E8a Emulator
R0E00008AKCE00EP33

Renesas Microcomputer Development Environment System
740 Family / 38000/740 Series
Notes on Connecting the 38D5, 38D2, 3803L and 3804L

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</tbody>
</table>

This user’s manual is applicable to the E8a emulator software V.1.02 Release 00 or later.
Section 1  Inside the E8a Emulator User’s Manual


(1) E8a Emulator User’s Manual
The E8a Emulator User’s Manual describes the hardware specifications and how to use the emulator debugger.

- E8a emulator hardware specifications
- Connecting the E8a emulator to the host computer or user system
- Operating the E8a emulator debugger
- Tutorial: From starting up the E8a emulator debugger to debugging

(2) E8a Additional Document for User’s Manual
The E8a Additional Document for User’s Manual describes content dependent on the MCUs and precautionary notes.

- MCU resources used by the E8a emulator
- Example of the E8a emulator connection or interface circuit necessary for designing the hardware
- Notes on using the E8a emulator
- Setting the E8a emulator debugger during startup
Section 2  E8a Emulator Specifications

Table 2.1 shows the E8a emulator specifications for the 38D5, 38D2, 3803L and 3804L Groups.

<table>
<thead>
<tr>
<th>Table 2.1  E8a Emulator Specifications for the 38D5, 38D2, 3803L and 3804L Groups</th>
</tr>
</thead>
</table>
| **Target MCUs** | 740 Family  
38D5, 38D2, 3803L and 3804L Groups |
| **Available operating modes** | Single-chip mode |
| **Break functions** | - Address match break, 2 points  
- PC break points (maximum 255 points)  
- Forced break |
| **Trace functions** | None |
| **Flash memory programming function** | Available |
| **User interface** | Clock-synchronized serial |
| **MCU resources to be used** | - ROM size: 600h bytes (1536 bytes)  
- RAM size: 50h bytes (80 bytes)  
- Stack 5 bytes  
- Address match interrupt |
| **Emulator power supply** | Unnecessary (USB bus powered, power supplied from the PC) |
| **Interface with host machine** | USB (USB 1.1, full speed)  
* Also connectable to host computers that support USB 2.0 |
| **Power supply function** | Can supply 3.3 V or 5.0 V to the user system (maximum 300 mA) |
| **Power voltages** | 2.7 - 5.5 V |

Table 2.2 shows the operating environment of the E8a emulator.

<table>
<thead>
<tr>
<th>Table 2.2  Operating Environment</th>
</tr>
</thead>
</table>
| **Temperatures** | Active : 10°C to 35°C  
Inactive : −10°C to 50°C |
| **Humidity** | Active : 35% RH to 80% RH, no condensation  
Inactive : 35% RH to 80% RH, no condensation |
| **Vibrations** | Active : maximum 2.45 m/s²  
Inactive : maximum 4.9 m/s²  
Transportation : maximum 14.7 m/s² |
| **Ambient gases** | No corrosive gases |
Section 3  Connecting the E8a Emulator to the User System

Before connecting the E8a emulator to the user system, a connector must be installed in the user system so a user system interface cable can be connected. When designing the user system, refer to Figure 4.1 “E8a Connecting Connector Pin Assignments” and Figures 5.1 to 5.12 “Example of an E8a Connection”. Before designing the user system, be sure to read the E8a Emulator User’s Manual and related device hardware manuals.

Table 3.1 shows the recommended connector for the E8a emulator.

<table>
<thead>
<tr>
<th>Type Number</th>
<th>Manufacturer</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2514-6002</td>
<td>3M Limited</td>
<td>14-pin straight type</td>
</tr>
</tbody>
</table>

Connect E8a connecting connector pins 2, 6, 10, 12 and 14 firmly to the GND on the user system board. These pins are used as an electric GND and monitor the connection of the user system connector. Note the pin assignments for the user system connector.

