

User Manual DA16200 and DA16600 Multi-Downloader Tool

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Abstract

This User Manual explains how to setup and use the Multi-Downloader for DA16200 and DA16600.

DA16200 and DA16600



Multi-Downloader Tool

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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] DA16200, SDK Programmer Guide, User Manual, Dialog Semiconductor
- [3] DA16200, EVK User Manual, Dialog Semiconductor
- [4] DA16200, AT Command User Manual, Dialog Semiconductor
- [5] DA16600MOD Series, Datasheet, Dialog Semiconductor
- [6] DA16600, Example Application Manual, Dialog Semiconductor



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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. And it can download the images to multiple devices at the same time.

4 UART Connection at DA16200 and DA16600 EVB

The DA16200 and DA16600 EVB has a USB port for a USB-to-UART interface. Figure 1 shows the interface in the DA16200 EVB and Figure 2 shows the interface in the DA16200 EVB. In case of a standalone device, the UART GPIOs must be connected to the RS232 port of PC directly or through UART-to-USB interface.



Figure 1: UART Connection with PC via USB Port at DA16200 EVB



Figure 2: UART Connection with PC via USB Port at DA16600 EVB

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5 Multi-Downloader

5.1 Requirements

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

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

5.2 Main Screen

Figure 3 shows the main screen of Multi-Downloader. It has the following menus and options:

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

🚥 Dialog MultiDownLoader v0.13	– 🗆 X
MENU Term Num 1 🗢 Setting Read Version NVRAM Init	DownLoad Total Elapsed Time: 00d:00h:00m:00s Elapsed Time: 00m:00s Count 0
Terminal 1	Terminal 2
Teminal 3	Terminal 4
Terminal 5	Teminal 6
Terminal 7	Terminal 8
Terminal 9	Terminal 10
Terminal 11	Terminal 12
Terminal 13	Terminal 14
Terminal 15	Terminal 16

Figure 3: 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.

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5.3 Setting

Figure 4 shows the setting of the Multi-Downloader. It has image selection and operation with the setting file.

5.3.1 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.

- **Module**: This selects module type. The address and size are changed automatically according to this selection. But all values can be changed manually. The predefined bootloader image is used in case of DA16600. The default is non-module type.
- **Flash type**: This selects the actual flash size used in the image. This changes the address and size automatically according to the selection. But it can be changed manually also.
- SFLASH_#0 image: This selects images files and checkbox for downloading to boot index 0.
 - BOOT: This selects 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.
 - **RTOS1**: This select the main image. The name is like DA16200_RTOS_GEN01-XX-YYYY-ZZZZZ.img.
 - **SLIB1**: This selects system library image. The name is like DA16200_SLIB_GEN01-XX-YYYY-ZZZZZ.img.
- SFLASH_#1 image: This selects images files and checkbox for downloading to boot index 1. It
 may not be needed necessarily if normal operation with #0 image is enough. RTOS2 and SLIB2
 images can be selected.
- **BLE image**: This selects BLE image for DA14531 in DA16600 module. The name is like da14531_multi_part_proxr.img
- **DATA image**: This selects any data image with any address and size.

com Setting —	
Module Part DA16200 DA16600 4M	2M
SFLASH_#0 Image	Address
BOOT RTOS1 SLIB1	Address 0x 0 0x a000 0x 18a000
SFLASH_#1 Image	Address
RTOS2 SLIB2	Address 0x 200000 0x 380000
BLE Image for DA16600 Address DBLE 0x 392000	Size 0x 1000
DATA Image Address	Size
DATA1 0x 393000 DATA2 0x 393000	0x 1000 0x 1000
Read Setting Save Setting Reset Setting	Done

Figure 4: Setting

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5.3.2 Setting File

Predefined setting values can be read and saved. Figure 5 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.
- Module type: NONE, DA16200, or DA16600 can be set.
- Flash Size: 4M or 2M can be set.
- Each Image path, start address, and size: The information of the images can be set.

Figure 5: Setting File

5.3.3 Menu Selection

- Read Setting: This read values from setting file and fill the values to the forms.
- Save Setting: This saves all values of the forms to the setting file.
- Reset Setting: This resets all values to default values.
- DONE: All information is kept and used for download.





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5.4 Run Multi-Downloader

5.4.1 Select Port Number

The number of devices connected must be selected. Figure 6 shows three ports selected, and three terminal boxes activated.

🚥 Dialog MultiDownLoader v0.13	- 🗆 X
MENU Term Num 3 ≱ Setting Read Version NVRAM Init	DownLoad Total Elapsed Time: 00d:00h:00m:00s Elapsed Time: 00m:00s Count 0
Teminal 1	Console Test Code: Teminal 2 IDLE
Teminal 3 ☑ COM56 ✓ IDLE	Teminal 4
Terminal 5	Terminal 6
Teminal 7	Teminal 8
Terminal 9 IDLE	Teminal 10 IDLE
Terminal 11	Teminal 12
Terminal 13	Teminal 14
Teminal 15	Teminal 16

Figure 6: Port Selection

5.4.2 Select Images, Address and Size

The images, address and size are selected in "Setting". Figure 7, Figure 8, and Figure 9 shows examples of image selection of DA16600, DA16200 and a non-module type. These values are set by reading the information from the "Setting" file.

