NEC

User's Manual

EP-75328GC-R

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Main revisions in this edition

Page	Description
General	Change of target device of in-circuit emulator to IE-75001-R from IE-75000-R
p.22	Addition of description to 3.3

PREFACE

Target: This manual is intended for the user who uses IE-75001-R(Note1) + IE-75000-R-EM or EVAKIT-75X(Note2) and EP-75328GC-R to debug uPD75328GC or uPD75P328GC.

Note 1: The IE-75001-R is a product provided by removing IE-75000-R-EM from IE-75000-R (maintenance product). IE-75000-R can also be used in place of IE-75000-R.

2: Not manufactured (the product cannot be purchased at present).

Purpose: The purpose of the manual is for the user to understand the connection method of EP-75328GC-R to IE-75001-R + IE-75000-R-EM or EVAKIT-75X and the mask option setting method.

Composition: The manual contains the following information:

General description of EP-75328GC-R
Connection method of EP-75328GC-R
Cautions on use (mask option setting method)

Use: Before reading this manual, read the IE-75001-R, IE-75000-R-EM or EVAKIT-75X manual to understand the debug system configuration and function.

To use the IE-75000-R, replace the IE-75001-R in the manual with IE-75000-R in reading. (See Chapter 1.) Unless otherwise noted, the IE-75001-R in the manual indicates the state of IE-75001-R + IE-75000-R-EM.

- To understand the EP-75328GC-R function and connection method in a general way

  ⊟→ Read the manual according to the table of contents.

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

  ⊟→ Read Chapter 1.

- To understand the specific connection method

  ⊟→ Read Chapter 2.

- 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:

- 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 the package: Check the names and quantity of the EP-75328GC-R accessories against the following: (If the accessories are not complete, call the NEC sales person or agency.)

- Emulation probe — One
- Adapter board — One
- User's manual (present manual) — One
- Spacer (with two screws)(Note 1) — One set
- Mounting screw(Note 2) — Two pieces
- Conversion socket
  (LCC socket: EV-9200GC-80)(Note 3) — One

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-75001-R.

Note 3: Use the IC socket to connect the emulation probe and target system.

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

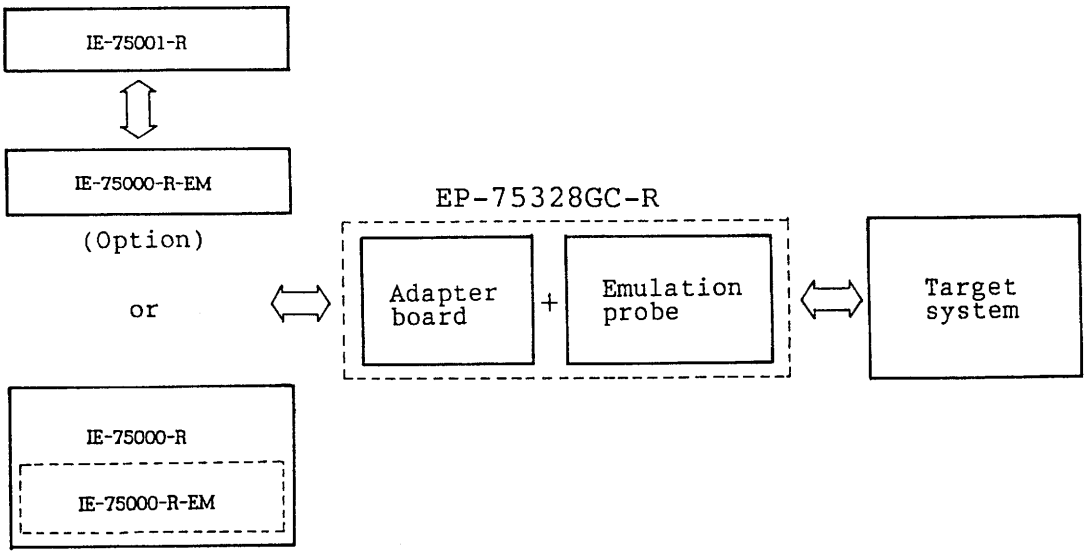
This chapter outlines the EP-75328GC-R.

