



## Concrete made to order

Getec Servicegesellschaft, normally a manufacturer of large concrete mixing plants, had long harbored the idea of a small, modular and expandable concrete filling station for self-pick-up. But it was only thanks to Eaton's comprehensive range of automation products and services that the company was able to turn this idea into reality.

### Location:

Kleve, Germany

### Challenge:

Implementation of a modular, expandable automation solution from a single source for a drive-in concrete mixing plant that produces different types of concrete.

### Solution:

Control via the XV300 HMI/PLC with adaptable software based on CODESYS; the slice-based modular XN300 system serves as an ultra-compact I/O platform. The solution also incorporates Eaton's PKZ motor-protective circuit breakers, NZM circuit breakers, EMR6 measuring and monitoring relays and RMQ series of pilot devices.

### Results:

A complete automation system from a single source – from power distribution to the automation components and programming. The drive-in concrete plant can be adapted to meet different requirements – all that is required to add further units to the system is to install an XN300 module and configure the software accordingly.

*“From the planning phase to the selection of equipment and programming, Eaton supported us in the development of the modular drive-in concrete filling station and helped us to differentiate ourselves in the market.”*

*Arne Gertgens,  
Managing Director of Getec  
Servicegesellschaft*

### Background

Concrete is a type of artificial stone consisting of cement, sand (or gravel), water and additives, where necessary. Variations in its composition make it possible to manufacture a wide array of different types of concrete and related products, which are used in civil engineering, construction and the exterior design of buildings. After being mixed at ready-mixed concrete plants, fresh concrete is usually delivered to construction sites using truck mixers. Among other products, Getec Servicegesellschaft supplies large concrete mixing systems where the truck mixers can be filled. But for a number of years, Managing Director Arne Gertgens has had the idea of creating smaller systems that could then be installed on the premises of building material retailers, for example. The idea was to produce small quantities – from one quarter of a cubic meter to one cubic meter – for contractors or garden/landscape designers who do not want to mix their own concrete, but who are looking for the same quality of material as that supplied by a concrete plant.

### Challenge

**Finding a system that is flexible, expandable and easy to use**

Gertgens wanted to develop a solution that had never been seen before: “I had in mind the principle of a drive-in, where customers select the desired quantity and type of concrete at the checkout, receive a barcode with their order and then simply drive up to the concrete filling station to pick up the fresh product, mixed to their specifications.”

This would not only save contractors time, but would also provide them with concrete of much higher quality than that mixed directly at a construction site. Gertgens envisaged a modular system, given that there are as many types of concrete as there are applications for it. The operator of the concrete drive-in therefore had to have the option of adding storage tanks for different sand grains or aggregates in order to offer customers the right choice of concrete. The system also had to be modular so that it could be easily retrofitted or expanded at a later date. This required an automation solution



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that would not only support the modular design of the system, but would also be easy for customers to operate.

**Solution**  
**A rugged touch display combined with a modular I/O platform**

To realize this idea, Arne Gertgens brought Eaton on board, since Getec was already using the power management company's products in its large-scale plants: "Eaton not only offers the flexibility required for such a project, but also supplies virtually all the automation components we need," says Gertgens, while adding that "Eaton's products are also reliable and available at any time through electrical wholesalers." To this end, Getec collaborates with Sonepar, which operates three large warehouses as well as smaller regional warehouses across Germany and can usually deliver orders within 24 hours.

Based on the system concept developed by Getec, Eaton suggested a number of suitable products. The XV300 HMI/PLC with integrated PLC function and touch display forms the core of the automation system. The panel's multi-touch technology enables intuitive operation and more effective human-machine interaction. The high level of system performance and the powerful graphics processor enable the direct transfer of smartphone user habits to the human-machine interface – this was particularly important, given that the concrete filling station needs to be operated by end customers themselves. Two such multi-touch panels are used for the drive-in: One

of these is located at the cash register of the building materials retailer, where customers select the required concrete mixture and quantity and receive a barcode for their order. This barcode then needs to be scanned at the concrete mixing system, where the second XV300 is installed: It extracts the required information from the barcode and then activates the actuators and valves that control the inflow of the required concrete components. "Eaton worked with us to develop the control system and supplied the necessary details," says Arne Gertgens.

For the planning of the XV300, Eaton offers version 10 of Galileo, an intuitive visualization software that supports a wide range of communication protocols and is thus compatible with most commercially available controllers. The programming of the PLC is based on CODESYS and the international IEC61131 standard. For this purpose, Eaton offers version 2 or 3 of XSoft CODESYS, enabling customers to protect their existing software investments and to develop new designs in line with the latest standards.

