

Conde de Benalúa pioneers oil digitization by implementing its Connected Oil Mill 4.0



PlantPAX DCS from Rockwell Automation enables the company to improve the availability, efficiency, integration and production in its oil mill



Reception area at the mill where olives are cleaned and weighed

Andalusia's green gold

Located in Southern Spain, the region of Andalusia stands out thanks to its huge cultural and historical legacy, beaches, and amiable people. It also famous for its gastronomy and, above all, for producing more olive oil than any other region in the world.

In the Eastern Mountains of the province of Granada, in the town of Benalúa de las Villas, lies the San Sebastián - Conde de Benalúa Cooperative, a company founded in 1954. It currently has about 1,500 members, and produces and sells olive oil, with trademarks such as Amarga y Pica, Conde de Benalúa, and Olivar del Sur.

Since its foundation, the company has striven to increase the quality of the whole production process chain that makes oil from olives. In fact, the company owns about 50 control stations distributed across 14,000 productive hectares, along with a careful treatment and fertilizer procedure. Once the product enters its facilities, this care and attention to detail remain, with the additional benefit of being able to process more than 34 million kilograms of harvested olives – that's about 8.5 million liters of oil production.

This is made possible by the company's oil mill, which comprises three areas: a reception facility, where olives are brought to be cleaned and

Challenge

The Conde de Benalúa oil mill was made up of non-integrated, isolated systems unable to offer high availability and security levels

Solutions

- PlantPAX DCS
- Allen-Bradley CompactLogix 5380
- Allen-Bradley PowerFlex 523/525 AC Drives
- Stratix 2000 Switches
- FactoryTalk Software
- ThinManager
- Allen-Bradley POINT I/O Safety Modules
- Allen-Bradley SMC-3 Soft Starters

Results

- Information integration
- Full integrity and operation availability among the different areas in the oil mill all synchronized in real-time with the ERP system
- Significant improvement of information availability and commissioning.
- Increased production capacity
- Higher machinery efficiency.
- Elimination of bottlenecks.
- Production increase without investing in new lines.
- Production monitoring
- Business Intelligence control panels to improve the business decision-making process.
- Access to production reports via web or mobile app.
- 24/7 remote support system

put into hoppers; an extraction area, where olives are transformed into oil; and a cellar to store the final product before being delivered to the cooperative members.

Information silos

To manage these three areas, the oil mill had an automation system based on control sections, developed with proprietary tools by industry integrators that supply specific solutions to automate oil plants. "The challenge is that they are "isolated, not fully integrated systems, which weren't designed to provide high availability or guard against short electric breakdowns," explains Marisa García, Production Manager of the Conde de Benalúa plant. "That led to unscheduled downtimes and faults in our highly valued equipment."

The company started to search for alternate technology solutions able to provide a higher degree of robustness. "We decided to contact recognized companies with proven experience in other industries, presumably more advanced than the oil sector. These companies should have standard, open technologies that would allow us to improve production control in our facilities," states García.

The selected integrator was Ansotec, a company founded by Luis Alberto Guzmán in 2007. Ansotec specializes in digital transformation solutions for the industry, including all kinds of automation and control processes, mainly for the food, chemical and, pharmaceutical industry.

Report and deployment

The first decision made by Ansotec, according to Guzmán, was to "start a plant digitization report, including a project to be executed in two steps." This is confirmed by García of Conde de Benalúa: "Along with Ansotec, we carried out a systems audit and the created the layout of an automation and digitization plan that would enable us to implement a comprehensive digitization of the plant in two or three years."

For that purpose, the Ansotec proposal for Conde de Benalúa consisted of basing the whole process on Rockwell Automation equipment, systems, and automation technology. Ansotec is a Rockwell Automation certified integrator.

The first stage included the automation of the extraction room, where olives are transformed into oil. Here, the ThinManager® visualization platform and the PlantPax™ Distributed Control System (DCS) were implemented to effectively manage the plant process core. Preliminary works were also made to integrate the Microsoft® (Dynamics NAV) ERP system used by the company.

