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Renesas Electronics Corporation

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April 1, 2003

User's Manual

Bus Monitor for E6000 Emulator HS6000EBR01H

User's Manual

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SAFETY PAGE

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• **KEEP the user's manual handy for future reference.**

Do not attempt to use the emulator product until you fully understand its mechanism.

DEFINITION OF SIGNAL WORDS

DANGER indicates an **imminently** hazardous situation which, **if not avoided,** will result in **DEATH** or **SERIOUS INJURY** to you or other people.

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NOTE emphasizes essential information.

⚠ WARNING

Observe the precautions listed below. Failure to do so will result in a FIRE HAZARD and will damage the bus monitor board, the host computer, and the emulator product or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

1. **Always switch OFF the emulator and host computer before connecting or disconnecting any CABLES, BOARDS, or PARTS.**
2. **Always before installing the bus monitor board into the emulator, make sure that the connectors of the bus monitor board and emulator are correctly aligned.**

Preface

Thank you for purchasing the bus monitor (HS6000EBR01H) for the E6000 emulator.

The bus monitor for the E6000 emulator (hereafter called the bus monitor) monitors the memory contents during user program execution in the E6000 emulator, without stopping the execution.

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Section 1 Specifications

Table 1 lists the bus monitor specifications.

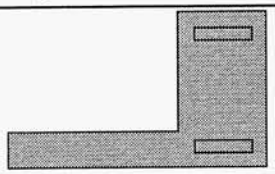
Table 1 Bus Monitor Specifications

Item	Specifications
Emulator	H8/300, H8/300L, and H8/300H series E6000 emulators. (Some versions of these emulators cannot be connected to the bus monitor. For details, refer to the corresponding emulator manual.)
Bus monitor functions	Up to eight continuous 256-byte blocks of memory can be monitored. The monitored data displayed in the HDI window is updated every second during user program execution.
Trigger functions	A trigger signal is output when the specified address is accessed. Up to four addresses can be specified.
External dimensions	155 × 134 (mm)
Weight	70 g
Temperature	Operating: 10°C to 35°C Storage: −10°C to 50°C
Humidity	Operating: 35%RH to 80%RH (no condensation) Storage: 35%RH to 80%RH (no condensation)
Vibration	Operating: 2.45 m/s^2 max. Storage: 4.9 m/s^2 max. Transportation: 14.7 m/s^2 max.
Ambient gases	No corrosive gases
Power-supply voltage	5.0 V ± 0.25 V (supplied from the E6000 emulator)
Current consumption	500 mA

Section 2 Components

Table 2 lists the bus monitor components.

Table 2 Components

Item	Product Name	Configuration	Quantity	Remarks
Hardware	Bus monitor board		1	—
	Screw		3	—
Manual	User's manual (this manual)		1	HS6000EBR01HE

Section 3 Preparation before Use

3.1 Connecting to E6000 Emulator

⚠ WARNING

Always switch OFF the emulator product, user system, and host computer, and make sure that the connectors are correctly aligned before connecting or disconnecting the BUS MONITOR BOARD. Failure to do so will result in a FIRE HAZARD and will damage the bus monitor, the host computer, and the emulator product or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

Connect the bus monitor board to the E6000 emulator by the following procedure:

1. Check that the E6000 emulator is turned off and remove the AC adapter from the AC outlet.
2. Remove the four screws from the E6000 emulator and remove the cover of the E6000 emulator.
3. If the optional memory (SIMM) is installed, remove it.
4. Align the 60-pin connectors as shown in figure 1, press the bus monitor board down until the connectors are locked, and fix the bus monitor board with the supplied three screws.
5. Insert the optional memory (SIMM), if removed at step 3.
6. To use trigger output signals, connect the external probes supplied together with the E6000 emulator to the bus monitor board.