1.1 Operation Environment

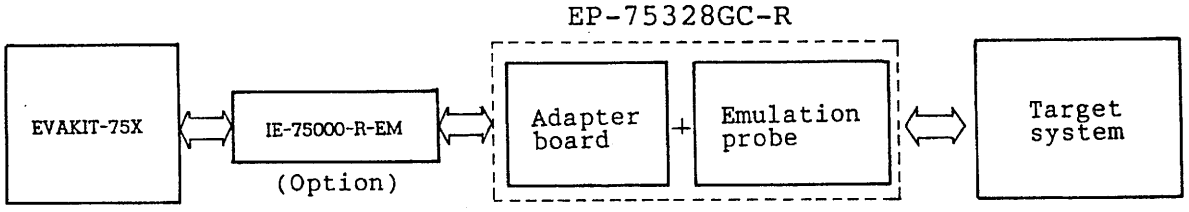
The EP-75328GC-R is a probe set to connect IE-75001-R + IE-75000-R-EM and a target system, or EVAKIT-75X and a target system. When they are connected by the EP-75328GC-R, a uPD75328GC or uPD75P328GC debug environment is provided and the target system hardware and software can be debugged totally. See Chapter 2 for the specific connection method.

Fig. 1-1 Operation Environment

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



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



1.2 Configuration

The EP-75328GC-R is a set of a emulation probe and adapter board.

(1) Emulation probe

The emulation probe consists of the following three:

- ☐ 80-pin leaded chip carrier (LCC) probe
  Connects IE-75001-R + IE-75000-R-EM or EVAKIT-75X and target system.

- ☐ Ground clip
  Is connected to target system GND. IE-75001-R and target system GND potentials become the same and resistance to static electricity and noise is provided.

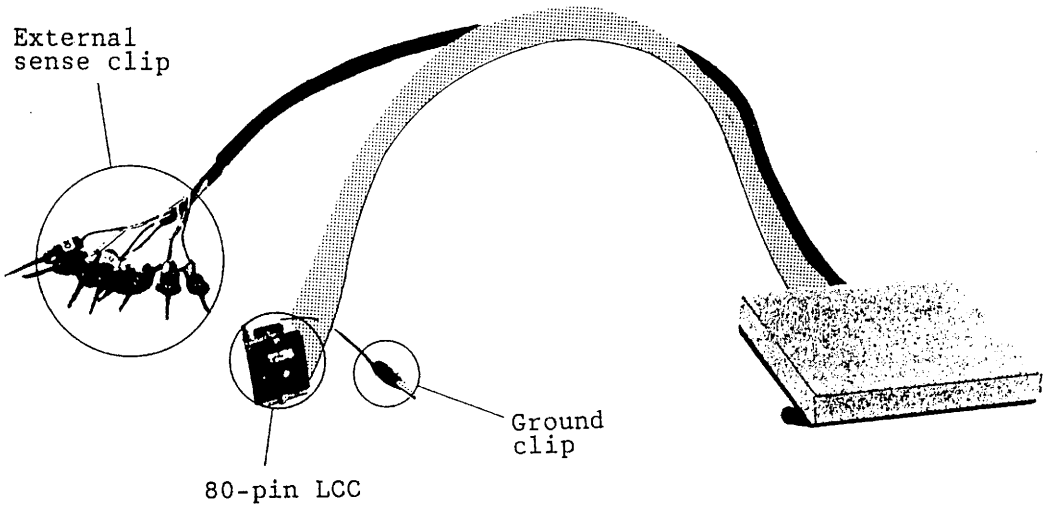
- ☐ External sense clips
  These eight sense clips are used to see the pin levels of ICs mounted on the target system.