![Figure 3.1 Connecting the User System Interface Cable with an E8a Connecting Connector](image)

**Notes:**
1. Do not place any components within 3 mm area of the connector.
2. When using the E8a emulator as a programmer, connect it to the user system in the same way.
Section 4  E8a Connecting Connector Pin Assignments

Figure 4.1 shows the pin assignments for the E8a connecting connector.

<table>
<thead>
<tr>
<th>Pin NO.</th>
<th>38D5 MCU signals</th>
<th>38D2 MCU signals</th>
<th>3803L/3804L MCU signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P42 (SCLK1)</td>
<td>P31 (SCLK2)</td>
<td>P46 (SCLK1)</td>
</tr>
<tr>
<td>2</td>
<td>Vss</td>
<td>Vss</td>
<td>Vss</td>
</tr>
<tr>
<td>3</td>
<td>CNVss</td>
<td>CNVss</td>
<td>CNVss</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>5</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>Vss</td>
<td>Vss</td>
<td>Vss</td>
</tr>
<tr>
<td>7</td>
<td>P41 (TxD)</td>
<td>P32 (TxD2)</td>
<td>P45 (TxD1)</td>
</tr>
<tr>
<td>8</td>
<td>Vcc</td>
<td>Vcc</td>
<td>Vcc</td>
</tr>
<tr>
<td>9</td>
<td>P43 (SRDY1)</td>
<td>P30 (SRDY2)</td>
<td>P47 (SRDY1)</td>
</tr>
<tr>
<td>10</td>
<td>Vss</td>
<td>Vss</td>
<td>Vss</td>
</tr>
<tr>
<td>11</td>
<td>P40 (RxD)</td>
<td>P33 (RxD2)</td>
<td>P44 (RxD1)</td>
</tr>
<tr>
<td>12</td>
<td>Vss</td>
<td>Vss</td>
<td>Vss</td>
</tr>
<tr>
<td>13</td>
<td>RESET</td>
<td>RESET</td>
<td>RESET</td>
</tr>
<tr>
<td>14</td>
<td>Vss</td>
<td>Vss</td>
<td>Vss</td>
</tr>
</tbody>
</table>

Note:
Pin 14 is used for checking the connection between the E8a and the user system, and pins 6 and 10 are connected to the internal circuit. These pins are not directly connected to the Vss inside the E8a. Make sure pins 2, 6, 10, 12 and 14 are all connected to the Vss.
Section 5  Examples of E8a Connections

(1) Connection example of the 38D5

Figure 5.1 shows a connection example of the 38D5. When using the emulator as a programmer, the connection specification between the E8a and the MCUs is the same as shown in Figure 5.1.

Note:
1. For details on setting pins P40, P42 and P43, refer to “Points to Remember for the 38D5” on page 6.
Points to Remember for the 38D5

1. Pins P40, P41, P42 and P43 are used exclusively by the E8a emulator. Connect the E8a emulator to the MCU pins. For P41, pull up an MCU pin and then connect it to the emulator. Pull up or down on P40, P42 and P43 according to the MCU pin state after disconnecting the E8a emulator. P43 may be in a Hiz state while the E8a emulator is active. Therefore, set the pin resistance value so the voltage cannot be at the midpoint potential, depending on the voltage dividing of the resistance inside the E8a emulator (Figure 5.13).

![Figure 5.2 E8a Emulator and MCU Connection](image)

2. The E8a emulator uses the CNVss pin for MCU control. Pull down the E8a emulator and MCU pins and connect the E8a emulator.

![Figure 5.3 E8a Emulator and CNVss Pin Connection](image)
3. The **RESET** pin is used by the E8a emulator. Therefore, use an open-collector output buffer or a CR reset circuit as the reset circuit for the user system. The recommended pull-up value is 4.7 kΩ or more. The MCU can be reset by outputting “L” from the E8a emulator. However, if the reset IC output is “H”, the user system reset circuit cannot be set to “L”. As such, the E8a emulator will not operate normally.

