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RENESAS

User's Manual

IE-789860-NS-EM1

Emulation Board

Target Devices

μPD789860 Subseries
μPD789861 Subseries
μPD789052 Subseries
μPD789062 Subseries

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- Product release schedule
- Availability of related technical literature
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INTRODUCTION

Product Overview

The IE-789860-NS-EM1 is designed to be used with the IE-78K0S-NS or IE-78K0S-NS-A to debug the following target devices that belong to the 78K/0S Series of 8-bit single-chip microcontrollers.

- μPD789860 Subseries: μPD789860, 78E9860A
- μPD789861 Subseries: μPD789861, 78E9861A
- μPD789052 Subseries: μPD789052, 78E9860
- μPD789062 Subseries: μPD789062, 78E9861

Target Readers

This manual is intended for engineers who will use the IE-789860-NS-EM1 with the IE-78K0S-NS or IE-78K0S-NS-A to perform system debugging.
Engineers who use this manual are expected to be thoroughly familiar with the target device's functions and use methods and to be knowledgeable about debugging.

Organization

When using the IE-789860-NS-EM1, refer to not only this manual (supplied with the IE-789860-NS-EM1) but also the manual that is supplied with the IE-78K0S-NS or IE-78K0S-NS-A.

IE-78K0S-NS
User's Manual

- Basic specifications
- System configuration
- External interface functions

IE-789860-NS-EM1
User's Manual

- General
- Part names
- Installation
- Differences between target device and target interface circuit
- Cautions

IE-78K0S-NS-A
User's Manual

- Basic specifications
- System configuration
- External interface functions

Purpose

This manual's purpose is to explain various debugging functions that can be performed when using the IE-789860-NS-EM1.

Terminology The meanings of certain terms used in this manual are listed below.

Term	Meaning
Emulation device	This is a general term that refers to the device in the emulator that is used to emulate the target device. It includes the emulation CPU.
Emulation CPU	This is the CPU block in the emulator that is used to execute user-generated programs.
Target device	This is the device to be emulated.
Target system	This includes the target program and the hardware provided by the user. When defined narrowly, it includes only the hardware.
IE system	This refers to the combination of the in-circuit emulator (IE-78K0S-NS or IE-78K0S-NS-A) and the emulation board (IE-789860-NS-EM1).

Conventions

Data significance: Higher digits on the left and lower digits on the right
Note: Footnote for item marked with **Note** in the text
Caution: Information requiring particular attention
Remark: Supplementary information

Related Documents The related documents (user's manuals) indicated in this publication may include preliminary versions. However, preliminary versions are not marked as such.

Document Name	Document No.
IE-78K0S-NS In-Circuit Emulator	U13549E
IE-78K0S-NS-A In-Circuit Emulator	U15207E
IE-789860-NS-EM1 Emulation Board	This manual
ID78K Series Integrated Debugger Ver. 2.30 or Later Operation (Windows™ Based)	U15185E
μPD789860, 789861 Subseries	U14826E
μPD789052, 789062 Subseries	U15861E

Caution The related documents listed above are subject to change without notice. Be sure to use the latest version of each document for designing.

CONTENTS

CHAPTER 1 GENERAL 10

1.1 System Configuration 11
1.2 Hardware Configuration 13
1.3 Basic Specifications 14

CHAPTER 2 PART NAMES 15

2.1 Parts of Main Unit 16
2.2 Initial Settings of Switches and Jumpers 17

CHAPTER 3 INSTALLATION 18

3.1 Connection 19
3.2 Switch and Jumper Settings on Main Unit 20
3.3 Setting Power Supply Voltage of Target Interface 21
3.4 Clock Settings 22
3.4.1 Overview of clock settings 22
3.4.2 System clock settings 24
3.5 Mask Option Settings 28
3.5.1 Mask option settings 28
3.5.2 Mask options of POC circuit 29
3.5.3 Mask options of oscillation stabilization wait time 29
3.6 External Trigger 30

CHAPTER 4 DIFFERENCES BETWEEN TARGET DEVICE AND TARGET INTERFACE CIRCUIT 31

CHAPTER 5 CAUTIONS 35

APPENDIX A EMULATION PROBE PIN ASSIGNMENT TABLE 36

APPENDIX B CAUTIONS ON DESIGNING TARGET SYSTEM 37

LIST OF FIGURES

Figure No.	Title	Page
1-1	System Configuration	11
1-2	Basic Hardware Configuration	13
2-1	IE-789860-NS-EM1 Part Names	16
3-1	Connection of Emulation Probe	19
3-2	Connecting TP1 and Target System Power Supply Voltage	21
3-3	External Circuits Used as System Clock Oscillator	22
3-4	When Using Clock That Is Already Mounted on Emulation Board	23
3-5	When Using User-Mounted Clock	23
3-6	When Supplying Pulse from Target System	24
3-7	Connections on Parts Board	25
3-8	Crystal Oscillator	26
3-9	Pin Alignment of Crystal Oscillator and Socket	27
3-10	Mask Option Setting	28
3-11	External Trigger Input Position	30
4-1	Equivalent Circuit 1 of Emulation Circuit	32
4-2	Equivalent Circuit 2 of Emulation Circuit	33
4-3	Equivalent Circuit 3 of Emulation Circuit	34
B-1	Distance Between In-Circuit Emulator and Conversion Socket	37
B-2	Connection Conditions of Target System	38

LIST OF TABLES

Table No.	Title	Page
1-1	Correspondence Between Emulation Probe and Conversion Socket	12
1-2	Basic Specifications	14
2-1	Initial Settings of Switches and Jumpers	17
3-1	Switch and Jumper Settings on IE-78K0S-NS	20
3-2	Switch and Jumper Settings on IE-78K0S-NS-A	20
3-3	Setting Power Supply of Target Interface	21
3-4	Main System Clock Settings	24
3-5	Mask Option Setting of Port 4	28
3-6	Differences in Oscillation Stabilization Wait Time	29
5-1	Illegal Access Conditions for EEPROM	35
A-1	NP-20GS Pin Assignments	36
B-1	Distance Between IE System and Conversion Socket	37

CHAPTER 1 GENERAL

This chapter describes the IE-789860-NS-EM1's system configuration and basic specifications.

