User Manual

DA16200 and DA16600 Multi-Downloader Tool

UM-WI-039

Abstract

This document explains how to set up and use the Multi-Downloader for DA16200 and DA16600.

Contents

Figures

1 Terms and Definitions

SDK	Software Development Kit
EVB	Evaluation Board
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus

2 References

[1] DA16200 Datasheet, Dialog Semiconductor

[2] DA16600 Datasheet, Dialog Semiconductor

[3] UM-WI-002 DA16200 DA16600 SDK Programmers Guide, Dialog Semiconductor

[4] UM-WI-023 DA16200 EVK User manual, Dialog Semiconductor

[5] UM-WI-026 DA16600 EVK User Manual, Dialog Semiconductor

3 Introduction

The Multi-Downloader is used to write the DA16200/600 images to the flash IC through the UART interface of the RS232 port between the DA16200/600 and PC. This tool also can download the images to multiple devices at the same time.

4 Multi-Downloader

4.1 Requirements

The following PC environment is recommended for proper operation of the Multi-Downloader:

- **Operating system**: Windows 7, Windows 10
- **Minimum RAM**: 8 GB or higher
- **Minimum processor**: Intel Core i5 or higher

NOTE
Windows does not support file path over 260 length. Accordingly, the absolute path of all files including images and log must be within the maximum.

4.2 Main Screen

Figure 1 shows the main screen of Multi-Downloader with the following menus and options:

- **Settings**: to select the module type, images, start address, and size
- **Read Version**: to display the SDK version after all images are downloaded
- **NVRAM Init**: to initialize NVRAM if needed
- **Terminal Number**: to provide a value that activates the terminal box to the number. The maximum value is 16
- **Download**: to start downloading the images to the device
- **Console**: to open a console with basic functions
- **Elapse Time**: to show the running time from start to end during downloading
- **Count**: to show a count of the download operation
- **Terminal Box**: is activated according to the value of the terminal number. The check box and port must be selected for download. The state and progress are shown during downloading

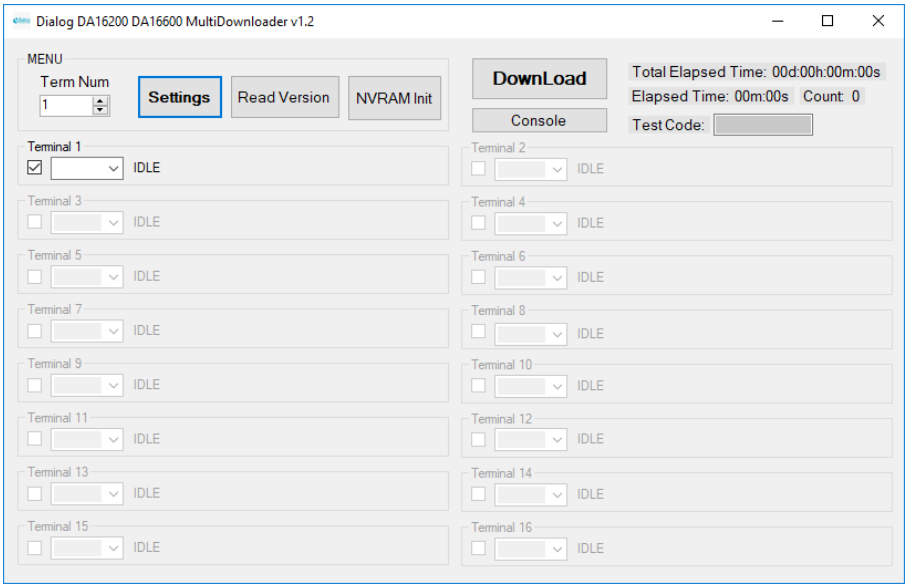

Figure 1: The Main Screen

The images can be downloaded by drag-and-drop to the main screen. The string "BOOT", "RTOS", "SLIB", "DATA1", and "DATA2" of file name would identify the image type automatically at drag-and-drop operation which does not support RTOS2 and SLIB2 image type.

4.3 Settings

Figure 2 shows the settings of the Multi-Downloader. It has image selection and operation with the settings file.

4.3.1 Image Selection

The images can be selected by double-clicking the box of each image path or drag-and-drop. The string "BOOT", "RTOS", "SLIB", "DATA1", and "DATA2" of file name would identify the image type automatically at drag-and-drop operation which does not support RTOS2 and SLIB2 image type.

