CMS Condition Monitoring System

Portable Vibration Analysis System

Kenjin

SHINKAWA

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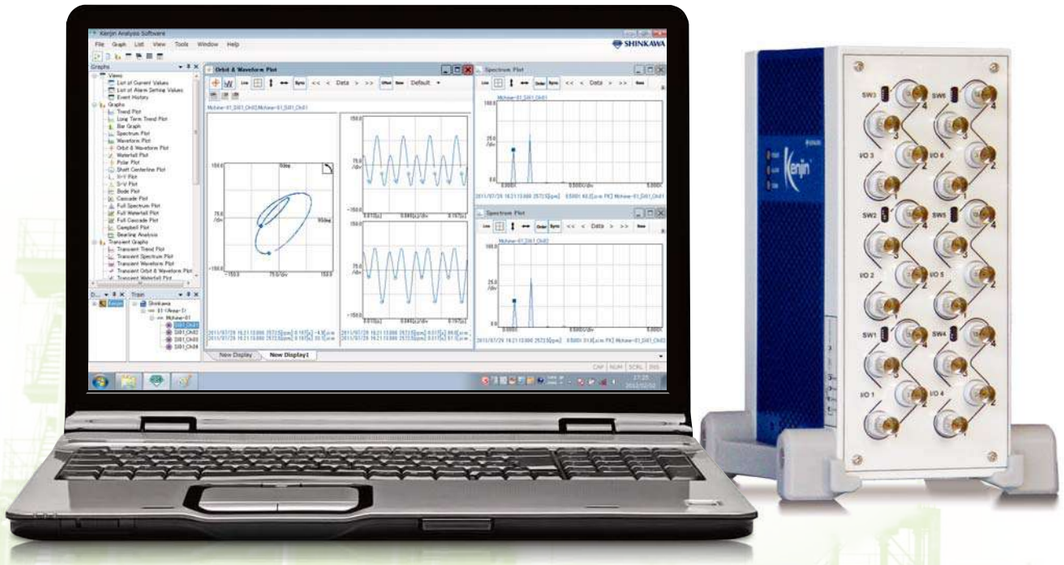
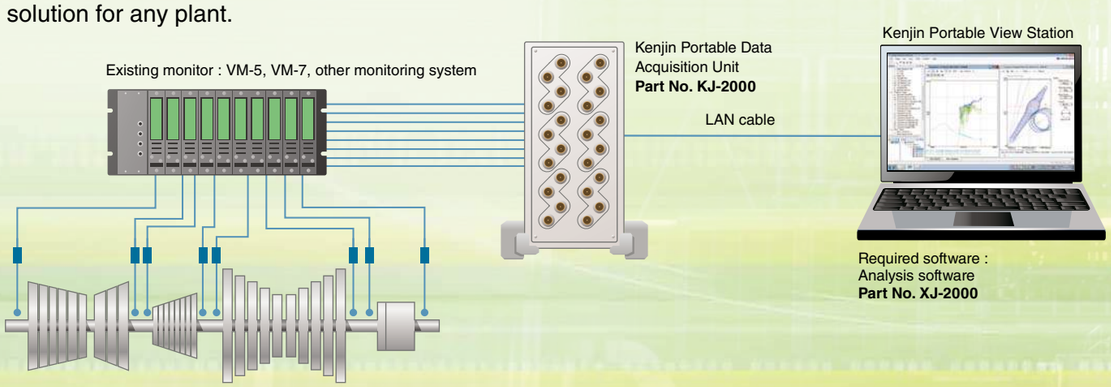
Easy to carry, easy to install.
Get real-time data acquisition with sophisticated off-line analysis system in a transportable package.

Kenjin is compact, lightweight, and transportable making it an excellent choice for vibration analysis on plant assets without permanent analysis system, and also for acquisition of transient data during startup/shutdown. This system can save time and money due to ease of use.



System Configuration

Simple configuration composed of a portable data acquisition unit and a laptop PC.
Ability to connect to existing vibration monitoring systems using buffered outputs make Kenjin a perfect solution for any plant.