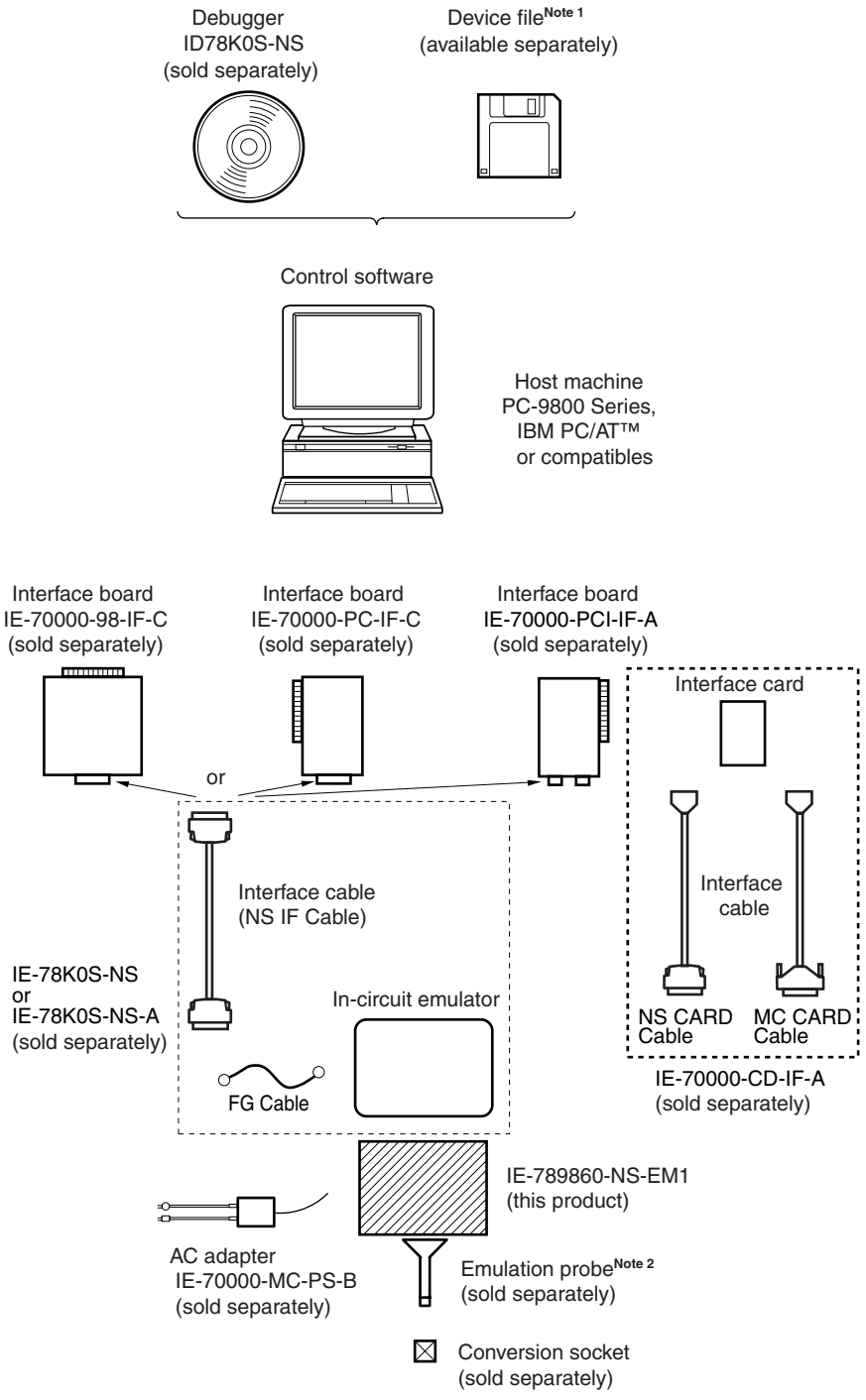
The IE-789860-NS-EM1 is a development tool for efficient debugging of hardware or software when using one of the following target devices that belong to the 78K/0S Series of 8-bit single-chip microcontrollers.

- Target devices
  - μPD789860 Subseries
  - μPD789861 Subseries
  - μPD789052 Subseries
  - μPD789062 Subseries

1.1 System Configuration

Figure 1-1 illustrates the IE-789860-NS-EM1's system configuration.

Figure 1-1. System Configuration



Notes 1. The device file is as follows, in accordance with the subseries.

μS××××DF789861: μPD789860, 789861 Subseries

μS××××DF789062: μPD789052, 789062 Subseries

The device file can be downloaded from the website of NEC Electronics (http://www.necel.com/micro/).

2. The emulation probe NP-20GS is a product of Naito Densei Machida Mfg. Co., Ltd.

For further information, contact Naito Densei Machida Mfg. Co., Ltd. (TEL: +81-45-475-4191).

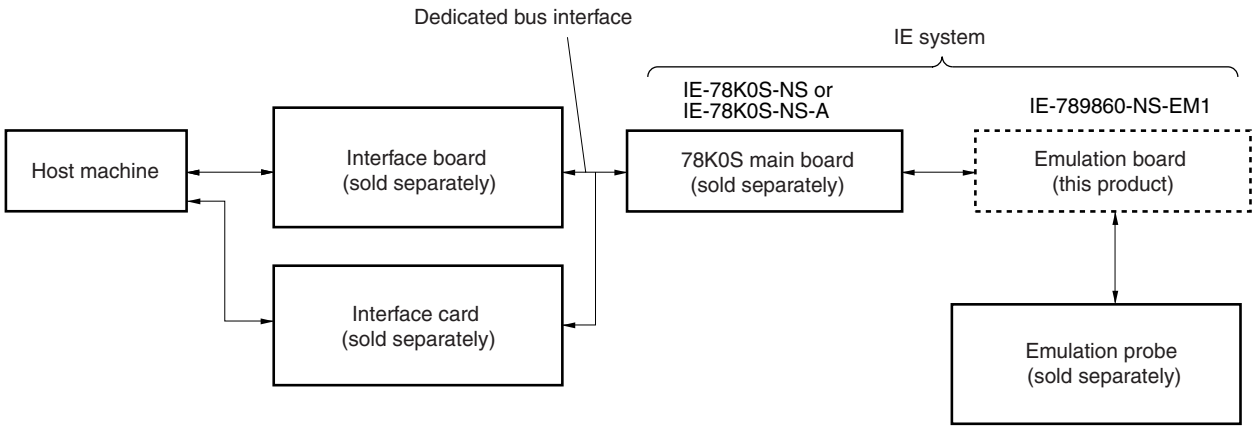
Table 1-1. Correspondence Between Emulation Probe and Conversion Socket

Package	Emulation Probe	Conversion Socket
20-pin plastic SSOP (MC type)	NP-20GS (probe length: 200 mm)	EV-9500GS-20

1.2 Hardware Configuration

Figure 1-2 shows the IE-789860-NS-EM1's position in the basic hardware configuration.

Figure 1-2. Basic Hardware Configuration



1.3 Basic Specifications

The basic specifications of the IE-789860-NS-EM1 are listed in Table 1-2.

Table 1-2. Basic Specifications

Item	Description
Target device	μPD789860, 789861, 789052, 789062 Subseries
System clock	1.0 to 5.0 MHz
System clock supply	External: Input via an emulation probe from the target system Internal: Mounted on emulation board (5 MHz), or mounted on the parts board by the user
Target interface voltage	V_{DD} = 1.8 to 5.5 V (same as that of target device) Operates on internal power supply (5 V) when target system is not connected

CHAPTER 2 PART NAMES

This chapter introduces the parts of the IE-789860-NS-EM1 main unit.

The packing box contains the emulation board (IE-789860-NS-EM1), packing list, user's manual, and guarantee card.

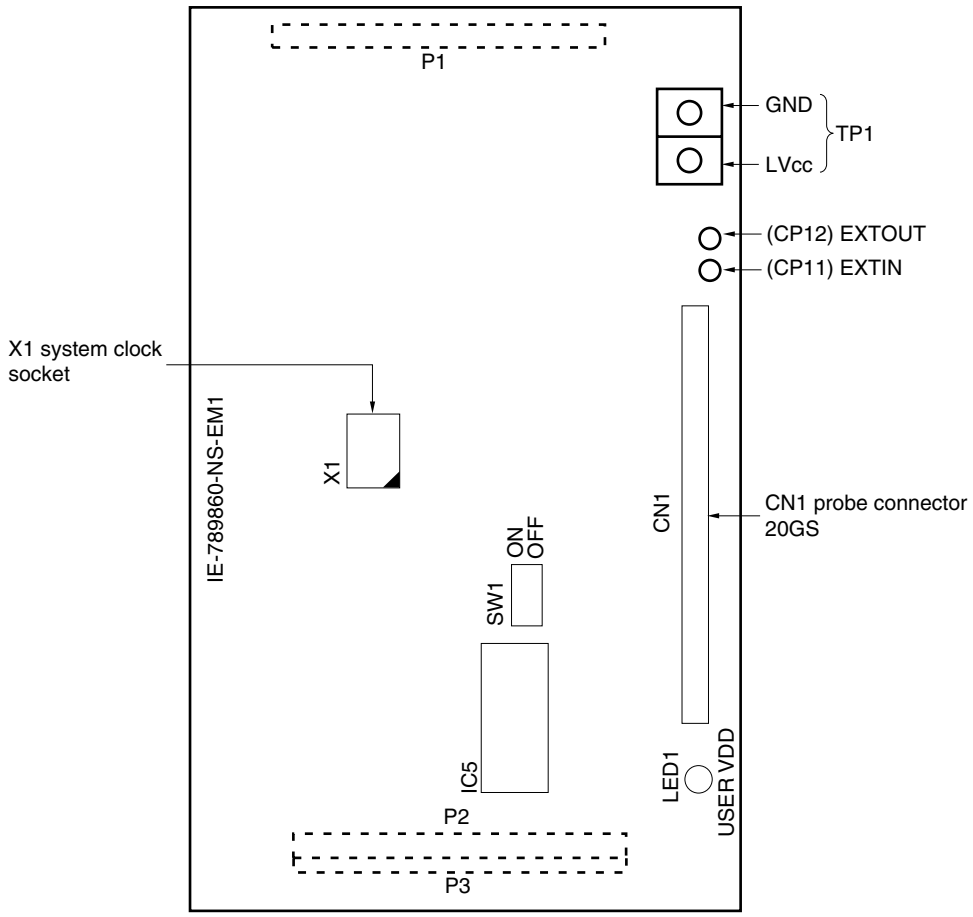
If there are any missing or damaged items, please contact an NEC Electronics sales representative.

