BENSTONE
Condition monitoring

iSee online

Condition Monitoring System

BENSTONE INSTRUMENTS, INC
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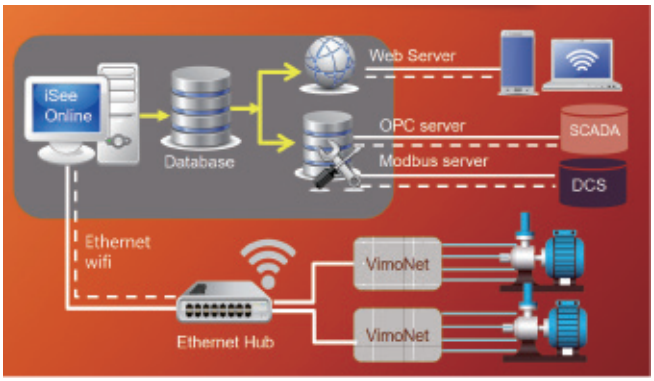
Introduction /

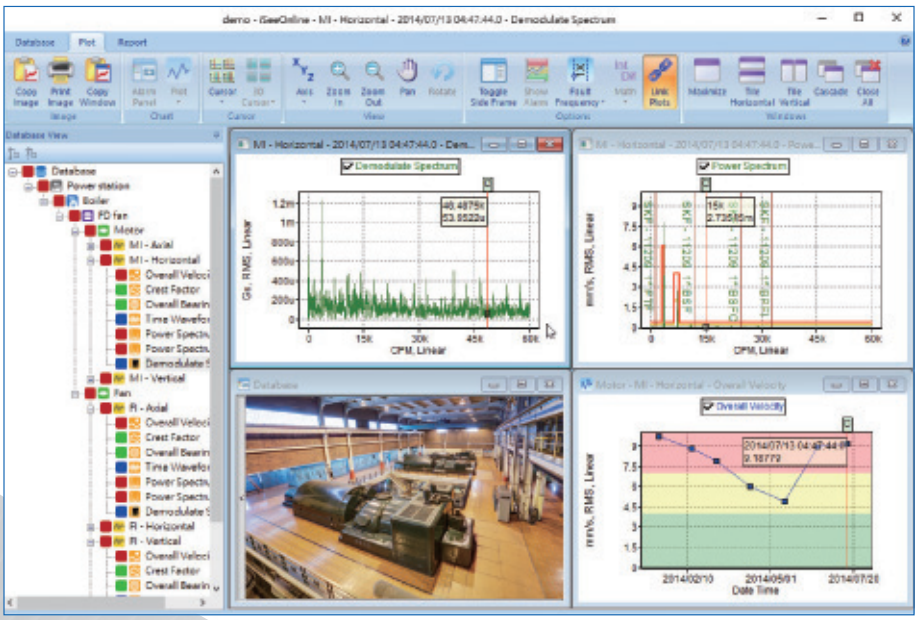
iSee online adopts the concepts and technology of "industry 4.0 smart factory," by continuously monitoring critical machines to prevent costly unscheduled shutdowns. iSee online manages the installed VimoNet hardware modules by collecting important parameters of rotating machines through cable, optical-fiber or wireless network; while providing instantaneous information of your machines' condition. No limit on number of users with browser viewable data on Android, IOS or PC Platform. Optionally, OPC and Modbus servers make it possible to share archive data to an enterprise database or DCS system for further data processing/ applications.



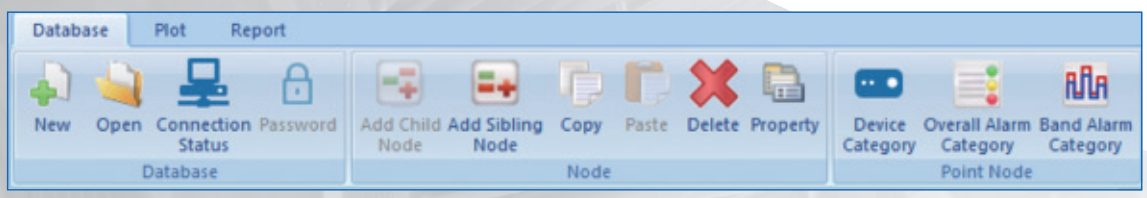
Example configuration of iSee online monitoring system.

iSee online software features /

iSee online software is easy to use - yet powerful. Easily build a database of your machines and monitored parameters, know about the alarm status and conduct fault analysis when necessary. iSee online software consists of 3 modes: Database, Plot and Report mode.



