

Computer Peripheral

- A device that is connected to a computer to add functionality
- But is not part of the core computer architecture
- Mouse, Keyboard, Monitor, Flash drive etc.

Types of Peripheral Devices

❑ Generally fall into three categories:

1. Input Devices

- Mouse, Keyboard, Scanner etc.

2. Output Devices

- Monitor, Printer, Speaker etc.

3. Storage Devices

- Flash Drives or Hard Drives

❑ Some device is used as both input & output device

- Modems, Headset (Speaker +Microphone), Touch Screen etc.

How Peripheral Device Connect?

- ❑ Internal Peripherals are directly connected to motherboard
- ❑ External Peripherals can be connected using-
 1. Wired Connection --USB
 2. Wireless Connection—Bluetooth, WiFi

Plug & Play (PnP)

- ❑ A capability of an operating system that gives users the ability to plug a device into a computer and have the computer recognize that the device is there.
- ❑ When you plug a device into computer, it is automatically recognized and configured to work in your system.

Interfaces

❑ The interface is the combination of hardware and software needed to link the CPU to the peripherals and to enable them to communicate with the CPU.

1. Hardware Interface

- USB, Buses etc.

2. Software Interface

- Driver software

Functions of Interface

- ☐ Buffering
- ☐ Converting data to and from serial and parallel forms
- ☐ Converting data to and from analogue and digital forms
- ☐ Voltage conversion
- ☐ Protocol conversion &
- ☐ Handling of status signals.

Interface

❑ Buffering:

- This is an area of RAM within the interface which stores the data while in transit between the processor and the peripheral.
- The interface uses the buffer to temporarily store the data it is working with.
- It also uses the buffer to compensate for the differences in speed between the peripherals and the CPU by temporarily storing incoming data so that the faster CPU can process it in manageable blocks rather than waiting for the slower peripheral.

Interfaces

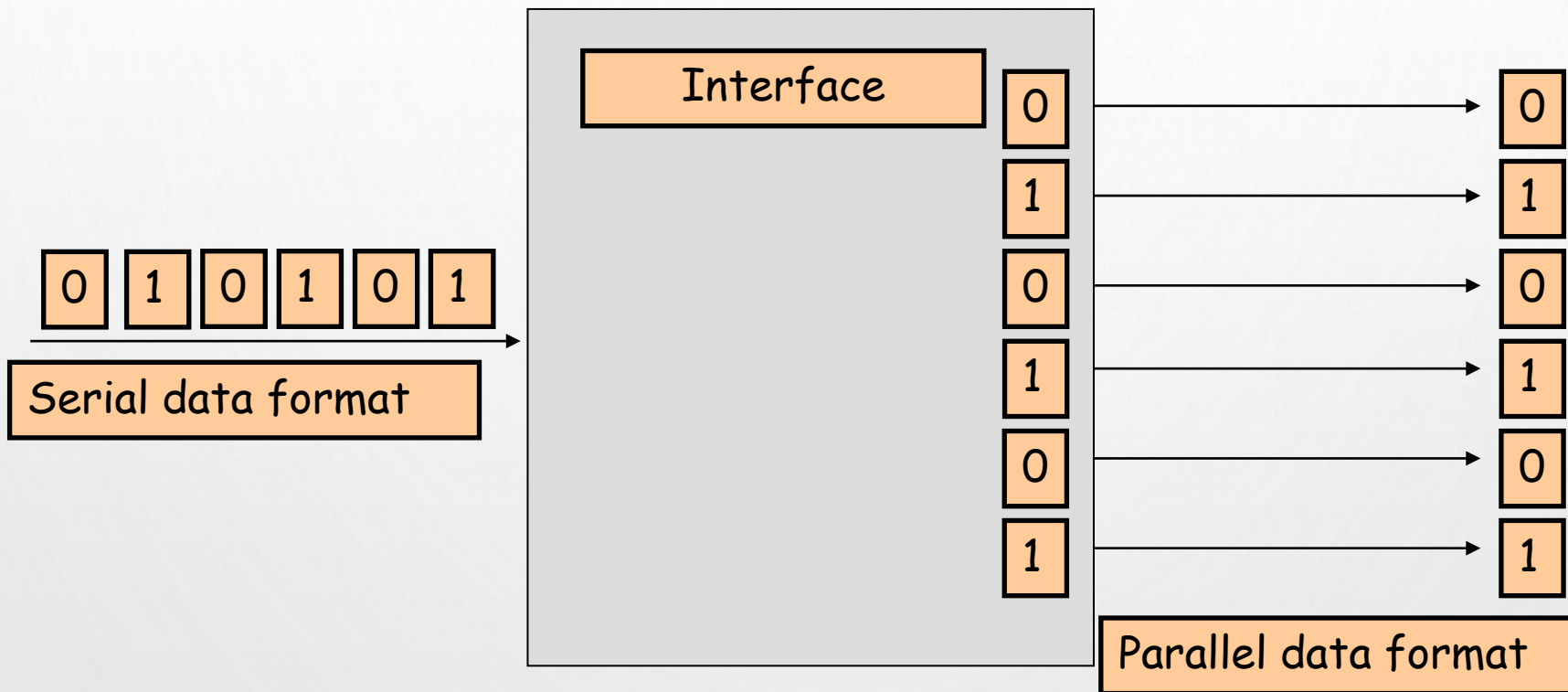
❑ Converting data to and from serial and parallel forms:

- Data transmission is the passing of data from one device to another.
- A **serial interface** uses **serial data transmission**;
- A **parallel interface** uses **parallel data transmission**.
- **Serial data transmission** - is when data is transmitted along a communication channel one bit after another in sequence. Very slow but efficient over long distances.

Interfaces

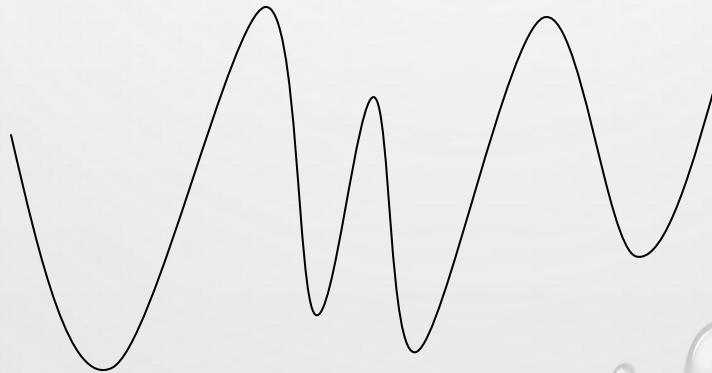
- **Parallel data transmission** - transmit several bits of data simultaneously across a series of parallel channels, often transmitting 16 at 32 bits at a time. Very fast but only suitable for short distances.
- The buses internal to the processor are parallel channels. Any data coming from a serial device has to be sent to an interface which buffers the data then converts it to parallel form before it is passed to the processor.

Interfaces



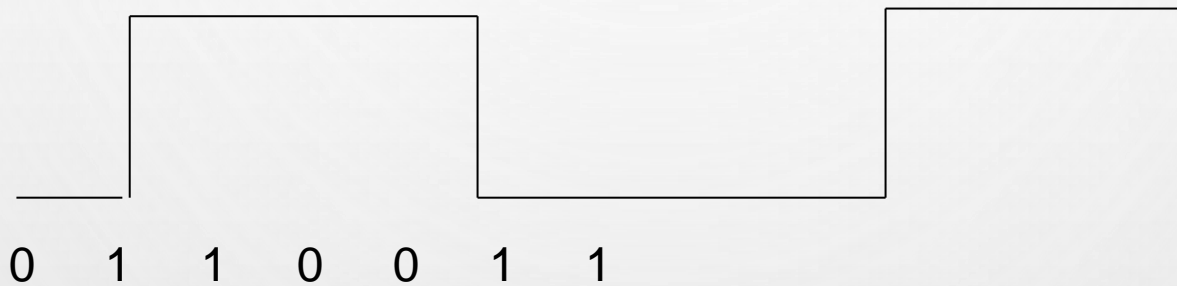
Interfaces

- ❑ **Converting data to and from analogue and digital forms:**
 - **Analogue signals** – many electrical signals are analogue signals. These signals vary between two limits. Analogue signals that are sent in from peripherals to the digital form that the CPU can handle. If you could see an analogue signal it would look roughly like this:



Interfaces

- **Digital signals** – computers can only work with digital signals, which have only two values – on or off. A digital signal therefore consists of a series of ‘ons’ and ‘offs’. An on signal is represented by a 1 and an off by a 0.



Interfaces

❑ ADC and DAC

- A computer is connected to a peripheral by an interface. This interface has to be able to change the digital signals from the computer to an analogue signal that the other device can understand. This is done by a DAC – **Digital to Analogue Converter**.
- Signals can be changed in the other direction by an ADC – **Analogue to Digital Converter**.

Interfaces

❑ **Voltage Conversion**

- Peripherals send data using a different voltage from that used by the processor and its associated components on the motherboard of the computer.
- An interface is used to compensate for these differences.

Interfaces

❑ Protocol Conversion

- A protocol is a standard that enables the connection, communication and data transfer between computers or between a computer system and a peripheral. Protocol conversion means ensuring that the protocols used by the peripheral can be understood by the computer it is attached to and vice versa.

❑ Handling of Status Signal

- The purpose of the status information is to show whether or not a peripheral device is ready to communicate. This information is used to inform the user of a problem requiring attention. Some printers

THANK YOU

Any Query?

