



**MMS – MCD
Application Team**

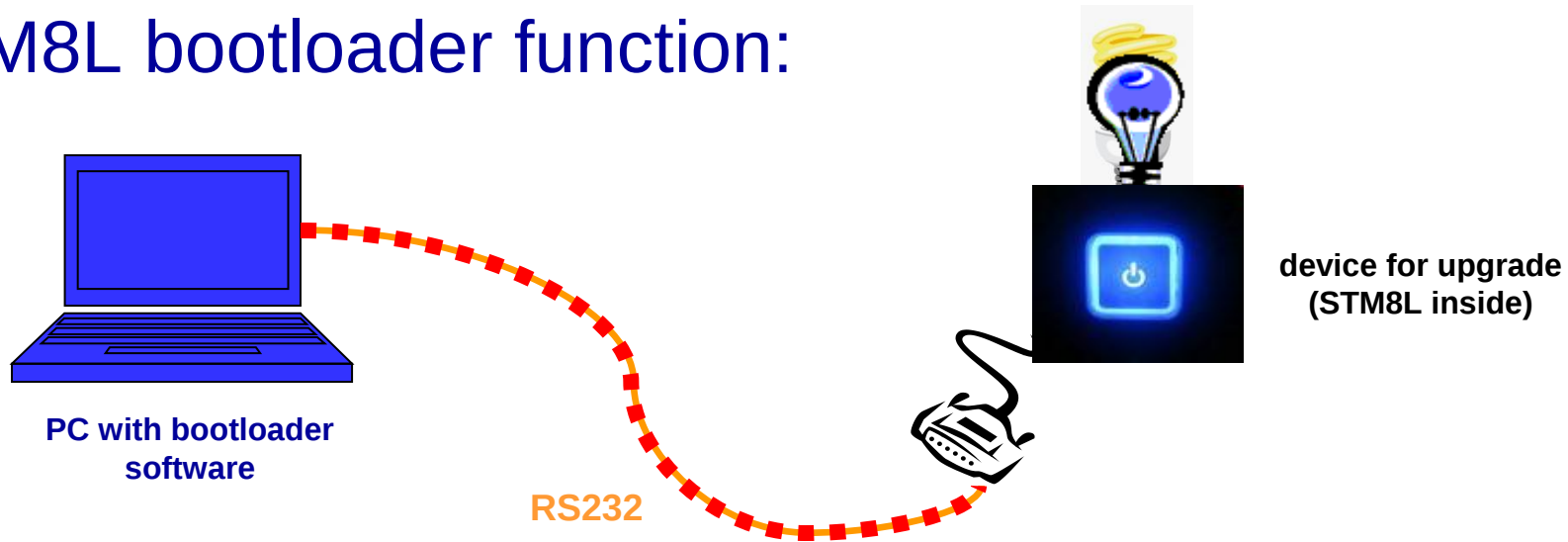
STM8L Training Slides

ROM bootloader

- **Bootloader required properties:**

- 1) Able to program Flash, EEPROM, RAM memory in final user application
 - IAP programming feature in STM8
- 2) Communicate with host by built-in interfaces
 - UART, SPI, CAN, I2C
- 3) Protected against self-rewrite (e.g. by accident)
 - location in ROM memory (address 0x6000)
- 4) Easy and safe to activate it
 - activated after each device reset
 - activation timeout – 1 second waiting for host command
 - can be disabled by option byte

STM8L bootloader function:



- running device - old firmware (bugs, slow execution, ...)
- PC with software (handheld, ...)
- communication interface
- restart + 1 second bootloader activation
- PC sends new firmware
- new firmware runs (removed bugs, new features, ...)

- STM8L bootloader memory map:
 - hardware reset is at 0x6000
 - ROM bootloader starts here (after reset)
 - 2kB of ROM code: 0x6000-0x67FF
- Bootloader activation:
 - by “Flash is empty” (virgin device):
 - if STM8 is not programmed (checking reset vector content for: 0x82xxxxxx or 0xACxxxxxx)
 - then bootloader is active continuously (no timeout)
 - by BL option byte:
 - active cca 1 second (to receive command from host)
 - if not valid – jump to reset vector (0x8000)

- Bootloader commands:
 - GET
 - to obtain supported commands codes (GET, READ, WRITE, ERASE, GO)
 - to obtain bootloader version number
 - READ
 - to read data
 - RAM, EEPROM (including Option bytes), Flash
 - WRITE
 - to write data
 - RAM, EEPROM (including Option bytes), Flash
 - automatic byte/word/page write mode selection (according address alignment and data length sent)
 - ERASE
 - to erase EEPROM, Flash
 - “erase all” and “erase sector” mode
 - GO
 - jump to given address to execute code (RAM, EEPROM, Flash code)
 - good for testing new firmware code (immediately after firmware upload)
 - for small RAM code execution (after writing given code into RAM)
- Command syntax:
 - interface independent
 - UART, LIN, SPI, CAN
 - [header] [checksums] [data] [answer]
 - see UM0560 – bootloader user manual

PC software – “Flash loader”



Flash loader demonstrator (v1.4 Alpha3)

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Select the communication port and set settings, then click next to open connection.

