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USER'S MANUAL

RENESAS

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EP-754304GS-R

EMULATION PROBE

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INTRODUCTION

Intended Reader

This manual is intended for use by users of μPD754304 subseries debugging using the IE-75001-R + IE-75300-R-EM and EP-754304GS-R.

Remark The IE-75001-R is a product equivalent to the IE-75000-R (maintenance product) with the IE-75000-R-EM removed. The IE-75000-R can be substituted for the IE-75001-R. In this case, replace the IE-75000-R-EM incorporated in the IE-75000-R with the IE-75300-R-EM.

Purpose

This manual provides an understanding of the method for connecting the EP-754304GS-R to the IE-75001-R + IE-75300-R-EM and methods for setting mask options.

Organization

The contents of this manual can be roughly divided under the following general headings.

General description
Methods for connecting this product
Methods for setting mask options

Using this Manual

Before reading this manual, be sure to read the manual for the IE-75001-R or IE-75300-R-EM and get a thorough understanding of the configuration and functions of the debugging system.

When using the IE-75000-R as an in-circuit emulator, "IE-75001-R" should be read as "IE-75000-R". Unless specified otherwise, "IE-75001-R" means "IE-75001-R + IE-75300-R-EM".

- When desiring to understand general EP-754304GS-R functions and connection methods:
  → Read in accordance with the table of contents.

- When desiring to understand the operating environment, configuration and object devices:
  → Read **CHAPTER 1 GENERAL DESCRIPTION**.

- When desiring to understand in detail how to understand the connection method:
  → Read **CHAPTER 2 CONNECTIONS**.

- When desiring to understand the mask option setting method:
  → Read **CHAPTER 3 SETTING THE MASK OPTIONS**.

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Legend

Note : Provides additional important information.
Caution : Contains especially important information.
Remark : Provides a supplementary explanation for the text.

Related Documents

- IE-75000-R/IE-75001-R User's Manual (Document No.: EEU-1455)
- IE-75300-R-EM User's Manual (Document No.: EEU-1493)

Confirmation

The following items are included in the EP-754304GS-R packing box. Check the items carefully. If any item is missing or damaged, be sure to contact this company's sales representative or authorized dealer.

• Emulation probe	1
• Adaptor board	1
• User's manual (This manual)	1
• Spacer (with 2 screws) Note 1	1
• Installation screws Note 2	2
• Flexible board Note 3 (EV-9500GS-36)	1

Notes 1. Used to connect the adaptor board and the IE-75000-R-EM.
2. Used to connect the emulation probe and the IE-75001-R.
3. Used to connect the emulation probe and the target system.

Phase-out/Discontinued

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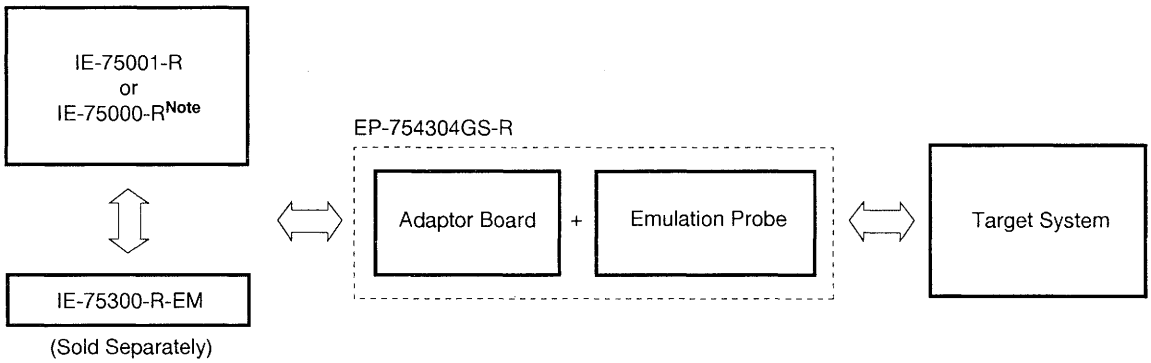
CHAPTER 1 GENERAL DESCRIPTION

This chapter gives an outline of the EP-754304GS-R.

1.1 OPERATING ENVIRONMENT

The EP-754304GS-R is a probe set designed for connection with the IE-75001-R and target system. By using the EP-754304GS-R in such connections, a debugging environment for the μPD754304 subseries is created making comprehensive debugging of target system hardware and software possible. See **CHAPTER 2 CONNECTIONS**, concerning concrete connection methods.

