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Поиск

## STM32 + 1-wire + DMA

STM32

Yandex

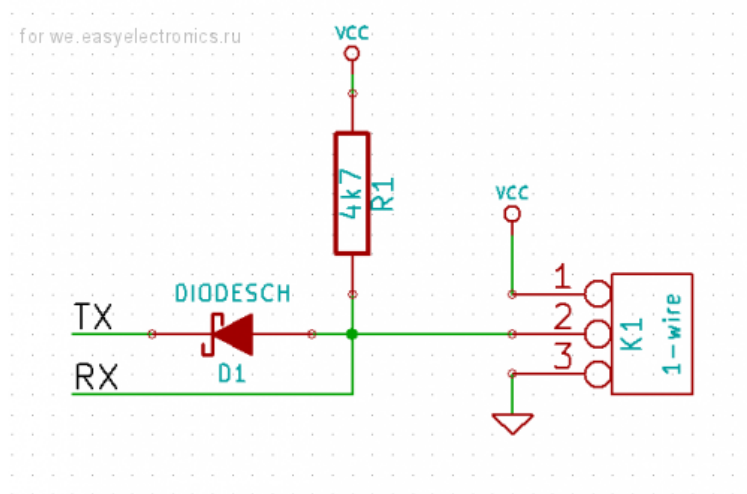
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Once again it took to read the data on the 1-wire. At first I did it on the AVR simply twitching legs. Then read on apnot notorious maxim **Solution: Using a the UART to Implement, a 1-Wire Bus the Master-**, began to use USART. When moved to the STM32, I saw that he usartov little more than dofiga so sweet deal to use them for this purpose. Clearly, it worked. But it noted that in addition to the USART is such a bonus - DMA. That's about screwing it to the 1-wire and will talk in this article.

## introduction

First, a little refreshment principles of working with 1-wire through the USART.

Wiring - simple as a penny. As a guinea will play DS1820 thermometer. Yes, I know that it would be better to take the DS18B20, but that came to hand ...



**the Reset** is performed so - port configuration 9600,8, n, 1, send 0xf0, if not come 0xf0 - it means on the line someone is sitting.

For all other actions 115,200.8 port configuration, n, 1



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**Record 0** - send 0x00. The idea is to come, and should 0x00

**Record 1** - send 0xFF. The idea is to come and be 0xFF

**Reading** - send 0xFF. If returned 0xFF - read 1, otherwise - 0.

Accordingly, to write bytes to the line 1-wire, we need to pump 8 bytes via USART. Manually do not interesting, read what we write about the DMA. As it is about looks - form a buffer to send, set up a DMA (specify what, where, and where to send), give a kick and everything started to happen.

We have two STM32F103 DMA controller, a total of 12 channels. Each channel is assigned to its periphery. And besides, any channel can handle memory-memory mode, but we have such a regime is not interested in.

The layout of the channels on the periphery, see the Reference manual, in the section on the DMA. We are interested in UART line. Historically, in the example I used USART2, employ the means and channels DMA1\_Channel6 DMA1\_Channel7 for him

**Table 57. Summary of DMA1 requests for each channel**

Peripherals	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
ADC1	ADC1						
SPI/I <sup>2</sup> S		SPI1_RX	SPI1_TX	SPI/I2S2_RX	SPI/I2S2_TX		
USART		USART3_TX	USART3_RX	USART1_TX	USART1_RX	USART2_RX	USART2_TX
I <sup>2</sup> C				I2C2_TX	I2C2_RX	I2C1_TX	I2C1_RX
TIM1		TIM1_CH1	TIM1_CH2	TIM1_CH4 TIM1_TRIG TIM1_COM	TIM1_UP	TIM1_CH3	
TIM2	TIM2_CH3	TIM2_UP			TIM2_CH1		TIM2_CH2 TIM2_CH4
TIM3		TIM3_CH3	TIM3_CH4 TIM3_UP			TIM3_CH1 TIM3_TRIG	
TIM4	TIM4_CH1			TIM4_CH2	TIM4_CH3		TIM4_UP