Features

1 Compact, lightweight, transportable

Dimensions : 96 (W) x 224 (H) x 163 (D) mm Weight : 2.6 kg

2 Instant setup and on-site data analysis

This simple system is user friendly and efficiently provides the necessary information to analyze conditions of your critical assets.

3 High-speed data acquisition

Fast data acquisition intervals of trend data 0.1 sec and waveform data 0.1 sec.

* Time may vary, depending on the number of inputs and FFT lines (resolution).

4 Sophisticated data analysis and various graphs

The software provides a variety of analytical graphs which are optimized for the type of machinery and condition, satisfying stringent demands of vibration analysts and other plant personnel.

5 User-friendly operability and plotting functions

Intuitively software interaction with drag & drop graph display manipulation, graph area switching tab, etc.

Advantages

- **Simple setup**
- **Fast data acquisition**
- **On-site analysis of the machine condition during startup/shutdown.**
- **Abnormal machine conditions are easily identified to help prevent damage and catastrophic failures.**
- **Can be used for extended time period monitoring on BOP equipment.**

Applications

Steam turbines Gas turbines Electric generators Feed pumps Fans

Blowers Compressors BOP machinery Rotating equipment critical to your facility

Features 1 Compact, lightweight, transportable

Compact, easy to carry anywhere.

Dimensions : 96 (W) x 224 (H) x 163 (D) mm * Excluding the projection parts.

Weight : 2.6 kg * Weight does not include carrying case.

Features 2 Instant setup and on-site data analysis

Easy-to-carry portable vibration analysis system acquires and analyzes data of startup/shutdown and anomalies quickly and easily.

Features 3 High-speed data acquisition

Fast high-resolution data acquisition provides detailed analytical graph display.

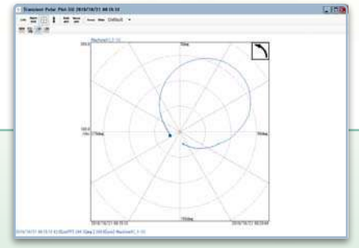
The user can see transient data even with a machine which completes startup period in a short period.

Features 4 Sophisticated data analysis and various graphs

Provides analysis/plotting functions required by vibration analysts certified in accordance with ISO 18436-2.

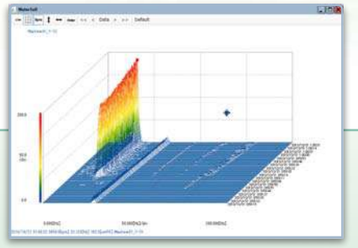
* ISO18436-2 : Condition monitoring and diagnostics of machines - Requirements for training and certification of personnel - Part 2 : Vibration condition monitoring and diagnostics

Data display examples



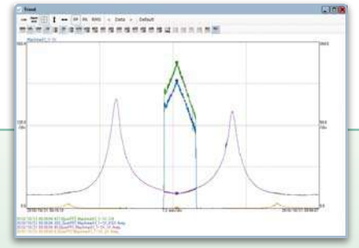
Polar Plot

This shows the vibration vector at the time of critical startup/shutdown of the machine. From this plot, the user can observe the balancing condition, vibration levels and critical speed during the startup/shutdown of the machine.
Displayed data (Switchable display): 1X, 2X
This allows over lay of current data on top of past data.



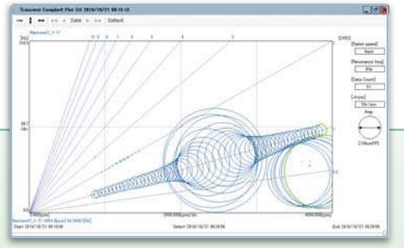
Waterfall Plot

This plot is used to analyze changes in frequency components that occur over time. Cascade plot can also be displayed with width (z-axis) as rotation speed to analyze changes in frequency components in relation to changes in rotation speed.



