Improve Manufacturing OEE Through the Power of IIOT

SwiftSensors

1 Overall Equipment Effectiveness

Is your plant leaving money on the table because overall equipment effectiveness (OEE) is not high enough?

OEE = AVAILABILITY X PERFORMANCE X QUALITY

OEE is more than just making good products as quickly as possible with no stop time. OEE is a concrete indicator of the gap between what machines are actually producing versus potential productivity. Incorporating availability, performance and quality make the OEE a powerful tool for management in the pursuit of less downtime, waste and equipment losses.

Many plants are operating as expected when they could be exceeding expectations. Additional insights into machine usage, compliance and employee efficiency can turn business concerns into big opportunities for revenue gain, cost reduction and increased productivity.

Getting real clarity about your plant's OEE through better data has the potential to improve product quality and help your team develop effective policies and procedures based on how your plant runs the best.

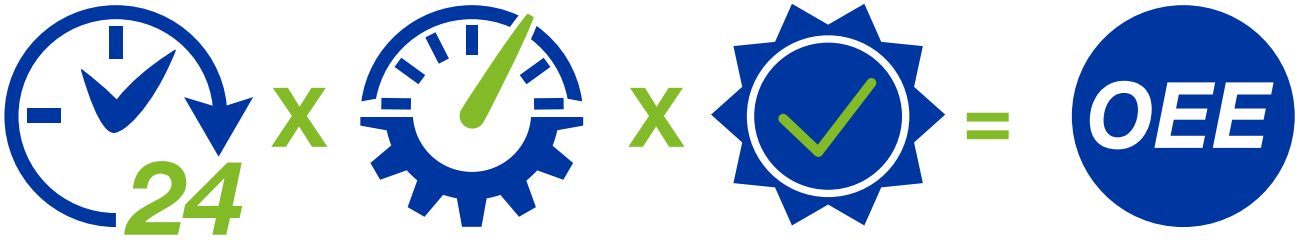
All of these elements are vital to success in a highly competitive manufacturing industry, but many companies are unaware to what their machines could be telling them.

Most traditional logs and monitoring methods are reactive and not designed for proactive discovery or subtle investigations into innovative solutions. Accessibility to different machines or processes can be a challenge with legacy systems and revamping an entire plant is a huge investment with a long development timeline.

If you want to make bold moves or explore new solutions without interrupting the critical processes of your plant, while keeping ROI top of mind, you need to know what's possible when you harness the power of the ***Industrial Internet of Things and OEE.***

2 How is OEE Calculated?

OEE has become the gold standard in evaluating manufacturing efficiency. OEE considers 3 factors of evaluating equipment effectiveness that are determined by multiplying Availability, Performance and Quality.



Availability **Performance** **Quality**

Availability, comprising of both unplanned – equipment failures and material shortages – and planned stops such as changeover time, is calculated as the ratio of Run Time to Planned Production time. Run Time is simply Planned Production Time minus Stop Time, which can be defined as all-time where the manufacturing process was intended to be running but was not due to the stops listed above.

Performance accounts for anything that may cause the manufacturing process to run less than its maximum potential or if any idling has occurred. Performance is calculated through Net Run Time, ideal cycle time multiplied by your total count, which is then divided against Run Time.

Lastly, Quality determines the ratio of manufactured parts that reduce your yield and parts that do meet the standard of being classified as a 'Good Part'. It is calculated as Quality = Good Count / Total Count.

