

CUSTOMER NOTIFICATION

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Koji Nishibayashi, Project Manager Microcomputer Group System LSI Solutions Engineering Div. NEC Electron Devices NEC Corporation

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IE-703217-G1-EM1

Preliminary User's Manual

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INTRODUCTION

Target Readers This manual is intended for users who design and develop application systems using the V850ES/Kx1.

Purpose The purpose of this manual is to describe the proper operation of the IE-703217-G1-EM1, and its basic specifications.

Organization This manual is broadly divided into the following parts.

- Overview
- Names and functions of parts
- Cautions

How to Read This Manual

It is assumed that the reader of this manual has general knowledge in the fields of electrical engineering, logic circuits, and microcontrollers. The IE-703217-G1-EM1 is used connected to the IE-V850ES-G1 in-circuit emulator. This manual explains the basic setup procedure and switch settings of the IE-V850ES-G1 when it is connected to the IE-703217-G1-EM1. For the names and functions of parts, and the connection of elements, refer to the IE-V850ES-G1 User's Manual.

To learn about the basic specifications and operation methods.

→ Read this manual in the order of the CONTENTS.

To learn the operation methods and command functions, etc., of the IE-V850ES-G1 and IE-703217-G1-EM1.

→ Read the user's manual of the debugger (sold separately) that is used.

Conventions

Note: Footnote for item marked with **Note** in the text.

Caution: Information requiring particular attention.

Remark: Supplementary information.

Numeral representation: Binary ... xxxx or xxxxB

Decimal ... xxxx

Hexadecimal ... xxxxH

Units for representing powers of 2 (address space or memory space):

K (kilo): $2^{10} = 1,024$

M (mega): $2^{20} = 1,024^2$

Terminology

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

Term	Meaning
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.

Related Document When using this manual, refer to the following manuals.

The related documents indicated in this publication may include preliminary versions.

However, preliminary versions are not marked as such.

- Documents related to development tools (user's manuals)

Document Name		Document Number
IE-V850ES-G1		Undetermined
IE-703217-G1-EM1		This manual
CA830,CA850 [C Compiler tool]	Operation Windows-based	U13998E
	C language	U13997E
	Project manager	U13996E
CA850 (Ver.2.40 or later) [C Compiler package]	Operation	U15024E
	C language	U15025E
	Project manager Windows-based	U15026E
	Assembly Language	U15027E
ID850 (Ver.2.40) [Integrated debugger]	Operation Windows-based	U15181E
SM850 (Ver.2.40) [System simulator]	Operation Windows-based	U15182E
RX850 [Real-time OS]	Basics	U13430E
	Installation	U13410E
RX850 Pro [Real-time OS]	Fundamental	U13773E
	Installation	U13774E
RD850 [Task debugger]	Windows-based	U13737E
RD850 Pro [Task debugger]	Windows-based	U13916E
AZ850 [System performance analyzer]		U14410E

