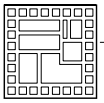


EXTENSION BOARD

TECHNICAL INFORMATIC LABORATORY

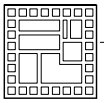


TABLE OF CONTENT

EXTENSION BOARD

1 OVERVIEW

1.1 Functionalities

The board used in the laboratory (STM32F746G-DISCO board) offers the ability to plug an ARDUINO module on it. This extension is used to offer more functionality to the laboratory.

- Extension board

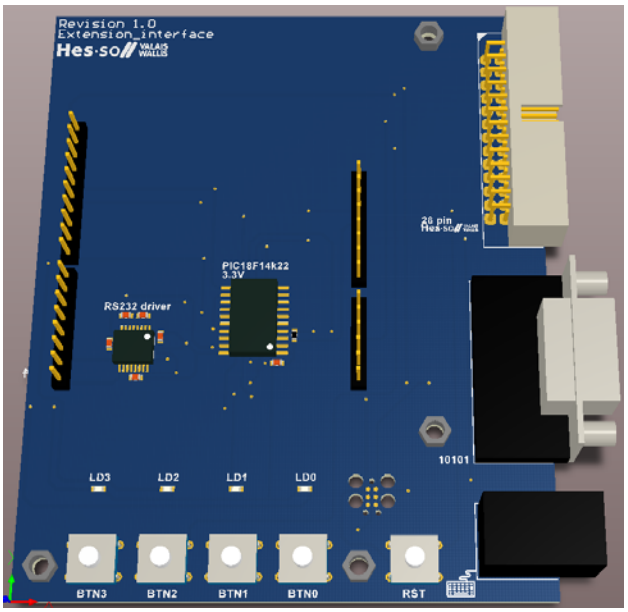


Figure 1: The “Arduino” Extension board

This document intends to explain in details the functionalities of this board.

2 BOARD CONNECTIONS

To have the ability for the user to drive the module totally custom without using any library, the following part describe the connections of this board to the “Arduino” connectors.

2.1 The board connections

2.1.1 ARDUINO connections

TOPLEFT	Signal name	STM32F746 connection	Board usage	Hes-so 26 pin mezzanine (pin nr)
1	SCL	PB8	-	6
2	SDA	PB9	-	8
3	-	-	-	-
4	GND	GND	GND	10,12,14,16,18, 20,22,24
5	SCK	PI1	KB_CLOCK	3
6	MISO	PB14	KB_MISO	1
7	MOSI	PB15	KB_MOSI	2
8	LD_2	PA8	LED_2	-
9	LD_0	PA15	LED_0	-
10	BTN_0	PI2	BUTTON_0	7
BOTLEFT	**Signal name**	**STM32F746 connection**	**Board usage**	**Hes-so 26 pin mezzanine (pin nr)**
1	BTN_1	PI3	BUTTON_1	9
2	LD_1	PH6	LED_1	-
3	nSS_KB	PI0	KB_CS	-
4	BTN_2	PG7	BUTTON_2	11
5	LD_3	PB4	LED_3	-
6	BTN_3	PG6	BUTTON_3	-
7	TX	PC6	UART_TX	-
8	RX	PC7	UART_RX	-
TOPRIGHT	**Signal name**	**STM32F746 connection**	**Board usage**	**Hes-so 26 pin mezzanine (pin nr)**
1	-	-	-	-
2	-	-	-	-
3	RESET	/RST	RTS_BTN	-
4	3V3	VCC 3.3V	VCC 3.3V	26
5	5V	5V	KB_PWR	-
6,7	GND	GND	GND	10,12,14,16,18,

				20,22,24
8	***-***	***-***	***-***	***-***
BOTRIGHT	***Signal name***	***STM32F746 connection***	***Board usage***	***Hes-so 26 pin mezzanine (pin nr)***
1	***ADC3_IN0***	***PA0***	***-***	***17***
2	***ADC3_IN8***	***PF10***	***-***	***19***
3	***PF9***	***PF9***	***-***	***5***
4	***nINT_KB***	***PF8***	***KB_INT***	***-***
5	***nINT_OUT***	***PF7***	***-***	***13***
6	***nSS_OUT***	***PF6***	***-***	***4***

Table 1 PIO connector

2.1.2 Keyboard usage

The keyboard has to be read through the SPI interface (`KB_CLOCK, KB_MISO, KB_CS`). The SPI mode 2 has to be used. The signal `KB_INT` is active low and is asserted when a new key has been pressed on the keyboard. This signal is released when the keyboard is read. The read value is the ASCII code of the pressed key.

2.1.3 UART usage

The USART connections (`RX, TX`) are just connected to the SUB-D 9 connector to the pins 2 (RX) and 3 (TX). The pin 5 of the SUB-D connector is the ground. If you want to connect this board to a PC, a NULL MODEM adapter is required.

