Encyclopedia

Q

Quad-Bit

The summary of four binary basic (Bits) of information. Through a Q. values from 0000 (decimal=0) to 1111 (decimal=15) can be displayed.

Quality control, acoustic

In acoustic Q. a signal is used, in order to judge the quality of the examined object. The goal is to identify and determine defective parts in which errors arose.

Examples for this are to be found with the quality control of ceramic(s) parts or electric motors. With the help of mathematical methods after the collection of the time signals and a Fourier transformation, the significant characteristics are extracted and the test specimens classified using the Fuzzy cluster procedure (cluster procedure) or Kohonen nets.

Quantity

A characteristic of an object, condition or procedure, which determines (measures) itself quantitatively. In addition a comparison with a homogenous, agreed Q. as a mass unit takes place, which supplies a yardstick, i.e. the numerical value of the Q. The indication formed from the numerical value and the unit is called the value of the Q. (e.g. $20\ mA$, $10\ kHz$).

Quantization error

An error due to the inability of a measuring instrument or data processing equipment to notice changes in a variable which are smaller than a given increment. With analogue variables the accuracy of the measuring and processing unit (processor) is definitive for this (tolerance interval). With digitally displayed variables the Q. corresponds to the valence of the lowest displayed number.

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Quasi-sinusoidal phenomenon

A phenomenon similar to the sinusoidal phenomenon, in accordance with the relationship

$$x(t) = \hat{x}(t) \sin \Psi(t)$$

for which the amplitude $\hat{x}(t)$ changes over time and the phase angle $\Psi(t)$, increases non-linearly over time, i.e. increases other than in accordance with the formula $\omega_T t + \varphi$ or both vary, $\omega_T = 2\pi f_T$ is the angular frequency constant over time, f_T, T is the carrier frequency and φ is the zero phase angle constant over time).

See also Beat phenomenon: sinusoidal phenomenon, modulated; Sinusoidal phenomenon, increasing or decreasing

Quasi-static unbalance

This condition occurs if the central mass centroid axis intersects the shaft axis at a point that is not the centre of gravity.

Quasi-stationary

One calls Q. a condition which changes so slowly with time that some laws for the stationary condition retain their validity.

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Quefrency

The value of the abscissa of a line (Rahmonic) in the Cepstrum.

Periodically in a spectrum (frequency domain), a family of lines which appear (frequency families of signal components linked multiplicatively by harmonics and frequencies) are illustrated in each case in the Cepstrum by only one characteristic value (line), the so-called Quefrency. The dimension of time in $msecs$ is the Q. Its value corresponds to the reciprocal frequency spacing of the harmonics.