User Manual

16200 UART SFlash Downloader

UM-WI-014

Abstract

This User Manual explains how to setup and use the 16200 UART SFlash Downloader.

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Terms and Definitions

GUI	Graphical User Interface
UART	Universal Asynchronous Receiver Transmitter
SSID	Service Set IDentifier
DHCP	Dynamic Host Configuration Protocol
AP	Access Point
USB	Universal Serial Bus
MFC	Microsoft Foundation Class

References

[1] DA16200, Datasheet, Dialog Semiconductor
[2] DA16200, SDK Programmer Guide, User Manual, Dialog Semiconductor
[3] DA16200, EVK User Manual, Dialog Semiconductor
[4] DA16200, AT Command User Manual, Dialog Semiconductor

1 Introduction

The 16200 SFlash UART Downloader is used to write the DA16200 images to the serial flash IC. And can download multiple devices at the same time. The 16200 SFlash UART Downloader can easily download the images with the use of the UART interface of the RS232 port between the DA16200 and PC.

1.1 Image Package

The DA16200 image package has three kinds of images. An explanation of each image is given in the following sub-sections.

1.1.1 Bootloader Image

The Bootloader image is also known as the second bootloader. This image has the important Sflash memory type info SFDP. This image must be loaded before successfully downloading the other images. The Bootloader image has the following file name convention:

- DA16200_BOOT_GEN01-01-XXXX-000000_IS25WP016D.img

1.1.2 Main RTOS Image

The Main RTOS image contains RTOS, Wi-Fi libraries, and system/user applications. The following file name convention applies:

- DA16200_RTOS_GEN01-XX-YYYY-ZZZZZZ.img

1.1.3 System Library Image

This System Library image has system libraries: RF drivers and libs for DPM operation. The following file name convention applies:

- DA16200_SLIB_GEN01-XX-YYYY-ZZZZZZ.img

1.2 UART Connection

The DA16200 EVB should be connected with a USB port that has a PC-dedicated UART interface known as UART_TXD, UART_RXD. See Figure 1.

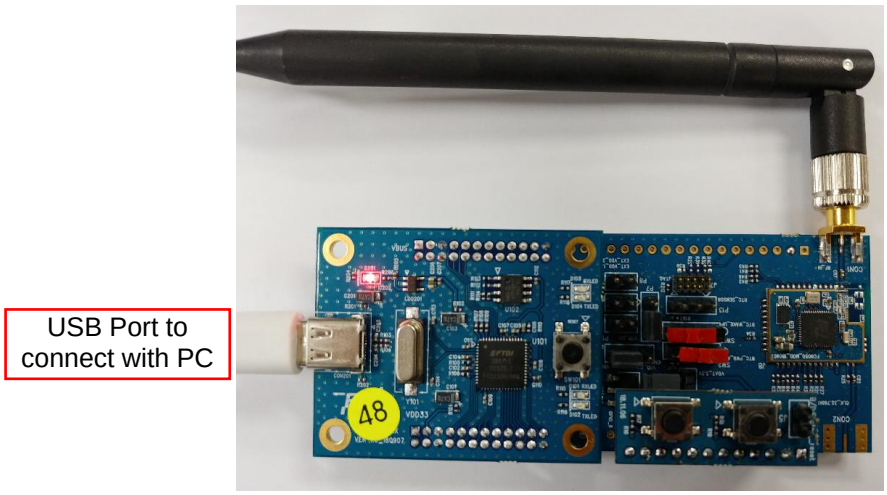

Figure 1: UART Connection with PC via USB Port

2 How to use UART Sflash Downloader

2.1 Execute UART Sflash Downloader

The executable file of UART Sflash downloader is DIALOG_MultiLoader.exe. See Figure 2.

- 2 Mbyte Sflash memory
  If the DA16200 device uses 2 Mbyte Sflash, then script file download_2M.xml should be used.
  To use this file, rename the filename as follows: download_2M.xml → download.xml.
- 4 Mbyte Sflash memory
  If the DA16200 device uses 4 Mbyte Sflash, the script file download_4M.xml should be used.
  To use this file, rename the filename as follows: download_4M.xml → download.xml.

