Experiment-1

AIM: To Identify and study the different parts of Multifunction Input/output controllers.

COMPONENTS REQUIRED:

Multifunction Input/output controllers

THEORY:

Multi-Function I/O Controllers are the solution to the complex problem of programming and excessive costs related to the purchase, installation and maintenance of "off-the shelf local device/systems used for monitoring and process controls in a mining environment. Multi-Function I/O Controllers can be either factory pre-programmed, to serve customer specific requirements. The benefits are greater cost savings and efficiencies through the ability of comprehensive data analysis, allowing operators to plan maintenance schedules rather than respond to costly downtime due to critical equipment failures.

Fan Monitoring and Control:

As part of a mine wide VMS [ventilation management system], the multi-function I/O Controllers are the critical interface for monitoring and control of variable speed fans; both primary and secondary ventilation systems. This non- proprietary, open-ended solution harmonizes equipment and information allowing for easy benchmarking and quantifying of savings in energy consumption.

Conveyor Control Systems:

The multi-function I/O Controllers can be critical to remote monitoring of an underground mining operation's conveyor network. Being able to interface directly with conveyor motors and sensors to monitor pull cords, belt slip/tear, amongst other capabilities, makes the multi-function I/O controllers a low-cost critical bridge bringing a mine's entire conveyor network under real-time supervisory control. This specialized monitoring quickly becomes an essential tool for preventative maintenance programs, integral in the fight to minimize costly systems failure that result in missed daily production targets. When tied into a mining plant's SCADA system, remote monitoring of critical elements, such as temperature. pressure, RPM, velocity, power, acceleration, position, torque and strain the conveyor systems have a higher percentage of operating in the peak range of performance. Additional benefits of the Multi-Function IVO Controllers are that when a centralized coordination of a mine's-conveyor network is in place the mine is able to, for example, shut down one section of the network while

coordinating shutdowns of the rest of the network simultaneously. This prevents material accumulation at conveyor transfer points-all of which minimize cleanup costs and reduce the time to return to full operation.

Geotechnical Measuring and Monitoring:

The multi-function I/O Controllers can easily interface with underground geotechnical measuring equipment, such as Mine Design Technologies (MDT) Smart MPBX, to provide a low-cost bridge to connect a mine's geotechnical sensor network over an existing data communication's backbone. This enables continuous live monitoring of rock movement and eliminates the need for costly post-blast manual measurement of each geotechnical sensor located within the mine.

Mine Water Monitoring and Control Network

The multi-function I/O Controllers can perform critical functions for controlling water levels in an underground mining operation. When tied into existing data infrastructure, local pumps and water level sensors the multi-function I/O Controllers will provide local sequencing of pump activities based on the water level detected. In addition, multi-function I/O Controllers ensure water pumps are operating at peak performance levels by monitoring temperature, pressure, RPM, velocity, power, acceleration. position, torque, and strain. In addition, this analysis of all operating parameters streamlines preventative maintenance scheduling, minimizing costly unplanned equipment downtime.

RESULT:

Studied about the Multifunction Input/output controller

Experiment-2

AIM: To Identify and study the different parts of Assembly of PC.

COMPONENTS REQUIRED:

Different components of PC

THEORY:

A computer is made up of a case (or chassis) which houses several important internal components, and provides places to connect the external components, including non-peripherals.

Inside the case go the Following Internal Parts:

- **Power Supply Unit/PSU:** Power Supply Unit, converts outlet power, which is alternating current (AC), to direct current (DC) which is required by internal components, as well as providing appropriate voltages and currents for these internal components.
- **Motherboard/mainboard:** As the name indicates, this is the electronic centerpiece of the computer: everything else connects to the motherboard.
- **Processor/CPU:** Central processing unit, the "brain" of the computer, most actual computation takes place here
- **RAM:** Random access memory, the "short-term memory" of a computer, used by the CPU to store program instructions and data upon which it is currently operating. Data in RAM is lost when the computer is powered off, thus necessitating a hard drive. Storage: Either **HDD** (Hard disk drive slower of the two but less expensive) and/or SSD (solid state drive. Very fast but not as cheap) the "long-term memory" of the computer, used for persistent storage- i.e. the things stored on it remain even when the computer is powered down. The operating system, and all your programs and data are stored here. OSes can be booted and use storage from inexpensive USB Drives, although this is only with extremely lightweight systems.

