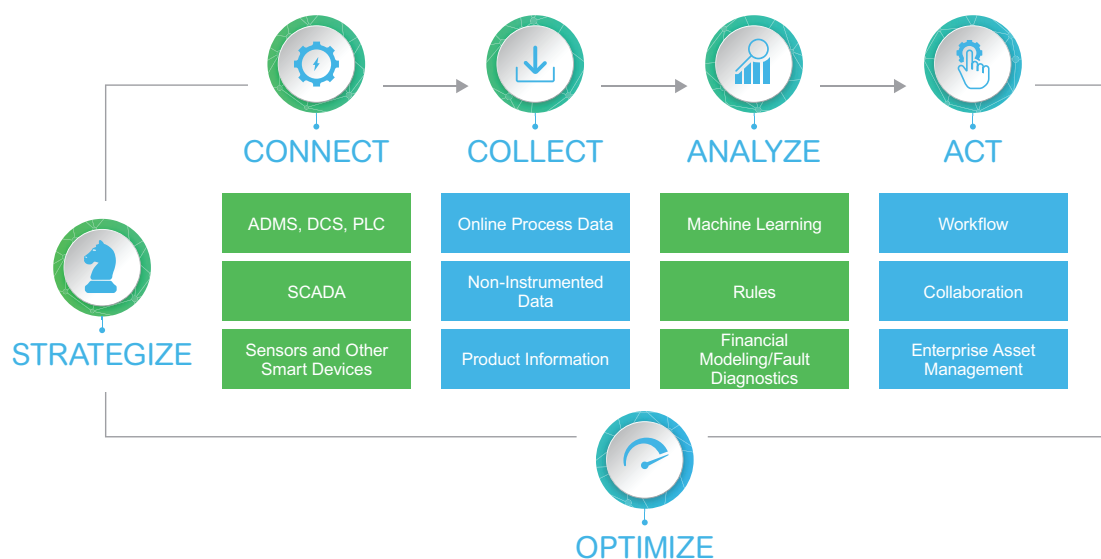# Achieve Asset Excellence

Improving reliability, performance and safety are among the top priorities of industrial plants and other asset-intensive organizations, and businesses today are focusing their efforts and resources on controlling costs and maximizing value from investments already made. Predictive Asset Analytics helps organizations gain the highest return on critical assets by supporting predictive maintenance (PdM) programs with early warning detection of equipment issues ahead of existing operational alarms.

More information is available about the health and performance of your equipment than ever before, and sensors are communicating ever increasing amounts of data in real time. Predictive Asset Analytics gives users the ability to quickly transform raw data into actionable insights to prevent equipment failure and make smart decisions that improve operations. Equipment agnostic, Predictive Asset Analytics can be configured to monitor assets regardless of equipment type, vendor, or asset age without the need for manufacturer specific asset information.

Enterprise Asset Performance Management Functional View

| STRATEGIZE	CONNECT	COLLECT	ANALYZE	ACT
	ADMS, DCS, PLC	Online Process Data	Machine Learning	Workflow
	SCADA	Non-Instrumented Data	Rules	Collaboration
	Sensors and Other Smart Devices	Product Information	Financial Modeling/Fault Diagnostics	Enterprise Asset Management

OPTIMIZE

Predictive Asset Analytics integrates with existing data historian systems and can be combined with Condition Manager to form the industrial analytics platform for a comprehensive Asset Performance Management program.

> **My organization already has an Enterprise Asset Management (EAM) system. Why do we need Predictive Asset Analytics?**
> Most asset-intensive organizations use EAM systems to track and manage maintenance processes and work orders. However, EAM systems alone do not provide the advanced pattern recognition technology used for online monitoring of assets to provide early warning notification of equipment failure.

