



APM Health Classic from GE Digital

Part of our On-Premise Asset Performance Management Classic Solution Suite

Drives rapid situational adjustments with decision-quality information based on comprehensive knowledge of asset conditions

Asset-intensive companies often struggle with a lack of visibility into physical asset information to make timely decisions for proactive responses to emerging issues. APM Health reveals an asset’s overall fitness to perform at the anticipated level, delivers early warning of potential failures, and highlights any elevated-risk areas.

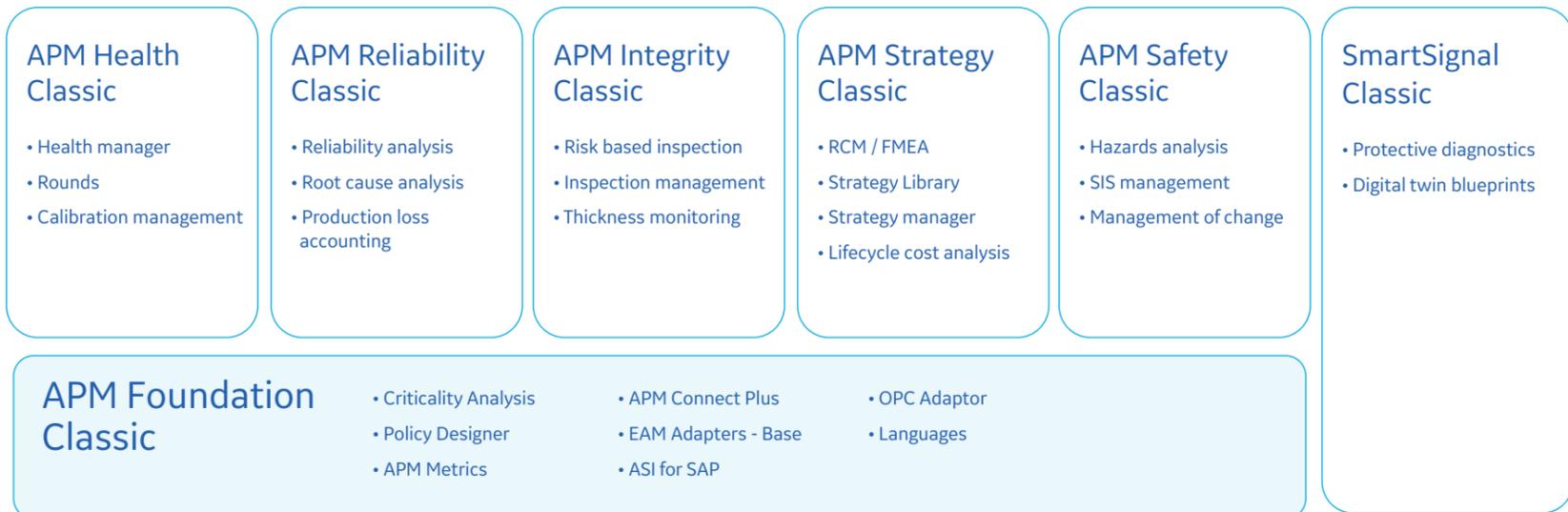
APM Health enables the following goals and outcomes:

- Increased availability
- Reduced reactive maintenance
- Gain in employee productivity

APM Health Classic, part of our on-premise Asset Performance Management Classic solution suite, provides the following capabilities:

- **Health Manager:** Combines health indicators in the context of known risk factors, inspections and work histories, and complex assessments and predictive analyses
- **Rounds:** Enables accurate and timely asset condition assessment in the field using mobile devices. This enables operational visibility to prevent failures and reduce disruptive unplanned downtime
- **Calibration Management:** Enables companies to standardize, manage, and optimize their instrument calibration strategies across the entire enterprise

APM Classic | On Premise





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Health Manager

Correctly interpreting asset health trends requires in-depth understanding of asset's operating and maintenance history. The Health Manager capability puts asset condition in context monitoring known asset failure modes, alerting users to emerging operating situations and empowering them to prioritize alerts and respond proactively to avoid disruptive unplanned maintenance.

Health Manager provides the ability to define and manage asset conditions for a comprehensive view of asset health. This capability is designed to provide visibility into asset conditions by leveraging data sources managed in APM as well as existing sources of data in your organization. Analysts may assign health indicators to asset condition data to provide context of the data being viewed in the system. The focus is to monitor data that is relevant to asset performance analysis and condition assessment, such as:

- Condition data checked periodically through inspection or activities, such as rounds
- Excursion events monitored directly from a process historian
- Asset performance history, such as key performance indicators (KPIs)

Health indicators are defined with high and low criteria for warning and alarm conditions. This information triggers personnel to take the appropriate follow-up action.



