

DBF Dayanand College of Arts and Science, Solapur

Data Acquisition System



Dr. G. S. Shahane
Head
Department of Electronics
DBF Dayanand College of Arts and
Science, Solapur

ELECTRONICS

Paper XV: Electronics Instrumentation

Module 1: Data Acquisition System

Module Tag: DAYA_ELE_GSS_PXV_C3M1

Table of Contents

- Learning Outcome
- Data Acquisition System
- Types of DAS
- Single Channel DAS
- Multichannel DAS
- Data Logger

Prerequisites

The student must know

- Sensors and Transducers
- Signal Conditioning Circuits
- Multiplexer, DAC, etc

Learning Outcome

In this module you will learn about

- Meaning of DAS
- Types of DAS
- Working of Single Channel DA S
- Working of Multichannel DAS
- Data Logger

Data Acquisition System

- Data acquisition is the process of sampling signals that measure real world physical conditions and converting into digital values that can be processed by a computer
- Data acquisition system is used to acquire the real world physical data and convert into digital data that can be processed by a computer
- It is abbreviated as *DAS* or *DAQ*

Types of DAS

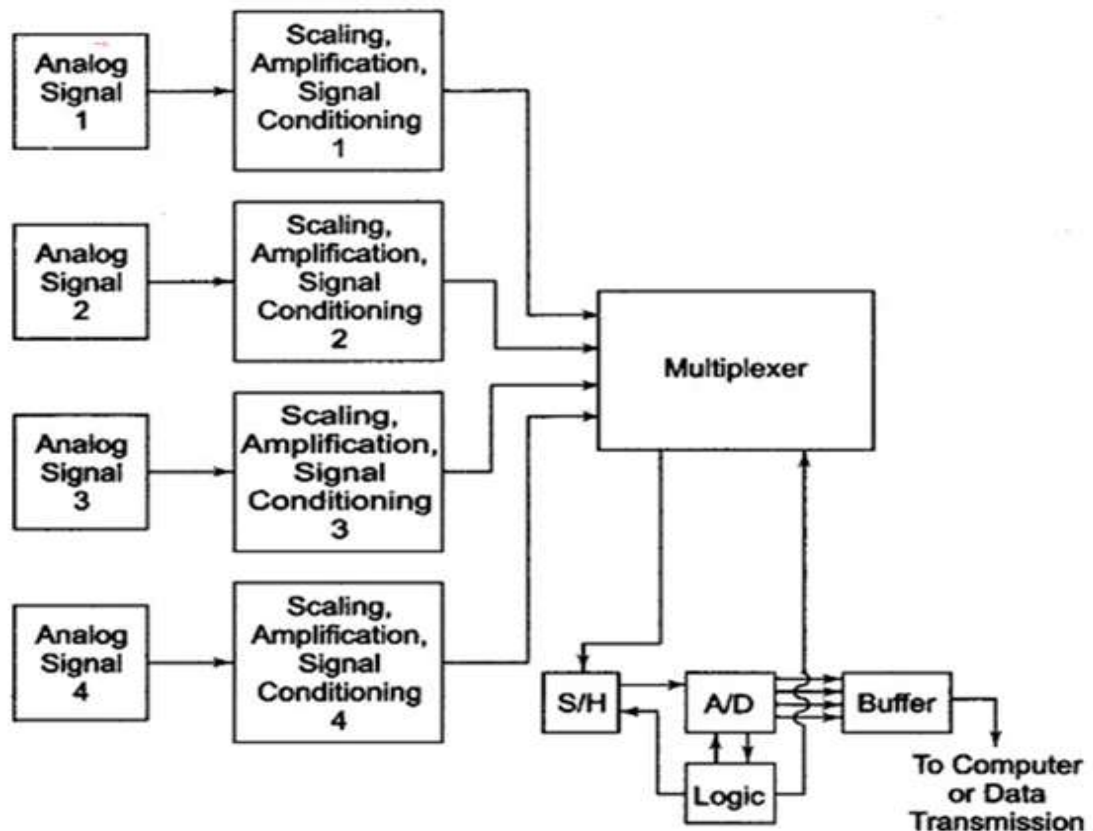
- There are two types of data acquisition systems
 1. Single Channel DAS
 2. Multichannel DAS