Fill out and return the guarantee card that comes with the main unit.

2.1 Parts of Main Unit

Figure 2-1 shows the part names of the IE-789860-NS-EM1.

Figure 2-1. IE-789860-NS-EM1 Part Names



2.2 Initial Settings of Switches and Jumpers

Table 2-1 shows the initial settings of the switches and jumpers on the IE-789860-NS-EM1.
For the setting of SW1, refer to **3.5 Mask Option Settings**.

Table 2-1. Initial Settings of Switches and Jumpers

	SW1			
	1	2	3	4
Initial setting	OFF	OFF	OFF	OFF

CHAPTER 3 INSTALLATION

This chapter describes methods for connecting the IE-789860-NS-EM1 to the IE-78K0S-NS or IE-78K0S-NS-A, emulation probe, etc. Mode setting methods are also described.

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 IE system and the target system has been switched OFF.

3.1 Connection

(1) Connection with IE-78K0S-NS or IE-78K0S-NS-A main unit

See the **IE-78K0S-NS User's Manual (U13549E)** for a description of how to connect the IE-789860-NS-EM1 to the IE-78K0S-NS[Note].

Note When using the IE-78K0S-NS-A, see the **IE-78K0S-NS-A User's Manual (U15207E)**.

(2) Connection with emulation probe

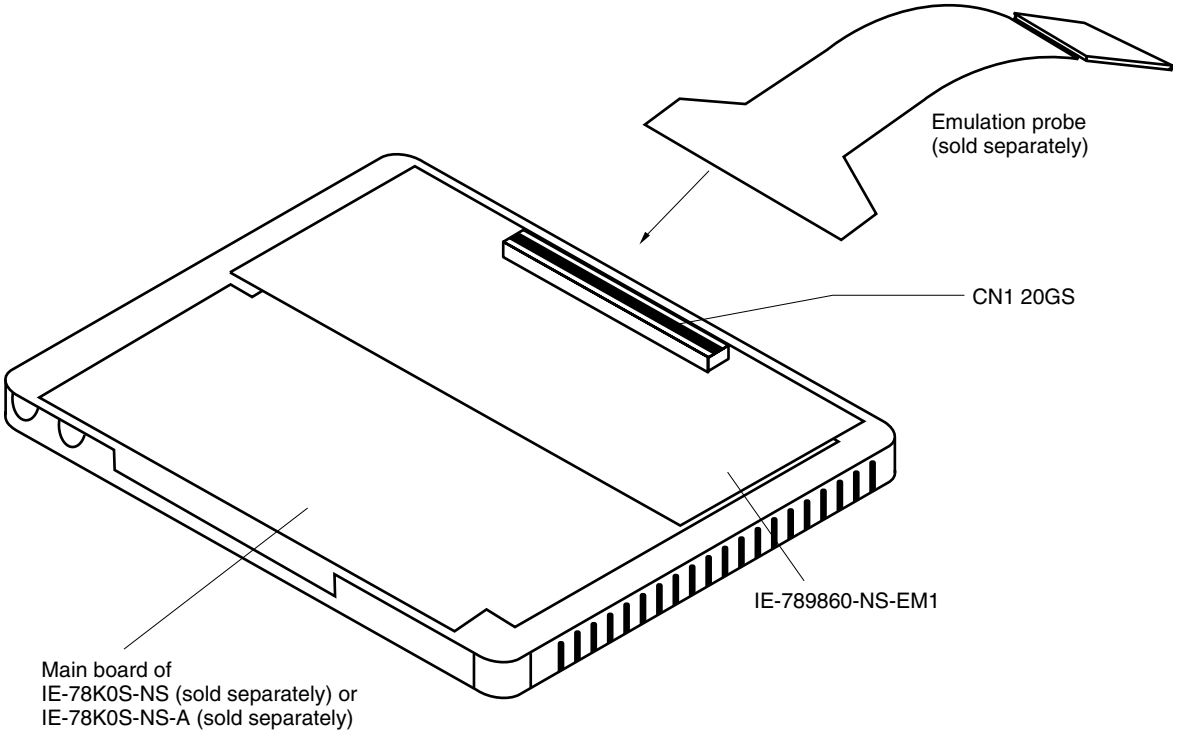
See the **IE-78K0S-NS User's Manual (U13549E)** for a description of how to connect an emulation probe to the IE-789860-NS-EM1[Note].

On this board, connect the emulation probe to CN1.

Note When using the IE-78K0S-NS-A, see the **IE-78K0S-NS-A User's Manual (U15207E)**.

Caution Incorrect connection may damage the IE system.
Be sure to read the emulation probe's user's manual for a detailed description of the connection method.

Figure 3-1. Connection of Emulation Probe



3.2 Switch and Jumper Settings on Main Unit

(1) Settings on the IE-78K0S-NS

When using the IE-789860-NS-EM1, set the switches and jumpers on the IE-78K0S-NS as shown in Table 3-1. For details of these switch and jumper settings, refer to the **IE-78K0S-NS User's Manual (U13549E)**.

Table 3-1. Switch and Jumper Settings on IE-78K0S-NS

	SW1	SW3	SW4	JP1	JP4
Setting	OFF	All switches ON (fixed)	All switches ON (fixed)	2 and 3 shorted	1 and 2 shorted

Caution Incorrect setting may damage the IE-789860-NS-EM1.

(2) Settings on the IE-78K0S-NS-A

When using the IE-789860-NS-EM1, set the switches and jumpers on the IE-78K0S-NS-A as shown in Table 3-2. For details of these switch and jumper settings, refer to the **IE-78K0S-NS-A User's Manual (U15207E)**.

Table 3-2. Switch and Jumper Settings on IE-78K0S-NS-A

	SW1	JP1	JP3
Setting	OFF	1 and 2 shorted	Shorted (fixed)

Caution Incorrect setting may damage the IE-789860-NS-EM1.

3.3 Setting Power Supply Voltage of Target Interface

In the IE system, emulation is possible with a voltage of the same level as the power supply voltage of the target system.

When the target system is not connected, the IE system automatically operates with the emulator's internal power supply (5 V). When debugging with a voltage that is the same level as that of the target system, supply the same voltage as that of the target system to the TP1 terminal pin of the IE-789860-NS-EM1 (the same applies when the voltage is 5 V). Set the target voltage to between 1.8 and 5.5 V.

