RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RX*-091A/E	Rev.	1.00
Title	Corrections to the RX111 Group User's Manual: Hardware regarding Communication Protocol of the Flash Memory		Information Category	Technical Notification		
Applicable Product	RX111 Group	Lot No.	Reference Document	RX111 Group User's Manual: Hardware Rev.1.00 (R01UH0365EJ0100)		
		All				

This document describes corrections to descriptions for communication protocol of the flash memory in RX111 Group User's Manual: Hardware.

1. Corrections

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Descriptions in 35.9.3, Boot Mode Status Inquiry are corrected as follows:

Before correction

Command	4Fh

Response	5Fh	Size	Status	Error

Size (1 byte): Total bytes of "Status" and "Error" (the value is always 2)
Status (1 byte): MCU status (see Table 35.13)
Error (1 byte): Information about the error occurred in the MCU (see Table 35.14)

After correction

Command	4Fh

Response	5Fh	Size	Status	Error	SUM

Size (1 byte): Total bytes of "Status" and "Error" (the value is always 2)
Status (1 byte): MCU status (see Table 35.13)
Error (1 byte): Information about the error occurred in the MCU (see Table 35.14)
SUM (1 byte): Value that is calculated so the sum of response data is 00h

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Descriptions in 35.9.4.1, Supported Device Inquiry are corrected as follows:

Before correction

Command	20h

Response

30h	Size	Number of devices	
Number of characters	Device code for little endian		Series name for little endian
Number of characters	Device code for big endian		Series name for big endian
SUM			

Size (1 byte): Total bytes of Number of Devices, Characters, Device code, and Series name
Number of devices (1 byte): Number of devices supported by the boot program
Number of characters (1 byte): Number of characters for the device code and device name
Device code (4 bytes): Identification code indicating the device
Series name (n bytes): ASCII code of the series name of the supported device
SUM (1 byte): Value that is calculated so the sum of response data is 00h

After correction

Command	20h

Response

30h	Size	Number of devices	
Number of characters	Device code for little endian		Series name for little endian
Number of characters	Device code for big endian		Series name for big endian
SUM			

Size (1 byte): Total bytes of Number of Devices, Characters, Device code, and Series name
Number of devices (1 byte): Number of endian types of program data (the value is always 02h)
Number of characters (1 byte): Number of characters for the device code and device name
Device code (4 bytes): Identification code indicating the endian of program data
Series name (n bytes): ASCII code of the series name of the supported device
SUM (1 byte): Value that is calculated so the sum of response data is 00h

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Descriptions in 35.9.5.1, Device Select are corrected as follows:

<u>Before correction</u>

Command	10h	Size	Device code	SUM

Size (1 byte): Number of characters of the device code (the value is always 04h)
Device code (4 bytes): Identification code indicating the device
　　　　　　　　　　　　　(code in the response to the support device inquiry command)
SUM (1 byte): Value that is calculated so the sum of command data is 00h

<u>After correction</u>

Command	10h	Size	Device code	SUM

Size (1 byte): Number of characters of the device code (the value is always 04h)
Device code (4 bytes): Identification code for selecting the endian of program data
　　　　　　　　　　　　　(code in the response to the support device inquiry command)
SUM (1 byte): Value that is calculated so the sum of command data is 00h

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Descriptions in 35.9.6, Operating Frequency Select are corrected as follows:

Before correction

Response | 06h |

Error Response | BFh | Error |

    Error (1 byte): Error code
            11h: SUM error
            24h: Bit rate selection error

Communication Confirmation | 06h |

Response | 06h |

Error Response | FFh |

After correction

Response | 06h |

Error Response | BFh | Error |

    Error (1 byte): Error code
            11h: SUM error
            24h: Bit rate selection error

Command (communication confirmation data) | 06h |

Response | 06h |

Error Response | FFh |

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Descriptions in 35.9.10.1, Bit Rate Automatic Adjustment Procedure are corrected as follows:

