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Machine Protection

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Introduction

With RioServer software and VMU data acquisition hardware, RioTech Instruments provide a flexible, scalable and cost effective approach to monitoring critical equipment.

- Provides 24/7 equipment monitoring, vibration & process inputs
- Notifies operations when equipment needs attention
- Provides e-mail notifications with trend and spectrum images
- Internet based data acquisition & separate remote viewing options
- View trending, alarm information, spectrums and waveforms
- Wireless options for low cost and easy installations
- Scalable from small (5 point) cost effective applications to large plant wide networks (1000's of points)
- Remote software module for viewing trends and data for operator and technicians

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Hardware

VMU105

The VMU105 is our standard data acquisition module. It is a Din rail mounted unit measuring 3” X 4” X 0.5”.

- 5 input channels
- 16 Bit maximum resolution
- 20 KHz sampling rate
- Vibration ICP, tachometer or 0-5 Volt
- Communications by Ethernet, USB, RS-485, Wireless radio’s and Internet based data acquisition
- Power Input - From 10 to 24 Volt DC

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Hardware

Optional Enclosures

The VMU comes in a various enclosures for easy configuration

- VMU205 – Is a small, light weight, portable Nema 4X enclosure for outdoor applications or when users need to move the monitoring system from machine to machine on a temporary basis.
- VMU305 – Is a larger, extremely rugged, steel Nema 4X enclosure for permanent mounting applications. Optional BNC outputs are available for remotely connecting portable analyzers.

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Hardware

Optional Wireless Communications

RM-900R

- RM-900R – Is a small, light weight, portable Nema 4X enclosure for outdoor applications or when users need to move the monitoring system from machine to machine on a temporary basis.
- The RM-900R uses a 900Mhz radio technology that provides communications ranging from 500 feet up to 2 miles in distance.

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Hardware

VDK500 Portable Wireless Kit

The VDK500 kit is an all inclusive package developed for easy installations when a portable monitoring system is required! Everything needed to start is included.

- RM-900R Wireless Radios
- VMU205 Nema 4X portable enclosure
- Communication cables
- Portable Battery Supply
- RioServer Software

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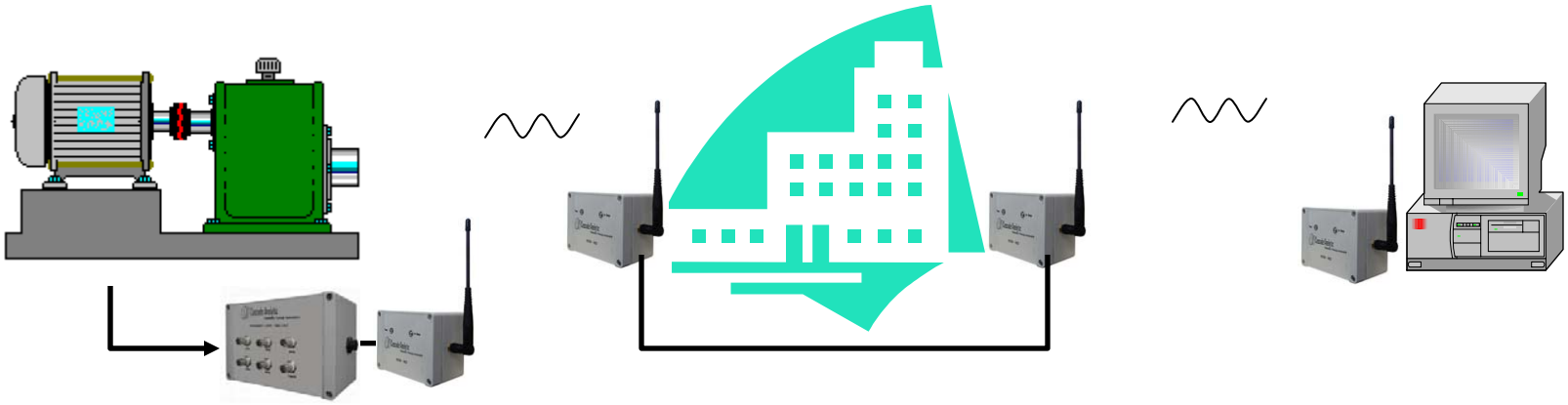
Hardware

Adding A Wireless Bridge For Difficult Applications

A wireless bridge uses two wireless modules hardwired together to overcome obstacles such as hills and buildings. Using two modules allows flexible placement for best radio reception and distance.



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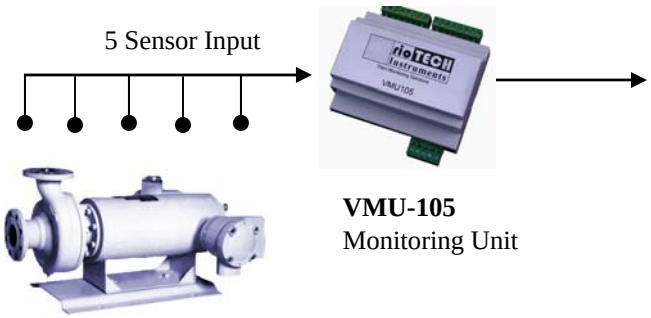
System Design



VMU-105
Monitoring Unit

Data Acquisition From A Variety Of Communication Technologies

- Internet and Direct Ethernet
- USB and RS 485
- Wireless Radios – From 500 feet up to 2 miles
- Cellular Data Modem - RioNet can also Cellular Data Modems allowing the monitoring of remote sites without phone lines or internet connections

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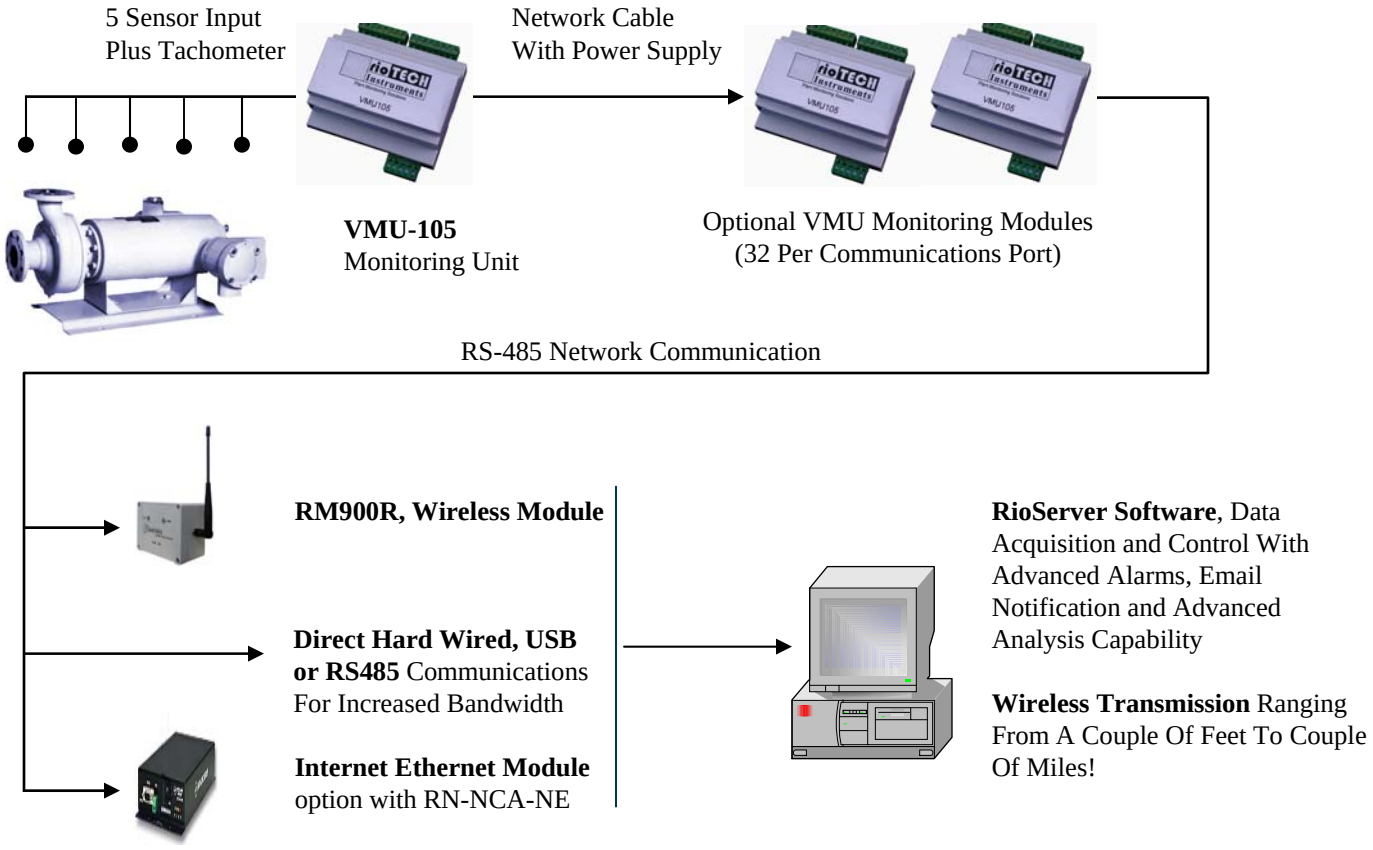
System Design