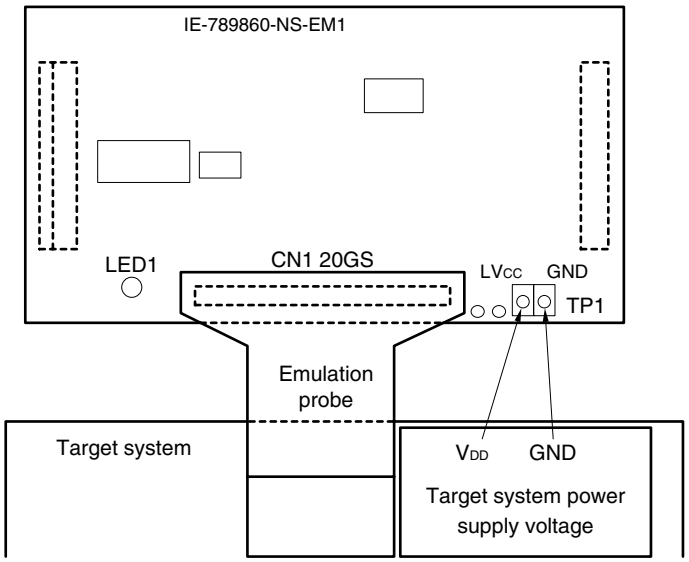
For how to select the operating power supply, refer to the **ID78K Series Ver.2.30 or Later Operation (Windows Based) User's Manual (U15185E)**.

- Maximum current consumption of TP1
  2.0 V: approximately 100 mA to 5.5 V: approximately 300 mA

Table 3-3. Setting Power Supply of Target Interface

Power Supply of Target Interface (LV_{CC})		Integrated Debugger (ID78K0S-NS)
		Operating Power Supply Selection
When connecting target system	1.8 to 5.5 V	Target
When not connecting target system	5 V	Internal

Figure 3-2. Connecting TP1 and Target System Power Supply Voltage



Caution Before connecting TP1 on the board and the target system power supply voltage, turn off the power to the IE-78K0S-NS or IE-78K0S-NS-A.

Remark The V_{DD} pin on the target system is exclusively used to control LED1 (USER VDD) that monitors whether the power supply of the target system is connected in the IE-789860-NS-EM1.

3.4 Clock Settings

3.4.1 Overview of clock settings

The system clock to be used during debugging can be selected from (1) to (3) below.

(1) Clock that is already mounted on emulation board
(2) Clock that is mounted by user
(3) Pulse input from target system

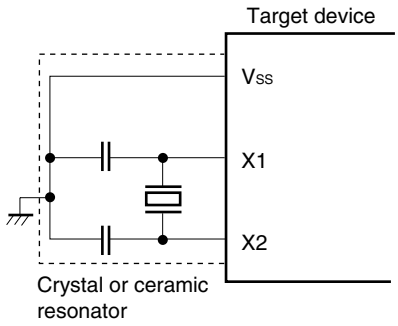
If the target system includes a clock oscillator, select either **(1) Clock that is already mounted on emulation board** or **(2) Clock that is mounted by user**. For the clock oscillator, a resonator is connected to the target device and the target device's internal oscillator is used. An example of the external circuit is shown in part (a) of Figure 3-3. During emulation, the oscillator that is mounted on the target system is not used. Instead, the clock that is mounted on the emulation board installed in the IE-78K0S-NS or IE-78K0S-NS-A is used.

If the target system includes an external clock, select either **(1) Clock that is already mounted on emulation board**, **(2) Clock that is mounted by user**, or **(3) Pulse input from target system**. For the external clock, a clock signal is supplied from outside of the target device and the target device's internal oscillator is not used. An example of the external circuit is shown in part (b) of Figure 3-3.

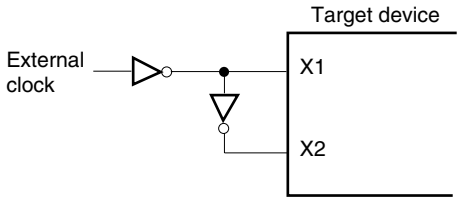
Caution The IE system will be hung-up if the main system clock is not supplied normally. Moreover, be sure to input a rectangular wave as the pulse from the target system. There is no need to supply a clock to the X2 pin. Also, even if a crystal resonator is connected directly to X1 (for the main system clock), the target device will not operate. When emulating the μPD789861 Subseries, RC oscillation cannot be used.

Figure 3-3. External Circuits Used as System Clock Oscillator

(a) Clock oscillator



(b) External clock

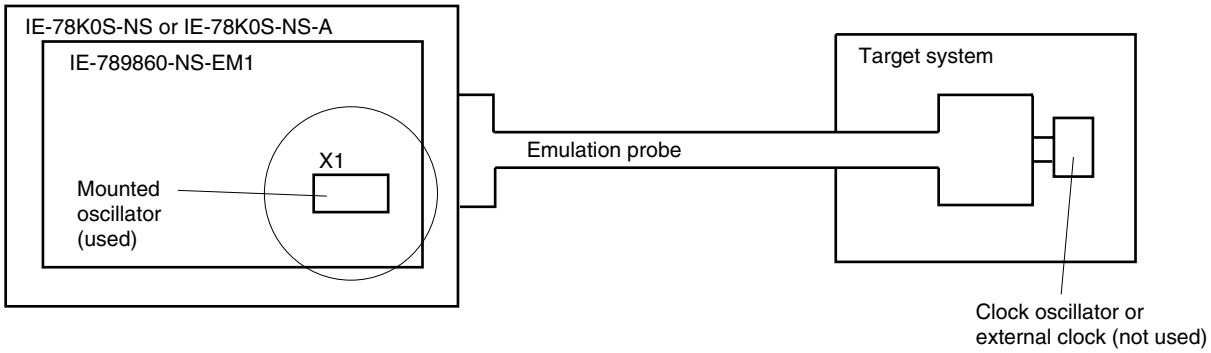


(1) Clock that is already mounted on emulation board

The crystal oscillator mounted on the IE-789860-NS-EM1 can be used.

A crystal oscillator (X1) is already mounted on the emulation board. Its frequency is 5.0 MHz.

Figure 3-4. When Using Clock That Is Already Mounted on Emulation Board



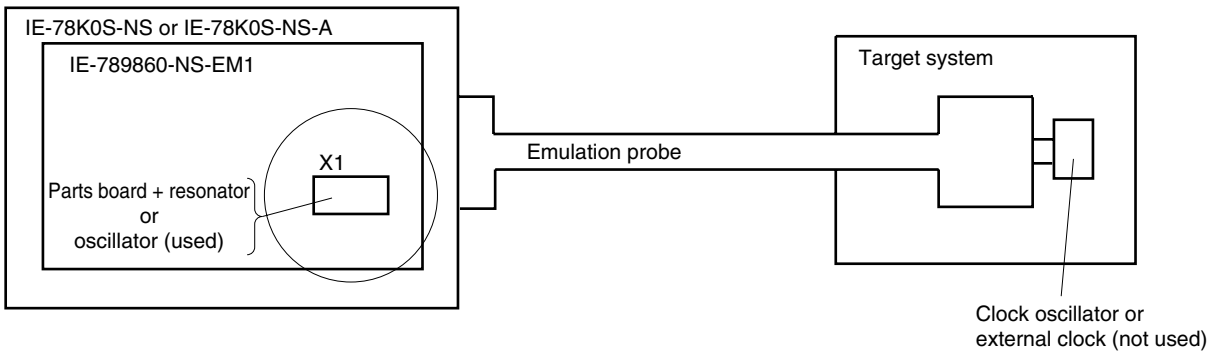
Remark The clock that is supplied by the oscillator of the IE-789860-NS-EM1 (encircled in the figure) is used.

(2) Clock that is mounted by user

The user can mount any clock supported by the set specifications on the IE-789860-NS-EM1. This feature is effective when debugging at a different frequency than the clock already mounted.

