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User's Manual

QB-V850ESJX3H

In-Circuit Emulator

User's Manual

Target Devices

V850ES/JC3-H
V850ES/JE3-H
V850ES/JG3-H
V850ES/JH3-H
V850ES/JG3-U
V850ES/JH3-U
V850ES/ST3

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1. **Circumstances not covered by product guarantee**
   - If the product was disassembled, altered, or repaired by the customer
   - If it was dropped, broken, or given another strong shock
   - Use at overvoltage, use outside guaranteed temperature range, storing outside guaranteed temperature range
   - If power was turned on while the AC adapter, USB interface cable, or connection to the target system was in an unsatisfactory state
   - If the cable of the AC adapter, the USB interface cable, the extension probe, or the like was bent or pulled excessively
   - If an AC adapter other than the supplied product was used
   - If the product got wet
   - If this product is connected to the target system when there is a potential difference between the GND of this product and GND of the target system.
   - If the connectors or cables are plugged/unplugged while this product is in the power-on state.[Note]
   - If excessive load is applied to the connectors or sockets.
   - If a metal part of the power switch, cooling fan, or another such part comes in contact with an electrostatic charge
   - If the product is used or stored in an environment where it may likely be exposed to electrostatic discharge or electrical noise

   Note For handling, see **2.5 Mounting and Connecting Connectors (When Using S Type)**, **2.6 Mounting and Connecting Connectors (When Using T Type)** .

2. **Safety precautions**
   - If used for a long time, the product may become hot (50°C to 60°C). Be careful of low temperature burns and other dangers due to the product becoming hot.
   - Be careful of electrical shock. There is a danger of electrical shock if the product is used as described above in **1 Circumstances not covered by product guarantee**.
   - The AC adapter supplied with the product is exclusively for this product, so do not use it with other products.

How to Use This Manual

Readers

This manual is intended for users who wish to perform debugging using the QB-V850ESJX3H. The readers of this manual are assumed to be familiar with the device functions and usage, and to have knowledge of debuggers.

Purpose

This manual is intended to give users an understanding of the basic specifications and correct usage of the QB-V850ESJX3H.

Organization

This manual is divided into the following sections.

- General
- Setup procedure
- Settings at product shipment
- Notes
- Optional functions

How to Read This Manual

It is assumed that the readers of this manual have general knowledge in the fields of electrical engineering, logic circuits, and microcontrollers.
This manual describes the basic setup procedures and how to set switches.

To understand the overall functions and usages of the QB-V850ESJX3H
→Read this manual in the order of the **CONTENTS**. The mark "<R>" shows major revised points. The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

To know the manipulations, command functions, and other software-related settings of the QB-V850ESJX3H
→See the user's manual of the debugger (supplied with the QB-V850ESJX3H) to be used.

Conventions

Note:	Footnote for item marked with **Note** in the text
Caution:	Information requiring particular attention
Remark:	Supplementary information
Numeric representation:	Binary ... xxxx or xxxxB
	Decimal ... xxxx
	Hexadecimal ... xxxxH
Prefix indicating power of 2 (address space, memory capacity):	K (kilo): 2^{10} = 1,024
	M (mega): 2^{20} = $1,024^2$

Terminology

The meanings of the terms used in this manual are described in the table below.

Term	Meaning
Target device	This is the device to be emulated.
Target system	This is the system to be debugged (system provided by the user). This includes the target program and the hardware provided by the user.
IECUBE™	Generic name for Renesas Electronics' high-performance, compact in-circuit emulator.

Related Documents

Please use the following documents in combination with this manual.

The related documents listed below may include preliminary versions. However, preliminary versions are not marked as such.

Documents Related to Development Tools (User's Manuals)

Document Name		Document Number
QB-V850ESJX3H In-Circuit Emulator		This manual
CA850 Ver. 3.00 C Compiler Package	Operation	U17293E
	C Language	U17291E
	Assembly Language	U17292E
	Link Directives	U17294E
ID850QB Ver. 3.40 Integrated Debugger	Operation	U18604E
SM+ System Simulator	Operation	U18010E
	User Open Interface	U17663E
RX850 Ver. 3.20 Real-Time OS	Basics	U13430E
	Installation	U17419E
	Technical	U13431E
	Task Debugger	U17420E
RX850 Pro Ver. 3.20 Real-Time OS	Basics	U13773E
	Installation	U17421E
	Technical	U13772E
	Task Debugger	U17422E
AZ850 Ver. 3.30 System Performance Analyzer		U17423E
PM+ Ver. 6.00 Project Manager		U17178E

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

CONTENTS

CHAPTER 1 GENERAL

The QB-V850ESJX3H is an in-circuit emulator for emulating the target device shown below.

Hardware and software can be debugged efficiently in the development of systems in which the target device is used. This manual descries basic setup procedures, hardware specifications, system specifications, and how to set switches.

