User's Manual

# RZ/V2MA Evaluation Board Kit Start-Up Guide

User's Manual

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# How to Use This Manual

## 1. Objective and Target Users

This manual sets out initial procedures for operating the RZ/V2MA evaluation board kit. Note that this manual is not intended for use in software development.

This document shows the installation and startup procedure of the first boot loader, second boot loader, and U-Boot on the RZ/V2MA evaluation board kit. For details and notes on the RZ/V2MA evaluation board kit, refer to *the RZ/V2MA Evaluation Board Kit Hardware Manual* provided by Shimafuji Electric Inc..

# Table of Contents

## Introduction

This document shows the startup procedure of the first boot loader, second boot loader, and U-Boot on the RZ/V2MA evaluation board kit (V2MAEVK).

For details on the procedure, refer to *the RZ/V2MA Linux Package Manual*. Descriptions in this document are based on *the RZ/V2MA Linux Package Rev1.0*. When referring to the different package version, follow the descriptions in that document.

## Related Documents

The following documents have been prepared for this V2MAEVK. Make sure to refer to the latest versions of these documents.

| Document Type | Document Title | Document No. | Description |
|---|---|---|---|
| Startup guide | RZ/V2MA Evaluation Board Kit Start-up Guide | This document | Startup procedure of the V2MAEVK |
| User's manual: Hardware | RZ/V2MA User's Manual: Hardware | R01UH0982EJ0100 | RZ/V2MA hardware specifications (pin assignments, memory maps, peripheral specifications, electrical characteristics, and timing charts) and descriptions of operation |
| Linux startup guide | RZ/V2MA Linux Package Startup Guide | R01US0578EJ0100 | Startup procedure of the RZ/V2MA Linux package |

# 1. Operating Environment

**Table 2.1-1** lists the recommended environment for V2MAEVK operation and **Figure 2.1-1** shows the connection method.

Table 2.1-1 Recommended Environment

| Equipment | | Details |
|---|---|---|
| RZ/V2MA evaluation board kit | | Evaluation board kit for RZ/V2MA |
| Windows PC | | For controlling the target board with terminal software |
| | OS | Windows 10 recommended |
| | Terminal software | Control serial console of the target board.<br>Tera Term is recommended and available at "Tera Term Open Source Project (osdn.jp)". |
| | VCP driver | Virtual COM port driver to enable communications between the Windows PC and the target board via USB. This is virtually used as a serial port and available at "FT230XS USB to UART Bridge VCP Drivers - FTDI Chip (ftdichip.com)".<br>Install "Currently Supported VCP Drivers for Windows" at the above web site. |
| Serial to micro–USB cable<br>(USB cable: Standard-A-Micro-B) | | Serial communications (UART) between the RZ/V2MA evaluation board kit and Windows PC |
| Micro–SD card | | Used to write the flash writer software to the V2MAEVK.<br>Use it as SDHC, formatted as FAT32, with one partition. |
| AC adapter | | 12 V, 5 A (Plug: Inner diameter 2.1 mm, outer diameter 5.5 mm) |

