

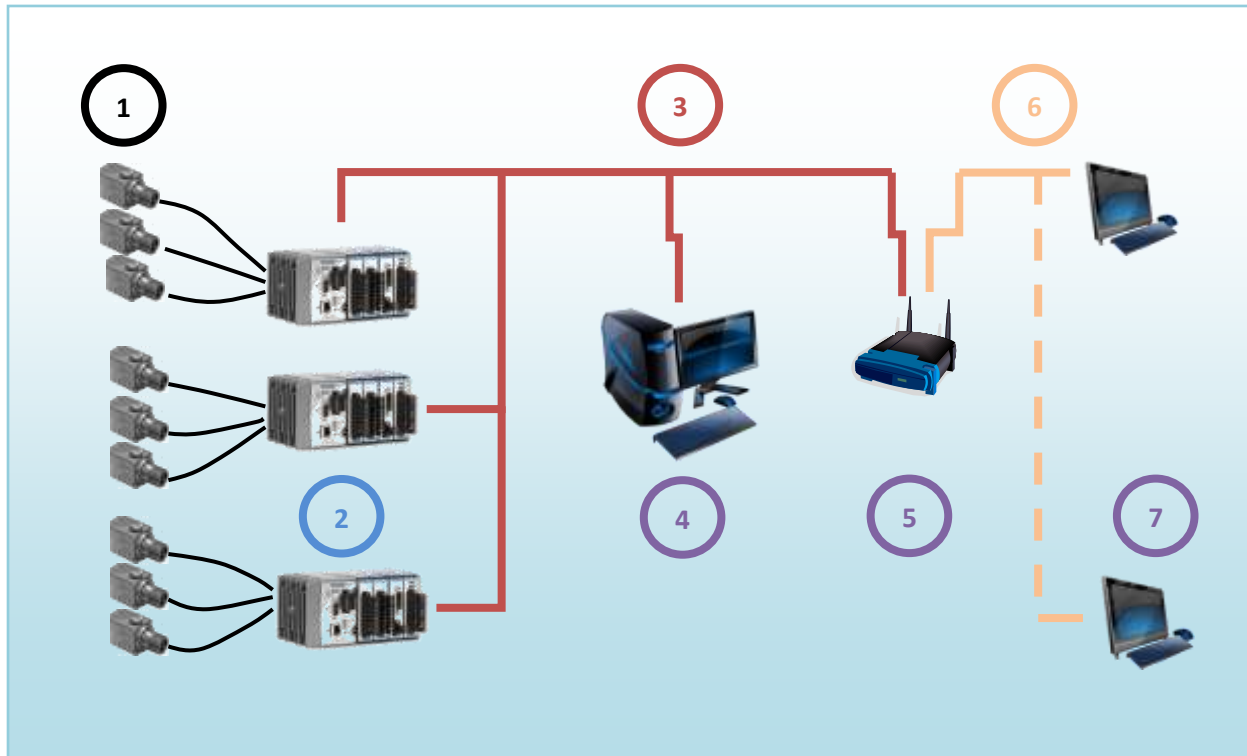
Online-system

Machinery Health Monitoring System

Maskindynamikk AS

2010

Distributed architecture



1. Sensors
2. Data acquisition node
3. Network

4. Server and database
5. Gateway
6. Internet

Sensors and Signals

- Accelerometers
- Pressure
- Temperature
- Displacement
- Tacho sensors
- Other current and voltage signals
- ... Integration with other systems

Main Features

- Band based vibration level measurements
- Machine load signal utilization
- Run-up, coast down, periodic and on-alarm signals recording
- Dynamic alarm limits
- Historical data trending
- Trend level prognosis
- Advanced frequency analysis of recorded data
- Orbit monitoring
- Bodé plot
- E-mail reporting
- Web interface to on-line and historical data