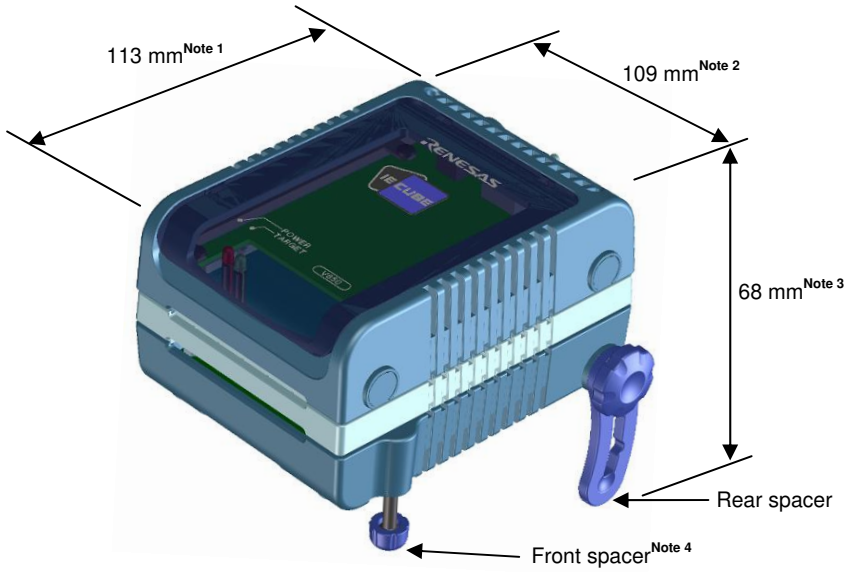
Target device : V850ES/JC3-H, V850ES/JE3-H, V850ES/JG3-H, V850ES/JH3-H, V850ES/JG3-U, V850ES/JH3-U, V850ES/ST3

1.1 Hardware Specifications

Table 1-1. QB-V850ESJX3H Hardware Specifications

Parameter		Specification
Target device		V850ES/JC3-H, V850ES/JE3-H, V850ES/JG3-H, V850ES/JH3-H, V850ES/JG3-U, V850ES/JH3-U, V850ES/ST3
Target system interface voltage		V_{DD} = EV_{DD} = UV_{DD} = AV_{REF0} = AV_{REF1} V_{SS} = EV_{SS} = UV_{SS} = AV_{SS} = 0 V
	V_{DD} = EV_{DD} = UV_{DD}	2.85 to 3.6 V
	AV_{REF0}	3.0 to 3.6 V
Maximum operating frequency		48 MHz
Operating temperature range		0 to 40°C (No condensation)
Storage temperature range		–15 to 60°C (No condensation)
External dimensions		See **Figure 1-1**
Power consumption	AC adapter	15 V, 1 A
	Target system power supply	160 mA (max.)
Weight		Approx. 500 g
Host interface		USB interface (1.1, 2.0)

Figure 1-1. External Dimensions



Notes 1 Does not include projection of power switch

2 Includes projection of screw that fixes rear spacer

3 Dimension when rear spacer is made shortest (98 mm when longest)

4 Front spacer can vary from 20 mm (longest) to 5 mm (shortest)

1.2 System Specifications

This section shows the QB-V850ESJX3H system specifications. For the usage of the debugging function, refer to **ID850QB Ver. 3.40 Operation User's Manual (U18604E)**.

Table 1-2. QB-V850ESJX3H System Specifications

Parameter		Specification
Emulation memory capacity	Internal ROM	1 MB max.
	Internal RAM	60 KB max.
	External memory	16 MB max. (optional[Note]) (mapping possible in 1 MB units)
Program execution functions	Real-time execution function	Go, Start from Here, Go & Go, Come Here, Restart, Return Out
	Non-real-time execution function	Step In, Next Over, Slowmotion
Break functions	Hardware break	Execution: 10 points Access: 6 points
	Software break	2000 points
	Fail-safe break	Non-map, I/O illegal, write protect
	Other	Trace full break, forced break, timer overflow break
Trace functions	Trace data types	Branch-source PC, branch-destination PC, all PCs, all execution data, access data, access address, R/W status, time stamp, DMA point (start/end)
	Trace modes	Real-time trace, Complete trace
	Trace events	Delay trigger, section, qualify
	Memory capacity	256K frames
Real-time RAM monitoring function		256 bytes × 8 points
Time measurement functions	Measurement clock	50 MHz
	Measurement objects	Beginning through end of program execution Start event through end event (7 sections)
	Maximum measurement time	Approximately 195 hours (When using measurement-dedicated clock divided by 32)
	Minimum resolution	20 ns
	Number of timers for measurement	8
	Measurement results	Execution time (Start through end of execution) Maximum, minimum, average, pass count (between events)
	Other	Timer overflow break function (1 point)
Time Machine function (optional[Note])		Contact a GHS tool dealer.
Coverage function (optional[Note])		Detection of execution or pass (optional)
	Measured range	Internal ROM space + arbitrary 1 MB space
Other functions		Mapping function, event function, register manipulation function, memory manipulation function

Note **Refer to** CHAPTER 5 OPTIONAL FUNCTIONS.

Caution Depending on the debugger, some functions are not supported.

1.3 Functional Overview

IECUBE is provided with a wealth of debug functions to enable efficient program debugging, in addition to being used to emulate the operation of a target device. An overview of the functions is provided in this section.

Some functions are not supported, depending on the debugger to be used. See also the manual of the debugger to be used to confirm.

1.3.1 Program execution function (real-time execution function)

The program execution function enables program execution equivalent to that of the target device. The executed program can be stopped under various conditions by using the break functions (**1.3.3 Break functions (program execution stop)**). The operation of only a function can be checked by executing a program, because a program can be executed from any address.

