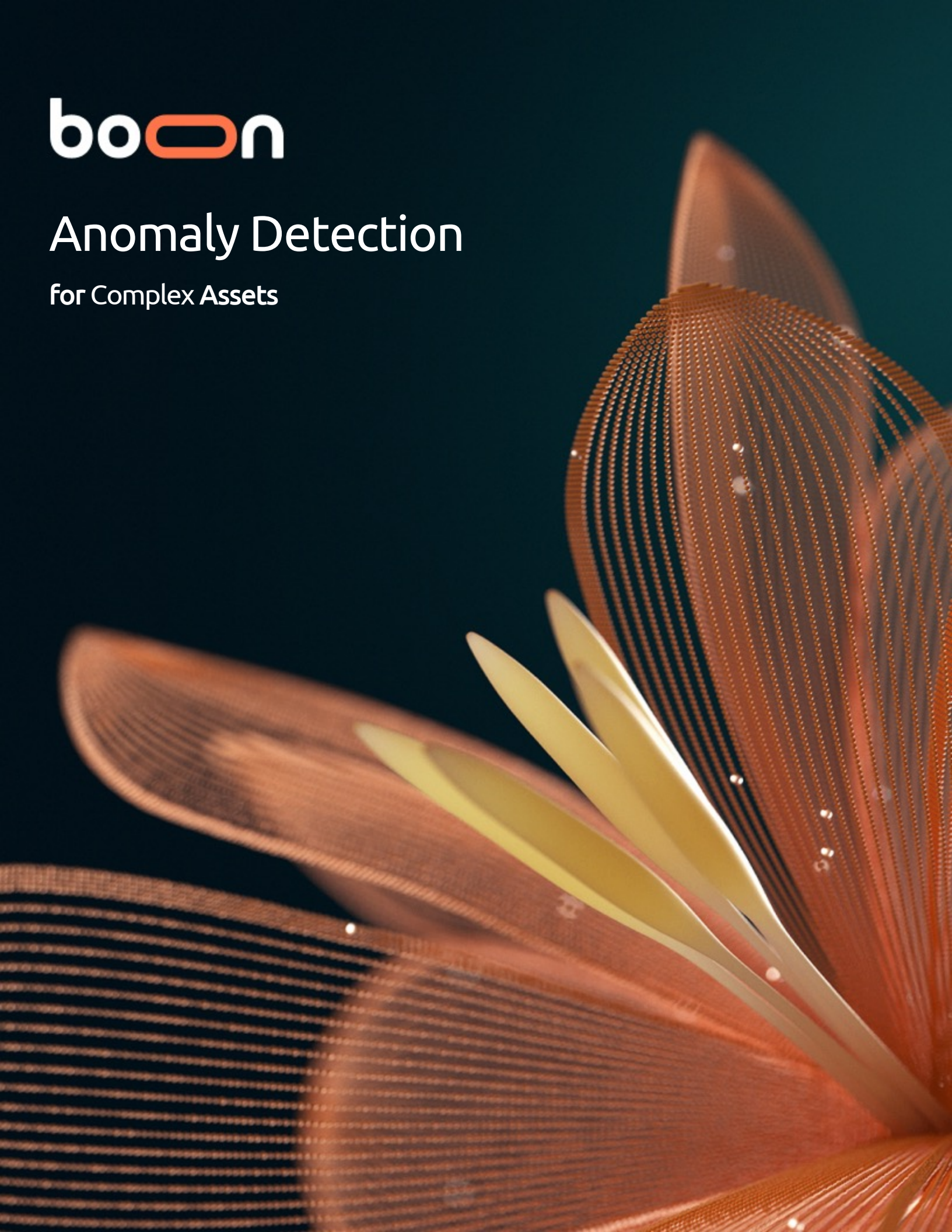
boon

Anomaly Detection

for Complex **Assets**



amber boon

Microservice for AI-based Predictive Analytics

Make better and faster decisions with complete visibility into the health of your operations. Amber detects equipment noncompliance earlier than any other predictive analytics tool, giving you more time to schedule maintenance, order parts, or change production settings. Lower your O&M costs by enabling your team to better utilize their existing data platforms with Amber.

Making Industrial Analytics and Actionable Intelligence Easy

Amber simplifies artificial intelligence. By using Boon Logic's leading unsupervised machine learning algorithm, the Boon Nano, Amber gives you the ability to create customized ML models from scratch in minutes. Amber turns the AI pipedream into next week's reality, immediately improving the quality and reliability of your operations.