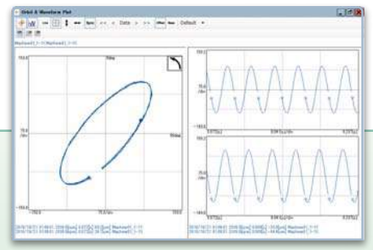
Trend Plot

This plot displays short term and long term chronological changes using a line chart.
Displayed data (multiple selections are allowed): Rotation speed, GAP, OA, 0.5 X amplitude, 0.5 X phase, 1X amplitude, 1X phase, 2X amplitude, 2X phase, Not-1X amplitude, nX1 to nX4 amplitude and phase, Smax amplitude, various alarm setting values.



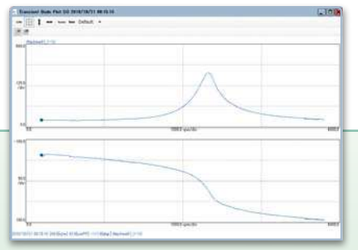
Campbell Plot (optional)

With horizontal axis as rotation speed and vertical axis as vibration frequency, the graph displays straight lines of individual orders emanating from the origin, as well as circles of amplitude proportional to the amplitude level. This plot is used to analyze rotation speed to vibration level relationship and frequency change, and to visually determine whether or not the series of vibration aligns with a specific order or specific frequency component.



Orbit and Waveform Plot

This plot composes signals from each X and Y sensor and displays the dynamic motion of the center of a rotating shaft. The Orbit plot helps to identify any abnormal status including imbalance, misalignment, oil whirl and oil whip.



Bode Plot

This plot displays the amplitude and phase in separate graphs with rotation speed used as the horizontal axis.
From this plot, the user can see the vibration status and critical speed during the startup/shutdown of the machine.
Displayed data (Switchable display): 1X, 2X
This allows over lay of current data on top of past data.

Features 5

User-friendly operability and plotting functions

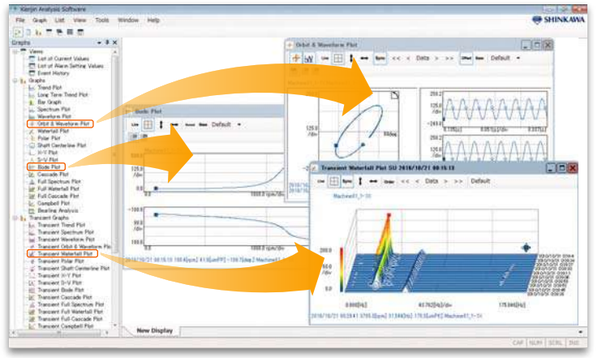
Kenjin (hardware & software) has a simple user interface, that is easy and instinctively operated by most plant personnel.

Quick learning of graphic display.

Examples of easy operation

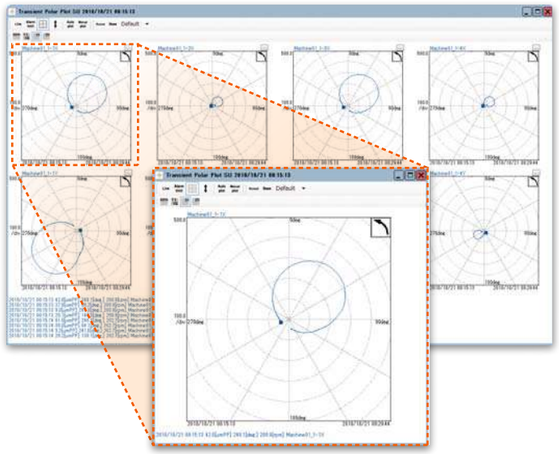
Drag & drop

From tree at left to display area at right, desired plots can be displayed anywhere you want.