1.3.2 Step execution function (non-real-time execution function)

The step execution function can be used to execute instructions one by one, in assemble instruction units. Only instructions to be executed purely in steps can be executed, because interrupts are not acknowledged during step execution.

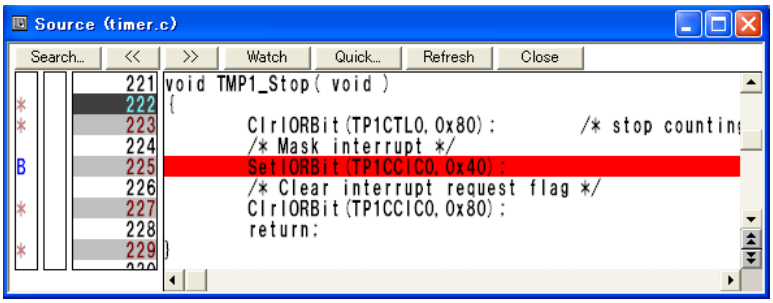
Caution Step execution to be performed at the C language level is performed by a debugger using the break function. In this case, interrupts are acknowledged in step execution. Consequently, if processing at the interrupt destination cannot be completed, step execution may not be completed. For handling such a case, see the manual of the debugger.

1.3.3 Break functions (program execution stop)

The break functions are used to stop program execution. With IECUBE, program execution can be stopped under the following various conditions. See (1) to (5) for an overview of each break function.

- An address has been executed → Hardware break function, software break function
- A variable has been accessed → Hardware break function
- An access-prohibited space has been accessed → Fail-safe break function
- A specific time has elapsed → Timer overflow break function

Figure 1-2. Image of Having Set Break Function by Using Debugger ID850QB



Variable values can be checked during a break and a program can be executed again by changing register values, because the CPU operates even during a break (while the program is stopped). Interrupts generated during the break are suspended, because basically peripheral functions also operate during the break. Use the peripheral break function (**1.3.9 Peripheral break function**) to stop peripheral functions during the break.

(1) Hardware break function

The hardware break function is used to observe the CPU bus cycles and set a break for a specific fetch or access operation. For example, a break can be set by detecting a state where an address has been executed or a variable has been accessed. For states that can be set, see **1.3.7 Event function (specific CPU operation detection)**.

Caution The address for which a break has been set is at a position ahead of the address where an actual access has occurred, because the break set for the access (write, read) is detected at an MEM stage or a WB stage on the CPU pipeline.

(2) Software break function

The software break function is used to set a break when a specific address has been executed (fetched).
The feature of the software break function is the large number of break points that can be set, because the function is performed by replacing with a break instruction (DBTRAP instruction) the instruction of an address for which a break is to be set.

Caution When obtaining the checksum of a memory space, the actual theoretical value will be different from the result due to the replacement of the instruction. Furthermore, break points cannot be set for a ROM that has been connected to an external bus. Use the hardware break function to solve such problems.

(3) Fail-safe break function

This function is used to set a break when the CPU has performed an illegal operation. For example, a break is set when a peripheral I/O register, that has written to a ROM area and is to be accessed in 8-bit units, is accessed in 16-bit units. The following illegal operations can be detected by using the fail-safe break function.

- ○ Accesses (fetching, reading, writing) to areas that are not mapped (prohibited areas)
- ○ A write operation for the ROM area
- ○ The following illegal operations for a peripheral I/O register
  - • Accesses with different access bit widths
  - • A write operation for a read-only register
  - • A read operation for a write-only register

(4) Timer overflow break function

This function is used to set a break when a time set by using the time measurement function (**1.3.6 Time measurement function**) has elapsed. For example, if the execution time of a function must be 2 ms, a break can be set when at least 2 ms have elapsed between starting and ending the function. This function and the trace function (**1.3.4 Trace function (program execution history)**) can be used together to find the source that has taken time.

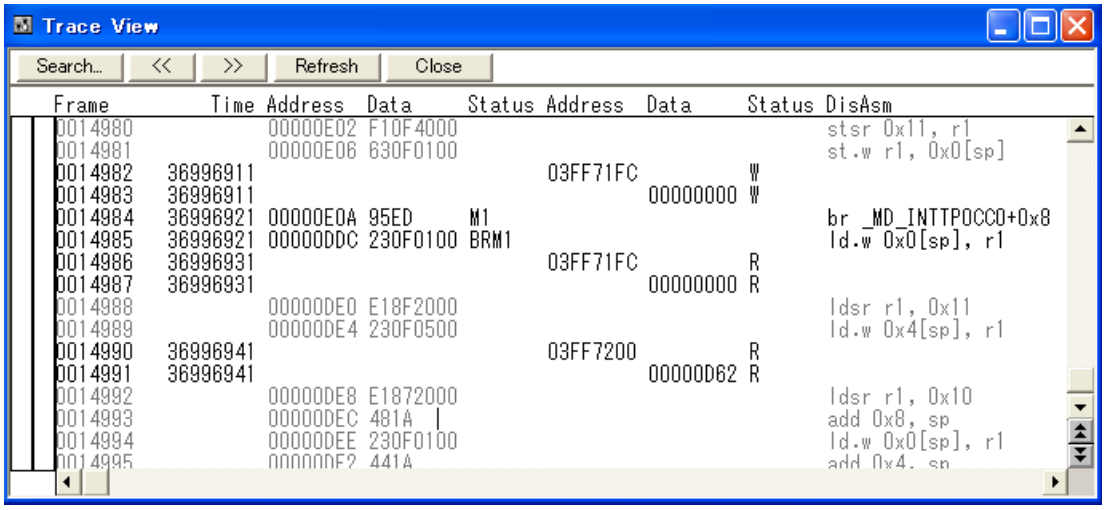
(5) Forcible break function

This function is used to forcibly stop a program when it is desired to be stopped.

