



COMPUTER STUDIES NOTES

POWER AND INTERFACE CABLES



MARCH 31, 2018
MANYAM FRANCHISE
0728 450425



POWER AND INTERFACE CABLES

A computer interface is a connection between the computer chassis and other peripheral devices. A peripheral device is any device connected to the computer chassis through a transmission medium such as a cable that has a connectors plugged into ports.

Examples of peripheral devices are such as the printer, the keyboard, the mouse, the monitor, the scanner etc.

A computer port is a special kind of socket protruding from interface cards at the back of the chassis (system unit). Interface cables are either used to transport power to the computer or data from or to the computer depending on the nature of the peripheral device.

Power cable

A power cable is a computer interface that is used to transport power from the main source to the computer's power supply unit (PSU). It connects a computer to the mains electricity supply via a wall socket, UPS (uninterruptible power supply) or extension cord.



FIGURE 1: POWER CABLE

POWER AND INTERFACE CABLES COURSE OUTLINE

Power and Interface Cables.

- Power Cable
- Parallel Cable
- Serial Cable

Basic Computer Set-up and Cabling.

- Connecting basic computer components
- Connecting other computer peripherals



Once the power supply unit has converted Alternating current (AC) to direct current (DC), it passes power to the internal power adaptors and splitter cables and cords that transport power to the motherboard, disk drives and other gadgets like internal speakers.



FIGURE 2: SPLITTER CABLES

Types of Interface Cables

1. Parallel Cables ('IEEE 1284')

These are cables that transmit information simultaneously using a set of many conductors (wires).

These cables are unidirectional meaning they can transport data in one direction at the same time.

I.e. a cable using 8 conductors to transmit data at the same time is said to be 8-bit parallel cable.

Examples of parallel cables:

1. Centronics connector

This cable is named after the manufacturer Centronics. The cable has 25-pin D-shell connector on one end that connect to a port behind the chassis and a 36-pin on the other end that connects to a printer. Centronics can transport up to 2.5 MBPS depending on the version of the cable and are mostly used to connect to printers, scanners and magnetic tapes.

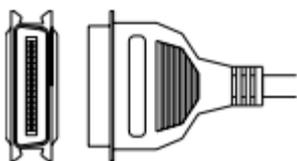


FIGURE 3: CENTRONICS CABLE

Parallel (IEEE 1284, where "IEEE" is an abbreviation for the "Institute of Electrical and Electronic Engineers")



2. LPT

LPT (line print terminal or local printer terminal) is commonly known as the parallel port and typically used as the printer connection device. It can transmit signals for distances limited to 20 feet or less. It's Faster than serial COM ports but more expensive. A typical LPT port reaches a speed of 150kb/sec. There can be more than one LPT ports in a computer and to differentiate them they are labeled with a number after LPT. It is most common to have only one for the printer called LPT1. It is shaped as a trapezoid with the short end in the bottom and 2 rows of pins, one 13 and other with 12 pins.

2. Serial Cables

Serial cables also called COM or RS232 transfer one bit of data at a time and are generally slower than parallel cables. However serial cables are bidirectional i.e. allow two way communication at a time.



FIGURE 4: SERIAL PORT

These cables are used to connect to a printer, mouse, keyboard and modem. They are able to transport data from speeds ranging from 75 to 128,000 bps (bits per second). They can also transport data over long distances. These cables are also versatile i.e. they can support a variety of peripheral devices.

Examples of Serial Cables are: RS 232 25-PIN DIN CABLE, 9-pin D-shell RS232C serial connector

3. Other common interfaces

i. The USB – Universal Serial Bus



This is a serial and female port that can be used for any peripheral available in computers. It is one of the newest and faster computers available. It is slower than a FireWire port but is more than adequate for the type of peripherals for which it was designed for. In many ways they have come to replace the standard parallel (LPT) and Serial (COM) ports, including printer, keyboard and mouse ports, having a much faster communication capabilities. Its speed goes up to 12 megabits/sec. The socket (and proper plug) in the computer has the shape of a thin a rectangle (called "Series A") measuring about 1/2 inch by 1/8 inch and are usually located on the back, front or side of your computer.