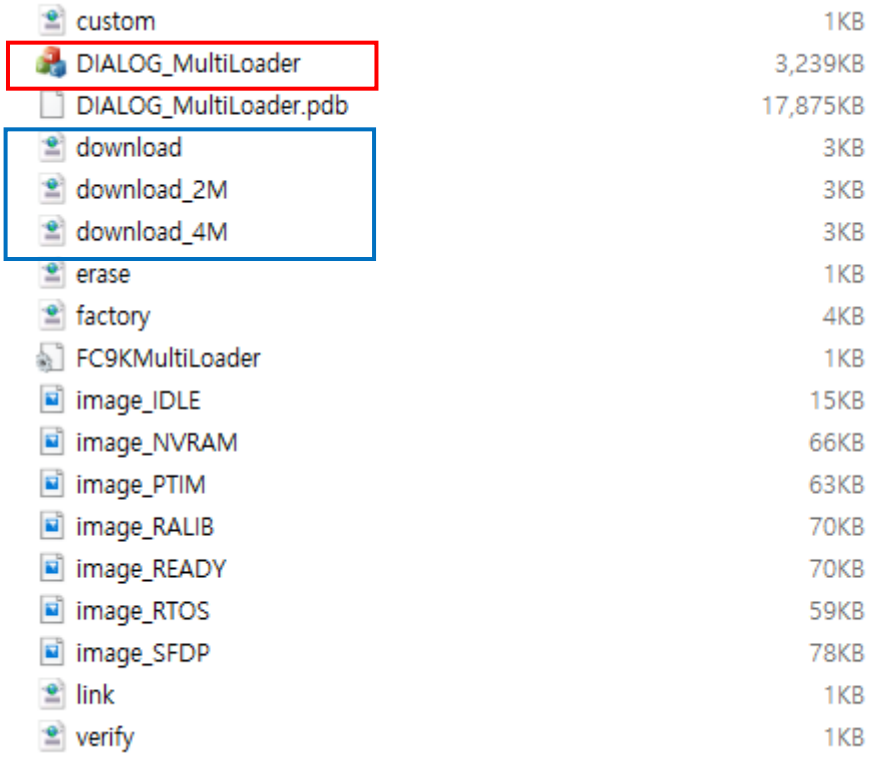

Figure 2: The Execute File of UART Sflash Downloader

2.2 Setting UART Sflash Downloader

The DA16200 UART SFlash Downloader supports up to 16 devices with the use of multiple UART ports at the same time. The terminals show the number of connected UART ports.