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Visibility of critical information:

Health Manager provides visibility of a collection of health indicators by asset in a hierarchical display. Existing asset and location structures can be leveraged to display the information in a meaningful way to the analyst. Warnings and alarm indicators are propagated up the asset hierarchy, enabling drill-down from the higher level. Detailed information is available for each health indicator, including data trends and history. Health Manager provides a summary view of all health indicators for an asset. This summary view represents the information in a normalized scale and with relevant positioning. The analyst may view “at-a-glance” to see if any indicators are high or low, and then drill into the details of any individual indicator for the actual trend in a specific range scale.

Health indicators are prioritized in the hierarchical display so that the most critical alerts are given focus for appropriate response.

Health Manager provides the ability to respond to emerging trends and initiate action to respond to the warnings and alarms through Recommendation Management. For any warning, alarm, or trend, a recommendation can be initiated for follow-up action for corrective work or changes to strategies in the form of planned work, procedures and/or policies.

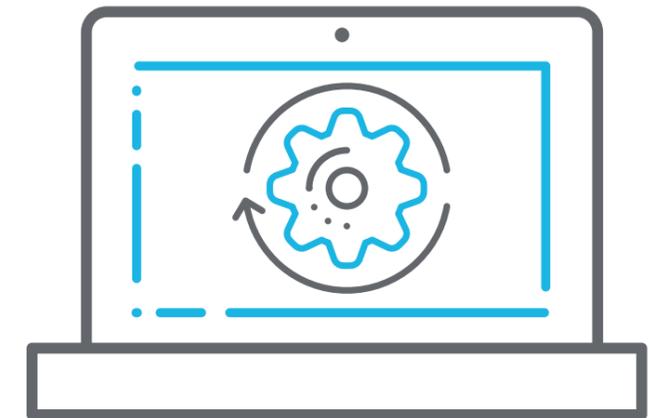
As follow-up actions are initiated or completed, Health Manager provides the ability to acknowledge the originating warnings and alarms. The system identifies the individual who acknowledged an early warning or alarm with the date, time and comment. The acknowledgement propagates up the hierarchy to clear high-level warning and alarm indicators.

Health Manager is fully integrated with machine data sources through APM Foundation, which provides an important dynamic data source for health indicators.

Process historian and sensor data is dynamically accessed through a standard OPC interface, or dedicated interfaces to GE® and Emerson® control and monitoring systems, as a source of asset health data. Policy Designer can be used to calculate custom health indicators based on M2M sources in combination with any other data managed in APM. Health Manager can be used as a visual tool to monitor process data for alarm conditions or excursion events based on process historian or Policy Designer logic.

New in V4.3, the Health Manager user interface has been updated to provide a more consistent experience. Trend charts have been enhanced to enable users to select their own date range for the trend, extending the maximum range to 100,000 points for trends sourced from a process historian, or, unlimited for trends sourced from data stored in the APM database.

Health Manager provides the tools and functionality that you need to develop a powerful enterprise APM solution that supports your workflows and has the flexibility to meet your changing business needs.





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Rounds

Rounds puts the power of Enterprise APM software in the hands of field personnel through a mobile application that lets them execute aspects of an asset strategy by monitoring asset performance and capturing condition data electronically in the field. Rounds also enables management of lubrication activities, which is a critical component of an effective reliability program. Rounds integrates equipment strategies into day-to-day operations and surveillance programs and facilitates the efficient assessment of asset performance.

Rounds Data Collection

Enhanced mobile support in V4.3 supports a wide variety of mobile devices. This enables Rounds Data Collection users to access other APM features while connected, providing for richer, fully integrated asset management capability. The touch-friendly Rounds Data Collection capability guides users through an intuitive, step-by-step workflow, making data collection both efficient and portable. Rounds supports seamless online/ offline capability. Routes and historical data can be downloaded to a mobile device for use in area with no data connection. Readings and recommendations are uploaded automatically when a connection is available without the need to manually synchronize data.

Key features include:

- **Reading Alerts** – Lets users know immediately that data collected in the field indicates a condition that falls outside of pre-defined limits. A detailed message can be displayed to inform the user of any specific actions that need to be taken based upon as-found conditions.
- **Recommendations** – Enables users to document a request for additional action, such as maintenance or repair work, when they are unable to correct an undesirable situation in the field. By creating a recommendation on the mobile device, users can ensure that potential failures are addressed in a timely manner.
- **History** – Offers access to historical reading and recommendations on the mobile device while routes are being executed. This information can provide valuable insight that helps personnel make decisions in the field that will ensure safe and reliable operations.
- **Integration** with device cameras adds rich visual condition reporting that saves time and improves accuracy of follow-up maintenance planning.
- A Rounds-specific **data collection** application for Windows mobile devices supports legacy ruggedized and intrinsically safe mobile computers.