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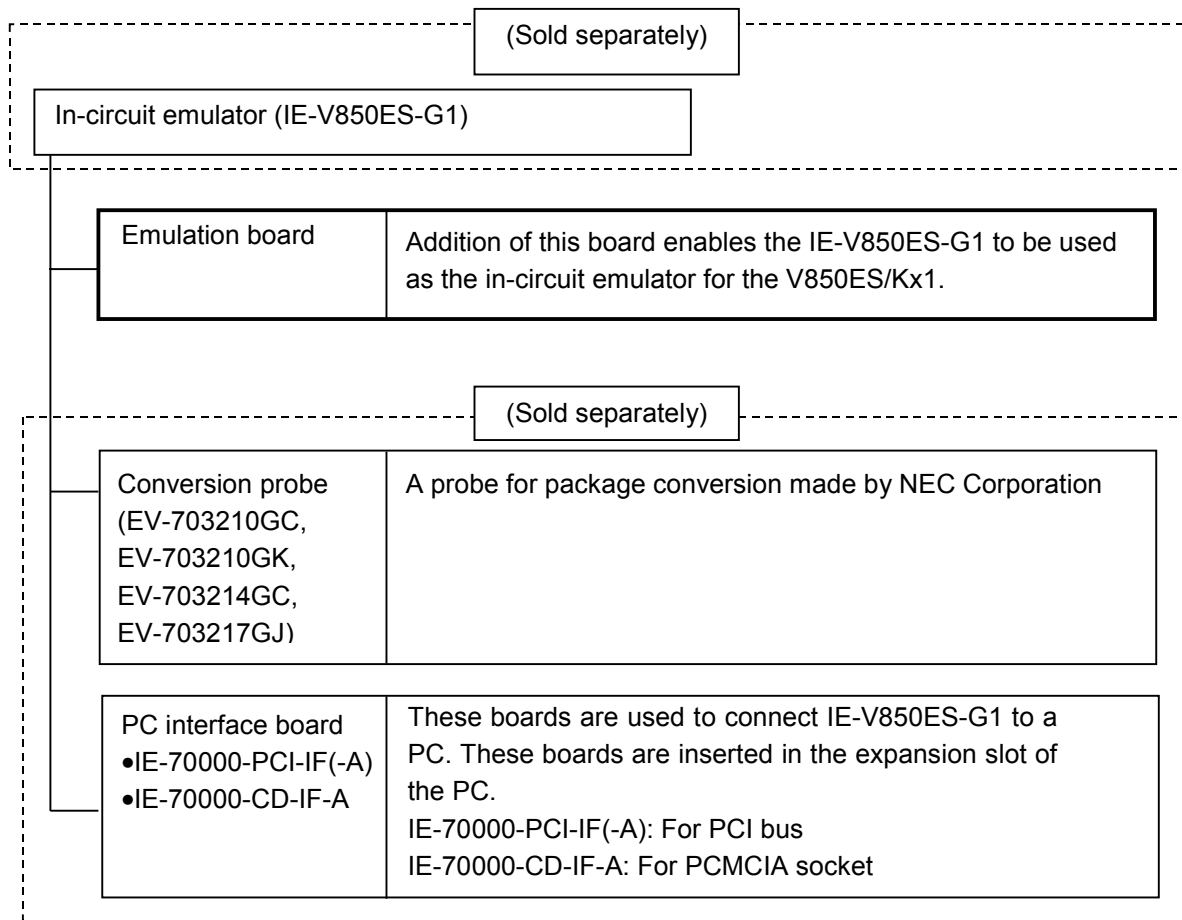
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CHAPTER 1 OVERVIEW

The IE-703217-G1-EM1 is an emulation board for the IE-V850ES-G1 in-circuit emulator. By connecting the IE-703217-G1-EM1 and IE-V850ES-G1, hardware and software can be debugged efficiently in system development using the V850E/Kx1.

In this manual, the basic setup procedure and switch settings of the IE-V850ES-G1 when using the IE-703217-G1-EM1 are described. For the names and functions of the parts of the IE-V850ES-G1, and for the connection of elements, refer to the IE-V850ES-G1 User's Manual.

Hardware Configuration



Features (When Connected to IE-V850ES-G1)

- Maximum operating frequency: 20 MHz (at 2.7 to 5.5 V operation)
- The following pins can be masked.
_RESET, NMI
- The dimensions of the IE-703217-G1-EM1 are as follows.

Parameter		Value
External dimensions	Height	35 mm
	Length	205 mm
	Width	140 mm

Function Specifications (When Connected to IE-V850ES-G1)

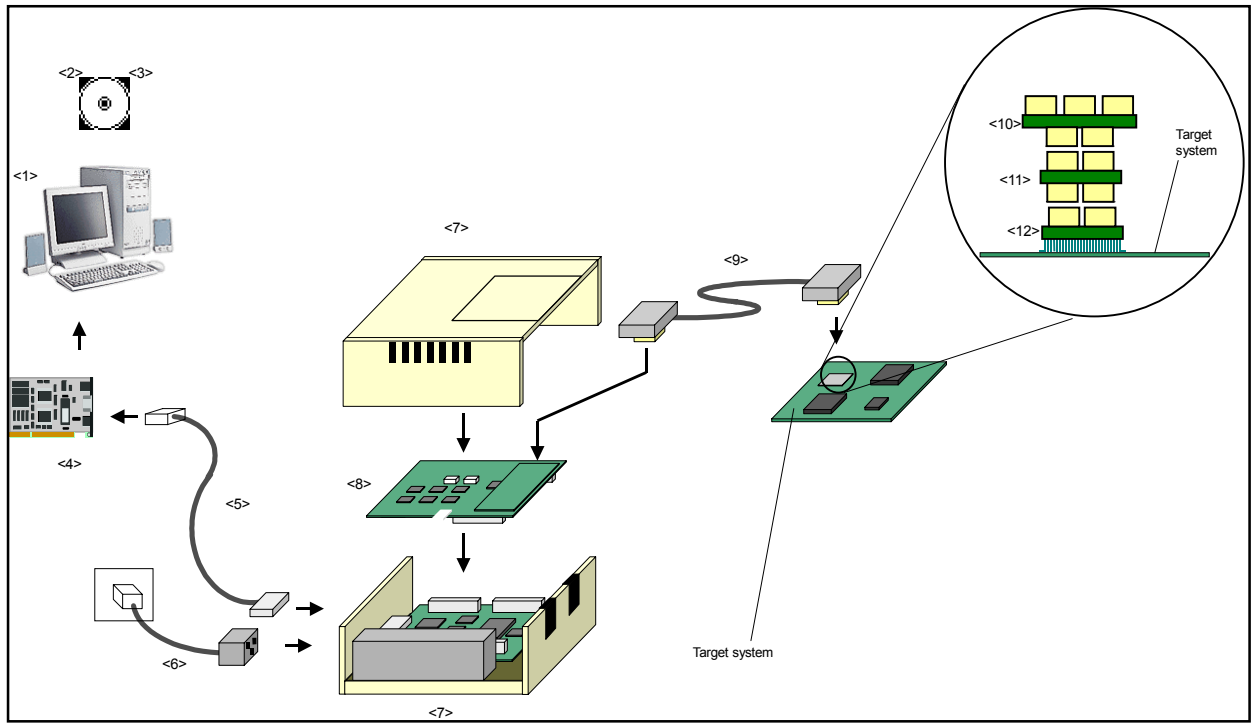
Parameter		Specification
Emulation memory capacity	Internal ROM	1 MB
	User memory	4 MB
Coverage memory capacity for execution/pass detection	Internal ROM	256 KB
	External memory	1 MB
Coverage memory capacity for memory access detection	External memory	1 MB
Coverage memory capacity for branching entry number counting	Internal ROM	256 KB
	External memory	1 MB
Trace memory capacity		168 bits × 32K frames
Time measurement function		On-chip timer: 3
External logic probe		8-bit external trace possible
		Event setting for trace/break possible
Break function		Event break
		Step execute break
		Forced break
		Fail safe break <ul style="list-style-type: none"> • Illegal access to peripheral I/O • Access to guard space • Write to the ROM space