- **OS**: to select OS version of the images
- **Module**: to select module type. The address and size are changed automatically according to this selection. However, all values can be changed manually
- **Flash type**: to select the actual flash size used in the image. This changes the address and size automatically according to the selection. However, it can also be changed manually
- **Erase Flash**: to erase the flash from start address to end address
- **BOOT_#0 Image**: to select image files and checkbox for downloading to boot index 0
  - **BOOT**: the bootloader image has the flash memory type info SFDP. This image must be loaded before successfully downloading the other images. The name is like DA16200_BOOT_GEN01-01-XXXX-000000_ W25Q32JW.img or DA16200_FBOOT-GEN01-01-XXXX_ AT25SL321.img
  - **RTOS1**: the main image. The name is like DA16200_RTOS_GEN01-XX-YYYY-ZZZZZZ.img or DA16200_FRTOS-GEN01-XX-YYYY-ZZZZZZ.img
  - **SLIB1**: system library image. The name is like DA16200_SLIB_GEN01-XX-YYYY-ZZZZZZ.img. This is not needed in Free RTOS version
- **BOOT_#1 Image**: to select image files and checkbox for downloading to boot index 1. If normal operation with #0 image is enough, this image is optional. RTOS2 and SLIB2 images can be selected

- **BLE Image**: to select Bluetooth® Low Energy image for DA14531 in the DA16600 module. The name is like da14531_multi_part_proxr.img
- **DATA Image**: to select any data image with any address and size
- **Options**
  - **Reboot After Download**: to reboot the devices automatically after download is completed
  - **Change BOOT index**: to change the boot index of the device

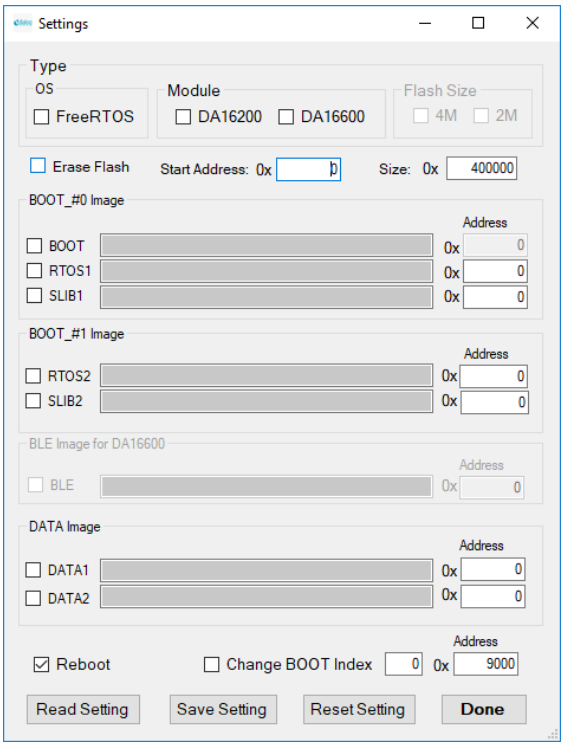

Figure 2: Settings

4.3.2 Setting File

Predefined setting values can be read and saved. Figure 3 shows an example file. Each content is separated with '|'. The setting file (settings.txt) must be located on the same folder of multi-downloader executable file. The setting values in the file are:

- **Port setting**: the port name of main screen is selected automatically if the defined name in the setting file exists in the device manager of Windows. The name of 16 ports can be defined
- **OS type**: FreeRTOS or ThreadX can be set
- **Module type**: NONE, DA16200, or DA16600 can be set
- **Flash size**: 4 M or 2 M can be set
- **Each Image path, start address, and size**: the information of the images can be set

```
|COM48|||||||||||||||
|FreeRTOS| //OS : FreeRTOS, ThreadX
|DA16600| //Module : NONE, DA16200, DA16600
|4M| //Flash Size : NONE, 4M, 2M
|D:\Project\WIFI\sdk\FreeRTOS\DA16600_SDK_FreeRTOS_v3.1.0.0\img\DA16600_FBOOT-GEN01-01-14128-000000_W25Q32JW.img|0| // |PATH|START ADDR| for SFLASH_#0_BOOT
|D:\Project\WIFI\sdk\FreeRTOS\DA16600_SDK_FreeRTOS_v3.1.0.0\img\DA16600_FRTOS-GEN01-01-14587-000000.img|23000| // |PATH|START ADDR| for SFLASH_#0_RTOS
||18a000| // |PATH|START ADDR| for SFLASH_#0_SLIB
||1e2000| // |PATH|START ADDR| for SFLASH_#1_RTOS
||380000| // |PATH|START ADDR| for SFLASH_#1_SLIB
|D:\Project\WIFI\sdk\FreeRTOS\DA16600_SDK_FreeRTOS_v3.1.0.0\img\da14531_multi_part_proxr.img|3ad000| // |PATH|START ADDR|forBLE
||3bd000| // |PATH|START ADDR| for DATA1
||3bd000| // |PATH|START ADDR| for DATA2
```