<u>Before correction</u>

After starting up in boot mode, wait for 400 ms and then send 00h to the MCU from the programmer. When the bit rate adjustment is completed, the MCU sends 00h to the programmer. When the programmer receives 00h, send 55h to the MCU from the programmer. When the programmer fails to receive 00h, restart the MCU in boot mode, and adjust the bit rate again. The programmer can send 00h to the MCU up to 30 times.
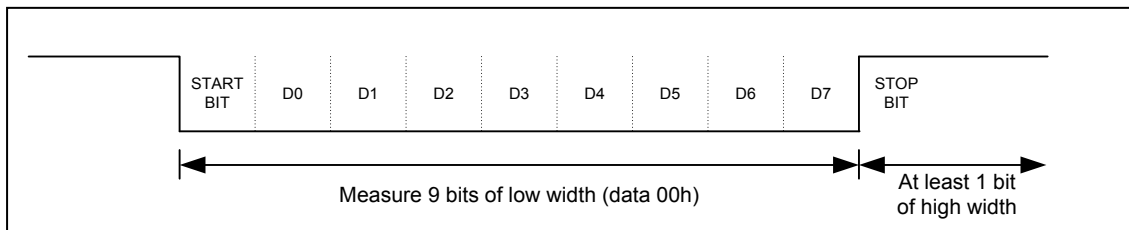
<u>After correction</u>

After starting up in boot mode, wait for 400 ms and then send 00h to the MCU from the programmer. The programmer can send 00h to the MCU up to 30 times. When the bit rate adjustment is completed, the MCU sends 00h to the programmer. When the programmer receives 00h, send 55h to the MCU from the programmer. When the programmer fails to receive 00h, restart the MCU in boot mode, and adjust the bit rate again.
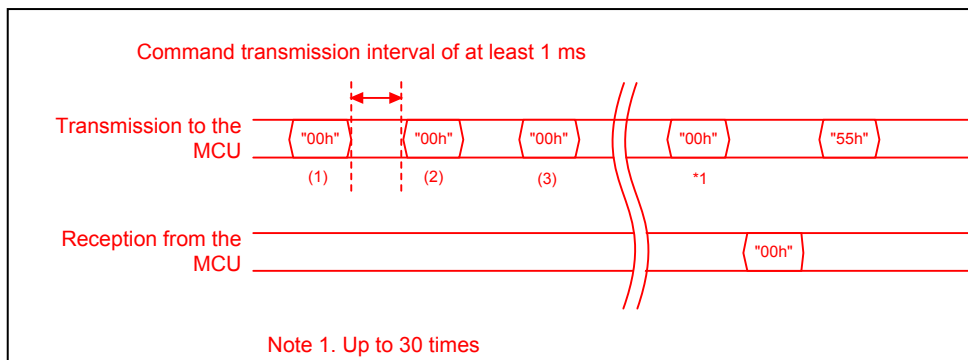
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Figure 35.13 Data Format for Bit Rate Automatic Adjustment is corrected as follows:

<u>Before correction</u>

<u>After correction</u>

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Descriptions in 35.9.10.3, Procedure to Select the Device and Change the Bit Rate are corrected as follows:

<u>Before correction</u>

(1) Send the device select command (10h) to select the device to connect with the programmer and the endian of data that is programmed. When the program data is little endian, select the same device code as that for little endian in the response to the support device inquiry command. When the program data is big endian, select the same device code as that for big endian in the response to the support device inquiry command. When the device is selected successfully, the MCU sends a response (06h). When the MCU fails to receive, the MCU sends an error response (90h).

(2) Send the operating frequency select command (3Fh) to change the bit rate for communication. When the bit rate is set successfully, the MCU sends a response (06h). When the bit rate cannot be changed, or when the MCU fails to receive, the MCU sends an error response (BFh).

