My "Blue Pill" Projects Test Setup

Description and Evaluation

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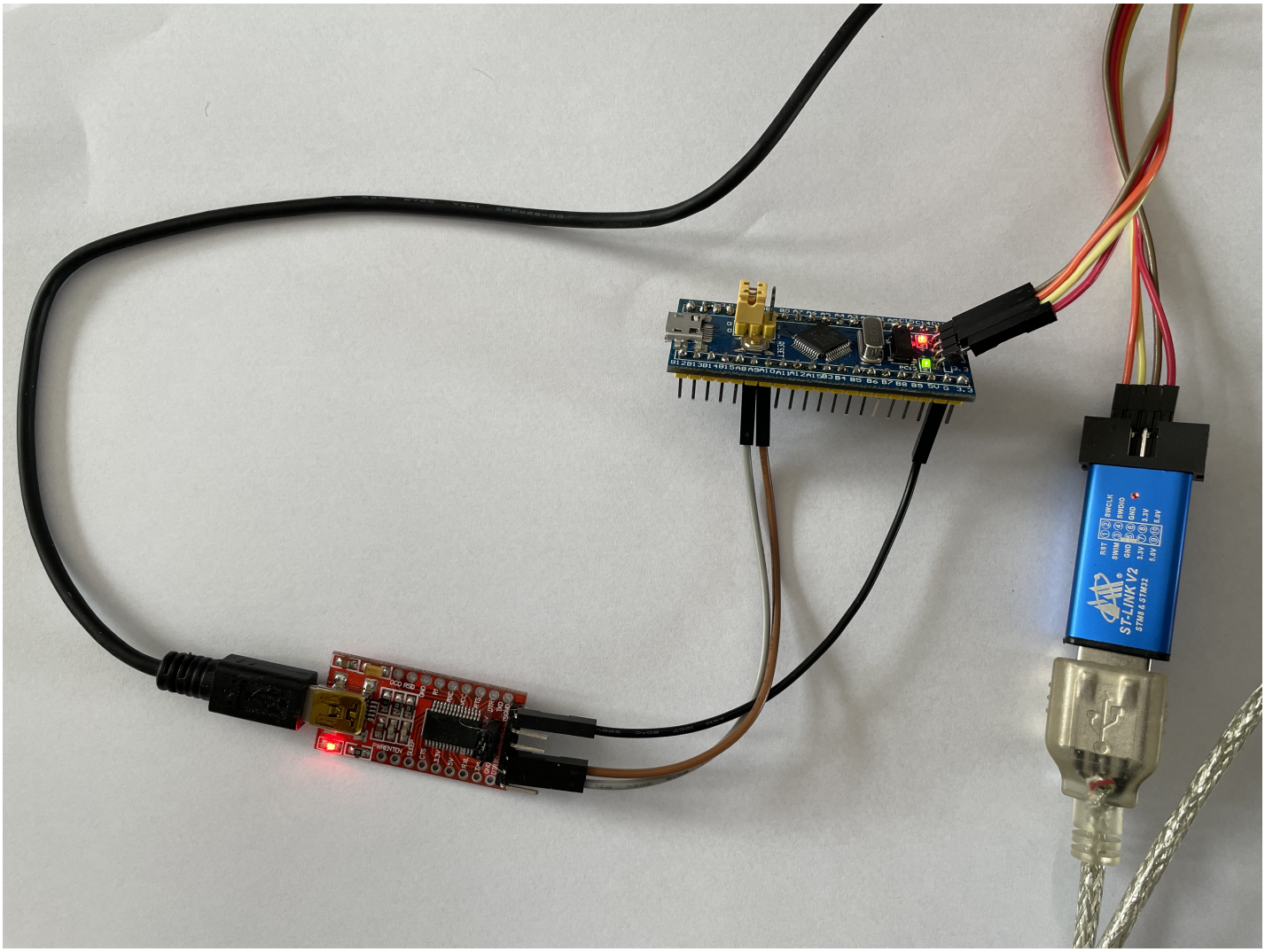
April 30, 2021



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1. Project goal

The project is created to test the HW / SW setup for projects based on the so-called "Blue Pill STM32 board".
The SW setup is based on VSCode with PlatformIO extension and STM32 board operated with the Arduino environment.
The HW setup allows to program the board with an ST-Link V2 adapter and also serial communications with a (Linux) PC via a USB/Serial adapter.
In a second HW setup the control of a LCD via the I2C interface is tested.
The "Blue Pill" STM32 board has a STM32F103C8T6 processor with 20KB RAM and 64KB EEPROM running at 72MHz. See also "Blue Pill F103C8" in PlatformIO.