**Table 58. Summary of DMA2 requests for each channel**

Peripherals	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
ADC3 <sup>(1)</sup>					ADC3
SPI/I2S3	SPI/I2S3_RX	SPI/I2S3_TX			
UART4			UART4_RX		UART4_TX
SDIO <sup>(1)</sup>				SDIO	
TIM5	TIM5_CH4 TIM5_TRIG	TIM5_CH3 TIM5_UP		TIM5_CH2	TIM5_CH1
TIM6/ DAC_Channel1			TIM6_UP/ DAC_Channel1		
TIM7/ DAC_Channel2				TIM7_UP/ DAC_Channel2	
TIM8 <sup>(1)</sup>	TIM8_CH3 TIM8_UP	TIM8_CH4 TIM8_TRIG TIM8_COM	TIM8_CH1		TIM8_CH2

1. ADC3, SDIO and TIM8 DMA requests are available only in high-density devices.

## Initialization

And the first step - initialize:

```
void OW_Init(USART_TypeDef USARTx) {
    GPIO_InitTypeDef GPIO_InitStructure
    USART_InitTypeDef USART_InitStructure

    if (USARTx == USART2) {
        RCC_APB2PeriphClockCmd(RCC_APB2Periph_GPIOA | RCC_APB2Periph_USART2, ENABLE);

        GPIO_InitStructure.GPIO_Pin = GPIO_Pin_2;
        GPIO_InitStructure.GPIO_Mode = GPIO_Mode_AF_PP;
        GPIO_InitStructure.GPIO_Speed = GPIO_Speed_50MHz;

        GPIO_Init(GPIOA, &GPIO_InitStructure);

        GPIO_InitStructure.GPIO_Pin = GPIO_Pin_3;
        GPIO_InitStructure.GPIO_Mode = GPIO_Mode_IN_FLOATING;
```

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```

        GPIO_InitStructure.GPIO_Speed = GPIO_Speed_50MHz;

        GPIO_Init(GPIOA, &GPIO_InitStructure);

        RCC_APB1PeriphClockCmd(RCC_APB1Periph_USART2, ENABLE);
    }

    USART_InitStructure USART_BaudRate= 115200;
    USART_InitStructure USART_WordLength= USART_WordLength_8b;
    USART_InitStructure USART_StopBits= USART_StopBits_1;
    USART_InitStructure USART_Parity= USART_Parity_No;
    USART_InitStructure USART_HardwareFlowControl=
        USART_HardwareFlowControl_None;
    USART_InitStructure USART_Mode = USART_Mode_Tx;

    USART_Init(USARTx, &USART_InitStructure);
    USART_Cmd(USARTx, ENABLE);

    RCC_AHBPeriphClockCmd(RCC_AHBPeriph_DMA1, ENABLE);
}

```

As a stream of consciousness write quickly and not get confused? Catholics have a mnemonic to remember how to be baptized - "glasses, eggs, wallet, watch." We have a little bit different "clocks, legs, peripherals»:

First team includes timing GPIOA port. Why A? Because USART2 legs are there. See pinout in the datasheet.

Then we set up the leg. About it it is necessary to read the section General-purpose and alternate-function I / Os (GPIOs and AFIOs). There are labels on all occasions, including USART. TX leg put in an alternative push-pull, leg RX - leave hanging.

**Table 21. USARTs**

USART pinout	Configuration	GPIO configuration
USARTx_TX	Full duplex	Alternate function push-pull
	Half duplex synchronous mode	Alternate function push-pull
USARTx_RX	Full duplex	Input floating / Input pull-up
	Half duplex synchronous mode	Not used. Can be used as a general IO
USARTx_CK	Synchronous mode	Alternate function push-pull
USARTx_RTS	Hardware flow control	Alternate function push-pull
USARTx_CTS	Hardware flow control	Input floating/ Input pull-up

And then turn on the periphery. In our case, USART and DMA1.

## Reset 1-wire bus

We go further - Reset.