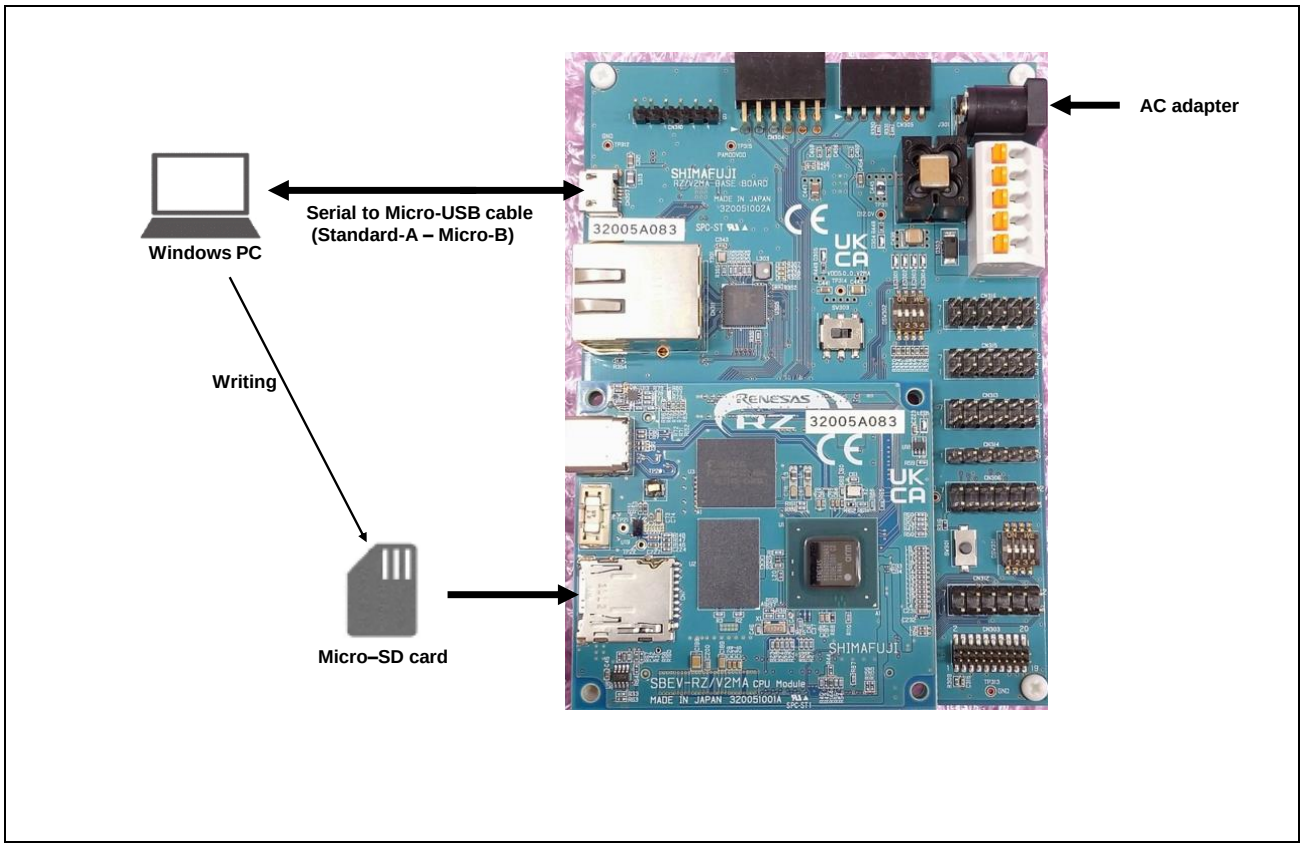



Figure 2.1-1 Connection Method

# 2. Startup Procedure

This section describes the procedure for writing the first boot loader, second boot loader, and U-Boot required to boot the Linux kernel. This procedure is accomplished by executing the following two functions in order.

1. SD card forced write function
2. Flash writer write function

For details, see *section 7, Flash Writer*, in *the RZ/V2MA Linux Package Startup Guide*.

Download the latest version of the following software package from the Renesas Web site.

| Software Package | Description |
|---|---|
| RZ/V2MA Linux Package | Linux package for the RZ/V2MA |

## 2.1 Flash Writer Writing Procedure (using SD Card Forced Write Function)

### 2.1.1 Preparing the SD Card

Store the files included in the RZ/V2MA Linux package on an SD card.

1. SD card format specifications
   - — FAT32
   - — 1 partition
   - — SDHC

2. Store the flash writer software on SD card
   The files to be stored are included in the following directory of the Linux package.

```
r01an6514ej0100<xxx>-rzv2ma-linux (<xxx>: Package version)
└─ option
    └─ flash_writer
        └─ B2_intSW.bin
```

