Wireless Communication Module For Interfacing With Micro Controllers

PM-ENTERPRISE
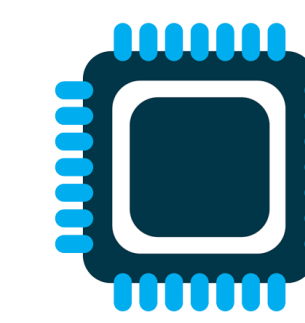
Microcontroller Kit

BLUETOOTH

- It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard and many more consumer applications.
- It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions.
- It is IEEE 802.15.1 standardized protocol, through which one can build wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over air.
- It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART).

XBee

- XBee radio family consist of various XBee RF modules. Each having different specification. Generally, XBee modules operate within ISM 2.4 GHz (Unlicensed) frequency band. XBee modules support ZigBee protocol which is based on IEEE 802.15.4 standard.
- XBee modules have source/destination addressing feature with unicast and broadcast communication support. They support point to point, point to multipoint, peer to peer etc. communication topologies.
- XBee modules uses DSSS (Direct Sequence Spread Spectrum) modulation technique for communication. XBee has on board features like Digital I/O pins, analog ADC (10-bit) input pins, PWM output etc. It has serial UART pins for communication with PC and Microcontrollers serially. Some XBee modules (e.g. S2C) has support for SPI interface too.

WIFI (ESP8266)

- ESP8266 wifi module is low cost standalone wireless transceiver that can be used for end-point IoT developments.
- ESP8266 wifi module enables internet connectivity to embedded applications. It uses TCP/UDP communication protocol to connect with server/client.
- To communicate with the ESP8266 wifi module, microcontroller needs to use set of AT commands. Microcontroller communicates with ESP8266-01 wifi module using UART having specified Baud rate (Default 115200).

