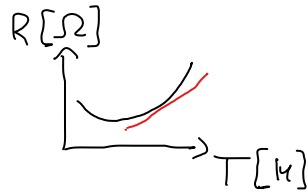


Transducer: Fro. an energy to another

- Sensors
- actuators

Sensitivity:  $\frac{\partial \text{out}}{\partial \text{in}}$



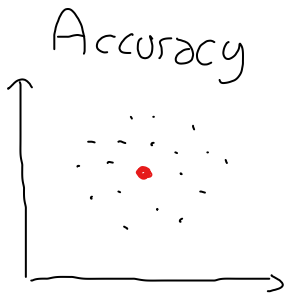
how much the output changes w.r.t. the input

Resolution (LSB): Smallest increment detectable by the device

measured in terms of the quantity in subject

Full scale Range (FSR): maximum interval measurable

Number of bits (n): bits used for storing the measured level:  $2^n = \frac{\text{FSR}}{\text{LSB}}$



Precision

(Repeatability)

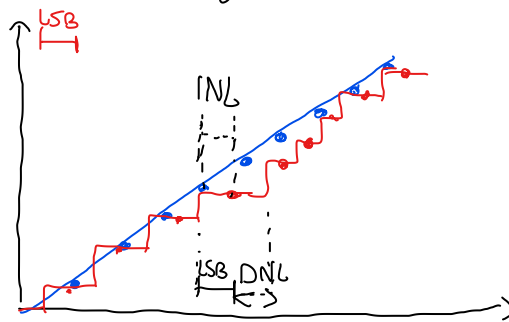


Preferable cause with calibration we could fix for the bias

Linearity:

- DNL: differential non-linearity is the difference among the actual step length and the ideal LSB
- INL: integral non-linearity is the displacement of the center of the step with relation to the best-fit straight line

$$\text{INL}(x) = \sum_{k=1}^n \text{DNL}(k)$$



Noise: characterized by his root mean square (rms)

Dynamic range: ratio among FSR and min input amplitude (noise)  $\Rightarrow \text{DR} = 20 \log_{10} \left( \frac{\text{FSR}}{\text{Noise}} \right)$

Smart sensor: analog sensor + built-in signal processing and communication