Figure 3: Setting File

4.3.3 Menu Selection

- **Read Setting**: reads values from setting file and fills the values to the forms
- **Save Setting**: saves all values of the forms to the setting file
- **Reset Setting**: resets all values to default values
- **DONE**: all information is kept and used for download

4.4 Run Multi-Downloader

4.4.1 Select Port Number

The number of connected devices must be selected. Figure 4 shows three ports selected, and three terminal boxes activated.

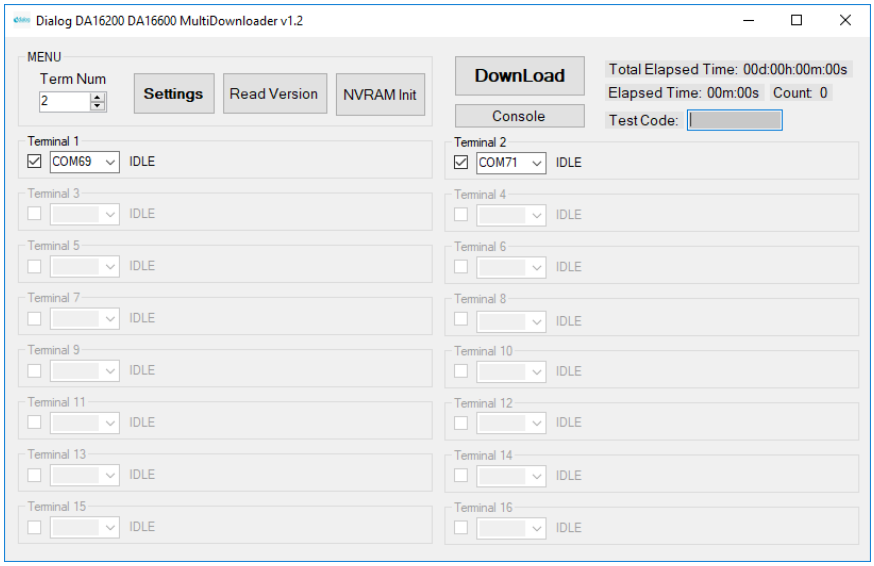

Figure 4: Port Selection

4.4.2 Select Images, Address, and Size

The images, address, and size are selected in **Settings**. Figure 5, Figure 6, and Figure 7 show examples of image selection of DA16600, DA16200 and a non-module type. These values could also be set by reading the information from the “Setting” file.

