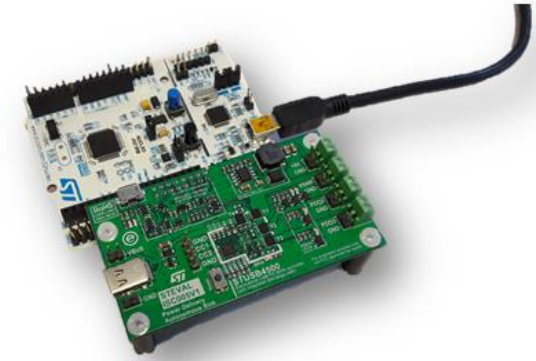


STSW-STUSB004 QUICK START

Programming STUSB
default parameters (NVM)
with an STM32



STEVAL-ISC004V1
STUSB4710
Eval BOARD



STEVAL-ISC005V1
STUSB4500
Eval BOARD

QUICK START

Introduction

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This document describes how to seamlessly configure STUSB default parameters. A Graphical User Interface (GUI) is used to manually customize STUSB parameters. Once frozen, the Non-Volatile-Memory settings can be then dumped by the GUI into an output file. The STSW-STUSB004 provide all the necessary Software structures and functions to load automatically the file into the NVM.

Main components	
NUCLEO-F072RB	STM32 Nucleo-64 development board with AMR Cortex M0
Mini-B USB cable	with USB data support
STSW-STUSB004	STUSB4500 Graphical User Interface
STEVAL-ISC004V1 STEVAL-ISC005V1	Compatible evaluation boards
IAR 8.x	C code compiler

Main files

Main components	
USB_PD_defines.h	Contains Registers definition from STUSB ICs
STUSB_NVM.h	File automatically generated by the GUI. Contains the NVM configuration
Main.c	Illustrates how to use the functions and build applications

C-compiler

In our example, an STM32F072RB MCU is used to run the code. Compiler is IAR.

Please note that the STUSB NVM library can runs equally with other MCU and/or using other Code compilers.

GENERATING the custom NVM setting file

(1/2)

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STEVAL_ISC004V1

The GUI can be downloaded by searching STSW-STUSB001 tool from www.st.com or from the STUSB4710 product pages in the TOOLS AND SOFTWARE tab.

TOOLS AND SOFTWARE

Embedded Software		
EVALUATION TOOL SOFTWARE		
Part Number	Manufacturer	Description
STSW-STUSB001	ST	Graphical User Interface for STUSB type-C and PD interfaces

Running the GUI on a Windows Laptop requires an USB to I²C interface in order to connect the USB port from the PC to STUSB I²C port. A simple NUCLEO-F072RB can act as an USB-to-I²C bridge. Please download quick installation guide from STSW-STUSB001 product page.

For full installation process, please check UM2254 – “STSW-STUSB001 Quick Installation Guide”.

GENERATING the custom NVM setting file

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STEVAL_ISC005V1

The GUI can be downloaded by searching STSW-STUSB002 tool from www.st.com or from the STUSB4500 product pages in the TOOLS AND SOFTWARE tab.

TOOLS AND SOFTWARE

Embedded Software		
EVALUATION TOOL SOFTWARE		
Part Number	Manufacturer	Description
STSW-STUSB002	ST	Graphical User Interface for STUSB45

Running the GUI on a Windows Laptop requires an USB to I²C interface in order to connect the USB port from the PC to STUSB I²C port. A simple NUCLEO-F072RB can act as an USB-to-I²C bridge.