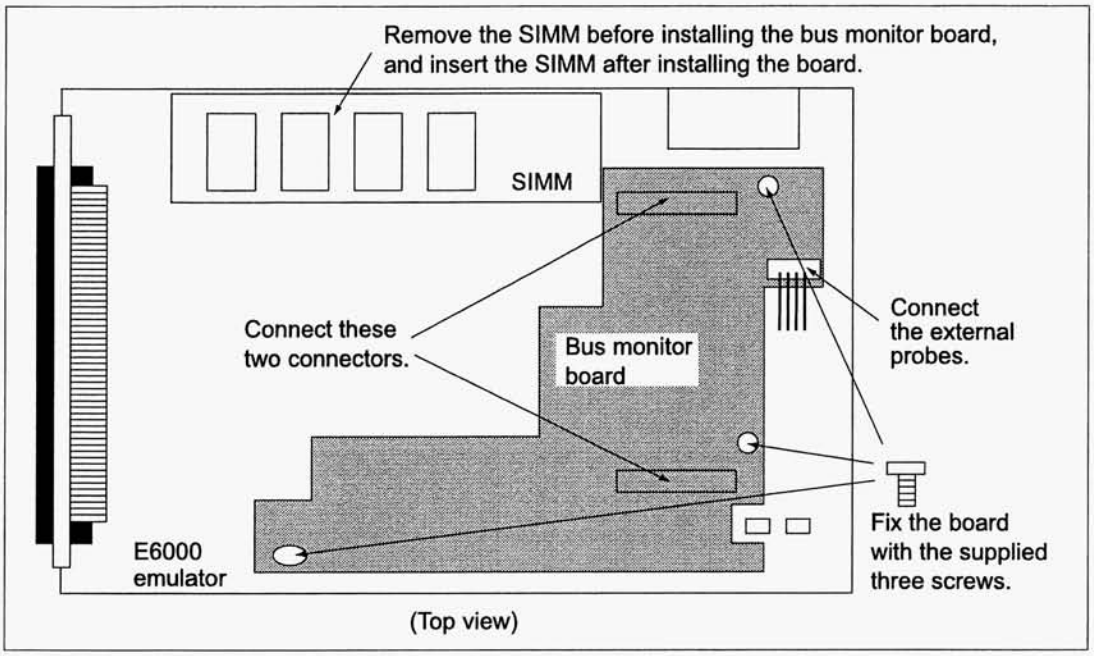


Figure 1 Connecting to E6000 Emulator

Section 4 Trigger Output Signals

Figure 2 shows the trigger pin arrangement, and figure 3 shows an example of the trigger output signal waveform.

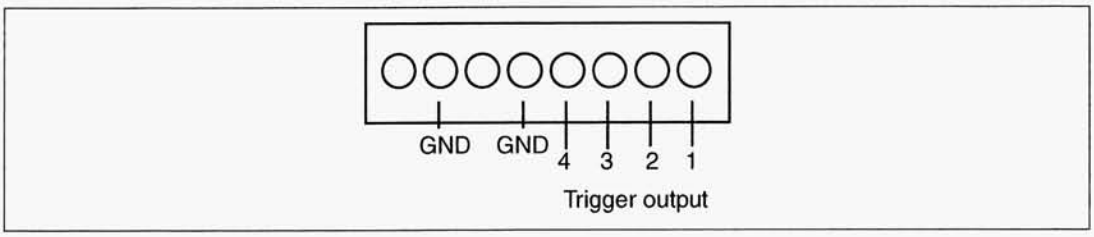


Figure 2 Trigger Pin Arrangement

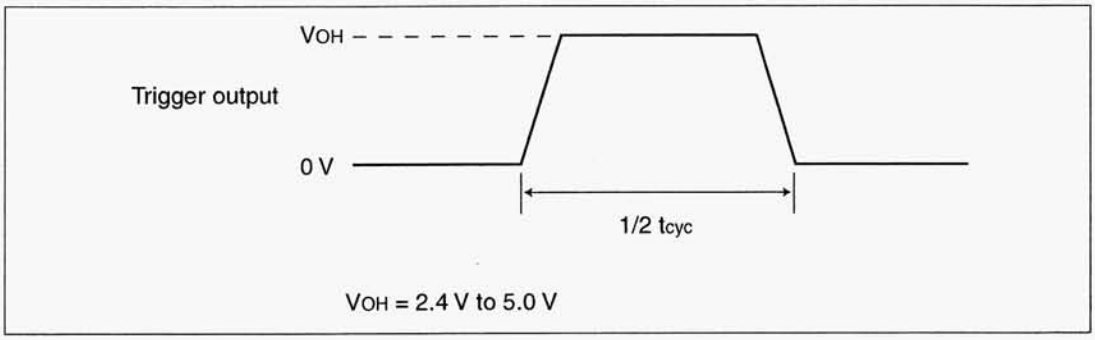


Figure 3 Trigger Output Signal Waveform

Section 5 Operating Procedures

5.1 Initializing Bus Monitor

After initiating or initializing the HDI, select the **Bus Monitor Window...** from the **View** menu. The following message box will open.

