

The logo features a large, stylized orange letter 'R' on the left. A horizontal yellow bar with rounded ends extends from the center of the 'R' towards the right. The text 'RioTech Instruments' is written in orange, with 'Rio' in a smaller font and 'Tech Instruments' in a larger font, positioned over the yellow bar.

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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.

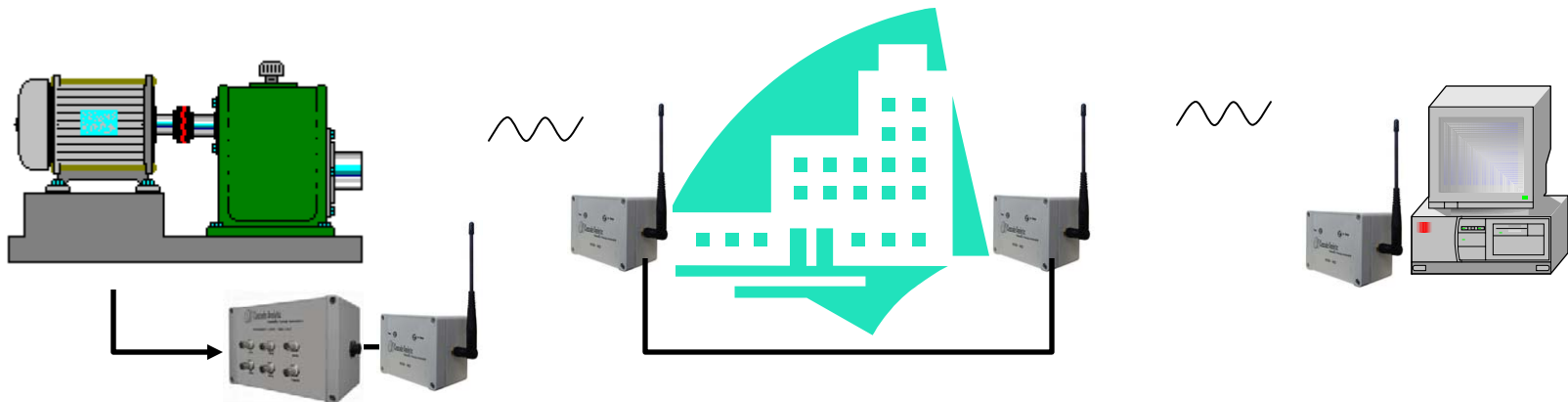
- RM-900R Wireless Radios
- VMU205 Nema 4X portable enclosure
- Communication cables
- Portable Battery Supply
- RioServer Software

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Hardware

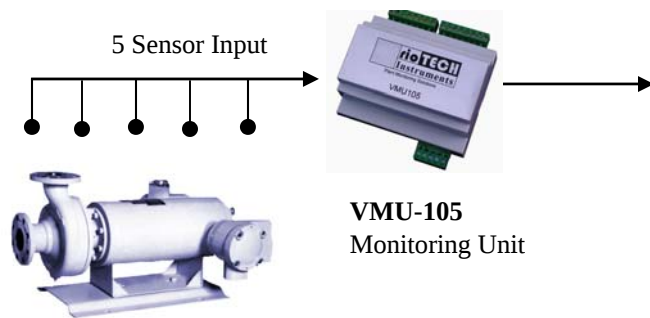
Adding A Wireless Bridge For Difficult Applications

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



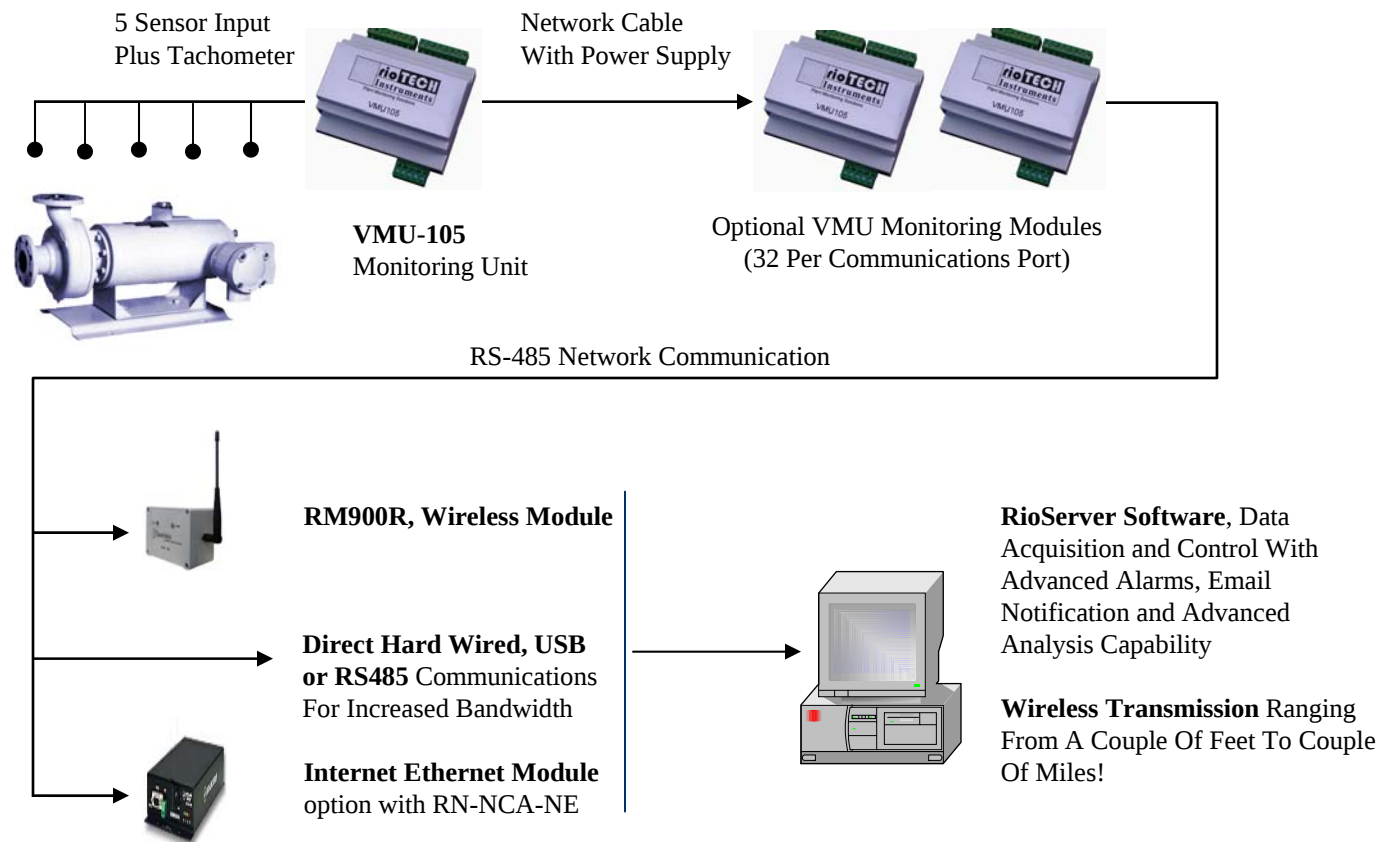
Data Acquisition From A Variety Of Communication Technologies