Remove the crystal oscillator (X1) that is already mounted on the emulation board, and mount the parts board on which the resonator to be used is mounted or mount the oscillator to be used.

Figure 3-5. When Using User-Mounted Clock

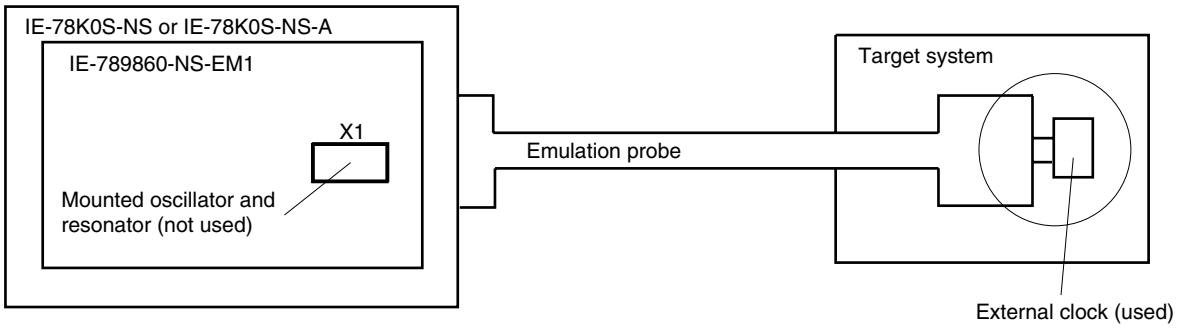


Remark The clock that is supplied by the resonator of the IE-789860-NS-EM1 (encircled in the figure) or the oscillator is used.

(3) Pulse input from target system

An external clock on the target system can be used as system clock via an emulation probe.

Figure 3-6. When Supplying Pulse from Target System



Remark The pulse that is supplied by the external clock on the target system (encircled in the figure) is used.

3.4.2 System clock settings

Table 3-4 shows the system clock settings of the IE-789860-NS-EM1 when the system clocks in (1) to (3) are used.

Table 3-4. Main System Clock Settings

Frequency of Main System Clock		IE-789860-NS-EM1 X1 Socket	CPU Clock Source Selection (ID78K0S-NS)
(1) When using clock that is already mounted on emulation board	5.0 MHz	Oscillator	Internal
(2) When using clock mounted by user	Other than 5.0 MHz	Oscillator configured by user	
(3) When inputting pulse from target system		Oscillator (not used)	External

Caution When inputting a pulse from the target system, open the configuration dialog box when starting the integrated debugger (ID78K0S-NS) and select "External" in the area (Clock) for selecting the CPU's clock source (this selects the user's clock).

Remark The factory settings of the IE-789860-NS-EM1 are those listed above under "when using clock that is already mounted on emulation board".

(1) When using clock that is already mounted on emulation board

When the IE-789860-NS-EM1 is shipped, a 5.0 MHz crystal oscillator is already mounted in the IE-789860-NS-EM1's X1 socket. When using the factory-set mode settings, there is no need to make any other hardware settings.

When starting the integrated debugger (ID78K0S-NS), open the configuration dialog box and select "Internal" in the area (Clock) for selecting the CPU's clock source (this selects the emulator's internal clock).

(2) When using clock mounted by user

Perform the settings described under either (a) or (b), depending on the type of clock to be used.

When starting the integrated debugger (ID78K0S-NS), open the configuration dialog box and select “Internal” in the area (Clock) for selecting the CPU’s clock source (this selects the emulator’s internal clock).

(a) When using a ceramic resonator or crystal resonator

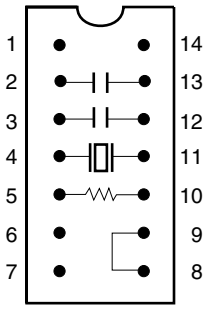
- Items to be prepared
  - Parts board
  - Ceramic resonator or crystal resonator
  - Resistor Rx
  - Capacitor CA
  - Capacitor CB
  - Solder kit

<Steps>

<1> Solder the target ceramic resonator or crystal resonator, resistor Rx, capacitor CA, and capacitor CB (all with suitable oscillation frequencies) onto the parts board (as shown below).

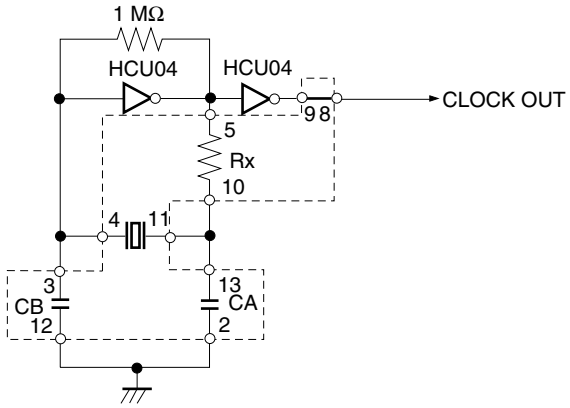
Figure 3-7. Connections on Parts Board

Parts board (X1)



Pin No.	Connection
2-13	Capacitor CA
3-12	Capacitor CB
4-11	Ceramic resonator or crystal resonator
5-10	Resistor Rx
8-9	Shorted

Circuit diagram



Remark The sections enclosed in broken lines indicate parts that are attached to the parts board.

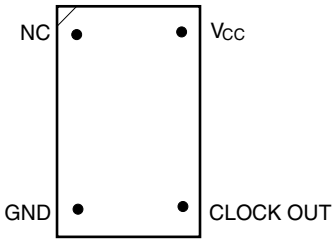
<2> Prepare the IE-789860-NS-EM1.
<3> Remove the crystal oscillator that is mounted in the IE-789860-NS-EM1's X1 socket.
<4> Connect the parts board (from <1> above) to the X1 socket from which the crystal oscillator was removed (in <3> above). Check the pin 1 mark to make sure the board is mounted in the correct direction.
<5> Make sure that the parts board is wired as shown in Figure 3-7 above.
<6> Install the IE-789860-NS-EM1 in the IE-78K0S-NS or IE-78K0S-NS-A.

The above steps configure the following circuit and enable supply of the clock from the mounted resonator to the emulation device.

(b) When using a crystal oscillator

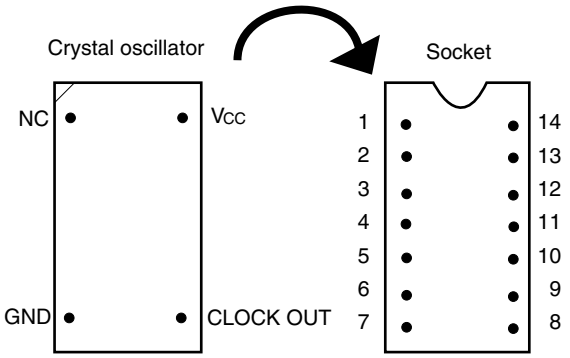
- Items to be prepared
  - Crystal oscillator (see pinouts shown in Figure 3-8)

Figure 3-8. Crystal Oscillator



<Steps>
<1> Prepare the IE-789860-NS-EM1.
<2> Remove the crystal oscillator that is mounted in the IE-789860-NS-EM1's X1 socket.
<3> Connect a crystal oscillator to the X1 socket from which the crystal oscillator was removed (in <2> above). Insert the pins of the crystal oscillator into the socket aligning the pins as shown in the figure below.

Figure 3-9. Pin Alignment of Crystal Oscillator and Socket



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

<4> Install the IE-789860-NS-EM1 in the IE-78K0S-NS or IE-78K0S-NS-A.

(3) When inputting pulse from target system

No hardware settings are required for this situation.

When starting the integrated debugger (ID78K0S-NS), open the configuration dialog box and select “External” in the area (Clock) for selecting the CPU’s clock source (this selects the user’s clock).

