

VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY



REPORT
LAB 5

Class: Microprocessors - Microcontrollers – CC04

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1 CODE FUNCTION OF UART

```
1 #define MAX_LENGTH_BUFFER 30
2
3 uint8_t temp = 0;
4 static uint8_t waiting_ack = 0;
5 static uint32_t deadline_ms = 0;
6 static uint32_t adc_value = 0;
7 static int command_flag = 0;
```

Listing 1: PV

```
1 static void command_parser_fsm_byte(uint8_t ch){
2     static enum { INIT, EXCLAM, R, S, T, O, K } state = INIT;
3     switch (state) {
4         case INIT: if (ch=='!') state=EXCLAM; break;
5         case EXCLAM:
6             if (ch=='R') state=R; else if (ch=='O') state=O; else state=INIT;
7             break;
8         case R: state = (ch=='S') ? S : INIT; break;
9         case S: state = (ch=='T') ? T : INIT; break;
10        case T: if (ch=='#'){ command_flag=1; state=INIT; } else state=INIT;
11            break;
12        case O: state = (ch=='K') ? K : INIT; break;
13        case K: if (ch=='#'){ command_flag=2; state=INIT; } else state=INIT;
14            break;
15    }
16 }
17
18 // FSM commu UART ( g i !ADC=..., ? !OK#, resend sau 3s)
19 static void uart_communicate_fsm(void){
20     if (command_flag==1 && waiting_ack==0){
21         HAL_ADC_Start(&hadc1);
22         HAL_ADC_PollForConversion(&hadc1, 10);
23         adc_value = HAL_ADC_GetValue(&hadc1);
24         HAL_ADC_Stop(&hadc1);
25
26         char pkt[48];
27         sprintf(pkt, "!ADC=%lu#\r\n", (unsigned long)adc_value);
28         HAL_UART_Transmit(&huart2, (uint8_t*)pkt, strlen(pkt), 100);
29
30         waiting_ack = 1;
31         deadline_ms = HAL_GetTick() + 3000;
32         command_flag = 0;
33     }
34
35     if (command_flag==2 && waiting_ack==1){
36         waiting_ack = 0;
37         command_flag = 0;
38     }
39
40     if (waiting_ack && (int32_t)(HAL_GetTick() - deadline_ms) >= 0){
41         char pkt[48];
42         sprintf(pkt, "!ADC=%lu#\r\n", (unsigned long)adc_value);
43         HAL_UART_Transmit(&huart2, (uint8_t*)pkt, strlen(pkt), 100);
44     }
```

```
41     deadline_ms = HAL_GetTick() + 3000;
42 }
43 }
```

2 main.c

```
1 HAL_UART_Receive_IT(&huart2, &temp, 1);
2 char boot[] = "Yeu Thay Sy neu thay cho eim 10\r\n";
3 HAL_UART_Transmit(&huart2, (uint8_t*)boot, sizeof(boot)-1, 100);
```

2.1 WHILE

```
1     uart_communicate_fsm();
2     HAL_GPIO_TogglePin(GPIOA, GPIO_PIN_5);
3     HAL_Delay(1000);
```

Listing 2: in while

2.2 CODE 4

```
1 void HAL_UART_RxCpltCallback(UART_HandleTypeDef *huart){
2     if (huart->Instance == USART2){
3         command_parser_fsm_byte(temp);
4         HAL_UART_Receive_IT(&huart2, &temp, 1);
5     }
6 }
```

Listing 3: in while

3 ANH

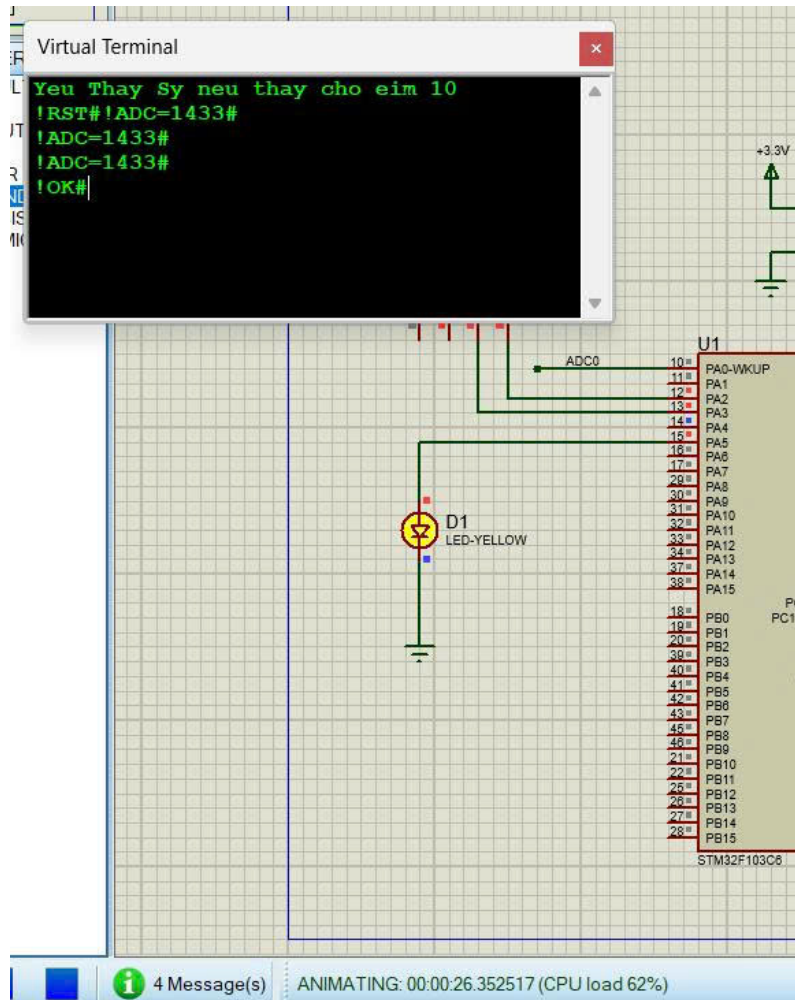


Figure 1: Kết quả hiển thị UART trên Virtual Terminal

4 Source

GG Drive Link: [My Source Code](#) Github Link: [My Source Code](#)