Caution Some of the functions may not be supported, depending on the debugger used.

System Configuration

The system configuration when connecting the IE-V850ES-G1 to the IE-703217-G1-EM1 and a PC (PC-9800 series or PC/AT compatible) is shown below.

Figure 1-1. System Configuration



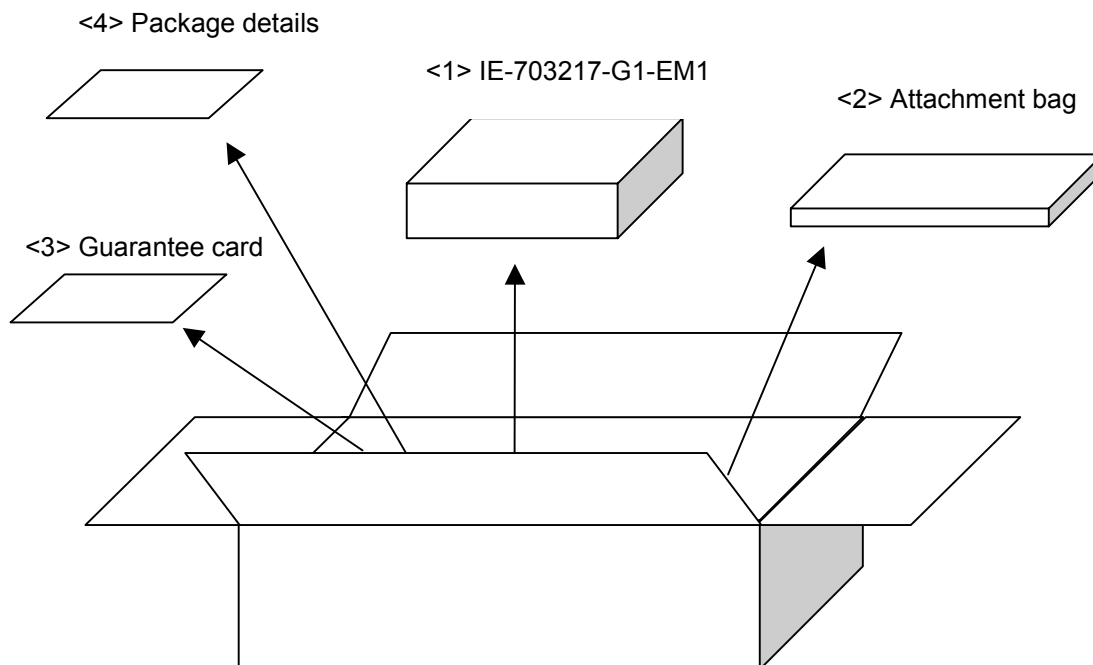
Remark

- <1>: PC (PC-9800 series or PC/AT compatibles)
- <2>: Debugger (sold separately as the SP850)
- <3>: Device file
- <4>: PC interface board (for PCI bus or PCMCIA: Sold separately)
- <5>: PC interface cable (included with the IE-V850ES-G1 [sold separately])
- <6>: Power supply cable (included with the IE-V850ES-G1 [sold separately])
- <7>: In-circuit emulator (IE-V850ES-G1: Sold separately)
- <8>: In-circuit emulator emulation board (IE-703217-G1-EM1: This product)
- <9>: Emulation probe cable (included with the IE-703217-G1-EM1)
- <10>: Conversion probe (EV-70321xGx: Sold separately)
- <11>: Mounting adapter (sold separately)
- <12>: Target connector (EV-70321xGx: Sold separately)