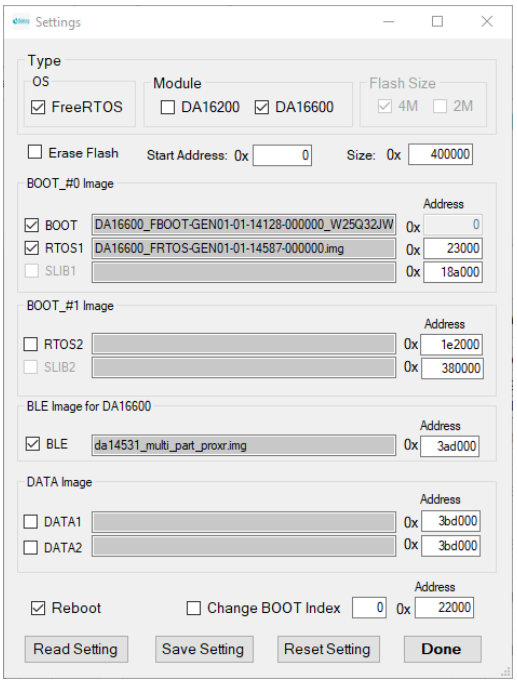

Figure 5: Settings for DA16600 Module

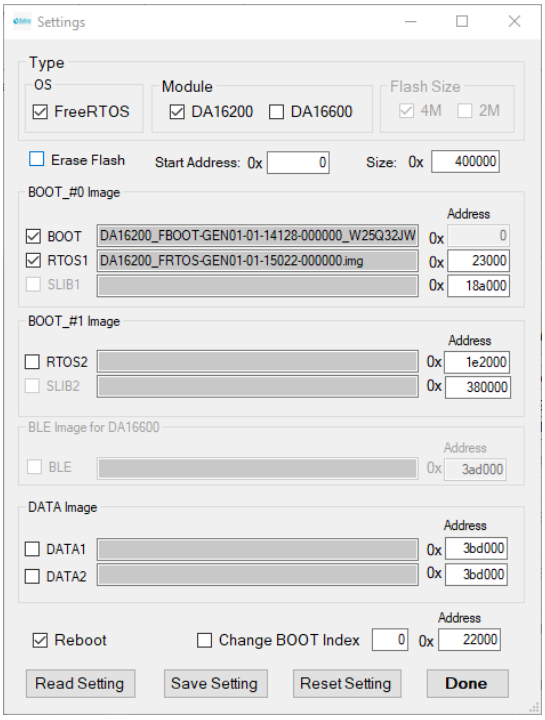

Figure 6: Settings for DA16200 Module

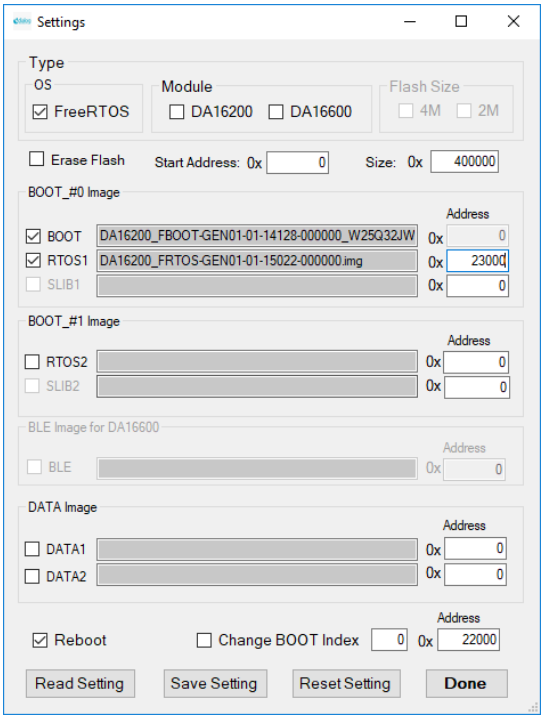

Figure 7: Settings for Non-Module Type

4.4.3 Download

The download button initiates download. The state and progress of each terminal for downloading is shown in Figure 8. Figure 9 shows a successful download without any errors. If there is an error, the failure number is shown as in Figure 10. In case of failure, check the state of the device or connection.