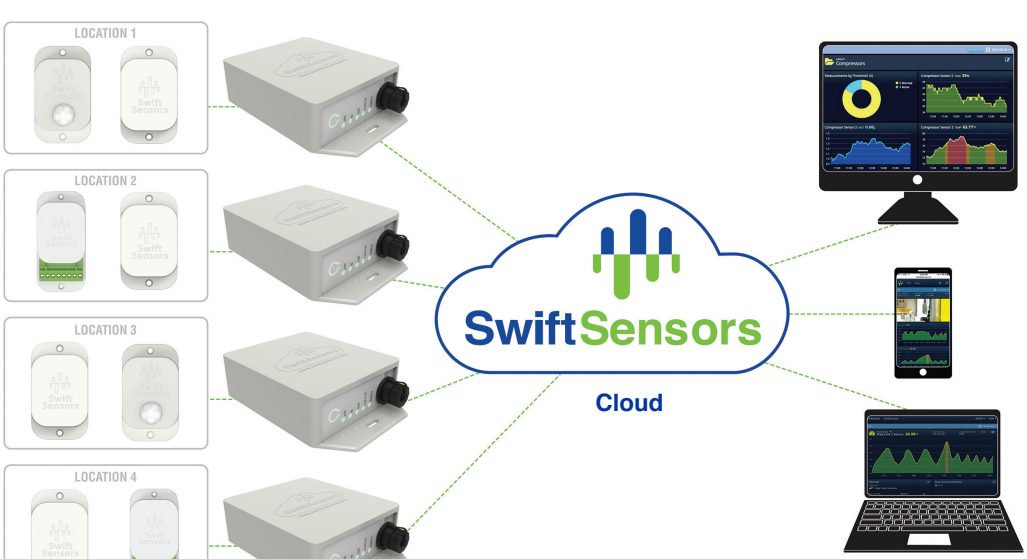
Once all of factors listed above are calculated, you may then calculate OEE by multiplying the numbers calculated within Availability, Performance, and Quality to get your percentage score.

With these factors that determine your OEE score, it is crucial to know when these machines are working at maximum potential both for your company's benefit and cost.

3 An IIoT Solution for OEE

A critical element of a successful OEE program is the real-time acquisition of equipment data. With the technical advances made possible by the Industrial Internet of Things (IIoT), wireless sensor networks can be easily deployed in manufacturing facilities to monitor equipment and processes. Data from these sensors gives plant and facility managers insights to prevent unwanted downtime while also supplying the critical equipment data needed to improve OEE.

Wireless sensor systems can be deployed rapidly and at a low-cost, both for the sensor system and the installation and maintenance. A cloud-based wireless sensor system has few or no wires to connect and no on-premise software to install and maintain.



Here's an overview of the end-to-end wireless sensor system:

- Install small, wireless sensors to monitor equipment.
- Set specific ranges (thresholds) for whatever measurements you want to monitor.
- Activate custom notifications (alerts) to be set when certain thresholds are met.
- Utilize the dashboard to analyze data stored securely on the cloud.
- Make informed decisions for your plant based on these powerful new insights.

How It All Works

A wireless sensor system and cloud-based storage has four primary elements. Here we break it all down, element by element.

A. Wireless Sensors

Wireless sensors are small, connected devices easily affixed to existing equipment or deployed on the plant floor. These are a unique Industrial IoT solution that transform equipment and assets into "smart" machines.

At Swift Sensors, we use plug-and-play, matchbook-size wireless sensors that transmit data via RF or BLE to a Swift Sensors Bridge. Most sensors are powered by a coin cell battery that lasts 6 to 18 months, depending on the inspection rate. Most sensors can be powered AC 110V/220V if needed.

A wireless sensor system can monitor "vital signs" of a manufacturing operation.

- Temperature
- Humidity
- Distance
- Motion
- Sound
- Pressure
- Vibration
- Water presence
- Power
- Gas/Chemical

B. Cloud Systems and Cloud Security

The sensors automatically connect to and securely communicate with the bridge, which securely transmits all sensor data to the cloud. A cloud is essentially a data storage center for a distributed sensing system. The computer architecture processes and stores the sensor data with built-in redundancies.

The Swift Sensors system is 100% cloud-managed. The on-premise bridge appliance securely transmits sensor data to the Swift Sensors cloud using 256 AES encryption for secure transmission of all sensor data.