```

uint8_t OW_Reset(USART_TypeDef USARTx) {
    uint8_t ow_presence;
    USART_InitTypeDef USART_InitStructure;

    USART_DMACmd(USARTx, USART_DMAREq_Tx | USART_DMAREq_Rx, DISAB

    USART_InitStructure USART_BaudRate= 9600;
    USART_InitStructure USART_WordLength= USART_WordLength_8b;
    USART_InitStructure USART_StopBits= USART_StopBits_1;
    USART_InitStructure USART_Parity= USART_Parity_No;

```

```

    USART_InitStructureUSART_HardwareFlowControl=
        USART_HardwareFlowControl_None
    USART_InitStructureUSART_Mode = USART_Mode_Tx | USART_Mode_Rx;
    USART_Init(USARTx, &USART_InitStructure);

    USART_ClearFlag(USARTx, USART_FLAG_TC);

    USART_SendData(USARTx, 0xf0);
    while (USART_GetFlagStatus(USARTx, USART_FLAG_TC) == RESET);
    ow_presence= USART_ReceiveData(USARTx);

    USART_InitStructureUSART_BaudRate= 115200;
    USART_InitStructureUSART_WordLength= USART_WordLength_8b;
    USART_InitStructureUSART_StopBits= USART_StopBits_1;
    USART_InitStructureUSART_Parity= USART_Parity_No;
    USART_InitStructureUSART_HardwareFlowControl=
        USART_HardwareFlowControl_None
    USART_InitStructureUSART_Mode = USART_Mode_Tx | USART_Mode_Rx;
    USART_Init(USARTx, &USART_InitStructure);

    if (ow_presence != 0xf0) {
        return 1;
    }

    return 0;
}

```

Here everything seems to be clear - set 9600 bytes hat, waiting to send, read it on the bus and set the speed back to 115200.

You could use an interrupt, but I will use freeRTOS, so I will give easier tick the system to another proven task than to mess with interruptions. What is the beauty of working with 1-wire via USART, it is that all the timings in the read / write slot maintains USART hardware, and the delay between bits no one cares, at least for a year will be stretched. So if we miss a couple of microseconds, us anything for it will not.

Well, the flag analyzing USART\_FLAG\_TC - Transfer Complete. This flag means that all the data left in the tire completely. It would seem that there is still a flag USART\_FLAG\_TXE, but it means that just cleared the data register, and the data is still milled in the wilds of the USART. As ATM card that I have gobbled up, and the money has not yet been given. And we also, that send data, it is necessary also to read what eventually turned our manipulation. Since the output of the TX and RX input rigidly connected by the scheme, in the end send miraculously we end receiving bytes. And it can be considered USART\_ReceiveData team ().

OW\_Reset () function returns 0 in the end - if there are no devices on the bus has not responded and the further exchange of no future, or 1 - otherwise.

## Sending commands

Now the fun part - sending commands to the package.

How, for example, looks to work with a thermometer? Submitting his first team selection, "Hey, you!", Well, or "hey you, listen here." Then send the proper command "Temperature is measured!". For example, I'm not going to use the device ID, and will scream all.

We need to send two bytes **0xcc (SKIP ROM)** and **0x44 (the CONVERT the T)** . At the same time through the USART will need to pump 16 bytes. Create a corresponding array:

```

#define OW_0    0x00
#define OW_1    0xff
#define OW_R    0xff

const uint8_t convert_T[] = {
    OW_0 OW_0, OW_1, OW_1, OW_0, OW_0, OW_1, OW_1, // 0x
    OW_0 OW_0, OW_1, OW_0, OW_0, OW_0, OW_1, OW_0 // 0x
};

```

The 1-wire bits are transmitted starting with the youngest, so write them on the contrary.

Then we call the function:

```

void OW_SendCommand(USART_TypeDef* USARTx, const uint8_t *command, uint32_t len)
{
    DMA_InitTypeDef DMA_InitStructure

    DMA_InitStructure.DMA_PeripheralBaseAddr= (uint32_t) &(USARTx->DR);
    DMA_InitStructure.DMA_MemoryBaseAddr= (uint32_t) command;
    DMA_InitStructure.DMA_DIR = DMA_DIR_PeripheralDST;
    DMA_InitStructure.DMA_BufferSize= len;
    DMA_InitStructure.DMA_PeripheralInc= DMA_PeripheralInc_Disable;
    DMA_InitStructure.DMA_MemoryInc= DMA_MemoryInc_Enable;
    DMA_InitStructure.DMA_PeripheralDataSize= DMA_PeripheralDataSize_Byte;
    DMA_InitStructure.DMA_MemoryDataSize= DMA_MemoryDataSize_Byte;
    DMA_InitStructure.DMA_Mode = DMA_Mode_Normal;
    DMA_InitStructure.DMA_Priority= DMA_Priority_Low;
    DMA_InitStructure.DMA_M2M = DMA_M2M_Disable;
    DMA_Init(DMA1_Channel7, &DMA_InitStructure);

    USART_DMACmd(USART2, USART_DMAREQ_Tx_ENABLE);
    DMA_Cmd(DMA1_Channel7, ENABLE);
}

```

Setting DMA analyze more:

As the periphery addresses set data register address USART2

```
DMA_InitStructure.DMA_PeripheralBaseAddr= (uint32_t) &(USART2->DR);
```

As the memory addresses passed to take an array of options - we made it earlier.