Advance detection, upgraded

With Amber, your team will receive notice of equipment noncompliance weeks in advance compared to traditional threshold- and statistics-based logic.

Concise asset health measurement

Amber measures the ongoing health of your asset on a scale of 0 to 100% relative to the compliant operational states learned during training.

Model training in minutes

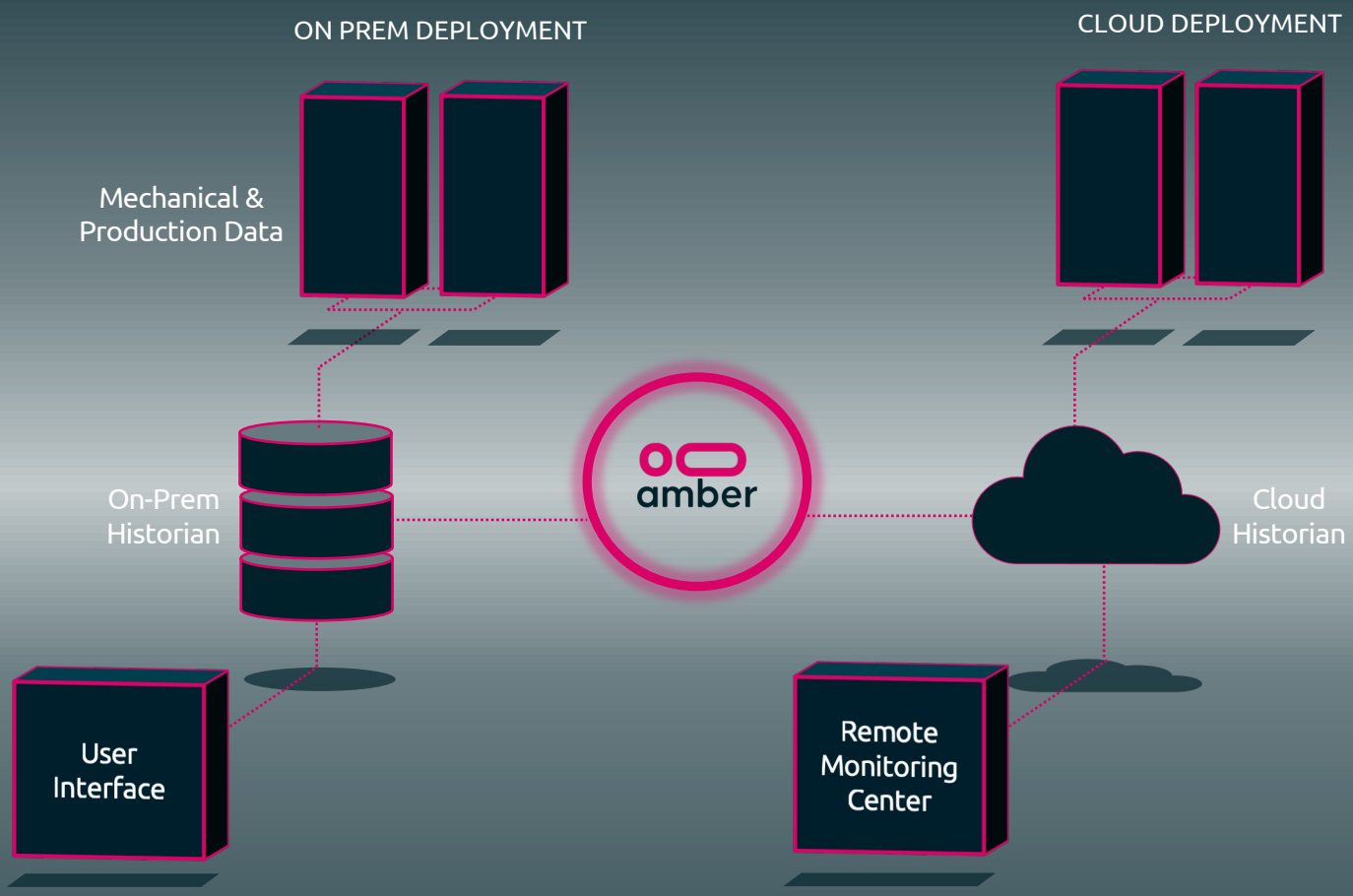
Scaling AI-based predictive analytics has never been easier. Users can build a unique model from scratch for each asset in a matter of minutes. Every asset is unique, even assets from the same production lot, and requires its own unique model to discern what is and is not normal.