GSM

- Global System for Mobile communication (GSM) is digital cellular system used for mobile devices. It is an international standard for mobile which is widely used for long distance communication.
- There are various GSM modules available in market like SIM900, SIM700, SIM800, SIM808, SIM5320 etc.
- SIM900A module allows users to send/receive data over GPRS, send/receive SMS and make/receive voice calls.
- The GSM/GPRS module uses USART communication to communicate with microcontroller or PC terminal. AT commands are used to configure the module in different modes and to perform various functions like calling, posting data to a site, etc.
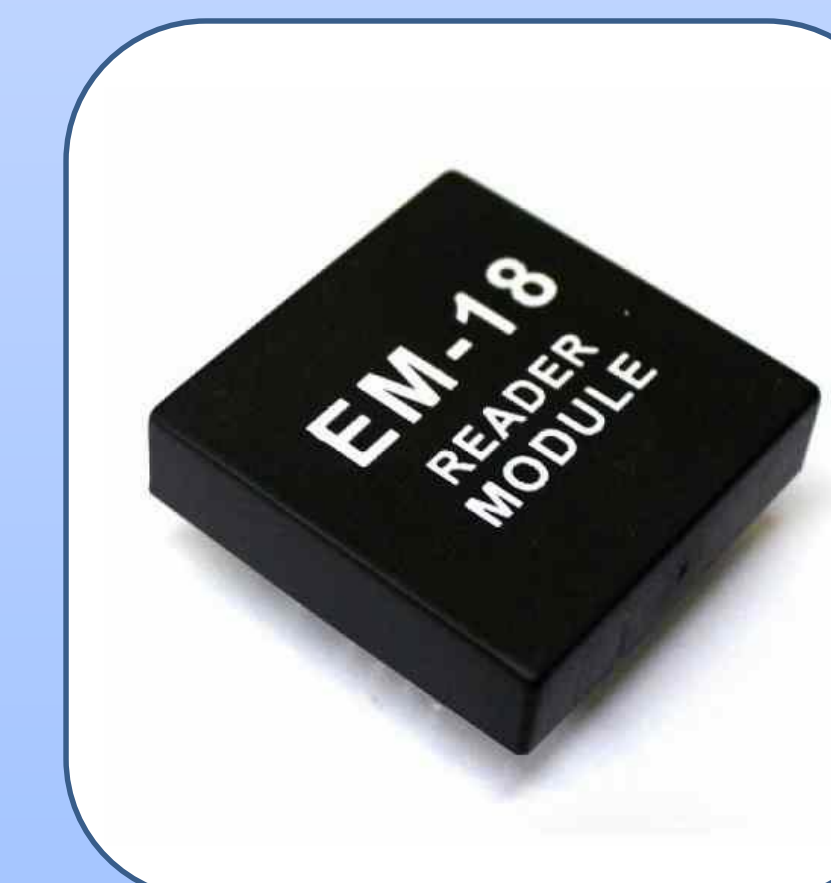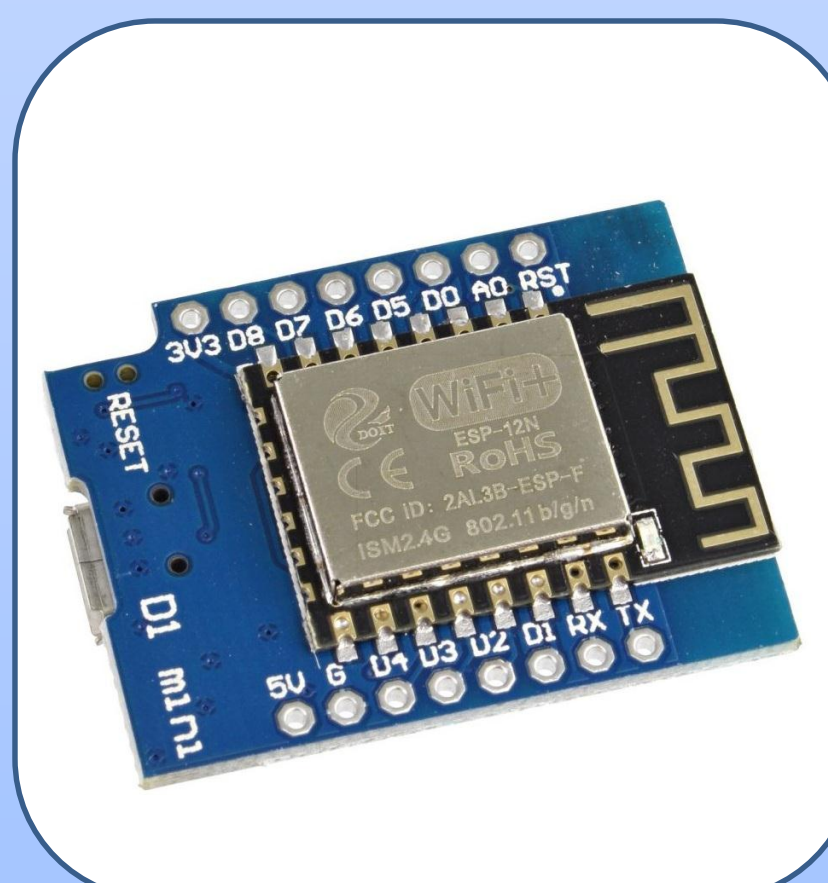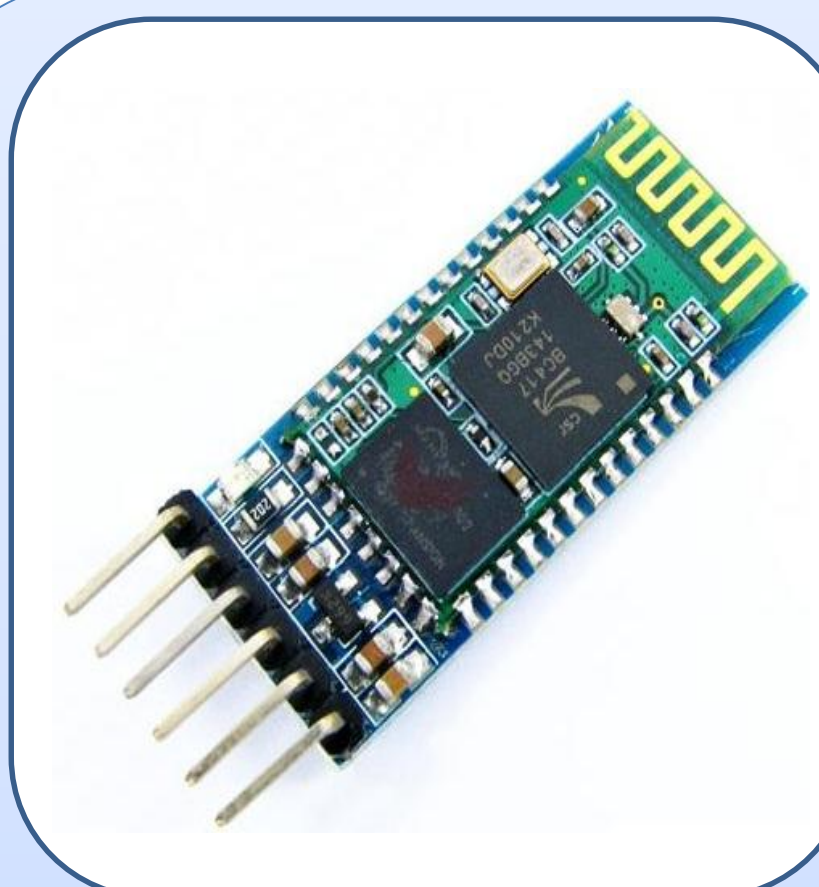
GPS

- **G**lobal **P**ositioning **S**ystem (GPS) makes use of signals sent by satellites in space and ground stations on Earth to accurately determine its position on Earth.
- The NEO-6M GPS receiver module uses USART communication to communicate with microcontroller or PC terminal.
- It receives information like latitude, longitude, altitude, UTC time, etc. from the satellites in the form of NMEA string. This string needs to be parsed to extract the information that we want to use

RFID

- EM18 RFID reader module is used to read RFID cards which work at 125 kHz.
- When a RFID card comes in the range of the reader, the unique data in the card is received by the reader in the form of RF signal.
- The reader then transmits this data in byte form on its serial transmit pin.
- This data can be read by a microcontroller using UART communication or can be viewed on PC terminal.

Finger Print Sensor R305

- The R307 fingerprint module has two interface TTL UART and USB2.0, USB2.0 interface can be connected to the computer; RS232 interface is a TTL level, the default baud rate is 57600 , can be changed, refer to a communication protocol ; can And microcontroller, such as ARM, DSP and other serial devices with a connection, 3.3V 5V microcontroller can be connected directly. Needs to connect the computer level conversion, level conversion note , embodiments such as a MAX232 circuit.
- Perfect function: independent fingerprint collection, fingerprint registration, fingerprint comparison (1: 1) and fingerprint search (1: N) function.
- Small size: small size, no external DSP chip algorithm, has been integrated, easy to install, less fault.
- Ultra-low power consumption: low power consumption of the product as a whole, suitable for low-power requirements of the occasion.