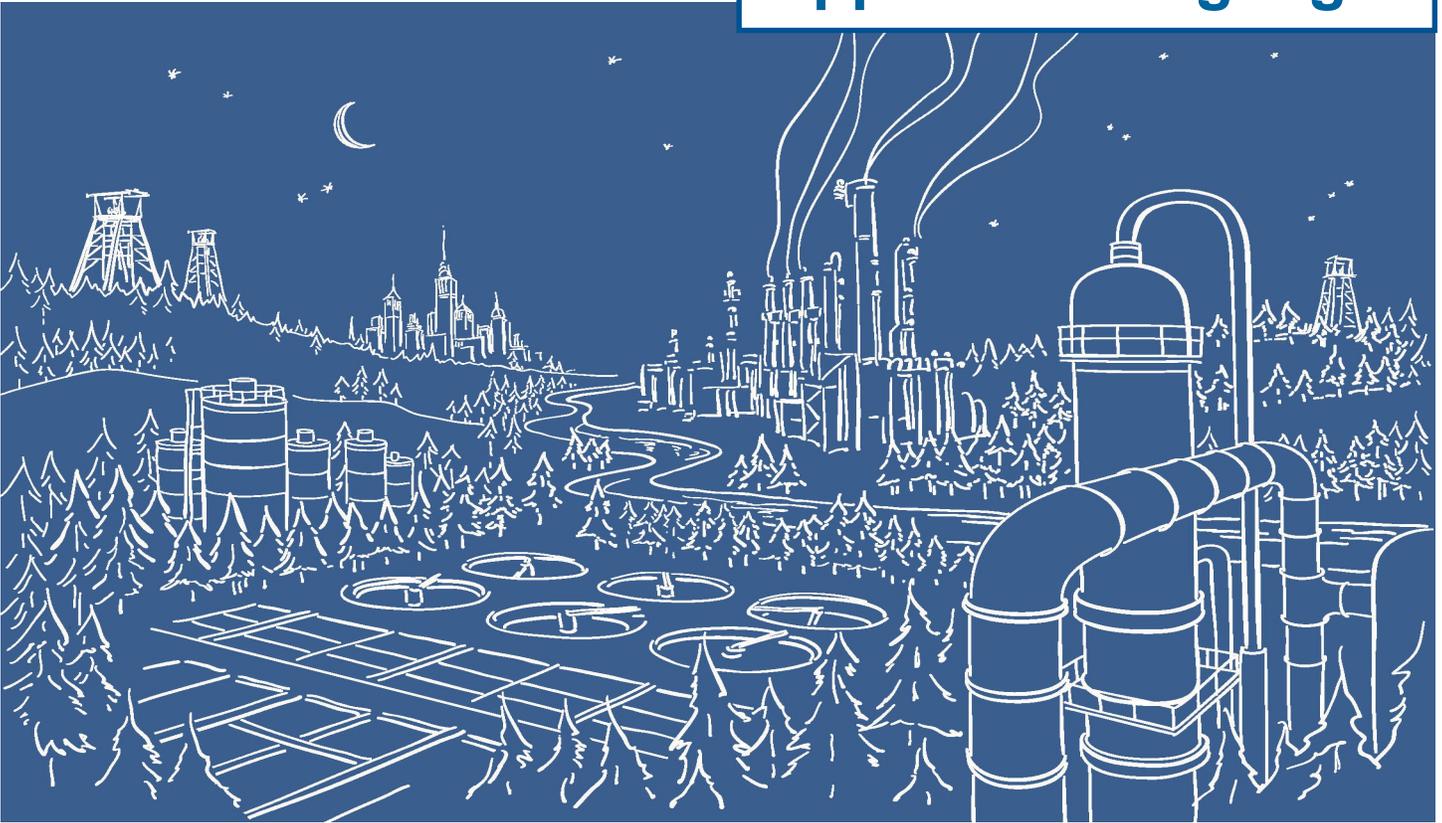


## Application Highlight



# 2500 Series® Programmable Automation Control System

French cheese maker utilizes CTI 2500 Series® CPUs and ECC1 modules to achieve dramatic performance improvements and a modernized automation system

The French cheese making company Fromarsac is located in the heart of the Dordogne region in the southwest of France. The factory, built in the early nineties, has enjoyed a successful expansion of its business thanks to the production and sales of several popular brands of fresh cheese whose names are commonly known in French households. Besides products for the local market, the company also produces several products which are exported to other 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.

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.



*This belongs to the past!*



The original plant had been equipped with Siemens SIMATIC 505<sup>®</sup> PLCs 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 The Siemens PCS system, which has been obsolete for several years, had been replaced by a Wonderware Intouch system that communicates with the SIMATIC 505<sup>®</sup> PLCs via a Woodhead Applicom card and the existing SINEC H1 Ethernet network.

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 since it could not be controlled in an optimized way.

