LAB 09
THE CONSOLE

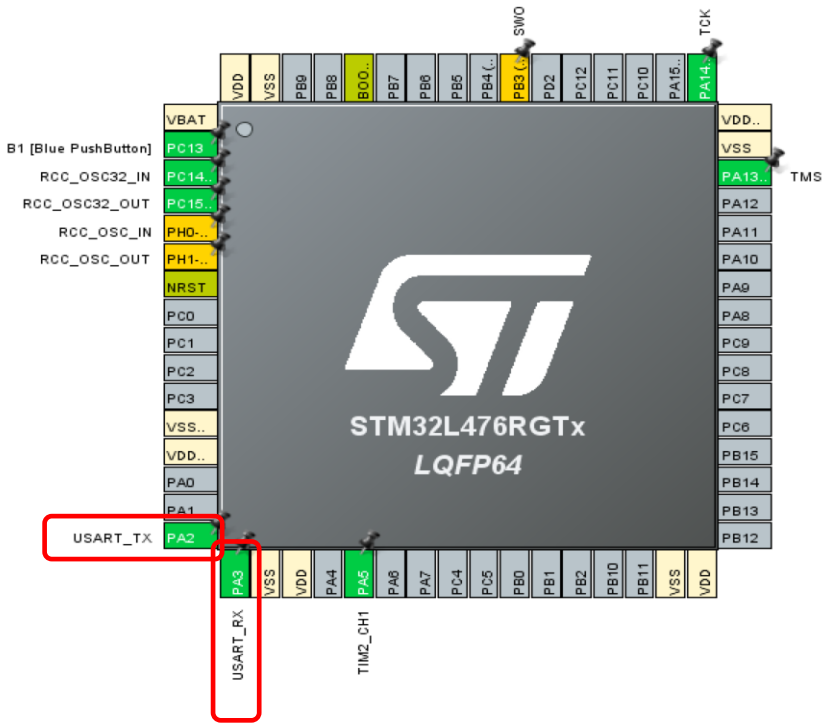
Prof. Davide Brunelli
Dept. of Industrial Engineering – DII
University of Trento, Italy
davide.brunelli@unitn.it

STM32 USART

Nucleo boards directly connect USART RX/TX pins to the miniUSB port integrated in the STLink

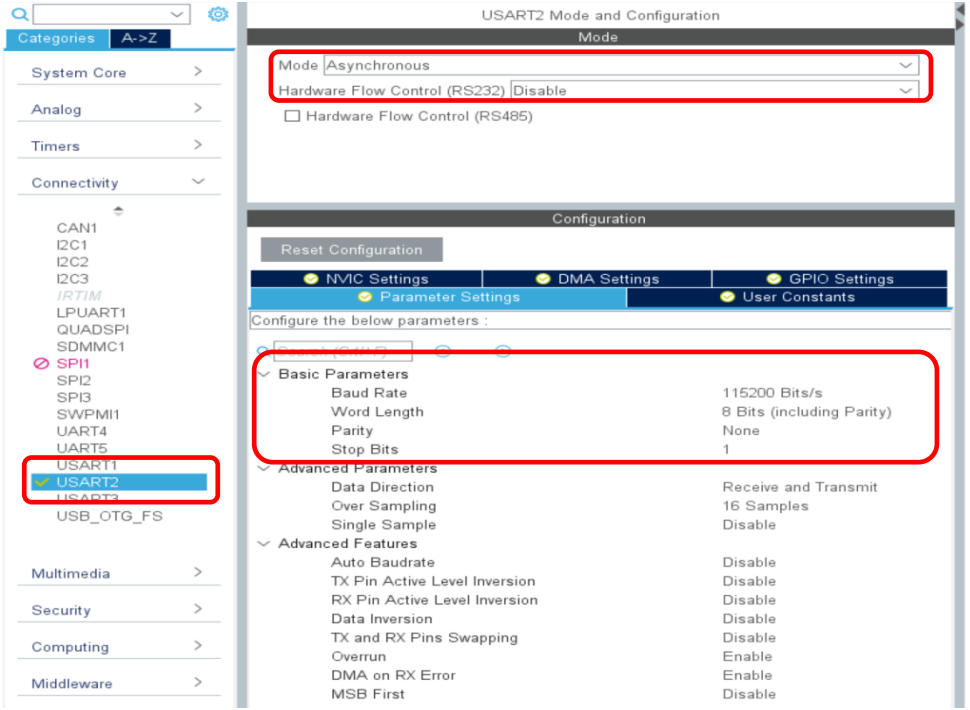
PA2 = TX

PA3 = RX



STM32 USART

Check that the USART2 is enabled.



