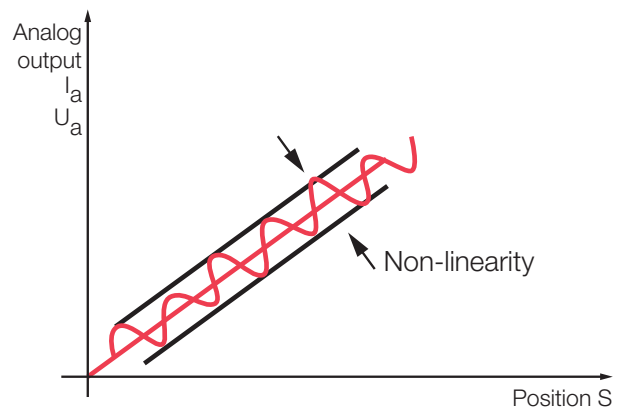
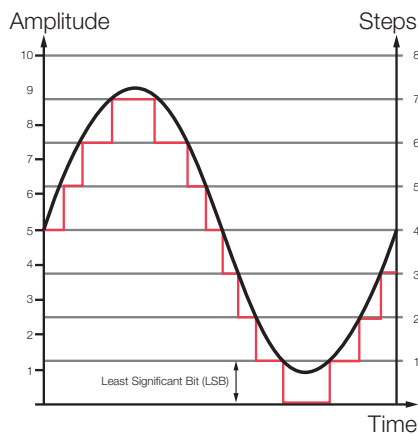


Fundamentals of Automation

WHAT RESOLUTION, NON-LINEARITY AND ACCURACY MEAN

Did you know that the resolution, non-linearity and accuracy are amongst the most important features of a measuring sensor system? These vary significantly depending on the application requirement and the measuring principle. We will explain the terms now.



Resolution is the smallest possible physical change which the measuring system can detect.

The non-linearity is the maximum deviation from an ideal straight line.

The **resolution** is the smallest possible physical change which the measuring system can detect.

Non-linearity is the maximum deviation from a straight line that connects the zero point of a measuring range with the end point (full scale). There is a linear relationship between the position or distance traveled and the output signal.

| | | | |
|-------------------------------|------------------------------|--|---|
| | | | |
| High precision, poor accuracy | Low precision, good accuracy | High precision, good accuracy Only in this case does one achieve high accuracy . | After multiple approaches under constant ambient conditions one achieves good repeat accuracy (see also Gaussian distribution) |

Accuracy indicates the agreement of a measuring result with the true value of the variable. Therefore high accuracy can only be achieved when the **precision** is high and the **correctness** is good. Another term in this connection is **repeat accuracy**. Repeat accuracy results when a certain point is approached always under the same ambient conditions and provides comparable results.