Figure 4 Bus Monitor Initialization Message Box

<OK>: Closes the message box and opens the **Open Bus Monitor Menu** dialog box.

5.2 Open Bus Monitor Menu Dialog Box

Selecting the **Bus monitor Window...** from the **View** menu will open the following message box.

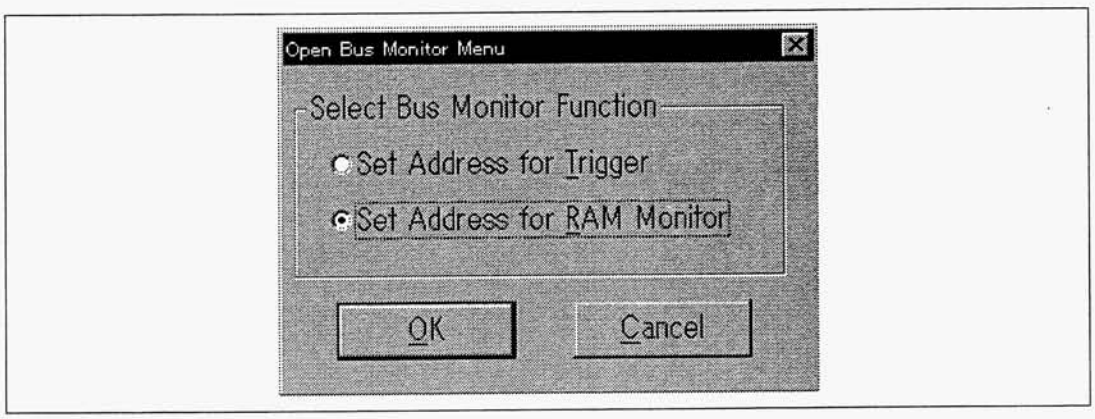


Figure 5 Open Bus Monitor Menu Dialog Box

Select a function in the dialog box: the trigger output function (`Set Address for Trigger`) or the RAM monitor function (`Set Address for RAM Monitor`).

Trigger Output Function: The bus monitor has four trigger output pins. Specify trigger addresses, and the bus monitor will output a trigger signal when one of the specified address is accessed during user program execution.

RAM Monitor Function: The bus monitor has 8-channel 256-byte monitor memory. The monitor memory data will be updated during user program execution.

<OK>: Closes the dialog box and opens the dialog box for the selected function. Specify the detailed conditions in the opened dialog box.

<Cancel>: Closed the dialog box.

5.3 Set Address For Trigger Dialog Box

Selecting the `Set Address for Trigger` in the **Open Bus Monitor Menu** dialog box and clicking the <OK> button will open the following dialog box.