Figure 1-1. Connection to the IE-75001-R and Target System



Note Replace the IE-75000-R-EM incorporated in the IE-75000-R with the IE-75300-R-EM.

1.2 CONFIGURATION

The EP-754304GS-R is a set consisting of a emulation probe and an adaptor board.

(1) Emulation Probe

The emulation probe is configured from the following 3 components.

- **36-pin GS probe**
  This connects the IE-75001-R and target system.

- **Ground clip**
  This connects to the target system's GND. This makes the GND potential of the IE-75001-R and the target system the same, and protects the system against static electricity and noise.

- **External sense clips**
  This consists of 8 sense clips. These clips are used to monitor the IC pin voltage level of the target system.

(2) Adaptor Board

The adaptor board is used to connect the emulation probe to the emulation board (IE-75300-R-EM). The adaptor board also includes functions to set mask options. For details, see **CHAPTER 3 SETTING MASK OPTIONS**.

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Figure 1-2. Emulation Probe and Flexible Board

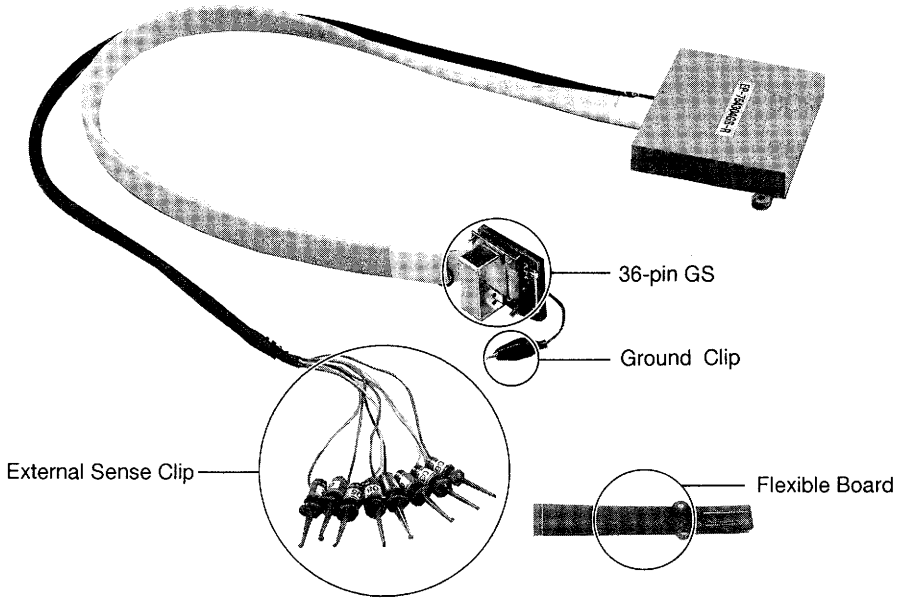
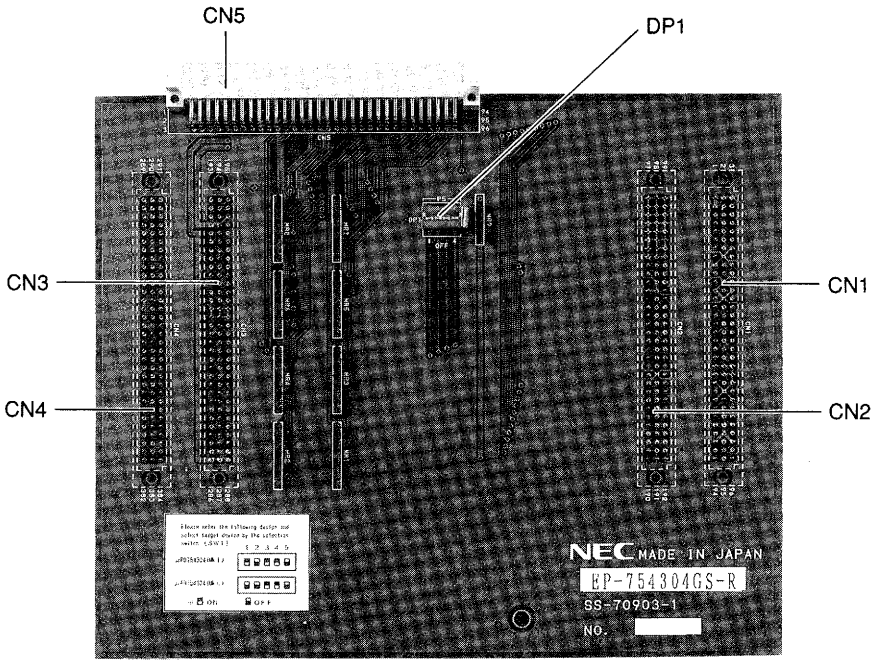


