ABPVibro

VibroRack1000 Series

Vibration Analyzer System

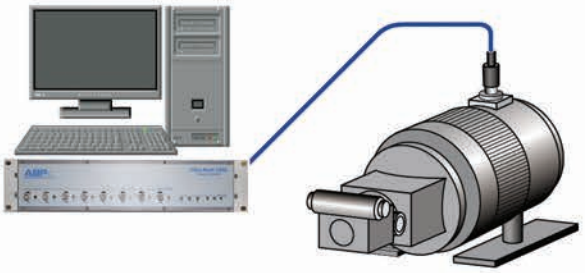
8-channel simultaneous
24-channel simultaneous

Introduction

Nowadays, the majority of medium to large-sized rotating machinery used in industry are protected against excessive vibrations via protection monitoring systems. Online condition monitoring systems create an obstacle for moving from preventive maintenance strategy to predictive maintenance strategy.

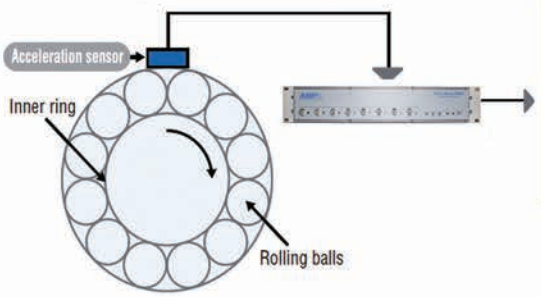
Vibration Measurement example for motor, pump

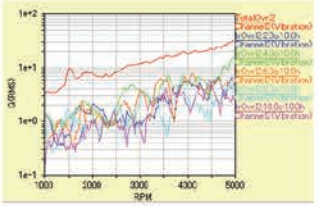
On top of frequency analysis of noise or vibration, etc., FFT analysis can be used widely for many other purposes. An acronym standing for Fast Fourier Transform, FFT is an algorithm which can calculate rapidly which frequency components are found to what degree inside signals. As each frequency component found by FFT has a narrow frequency range they are expressed as line spectrum and FFT analysis is also referred to as narrow band analysis, it is very useful for figuring out the frequency components of vibrations or noise, etc. For noise analysis, as it has a high correlation with humans' auditory perception, the 1/3 octave band is used a lot. Since,it is used to calculate the octave band from the spectrum found by FFT, it is also called the FFT formula octave.



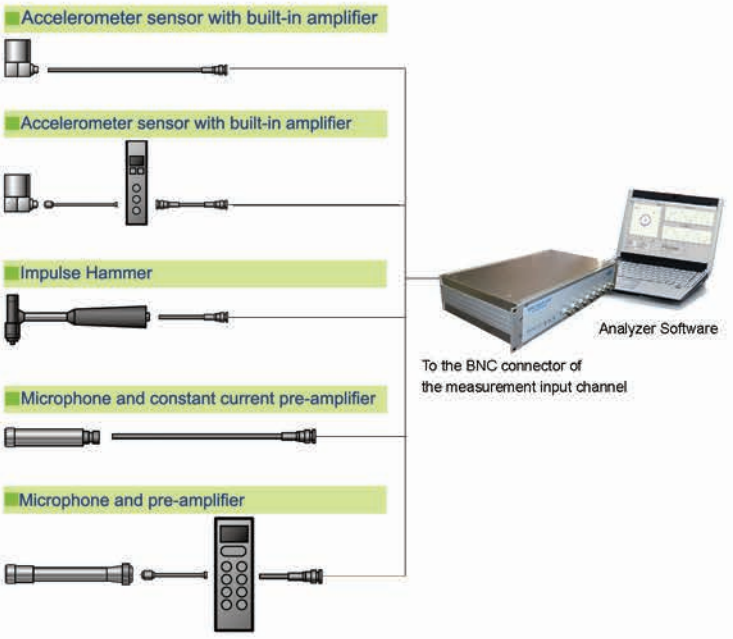
Automatic Defect Detection Using FFT Analyzer