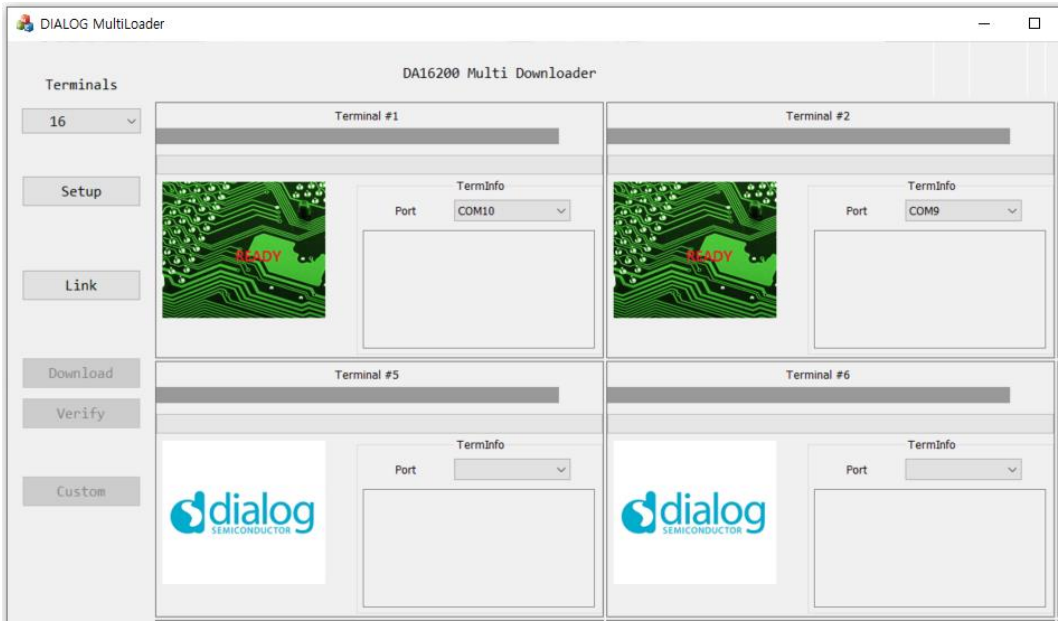

Figure 3: DA16200 UART Sflash Downloader

2.2.1 Terminals

The terminals are used to connect DA16200 UART consoles. After all terminals are connected, the Multi-SFlash UART downloader automatically aligns the available UART ports and displays each terminal status on an individual terminal window. If the UART console is misaligned, the Multi-SFlash UART downloader will change the UART port to find the correct terminal number. The terminal window consists of several parts as described below.

- Port Button

This process connects the UART port of the corresponding DA16200 target device.

- Colored Status Bar

This bar displays the status of the download process. A blue color indicates a “BUSY” state and means that download is in process. A green color indicates a “SUCCESS” status and means that the download has successfully completed. A red color indicates an “ERROR" status and means that the download failed. A gray color indicates a “Not Connect” status. The UART port is not connected.

- Progress Bar

Progress Bar displays the transmission status of Ymodem.

- Picture

Picture displays the UART connection status and the Ymodem transmission steps. An IDLE image tells that the UART port is disconnected. A READY image tells that the UART port is connected. The Picture displays BOOT, RTOS, RALIB, PTIM, and NVRAM images according to the Ymodem transmission file.

- Text Control

The Text Control displays the UART connection status and console output on the screen.

Each terminal window creates a log file of the console. The log filename is "Term #" in Postfix.

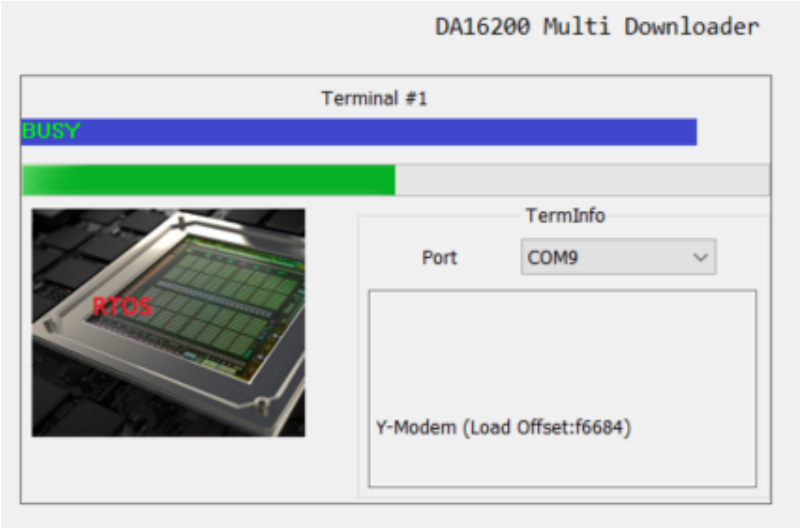

Figure 4: Downloader Terminal Window

3 Download Sequence

SFlash download is done in the following sequence:

- Setup
- Link
- Download
- Verify
- Unlink

3.1 Setup

The Setup process configures a UART port for the console and images to be loaded. In the configuration of the Console UART, set the Baud rate to 230400 Baud, Data length to 8bit, Parity to none, Stop bit to 1bit, and Flow control to none.

DA16200 UART Sflash downloader tool can download 2 image packages in simultaneously.

To set up the first image package downloading, it is required to select three images at SFLSH _#0 window in Figure 5.

- BootLoader: DA16xxx_ueboot_XXXXX.img

The BootLoader includes the Sflash type information of the SFlash parameters. The bootloader can be used both the first and second image package, so download is only required one time.