2. Project Hardware setup

The project setup for the HW part is shown in figure 1.

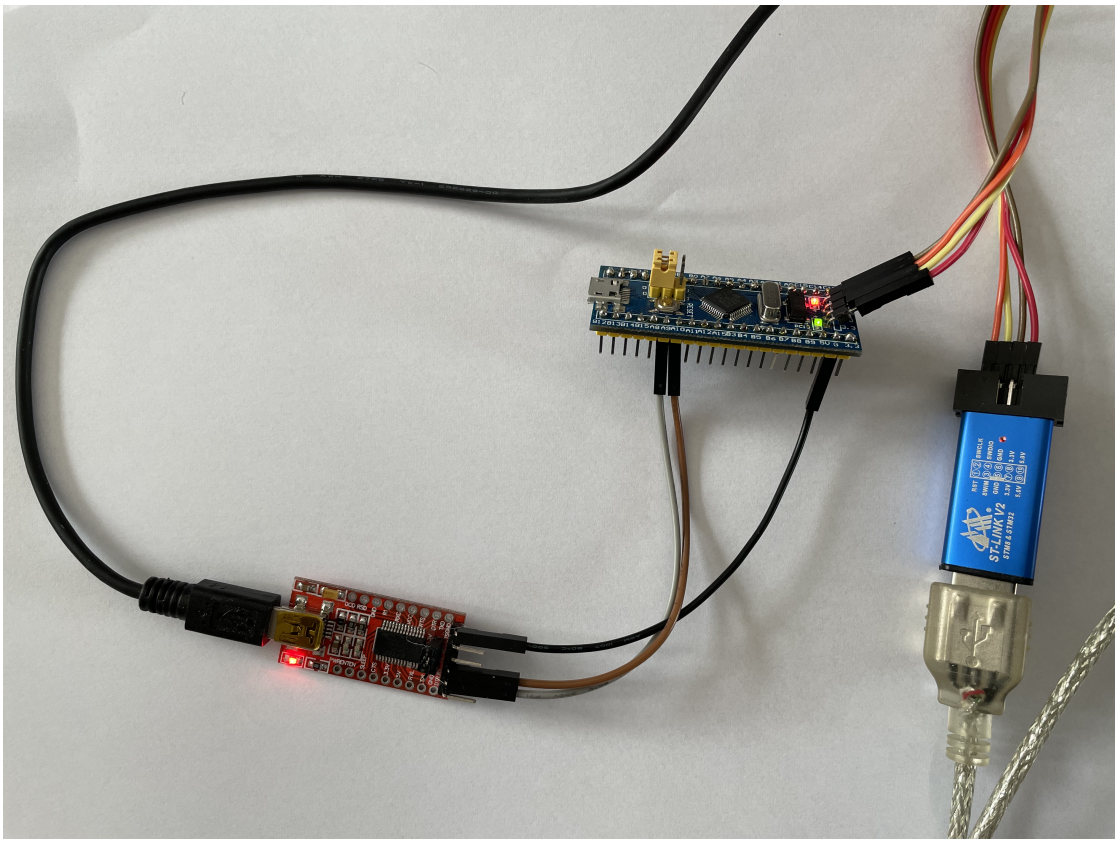

Figure 1: Hardware setup

Note: The jumper positions of the two yellow jumpers on the (blue colored) "Blue Pill"

board.

Programming is done with the (metallic blue) ST-Link V2 module. There are four pins connected with the Blue Pill board. The connections are done as follows:

Blue Pill	**Cable color**	**ST-Link V2**
GND	Brown	GND (Pin 6)
3.3V	Red	3.3V (Pin 8)
CLK	Orange	SWCLK (Pin 2)
DIO	Yellow	SWDIO (Pin 4)

A USART serial interfacing between the Blue Pill board and the PC / IDE is realized with the (red) USB/Serial adapter board. Note the jumper position on the board is such that the 3.3V output voltage is provided (but not connected in this setup) as the "Blue Pill" processor is operated with 3.3V. In the software the Arduino Serial1 interface port is used. The connection between the USB/Serial adapter and the Blue Pill board is done as follows:

Blue Pill	**Cable color**	**USB/Serial**
GND	Black	GND
TX1 (Pin PA9)	Gray	RX
RX1 (Pin PA10)	Brown	TX

The USB/Serial adapter appears under /dev/ttyUSB0 in the Linux operating system. This port has to be selected in the IDE, when the Serial Monitor is activated.