- 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



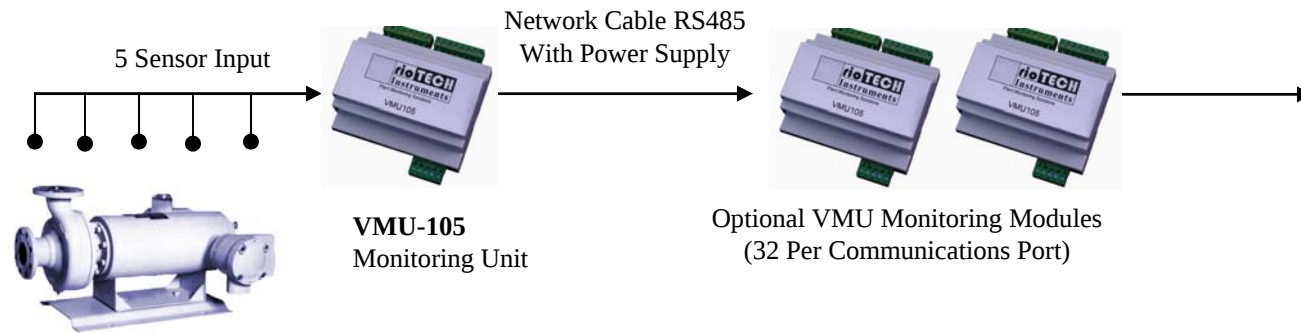
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System Design



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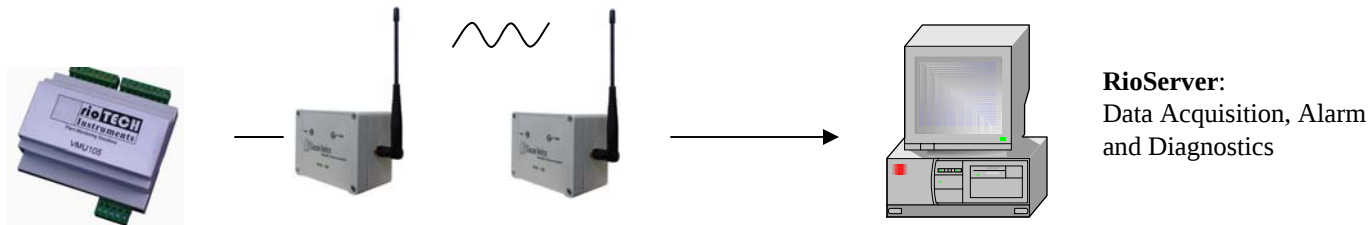
System Design



- 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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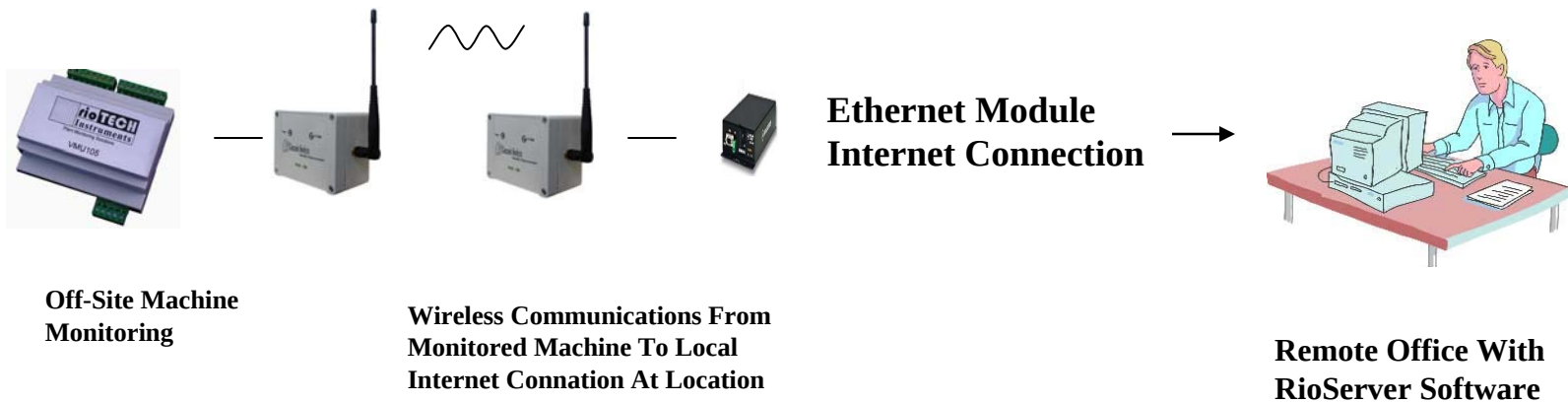
System Design



- **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



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



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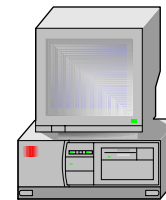
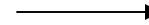
System Design