(3) When the MCU receives a response (06h), the MCU waits for 1-bit period at the bit rate for sending the operating frequency select command, and then set the bit rate of the programmer to the changed value. After that, the MCU sends communication confirmation data (06h) at the changed bit rate. When the MCU receives the command successfully, the MCU sends a response (06h) of the communication confirmation data.
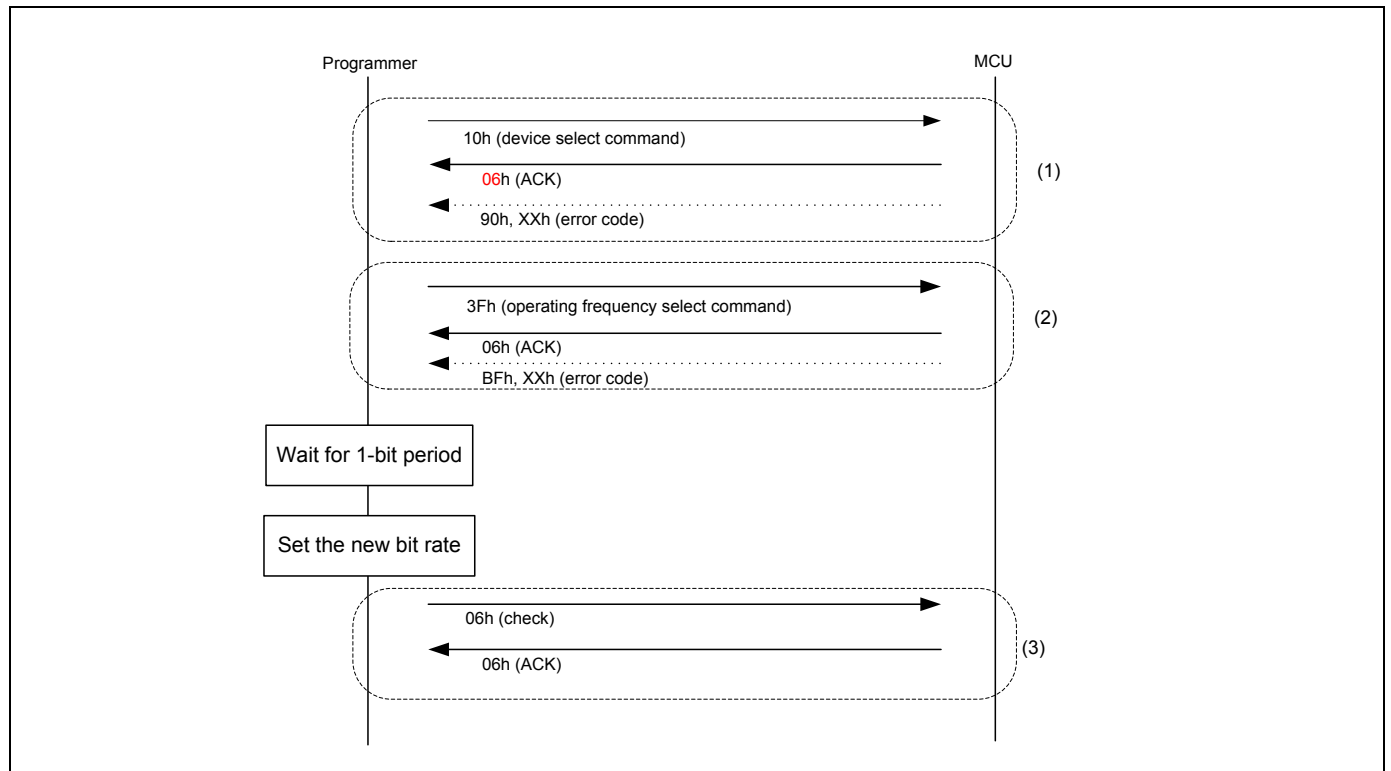
<u>After correction</u>

(1) Send the device select command (10h) to select the device to connect with the programmer and the endian of data that is programmed. When the program data is little endian, select the same device code as that for little endian in the response to the support device inquiry command. When the program data is big endian, select the same device code as that for big endian in the response to the support device inquiry command. When the device is selected successfully, the MCU sends a response (46h). When the MCU fails to receive, the MCU sends an error response (90h).