Measurement Hardware

←

Embedded

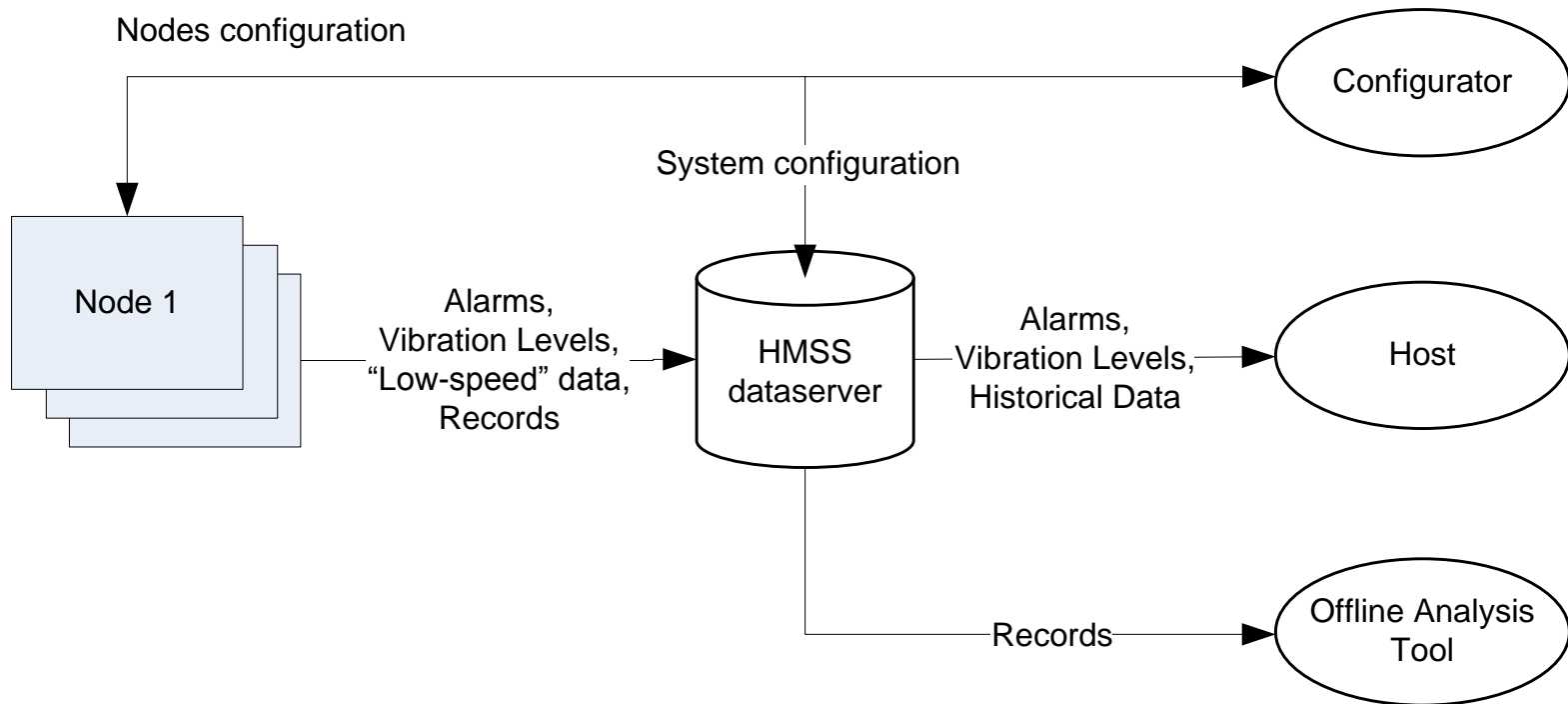


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High-Performance



Software components



Future Development

Documentation

How-to's
Video help
On-line documentation
