Brüel & Kjær Vibro

Encyclopedia

T

TAE

Abbreviation for type telephone jack
Standard plug for Deutsche Telekom (6-pole), ISDN (8-pole)

Timing signal

A signal for determining the points in time at which operations are to be triggered.

Telefax

Invented word made up of “Tele” = far and “Facsimile” = faithful copy; Telefax is the “remote copying” via a telephone network (Group 2 and 3) and ISDN (Group 4).

Telemetry

Remote measuring technology

Temperature drift

The (slow) change in properties when temperature changes.

Testplane

The radial plane of the rotor, into which test masses can be placed.

Test mass

A precisely defined weight, with which, in combination with a test rotor, a *balancing machine* can be tested.

Theoretically usable signal frequency range

Signal frequency range, theoretically usable

Thermally induced unbalance

The unbalance caused an asymmetric temperature change in the rotor.

Thermic instability

Instability, thermic

Thermal growth

Movement of shafts and shaft axes because of process temperature, sunshine or energy input in both the static state as well as under operating conditions (dynamic state).

Thermic rating

Rating, thermic

Thermocouple

A temperature-sensitive component made of two chemically dissimilar metal probes joined at one end. A thermal effect (heating, cooling) causes a corresponding change in the electrical potential at the working end.

Brüel & Kjær Vibro

Encyclopedia

T

Threshold switch; Threshold element

An electronic circuit and/or an electronic element where the output variable changes suddenly when the input variable falls below or rises above a threshold value.

Threshold value

Smallest change of a measured variable which results in a measurable change of the output signal.

Time averaging

See Average, synchronous

Time base

The vibration used as reference quantity, from the time interval of which the momentary events of particular cycle segments of the vibration can be deduced.

Time-based maintenance

See Maintenance, time-based

Time controlled data storage

See Data storage, time controlled

Time constant

Characteristic value of transfer elements that has the dimension of time and is necessary for the definitive determination of the dynamic behaviour. The “time constant” terminus is used in many connections and occurs, for example, in connections like integration time constant, delay time constant (delay time), etc.

See also Decay time

Time domain

The time domain is the traditional level used for displaying vibration signals (temporal signals). It is the starting point of all analytical procedures. In it the time behaviour of vibration signals (time course of the momentary values) is shown.
The best known applications are the oscillograph and above all, the oscilloscope. The analogue electron beam oscilloscope can capture and display vibration signals precisely in their temporal movement.
By way of contrast, digital vibration measurement devices sample the time signal only at equal intervals of time (in equal time intervals) or at equal rotational angles (in equal rotational angle intervals). In the process, the equal rotational angle capture has paramount meaning in machine diagnosis.
The problem with analyses in the time level arises from the fact that in vibration signals received from machines, there are small (in comparison with the main component) signal components that hint at initial damage but that cannot be recognised.

Time-equidistant

In equal intervals of time.

Time function

If an analysis procedure is applied continuously or intermittently, the result can be shown as a function of time. Thereby possible trends can be recognised and if appropriate, predictions made based on extrapolation.

Note: the time function is often designated as the trend itself. It should not be confused with the concept of the time signal.

Brüel & Kjær Vibro

Encyclopedia

T

Time grid

Consequence of predetermined time intervals, one after another.

Note: The time slots in a time grid must all have the same duration.

Timeout

Latency. Set by the sender of a message during transfer of information. If the time interval elapses without the message being acknowledged by the recipient, the sender assumes that a transmission error has occurred. The length of the time interval depends upon the upper limit of the transmission time needed for the transmission and acknowledgement of the message, taking into account processing times, when necessary.

Time quantisation

See Scanning

Time series analysis

With the aid of time series analytical procedures, the course of economic, physical, technical, demographic, etc. time series is supposed to be described, explained, forecast (forecasting system), and controlled.

Included in the descriptive techniques of time series analysis are:

- Seasonal fluctuations,
- Autocorrelation coefficients (Autocorrelation),
- Index numbers,
- Inventory updates.

Inference techniques included, among others, in time series analysis are:

- Moving average models,
- Auto-regressive models,
- Mixed models - moving average and auto-regression, spectral analytical procedures.

Time slice processing; time-shift technique

Instead of waiting until the running process delivers from the processing core, it is often sensible in interactive dialogue to limit the running time of every process so that after a specific time interval, the processing core is withdrawn. This time interval is called the time slice. Its size lies in the range of 50 to 300 milliseconds and adjusts in accordance with the number of processes running simultaneously. Control is accomplished with the aid of the system clock that brings about an interruption after the end of the predetermined time interval.