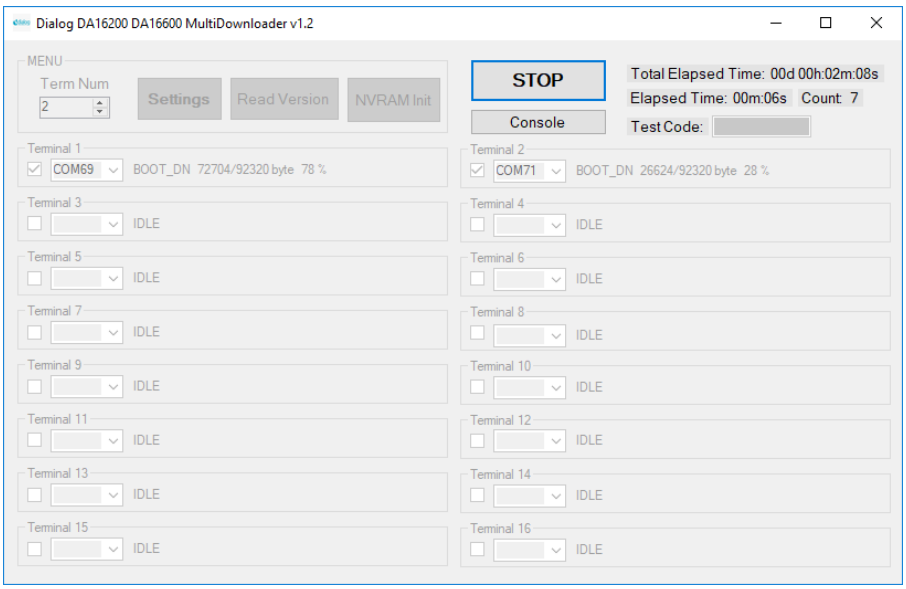

Figure 8: State and Progress During Downloading

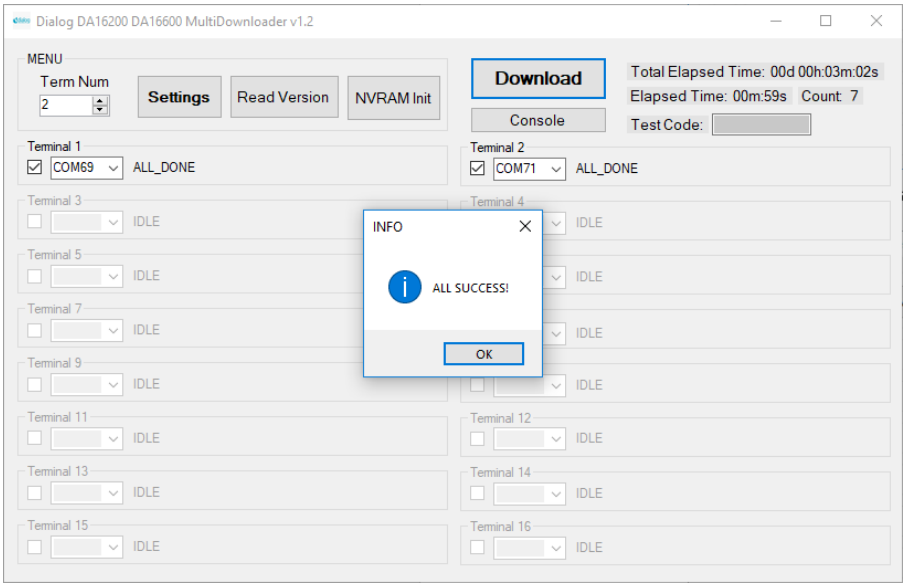

Figure 9: Completion Screen, No Errors

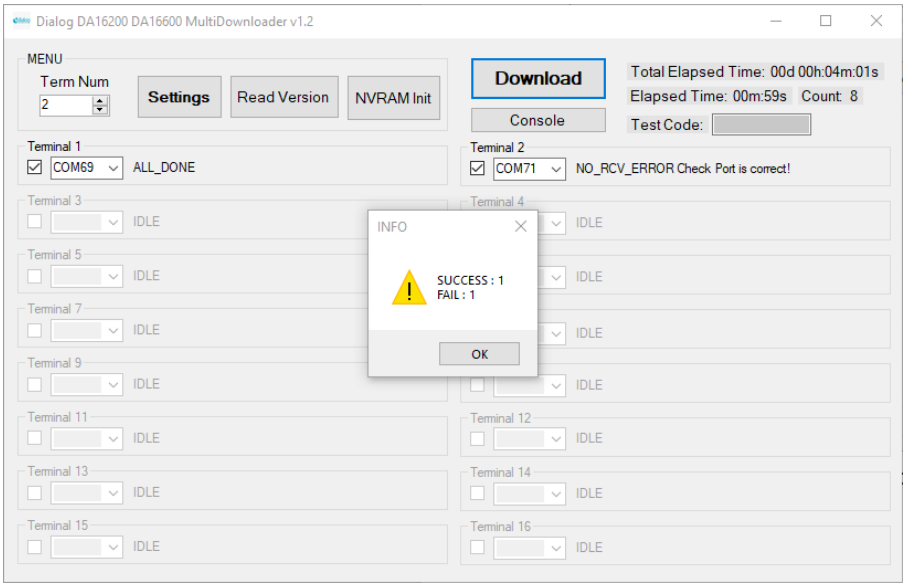

Figure 10: Completion Screen Showing One Failure

4.4.4 Read SDK Version

The device boots automatically after downloading is finished. Read Version shows the SDK version of the running image through AT command communication. Figure 11 is a success case and Figure 12 is a failure case. In case of failure, check the state of the device or connection.

