws.

Fig. 2-2 Connection of IE-75000-R and Emulation Probe



(3) Connection of emulation probe and target system

Connect the emulation probe and target system in the following sequence:

Caution 1: Before connecting the probe to the target system, be sure to connect the ground clip first. If the ground clip is not connected, IE-75000-R may be destroyed due to static electricity, etc.

Caution 2: In connection, be careful so as not to insert the pins oppositely. If erroneous connection is made, IE-75000-R may be destroyed.

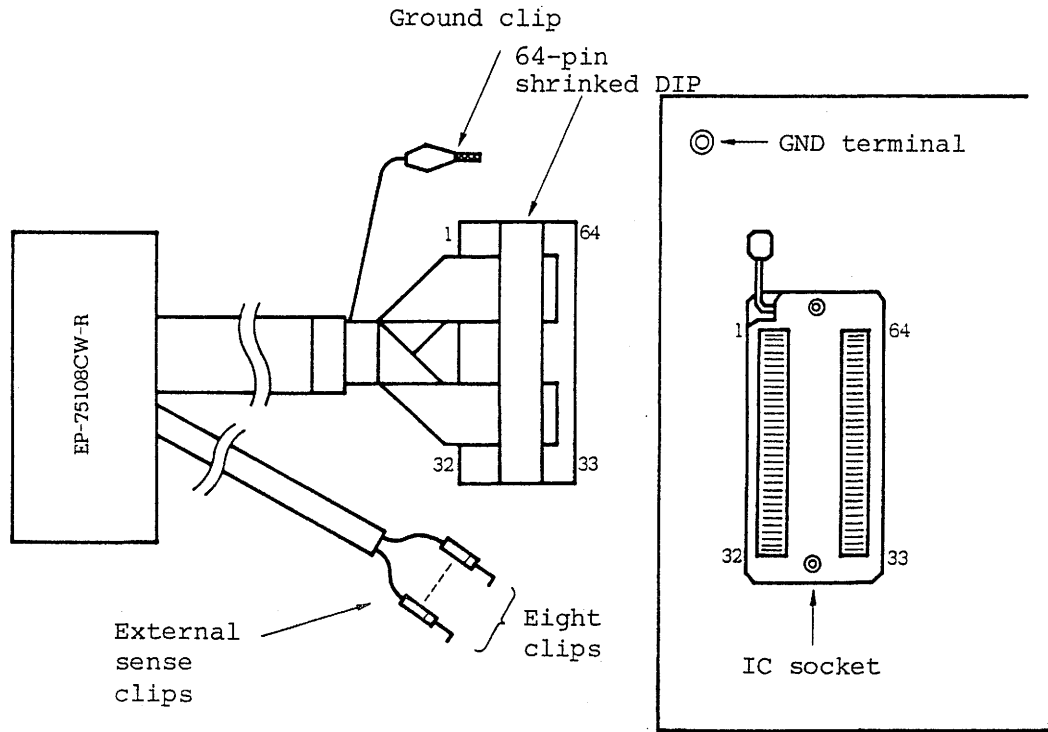
- ① Turn off the target system power.
- ② Solder a commercially available IC socket on the target system.
- ③ Connect the emulation probe ground clip to the target system ground (GND).
- ④ Insert the emulation probe so that pin 1 of the 64-pin shrunked-dual-in-line package at the tip of the emulation probe main unit couples with pin 1 of the IC socket soldered on the target system in 2.

