

1.3 ELEMENTS OF A GENERALIZED MEASUREMENT SYSTEM

The various elements of measurement system are,

1. Primary sensing Element
2. Variable conversion element.
3. Variable manipulation element
4. Data transmission element.
5. Data processing Element
6. Data presentation element.

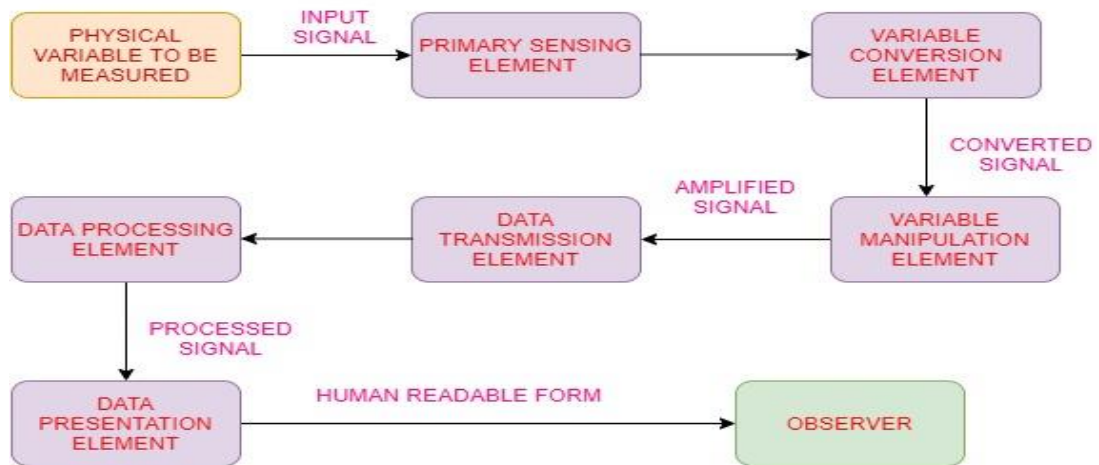


Fig 1.1 Elements of Generalized Measurement system

[source: “Metrology & Measurements”, Dr.G.K. K Vijayaraghavan., page-1.12]

1.3.1 PRIMARY SENSING ELEMENT

it is the first element which receives energy from the measured medium and it produces an output corresponding to the measurand. This output is then converted into an analogous electrical signal by a transducer.

1.3.2 VARIABLE CONVERSION ELEMENT.

It converts the output electrical signal of the primary sensing element into a more suitable form signal without changing the information containing in the input signal. In some

instruments, there is no need of using a variable conversion element while some other instruments require the variable conversion element.

1.3.3 VARIABLE MANIPULATION ELEMENT

This element is used to manipulate the signal presented to it and preserving the original nature of the signal. In other words, it amplifies the input signal to the required magnification. For example, an electronic voltage amplifier receives a small voltage as input and it produces greater magnitude of voltage as output. A variable manipulation element does not necessarily follow a variable conversion element and it may precede it.

1.3.4 DATA TRANSMISSION ELEMENT.

It transmits the data from one element to the other. It may be as shaft and gear assembly system or as complicated as a telemetry system which is used to transmit the signal from one place to another.

1.3.5 DATA PROCESSING ELEMENT

It is an element which is used to modify the data before displayed or finally recorded. It may be used for the following purposes.

- i. To convert the data into useful form
- ii. To separate the signal hidden in noise
- iii. It may provide corrections to the measured physical variables
- iv. to compensate for zero offset, temperature error, scaling etc

1.3.6 DATA PRESENTATION ELEMENT

These are the elements that they finally communicate the information of measured variables to a human observer for monitoring, controlling or analysing purposes. The value of measured variables may be indicated by an analog indicator, digital indicator, or by a recorder.