

CUSTOMER NOTIFICATION

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Yoichi Hirasawa, Expert *Yoichi Hirasawa*
Microcomputer Engineering Dept.
Solution Engineering Div.
NEC Electron Devices
NEC Corporation

CP(K),O

IE-178054-NS-EM1
User's Manual
(Preliminary)

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PREFACE

- **Intended readers:** This manual is intended for engineers who perform system debugging, using the 8-bit single-chip microcomputer μ PD178F054 series with the IE-78K0-NS and the IE-178054-NS-EM1.
- **Configuration:** When using the IE-178054-NS-EM1, please refer to the manual (this manual) which comes with the IE-78K0-NS.

IE-78K0-NS User's Manual	IE-178054-NS-EM1 User's Manual
Basic specifications System configuration External interface function	Function outline Target interface difference

- **Purpose:** The purpose of this manual is to help the reader understand the debugging functions which are available by using the IE-78K0-NS and the IE-178054-NS-EM1 together.
- **Terminology:** The meanings of the terms used in this manual are described in the table below.

Term	Meaning
Emulation device	Refers to the generic name for the devices in the emulator, which perform emulation of the target device. These include the emulation CPU.
Emulation CPU	Refers to the CPU which executes the user's program in the emulator.
Target device	Refers to the device targeted for emulation.
Target system	Refers to the system targeted for debugging. This includes the target program and the hardware created by the user. In the narrow sense, it means hardware only.
IE system	Refers to the IE-178054-NS-EM1 with the IE-78K0-NS.

- **Explanatory notes**

Weight of data representation: The left columns are of a higher order whereas the right ones are of a lower order.

- Note: A note attached to the text.
- Caution: Content which requires particular attention.
- Remark: Supplementary explanation of the text
- *: Comment

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CHAPTER 1. GENERAL

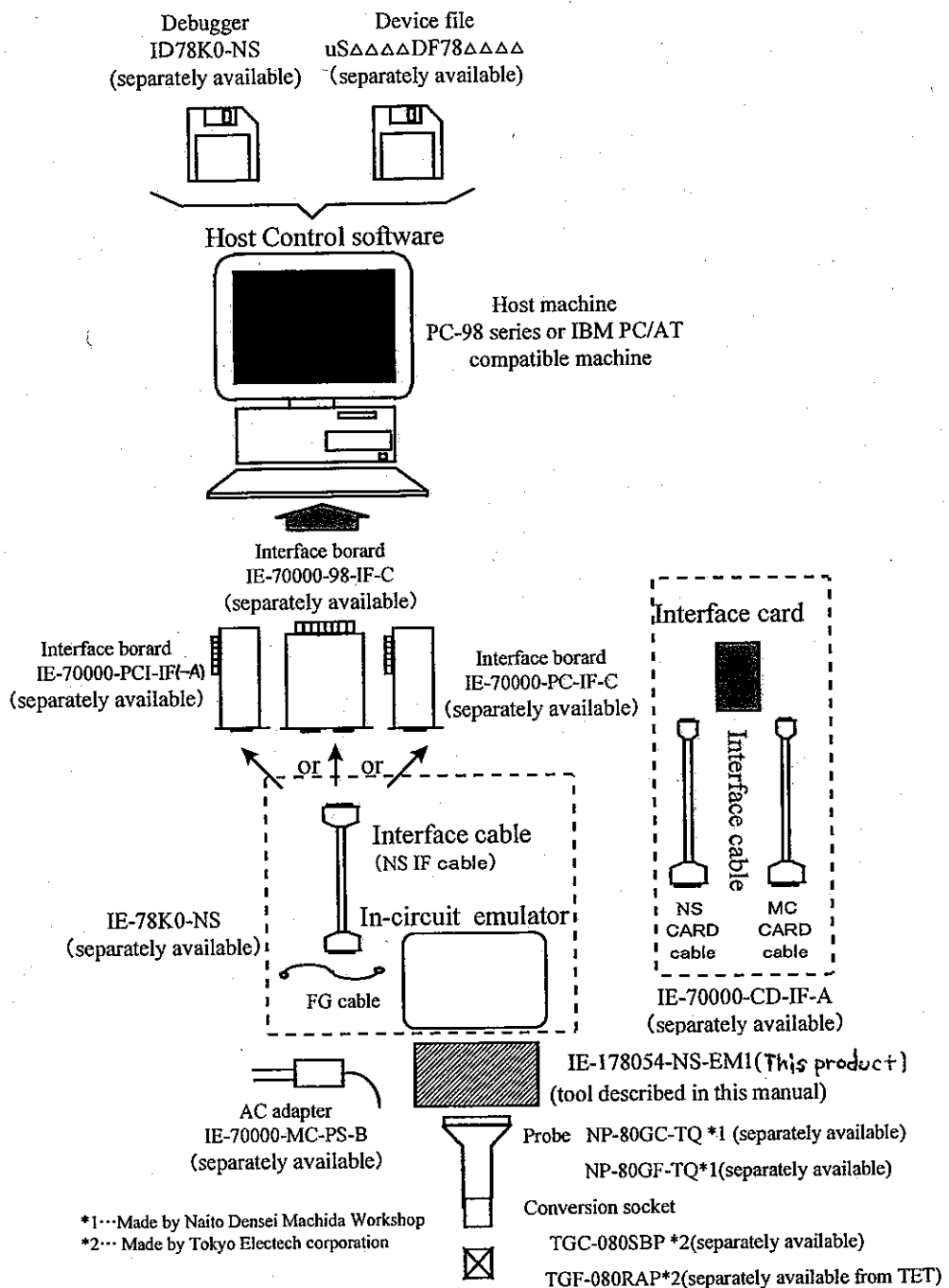
IE-178054-NS-EM1 is a development tool for effectively debugging the hardware or the software using the 8-bit single-chip microcomputer μ PD178F054 series.

