# Optimise the Performance of Critical Rotating Plant

**The SentryCMS condition monitoring system is a scalable addition to the Sentry G3 API670 compliant machine protection system. Providing flexible data acquisition combined with powerful analysis tools for both online and offline performance monitoring.**

**The Sentry VAM DAQ module locates in slot 6 and provides data acquisition for up to 32 sensor & 8 phase reference channels. Simultaneously acquiring and storing asynchronous sampled and order locked processed data means no event remains undetected. With the SentryCMS software offering detailed post analysis features in combination with standard order locked displays.**

**The separate SentryG3 VAM hardware concept ensures the protection element of the machine monitoring system is separate and diverse from the analysis acquisition and associated software tools.**

**Acquisition modes and the alarm configurations are programmed directly to the Sentry VAM module through the remote user interface. Other plant data can be captured and trended through both OPC and TCPIP Modbus protocols to the Server.**

SENSONICS Keeping Industry Turning

# Sentry G3 Flexible Condition Monitoring


## Data Acquisition

- Simultaneous Acquisition of Order Locked and Asynchronous Data
- Acquire on Speed, Amplitude and FTT Alarms
- Fast update rate of up to 50ms
- Trend data through OPC, TCPIP Modbus and DDS
- Field Upgradable and Independent to Protection Function

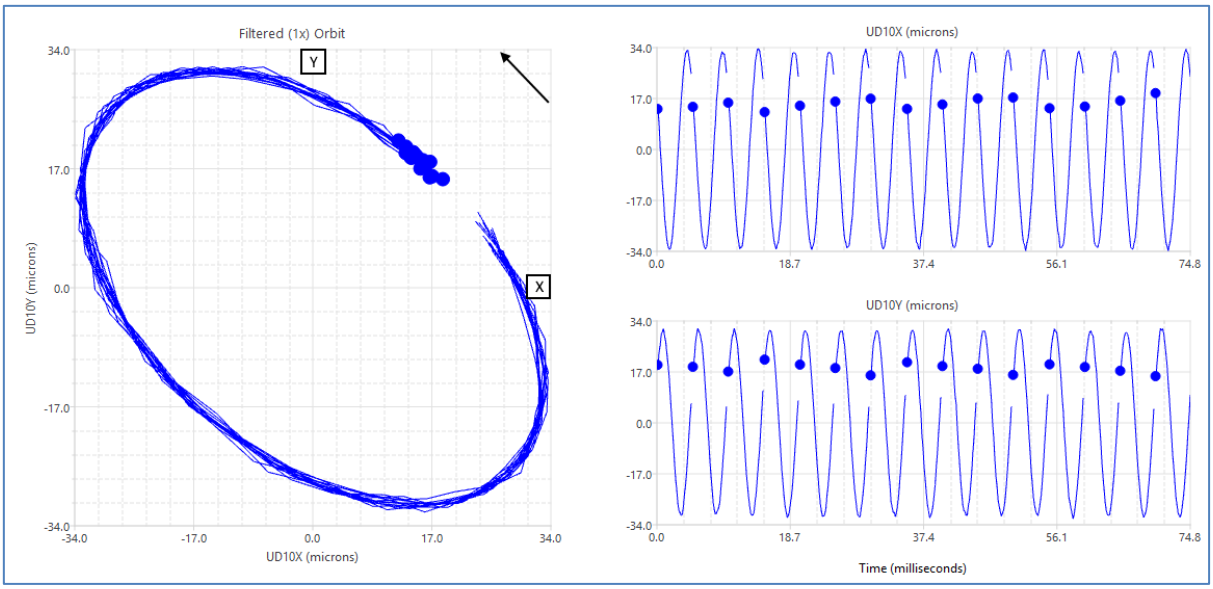
## Measurement and Display Modes

- Orbit (Full or Ordered)
- Bode
- Polar
- Bar Graph / Histogram
- Time Waveform
- FFT (Full, Horizontal and Vertical views)
- Waterfall and Campbell Diagrams
- Trend
- Nyquist
- Multiple Plot Overlays

