

FactoryTalk Analytics LogixAI

Empower OT personnel with out-of-the-box, no-code Machine Learning at the Edge



ML Embedded Compute Module

Module runs in the chassis and communicates with ControlLogix® via the backplane



Anomaly Detection

A predictive model learns what normal operation looks like and detects when a deviation begins to occur.



Soft Sensor®

A real-time, logical prediction of an operational parameter's value to replace manual testing.

CUSTOMER USE CASE

Furnace

Scenario

Sensors are often subjected to hot and harsh conditions, especially in the chemicals, metals & mining and fertilizer industry.

For example, temperature sensors in a blast furnace, flash furnace, cement kiln etc.

Problem

Data from these sensors are often used to control other variables such as fuel flow, airflow etc.

A faulty sensor or erroneous readings can have a direct impact on the quality of the final product.

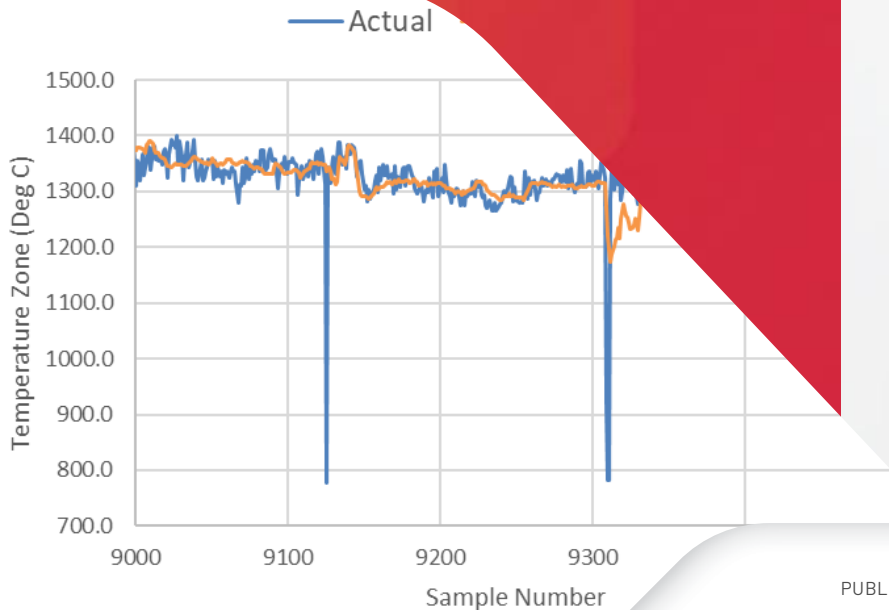
Value

With LogixAI®, the end user can train the LogixAI module with streaming or historical data to model a temperature dependent on several variables.

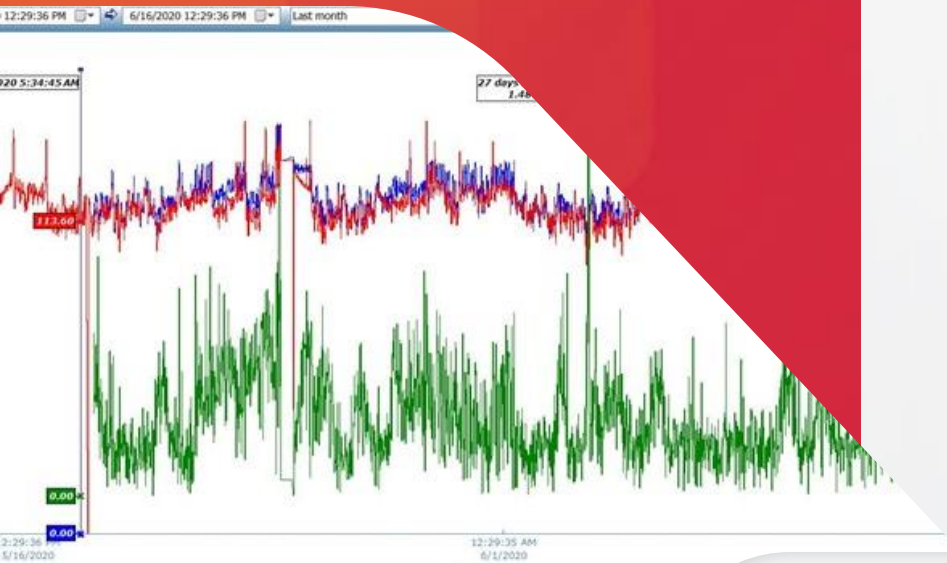
Once the model is operationalized, the model can monitor the measured temperature and compare it with the modeled temperature.

Unusual variances between actual and modeled, indicates a faulty reading.

Now the faulty reading can be rejected or replaced with the modeled data until repaired.



Air Compression



Scenario

Industrial Air Compressors drive all the pneumatic tools in a shop floor.

