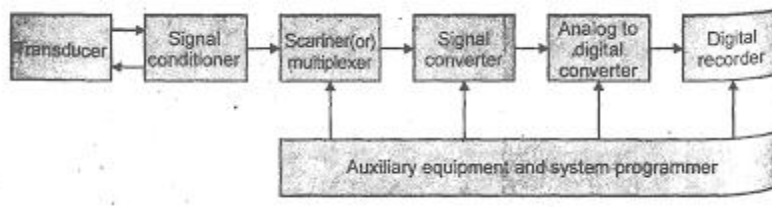


DIGITAL DATA ACQUISITION SYSTEM

In general analog DASs are used for measurement systems with wide bandwidth. But the accuracy is less. So digital DASs which have high accuracy, low per-channel cost and narrow bandwidth (slowly varying signal) are designed. Figure shows the block diagram of a digital data acquisition system. The function of the digital data acquisition system include handling analog signals, making the measurement, converting and handling digital data, internal programming and control.



Block diagram of a digital data-acquisition system

Here, the transducer translates physical parameters to electrical signals acceptable by the acquisition system. The physical parameters include temperature, pressure, acceleration, weight, displacement, velocity etc.

Electrical quantities such as voltage, stance, and frequency may be measured directly. The signal conditioner includes the supporting circuitry for the transducer. This circuit may provide excitation power, balancing circuits and calibration elements and an example of this is a strain-gauge bridge lance and power supply unit. The scanner or multiplexer accepts multiple analog inputs and sequentially connects them to one measuring instrument. The signal converter translates the analog signal to a form acceptable by the analog to digital converter like an amplifier used for amplifying low-level voltages generated by thermocouples or strain gauges.

The analog to digital converter (ADC) converts the analog voltage to its equivalent digital form. The output of the ADC may be displayed visually and is also available as voltage outputs in discrete steps for further processing or recording on a digital recorder. The auxiliary section contains instruments for system programming and digital data processing such as linearizing and limit comparison. These functions may be performed by individual instruments or by a digital computer. The digital recorder records digital information on punched cards, perforated paper tape, magnetic tape, typewritten pages or a combination of these systems. Digital recorder may be preceded by a coupling unit that translates the digital information to the proper form for entry into particular digital recorder selected.

Interfacing of transducers

Interfacing is defined as the interconnection of different 3 to perform a function in a compatible and co-ordinated fashion. Since, both analog and digital instruments are often used in measurement systems, interfacing is needed under the f categories.

1. Interfacing analog to analog instruments
2. Interfacing analog to digital instruments
3. Interfacing digital instruments to other digital device like printer, computer etc.,

Source: <http://mediatoget.blogspot.in/2012/02/digital-data-acquisition-system.html>