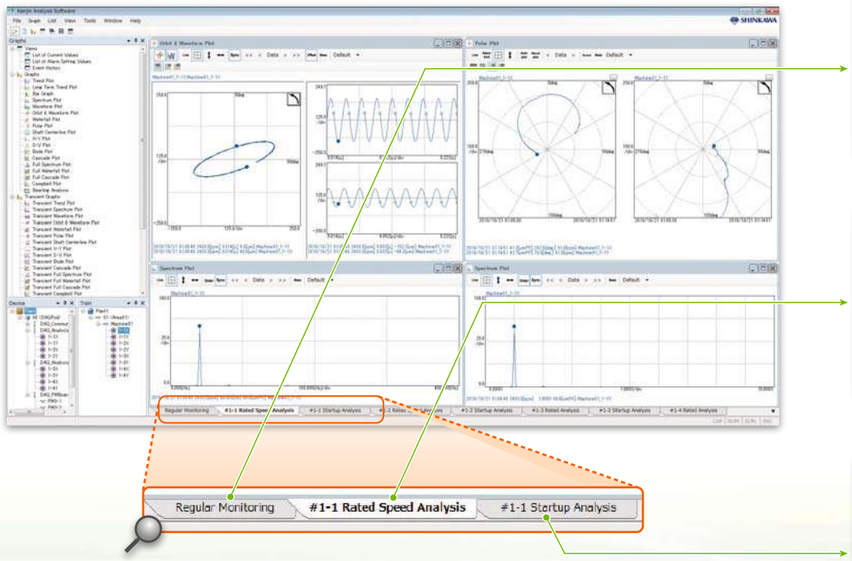
Tile display

Instant pickup of desired channel plot from tile display window. Channel plot specific window opens with one click.

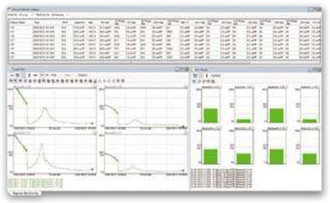


Page switching tab

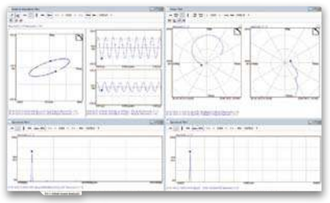
Desired graph display page can be displayed simply by switching the tabs.
A step to create a new page is also simple. (Up to 20 pages.)