Fig. 2-3 64-pin Shrunked-dual-in-line Package
Emulation Probe Connection



Emulation probe

Target system



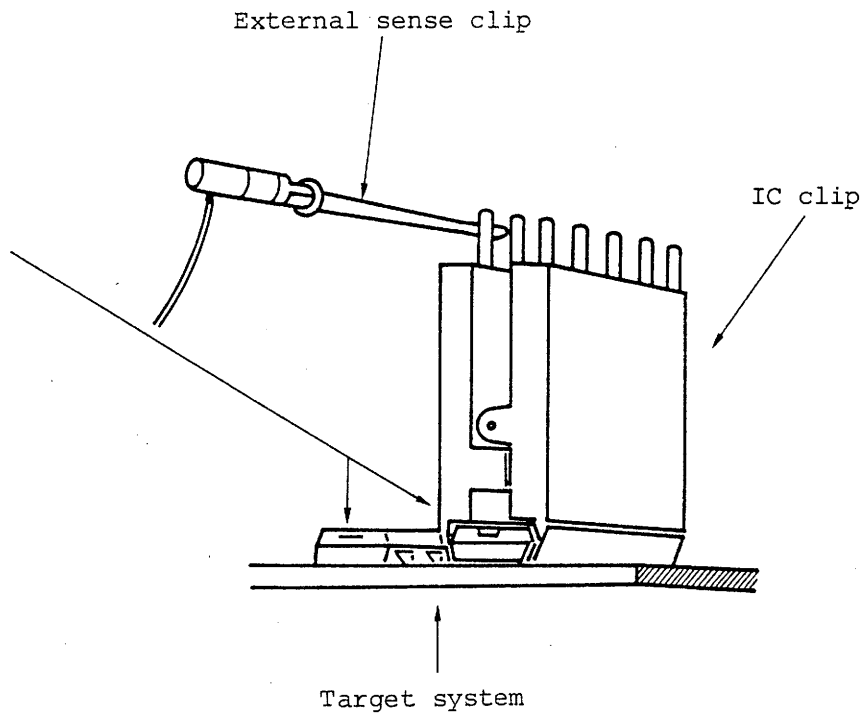
(4) External sense clip connection

To use the external sense clips, connect in the following sequence:

Caution: Connect the external sense clips only to TTL level signal lines. If the external sense clip is connected to any other signal line than the TTL level, accurate high or low level cannot be detected. The IE-75000-R sensor may be destroyed depending on the voltage level.

- ① Turn off the target system power and the IE-75000-R power in order.
- ② Attach a commercially available IC clip to any IC to be traced on the target system.
- ③ Connect the external sense clip to the attached IC clip.
- ④ Turn on the IE-75000-R power and the target system power in order.

Fig. 2-4 External Sense Clip Connection



Remarks 1: To connect the external sense clips, preferably use IC clips. Touch mistake can be prevented to improve operability.

2: The external sense clips cannot be used with EVAKIT-75X.

2.2 Connection of EVAKIT-75X and Target System

The connection procedure is outlined below:

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

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

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

(3) Connection of adapter board and emulation probe

(4) Connection of emulation probe and target system

- ① Turn off the target system power.
- ② Solder a commercially available IC socket on the target system.
- ③ Insert the emulation probe tip in the IC socket.

(5) Power on

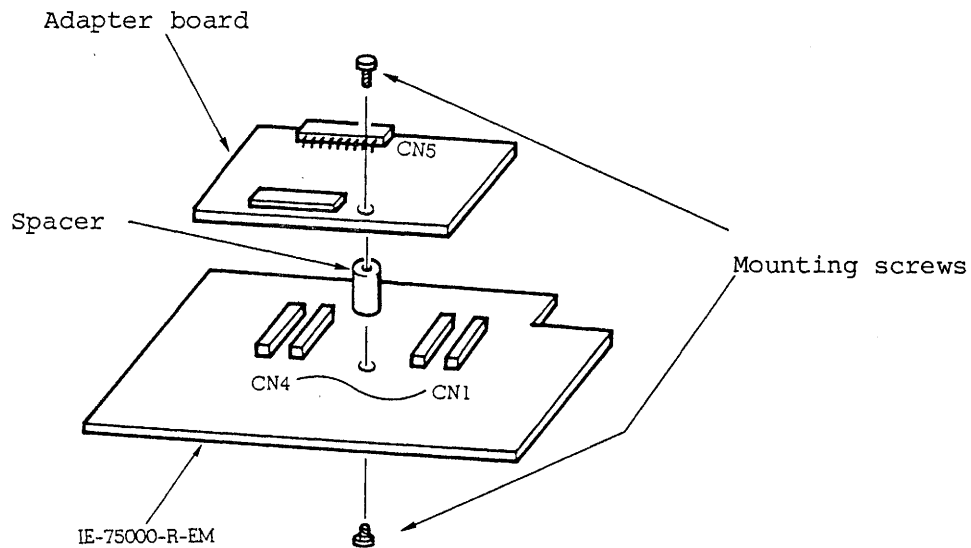
Next, these connection procedures are explained in detail.

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

Connect the adapter board to IE-75000-R-EM (option). First, provide IE-75000-R-EM.

- ① Inserting a given spacer between IE-75000-R-EM and the adapter board, connect IE-75000-R-EM CN1-CN4 and adapter board CN1-CN4 respectively.
- ② Fix the spacer between IE-75000-R-EM and the adapter board with spacer mounting screws.