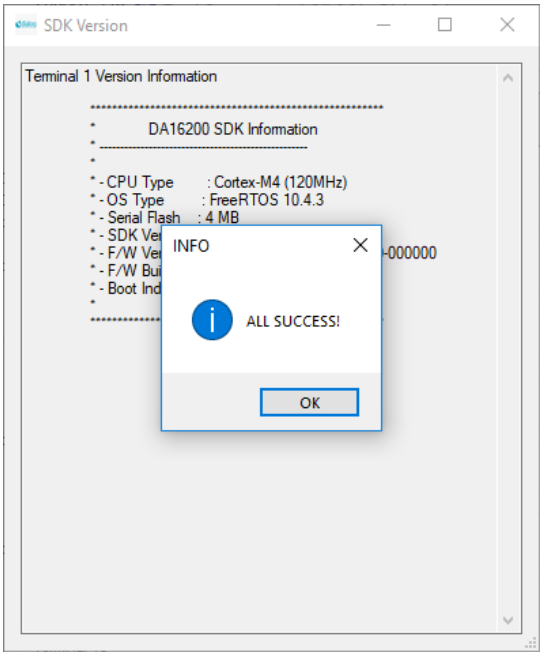

Figure 11: Read Version with Success

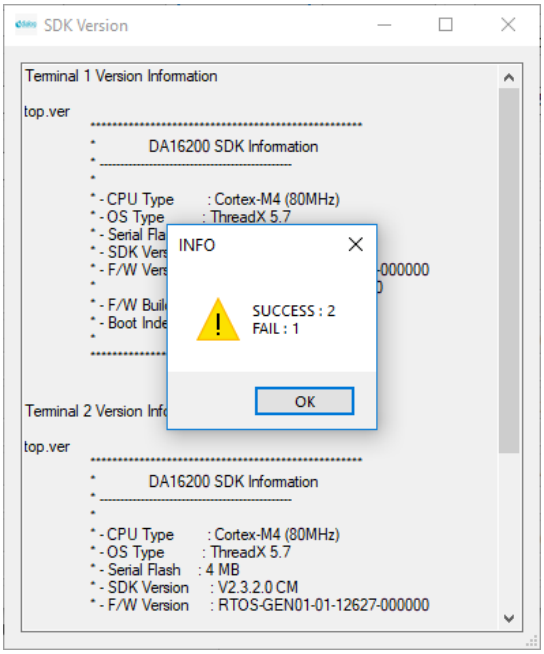

Figure 12: Read Version with Failure

4.4.5 Initialize NVRAM

NVRAM Init initializes NVRAM through AT command communication. Figure 13 is a success case and Figure 14 is a failure case. In case of failure, check the state of the device or connection.