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

Software : RioServer

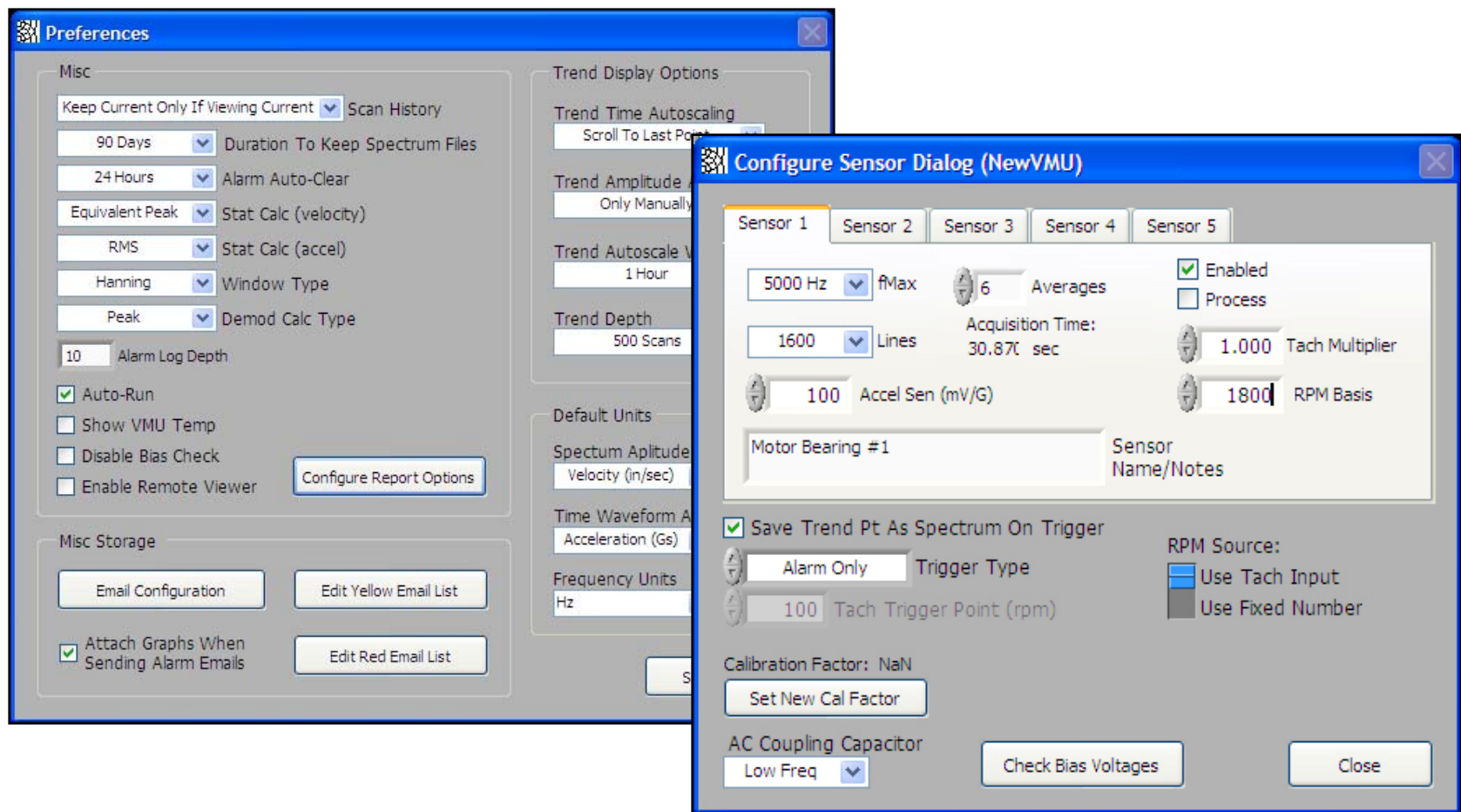
Advanced Trending, Alarm and Analysis Capabilities

- 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

The screenshot shows the 'Preferences' dialog box with a blue title bar and a close button. The dialog is divided into several sections:

- Misc:** Contains a dropdown menu 'Keep Current Only If Viewing Current' (set to 'Scan History'), a 'Duration To Keep Spectrum Files' dropdown (set to '90 Days'), an 'Alarm Auto-Clear' dropdown (set to '24 Hours'), a 'Stat Calc (velocity)' dropdown (set to 'Equivalent Peak'), a 'Stat Calc (accel)' dropdown (set to 'RMS'), a 'Window Type' dropdown (set to 'Hanning'), a 'Demod Calc Type' dropdown (set to 'Peak'), an 'Alarm Log Depth' text field (set to '10'), and checkboxes for 'Auto-Run' (checked), 'Show VMU Temp' (unchecked), 'Disable Bias Check' (unchecked), and 'Enable Remote Viewer' (unchecked). A 'Configure Report Options' button is located to the right of the checkboxes.
- Misc Storage:** Contains buttons for 'Email Configuration', 'Edit Yellow Email List', and 'Edit Red Email List', and a checked checkbox for 'Attach Graphs When Sending Alarm Emails'.
- Trend Display Options:** Contains a 'Trend Time Autoscaling' dropdown (set to 'Scroll To Last Point'), a 'Trend Amplitude Autoscaling' dropdown (set to 'Only Manually'), a 'Trend Autoscale Width' dropdown (set to '1 Hour'), and a 'Trend Depth' dropdown (set to '500 Scans').
- Default Units:** Contains a 'Spectrum Aplitude' dropdown (set to 'Velocity (in/sec)'), a 'Time Waveform Amplitude' dropdown (set to 'Acceleration (Gs)'), and a 'Frequency Units' dropdown (set to 'Hz').

A 'Save & Close' button is located at the bottom right of the dialog.

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Software

Advanced Band and Envelope Alarms

Band Alarm Options - NewVMU - Motor Bearing #1

Sensor 1 | Sensor 2 | Sensor 3 | Sensor 4 | Sensor 5

☒ Enable Frequency Units: Hz

Yellow Alarm	Red Alarm	New Start	New Stop
.002	.004	105	2000

Replace

Yellow Alarm	Red Alarm	Freq Start	Freq Stop
0.0200	0.0400	1	35
0.0075	0.0200	35	45
0.0040	0.0075	45	105
0.0020	0.0040	105	2000
X 0.0000	X 0.0000	0	0
X 0.0000	X 0.0000	0	0
X 0.0000	X 0.0000	0	0
X 0.0000	X 0.0000	0	0
X 0.0000	X 0.0000	0	0

Move Up
Move Down
Disable
Clear

☒ Automatically Learn Alarm Values ☒ Temporarily Suppress Alarms

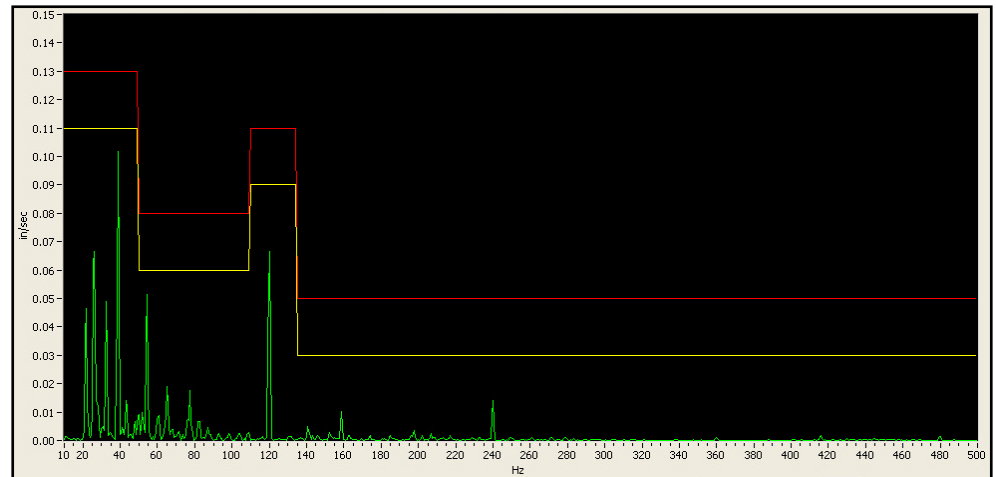
11:06:43 Learn Mode 16:00:00 Suppress
06/19/07 Expiration 12/31/03 Expiration