![Diagram of a Reset Circuit]

Figure 5.4 Example of a Reset Circuit

4. Connect Vss and Vcc to the Vss and Vcc of the MCU, respectively.
5. Do not connect anything to the N.C. pin.
6. The amount of voltage input to Vcc must be within the specified range of the MCU.
7. Pin 14 is used for checking the connection between the E8a and the user system, and pins 6 and 10 are connected to the internal circuit. These pins are not directly connected to the Vss inside the E8a. Make sure pins 2, 6, 10, 12 and 14 are all connected to the Vss.
(2) Connection example of the 38D2

Figure 5.5 shows a connection example of the 38D2. When using the emulator as a programmer, the connection specification between the E8a and the MCUs is the same as shown in Figure 5.5.

Note:
1. For details on setting pins P30, P31 and P33, refer to “Points to Remember for the 38D2” on page 9.
Points to Remember for the 38D2

1. Pins P30, P31, P32 and P33 are used exclusively by the E8a emulator. Connect the E8a emulator to the MCU pins. For P32, pull up an MCU pin and then connect it to the emulator. Pull up or down on P30, P31 and P33 according to the MCU pin state after disconnecting the E8a emulator. P30 may be in a Hiz state while the E8a emulator is active. Therefore, set the pin resistance value so the voltage cannot be at the midpoint potential, depending on the voltage dividing of the resistance inside the E8a emulator (Figure 5.13).

![Figure 5.6 E8a Emulator and MCU Connection](image)

2. The E8a emulator uses the CNVss pin for MCU control. Pull down the E8a emulator and MCU pins and connect the E8a emulator.

![Figure 5.7 E8a Emulator and CNVss Pin Connection](image)
3. The **RESET** pin is used by the E8a emulator. Therefore, use an open-collector output buffer or a CR reset circuit as the reset circuit for the user system. The recommended pull-up value is 4.7 kΩ or more. The MCU can be reset by outputting “L” from the E8a emulator. However, if the reset IC output is “H”, the user system reset circuit cannot be set to “L”. As such, the E8a emulator will not operate normally.

![Figure 5.8 Example of a Reset Circuit](image)

4. Connect Vss and Vcc to the Vss and Vcc of the MCU, respectively.
5. Do not connect anything to the N.C. pin.
6. The amount of voltage input to Vcc must be within the specified range of the MCU.
7. Pin 14 is used for checking the connection between the E8a and the user system, and pins 6 and 10 are connected to the internal circuit. These pins are not directly connected to the Vss inside the E8a. Make sure pins 2, 6, 10, 12 and 14 are all connected to the Vss.
(3) Connection example of the 3803L and 3804L

Figure 5.9 shows a connection example of the 3803L and 3804L. When using the emulator as a programmer, the connection specification between the E8a and the MCUs is the same as shown in Figure 5.9.

![Diagram](image)

**Figure 5.9  Example of an E8a Connection (3803L and 3804L)**

Note:
1. For details on setting pins P44, P46 and P47, refer to “Points to Remember for the 3803L and 3804L” on page 12.
Points to Remember for the 3803L and 3804L

1. Pins P44, P45, P46 and P47 are used exclusively by the E8a emulator. Connect the E8a emulator to the MCU pins. For P45, pull up an MCU pin and then connect it to the emulator. Pull up or down on P44, P46 and P47 according to the MCU pin state after disconnecting the E8a emulator. P47 may be in a Hiz state while the E8a emulator is active. Therefore, set the pin resistance value so the voltage cannot be at the midpoint potential, depending on the voltage dividing of the resistance inside the E8a emulator (Figure 5.13).

2. The E8a emulator uses the CNVss pin for MCU control. Pull down the E8a emulator and MCU pins and connect the E8a emulator.
3. The RESET pin is used by the E8a emulator. Therefore, use an open-collector output buffer or a CR reset circuit as the reset circuit for the user system. The recommended pull-up value is 4.7 kΩ or more. The MCU can be reset by outputting “L” from the E8a emulator. However, if the reset IC output is “H”, the user system reset circuit cannot be set to “L”. As such, the E8a emulator will not operate normally.