Optional Components Follow:

(Components that depend on the function that will be given to the machine)

- **Optical Drive:** Device for reading/writing optical disks. May read CDs, DVDs, or other optical media, depending on the type. It is essential for installing many operating systems and programs, although the vast majority can be run from USB. It may be able to write some of these discs, as well. Some

people like to have two such drives for copying disks.

- **GPU/Graphics Card/GPU:** Does processing relating to video output. Some motherboards and processors have an "on-board" GPU built in so you don't need (but may add) a separate video card. Otherwise, you will need a video card. These plug into a slot on the motherboard and provide a place to connect a monitor to your computer.
- **Sound Card:** Comes with motherboard but may want to be upgraded on top of the internal components listed above, you will also need these external components:
- **Keyboard:** For typing on some motherboards will not complete the boot process without a Keyboard attached (option often found on the BIOS) and most will report an error on boot if not set otherwise.
- **Mouse:** For pointing and clicking, Unless you chose a text-based operating system, you will likely want one these.
- **Monitor:** It is a output device that displays the information after it is processed. They come in

RESULT:

Studied about the different parts of Assembly of PC.

Experiment-3

AIM: To Troubleshoot & repair of Digital Plotter.

COMPONENTS REQUIRED:

Digital Plotter

THEORY:

Plotters are complex pieces of machinery used for complicated jobs. The more complex a machine is, the more likely those issues will arise. While there are many models of plotters available, most wide-format printers run into the same main issues. Most require an expert to address, but some you may be able to take on in-house. Here are three of the most common plotter problems:

Dead Print Heads:

Over time, print heads will naturally wear out and need to they can fail prematurely if they aren't properly cared for be replaced-just like brakes on your car. But, properly. Most wide-format printers, however, are sophisticated enough to self-diagnose the problem and alert you of the fact. But, that is not always the case. Sometimes print quality issues will start happening for no apparent reason. Unless there is another suspected culprit, the print head is a great candidate as the source of the issue.

- Non-use is the biggest culprit to early print-head failure. This can be an unintended consequence of powering off the machine in periods of low or non-use.
- Each print head has thousands of microscopic nozzles which can easily clog with dried ink if the liquid isn't kept flowing. Think about the concept of leaving a dripping faucet on a freezing night. The same concept applies.

The two easiest remedies are to:

1. Perform routine internal print head checks and calibrations
2. Leave your machine powered on so that the automated cycle maintenance can be performed

Paper Jams and Poor Stacking

Most wide-format printers rely on a gravity-fed delivery system. In other words, the printed sheets simply fall out of the machine into a catch basket. There have been advancements made in the past few years to offer plotters with better integrated stacking offerings. An example of this is the paper output tray included with the Canon iPF850. However, many wide printers still use the drop- basket format. In that case,

here are a few ideas.

- Often, jams and stacking issues are exaggerated by curled plans. This often is a byproduct of ink saturating the paper media and curling as a result. If this is problematic, try printing on a heavier stock.
- LED plotters can have issues with static electricity. Although frustrating, this is an easy problem to correct with some anti-static measures. Consult with a service technician to see the best practice for your particular
- Some systems offer flat stacking trays that are effective, but they can take up quite a bit of room.
- Newer models are coming equipped with integrated top-stacking units.

Software Compatibility

This is a big one, especially when upgrading an OS.