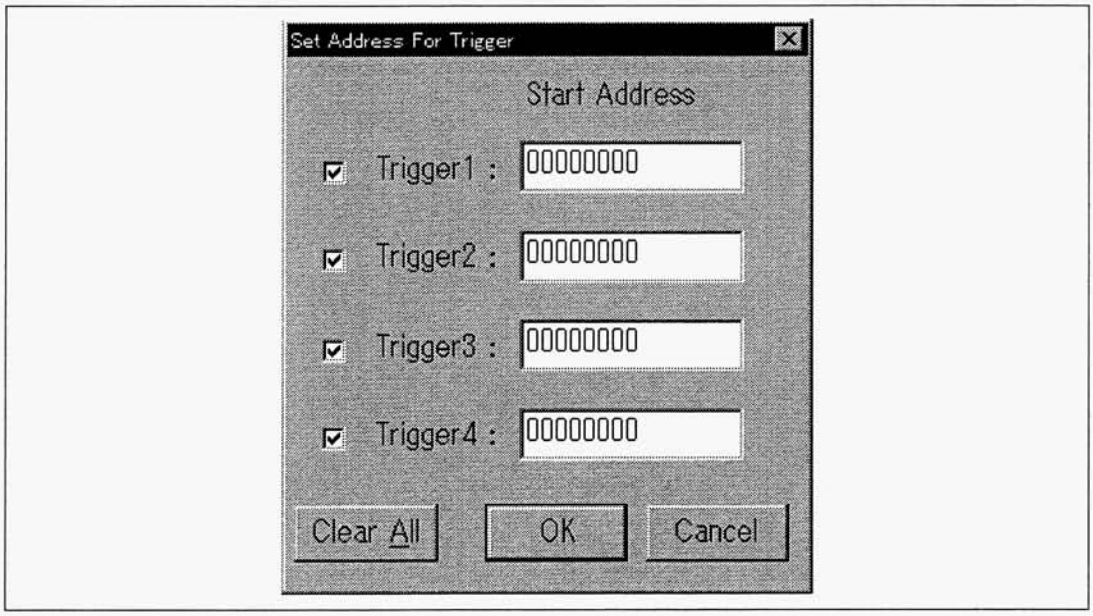


Figure 6 Set Address For Trigger Dialog Box

Up to four trigger addresses can be specified. Trigger output signals are used when a logic analyzer is connected to the bus monitor.

Selecting the check box by clicking on it enables the corresponding trigger address.

<Clear All>: Clears all trigger addresses.

<OK>: Stores the trigger conditions and closes the dialog box.

<Cancel>: Closes the dialog box.

5.4 Set Address For RAM Monitor Dialog Box

Selecting the `Set Address for RAM Monitor` in the **Open Bus Monitor Menu** dialog box and clicking the <OK> button will open the following dialog box.

