

TI-RSLK **MAX**

Texas Instruments Robotics System Learning Kit



Module 18

Activity: Serial Communication



Activity: Serial Communication

Question 1

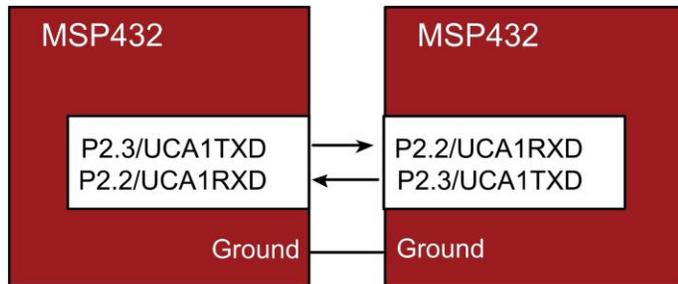
In this activity you will evaluate how the UART works using a logic analyzer or oscilloscope. Write software that outputs to the UART the same data at a fixed rate. Capture the digital output on the TxD pin and identify

- Start bit
- Bit 0
- Bit 1
- Bit 2
- Bit 3
- Bit 4
- Bit 5
- Bit 6
- Bit 7
- Stop bit

Make an empirical measurement of the bit time and baud rate.

Question 2

Connect two MSP432 microcontrollers together using the UART protocol. Connect the TxD of one to the RxD of the other. Connect the two grounds



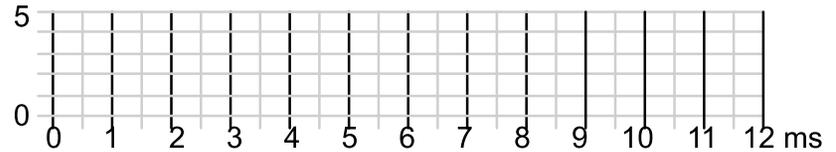
Develop a suite of functions to facilitate communication between computers:

```

Channel_Init();
Channel_TransmitMessage();
Channel_ReceiveMessage();
  
```

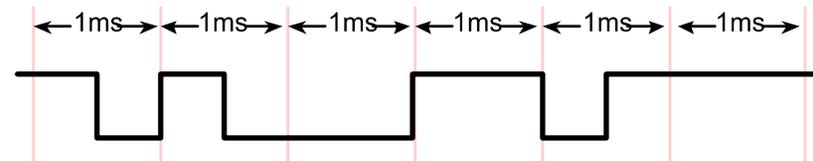
Question 3

Assuming the baud rate is 1000 bits/sec, draw the waveform on TxD as the data 0x31 is transmitted.



Question 4

This was measured on RxD. Assuming it is one frame, what is the baud rate and what is the data?



Question 5

- Write software to communicate with UCA1 (P2.2, P2.3).
- a) Write the initialization for the UART to run at 38400 bits/sec. Assume the SMCLK is 12 MHz, and busy-wait synchronization is used
 - b) Write a busy-wait function that receives one 8-bit data. Wait for a frame to arrive on P2.2 and return the data.
 - c) Write a busy-wait function that transmits one 8-bit data. Wait for UART transmitter to be idle, and send the data out P2.3

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