Figure 1-3. Adaptor Board



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1.3 TARGET DEVICES

The EP-754304GS-R is used in emulation of the following target devices (as of July 1995).

- μPD754302GS
- μPD754304GS
- μPD75P4308GS[Note]

Note Under development

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CHAPTER 2 CONNECTIONS

EP-754304GS-R, the sequence for switching on the power and switching it off and the method used to disconnect the emulation probe from the emulation system.

2.1 CONNECTION TO THE IE-75001-R AND TARGET SYSTEM

The connection procedure is outlined as follows.

(1) Connection of the IE-75300-R-EM and adaptor board

(2) Connecting the IE-75001-R and the emulation probe

(3) Connecting the emulation probe and target system

(4) Connecting the external sense clip (if the external sense clip is used)

(5) Switching on the power

Next, details of each item in the connection procedure are explained.

(1) Connecting the IE-75300-R-EM and Adaptor Board

Connect the adaptor board to the IE-75300-R-EM.

<1> While placing a spacer between the IE-75300-R-EM and the adaptor board, connect connectors CN1 to CN4 of the IE-75300-R-EM to connectors CN1 to CN4 of the adaptor board.
<2> Fasten the spacer between the IE-75300-R-EM and the adaptor board using the spacer installation screws.
<3> First, switch off the IE-75001-R's power.
<4> Take out the 6 screws in the top of the IE-75001-R unit, then open the unit's top cover.
<5> Pull the card pullers on both ends of the board forward and pull out the IE-75000-R-BK[Note].
<6> Screw the IE-75300-R-EM to the IE-75000-R-BK together.
<7> Return the IE-75000-R-BK with the IE-75300-R-EM to the original position of the IE-75001-R.

Note In the case of the IE-75000-R, the IE-75000-R-EM and IE-75000-R-BK are installed screw together. Therefore, pull out the IE-75000-R-BK from the main unit in above steps <3> → <4> → <5>, screw off and remove the IE-75000-R-EM before following steps <1> → <2> → <6> → <7>.

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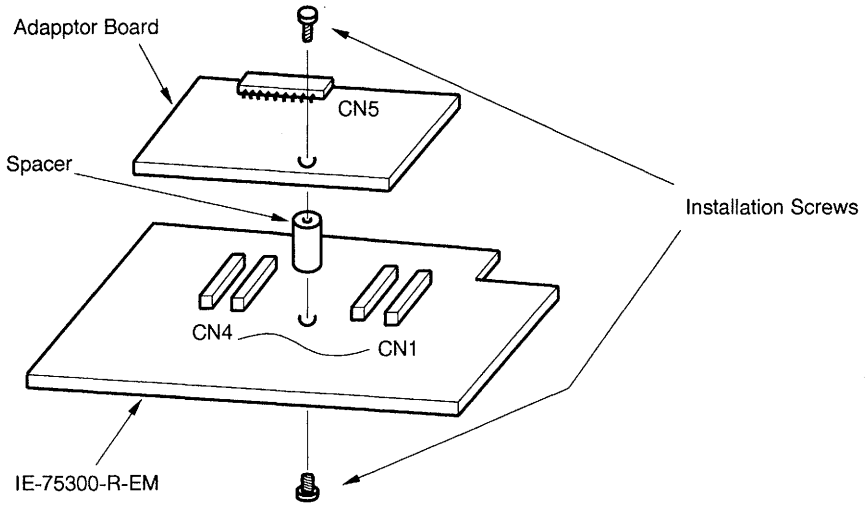
Figure 2-1. Connecting the IE-75300-R-EM and the Adaptor Board