1.20 Learn Multiplier

☒ Track Band Alarms Using Tachometer 1800 RPM Basis

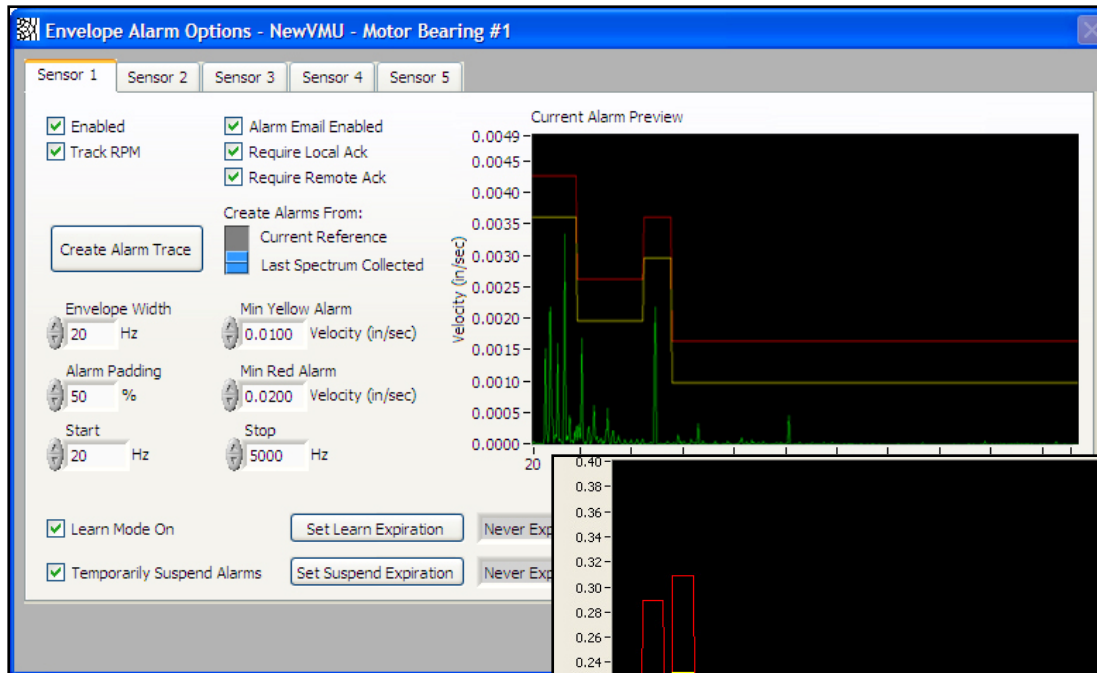
☒ Send Email Alerts ☒ Require Local Ack ☒ Require Remote Ack

