

# AUTONOMOUS INSPECTION

Computer Vision Software for Smart Inspections Integrated with APM

## BENEFITS

01

Faster, Cost-effective Detection and Response

02

Improved Worker Productivity and Safety

03

Improved Outcomes with Additional Visual Insights

### AI-based image analytics for faster, safer, and more cost-effective inspections and monitoring

Traditional manual inspection processes used by industrial firms are highly resource-intensive, prone to safety risks and errors, and difficult to sustain.

Autonomous Inspection utilizes image capture devices and Artificial Intelligence/Machine Learning (AI/ML) algorithms to automate the manual inspection and monitoring process, either partially or completely. Its integration with select GE Vernova Asset Performance Management (APM) applications helps users access and act on visual data and insights within the APM applications to improve asset and operational outcomes.

Get started 

## KEY FUNCTIONALITY

Autonomous Inspection is packed with powerful capabilities designed to automate inspection workflows. This includes automated image data collection, processing, integration, analysis, and management. Detailed functionality includes the following:

### COLLECTION & CONVERSION

#### Image Data Ingestion

- Securely collect images using fixed (RGB/thermal) and mobile cameras from various on-premises industrial assets.
- Supports multiple image formats (including JPEG, PNG, and others).
- Real-time and batch data ingestion options.

#### Conversion to Time Series Data

- Transforms images into structured time series data.
- Timestamped data points for synchronization.
- Data normalization and preprocessing for consistency.

### INTEGRATION

#### AI/ML Engine Integration

- Seamless integration with GE Vernova's AI/ML models for image analysis.
- Automated detection of patterns, anomalies, and trends in image data.
- Machine learning model training and retraining capabilities for:
  - Circular and square gauge detection and reading.
  - Thermal profiling.
  - Corrosion detection, severity classification, and alerting.
  - Panel monitoring for Motor Control Center (MCC) and other panel types.

#### Integration with APM

- Current integration with APM Reliability+ (license required to use). The integration enables running additional analyses on visual data in Reliability+ application to help improve asset reliability. Integration with more APM applications is part of the product roadmap.<sup>1</sup>

### ALERTING & RECOMMENDATION

#### Threshold-Based Alerting

- User interface to easily configure threshold values for key image metrics like temperature, pressure, and others.
- APM alert generation when monitored values cross defined thresholds.
- Event-based notifications for alerts and cases.

#### Integration with Alert Management

- Alert prioritization and categorization.
- Audit logs to track alert resolution and responses.

#### ML Recommendation Engine

- Offers actionable insights and recommendations based on AI/ML analysis and pushed to APM Time Series

### MONITORING & CUSTOMIZATION

#### User Interface (UI)

- User-friendly, web-based UI to configure captured camera images.
- Cloud UI to monitor and configure threshold levels per customer tenant.

#### Dashboard Customization

- Advanced Visualization to create dashboards and reports tailored by asset type.
- User-defined Key Performance Indicators (KPIs) and metrics.

### DATA MANAGEMENT & ANALYSIS

#### Historical Data Analysis

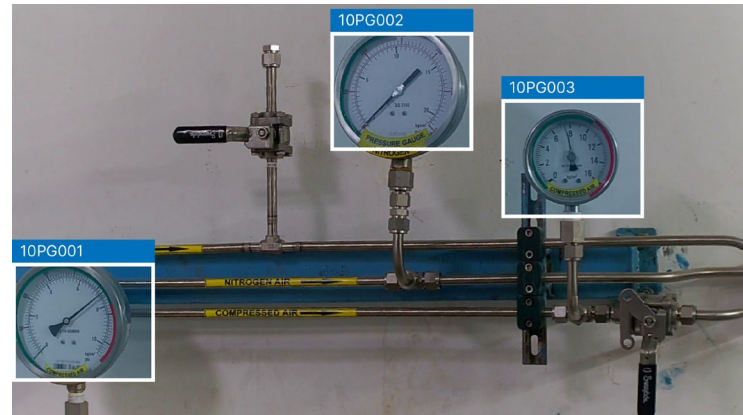
- Store and manage historical image data.
- Advanced querying and filtering capabilities for historical analysis.
- User-friendly data exploration and visualization tools.

#### Data Retention and Archiving

- Data retention policies to manage historical data storage.
- Long-term data archiving options.

