

Postlab 05 (I2C)

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?

The AUTOEND bit in the CR2 register, when set, instructs the peripheral to automatically generate a stop condition at the end of a transaction. You don't want to use it when you will be needing a restart condition because it is undesirable when performing chained writes and reads, as it would prematurely end the transaction before the subsequent read or write operations.

2. 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?

The values that you would write in the TIMINGR if we were using 400 kHz fast-mode consist of the following:

- PRESC - 0
 - SCLL - 0x9
 - SCLH - 0x3
 - SDADEL - 0x1
 - SCLDEL - 0x3
3. 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 - TXEIE
 - NACKF - NACKIE
 - TXIS (transmit interrupt) - TXIE
 - ARLO - ERRIE
 4. The gyro can operate in three full-scale/measurement ranges, measured in degrees-per-second (dps). What are these three ranges?

Using the I3G4250D datasheet for the digital gyroscope the three user-selectable measurement ranges, expressed in degrees per second (dps), are ± 245 dps, ± 500 dps, and ± 2000 dps.

5. 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.

When the SDO pin is low, the I2C address of the gyro is 1101000b. This is because when the SDO pin is connected to ground, the least significant bit (LSb) of the device address becomes '0', resulting in the address 1101000b.