Fig. 2-5 Connection of IE-75000-R-EM and Adapter Board



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

Connect IE-75000-R-EM connected to the adapter board in (1) and EVAKIT-75X as described below:

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

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

(3) Connection of adapter board and emulation probe

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

Fig. 2-6 Connection of Adapter Board and Emulation Probe

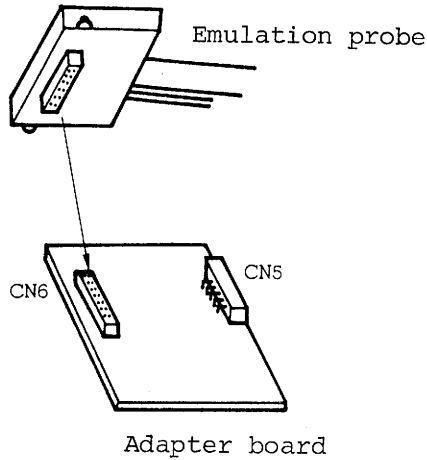
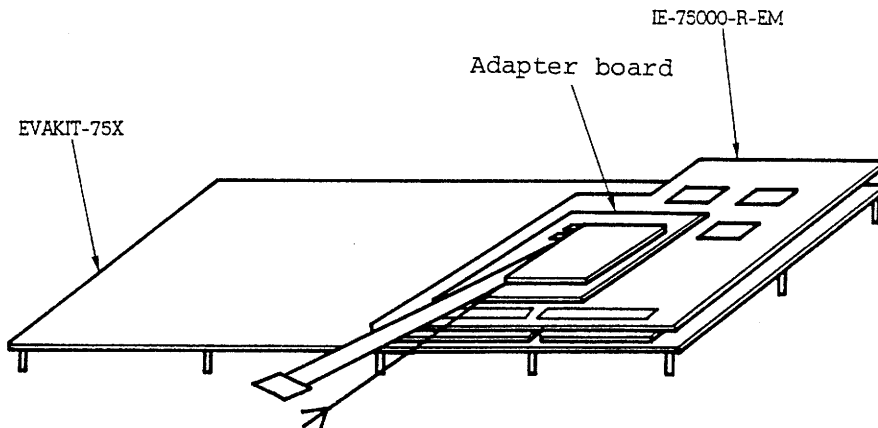


Fig. 2-7 When EVAKIT-75X and EP-75108CW-R are Connected



- (4) Connection of emulation probe and target system

Connect the emulaiton probe and target system in the following sequence:

Caution 1: Before connecting the probe to the target system, be sure to connect the ground clip first. If the ground clip is not connected, EVAKIT-75X may be destroyed due to static electricity, etc.

2: In connection, be careful so as not to insert the pins oppositely. If erroneous connection is made, EVAKIT-75X may be destroyed.

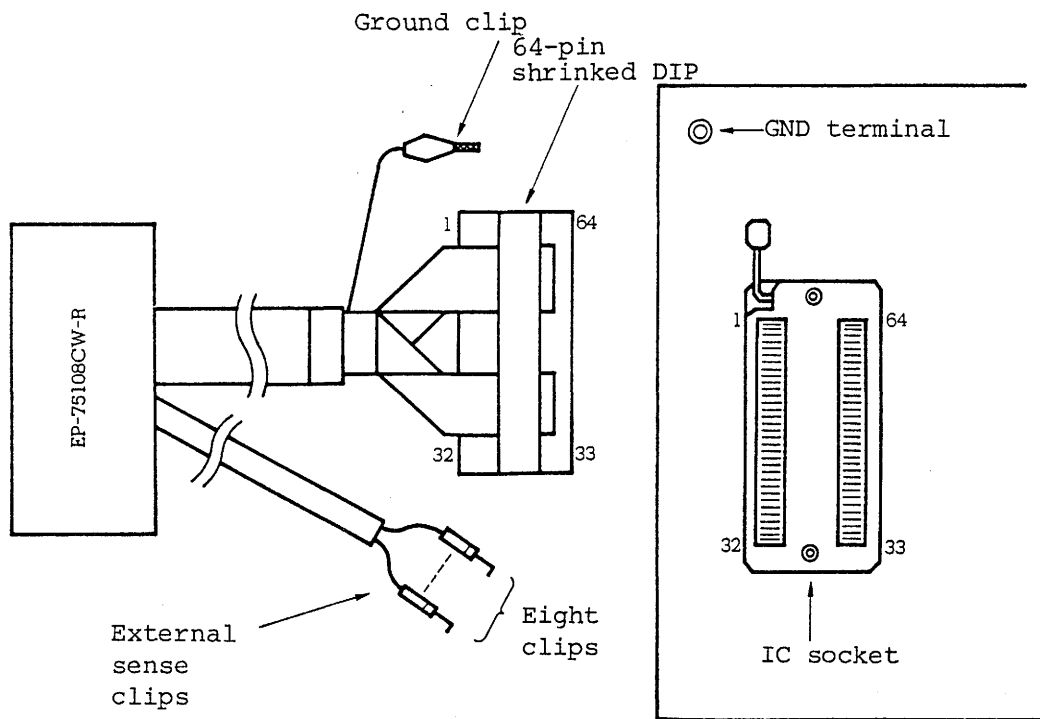
- ① Turn off the target system power.
- ② Solder a commercially available IC socket on the target system.
- ③ Connect the emulation probe ground clip to the target system ground (GND).
- ④ Insert the emulation probe so that pin 1 of the 64-pin shrunked-dual-in-line package at the tip of the emulation probe main unit couples with pin 1 of the IC socket soldered on the target system in ②.