Packing Contents

The packing box contains the emulation board (IE-703217-G1-EM1), package details, user's manual, and guarantee card. If there are any missing or damaged items, please contact an NEC sales representative.

Figure 1-2. Contents of Package



(Contents of package)

<1> In-circuit emulator emulation board (IE-703217-G1-EM1)	1
<2> Attachment bag	1
<3> Guarantee card	1
<4> Package details	1

Make sure that the following items are included in the attachment bag in addition to this manual and the attachment list (one sheet).

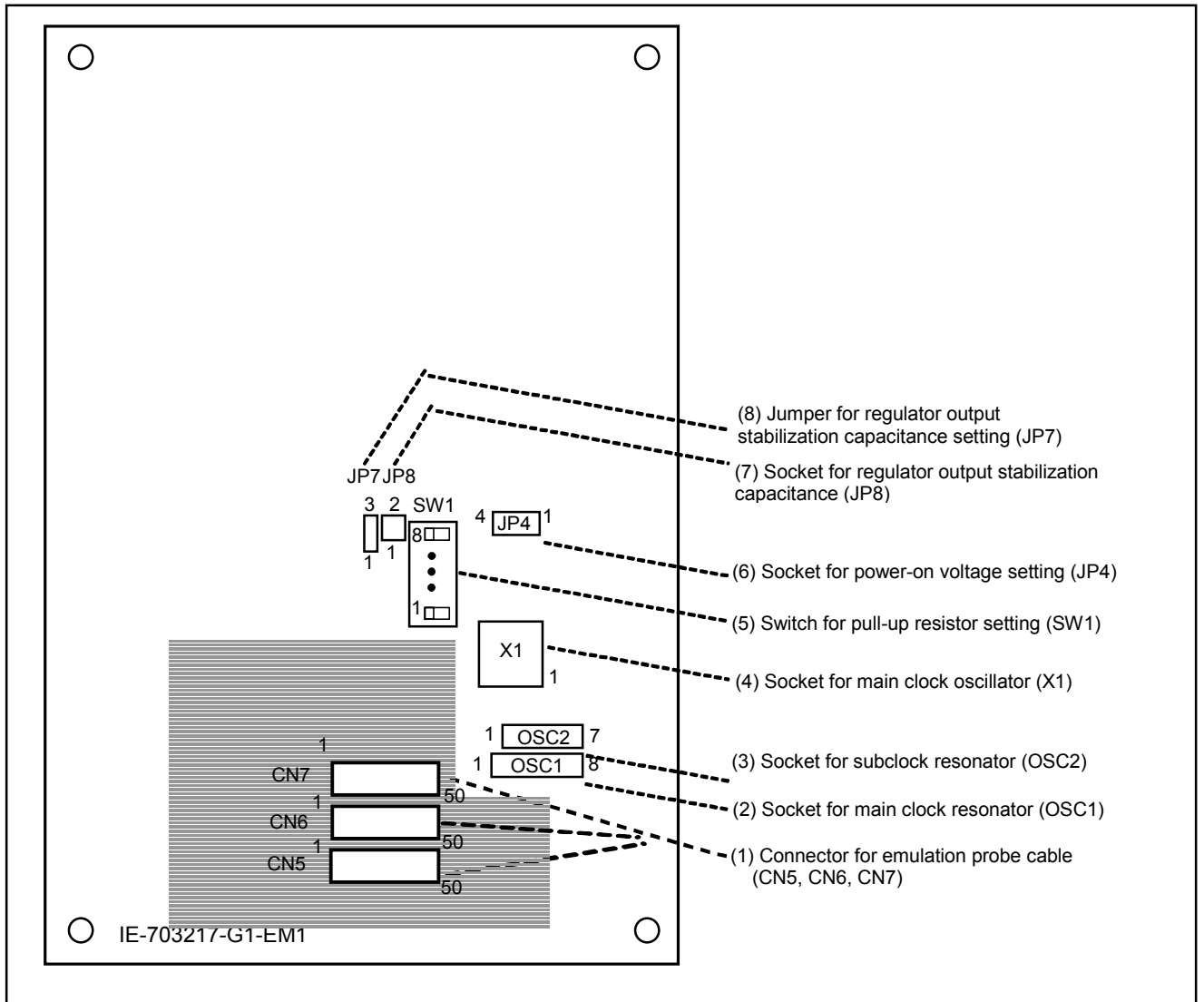
- (a) 8-pin header (for exchanging resonators): 1
- (b) 4-pin header (for exchanging reference voltage): 1
- (c) Socket (for exchanging REGC capacitors): 1
- (d) Screws/washers: 6 sets (6 screws and 6 washers included)
- (e) Emulation probe cable: 1