# SentryCMS Analysis

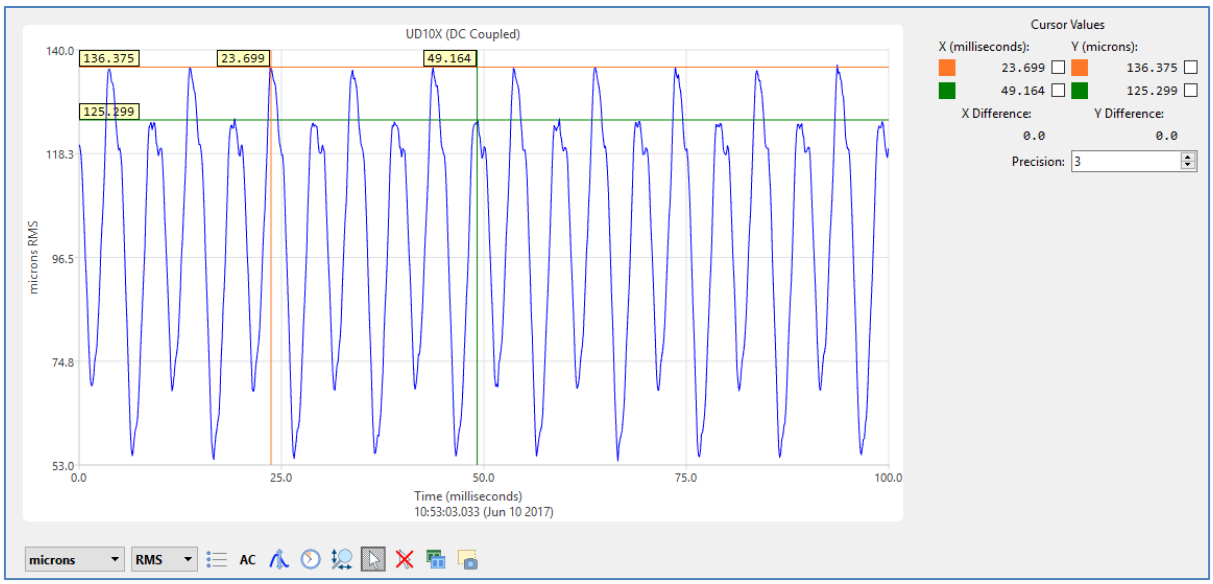
The SentryCMS application offers a suite of analysis functions offering intuitive displays with common menu functions with acquisition based on a range of machine operational states and alarm conditions.

**SHAFT ORBIT**




Orbit display can be configured for either overall or filtered to a selected order. The corresponding time waveforms for both the X and Y channels are displayed according to the number of cycles selected for display. Identify rotor unbalance, rubs and instabilities.