(2) Send the operating frequency select command (3Fh) to change the bit rate for communication. When the bit rate is set successfully, the MCU sends a response (06h). When the bit rate cannot be changed, or when the MCU fails to receive, the MCU sends an error response (BFh).

(3) When the programmer receives a response (06h), the MCU waits for 1-bit period at the bit rate for sending the operating frequency select command, and then set the bit rate of the programmer to the changed value. After that, the MCU sends communication confirmation data (06h) at the changed bit rate. When the MCU receives the command successfully, the MCU sends a response (06h) of the communication confirmation data.
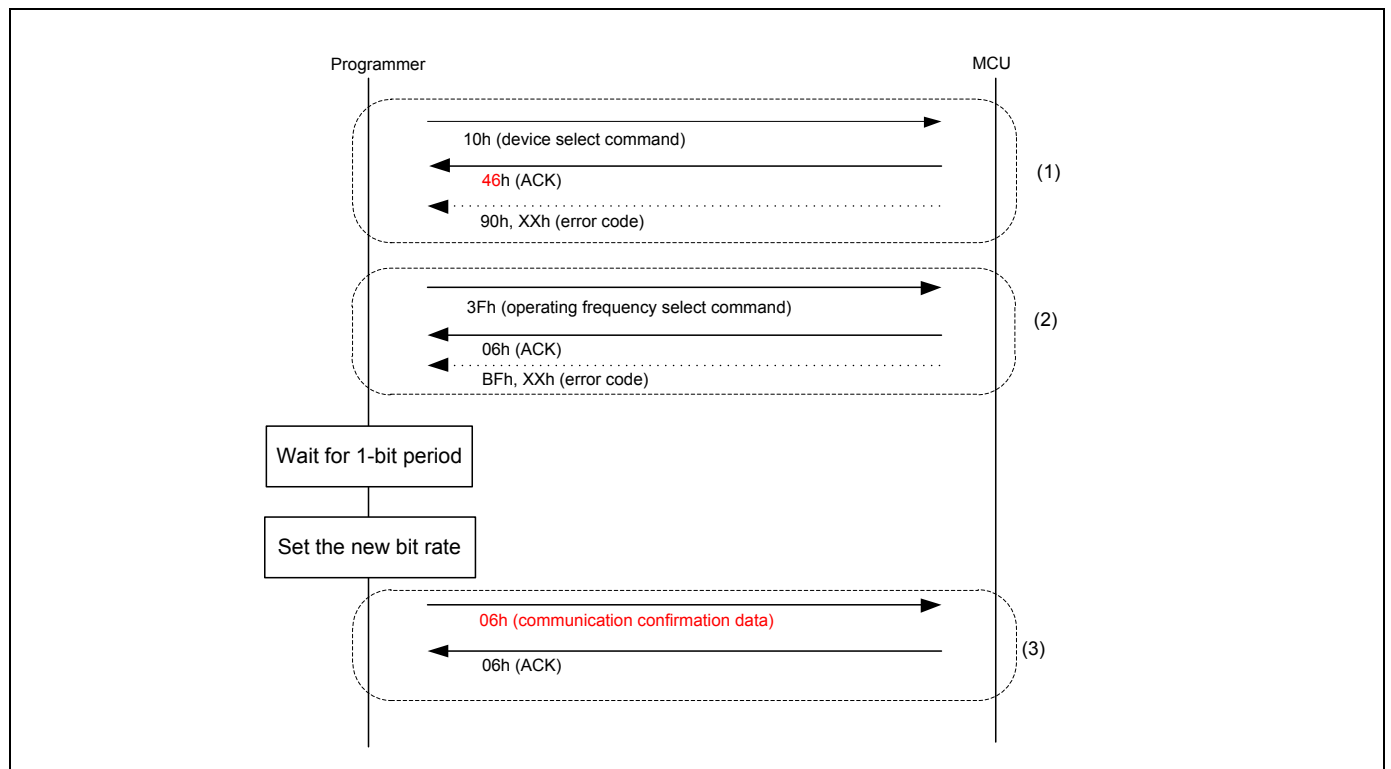
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Figure 35.16 Procedure to Select the Device and Change the Bit Rate is corrected as follows:

<u>Before correction</u>

<u>After correction</u>

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Descriptions in 35.9.10.6, Erase Ready Operation are corrected as follows:

<u>Before correction</u>

(1) Send the erase preparation command (48h) to place the MCU in the erase wait state. The MCU enters the erase wait state and sends a response (06h).

(2) Send a block erase command (59h) to erase blocks in the MCU. When blocks are erased successfully, the MCU sends a response (06h). When the MCU fails to receive, the MCU sends an error response (D9h).

Send a block erase command repeatedly until block erase commands for all blocks are sent. When the operation ends before all the block erase commands are sent, a command error may occur even when a correct command is sent in the program/erase state.

(3) In order to place the MCU in the program/erase state, send a block erase command for end of erase (59h 04h FFh FFh FFh FFh A7h). The MCU enters the program/erase state and sends a response (06h).

<u>After correction</u>

(1) Send the erase preparation command (48h) to place the MCU in the erase wait state. The MCU enters the erase wait state and sends a response (06h).

(2) Send a block erase command (59h) to erase blocks in the MCU. When blocks are erased successfully, the MCU sends a response (06h). When the MCU fails to receive, the MCU sends an error response (D9h).
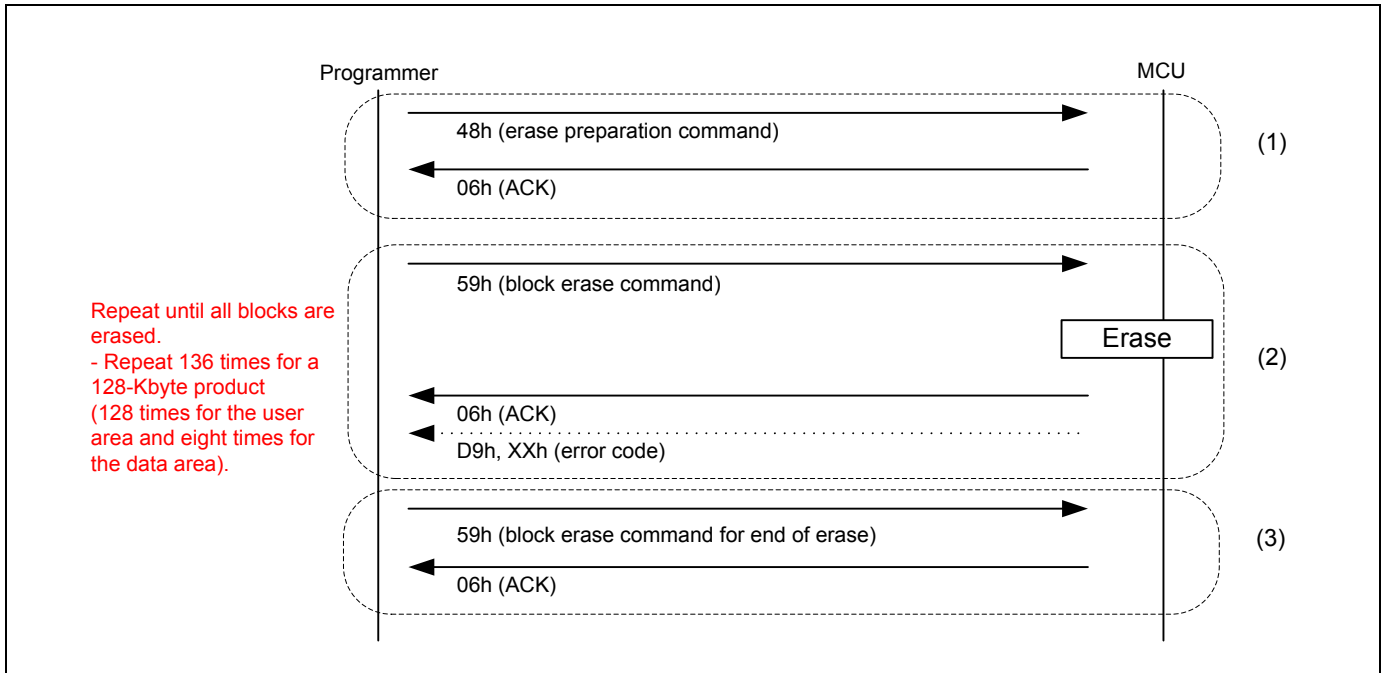
Send block erase commands repeatedly until a block erase command has been sent for the total number of blocks. The total number of blocks is the sum of the user area blocks and data area blocks that are obtained in advance using the block information inquiry command. If the operation ends before all the block erase commands are sent, a command error may occur even when a correct command is sent in the program/erase state.