- Setting -	- 🗆 X
Module Part Flash Size ☐ DA16200 ☑ DA16600 ☑ 4M	2M
SFLASH_#0 Image	Address
BOOT AUTO SELECTION	0 x 0
RTOS1 DA16200_RTOS-GEN01-01-12627-000000.img	0x a000
SLIB1 DA16200_SLIB-GEN01-01-12283-000000.img	0x 18a000
SFLASH_#1 Image <	Address 0x 200000 0x 380000
BLE Image for DA16600	~
Address BLE da14531_multi_part_proxr.img 0x 392000	0 0x 1000
DATA Image	Cine.
DATA1 0x 393000 DATA2 0x 393000	0 0x 1000 0 0x 1000
Read Setting Save Setting Reset Setting	Done

Figure 7: Setting for DA16600 Module

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lleor	Manual	
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🚥 Setting —	
Module Part Flash Size ☑ DA16200 □ DA16600 ☑ 4M	□ 2M
SFLASH_#0 Image	Address
BOOT DA16200_BOOT-GEN01-01-11003-000000_W25Q32JW_	0 x 0
RTOS1 DA16200_RTOS-GEN01-01-12627-000000.img	0x a000
SLIB1 DA16200_SLIB-GEN01-01-12283-000000.img	0x 18a000
SFLASH_#1 Image SFLASH_#1 Image DA16200_RTOS-GEN01-01-12627-000000.img	Address 0x 200000
SLIB2 DA16200_SLIB-GEN01-01-12283-000000.img	0x 380000
BLE Image for DA16600 Address Address RI E VII 1671 multi and manufacture Ox 292000	Size
bic da 14551_mulu_par_proximing 0x 552000	0. 1000
DATA Image Address	Size
DATA1 0x 393000 DATA2 0x 393000	0x 1000 0x 1000
Read Setting Save Setting Reset Setting	Done

Figure 8: Setting for DA16200 Module

🚥 Setting		_	
Module Part	16200 DA16600	ash Size	2M
SFLASH_#0 Ima	age		Address
 ☑ BOOT DA ☑ RTOS1 DA ☑ SLIB1 DA 	BOOT DA16200_BOOT-GEN01-01-11003-000000_W25Q32JW_ RTOS1 DA16200_RTOS-GEN01-01-12627-000000.img SLIB1 DA16200_SLIB-GEN01-01-12283-000000.img		
SFLASH_#1 Ima	age		Admaa
✓ RTOS2 DA ✓ SLIB2 DA	RTOS2 DA16200_RTOS-GEN01-01-12627-000000 img SLIB2 DA16200_SLIB-GEN01-01-12283-000000 img		
BLE Image for D	A16600 14531_multi_part_proxr.img 0x	Address 392000 0;	Size x 1000
DATA Image		Address	Sine
DATA1	0x	393000 0: 393000 0:	x 1000 x 1000
Read Settin	g Save Setting Reset S	etting	Done

Figure 9: Setting for Non-module Type



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5.4.3 Download

The download button initiates download. The state and progress of each terminal for downloading is shown in Figure 10. Figure 11 shows a successful download without any error. If there is any error, the failure number is shown as in Figure 12. The state of the device or connection should be checked in case of failure.

🚥 Dialog MultiDownLoader v0.13	– 🗆 X
MENU Term Num 3 🐳 Setting Read Version NVRAM Init	STOP Total Elapsed Time: 00d 00h:00m:20s Elapsed Time: 00m:20s Count: 0 Console Test Code:
Teminal 1 COM5 RTOS1_DN 231424/894880 byte 25 %	Terminal 2 ✓ COM54 ✓ RTOS1_DN 231424/894880 byte 25 %
Teminal 3 COM56 RTOS1_DN 236544/894880 byte 26 %	Terminal 4
Terminal 5	Teminal 6
Terminal 7	Terminal 8
Terminal 9 IDLE	Terminal 10
Terminal 11	Terminal 12
Terminal 13	Terminal 14
Terminal 15	Terminal 16

Figure 10: State and Progress During Downloading

👐 Dialog MultiDownLoader v0.13			- 🗆 X
MENU Term Num 3 • Setting Read Version	NVRAM Init	Download Console	Total Elapsed Time: 00d 00h:01m:05s Elapsed Time: 01m:05s Count 0 Test Code:
Teminal 1 COM5 V ALL_DONE 65336/65336 byte 100 %		Teminal 2 ✓ COM54 ✓ ALL_I	DONE 65336/65336 byte 100 %
Terminal 3 COM56 V ALL_DONE 65336/65336 byte 100 %	INFO	Terminal 4	
Teminal 5	ALL	SUCCESS!	
Teminal 7		→ IDLE	
Teminal 9 IDLE		OK IDLE	
Teminal 11		Teminal 12	
Terminal 13		Teminal 14	
Teminal 15		Terminal 16	