Database mode /



In this mode, you can create a database for the machines you are going to monitor, setup the monitored parameters for each point, assign the points to corresponding remote VimoNet hardware modules, define the alarm status, fault frequency tables and more.

Monitored parameters /

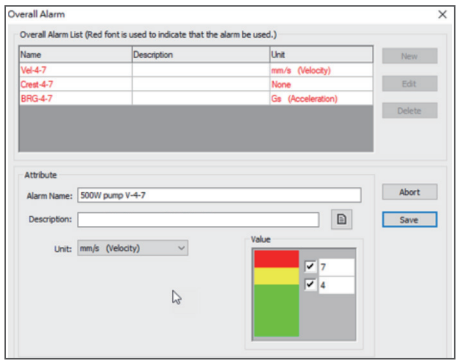
For each monitored point, iSee online allows you to select the desired vibration parameters and functions including: bearing condition values, various overall values, time waveforms, envelope spectrums, cepstrum, and up to 6 independent power spectrums.

Alarm setup and management /

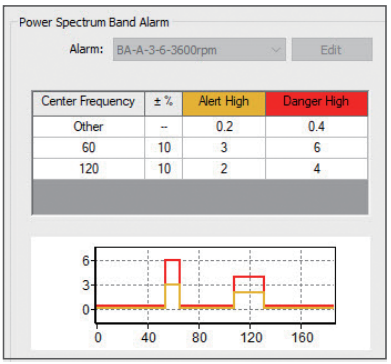
To create an alarm setting, first create the alarm setting for the “alarm category.” This function is easily copied to similar machines saving key-in time at the point level. To make a change in alarm level, select the category level to make the change and all associated points will be changed, saving time.

Band Alarm /

Create a specific band alarm to monitor the status on each spectrum as needed. This is very helpful when monitoring critical machines with a specific problem.



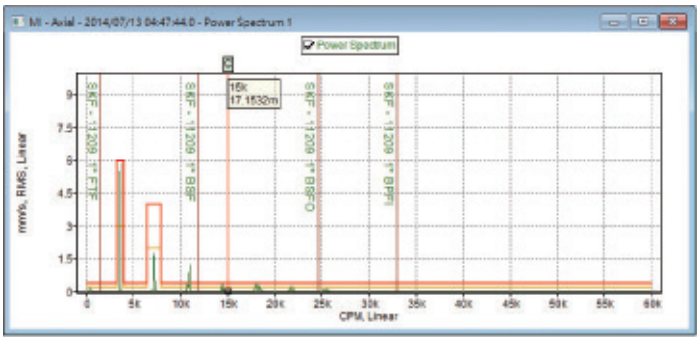
Setup an alarm type for overall parameters



Setup band alarm for spectral functions

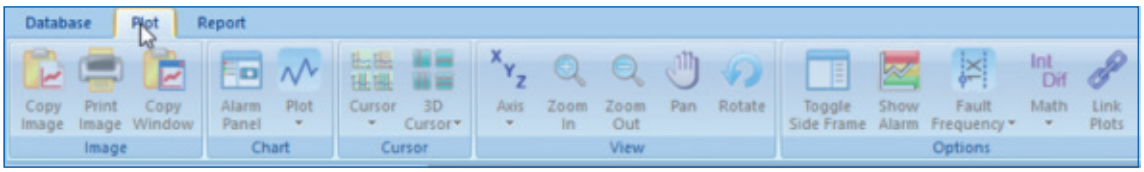
Bearing fault frequency table /

Create pre-defined bearing fault frequencies from a database or user-entered parameters such as multiples of the rotation frequency, inner race, outer race and more. The display of the fault frequencies on spectral plot makes your vibration analysis convenient and simple.