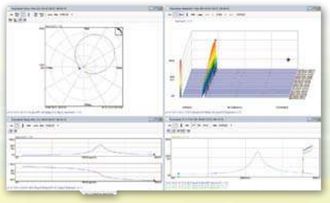
Regular Monitoring Data sample page



Rated Analysis sample page



Startup Analysis sample page

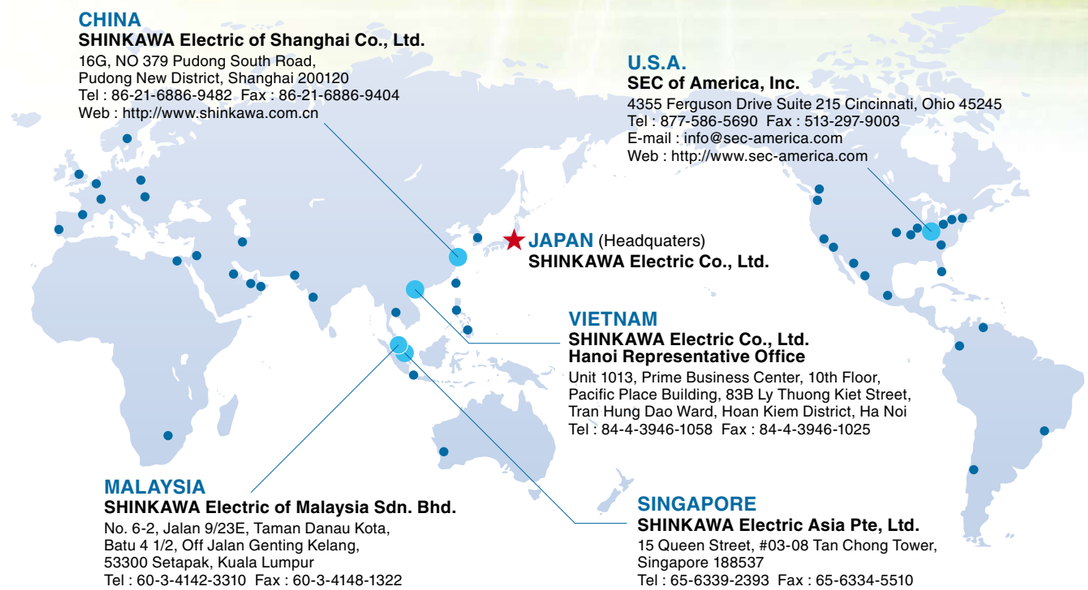


Up to 20 pages can be created.

Pages with desired plots in desired arrangement can be created with specified tab name. Users can lock the displays as well, this allows uniformity and protection on your custom view settings.

The SHINKAWA Network

SHINKAWA is employing global thinking to create a business with a worldwide network currently comprising over 50 bases around the world.



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Analysis Software Kenjin XJ-2000 Specifications

System requirements	
Processor	Intel® Core i5
	(2.4 GHz or higher processor clock speed recommended) *1
Memory	4 GB or more recommended
Display	1280×800 or higher-resolution video adapter and monitor
Graphic card	DirectX® 9.0C supported *2
HDD	250 GB of available hard-disk space
Drive	DVD-ROM drive
Network	Ethernet 100 Base-TX
OS	Microsoft® Windows® XP Professional SP3 or later (32 bit) *2 Microsoft® Windows® 7 Professional or higher (32 / 64 bit) *2
Connection	
Connectable units	KJ-2000 Portable Data Acquisition Unit
Number of connectable units	1
Display	
Displayable graphs :	Trend Plot, Long Term Trend Plot, Bar Graph, Spectrum Plot, Waveform Plot, Orbit and Waveform Plot, Waterfall Plot, Polar Plot, Shaft Centerline Plot, X-Y Plot, S-V Plot, Bode Plot (Optional plots : Cascade Plot, Full Spectrum Plot, Full Waterfall Plot, Full Cascade Plot, Campbell Plot)
List view :	List of Current Values, List of Alarm Setting Values, Event History Machine Train (maximum 24)

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*2 Windows and DirectX are registered trademarks of Microsoft Corporation in the United States and other countries.
*3 Weight does not include the AC adapter and the carrying case.

Portable Data Acquisition Unit Kenjin KJ-2000 Specifications

Dimensions	96 (W) x 224 (H) x 163 (D) mm (Excluding the projection parts)
Weight	Maximum 2.6 kg *3
Environmental condition	
Operating temperature	-10°C to +45°C
Relative humidity	20 to 90% RH (non-condensing, non-submerged)
Power	85 to 264 VAC (using dedicated AC adapter)
Interface	
Communication	Ethernet 100 Base-TX
Connector	RJ-45
Input	
Number of vibration signal inputs	up to 24 *4
Number of phase mark signal inputs	none, 4, 8
Input voltage range	±20 V
Sensors supported	non-contact displacement / velocity / acceleration / phase mark
Connector	BNC connector
Sampling	
A / D resolution	24 bit
Sampling frequency	up to 51.2 kHz
Number of FFT lines	400 / 800 / 1600
Communication	
Acquisition interval Trend data	0.1 sec (fastest) *5
Waveform data	0.1 sec (fastest) *5
Output	
Trend data	Rotation speed, GAP, OA amplitude, 0.5X amplitude / phase, 1X amplitude / phase, 2X amplitude / phase, nX amplitude*6 / phase, Not 1X amplitude, fX amplitude, Sp-p max amplitude
Waveform data	Synchronous sampling waveform, asynchronous sampling waveform

*4 Maximum sum of vibration signal inputs and phase mark signal inputs.
*5 Actual acquisition interval may differ depending on the number of channels and / or system requirements.
*6 "n" of "nX" can be set to any number between 0.01 and 10.00 in 0.01X step.