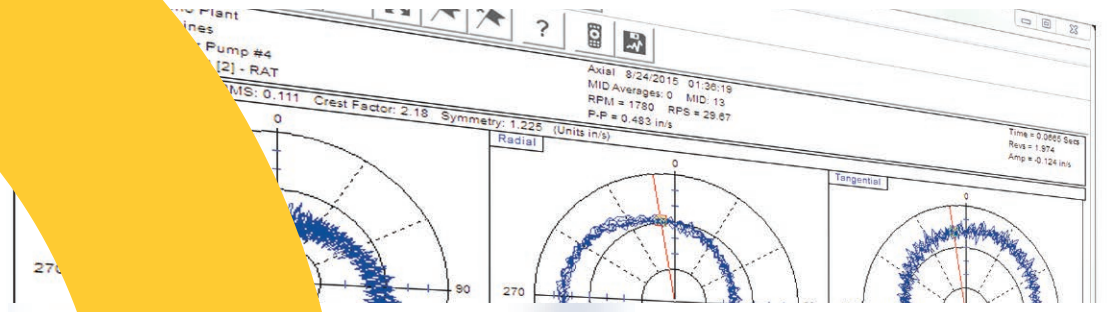


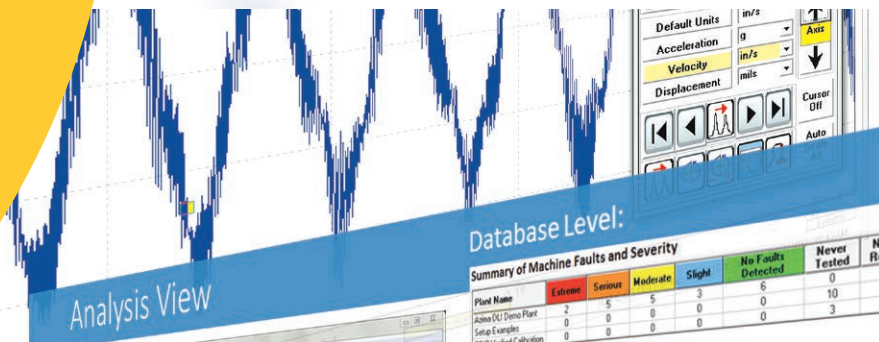
ed Pump A
 ed Pump B
 Water Pump #1
 TOR, BEARING 2
 MP, BEARING 4
 Water Pump #2
 TOR, BEARING 2
 MP, BEARING 4
 Water Pump #3
 TOR, BEARING 2
 MP, BEARING 4
 Water Pump #4
 tor Cpld End
 mp Cpld Support
 phs
 asonic UDP
 Fan #1
 or Fan Unit
 or Drive End
 wer Drive End
 wer Non Drive End
 Water Pump #12
 ups
 mp A
 mp B
 mp C
 mp D
 mp E
 mp F
 ervice Pump #1
 ervice Pump #2
 ervice Pump #3
 ervice Pump #4



ALERT™

Vibration Diagnostic Software

Proven Technology for Machinery Condition Assessment



Database Level:

Plant Name	Extreme	Serious	Moderate	Slight	No Faults Detected	Never Tested	Needs Review	Total Machines
Alpha O&U Demo Plant	2	5	5	3	6	0	13	34
Setup Examples	0	0	0	0	0	10	0	10
EPD Verified Calibration	0	0	0	0	0	3	0	3

Summary of Machine Recommended Actions/Events and Priority

Plant Name	Mandatory	Important	Desirable	No Recommendations	Never Tested	Total Machines
Alpha O&U Demo Plant	2	5	5	9	13	34
Setup Examples	0	0	0	0	10	10
EPD Verified Calibration	0	0	0	0	3	3

Plant Level:

Summary of Machine Faults and Severity

Area Name	Extreme	Serious	Moderate	Slight	No Faults Detected	Never Tested	Needs Review	Total Machines
Uncommon Machines	0	3	0	0	0	0	0	3
Common Machines	1	1	1	0	3	0	4	10
Machine Groups	1	1	1	0	3	0	9	21

Summary of Machine Recommended Actions/Events and Priority

Area Name	Mandatory	Important	Desirable	No Recommendations	Never Tested	Total Machines
Common Machines	1	1	1	3	6	10
Machine Groups	1	1	1	3	9	21
Uncommon Machines	0	3	0	0	0	3

Asset Level:

Summary of Machine Faults and Severity

Machine Name	3/18/2016	8/24/2015	4/21/2015	1/24/2015	8/12/2014
Chilled Water Pump #4					
Boiler Feed Pump #4					
Exhaust Blower #1					
Generator Fan #1					
Generator Fan Unit					
Make-up Water Pump #12					

Machine Design Information - Chilled Water Pump #4

- Motor
 - AC Motor 40 with motor bars
 - Roller bearings and no cooling fan
- Flexible Coupling
- Centrifugal Pump
 - Overhung rotor with roller main and thrust bearings
 - 5 first stage vanes and 0 second stage vanes
- Machine Bearing Information
 - Pump Cpld Support
 - SKF6315

RECOMMENDATIONS: **Replace Pump Bearings**
 Machine Knowledge: **Replace bearings and check pump**
 Notes: **Flange wear will need to be replaced**

Machine expires on: 9/28/2
 Version 4.0
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UNMATCHED CAPABILITIES WITH ALERT™ AUTOMATED DIAGNOSTIC SOFTWARE

ExpertALERT™

AUTOMATED DIAGNOSTIC SOFTWARE

ExpertALERT provides critical machinery health information in addition to vibration data, by rapidly screening vibration measurements and applying over 6000 unique rules to identify over 1200 individual faults in a wide variety of machine types. Our proven automated machinery condition assessment system can process hundreds of vibration measurements in just a few minutes leaving you with a fault diagnosis, fault severity and repair priority and action. Instead of overwhelming you with data that is difficult to interpret, ExpertALERT provides fast and accurate screening that will lead to better diagnostic results. TRIO X-series data collectors include embedded ExpertALERT software.

ExpertALERT™ Cloud Subscription

CLOUD-BASED AUTOMATED DIAGNOSTIC SOFTWARE

All of the same great features of ExpertALERT without the cost of a local IT infrastructure, database management, and software maintenance costs. ExpertALERT-Cloud operates through Azima's secure, web-accessible terminal servers. Fast and convenient, users can access their data at the office or on the go. ExpertALERT-Cloud works with all portal-enabled data collectors and the WATCHMAN Reliability Portal™.



StandardALERT™

MANUAL ANALYSIS SOFTWARE

StandardALERT contains all of the manual analysis tools found in ExpertALERT. The software automatically screens your data for alarms or exceedances in up to 63 alarm bands per test location and up to 99 test locations per machine. This software is appropriate for those on a budget or who have machines or applications that lend themselves better to manual analysis.

ViewALERT™

READ-ONLY VIEWER SOFTWARE

ViewALERT is a read-only version of ALERT. Users have access to all reports and analysis tools but they cannot add, edit, delete or modify any information. ViewALERT is typically used when your data is transmitted elsewhere for analysis or as a license on an Enterprise network. TRIO A-series data collectors include embedded ViewALERT software.

GETTING MORE FROM YOUR PROGRAM

CLOUD SUPPORTED IIoT

Successful programs require more collaborators to contribute to the understanding of faults and the impact they have to the plant operation. ALERT provides the necessary infrastructure to support the Industrial Internet of Things.



SIMPLICITY

Straightforward machine setup wizards simplify the configuration of machinery for vibration testing. Answering a few questions configures the collector for optimum routine diagnostic settings. ALERT bridges the gap between analysts and data collector allowing analysts to focus attention on diagnostics, leaving data collection to field personnel.



DOMAIN EXPERTISE

Program sustainability is essential for any organization. As the plant size grows, production shifts increase, personnel are changed, and technological knowledge increases, knowing your machines can be covered by seasoned professionals is critical for success.

WATCHMAN DATA CENTER IN THE CLOUD

PORTAL | WEB TOOLS | ANALYTICS



BUSINESS LEVEL METRICS

Beyond mere vibration data and fault conditions, Azima's team of analysts, data scientists, and program managers ensures decision makers and plants managers understand effectiveness of their program and risk to operation of the plant.



LEVERAGE

Integrate the ALERT database across multiple plants for your enterprise for the rapid deployment and fastest ROI. ALERT allows analysts to effectively leverage cross-plant knowledge.

ALERT™

Vibration Diagnostics Software



We understand the requirements of a successful condition assessment program and have built these into ALERT™.

