



# Encyclopedia

## I

### **Image element**

The smallest unit of a display. With alphanumeric announcements the I. can e.g. be a line, a bar or a letter. With screen displays on the other hand the I. is usually a pixel. All representations on a screen display (both graphic and alphanumeric) are built up from pixels. The larger the number of pixels displayable on a screen, the higher the resolution capability and, in addition, the higher the technical expenditure.

### **Immission sound**

The sound acting on or influencing an area or a point.

*Note:* Frequently the shortened designation "immission" is common.

### **Impedance converter**

An electrical circuit, whose input impedance is different from the output resistance.

### **Impeller**

With fluid-flow or gas-flow machines, a rotating component provided with blades, by means of which mechanical energy is drawn (turbines) or supplied (centrifugal pumps and compressors) through the flowing medium.



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### **Impulse;** impulse-shaped event

An event, whose instantaneous value deviates only within a limited time interval noticeably from zero and which within this time interval has an arbitrary time course. It is characterised by the impulse form, the impulse amplitude, the impulse duration as well as by the time of its occurrence. A precipitous, short-term change of a physical dimension, followed by a fast return to the original value.

### **Impulse amplitude**

The height of an impulse characteristic value, e.g. the peak value.

### **Impulse duration; impulse width**

A variable  $\tau$  defined in different ways, e.g. the time interval between first and the last violation of given threshold values. By the half-amplitude duration one understands that time interval, in which the momentary value exceeds 50% of the impulse magnitude.

The I. can also be defined by the duration of an equal-area or equal-energy square-wave impulse with the same impulse magnitude.

Time interval between first and the last point in time, in which the instantaneous value of an impulse reaches a given fraction of its amount of impulse or a given threshold value.

### **Impulse magnitude**

Individual value, e.g. average value, quadratic average value or peak value, which marks the total instantaneous value of a simply-arranged impulse with reference to the common start and end value.

*Note:* The term "impulse amplitude" should not be used.



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### **Impulse, uni-directional**

Impulse at which the instantaneous value of the physical dimension is larger or smaller than the common start and end value.

### **Impulse response**

The time-signal represents the I., which is derived by inverse Fourier transform from the averaged frequency response (transfer function). I. is the accepted reaction of a system to an impulse at the system input, i.e. it characterizes the transient behaviour of a system which lies between channels A and B.

### **Impulse rise-time**

Duration, in which the rise flank of an impulse of a fixed small fraction of the maximum value grows on a fixed larger fraction.

### **Impulse spacing**

Time interval between two given points in time corresponding to one another in two sequential impulses.

### **Impulse train**

A train of a finite number of homogenous impulses. A periodically repeating consequence of individual impulses. The single pulses usually have the same distance. One calls a temporally limited I. an impulse series, an unlimited I. The pulse recurrence frequency (pulse frequency) is the reciprocal value of the duration of a periodic I. The palpation relationship, as a characteristic quantity of an I. of rectangular-shaped single pulses, is defined as the relationship of pulse duration to period duration;



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occasionally also the reciprocal value of the mentioned quantity or the quotient of impulse duration and difference of period duration and impulse duration is called the palpation relationship. With a modulated pulse, the maximum value of the impulses (pulse amplitude modulation), the time of its occurrence (pulse time modulation) pulse phase modulation), the pulse time (pulse duration modulation), or some these quantities, change simultaneously in clear dependence from a modulating quantity.

### **Impulse shape**

A process of the impulse fixed to proportionality factors for value and time.

*See also Impulse, uni-polar; Impulse, bi-polar; sinus vibration impulse*

### **Impulse-shaped vibration**

A vibration with an impulse shape.

### **Impulse-shaped event; impulse phenomenon**

*See also Impulse*

### **Impulse-shaped**

Procedure, with which the course of impulses of a desired form is approximated.

### **Impulse response**

*See impulse answer*



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### **Impulse generator**

An instrument or electrical circuit for creating impulses.

### **Impulse regeneration**

Procedure, with which incoming impulses can be distorted to control new impulses which are similar in time situation, form and amount to the original impulses.

### **Impulse regenerator**

A circuit used for impulse regeneration.

### **Impulse spectrum**

*See spectrum*

### **Impulse, unipolar**

An impulse, whose instantaneous value does not experience a polarity change during the entire duration.

Usually the designation is according to the shape of the curve, e.g. square-wave impulse (a), triangular pulse (b), trapezoidal pulse (c), sine impulse (d), sine-squared impulse (e), unequal increasing and fading impulse (f) exponential impulse (g), Gaussian impulse, i.e. impulse with a curve shape according to the Gaussian error distribution curve (h).



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### **Inboard rotor**

A rotor with the impeller supported between the bearings.

### **Induction**

Creation of a voltage in a coil due to the influence of a changing magnetic field acting upon it, or caused by a current flowing through it.

### **Inductive sensor**

A sensor which operates on the induction principle.

### **Inductive displacement sensor**

Displacement sensor, inductive

### **Inductive measurement principle**

The principle of measurement by induction.

### **Infra-sound**

Sound in the frequency range below the audio frequency range (< 16 cycles per second).



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### **Inner race**

In general the cylindrical part of a rolling-element bearing between the shaft and the rolling elements.

### **Inner-race pass frequency**

*See also roller-bearing frequencies*

### **Input quantity**

An electrical parameter at the input of an electronic element or circuit. I. are e.g. input voltage, input current, input impedance, input capacitance.

### **Input capacitance**

The capacitance which is measured between the input terminals of an electronic element and/or an electronic circuit.

### **Input voltage**

Electrical tension at the input of an electrical circuit and/or equipment.

### **Input current**

Electrical current in the input circuit of an electrical tension and/or equipment.



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### **Inspection; Test**

A procedure to specify, to what extent an inspected item fulfils a demand.

### **Instantaneous frequency (of a signal);**

Temporal derivative of the phase angle of a signal, divided by  $2\mu$ .

### **Interference, electromagnetic**

A reduction in the functionality of an instrument, or a transmission channel of a system, caused by an electro-magnetic disturbance variable.

### **Integrator; Integrator circuit; Integration amplifier**

A circuit for the creation of an output variable which is proportional to the time-integral of the input variable.

An electronic circuit which undertakes the integration of an (electrical) input variable.

The output voltage is given by the integration of the input voltage  $U_E$  zu

$$U_A = \frac{1}{RC} \int U_E dt$$

In vibration measurement technology an I. is used for the integration of vibration velocity to vibration displacement (single integration) or vibration acceleration to vibration displacement (double integration).



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### **Intermittent monitoring**

*See Monitoring, intermittent*

### **Intermittent monitoring systems**

*See Monitoring system, intermittent*

### **Internal noise**

The noise of an active four-pole network, e.g. an amplifier, independently of whether a resistance is connected at the input or not.

### **Internal triggering**

*See Triggering, internal*

### **International unitary system**

Abbr.: SI

*See also Unit*

### **ISO standard**

*See ISO*



**Brüel & Kjær Vibro**

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### **Inverse transformed**

The result of the inverse Fourier transform.