![Figure 5.12 Example of a Reset Circuit](image)

4. Connect Vss and Vcc to the Vss and Vcc of the MCU, respectively.
5. Do not connect anything to the N.C. pin.
6. The amount of voltage input to Vcc must be within the specified range of the MCU.
7. Pin 14 is used for checking the connection between the E8a and the user system, and pins 6 and 10 are connected to the internal circuit. These pins are not directly connected to the Vss inside the E8a. Make sure pins 2, 6, 10, 12 and 14 are all connected to the Vss.
(4) Interface circuit inside the E8a emulator

Figure 5.13 shows the interface circuit in the E8a emulator. Use this figure as a reference when determining the pull-up resistance value.

Figure 5.13  Interface Circuit inside the E8a Emulator (For Reference)
Section 6  Notes on Using the E8a Emulator

1. Program area for the E8a emulator

Table 6.1 lists the program areas allotted for the E8a emulator. Do not change this area allocation.

Table 6.1  Program Area for the E8a Emulator

<table>
<thead>
<tr>
<th>Group</th>
<th>ROM Area</th>
<th>RAM Size</th>
<th>Program Area for E8a Emulator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Programming Area</td>
<td>Data Area</td>
<td>Vector Area</td>
</tr>
<tr>
<td>38D5</td>
<td>58 KB</td>
<td>2 KB</td>
<td>2 KB</td>
</tr>
<tr>
<td>38D2</td>
<td>58 KB</td>
<td>2 KB</td>
<td>2 KB</td>
</tr>
<tr>
<td>3803L</td>
<td>58 KB</td>
<td>2 KB</td>
<td>2 KB</td>
</tr>
<tr>
<td>3804L</td>
<td>58 KB</td>
<td>2 KB</td>
<td>2 KB</td>
</tr>
</tbody>
</table>

2. I Flag Setup

(1) Setup in the user program

In the user program, avoid setting I flag to “1” (interrupt disabled). [*1]

Note:

1. In cases where I flag is “1” (interrupt disabled), it is impossible to use the following functions effectuated by serial I/O 1 receive interrupt:
   - Memory reference and memory rewriting during user program execution
   - Automatic watch window update during user program execution
   - User program stop by STOP button

Note that PC break and address match break can be used even when I flag is “1” (interrupt disabled) since these breaks are not affected by I flag.
3. After a reset is released, the E8a emulator initializes the general registers and some of the flag registers as shown in Table 6.2.

<table>
<thead>
<tr>
<th>Status</th>
<th>Register</th>
<th>Initial Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>After a reset is released</td>
<td>PC</td>
<td>Reset vector value in the vector address table</td>
</tr>
<tr>
<td></td>
<td>A, X and Y</td>
<td>00h</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>FFh</td>
</tr>
<tr>
<td></td>
<td>PS</td>
<td>00h</td>
</tr>
</tbody>
</table>

4. The E8a emulator communicates with the MCU by using the RxD, TxD, SCLK, BUSY, **RESET** and CNVss pins.

5. The E8a emulator uses up to 5 bytes of the stack pointer during a user program break. Therefore, set aside 5 bytes for the stack area.

6. SFRs used by the E8a emulator program
As the SFRs listed in Tables 6.3, 6.4 and 6.5 are used by the E8a emulator program, do not change any of these values. If these values are changed, the E8a emulator cannot control the MCU. These registers are not initialized by selecting [Debug] -> [Reset CPU] or by using the RESET command. If register contents are referred to, a value that has been set in the E8a emulator program will be read out.

