

# UM0462 User manual

STM32F101xx and STM32F103xx Flash loader demonstrator

## Introduction

The purpose of this document is to describe the STMicroelectronics STM32F101xx and STM32F103xx Flash loader demonstrator application that was developed to illustrate the System Memory bootloader capabilities.

This document details the prerequested hardware and software environments, as well as the use cases of the demonstrator software.

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## **1 Getting started**

### 1.1 Package contents

The following items are supplied in the Flash loader demonstrator package:

#### 1.1.1 Software contents

- 1. *STBLLIB.dll*: a dynamic link library implementing the system memory bootloader protocol and the COM communication APIs.
- 2. *Files.dll*: a dynamic link library implementing the needed file manipulation APIs to load and store binary, hexadecimal and motorola S19 files.
- 3. STMicroelectronics flash loader.exe: a wizard application that provides the high-level operations that can be performed by the user.

#### 1.1.2 Hardware contents

This tool is designed to work with all STMicroelectronics devices that support the system memory bootloader protocols. For more details, please visit the STMicroelectronics website (http://www.st.com) and refer to the application note AN2606: "STM32F101xx and STM32F103xx system memory boot mode".

### 1.2 System requirements

In order to use the Flash loader demonstrator with the Windows operating system, a recent version of Windows, such as Windows 98, Millennium, 2000, XP or Vista, must be installed on the PC.

The version of the Windows OS installed on your computer may be determined by rightclicking on the "My Computer" icon on the desktop, then clicking on the "Properties" item in the displayed pop-up menu. The OS type is displayed in the "System Properties" dialog box under the "System" label as shown in *Figure 1*.



Figure 1. System Properties dialog box

For the communication, you need to verify that you have an available COM port(RS232) as one COM port is required for system connection.

To check that you have an available communication port, right-click on the "My Computer" icon on the desktop and select "Properties" from the pop-up menu. The "System Properties" dialog box appears. Click on the "Hardware" tab, and then on the "Device manager" button to display the system hardware configuration. Available COM ports are grouped under the "Ports (COM & LPT)" node in the hardware tree as shown in *Figure 2*.



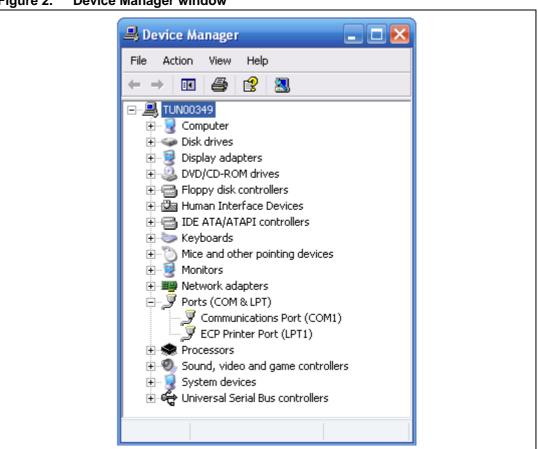


Figure 2. Device Manager window

## **1.3** Flash loader demonstrator installation

#### 1.3.1 Software installation

Run the *UM0462.exe* file: the InstallShield Wizard will guide you to install Flash loader demonstrator application on your computer. When the software is successfully installed, click on the "Finish" button.

### 1.3.2 Hardware installation

Connect the device to a spare COM port on your PC.



## 2 User interface description

The Flash loader demonstrator is designed as a wizard application. It is structured into five steps, the:

- welcome page
- connection settings
- device information
- operation choice
- operation progress

#### Step 1

Run the Flash loader demonstrator from the "Programs" menu (connection to the device has not been made yet) then, make sure that the device is connected to your PC and reset it to restart the system memory bootloader code. The Welcome window shown in *Figure 3* appears.

If all is ready click "Next" to continue.

#### Figure 3. Welcome window





The second step consists in selecting the connection settings. Select the desired UART settings (port name, baud rate, data bits, parity and stop bits and timeout) as shown in *Figure 4*. The default configuration is automatically set.

Ensure that the boot configuration pins are set correctly, then reset the device and click "Next" to continue. If a connection has been established, the wizard moves to the next step, otherwise a message box is displayed that indicates the error that occurred.



🗢 Flash loader demonstrator (v1.0)						
	<b>STM</b> 32 R	eleasing you	r <b>creati</b> v	vity 🗾		
	Select the communication port and set settings, then click next to open connection.					
- 10-1	• UART					
	Port Name	COM1 -	Parity	None		
	Baud Rate	115200 💌	Stop Bits	1 💌		
	Data Bits	8 💌	Timeout(s)	5 💌		
FLASHIT	SRIT Please, verify the boot mode configuration (set B00T0 pin to 1 and B00T1 pin to 0 ), reset your device, then click next to continue					
		< Back Ne	xt>	Cancel Finish		



In this step the connection has been established and communication has started. The Wizard displays the available device information such as the target ID or the number of times the read protection is disabled/enabled.