The system is scalable from single sensor type, one-site applications through multi-site enterprises with 1000s of varied sensor types combined in one unified system. That means no extra time wasted piecing together end-to-end solutions.

Swift Sensor system is always up to date, regardless of project or enterprise size, eliminating ongoing server, storage, and software maintenance.

Of course, security is always a concern when handling important data and processes.

The Swift Sensors cloud system is built by industry experts with extensive experience in keeping corporate networks secure. Built-in cyber security, with continuous monitoring and security updates delivered through the cloud, aims to avoid cyber-attacks as compared with more traditional systems designed to be on-site, and only later modified to connect to the internet.

C. Dashboard and Analytics for OEE

Plant managers can interact with the data and analytics collected by a wireless sensor system through the Swift Sensors Dashboard. Customizable to the exact needs of each facility, the intuitive dashboard interface allows facility managers to fine tune data collection to their needs, generate reports and gain valuable insights to operations and trends.

The Swift Sensors Dashboard allows real-time asset monitoring and sophisticated analytics from anywhere. Users can set notifications via SMS text, email, and phone based on customizable threshold values and complex rules, setting notification profiles by individual sensors or sensor groups.

The Manufacturing Analytics Dashboard provides a real-time overview of the manufacturing process and insights to improve operations. The dashboard collects and displays different categories of data to give an in-depth view of the production process. Dashboard categories include productivity, compliance, utilization, shift schedule management, analytic reports, goals and group analytics.

Applications for these alerts and deep insights are almost unlimited in manufacturing. New data and optimized workflows – informed by the alerts and analytics from a wireless sensor system and intuitive dashboard – can transform operational efficiency.

4 OEE Success Snapshot

Swift Sensors works with manufacturers to deploy custom Industrial IoT solutions for improving overall equipment effectiveness.

One manufacturer improved utilization of their current machines and increased the overall output of their factory, with the potential revenue gains at over $140,000 per machine, per year.

Meggitt Polymers & Composites

Meggitt Polymers & Composites (MPC) specializes in creating seals for commercial airplanes. The company excels in the production of parts for airplanes by embracing lean manufacturing, automation, and the deployment of cutting edge technologies. Advances in materials manufacturing have led to the reduction of a typical aircraft's weight by more than 200 lbs. The McMinnville plant produces over 17,000 unique parts and supplies it products to the leading aircraft manufacturers Boeing, Airbus, and Embraer.

The Meggitt management team wanted to learn if they could increase revenue by adding more machines, but to answer that question, they had to determine whether or not their existing machines were being used to capacity. Meggitt's Continuous Improvement Engineer faced the challenge of proactively gathering vital data about the factory's OEE and compliance so that management could decide how best to accomplish faster performance.

Meggitt Polymers and Composites (continued)

In all, Meggitt connected over 50 sensors to five bridges in their factory. Data collected by the sensors is securely transmitted from the sensor to the bridge, and then securely transmitted from the bridge to the cloud using WiFi (alternatively Ethernet or Cellular could be used).

Meggitt's Swift Sensors system monitored the following:

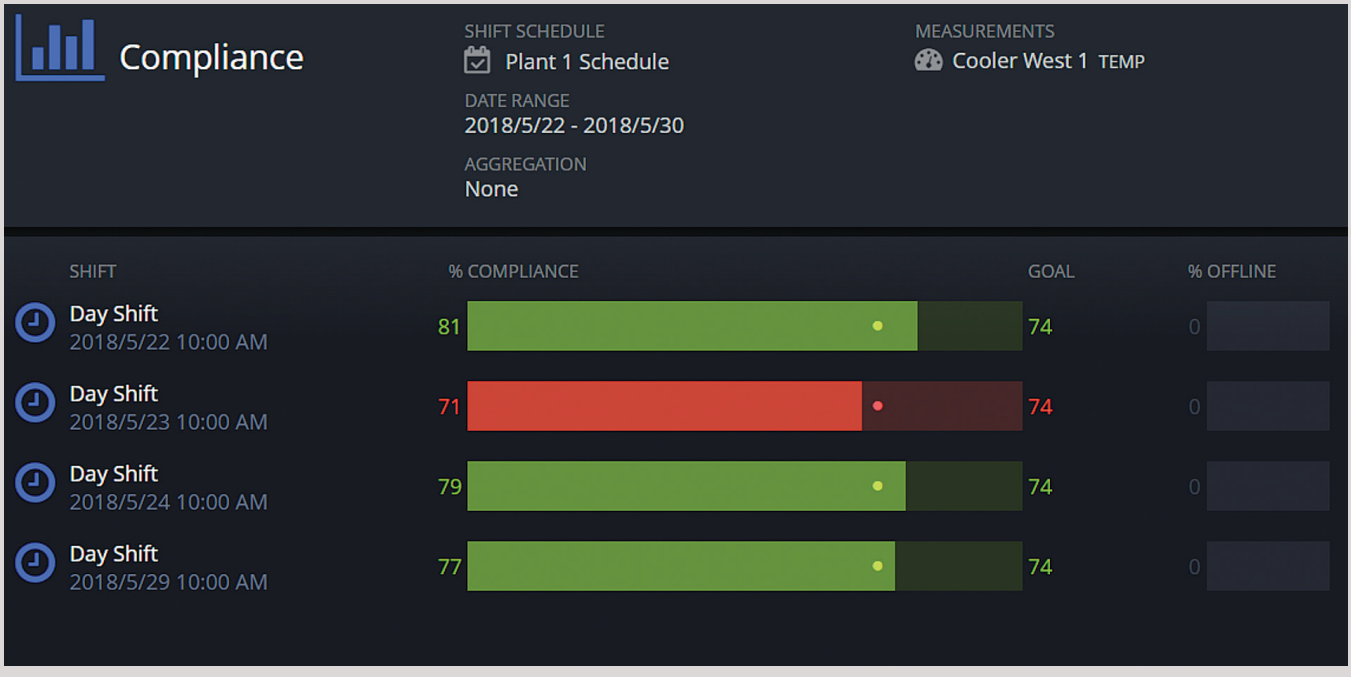
- Temperature
- Contact
- Motion
- Vibration

Since early 2018, Meggitt has had a Swift Sensors up and running to monitor quality, compliance and machine usage. Additionally, the Swift Sensors solution allows plant managers to proactively address minor machine issues, before they become major machine issues.

The manufacturing analytics dashboard improved Meggitt's operational efficiency by providing an at-a-glance view of productivity, utilization, and compliance measured by Swift Sensors wireless sensor system.

Meggitt learned from their Swift Sensors data and analytics that they did not need any more machines, they just needed to improve the utilization of current machines. They were then able to institute policy changes that increased OEE and machine utilization, which can directly translate into revenue gains.

Industrial IoT, through Swift Sensor's wireless sensor solution, made these insights into the exact utilization of their machines possible.