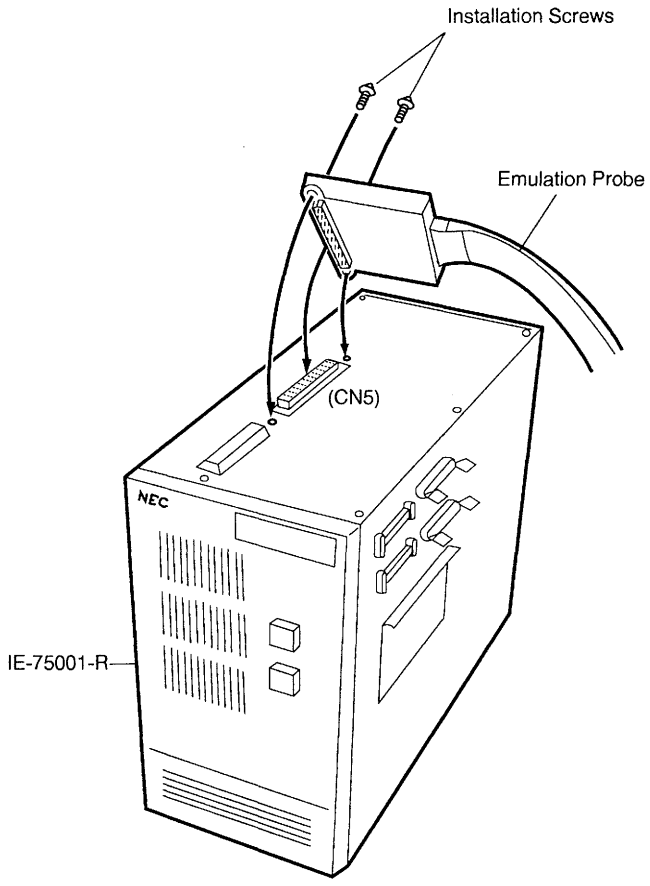


(2) Connecting the IE-75001-R and Emulation Probe

<1> Connect the emulation probe to the emulation probe DIN connector (CN5 of the adaptor board) on the top of the IE-75001-R.

<2> After connection, be sure to fasten the emulation probe to the IE-75001-R with the installation screws provided.

Figure 2-2. Connecting the IE-75001-R and Emulation Probe



Phase-out/Discontinued

(3) Connecting the Emulation Probe and Target System

Connect the emulation probe to the target system by the following procedure.

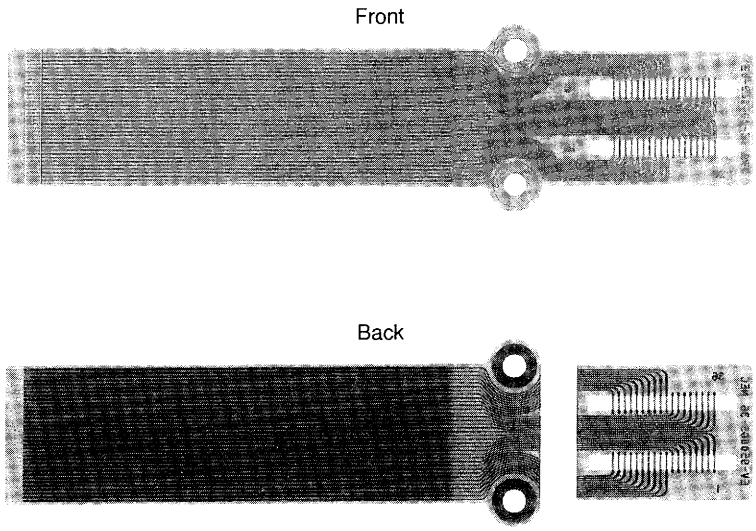
Cautions1. Before connecting the emulation probe to the target system, be sure to connect the ground clip. If the ground clip is not connected, the IE-75001-R could be damaged by static electricity, etc.

2. When making connections, be careful not to reverse the pins. If connections are incorrect, it could damage the IE-75001-R.

<1> Switch off the target system's power supply.

<2> Solder the flexible board (EV-9500GS-36) to the target system.