1.3.4 Trace function (program execution history)

The trace function can be used to check the CPU execution history (trace). Items (1) to (9) can be recorded in the execution history.

Figure 1-3. Image of Execution History (Trace) with Debugger ID850QB



(1) Program counter (PC) of branch source and branch destination

The PCs of a branch source and a branch destination can be recorded in the history.

Consequently, practically all executed programs can be checked, because programs executed between branch points also will be clarified. The amount of trace memory used can be saved and more history items can be traced by that amount, by recording only branch information. (The amount of traces that can be traced back depends on the number of branches.)

(2) All executed addresses

All executed address can be recorded in the history.

Normally, the programs that have been executed can be traced back if branch PC information described in (1) is available. This trace information is mainly used by the coverage function (**5.2 Coverage Measurement Function**).

(3) Access data/access address

Access addresses for memories and peripheral I/O registers, and access data can be recorded in the history. Read and write operations can also be recorded in the history.

Caution Accesses to CPU program registers (such as r1 and r2) and system registers (such as PSW and EIPC) cannot be recorded in the history. Furthermore, if an internal RAM is successively accessed for at least 32 times, some trace information may be omitted. (Whether trace information has been omitted can be checked in the debugger display.)
To prevent such omissions, IECUBE is provided with a mode (trace priority mode) in which the CPU execution cycle is stopped and the acquisition of traces is prioritized. Note that, when the trace priority mode is executed, however, operation may not be performed in real-time.

(4) Access program counter (PC)

PCs that have accessed memories and peripheral I/O registers can be recorded in the history.

(5) Time stamp

The time elapsed from the trace start point can be added to each trace information. The timer performance for time stamps is the same as that of the time measurement function (**1.3.6 Time measurement function**). For the timer performance, see the time measurement function column in **Table 1-2. QB-V850ESJX3H System Specifications**.

Caution The addition of a time stamp is not suited for accurately measuring time in 1-instruction units, because only one time stamp is added to four pieces of trace information at most. If all execution addresses are left as trace information, only one time stamp is added to four instructions. The same applies when the timer resolution is slower than the CPU operation frequency. Use the time measurement function (1.3.6 Time measurement function) to accurately measure time.

(6) DMA start and end points (DMA points)

When the DMA function of the target microcontroller is being used, the DMA start and end points can be recorded in the history.

(7) History of specific sections (section trace)

Only specific sections can be recorded in the history by using the event function (**1.3.7 Event function (specific CPU operation detection)**) in combination. For example, the execution history of from the start to the end of a function can be recorded.

(8) History of specific phenomenon occurred (qualify trace)

Only the occurrence of specific phenomena can be recorded in the history by using the event function (**1.3.7 Event function (specific CPU operation detection)**) in combination.

For example, a history of having accessed to only a variable can be recorded.

(9) Recording histories before and after specific phenomenon has occurred (delay trigger trace)

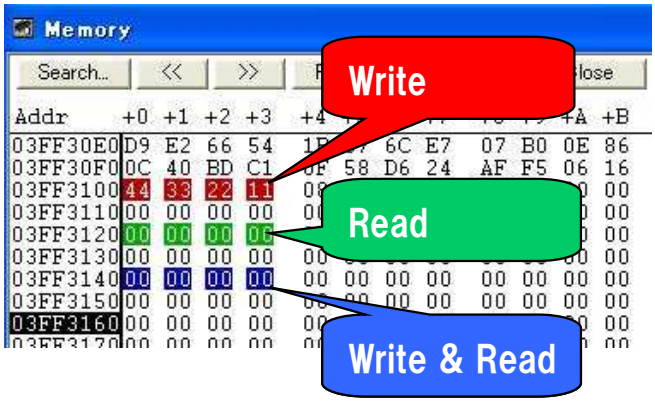
The history after a specific phenomenon has occurred can be recorded by using the event function (**1.3.7 Event function (specific CPU operation detection)**) in combination. This is similar to being able to observe a signal waveform by assuming an edge as a trigger, when using an oscilloscope to observe a signal.

For example, the program execution histories before and after a write access has been performed for a variable can be viewed.

1.3.5 Real-time RAM monitoring function (checking RAM values during program execution)

The real-time RAM monitoring function can be used to check RAM values during program execution. Real-time operation is guaranteed so that program execution is not affected when reading RAM values. Furthermore, whether the RAM has been read or written can be checked.

Figure 1-4. Image of Having Displayed Memory Space by Using Debugger ID850QB



Caution When a RAM to be monitored has been changed during a break or changed by the DMA function of the target microcontroller, the changed values cannot be monitored. Only RAM values that have been changed by CPU accesses can be monitored during program execution.

1.3.6 Time measurement function

This function is used to measure the execution time of a specific section. The measurement start and end points can be set by using the event function (**1.3.7 Event function (specific CPU operation detection)**).