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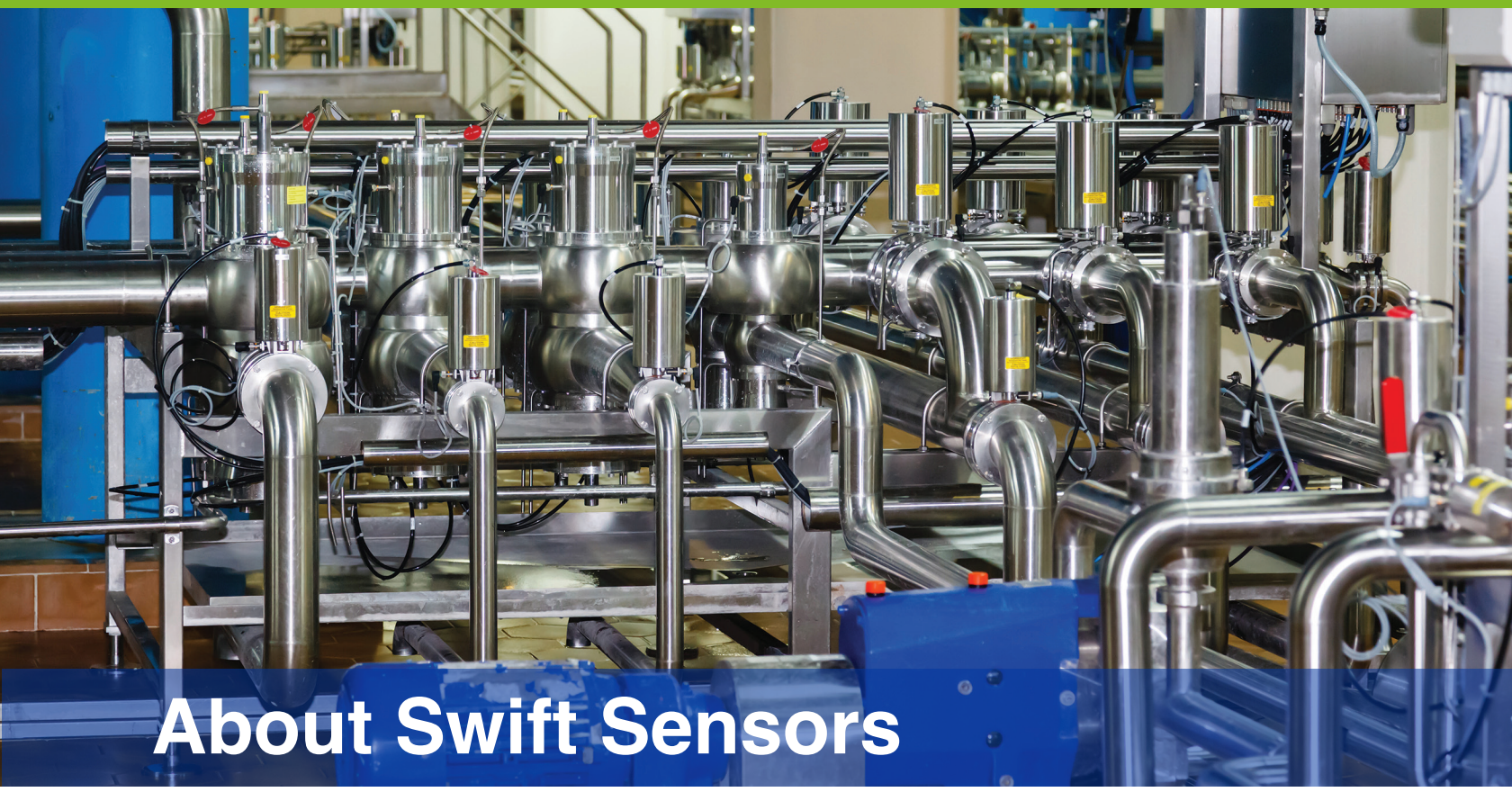

About Swift Sensors

Swift Sensors is a cloud wireless sensor IIoT company, providing a low-cost, wireless sensor system for industrial and commercial applications. Founded in early 2015, Swift Sensors brings together the technology advantages of cloud and wireless technology in a globally scalable sensor system.

The Swift Sensors Cloud Wireless Sensor System, is comprised of a comprehensive line of low-power wireless sensors ,cloud-based monitoring, alerts and data analytics.

The sensor system enables companies to proactively protect and monitor a wide range of equipment and processes, comply with regulations, and enhance business performance.Swift Sensors applications include food chain, transportation, cold chaing transportation manufacturing, restaurants, industrial, IT data centers, research & development, power, facility monitoring, food service, and agriculture.

Get in Touch

Ready to see exactly how a Swift Sensors wireless sensor system can improve operation efficiency in your facility?

Get Your Own Free Dashboard Account Today

For more information, please visit:
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