

Lab 5 I²C Interface

Pre Lab-Questions:

1. Describe two differences between I2C master and slave devices?

- The master can initiate communication while the slave cannot.
- The master can pick which slave to communicate with but a slave can only respond.

2. What are the two connections in an I2C bus? Describe their purpose.

- SDA is Serial Data which is used for producing and sharing data depending on the direction of communication.

- SCL is Serial Clock which has clock transitions from the master device. The slave device will use this signal to both receive and transmit data. The slave can also pause this line if processing time is needed.

3. What is the difference between open-drain and push-pull outputs?

- Push pull outputs have drive transistors that allow the system to either pull the connection high or pull it low to source or sink the current depending on the external voltage. An open drain system only has one transistor that can pull the output low and to get pulled to a high state there is a pull up resistor.

4. What is the purpose of the I2C restart condition?

- The purpose of a restart condition is to switch the master from reading to writing or vice versa without a full stop condition which would possibly lose control to other slaves or masters.

5. What peripheral register would you use to set the read/write direction of the next I2C transaction?

- The RD_WRN control register.

6. The 10-bit SADD bit-field holds the slave device address. Since standard I2C addresses only use 7 bits, to which bits in the bit-field would you write the shorter address?

- The default 7 bit addressing uses bits [7:1].

7. Name one thing you found confusing or unclear in the lab.

- I had a hard time trying to understand how a restart condition is shown or done without both of the connections going high causing a stop condition.