**I2C- Inter Integrated Circuit**

I2C is a Two Wire Interface

Preferred only for communication in a Short Distances

SCL-Serial Clock

SDA-Serial Data

I2C also known as TWI or twi or Two Wire Interface

Any devices can be a master or slave

Any devices can transmit or receieve data

4 Modes of operation:

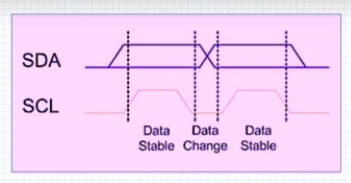
1.Master Transmitter

2.Master Receiever

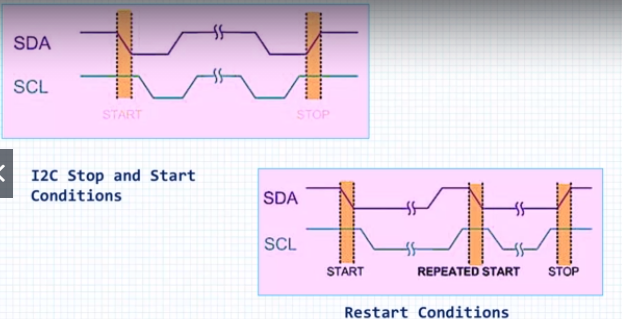
3.Slave Transmitter

4.Slave Receiever

**Data format:**



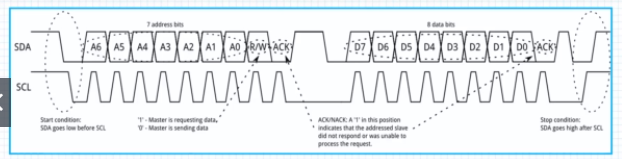
**Start and Stop condition:**



1. When Master made the BUS to Start, no other master tries to control the BUS until there is a STOP condition

2. The master can restart the process using REPEATED START condition

**9-Bit data format**

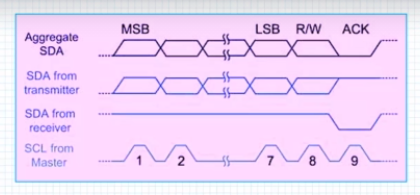


All data in I2C has 9bit

1. 7 bit data + R/W + ACK by the receiever

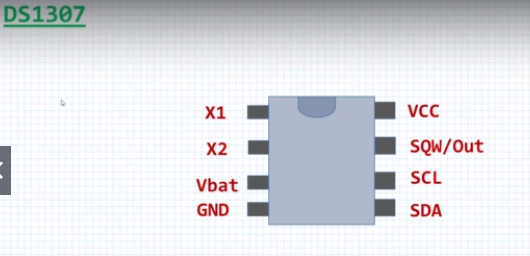
2. 8bit data + ACK by the reveiever

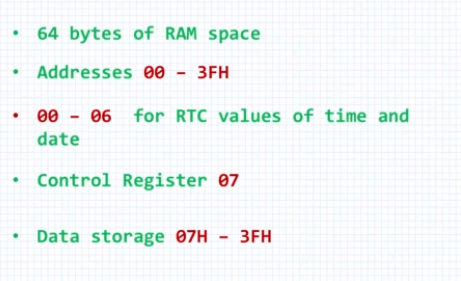
**ACK**

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1. During the 9th clock or 9th BIT clock, the transmitter gives the SDA line control to receiever
2. If its a positive ACK then the receiever pulls the SDA line to GND
3. If its a negative ACK then the receiever doesn't pulls the SDA line to GND

**Analysis of DS1307 I2C clock**

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1. Serial RTC with I2C
2. X1 and X2 inputs for External Clock source like Quad Crystal oscillator of 32.876KHz
3. Vbat pin uses battery power, when Vcc is not available, else connect this PIN to GND
4. SQW/Out provides 1kHz, 4, 8 even 32KHz freq
5. From Datasheet
6. 
7. Check I2C\_Clk\_DS1307 file