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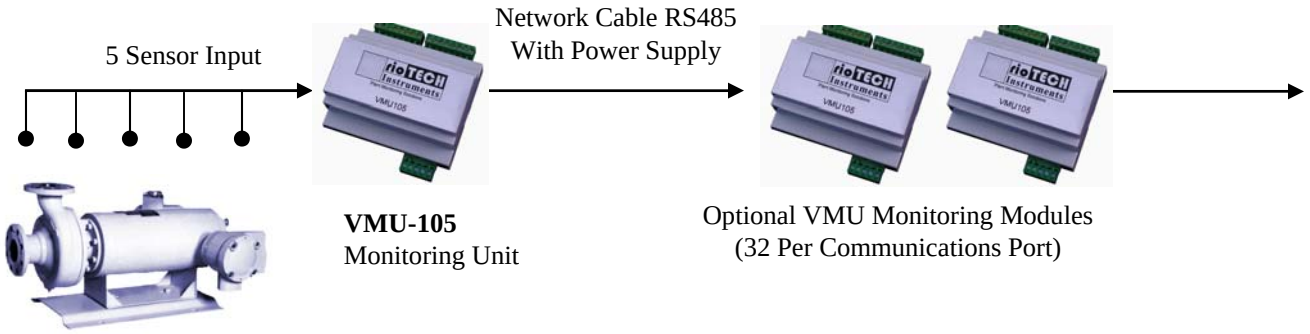
System Design



- **One RS485 network cable can manage 20 modules spanning 1500 feet**
- **Multiple networks can be managed by a single RioServer software**
- **Different types of networks such as wireless, Ethernet and USB can be combined into one RioServer system**
- **Network cable also provides operational power – avoids costly multi power supply requirements and one power supply per RS485 cable run prevents grounding differentials**

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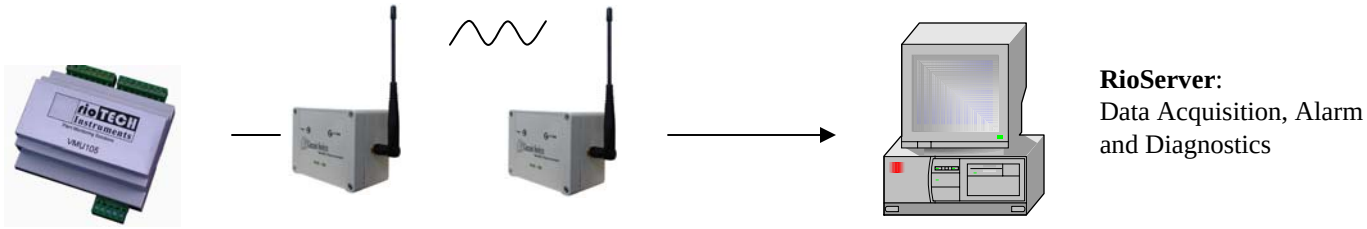
System Design



RioServer:
Data Acquisition, Alarm and Diagnostics

- **Wireless capability from 500 feet to 2 miles**
- **900mhz radios allow reliable vibration data transmission over much longer distances than the 802.11 Ethernet standard**
- **Configured for either battery, 5 volt or 120 VAC options**
- **Built-in wireless signal strength test sequence for setting up networks**
- **Nema 4X weather proof enclosures allow radio installations in harsh environments**

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System Design

Off-Site Machine Monitoring

Wireless Communications From Monitored Machine To Local Internet Connation At Location

Ethernet Module
Internet Connection

Remote Office With RioServer Software

- **Wireless Capability can be connected directly to the Internet for wide area networking**
- **Remote Internet data acquisition**

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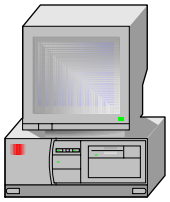
System Design

VMU-105
Monitoring Unit

Internet Connection , Local or Wide Area Network “Ethernet” USB Communications also available



RioServer:
Data Acquisition, Alarm and Diagnostics

- **Direct hardwired for simple, low cost applications**
- **Maximizes bandwidth and speed**
- **Directly connects to the local facility network**

Software : RioServer

Advanced Trending, Alarm and Analysis Capabilities

- Multi parameter alarm capability
- Email notification
- PLC and DCX output (OPC, Volts, and Modbus)
- Auto Learning Feature
- Trend - 5 Configurable Trends Per Sensor
- Automatic Alarm Profile Generation
- Data and/or Graph Sent with Alarm Emails
- Data and/or Graphs Easily Sent to Pagers, Cellphones, or PDA's