In addition, the maximum, minimum, and average execution time and the number by which the measurement section has been passed can be measured. For the performance of the time measurement function, see **Table 1-2. QB-V850ESJX3H System Specifications**.

Figure 1-5. Image of Having Displayed Time Measurement Result by Using Debugger ID850QB

1.3.7 Event function (specific CPU operation detection)

The event function is used to detect specific fetch and access operations by observing the CPU bus cycle. CPU operations, such as of an address being executed and a variable being accessed can be detected. Such specific CPU operations are called events. Use the event function together with the following functions.

- Hardware break function
- Trace function
- Time measurement function

The events that can be registered by using the event function are as follows.

(1) Pre-execution event

A pre-execution event is detected when execution of an address is attempted. It can be used only with the hardware break function. Two pre-execution event points can be specified.

[Detection conditions that can be specified]

- Execution address

(2) Post-execution event

A post-execution event is detected when an address has been executed. The address of a post-execution event can be specified as a range. Up to eight post-execution event points can be specified, but if the execution address has been specified as a range, two points will be consumed. When the execution address has been specified as a range for all events, four event points can be specified.

[Detection conditions that can be specified]

- Execution address (can be specified as a range)

(3) Access event

An access event is detected when an address has been accessed (read or written). The following detection conditions can be specified for an access event.

Up to six access event points can be specified, but if the access address has been specified as a range, two points will be consumed. When the access address has been specified as a range for all events, three event points can be specified.

[Detection conditions that can be specified]

- Access address (can be specified as a range)
- Access data
- Access size
- Access status (read, write, both read and write)

1.3.8 Event link function (event combinations)

The event link function is used to combine into one event, events that have been registered by using the event function (**1.3.7 Event function (specific CPU operation detection)**). It is used to detect a specific sequence, such as when an address has been executed after a variable was accessed.

1.3.9 Peripheral break function

When the break function has been used to stop program execution, peripheral functions other than the watchdog timer continue to operate in general, but some peripheral functions can be stopped by using the peripheral break function. See **4.2.7 Operation during Break** for details.

1.3.10 Mask function

The mask function can be used to mask the following sources.

- Reset (external reset)
- Non-maskable interrupt
- Bus hold request input ($\overline{\text{HLDRQ}}$ pin)
- External wait input ($\overline{\text{WAIT}}$ pin)

1.3.11 Optional functions

The following optional functions can be added to IECUBE. See **CHAPTER 5 OPTIONAL FUNCTIONS** for details.

- Memory emulation function
- Coverage function
- TimeMachineTM function

1.3.12 Function to control reset when power of target system is turned off

When the power supply voltage of the target interface is decreased by 10% from the value stated in Table 1-1 when the target system is connected and a program is being executed, a state equivalent to a reset state of the target device is entered. When the power supply voltage of the target interface has been restored, the reset will be released and program execution will be started.

Consequently, the operation of the target system when its power is turned on can be pseudo-checked.

Caution The operation performed after a reset by this function will not be completely equivalent to an operation of the target device. Mount an actual device and perform final verification of the operation when starting the power supply.

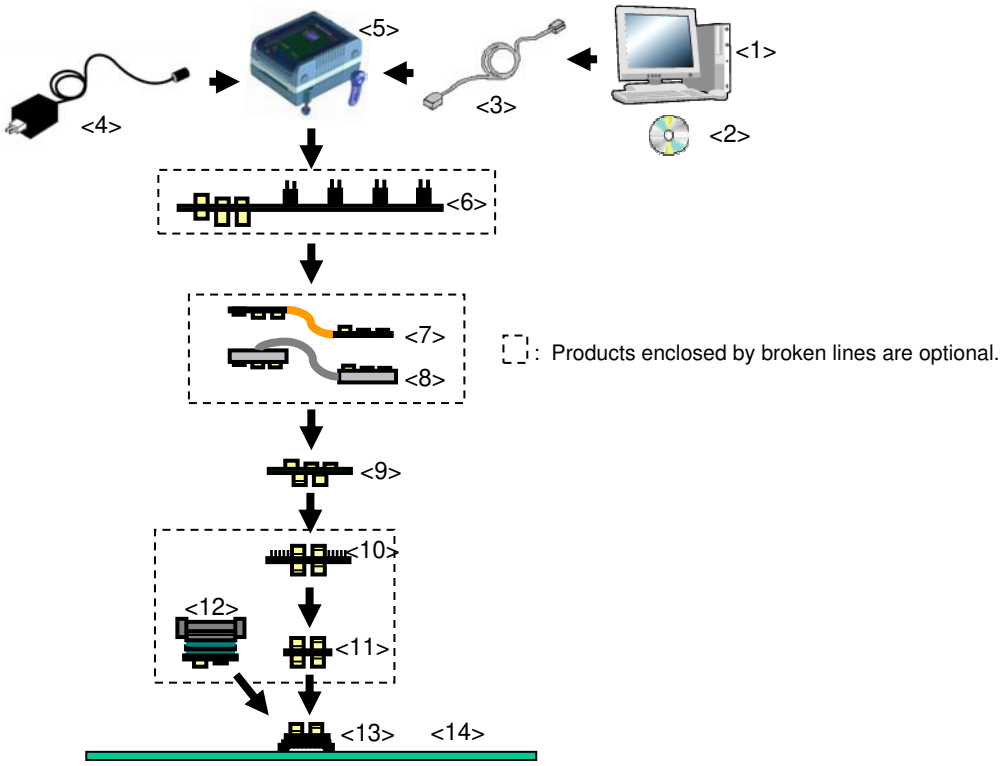
1.4 System Configuration

There are two configuration types: S Type and T Type.