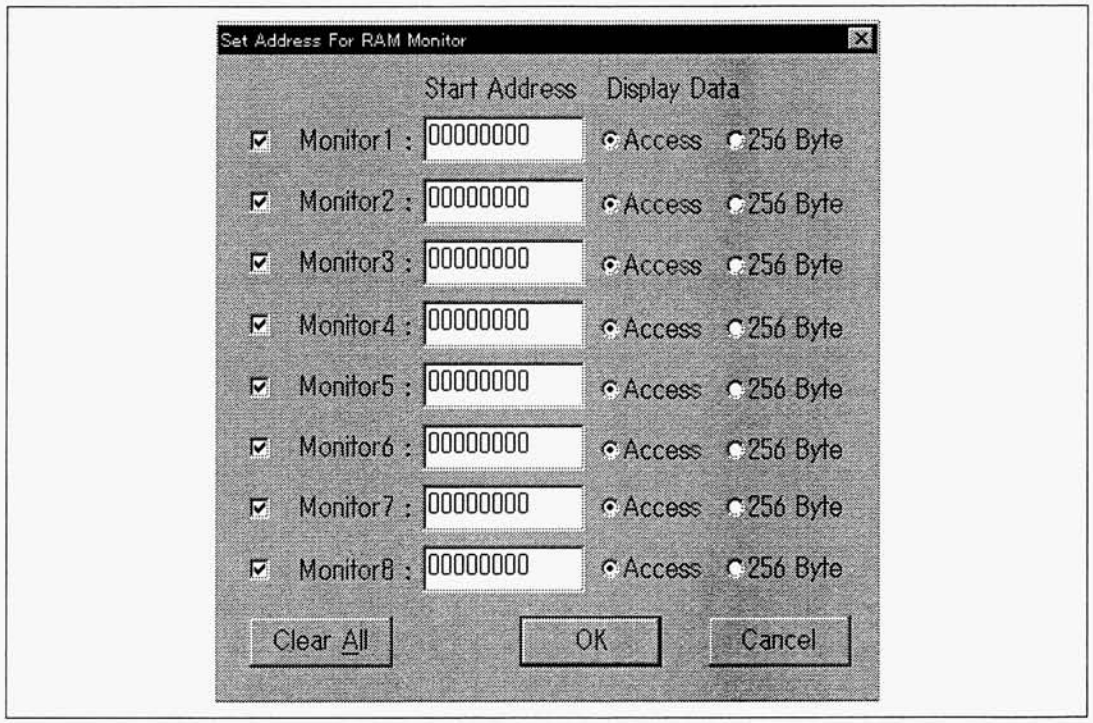


Figure 7 Set Address For RAM Monitor Dialog Box

Up to eight RAM monitor addresses can be specified (H'00000000 to H'0000FF00 for H8/300 and H8/300L series, and H'00000000 to H'00FFFF00 for H8/300H series). The same address cannot be specified for two or more points.

The bus monitor watches the 256-byte RAM area starting from the specified address.

Selecting the check box by clicking on it enables the corresponding monitor point.

The monitored data will be displayed in two ways: selecting `Access` under the `Display Data` will display only the accessed data, and selecting `256 Byte` will display all data in the 256-byte area.

<Clear All>: Clears all monitor addresses.

<OK>: Stores the monitor conditions and closes the dialog box.

<Cancel>: Closes the dialog box.

5.5 RAM Monitor Display For Address X Setting Window (X: 1 to 8)

Specifying an address in the **Set Address For RAM Monitor** dialog box and clicking the <OK> button will open the following window. Windows will open for the number of monitor addresses enabled in the **Set Address For RAM Monitor** dialog box.

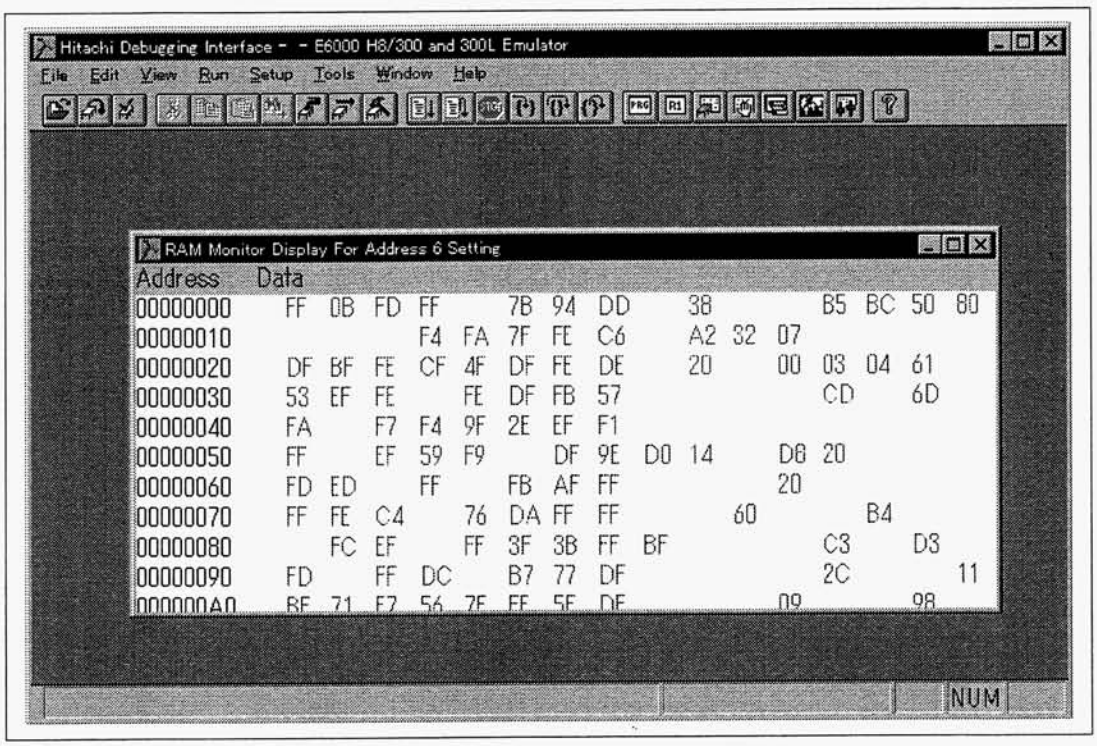


Figure 8 RAM Monitor Display For Address X Setting Window

The display will be updated during user program execution. The display format depends on the `Display Data` setting (`Access` or `256 Byte`) in the **Set Address For RAM Monitor** dialog box.