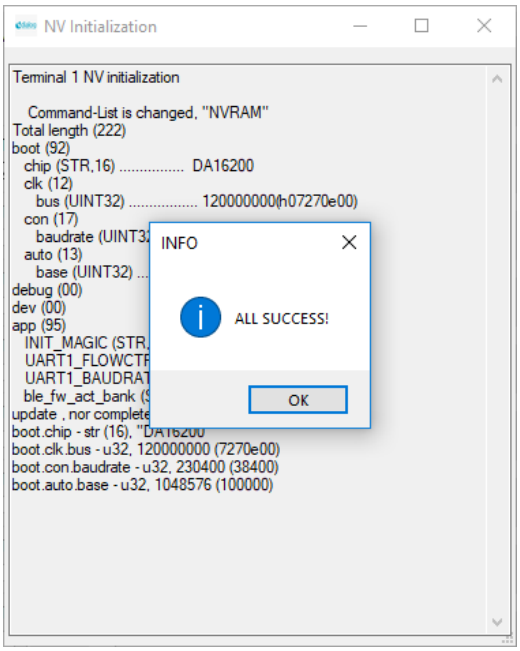

Figure 13: NVRAM Initialization with Success

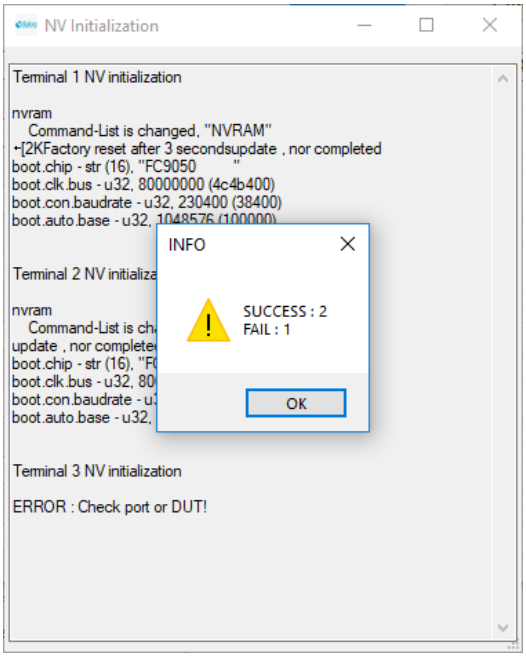

Figure 14: NVRAM Initialization with Failure

Appendix A Log Option

If there is any problem with this tool, log could help fix it. The log is activated with input "logon" to the text box of version information as shown in Figure 15. A log file for each terminal is generated in the same folder of the multi-downloader executable file. The file name is MD_Log_<terminal number>.txt. The log is deactivated with input "logoff". The character 'L' to the right of the text box means the log is enabled (see Figure 15).

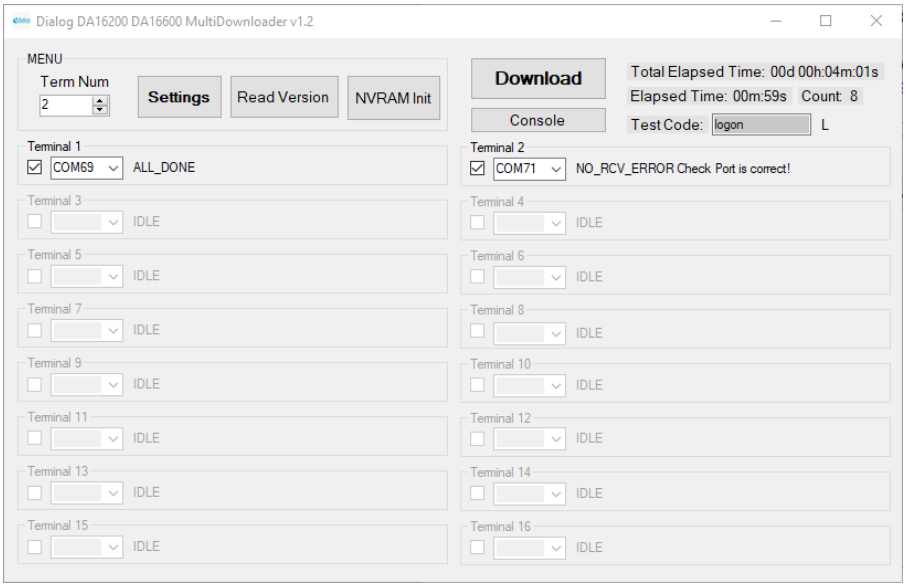

Figure 15: Log Activation

Appendix B Console Functionality

There is a console function in the multi-downloader. The **Console** screen can be shown to maximum 16 independent windows. Figure 16 is an activated console window. The port must be selected and opened. Then command can be input and any message from the connected device as shown. Figure 17 is the screen with messages from the device. The text box to the right of the window is a command history. The function of each button for the command history is as follows:

- **Add**: add command of input box to the command history
- **Delete**: delete the selected command in the command history
- **Delete all**: delete all commands in the command history
- **Copy all**: copy all commands to Windows clipboard
- **Load**: load the commands from the file which have predefined commands
- **Save**: save the command history to a file