<table>
<thead>
<tr>
<th>Address</th>
<th>Register</th>
<th>Symbol</th>
<th>Bit</th>
<th>Notes on using the E8a emulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0018h</td>
<td>Transmit 1/receive 1 buffer register</td>
<td>TB1/RB1</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0019h</td>
<td>Serial I/O 1 status register</td>
<td>SIO1STS</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>001Ah</td>
<td>Serial I/O 1 control register</td>
<td>SIO1CON</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0018h</td>
<td>UART1 control register</td>
<td>UART1CON</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0008h</td>
<td>Port P4 data register</td>
<td>P4</td>
<td>Bits 0, 1, 2 and 3</td>
<td>[*2]</td>
</tr>
<tr>
<td>0009h</td>
<td>Port P4 direction register</td>
<td>P4D</td>
<td>Bits 0, 1, 2 and 3</td>
<td>[*2]</td>
</tr>
<tr>
<td>003Dh</td>
<td>Interrupt request register 2</td>
<td>IREQ2</td>
<td>Bit 1</td>
<td>[*2]</td>
</tr>
<tr>
<td>003Fh</td>
<td>Interrupt control register 2</td>
<td>ICON2</td>
<td>Bit 1</td>
<td>[*2]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Register</th>
<th>Symbol</th>
<th>Bit</th>
<th>Notes on using the E8a emulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>001Dh</td>
<td>Transmit 2/receive 2 buffer register</td>
<td>TB2/RB2</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>001Eh</td>
<td>Serial I/O 2 status register</td>
<td>SIO2STS</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>001Fh</td>
<td>Serial I/O 2 control register</td>
<td>SIO2CON</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0FF1h</td>
<td>UART2 control register</td>
<td>UART2CON</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0006h</td>
<td>Port P3 data register</td>
<td>P3</td>
<td>Bits 0, 1, 2 and 3</td>
<td>[*2]</td>
</tr>
<tr>
<td>0007h</td>
<td>Port P3 direction register</td>
<td>P3D</td>
<td>Bits 0, 1, 2 and 3</td>
<td>[*2]</td>
</tr>
<tr>
<td>003Dh</td>
<td>Interrupt request register 2</td>
<td>IREQ2</td>
<td>Bit 3</td>
<td>[*2]</td>
</tr>
<tr>
<td>003Fh</td>
<td>Interrupt control register 2</td>
<td>ICON2</td>
<td>Bit 3</td>
<td>[*2]</td>
</tr>
</tbody>
</table>
Table 6.5  SFRs Used by the E8a Emulator Program (3803L and 3804L)

<table>
<thead>
<tr>
<th>Address</th>
<th>Register</th>
<th>Symbol</th>
<th>Bit</th>
<th>Notes on using the E8a emulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0018h</td>
<td>Transmit 1/receive 1 buffer register</td>
<td>TB1/RB1</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0019h</td>
<td>Serial I/O 1 status register</td>
<td>SIO1STS</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>001Ah</td>
<td>Serial I/O 1 control register</td>
<td>SIO1CON</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>001Bh</td>
<td>UART1 control register</td>
<td>UART1CON</td>
<td>All bits</td>
<td>[*1]</td>
</tr>
<tr>
<td>0008h</td>
<td>Port P4 data register</td>
<td>P4</td>
<td>Bits 4, 5, 6 and 7</td>
<td>[*2]</td>
</tr>
<tr>
<td>0009h</td>
<td>Port P4 direction register</td>
<td>P4D</td>
<td>Bits 4, 5, 6 and 7</td>
<td>[*2]</td>
</tr>
<tr>
<td>003Dh</td>
<td>Interrupt request register 1</td>
<td>IREQ1</td>
<td>Bit 2</td>
<td>[*2]</td>
</tr>
<tr>
<td>003Fh</td>
<td>Interrupt control register 1</td>
<td>ICON1</td>
<td>Bit 2</td>
<td>[*2]</td>
</tr>
</tbody>
</table>

Notes:
1. Do not change this register value.
2. Do not change the value of the bits listed in the column to the left. When operating this register, make changes using the bit operation instructions to avoid changing the bit values.

7. Interrupts used by the E8a emulator program
   The BRK instruction interrupt and serial I/O 1 receive interrupt are used by the E8a emulator program. Therefore, make sure the user program does not use any of these interrupts.