How Predictive Asset Analytics Achieves Early Warning Detection

Predictive Asset Analytics is a predictive asset analytics solution based on a proprietary algorithm called OPTiCS that uses Advanced Pattern Recognition (APR) and machine learning technology. Predictive Asset Analytics learns an asset's unique operating profile during all loading, ambient and operational process conditions. Existing machinery sensor data is input into the software's advanced modeling process and compared to real-time operating data to determine and alert upon subtle deviations from expected equipment behavior. Once an issue has been identified, the software can assist in root cause analysis and provide fault diagnostics to help the user understand the reason and significance of the problem.
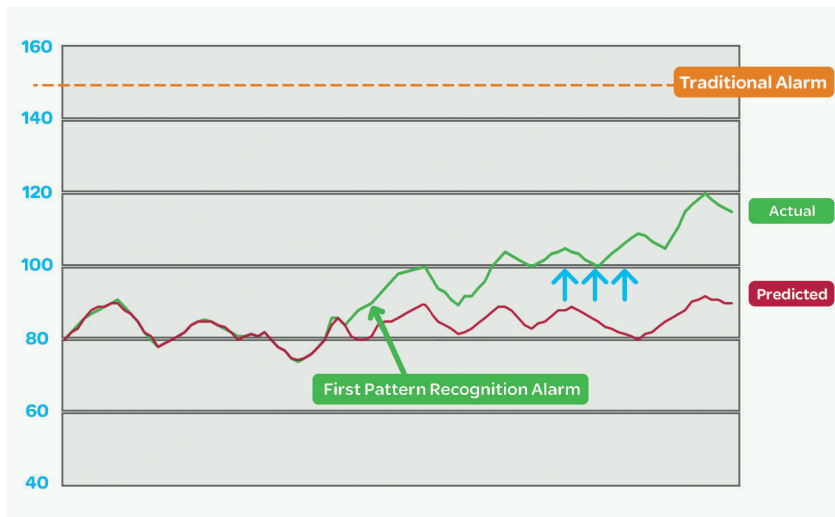
The Predictive Asset Analytics Advantage

1. Reduce Unscheduled Downtime
2. Prevent Equipment Failures
3. Reduce Maintenance Costs
4. Increase Asset Utilization
5. Extend Equipment Life
6. Identify Underperforming Assets
7. Improve Safety

Predictive Asset Analytics makes it easy to identify anomalies and provides notification of abnormal conditions before operational alarms.

Predictive Asset Analytics Benefits

Predictive Asset Analytics predictive asset analytics software makes reliability, performance and efficiency goals more achievable by allowing the user to address issues before they become problems that significantly impact operations. With continuous maintenance and reliability improvements, additional benefits can be achieved. Unscheduled downtime can be reduced because personnel receive early warning notifications of developing issues. Instead of shutting down equipment immediately, the situation can be assessed for more convenient outcomes. Maintenance costs can also be reduced due to better planning; parts can be ordered and shipped without rush and equipment can continue running.

With predictive analytics, personnel know and understand the actual and expected performance for an asset's current operational state. They know where inefficiencies are and their impact on financial performance and can use this information to understand the impact of performance deficiencies on current and future operations. This information also helps assess the risk and potential consequences associated with each monitored asset and can be used to better prioritize capital and operational expenditures.

Another increasingly important benefit is the capability for knowledge capture and transfer. Predictive Asset Analytics ensures that maintenance decisions and processes are repeatable even when organizations are faced with transitioning workforces.

What costs could you avoid through Predictive Asset Analytics early warning notification?

$4,000,000+ avoided through early identification of power generation turbine blade damage

$500,000+ avoided due to early identification of a plant motor coupling approaching failure

$250,000 avoided due to early warning of a bearing seal differential pressure problem

$243,000+ avoided by early identification of improper control valve positioning

$370,000 avoided due to early warning of pump feedwater heater and bypass valve problems

$250,000 savings per year through identification of pump inefficiencies for thermal performance improvements

$50,000+ avoided through performance optimization

Software Features

Predictive Asset Analytics integrates with a wide variety of data historian solutions, control and monitoring systems and can be deployed on premise or in the cloud. The system is highly scalable and can be used to monitor a single asset, plant or hundreds of remote assets across multiple sites. Results of the Predictive Asset Analytics models can be easily integrated with other business systems through the use of web services.

Server

The software contains a server-based application that collects data from plant historians, predicts the signal values and archives the results. Predictive Asset Analytics Server detects anomalies, creates alerts and sends notifications.

Desktop Client

The Predictive Asset Analytics Client is a desktop-based application used to develop, train, validate and deploy equipment models and alert notifications. The Predictive Asset Analytics Client is equipped with templates and a database of known assets and conditions that streamline the model-building process, making it simple for users to create and maintain their own models. The intuitive, graphically driven process allows models to be built in minutes rather than hours and does not require any programming or detailed equipment knowledge.

Web Access

The web-based application, Predictive Asset Analytics Web, is used to manage alerts, quickly retrain models and analyze and chart model results. Predictive Asset Analytics Web organizes alert information in a hierarchical structure allowing users to
identify systems that are in an abnormal state and then view the individual components of the alert for further analysis.

Alerts and Notifications

Users can set alert thresholds to communicate when the deviation between actual values and predicted values exceeds allowed limits. Alerts can be managed in a variety of ways including by alert category, level, criticality, duration and frequency. Each alert event is also directly linked to a graphical trend for that asset that shows the event data, threshold limits and times when the values are in alarm. Relevant users and groups can be notified in real time if an asset is in alert status through Predictive Asset Analytics's customizable email notification capabilities.

