

Name: Udengba Rita Chidum

Matric No: 17/AN/04/1669

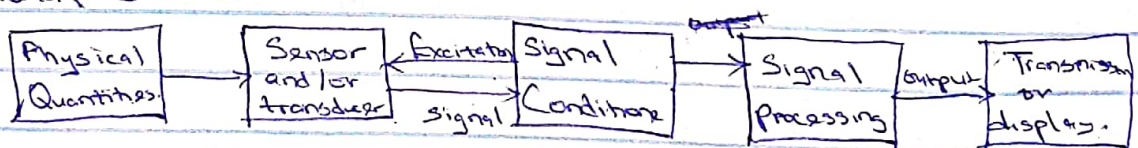
EEE 471 Assignment

1. Explain briefly the signal processing and interfacing techniques in measuring instruments.

• The interfacing techniques

Instruments are designed to maintain prescribed relationships between the parameters being measured and the physical variables under investigation. The physical parameter under investigation is known as measurand. Sensors and transducers are the primary sensing elements that respond to physical variations to produce an output. In specific application, a diverse range of sensors and transducers may be available to meet the measurement requirements of a physical system. Correct sensors must always be selected and correct signal processing must be employed to retrieve the required information.

In the applications of instruments, the information about a physical variable is collected, organized, interpreted, and generalized. Experiments are conceived, performed and repeated; as we acquire confidence in the results. The functionality of an instrument can be broken into smaller elements. All instrument have some or all of the functional blocks.



• Interfacing of Flow sensor

A flow sensor is a device for sensing the rate or quantity of fluid flow whether it be a gas, steam, liquid or solid. The simple differential pressure sensor used to measure flow rate is the CMOS sensor chip. Interfacing this sensor would be applying it to ADC0809 and the digital output is applied to the microcontroller.

Interfacing of Pressure Sensor.

To interface the pressure sensor with a microcontroller a signal conditioning circuit is necessary. It is done by connecting the sensor to the Microcontroller using ADC0809.

Interfacing is the method of connecting or linking together one device, especially a computer or micro controller with another, allowing us.

2. Briefly explain the expert system, ^{instrumentation} in measurement-instrumentation.

Expert system is a part of the artificial intelligence, a solution software for complicated problems, which solving the problems need experiences and knowledge. Recent developments in AI can help in an organized use of experiential knowledge available in instrumentation for laboratory and in-situ measurement.

Usually the instrumentation decision is based on the experience and judgement of experimentalists. An expert system may be monitoring many sensors over a wide spectrum of the process and will have the ability to filter out appropriate data as required, in order to preserve its computer resources.

The list below defines the important requirements for an expert system when used as a tool for real-time control applications

- Response time
- Multitasking operating system
- Knowledge representation
- Search strategy
- Database facilities.
- Communication with the process and with the operators.
- Coping with uncertainty.
- Knowledge base design.
- Deadline prediction and time reasoning.