

Lab-6

Friday, October 09, 2020 11:28 AM

DATE: 25/09/20

AIM: Using RTC in UART print date and time with LPC2129

Source code:

MAIN FILE:

```
UART.c  RTC.c  header.h  main.c
1 #include <lpc21xx.h>
2 #include "header.h"
3
4 int main()
5 {
6     Uart_Init();
7     Uart_String("17070123120");
8     Uart_Data('\n');
9     Uart_String("Ventrpragada Sai Shravani");
10    Uart_Data('\n');
11
12    rtc_config();
13
14    while(1)
15    {
16
17        Uart_Data(HOUR/10+'0');
18        Uart_Data(HOUR%10+'0');
19        Uart_Data(':');
20        Uart_Data(MIN/10+'0');
21        Uart_Data(MIN%10+'0');
22        Uart_Data(':');
23        Uart_Data(SEC/10+'0');
24        Uart_Data(SEC%10+'0');
25
26        Uart_Data('\n');
27        Uart_Data(DOM/10+'0');
28        Uart_Data(DOM%10+'0');
29        Uart_Data('/');
30        Uart_Data(MONTH/10+'0');
31        Uart_Data(MONTH%10+'0');
32        Uart_Data('/');
33        Uart_Data(YEAR/1000+'0');
34        Uart_Data((YEAR/100)%10+'0');
35
36        Uart_Data(SEC%10+'0');
37
38        Uart_Data('\n');
39        Uart_Data(DOM/10+'0');
40        Uart_Data(DOM%10+'0');
41        Uart_Data('/');
42        Uart_Data(MONTH/10+'0');
43        Uart_Data(MONTH%10+'0');
44        Uart_Data('/');
45        Uart_Data(YEAR/1000+'0');
46        Uart_Data((YEAR/100)%10+'0');
47        Uart_Data((YEAR%100)/10+'0');
48        Uart_Data((YEAR%100)%10+'0');
49        Uart_Data('\n');
50    }
51 }
```

RTC FILE:

```
UART.c  RTC.c  header.h  main.c
1 #include <LPC21xx.h>
2 #include "header.h"
3
4 void rtc_config()
5 {
6     PREINT = 0x1C7;
7     PREFRAC = 0xE1C0;
8     AMR = 0xFF;
9     CCR = 0x01;
10    SEC = 20;
11    MIN = 23;
12    HOUR = 12;
13    DOM = 25;
14    DOW = 5;
15    DOY = 268;
16    MONTH = 9;
17    YEAR = 2020;
18 }
```

HEADER FILE:

```
UART.c  RTC.c  header.h  main.c
1 void Uart_Init(void);
2 void Uart_Data(unsigned char);
3 void Uart_String(unsigned char*);
4 void rtc_config(void);
```

```

1 #include<stdio.h>
2 #include "header.h"
3
4 void Uart_Init()
5 {
6     PINSEL0 = 0X00000005;    // selecting UART
7     UOLCR = 0X03;            // line control register (no parity is used, only 8 bit word length and DLAB bit as 1)
8     UODLLR = 0XC3;           // baud rate register (baud rate is 4600)
9     UODLMR = 0X00;           // baud rate register
10    UOLCR = 0X03;             // line control register (now DLAB bit is set 0)
11 }
12
13 void Uart_data (unsigned char 'dat')
14 {
15     while (UOLSR & 0X02) //UOLSR is Transmitt Holding register, the data is stored in it
16         ; //wait until this condition is satisfied, and once it's satisfied, the data will be
17         // sent to THR. UOLSR is a 8 bit register, so at a time we can send only one bit data. UOLSR is a 8 bit register and THR
18         // comes at 8th bit so if THR becomes empty that means UOLSR = 0X0010 0000 = 0X20
19     }
20     void Uart_String (unsigned char 'dat')
21     {
22         while ('dat' != '\0')
23         {
24             Uart_Data (*dat);
25             dat++;
26         }
27     }
28 }

```

Real Time Clock

Clock Control		Clock Tick Count		Interrupt Location	
CCR: [0x01]	<input checked="" type="checkbox"/> CLKEN <input type="checkbox"/> CTRST	CTC: [0x4080]		ILR: [0x00]	<input type="checkbox"/> RTCIF <input type="checkbox"/> RTCLF
Counter Increment Interrupt					
CIIR: [0x00]					
<input type="checkbox"/> IMSEC	<input type="checkbox"/> IMDOM	<input type="checkbox"/> IMMON			
<input type="checkbox"/> IMMIN	<input type="checkbox"/> IMDOW	<input type="checkbox"/> IMYEAR			
<input type="checkbox"/> IMHOUR	<input type="checkbox"/> IMDYY				
Alarm Mask					
AMR: [0xFF]					
<input checked="" type="checkbox"/> AMRSEC	<input checked="" type="checkbox"/> AMRDOW	<input checked="" type="checkbox"/> AMRMON			
<input checked="" type="checkbox"/> AMRMIN	<input checked="" type="checkbox"/> AMRDY	<input checked="" type="checkbox"/> AMRYEAR			
<input checked="" type="checkbox"/> AMRHOUR	<input checked="" type="checkbox"/> AMRDDY				
Time Counter					
SEC: [24]	DOM: [25]	MONTH: [9]			
MIN: [23]	DOW: [5]	YEAR: [2020]			
HOUR: [12]	DOY: [268]				
Consolidated Time					
CTIME0: [0x050C1718]					
CTIME1: [0x07E40919]					
CTIME2: [0x0000010C]					
Alarm					
ALSEC: [0]	ALDOW: [0]	ALMON: [0]			
ALMIN: [0]	ALDOW: [0]	ALYEAR: [0]			
ALHOUR: [0]	ALDOY: [0]				
Prescaler					
PREINT: [0x01C7]					
PREFRAC: [0x61C0]					
Is Tick (s): [0.20043786]					

In this code I have learnt how to print date by configuring UART file with LPC2129