CUSTOMER NOTIFICATION

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IE-780066-NS-EM4

Preliminary User's Manual

2nd edition, June 2001

Major Revisions in 2nd Edition

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p. 11	3.4 Jumper Settings of Main Board

INTRODUCTION

■ Intended readers: This manual is intended for engineers who perform system debugging, using the μPD78F0066 and 780065 Subseries of 8-bit single-chip microcontrollers with the IE-78K0-NS, IE-78K0-NS-P01, and the IE-780066-NS-EM4.

■ Organization: When using the IE-780066-NS-EM4, refer to the manual (this manual) included with the IE-780066-NS-EM4 as well as the manuals included with the IE-78K0-NS-P01 and IE-78K0-NS.

IE-78K0-NS User's Manual	IE-78K0-NS-P01 User's Manual	IE-780066-NS-EM4 User's Manual
● Basic specifications ● System configuration ● External interface function	● Function outline ● Target interface differences	● Function outline

■ Purpose: The purpose of this manual is to help the reader understand the debugging functions that are available by using the IE-780066-NS-EM4 with the IE-78K0-NS-P01 and IE-78K0-NS 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-78K0-NS-P01 and IE-780066-NS-EM4 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

*: Notes

CONTENTS

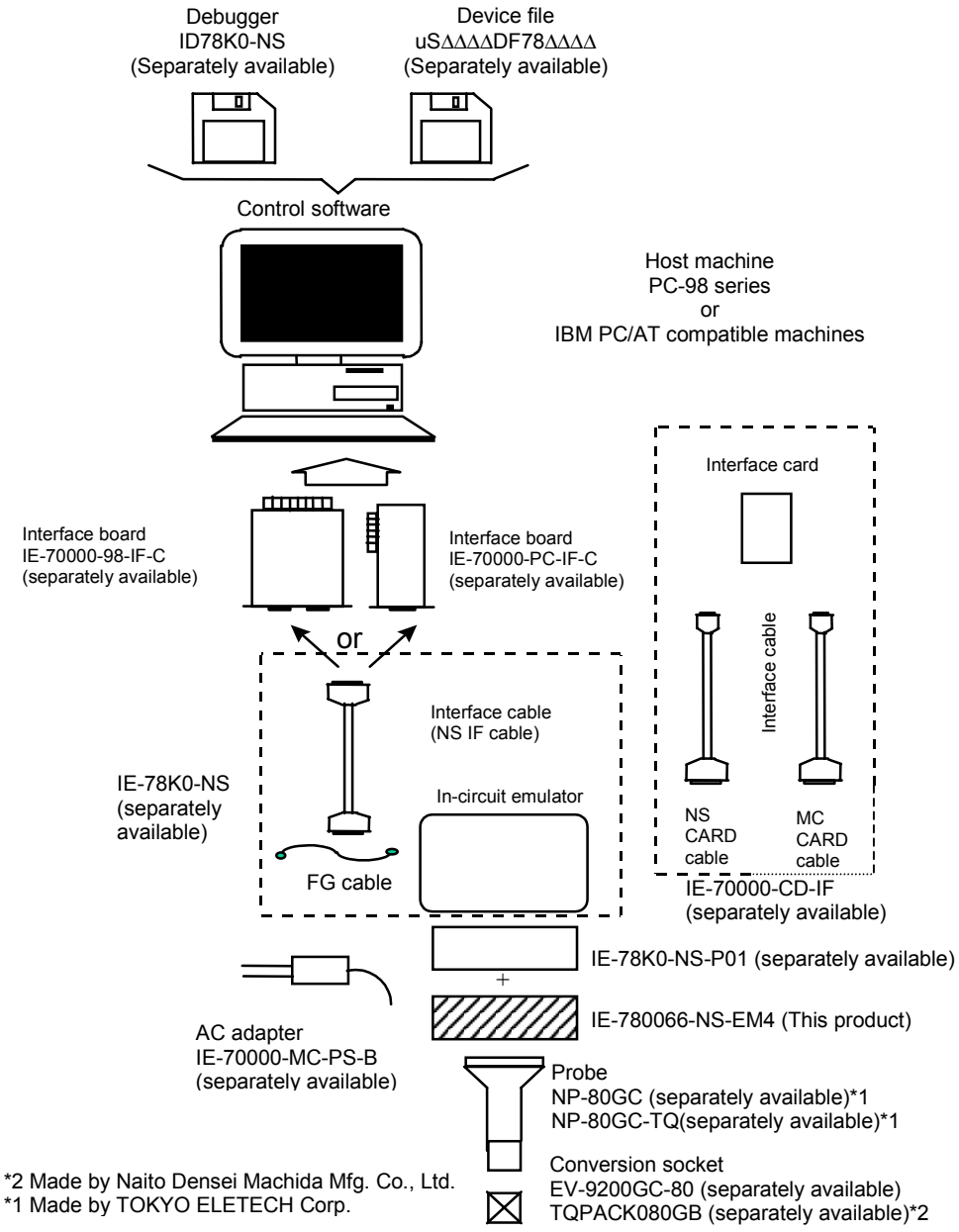
CHAPTER 1 GENERAL

The IE-780066-NS-EM4 is a development tool for effectively debugging hardware or software that uses the μPD78F0066 and 780065 Subseries of 8-bit single-chip microcontrollers.
This chapter describes the system configuration and basic specifications of the IE-780066-NS-EM4.

1.1 System Configuration

The IE-780066-NS-EM4 system configuration is as shown below.

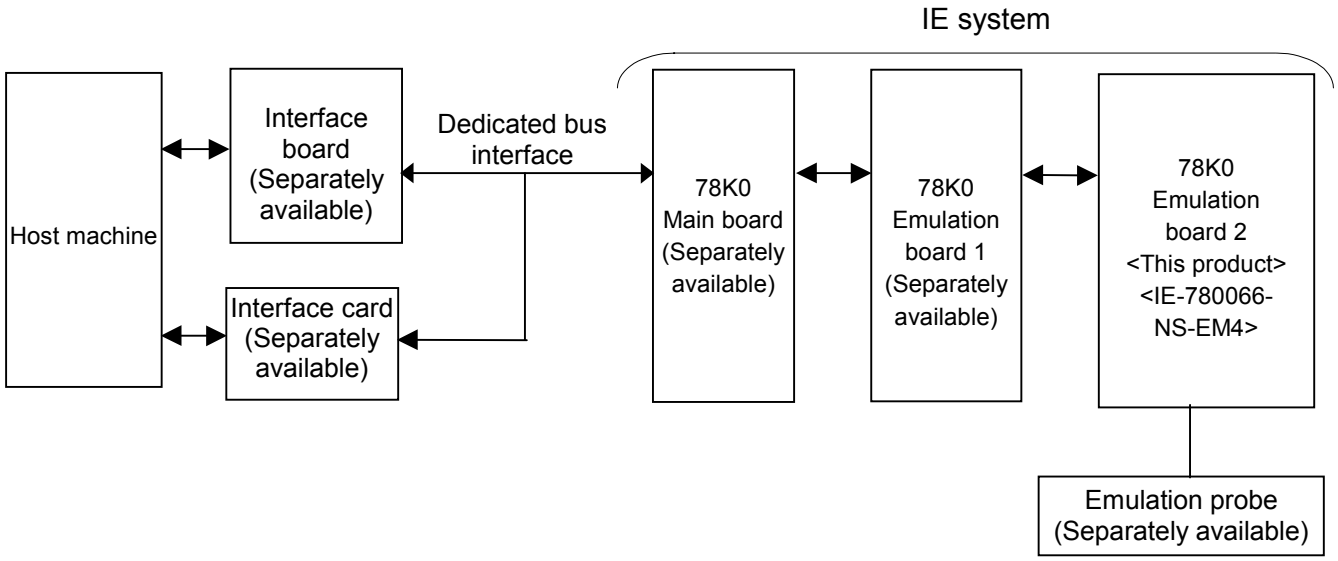
<IE-780066-NS-EM4 System Configuration>



1.2 Hardware Configuration

The following diagram shows hardware configuration of the IE-780066-NS-EM4.