Getec uses the exceptionally compact, slice-based modular XN300 I/O platform to connect the various system components such as contactors, valves, control and signaling devices. This platform facilitates application-specific, adaptable system solutions, especially if used in combination with the XV300. The I/O system also saves space inside the control cabinet: the design of the XN300 allows for the neat integration of up to 20 channels by means of push-in



technology, including a status display, despite the fact that the front panel measures only 12.5 x 102 millimeters. Depending on the model, the digital inputs can be used for counter functions, while the analog modules facilitate additional functions such as reference voltages, temperature measurement or cold-junction compensation. The modular I/O concept allows users to create tailor-made solutions that can be extended anytime should needs change.

The concrete filling station is equipped with many other Eaton products, including the PKZ motor-protective circuit breakers, NZM circuit breakers, EMR6 measuring and monitoring relays and the pilot devices of the RMQ series. "Our system relies almost exclusively on devices from Eaton," says Gertgens. "Because they are simply well matched to each other."

### Results Effortless expansion

The "concrete drive-in" concept has been a resounding success for Getec: the first system has now been operational for over five months – without any problems – and the fifth concrete filling station is already under construction.

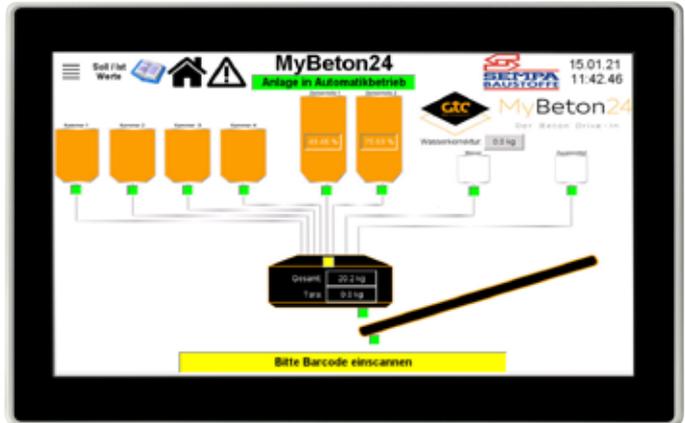
"We have stored 99 different concrete mixtures in the control system, even though building materials retailers usually only offer their customers five to ten different options," says Arne Gertgens. The system concept can be easily expanded and adapted, according to Dominik Hüfing, the electrician in charge at Getec: "If we want to add another metering unit to the system, for example, we only have to install a new I/O slice in the automation system and configure the system accordingly. No major modifications are necessary because all the components are part of the same system and can communicate with

each other." The system offers many options in this respect, such as the logging of setpoint/actual values or the evaluation of strain gauges. "Analog values can also be processed, for example for level measurement in the cement silo or for measuring the moisture content of the sand," adds Hüfing. The programming has also been prepared accordingly, meaning all that is needed to implement the maximum possible expansion of the plant is to activate the respective software modules – no additional programming is necessary.

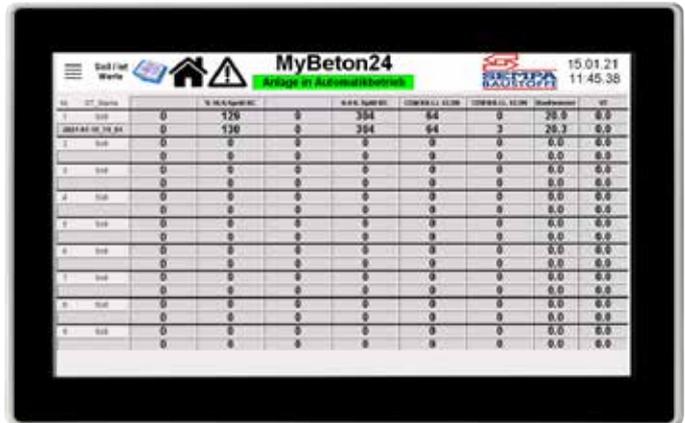
"For me, the project is not yet finished," emphasizes Arne Gertgens. "We still have many other functions in mind that we would like to implement in the system concept." The ideas range from payment via a smartphone app to predictive maintenance, and thanks to the XV300's Ethernet interface, the system is well equipped for these future projects.



At the building materials market, customers select the desired quality and quantity of concrete, pay for it and get printed out a barcode.



The barcode is scanned at the concrete drive-in. And the machine can be started to mix the desired quality and quantity.



Building material dealers can offer their customers a very large number of recipes

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