

2) Parallel Device Ports

A parallel port is a port in which read and write operations are carried over multiple transmission lines and all the bits are transmitted at once. The data is transmitted within a single clock pulse. It is used when the distance between source and destination station is short. A parallel port communicates between ICs or wires of the same board.

The parallel ports can be understood by understanding the following:

→ Parallel port one bit input

→ Parallel port one bit output

→ Parallel port input

→ Parallel port output

Parallel port interface offers high speed data transfer than serial port interface. Parallel port is used for internal communication. In parallel port communication, the data is transmitted within a single clock pulse whereas serial port requires multiple clock pulses. Parallel port programming is easier. It does not need high frequency of operation.

Parallel ports can be interfaced with the following:-

→ switches and Keypads

→ Encoders

→ Stepper Motors

→ LCD Controller

→ Touchscreen

Parallel port interfacing requires more number of wires for data transmission than serial port interfacing. The clock speed of serial communication can be increased easily compared to that of

parallel port. Parallel communication is used for short distance. High capacitance can produce noise and crosstalk between the wires.

2) A B C D

Wireless devices (81) wireless communication

different protocols:-

* The wireless devices after suitably modulating the data bits, uses either Infrared (IR) (81) Radio frequencies for their operation.

(i) Infrared frequency (IR):- The IR transmitter communicates over LOS (line of sight) and employs a photo transistor at the receiver side, in order to detect the IR Rays. TV Remote Controller, robotic systems are the major application domains of IR Communication. The IR devices make use of IRDA protocol for communication purposes.

* Frequency hopping is employed in bluetooth as more number of devices need to communicate in limited number of frequency bands. The data bits are modulated and demodulated as per protocol specification.

(ii) Radio frequencies:-

* These frequencies provide both short and long distance communications. The source and receivers employ antenna to send and receive signals. A modulator and demodulator is also used in order to transmit data

Over RF frequencies.

* The most commonly used protocols in wireless devices are bluetooth, IRDA (Infrared Data Association), 802.11, zigbee.

* The below table illustrates the various frequency bands used by radio frequency wireless devices.

Wireless Device protocol	Carrier Frequency.
Bluetooth / Zigbee	2.4 GHz / 900 MHz
Mobile CDMA	2 GHz
Mobile GSM	890-915 / 1710-1785 / 1850-1910 MHz

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