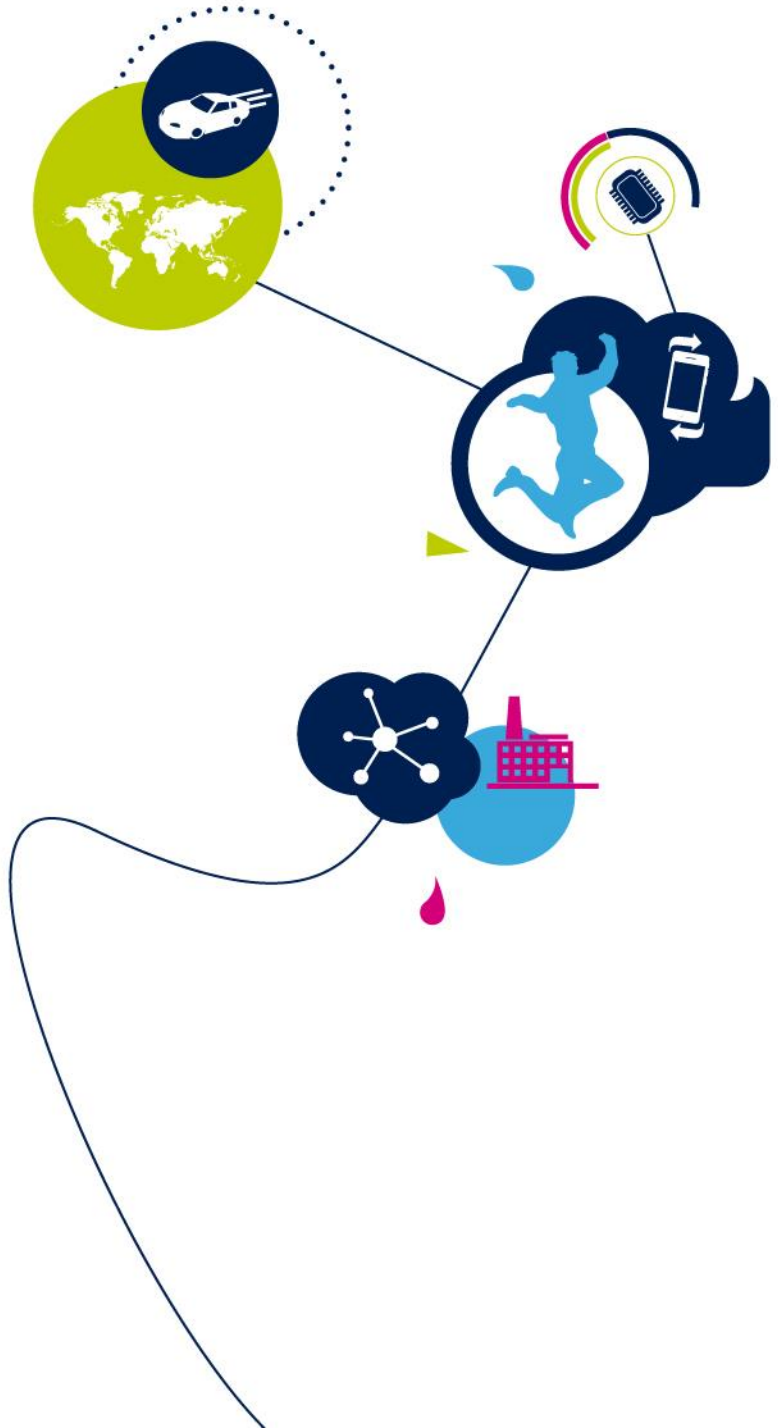
STSW-STUSB010

Quick Start Guide

STUSB1602 software library
for P-NUCLEO-USB002



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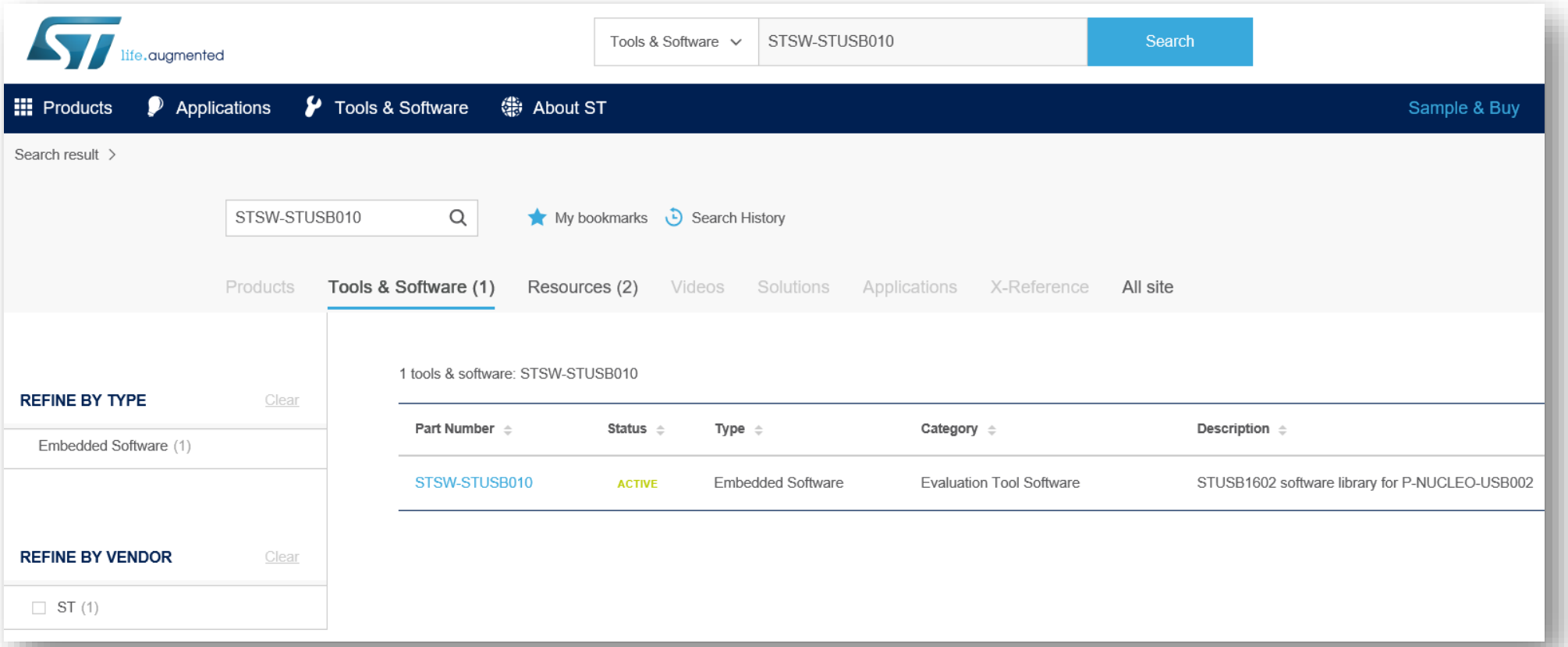
Introduction

This document provides an overview of the STUSB1602 software package enabling