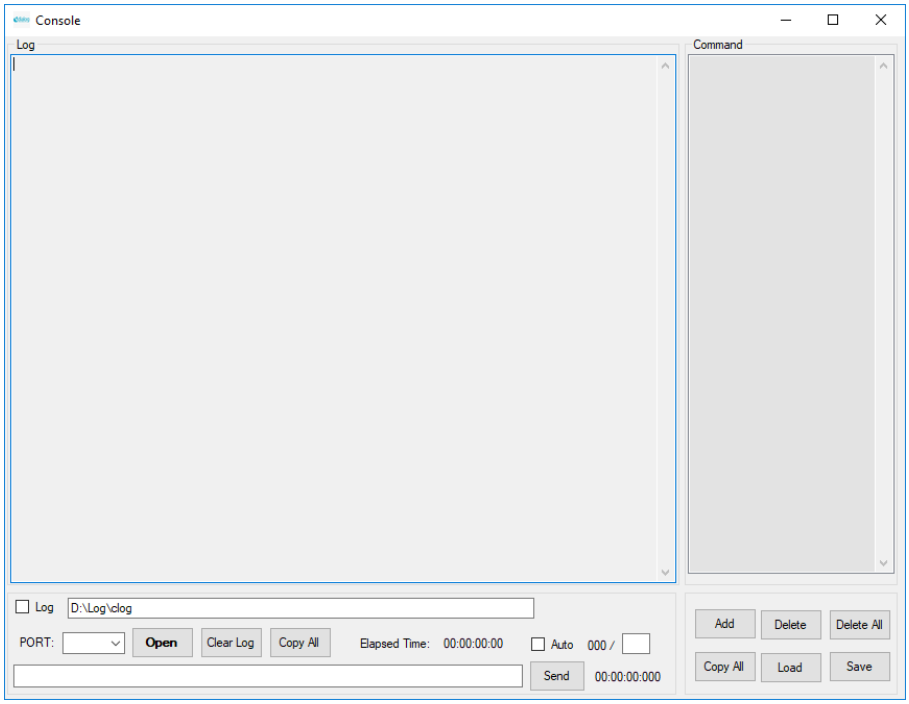

Figure 16: Console Screen

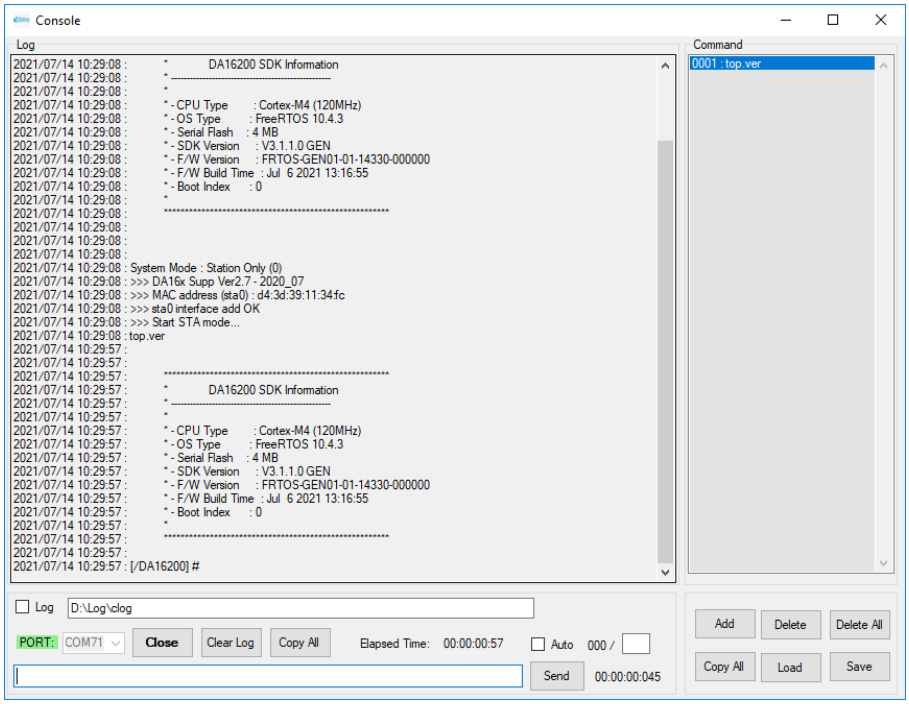

Figure 17: Screen with Messages

Revision History

Revision	Date	Description
1.1	16-Sep-2021	● Added Support FreeRTOS SDK ● Added Support flash erase ● Removed auto selection of bootloader for DA16600 module ● Added a detection function of flash ID in flash IC, bootloader and SFDP of RAM
1.0	05-Jan-2021	First Release

Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

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