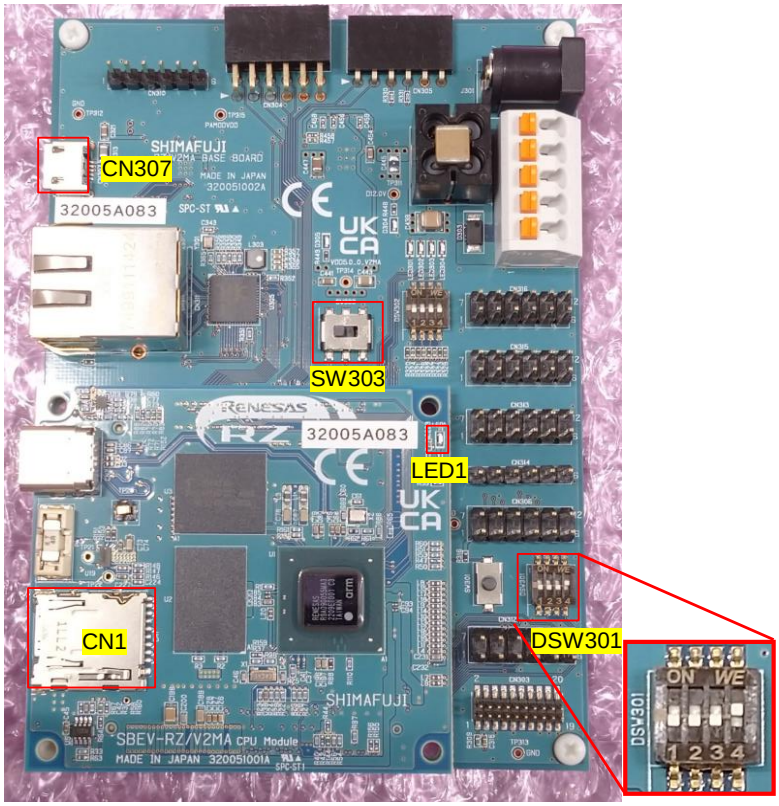
### 2.1.2 Writing Flash Writer Software (SD Card Forced Write Execution)

Write the prepared file (Flash writer, file name: B2_intSW.bin) to eMMC™ on the board by using the forced write function of RZ/V2MA.

1. With the V2MAEVK board power turned off, insert the prepared SD card into the V2MAEVK's CN1 connector and set DSW301 (see **Figure 2.1-1** for the DSW301 setting method)
2. Turn on SW303 of V2MAEVK
3. The RZ/V2MA automatically acquires data from the SD card and writes the data to eMMC.
   LED1 lights up when writing is successfully completed.

SUPPLEMENTARY EXPLANATION

If LED1 is blinking, the write operation has failed and an error may have occurred on the SD card.
Check whether the SD card is inserted and formatted correctly.




| DSW301-1 | DSW301-2 | DSW301-3 | DSW301-4 |
|---|---|---|---|
| OFF | OFF | OFF | ON |

Figure 2.1-1 DSW301 Settings

## 2.2 Writing Procedure for First Boot Loader, Second Boot Loader, and U-Boot (Using Flash Writer Writing Function)

### 2.2.1 Starting Flash Writer

Start the flash writer written in section **2.1 Flash Writer Writing Procedure (using SD Card Forced Write Function)**.

1. Turn off SW303 of V2MAEVK
2. Turn off all DSW301 switches (DSW301-1, DSW301-2, DSW301-3, and DSW301-4) of V2MAEVK
3. Connect CN307 of V2MAEVK and the Windows PC with a USB cable (standard-A-micro-B) and start Tera Term.
   See **Figure 2.2-1** for Tera Term settings.
4. Turn on SW303 of V2MAEVK
   Check that the display is as shown in **Figure 2.2-2**.

*Note*: **Figure 2.2-1** shows the configuration for RZ/V2MA Linux Package Ver1.0. If you will be using a different version, refer to *the RZ/V2MA Linux Package Startup Guide for that version*.