Promotion materials

System Connectivity

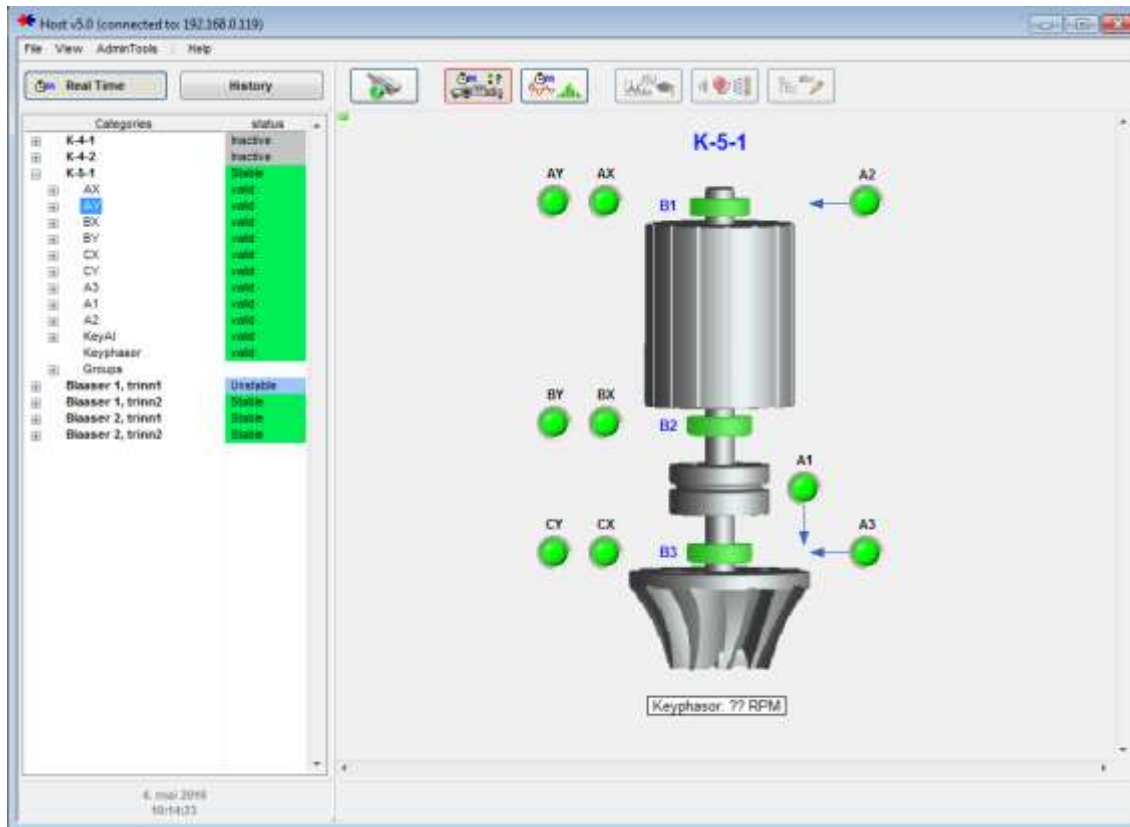
OPC,
Web Services
Web Interface

Improved Alarming

Statistical self-learning alarm
detection algorithm

UI Improvements
Mathematical models support
And more ...