Figure 11: Completed Screen, No Error

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MENU Term Num 3 • Setting Read Version N	VRAM Init	Download Console	Total Elapsed Time: 00d 00h:01m:49s Elapsed Time: 01m:02s Count 1 TestCode:
Teminal 1 COM5 V ALL_DONE 65336/65336 byte 100 %		Terminal 2	ALL_DONE 65336/65336 byte 100 %
Terminal 3 COM56 NO_RCV_ERROR Check Port is correct!	INFO	Terminal 4	DLE
Terminal 5	SUC	CESS : 2	DLE
Terminal 7			DLE
Terminal 9			DLE
Terminal 11		Teminal 12	DLE
Terminal 13		Teminal 14	DLE
Terminal 15		Terminal 16	DLE

Figure 12: Completed Screen Showing One Failure

5.4.4 Read SDK Version

The device will boot automatically after download is done. Read Version will show the SDK version of the running image through AT command communication. Figure 13 is a success case and Figure 14 is a failure case. The state of the device or connection should be checked in case of failure.



Figure 13: Read Version with Success





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SDK \	/ersion —		\times
Terminal top.ver	1 Version Information DA16200 SDK Information CPU Type : Cortex-M4 (80MHz) OS Type : ThreadX 5.7 Serial Ra SDK Vert INFO × - F/W Vert 000	00000	^
Terminal	2 Version Infe		
top.ver	DA16200 SDK Information		
		0000	~

Figure 14: Read Version with Failure

5.4.5 Initialize NVRAM

NVRAM Init will initialize NVRAM through AT command communication. Figure 15 is a success case and Figure 16 is a failure case. The state of the device or connection should be checked in case of failure.

🐝 NV Initialization	1	—	×
Terminal 1 NV initializa	ation		 ^
Command-List is ch No such command - t update , nor complete boot.chip - str (16), "F boot.ck .u32, 80 boot.con.baudrate - u boot.auto.base - u32,	anged, "NVRAM" ype help d C9050 " 000000 (4c4b400) 32, 230400 (38400) 1048576 (100000)	_	
	INFO	×	
Terminal 2 NV initializ			
Command-List is ch update , nor complete boot.chip - str (16), "F boot.clk.bus - u32, 80	ALL SUCCESS!		
boot.con.baudrate - u boot.auto.base - u32,	ОК		
Terminal 3 NV initializa	ation		
Command-List is ch update , nor complete boot.chip - str (16), "F boot.clk.bus - u32, 80 boot.con.baudrate - u boot.auto.base - u32,	anged, "NVRAM" d C9050 " 000000 (4c4b400) 32, 230400 (38400) 1048576 (100000)		
			~

Figure 15: NVRAM Initialization with Success



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Figure 16: NVRAM Initialization with Failure



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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 17. 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 17).

🚥 Dialog MultiDownLoader v0.13	- 🗆 X
MENU Term Num 3 • Setting Read Version NVRAM Init	Download Total Elapsed Time: 00d 00h:02m:54s Elapsed Time: 01m:05s Count 2 Console Test Code:
Terminal 1 COM5 V IDLE	Teminal 2
Terminal 3 Image: COM56 v IDLE	Terminal 4
Teminal 5	Teminal 6
Teminal 7	Terminal 8
Teminal 9 IDLE	Terminal 10
Terminal 11	Terminal 12
Teminal 13	Terminal 14
Teminal 15	Teminal 16

Figure 17: Log Activation



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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 18 is an activated console window. The port must be selected and opened. Then command can be input and any message from the connected device is shown. Figure 19 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.

Console		_	
Log	Command		
	Command		
· · · · · · · · · · · · · · · · · · ·	L		
Log d.\Project.\WIFI\flash_download_tool\new_gui_flash_downloader\MultiDownLoader\bin\Deb	Add	Delete	Delete All
PORT: Open Clear Log Copy All Bapsed Time: 00:00:00:00 Auto 000 /			
Send 00:00:000	Copy All	Load	Save

Figure 18: Console Screen



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com Console		-		\times
Log	Command			
Dop.ver 2020/12/21 04 09:24 : 2020/12/21 04 09:24 :	0001 top ver			~
Log d:\Project\WIFIYflash_download_tool\new_gui_flash_downloader\MultiDownLoader\bin\Deb	Add	Delete	Delete	All
Cose Cose Copy All Elapsed Time: 00:00:00:03 Auto 000 /	Copy All	Load	Save	ð

Figure 19: Screen with Messages



Revision History

Revision	Date	Description
1.0	05-Jan-2020	First Release







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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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