Show or hide alarm levels and fault frequencies on a spectral plot

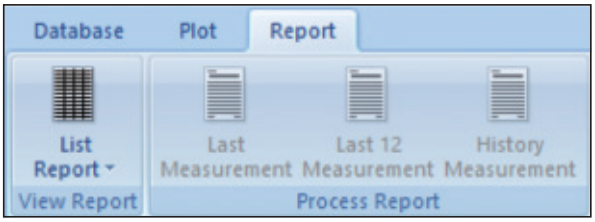
Plot mode /

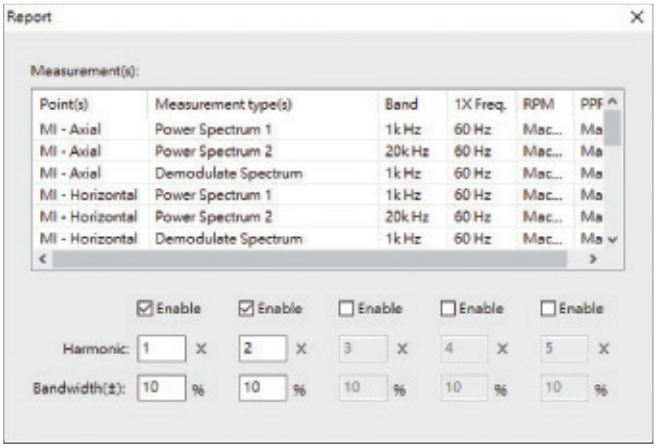


Diagnose and analyze machinery root causes. View live or historical spectral and time waveform plots, synchronize your cursor across multiple spectral or time waveform plots to easily view trend data. Enable alarm levels, fault frequencies and other diagnostic functions with a simple click of an icon and more.

Report mode /

In the report mode, generate custom reports with selected formats and custom options with the built-in report setup wizard.

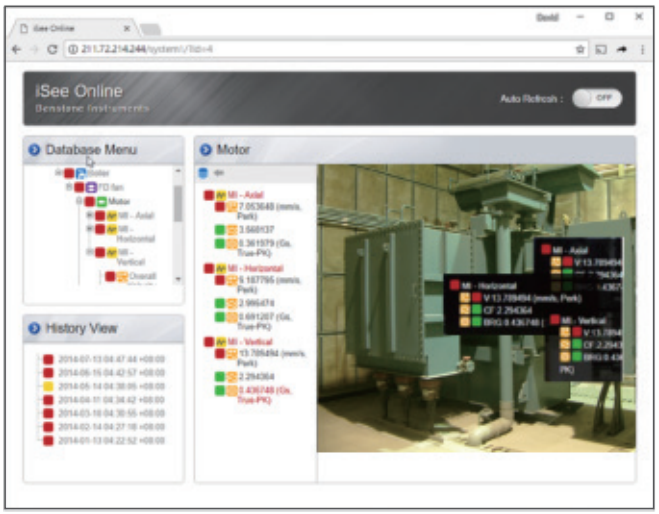




Report wizard options enable you to create your own custom reports.

Web server (optional)

The optional web server software allows viewing of the archive data across multiple computers and mobile devices. Unlike the traditional server/client technology, the web server is cost effective and has no limitation on the number of client users, and can be accessed via all platforms- Android, IOS, Windows or Linux. Simply use your browser to login to view the data. Additionally, the web server can be installed in a cloud network to view data on the internet – anywhere in the world, yet keeping your factory network secure.



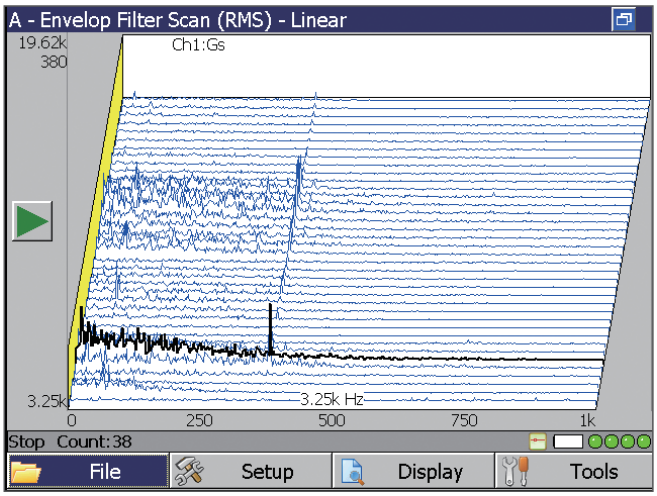
Use your browser to login to view the archive data on various platforms.

OPC and Modbus server (optional)

The optional OPC and Modbus servers make it possible to share isee online archive data to facilities that employ either an enterprise database structure (OPC) or DCS systems with a Modbus interface for further applications.

Detection of bearing failure /

When a bearing or gear begins to develop damage, the impact of the bearings' internal components will create a signal that can be viewed in Isee online. Isee online employs true-peak detection of high-pass filtered time waveforms to properly detect this condition. As damage increases, true-peak values increase. By trending true-peak values and setting correct alarm levels, critical bearings/ gears can be effectively monitored. 3D envelope scanning and envelope spectrums are also used to confirm bearing damage, aiding the proper maintenance of your machines.



3D envelope filter scanning for finding best envelope filter setting and confirming bearing damage.