Data scientist not required

Implementing AI no longer requires a data scientist. Amber allows staff members without a machine learning background to easily create ML models from scratch.

Enhance Your Existing Data Platform

Amber can integrate into your existing data management platform for deployment entirely on-premise or in the cloud. Amber makes things easy by allowing visualization in your current user interface.



PROGRAMMING INTERFACES

- REST API
- Python SDK
- JavaScript SDK
- C++ SDK
- Go SDK
- R SDK
- C# SDK
- Java SDK

MESSAGING PROTOCOLS

- MQTT
- OPC UA
- MODBUS
- SQL

SUPPORTED PLATFORMS

Microsoft Azure

Ignition!

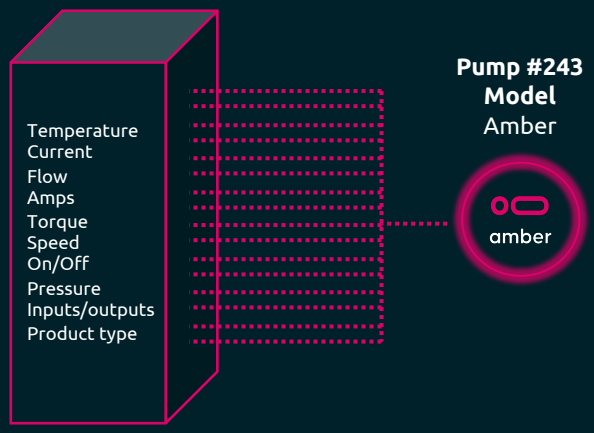
software AG

OSIsoft.

... and others

CHOOSE PARAMETERS

To configure Amber, choose 1–500 tags to be incorporated into a model. The selected tags should all be related to the health of the equipment or process, as Amber will learn the relationships that exist between all the tags.

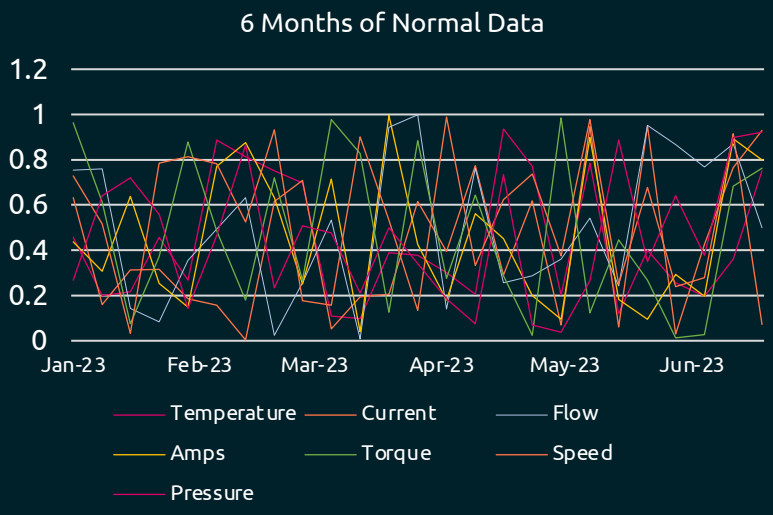


SELECT TRAINING DATA

Select 1–6 months of historical data that represent the asset's normal operating state for training. During this time, the asset doesn't need to be in perfect condition, but it should be free from major problems.

Variations of normal that should be included (if applicable):

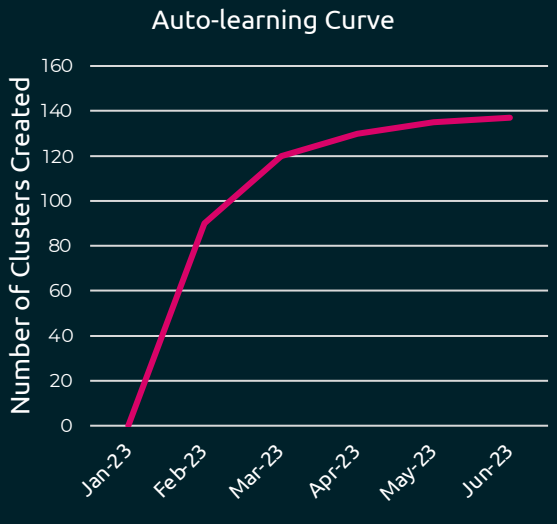
- Equipment on or off
- All normal production modes
- All normal product types
- All weather conditions



AUTO-LEARNING

Amber's auto-learning algorithm trains itself, enabling deployment in minutes, not weeks. During training, Amber learns hundreds of relationships between the tags selected during the training period. As training progresses, Amber's learning curve starts to level, indicating Amber is becoming familiar with the asset's normal operations. Once the learning curve plateaus, training is complete.