- Plotter manufactures systematically drop software support on older models when they announce an end to hardware support.
- Many tried and true legacy plotters won't be able to make the jump to newer OS platforms because the manufacturers have ceased development on driver upgrades.
- Unfortunately, sometimes the only fix is to upgrade your printer technology with your operating system. The good news is that the price of wide-format printers is significantly less than they were even just a few years ago. In fact, you might be shocked to see how inexpensive some new plotters are today.

Result:

All problems have been fixed.

Experiment-4

AIM: To Troubleshoot Network

THEORY:

If you are having a problem with your network, use this troubleshooter

1) Make sure you are using the correct cables. There are crossover cables, straight cables, and other types of cables. If you use the wrong type, it will prevent the network from working.
2) Make sure the cables are plugged into the router correctly.
3) Try other cables to see if the cable is bad.
4) If you have another system, try that system to see if it is the computer or a problem outside of the computer.
5) Make sure the router is configured properly.
6) Make sure the DSL/Cable modem is configured properly. (some use PPOE and require a special setup for it to work with a router. Consult the manufacturer on how to set it up).
7) Make sure your network card is installed properly. (If it built into the motherboard, then just make sure the driver is installed correctly for it).
8) If you are connecting your system via wired and not wireless, make sure you have a link light lit on the network card where the cable is plugged in (if you don't have the light then you have a hardware issue somewhere).
9) Click here for the differences in wired and wireless.
10) Make sure the workgroup name matches on all systems.
11) Make sure the Full computer name is different on each system.
12) Be sure a file is shared on each system.
13) Run the Network Wizard (Windows XP).
14) Run Windows Update.
15) If you are using wireless, make sure the wireless is setup correctly. Click here for assistance with this.
16) Try a repair of the connection (Windows XP only)
17) Deleting Winsock may fix the issue (Windows XP only) (manual method).
18) Download tool to fix Winsock. (Windows XP only) (using tool).
19) Use the Software Troubleshooter page to troubleshoot software.

RESULT: Troubleshooting done successfully.

Experiment-5

AIM: To Troubleshoot Power Supplies.

THEORY:

Your PC doesn't take power directly from a wall outlet, but instead needs a power supply to convert normal electricity into a lower wattage. If the power supply on your PC stops working, the computer either will not power on or will shut itself off at random times. Although your first instinct may be to take the PC to a technician, you can instead troubleshoot and repair the power supply on your own at home

Step 1: Unplug your PC's power cable and each of the other cords connected to the back of the case Set the computer case on its side.

Step 2: Remove the two screws at the back end of the case if the PC uses case screws. Grab the metal latch at the top of the case if there are no case screws present. Lift the latch up to unlock the side panel from the computer case.

Step 3: Push down on the panel, and slide it off of the case. Remove the screws holding the power supply into place at the upper-left corner of the motherboard. Disconnect the cables running from the power supply to the motherboard.

Step 4: Check to see if the power supply has a burning smell coming from it. Discard the power supply immediately if there is a burning scent, it will need to be replaced entirely.

Step 5: See if the power supply fan is clogged with dust. Spray the fan with canned air to remove the debris. Reattach the power supply to the motherboard. Reassemble the computer and see if the problem persists

Step 6: Take the power supply out of the computer again if the problem continues. Check the model number on the side of the power supply. Check the manufacturer's Web site to see if you can acquire a replacement fan.

Step 7: Remove the screws at the top of the power supply, and pull off the top half of the metal casing Remove the screws holding the fan to the power supply case. Pull out the fan, and set in the replacement unit.

Step 8: Reassemble the power supply and put the computer back together. Check to see if the problem continues. Acquire a new power supply if the problem continues.

Step 9: Take the old power supply out of the computer again, and replace it with the new one. Attach the screws to hold the power supply to the case. Connect the power supply's cables to the motherboard. Put the side panel back on the PC, then reattach the power cable. Power the computer on to make sure the power supply was installed correctly.

RESULT: Troubleshooting done successfully.