Figure 2-3. Flexible Board

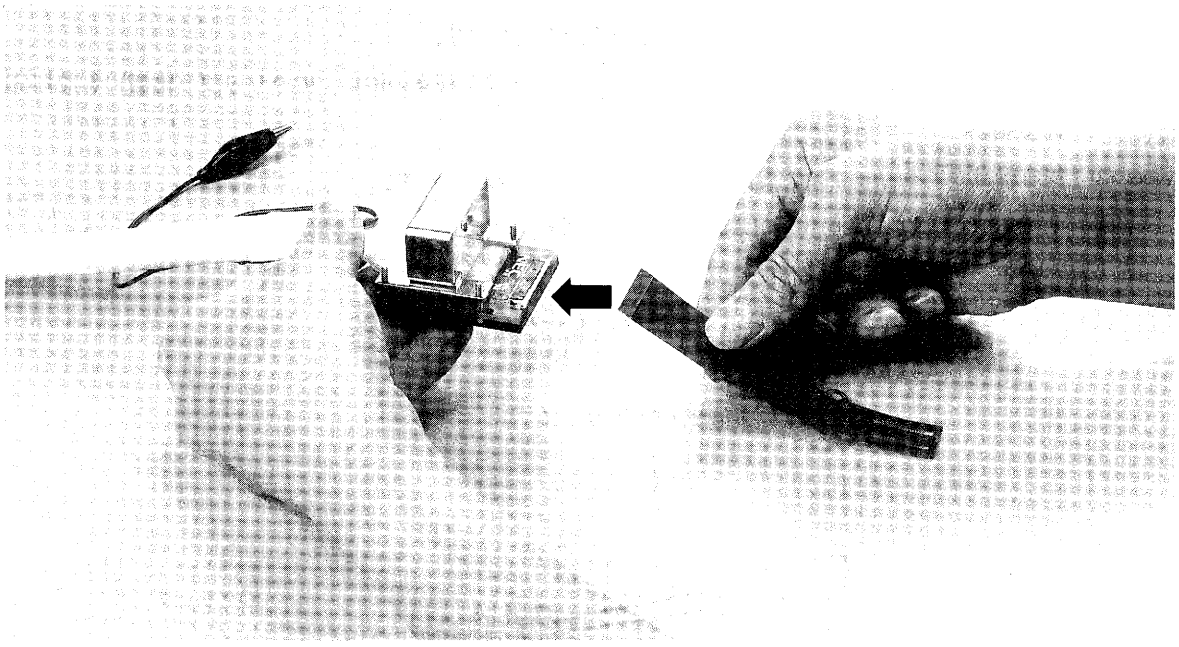


<3> Connect the emulation probe's ground clip to the ground (GND) pin of the target system.

<4> Insert into the emulation probe connector under the solder-plated surface of the flexible board soldered on the target system in step <2> in the emulation probe main unit edge connector.

Phase-out/Discontinued

Figure 2-4. Emulation Probe Connection



(4) Connecting the External Sense Clip

The emulation probe is provided with 8 external sense clips which can trace hardware signals on the target system in real time.

Since the external sense clips are directly connected to the input buffer HCT244 inside the in-circuit emulator unit, they are TTL level inputs.

The 8 external sense clips are normally input signal lines. However, by setting the in-circuit emulator OUT command, the signal line of external sense clip 1 can be used as an outgoing trigger output signal line in the case of an event (see the in-circuit emulator manual for details).

Cautions 1. Connect the external sense clip to a TTL level signal line only. If it is connected to a signal line other than a TTL level signal line, it will not detect the high level and low level accurately. Also, depending on the voltage level, the IE-75001-R's sensor could be damaged.

2. Before using external sense clip 1 as an external trigger output, ensure that external sense clip 1 is not connected to the signal output line. If it is connected, a fault may result.

Connect the external sense clip by the following procedure if it is used.

<1> Switch off the power to the target system, then the IE-75001-R.
<2> Install the IC clip (commercially available) on the IC in the target system which is to be traced.
<3> Connect the external sense clip to the IC clip.
<4> Switch on the power to the IE-75001-R, then the target system.