15,000+

Predictive Asset Analytics is used to monitor more than 15,000 assets globally.

Sample assets monitored:
- Compressors
- Pumps
- Motors
- Turbines
- Electric generators
- Fans, Blowers
- Heat exchangers, Boilers, Ovens, Kilns
- Water heaters
- Pulverizers, Crushers
- Condensers
- Transformers, Breakers, Capacitors
- Agitators, Blenders, Mixers
- Gearboxes
- Chillers
- Industrial vehicles
- Many more

Data Analysis

Predictive Asset Analytics includes a variety of advanced statistical and model-based comparison applications and business intelligence tools that enable users to spend less time searching for potential problems. Users have the ability to view the raw training data, results of the model, compare the performance of similar assets of the same type, and view the effects of alerts. The statistical applications interpret the data using visual representations so that data scientists and equipment experts are not required to interpret the results. Predictive Asset Analytics is equipped with fault diagnostics capabilities to help the user determine the cause of the identified abnormality and how to avoid it in the future. Diagnostic ability reduces the likelihood that an engineer will attribute abnormal operating conditions to the wrong variable.

Transient Module

The Predictive Asset Analytics Transient Module provides the ability for online monitoring of abnormal conditions during a transient, such as startups and shutdowns. Predictive Asset Analytics is also able to automatically identify previous transient events from the historian, which is useful for comparisons.

Calculation Engine

The software includes an advanced calculation engine that provides the ability to develop simple and complex calculations to create pseudo or 'virtual' points. The results of these calculations can be used in Predictive Asset Analytics models, allowing for greater system flexibility. The calculations can automatically back-calculate, making historical data available for the monitoring period before the current calculation was created.

Security

Predictive Asset Analytics software integrates with existing enterprise security systems. The system supports single sign on authentication, and administrators have the ability to limit user access rights and editing privileges at a granular level.
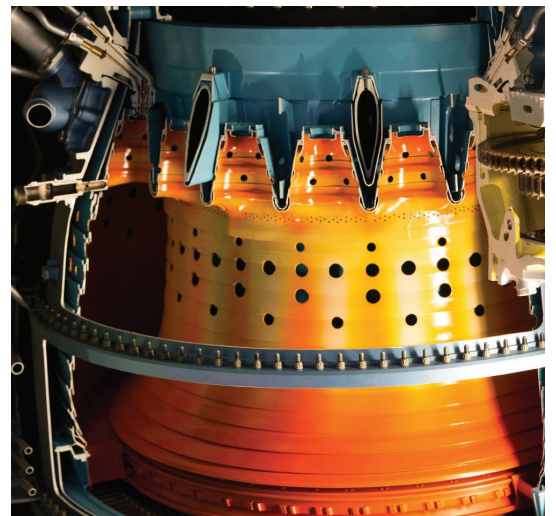
Monitoring & Diagnostic Services

Schneider Electric offers comprehensive monitoring and diagnostic services remotely or on-site. We can train you to deploy, maintain and monitor your own models, or we can do the monitoring for you. Our team of experienced engineers can assist you with every step of the process from model training, to diagnostics, to best practices.

Additional Products Available

Schneider Electric offers a comprehensive portfolio of software solutions that integrate with Predictive Asset Analytics, including mobile applications, data historians, condition management systems, EAMs, and more.

SmartGlance Mobile Reports
Integration with Predictive Asset Analytics enables users to monitor the performance of critical assets on-the-go from any mobile smartphone or tablet. The SmartGlance App allows users to view and analyze data and alerts—anywhere, anytime and from any device.

Enterprise Historian
Wonderware eDNA is a real-time enterprise data historian that bridges the IT/OT information gap. It collects, stores, displays, analyzes and reports on operational and asset related health information for more timely and informed decisions.

Mobile Operator Rounds
Mobile Operator Rounds is the most comprehensive mobile workforce enablement and decision support system. It enables consistent execution of Operations, Maintenance, and Inspection activities to achieve higher levels of plant safety, regulatory compliance, availability, reliability and performance.

Condition Manager
Condition Manager is a unique, intelligent real-time condition management system solution that collects and analyzes real-time diagnostics from all plant production assets using rule based logic. The results drive a condition-based maintenance strategy.

Enterprise Asset Management
Enterprise Asset Management (EAM) solution comprised of a set of integrated modules designed to enable improved asset reliability and real-time access to information to manage maintenance and supply chain operations.

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For more information, visit: software.schneider-electric.com