

Detecting flaws in production

The company “ia: industrial analytics GmbH” from Aachen offers a comprehensive solution for the digitisation of production plants – from data acquisition to visualisation.

Transparent processes: looking into the black box

ia: industrial analytics use IO-Link sensors from ifm which enable easy, plug & play data extraction from production processes. The goal: By visualisation in an OEE waterfall, the causes of a bumpy transition between production steps are shown transparently with their respective effects. Based on these insights, individual production steps can be optimally interlocked. This leads to increased efficiency, as the application example from the steel processing industry shows.



The heart of the plant is the ia:factorycube. With its computing unit, router and evaluation software, it contains all the IT components required to collect, evaluate and visualise generated data – and to transfer it to the cloud if required.

Jeremy Theocharis, founder and CEO of industrial analytics: “Via the factorycube we can connect the different IO-Link sensors or use completely different data sources, for example camera solutions for quality assurance or barcode scanners for product tracking. In this plant, however, the focus is on IO-Link sensors, which



Increasing performance



give us a very good opportunity to digitise plants very quickly and very efficiently in order to derive key figures.”

The complete information processing is done in the factorycube. In addition, the system can be modularly adapted to the customer's wishes.

“It is possible to store the data on the factorycube or to integrate the device into the customer's own IT infrastructure. The third option is the storage and evaluation of the data in our cloud system, which we make available to our customer if desired.”

Nicolas Altenhofen, Marketing Manager at industrial analytics, adds: *“Our approach is not only about data storage. Much more important is the second step, the processing and visualisation of the data. We are less concerned with optimising production processes. We focus on performance figures. For example, we use an optical sensor to find out whether the machine is running or not, or to determine the number of pieces. We want to know: When did the machine stop? When did the machine run? What were the reasons for a machine downtime? This data is then prepared and visualised in different ways.”*

In order to make the use of the factorycube as versatile and thus as efficient as possible, industrial analytics deliberately rely on open interfaces. This means that extensions can be easily implemented. Currently, for example, solutions are being developed for quality assurance with camera systems and machine learning as well as for capacity planning, capacity distribution or predictive maintenance with high-frequency vibration analysis. Thanks to the great modularity, every customer receives exactly the solutions they need on their way to Industry 4.0.

Jeremy Theocharis explains what it is all about: *„We can uncover optimisation potential. There are expensive plants that are not used efficiently. Many customers simply lack transparency on how long, for example, order*



Measure utilisation: ifm sensors detect whether machines are running or in a waiting state.

processing takes. The actual capacity utilisation of the plant is also often unknown. We open this black box and enable the customer to make data-based decisions and gain relevant insights, for example that the bottleneck is not the machine but the material procurement.”

One example is the case of a major customer in the steel processing industry whose machines at two locations were retrofitted by industrial analytics within a few weeks, so that comprehensive performance management is now possible.

■ No data transparency on the shop floor

The customer's machine park consists of plasma cutting machines, oxyfuel cutting machines and blasting machines, among others. These machines are used to cut steel plates and rework them.

Jeremy Theocharis: *“Our customer's problem was that they had no transparency regarding their production processes and performance. For example, the company didn't know how long it actually takes to produce a particular workpiece on a particular machine”.*

Although theoretical target times existed for the various products, these were not compared with the actual time

” *At the beginning we compared many suppliers of sensor technology. We ended up in the ifm webshop.*

required. There was also a lack of knowledge about the availability and capacity utilisation of the machines. Machine downtimes and their causes were not recorded. Without this valuable information, the company had no way to monitor production performance, identify problems and make data-driven decisions to improve production processes.

■ Real-time data through ifm sensors

With the help of the factorycube and various sensors from ifm, it was possible to collect the non-existent data and achieve the necessary transparency of the production processes. A total of 14 optical distance sensors of type O5D100 and O1D108 were installed on eight plasma and oxyfuel cutting machines. These sensors are used to determine whether the respective machine is in operation and how long this has been the case. The sensors were positioned so that the light beam points to the cutting head of the machine. As soon as the machine is started, the cutting head is lowered and the distance to the distance sensor changes. Through this change in distance, the system detects that the machine is in operation. In addition, vibration sensors of type VTV122 and optical sensors of type O5D100 were installed on three blasting machines. These sensors also help to determine the operating status of the machines.



The distance sensor O1D108 detects whether the cutting head is in operation or in the rest position by means of time-of-flight measurement.

■ Reduced machine downtime and increased productivity

The data collected by the ifm sensors is processed in the factorycube, sent to a cloud and visualised in a dashboard. The company's decision-makers can check machine conditions and production key figures, such as OEE (Overall Equipment Effectiveness), in real time. Based on the data, measures can be taken to optimise the production processes.

Success was not long in coming: A few weeks after installing the sensors, the company had considerably increased its efficiency and productivity.

■ Simple order process

The fact that industrial analytics relies on sensor technology from ifm is mainly due to their good search engine presence and the ifm webshop.

Jeremy Theocharis explains: *"At the beginning we compared many suppliers of sensor technology. We ended up in the ifm webshop. I was very enthusiastic*

about the fact that you could see the prices right away and that you could simply click on "Order" without having to spend ages defining a project. Then we ordered the sensors. Thanks to IO-Link, they were quickly set up, and they work well and provide precise results. Maybe the sensors are a bit more expensive, but they work reliably, and we can simply order sensors at the press of a button in the shop."

■ Conclusion

"It doesn't matter what industry 4.0 solution you're looking for – without reliable and accurate data, you won't get a satisfactory result," says **Jeremy Theocharis**.

With powerful IO-Link sensors, ifm creates the database which is collected, processed and visualised by means of the factorycube from ia: industrial analytics. This interaction makes it possible to create transparency, improve performance and ultimately reduce production costs.