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wireless machine condition evaluation system

WiViD™ is a comprehensive tool for machine condition monitoring and fault diagnostics which utilizes a smartphone or a tablet as the user interface. It has a built-in high-quality 3D vibration sensor and simplified thermal camera. It is intuitive to use and allows you to add new analysis even after the measurement survey is completed. It is the only tool of this type available on the market.

Other than all

Simplicity of operation, high accuracy and easy implementation of new required by individual users functionality were the assumptions we considered while designing the new portable machine condition monitoring system.

Because one of the most important aim of our activity is an increasing the availability of preventive maintenance tools for companies operating in Central and Eastern Europe, we took care about the WiViD price.

Deriving from the knowledge and the experience of our team, using the latest technologies we built a system that utilizes the best features of today's mobile devices: smartphones and tablets. The measurement data are stored in the mobile database 30 GB of capacity and processed by the multi-core processors. All system functions are controlled by the touch panel. The results of the analysis are displayed on high-resolution screens. Data can be sent over the Internet directly to the diagnostician who supports the work of the factory maintenance team.

WiViD stands out from other solutions by using wireless measuring device enclosed in a durable and ergonomic case. It has been equipped with high-quality 3D sensor and a miniature infrared camera.

Vibration measurement

The unique transducer head of WiViD system enables an easy vibration measurement in three directions. Wide frequency range (0.4Hz - 20kHz) and measurement range of 100g fulfill requirements of the technical state evaluation of virtually every machine containing moving parts. The area of application extends the connection possibility of an external vibration 3D sensor, force sensor, microphone or ultrasonic detector (leakage test). The device works with wireless and wired tachometer. All measuring channels operate synchronously.

Temperature measurement

As the industry's only portable vibration measuring device, WiViD can act as a thermal imaging camera. The interpolated image with a resolution of 16x4 point provides surprisingly clear information about objects temperature in the range of -50 ° C to 300 ° C.

Advanced diagnostic software

mVIDIA™ specialized software acquires measurement information to the mobile database and after processing, presents in a readable form. The program integrates a set of tools to evaluate the technical condition of machinery components such as bearings, gears, engines and other technical equipment which requires vibration level monitoring.

The basic modules of the mVIDIATM software include a high resolution signal spectrum analysis and envelope spectra analysis. They calculate diagnostic parameters, such as overall vibration parameters in any frequency band (built-in AFD filter design module), statistical parameters, specific damage parameters and enable its time trend analysis.

The original waveforms are stored in the database, allowing subsequent addition of the necessary analysis. Optionally, the program allows for multiplane balancing of rotors in their own bearings.

Historical measurements can be viewed and analyzed by mVIDIA Explorer software installed on a PC. It enables to collect data stored in many mobile devices. The built in localization tree and timetable editors allows to plan measurement routines and observe the current condition of the machinery.

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WiViD™
Technical specification

Number of analog and digital measurement channels	5 with simultaneous sampling, internal 3D accelerometer
Analog input type	3 voltage inputs for external sensors (Binder 420 connector)
Analog input configuration	AC voltage mode with integrated current source for ICP/ IEPE (CLPS™) sensors supply (external channels)
Analog input voltage range	±2,5V (other as an option)
Analogue to digital converter type	4 converters of ΔΣ type
Analogue to digital converter resolution	24 bits
Digital input type	1 opto-isolated digital input for phase sensor or tachometer (low level: <1,4V, high level: >5V, maximum input voltage 9V, other value as an option)
Internal vibration sensor parameter	• perpendicularly oriented 3D • vibration acceleration range: ±100 g (other as an option) • frequency bandwidth (-3dB): 0,4 … 21000 Hz • frequency bandwidth (10%): 0,8 … 10500 Hz • sensitivity tolerance: ±5% • program compensation of temperature influence
Analog input overall noise level	50 μV_{RMS} (for f_{out} = 65,536 kHz, frequency range 25,6 kHz)
Signal sampling frequency (f_s)	1..8 MHz
Effective sampling frequency (f_{out}) (output data actualization frequency)	65,536 kHz maximum
Applied filters	• 3rd order Butterworth analog low-pass filter , frequency limit $f_{3dB\ high}$ = 68 kHz • 1st order analog high-pass filter, frequency limit $f_{3dB\ low}$ = 0,5 Hz • anti-aliasing low-pass filter, linear phase, frequency limit set automatically as $f_{3dB\ high} = 0{,}49 f_{out}$ ($f_{0{,}005dB\ high} = 0{,}39 f_{out}$, $f_{-100dB\ high} = 0{,}54 f_{out}$)
Signal gain error	±0,02 % (with calibration in the measurement condition)
Overall maximal measurement error (without/with sensor)	±0,1 % / ± 5% measurement range (with calibration in the measurement condition)
Calibration	• factory calibration of the reference measurement path • built in mechanism of zero level and gain calibration
CLPS™ sensor power supply	2mA / 20V (other as an option)
Integrated contactless IR sensor	• 16 x 4 point matrix (observation angle 60° x 16,4°) • temperature measurement range: –50..+300°C • measurement accuracy (0..+300°C): ±1°C ±3% | T_o-T_a | (T_o: object temperature, T_a: ambient temperature) • measurement accuracy (-50..0°C): ±3°C ±5% | T_o-T_a | (T_o: object temperature, T_a: ambient temperature)
Communication interface	IEEE802.11b/g/n WiFi, WPA2 wireless digital output for measurement synchronisation (option)
Communication protocol	ATC MESbus
Operation condition	Temperature: –5..+60°C; humidity: 10..90% RH
Software	ViMEA DAQ; ViMEA VIDIA; ViMEA DAAC/VSI as an option: API, Matlab control function, LabView driver, application specified
Power supply	• Li-Poly 3,7V/3000mAh internal battery with integrated charger • power supply 5V/1A • working time: up to 20 hours • built-in energy saving and battery protection mechanisms