3. Project Software Setup (first sketch)

The project setup for the IDE part with the first Arduino sketch is shown in figure 2. The picture shows the PlatformIO IDE within the VSCode editor and the main Arduino

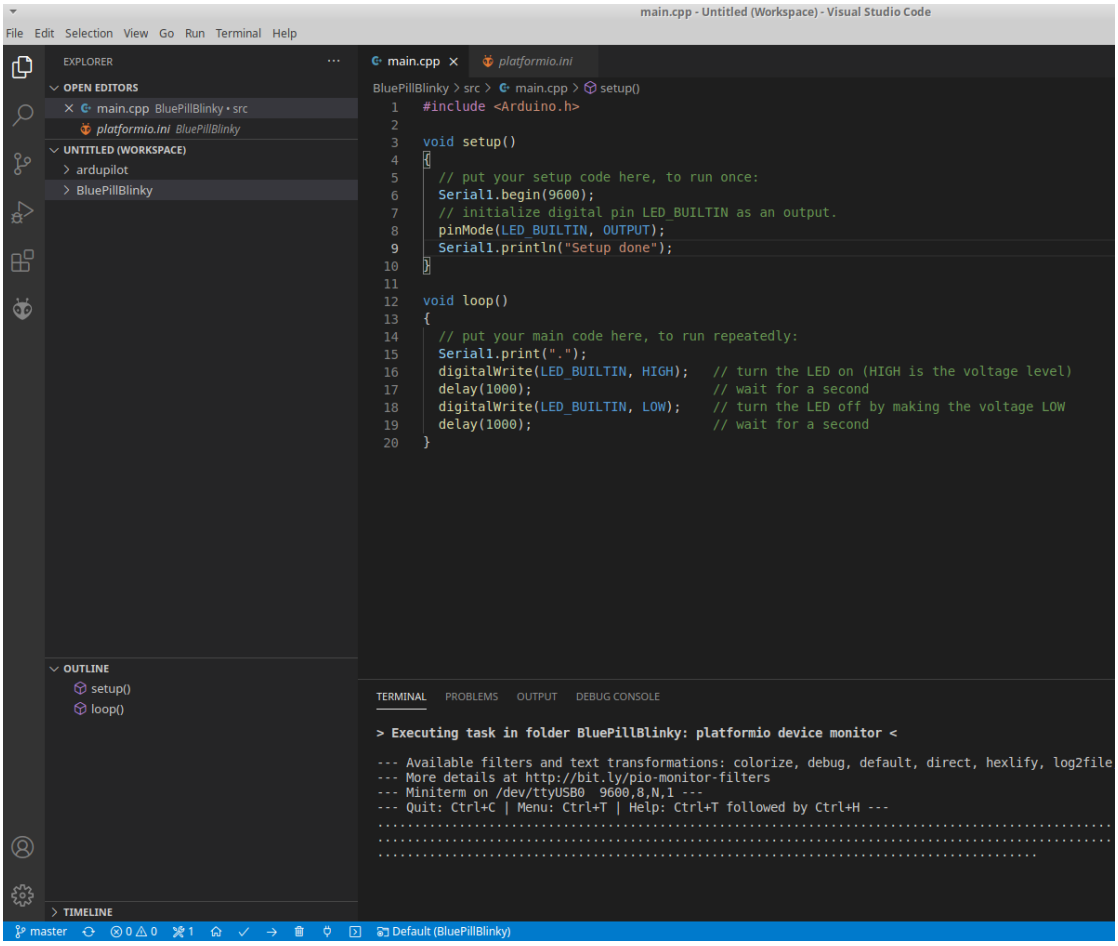

Figure 2: VSCode/PlatformIO (Arduino environment) IDE

sketch which implements the simple blinking of the on-board LED and the output of data via the Serial1 port.
The picture also shows the output of dots (see the sketch code) via the USB/Serial adapter and the Serial1 Arduino port to the Arduino Serial Monitor displayed in the lower part of the IDE.

The development cycle is controlled by pressing the relevant buttons in the blue bottom line of the IDE (see the call-outs of the buttons when moving over them with the mouse pointer).

Important Note: If you have multiple projects within the Platform IDE, do not forget to select the right project in the bottom line (in the figure here: "Default (BluePill-Blinky)") before compiling.

Compilation is done by pressing the "Check" button.
Program download is done by pressing the "Right Arrow" button.
Activation of the Serial Arduino Monitor is done with the "Plug" button.
To switch back to the PlatofromIO home screen is done with the "Home" button.