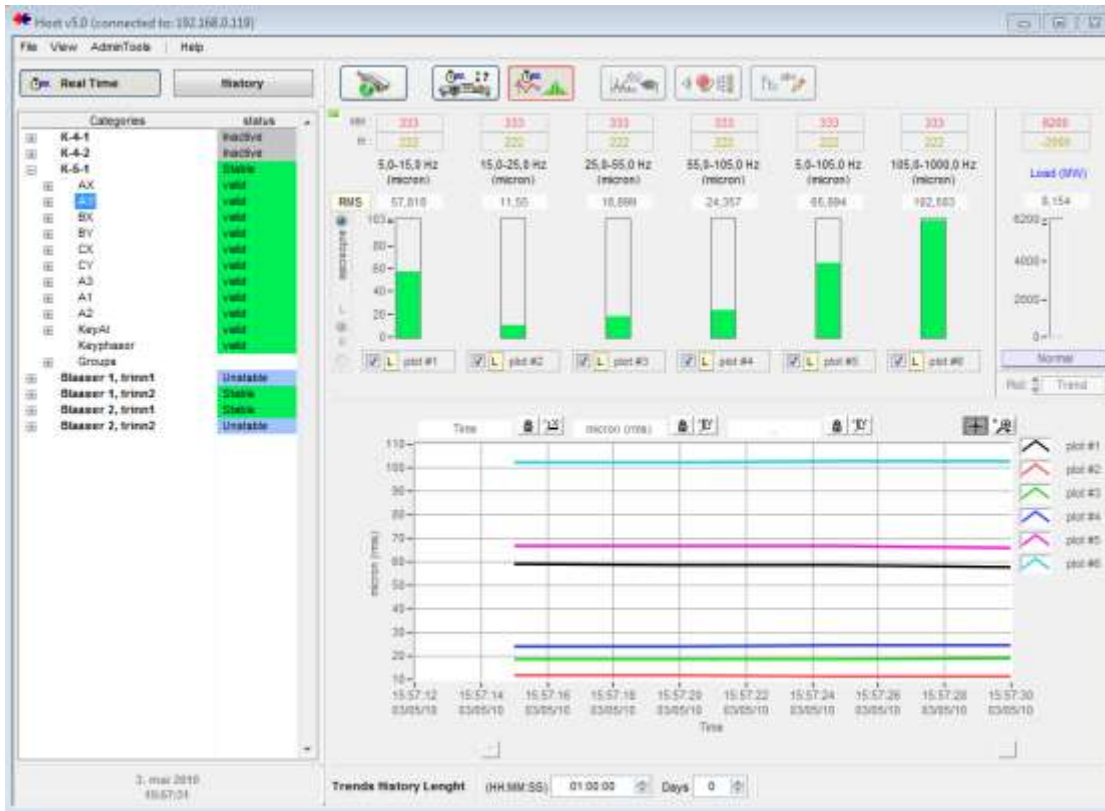
Real Time Machine Model



The activated **Real Time Model** push-button (in Real Time mode) is the one in red frame on top of the screen. Here you can select the Machine model and related measuring points/ channels. These points can be seen and selected from both the model and from the tree structure on the left side of the screen.

Color coded points where green color means that connections, signal condition, vibration level and data acquisition status are all OK. The Yellow and color means that the data points is in a warning status, and red color