This section shows each system configuration when using the QB-V850ESJX3H connected to a PC (a computer equipped with a USB port). Connection is possible even without optional products.

Connectors <9> to <13> differ depending on the target device to be emulated.

Figure 1-6. System Configuration (S Type)



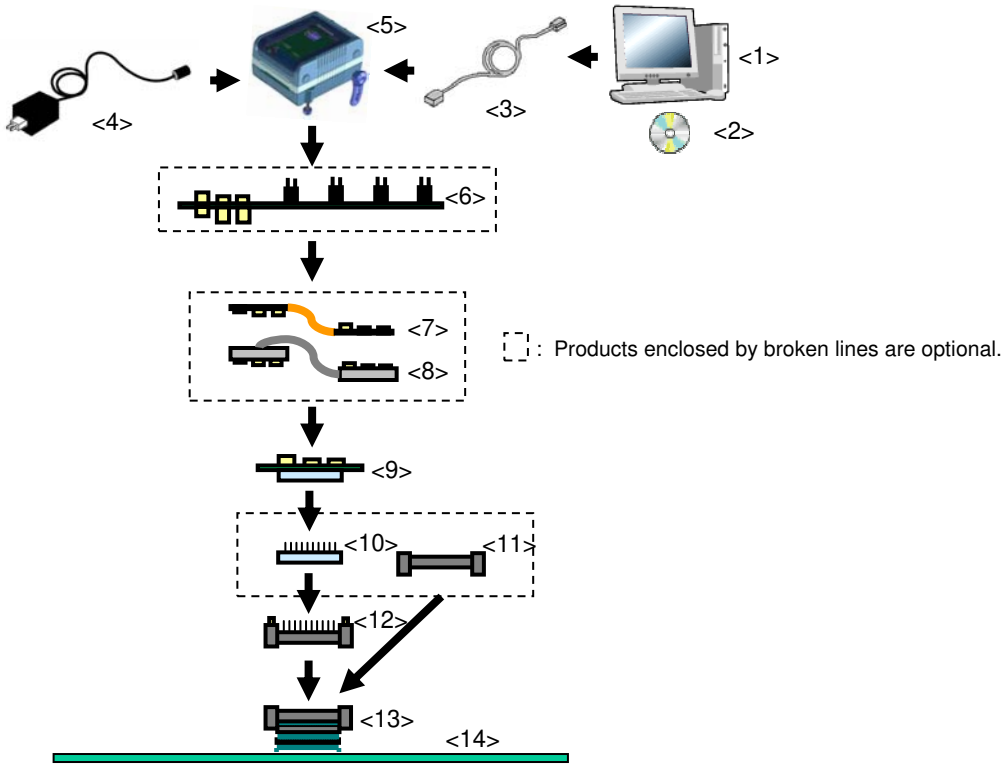
<1> Host machine: Computer equipped with a USB port
<2> ID850QB Disk/Accessory Disk[Note 1]: Debugger, USB drivers, manual, etc.
<3> USB interface cable: Cable used for connecting QB-V850ESJX3H to host machine
<4> AC adapter: Can support 100 to 240 V by replacing AC plug
<5> QB-V850ESJX3H: This product
<6> Check pin adapter (optional): Adapter used for monitoring waveforms with oscilloscope
<7> Extension probe flexible type (optional)
<8> Extension probe coaxial type (optional)
<9> Exchange adapter: Adapter that performs pin conversion
<10> Check pin adapter (optional): Adapter used for monitoring waveforms with oscilloscope[Note 2]
<11> Space adapter (optional): Adapter used for height adjustment[Note 2]
<12> Mount adapter (optional): Adapter used for mounting target device
<13> Target connector: Connector to be soldered to target system
<14> Target system

Notes 1. Download the device file from the Renesas Electronics website.
http://www2.renesas.com/micro/en/ods/index.html

2. If both <10> and <11> are used, connection sequence of <10> and <11> may be reversed.

Remark For notes on target system design and package drawings, refer to **[Related Content]** on the following URL.
http://www2.renesas.com/micro/en/development/asia/Emulator/IE/iecube.html

Figure 1-7. System Configuration (T Type)



<1> Host machine: Computer equipped with a USB port
<2> ID850QB Disk/Accessory Disk[Note]: Debugger, USB drivers, manual, etc.
<3> USB interface cable: Cable used for connecting QB-V850ESJX3H to host machine
<4> AC adapter: Can support 100 to 240 V by replacing AC plug
<5> QB-V850ESJX3H: This product
<6> Check pin adapter (optional): Adapter used for monitoring waveforms with oscilloscope
<7> Extension probe flexible type (optional)
<8> Extension probe coaxial type (optional)
<9> Exchange adapter: Adapter that performs pin conversion
<10> Space adapter (optional): Adapter used for height adjustment
<11> Mount adapter (optional): Adapter used for mounting target device
<12> YQ connector: Connector used for connecting emulator
<13> Target connector: Connector to be soldered to target system
<14> Target system

