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# YÊU CẦU

## Gửi dữ liệu qua USART

## Nhận dữ liệu qua USART

# Gửi dữ liệu

## README

* Send string through USART1, baudrate 115200
* Notice:
* AT32 IDE and Hercules terminal is recommended
* AT-START-F403A is currently in use

## Source code

### Include & definition

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### system\_clock\_config():

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* + system clock source (= 240 000 000) = pll (hext): clock ngoại thạch anh (HEXT\_VALUE = 8 000 000) \* pll\_mult(=60)
  + => PLL\_range greater than 72mhz
  + Apb1clk ( = sclk / apb1div(=2) ): 120 000 000 (maximum frequency of APB1/APB2 )

**void** **system\_core\_clock\_update**(**void**)

{

uint32\_t hext\_prediv = 0, pll\_mult = 0, pll\_mult\_h = 0, pll\_clock\_source = 0, temp = 0, div\_value = 0;

crm\_sclk\_type sclk\_source;

**static** **const** uint8\_t sys\_ahb\_div\_table[16] = {0, 0, 0, 0, 0, 0, 0, 0, 1, 2, 3, 4, 6, 7, 8, 9};

/\* get sclk source \*/

sclk\_source = crm\_sysclk\_switch\_status\_get();

**switch**(sclk\_source)

{

**case** *CRM\_SCLK\_HICK*:

**if**(((CRM->misc3\_bit.hick\_to\_sclk) != *RESET*) && ((CRM->misc1\_bit.hickdiv) != *RESET*))

system\_core\_clock = HICK\_VALUE \* 6;

**else**

system\_core\_clock = HICK\_VALUE;

**break**;

**case** *CRM\_SCLK\_HEXT*:

system\_core\_clock = HEXT\_VALUE;

**break**;

**case** *CRM\_SCLK\_PLL*:

pll\_clock\_source = CRM->cfg\_bit.pllrcs;

{

/\* get multiplication factor \*/

pll\_mult = CRM->cfg\_bit.pllmult\_l;

pll\_mult\_h = CRM->cfg\_bit.pllmult\_h;

/\* process high bits \*/

**if**((pll\_mult\_h != 0U) || (pll\_mult == 15U)){

pll\_mult += ((16U \* pll\_mult\_h) + 1U);

}

**else**

{

pll\_mult += 2U;

}

**if** (pll\_clock\_source == 0x00)

{

/\* hick divided by 2 selected as pll clock entry \*/

system\_core\_clock = (HICK\_VALUE >> 1) \* pll\_mult;

}

**else**

{

/\* hext selected as pll clock entry \*/

**if** (CRM->cfg\_bit.pllhextdiv != *RESET*)

{

hext\_prediv = CRM->misc3\_bit.hextdiv;

/\* hext clock divided by 2 \*/

system\_core\_clock = (HEXT\_VALUE / (hext\_prediv + 2)) \* pll\_mult;

}

**else**

{

system\_core\_clock = HEXT\_VALUE \* pll\_mult;

}

}

}

**break**;

**default**:

system\_core\_clock = HICK\_VALUE;

**break**;

}

### at32\_board\_init():

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### uart\_print\_init(uint32\_t baudrate)

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### Define print uart

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### Main code

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* Gửi USART PRINT START\r\n"MINH MAN\r\n"TAN PHAT\r\n" khi reset
* Gửi giá trị Counter tăng dần sau mỗi 1 giây

## Github & Video demo

### Github:

[Github\_print](https://github.com/hniman135/UsartPrint)

### Video demo:

[USART\_print](https://drive.google.com/file/d/1uOcPU77uXGnxCs-fxuyxpUKYMQovUvFv/view?usp=sharing)

# Nhận dữ liệu

## README

* Control LED2,3,4 when get accurate data
* LED2: 0x02
* LED3: 0x03
* LED4: 0x04
* Notice:
* AT32 IDE and Hercules terminal is recommended
* AT-START-F403A is currently in use

## Source code

### Include & Typedef

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### system\_clock\_config(); at32\_board\_init();

* Tương tự config Gửi dữ liệu

### usart\_configuration()

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* Cấu hình GPIO, mode cho USART1 tx, rx
* Enable transmitter và receiver để gửi/ nhận dữ liệu

### Main code

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* Thay đổi trạng thái LED khi nhận chính xác dữ liệu. Cụ thể:
  + 0x02: LED2
  + 0x03: LED3
  + 0x04: LED4

## Github & Video demo:

### Github:

[Github\_receive](https://github.com/hniman135/UsartReceive)

### Video demo:

[USART\_receive](https://drive.google.com/file/d/1uW3YB3ri_tDcoWDttA-ChmLcQjMLzi4L/view?usp=sharing)