The value of a bearing is determined by how smoothly they rotate while in use. If they have defect inside, when they rotate vibration will occur. The relationship between the location of the defect (on the inner ring, outer ring or rolling balls) and the vibration frequency





that occurs is quite clear, so by analysing the vibration signals with the use of VibroRack1000 series automatic determination of whether a bearing is defected or not is possible. VibroRack1000 series is a multi-purpose vibration analyzer which has been developed to be used in different conditions from harsh environmental situations to laboratory modal testing applications. Based on the software and hardware options the customer chooses, it may be used as:Laboratory Vibration Analyzer, Protection & Condition monitoring and Condition monitoring system installed parallel to other 3rd party vibration protection systems



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Technical Data	VibroRack1000-8	VibroRack1000-24
• Input Type: a wide range of sensors can be used directly or indirectly via corresponding transmitters as inputchannels:		
	*ICP® / charge mode accelerometer *Displacement Sensors *Velocity Sensors	
	*Key Phasor®/ Tachometer *Other voltage/current driven sensors	
• Input Channels:	8 Channels	3 Up to 24 channels
• Input Connector:	BNC connector / screw terminal	
• Frequency Response:	1 Hz to 10KHz (Optional)	
• Signal Conditioner:	Amplifier/integrator to obtain velocity or displacement response by integration	
• Supply Voltage:	110 / 220 VAC	
• Current Output:	4-20 mA	----------
• Buffered Output:	for connection to portable data collectors	
• Anti-Alias:	Root raised cosine linear phase 10th order lowpass filter	
• Resolution:	12bit	16bit
• Waveform Sampling		
Coupling:	DC/AC/Current	
Sampling Method:	Synchronous sampling (simultaneous)	
Sampling Rate*:	From 1 KHz to 10KHz per channel (Anti-alias filtered)	From 12KHz to 40KHz per channel (Anti-alias filtered) (depends on the number of channel)
Number of Samples*:	From 1000 to 100000 per channel	From 36000 to 300000 per channel
• Over Voltage protection:	30 V Pk-Pk	
• Data transmission communication standards:*	TCP/IP	
• Data Transfer from Serve		
Communication Standard:	RS-485 or RS-232 with ModBus protocol	
Output data:	1X, 2X, DC gap, overall vibration and RPM values for all 1Keyphasor inputs	
• Adjustable Full Scale Range:	Single Turn Potentiometer (0-100% Full Scale Range)	
• Accuracy:	Input: 0~2.5 V, Accuracy(%FSR) ±1LSB: 0.05	
• Dynamic Range:	0,6,14,20 dB	
• Trigger	Software	Software and Hardware
• Function Generator	----------	✓

Physical		Environmetal	
• Housing:	Aluminum Alloy	• Operating Temperature:	0°C to +65°C (+32°F to +149°F)
• Weight:	2Kg	• Humidity:	0% to 95% non-condensing
• Dimension:	48*9*27 cm		
• Mounting:	Rackmount		

Communication

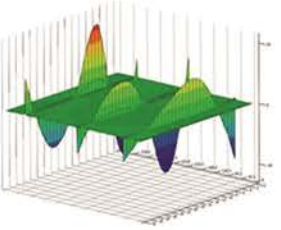
- Standard communication: Ethernet Port

Modal Testing

Based on data measured by VibroRack1000 series, it is possible to identify the unique vibration frequencies of structural objects (mode frequencies), damping ratios and mode shapes. With modal testing, from imparting excitation force on the test object, measuring the response, and using the transfer function data from that response, the dynamic characteristics (unique vibration frequencies, damping ratios and mode shapes) of machines and structural objects can be sought. From mode shape, the differences in deformation patterns (bending, screwing, etc.) in each unique vibration frequency can be figured out.

Trigger Setup

including trigger level and pre-trigger are used to capture the transient signal for FRF processing. It is important to capture the complete impact and response signals in the block (or frame) of the FFT analyzer. To insure that the entire signal is captured, the analyzer must be able to capture the impulse and impulse response signals prior to the occurrence of the impulse with the pre-trigger.
This setup is adjusted in VibroRack1000-8 by software and in VibroRack1000-24 by hardware and software.



Sound Analysis

Based on data measured by VibroRack1000 series, sound intensity, sound pressure level and sound power are sought and it is possible to effectively display the relationship between the vibration of the surfaces of machines or structural objects and sound data. Further, with the creation of an animation displaying vibration and sound data together, vibration and sound issues can be tested.