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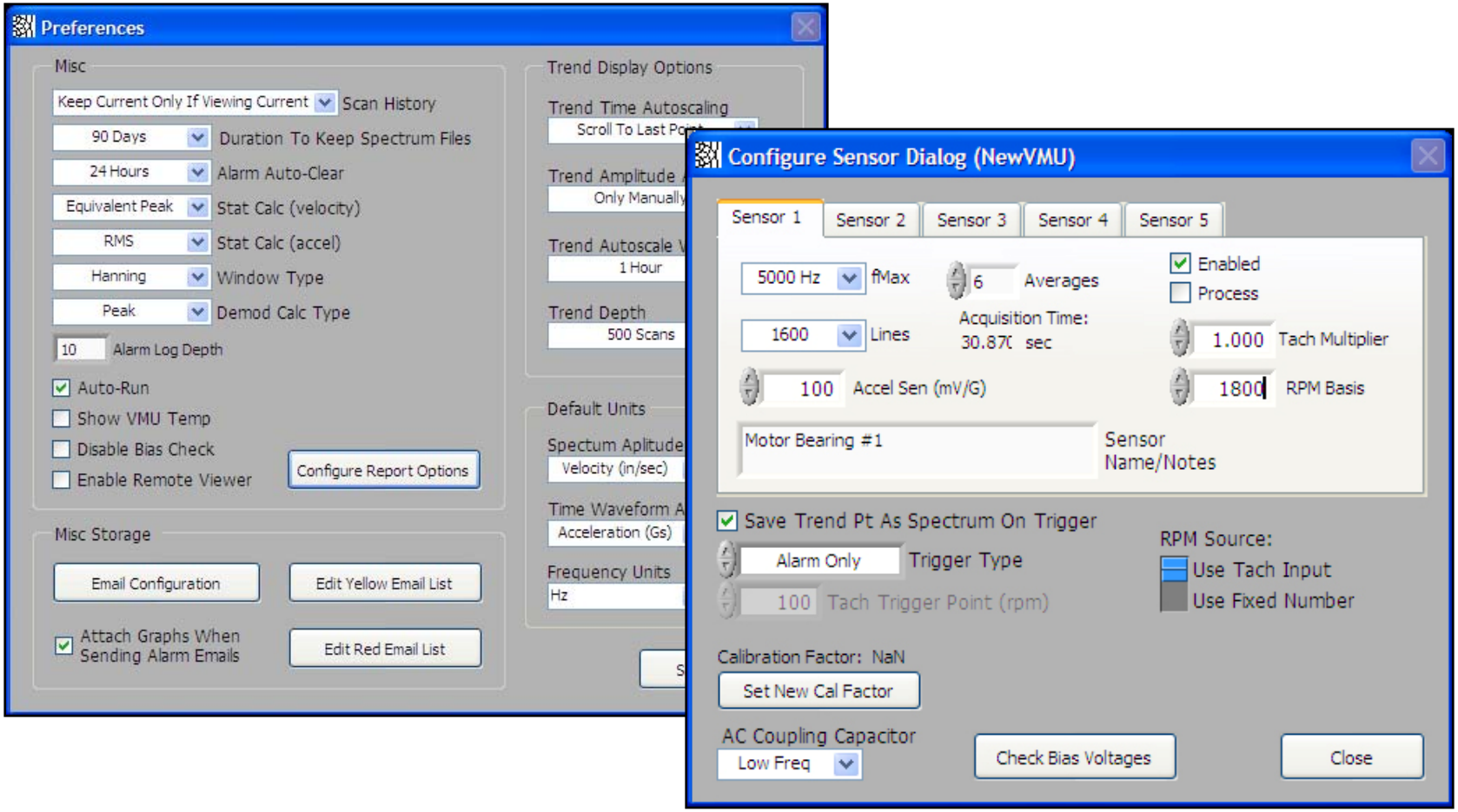
Software

Full Configuration Options



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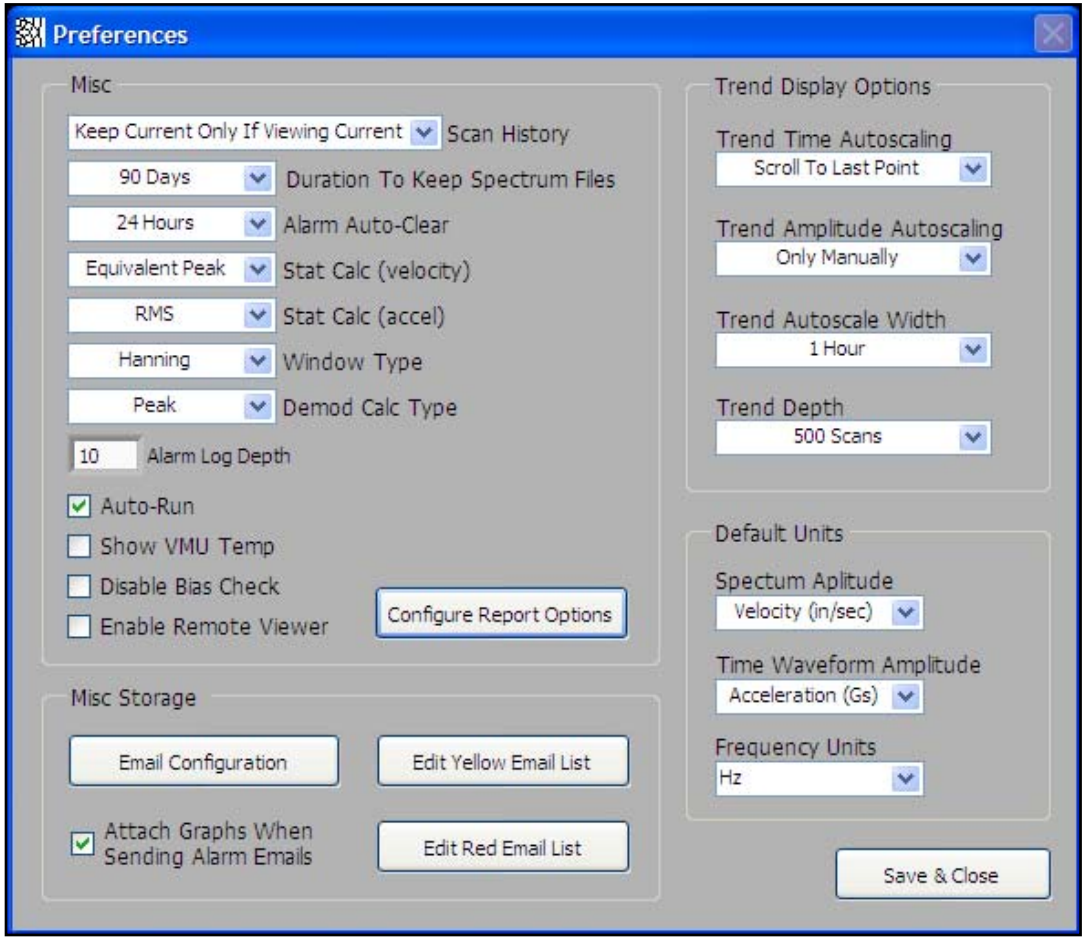
Software

Configuration



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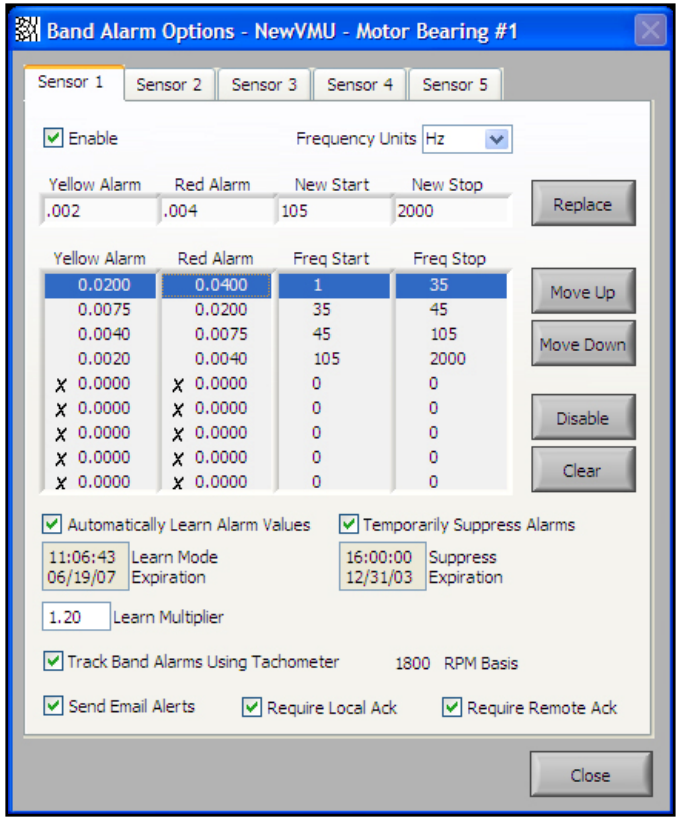
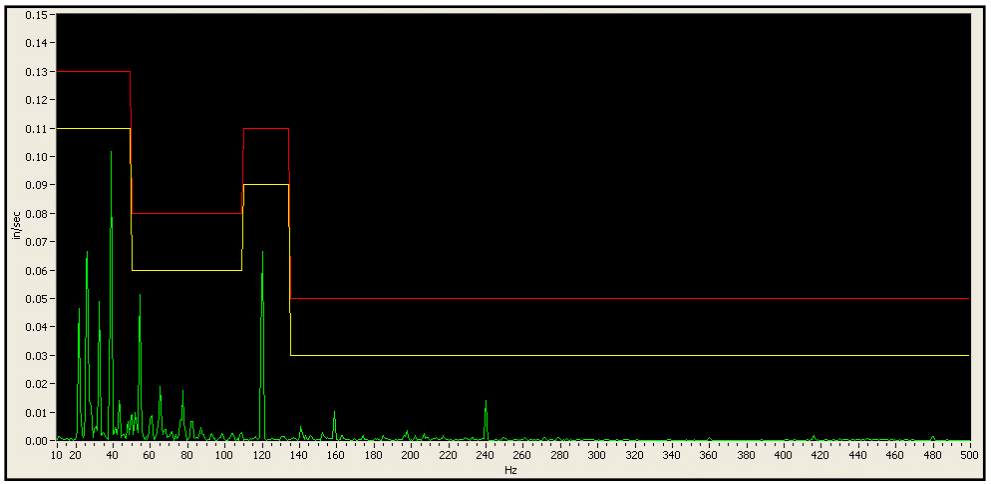
Software