```
DMA_InitStructure.DMA_MemoryBaseAddr= (uint32_t) command;
```

Direction of transmission - from memory to peripherals

```
DMA_InitStructure.DMA_DIR = DMA_DIR_PeripheralDST;
```

The length of the transmission data block. It can not exceed 65536 bytes.

```
DMA_InitStructure.DMA_BufferSize= len;
```

Is it necessary to increase the port address after each transfer? No it is not necessary - all pour into one port

```
DMA_InitStructure.DMA_PeripheralInc= DMA_PeripheralInc_Disable
```

Is it necessary to increase the memory address? We must of course, we have to pass the entire buffer.

```
DMA_InitStructure.DMA_MemoryInc= DMA_MemoryInc_Enable
```

Data Width - one byte.

```
DMA_InitStructure.DMA_PeripheralDataSize=
    DMA_PeripheralDataSize_Byte
DMA_InitStructure.DMA_MemoryDataSize= DMA_MemoryDataSize_Byte
```

Mode of operation - normal (there is a ring)

```
DMA_InitStructure.DMA_Mode = DMA_Mode_Normal
```

Priority - Low

```
DMA_InitStructure.DMA_Priority= DMA_Priority_Low
```

Disabled mode memory memory

```
DMA_InitStructure.DMA_M2M = DMA_M2M_Disable
```

Here is the team says - USART2, hast you have nothing to transmit, the DMA twitch, he'll still otsyplet. A DMA channel is not specified, it is already clear how - DMA1\_Channel7.

```
USART_DMACmd(USART2, USART_DMAREq_Tx ENABLE);
```

Well, the DMA start.

```
DMA_Cmd(DMA1_Channel7, ENABLE);
```

After the DMA launched, the first thing he will throw the first byte, and after that it will pull USART. Therefore, the order of initialization is this - first USART\_DMACmd, and only then -. DMA ENABLE

The datasheet said - once you finish to use, just make

```
USART_DMACmd(USARTx, USART_DMAREq_Tx | USART_DMAREq_Rx DISABLE);
```

Well, since we no activity in the USART port do not expect, and the following command will be guaranteed the RESET, then shove this command at the beginning of OW\_Reset () function.

## Reading data

That is, if we do not have anything to read from device 1-wire. And what to do if they will send us something? It is necessary to connect a second DMA channel

as well, in addition to determine the buffer where we will all be read.

```
const uint8_t read_scratch[] = {
    OW_0 OW_0, OW_1, OW_1, OW_0, OW_0, OW_1, OW_1, // 0x00
    OW_0 OW_1, OW_1, OW_1, OW_1, OW_1, OW_0, OW_1, // 0x01
    OW_R OW_R, OW_R, OW_R, OW_R, OW_R, OW_R, OW_R,
    OW_R OW_R, OW_R, OW_R, OW_R, OW_R, OW_R, OW_R
};

uint8_t scratch[sizeof(read_scratch)];

void OW_ReadData(USART_TypeDef* USARTx, const uint8_t *command, uint8_t *buf,
DMA_InitTypeDef DMA_InitStructure)
{
    DMA_DeInit(DMA1_Channel6);
    DMA_InitStructure.DMA_PeripheralBaseAddr= (uint32_t) &(USARTx);
    DMA_InitStructure.DMA_MemoryBaseAddr= (uint32_t) buf;
    DMA_InitStructure.DMA_DIR = DMA_DIR_PeripheralSRC;
    DMA_InitStructure.DMA_BufferSize= len;
    DMA_InitStructure.DMA_PeripheralInc= DMA_PeripheralInc_Disable;
    DMA_InitStructure.DMA_MemoryInc= DMA_MemoryInc_Enable;
    DMA_InitStructure.DMA_PeripheralDataSize= DMA_PeripheralDataSize_Byte;
    DMA_InitStructure.DMA_MemoryDataSize= DMA_MemoryDataSize_Byte;
    DMA_InitStructure.DMA_Mode= DMA_Mode_Normal;
    DMA_InitStructure.DMA_Priority= DMA_Priority_Low;
    DMA_InitStructure.DMA_M2M= DMA_M2M_Disable;
    DMA_Init(DMA1_Channel6, &DMA_InitStructure);