(2) Adapter board

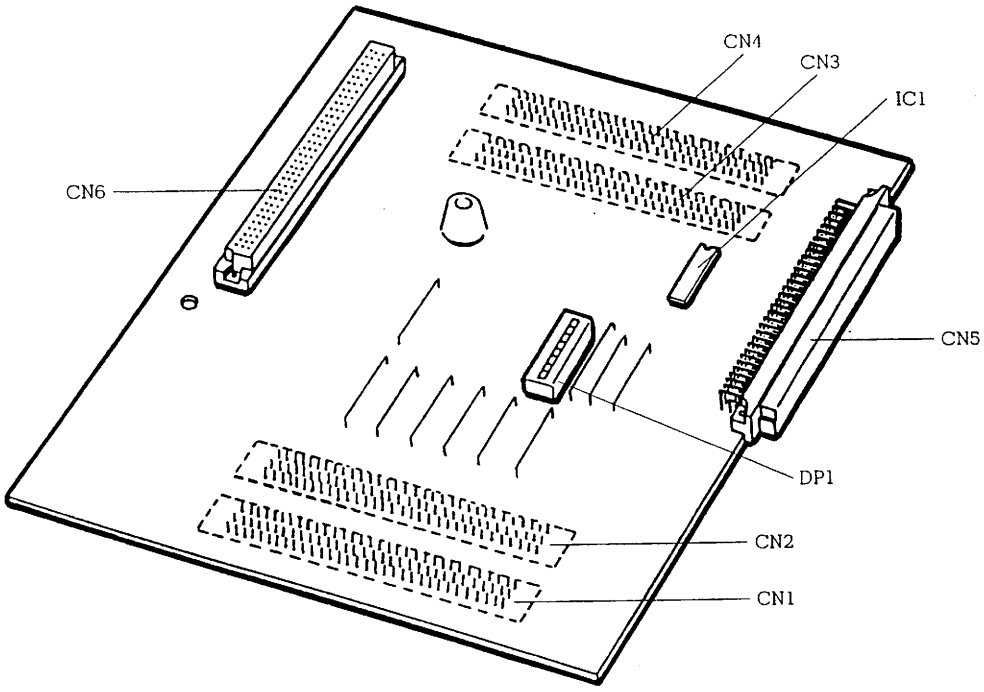
The adapter board is a board to connect the emulation board (IE-75000-R-EM) and emulation probe. The adapter board also contains the mask option settign function. See Chapter 3 for details.

Fig. 1-2 EP-75328GC-R

Emulation probe



Adapter board



1.3 Target Devices

The EP-75328GC-R is used to emulate the following target devices:

- uPD75328GC
- uPD75P328GC

CHAPTER 2 CONNECTION

This chapter explains the EP-75328GC-R connection method, power on and off sequence, and emulation probe removal method from the target system.

The connection method is explained for each debugger to be connected. Read the appropriate section according to the EP-75328GC-R application.

- 2.1 Connection of IE-75001-R and target system
- 2.2 Connection of EVAKIT-75X and target system

2.1 Connection of IE-75001-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-75001-R power.
② Connect IE-75000-R-EM and the adapter board.
③ Install IE-75000-R-EM (with the adapter board) on IE-75001-R

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

(3) Connection of emulation probe and target system

① Turn off the target system power.
② Solder a given conversion socket on the target system.
③ Insert the emulation probe tip in the conversion socket.

(4) External sense clip connection (when external sense clips are used)

(5) Power on

Next, these connection procedures are explained in detail.

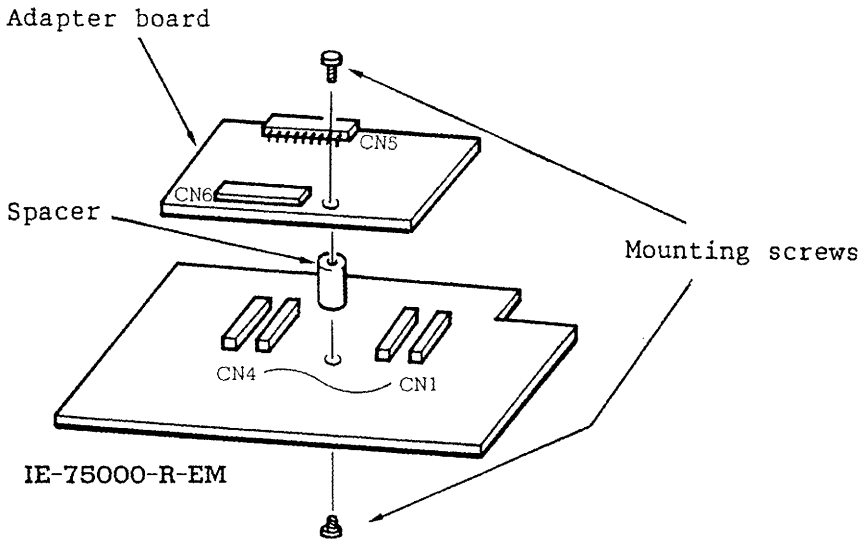
(1) Connection of IE-75000-R-EM and adapter board