Fig. 2-8 64-pin Shrunked-dual-in-line Package
Emulation Probe Connection



Emulation probe

Target system



2.3 Power On and Off Sequence

Upon completion of connection of the emulation probe and target system, next turn on the power. The power on and off sequence is as follows:

Caution: Be sure to turn on and off the power in the sequence described below. If you turn on and off the power in erroneous sequence, IE-75000-R or EVAKIT-75X may be destroyed.

(1) When IE-75000-R and target system are connected

Power on sequence

- ① Turn on the IE-75000-R power.
- ② Turn on the target system power.

Power off sequence

- ① Turn off the target system power.
- ② Turn off the IE-75000-R power.

(2) When EVAKIT-75X and target system are connected

Power on sequence

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

Power off sequence

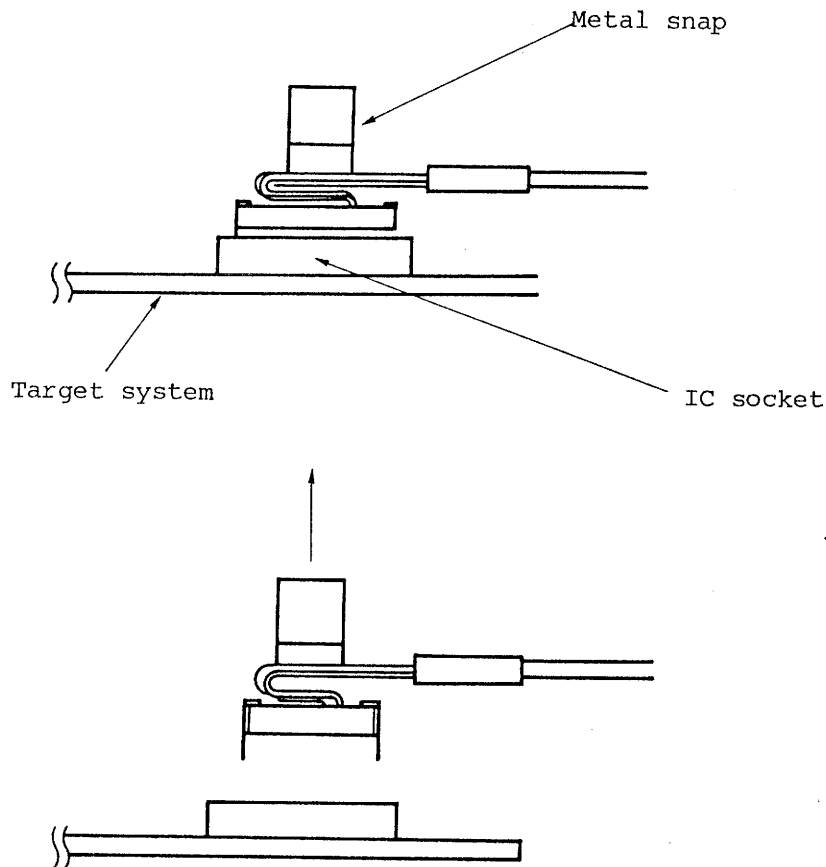
- ① Turn off the target system power.
- ② Turn off the EVAKIT-75X power.