the functionalities of the P-NUCLEO-USB002 development board.

SOFTWARE	
STSW-STUSB010	STUSB1602 software library for P-NUCLEO-USB002
IAR 8.x	C code compiler
HARDWARE	
P-NUCLEO-USB002	USB-C and Power Delivery Nucleo Pack with NUCLEO-F072RB

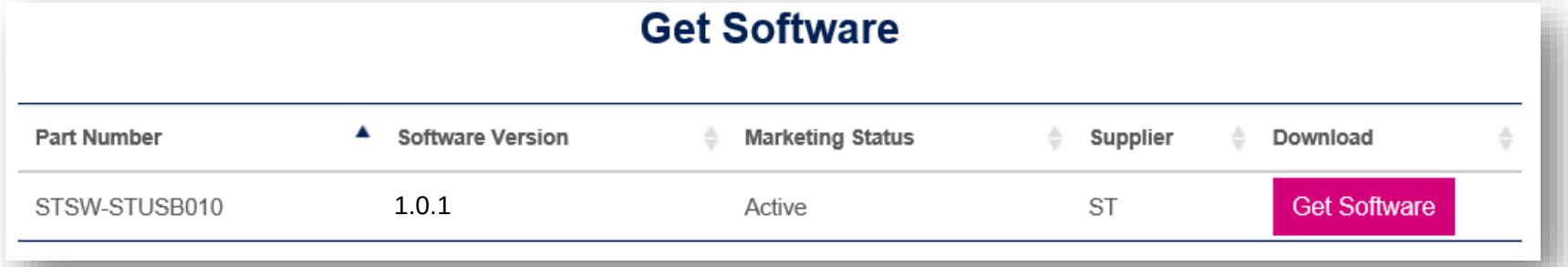
SW library set-up (1/3)