CHAPTER 2 NAMES AND FUNCTIONS OF PARTS

This chapter describes the names and functions of the parts in the IE-703217-G1-EM1. For details of the IE-V850ES-G1, refer to the IE-V850ES-G1 User's Manual.

Names and Functions of Parts in IE-703217-G1-EM1

Figure 2-1. Part Names of IE-703217-G1-EM1



(1) Connector for emulation probe cable (CN5, CN6, CN7)

This connector connects the probe cable supplied with the IE-703217-G1-EM1.

(2) Socket for main clock resonator (OSC1)

This is a socket to connect the main clock resonator. See **Clock Settings** in **CHAPTER 3** for details.

(3) Socket for subclock resonator (OSC2)

This is a socket to connect the subclock resonator. See **Clock Settings** in **CHAPTER 3** for details.

(4) Socket for main clock oscillator (X1)

This is a socket to connect the main clock oscillator. See **Clock Settings** in **CHAPTER 3** for details.

(5) Pull-up resistor setting switch (SW1)

This is a switch to set emulation of the pull-up resistor, which is a mask option of the V850ES/KF1, V850ES/KG1, and V850ES/KJ1. See **Pull-Up Resistor Settings** in **CHAPTER 3** for details.

(6) Socket for setting power-on threshold voltage (JP4)

This is a socket to set the threshold voltage, which is used to detect the connection of the target system. See **Power-On Threshold Voltage Settings** in **CHAPTER 3** for details.

(7) Socket for connecting regulator output stabilization capacitance (JP8)

This is a socket to connect the capacitance to stabilize the output from the regulator of the V850ES/KF1, V850ES/KG1, and V850ES/KJ1. See **Regulator Output Stabilization Capacitance Setting Jumpers** in **CHAPTER 3** for details.

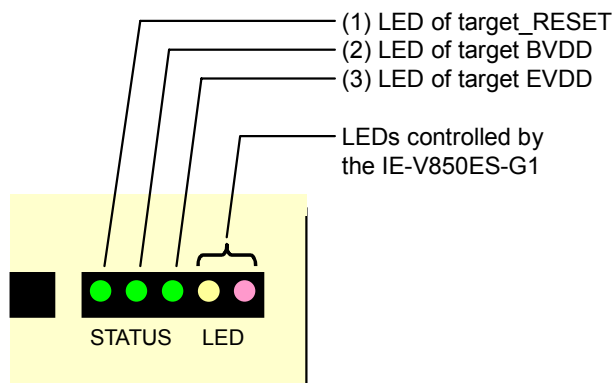
(8) Jumper for setting regulator output stabilization capacitance (JP7)

This is a jumper to set the use of the V850ES/KF1, V850ES/KG1, or V850ES/KJ1 regulator. See **Regulator Output Stabilization Capacitance Setting Jumpers** in **CHAPTER 3** for details.

LEDs Controlled by IE-703217-G1-EM1

Some of the LEDs mounted on the IE-V850ES-G1 are controlled by the IE-703217-G1-EM1. Refer to the IE-V850ES-G1 User's Manual for details of the LEDs controlled by the IE-V850ES-G1.

Figure 2-2. LEDs Controlled by IE-703217-G1-EM1



(1) LED of target _RESET

The status of the _RESET connected to the target system is shown below.

Lit (ON): The target system is connected and the _RESET signal is active (GND level).

Extinguished (OFF): The target system is not connected or the _RESET signal is inactive (VDD level).

(2) LED of target BVDD

The status of BVDD connected to the target system is shown below.

Lit (ON): The target system is connected and voltage is being applied to BVDD.

Extinguished (OFF): The target system is not connected or voltage is not being applied to BVDD.

(3) LED of target EVDD

The status of EVDD connected to the target system is shown below.

Lit (ON): The target system is connected and voltage is being applied to EVDD.

Extinguished (OFF): The target system is not connected or voltage is not being applied to EVDD.

CHAPTER 3 SWITCH SETTINGS

This chapter explains how to set the switches in the IE-703217-G1-EM1.