Single Channel DAS



- The single channel data acquisition system has only one input signal
- It consists of a transducer, signal conditioner, an analog to digital converter and a buffer circuitry
- Sensors, to convert physical parameters to electrical signals
- Signal conditioning circuitry, to convert sensor signals into a form that can be converted to digital values
- Analog-to-digital converters, to convert conditioned sensor signals to digital values

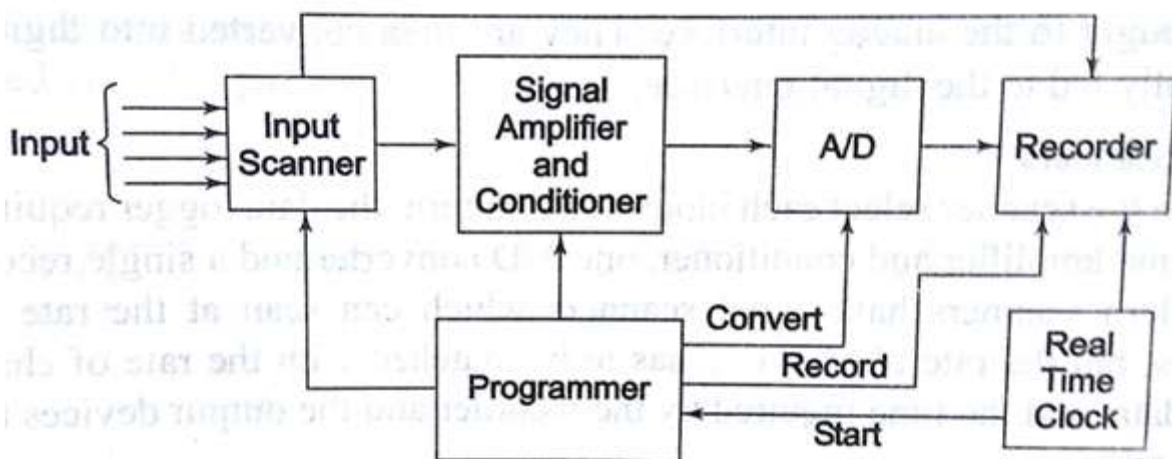
Multichannel DAS



- There are multiple input signals
- The output of transducers is processed with signal conditioning circuits
- A multiplexer is used to select the processed input signal
- It is then converted in to digital signal with the help of ADC

Data Logger

- The term 'Data Logging' refers to collecting or gathering data over a period of time
- A data logger is a device that can be used to collect, store and retrieve the data
- In general, data logger is a comprehensive and highly advanced DAS



- Basic parts of data logger are:
 - Input scanner
 - Signal conditioner
 - A/D converter
 - Recording equipment
 - Programmer

Advantages of Data Logger

1. Data logger can accommodate from 10 to 1000 analog signals, depending on its capacity
2. It can be used in remote or dangerous situations
3. Data logging can be carried out 24 hours a day, 365 days of the year
4. Time intervals for collecting data can be very frequent and regular, for example, hundreds of measurements per second
5. No need to have a person present
6. Data logging is often more accurate because there is no human error

Links for PPT and Assignment

Link 1

<https://www.slideshare.net/sumeetpatel21/data-acquisition-system-40835631>

Link 2

<https://www.slideshare.net/amoldude/data-acquisition-system-33836067>

Link 3

<https://www.slideshare.net/dilip2993/data-logger-84441106>

Source: www.slideshare

Assignment

<https://forms.gle/zP3dqxxWKmvY6ydf6>

Additional Resources

1. Electronic Instrumentation by K.S.Kalsi, TMH Publication
2. Electronic Measurements by U.A.Bakshi and V.U. Bakshi Technical Publication
3. Instrumentation Measurement and Analysis by Nakara Choudhary(TMh)
4. A Course in Electrical and Electronics Measurements and Instrumentation by AK Sawhney, Dhanpat Rai Publication