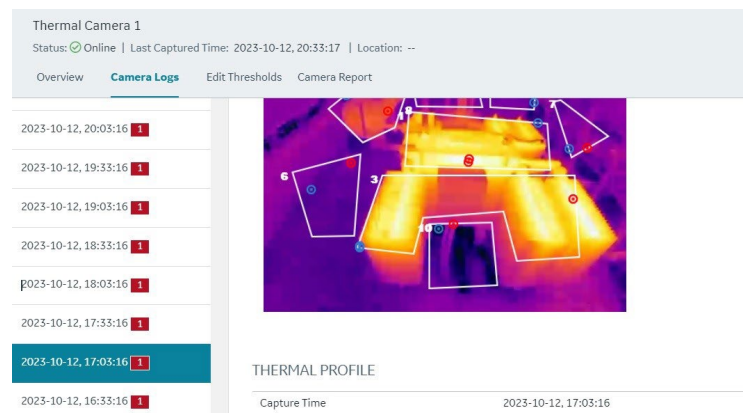
<sup>1</sup>Timing or future availability of integrations cannot be guaranteed.

# USE CASES



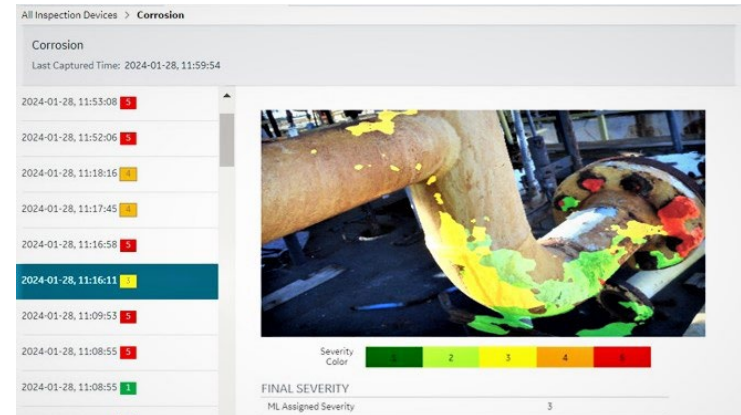
## GAUGE DETECTION & READING

- Automatic detection of circular and square gauges.
- Automatically extract values (e.g., pressure) from gauges using images and AI/ML models.



## THERMAL PROFILING

- Monitor user-defined regions on asset images for hot spot and cold spot thermal activities.
- Identify and get alerted on overheating assets from thermal images.



## CORROSION DETECTION AND QUANTIFICATION

- Identify damage modes (external corrosion, cracking, or others).
- Detect corrosion and estimate severity. Classify severity per chosen corrosion standard(s).
- Send alerts and recommended maintenance actions based on customer-trained model(s).



## MCC/PANEL MONITORING

- Digital panel reading.
- Monitor status indicators, such as LEDs or warning lights to check operational status (on/off, error codes, etc.).

# TECHNICAL OVERVIEW

## Software Deployment

Autonomous Inspection is a cloud application available as an add-on to the APM Essentials Platform and requires a separate license to use. It is delivered as a SaaS application hosted within GE Vernova's virtual private cloud.

## Compute and Connectivity

Additional hardware components and virtual machines are required to host an on-premises software application when a stationary camera is used for image capture. This setup also includes IP cameras and cables to capture and transmit images to the cloud. The customer is responsible for on-premises cameras, networking devices, hardware, and virtual machines.

## Data Collection

The AWS File Storage Gateway facilitates the transfer of images from on-premises systems to the cloud.

## Analytics

Centralized management of use-case-driven deep learning algorithms is implemented using AWS SageMaker, which comes with an Autonomous Inspection subscription. No separate AWS license is required by the customer.

## APM Modules Integration

Current integration with APM Reliability+. Integration with additional APM applications (such as APM Integrity) is part of the product roadmap. However, timing or future availability of integrations cannot be guaranteed.

## Security and Compliance

Robust data encryption during transit and at rest. Adherence to applicable cybersecurity and compliance requirements adopted by GE Vernova's software business.

## Support and Maintenance

24/7 customer support with Service-Level Agreement (SLA) options. Cloud-based subscription ensures regular SaaS software updates and bug fixes. Forums for user knowledge and assistance are available through the GE Vernova Community portal.

# GET STARTED WITH AUTONOMOUS INSPECTION FROM GE VERNOVA

To learn more about Autonomous Inspection or book a demo, reach out to your sales representative.

Contact us 