Faulty UART?

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bradhogg
 
Level: Hangaround
Joined: Fri. Aug 29, 2008
Posts: 125 View posts
	Posted by bradhogg: Fri. Sep 12, 2008 - 03:49 PM #1
	Fivestar widget
	Total votes: 0
	
	Hi all.The present project I ma working on requires the UART to transmit at 250kbps.I recently bought a AT90 USB demokit with AT90USB1287 on it. I was running a test program to check out the accuracy of the UART transmission.
	
	`#include`
	`#include`
	
	`#define F_CPU 8000000`
	`#define USART_BAUDRATE 250000`
	`#define BAUD_PRESCALE (((F_CPU / (USART_BAUDRATE * 16UL))) -`
	
	`int main (void)`
	`{`
	
	`unsigned char data;`
	`data = 0x55;`
	
	`// Turn on the Transmitter`
	`UCSR1B |= (1 << TXEN1);`

```
    //Set the baud rate to 250kbps
    UBRR1L = BAUD_PRESCALE;
    UBRR1H = (BAUD_PRESCALE >> 8);

    // Set the USART Asynchronous communication mode,
    // no parity bit, 1 stop bit, 8 bit data
    UCSR1C = (0<<UMSEL11)|(0<<UMSEL10)|(0<<UPM11)|(0<<UPM10)|

                        (0<<USBS1)|(0<<UCSZ12)|(1<<UCSZ11)|(1<<UC

    for (;;) // Loop forever
    {

        while( !(UCSR1A & (1 << UDRE1)) );
        UDR1 = data;

    }

}
```

But when I check out the frequency on the scope it only gives out 15khz instead of ~125khz.Is there a flaw in the program or is the UART is faulty.
Thanks in advance.

Tags:
AVR Microcontrollers, **megaAVR and tinyAVR**, **AT90USB1287**

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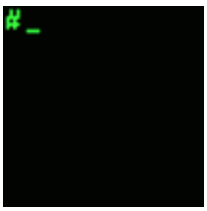
clawson



Level: Moderator
Joined: Mon. Jul 18, 2005
Posts: 97645 **View posts**
Location: (using avr-gcc in) Finchingfield, Essex, England

Posted by **clawson**: Fri. Sep 12, 2008 - 03:53 PM **#2**

Total votes: 0

The fact that 125/15 is close to a factor of 8 smells strongly of CKDIV8 problems!

Does that chip have a CKDIV8 fuse and does your ISP programmer show whethere it's set.

Even if it is you should be able to whizz things up to full speed in the early part of the software with:

```
CLKPR = (1 << CLKPCE); // enable a change to CLKPR
CLKPR = 0; // set the CLKDIV to 0 - was 0011b = div
```

and you don't even need an ISP in this case.

Cliff

FAQ#1: ISR/main shared variables MUST be defined 'volatile'
FAQ#2: embedded programs must NEVER return from main()
FAQ#3: 99.9% of UART errors are AVRs not being clocked right
FAQ#4: If using avr-gcc avoid -O0 optimisation setting at all costs
FAQ#5: If PORTC bits don't seem to work JTAG probably needs disabling
Click 4 more (GCC)

(http://www.nongnu.org/avr-libc/user-manual/FAQ.html)

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bradhogg

Level: Hangaround
Joined: Fri. Aug 29, 2008
Posts: 125 **View posts**

Posted by **bradhogg**: Fri. Sep 12, 2008 - 04:10 PM **#3**

Total votes: 0

The demo kit has an external crystal oscillator of 8Mhz and the avr(AT90USB1287) is using that as the clock but I havent thought about the CKDIV8 fuse. The ISP for the demo kit is FLIP programmer which does not allow me to peek into the fuse bits.I will try doing it with software as you have shown above.

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bradhogg

Level: Hangaround
Joined: Fri. Aug 29, 2008
Posts: 125 **View posts**

Posted by **bradhogg**: Fri. Sep 12, 2008 - 04:15 PM **#4**

Total votes: 0

BINGO ! ! That was the problem. Its doing fine after altering CLKPR. Thanks a ton Cliff.

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clawson

Level: Moderator
Joined: Mon. Jul 18, 2005
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Posted by **clawson**: Fri. Sep 12, 2008 - 04:16 PM **#5**

Total votes: 0

Well another idea, assuming the code is running exactly 8 times too slow then program it to do 9600 baud but set your PC terminal to 1200 baud and you should see output. Then just get it to print out the current CLKPR register contents to the UART. My guess it is 3 and not 0.

FAQ#1: ISR/main shared variables MUST be defined 'volatile'
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bradhogg

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Posted by **bradhogg**: Fri. Sep 12, 2008 - 05:16 PM **#6**

Total votes: 0

I wish I could do this thing now but I dont think I can connect the UART to PC, I just have one wire on the kit at the TXD pin.Will have to do a little bit more soldering before I can try your idea. For now the problem seems to be solved.

Quote:

> *My guess it is 3 and not 0.*

I think the CLKPR register is 0 now since it gives out proper baud rate as if set to 8 MHz.

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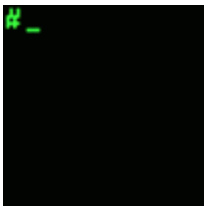
clawson



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Posted by **clawson**: Fri. Sep 12, 2008 - 05:38 PM **#7**

Total votes: 0

Well the two pieces of evidence don't seem to stack up. On the one hand you observe what looks like the consequence of a /8 clock and on the other you say "proper baud rate for 8MHz" (in which case I'm not sure what the problem here is - I thought you said 15KHz rather than expected 125KHz - there's most decidedley nothing "proper" about that!)

FAQ#1: ISR/main shared variables MUST be defined 'volatile'
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bradhogg

Level: Hangaround
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Posted by **bradhogg**: Fri. Sep 12, 2008 - 06:54 PM **#8**

Total votes: 0

Ok I think I mixed up things .I will explain again. I was using this avr (which I assumed was running at 8 Mhz) and ran the above program to output 125Khz signal from the UART and observed to find out that it gives out 15 Khz signal instead of the expected 125Khz. After changing the CLKPR register contents and running the program I am able to get the expected output at 125Khz.

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