Real Time Narrow Band Monitoring

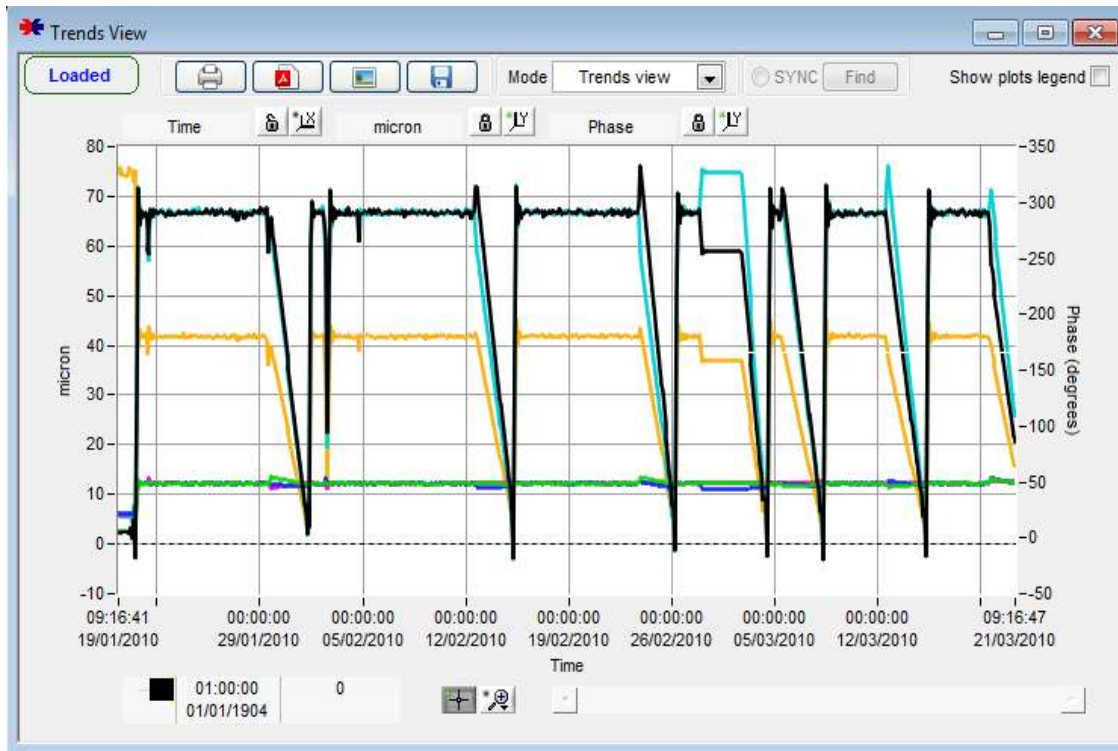


The enabled **Real Time Data** push-button is the one in red frame on top of the screen. The three-structure on the left side of the screen contains machines, channels etc. and are color coded (green = normal, yellow=warning and red=alarm).

Here you can select Machine and channel, and study the variations and levels of each individual narrow band parameters (NBP).

The warning and alarm levels are also visible on top of the screen, and **Load** on the right side of the screen. The **Trends History Length** can be adjusted on bottom of the screen. And **zoom** functions can be selected from the top right corner of the graph.