Advanced Band and Envelope Alarms





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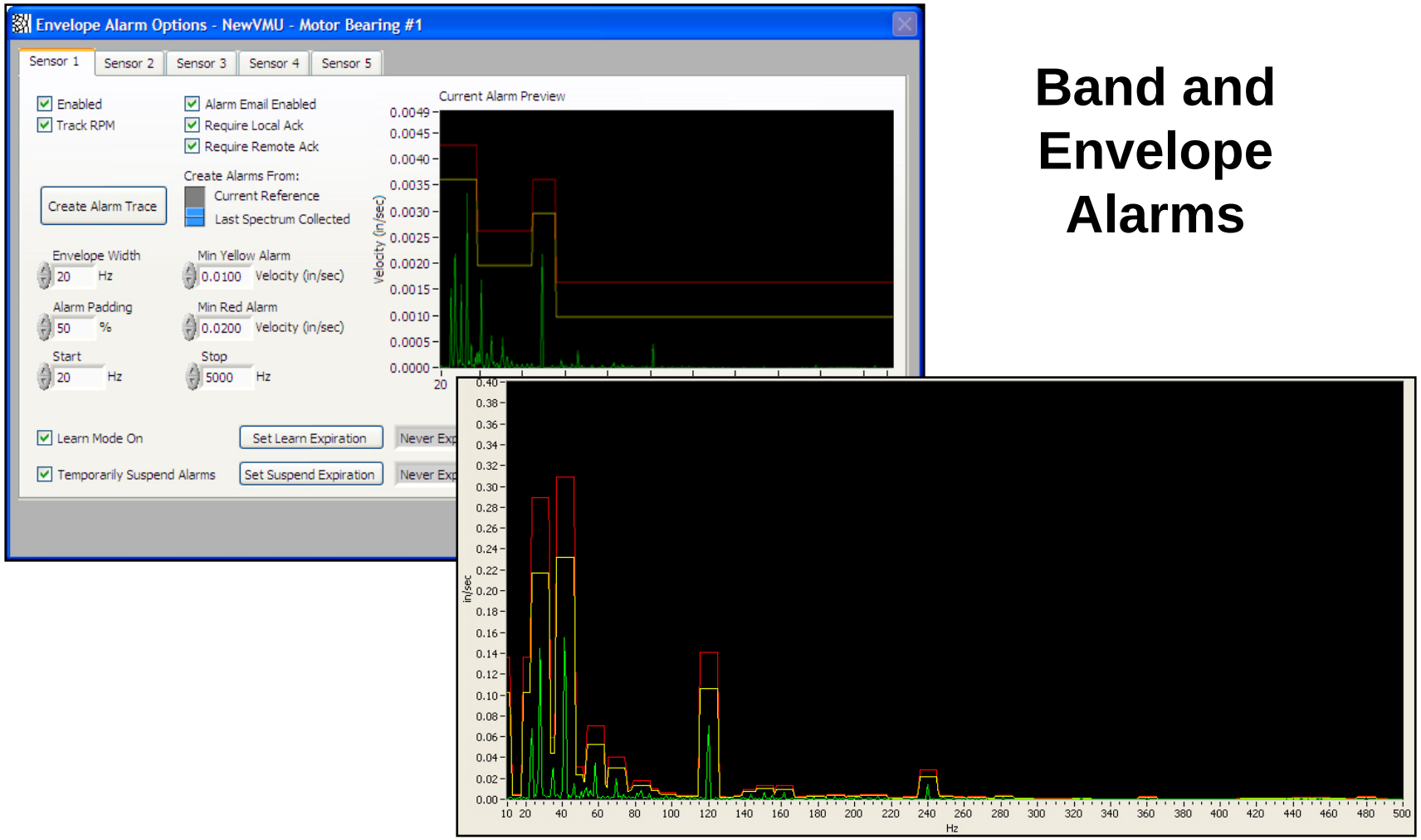
Software



Band and Envelope Alarms

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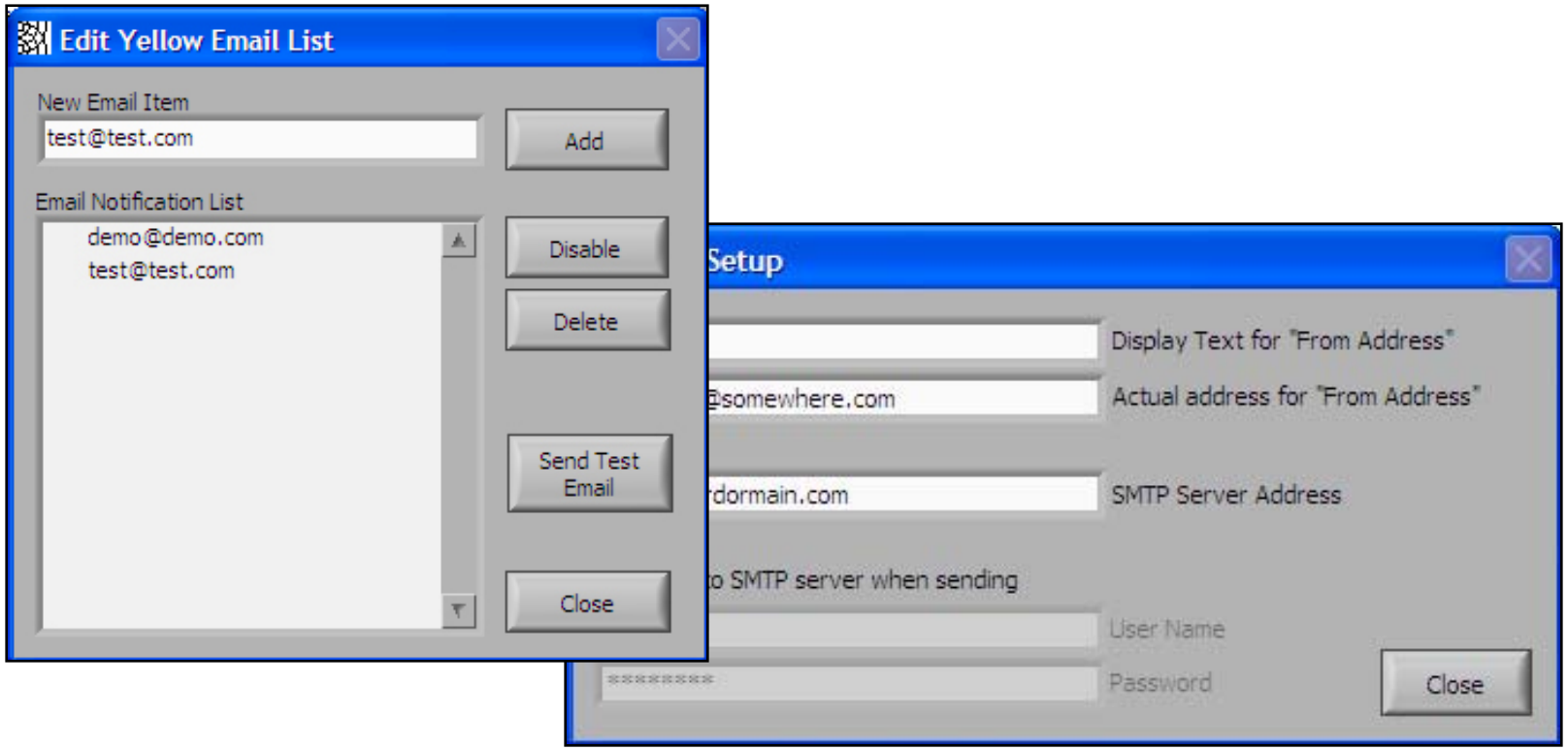
Software