FIGURE 5: USB CABLE

Advantages of USB cable

1. It has the capability of "hot plugging" which is the ability for plugging and unplugging a device without powering down.
2. They are bidirectional
3. They have high speeds of data transfer up to 12 Mbps
4. They are capable of transmitting data over long distances up to 5 metres
5. They are small in size
6. They can support a variety of peripheral devices, removable storage devices and peer to peer networks (USB 3.0)

ii. SCSI – Small Computers Systems Interface

This is a general-purpose parallel port for connecting many different devices to a computer. It's a fast port that was available before USB and FireWire. Usually used with CD-ROM drives



and scanners. Commonly present in older Macs, if you want to use it on a PC they require an additional card that rarely comes on a regular PC. A common SCSI port reaches between 5 and 10 megabits/sec. SCSI usually is more used in big computers like servers and mainframes. When it is used in desktop PCs it is because you can add a scanner and several other drives (CD, DVD or Zip drives) to one SCSI cable chain. However this is less important now that alternate multi purposes flexible ports such as USB and FireWire are more popular.

SCSI is used to connect to hard and optical disks, magnetic tape storage, printers, scanners and peer to peer networks



FIGURE 6: SCSI

iii. PS/2 Cable (Personal System 2)

PS/2 is a serial medium that was specially designed to use with mice and keyboards. It is also known as the standard mouse port. It's circular in shape about 1/2" and has six metal pins on the inside (Not to confuse with the old keyboard 5 pin bigger round connector.) This type of connection is common on all computers since 1997 and among other things it can serve to the purpose of freeing up a COM port to be used with other devices.

It has a data transfer rate of up to 12000 Bps. Also has the capacity to carry power (5 volts) to power devices and mostly used with audio interface, mouse and keyboard.

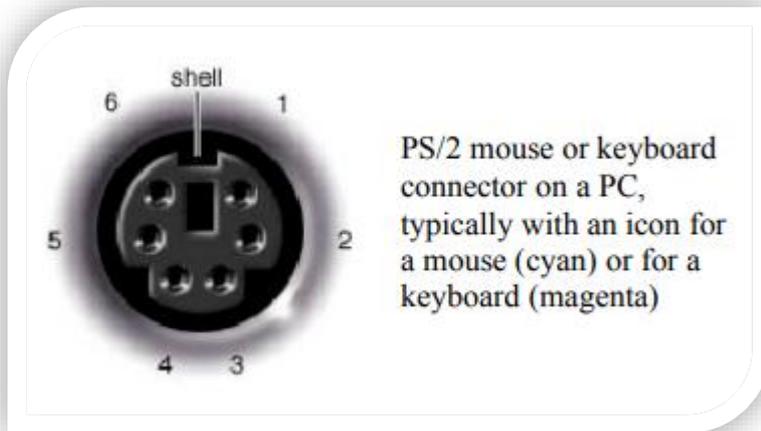


FIGURE 7: PS/2 PORT

iv. **Fire wire Interface**

FireWire is the newest and fastest serial computer port (bus) known also as i.Link (Sony) or IEEE-1394 by its technical name. It was developed by Apple and Texas Instruments mainly for use with video and audio demands in both Macs and PCs, but can be used for connecting many different peripherals. It reaches speeds of 400mbits/sec or even more in newer versions. It has 6 pins. The female or socket in the computer has a rectangular shape and the connector that goes on the peripheral is round. It has the capability of "hot plugging" which is the ability for plugging and unplugging a device without powering down. In many ways has come to replace SCSI as an external port.

Can connect to a printer, scanner, portable media player, external floppy or hard or optical disk, digital still or video camera.