3.5 Mask Option Settings

3.5.1 Mask option settings

By setting the DIP switch (SW1) in the IE-789860-NS-EM1, a 33 kΩ pull-up resistor can be connected to P40 to P43 by mask option.

Use the mask option setting dialog box of the integrated debugger (ID78K0S-NS) to set the mask option. When reading a project file, however, setting is not required. The results of reading a project file are reflected in the mask option setting dialog box.

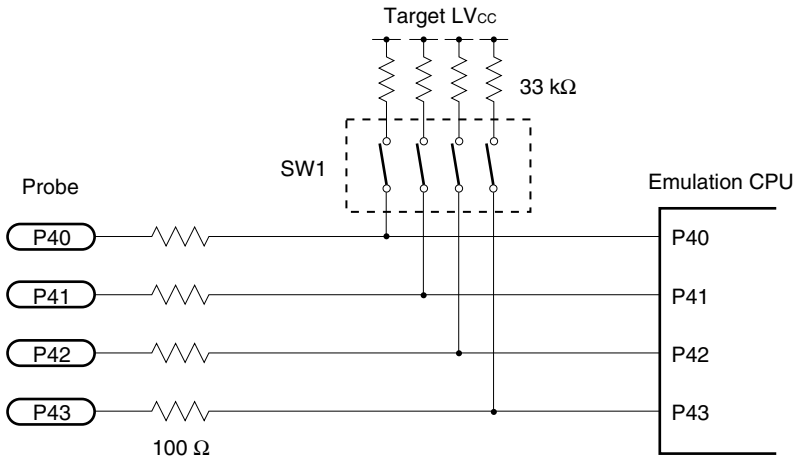
For the usage method, refer to the **ID78K Series Ver.2.30 or Later Operation (Windows Based) User's Manual (U15185E)**.

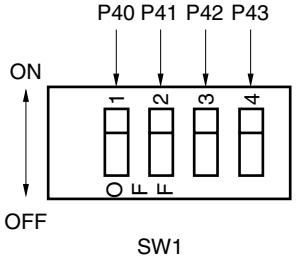
Table 3-5. Mask Option Setting of Port 4

	SW1			
	1	2	3	4
Connected to:	P40	P41	P42	P43

When the DIP switch is ON, the corresponding pin is pulled up by the target interface power supply voltage (LV_{CC}). When it is OFF, the corresponding pull-up resistor is disconnected. Set the DIP switch to OFF for ports that do not exist.

Figure 3-10. Mask Option Setting





The initial setting of all these switches is OFF.

3.5.2 Mask options of POC circuit

The IE-789860-NS-EM1 includes a “POC switching circuit” that controls the power-on-clear circuit functions by software. Perform the ON/OFF settings using an SFR.

When emulating the detection voltage of the low-voltage detection circuit and power-on-clear circuit, the detection voltage must be finally checked with EEPROM™ products because of the effect of power supply fluctuations and noise.

3.5.3 Mask options of oscillation stabilization wait time

The oscillation stabilization wait time of the IE-789860-NS-EM1 is fixed to $2^7/f_X$. The differences between target devices are shown in Table 3-6 below.

When emulating the oscillation stabilization wait time after the release of STOP mode by $\overline{\text{RESET}}$ or the release of reset via the POC circuit, the oscillation stabilization wait time must be finally checked with EEPROM products because of the effect of power supply fluctuations and noise.

Table 3-6. Differences in Oscillation Stabilization Wait Time

	IE-789860-NS-EM1	μPD789052 μPD78E9860	μPD789062 μPD78E9861	μPD789860	μPD789861
Oscillation stabilization wait time after release of STOP mode by $\overline{\text{RESET}}$ or release of reset via POC circuit	$2^7/f_X$	$2^{15}/f_X$	$2^7/f_{CC}$	$2^{15}/f_X$ or $2^{17}/f_X$ can be selected by mask option	$2^7/f_{CC}$

3.6 External Trigger

To set an external trigger, connect the IE-789860-NS-EM1's check pins EXTOUT and EXTIN as shown below.

See the **IE-78K0S-NS User's Manual (U13549E)** or **IE-78K0S-NS-A User's Manual (U15207E)** for pin characteristics. For the use methods, see the **ID78K Series Ver.2.30 or Later Operation (Windows Based) User's Manual (U15185E)**.

(1) EXTOUT

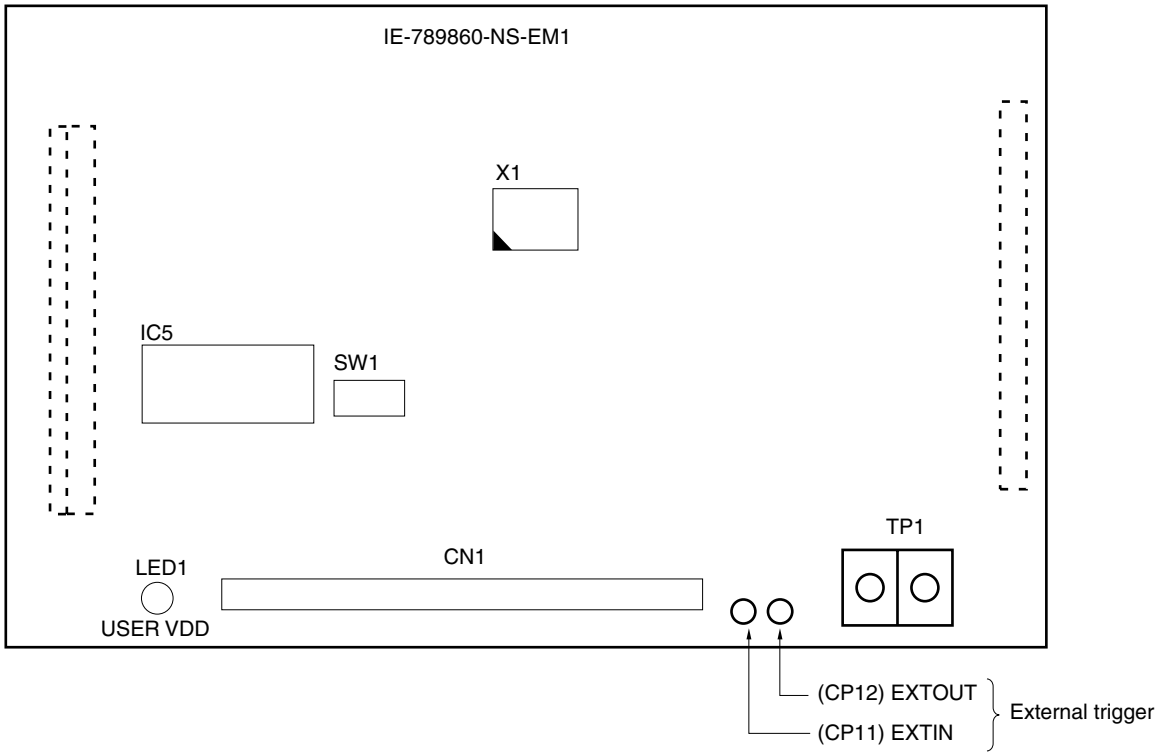
The EXTOUT pin on the IE-789860-NS-EM1 outputs a low level for 1.3 μs when a break event occurs.

Caution Connect a pull-up resistor on the target system because this is an open drain output.

(2) EXTIN

An event signal can be input from the EXTIN pin on the IE-789860-NS-EM1. Input a high-level pulse signal for 2 CPU operation clocks or more.

Figure 3-11. External Trigger Input Position



CHAPTER 4 DIFFERENCES BETWEEN TARGET DEVICE AND TARGET INTERFACE CIRCUIT

This chapter describes differences between the target device's signal lines and the signal lines of the target interface circuit of the IE system.

The target interface circuit of the IE system realizes emulation via an emulation circuit configured by an emulation CPU, TTL, CMOS-IC, and other components. The electrical characteristics are different from those of the target device because a protector and other circuits are provided.