For full installation process, please check “STSW-STUSB002 Quick start Guide from the “Presentation & Training Material tab”

EXPORTING the NVM_config.h file

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GUI for STEVAL-ISC004V1

STUSB 47xx Autorun Source Configuration

Version 3.23

USB Type-C configuration

Source current (Rp resistor) Rp 3.0 A

Interrupt Mask Configuration (ALARM pin)

☒ Mask Connection IRQ

☒ Mask Monitoring IRQ

☒ Mask Hardware-Fault IRQ

GPIOs Configuration

☒ GPIO_Smoothing

☒ VBus Internal Discharge

☒ External FET Discharge

☒ PMOS

☐ NMOS

PDO Sources Configuration (USB-PD)

Number of PDO (2 to 5) 5

PDO	Voltage	Current
PDO 1:	5V	3.00 A
PDO 2:	9V	3.00 A
PDO 3:	FLEX_V1	3.00 A
PDO 4:	15V	3.00 A
PDO 5:	FLEX_V2	2.25 A

FLEX_V1 12.00 V

FLEX_V2 20.00 V

FLEX_I 2.40 A

OVLO - UVLO Configuration

PDO	Low Level (5 to 20 %)	High Level (5 to 20 %)	Peak current
PDO 1:	10 %	12 %	00 : equal ioc
PDO 2:	10 %	10 %	00 : equal ioc
PDO 3:	10 %	10 %	00 : equal ioc
PDO 4:	10 %	10 %	00 : equal ioc
PDO 5:	20 %	10 %	00 : equal ioc

VBus Discharge time

Transition to 0V (from 84 to 1260ms) 2 * 84 ms

Transition to other PDO (from 20 to 300ms) 12 * 20 ms

Dashboard

PDO	Voltage	Current	UVLO	OVLO
PDO 1:	5V	3.00 A	4.50 V	5.60 V
PDO 2:	9.00 V	3.00 A	8.10 V	9.90 V
PDO 3:	12.00 V	3.00 A	10.80 V	13.20 V
PDO 4:	15.00 V	3.00 A	13.50 V	16.50 V
PDO 5:	20.00 V	2.25 A	16.00 V	22.00 V

Buttons: Read device NVM, Load NVM file..., Write device NVM, Save NVM to file..., Verify after write

GUI for STEVAL-ISC005V1

STSW-STUS8002 Graphical User Interface

Version S 1.03

CONNECTION STATUS:

STUSB4500 Detected at address 0x28 on I2C port 1

Buttons: Load NVM Config, Read device NVM, Save NVM Config, Write device NVM, Verify after write

SNK_PDO_NUMB (1 to 3) 3

PDO Sink Parameters

PDO	Voltage	Current	Low Level (5 to 20 %)	High Level (5 to 20 %)
PDO 1:	5V	1.50 A	20	15
PDO 2:	15.00	1.50 A	20	10
PDO 3:	20.00	1.00 A	20	10

FLEX_I 2.00

PDO Sink resume

Voltage	Current	UVLO	OVLO
5.00 V	1.50 A	4.00	5.75
15.00 V	1.50 A	12.00	16.50
20.00 V	1.00 A	16.00	22.00

IO Behavior

GPIO Ctrl ERROR_RECOVERY

Power OK GPIO's Configuration 2 (default)

VBus Enable Behavior

☐ POWER_ONLY_ABOVE_5V

Algorithm Parameter

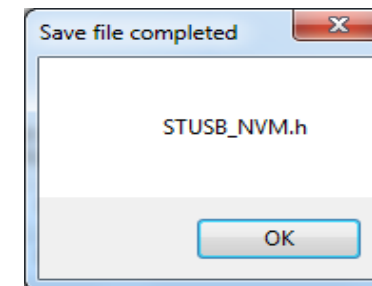
☐ REQ_SRC_CURRENT

Application PDO Parameters

☐ SNK_UNCONS_POWER

☐ USB_COMM_CAPABLE

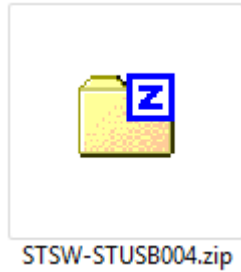
From the above configuration window, press the “Save NVM to file” (or “Save NVM config”) button. The configuration is saved into a .txt file for further re-use or debug. In parallel, a “STUSB_NVM.h” file is generated in the GUI directory.