Clock Settings

The main clock settings are shown in Table 3-1. See Figure 2-1 for details of the PSC1 and X1 positions.

Since only the 32.768 kHz resonator on the IE-703217-G1-EM1 is supported for the subclock, it cannot be changed to the oscillator.

Table 3-1. Main Clock Settings

Main Clock Supply Source	OSC1	X1	Software Debugger
<p>Resonator (Resonator: 4 MHz, capacitor: 15 pF as default setting)</p>		– (don't care)	– (don't care)
<p>Oscillator on IE-703217-G1-EM1</p>		Put the oscillator on X1 socket.	Select Internal clock in Configuration dialog box
<p>Oscillator on target system Note: Be sure to input a rectangular signal</p>		– (don't care)	Select Target clock in Configuration dialog box

Pull-Up Resistor Settings

The emulation settings of the pull-up resistor, which is a mask option of the V850ES/KF1, V850ES/KG1, and V850ES/KJ1, are shown in Table 3-2. See Figure 2-1 for details of the SW1 position.

Table 3-2. Pull-Up Resistor Settings

SW1	Port
1	P36
2	P37
3	P38
4	P39
5	P614
6	P615
7	Not used
8	Not used

ON: Pull-up resistor is connected

OFF: Pull-up resistor is not connected

Remark All the switches are set to OFF at shipment.

Power-On Threshold Voltage Settings

The threshold voltage that is used to detect the connection of the target system (hereafter referred to as the power-on threshold voltage) is set to 1.7 V when the IE-703217-G1-EM1 is shipped (see **Figure 3-1 JP4 Setting at Shipment**). To change this threshold voltage, insert the 4-pin jumper on which a resistor is mounted (supplied with the IE-703217-G1-EM1) in JP4 as shown in Figure 3-2. See Figure 2-1 for details of the JP4 position.

Figure 3-1. JP4 Setting at Shipment

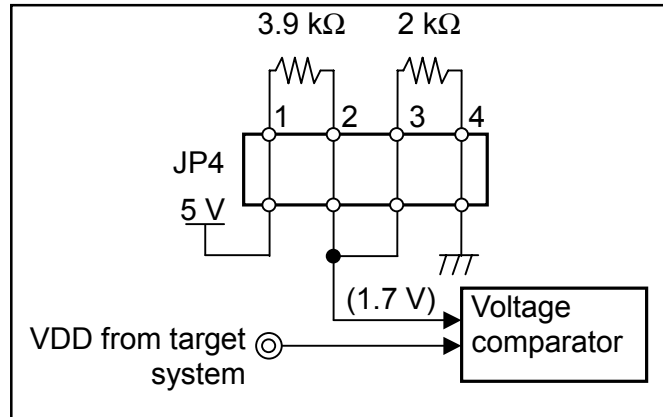
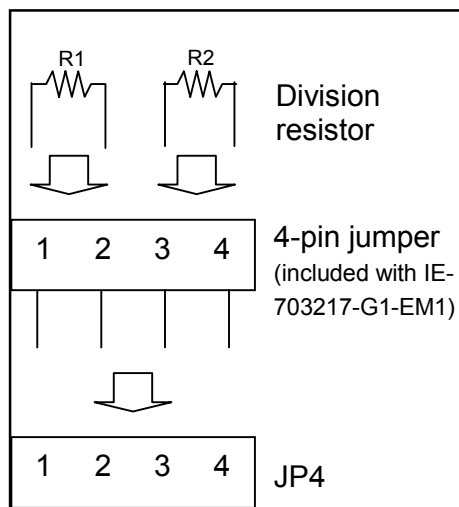


Figure 3-2. Modification of Power-On Threshold Voltage



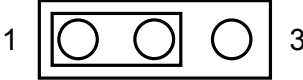
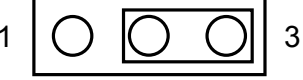
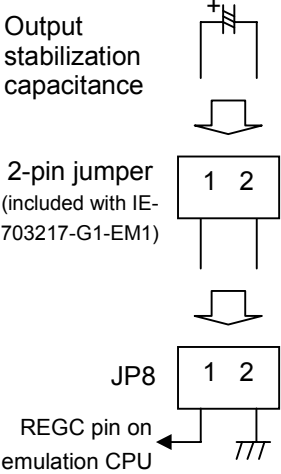
Obtain the threshold voltage from the following expression.

$$\text{Threshold voltage value} = 5 \text{ V} \times R2 / (R1 + R2)$$

Regulator Output Stabilization Capacitance Setting Jumpers

This is a socket to connect the capacitance to stabilize an output from the regulator of the V850ES/KF1, V850ES/KG1, and V850ES/KJ1. See Figure 2-1 for details of the JP7 and JP8 positions. A 10 μ F electrode capacitor is connected to JP8 when the IE-703217-G1-EM1 is shipped.