- Trains a unique model from scratch for each individual asset
- No programming required
- No data scientist required



Watch a Demo

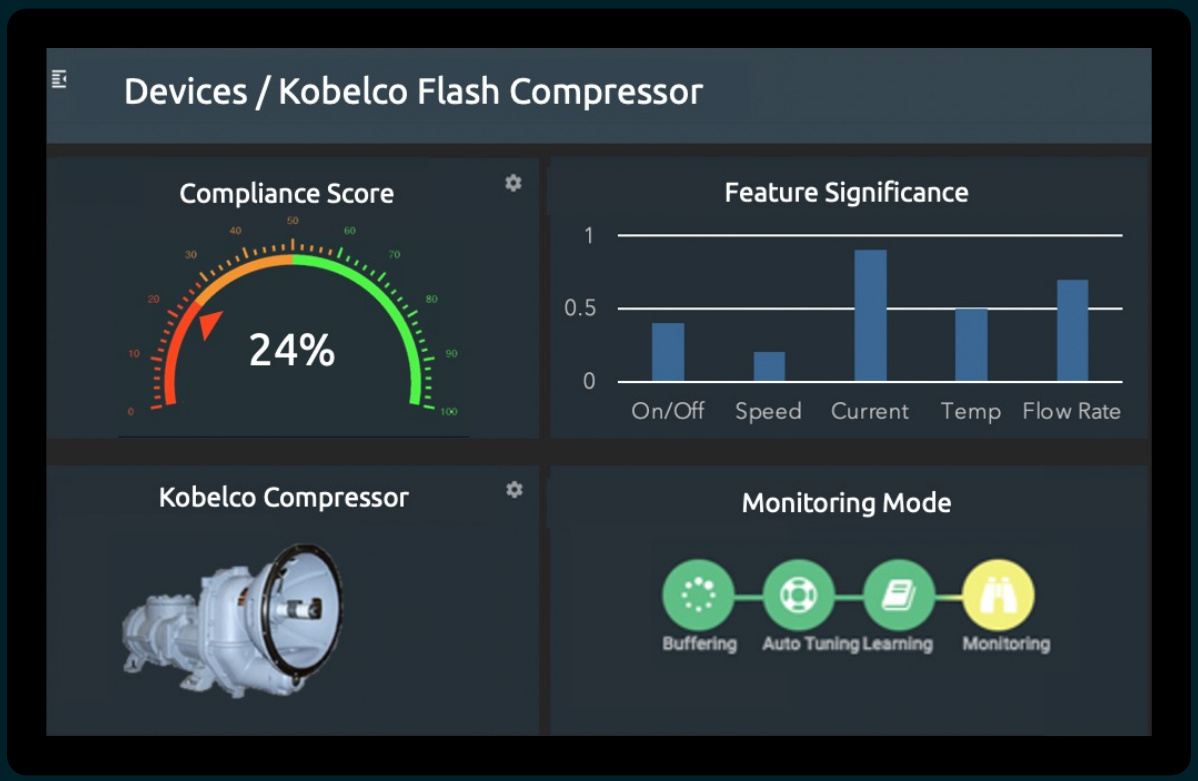
Actionable Analytics

Users receive real-time insight into the health of their asset and the tags that indicate a changing condition. Warnings can be preset to send alarms to specific users when an asset is changing or critical.