This chapter describes system configuration and basic specifications of the IE-178054-NS-EM1.

1.1 System Configuration

The IE-178054-NS-EM1 system configuration is as shown below.

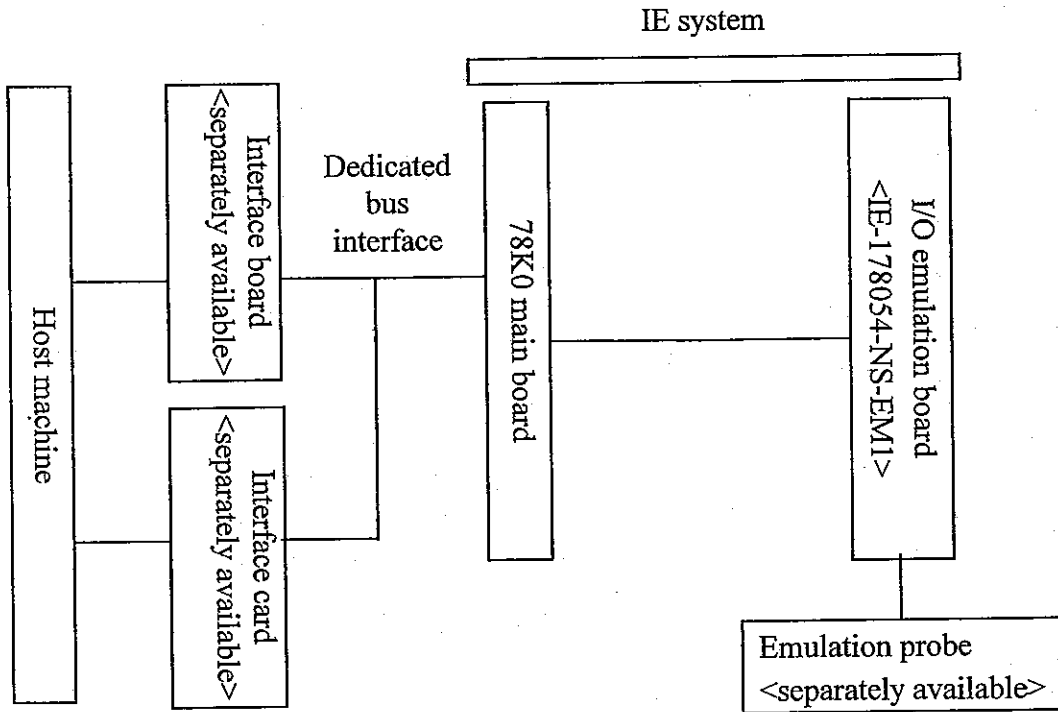
<<IE-178054-NS-EM1 system configuration>>