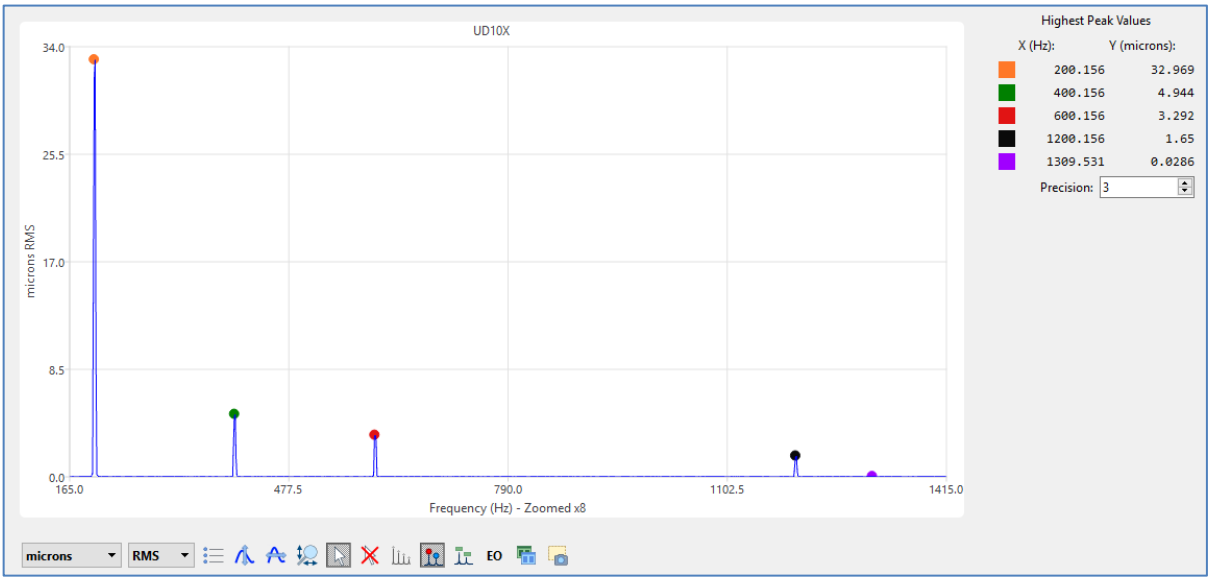
**TIME WAVEFORM**




Whilst order locked data is processed in the hardware the system acquires waveform data up to a maximum sampling rate of 25 kHz. The waveform display provides multiple marker facilities with the added function on any display of capturing the graph in an image file for report generation.

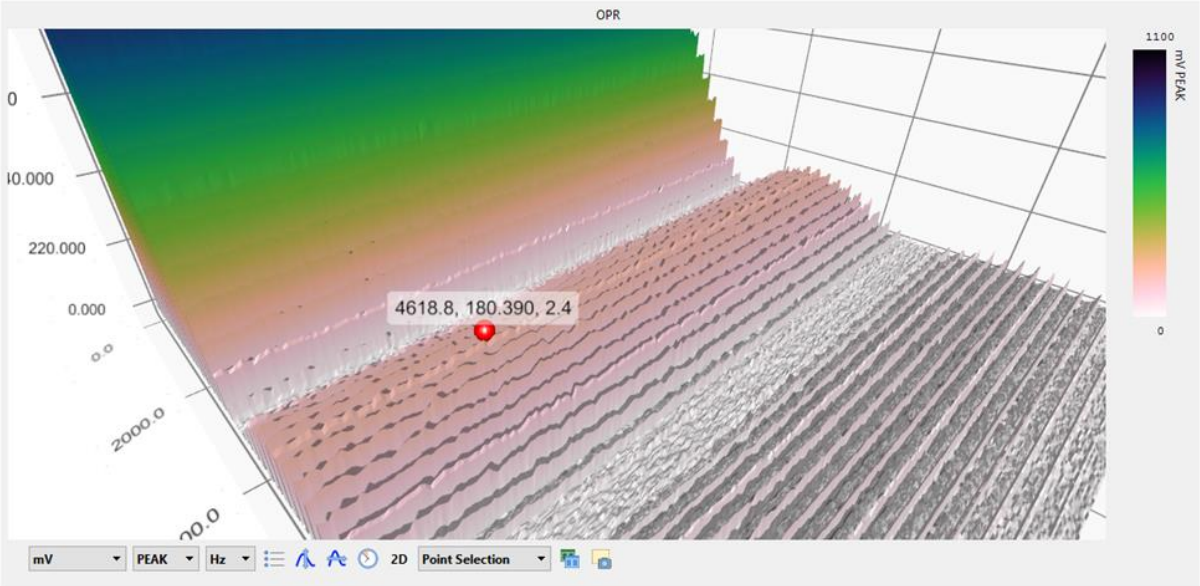
# SentryCMS Analysis

**FREQUENCY ANALYSIS**




Synchronous and Asynchronous FFT data can be displayed live or analysed offline from acquired data. Display options include normal and full FFT as well as waterfall for analysis of vibration frequency changes with machine speed and the detection of asynchronous components.