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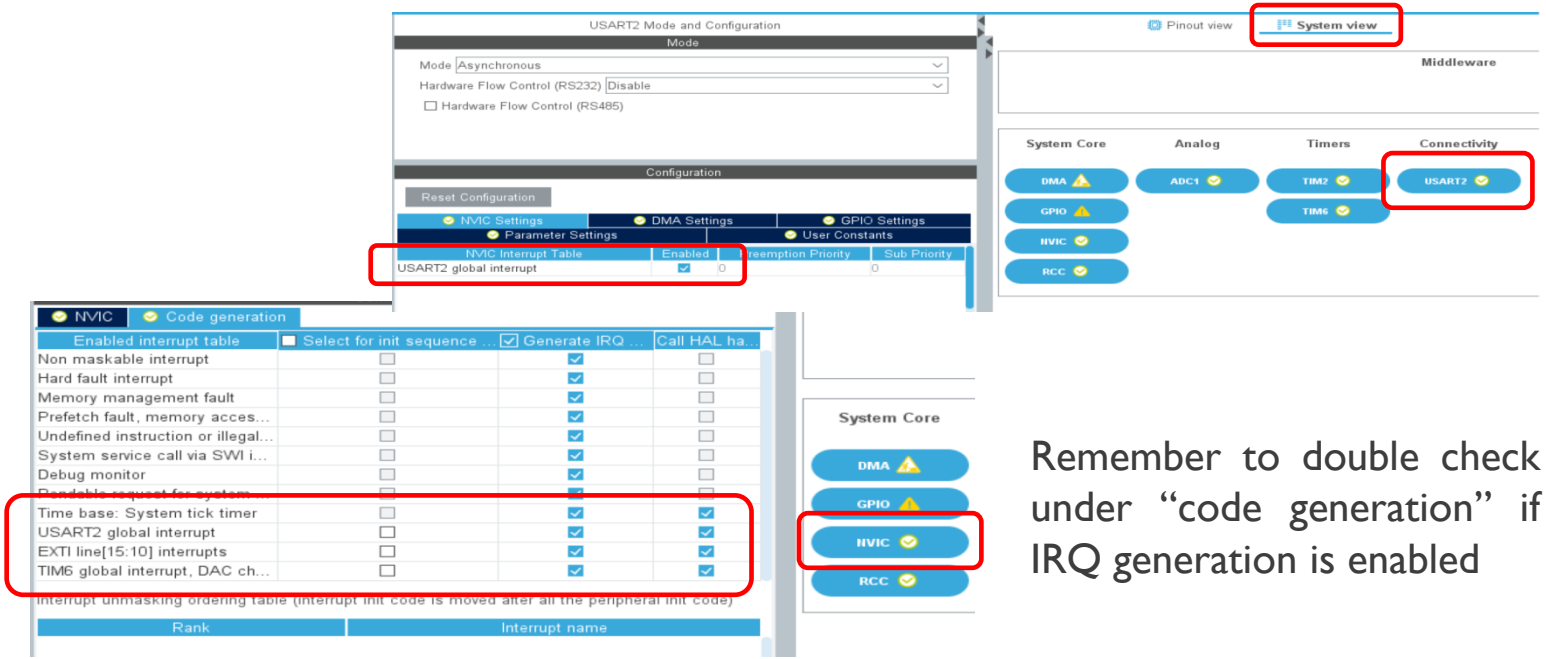
Enable the USART interrupt.



Remember to double check under “code generation” if IRQ generation is enabled

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Once everything is configured and the code generated, we have to add the callback called when the USART receive a character.

In the **callback**, we take care of echoing back user input and storing it inside a buffer (defined as global variables).

```
#define MAXBUFFSIZE    100
uint8_t RxBuf [MAXBUFFSIZE];
uint8_t TxBuf [MAXBUFFSIZE];

void HAL_UART_RxCpltCallback(UART_HandleTypeDef *huart){
        if(RxBuf[0] == '\r'){          // Check new line
                HAL_UART_Transmit(&huart2, (uint8_t *)"\r\n", sizeof("\r\n"),10);
                //cmd_check(); //TO BE IMPLEMENTED!!
        }
        else if(RxBuf[0] == '\b'){  //Check back space
                HAL_UART_Transmit(&huart2, (uint8_t *)"\b \b", sizeof("\b \b"),10);
                TxBuf[--char_counter] = NULL;
        }else{     //Otherwise store inside our buffer
                TxBuf[char_counter++] = RxBuf[0];
                HAL_UART_Transmit(&huart2, (uint8_t *) RxBuf, sizeof(RxBuf),10); //Echoing
        }
        HAL_UART_Receive_IT(&huart2 , RxBuf, 1); // Restart UART in Interrupt mode
}
```

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Finally start the UART in interrupt mode.

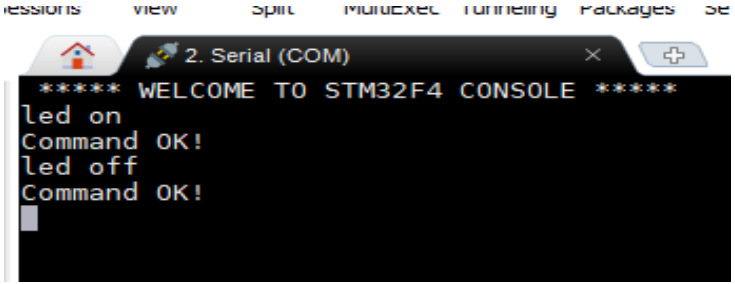
```
/* Reset of all peripherals, Initializes the Flash interface and the Systick. */
HAL_Init();

/* USER CODE BEGIN Init */

/* USER CODE END Init */

/* Configure the system clock */
SystemClock_Config();

/* USER CODE BEGIN SysInit */

/* USER CODE END SysInit */

/* Initialize all configured peripherals */
MX_GPIO_Init();
MX_USART2_UART_Init();
MX_TIM6_Init();
MX_ADC1_Init();
MX_TIM2_Init();
/* USER CODE BEGIN 2 */

HAL_UART_Transmit(&huart2, welcomeBuff, sizeof(welcomeBuff), 5000);
HAL_UART_Receive_IT(&huart2 , RxBuf, 1);

/* USER CODE END 2 */

/* Infinite loop */
/* USER CODE BEGIN WHILE */
while (1)
{
  /* USER CODE END WHILE */

  /* USER CODE BEGIN 3 */

}
/* USER CODE END 3 */
```

CONSOLE – INTERACT WITH THE EMBEDDED SYSTEM

6D ORIENTATION ESTIMATOR

Create a console program, that recognize a set of commands and execute them on board.

- Switch LED ON and OFF
- Toggle LED
- Start LED blinking
- Get internal temperature



Hint: you can use **strcmp((char *)TxBuf, command)** to compare two strings