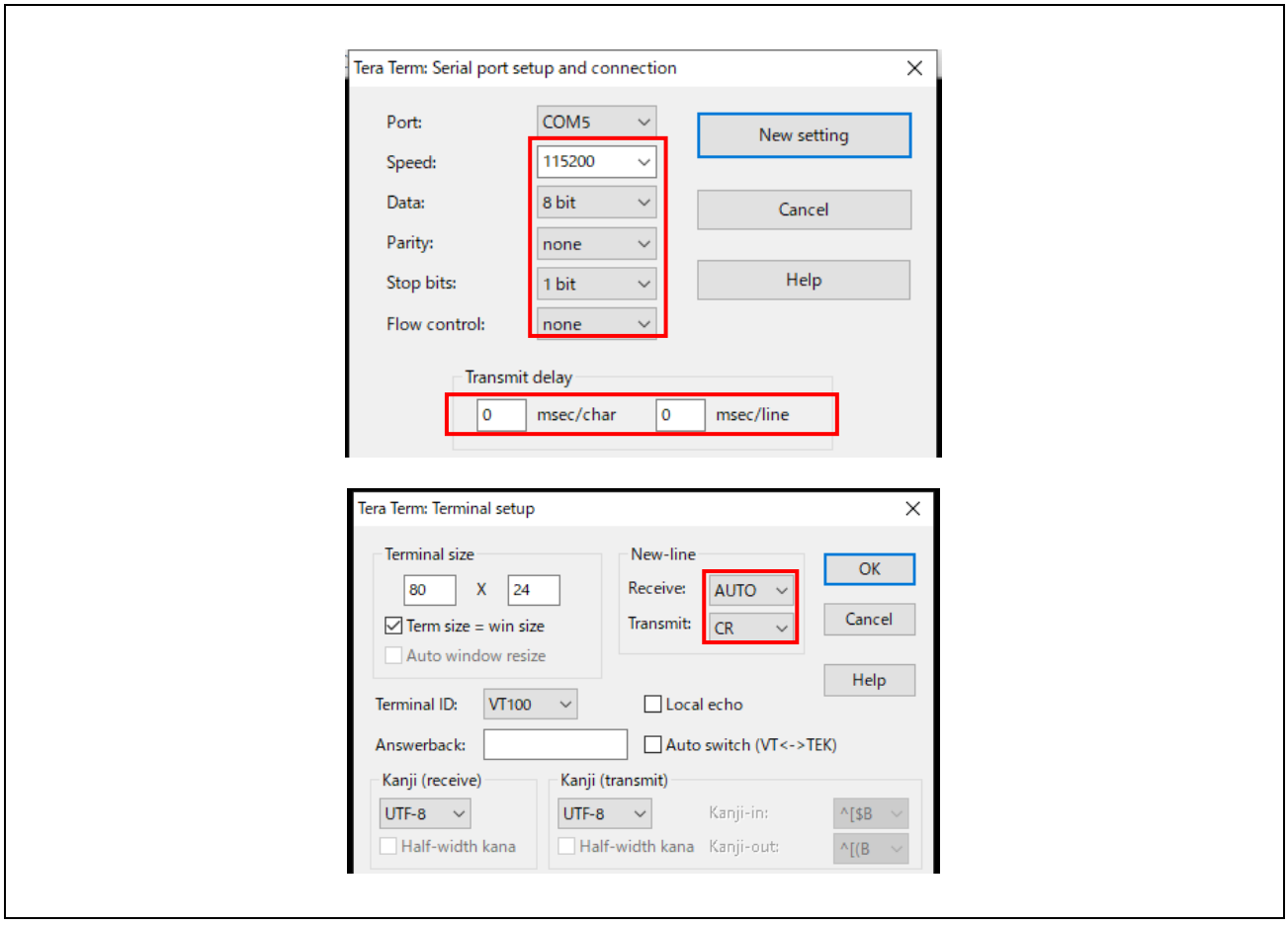



Figure 2.2-1 Settings of Tera Term

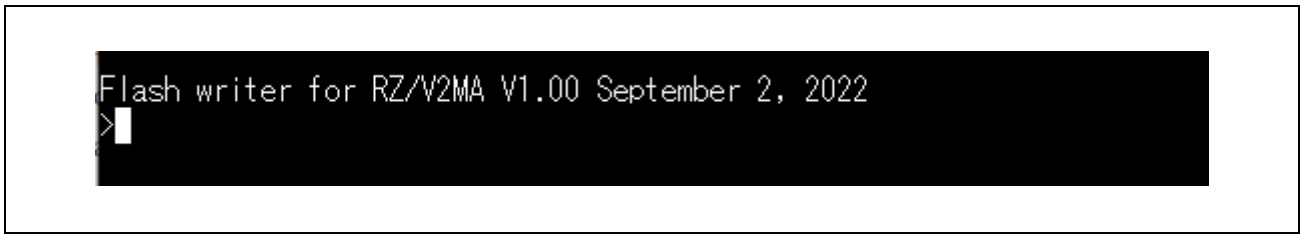



Figure 2.2-2 Starting the Flash Writer

### 2.2.2 Erasing the Area to be Written in eMMC

Erase the area in the eMMC for storing (writing) the first and second boot loaders and U-Boot.