- RTOS: DA16xxx_RTOS_XXXXXX.img

The Main image that includes "RTOS" and applications in the first image package.

- RaLIB: DA16xxx_slib_tim_XXXXX.img

The System Library image that includes RF drivers, and DPM relevant libraries in the first image package.

To set up the download of the second image package, it is required to select two images at the SFLSH _#1 image window. See Figure 5.

- RTOS: DA16xxx_RTOS_icv.img

The Main image that includes "RTOS" and applications for the second image package.

- RaLIB: DA16xxx_slib_tim_icv.img

The System Library image that includes RF drivers, and DPM relevant libraries for the second image package.

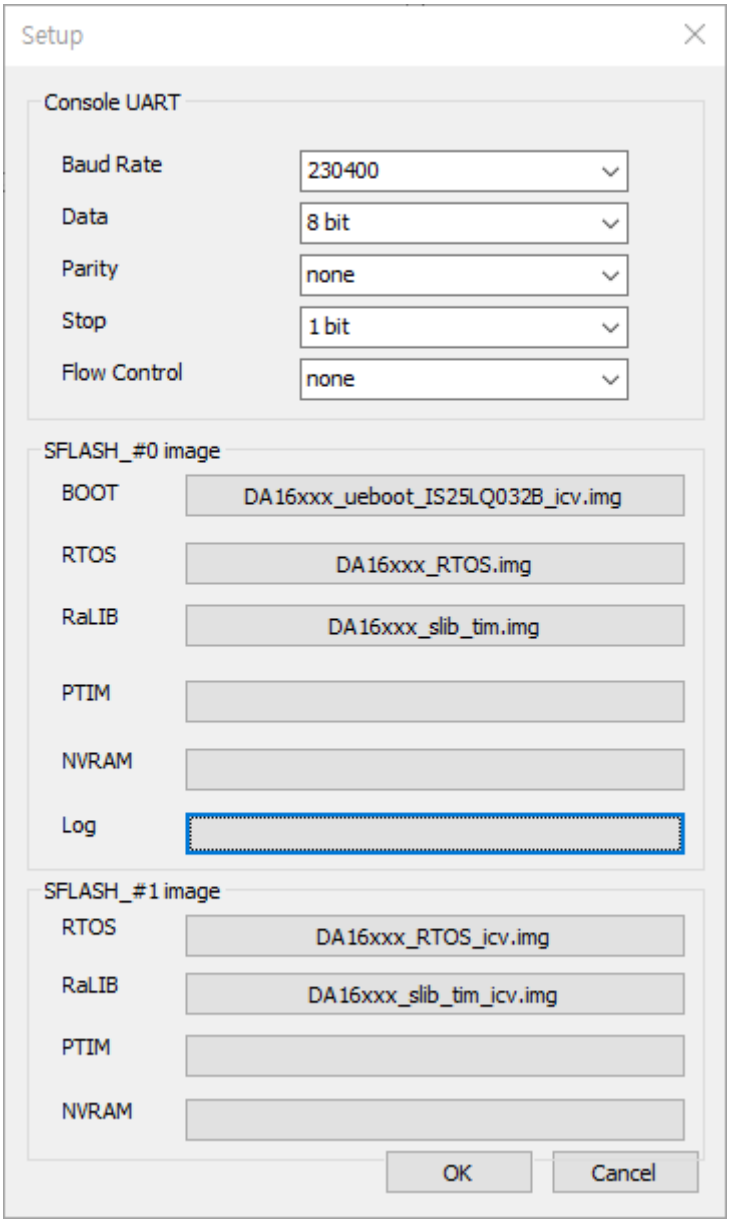

Figure 5: Setup Window

3.2 Link

Link process links SFlash parameters of the SFDP file before SFlash is downloaded.