2.1.4 Buttons usage

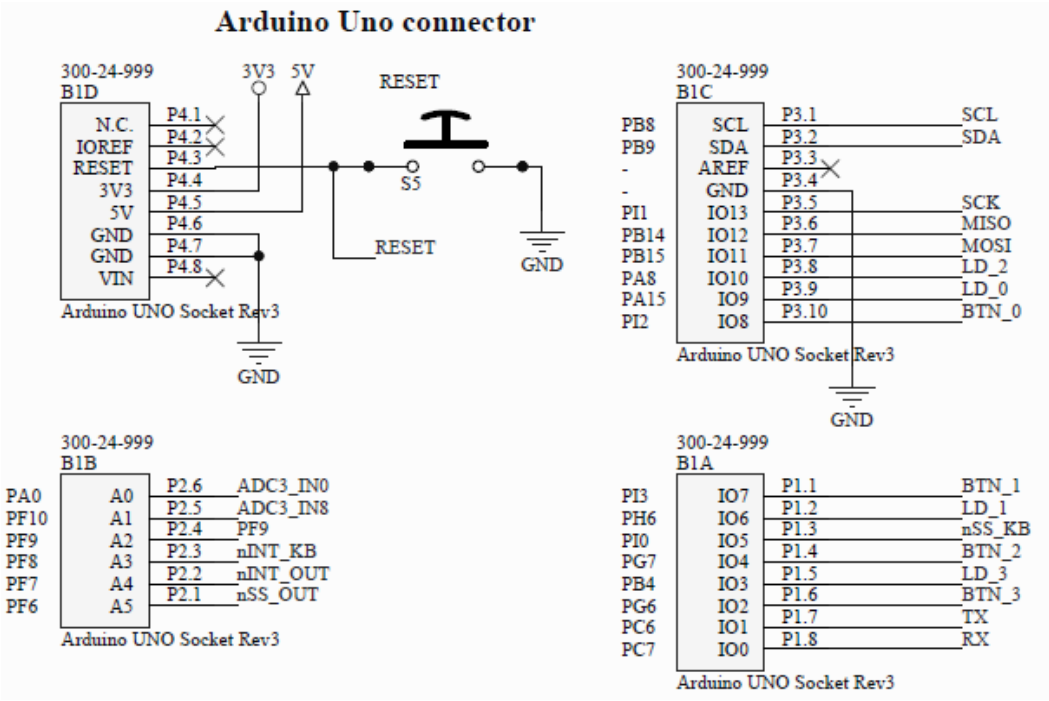
The buttons on the board are active low. Caution, no pullup is placed on the board.

2.1.5 LEDs usage

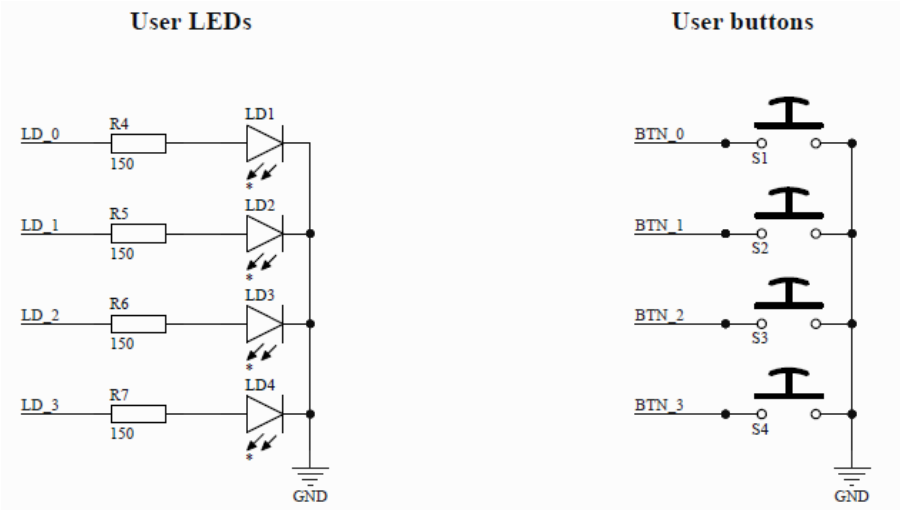
The LEDs on the board are active high. A current limiter resistor is placed in serial with each LED. Normally, they have to be driven with a supply of 3.3 volt but a 5V supply is acceptable.