<IE-780066-NS-EM4 Basic Hardware Configuration>



1.3 Basic Specifications

< Function List <Individual Specifications>

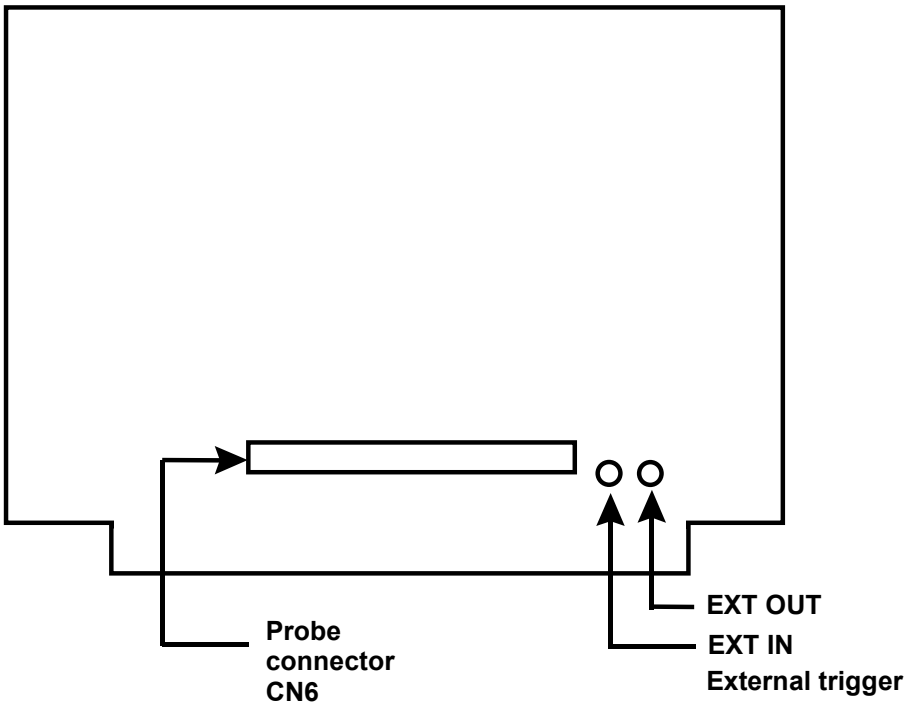
Parameter	Description
Target device	μPD78F0066, 780065 Subseries
System clock	8.388608 MHz
Main clock supply	External: Pulse input Internal: 8.388608 MHz
Low voltage	2.7 V or higher

CHAPTER 2 PART NAMES

This chapter introduces the parts of the IE-780066-NS-EM4 main unit.
The packing box contains the emulation board 2 (IE-780066-NS-EM4). 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 included with the main unit.

2.1 Parts of Board

<IE-780066-NS-EM4>



CHAPTER 3 INSTALLATION

This chapter describes methods for connecting the IE-780066-NS-EM4 to the IE-78K0-NS, IE-78K0-NS-P01, and emulation probe.

Caution Connecting or removing components to or from the target system, or making switch or other setting changes must be carried out after the power supply to both the main unit and the target system has been switched off.

3.1 Connection

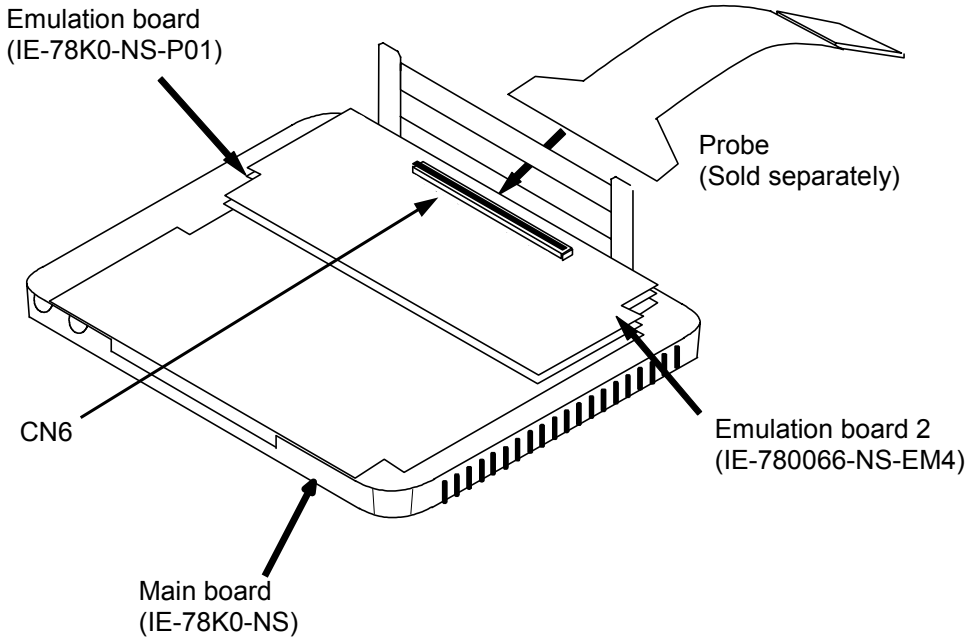
(1) Connection with IE-78K0-NS main unit