2.4 Removal of Emulation Probe from Target System

Remove the emulation probe from the target system in the following sequence:

- ① Turn off the target system power.
- ② Turn off the IE-75000-R or EVAKIT-75X power.
- ③ Pull the metal snap at the emulation probe tip just above and draw out the emulation probe from the IC socket.

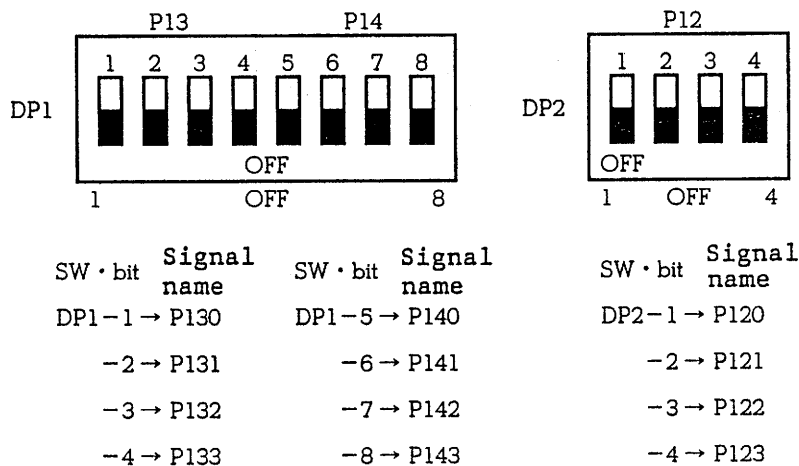
Fig. 2-9 Removal of Emulation Probe



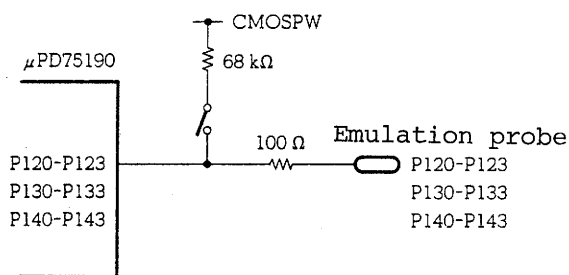
CHAPTER 3 MASK OPTION SETTING

The DIP switches DP1 and DP2 on the adapter board are mask option setting switches for ports 12 to 14. If one element of the switch is set to ON, a pull-up resistor (68 kΩ) is connected to the port pin corresponding to the switch element.

Fig. 3-1 DIP Switch Setting



Pin treatment



APPENDIX 64-PIN SHRINKED-DUAL-IN-LINE PACKAGE 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	15	49	39	73	63
2		26	16	50	40	74	64
3	EXT0	27	17	51	41	75	NC
4	EXT1	28	18	52	42	76	
5	EXT2	29	19	53	43	77	
6	EXT3	30	20	54	44	78	
7	EXT4	31	21	55	45	79	
8	EXT5	32	22	56	46	80	
9	EXT6	33	23	57	47	81	
10	EXT7	34	24	58	48	82	
11	1	35	25	59	49	83	
12	2	36	26	60	50	84	
13	3	37	27	61	51	85	
14	4	38	28	62	52	86	
15	5	39	29	63	53	87	
16	6	40	30	64	54	88	
17	7	41	31	65	55	89	
18	8	42	32	66	56	90	
19	9	43	33	67	57	91	
20	10	44	34	68	58	92	
21	11	45	35	69	59	93	
22	12	46	36	70	60	94	
23	13	47	37	71	61	95	GND
24	14	48	38	72	62	96	

Remarks 1: CN5 and CN6 are connectors used for the following:

CN5: Connector connecting the emulation probe when
IE-75000-R is used

CN6: Connector connecting the emulation probe when
EVAKIT-75X is used

2: The symbols under Emulation Probe mean:

GND : Ground clip pin number

EXT0-EXT7: External sense clips

1-64 : Pin numbers of 64-pin shrinked
DIP at emulation probe tip

NC : No connection

- o The contents of this document may be changed later.
- o No part of the document may be reproduced or copied in any form or by any means without the written permission of NEC Corporation.
- o If a problem related to the industrial property of the third party or the like is caused by using the product, NEC Corporation is responsible only for the parts directly related to the structure and production method of the NEC product.

Phase-out/Discontinued

Phase-out/Discontinued

NEC