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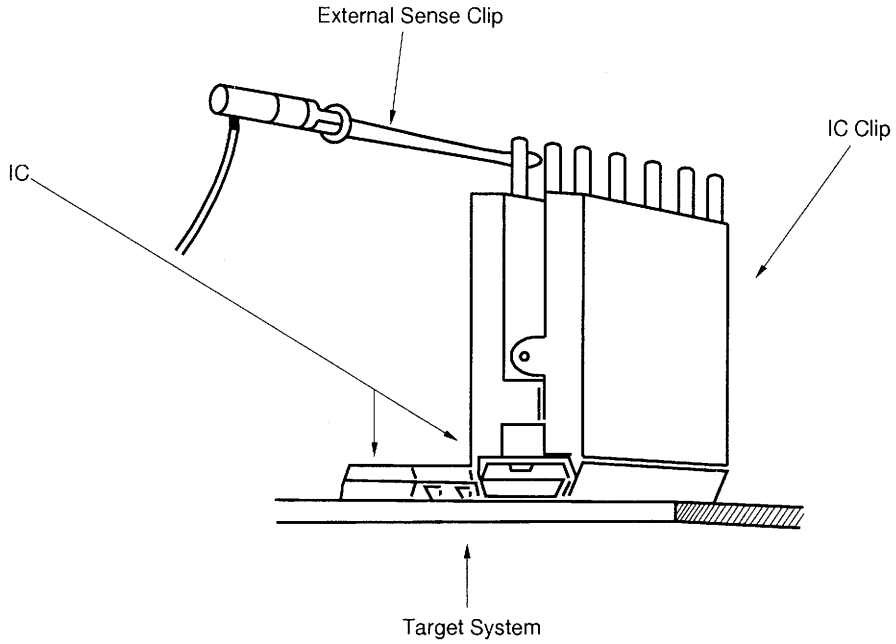
Figure 2-5. Connecting the External Sense Clip



Remark If an external sense clip is connected, be sure to use an IC clip if at all possible. Thishelps prevent faulty contact and improves operability.

2.2 POWER ON AND OFF SEQUENCE

After connection of the emulation probe to the target system has been completed, switch on the power. The sequence for switching on the power and switching it off is shown below.

Caution Be sure to follow the correct sequence for switching the power ON and OFF. If the sequence is mistaken, the IE-75001-R could be damaged.

(1) If the IE-75001-R is Connected to the Target System

- Power ON sequence
  <1> Switch on the power to the IE-75001-R.
  <2> Switch on the power to the target system.

- Power OFF sequence
  <1> Switch off the power to the target system.
  <2> Switch off the power to the IE-75001-R.

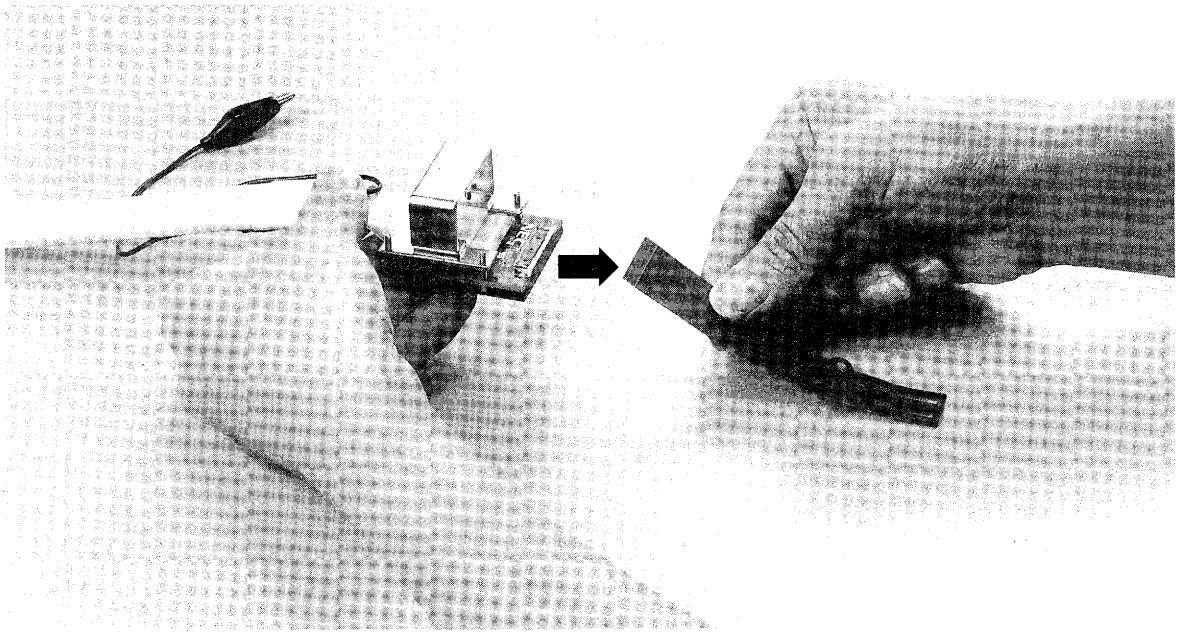
Phase-out/Discontinued

2.3 DISCONNECTING THE EMULATION PROBE FROM THE TARGET SYSTEM

Disconnect the emulation probe from the target system by the following procedure.