Timestamp

Timestamp; time marker. Timestamps are attached as an attribute to messages, data, tasks, etc. in order to make it possible to synchronise parallel activities in networks, operating systems and data bank systems.
Another area of application is the recording of system events for the purpose of being able to trace their actual sequence (e.g. the execution of a program). In the simplest case, a timestamp is the position of the system clock (hardware timer) with the desired precision. In distributed systems, however, the synchronisation of the hardware timer requires too much effort; so instead, logical clocks are used for timestamps. In this case, it becomes a matter of, for the most part, separately administered counters in the individual nodes on which an overall arrangement can be defined in accordance with different protocols (communication protocol) that then provide relative order for the events related to them.

Brüel & Kjær Vibro

Encyclopedia

T

Time waveform

Time signal

Timing signals

Course of the momentary values, $x = f(t)$ as a function of time-dependent processes. The courses of the momentary values of variable processes (variable vibrations), periodic processes (periodic vibrations) and sinusoidal processes (sinusoidal vibrations) are of particular importance.

Time signals – classification

Time signals (vibration signals) are classified into the following classes in accordance with their characteristics:

- stationary time signals
- deterministic time signals
- periodic time signals
- quasi-periodic time signals
- stationary stochastic time signals
- transient time signals
- transient, continually stochastic time signals
- transient time signals

Token

By token is meant a word occurring in a text, i.e. a character string (character chain) between two word separators (generally, spaces) that follow one another in sequence. Every repetition of such a character string is seen as a different token, so that the number of tokens provides the length of the text measured in words.

Token ring

A network (computer network) in ring topology with the token scheme as access method.

Token scheme

The token scheme defines an access method that is especially well suited for the authorisation of the connected nodes to send and receive during information transfer (data transmission) in local networks and especially for regular live loads.
The method is basically feasible for all network topologies, since a logical ring will be associated with the network so that every node knows its predecessor and successor. An identifier (token) circulates on this ring; it indicates whether the network is currently free or occupied. A node that would like to send a message changes one of the arriving free tokens into an occupied one and now transmits the information across the network; that information comes across as addresses to the logical successors. After receiving the message, this node now sends a confirmation of receipt to the sending node which now also can declare the network to again be free by changing the token.
The advantages of the token scheme in efficiency that come to the fore particularly under heavy load, is matched, on the other hand, by the increased protocol effort (communications protocol).

Tolerance values

During adjustment, the maximum allowable deviation from the ideal offset values that define the boundaries of the parallel and angular offsets.

See also Misalignment

Brüel & Kjær Vibro

Encyclopedia

T

Tone dialling procedure

During tone dialling procedure, every digit is assigned a frequency pair. The dialling process runs significantly faster than with the impulse dialling procedure.

Torsional clearance

Relative rotary motion between two connected shafts that is to be avoided; it can lead to erroneous measurements during alignment.

Torsional vibration

The modulation in amplitude of rotary motion, measured in angular degrees, with respect to the axis perpendicular to the shaft's axis of rotation.
The rotary motion of a shaft that is running at a constant rotational speed, can be superimposed by a rotational oscillation.

Trap circuit

An electrical resonant circuit, which particularly strongly damps an alternating current with a frequency which corresponds to its natural oscillation.

Transducer; converter; transformer

Device to capture an input signal of a specific type and deliver an output signal of a different type, whereby the desired performance characteristics of the input signal recurs in the output signal.

An apparatus that receives one or more inputs and can deliver these inputs as corresponding outputs but of a different physical type.

Transfer function

In a linear system, the relationship of the Fourier- or Laplace- transformed (Fourier transform; Laplace transform) output signal to the identical transformation of the input signal, where the initial conditions are equal to zero.

Transfer speed

It provides the average value of data bits (useful bits) transferred in a data frame in Bits/second. Frame bits and error recognition bits are ignored.

Transformer

A quadrupole that couples two circuits across a common magnetic field. If the transformer has an iron core, it will also be called a core transformer. As a power transformer, it serves to change the voltage level for current being supplied to electronic devices at low frequencies (circuit transformer) and as transformer, to adjust resistances between various circuits or to achieve galvanic isolation. Furthermore, transformers for high frequencies behave like filters for particular frequencies.
The transformer consists of two coils (windings), with the number of windings w_1 and w_2 (windings ratio $r = w_1/w_2$), that are coupled via a magnetic field. To strengthen the coupling, an iron core is used in most cases. The circuit in coil 1 is designated the primary side and that in coil 2 is the secondary side.

Brüel & Kjær Vibro

Encyclopedia

T

Transient, continually stochastic signals

These time signals can be defined as stochastic signals whose statistical properties are time-dependent (within the time interval necessary for their description). Therefore, for the analysis and description of such signals, the temporal change in their statistical properties must be included.

Transient phenomenon

Event, transient

Transient response

The behaviour of the output value of a control circuit under application of a specific input signal.

Transient signals

Signals, transient

Transient time signals

All time signals that during a particular time interval are different from zero are called transient time signals. The generic transient time signal includes several periods of decay (e.g. decay process in the wake of an impact-like excitation). In contrast, the impact is, as a special case, a one-time introduction of energy in a short period of time relative to the observation period. Ideal impacts such as a jump, corner bump or square-wave pulse can be described mathematically. These functions are in their pure,

undistorted form not typical for mechanical events. They can, however, be produced potentially as test functions for certain vibration causes.

