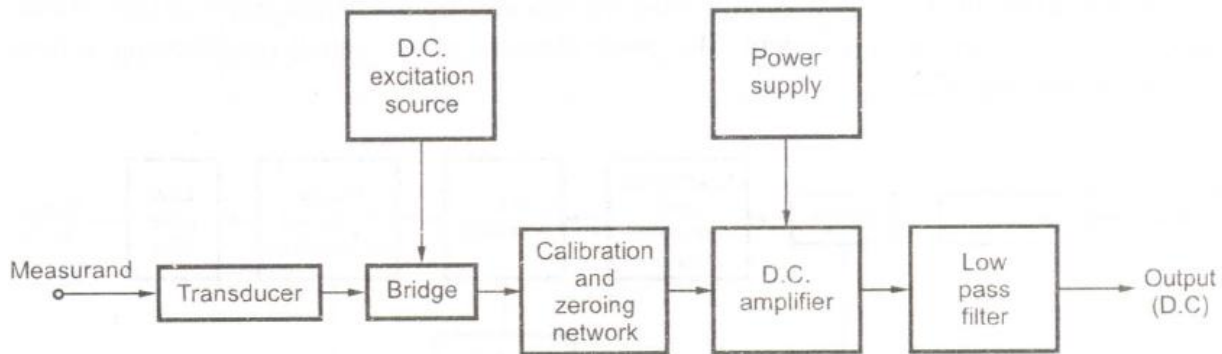


# D.C. SIGNAL CONDITIONING SYSTEM

The block diagram of d.c. signal conditioning system is shown in the Fig



The resistance transducers are commonly used for the d.c. systems. The resistance transducers like strain gauge forms one or more arms of a wheatstone bridge circuit. A separate d.c. supply is required for the bridge. The bridge is balanced using potentiometer and can be calibrated for unbalanced conditions. This is the function of Calibration and zeroing network. Then there is d.c. amplifier which also requires a separate d.c. supply.

The d.c. amplifier must have following characteristics:

1. Balanced differential inputs.
2. High common mode rejection ratio. (CMRR)
3. High input impedance.
4. Good thermal and long term stability.

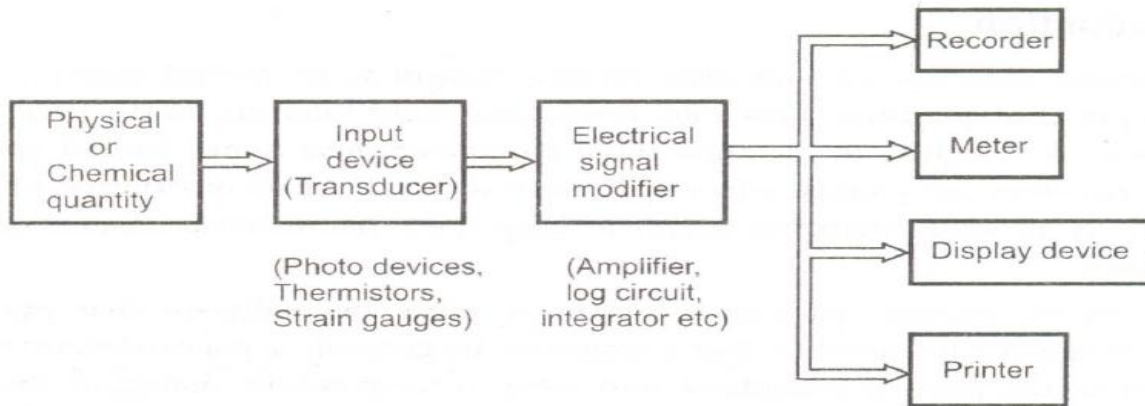
The d.c. system has following advantages:

1. It is easy to calibrate at low frequencies.
2. It is able to recover from an overload condition.

But the main disadvantage of d.c. system is that it suffers from the problems of drift. The low frequency spurious unwanted signals are available along with the required data signal. For overcoming this, low drift d.c. amplifiers are required.

The output of d.c. amplifier is given to a low pass filter. The function of low pass filter is to eliminate unwanted high frequency components or noise from the required data signal. Thus the output of low pass filter is the required data signal. Thus the output of low pass filter is the required d.c. output from the d.c. signal conditioning system.

^ typical electronic aided measurement system is as shown in the Fig



The first stage is the input device which is nothing but a transducer which converts measurand into an usable form i.e. electrical signal. In other words, the quantity measured is encoded as an electrical signal. The next stage modifies the electrical signal in the form suitable for the output or read-out devices. Generally the most frequently used electronic circuits are amplifiers, with parameter adjustments and automatic compensation circuits specially used for temperature variation. of the input device and non-linearities of the input device. The output is obtained from read-out devices such as meter, recorder, printer, display units etc.

In general, the quantity which is measured by using transducer can be encoded in different ways. For example, as a physical or chemical quantity or property, as a characteristics of the electrical signal, as a number. The property or different characteristics used to represent a data is called **data** domain.

The electronic aided measurement system represents the measurement of physical quantity faithfully in the analog or digital form of it obtained from the signal conditioning circuits. For passive transducers, the signal conditioning circuit mainly' includes excitation and amplification circuitry, while for active transducers, only amplification circuitry is needed and the excitation is not needed. Depending on the type of the excitation either a.c. or d.c. source, we have a.c. signal conditioning system and d.c. signal conditioning system.

Source : <http://elearningatria.files.wordpress.com/2013/10/ece-iii-electronic-instrumentation-10it35-notes.pdf>