Snap-shot from Trend Analysis

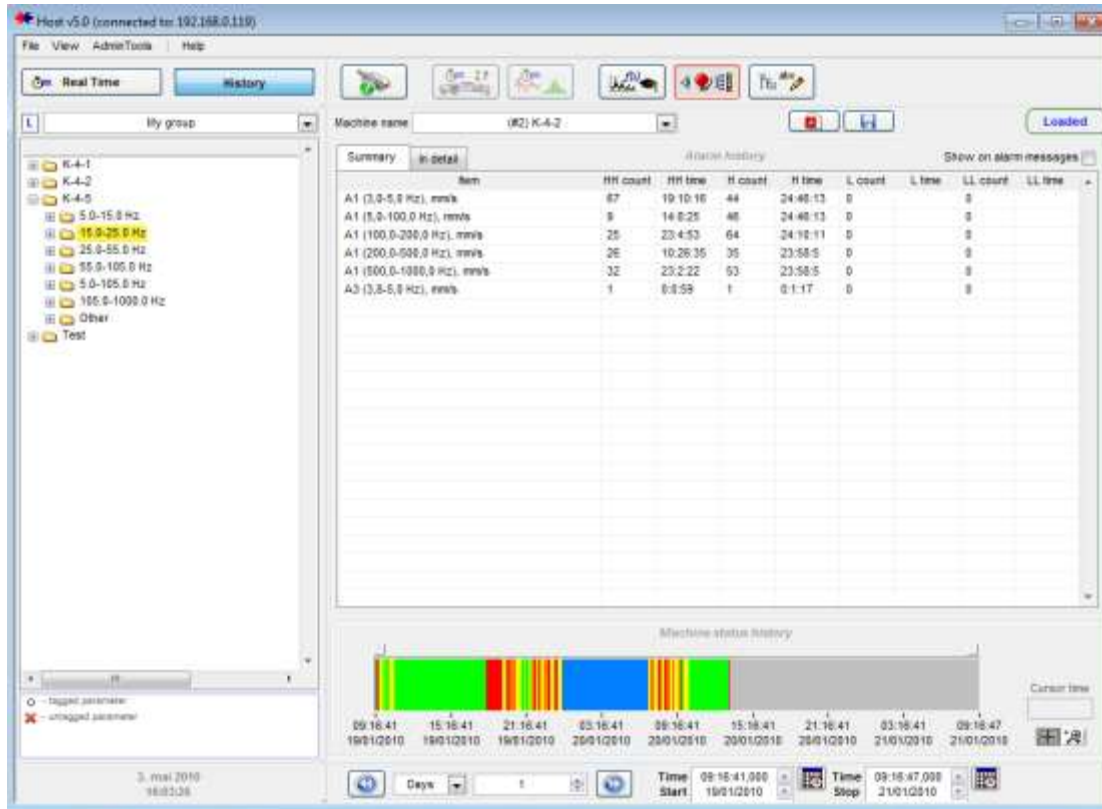


From the Snap-shot Analysis options we have now selected **Trends View** analysis. To enable the cursor – right click on the screen and select **cursor plot** and one of the available parameters.

Available buttons on top of the window allows you to print, save and report the trend plot. You can enable/ disable the **Show plots legend** in the upper right corner to identify the different parameters.

From the **mode** drop-down menu, you can select between the two modes - **Trend View** and **Forecast analysis**.

Analysis and Status History

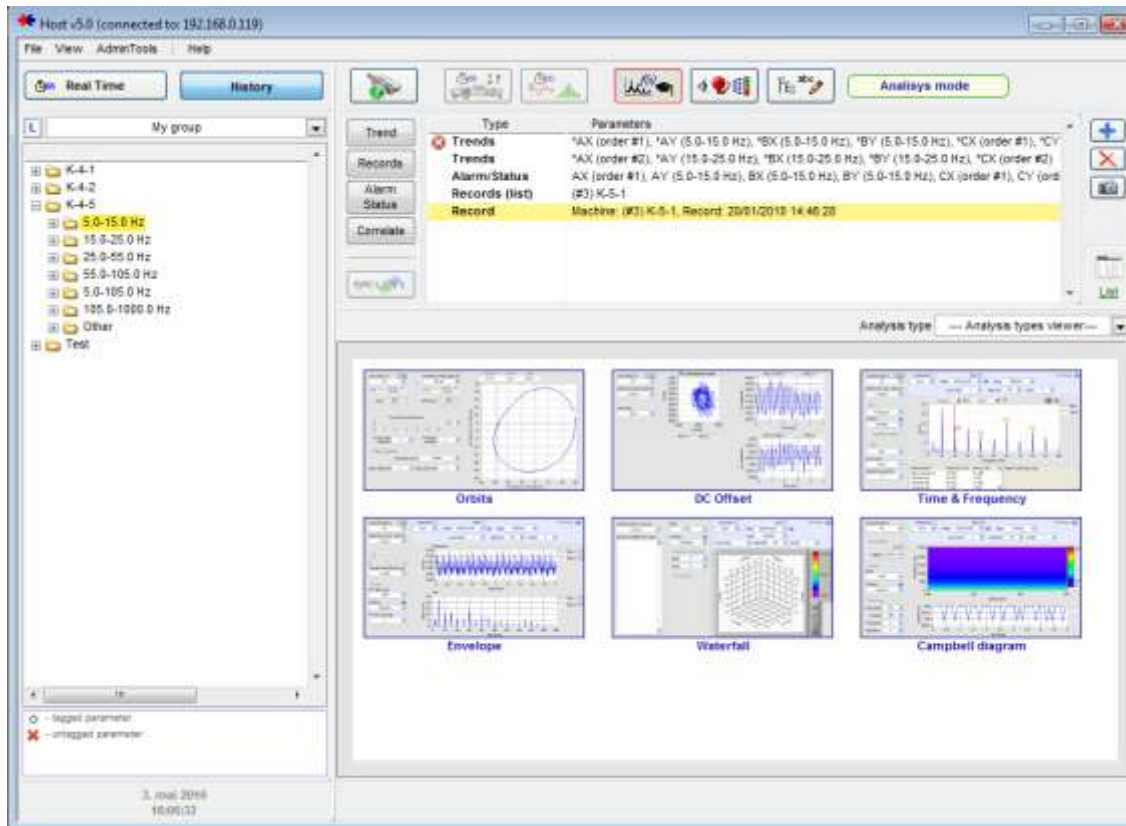


The enabled/ activated **Analysis and Status history** push-button is the one in red frame on top of the screen.

