

Virtual Sensors- Tracking Quality in Real-Time

Manufacturers must strive for a high level of [Overall Equipment Effectiveness, or OEE](#), which is the product of three parameters: availability, quality, and performance. We are excited to announce the brand-new virtual sensors feature in the SAM GUARD [predictive monitoring](#) suite designed to help you diminish the challenges that come with measuring quality in real-time, ultimately improving your plant's overall OEE.

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Based on our clients' needs and many customer requests, we developed the new virtual sensors feature to improve the quality issues which commonly arise during batch production processes. With the assistance of SAM GUARD's virtual sensors, your plant will be well on its way to increased plant efficiency with high quality finished goods, and less wasted materials and their associated costs.

What are Virtual Sensors?

Virtual sensors allow the SAM GUARD system to predict and

monitor a sensor that doesn't actually exist, based on data from other, physical, sensors. It works by adding a virtual tag value to historical data, then when the data is live, the virtual sensor value is "collected" based on a pre-defined formula applied to data coming from the physical sensors and their predefined tags.

SAM GUARD's machine learning algorithm learns the correlations between the existing data and this new value and builds a model automatically.

Why Implement Virtual Sensors?

Without the help of virtual sensors, it would be nearly impossible or highly cost-prohibitive to manage and retrieve quality information in real-time. Prior to virtual sensors, tracking the quality of materials throughout the manufacturing process was not a simple undertaking, as there was no single sensor that could trace it accurately.

What's more, inspecting quality in the lab is most often completed post production rather than during the manufacturing process – leading to wasted time, materials, and costs if the batch turns out to be of poor quality. Discovering poor quality finished products after the fact can be a huge drain on profitability, and if they have somehow been released already to a customer, the domino effect can lead to lost customers.

Virtual sensors provide plant management with the ability to identify if quality is declining in real-time. They can then change the process accordingly, or even halt the production line if it is due to something major, thus preventing unnecessary waste.

Always Produce the Golden Batch

By utilizing the data tracked in the [data historian](#), you can set your ideal quality parameters based on previous production processes. When you know you have a high-quality batch, you then go back to the history and identify the specific parameters that went into creating this so-called “golden batch.”

Whether those criteria include specific temperatures, vibrations, flows, or precise measurements of ingredients, the system can use this information to generate the ideal parameters that lead to the perfect finished product.

Once these parameters are set, the virtual sensor simply tracks the quality of the products throughout the process, making sure each element matches the pre-chosen constraints from the data history.

No matter where the materials are in the production process, SAM GUARD uses the data from the virtual sensor to alert if the process is straying from the Golden Batch, in other words, if a potential quality problem is arising. It compares the values to the best-case scenario and can identify what may be going wrong, preventing wasted materials and time.

The plant manager will be notified if the quality of the product quality is diminishing, where and why it’s occurring, and how to change the parameters to match the golden batch quality.

Precognize’s virtual sensor software thoroughly understands the plant based on its historical data, and it allows the manufacturing managers to get to the root cause of why and if the plant is not meeting the “golden batch” or perfectly pre-crafted parameters.

Chemical Plant Turns to Virtual Sensors, Improving its Quality

One of our trusted chemical manufacturing clients struggled with quality issues leading to a huge waste of chemicals and money, and at times up to 10% disposal of their finished goods. They discovered numerous quality issues far too late in the process to modify and perfect the product before it reached its final stages of production.

After much frustration, they turned to Precognize to see how we could help them reduce their quality problems in the manufacturing process. Virtual sensors were the answer to their issues with quality, and according to the chief engineer, “after running virtual sensors in a beta trial for two months, we now have almost 100% quality assurance in our plants prior to reaching the laboratory test phase.”

Quality Monitoring is the Future

SAM GUARD's virtual sensors can help you to advance the predictive monitoring of your plant, leading to smoother operations and higher accuracy according to your batch production needs.

By continuously monitoring quality, you can drastically improve your plant's OEE.

Welcome to the next phase of [industry 4.0](#).

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