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Description of I2C

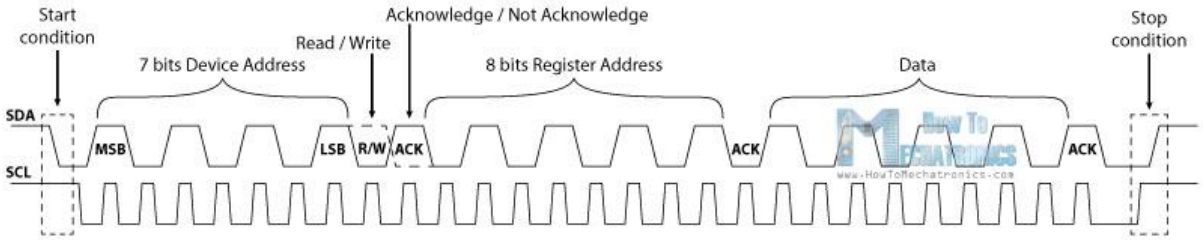
I squared C (I2C) or Inter Integrated Circuit (IIC) is a popular serial communication protocol which helps a master device to communicate with several other master and slave devices by the help of a synchronising clock.

I2C consists of only two buses which are the Serial Data (SDA) and the Serial Clock (SCL). These both lines are connected to a pull-up resistor which are connected to the VCC because these two lines are active low **[1]**.

The SCL is the shared clock produced by the master device in order to synchronize the data transferred between the devices, whereas the SDA is the line which carries the data between these devices.

I2C has the advantage of connecting many Master and Slave devices on the same bus. This depends on the bits of the address, if it is 7-bit address, then there can be up to 128 devices connected on the same bus. If it is a 10-bit address, then there can be up to 1024 devices connected on the same bus **[2]**.

The communication between the master and the slave devices starts by the start bit when the clock is being high, then the master device will state the address of the device it wants to communicate with. This address ends with a bit which states the operation of reading from the device or writing to it, then there is a bit set by the slave device which is either acknowledging or not acknowledging the communication. After that, there is a sequence of bits which specifies the address of the register inside the slave device. The bits after that are the actual data which will be either read from the internal register or writing into it. Finally, the communication ends by the stop bit **[3]**. This process is summarised in the image below **[3].**



References:

[1] https://learn.sparkfun.com/tutorials/i2c/all

[2] https://i2c.info/

[3] https://howtomechatronics.com/tutorials/arduino/how-i2c-communication-works-and-how-to-use-it-with-arduino/