Close

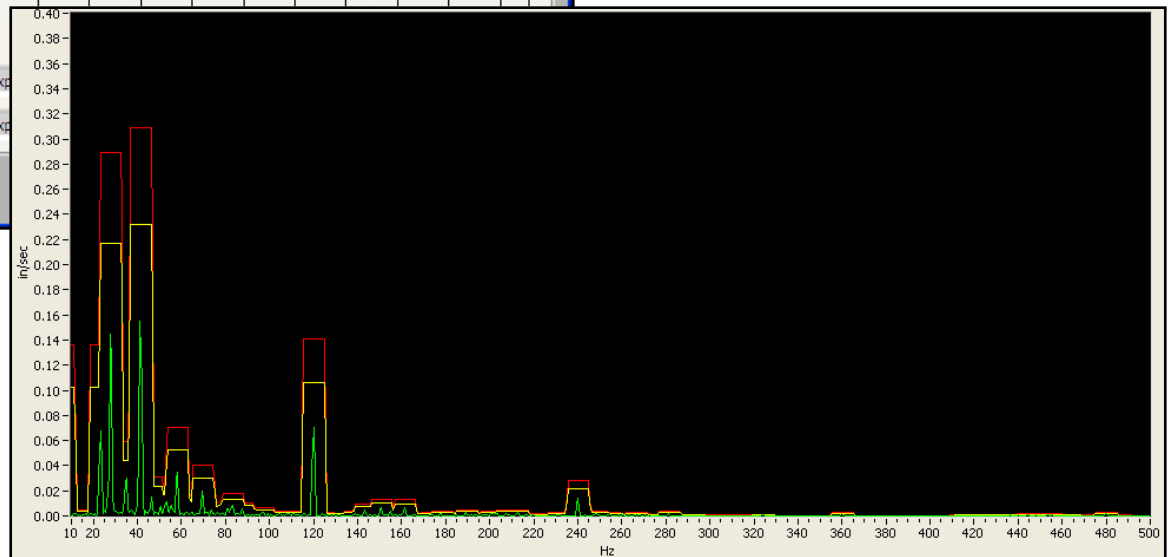


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Software



Band and Envelope Alarms

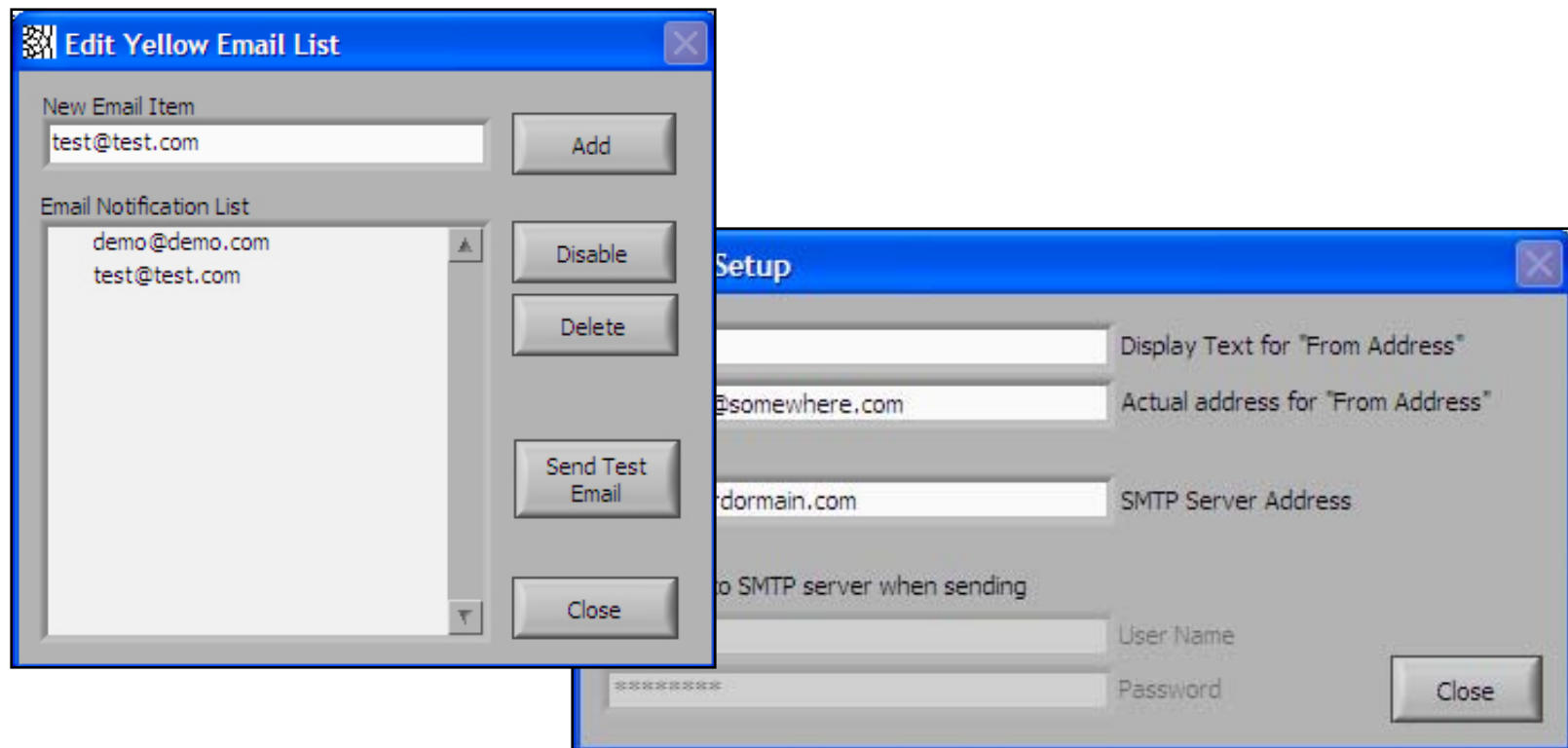


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Software

Email Alarm Setup:

Email options include attached Image and Data

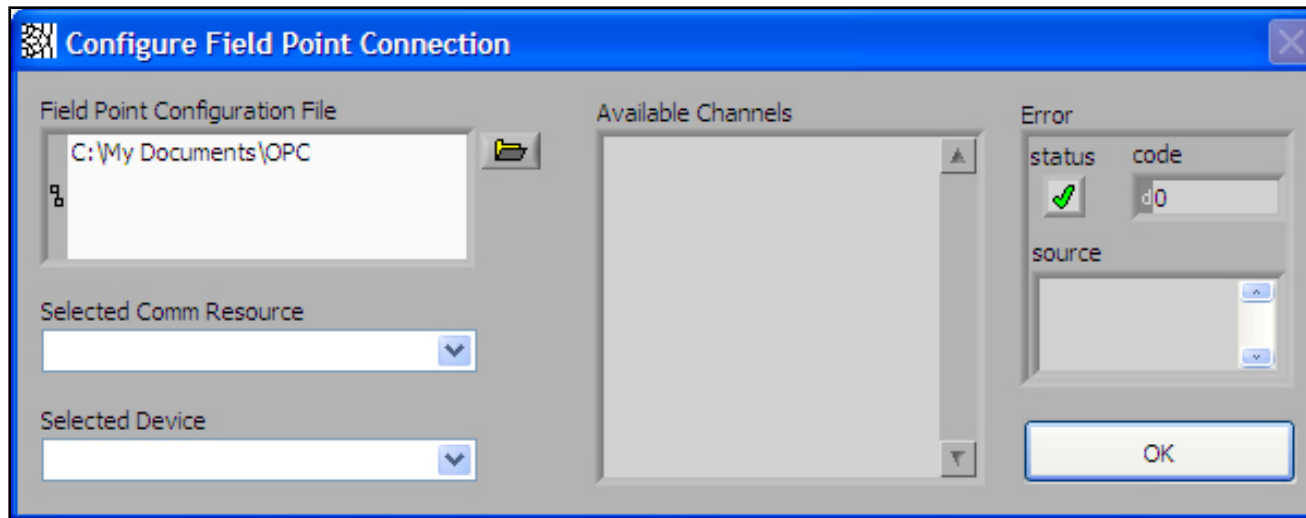


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Software

Software and Hardware Output Interfaces

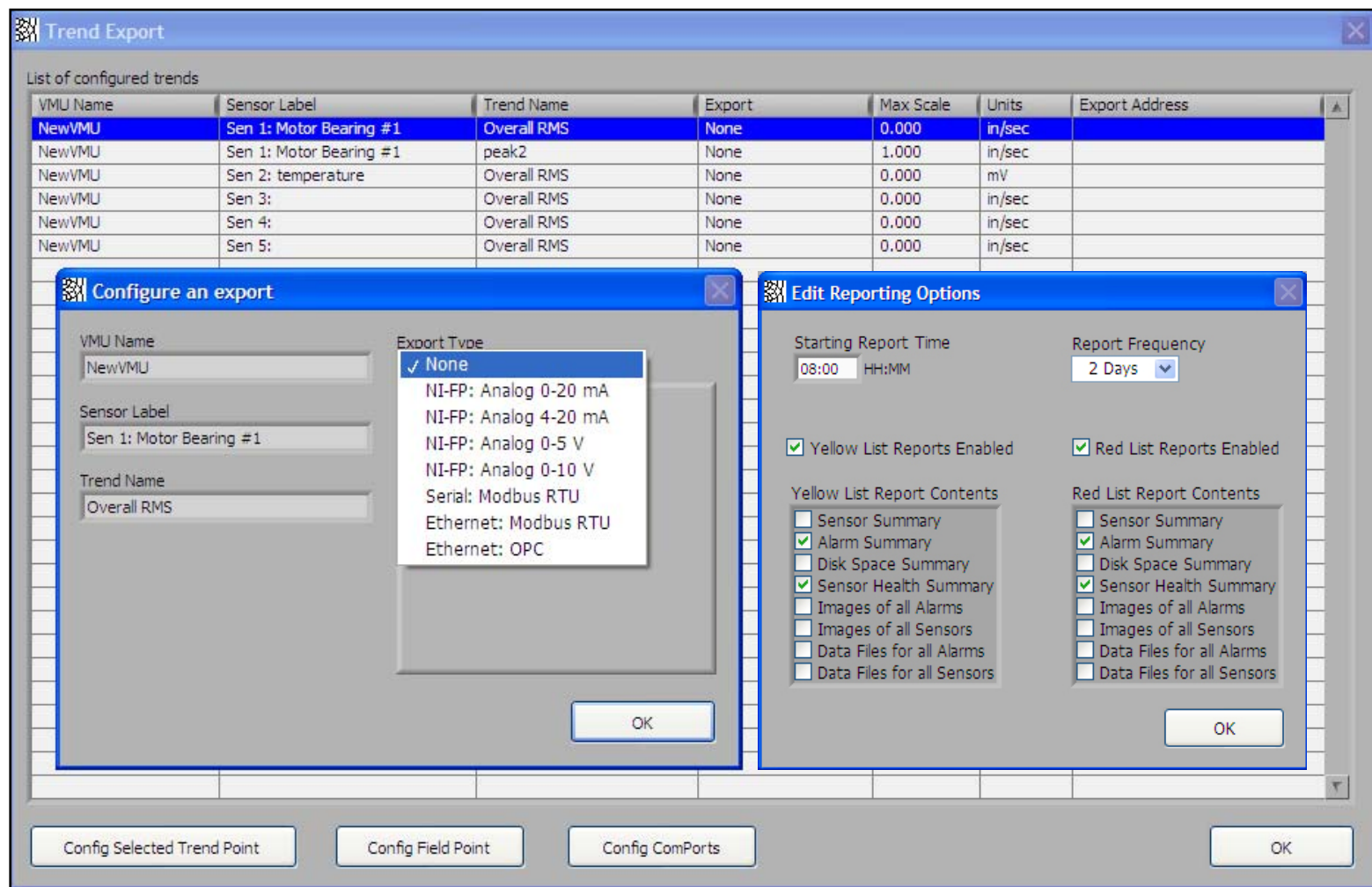
- 4-20mA, 0-5V outputs
- Modbus
- OPC



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Software