The second stage spanned the whole ThinManager platform to the rest of the plant, and the PlantPax system was implemented in other areas – the olive reception yards and cellar. At the same time, the production management solution developed by Ansotec, and named "Almazara Conectada 4.0" – Connected Oil Mill 4.0 – was implemented to control all process and plant management. Several types of devices were integrated in



Process control hall located at the Extraction Area; from here olives are ground to extract olive oil



Local operation system at the Extraction Room next to the Vertical Centrifuges, which offer the same integral visualization and operation benefits as the control room at the shop floor

In this way, the oil company has eliminated isolated control sections and now the whole plant is supported by an integrated system under a unique unified framework for process control and production management. At the same time, says García, “downtimes have been reduced and now we rely on a historization system, with alarms that allow us to analyze production trends. Our infrastructure provides a remote 24/7 support system with our partner Ansotec during the harvest season, and that ensures the ongoing operation at our facilities.”

the solution by means of EtherNet/IP™ networks: tablets, smartphones, RFID readers, and cameras.

The Connected Oil Mill 4.0 allows “all data to be integrated,” states Guzmán. “With this tool, any devices and equipment we chose comply to standards from recognized manufacturers, such as Rockwell Automation. We gather and store all the information, which can be displayed in several ways to be analyzed later.”

Data visualization makes it easy to check the evolution of the production process. Metrics can be checked instantly to improve the business decision-making process

With the aim of managing all this data, Ansotec supplied control panels based on Business Intelligence. “Data visualization makes it easy to check the evolution of the production process – idle and operational machines, production output by shift, etc. Metrics can be checked instantly to improve the business decision-making process,” comments Guzmán. This is confirmed by García of Conde de Benalúa: “The integration of all data generated by the control system ensures access to information in real time, as well as the production and control track of our business. All this with the premise of keeping a friendly system for our staff.”

Benefits

Digitization provides additional benefits to the Conde de Benalúa oil mill. “The solution deployed by Ansotec has enabled us to significantly improve the overall availability of our facilities, as well as suppress bottlenecks, and therefore increase production and machinery efficiency,” says García.

From the management point of view, the company can check production reports via web or app from smartphones, accessing control panels to monitor production, as well as a “seamless integration of labs, olive reception, extraction rooms, cellar, all synchronized in real time to our ERP system,” explains García.

In short, as Guzmán of Ansotec states: “This system provides robustness, particularly to the olive oil industry, where companies usually rely on partial, not integrated solutions.” In addition to this, he adds: “Production capacity can be increased with no need to invest in new production lines, and information is provided to enhance the management decision-making process.”

From Conde de Benalúa there is optimism about the business performance enabled by this solution. “We think that our brands will grow thanks to this investment. The high technology supplied by manufacturers such as Rockwell Automation is going to foster our business in an industry that address growing cost pressures, the need to improve quality, and comply with many regulations,” adds García.

But it’s not only providers who benefit from the information efficiency and process costs with the Connected Oil Mill 4.0 solution. It is also good for the whole industry, since the project has gained wide attention, which in turn, according to Guzmán, “places the company at the forefront of digital transformation in the oil industry.”

Additional Information www.rockwellautomation.com

The results mentioned above are specific to Conde de Benalúa and Ansotec’s use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers.



Rockwell Automation and PartnerNetwork companies collaborate to help you develop an ongoing approach to plant-wide optimization, improve your machine performance and achieve your sustainability objectives.





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Dynamic and modern companies achieve the best results, something that is extrapolated to the production area, as they improve processes and systems by applying innovative technologies that allow cost reduction by increasing output.

ANSOTEC has an expert team for the development of comprehensive advanced engineering projects that provides youth, dynamism and know-how with a high level of service.

The structure of the company allows it to develop projects that combine engineering and software, working as a single team that develops comprehensive solutions in Spain, Chile, the USA and South Africa.

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