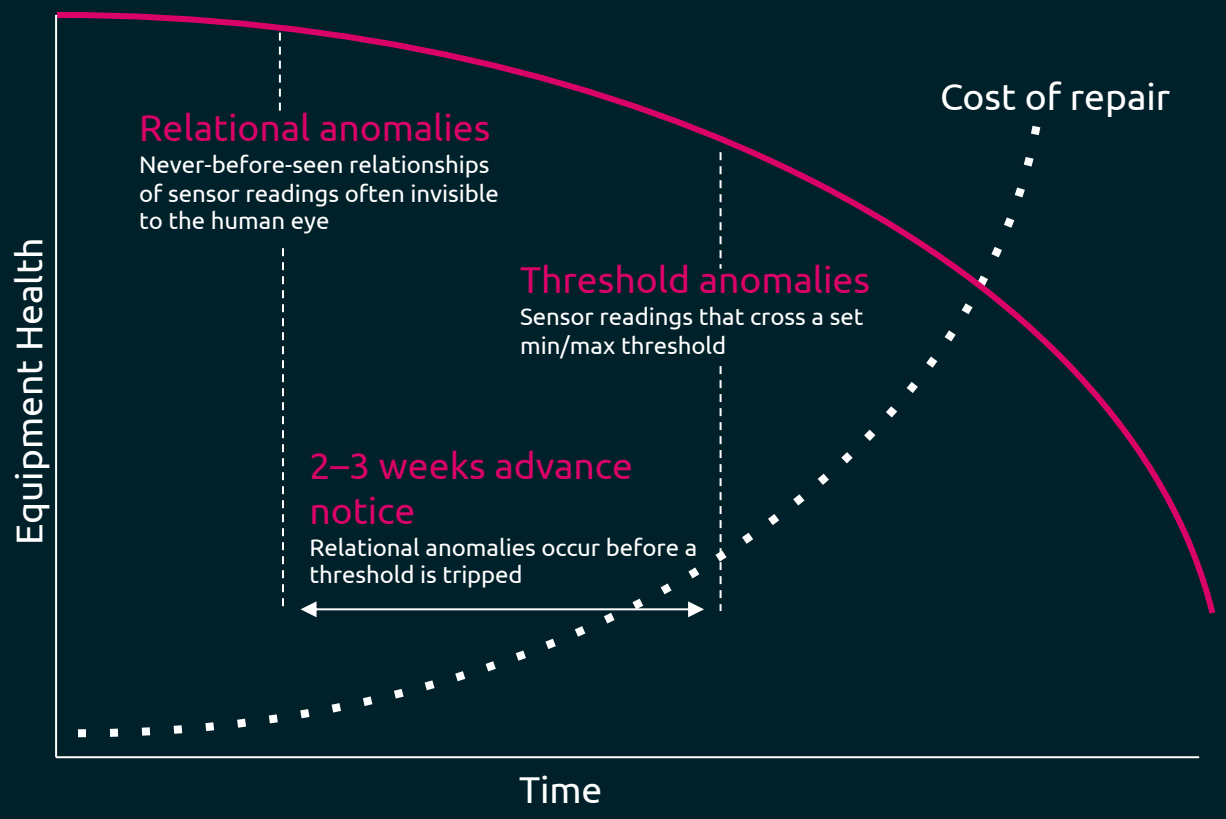
Compliance Score (CS) shows the health of the asset on a scale from 0–100%

NORMAL 100% – 51%
CHANGING 50% – 26%
CRITICAL 0% – 25%

Feature Significance highlights the top tags that contribute to causing an alarm to occur. Often this is from an abnormal never-before-seen relationship of two or more parameters.



Detect what others can't



When a reliability engineer looks at historical data on a pump to assess if it needs maintenance, they look at all available data, both mechanical and operational, to identify abnormal relationships between the mechanical and operational behavior of the pump.

Analytics used for asset monitoring shouldn't be any different. Similar to an experienced reliability engineer, Amber looks for anomalies that take place as an unusual relationship between multiple parameters. Oftentimes, these relational anomalies provide notice 2–3 weeks earlier than statistics- and threshold-based anomaly detection.

Amber's models can have up to 500 tags, meaning that Amber can identify subtle, never-before-seen relationships in even the most complex of environments.

Centrifugal Compressor Use Case

THE CHALLENGE

The world's largest industrial gas company provides gas for a semiconductor manufacturer in Taiwan. Compressor failure is difficult to predict using PLC thresholding and user-built logic. The customer has backup compressors and requires advance warning for when the compressor should be switched to avoid production losses.

TIMELINE

December 1, 2021 — System Integrator, Paul Chen, connected Amber to the customer's Atlas Copco centrifugal compressors.

January 15, 2022 — Amber model finished training using real-time data.