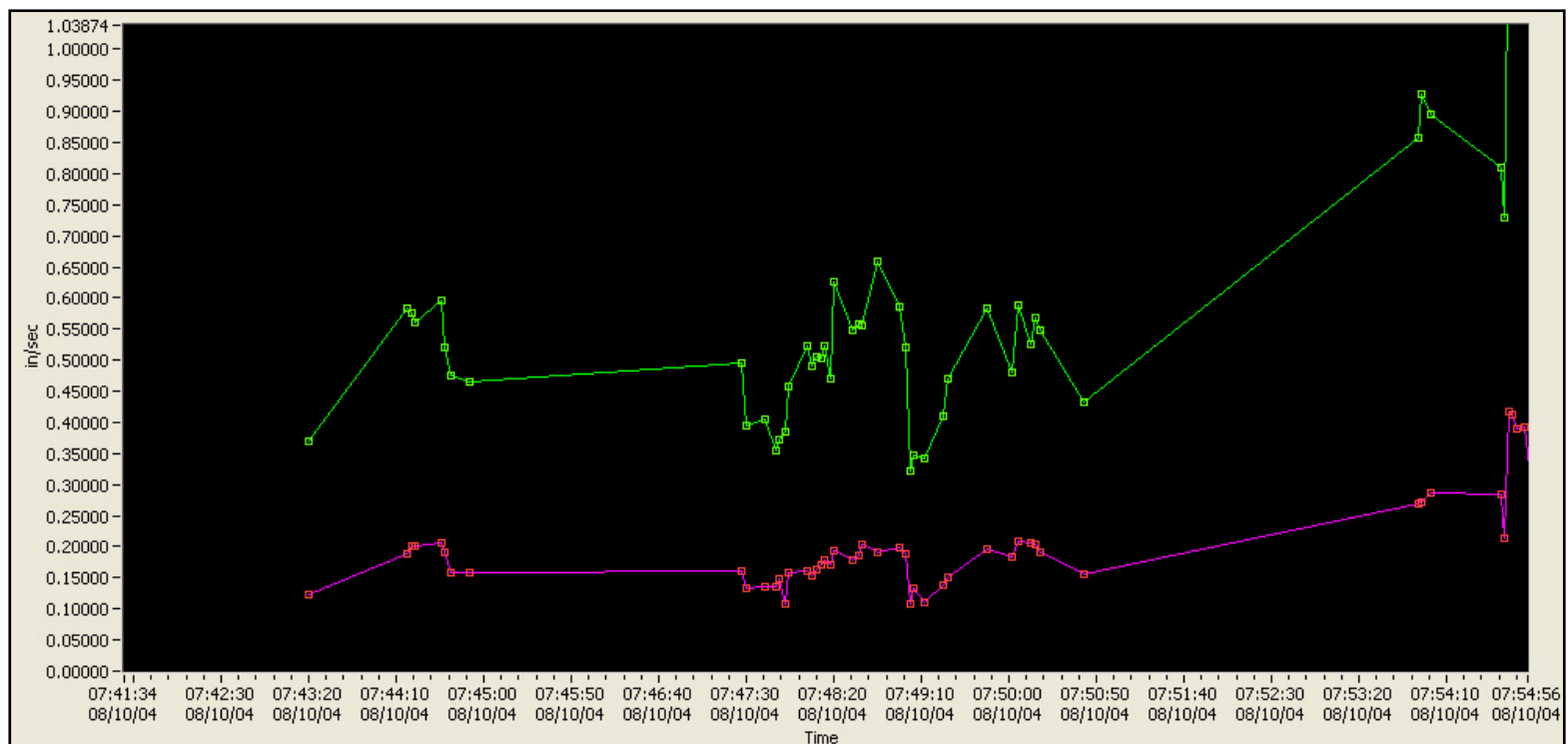
Output Interfaces – Modbus and OPC



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Software

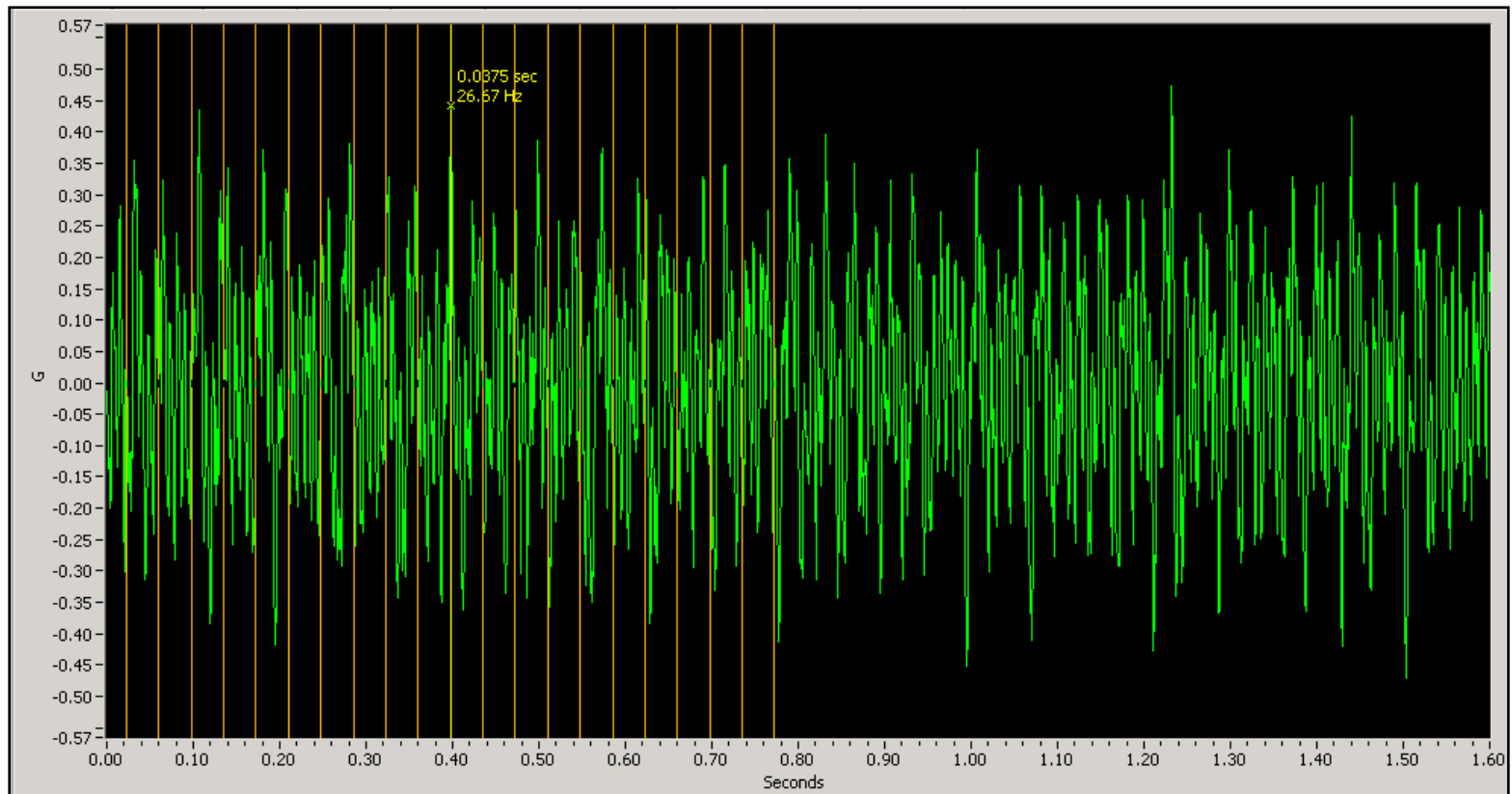
Multi Trend Display and Alarm Capability



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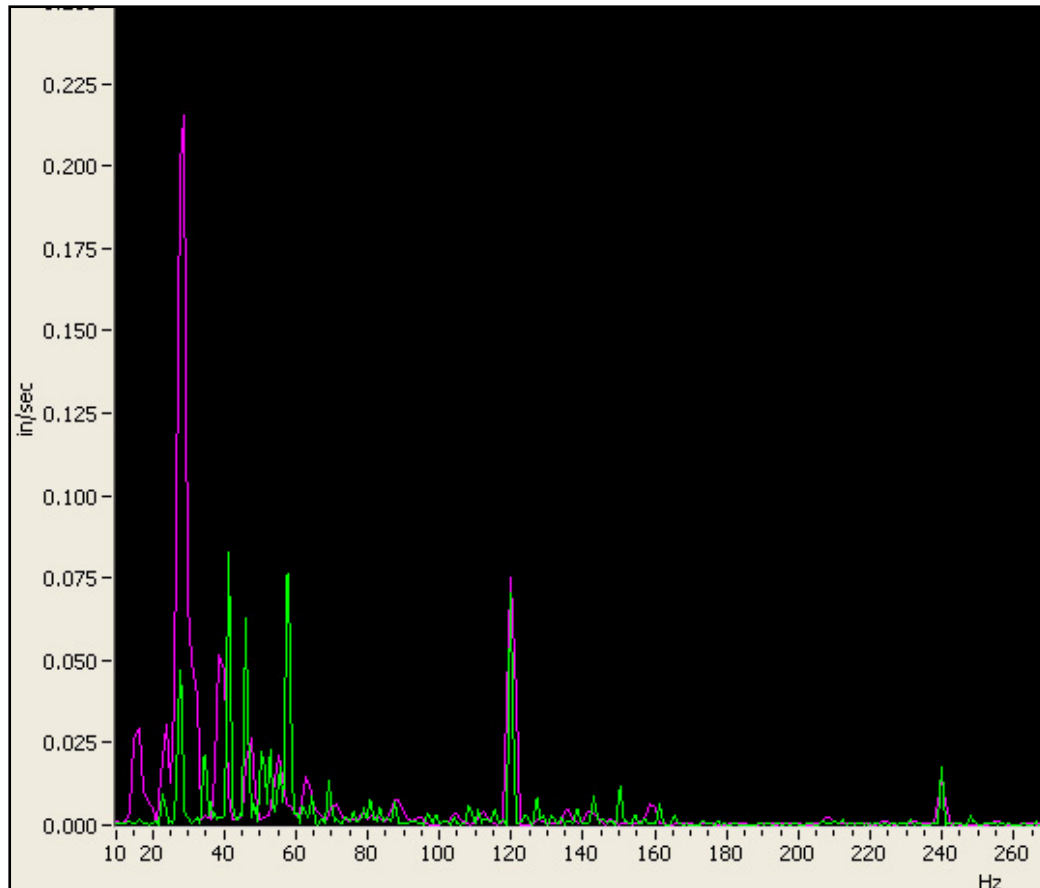
Software

