

A photograph of two men, one Asian and one Caucasian, both wearing glasses, looking intently at a piece of industrial machinery. The man on the left is leaning on a yellow panel, while the man on the right is pointing at a component. The machinery is complex, with various pipes, wires, and mechanical parts visible. The background is slightly blurred, showing more of the industrial environment.

Real-time industrial product inspection

Spyglass Visual Inspection is a rapid time-to-value IoT solution that helps manufacturers reduce product defects, eliminate false rejects, and increase customer satisfaction.

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Defects in Manufacturing: A Persistent Challenge

Manufacturers have been using cameras to detect flaws for decades but these systems are limited in the quantity and variability of defects they can detect. They usually require human inspectors to review both the images and the product itself to confirm the defect, making it a slow, time-consuming process. These older analog systems are inadequate for identifying complex variations in product features because their approach is one-dimensional and fixed, meaning they can't learn and evolve like today's AI-powered solutions. Some manufacturers still rely on manual defect detection because installing vision systems didn't make sense due to technology and budget constraints. The goal of Mariner's Spyglass Visual Inspection is to match or exceed a human inspector operating at their highest accuracy levels and apply that to all products in real time on all production lines.

Overcoming defect-related challenges

To reduce the occurrence of product defects, manufacturers need to:

- Identify defects early in the production cycle and use analytics to identify the root cause of these defects
- Aggregate data from disparate systems, equipment, and locations
- Monitor the production process and alert operators and inspectors when the volume or type of defect is outside of permissible limits so immediate action can be taken

Introducing Spyglass Visual Inspection

The investments you've made to ensure your production equipment and processes run smoothly can now help you further control costs by minimizing defects in your products. Mariner's Spyglass Visual Inspection, powered by Microsoft Azure, uses your existing cameras and sensors to identify defects in real time and help you figure out what is causing them. Using state-of-the-art IoT, artificial intelligence, and machine learning technologies, Spyglass Visual Inspection drives quality improvements for improved customer satisfaction without the risk of a large, upfront investment in software or IT infrastructure. For customers who do not already have cameras installed, Mariner can help choose and install a vision system that meets your budget and needs.

Spyglass Visual Inspection leverages Azure for real-time monitoring and analysis



Azure Stack Edge Pro ingests images from industrial cameras on the production line and runs cloud artificial intelligence algorithms locally so operators are alerted to defects in real time.



Azure IoT Hub receives images, meta data from images, and results from the defect detection analysis on the edge.

