Manufacturer of delicatessen products relies on Emalytics IoT-based building management system

Significant savings, thanks to greater transparency

Lead Image - (Image source: Kühlmann)

Due to market-specific requirements, each year over 20 audits are conducted in various areas at Kühlmann, a German manufacturer of delicatessen products. These include audits for IFS certification, energy management in accordance with DIN EN ISO 50001, and various customer audits. Controllers and the Emalytics building management system from Phoenix Contact help ensure that operation is more transparent and that energy is used more efficiently (lead image 1/lead image 2).

Based in Rietberg in the district of Gütersloh, Heinrich Kühlmann GmbH & Co. KG is one of Germany's leading manufacturers of delicatessen products. Each day, over a million portions leave the logistics centre of the family-run company, which was originally established in 1912 as a farm trade business. In addition to the company's core business of classic deli salads and antipasti, the team at Kühlmann is constantly developing new creations in modern superfood and bulgur salads, innovative convenience products, and comprehensive ranges for the food service industry. The company's site in the Westerwiehe district is home to management, production operations, and the 2000 sqm innovation centre, while another manufacturing area and the 11,000 sqm logistics centre are located in the Westenholz district. In total, Kühlmann employs over 600 permanent staff. Due to the large volume of data generated by the individual sites, in 2016 the company's Executive Board decided to implement a higher-level management operating level (Figure 1a/Figure 1b).

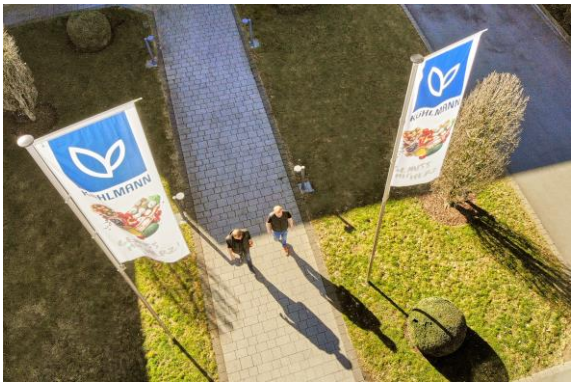

Figure 1a/1b - Management, production operations, and the innovation centre are housed at the Westerwiehe site (Image source for Figure 1a: Kühlmann)

While the Industry 4.0 future project is still merely a topic of discussion in many companies, it has already been put to practical use by Kühlmann. At present, around 100,000 items of data are acquired daily from production, building services systems, and other premises and further processed in such a way that various user profiles can access this data. It is not just Production that uses the data; Controlling and Quality Management are also integrated into the IoT platform. And this is only the beginning: a further 18 projects are set to follow to complete the transition from the analogue age to the new digital world.

Easy integration of installed sensors and actuators

Figure 2 - ILC 2050 BI IoT-based controllers forward the acquired data to the Emalytics building management system

To ensure that all facilities are operated sustainably and efficiently, Kühlmann uses the Emalytics IoT-based building management system. Thanks to the integration of over 1000 data points, maximum transparency can be achieved. In addition, evaluating information identifies potential for optimisation, which if realised ensures efficient production methods and the efficient operation of building services systems and buildings. To this end, ILC 2050 BI IoT-based controllers are installed in the halls and transfer the collected data to Emalytics (Figure 2).

Up to 63 I/O modules can be connected to the PLC – ranging from digital and analogue inputs and outputs with different numbers of channels right through to function terminals for DALI, pulse counting, M-Bus or serial interfaces. In addition to the protocols mentioned, the ILC 2050 BI also supports BACnet IP, BACnet MS/TP, KNX IP, Modbus, and SNMP (Simple Network Management Protocol) for easy integration of the sensors and actuators installed in the building. The controller also features a web server, enabling custom web pages to be loaded on the controller. In addition, the ILC 2050 BI has two IP interfaces that are logically

separated from each other as well as an Ethernet switch with four ports. Thanks to the configurable assignment of Ethernet ports to the two IP interfaces and the use of the Spanning Tree Protocol, flexible topologies such as daisy chains or redundant ring structures can be implemented in the backbone network and in the local control network.

Permanent monitoring of the refrigeration chain

In the various production segments at Kühlmann, the temperature values are checked every two minutes. All refrigerators and incubators, as well as the automatic devices required for the process, are integrated into the management operating level. As soon as one of the relevant limit values is exceeded, this is categorised in the alarm console and an alert is generated, sent to the relevant employee by e-mail or phone, acknowledged, and documented. This ensures permanent monitoring of the refrigeration chain in production (Figure 3).