Email Alarm Setup:

Email options include attached Image and Data



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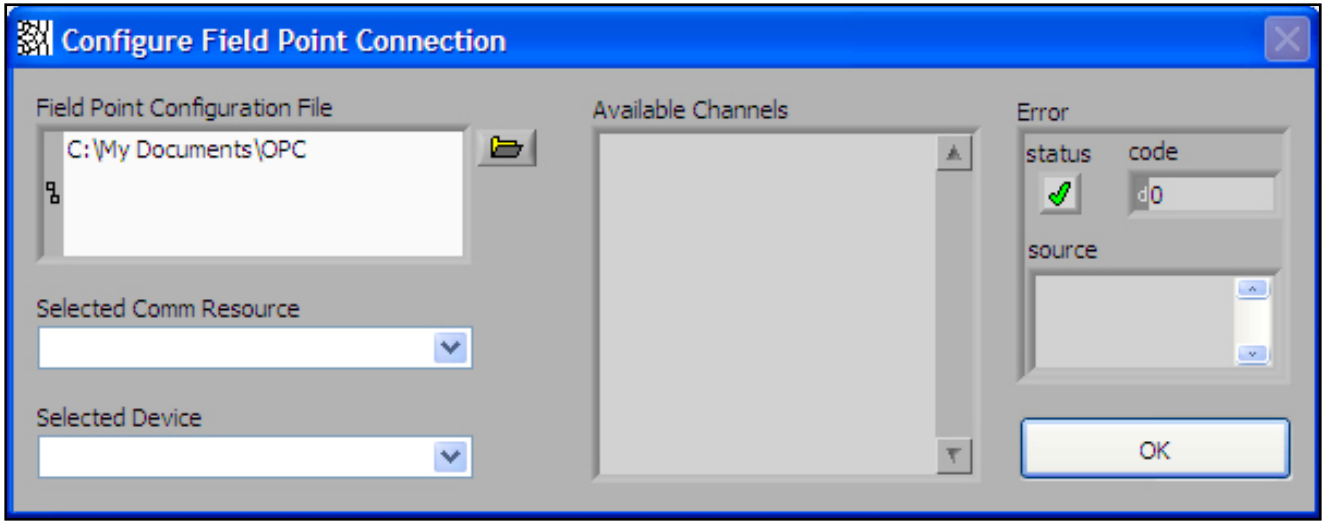
Software

Software and Hardware Output Interfaces

- 4-20mA, 0-5V outputs
- Modbus
- OPC



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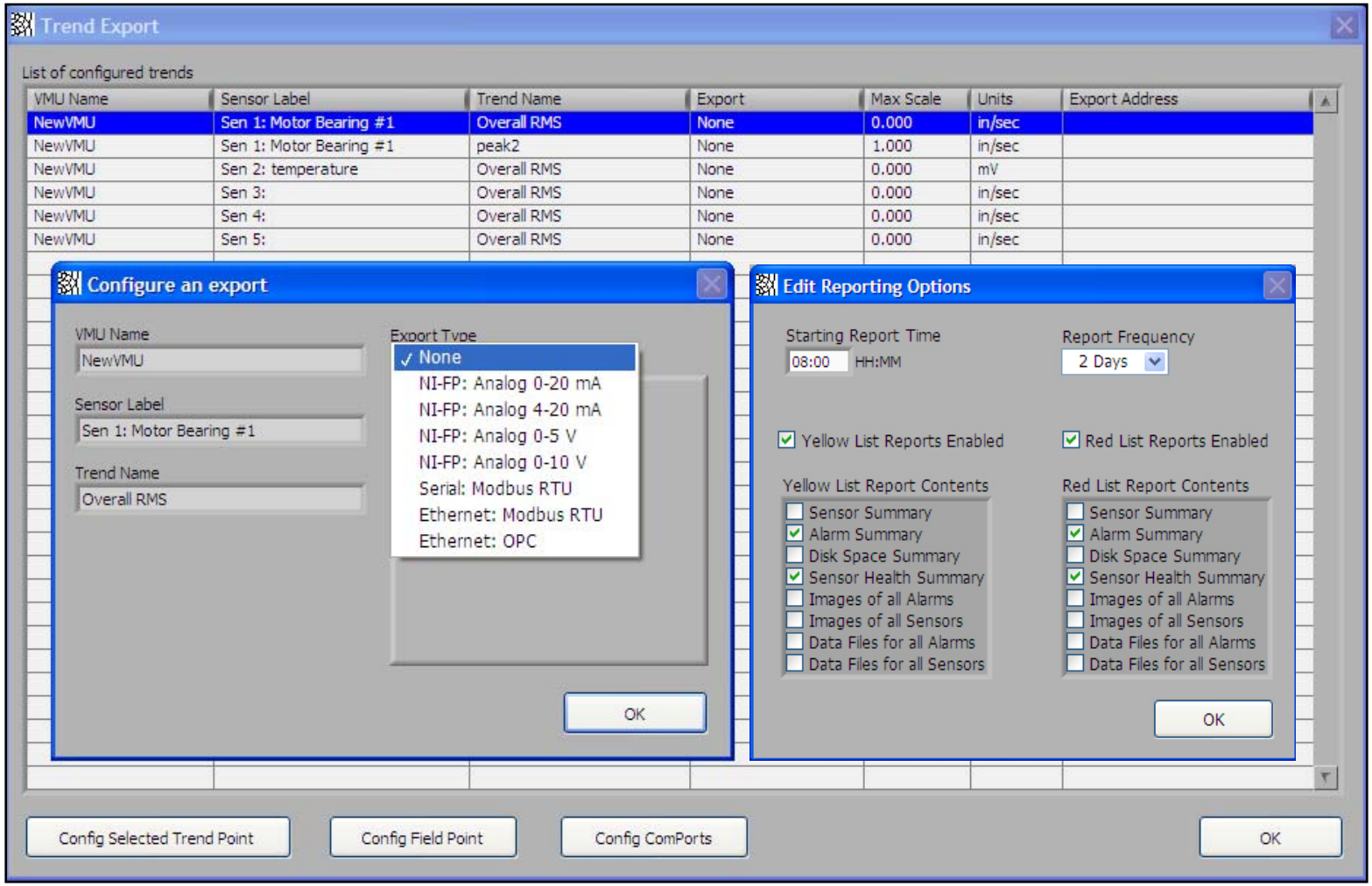
Software