1.2 Hardware Configuration

The following diagram shows hardware configuration of the IE-178054-NS-EM1.

<<IE-178054-NS-EM1 basic hardware configuration>>



1.3 Basic Specifications

<<List of functions (unique specifications)>>

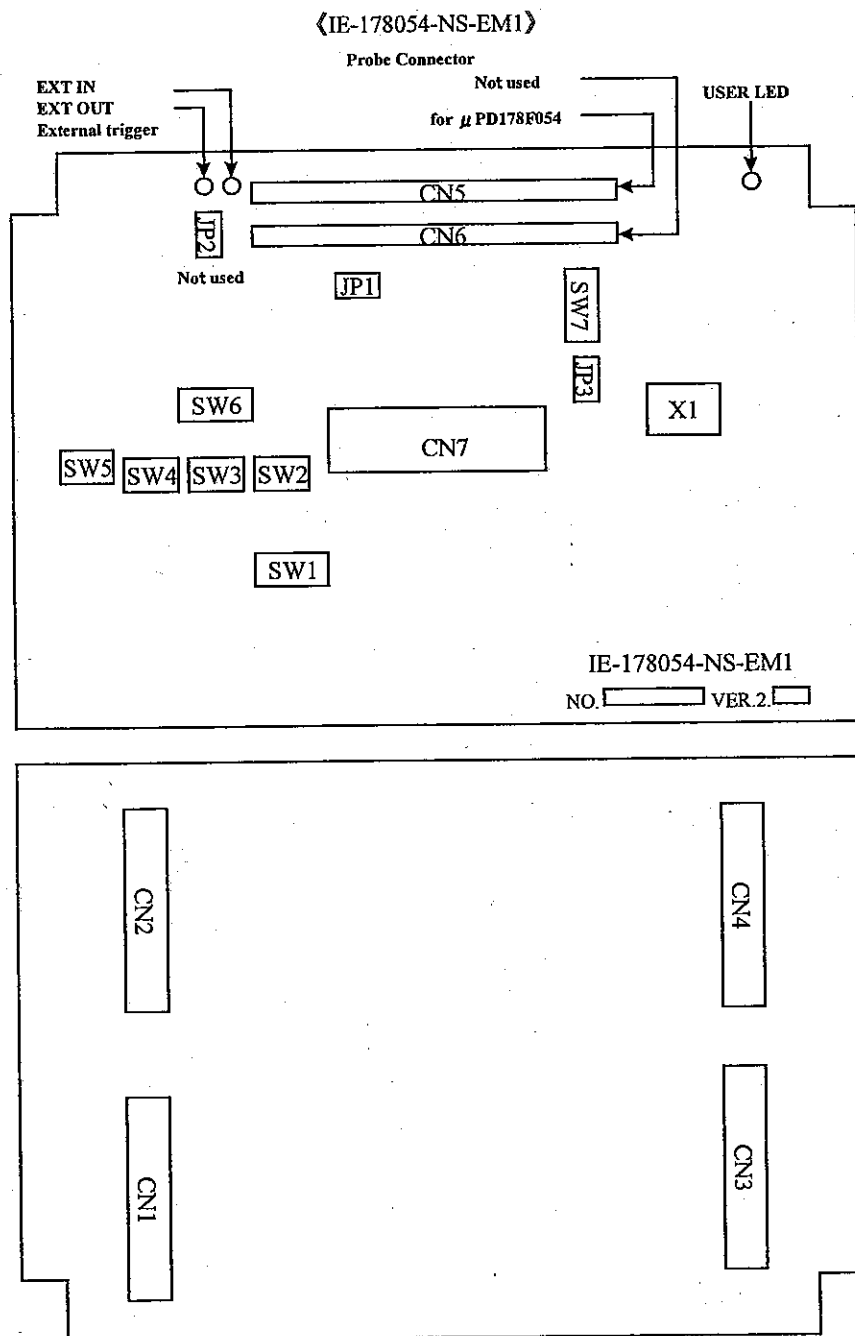
Parameter	Description
Target device	μPD178F054 series
Main clock supply	External: Pulse input Internal: 4.5MHz
Low-voltage compatible	+3.5V ~ +5.5V