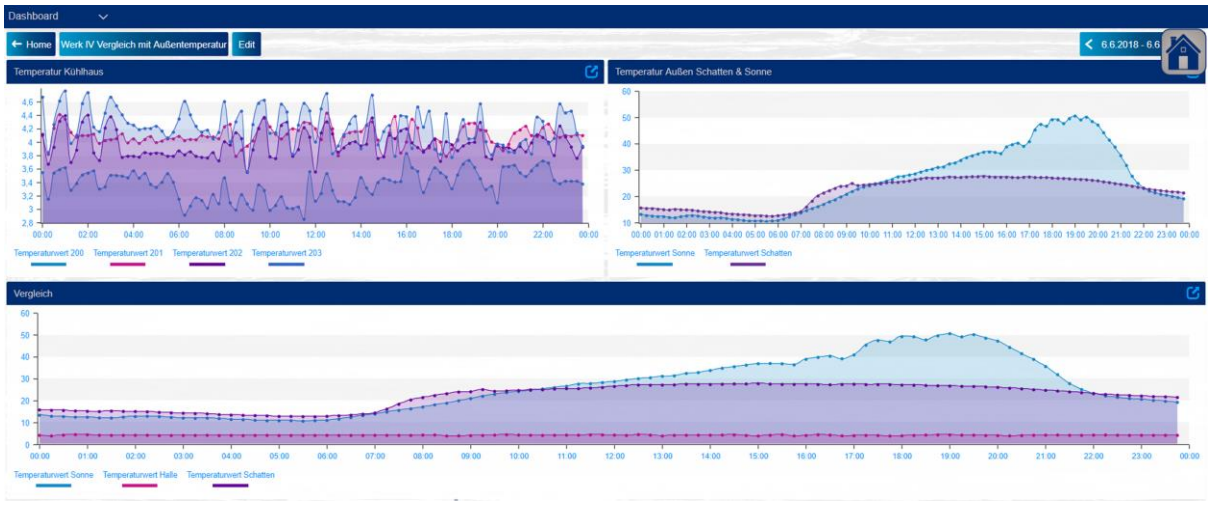

Figure 3 - The temperatures in the refrigerated warehouse are displayed via an informative dashboard - (Image source: Kühlmann)

While individual employees previously had to log the values manually, this is now done digitally. This allows specialists to concentrate on their actual work at hand. In addition, on-call employees no longer have to be on site at all times. Employees that have the appropriate access rights can connect to the system from the comfort of their sofa. Conventional smart devices, like laptops, tablets or mobile phones, can of course be integrated into the solution. More than 70 active users from different areas of the company are now working with the building management system.

Numerous advantages for users

Kühlmann's Executive Board did of course raise the question of whether Emalytics generates added value. After all, temperature data can also be provided using other solutions. However, the only topic now being discussed is the next project to be implemented in the IoT platform, as the financial savings are clearly evident. For example, in future the individual filters for ventilation systems will no longer be replaced at regular intervals according to a maintenance contract; they will instead only be replaced when the relevant data in the building management system indicates that this is necessary.

Figure 4 - The tanks for cooking oil and vinegar are automatically filled by the respective suppliers three times a day

Emalytics also evaluates the consumption of cooking oil and vinegar. The fill level of the tanks is automatically sent to suppliers three times a day so that they can plan replenishment supplies accordingly (Figure 4). The quantities supplied can be stored in the database and compared with the volume extracted, making the supply chain transparent (Figure 5).

Furthermore, the water supply is checked. The water pressure is continuously monitored in addition to consumption. This enables employees to quickly identify any drop in pressure and immediately rectify the malfunction so that it does not result in production downtime.

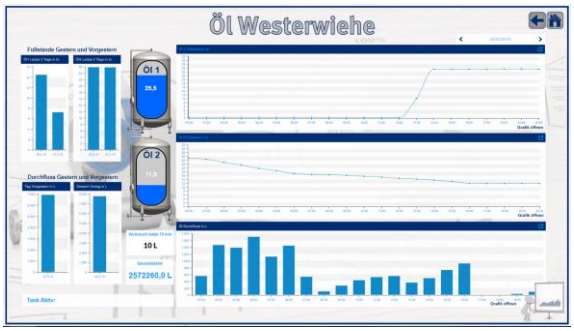

Figure 5 - Clear visualisation of the fill levels of both oil tanks creates a high degree of transparency - (Image source: Kühlmann)

The energy management auditor also benefits from Emalytics, as key data for water, gas, and electricity consumption is recorded and visualised. Almost 100 electricity meters have since been installed in buildings. When purchasing new machinery and production lines, Kühlmann explicitly looks at consumption. Lower values for consumption are firmly enshrined in the requirement specification. As soon as the new systems are started up, they can be checked with regard to the specified values thanks to the transparency achieved as a result of using the Emalytics system (Figure 6).

Figure 6 - In addition to the consumption of cooking oil and vinegar, employees can also view the energy consumption values - (Image source: Kühlmann)

Continuous expansion of the system

Mattias Lütkevollmer, from the Technical Engineering department at Kühlmann, implemented the building management system in conjunction with local company Elektro Westhoff, and is responsible for the continuous expansion of Emalytics. The automation specialist's application engineers are always on hand to assist with more complex requirements or queries, as partnership and cooperation are key to their business (Figure 7).

Figure 7- Mattias Lütkevollmer, from the Technical Engineering department at Kühlmann, ensures the clear and content-rich implementation of the individual projects

The integral Emalytics system from Phoenix Contact therefore enables process, building, and energy management across locations. The simple engineering and high degree of data transparency achieved as a result of standardisation now make it possible to network the building infrastructures and facilities intelligently and sustainably. This ensures the efficient operation of production processes and buildings. Kühlmann has most definitely entered the digital age.

More information: www.phoenixcontact.de/gebaeude

If you are interested in publishing this article, please contact Becky Smith: marketing@phoenixcontact.co.uk or telephone 0845 881 2222.