Time Waveform Analysis



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Software

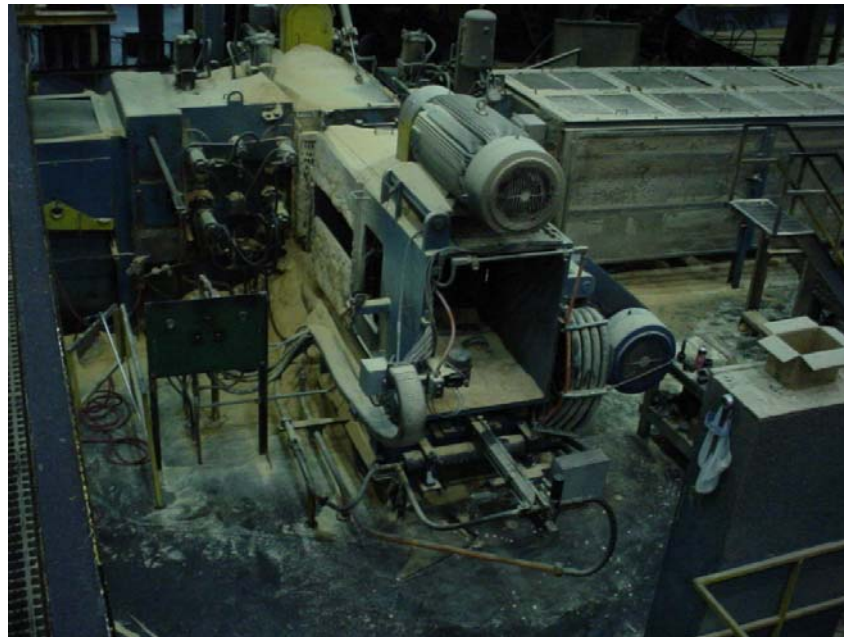


**Spectrum FFT overlay
with reference
spectrum overlaid
comparing current
readings with baseline**

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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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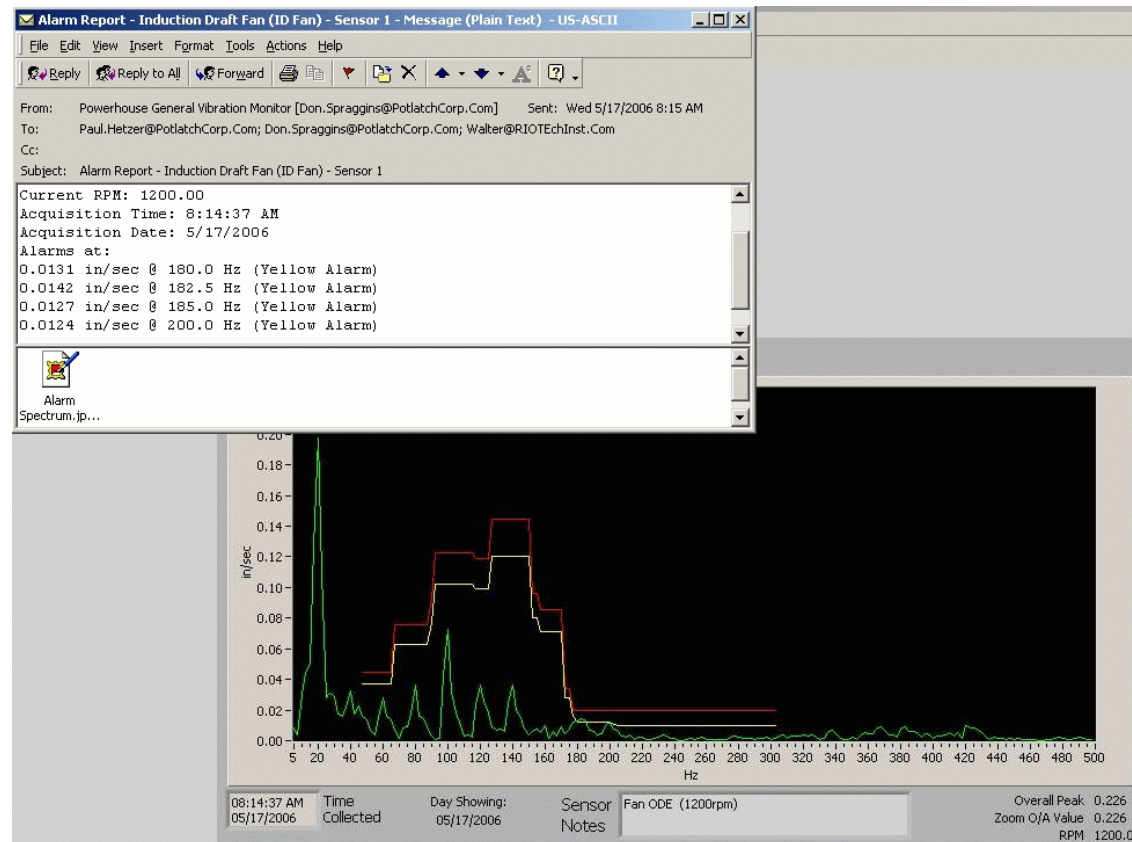
Sample Installations



- 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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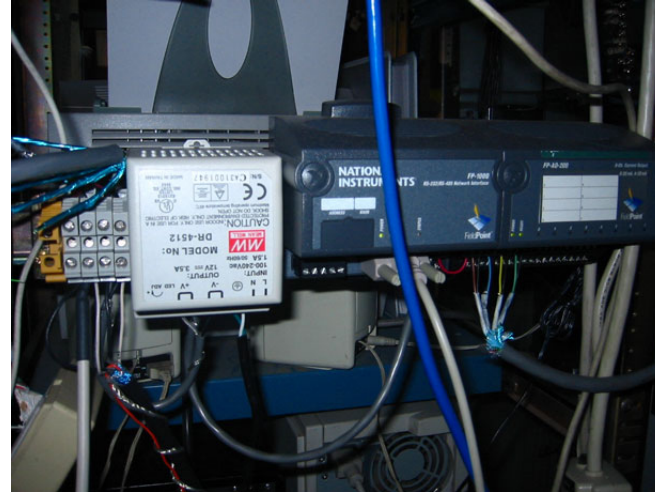
Sample Installations



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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