CHAPTER 2. PART NAMES

This chapter introduces the parts of the IE-178054-NS-EM1 main unit.

The packing box contains the emulation board (IE-178054-NS-EM1). If there are any missing or damaged items, please contact an NEC sales representative. Please make sure to fill out and return the guarantee document that comes with the main unit.

2.1 Part Names



CHAPTER 3. INSTALLATION

This chapter explains how to connect the IE-178054-NS-EM4 to the IE-78K0-NS or the probe.

[Caution] Connection and disconnection between the IE system and the target system, and mode changes including switching should be conducted after confirming their power supply set to OFF.

3.1 Connection

(1) How to connect the IE-78K0-NS to the IE-178054-NS-EM1

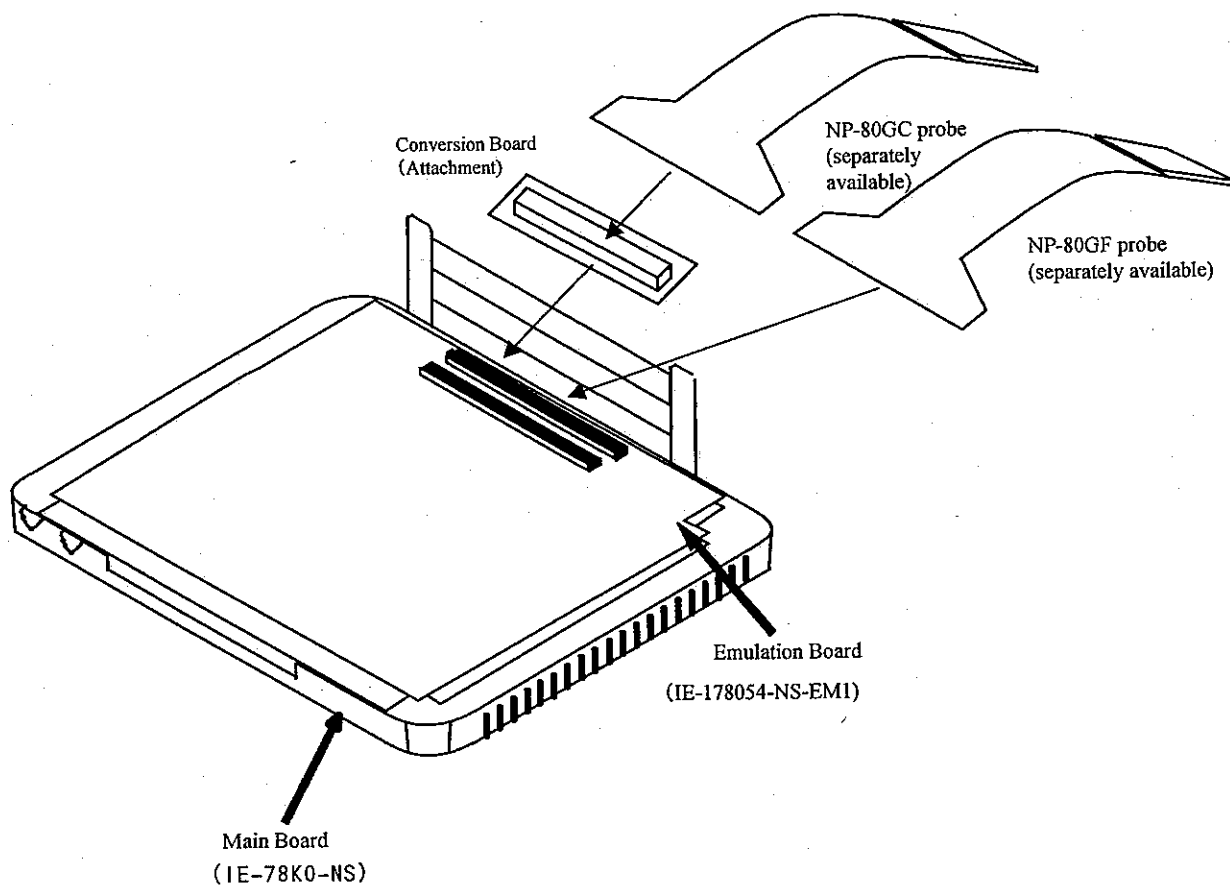
Refer to the IE-78K0-NS user's manual.