FIGURE 8: FIRE WIRE



Commonly used interfacing symbols

Port	Symbol				
USB					
PS2	<table border="1"><tr><td>keyboard</td><td>Mouse</td></tr><tr><td></td><td></td></tr></table>	keyboard	Mouse		
keyboard	Mouse				
					
LPT					
FireWire symbol					
COM					
SCSI					

TABLE 1: INTERFACING SYMBOLS



Basic computer setup cabling

Before attempting to carry any setup activity, the following precautions should be observed:

1. Disconnect all drives from power source before starting to work on them.
2. Do not work on peripheral device without the guidance of a teacher.
3. Never work alone because, you may need help in case of an emergency.
4. Discharge any static electricity that might build upon the hands by touching an earthen metallic object and then wearing an antistatic wrist member. This is because your body can hold as much as 200 volts of static charge that can damage sensitive components on the mother board.
5. Avoid touching metal conductors with wet hands. This may cause short circuiting thus damaging chipsets.
6. Don't force a component to open/eject. There are laid procedures for every opening/ejection. Force can break or destroy a component makeup.

Tools and other requirements

The following tools are necessary in any setup:

1. Screw drivers
2. Antistatic wrist member
3. Pliers
4. Devices manual
5. Devices software (drivers)
6. Fuse testers
7. Gloves etc.

Mounting internal devices

External devices are connected to the motherboard via special sockets known as ports whilst internal devices are connected through slots and sockets. It's recommended to study the manufacturer's manual before connecting devices.



FIGURE 9: PORTS AND SOCKETS BEHIND THE CHASSIS

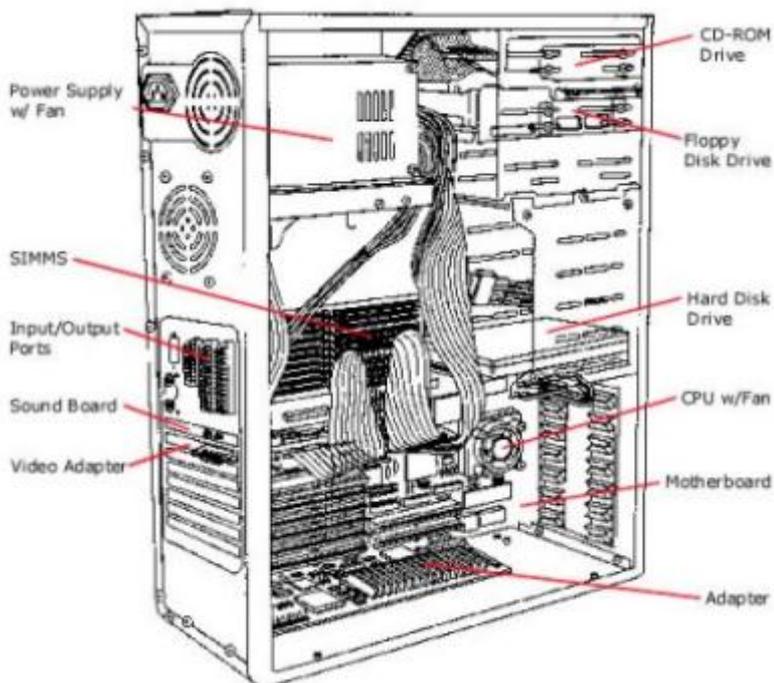


FIGURE 10: INTERNAL PARTS OF A CHASSIS

Mounting hard drives and optical drives

Internal devices are connected to the motherboard using special ribbon cables. Hard disks and optical drives are connected to the motherboard through interface connectors commonly referred to as controllers.



Three types of controllers are:

EIDE- enhanced Integrated Drive Electronics

SCSI- Small Computer Systems Interface

SATA- Serial Advanced Technology Attachment

EIDE are more efficient and supports hot-swapping. Hot-swapping means that a drive can be removed or inserted while the computer is still on. Each EIDE supports up to two drives on a single ribbon cable.

This type of setup is called a master/slave configuration because one controller directs the activities of both drives.

