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CS 5780

3/6/17

Lab 5 – Post Lab

1. What does the AUTOEND bit in the CR2 register do? Why don't you want to use it when you'll be needing a restart condition?

It causes the peripheral to automatically generate a stop condition at the end of a transaction. And because ending the current transaction with a stop condition would release the bus and allow other devices to steal control before the master begins again. So we use the restart condition in order to allow devices to issue new start conditions without properly ending the previous transaction with a stop.

1. This lab used standard-mode 100 kHz I2C speed. What values would you write in the TIMINGR if we were using 400 kHz fast-mode?

You would need to set the PRESC register to 0, the SCLL register to 0x9, the SCLH register to 0x3, the SDADEL register to 0x1, and finally the SCLDEL register to 0x3.

1. This lab used blocking code. To implement it completely as non-blocking you would replace all of the wait loops with interrupts. Most flags in the I2C peripheral can trigger an interrupt if the proper enable bit is set. Find the interrupt enable bits that match the following flags:
   * TC
   * NACKF
   * TXIS (transmit interrupt)
   * ARLO

For TC use the TCIE interrupt enable bit. For NACKF use the NACKIE interrupt enable bit. For TXIS use the TXIE interrupt enable bit. And finally for ARLO use the ERRIE interrupt enable bit.

1. The gyro can operate in three full-scale/measurement ranges, measured in degrees-per-second (dps). What are these three ranges?

The rangers that the gyro can operate at is at 250dps, 500dps, and 2000 dps.

1. What is the I2C address of the gyro when the SDO pin is low? (The lab has the pin set high, read the I2C section of the gyro datasheet)

If the SDO pin is connected to ground, the LSb value will be ‘0’ making the address 1101010b.