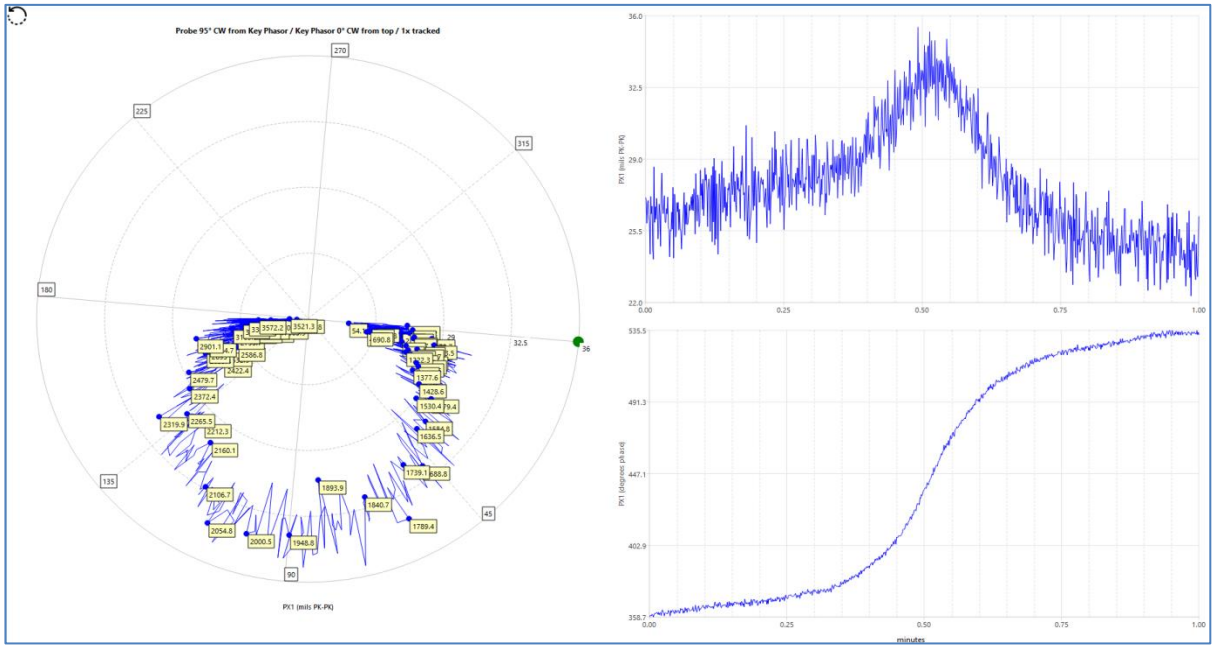
Frequency displays also provide automatic order marker functions for fast analysis of data.




Frequency data can be displayed in both Waterfall and Campbell formats providing a detailed analysis of machine critical speeds as well as the effect of speed on turbine blade vibration frequencies and associated damping. Graphical zoom and rotate features provide a professional analytical user interface which has been developed in conjunction with our customers.

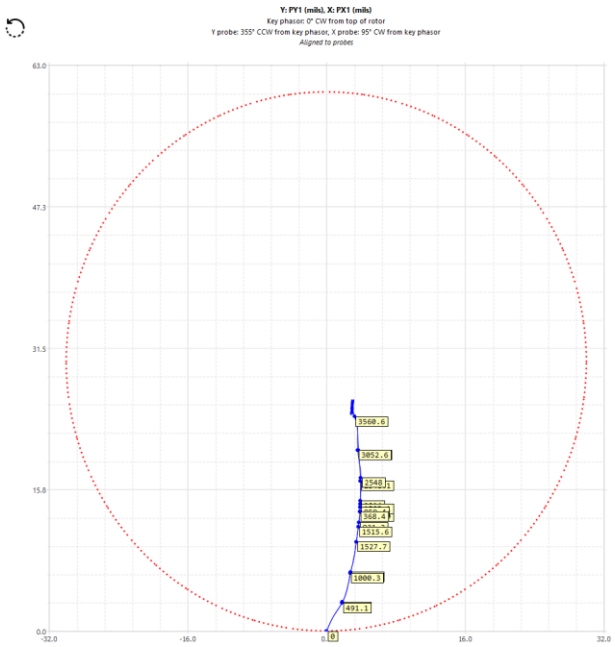
# SentryCMS Analysis

**BODE and TREND PLOTS**




Overall vibration magnitude or selected order displayed against speed with phase for determination of critical speeds and the detection of vibration vector changes. Overlay multiple channels for both current and historical data. Trend vibration data with other key process parameters through the data link communication options.