Note Download the device file from the Renesas Electronics website.
http://www2.renesas.com/micro/en/ods/index.html

Remark For notes on target system design and package drawings, refer to **[Related Content]** on the following URL.
http://www2.renesas.com/micro/en/development/asia/Emulator/IE/iecube.html

Table 1-3. List of Probe/Connector for Each Target Device (S Type)

No.	Name	Target Device to Be Emulated						
		V850ES/JC3-H (40-Pin K8)	V850ES/JC3-H (48-Pin GA)	V850ES/JC3-H (48-Pin K8)	V850ES/JE3-H (64-Pin GB)	V850ES/JG3-U (100-Pin GC)	V850ES/JG3-H (100-Pin GC)	V850ES/JH3-U, V850ES/JH3-H, V850ES/ST3 (128-Pin GF)
<6>	Check pin adapter	QB-144-CA-01 (sold separately)						
<7>	Extension probe (flexible type)	QB-144-EP-02S (sold separately)						
<8>	Extension probe (coaxial type)	QB-144-EP-01S (sold separately)						
<9>	Exchange adapter	QB-40K8-EA-01S	QB-48GA-EA-01S	QB-48K8-EA-01S	QB-64GB-EA-02S	QB-100GC-EA-04S (sold separately)Note	QB-100GC-EA-05S (sold separately)Note	QB-128GF-EA-01S (sold separately)Note
<10>	Check pin adapter	-			QB-64-CA-01S	QB-100-CA-01S (sold separately)		QB-128-CA-01S (sold separately)
<11>	Space adapter	-			QB-64-SA-01S	QB-100-SA-01S (sold separately)		QB-144-SA-01S (sold separately)
<12>	Mount adapter	-			QB-64GB-MA-01S	QB-100GC-MA-01S (sold separately)		QB-128GF-MA-01S (sold separately)
<13>	Target connector	QB-40K8-TC-01S	QB-48GA-TC-01S	QB-48K8-TC-01S	QB-64GB-TC-01S	QB-100GC-TC-01S (sold separately)Note		QB-128GF-TC-01S (sold separately)Note

Table 1-4. List of Probe/Connector for Each Target Device (T Type)

No.	Name	Target Device to Be Emulated		
		V850ES/JG3-U (100-Pin GC)	V850ES/JG3-H (100-Pin GC)	V850ES/JH3-U, V850ES/JH3-H, V850ES/ST3 (128-Pin GF)
<6>	Check pin adapter	QB-144-CA-01 (sold separately)		
<7>	Extension probe (coaxial type)	QB-144-EP-01S (sold separately)		
<8>	Extension probe (flexible type)	QB-144-EP-02S (sold separately)		
<9>	Exchange adapter	QB-100GC-EA-05T (sold separately)Note	QB-100GC-EA-06T (sold separately)Note	QB-128GF-EA-02T (sold separately)Note
<10>	Space adapter	QB-100GC-YS-01T (sold separately)		QB-128GF-YS-01T (sold separately)
<11>	Mount adapter	QB-100GC-HQ-01T (sold separately)		QB-128GF-HQ-01T (sold separately)
<12>	YQ connector	QB-100GC-YQ-01T (sold separately)Note		QB-128GF-YQ-01T (sold separately)Note
<13>	Target connector	QB-100GC-NQ-01T (sold separately)Note		QB-128GF-NQ-01T (sold separately)Note

Note These accessories are supplied depending on the part number ordered (Refer to 1.5 Package Contents).

1.5 Package Contents

The following items have been placed in the QB-V850ESJX3H packing box. Please check the contents.

Products supplied with QB-V850ESJX3H-ZZZ

1: QB-V850ESJX3H
2: AC adapter
3: USB interface cable
4: ID850QB Disk (CD-ROM)
5: Accessory Disk (CD-ROM)
6: IECUBE Setup Manual (J/E)
7: User registration (Guarantee card and software contract in one)
8: Simple flash memory programmer QB-MINI2
9: Probe holder
10: Parts board (for clock)

Products supplied with QB-V850ESJX3H-S40K8

1 to 10
11: Exchange adapter QB-40K8-EA-01S
12: Target connector QB-40K8-TC-01S

Products supplied with QB-V850ESJX3H-S48GA

1 to 10
11: Exchange adapter QB-48GA-EA-01S
12: Target connector QB-48GA-TC-01S

Products supplied with QB-V850ESJX3H-S48K8

1 to 10
11: Exchange adapter QB-48K8-EA-01S
12: Target connector QB-48K8-TC-01S

Products supplied with QB-V850ESJX3H-S64GB

1 to 10
11: Exchange adapter QB-64GB-EA-02S
12: Target connector QB-64GB-TC-01S

Products supplied with QB-V850ESJX3H-S100GC

1 to 10
11: Exchange adapter (2 xxxxx) QB-100GC-EA-04S (V850ES/JG3-U)
QB-100GC-EA-05S (V850ES/JG3-H)
12: Target connector QB-100GC-TC-01S

Products supplied with QB-V850ESJX3H-T100GC

1 to 10
11: Exchange adapter (2 xxxxx) QB-100GC-EA-05T (V850ES/JG3-U)
QB-100GC-EA-06T (V850ES/JG3-H)
12: YQ connector QB-100GC-YQ-01T
13: Target connector QB-100GC-NQ-01T

Products supplied with QB-V850ESJX3H-S128GF

1 to 10

11:	Exchange adapter	QB-128GF-EA-01S
12:	YQ connector	QB-128GF-TC-01S

Products supplied with QB-V850ESJX3H-T128GF

1 to 10

11:	Exchange adapter	QB-128GF-EA-02T
12:	YQ connector	QB-128GF-YQ-01T
13:	Target connector	QB-128GF-NQ-01T

CHAPTER 2 SETUP PROCEDURE

This chapter explains the QB-V850ESJX3H setup procedure.
Setup can be completed by performing installation/setup in the order in which it appears in this chapter.
Perform setup along the lines of the following procedure.