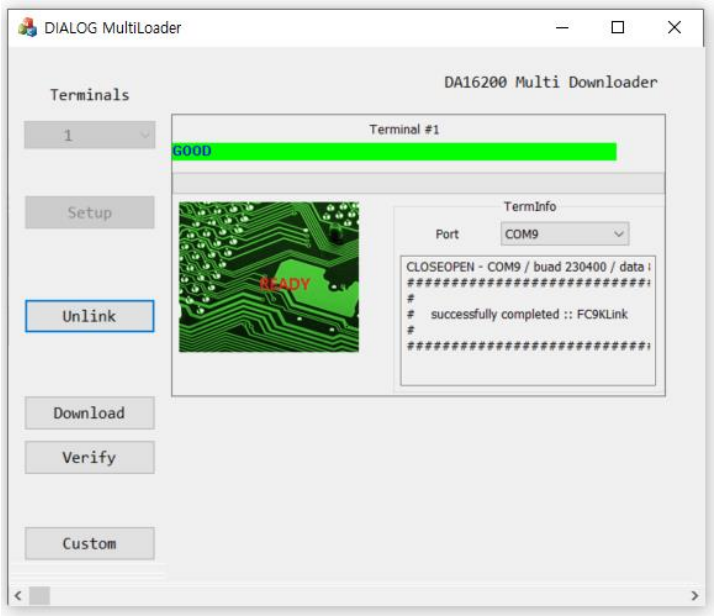

Figure 6: Link Process

3.3 Download

This process downloads images.

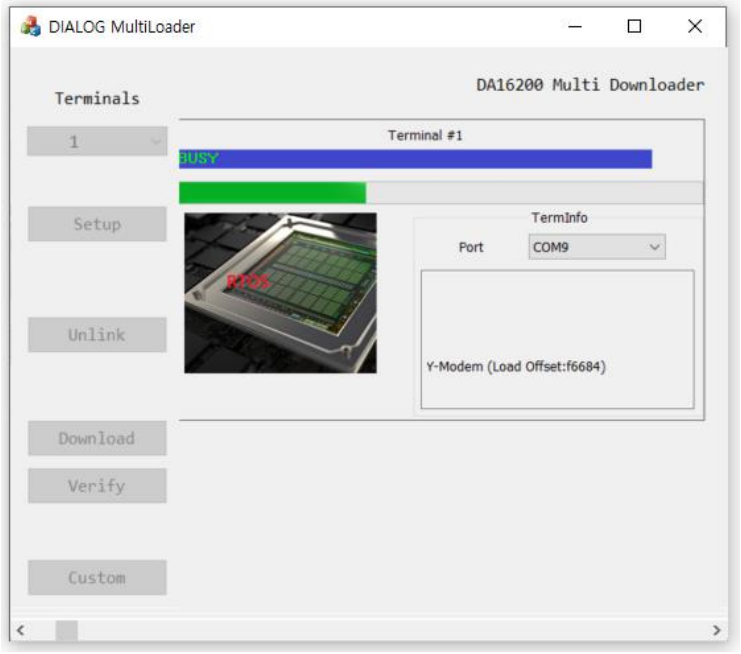

Figure 7: Download Process

3.4 Verify

The Verify process verifies if the loaded images operate correctly.

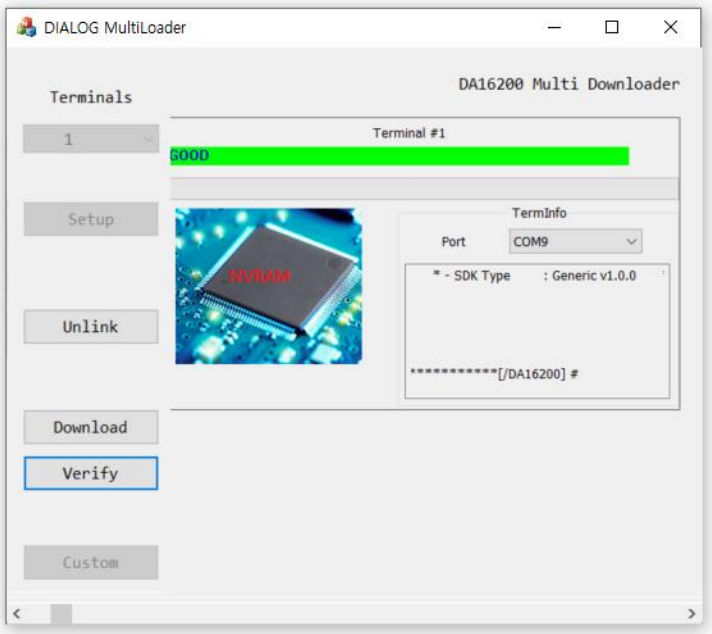

Figure 8: Verify Process

3.5 Unlink

Unlink process unlinks SFlash memory information of SFDP after SFlash is downloaded.