Here you can study alarm history and alarm statistics for each machine, measuring channel and analysis parameter.

You can also study the **Machine status history** – including color coded status, and easily change time span and scroll resolution in time, hours, days and months.

Analysis Groups and options

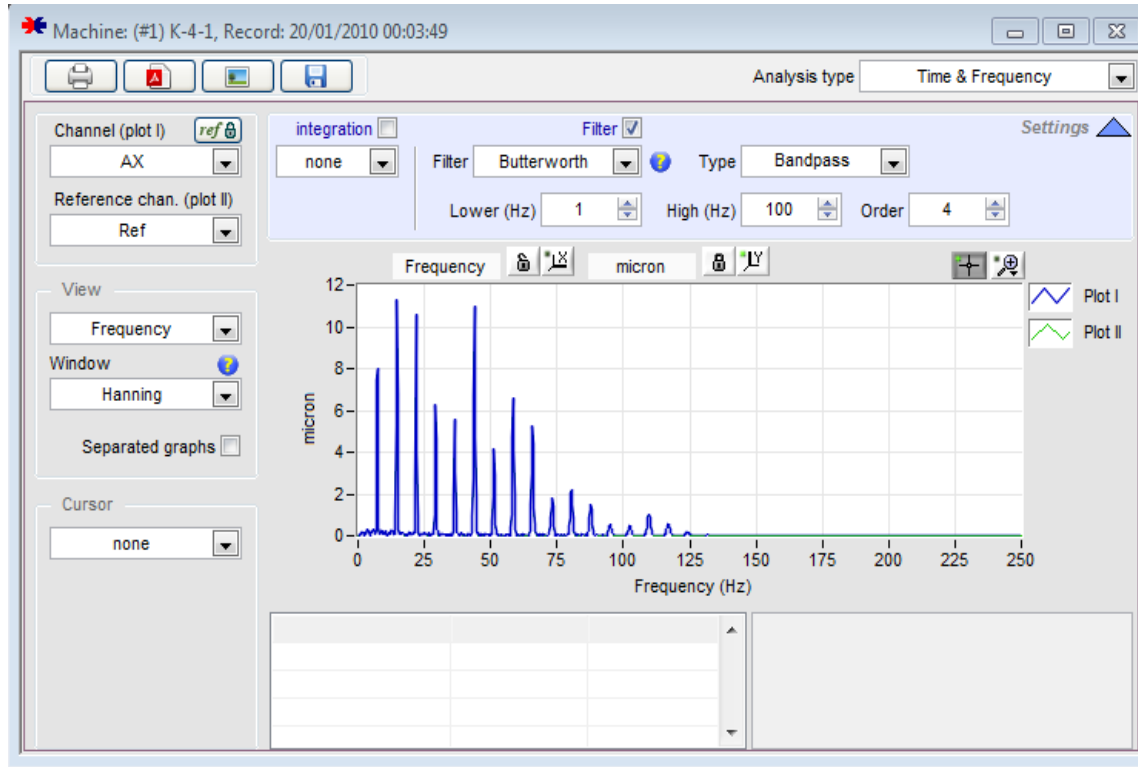


Analysis Groups are located on the left side of the screen. These groups contain analysis parameters and makes it fast and easy to analyze vibration data. There are Local groups and Server groups.

Different groups can be selected and highlighted by the mouse (here machine K-4-5 and parameter 5.0-15.0 Hz). Then click on the upper part of the screen and select one of the analysis tools for example **Record**.

The different analysis options will then be highlighted and displayed on the graphical field of the screen. Then select one of these (normally time & frequency) and start to analyze the record in question.