Select the target name in the target combobox as shown in *Figure 5*, then click on "Next" to continue.

Figure 5. Device information

🗢 Flash loader demonstrator (v1.0)					
	<b>STM</b> 3	2 Releas	ing your	creativity	
	Please, se	elect the target in	n the targets list	ьох	
	Target	STM32F10	«Вхх		•
	PID 0x	06410041			
	Version	2.0			
	Flash map	ping			
and the second second second	Name	Start address	End address	Size	R W E 🟊
FLASHIT	Page0	0x 8000000	0x 80003FF	0x400 (1K)	X X X 🗖
	Page1	0x 8000400	0x 80007FF	0x400 (1K)	XXX
Concession of the local division of the loca	Page2	0x 8000800	0x 8000BFF	0x400 (1K)	XXX
	Page3	0x 8000C00	0x 8000FFF	0x400 (1K)	<u> </u>
	Page4	0x 8001000 0x 8001400	0x 80013FF 0x 80017FF	0x400 (1K)	X X X X X X
Red Com	Page5 Page6	0x 8001400 0x 8001800	0x 80017FF 0x 8001BFF	0x400 (1K) 0x400 (1K)	$\hat{\mathbf{x}}$ $\hat{\mathbf{x}}$ $\hat{\mathbf{x}}$
a de la companya de l	Page7	0x 8001800	0x 80016FF	0x400 (1K) 0x400 (1K)	$\hat{\mathbf{x}} \hat{\mathbf{x}} \hat{\mathbf{x}}$
	Page8	0x 8002000	0x 80023FF	0x400 (1K) 0x400 (1K)	$\hat{\mathbf{x}} \hat{\mathbf{x}} \hat{\mathbf{x}}$
J. 34011 - 1	Page9	0x 8002400	0x 80027FF	0x400 (1K)	× × × × 🔽
		< Back	Next >	Cancel	Finish

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At this step, select the requested operation –Erase, Download or Upload– and set the related parameters:

- Erase
  - Select the "All" button to erase the whole memory
  - Select the "Selection" button to customize the Erase operation. Click on the "Selection" button to display the memory mapping dialog window, then check the pages to be erased and click "Ok".
- Download
  - Click the related browse button to open a binary, hexadecimal or S19 Motorola file.
     If the loaded file is a binary file, the download address is the start address of the first page and the "@" field is still editable to accept changes.
     If the loaded file is a hexadecimal or an S19 motorola file, the download address is the start address of the first record in the file, and the "@" field is read-only.
  - Check the "Verify" check box to launch the verification process when the Download operation is finished.
  - Check "Jump to the user program" to launch the downloaded program.
  - Check the "Optimize download duration" to filter FFs packets (256 bytes).
  - Check "Enable read protection after download" to activate the Flash memory read protection.
- Upload
  - Click the related browse button to select which binary, hexadecimal or S19 motorola file will store the uploaded data.

Note: Erase and Download operations can be performed only if the write protection is disabled. Consequently, the software will automatically disable the write protection before launching the operation.

For Upload operations, the software will automatically disable the read protection before launching the operation.



൙ Flash loader demonstrator (v1.0)						
N	STM32 Releasing your creativity					
The second	Please, select the requested operation and set the related parameters, then click next to start the operation C Erase					
	Pages					
	Download     Download file					
	C\\STM22 Demo 2.0 her					
FLASHIT						
	<ul> <li>@ 0x 08000000</li> <li>✓ Verify</li> <li>✓ Jump to the user program</li> <li>✓ Optimize download duration (Remove some FFs)</li> </ul>					
Enable read protection after download						
6 5 -	C Upload					
	Upload file					
	< Back Next > Cancel Finish					

#### Figure 6. Operation choice



The last Wizard page shows the operation progress: it gives the size of the data to be downloaded or uploaded, the percent completed and the duration of the operation as illustrated in *Figure 7*.

- In case of success, the progress bar is green colored. If an error occurs, the bar turns red and the error is displayed.
- To stop the operation click the "Cancel" button.
- If the user program is successfully executed and
  - the "Jump to the user program" check box was checked in the previous step, the communication with the system memory bootloader is lost. Consequently, the "Back" button is disabled to avoid the launch of another operation.
  - If the "Jump to the user program" check box was not checked in the previous step, the "Back" button remains active and it is possible to return to the previous step to select the same or a different operation.

#### Figure 7. Operation progress

൙ Flash loader demonstrator (v1.0)					
	STM32	Releasing	) your <b>cre</b>	ativity	57
	Target	STM32			
	Map file	STM32.STmap			
	Operation	DOWNLOAD			
FLASHIT	File name	C:\STM32 Dem	o 2.0.hex		
and the second second	File size	5 KB (5328 byte	s)		
	Status	3127 of 5328 by	tes		
	Time	00:00:02			
1 11/1	Downloading data 59%				
		< Back	Next >	Cancel	Finish



# 3 Revision history

#### Table 1.Document revision history

Date	Revision	Changes
25-Oct-2007	1	Initial release.



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