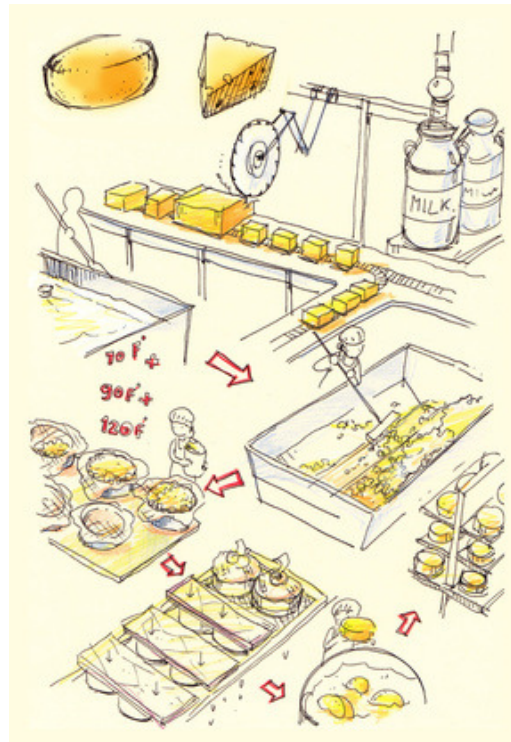


Application Highlight:

French cheese maker selects CTI for major automation revamping

The French cheese making company is located in the south of France. The factory, built in the early nineties, has enjoyed a successful expansion of its business thanks to the development of several popular brands of fresh cheese whose names are commonly known in French and European households. The company also exports to many European countries.



As opposed to dry cheese, where the cheese is poured into a mold in an early stage of the production process and then goes through an aging process, the production process of fresh cheese is well suited to be automated in a high degree because of the fluid properties of the product. Because of the freshness of the product and the absence of any cooking stage, it is important to eliminate manual steps involving people, since these can introduce the possibility of contamination.

This belongs to the past!



While the factory has done several extensions and modernizations of the tanks, piping and mechanical production equipment, the automation equipment had relatively little evolution after the initial construction. The original plant had been equipped with Siemens SIMATIC® 505 PLC's and a Siemens PCS SCADA system, connected to each other by means of a Siemens Ethernet network with proprietary SINEC H1 protocol. The Siemens PCS system, which has been obsolete for several years, has been replaced by a Wonderware Intouch® system which communicates with the SIMATIC® 505 PLC's via a Woodhead Applicom® card and the existing SINEC H1 Ethernet network.



Modern cheese making factories use a high level of automation

This architecture, however, had several shortcomings: due to the continuous expansion of the plant, the load on the Ethernet work had continuously increased and the update times of the Intouch® SCADA system had become very slow. It was not unusual for certain parts of the process to have to deal with update times of 10 to 20 seconds on the SCADA system. This made the task for the plant operators very difficult and had an impact on the production that could not be controlled anymore in an optimized way.

Also there were several problems of obsolescence and performance limitations in the PLC's. The CPU's were limited in memory size, it became harder and harder to obtain spare parts for the PLC's and the Ethernet network used an archaic hardware that was hard to maintain.

On top of that there was an additional problem in the configuration of the plant: the whole plant was controlled by 12 PLC's, but since this is an almost continuous production process, all the PLC's were interconnected to obtain information from each other. This led to a complex communication matrix which took a long time to commission during the initial startup of the plant and the engineering Manager of the plant was concerned that a replacement of the Ethernet network would lead again to a long commission time and extended production stops.

The Cheese making company had already been in contact with CTI through its distributor NAPA in France and had purchased a few CTI 2500 Series® CPU's to replace autonomous parts of the plant but had not considered revamping the whole plant to CTI. It was the availability of the new CTI ECC1 communication which made them receptive to the idea of doing a revamping of all the CPUs and the Ethernet network.

The ECC1 card had a certain number of advantages that made it ideal for this job. Not only would the performance of the communication with the SCADA system be largely improved, but thanks to the user friendly configuration interface and no need to do programming in the CPU, the PLC-PLC communication interface could easily be implemented. It didn't take the engineers more than a day to configure the communication between the 12 PLC's, while it had taken several weeks of programming in the original PLC's to set up that same configuration.

Together with the ECC1 communication card it was decided to replace also the Simatic® 555 CPU's in order to solve problems of obsolescence and obtain a better performance and memory resources. These enhancements were made without having to change any of the I/O's or PLC bases, which made the investment for the customer considerably lower than solutions from other automation suppliers.

*CTI 2500P-ECC1
Ethernet communications Coprocessor*





Minimum downtime of the production lines was a major requirement of the Cheese making company. They can't stop the whole plant for a long period, as cows don't stop giving milk. The tanker trucks collecting the milk at the farms continue to come in 7 days a week, 365 days a year. Particularly the pasteurizing system (also called standardization) is critical because quality regulations require that fresh milk is pasteurized within a few hours after being delivered to the plant.

To validate the performance, configuration and features of the new CTI CPU's and ECC1 communication cards, the plant engineering team decided to set up a test system with 6 PLC's and SCADA server and client PC's.

The tests were performed well ahead of the commissioning date and allowed some minor adjustments to be made. The general result of the tests was very satisfactory and gave the plant engineering and production teams the confidence that was needed to go ahead with the commissioning.

Finally came the critical date for the installation and startup of the CTI CPU's and the replacement of the complete hardware of the network based on modern Ethernet switches, fiber optic links and the ECC1 communication cards. It was decided to do the commissioning over the weekend with the goal to have the production running again on Monday morning. Especially for the Pasteurizing PLC, the down time was limited to 4 hours. On Saturday morning the first CPU's and ECC1 cards were installed in a few smaller PLC's. The installation went smoothly and in the afternoon the engineers felt confident to also migrate the Pasteurization PLC. The biggest challenge here was to get the PLC back into the same process state as it was before the shutdown, but since the program backup from the original CPU could be used to reload the new CTI without making any changes to the program, also this replacement went quite smoothly and the pasteurizer was up and running again before the planned production stop of 4 hours had been reached. On Sunday the remaining PLC's were migrated and now it was possible to verify the cross PLC communication. Aside from a few cabling problems, the communication was working as expected and by 3 pm the operators could start executing the cleaning in place sequences to get the equipment ready for production. When the first production shift came in on Monday morning it seemed as if nothing had been stopped over the weekend and everything had been just like before - except for this one notable difference: in the control room the operators now have a response time of the system of on average 1 second instead of 10 to 20 seconds before! And the maintenance personnel can now connect to all the PLC's via the Ethernet TCP/IP network from their desktop instead of having to connect locally to the CPU every time when they are called for troubleshooting.

All in all this has been a very successful revamping of the plant with all the targets met, no exceeding of the project budget and very little impact on the production schedule.

The engineering team was very satisfied about the features and quality of the CTI equipment and feels very confident that they now have a modern automation system again that is set to produce delightful cheese for many years to come!

For more information on CTI 2500 Series®, please contact NAPA.