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

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.
② Fix the spacer mounted between IE-75000-R-EM and the adapter board with the spacer mounting screws.
③ Turn off the IE-75001-R power.
④ Unscrew the six screws on the top of the IE-75001-R main unit and open the main unit top cover.
⑤ Pull the card pullers at both ends of the board toward you and draw out IE-75000-R-BK(Note).
⑥ Screw IE-75000-R-EM and IE-75000-R-BK together.
⑦ Upon completion of the connection, restore IE-75000-R-BK with IE-75000-R-EM to the former position in the IE-75001-R main unit.

Note: For the IE-75000-R, the IE-75000-R-EM and IE-75000-R-BK are screwed together for installation. Take out the IE-75000-R-BK from the main unit in order of ③, ④, ⑤ and unscrew it, then remove the IE-75000-R-EM and execute steps ①, ②, ⑥, and ⑦ in order.

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

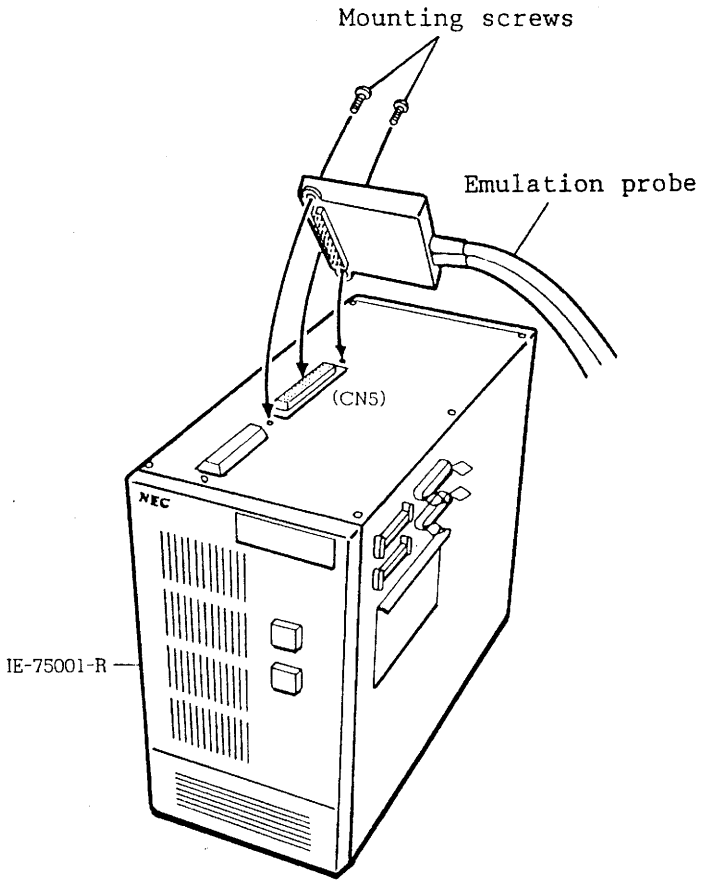


(2) Connection of IE-75001-R and emulation probe

① Connect the emulation probe to the emulation probe connection DIN connector on the IE-75001-R top (adapter board CN5).

② After connection, be sure to fix the emulation probe and IE-75001-R with mounting screws.