Main clock settings

A 6 MHz resonator will be mounted upon shipment.
If 6 MHz is acceptable for the frequency of the resonator, the setting is not required to be changed.
If modification is necessary, see **2.2 Removal of Acrylic Board** and **2.3 Clock Settings**.

↓

Software settings

See **2.4 Software Settings**.

↓

Mounting and connecting connectors

When using the S Type, see **2.5 Mounting and Connecting Connectors (When Using S Type)**.
When using the T Type, see **2.6 Mounting and Connecting Connectors (When Using T Type)**.

↓

Connecting QB-V850ESJX3H to target system

See **2.7 Connecting QB-V850ESJX3H to Target System**.

- When not using the extension probe (QB-144-EP-01S/02S): see **2.7.1**.
- When using the extension probe (QB-144-EP-01S/02S): see **2.7.2**.

↓

Connecting USB interface cable and AC adapter

See **2.8 Connecting USB Interface Cable and AC Adapter**.

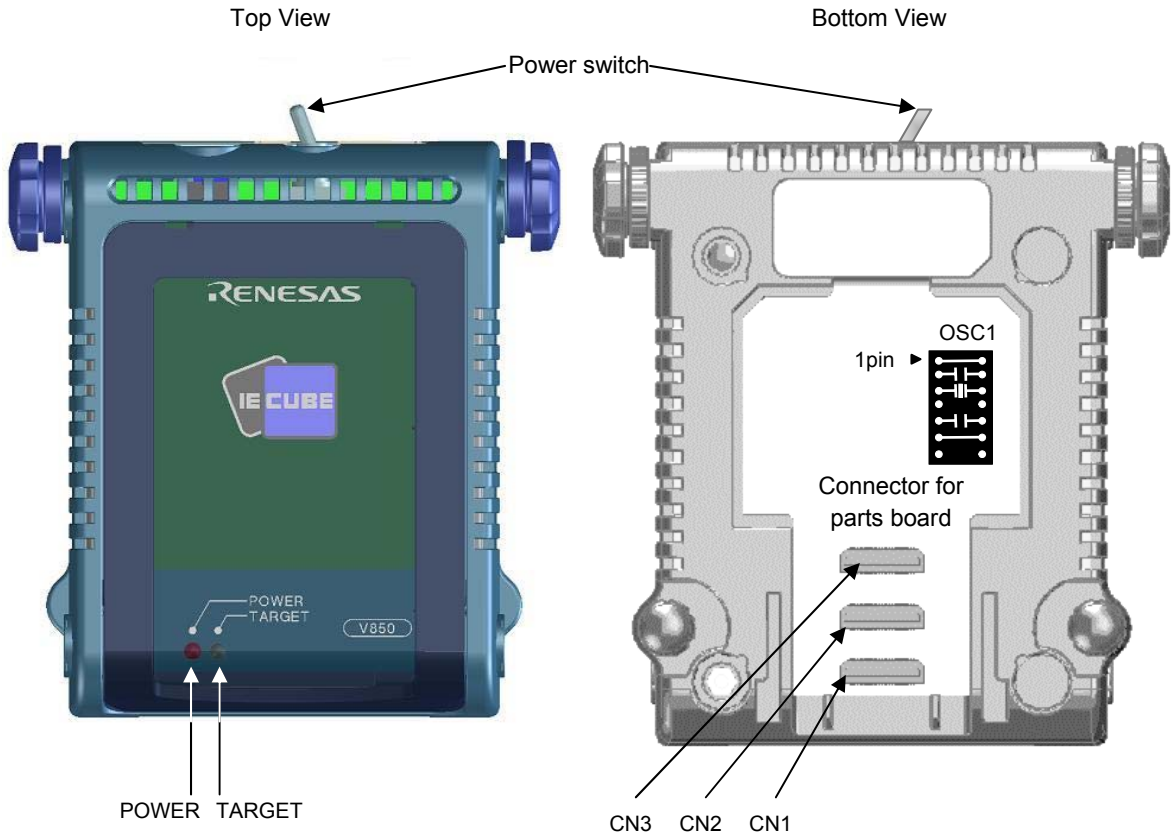
↓

Switching power on and off

See **2.9 Switching Power On and Off**

2.1 Names and Functions of Hardware

Figure 2-1. Names of Parts of QB-V850ESJX3H



(1) CN1, CN2, CN3

These connectors are used to connect the exchange adapter or extension probe.

(2) Parts board connector

This connector is used to mount an oscillator for the main clock.

(For details, refer to **2.3 Clock Settings**.)