Output Interfaces – Modbus and OPC



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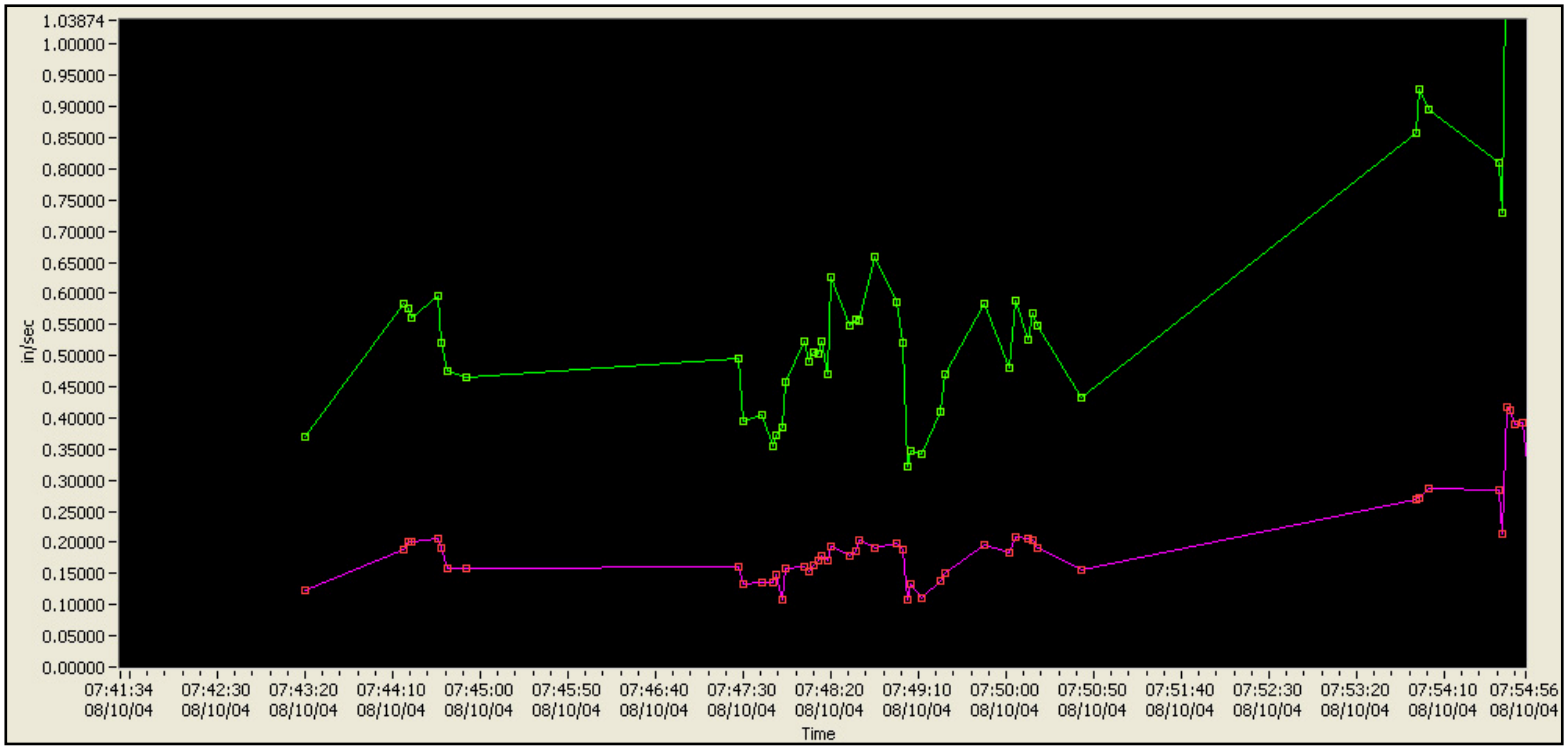
Software

Multi Trend Display and Alarm Capability



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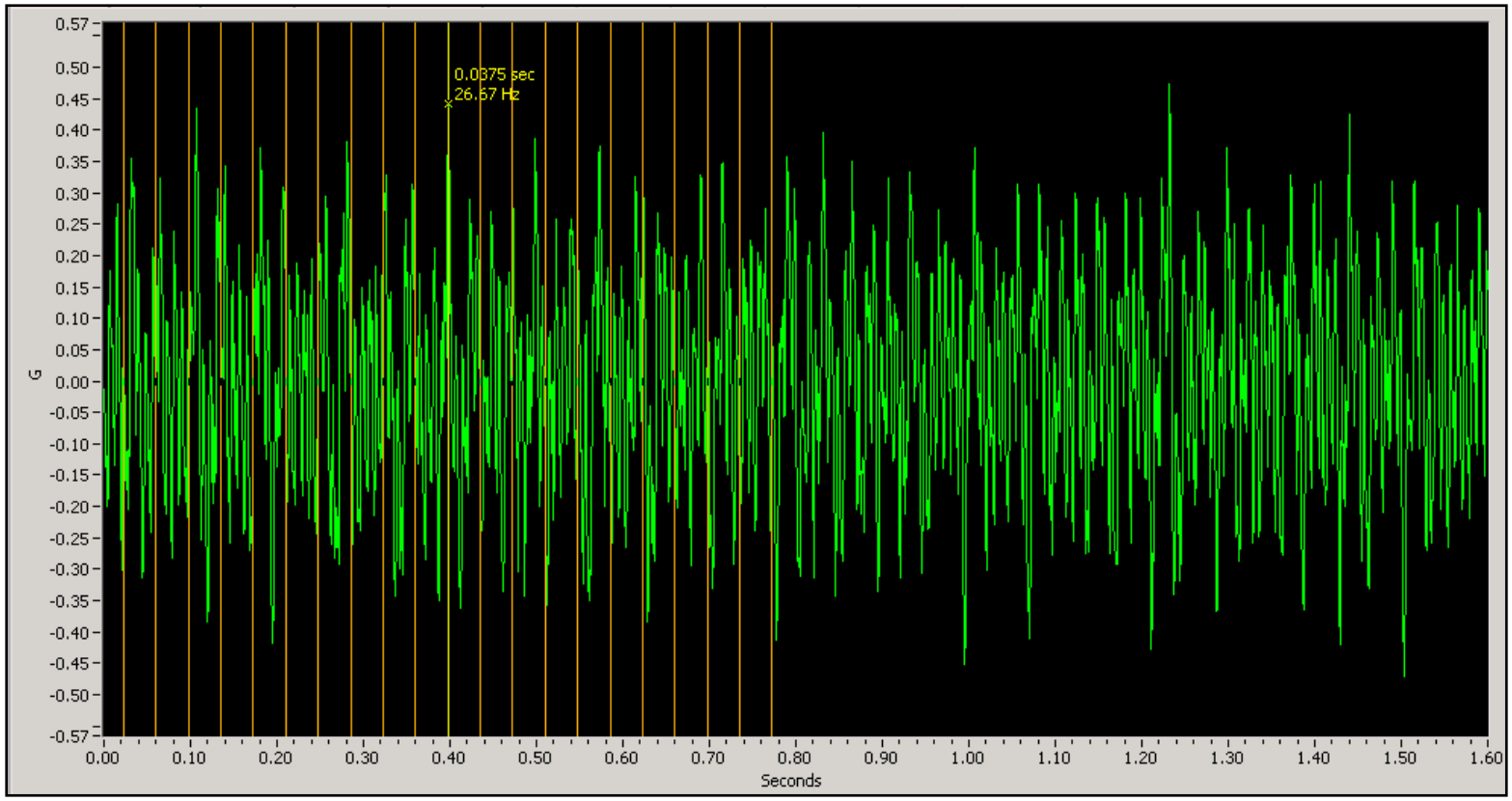
Software