Fig. 2-2 Connection of IE-75001-R and Emulation Probe



(3) Connection of emulation probe and target system

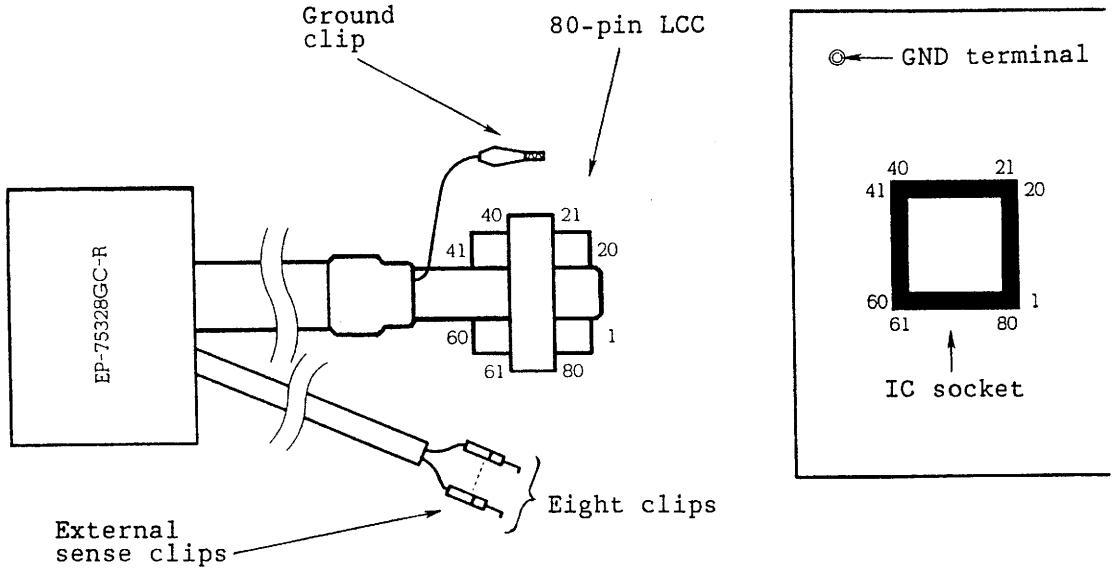
Connect the emulation probe and target system in the following sequence:

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-75001-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-75001-R may be destroyed.

① Turn off the target system power.
② Solder the accessory conversion socket (EV-9200GC-80) 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 80-pin leaded clip carrier (LCC) at the tip of the emulation probe main unit couples with pin 1 of the conversion socket soldered on the target system in ② .

Fig. 2-3 80-pin LCC Emulation Probe Connection



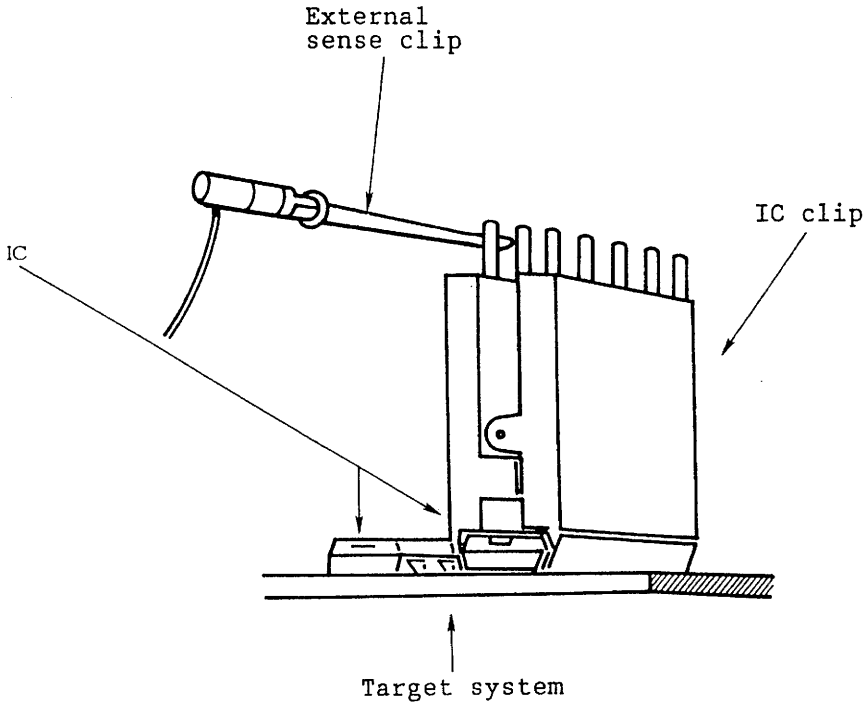
(4) External sense clip connection

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-75001-R sensor may be destroyed depending on the voltage level.