(1) Signals directly input to or output from the emulation CPU

(2) Signals input from the target system via a gate

(3) Other signals

The circuits of the IE-789860-NS-EM1 are used as follows for signals listed in (1) to (3) above. The same applies to handling alternate-function pins, for which no circuit is provided in the IE system.

(1) Signals directly input to or output from the emulation CPU

Refer to **Figure 4-1 Equivalent Circuit 1 of Emulation Circuit**. The following signals operate the same as in the μPD789052, 789062, 789860, and 789861 Subseries.

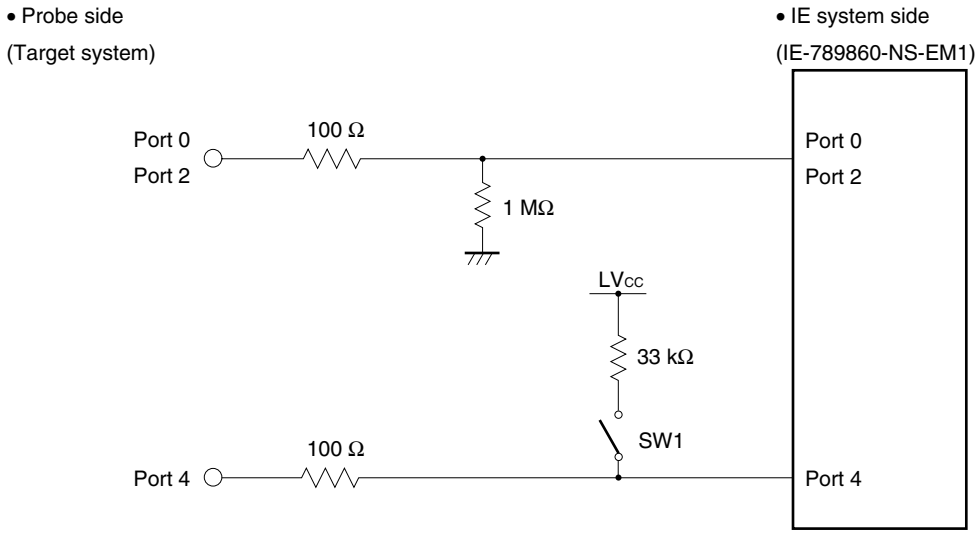
Note that for the following signals, a 1 MΩ pull-down resistor and a 100 Ω resistor are connected in series. Signals related to port 0 are connected to a 1 MΩ pull-down resistor in the IE-78K0S-NS or IE-78K0S-NS-A.

- Signals related to port 0
- Signals related to port 2

A 33 kΩ pull-up resistor is connected to the following signals by setting the switch.

- Signals related to port 4

Figure 4-1. Equivalent Circuit 1 of Emulation Circuit



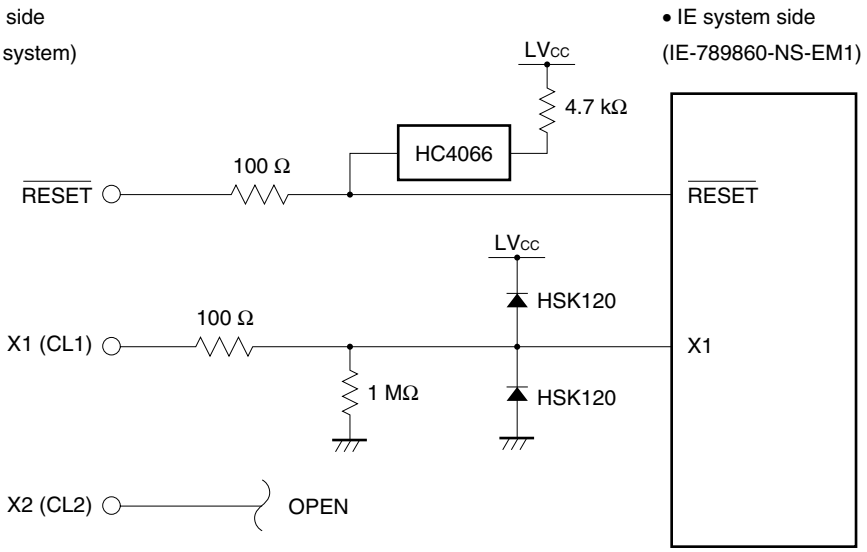
(2) Signals input from the target system via a gate

Since the following signals are input via a gate, their timing shows a delay compared to the μPD789052, 789062, 789860, and 789861 Subseries. Refer to **Figure 4-2 Equivalent Circuit 2 of Emulation Circuit**.

- $\overline{\text{RESET}}$ signal
- Signals related to clock input

  The X2 (CL2) pin is not used in the IE-789860-NS-EM1.

Figure 4-2. Equivalent Circuit 2 of Emulation Circuit



(3) Other signals

Refer to **Figure 4-3 Equivalent Circuit 3 of Emulation Circuit**.

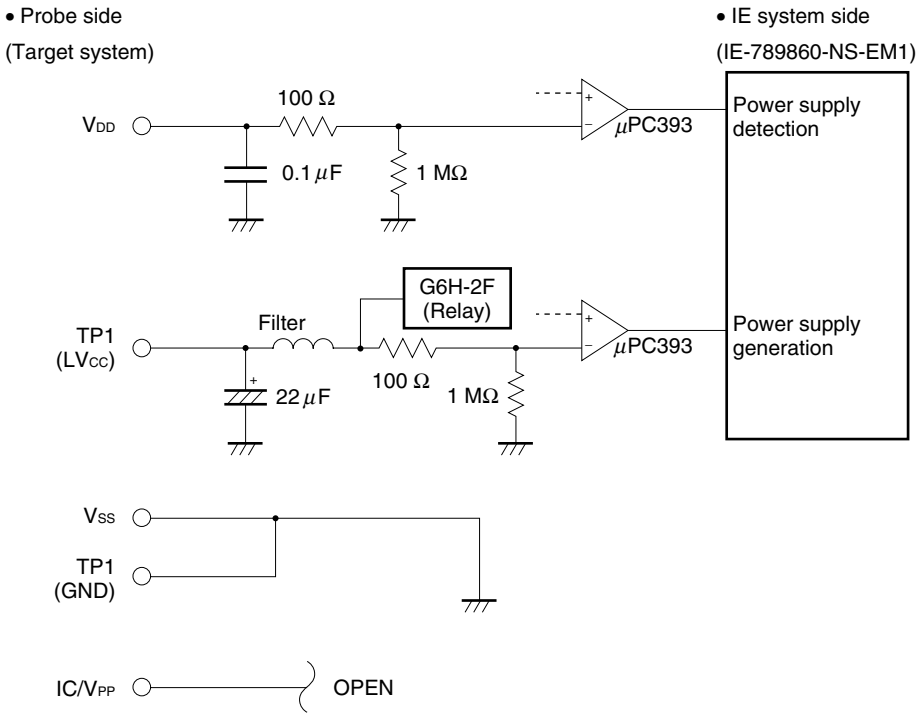
- V_{DD} pin

  The power supply of the emulation CPU operates on the internal power supply voltage (5 V) when the target system is not connected, and on the voltage (LV_{CC}) supplied from the power voltage supply pin (TP1) when the target system is connected. In the IE-789860-NS-EM1, the V_{DD} pin of the target system is exclusively used for controlling LED1 (USER VDD), which monitors whether the power of the target system is on.
- V_{SS} pin

  The V_{SS} pin is connected to GND in the IE-789860-NS-EM1.
- IC/V_{PP} pin

  The IC/V_{PP} pin is not used in the IE-789860-NS-EM1.