    DMA_DeInit(DMA1_Channel7);
    DMA_InitStructure.DMA_PeripheralBaseAddr= (uint32_t) &(USARTx);
    DMA_InitStructure.DMA_MemoryBaseAddr= (uint32_t) command;
    DMA_InitStructure.DMA_DIR = DMA_DIR_PeripheralDST;
    DMA_InitStructure.DMA_BufferSize= len;
    DMA_InitStructure.DMA_PeripheralInc= DMA_PeripheralInc_Disable;
    DMA_InitStructure.DMA_MemoryInc= DMA_MemoryInc_Enable;
    DMA_InitStructure.DMA_PeripheralDataSize= DMA_PeripheralDataSize_Byte;
    DMA_InitStructure.DMA_MemoryDataSize= DMA_MemoryDataSize_Byte;
    DMA_InitStructure.DMA_Mode= DMA_Mode_Normal;
    DMA_InitStructure.DMA_Priority= DMA_Priority_Low;
    DMA_InitStructure.DMA_M2M= DMA_M2M_Disable;
    DMA_Init(DMA1_Channel7, &DMA_InitStructure);

    USART_DMACmd(USARTx, USART_DMAREq_Tx | USART_DMAREq_Rx, ENABLE);
    DMA_Cmd(DMA1_Channel6, ENABLE);
    DMA_Cmd(DMA1_Channel7, ENABLE);

    while (DMA_GetFlagStatus(DMA1_FLAG_TC6) == RESET);
}
```

Here is initialized to the first controller channel 6. Because of differences:

As a memory address used by the allocated buffer

```
DMA_InitStructure.DMA_MemoryBaseAddr= (uint32_t) buf;
```

And the direction of a little more - from the periphery to the memory

```
DMA_InitStructure.DMA_DIR = DMA_DIR_PeripheralSRC;
```

Accordingly USART's team will be:

```
USART_DMACmd(USARTx, USART_DMAReq_Tx | USART_DMAReq_Rx, ENABLE);
```

Is sent as the last example, but if something is accepted, it is also twitches DMA.

Here I'm just looking forward to the end of the work with the DMA. Again, you can use an interrupt, the benefit of a lot of them we have - and the exhaustion of half of the buffer, and the full completion of the transfer. But again, I'd rather give the system tick.

```
while (DMA_GetFlagStatus(DMA1_FLAG_TC) == RESET);
```

## main.c

As it is now to use it?

```
OW_Init(OW_USART);

OW_Reset(OW_USART);
OW_SendCommand(OW_USART, convert_T, sizeof(convert_T));

for (i=0; i<1000000; i++);

OW_Reset(OW_USART);
OW_ReadData(OW_USART, read_scratch, scratch, sizeof(read_scratch));

uint16_t tt=0;

for (i=16; i<32; i++) {
    if (scratch[i] == 0xff) {
        tt = (tt>>1) | 0x8000;
    } else {
        tt = tt>>1;
    }
}
```

Delay after command Convert T - this time on the temperature measurement. Read the datasheet in the sensor.

As a result of the action in the variable tt is the value of the first two bytes of scratch-memory thermometer. This is the temperature.

## conclusions

As long as the finished library does not spread, run-in project and see what will result.

Search for devices not particularly parallelize it online at each step. We'll have to do in OW\_Reset - thrown Baitik, waiting.

Minus one - is required buffer is big enough.

But it is possible to neutralize a slightly negative - in this buffer is a command and it is to read the data being transmitted. Let's see.

The UPD. Here is a link to the post with decorated library:

<http://we.easyelectronics.ru/STM32/stm32-1-wire-dma-prodolzhenie.html>



## Спонсор конкурса MASTERAM МАГАЗИН ИНСТРУМЕНТОВ

STM32 , 1 wire- , the USART , DMA , konkurs2

6 February 11, 2012, 00:57 **steel\_ne**

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Where you give management system? Or you vytesnyayka?

0



**DIHALT**

February 11, 2012, 1:19

This is just an example of working with 1-wire, kick without rtos. Giving will be so

0