- One model for each of the four stages of the compressor
- Two vibration sensors per stage, including X,Y, and Z acceleration
- Total of 6 parameters per model

Centrifugal Compressor Use Case, continued

February 7, 2022

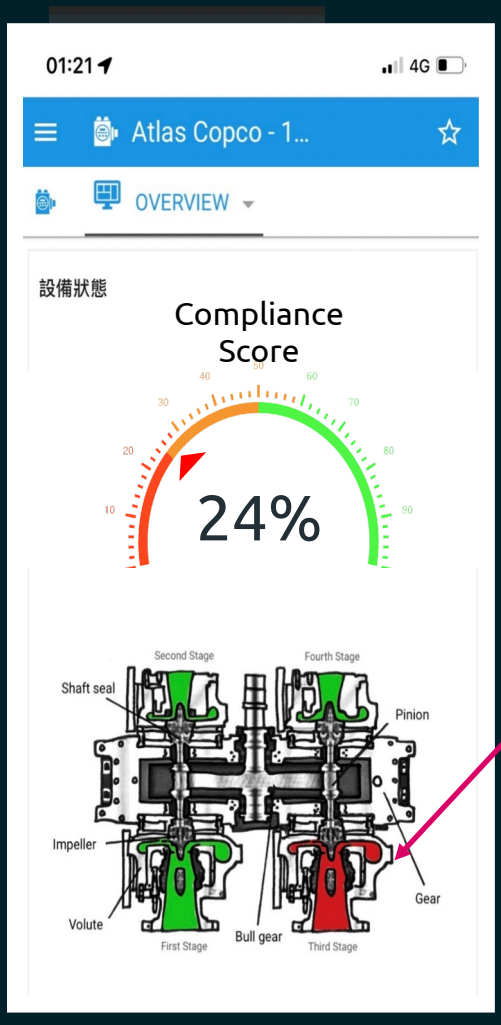
Amber showed early indications of changing asset compliance, a sign that reliability teams should watch this asset.

The OEM monitoring system for the compressor showed no issues.

March 2, 2022

Amber showed a clear indication that asset compliance had changed significantly.

The OEM monitoring system for the compressor showed no issues.



A continued downward trend in the asset compliance score prompted reliability teams to investigate.

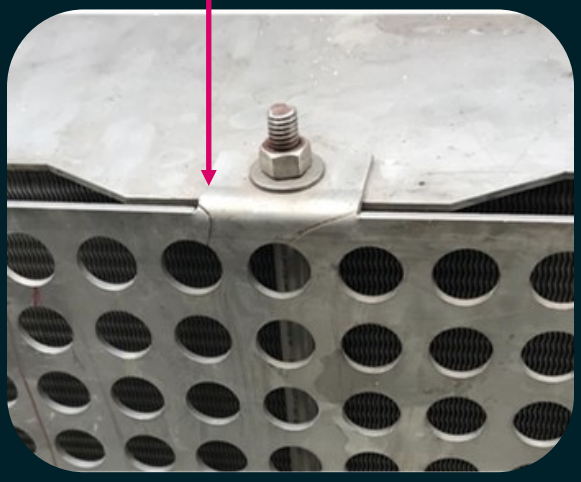
Amber Feature Significance showed that the issue was with the third stage of the compressor.

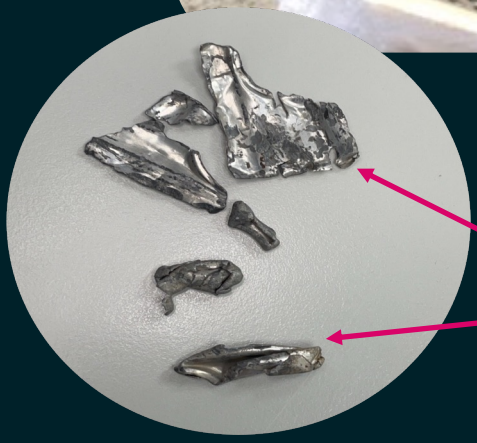
Centrifugal Compressor Use Case, continued

March 15, 2022

The maintenance team had planned to overhaul the compressor on June 15, but because of Amber's warnings, they shut down the compressor early on March 15.

After shutting down the compressor, the maintenance team found small cracks on the cooling bundle.





Several aluminum tears were found on the cooling fin.

Centrifugal Compressor Use Case, continued

Amber alerted our staff members that they needed to stop and repair their compressor, which they did three months earlier than originally planned. That allowed them to see several cracks on their cooling bundle that, **if left unrepaired, could have caused $800,000 in repair costs**. Instead, they spent $60,000 to repair the cooling bundle and were up and running in 72 hours.

Paul Chen
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The New Normal in Anomaly Detection

Explore the demo and discover anomaly detection like you've never seen it before!

Amber integrated into Pi Vision

Watch a Demo

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