1. Refer to **Table 2.2-1** and enter the contents of the input column with Tera Term.

Table 2.2-1 Procedure of eMMC Initialization

| Step | Tera Term Display | Input | Supplemental Information |
|---|---|---|---|
| 1 | > | EM_E | The first and second boot loaders and U-Boot are stored in boot partition 1. For the sector number of boot partition 1 that first and second boot loaders and U-Boot are stored, refer to **Figure 2.2-4**. |
| 2 | Select area(0-2)> | 1 | |
| 3 | EM_E Complete! | — | |

**Figure 2.2-3** shows an example of the screen display when the above procedure is successfully executed.

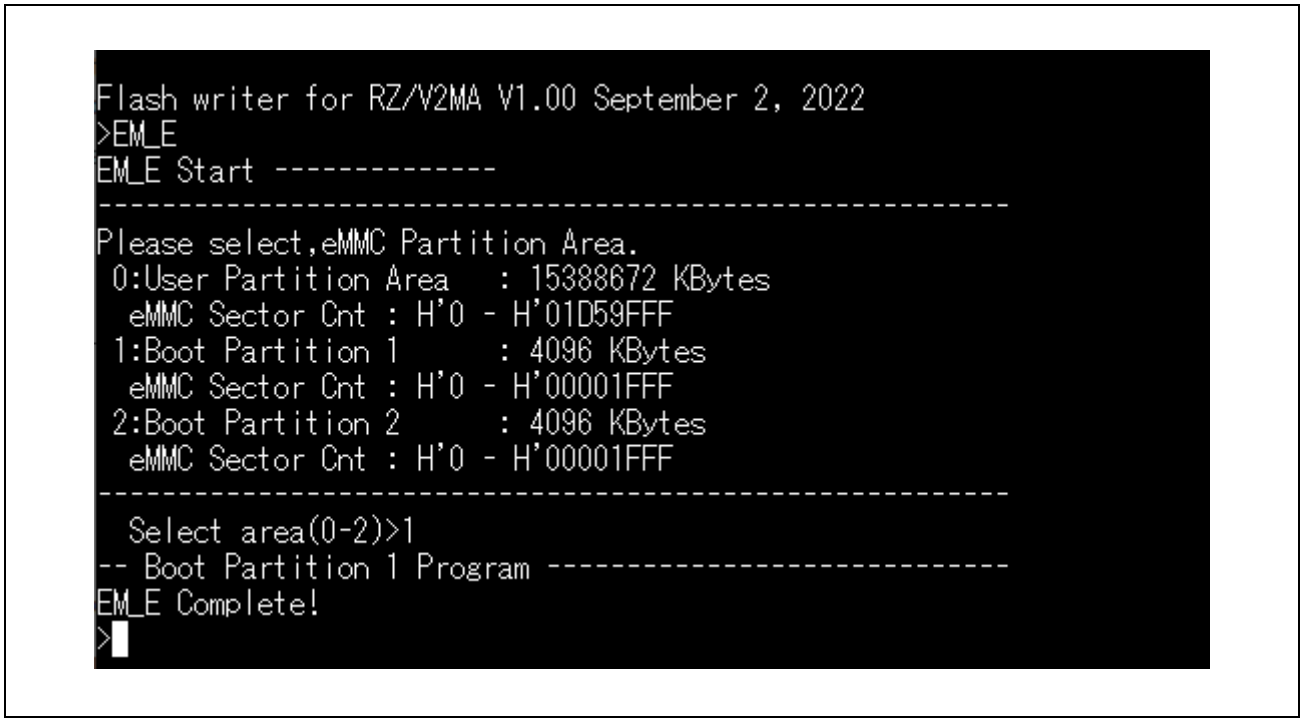



Figure 2.2-3 EM_E Command

### 2.2.3 Writing the First Boot Loader, Second Boot Loader, and U-Boot

Write first boot loader, second boot loader, and U-Boot, respectively, to eMMC.

1. Storage location of sample first boot loader, second boot loader, and U-Boot
   The files to be written are included in the following directory of the Linux package.

   For details, see Chapter 7.1.1 Boot loader and U-Boot in the RZ/V2MA Linux Package Startup Guide.