```
while (DMA_GetFlagStatus(DMA1_FLAG_TC7) == RESET) {
    taskYIELD();
}
```



**steel\_ne**

February 11, 2012, 1:33

↑

It even vytesnyayke useful.

Actually, I made for myself a conclusion - preemptive multitasking is only useful when you have someone else turns the heavy library. If your problem, it is always clear where you can give the tick, and where better to put the critical section.

0



**steel\_ne**

February 11, 2012, 1:37

↑

Hmm. I'd shoved the formation of arrays of OW\_x in the library. Then there will be a function of the type uint8\_t OW\_SendByte (uint8\_t Data), using a 16-byte internal buffer (8 transmission 8 at the reception), and the host / outputs data immediately digestible Baitik.

In general, the buffer can be a single use. Anyway, when he came to the next RX Baitik - this means that the transfer of the buffer it has withdrawn and is no longer needed. So it is possible to set on both channels of a buffer.

0



**Vga**

February 11, 2012, 3:30

It should first create the entire parcel, and then it spit out. By and large part of the teams - it is constant. For example, the start of temperature measurement, the scratch entry (sensor configuration). In another part of the team will use eight-Aidi sensor, that's how it will meet the team - I do not know.

And as for the two channels on a single buffer - this is real.

0



**steel\_ne**

February 11, 2012, 9:15

↑

Well, firstly, the constant of such parcels embarrassing record.

Secondly, they spent 8 times more memory. Why?

Generate enough byte packages, this would require a total of 8 bytes of RAM for the buffer.

0



**Vga**

February 11, 2012, 9:35

↑

Oh, how udachnenko! Just need to implement a 1-wire. And everything is painted in detail, so even with the blackjack. I would use, except, perhaps, instead of zayuzat interrupt rtos. Thank you!

0



**ACE**  
February 11, 2012, 15:10

Tell me, please, and multidrop for this scheme will work?

0



**Ensase**  
February 13, 2012, 6:03

It is understood when several devices 1-wire bus? It will of course. In terms of 1-wire, nothing has changed.

0



**steel\_ne**  
February 13, 2012, 15:35



On liflabsovskom forum just floated a similar topic, posted a link to the article there. By the way, there is no desire / opportunity to translate the article into English? I think wanting to read it in this way there will be many.

0

The PS That would be the same, but libmaple ...



**evsi**  
February 15, 2012, 14:53

That somehow did not hang out at foreign forums. A liflabs normal contingent on?

0

And what is generally libmaple? :)



**steel\_ne**  
February 15, 2012, 18:01



Yes, it is quite. Only the activity there is not very high.

0

The PS [www.leaflabs.com](http://www.leaflabs.com) further on the links, there is a forum, and Maple, and libmaple. Another is to look [github.com/gbulmer/openstm32sw](https://github.com/gbulmer/openstm32sw) and [github.com/gbulmer/openstm32hw](https://github.com/gbulmer/openstm32hw).



**evsi**  
February 15, 2012, 22:04



With regard to the translation: I can help, if necessary.

0

The PS at least two more people from the local community are periodically hang on liflabse.

The PPS curious whether DIHALT against posts in other languages or, for example, the combined positions, where the text is present in more than one language ...



**evsi**  
February 15, 2012, 22:08



If personal blog, then do not. The public is not yet known. The rules stated that no such posts must be only in Russian.

0



**angel5a**  
August 29, 2012, 16:03



I noticed that if the thermometer immediately after the interview and continue to interrogate ~ times a second, then after 5-10 seconds, it shows by 0.5-1 degrees higher than immediately after switching. Heated what-if of himself. With the layouts in the precision of 1/16 of a degree can not be trusted ((On good, 1/2 of a degree - is the most that he is able And if someone knows more accurate thermometer.?)

0



**phantom\_lord**  
March 27, 2012, 13:59

I do not know about that, but in the datasheet SHT21 directly stated - if the duty cycle of more than 10% (ie, polling more than 1 Hz at a maximum conversion accuracy - it thus takes 100ms) chip is heated.

0

In addition, we must not forget details next to the thermometer. This Sensirion even dedicated a separate document. No wonder sensor demoplatah separated from the other card slot in the PCB.



