FLUKE
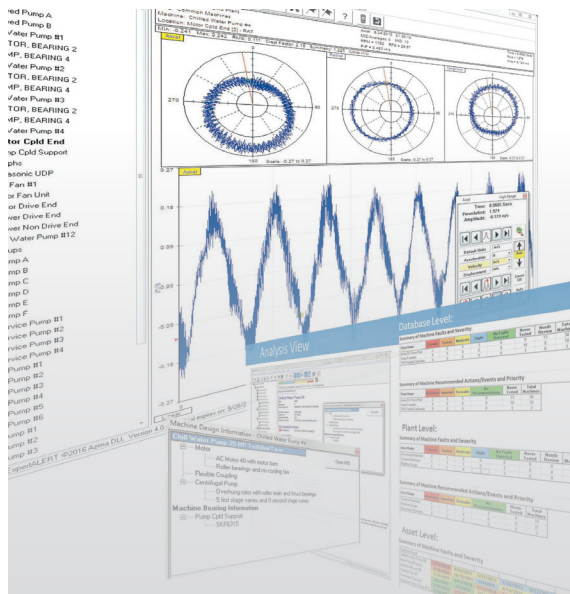
Reliability

ALERT™
Vibration Diagnostic Software

Proven Automated Diagnostic Technology for Machinery Condition Assessment

AZIMA | DLI

A Fluke Reliability Company

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-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 our 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 Watchman Reliability Portal™.

StandardALERT™

MANUAL ANALYSIS SOFTWARE PLUS

StandardALERT contains all of the analysis tools found in ExpertALERT, including building asset templates and baseline criteria allowing analysts to manually screen through data quickly to write diagnostic reports. Add the optional Expert Automated Diagnostic System to upgrade StandardALERT with the full features of diagnostic rules engine and automation of ExpertALERT. StandardALERT is a low-cost option to get a program operational with flexible deployment and ability to apply the expert automation licenses as desired.

UNMATCHED CAPABILITIES

With ALERT™ Automated Diagnostic Software

Cloud Supported

Successful programs require more collaborates 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 Platform
IN THE CLOUD

PORTAL | WEB TOOLS | ANALYTICS

Business Level Metrics

Beyond mere vibration data and fault conditions, Azima DLI's professional 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™.
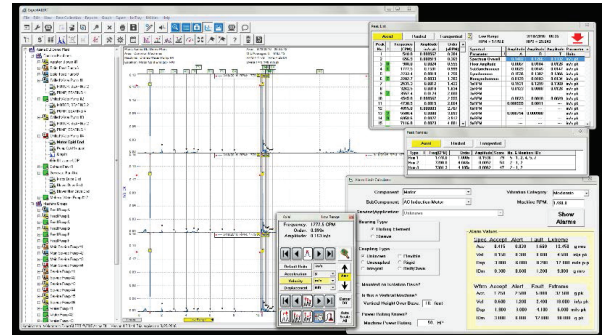
Software and User Interface Benefits

- 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 narrow-band techniques
- Sophisticated automated rotational or linear speed entry and detection
- Early machine faults detection using 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 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 and 15,000 motor-asset libraries
- Synchronized for diagnostic and business metric reporting