See the IE-78K0-NS User's Manual for a description of how to connect the IE-780066-NS-EM4 to the IE-78K0-NS.

(2) Connection with emulation probe

See the IE-78K0-NS User's Manual for a description of how to connect an emulation probe to the IE-780066-NS-EM4.

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 Settings

3.2.1 User clock settings

(1) Main clock

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

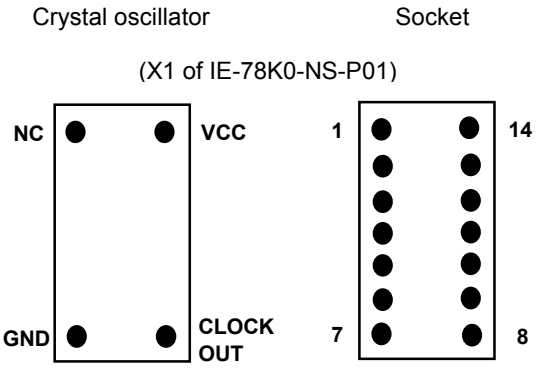
- Mount the crystal oscillator (X1 socket of IE-78K0-NS-P01)
- Add an oscillator (X1 socket of IE-78K0-NS-P01)
- Input pulses from the target (X1 pin)

The socket clock and the target clock can be switched using a control software command. For details, see user's manual for each control software.

Note: An incorrect main clock supply will cause the IE system to hung up.
The clock input from the target should be a rectangular 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.

