



ChristenTen (/s/profile/0050X000007RTiHQAW) (Customer) asked a question.

February 4, 2022 at 3:02 PM (/s/question/0D53W00001LUyIfSAD/uart-communication-problem-between-raspberry-pi-4-and-stm32f767zi)

## UART communication problem between Raspberry Pi 4 and STM32F767ZI

Hello everyone,

I'm trying to debug a problem with the UART communication between the raspberry pi 4 and an STM32.

Indeed, I try to send the number 1 from the raspberry pi to the stm32 but I can't get the right result.

Here is the code I implemented on the raspberry pi 4 :

```
1  import serial
2
3  from time import sleep
4
5
6
7  ser = serial.Serial(
8
9      port = "/dev/ttyS0",
10
11      baudrate = 9600,
12
13      parity = serial.PARITY_NONE,
14
15      stopbits = serial.STOPBITS_ONE,
16
17      bytesize = serial.EIGHTBITS,
18
19      timeout = 1
20
21  )
22
23 data = 1
24
25 while True:
26
27     data_str_list = [str(data)]
28
29     send_string = ','.join(data_str_list)
30
31     ser.write(send_string.encode())
32
33     sleep(1)
```

Feedback

Here is the STM32 code :

```
1  char data_sign[1];
2
3
4  int main(void)
5  {
6
7
8
9
10  HAL_Init();
11
12  SystemClock_Config();
13
14  MX_GPIO_Init();
15
16  MX_DMA_Init();
17
18  MX_USART3_UART_Init();
19
20  MX_DAC_Init();
21
22  MX_UART4_Init();
23
24  MX_TIM6_Init();
25
```

```

26
27  while (1)
28  {
29      {
30
31          /* USER CODE END WHILE */
32
33          /* USER CODE BEGIN 3 */
34
35
36
37          HAL_UART_Receive(&huart4, data_sign, sizeof(data_sign), 1000);
38
39      }
40  }
41
42  /* USER CODE END 3 */
43
44  }
45
46
47  static void MX_UART4_Init(void)
48  {
49      {
50
51
52      huart4.Instance = UART4;
53
54      huart4.Init.BaudRate = 9600;
55
56      huart4.Init.WordLength = UART_WORDLENGTH_8B;
57
58      huart4.Init.StopBits = UART_STOPBITS_1;
59
60      huart4.Init.Parity = UART_PARITY_NONE;
61
62      huart4.Init.Mode = UART_MODE_TX_RX;
63
64      huart4.Init.HwFlowCtl = UART_HWCONTROL_NONE;
65
66      huart4.Init.OverSampling = UART_OVERSAMPLING_16;
67
68      huart4.Init.OneBitSampling = UART_ONE_BIT_SAMPLE_DISABLE;
69
70      huart4.AdvancedInit.AdvFeatureInit = UART_ADVFEATURE_NO_INIT;
71
72      if (HAL_UART_Init(&huart4) != HAL_OK)
73      {
74
75          Error_Handler();
76
77      }
78  }
79
80  }

```

Feedback

When I send 1, I get this with the STM32 debug:

(*)= data_sign[0]	uint8_t	240 '8'
-------------------	---------	---------

Sometimes, the value is 241 but I don't know how to interpret this data. Can you please help me please? I think it's a problem with the data types but I tried to change them but I still can't find the right result.

I also changed the clock frequency of the STM32 but nothing changes. The function HAL\_UART returns 0.

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Answer



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[Bruno ST \(/s/profile/0050X0000088ivbQAA/\)](/s/profile/0050X0000088ivbQAA/) (Employee)

9 months ago

Hello [@ChristenTen \(/s/profile/0050X000007RTiHQAW/\)](/s/profile/0050X000007RTiHQAW/) (Customer) ,

Raspberry PI 4 UART Levels for RX/TX are 0V to 5V and STM32 levels are from 0V to 3.3V.

You need a level shifter to secure communication from STM32 to raspberry PI4. Make sure that you use PIO that are 5V tolerant also.


When PI4 doinx a TX the characters received by STM32 should be undersood.

Try to perform a loopback (shortcut between TX & RX) on STM32 first to be sure the UART is working fine.

BR,

Bruno


Like Reply

 **ChristenTen** (/s/profile/0050X000007RTiHQAW) (Customer)  
9 months ago

Thanks for your answer @Bruno ST (/s/profile/0050X0000088ivbQAA) (Employee).

The UART on Raspberry pi 4 is 3V3 and not 5V. I checked this with my scope.


Like Reply 2 likes

 **Bruno ST** (/s/profile/0050X0000088ivbQAA) (Employee)  
9 months ago

Sorry, you are right !! I mixed-up myself...

Bruno

Like Reply


 **Muhammed Güler** (/s/profile/0050X000007S09zQAC) (Customer)  
9 months ago

Your code on the STM32 side can only read 1 byte. The 1bytes of data you read looked like part of a UTF-8 encoded character.

If you don't know how many bytes the incoming data will be, below is an example I randomly found on google. it will solve your problem.

<http://www.bepat.de/2020/12/02/stm32f103c8-uart-with-dma-buffer-and-idle-detection/> (<http://www.bepat.de/2020/12/02/stm32f103c8-uart-with-dma-buffer-and-idle-detection/>)


Like Reply

 **ChristenTen** (/s/profile/0050X000007RTiHQAW) (Customer)  
9 months ago

@Muhammed Güler (/s/profile/0050X000007S09zQAC) (Customer)

What I wanted is to receive just 1 byte (0x01 or 0x00). Nevertheless, I get 240 but I can't see the link between 240 and 1 even with the UTF-8 encoding.


Like Reply

 **Javier** (/s/profile/0053W000001iZEzQAM) (Customer)  
Edited February 7, 2022 at 8:24 AM

I know its a dumb question but is your wiring OK?


Are you wiring your stm32's GND with your raspi GND?

Like Reply 1 like

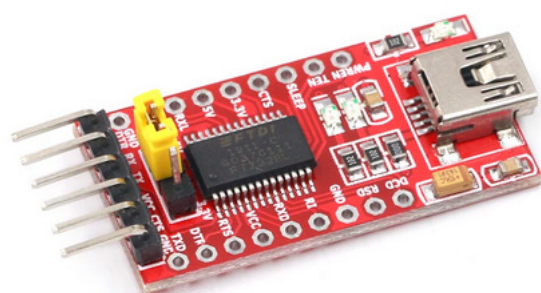
 **ChristenTen** (/s/profile/0050X000007RTiHQAW) (Customer)  
9 months ago

I already checked the connection : Tx\_Raspberry -> Rx\_STM32 and Rx\_Raspberry ->Tx\_STM32 and also same ground.

Like Reply 1 like

 **Javier** (/s/profile/0053W000001iZEzQAM) (Customer)  
Edited February 7, 2022 at 11:46 AM

i find ftdi's usb-UART modules very usefull to debug this kind of scenarios.



\*\*extra: i had some problems back in the day with the raspi's internal bluetooth trying to take over the uart i was using .....

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