① Turn off the target system power and the IE-75001-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-75001-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 given conversion socket on the target system.
③ Insert the emulation probe tip in the conversion socket.

(5) Power on

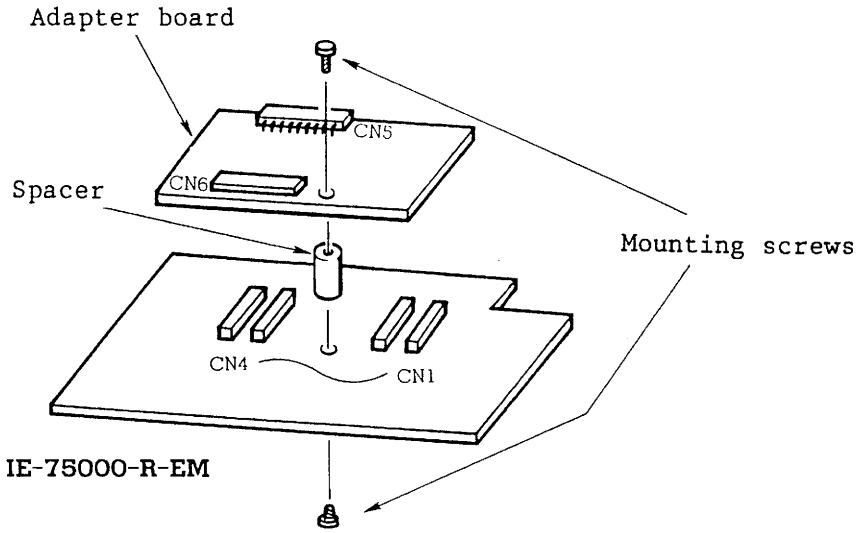
Next, the connection procedures are explained in detail.

(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.
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

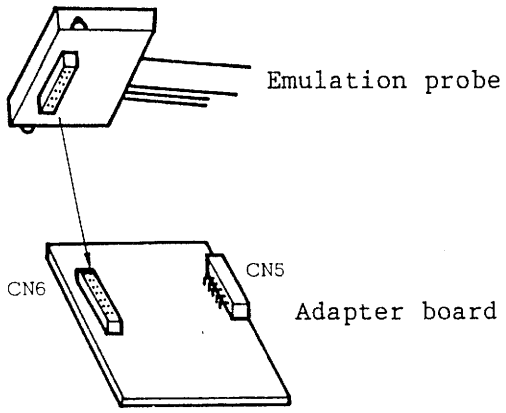
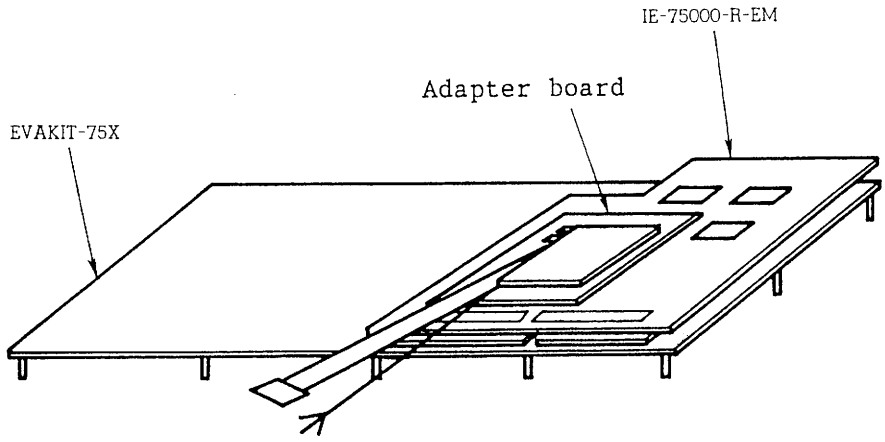


Fig. 2-7 When EVAKIT-75X and EP-75328GC-R are Connected



(4) Connection of emulation probe and target system

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

Caution 1: Before connection 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.