Transient vibration; transient oscillation

Vibration, transient

Transition phenomenon

If, in a mechanical or electrical system, a sudden transition is forced in any way from a periodic process (or equalisation process) into a different one, the system passes in a transition process from an initial periodic process (or equalisation process) into the subsequent process. The transient phenomenon is the difference between the transition process and the later forced periodic process (or equalisation process).

Note: When it comes to the special cases of “transient oscillation” and “decay” process, see Sine process, exponentially growing (assonant) and Sine process, exponentially fading (decaying) as well as DIN 1311-2.

Translational motion sensor

Translational motion sensors are sensors that only capture translational movements.

Note: The prefix, "Translations-" is only used - when necessary - to differentiate this type of transducer from rotational motion sensors.

Transmitter

Measuring transducer

Transmission attenuation

Attenuation of a signal between the two ends of a transmission segment.

Brüel & Kjær Vibro

Encyclopedia

T

Transmission channel

That portion of a transmission path that includes the necessary equipment, frequency range and resources to accomplish information transfer in one direction.

Transmission element

An electronic circuit, usually a quadripolar one, that is a component of the modus operandi of the information transfer path. A transmission element can, for example, be a coupling circuit (coupling), a filter, an electrical conductor or even a complex information transfer unit.

Transmission medium

The material or substance that can be used to transmit signals. Typical transmission media include cables, optical fibre, air, etc.

Transmission protocol

Protocol

Transmission rate

Gives the number of transferred bits per second in units of bit/s. It makes no difference which function the bits have - in other words, whether they are data bits, framing bits or error recognition bits. The transfer speed should not be confused with the modulation rate.

Transmission technique

The branch of information technology that includes the transmission of information between two distant locations.

Transverter

DC to DC converter

Trend analysis

Methods of trend analysis are often integrated into systems designed for early recognition or early diagnosis. Initially, the machine remains in operation if an error is detected in the early stage of operation. Trend analysis forecasts how much life remains before errors reach a critical level.

Trend data

Statistical and dynamic values that are stored periodically in order to be able to detect time-dependent changes.

Trend diagram

A diagram in Cartesian coordinates with the trend data on the y-axis and time on the x-axis. This provides the most elementary form of information capture for forward-looking and condition-oriented maintenance.

Trend interval

The trend data of one or more measured values over a complete time interval (from beginning to end) displayed in a trend diagram.

Brüel & Kjær Vibro

Encyclopedia

T

Triboelectric effect

Effect, triboelectric

Trigger

An electronic circuit that triggers an action in another electronic circuit. This is usually achieved with a pulse trigger.

Trigger circuit

A circuit with a number of stable or unstable conditions of which at least one is stable and calculated so that the desired transition can be initiated by the application of a suitable impulse.

Triggering

The automatically running processes that trigger the start of data capture by sampling a time data record are called triggering. In the simplest case, the acquisition of the data can be initiated manually by activating a button on the analytical instrument.

Triggering, continuous

With continuous triggering, a further time data set will be captured every time the trigger criterion is fulfilled. Continuous triggering will be applied mainly to the averaging of measured results.

Trigger modes

Three basic types of trigger for vibration measurement can be distinguished:

- Freewheeling or continuous trigger
- Internal trigger
- External trigger

Trimming

See Adjusting

Truth value

Logical values are the values, “True” and “False”. In formal languages, the values, true, W and 1 (for “True”) and false, F, and 0 (for “False”) are used.

TTL

Abbreviation for **T**ransistor-**T**ransistor-**L**ogic

See TTL circuit

TTL circuit

A family of circuits for digitally integrated circuits. They show the most frequently applied circuits and are constructed of bipolar transistors. TTL works with logic levels: $5V$ (Bit=1) and $0V$ (Bit=0). These components which used to be applied in computers everywhere, had a crucial disadvantage: they were like warm stoves and used relatively large amounts of energy (5 Volts supply voltage). Through the development of MOS circuits (NMOS technology, CMOS technology (see CMOS), and PMOS technology), TTL components faded further and further into the background.

Brüel & Kjær Vibro

Encyclopedia

T

TÜV

Abbreviation for German Technical Inspection Association

Twisted cable

Conductor, twisted

Twisted pair

A twisted two-wire line.

Two-level balancing

A procedure through which the weight distribution of a rigid rotor is corrected in order to make sure that the dynamic residual unbalance lies between fixed limits.

Two-port

An electrical network (see network, electrical) or component, with two distinct ports through which signals can enter or exit.

Two-terminal

Single port whose access consists of a terminal pair.

Two-terminal-pair

Quadripole on which each gate consists of a terminal pair.