UART

Port Name: COM1, Parity: Even, Baud Rate: 115200, Stop Bits: 1, Data Bits: 8, Timeout(s): 5

Flash loader demonstrator (v1.4 Alpha3)

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Please, select your device in the target list

Target: STM8_128K

Version: 2.1

Name	Start address	End address	Size
DataEE0	0x 4000	0x 43FF	0x400 (1K)
DataEE1	0x 4800	0x 4BFF	0x400 (1K)
SEC0	0x 8000	0x 83FF	0x400 (1K)
SEC1	0x 8400	0x 87FF	0x400 (1K)
SEC2	0x 8800	0x 8BFF	0x400 (1K)
SEC3	0x 8C00	0x 8FFF	0x400 (1K)
SEC4	0x 9000	0x 93FF	0x400 (1K)
SEC5	0x 9400	0x 97FF	0x400 (1K)
SEC6	0x 9800	0x 9BFF	0x400 (1K)
SEC7	0x 9C00	0x 9FFF	0x400 (1K)
SEC8	0x A000	0x A3FF	0x400 (1K)
SEC9	0x A400	0x A7FF	0x400 (1K)
SEC10	0x A800	0x ABFF	0x400 (1K)

Flash loader demonstrator (v1.4 Alpha3)

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Erase

Download to device

Download from file

Q:\Users\Ugor\ST\Projects\STM8\AN2646-STM8smartcardDem

Erase necessary pages, Erase all pages (faster)

@ (h) 8000, Jump to the user program, Optimize (Remove some FFs), Verify after download

Upload from device

Upload to file

Flash loader demonstrator (v1.4 Alpha3)

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Target: STM8_128K, Map file: STM8_128K.STmap

Operation: DOWNLOAD

File name: Q:\Users\Ugor\ST\Projects\STM8\AN2646-STM8smartcardD

File size: 9.68 KB (9915 bytes), Status: 3.09 KB (3168 bytes) of 9.68 KB (9915 bytes), Time: 00:00:01

Downloading data 32%

- ▶ for UART only
- ▶ user friendly – no need to work with bootloader commands
- ▶ upload “*.s19” file to device

List of resources related to ROM bootloader :

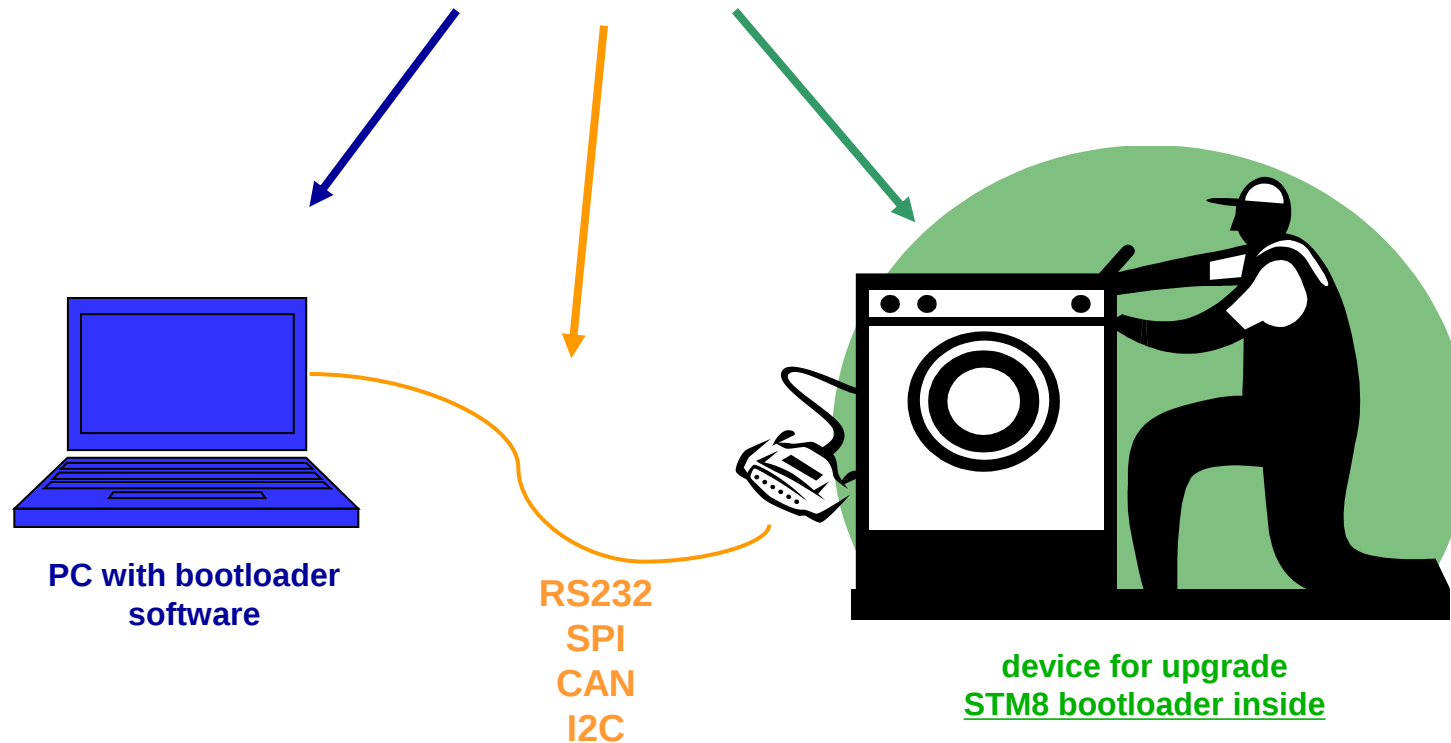
1) UM0560 manual

- detailed user manual for ROM bootloader
- published on internet

2) AN2659: In Application Programming (IAP)

- User Bootloader implementation
- compatible with ROM bootloader protocol
- source codes
- written in C-language
- for STM8L devices without build-in ROM bootloader

Understandable? Questions?



- Where is located bootloader in STM8L (memory type, address) ?

- How can be bootloader activated ?

- What are the bootloader commands ?

- Have all STM8L devices ROM bootloader ?

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