3.1. LCD control via I2C (second sketch)

The IDE with the second Arduino sketch is shown in figure 3. The sketch controls a

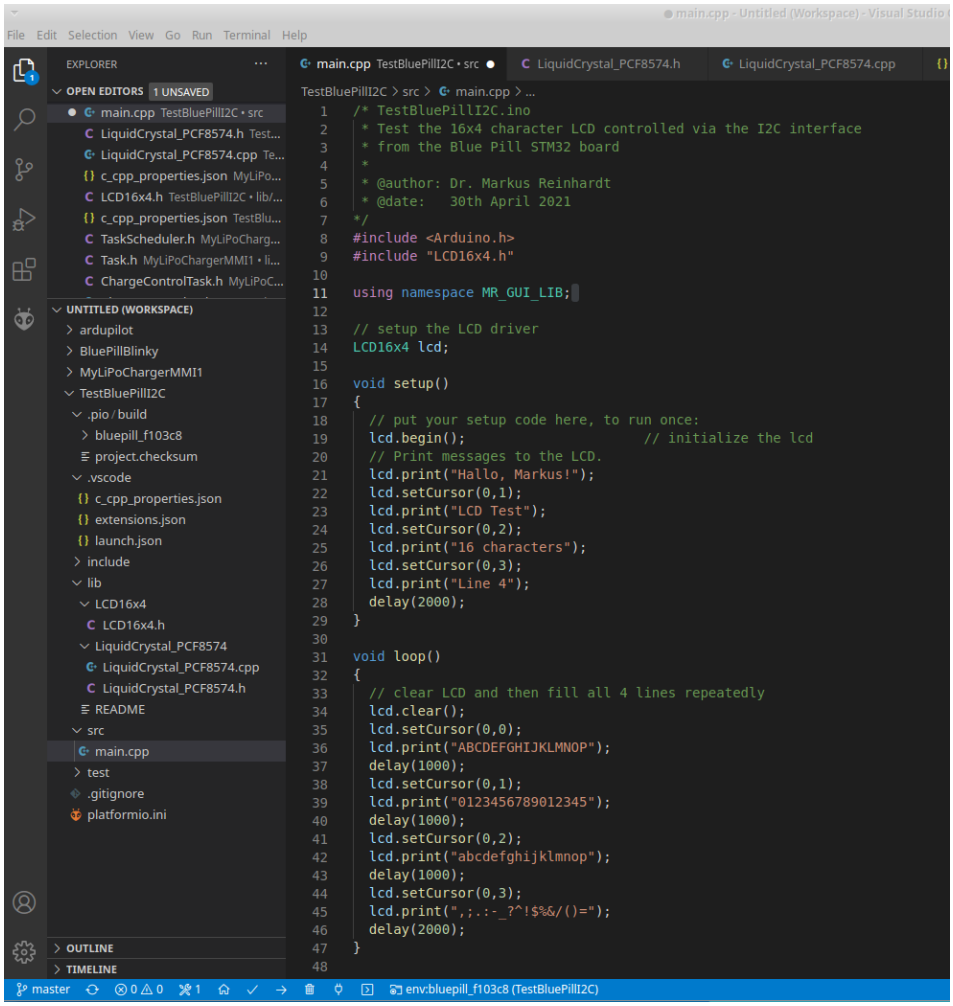

Figure 3: VSCode/PlatformIO IDE (second sketch)

16x4 character LCD connected to the "Blue Pill" board via the I2C interface.

The HW setup for this test is shown in figure 4 The connection from the ST-Link V2