To mount an EIDE drive, proceed as follows:

1. Wear antistatic wrist member to discharge any static charge on the body.
2. Determine which drive will be the master and use the drive label information to determine which jumper settings to use for a master or a slave.
3. Check that a free drive bay is available, slide the disk into that bay and screw it into place.
4. Ensure that there is free power connector from the power supply unit and connect it to the drive.
5. Notice that it is designed to fit in its socket in only one direction.
6. Identify pin 1 as labeled on the drives socket and match it with the red or brown continuous line of the ribbon cable. Most cables will only fit in one direction.
7. Connect the interface cable to the drive, then into the controller slot on the motherboard.
8. If installation is complete, replace the casing power.

Connecting external devices

To connect a device to the system unit, you need to identify its port and interface cable.

1. Gently and carefully connect the interface cable of each device to the correct port and to the device if it is not already fixed permanently.
2. Connect the computer to the power source and switch it on.



3. Observe boot up information on the screen to see whether Power-On-Self-Test (POST) displays any error message.
4. A successful boot means that the computer was properly set up



QUESTIONS ON TOPIC

1. The monitor connects to the 15-pin port via the _____
2. Describe the difference between powering of the printer and the keyboard
3. What is the difference between a tower chassis and a desktop chassis
4. What are ribbon cables? What are they used for?
5. With the help of a teacher, open one system unit and establish the following:
 - a. How many USB ports does it have
 - b. Which color is the PS2 port for the mouse if available
 - c. Which color is the PS2 port for the mouse if available
 - d. What is the total size in MB does your computer use?
 - e. What is the size in GB for the hard disk
 - f. Identify the ribbon, CPU, heat sink, CPU fan, extension slots, serial and parallel (male and female) ports and what they are used for
 - g. Identify the CD/DVD ROM, Hard Disk Drive, Floppy Drive if available
 - h. Also establish:
 - i. The size of the monitor
 - ii. They type of monitor
6. Use the internet to research in details the meaning of the following computer words/acronyms.
 - a. PCI
 - b. ISA
 - c. DIMM
 - d. SIMM
 - e. Computer Bus
 - f. Wireless peripheral interface
 - g. Fire wire
 - h. NIC
 - i. VGA



Works Cited

COMPUTER CABLES AND ACCESSORIES. (n.d.). Retrieved from CABLES AND CONNECTORS:

<http://www.cablesandconnectors.com/cc-067-100.pdf>

COMPUTER INPUT/OUTPUT PORTS AND INTERFACES. (n.d.). Retrieved from EXPLORERS

POSTS: <https://explorersposts.grc.nasa.gov/post631/2006->

[2007/computer_basics/ComputerPorts.pdf](https://explorersposts.grc.nasa.gov/post631/2006-2007/computer_basics/ComputerPorts.pdf)

elimu.net. (n.d.). *Kenya, Form I-Computer Systems*. Retrieved from THE ELIMU NETWORK:

http://www.elimu.net/Secondary/Kenya/KCSE_Student/Comp_Sc/Form1/Comp_Systems/Comp_Systems.htm

Mburu, s., & Chemwa, G. (2004). LONGHORN SECONDARY COMPUTER STUDIES FORM 1. In

s. Mburu, & G. Chemwa, *LONGHORN SECONDARY COMPUTER STUDIES FORM 1* (pp.

65-72). Nairobi: LONGHORN PUBLISHERS.

NYAMOTI, M. (2013, MARCH 09). *AtikaSchool - KCSE Computer Studies Projects, News, Notes*

and Quiz. Retrieved from MANYAM FRANCHISE:

<http://webartika.manyamfranchise.com/notes/computernotes/computerform1/ebook1.zip?attredirects=0&d=1>

Onunga, D. J., & Renu , S. (2003). KCSE COMPUTER STUDIES BOOK 1. In D. J. Shah, *KCSE*

COMPUTER STUDIES BOOK 1 (pp. 115-122). Nairobi: Mariwa Publishers.

PARALLEL PORTS. (n.d.). Retrieved from CHIMICA:

http://www.chimica.unipd.it/luigino.feltre/pubblica/unix/cable_printer.pdf

MANYAM FRANCHISE

P.O BOX 1189 – 40200 Kisii

 0728450425 | 0738619279 | 0763450425 

sales@manyamfranchise.com

<http://atikaschool.org> | <http://manyamfranchise.com>