SOFTWARE AND USER INTERFACE BENEFITS

- Intuitive user interface that is simple to learn and operate
- Setup wizards reduce set up time and improve configuration accuracy
- Rapid automated data screening using sensitive narrow-band techniques
- Sophisticated automated rotational or linear speed entry and detection
- Early detection of machine faults through average+sigma relative criteria
- Automated bearing fault identification
- Multi-level fault severity and prioritized repair recommendations
- Advanced reporting tools that produce professional reports
- Machine performance determination through ALERT's calculated process points
- Integration of other PdM technologies, reports, documents, inspections, etc.
- Integrated online monitoring, walk-around vibration collection and operating logs
- Enhanced visualization of dynamic data
- Includes 75,000 bearing asset library; 15,000 motor asset library

ALERT™

Vibration Diagnostics Software



EXPERT AUTOMATION - RULEBASE INTELLIGENCE FOR AUTOMATED DIAGNOSTICS

Reliability through superior diagnostics.

Azima's sophisticated rulebase methodology extends beyond simple monitoring of alarms on peaks or spectral bands. Our test-point variation feature captures and compares complex patterns detected from the entire set of locations on your machine. By adding this machine-specific baseline data to the database, ALERT™ becomes a highly accurate, automated diagnostic system.

OVER
1,200
FAULTS

ALERT™ DIAGNOSTIC SOFTWARE SPECIFICATIONS

PARTIAL LIST OF EXPERT AUTOMATED DIAGNOSTIC SYSTEM (EADS) FAULTS

PARTIAL LIST OF MACHINE TYPES

Bearings	Multiple Stage Ball / Roller Contact Journal / Sleeve Multiple pad / shoe 75,000 bearing library
Compressors:	Generators AC DC
Centrifugal Lobed Blowers Piston Screw	Motors AC DC VFD 15,000 motor library
Couplings	Pumps Centrifugal Hydraulic / Axial Piston Propeller
Flexible Solid Fluid Magnetic Belts Chains	Reciprocating Rotary Thread / Screw Sliding Vane Vacuum
Diesel Engines	Centrifuge Purifiers
2 Stroke 4 Stroke	Spindles/Rolls
Fans	Turbines Steam Gas
Axial Flow Centrifugal	Turbochargers
Gear Boxes	
Single Stage	

GRAPHICAL ANALYSIS

Amplitude Alarm Triggering Impact Demod Spectra and Waveform Overall Values Spectrum Waveform	Markers Reference Cursor Delta Harmonics Sidebands Fault Frequencies	Time Synchronous Averaging
Automated Peak Locator Harmonics Order Normalization Sidebands	Nyquist Plot	Waveform Autocorrelation Single Axis Triaxial Double-Triaxial Orbit, Filtered Orbit Poincare Map Single Circular Graph Triaxial Circular Graph Waterfall with Correlation Factor Native, Integrated, Double-integrated
Average Baseline Comparison Synthesized Average Average plus sigma	Order Tracking	
Bode Plot	Peak Analysis and Identification Functions	
Bump Test Equipment ON Equipment OFF	Phase Analysis Cross Channel Polar Phase Plot	
Customized Real-time Setup	Run-up / Coast-down plotting Spectral Waterfall Bode-Peak & Phase Peak Hold	
Graphical Remote Control Window	Spectrum Single Axis Triaxial Double-Triax Demodulation Waterfall Native, Integrate, Double-integrated, Decibel	
Hotkeys & Hotspots		
Integration & Differentiation		
Long-time Data Capture		