ALERT™ Diagnostic Software Specifications

Partial List of Machine Types		Graphical Analysis		
Bearings	**Gearboxes**	**Amplitude Alarm Triggering**	**Markers**	**Time Synchronous Averaging**
Ball / Roller Contact	Single / Multiple Stage	Impact Demod Spectra / Waveform	Reference Cursor	**Waveform**
Journal / Sleeve	Integrated Oil Pumps	Overall Values	Delta Harmonics	Autocorrelation
Multiple Pad / Shoe	**Generators**	Spectrum	Fault / Forcing Frequencies	Single Axis
75,000 Bearing Library	AC / DC	Waveform	**Nyquist Plot**	Triaxial
Compressors	**Motors**	**Automated Peak Locator**	**Order Tracking**	Double-Triax
Centrifugal	AC / DC / VFD	Harmonics	**Peak Analysis / Identification Function**	Orbit / Filtered Orbit
Lobed Blower	15,000 Motor Library	Order Normalization	**Phase Analysis**	Poincare Map
Piston	**Pumps**	Sidebrands	Cross Channel	Single Circular Graph
Screw	Centrifugal	Fundamental Frequencies	Polar Phase Plot	Triaxial Circular Graph
Couplings	Hydraulic / Axial Piston	**Average Baseline Comparison**	**Run-up / Coast Down**	Waterfall with Correlation Factor
Flexible	Propeller	Synthesized Average	Spectral Waterfall	Native
Solid	Reciprocating	Average plus Sigma	Bode-Peak & Phrase	Integrated
Fluid	Rotary Thread / Screw	**Bode Plots**	Peak Hold	Double-integrated
Magnetic	Sliding Vane	**Bump Test**	**Spectrum**	
Belts	Vacuum	Equipment On	Single Axis	
Chains	**Centrifuge Pruifiers**	Equipment Off	Triaxial	
Diesel Engines	**Spindles / Rolls**	**Customized Real-time Steup**	Double Triax	
2 stroke / 4 stroke	**Turbines**	**Graphical Remote Control**	Demodulation	
Fans	Steam	**Hotkeys / Hotspots**	Waterfall	
Axial Flow	Gas	**Integration & Differentiation**	Native, Integrated, Double-integrated	
Centrifugal	Turbochargers	**Long-time Data Capture**	Decibel	

ALERT™
Vibration Diagnostics Software

Expert Automation – Rulebase Intelligence for Automated Diagnostics

Reliability through superior diagnostics.

AzimaAI'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

Partial List of Expert Automated Diagnostic System (EADS) Faults

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

ALERT™ is Portal Enabled

ALERT is connected to the Watchman Data Center, delivering results to decision makers through 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 360™ Expert Review. This Second Opinion function will notify the Azima DLI 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 Industrial AI's Watchman™ Online Systems and is used by Industrial AI's machinery experts to perform vibration analysis for Watchman 360+ Service customers

Need additional assistance?
Use the Second Opinion Feature to get help from Industrial AI's Certified Analysts and Engineers.

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 infrared thermography and oil analysis results, procedures, logs, and more.

✓ ALERT synchronizes this data to other locations using Industrial AI's database replication capability, offering you the power to distribute any document or CBM report to everyone in your replicating network.