2. Execute writing of first boot loader
   Use the flash writer function for writing.
3. Refer to **Table 2.2-2** and enter the contents of the input column with Tera Term.
   The following is an example of the first boot loader (file name to be written: loader_1st_128kb.bin).

Table 2.2-2 Procedure of Writing the Binary File

| Step | Tera Term Display | Input | Supplemental Information |
|---|---|---|---|
| 1 | > | EM_WB | — |
| 2 | Select area(0-2)> | 1 | See エラー! 参照元が見つかりません。**Figure 2.2-4** for details on specifying parameters.<br>(For details, see *Table 4-1*, *Boot loader data stored in the eMMC* in *the RZ/V2MA Linux Package Startup Guide*.) |
| 3 | Please Input Start Address in sector: | 000 | |
| 4 | Please Input File size(byte): | 20000 | |
| 5 | Please send binary file! | — | This control should be executed by the file transfer function, not by Tera Term command input.<br>1. Click “File” and “Send file...”<br>2 Select “loader_1st_128kb.bin”<br>3. Check “Binary” in “Option”. (see **Figure 2.2-5**)<br>4. Click “Open”. |
| 6 | EM_WB Complete! | — | — |

**Table 4-1. Boot loader data stored in the eMMC**

| File name | Program top address | eMMC save partition | eMMC save sectors*1 | File size(byte)*2 | Description |
|---|---|---|---|---|---|
| loader_1st_128kb.bin | H'80100000 | Boot partition 1 | H'000000 | H'20000 | 1st loader binary |
| loader_2nd_param.bin | On RAMA area *3 | Boot partition 1 | H'000100 | H'8 | Boot parameter for 2nd loader |
| loader_2nd.bin | H'B6000000 | Boot partition 1 | H'000101 | Variable*2 | 2nd loader binary |
| u-boot_param.bin | On RAMB area *3 | Boot partition 1 | H'000901 | H'8 | Boot parameter for U-Boot |
| u-boot.bin | H'57F00000 | Boot partition 1 | H'000902 | Variable*2 | U-Boot binary |

```
>EM_WB
EM_WB Start -------------
-----------------------------------------------------
Please select,eMMC Partition Area.
 0:User Partition Area    : 15388672 KBytes
  eMMC Sector Cnt : H'0 - H'01D59FFF
 1:Boot Partition 1       : 4096 KBytes
  eMMC Sector Cnt : H'0 - H'00001FFF
 2:Boot Partition 2       : 4096 KBytes
  eMMC Sector Cnt : H'0 - H'00001FFF
-----------------------------------------------------
  Select area(0-2)>1
-- Boot Partition 1 Program ---------------------------
Please Input Start Address in sector :000
Work RAM(H'B6000000-H'B60FFFFF) Clear....
Please Input File size(byte) : 20000
please send binary file!
```

Figure 2.2-4 EM_WB Command (Determining the Specified Parameters)

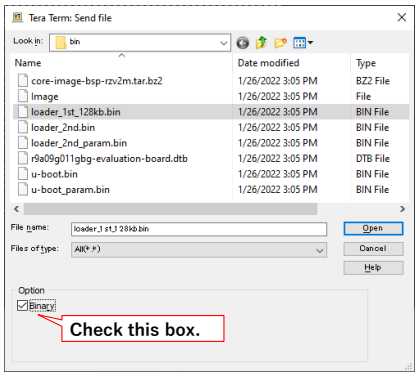



Figure 2.2-5 File Transmission

4. Execution of writing second boot loader and U-Boot
   Writing the second boot loader and U-Boot also requires use of the functions of the flash writer. Change the following from the procedure for the first boot loader (file name to be written: loader_1st_128kb.bin) and write it.

   4-1) Change the parameters specified in STEP 2 to 4.

   4-2) Change the name of the file to be sent
   Second boot loader: “loader_2nd.bin”, “loader_2nd_param.bin”
   U-Boot: “u-boot.bin”, “u-boot_param.bin”

## 2.3 Startup with Written Information

Boot V2MAEVK with the respective data for the first boot loader, second boot loader, and U-Boot that have been written to eMMC.

1. Turn off SW303 of V2MAEVK
2. Turn on SW303 of V2MAEVK
3. Restart V2MAEVK and if the display is as shows in **Figure 2.3-1**, startup is complete.