Time Waveform Analysis



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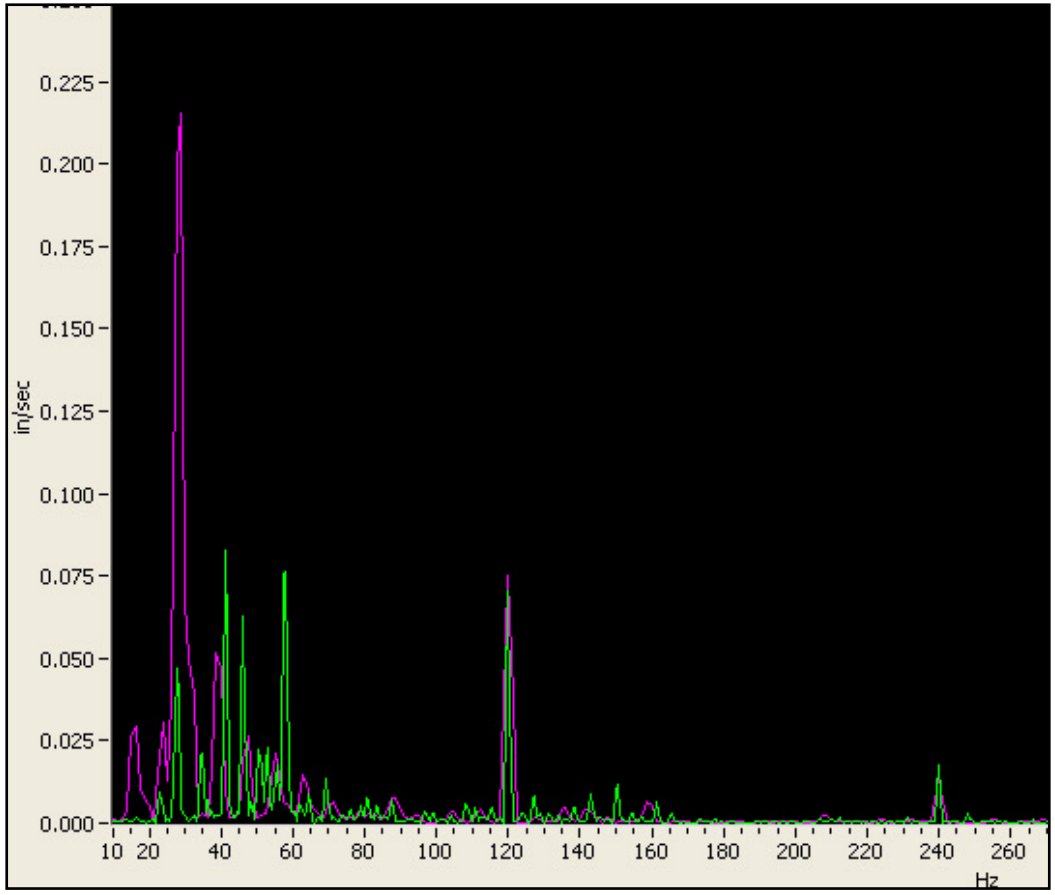
Software



Spectrum FFT overlay with reference spectrum overlaid comparing current readings with baseline

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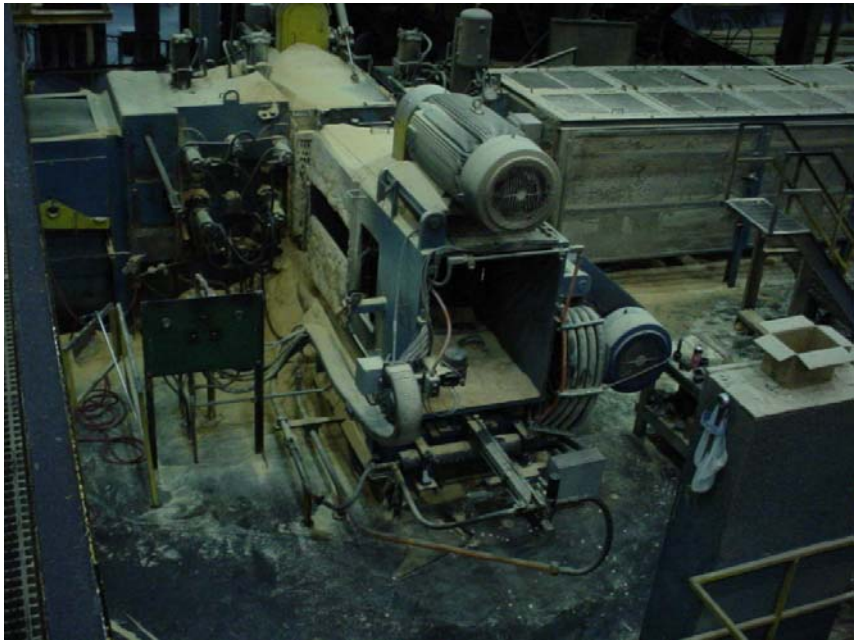
Sample Installations

Customer Examples



- Monitored gang edger in lumber mill
- System has detected multiple events over the past two years

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Sample Installations

Installation showing two VMU105s installed to monitor boiler feed water pumps on a wood fired boiler. BNC connections allow vibration techs to walk up and access data.

Detected two events on the main boiler feed water pump. The second, upon installation of the repaired pump!

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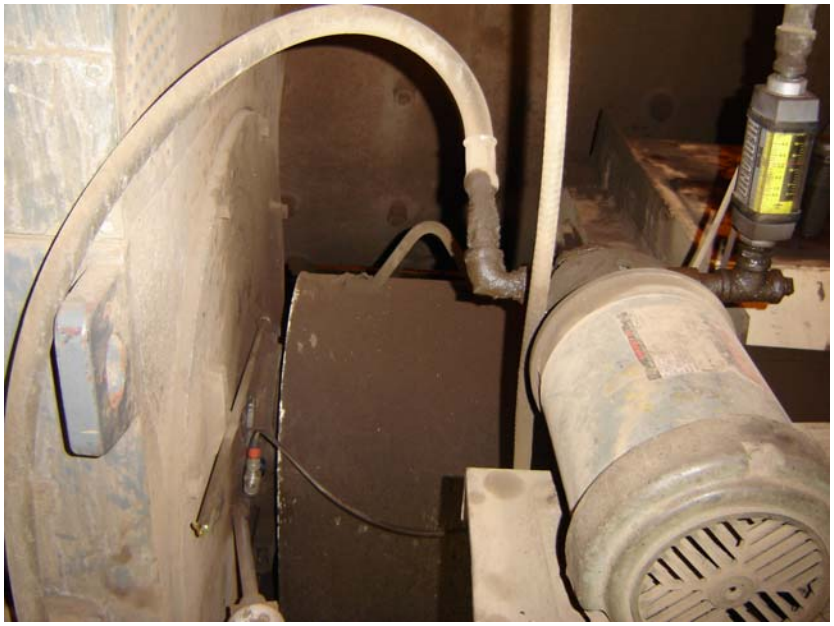
Sample Installations