**SHAFT CENTRELINE**



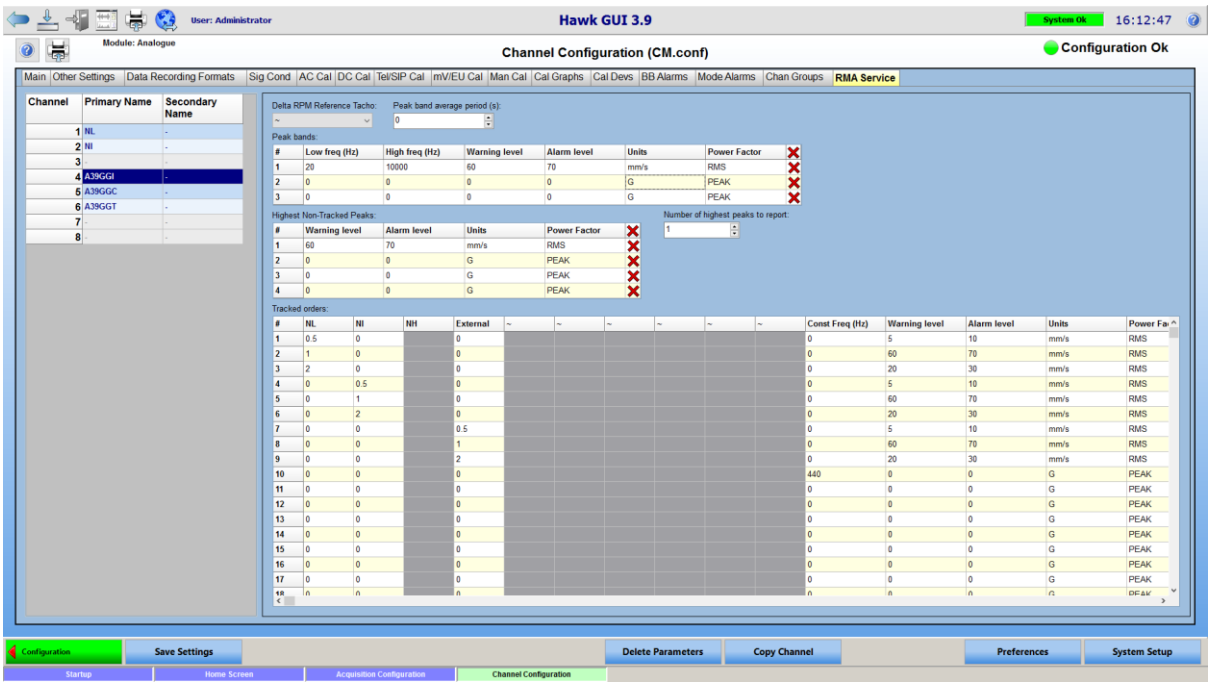

Shaft centreline plot utilises the proximity probe DC gap voltage; analyse changes in radial rotor position with respect to the stationary bearing over ranges of time and speed. Provides additional insight of the bearing performance when used in combination with the orbit analysis.

# SentryCMS Configurator

## DATA ACQUISITION

SentryCMS offers the best in class acquisition facilities with the capability and speed to collect all channel data simultaneously at the maximum sampling rate. Tagging of events in the database is a standard feature which enables rapid retrieval and analysis. Processed order locked data in addition to the full sampled waveforms is acquired providing complete flexibility in the online displayed data and offline analysis.