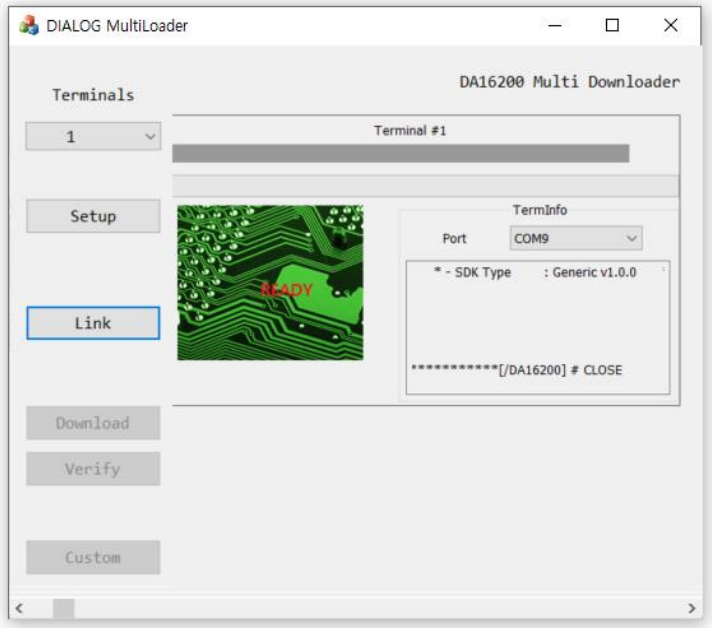

Figure 9: Unlink Process

3.6 Use Command for Conversion of Image Package

The command to change between #0 image and #1 image package is given in the following sub-sections.

3.6.1 Change From #0 Image to #1 Image

- boot_idx 0: command to change from #0 image to #1 image
- reboot: command to reboot the system

```
[/DA16200] # boot_idx 0
[/DA16200] # reboot
```

```
*********************************************
*             DA16200 SDK Information
* -------------------------------------------
*
* - CPU Type         : Cortex-M4 (80MHz)
* - OS Type          : ThreadX 5.7
* - Serial Flash     : 16 Mbits (2 MBytes)
* - SDK Type         : Manufacture v1.1.2
* - F/W Version      : RTOS-GEN01-01-8254-000000
*                    : SLIB-GEN01-01-8209-000000
* - F/W Build Time   : Nov  5 2019 16:04:29
* - Boot Index       : 0
*
*********************************************
```

Figure 10: Conversion From #0 Image to #1 Image

3.6.2 Change From #1 Image to #2 Image

- boot_idx 1: command to change from #1 image to #0 image
- reboot: command to reboot system

```
[/DA16200] # boot_idx 1
[/DA16200] # reboot
```

```
*********************************************
*             DA16200 SDK Information
* -------------------------------------------
*
* - CPU Type         : Cortex-M4 (80MHz)
* - OS Type          : ThreadX 5.7
* - Serial Flash     : 16 Mbits (2 MBytes)
* - SDK Type         : Generic v1.1.2
* - F/W Version      : RTOS-GEN01-01-8254-000000
*                    : SLIB-GEN01-01-8209-000000
* - F/W Build Time   : Nov  5 2019 16:19:11
* - Boot Index       : 1
*
*********************************************
```

Figure 11: Conversion From #1 Image to #0 Image

Revision History

Revision	Date	Description
1.3	28-Nov-2019	Finalized for publication
1.2	27-Nov-2019	Added section on downloading 2 images packages simultaneously
1.1	19-Nov-2019	Editorial review
1.0	22-Jul-2019	Preliminary DRAFT 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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