**Serial Peripheral Interface (SPI)**

* Developed by Motorola.
* It is low cost, simple interface, is easy to use, and uses less hardware and system resources.
* SPI bus is used to send data between microcontrollers and peripherals like EEPROM, ADC, DAC, RTC, SENSORS, SD CARD, LCD, RFID, CARD MODULE etc.
* It is a serial communication protocol.
* It has a synchronous data bus as the master and slave is synchronized on the edges of the clock.
* Maximum speed up to 10Mbps.

A diagram of a computer chip

Description automatically generated

* It is a simple bus with 4 wires for data communication.
* SCLK – serial clock used for all data communication.
* MOSI – master out slave in – output data line from master.
* MISO – master in slave out – input data line for master coming from slave.
* SS/CS – slave select / chip select – used to select the slave
* It is a simple master communication protocol (clock signal produced by master) where one device(master) initiates the communication with slaves.
* It is full duplex(both master and slave can send and receive data at same time through MISO and MOSI lines).
* It is normally used for short circuit communication(communication within same circuit board or between devices on same PCB)
* It supports single master(one device is considered as master and all other devices as slave). Slaves take instruction from master.
* One master, many slaves.
* For every slave there is one SS/CS lines. This occupies space when more slaves are added(disadvantage).
* It is preferrable where large amount of high speed data is not transferred.
* Any number of bits can be sent or received in countinous stream(advantage)
* It soedn’t have any start or stop bit(simple communication).