Table 3-3. Setting of Regulator Output Stabilization Capacitance

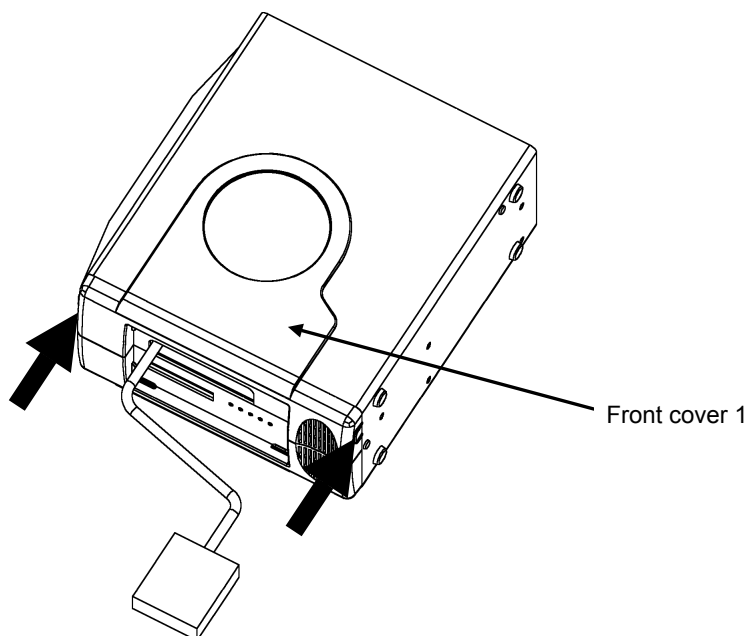
Regulator	JP7	JP8
Not used (Default)		– (don't care)
Used		

CHAPTER 4 INSTALLATION

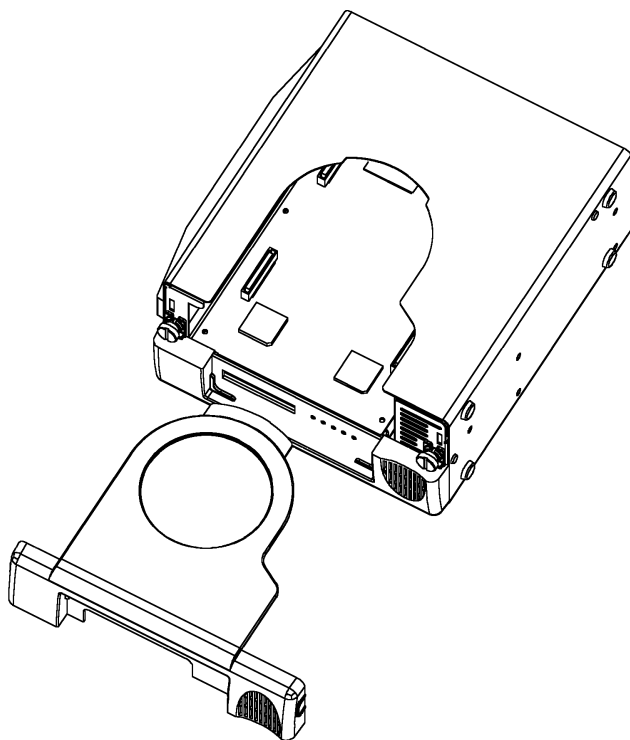
This chapter explains how to connect the IE-703217-G1-EM1 to related products.

- Removing the probe and exchanging the clock module

(1) Hold the two positions indicated by the arrows in the following figure and pull front cover 1.

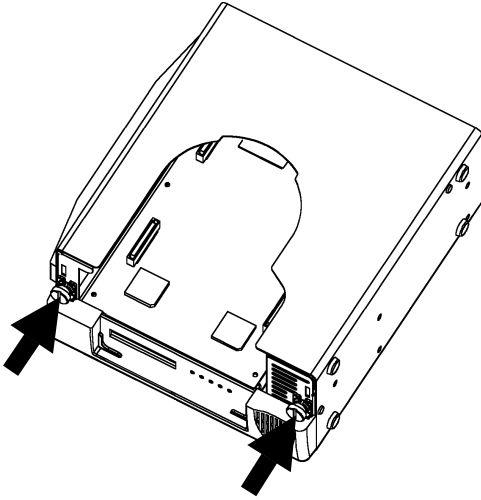


(2) After the front cover is removed, remove the probe or change the clock.