(3) Send a block erase command for end of erase (59h 04h FFh FFh FFh FFh A7h). The MCU sends a response (06h).

(4) To confirm whether erase ready operation has ended, send a boot mode status inquiry command (4Fh). When the erase ready operation has ended, the MCU returns the result of the boot mode status inquiry. When the erase ready operation has not ended, the MCU sends an error response (80h 4Fh). When an error response is received, restart the MCU in boot mode and perform the procedure again from section 35.9.10.1, Bit Rate Automatic Adjustment Procedure.

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Figure 35.19 Procedure to Send Commands in Erase Ready Operation is corrected as follows:

<u>Before correction</u>

Programmer   MCU

48h (erase preparation command)   (1)

06h (ACK)

Repeat until all blocks are erased.
- Repeat 136 times for a 128-Kbyte product (128 times for the user area and eight times for the data area).

59h (block erase command)

Erase   (2)

06h (ACK)

D9h, XXh (error code)

59h (block erase command for end of erase)   (3)

06h (ACK)

<u>After correction</u>

Programmer   MCU

48h (erase preparation command)   (1)

06h (ACK)

59h (block erase command)

Erase   (2)

Repeat until all blocks are erased.

06h (ACK)

D9h, XXh (error code)

59h (block erase command for end of erase)   (3)

06h (ACK)

4Fh (boot mode status inquiry command)

Response to the boot mode status inquiry command   (4)

80h, 4Fh (error response)

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Descriptions in 35.9.10.11, Set the Access Window in the User Area are corrected as follows:

<u>Before correction</u>

(1) When setting the access window, set 00h in the access window, set the start address of the area that can be programmed the by self-programming library in the access window start address LH and access window start address HL, and set the end address of the area that can be programmed by the self-programming library in the access window end address LH and access window end address HL.

When clearing the access window settings, set FFh in the access window, access window start address LH, access window start address HL, the access window end address LH, and the access window end address HL.

When the MCU writes the addresses, the MCU sends a response (06h). If the MCU fails to receive, the MCU sends an error response (F4h).

<u>After correction</u>

(1) Send the access window program command (74h) to set the access window or clear the access window settings.

When setting the access window, set 00h in the access window, set the start address of the area that can be programmed by the self-programming in the access window start address LH and access window start address HL, and set the end address of the area that can be programmed by the self-programming in the access window end address LH and access window end address HL.

When clearing the access window settings, set FFh in the access window, access window start address LH, access window start address HL, the access window end address LH, and the access window end address HL.

When the MCU writes the addresses, the MCU sends a response (06h). If the MCU fails to receive, the MCU sends an error response (F4h).