(2) How to connect the emulation probe to the IE-178054-NS-EM1

Refer to the IE-78K0-NS user's manual.

Remark: When using the NP-80GC, connect the conversion board supplied with the IE-178054-NS-EM1 between connector CN5 and NP-80GC probe.

[Caution] Incorrect connection may damage the IE system. For more details on connection, see the user's manual for each emulation probe.



3.2 Clock Setting

3.2.1 User clock setting

(1) Main clock

The frequency of the main clock can be changed in the following three ways.

- Mount the crystal oscillator (X1 of IE-178054-NS-EM1)
- Add an oscillation circuit (X1 of IE-178054-NS-EM1)
- Input pulses from the target (X1 terminal)

Switching the clock between the socket and the target can be performed from a control software command. But select the external clock only. For details, see user's manuals for each control software.

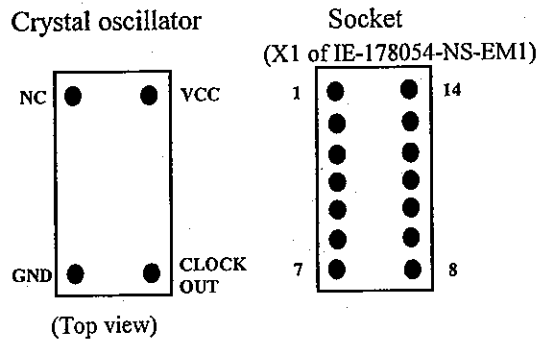
Note: An abnormal main clock supply will cause the IE system to hung up.

The clock input from the target should be a square wave.

Clock supply is not necessary for X2 pin.

(a) When using a crystal oscillator

When using a crystal oscillator for the main clock, install a crystal oscillator with the following pin configuration, in the socket as shown in the diagram.