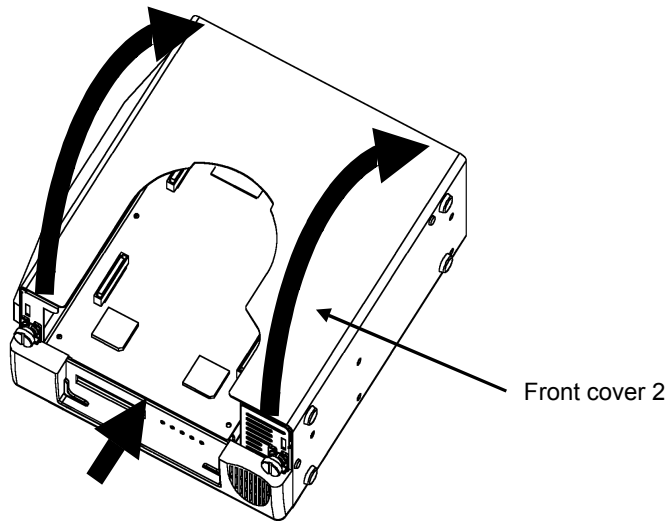


- Removing the emulation board

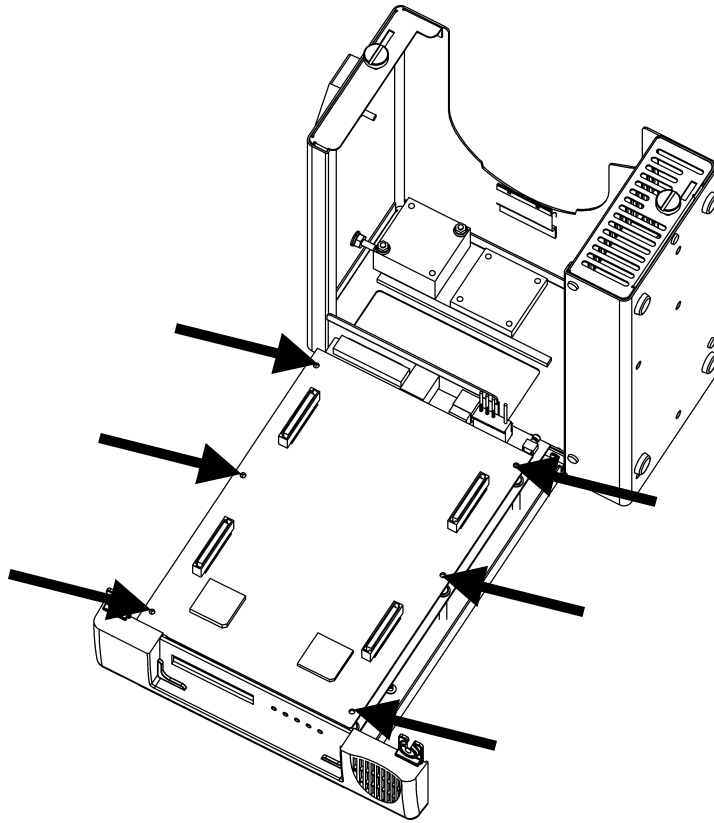
- (1) Place the main unit sideways.
- (2) Remove the power supply cable and host interface cable.
- (3) Remove front cover 1 as described on the previous page.
- (4) Fix the two screws indicated by the arrows in the following figure.



- (5) Hold front cover 2 and raise the main unit with the hinges on the rear panel as the fulcrums.



(6) Remove the six screws on the board indicated by the arrows in the following figure and replace the board.



CHAPTER 5 CAUTIONS

Take note of the following points when using the IE-703217-G1-EM1.

Connection to Target System

Be sure to turn off the power supply to the IE-V850ES-G1 before connecting it to the target system.

CHAPTER 6 RESTRICTIONS

The IE-703217-G1-EM1 has the following restrictions.

Permanent Restrictions

(1) Clock generator

- **Emulation of oscillation stabilization time after reset**

Oscillation stabilization time is inserted after reset in the emulation target device, but it is not inserted in the in-circuit emulator.

- **Operating clock after reset**

The operating clock after reset is $f_{xx}/8$ in the emulation target device, but in the in-circuit emulator, there may be a period in which the clock is not reset to $f_{xx}/8$ (depending on the reset release timing).

(2) Timing for setting/releasing standby mode

The timing for setting/releasing standby mode differs between the target device and the in-circuit emulator.

The differences are 1 clock or less for setting and 2 to 3 clocks for release.

(3) Reset timing by watchdog timer

The reset timing due to overflow of WDT1 and WDT2 differs between the target device and the in-circuit emulator.

<Operation During Break>

There may be differences between the operation of the in-circuit emulator and target device because the peripheral functions of the in-circuit emulator operate during a break.

(However, the watchdog timer counter stops when the in-circuit emulator is in a break operation.)