8. Watchdog timer operation
   Do not operate the watchdog timer.

9. Flash memory ID code
   This MCU function prevents the Flash memory from being read out by anyone other than the user. The ID code in Table 6.6 written to the flash memory of the MCU must match the ID code displayed in the Figure 6.1 [ID Code verification] dialog box at debugger startup, otherwise the debugger cannot be launched. Note that when the ID code is FFh, FFh, FFh, FFh, FFh, FFh, FFh, FFh, the ID code is regarded as undefined. In this case, the ID code is automatically authenticated and the [ID Code verification] dialog box is not displayed.
   In ‘Program Flash’ mode, the contents of the user program are input into the ID code area. When debugging in other modes, FFh, FFh, FFh, FFh, FFh, FFh, FFh, FFh is written into the ID code area regardless of the contents of the downloaded user program.

Table 6.6  ID Code Storage Area of 38D5, 38D2, 3803L and 3804L

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFD4h</td>
<td>First byte of ID code</td>
</tr>
<tr>
<td>FFD5h</td>
<td>Second byte of ID code</td>
</tr>
<tr>
<td>FFD6h</td>
<td>Third byte of ID code</td>
</tr>
<tr>
<td>FFD7h</td>
<td>Fourth byte of ID code</td>
</tr>
<tr>
<td>FFD8h</td>
<td>Fifth byte of ID code</td>
</tr>
<tr>
<td>FFD9h</td>
<td>Sixth byte of ID code</td>
</tr>
<tr>
<td>FFDAh</td>
<td>Seventh byte of ID code</td>
</tr>
</tbody>
</table>
10. Operation clock during a user program halt
   While the user program halts, the E8a emulator program changes the main clock divide-by-N value to operate.

11. Reset
   The reset vector is used by the E8a emulator program. If the MCU is reset while executing the user program, control is transferred to the E8a emulator program and the user program is forced to stop.

12. Memory access during emulation execution
   When referring to or modifying the memory contents, the user program is temporarily halted. For this reason, a real-time emulation cannot be performed.

13. When the E8a emulator does not supply power to the user system, it consumes the power voltage of the user system from several mA to more than 10 mA. This is because the user power supply drives 74LVC125, 74LVC1T45 and 74LVC2T45 to make the communication signal level match the user system power supply voltage.

14. When debugging, the Flash memory is frequently rewritten by the E8a emulator. Therefore, do not use an MCU that has been used for debugging in products. Also, as the E8a emulator program is written to the MCU while debugging, do not save the contents of the MCU Flash memory which were used for debugging nor use them as the ROM data for products.

15. Reserved area
   The addresses not specified in the Hardware Manual are reserved area. Do not change the contents. Otherwise, the E8a emulator cannot control the MCU.

16. Debugging in stop mode or wait mode
   When debugging in stop mode or wait mode, do not operate windows until the program stops at the breakpoint by setting the breakpoint at the line of the program which will be executed after the stop mode or wait mode is cancelled. In addition, disable the automatic update in the watch window or fix the display in the memory window before running the program so memory accesses do not occur during an execution. When the program is forcibly stopped, or the memory is referred to or modified in stop or wait mode, the stop or wait mode will be cancelled.

17. Peripheral I/Os during a halt
   During a user program halt, interrupts are not accepted although peripheral I/Os continue to run. For example, a timer interrupt is not accepted although the timer continues to count when a user program is stopped by a break after the timer started.
18. “Go to cursor” function
   The “Go to cursor” function is actualized using an address match break. Therefore, when you execute the “Go to
   cursor” command, all the address match breaks and hardware breaks you set become invalid, while all the PC
   breaks remain valid.

19. Note on PC break point
   When downloading a user program after modifying it, the set address of PC break may not be corrected normally
   depending on the modification. Therefore, break points other than the set PC breaks may shift. After downloading
   a user program, check the setting of PC breaks in the event point window and reset it.

20. Note on debugging in CPU rewrite mode
   When debugging in CPU rewrite mode, do not rewrite the FLASH area. If this area is rewritten, the E8a emulator
   cannot control the MCU.

