

## Automation and dairy products: no longer like chalk and cheese

**Dewlay Cheesemakers has commissioned a new automation system to help apply the expertise of its finest cheesemakers to a wider range of cheeses. The challenge was to introduce new varieties while continuing to deliver exceptional batch quality and consistency. Tritec Developments Ltd has provided a solution incorporating hardware from Mitsubishi Electric to develop an advanced tracking and monitoring solution to help supervise and manage the individual processes.**

Garstang-based Dewlay Cheesemakers was founded in 1957 by George Kenyon and is now run by his grandchildren, Nick and Richard who are its third-generation of cheesemakers. Over the years, the company has earned a reputation for delivering award winning Lancashire cheese varieties. Dewlay's recently developed Red Leicester, Caerphilly, Cheshire and Derby cheeses, however, have won prizes at the 2018 International Cheese & Dairy Awards, attesting to the company's commitment to deliver new outstanding cheeses.

Award winning traditional cheesemaking relies on a detailed understanding of the mechanisms governing quality changes in the curd as it is processed in large batches. Being able to monitor these key process parameters simultaneously for multiple batches and modify them promptly when necessary, was deemed crucial to moving Dewlay's business forward. A responsive but easy to use automation platform was needed that allowed for the subtleties of the cheesemaking process to be retained while introducing the right adjustments to deliver a consistent end-result.

The drive for quality is supported by the extensive knowledge of Dewlay's production team, working under their head cheesemaker who has over 35 years of experience. Every day, they monitor the various cheese vats, where pasteurised milk is processed by starter cultures. The milk goes through a cycle of stirring, cooking, setting, cutting and whey removal. This induces coagulation and syneresis, resulting in the production of curd. The curd is then processed until it achieves the required consistency and pH value. Next, it is sent downstream for further whey removal, it is then formed or moulded and packaged ready for the maturation process.

### **The challenges behind quality cheese production**

Milk composition and bacterial activity is influenced by several environmental conditions such as weather patterns and seasons, feedstock, plus a cow's genetics and physiological make up. As a result, producing consistent high-quality dairy products given all the variables, is the biggest challenge for Dewlay's expert cheesemakers.

Richard Jones, Operations Director at Dewlay explains: "We believe cheesemaking is a mix of art and science as it relies on living organisms. As a result, we need to be able to address this variability by having access to key process parameters and curd quality attributes, as well as by responding quickly to optimise the reactions taking place within the vats.

"We see increasing the varieties of cheese we offer while maintaining our artisan qualities, as an ideal way to expand the business. However, it makes the tracking and monitoring of each vat even more challenging. In fact, the family-owned business uses 20 different cheesemaking recipes, which can vary in the ingredients used and in the processing sequences."

He adds: "Ours is a fast-paced production environment simply because we have so many cheese vats at different stages of the production cycle, following individual recipes. Our cheesemakers had been doing their best to keep track of timing and procedures manually for all the active vats by relying on their memory, continuously looking at the clock and making notes. However, this approach is not optimal and doesn't support continuing growth."

### **Automation that blends rigour and flexibility**

To address these issues and ensure consistent quality throughout the year, Dewlay decided to support its cheesemakers with an automated control system. One that would help them to monitor the vats by providing live, accurate, actionable insight, without limiting the ability of cheesemakers to intervene and modify the curd production process.

To develop a suitable system, the company contacted local control system integrator TRITEC Developments. The team at TRITEC Developments turned to its preferred automation supplier Mitsubishi Electric to help create a bespoke solution. The components selected were supplied by Mitsubishi Electric's channel partner LC Automation.

Richard Jones said: "This was not a straightforward automation solution but rather an implementation mindful of the cheesemaking art. Mitsubishi Electric and our system integrator partner immediately understood that. In order to define our needs and deliver the right solution, Mitsubishi Electric worked closely with us to add all the relevant information on the cheesemaking process into its project management software and was able to test the software and its corresponding hardware off-line and then quickly refine the programme on-line."

Dewlay's cheesemakers can now monitor the different cheese vats simultaneously, receive alarms as well as adjust the processes parameters in real-time and according to their expertise. The primary interface is a Mitsubishi Electric GOT2000 Human-Machine Interface (HMI). This touch-screen operator terminal was networked to a MELSEC FX3 Series programmable logic controller (PLC).

The FX3 Series is an extremely compact market leading solution and able to offer performance that is typical of much larger controllers. In this application it collects the process data from existing in-line sensors measuring temperature, indirectly monitoring coagulation and syneresis, so determining the progress within the cheese vats. In addition, the entire system interfaced with a safety system, which was already present in the factory.

### **Innovation in cheesemaking**

The control system quickly fulfilled Dewlay's expectations by ensuring flexible operation and simple process tracking. It has allowed Dewlay to expand by increasing the number of cheese vats that can be monitored as well as the number of possible recipes in use. This allows existing products to be produced more efficiently, alongside perfecting new ones that can then be added to the overall production schedule. The upgrades also resulted in an increase in productivity and overall efficiency.

Richard Lawton, Account Manager at Mitsubishi Electric, commented: "Customer satisfaction is extremely important to us, so we were really pleased that the system delivered exactly what was requested. Helping to achieve quality manufacturing and flexible operations is a fundamental part of many automation applications we are involved in. Fortunately, we have both the product portfolio and the experience to deliver on projects such as adding intelligent automation to Dewlay's traditional production processes. Thanks to our strong partnerships with system integrators such as TRITEC Developments our cutting-edge technologies provide futureproof solutions that will help keep food producers competitive for years to come."

#### **Image Captions:**

**Image 1:** Award winning traditional cheesemaking relies on a detailed understanding of the mechanisms governing quality changes in the curd as it is processed in large batches.

[Source: Dewlay Cheesemakers]

**Image 2:** With the new Mitsubishi Electric GOT2000 Human-Machine Interface (HMI) Dewlay's cheesemakers can now monitor the different cheese vats simultaneously, receive alarms as well as adjust the processes parameters in real-time and according to their expertise.

[Source: Dewlay Cheesemakers]

**Image 3:** To support continuing growth and ensure consistent quality throughout the year, Dewlay decided to support its cheesemakers with an automated control system.

[Source: Dewlay Cheesemakers]

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**Note to Editor:** if you would like the text in another language please contact Carolin Heel at DMA Europa – [carolin@dmaeuropa.com](mailto:carolin@dmaeuropa.com).

## About Mitsubishi Electric

With nearly 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of approximately 40.7 billion dollars\* in the fiscal year that ended on March 31, 2019.

Mitsubishi Electric Europe, Industrial Automation – UK Branch is located in Hatfield, United Kingdom. It is a part of the European Factory Automation Business Group based in Ratingen, Germany which in turn is part of Mitsubishi Electric Europe B.V., a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan.

The role of Industrial Automation – UK Branch is to manage sales, service and support across its network of local branches and distributors throughout the United Kingdom.

*\*At an exchange rate of 111 Yen = 1 US Dollars, last updated 31.03.2019 (Source: Tokyo Foreign Exchange Market)*

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