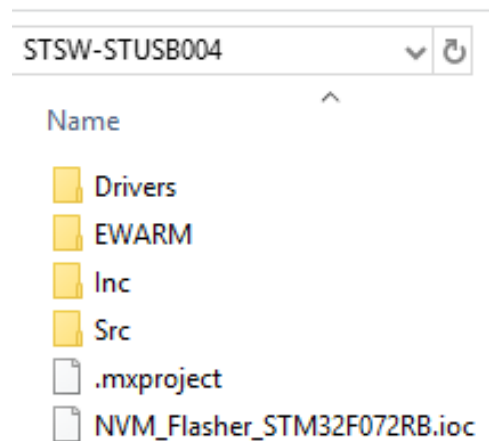
COMPILING the NVM_config.h file (1/3)

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1) Unzip the STSW-STUSB004 library



2) The following folder tree is installed locally

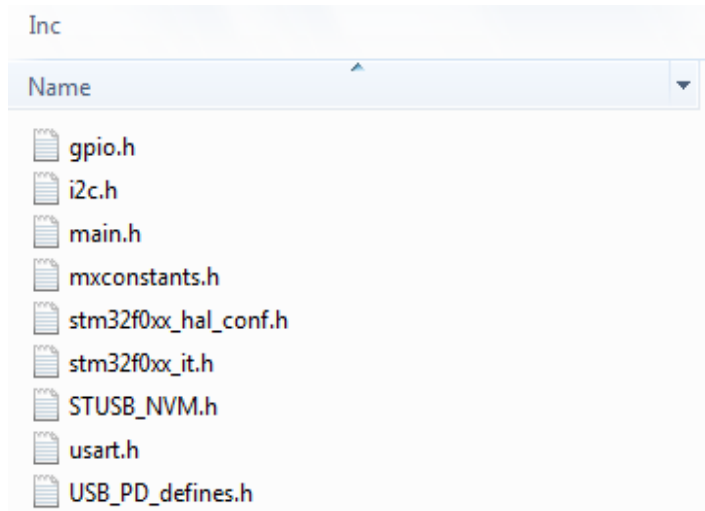


COMPILING the NVM_config.h file

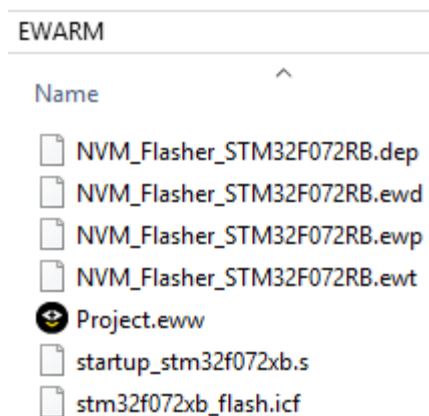
(2/3)

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3) Copy and replace the “STUSB_NVM.h” generated by the GUI into the “Inc” directory.



4) Open the “Project.eww” file from EWARM directory into IAR

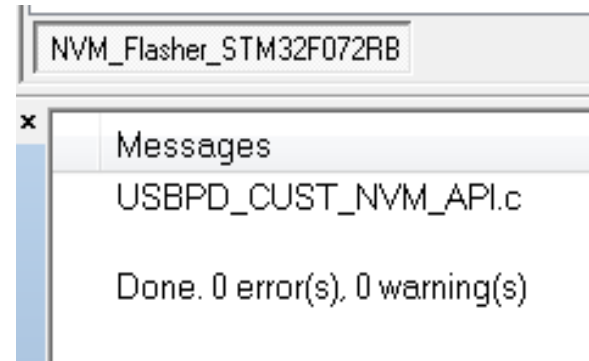


COMPILING the NVM_config.h file

(3/3)