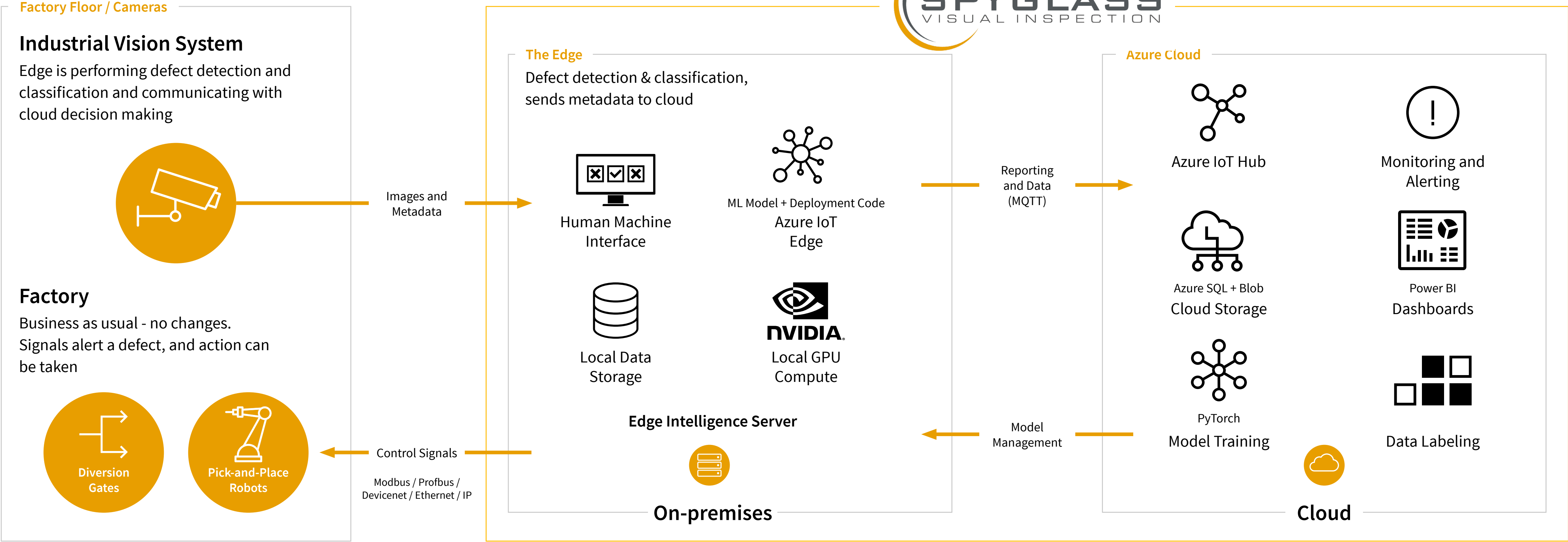


Cosmos DB provides a fast NoSQL database with open APIs for any scale.



Power BI provides interactive dashboards that make data easy to access and understand, so users can make analytics-driven decisions.

How it works and delivers value



- 1. Detect** product defects with custom vision, image recognition, and machine learning. Simple to complex defects can be identified at high speed in large volume with greater accuracy than human inspectors across several industry benchmarks.
- 2. Classify** hundreds of defect types to help identify and characterize the conditions under which they may arise.
- 3. Control operational activity** – Sends pass/fail control signals to production lines via PLC.
- 4. Monitor** their production process and alert operators and inspectors when the volume or type of defect is outside of permissible limits so that action can be taken.
- 5. Perform defect analytics** to identify the conditions and variables that create flaws and perform root cause analysis. Quality inspectors can set the business rules to determine what a defect is, analyze the data, and act to prevent future issues.
- 6. Predict** with confidence thanks to machine learning algorithms that accurately calibrate the defect detection model over time.

Customer example:

Automotive glass inspection made intelligent

A global glass manufacturer's false reject problem was costing them millions of dollars in labor costs, as well as lost opportunities for further production line automation. Additionally, their production lines were operating at 85% of rated speeds to allow for human oversight.

Results:

They deployed Mariner's Spyglass Visual Inspection, powered by deep learning and Azure Stack Edge Pro, and have reduced false reject rate from 25% to 0.2%, saving \$4m annually.

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Customer example:

Automotive interior inspection made easy

A global automotive interior manufacturer had a costly problem with their existing machine vision system: False reject rates were unacceptable, defect classification was insufficient.

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Results:

They deployed Mariner's Spyglass Visual Inspection, powered by deep learning and Azure IoT Edge. Now, they are alerted in real time when defect rates exceed established thresholds and they can accurately classify defects. Spyglass Visual Inspection has reduced their false reject rate from 34% to 1.4%, saving \$2m annually.

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Insight to Achieve

Mariner provides AI-driven solutions to help manufacturers overcome production issues that negatively affect profitability and customer satisfaction. Spyglass Visual Inspection is rooted in data and the power of data to help manufacturers gain more insights and make better decisions.

For over two decades, Mariner has been learning from manufacturers and guiding them to ensure they gain real value from their data – and this learning has been translated in to Spyglass Visual Inspection.



Azure IoT provides the industry's broadest portfolio of services and capabilities that meet you where you are, from the edge to the cloud, according to your needs and industry-specific requirements.

We provide the cloud building blocks to securely connect, monitor, authenticate, and aggregate data from your critical equipment and systems so you can take advantage of the cutting-edge technologies that today's companies use to optimize operations, enable innovation, and keep customers satisfied.

Partners in your success:

Mariner and Microsoft

As a 20-year Microsoft Gold Data Analytics Partner and 2020 IoT Partner of the Year, Mariner develops solutions that help drive operational efficiency, visibility, and cost-reduction for manufacturers: excessive cost and access to infrastructure. Leveraging the power, flexibility, and security of Azure, Mariner provides robust, innovative solutions that help manufacturers stand apart.

Solve your defect-related challenges today

1. Define Success

We work with you to define your unique defect detection accuracy requirements

2. Supply images

You provide sets of images of your products that represent acceptable quality as well as images of each class of defect

3. Prove it works

Using the supplied images, we'll configure an AI model that demonstrates the required accuracy

4. 100% satisfaction guarantee

If we are unable to meet your success criteria, your money is refunded

Learn more

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