Accelerometer Overload Accessory Drive Gear Mesh Problem or Wear Auxiliary Gear Mesh Problem or Wear Bearing Fit Problem Bearing Looseness Bearing Misalignment or Shaft Runout Bearing Wear, Demod & Impact Demod Blower Shaft Ball Bearing Wear Camshaft Drive Gear Problem Camshaft Problem Clutch Imbalance Clutch Misalignment Clutch Wear Compressor Impeller Wear Compressor Rotor and/or Idler Wear Cooling Fan Problem Coupling Wear Drive Belt/Chain Irregularity Drive Sheave Runout or Wobble Electrical Phase Imbalance Exciter Commutator or Exciter Problem Exciter Imbalance Fan Air Flow Problem Fan Blading Problem Fan Dirt Buildup or Blading Clearance Problem Fan Wheel Wobble	Fluid Coupling Misalignment Foundation Flexibility Foundation Resonance Gearbox Specific Shaft Bearing Wear Gearbox Specific Shaft Mesh Problem Gearbox Specific Shaft Misalignment Gearbox Specific Shaft Problem Gearbox Oil Pump Gear Mesh Problem or Wear Gearbox Oil Pump Internal Wear Idler Shaft Looseness Imbalance Indication of Bad Data Indication of Impacting Internal Looseness Internal Valve Plate Wear or Flow Restriction Journal Bearing Clearance Problem (Trapped Fluid) Journal Bearing Looseness Journal Bearing Oil Whirl Line Phase Voltage Imbalance Misalignment, Angular Misalignment, Parallel Motor Air Gap Problem Motor Stator Lamination Looseness Motor Stator Problem or Abnormal Electrical Load	Motor Winding Fault Mounting Flexibility Mounting Looseness Oil Pump Internal Wear or Flow Problem Oil Pump Problem Oil Pump Shaft Looseness Piston Problem or Internal Wear Planetary Drive Gear Mesh Problem or Wear Proximity Probes Change in Phase Proximity Probes Misalignment Proximity Probes Rubbing and/or Impacting Pump Air Ingestion or Flow Problem Pump Impeller Wear or Rotor Clearance Problem Pump Internal Looseness Pump Lobe Wear Pump Mounting Flexibility Pump Thrust Bearing Problem Pump Timing Gear Wear Pump Vane Wear Structural Resonance Timing Gear Wear or Mesh Problem Turbine Blading or Rotor Clearance Problem Turbine Wheel Runout VFD Electrical Switching Fault Worm Wheel Gear Mesh Problem or Tooth Wear
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ALERT™

Vibration Diagnostics Software

ALERT™ IS WATCHMAN RELIABILITY PORTAL™ ENABLED

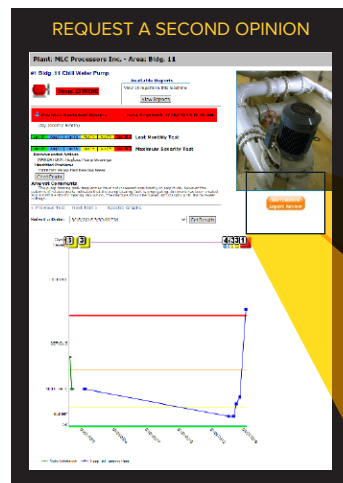
ExpertALERT is connected to the WATCHMAN Data Center, delivering results to all decision makers through the WATCHMAN Reliability Portal.

Vibration analysis of complex machinery is not an exact science which requires skilled, seasoned analysts to decipher patterns and trends within multiple types of data. ExpertALERT provides the starting point to allow analysts to be more efficient in scrubbing through data and prioritizing their workload.

Local analysts can get the assistance they need by utilizing the WATCHMAN Expert Review. This Second Opinion function will notify the Azima Domain Experts to provide technical guidance on machinery diagnostics.

DESIGNED FOR WORLD-CLASS PdM PROGRAMS

Designed to meet the best practices of world-class PdM programs, ALERT 4.0's flexible design is easily scalable and integrates seamlessly with reliability programs of all sizes and geographic diversity. It can be installed on an office PC, embedded on a TRIO™ portable vibration data collector, or accessed remotely over the Internet via a cloud subscription with no software to manage. It is also the core of vibration diagnostics for Azima's WATCHMAN™ Online Systems and is used by Azima's machinery experts to perform vibration analysis for WATCHMAN Service customers.



ALERT incorporates multiple technologies into a single database for a complete understanding of your condition based maintenance program.

- ✓ With ALERT's User-Defined Points, plant managers can easily integrate content from other condition assessment programs and service centers directly into ALERT.
- ✓ Use ALERT as an information manager to track content such as reports, IR, oil analysis results, procedures, logs and more.
- ✓ ALERT synchronizes this data to other locations using Azima's database replication capability, offering you the power to distribute any document or CBM report to everyone in your replicating network.

- ✓ Event tracking lets others get more involved to ensure priorities are set, maintenance is planned, and repairs are successful.

CLOUD-BASED INTEGRATION

FOR MULTIPLE TECHNOLOGIES & CONDITION MONITORING TOOLS

WATCHMAN DATA CENTER IN THE CLOUD
PORTAL | WEB TOOLS | ANALYTICS

- ✓ Advanced Vibration Analysis
- ✓ Infrared Technology
- ✓ Oil Analysis
- ✓ Reciprocating Engine / Compressor Analysis
- ✓ Remote & Critical Machine Monitoring
- ✓ Motor Electrical Testing





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