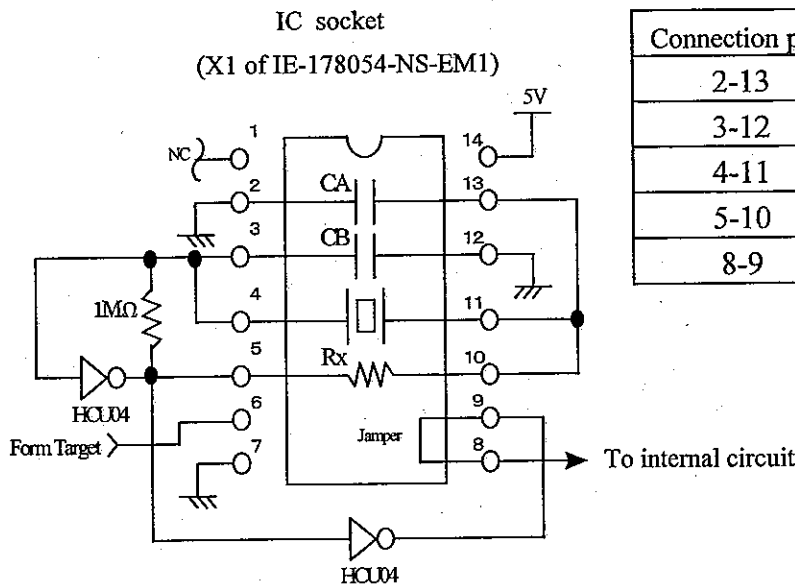


Crystal oscillator pin	Socket pin No.
NC	1
GND	7
CLOCK OUT	8
Vcc	14

(b) When using a ceramic resonator or crystal oscillator

- Main clock

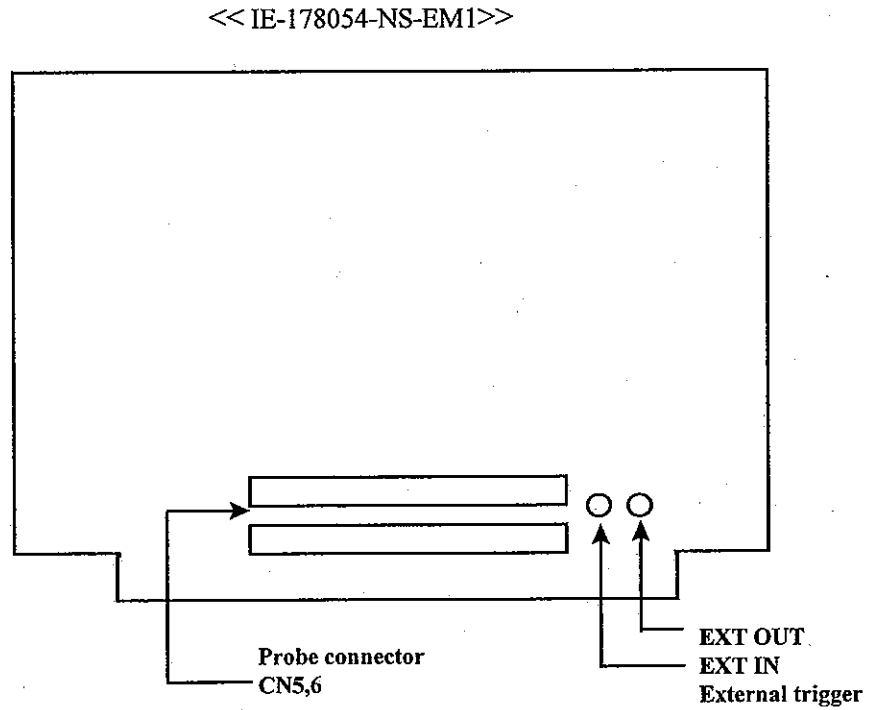
The diagram below shows the circuit configuration. Install the required frequency resonator/oscillator, resistor and capacitor in the IC socket.



Connection pins	Parts in use
2-13	Capacitor CA
3-12	Capacitor CB
4-11	Oscillator/resonator
5-10	Resistor Rx
8-9	Short

3.3 External Trigger

Connect external trigger to check pin, EXT OUT and EXT IN of the IE-178054-NS-EM1.
Please refer to the manual of the debugger for details.



3.4 Jumpers of IE-78K0-NS Setting

Set jumpers of IE-78K0-NS when using the IE-178054-NS-EM1 as shown below.

	JP2	JP3	JP4	JP6	JP7	JP8
Short	2-3	1-2	1-2	5-6	1-2	1-2

3.5 Jumpers of IE-178054-NS-EM1 Setting

Set jumpers of IE-178054-NS-EM1.