1. Download the STUSB1602 software package by searching STSW-STUSB010 from www.st.com home page:

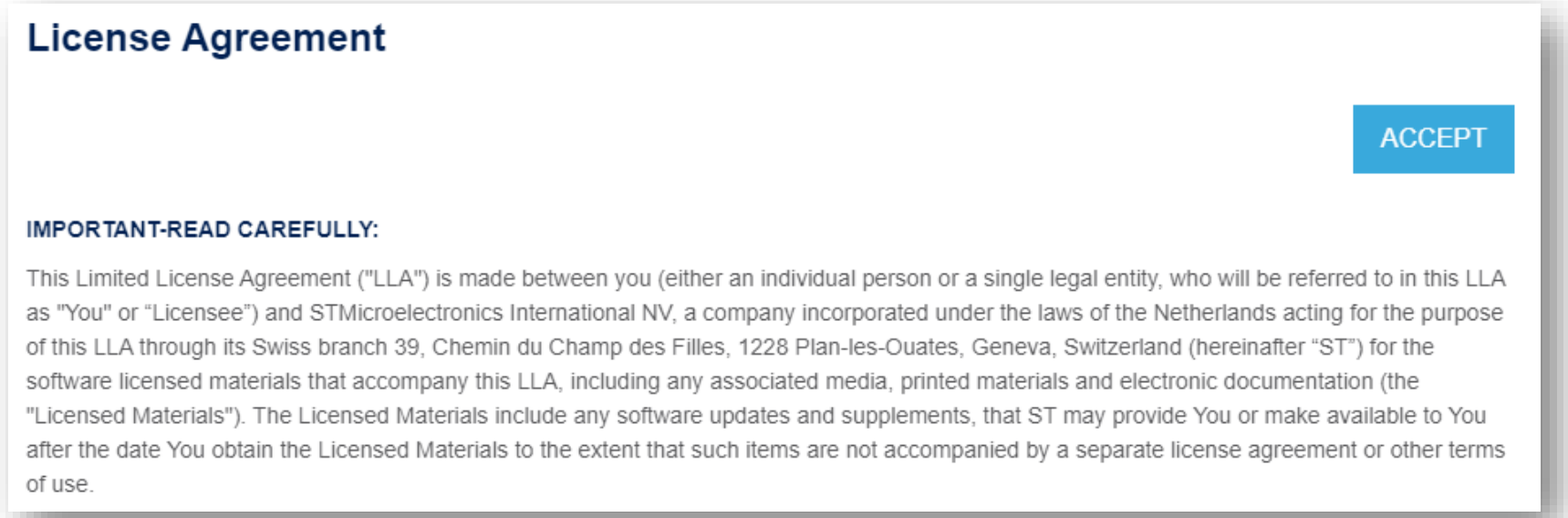


SW library set-up (2/3)

2 Then click on “Get Software” from either the bottom or top of the page

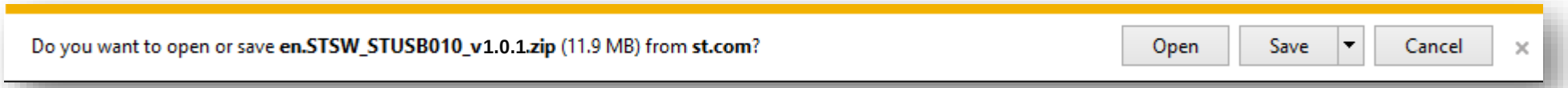


3 Download will start after accepting the License Agreement, and filling contact information.

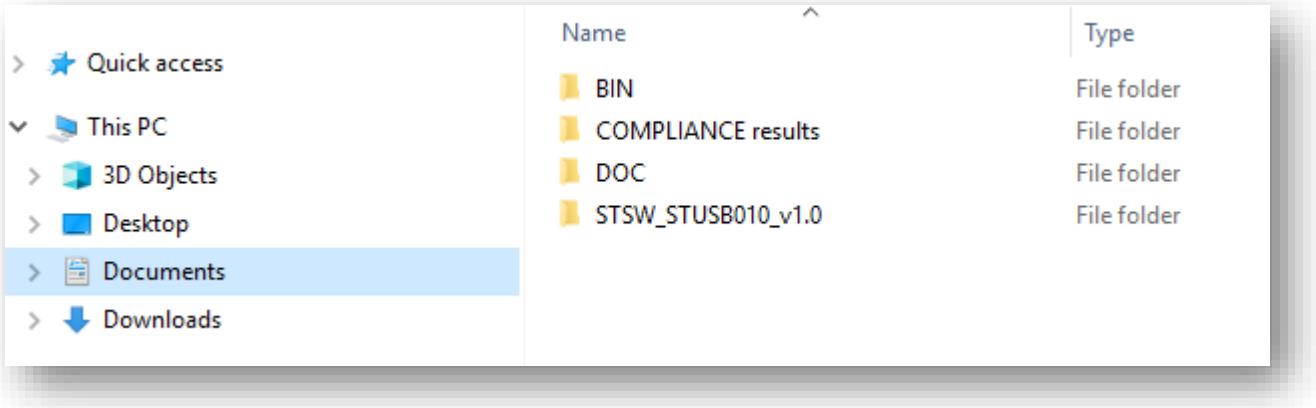


SW library set-up (3/3)

4 Save the file **en.STSW-STUSB010.zip** on your laptop



and unzip:



5 The package contains a DOC directory, ready-to-use binary files, associated projects and compliance reports

Hardware settings

The software library has been optimized to quickly compile on the P-NUCLEO-USB002 development board. The board is composed of a customized NUCLEO-F072RB and a STUSB1602 expansion board.