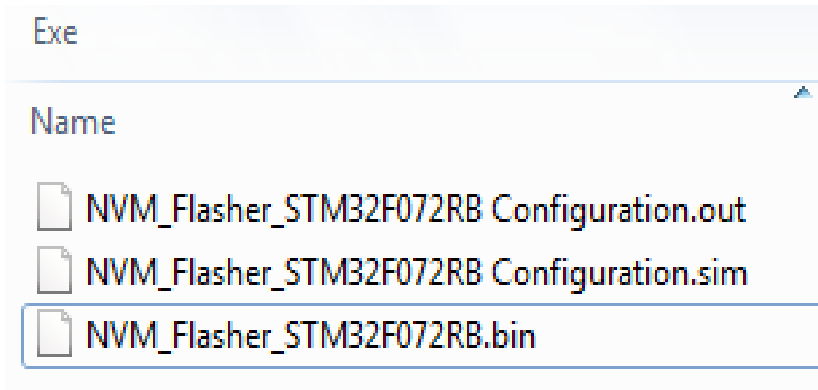
9

5) Compile the project

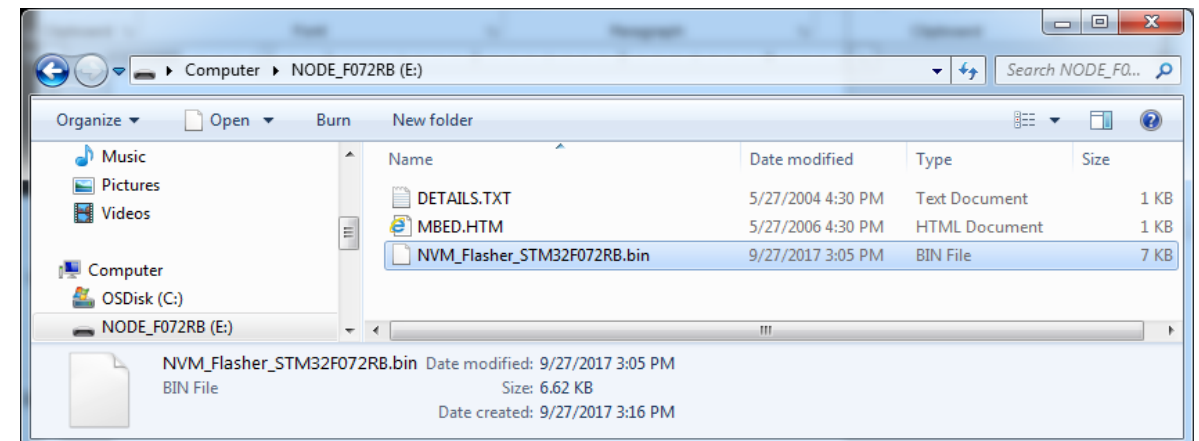


6) From the “Exe” directory, drag & drop the “NVM_Flasher_STM32F072RB.bin” file to the NUCLEO-F072RB nucleo board.

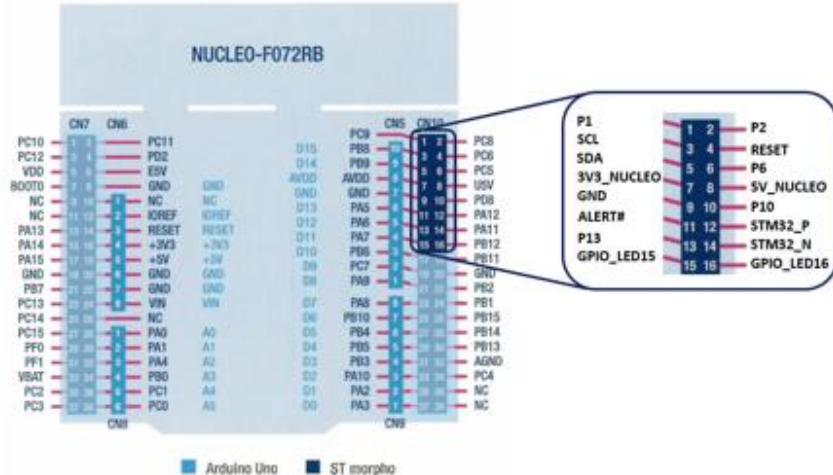
SOURCE



DESTINATION



PROGRAMING the NVM using the .bin



more information at:
www.st.com/stusb4500-pr