	JP1	JP2	JP3
Short	1-2	don't care (Factory setting:2-3)	1-2

3.6 Switch of IE-178054-NS-EM1 Setting

Set switch of IE-178054-NS-EM1.

(1) SW1,6 : Select a target device.

	SW1	SW6
Setting of SW	PORT side	124 side

(2) SW2~5 : Select line for AMIFC/FMIFC/VCOL/VCOH.

	SW2 (VCOL/J1)	SW3 (VCOH/J2)	SW4 (FMIFC/J3)	SW5 (AMIFC/J4)
Open a circuit of AMP (Factory setting)	AMP	AMP	AMP	AMP
Close a circuit of AMP	NO AMP	NO AMP	NO AMP	NO AMP

AMP: Connect to terminal of "Jx" by way of AMP circuit.

NO AMP: Connected directly with terminal of "Jx".

A recommendation BNC connector on the target board.

Manufacturer:JAE Product name:CN10-RP-M-O

(3) SW7 : Select REGOSC/REGCPU.

	SW7
REGOSC and REGCPU signal manage by IE-178054-NS-EM1. Use it on this side usually, please. (Factory setting)	I
Manage on a target board	U

When you set "I", this board manage GND through 0.1uF capacitor. You usually set "I".
In this case, you set "U".

- You want to change of 0.1uF for other value.
- You force electrical potential to change.
- Your board have already manage GND through capacitor.

Chapter 4. Differences between Target Device and Target Interface Circuit

This chapter describes the difference between the signal lines of the target device (μ PD178F054 series) and that of the IE-178054-NS-EM1's target interface circuit.

The target device consists of CMOS circuits, whereas the IE-178054-NS-EM1's target interface circuit consists of emulation circuits such as the gate array TTL and CMOS IC.

At the time of debugging by connecting the IE system and the target system, the IE system performs the emulation as if the actual target device is operating on the target system, however, in reality, it is the IE system that performs the emulation, thus producing a slight differences.

- (1) Signals that are directly input/output from an emulation gate array and μ PD7880
- (2) Signals that are directly input/output from an emulation gate array and μ PD7883
- (3) Other signals

Regarding the signals in (1) to (3) above, the circuits of the IE system are shown below.

- (1) Signals that are directly input/output from an emulation gate array and μ PD7880

- P57—P50
- P67—P60

- (2) Signals that are directly input/output from an emulation gate array and μ PD7883