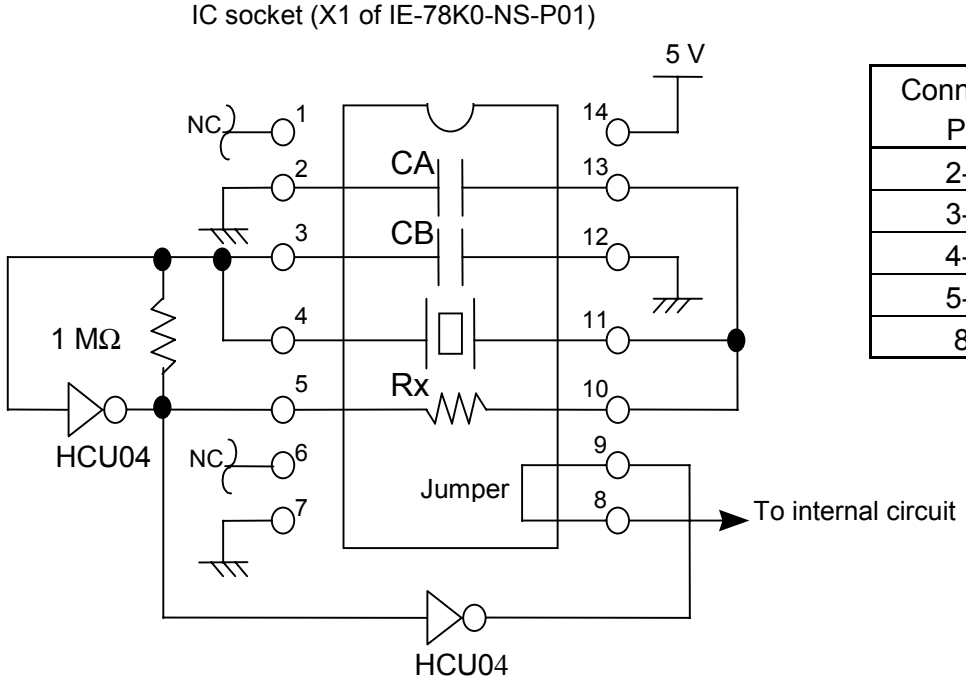


Crystal Oscillator Pin	Socket Pin No.
NC	1
GND	7
CLOCK OUT	8
V_{CC}	14

(b) When using a ceramic resonator or crystal resonator

- Main clock

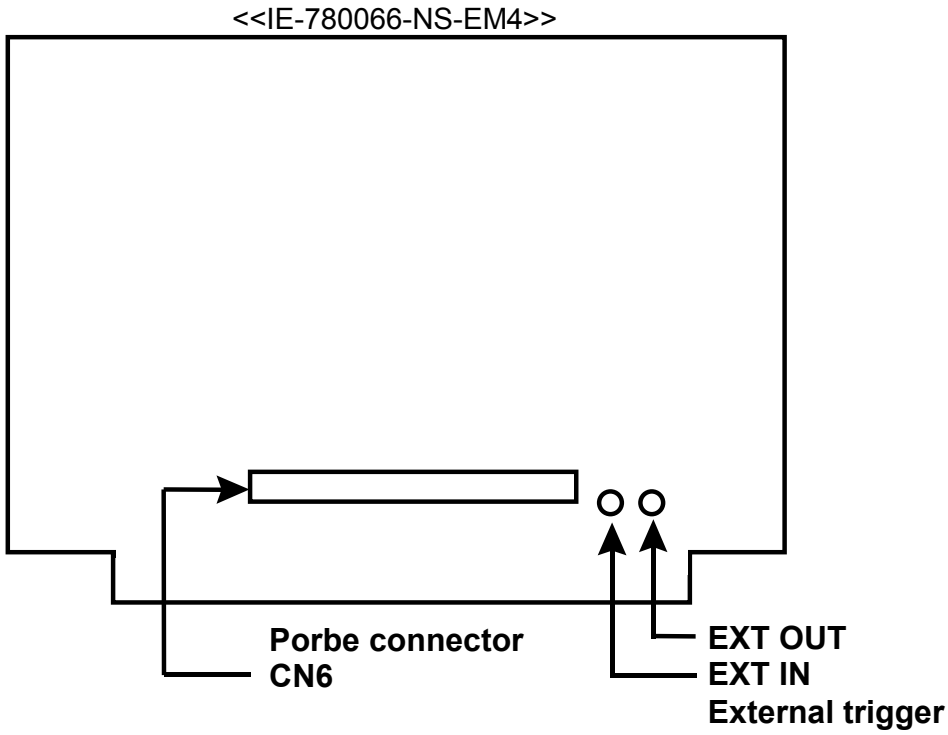
  The diagram below shows the circuit configuration. Install the required frequency resonators, resistor and capacitor in the IC socket.



Connection Pins	Parts in Use
2-13	Capacitor CA
3-12	Capacitor CB
4-11	Resonator
5-10	Resistor Rx
8-9	Shorted

3.3 External Trigger

Connect the external trigger to IE-780066-NS-EM4 board check pins, EXT OUT and EXT IN. For details, please refer to the manual of debugger.



3.4 Jumper Settings of Main Board

Set the jumper switches on the IE-78K0-NS as described below when using the IE-780066-NS-EM4.

	JP2	JP3	JP4	JP6	JP7	JP8
Shorted	2-3	1-2	1-2	3-4	1-2	3-4

CHAPTER 4 DIFFERENCES BETWEEN TARGET DEVICE AND TARGET INTERFACE CIRCUIT

This chapter describes the difference between the signal lines of the target device (μPD78F0066, 780065 Subseries) and that of the IE-780066-NS-EM4's target interface circuit. The target device consists of CMOS circuits, whereas the IE-780066-NS-EM4'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 input/output from an emulation gate array μPD7880

(2) Signals that are input/output from an emulation gate array μPD7881

(3) Other signals

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

(1) Signals that are input/output from an emulation gate array μPD7880

- ANI7 to ANI0
- P27 to P20/TI00/TO0
- P37 to P30
- P77 to P70/PCL
- P84/SI1 to P80/STB
- P92/SI31 to P90/SCK31
- AVSS
- AVREF
- $\overline{\text{RESET}}$
- X1, XT1