It is composed of 2 Dual Role Ports (DRP) USB PD capable receptacles.

It is mandatory to align board settings with the selected application requirements.
Please refer to bellow 2 user manuals from P-NUCLEO-USB002 web page.

Title	Type	Product Associations	Version	Size	Icon
UM2205: Getting started with the STM32 Nucleo pack for USB Type-C™ and Power Delivery with the Nucleo-F072RB board and the STUSB1602	User Manual	P-NUCLEO-USB002	1	1.6 MB	PDF
UM2191: STM32 Nucleo pack for USB Type-C™ and Power Delivery with the Nucleo-F072RB board and the STUSB1602	User Manual	P-NUCLEO-USB002	2	3.7 MB	PDF

Overview

The software library includes 6 different software frameworks already optimized to address most common application scenarii:

	Project	.bin	Typical Application
#1	MB1303_SRC_ONLY	Provider_RTOS	SOURCE – power management
#2	MB1303_SRC_VDM	Provider_VDM_RTOS	SOURCE – power management + extended message support
#3	MB1303_SNK_ONLY	Consumer_RTOS	SINK – power management
#4	MB1303_SNK_VDM	Consumer_VDM_RTOS	SINK – power management + extended message support + UFP support
#5	MB1303_DRP_SNK	Consumer_DRP_RTOS	Dual Role Port power management support supporting dead battery mode
#6	MB1303_DRP_VDM	Consumer_DRP_VDM_RTOS	Dual Role Port power management support supporting dead battery mode + extended message support + UFP support

#1 - MB1303_SRC_ONLY overview

- This is the typical framework for SOURCE only applications, implementing USB PD power negotiation.
- The code provided includes 1 PDO including EMCA support : when used with 3A only cables, maximum current advertised by the SOURCE is bounded to 3A for those PDO which normally support more than 3A.
- Default profiles is:
  - PDO1: 5V, 3A

#2 - MB1303_SRC_VDM overview

- This is the typical framework for SOURCE only applications, implementing USB PD power negotiation and supporting optional extended messages.

- The code provided includes 1 PDO (including EMCA support), and is able to answer to the following messages:
  - Manufacturer info
  - Discover identity
  - Unchunked extended messages

- Defaults profiles is:
  - PDO1: 5V - 3A

#3 - MB1303_SNK_ONLY overview

- This is the typical framework for SINK only applications, implementing USB PD power negotiation.
- The code provided includes 2 PDOs (max power has priority),
- Defaults profiles are:
  - PDO1: 5V - 1.5A
  - PDO2: 9V - 1.5A

#4 - MB1303_SNK_VDM overview

- This is the typical framework for SINK only applications, implementing USB PD power negotiation and supporting optional extended messages. Project is defined as an Alternate Mode Adapter: it is able to enter alternate as a Display Port and enumerate as Billboard otherwise.

- The code provided includes 2 PDOs, and is able to answer:
  - Manufacturer info
  - Discover identity
  - Unchunked extended messages

- Defaults profiles are:
  - PDO1: 5V - 1.5A
  - PDO2: 9V - 1.5A

#5 - MB1303_DRP_SNK overview

- This is the typical framework for Dual Role Port applications, such as Power bank applications.
- By default, the port connects as a SINK when application is not supplied (dead Battery mode), and supports both power and data role swap (PR_SWAP and DR_SWAP) and EMCA.
- Defaults profiles are:
  - Source:
    - PDO1: 5V - 3A
  - Sink:
    - PDO1: 5V - 1.5A
    - PDO2: 9V - 1.5A

#6 - MB1303_DRP_VDM overview

- This is the typical framework for Dual Role Port supporting alternate mode in UFP.
- By default, the port connects a SINK when application is not supplied (dead Battery mode), and supports both power and data role swaps (PR_SWAP and DR_SWAP). It implements USB PD power negotiation for both SOURCE (including EMCA support) and SINK, and supports optional PD3 features like:
  - Manufacturer info, Discover identity, Unchunked extended messages
  - Alternate mode:
    - Enters DP mode
    - Enumerate as Billboard if needed
- Defaults profiles are:
  - Source:
    - PDO1: 5V – 3A
  - Sink:
    - PDO1: 5V 1.5A
    - PDO2: 9V 1.5A