Acquire on speed, overall vibration or selected FFT bands, acquisition modes are configured directly in the SentryG3 VAM module hardware which permits online updating without any impact on the supervisory element of the protection system.




## ALARMS

Order locked and band alarms are configured within the SentryG3 VAM module and automatically acquired in to the dataset with up to 4 order locked alarms and 2 band alarms available to be configured per channel.

Multiple alarms can be configured across any monitored channel resulting in both visual indication in the application and database tagging. Combined with the concept of all data being acquired ensures the pre and post event vibration signatures will always be sufficiently captured, simplifying the set up and minimising the risk of insufficient acquisition during post analysis.

## SYSTEM INTERFACES

Connect the CMS server through Modbus TCPIP, OPC or DDS for exchange of process data for trending in the analysis database. System security is maintained by VPN access only to application data with web option for processed data viewing. On board data storage of 500GB ensures no event data is lost through network downtime.

# Protect your critical rotating plant

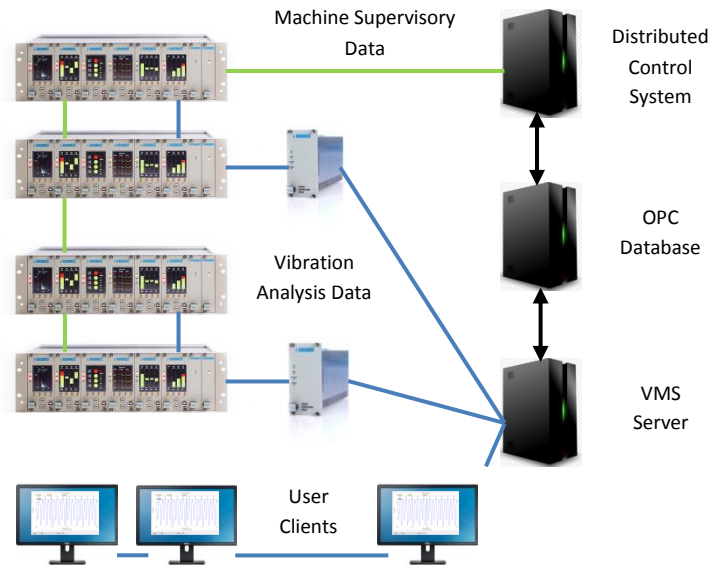
**Continuous protection and monitoring is an essential requirement for critical rotating plant in many areas of industry. Whether you are generating power, pumping essential fluids or driving process equipment – it is vital to monitor the machine dynamic behaviour through the measurement of vibration.**

**For over 40 years Sensonics has been at the forefront in developing sophisticated condition monitoring systems and products which help industry to monitor and protect critical rotating plant.**

**From its UK base Sensonics is proud of its reputation as a leading manufacturer of condition monitoring systems . This is underlined by the ongoing success of the innovative Sentry G3 system which represents the third generation of the Sentry concept – evolved from 40 years of real world applications.**

**The Sentry G3 Machinery Protection System is a rack mounted high performance sensor conditioning, monitoring and analysis system. Providing a universal hardware platform for the interfacing of various sensor types to meet with the demanding applications of rotating machinery protection.**

**Typical Connectivity Diagram**




Sentry G3 Module Options

Four Channel Universal Monitor

Vibration Analysis Module – 32 Chan

TCPIP Communication Module

Universal Mains Power Supply

## Applications

- Steam Turbines
- Industrial Gas Turbines
- Hydro Electric Machines
- Electric Motors and Generators
- Centrifugal Pumps and Compressors
- Axial Compressors
- Horizontal and Vertical Pumps
- Turbo expanders
- Fans and Blowers
- Centrifuges


Tel: +44 (0)1442 876833
Fax: +44 (0)1442 876477
Email: sales@sensonics.co.uk
Web: www.sensonics.co.uk

Sensonics Ltd
Northbridge Road
Berkhamsted
Herts, HP4 1EF
United Kingdom


SENSONICS Keeping Industry Turning