Snap-shot Time & Frequency Analysis - History mode

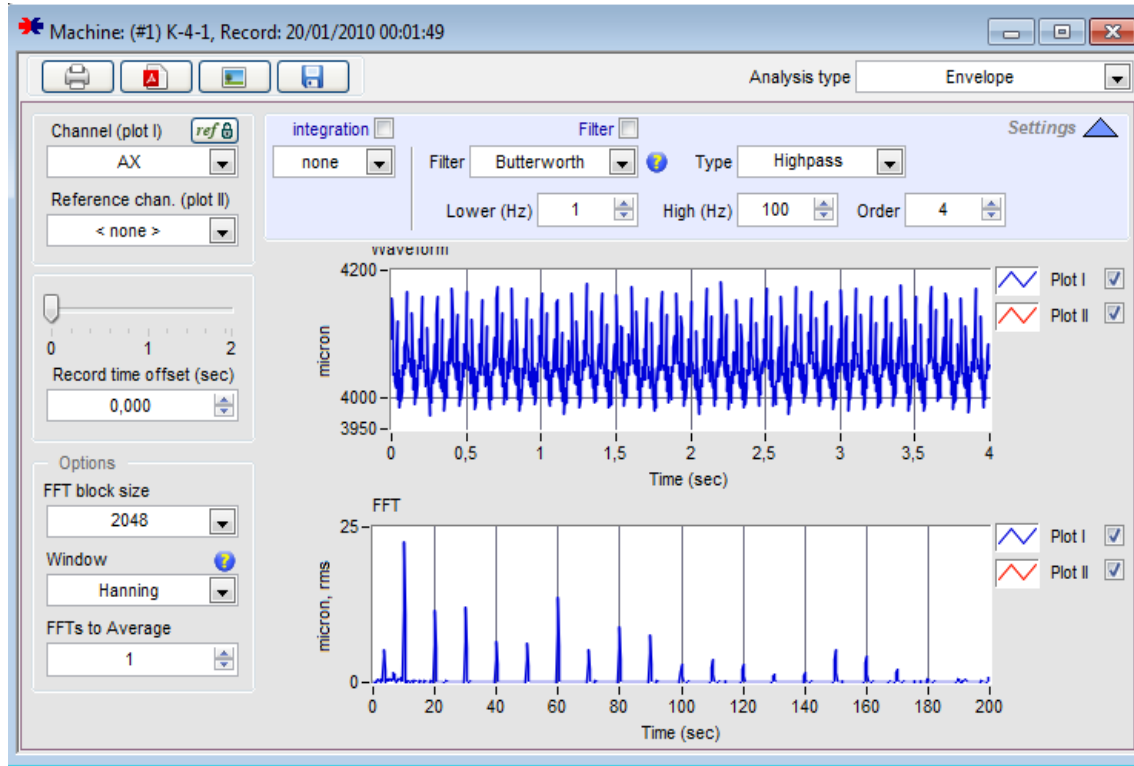


From the Snap-shot Analysis options we have now selected **Time & Frequency** analysis. From the **Channel (plot 1)** we can now select and generate Time & Frequency analysis plots for all available channels. You can select between **Time** and **Frequency** under **View** scroll-down menu.

If **Reference chan. (plot 2)** is also selected, you can view Channel (plot 1) and Reference channel in the same window or in **Separated graphs**.

Filtering options are also available on top of the screen. **Integration** and **Filter** settings can be opened and closed by the **blue arrow** button. Normally you can use the default settings, but in some cases the filter settings should be optimized for trouble shooting purposes.

Snap-shot Envelope Analysis in History mode



From the Snap-shot Analysis options we have now selected **Envelope** analysis. From the **Channel (plot 1)** you can select and generate Envelope analysis plots for all available channels.

You can use the scroll bar on the left side of the screen to view the full time signal length by scrolling through it. The **Options** controls on the left side should be used as set as defaults.