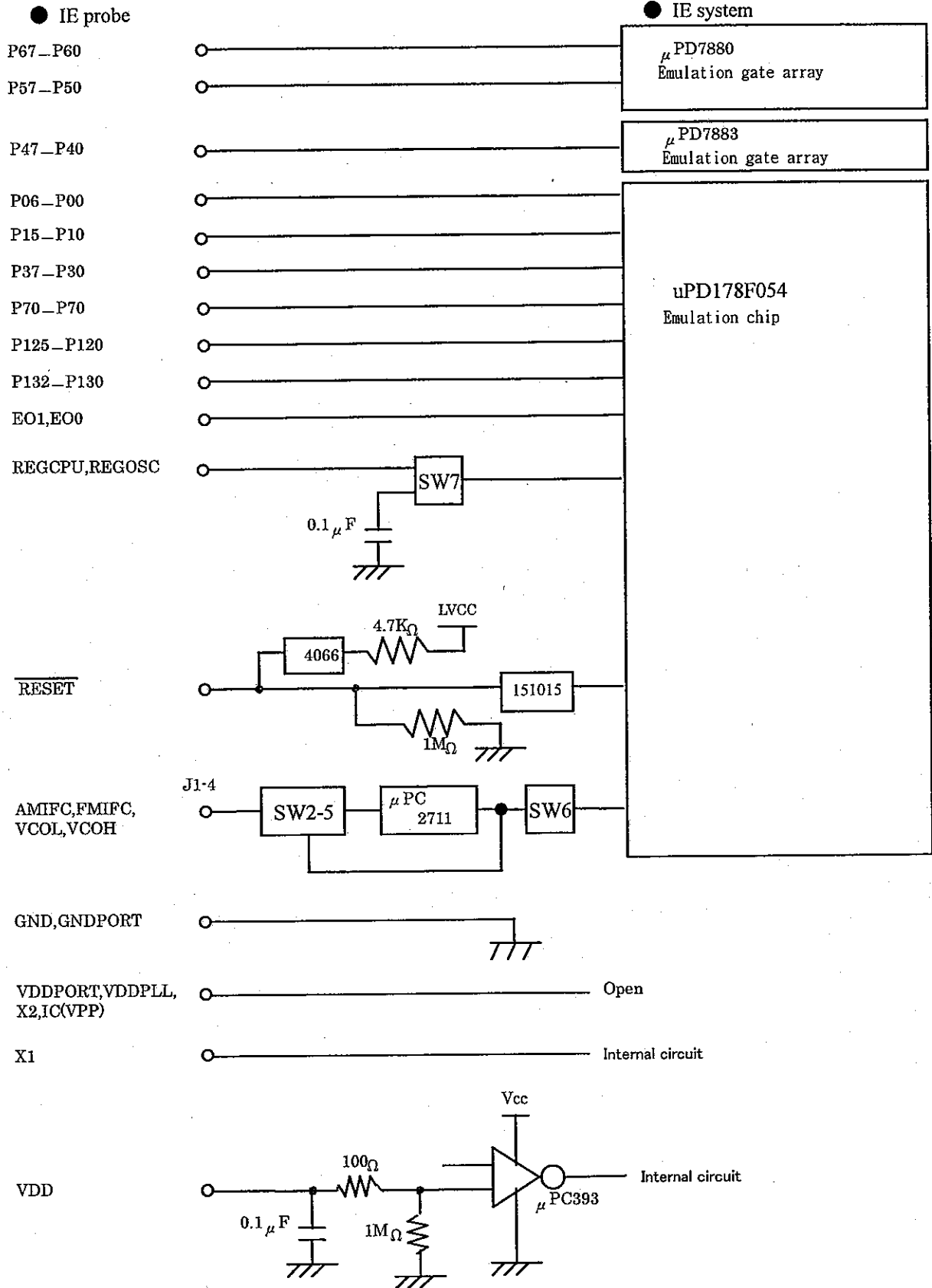
- P47—P40

- (3) Other signals

- P05—P00
- P15—P10
- P37—P30
- P77—P70
- P132—P130
- EO1,EO0
- REGCPU,REGOSC

- RESET
- AMIFC,FMIFC,VCOL,VCOH
- GND,GNDPORT
- VDD
- VDDPORT,VDDPLL
- IC/VPP
- X1
- X2

<<Equivalent circuit of emulation circuits>>



Chapter 5. Restrictions

1. When the IE system is started up without connecting to a target board, initial values of all ports are indefinite.

APPENDIX Correspondence between the pin of the IC and emulation probe

Pin No.	Emulation Probe	Pin No.	Emulation Probe
1	114	41	8
2	113	42	7
3	108	43	14
4	107	44	13
5	104	45	18
6	103	46	17
7	100	47	22
8	99	48	21
9	94	49	28
10	93	50	27
11	30	51	92
12	29	52	91
13	24	53	98
14	23	54	97
15	20	55	102
16	19	56	101
17	16	57	106
18	15	58	105
19	10	59	112
20	9	60	111
21	37	61	83
22	43	62	77
23	44	63	78
24	47	64	73
25	48	65	74
26	51	66	69
27	52	67	70
28	57	68	63
29	58	69	64
30	59	70	61
31	60	71	62
32	55	72	65
33	56	73	66
34	49	74	71
35	50	75	72
36	45	76	75
37	46	77	76
38	41	78	79
39	42	79	80
40	35	80	85

When using the NP-80GC, connect the conversion board supplied with the
IE-178054-NS-EM1 between connector CN5 and NP-80GC probe.