March 27, 2012, 18:13



Correct me if I'm wrong.

If you configure USART\_TX output as open drain, the diode can be eliminated from the circuit.

In the datasheet just specified that USART\_TX can be both PushPull and OpenDrain.

0

**shein**

August 29, 2012, 15:06

Overlooked datasheet, did not find this. I wrote for STM32F103 series. Maybe on the STM8, for example, and is allowed such flexibility.

0

**steel\_ne**

August 30, 2012, 10:40



Just for STM32F103

The USART\_TX pin can also be configured as alternate function open drain.

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By the way, I was lying still, this document 11 audits, so there really is not the footnote :)

Yesterday tried to configure a USART\_TX OpenDrain and diode removed, everything works fine.

PS: Generally excellent article, it helped me a lot, Thank you.

0

**shein**

August 30, 2012, 10:54



Thanks I'll know. Most of all, I myself, and ran into the classics - Read the latest datasheet, not one that is))

0

**steel\_ne**

September 10, 2012, 10:27



a question on the number of legs ... type 1-wire, so 1-wire

0

poke his nose, can something I do not understand in all of chemistry, but the inner connection TX c RX and OpenDrain in one bottle:

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### **27.3. 10 wire the half-Single Room-duplex communication**

of the the single-wire the half-duplex the mode is selected by setting the bit in the HDSEL USART\_CR3

the register. The this the mode with In, the the following bits a must Kept the BE cleared:

- LINEN and CLKEN bits in the USART\_CR2 The register,
- SCEN and of IREN bits in the USART\_CR3 The register.

Of The the USART CAN the BE configured to follow a the single-wire the half-duplex protocol. The single-wire with In the half-duplex the mode, the TX and the RX the pins are the connected INTERNALLY. Of The selection Between halfand full-duplex communication is made with a control bit 'the HALF the DUPLEX the SEL' (HDSEL in USART\_CR3).

Of As soon's as with HDSEL is Written to 1:

- the RX is the no longer a USED,
- the TX is the always released The the when the no the data is transmitted. THUS, IT Acts as with a standard the IO in the idle or in the reception. It Means That the the IO a must the BE configured SO That the TX is configured as with floating input the (or output the high the open-drain) the when not-driven by the the USART.

The Apart from the this, the communications are Select Similar to what is done The in normal the USART the mode.

Of The Conflicts the line a must on the BE 'managed by the software (by the use of a Centralized arbiter, for the instance). Particular with In, the transmission is blocked by by never-hardware and

'continue' to On occur as with as with a soon's the data is the data

Written in the 'while' The register the the TE bit is the set.

There is no subscription, no glands - such as getting ready to theorize ...  
Bumped While playing with MicroXplorer 2.1



**Gaaaaaad**

October 14, 2012, 21:04



Lord! The question is. I am confused by this: "

The Means That It a must the IO configured the BE SO That the TX is configured as with floating input the (or the high output the open-drain) **the when the not-driven by the USART**

. "And when administered UART-ohm znachitstva, not necessarily open drain?

Definitely not Pohorje, for example, a half-year, a year of work, if without a diode?

Can anyone have a circuit ready to quickly try to send in the UART to half duplex A pull-up resistor is replaced by a pull-up to the ground - it will be clear, open drain or not.

0



**dr\_livsey**

February 20, 2013, 12:42



```
while (USART_GetFlagStatus(USARTx, USART_FLAG_TC) == RESET);
```

That is, this construction can cause trouble. If you fall off the sensor, there is an endless cycle of work. Give tick, do not give, and the current task is blocked.

0



**izwerg**

May 16, 2013, 16:28

The sensor does not affect the USART transmitter after the transmitter will transmit the last bit, he put up the flag TC.

0



**Exeland**

June 27, 2013, 15:35



Good article. Also read appnot «**Using a UART to Implement a 1-Wire Bus the Master-»**, will implement, but without Standart Peripheral Library

0



**Zlodey**

August 11, 2015, 17:53

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