When `Access` is selected, the window displays only the accessed data and displays the most recently accessed data in red. When `256 Byte` is selected, the window displays 256-byte data and displays all accessed data in red.

5.5.1 Pop-Up Menu

Clicking the right mouse button on the window will display a pop-up menu.

<Set 8point Address>: Opens the **Set Address For RAM Monitor** dialog box.

<Set Address...>: Opens the dialog box for changing the start address of the monitor area for the window.

<Set Trigger...>: Opens the **Set Address For Trigger** dialog box.

<Display Data access>: Changes `Display Data (Access/256 Byte)`

<Clear Screen...>: Returns the window display to the state when no data has been accessed.

<Update Screen>: Updates the display data when the memory contents are modified after the user program execution stops.

5.5.2 RAM Monitor Address Editing (Set Address) Dialog Box

Selecting <Set Address...> from the pop-up menu will open the following dialog box.

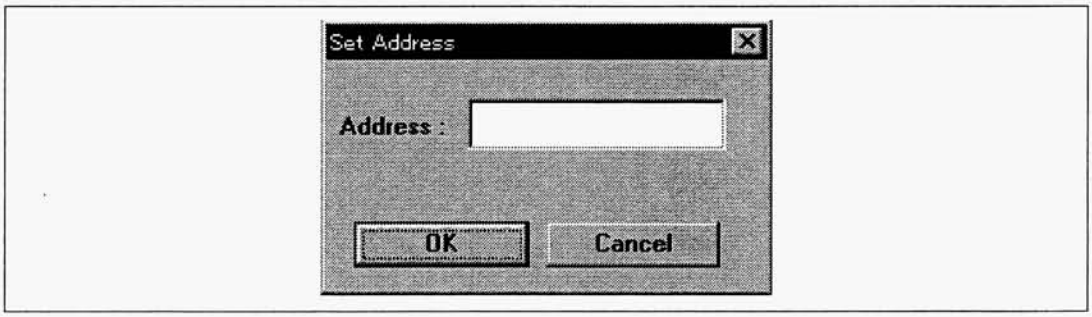


Figure 9 Set Address Dialog Box

Enter the new start address for the monitor area displayed in the window (H'00000000 to H'0000FF00 for H8/300 and H8/300L series, and H'00000000 to H'00FFFF00 for H8/300H series).

<OK>: Closes the dialog box and displays the area corresponding to the new address.

<Cancel>: Closes the dialog box.

Note: If data is not displayed correctly after address modification, select <Clear Screen...> from the pop-up menu.

Section 6 Bus Monitor Information Loading and Saving

6.1 E6000BUS.HDB File

The E6000BUS.HDB file provided in the HDI installation directory is used to load and save the bus monitor information.

The settings during the last session are saved in the file, that is, the four trigger addresses, eight RAM monitor addresses, enabled or disabled state for each condition, and display format for each RAM monitor window.

6.2 Loading Bus Monitor Information

The E6000BUS.HDB contents will be automatically loaded into the emulator when the **Bus Monitor Window...** is selected from the **View** menu. If this file cannot be found, the **Open Bus Monitor Menu** dialog box will be open with the HDI default settings.

6.3 Saving Bus Monitor Information

When the <OK> button is clicked in the **Set Address For Trigger** or **Set Address For RAM Monitor** dialog box, the E6000BUS.HDB file will be overwritten by the current settings. If this file cannot be found, a file with the same name (E6000BUS.HDB) will be automatically created.

Section 7 Notes on Use

1. The contents of software breakpoint addresses are replaced with break instructions by the HDI. However, this replacement is performed immediately before Go command execution, and therefore, even if the area including a software breakpoint is specified as the monitoring area, the original program contents will be displayed immediately after the `256 Byte` is specified as a monitoring condition.
2. When `256 Byte` is selected, the contents of the specified addresses are all read before program execution and displayed in the monitor window as initial data. For the registers whose contents are affected by read accesses, do not specify `256 Byte`.
3. The bus monitor function cannot be used while in subactive mode.