Figure 4-3. Equivalent Circuit 3 of Emulation Circuit



CHAPTER 5 CAUTIONS

This chapter describes differences between the target device specifications and the IE system specifications. The emulation circuit of the IE system realizes emulation via a configuration of emulation CPU, TTL, CMOS-IC, and other components. Therefore, the target device specifications are different from the IE system specifications.

(1) The RC oscillator cannot be emulated in the IE-789860-NS-EM1. For the oscillator, only the functions described in **3.4 Clock Settings** can be emulated.

(2) When emulating the detection voltage of the low-voltage detection circuit and power-on-clear circuit in the IE-789860-NS-EM1, the detection voltage must be finally checked with EEPROM products because of the effect of power supply fluctuations and noise.

(3) If a program that illegally accesses EEPROM is executed in the IE-789860-NS-EM1, the error message "Unspecified illegal" is displayed and a break occurs. The illegal access conditions for EEPROM are shown in Table 5-1.

Table 5-1. Illegal Access Conditions for EEPROM

<1>	If a write instruction is executed to EEPROM when EWC = 0
<2>	If a write instruction is executed to EEPROM while the clock selected by EEPROM is stopped
<3>	If a write instruction is executed to EEPROM while EEPROM is being written
<4>	If read instruction is executed from EEPROM while EEPROM is being written
<5>	If instruction fetch is executed from EEPROM while EEPROM is being written
<6>	If EWC = 0 is set while EEPROM is being written
<7>	If the main clock is stopped while EEPROM is being written
<8>	If the count clock selection of the write time setting timer is changed and executed while EEPROM is being written
<9>	If $\overline{\text{RESET}}$ is input while EEPROM is being written

(4) The IE-789860-NS-EM1 includes a "POC switching circuit" that controls the power-on-clear (POC) circuit functions by software. Perform the ON/OFF settings using an SFR.

(5) The oscillation stabilization wait time after the release of STOP mode by $\overline{\text{RESET}}$ or the release of reset via the POC circuit is fixed to "2^7/fx" in the IE-789860-NS-EM1. For the mask options, only the functions described in **3.5 Mask Option Settings** can be emulated.

APPENDIX A EMULATION PROBE PIN ASSIGNMENT TABLE

Table A-1. NP-20GS Pin Assignments

Emulation Probe	CN1 Pin No.	Emulation Probe	CN1 Pin No.
1	33	11	16
2	32	12	15
3	74	13	14
4	31	14	13
5	75	15	6
6	34	16	5
7	7	17	4
8	8	18	3
9	9	19	17
10	10	20	73

Remarks 1. NP-20GS is a product of Naito Densei Machida Mfg. Co., Ltd.

2. The numbers in the “Emulation Probe” column indicate the pin number on the tip of the target system side with NP-20GS and EV-9500GS-20 combined together.

APPENDIX B CAUTIONS ON DESIGNING TARGET SYSTEM

The following shows the conditions when connecting the emulation probe to the conversion socket. Follow the configuration below and consider the shape of parts to be mounted on the target system when designing a system.

Among the products described in this appendix, NP-20GS is a product of Naito Densei Machida Mfg. Co., Ltd.

Table B-1. Distance Between IE System and Conversion Socket

Emulation Probe	Conversion Socket	Distance Between IE System and Conversion Socket
NP-20GS	EV-9500GS-20	185 mm

Figure B-1. Distance Between In-Circuit Emulator and Conversion Socket

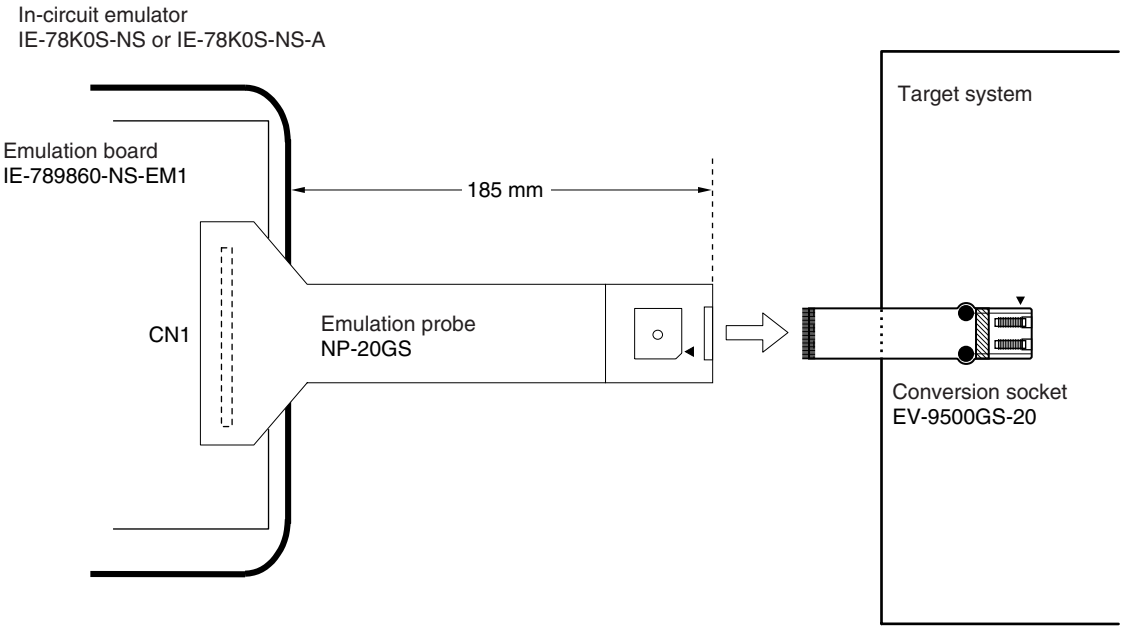
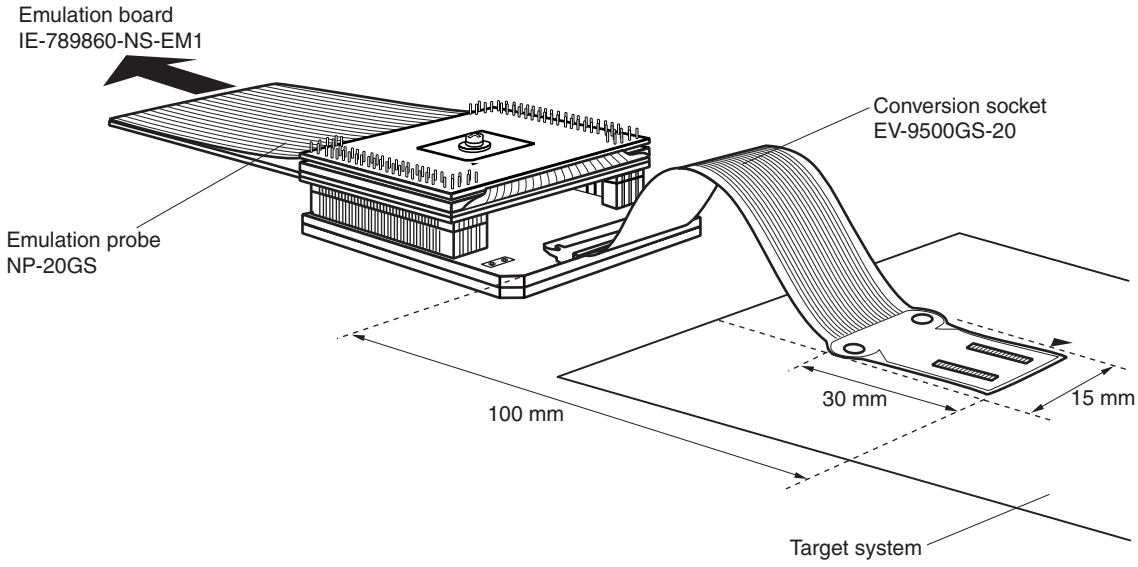



Figure B-2. Connection Conditions of Target System