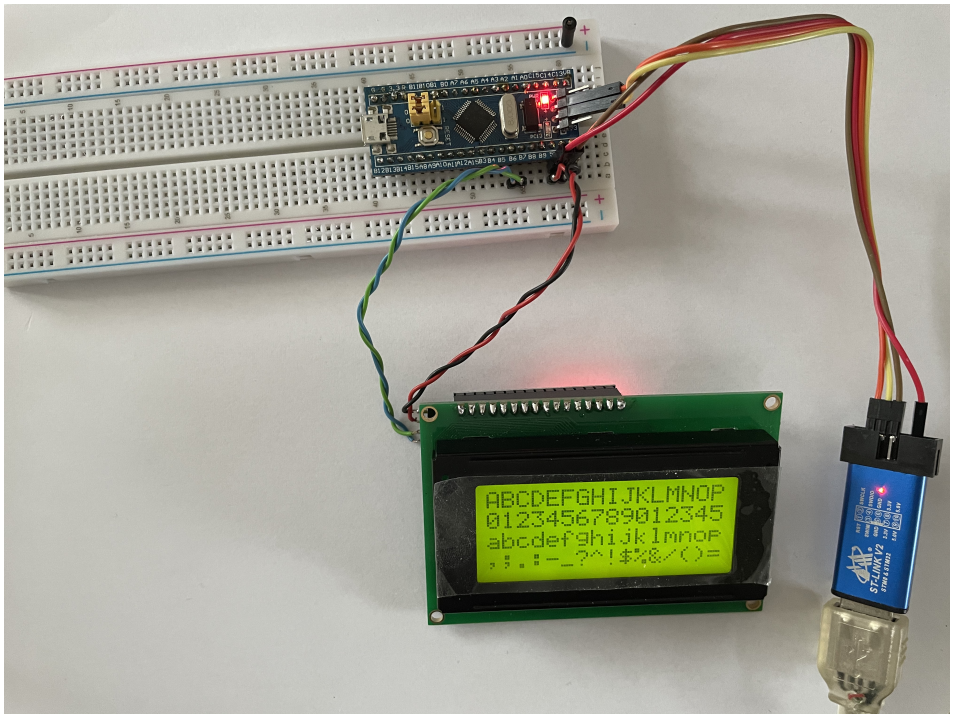

Figure 4: VSCode/PlatformIO IDE (second sketch)

adapter to the "Blue Pill" board is now using the 5V pins according to the following table. The 3.3V for the processor is now provided by the on-board fixed power regulator. The 5V power supply is also required for the LCD.

Blue Pill	**Cable color**	**ST-Link V2**
GND	Brown	GND (Pin 6)
5V	Red	5V (Pin 10)
CLK	Orange	SWCLK (Pin 2)
DIO	Yellow	SWDIO (Pin 4)

A. Appendix A

A.1. Pin-out of the "Blue Pill" board

Figure 5 shows the pin-out of the "Blue Pill" board.

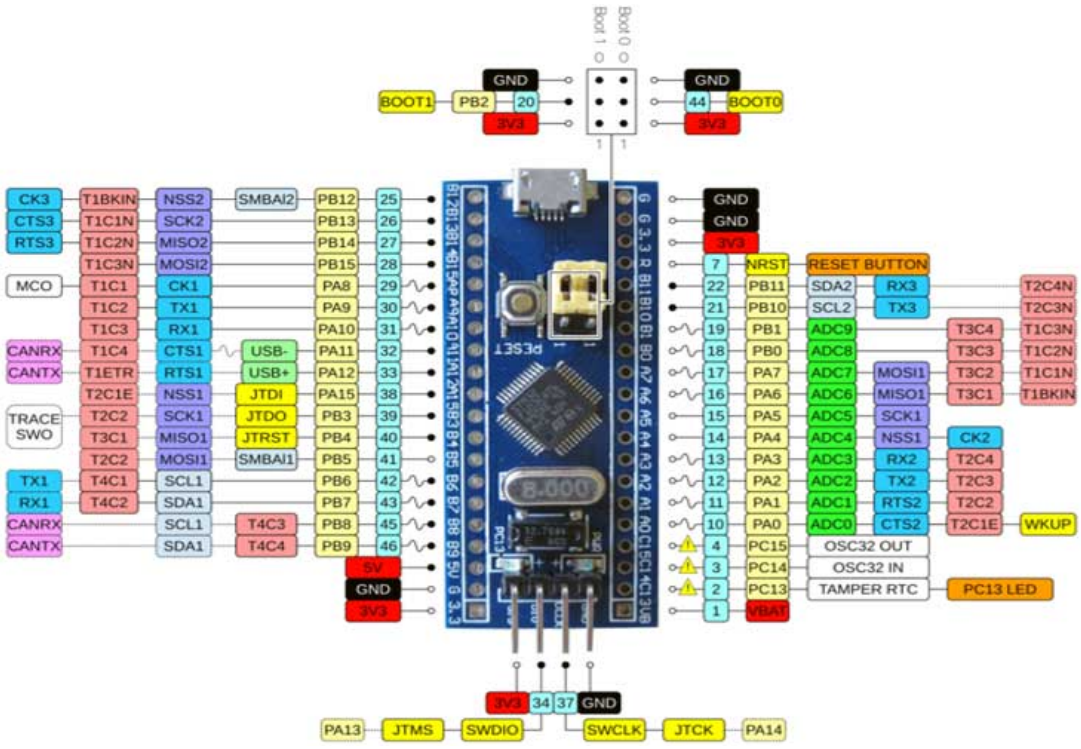

Figure 5: Pin-out of the "Blue Pill" board

A.2. Helpful Links

PlatformIO IDE
"Blue Pill F103C8" in PlatformIO
Installing PlatformIO and creating a sample program for STM32 Blue Pill
Arduino Getting Started and Tutorials