<1> Switch off the power to the target system.
<2> Switch off the power to the IE-75001-R.
<3> Pull the flexible board from the connector on the end of the emulation probe.

Figure 2-6. Disconnecting the Emulation Probe



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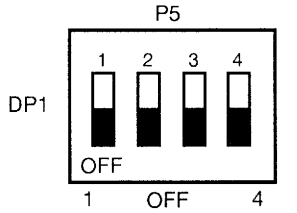
CHAPTER 3 SETTING MASK OPTIONS

3.1 SETTING THE PORT 5 MASK OPTION

The adapter board DP1 switch is the port 5 mask option setting switch. When these switches are switched ON, pull-up resistors (68 kΩ) are connected.

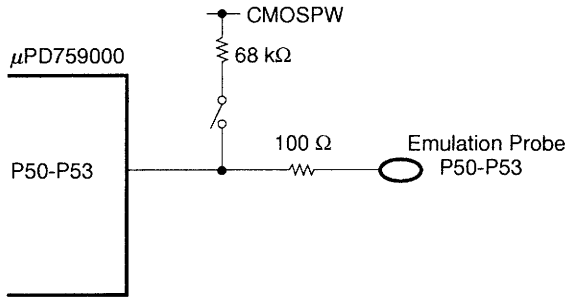
At shipping time, the DP1 switches are set in the OFF position.

Figure 3-1. DP1 Switch Arrangement Diagram



SW	Bit	Signal Name
DP1	–1	P50
	–2	P51
	–3	P52
	–4	P53

Pin Processing



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APPENDIX EMULATION PROBE PIN ARRANGEMENT TABLE

(1/2)

CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name
1	GND	GND	25	NC	NC	49	6	P32
2	GND	GND	26			50	7	P31
3	EXT0	EXT0	27			51	8	P30
4	EXT1	EXT1	28			52	9	P81
5	EXT2	EXT2	29			53	NC	NC
6	EXT3	EXT3	30			54		
7	EXT4	EXT4	31			55		
8	EXT5	EXT5	32	31	P61/KR1	56		
9	EXT6	EXT6	33	32	P60/KR0	57		
10	EXT7	EXT7	34	33	P53	58		
11	NC	NC	35	34	P52	59		
12			36	35	P51	60		
13			37	36	P50	61		
14			38	NC	NC	62		
15			39			63		
16			40			64		
17			41			65		
18			42	1	GND	66		
19			43	NC	NC	67		
20			44			68		
21			45	4	$\overline{\text{RESET}}$	69		
22			46	2	X1	70		
23			47	3	X2	71		
24			48	5	P33	72		

Remarks 1. If the IE-75001-R is used, the emulation probe is connected to CN5 connector.

2. Symbols and numbers in the emulation probe column mean as follows.

GND : Ground clip

EXT0 to EXT7 : External sense clip No. 1 to No. 8

1 to 36 : Pin No. of 36-pin GS on end of emulation probe

NC : No Connection

Phase-out/Discontinued

(2/2)

CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name	CN5 Pin No.	Emulation Probe	Signal Name
73	NC	NC	81	22	P11/INT1	89	25	P73/KR7
74	10	P80	82	21	P10/INT0	90	26	P72/KR6
75	15	P03/SI	83	19	IC	91	27	P71/KR5
76	16	P02/SO/SB0	84	20	V_{DD}	92	28	P70/KR4
77	17	P01/$\overline{SCK}$	85	11	P23	93	29	P63/KR3
78	18	P00/INT4	96	12	P22/PCL	94	30	P62/KR2
79	24	P13/TI0/TI0	87	13	P21/PTO1	95	GND	GND
80	23	P12/INT2	88	14	P20/PTO0	96	GND	GND

Remarks 1. If the IE-75001-R is used, the emulation probe is connected to CN5 connector.

2. Symbols and numbers in the emulation probe column mean as follows.

GND : Ground clip

EXT0 to EXT7 : External sense clip No. 1 to No. 8

1 to 36 : Pin No. of 36-pin GS on end of emulation probe

NC : No Connection

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