- Gearbox Monitoring Application for Roller Mill

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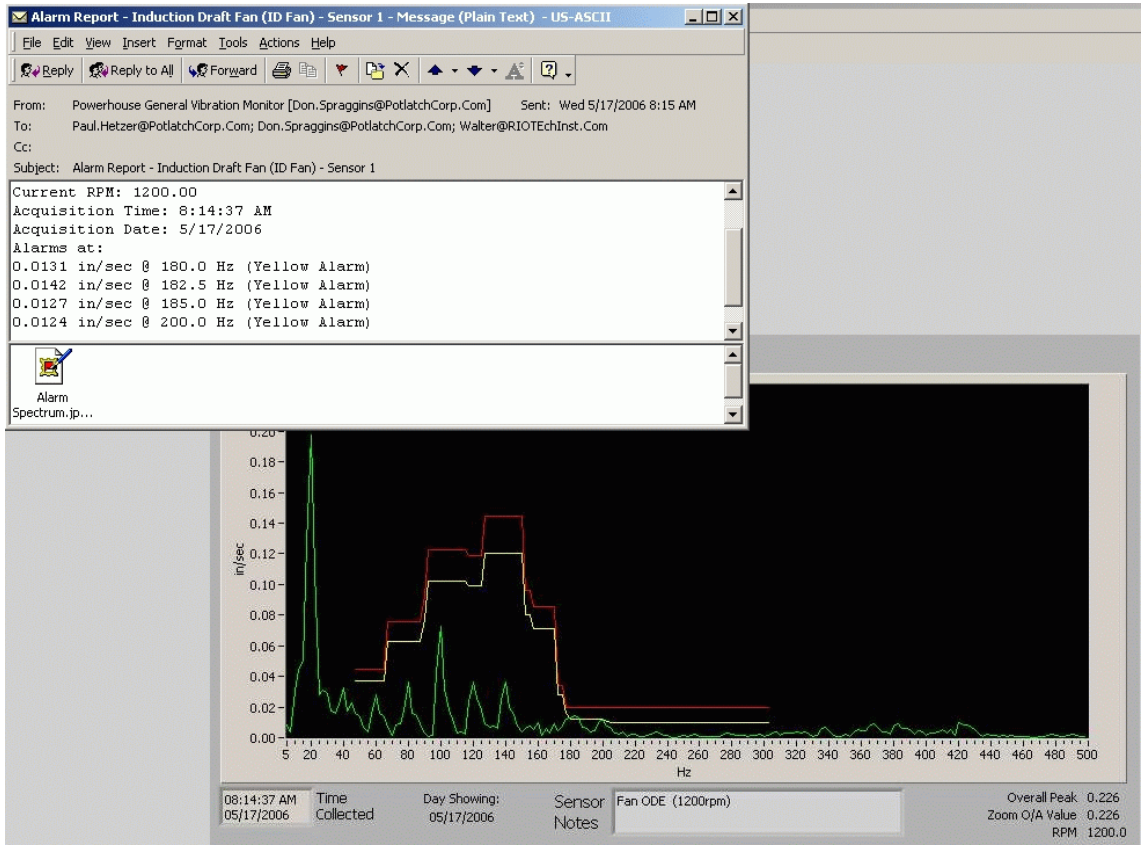
Sample Installations



Example customer Email alarm with attached jpg image showing alarm condition. This type of technology allowed the customer to forward the email to the pump vendor for analysis and recommendations.

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Sample Installations

- Installation showing monitored FD and ID fans on wood fired boiler
- Detected event on tail bearing caused by over tightened drive belts

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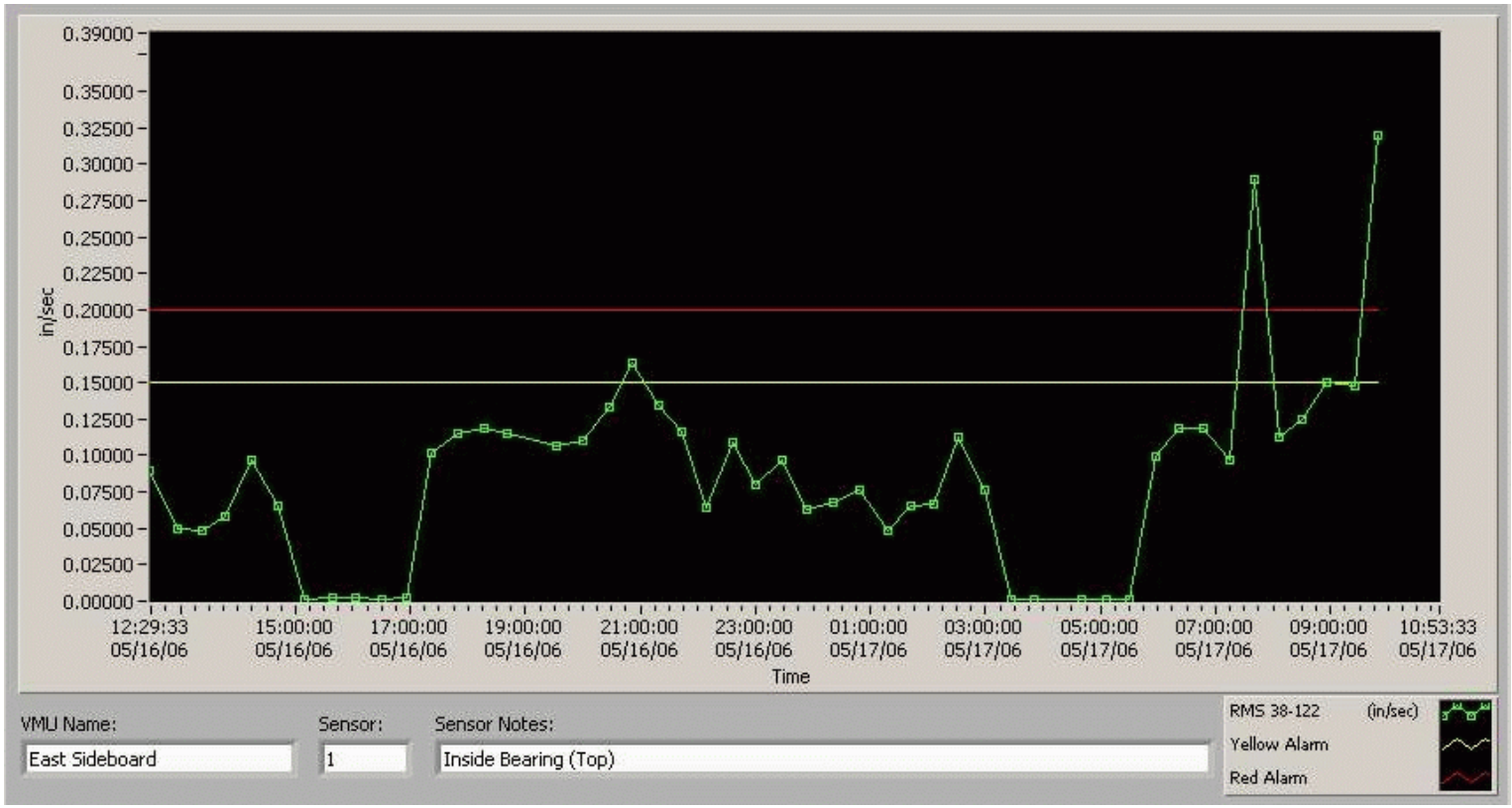
Sample Installations



Tail bearing event caused by over tightened drive belts. This screen image as a jpg was sent automatically by EMAIL from RioServer software.

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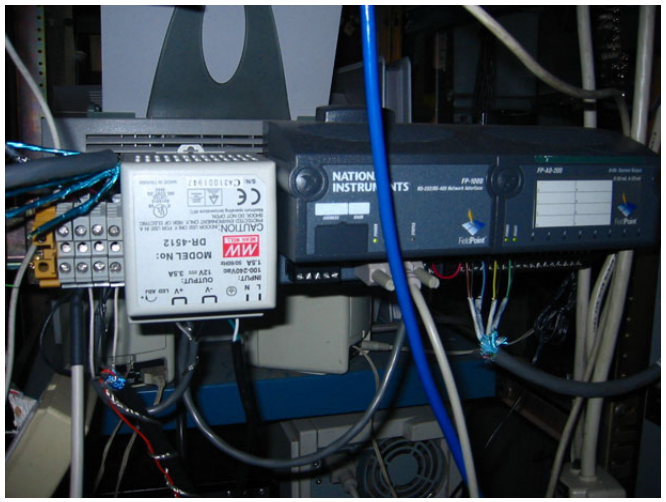
Sample Installations



Monitored turbine and 4-20mA outputs to drive alarm and shutdown system on a Yokogawa digital control system.

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Sample Installations

- Paper Plant where FD fan is being monitored

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Sample Installations

- Picture showing why women live longer than men

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Conclusion

For an on-line web demonstration, brochures, technical notes and questions please contact:

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