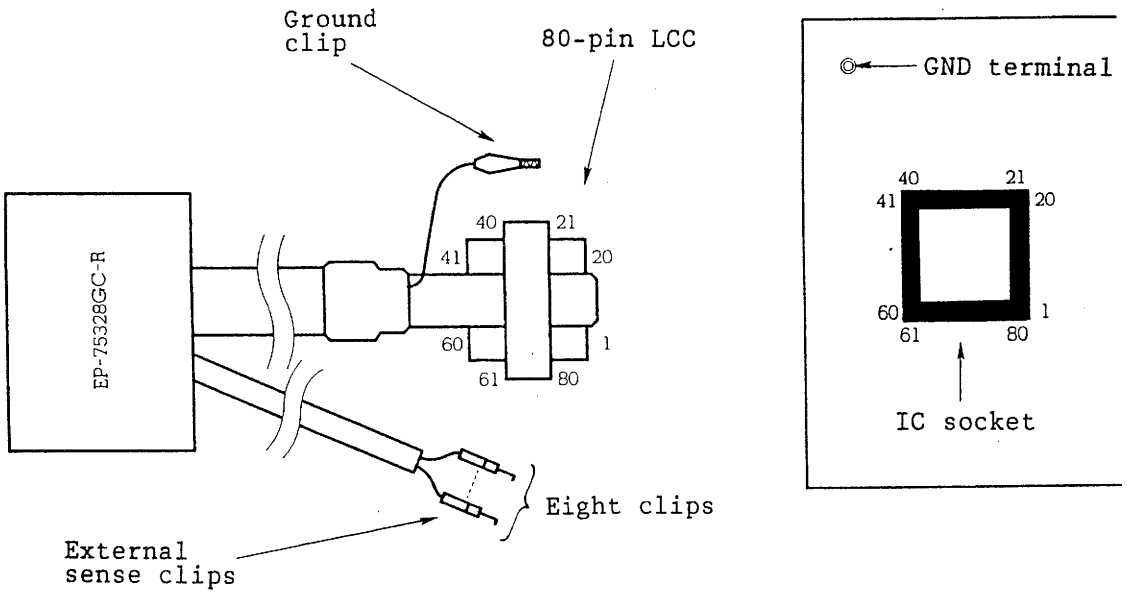
① Turn off the target system power.

② Solder the accessory conversion socket (EV-9200GC-80) 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 80-pin leaded chip carrier (LCC) at the tip of the emulation probe main unit couples with pin 1 of the conversion socket soldered on the target system in ②.

Fig. 2-8 80-pin LCC Emulation Probe Connection



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-75001-R or EVAKIT-75X may be destroyed.

(1) When IE-75001-R and target system are connected

◆ Power on sequence

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

◆ Power off sequence

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

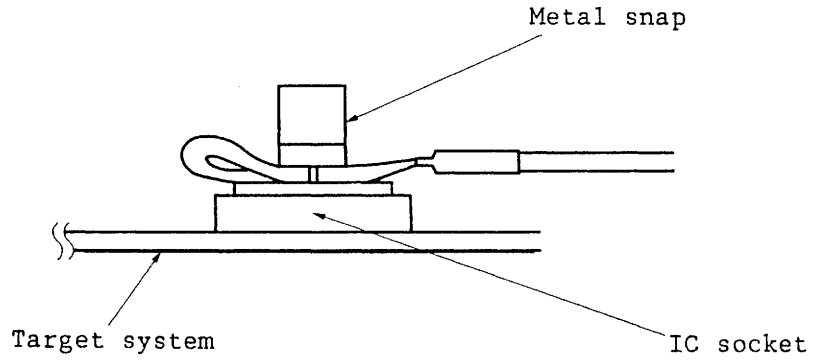
① Turn off the target system power.
② Turn off the EVAKIT-75X power.