21. Notes on the E8a emulator power supply
   When writing a program with the E8a emulator for mass production processes, the program requires reliability, so
   do not use the E8a emulator power supply function. Supply power separately to the user system according to the
   allowable voltage for MCU writing. Voltage supplied from the E8a emulator depends on the quality of the USB
   power supply of the PC, and as such, precision is not guaranteed. Note that when debugging the system which
   operates the MCU with a dual power supply, power cannot be supplied from the E8a.
Section 7  Debugger Setting

1. [Emulator Setting] dialog box

The [Emulator Setting] dialog box is provided for setting items that need to be set when the debugger is launched. The contents set from this dialog box (excluding [Power Supply] group box items) also become valid the next time the debugger is launched.

![Emulator Setting Dialog Box]

Figure 7.1  [Emulator Setting] Dialog Box

If you check “Do not show this dialog box again.” at the bottom of the [Emulator Setting] dialog box, the [Emulator Setting] dialog box will not be displayed the next time the debugger is launched. You can open the [Emulator Setting] dialog box using one of the following methods:

- After the debugger is launched, select Menu -> [Setup] -> [Emulator] -> [Emulator Setting...].
- Hold down the Ctrl key while launching the debugger.

When “Do not show this dialog box again.” is checked, the E8a does not supply power to the user system.
2. **[Emulator mode] tab**

Device selection, mode specification and power supply setting are made from the [Emulator mode] tab of the [Emulator Setting] dialog box.

![Emulator Setting](image)

**Figure 7.2 [Emulator mode] Tab**

**[MCU Group]**
Select the name of the MCU group to be used from the [MCU Group] drop-down list.

**[Device]**
Select the type of MCU to be used from the [Device] drop-down list.
[Mode]
- Erase Flash and Connect
  When starting the debugger, the E8a emulator erases the Flash memory data for the MCUs and simultaneously writes the E8a emulator program.
- Keep Flash and Connect
  When launching the debugger, the E8a emulator retains the Flash memory data for the MCUs. Note that the area for the E8a emulator program and the vector area used by the E8a emulator will change.
- Program Flash
  The E8a emulator starts as a simple programmer. When downloaded, the E8a writes only the user program (E8a emulator program is not written). Therefore, the program cannot be debugged in this mode.
- Debugging of CPU rewrite mode
  Select this setting when debugging the program which rewrites the CPU. In this mode, the following debug operation which rewrites the Flash memory cannot be executed.
     - Setting the PC break points
     - Changing the memory contents in the Flash memory area
  In this mode, when starting the debugger, the E8a emulator erases the Flash memory data for the MCUs and simultaneously writes the E8a emulator program.
  When [Execute the user program after ending the debugger.] is selected, with the E8a emulator connected to the user system, the user program is executed at the same time the debugger is terminated. This check box setting is available only when the [Program Flash] mode is selected.

[Power supply]
When supplying power to the user system from the E8a, click the [Power Target from Emulator. (MAX 300mA)] check box.

3. [Communication Baud Rate] Tab
Select communication baud rate between the E8a and MCU in the [Communication Baud Rate] tab. 500000bps (default setting) should be selected.

![Figure 7.3 [Communication Baud Rate] Tab](image)
Section 8  Applicable Tool Chain

With the 740 Family E8a emulator, you can debug a module created by the inhouse tool chain listed in Table 8.1 below.

<table>
<thead>
<tr>
<th>Tool chain</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3T-SRA74</td>
<td>V.4.10 Release 02 or later</td>
</tr>
<tr>
<td>M3T-ICC740</td>
<td>V1.01 Release 01 or later</td>
</tr>
</tbody>
</table>
E8a Emulator (R0E00008AKCE00)
Notes on Connecting the 38D5, 38D2, 3803L and 3804L

Publication Date: Apr 30, 2010 Rev.5.00

Published by: Renesas Electronics Corporation

Edited by: Microcomputer Tool Development Department 2
Renesas Solutions Corporation
E8a Emulator (R0E00008AKCE00)