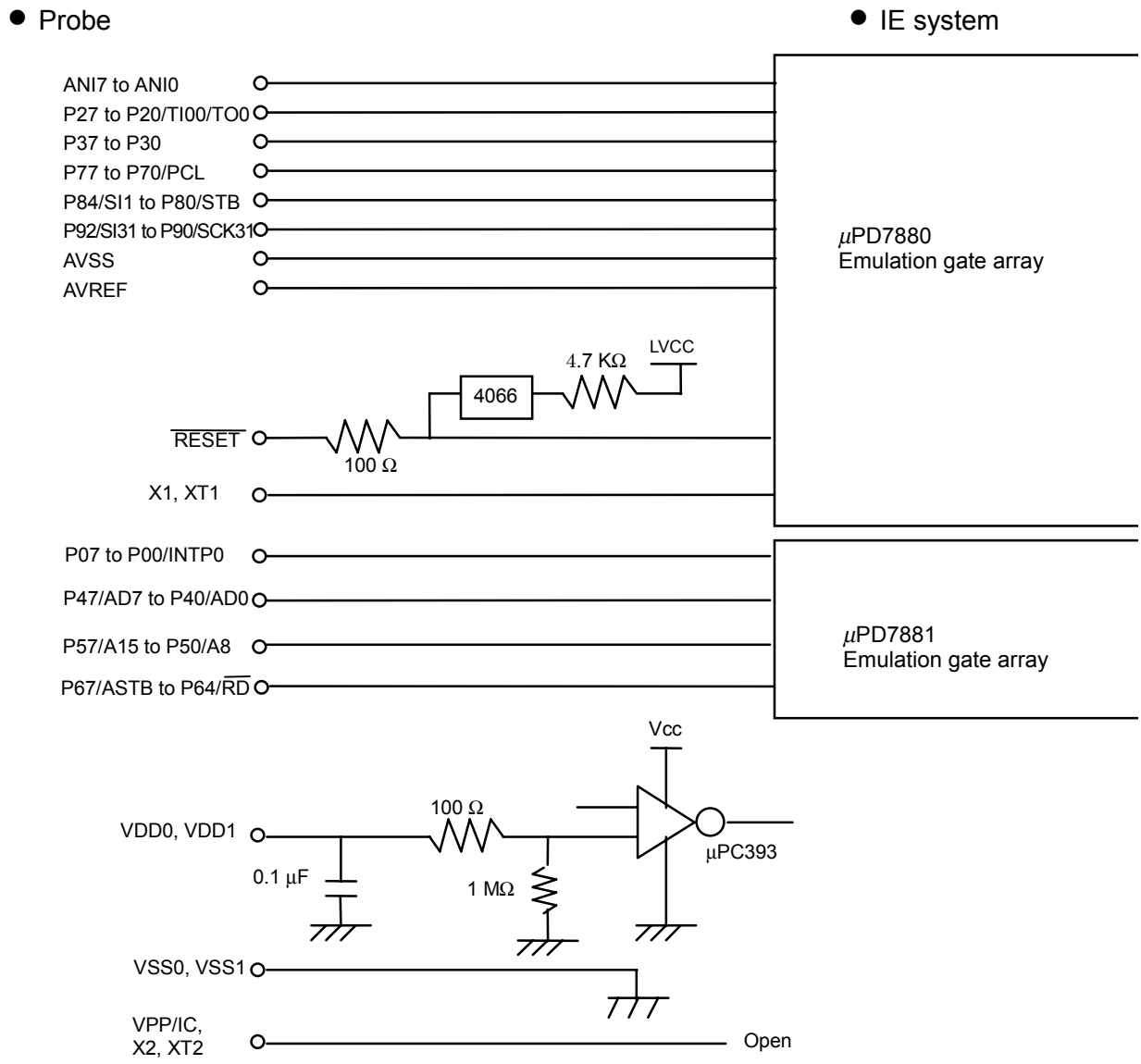
(2) Signals that are input/output from an emulation gate array μPD7881

- P07 to P00/INTP0
- P47/AD7 to P40/AD0
- P57/A15 to P50/A8
- P67/ASTB to P64/$\overline{\text{RD}}$

(3) Other signals

- VDD0, VDD1
- VSS0, VSS1
- VPP/IC
- X2, XT2

< Equivalent circuit of emulation circuits >



CHAPTER 5 RESTRICTIONS

1. When the IE system is started without the target board being connected, the initial values of each port will be undefined.

	Emulator	Target CPU
Initial value of ports	Undefined	00H

2. The SFRs related to flash memory and the self-programming function are not supported when emulating the μPD78F0066.