VimoNet On-Line Condition Monitoring Modules /

VimoNet data acquisition modules are uniquely designed for easy configuration of your on-line condition monitoring system. VimoNet can be used with or without a network connection, be used as the data acquisition front end, or be deployed as a stand-a-lone data logger with relay and DC outputs. Equipped with high-speed DSP processing chip, VimoNet can perform signal analysis and activate relay outputs should the monitored parameters raise to alarm level.

VimoNet X1 hardware /

VimoNet X1 is a single channel module which can work in either remote mode or stand-alone mode. In remote mode, the VimoNet X1 throughputs digital data to the host computer or instrument via an Ethernet connection at real-time rates; while in stand-alone mode, VimoNet X1 works independently as a data logger for acquiring signal, conducting data calculation, controlling the relay outputs on alarm status and saving measured data to its 16G or optional 32G flash memory.

Each VimoNet X1 has two built-in Ethernet ports providing the flexibility to build a centralized or distributed monitoring networks. Create a wireless network with the addition of a wifi module. VimoNet x1 also provides an analog overall-level output with either 0-10V or 4-20 mA signal, which can connect to a DCS (distributed control system) or PLC (programmable logic controller).

VimoNet X04 and X08 hardware /

VimoNet X04 and X08 are 4 and 8 channel economical solutions with IEPE power and multiplex sequential circuits where real time monitoring is not required. Complete with bright LED's (4 or 8) for IEPE status, and showing alarm status for each channel.

Built-in memory storage if the network connection is broken. VimoNet X04 or X08 can work as a stand-alone data logger or monitoring module without a network connection with its built-in DSP processor for real-time signal processing and the ability to send relay outputs instantly when programmed alarm levels are met. The VimoNet X04/ X08 is ideal for Network connected systems, or as a stand-alone system to measure, process data, and save to internal memory, triggering relays, and showing the alarm status.

Specifications of iSee online software

Operational modes	Database, Plot and Report
Hierarchic levels	2~5 levels selectable
Measurement types	overall acceleration, overall velocity, overall displacement, crest factor, overall bearing, time waveform, power spectrum, cepstrum, envelope spectrum, 1/3 octave spectrum and Envelope scanning map, temperature and process parameters
Alarm types	overall & band alarm, edited by category
Fault frequency	bearing frequencies or user defined
Bearing database	editable 2000 bearing database or optional 500,000 bearing database
Chart types	Trend, time waveform, Spectrum and 3D waterfall and waterfall with band trend.
Cursor types	Single (multiple), harmonic, dual, side band, stay on peak.
Diagnosis tools	show/hide fault frequencies or alarm levels on the plot
Bearing condition	Crest factors and true peak values
Minimum time span	1 minute between measurements
Measurement schedule types	Normal schedule and alarm schedule

General Specifications of VimoNet modules

Input range	±5V
Maximum input voltage	±20V
Coupling	AC, DC IEPE (4 mA/22V)
A/D resolution	24 bits
Max sampling rate	102.4 kHz
Max bandwidth	40 kHz
Input impedance	1 MΩ
Ethernet ports	RJ45 (2pcs)
DSP processor	TMS320C6713B
Flash memory	16G (optional 32G)
Acceleration overall	10Hz-10kHz (±5%)
Velocity overall	10Hz~5kHz, 10Hz-1khz (±5%)
Displacement overall	10Hz-1kHz (±10%)
Band passed acceleration overall	2khz ~ 10kHz(±5%) ISO-TR-17243-1
Relay outputs	normal open, 60 Vp/30Vdc
Data types	overall, time waveform, power spectrum
Power supply	DC 24V
Power consumption	< 6W
Working temperature	-10℃~ 60℃
Sampling synchronization	with additional synchronization box
Installation mechanism	Din rail type

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Individual Specifications of VimoNet Modules

	VimoNet X1	VimoNet X04	VimoNet X08
Input channels	Real-time single channel	Sequential 4 channels	Sequential 8 channels
LED indicators	IEPE bias status Power & network status	IEPE bias status x4 Alarm status x4 Power & network status x1	IEPE bias status x8 Alarm status x8 Power & network status x1
DC signal output	DC voltage 0-10V or current 4~20mA	None	None
Relay outputs	5 relay outputs	4 relay outputs	8 relay outputs
Size	35 mm x 114 mm x 99 mm (1.38 x 4.5 x 3.9 in)	177 mm x 165 mm x 75 mm (7.0 x 6.5 x 3 in)	234 mm x 165 mm x 75 mm (9.2 x 6.5 x 3 in)
Weight	0.22 kg (.49 lb)	1.2 kg (2.7 lb)	1.8 kg (4.0 lb)

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