✓ Event Tracker lets other decision makers get more involved to ensure priorities are set, maintenance is planned, and repairs are successful.
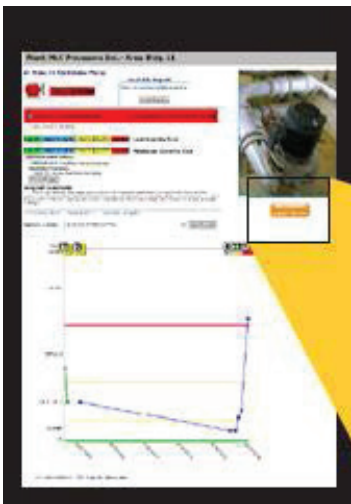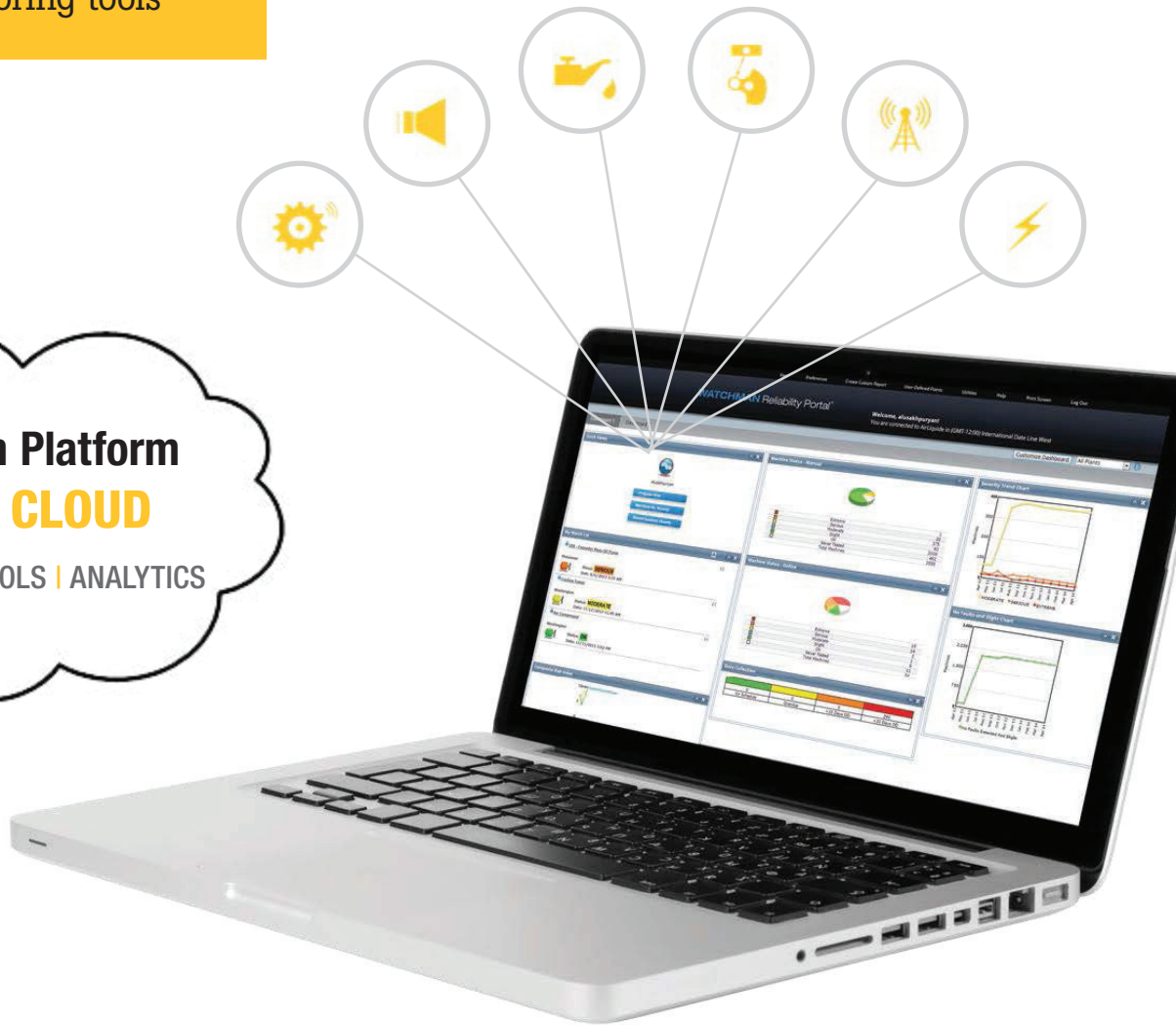
Cloud-Based Integration

For multiple technologies and condition monitoring tools

Watchman Platform
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

Expert Automated Diagnostic System

- Trained Diagnostics

- 6000+ Diagnostic Rules
- 1200+ Fault Conditions
- 50+ Machine Components

- Normalized Data
- Prioritized Actions
- Statistical Averages

- Supports:
  - Volumetric Analysis
  - Asset Template Leverage
  - Business Level Metrics

Analyst Reviewed Results

Main Service Pump #1
MID:	6
Averages:	4
Date Acquired:	11/5/2015 3:36:59 PM (UTC)
Machine Speed:	1781 RPM
Rulebase:	20130322
Figure of merit:	201
Maximum Level:	111 (+14) VdB at 1.00x on Motor Drive End Axial

RECOMMENDATIONS:
<2> IMPORTANT: INSPECT COUPLING AND CHECK SHAFT ALIGNMENT

DIAGNOSTICS:
<2> SERIOUS: ANGULAR MISALIGNMENT
111 (+14) VdB Motor Drive End Axial at 1.00xM
107 (+11) VdB Motor Drive End Tangential at 1.00xM
107 (+12) VdB Pump Drive End Axial at 1.00xM
105 (+12) VdB Pump Drive End Tangential at 1.00xM
103 (+11) VdB Pump Drive End Radial at 1.00xM
103 (+ 8) VdB Motor Drive End Radial at 1.00xM
96 (+ 8) VdB Pump Drive End Axial at 2.00xM

DISCUSSION BY ANALYST:
The vibration has increased over the previous tests.

Analyzed by: Jeremy Smith   11/5/2015 10:27:49 PM (UTC)

Repair Priority

Repair Recommendation

Fault Severity

Fault Diagnostic

Cited Peaks

FLUKE Reliability