3 SCHEMATICS

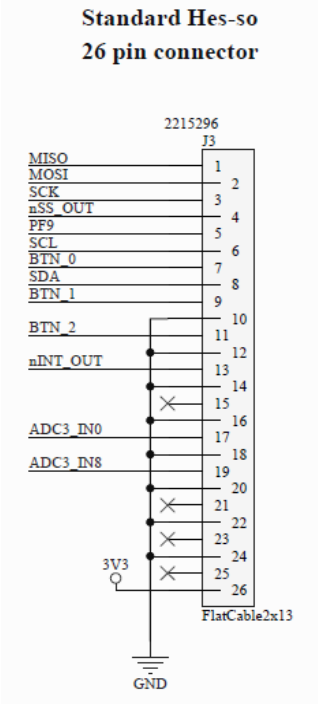
3.1 Arduino uno



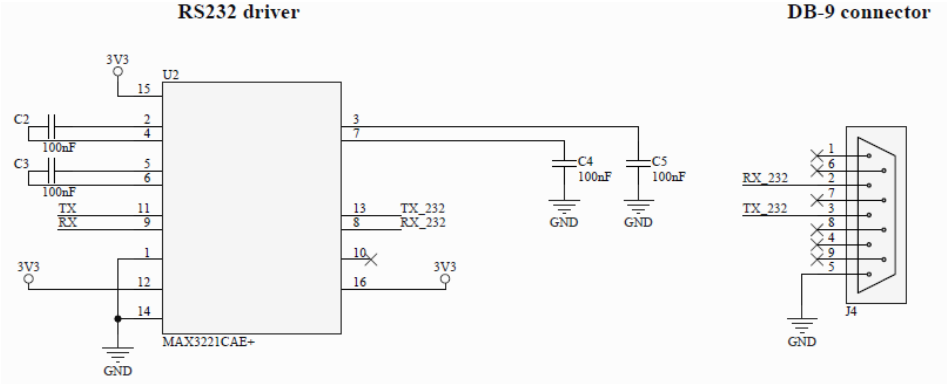
3.2 LEDs and buttons



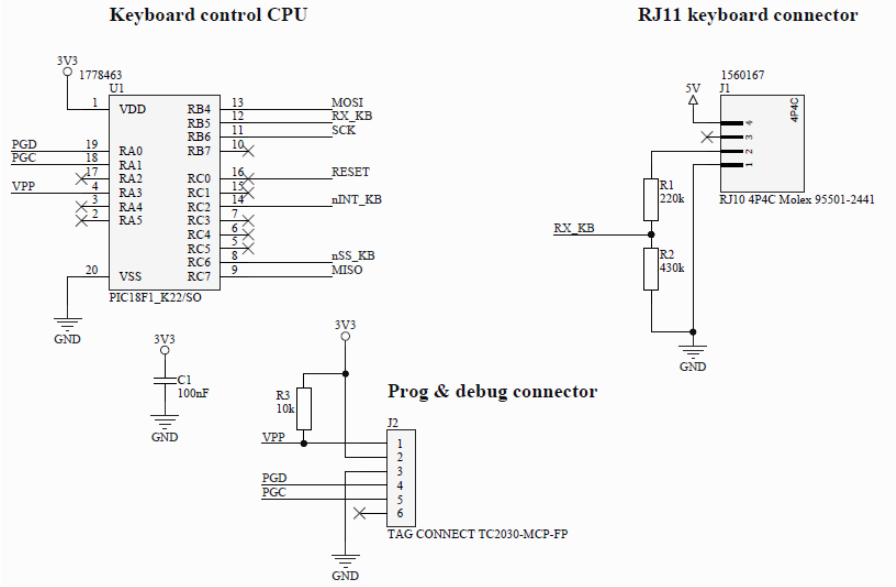
3.3 Hes-so 26 pin mezzanine



3.4 UART

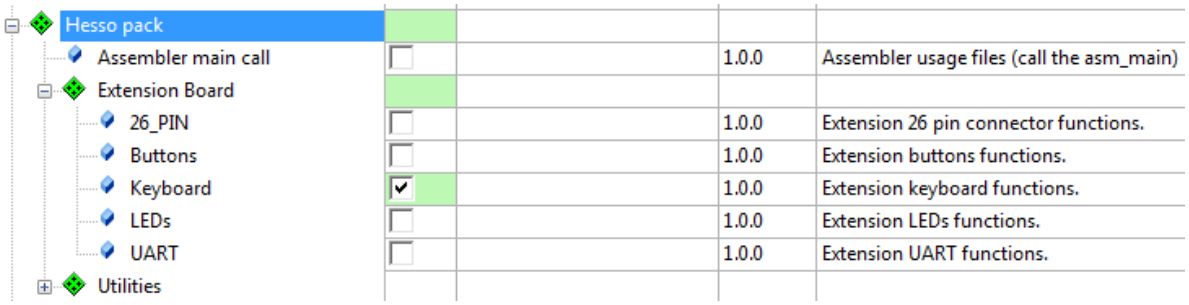


3.5 Keyboard



4 EXISTING SOFTWARE

To use this board in the laboratories, the Keil software pack “Hesso pack” offers all the functions to use the board features.



5 GENERAL REMARKS

5.1 Opened questions

In any case of incertitude, don't hesitate to ask the laboratory responsible before to damage the system.