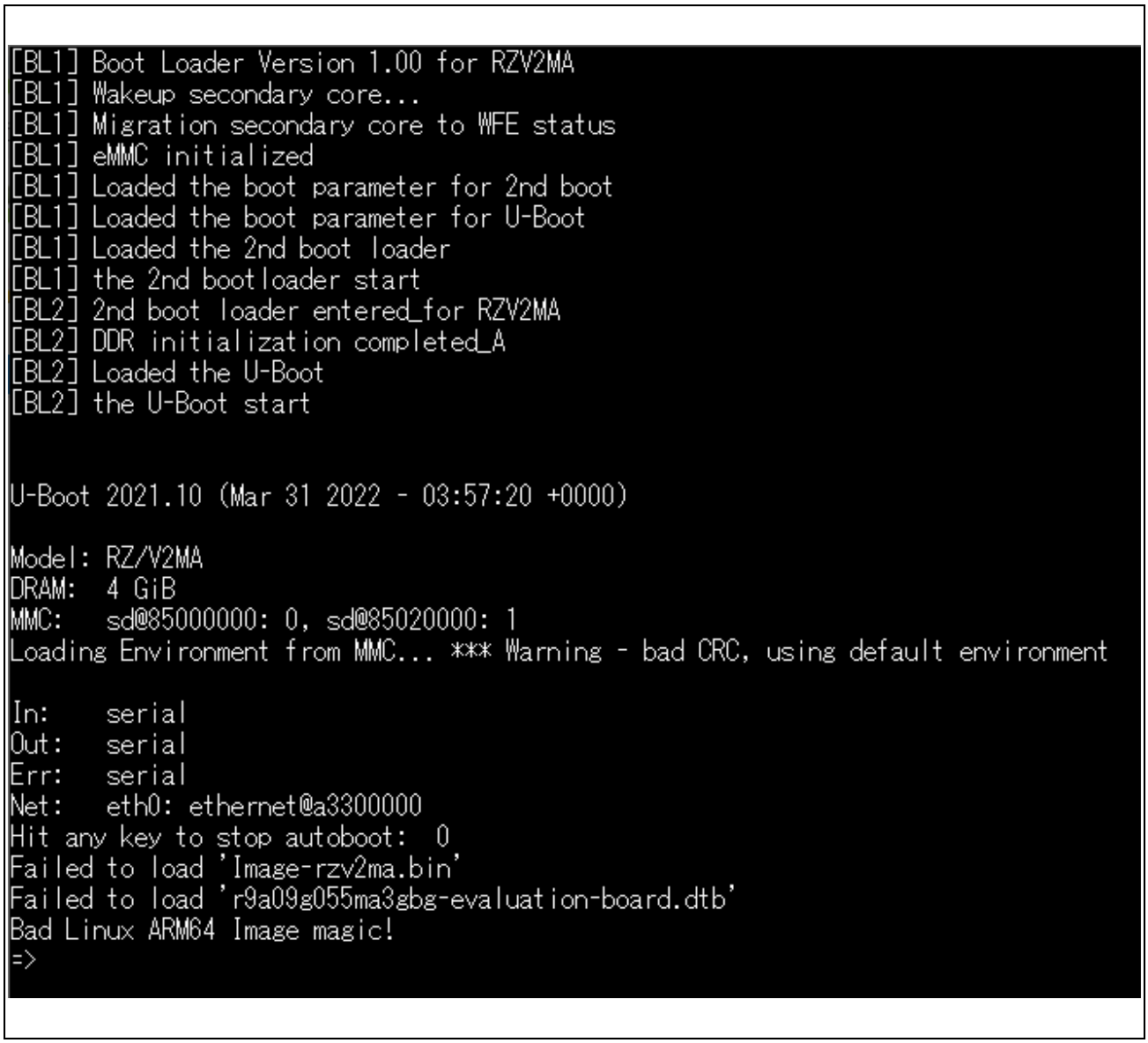



Figure 2.3-1 U-Boot Startup Display

| REVISION HISTORY | RZ/V2MA Evaluation Board Kit Start-Up Guide |
|---|---|

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 1.00 | Sep 27, 2022 | — | First edition, issued |

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