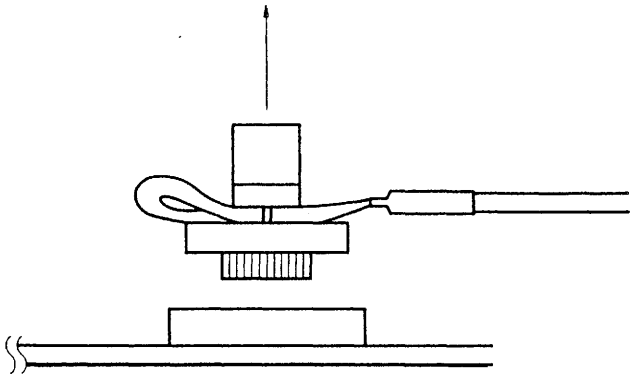
2.4 Removal of Emulation Probe from Target System

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

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

Fig. 2-9 Removal of Emulation Probe





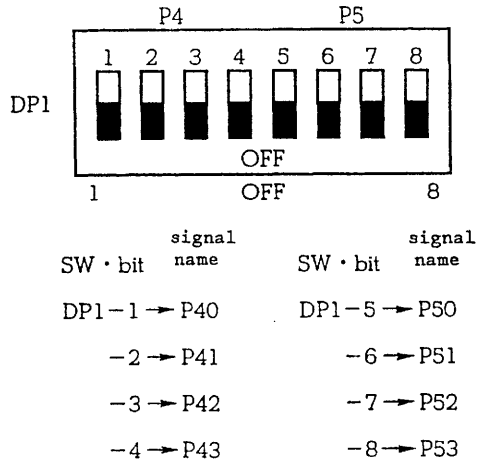
CHAPTER 3 CAUTIONS ON USE

3.1 Mask Option Setting for Ports 4 and 5

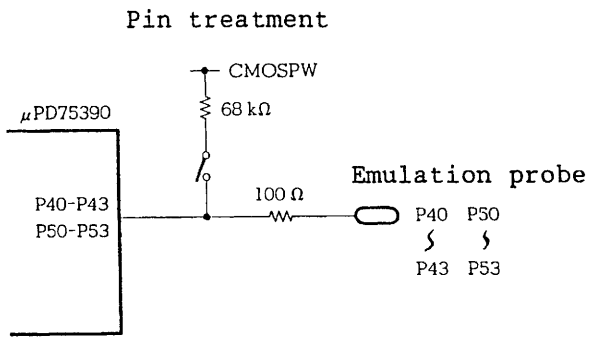
The DP1 switch on the adapter board is a mask option setting switch for ports 4 and 5. If one element of the switch is set to ON, a pull-up resistor (68 kΩ) is connected to the port pin corresponding to the switch element.

At shipment, the DIP switch is all set OFF.

Fig. 3-1 DIP Switch Setting



Pin Treatment

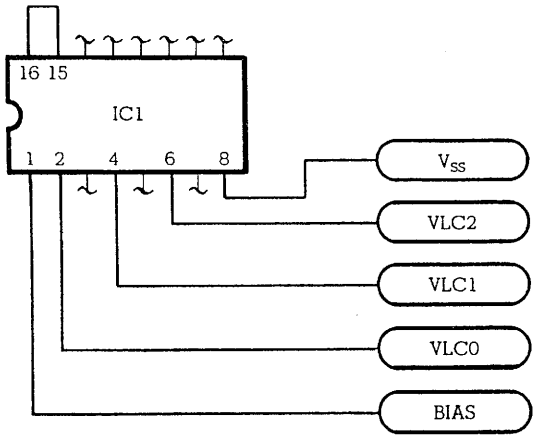


3.2 Split Resistor Setting for LCD Driving

The adapter board conversion socket (IC1) is a socket to set LCD driving split resistors that can be set by mask option.

To set LCD driving split resistors, install resistors on a parts board and insert the parts board in the conversion socket. (See Fig. 3-2.)

Fig. 3-2 IC1 Pin Connection



3.3 To Use Port 8 as Input

Even if the input mode is selected for port 8 and pull-up resistors are selected in 4-bit units by software, P82 and P83 are not set high. However, since P80 and P81 are set high, these pins can be checked to see if pull-up resistors are selected by software.

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

Remarks 1: CN5/CN6 are connectors used as:

CN5: Connector connecting the emulation probe when IE-75001-R is used

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

2: The meaning of symbols and number under emulation probe have the following meanings:

GND	:	Ground clip (GND)
EXT0-EXT7	:	External sense clips
1-80	:	Pin numbers of 80-pin LCC at emulation probe tip
NC	:	No connection

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