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Rounds Designer

APM Health's Rounds capability provides comprehensive Route Management features. The intuitive drag-and-drop user interface enables route designers to organize and sequence measurement and lubrication points, which define the location, data collection and maintenance action requirements for assets along a route. The comprehensive templating capability enables route designers to quickly build routes that leverage standard maintenance and data collection protocols. Flexible scheduling enables entire routes, or individual measurement and lubrication points, to be programmed efficiently for daily, weekly, and longer check intervals. Configurable compliance tracking and reporting provides supervisors with insight into overdue data collection requirements as well as overall compliance with routine asset monitoring and maintenance activities.

Rounds Analysis, Trending and Alerts

The data collected through Rounds is fully integrated with the Health Manager capability to provide a complete view of an asset's health. This includes current readings, trends and alert information captured during the mobile inspection process. Health Manager provides all asset health information "at-a-glance" to the analyst to correlate data and ensure that follow-up activities are carried out to avoid unplanned asset failures.



Calibration Management

Instrumentation and control systems play an essential role in monitoring and controlling manufacturing processes and represent a significant investment for process plants. In addition to supporting the efficient operation of the plant, instrumentation is also a fundamental element of most safety and shutdown systems, so ensuring the reliability and performance of these systems is paramount. Most manufacturing facilities have a large number of diverse instruments, making the implementation of a comprehensive instrument and calibration management program a daunting task without the support of standard practice processes and solution.

Calibration Management enables companies to standardize, manage, and optimize their instrument calibration strategies across the entire enterprise. Instrument technical data can be classified and managed in a standard format, and the overall calibration plan and results can be captured and preserved in a fully auditable format, meeting the compliance requirements of both OSHA 1910 and ISO 9000.

APM Classic interfaces to Enterprise Asset Management (EAM) systems, allowing for seamless work-process integration between maintenance, operations, engineering, and instrumentation groups, thus eliminating the need to manually maintain data between multiple systems.

The Calibration Management capability enables the definition of the overall calibration strategy for an instrument, the objective of the strategy, the frequency of the calibration, and the resource responsible for ensuring that the calibrations are successfully executed and completed. The application provides quick access to key information like tags, engineering specifications, calibration schedules, calibration results, maintenance and repair history, and associated reference documents, such as the loop diagrams, OEM manual, and testing procedures.

The capability enables you to add digital photos, vendor specification sheets, links to document management systems, associated process and instrumentation diagrams (P&ID), single line diagrams, and any other relevant document.

Also included is a complete management and documentation system to capture critical components of calibration events via handheld field calibrators, spreadsheets, and manual feeds using built-in data entry forms.

The tool supports multiple types of calibrations such as:

- Analog
- Analyzer Multi-Component
- Analyzer Single Component
- Discrete
- Weight Scale
- Functional Test



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Calibration Management's configurable workflow supports the complete lifecycle approach for instrumentation management that includes definition, execution, review, approvals, and storage of completed calibrations. The workflow tool enables alert notifications to drive visibility into calibration programs and events, as well as help ensure the regulatory compliance targets are achieved. A wide variety of calibration reports are available for pre-formatted viewing and printing.

Out of the box configurable graphs including:

- Calibration Measurement
- Calibration Error
- Calibration Historical Error Trend
- Calibration Historical Pass/Fail Trend

Calibration Management helps ensure a standardized approach for lifecycle calibration management is executed, as well as the best practice processes to analyze the effectiveness of calibration strategies after implementation.

APM Designer Integration

Health Manager, Rounds and Calibration are fully integrated with Policy Designer, a capability within the APM Foundation Classic solution, which provides a graphical, user-friendly tool to define asset policies to monitor conditions and initiate action, such as generating a work request for follow-up

maintenance activity. Data from Rounds and integrated M2M sources is a key input source for asset monitoring policies. Current reading values or aggregate values of readings can be used to drive complex asset monitoring logic. Policies can automatically generate recommendations and email alerts to ensure follow-up activities are carried out in a timely fashion to avoid unplanned asset failures. Policies can create or update other V4.3 APM data to enable automated workflows based on asset condition, including support for highly configured APM solutions.

Strategy Manager Integration

Health Manager is fully integrated with the Strategy manager capability in the APM Strategy Classic solution. Any failure mode or degradation mechanism identified in the asset strategy may be mitigated by a health monitoring action. Strategy analysts can quickly create or assign existing indicators to implement a risk-mitigation action, enabling health analysts to see the relevant risk context for asset health conditions. In addition, health indicators are used to monitor asset strategy compliance and effectiveness.

Data Integration

Health Manager is fully integrated with APM Foundation Classic's M2M data connections, as well as Rounds measurement locations, and KPIs delivered through APM Metrics, a capability also found in the APM Foundation Classic solution. Health Manager may be extended to any other data source integrated with APM Classic V4.3 as part of your implementation solution.

Summary

APM Health Classic reveals an asset's overall fitness to perform at an anticipated level, delivers early warning of potential failures and highlights any elevated-risk areas.





About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

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