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

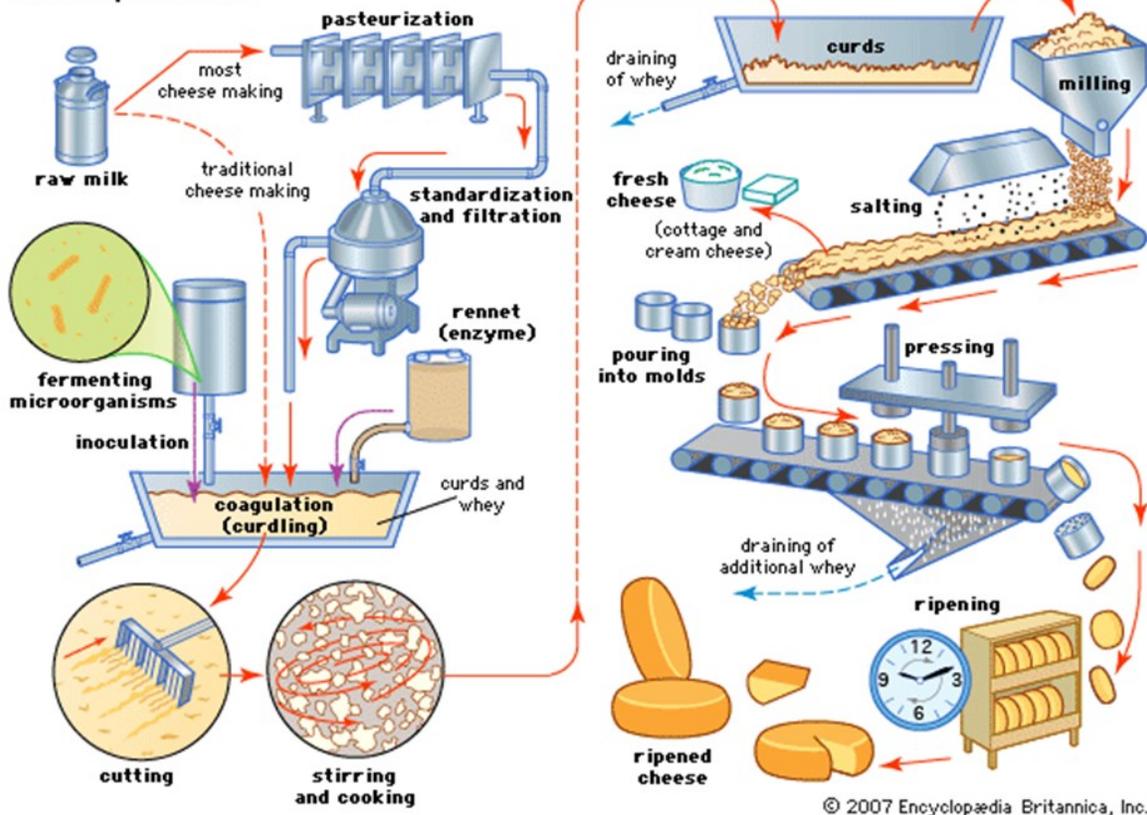
On top of that there was an additional problem in the

configuration of the plant.: The whole plant is controlled by 12 PLCs, but since this is an almost continuous production process, all the PLCs are 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 commissioning time and extended production stops.

Fromarsac had already been in contact with CTI through its distributor NAPA in France and had purchased a few CTI CPUs 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 module which made them receptive to the idea of doing a revamping of all the CPUs and the Ethernet network.

The new ECC1 card has 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 be easily implemented. It didn't take the engineers more than a day to configure the communication between the 12 PLCs, while it had taken several weeks of programming in the original PLCs to set up that same configuration.

### Cheese production





*Modern cheese making factories use a high level of automation*

Together with the ECC1 communication card, it was decided to replace also the Simatic 555 CPUs in order to solve problems of obsolescence and obtain 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.

Minimum downtime of the production lines was a major requirement of Fromarsac. They can't stop the whole plant for a long period, as cows don't stop giving milk and 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 CPUs 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 CPUs and ECC1 cards were installed in a few smaller PLCs. 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 CPU without making any changes to the program, this replacement also went quite smoothly and the pasteurizer was up and running again before the planned production stop of 4 hours had been reached.



*Tank truck unloading fresh milk*



On Sunday, the remaining PLCs 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 clean-in-place sequences to get the equipment ready for production.



2500-ECC1  
Ethernet  
Communications  
Coprocesor

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 1 second on average instead of 10 to 20 seconds before the upgrade! 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 — a huge issue for a plant that cannot afford to shut down due to food quality regulations and the continuous nature of the production process.

Using CTI's 2500 Series Automation Solutions, the plant now has a modern automation system for a fraction of the investment in time, money and downtime required by competing automation solutions. The engineering team was very satisfied with 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! That's what we at CTI call Smart Modernization™.



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