These pneumatic tools require a minimum air pressure of 90psi to work effectively and perform the intended critical function.

Problem

Though it is infrequent, sometimes these air compressors fail to produce the required 90psi and this leads to a total shutdown of the shop floor.

Once the air compressor is repaired and brought back to the desired state, it takes additional valuable production time for all the pneumatic tools to perform at the optimal level, leading to significant production loss cost.

Value

The user can train the LogixAI[®] module with streaming or historical data to model an output pressure that may be dependent on several variables such as current, speed etc.

Once the model is operationalized, the model can be set to monitor the actual pressure and compare it with the predicted pressure.

Any unusual variance is an early warning of the air compressor's performance degradation, and a service for initial investigation / inspection submitted.

Rolled Products



Scenario

Rolled products such as paper, hot-rolled steel, plastics etc. are usually manufactured at a moderate to high speed.

Machines involved in the manufacturing process use sensor measurements to define the positioning of other machine components.

Positioning is required in printing, cuts & perforations, applying glue at the tail end etc.

Problem

These sensors lose integrity periodically at unknown intervals due to high-speed operations and harsh operating conditions.

Value

The user can train a LogixAI® module with streaming or historical data to model key sensor measurements utilizing the LogixAI Soft Sensor® model capability.

When the physical sensor loses integrity, the estimated measurements can be used through feedforward PID control strategy.

Once the model is successfully validated on a production machine, a global rollout can help to drive enterprise process effectiveness.

Freeze Drying



Scenario

Freeze Drying is used across various industries including pharmaceuticals, food processing, and chemicals, to remove moisture from a product by freezing it and then removing the ice that forms.

Freeze drying is used instead of more conventional heat drying because it preserves the quality of the product for future rehydrating.

Problem

It's difficult to measure the moisture content of a product during the freeze-drying process.

Often, samples are taken after the process is complete to measure the % moisture left in the material and adjustments are reactively made to the process setpoints to improve future drying results.

The delay between sampling and correcting can result in off spec product.

Value

With LogixAI®, moisture of the product can be predicted in real time and setpoints can be adjusted automatically to keep production on spec.

Historical data maybe collected and cleansed to remove any data during which the plant was not running in normal operation. This data can be imported and trained in LogixAI.

Once the model is evaluated and accepted, it runs at the control level, using live data to continuously predict the moisture of the product in the freeze dryer and adjust process setpoints via the PLC, keeping the moisture content on target and reducing deviations.

CUSTOMER USE CASE

Dryer

Scenario

Dryers are a common unit operation for dehydrating pellet products such as wood chips, food, and animal food. Sensors are used to measure the moisture content of the pellet and determine when the product is dry enough to move on to the next step of the process.

Problem

The surface of the pellet is usually dryer than the interior, so surface measurements alone will under-predict the average moisture.

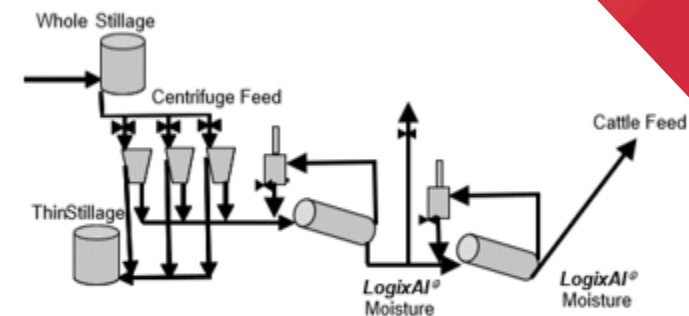
As a result, it's common to take a sample of the product at regular intervals, grind it, and measure the moisture of the ground material to get a more accurate indication of the average moisture throughout the whole product.

This process is time consuming and results in wasted product.

Value

With mathematical models developed with FTA LogixAI®, the average moisture content of the pellet can be predicted from surface moisture and other key measurements. With predictive quality, operators can adjust parameters, such as temperature or drying time, to achieve targets on the final product, improving consistency and reducing give-away.

The FTA LogixAI appliance resides in-chassis providing online predictions, without extra infrastructure. Because FTA LogixAI is a standard, application with autonomous AI, OT professionals can deploy and maintain it, enabling existing staff with a packaged data science answer.



Tire & Automotive



Challenge

The length of the tire splice must adhere to strict tolerance limits to ensure product quality.

Often, operators must make manual adjustments to the process to achieve consistent, in-tolerance splice lengths.

When out of tolerance events occur, it causes machine downtime, which cuts into production and results in wasted product.

Solution

One tire manufacturer used the ML capability of FactoryTalk® Analytics™ - in combination with edge data management and ControlLogix® solutions - to consistently make automated adjustments through an innovative closed-loop learning approach to reduce the number of out of tolerance splices.

Value

Out-of-tolerance events were reduced by 70%, resulting in 80 incremental tires per machine per day and leading to higher profitability.