Case Study 🚹 Unical

Elettrondata Automation Powers Unical to Deliver High-Quality Ready-Mix Concrete

The ready-mix concrete production industry is an industry where partnerships are essential, with quality and responsiveness being hyper-critical to business success. An RMC producer's ability to be successful hinges on the consistency of on-time delivery of to-specification products so that projects can meet their milestones. Any deviation to the product's quality can result in lower profits and lost business for RMC producers. While automating RMC production is essential for RMC producers, consistently delivering high-quality concrete that has the right texture to the project site at the right time is critical.

Unical is a proven example of how automating concrete production and proving the concrete has the right mix on delivery can provide successful business results. With a partnership that exceeds 25 years, the concrete producer uses the full suite of Elettrondata's hardware and software products that automate production and improve the quality, reliability, and timeliness of the different concrete mixes customers' projects demand. Unical has expertise of Elettrondata's systems across a broad range of ready-mix applications. The net result: Unical is a leading producer of top-quality concrete mixes used in a wide variety of construction projects throughout southern and western Europe.

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Elettrondata is our go-to automation partner. eSLUMP, their on-truck solution for tracking and managing concrete mixability, offers us highly accurate slump measurements at our customer sites.

 Marco Borroni, Director of Operations & Plant Design Unical, Buzzi Unicem Group





The Client

With more than 100 RMC plants, Unical, a Buzzi Unicem Group company, is a long-established market-leading producer of ready-mix concrete. With their high volume of demanding clients, they are continuously seeking out new capabilities and technologies to improve their operations without sacrificing quality. The long-term relationship between Unical and Elettrondata allows the two to work closely together on creating new innovative solutions that enhance the quality of the ready-mix products that the successful concrete producer delivers to their customers.

The Need

One of the RMC producers' challenges is delivering concrete that meets the mix specifications and has the correct consistency when it arrives at the site. If the product is outside of specs or cannot be used because the mix's fluidity is not right, the customer rejects the load, which can incur project delays for the customer and reduce or lose business for the RMC producer.

RMC producers have tried many solutions to help manage the slump of concrete at the site, and most lack the durability that makes a solution viable. Most involve placing probes in the mixer barrel to measure the slump before pouring. The reliability and durability of this approach are problematic, as the forces of the concrete on the device can break the sensors. When the sensors do not fail, the buildup of layers of residual concrete on the internal probe reduces the system's effectiveness.

Unical identified the following critical needs for a useful mixer-mounted slump management tool:



Automated calculation and display of slump value at the delivery site for a specific mixer truck.



External measurement mechanism that does not require access to ne actual concrete mix.



Easy access to the controls that introduce water to adjust slump value.



Accurately tracks the amounts of added water for quality tracking.



Uses easy-to-access controls that keep the driver safe.

The Elettrondata Solution

Elettrondata viewed these requirements from Buzzi as a challenging exercise. The Elettrondata team innovated quite a unique solution that meets all the specified needs.

Elettrondata's eSLUMP provides complete closed loop tracking of the ready-mix concrete by monitoring the mix characteristics during load, transport, and pouring at the delivery site.

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Our long-standing partnership with Unical is one example of how our strong customer relationships lead to innovative

— Leonardo Nigro, CEO, Elettrondata

The Elettrondata team arrived at the idea of measuring the rotational forces exerted on the mixing drum to derive the slump value. This approach not only meets the "no-touch" need by eliminating internally mounted sensors, but the accuracy of the solution over time also remains consistent, as the calculation of the slump starts at the plant before the components even get put into the mixer.



Hydraulic pressure sensor provides real-time pressure measurements used in the slump calculation.



The on-cab radio transceiver communicates with the plant's radio transceiver.



The on-board microprocessor identifies the truck and uses hydraulic pressure to calculate slump values.



The rotation sensor provides barrel rotation and speed, critical for determining the slump value.



The control button and electronic valve.





Manage the addition of



water to the concrete mix before pouring.

Waterproof display and control unit indicates slump, mixing cycle, phase, amount of added water, and time.



Location unit contains the GPS receiver and wireless data module for tracking mixer location.



Automatically initiates the eSLUMP calibration process at the loading point.

eSLUMP software on the truck provides trip duration and route taken to the site, serving as the interface between the truck, the dispatch software, and the batch control system.

The Result

According to field tests conducted by Unical, the slump calculations provided by the eSLUMP hardware and software components provide highly accurate measurements of the concrete slump. The solution's "external" implementation offers a durable, long-lasting technique that incorporates automated tracking of additions to the concrete to improve slump management, reducing human errors. Elettrondata's eSLUMP solution keeps the driver safe by placing all controls within easy reach for a driver standing on the ground. The innovative solution helps Unical meet its customers' expectations regarding concrete workability. These demanding customers know by looking at the concrete and its slump that the mix meets their specifications.

About Elettrondata

Elettrondata provides state-of-the-art hardware and software automation tools and management solutions that help ready-mix and precast plants achieve 24/7 production, gain unmatched operational flexibility, and deliver high-quality concrete every time on-time. With over 40 years of experience, Elettrondata has successfully implemented thousands of integrated automation systems for concrete producers globally and provided end-to-end customized solutions comprising feasibility analysis, technology design, software programming, installation, on-site testing, and after-sales support.

Elettrondata manufactures a wide range of hardware and software solutions including humidity probes, weight indicators, control panels, batch automation, quality control, quality assurance, slump monitoring, and dispatch management system. The portfolio provides plant operators with the utmost flexibility to modernize their system intelligently, get better visibility and controls that maintain high quality consistently, enhance production efficiency, and optimize business processes.



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