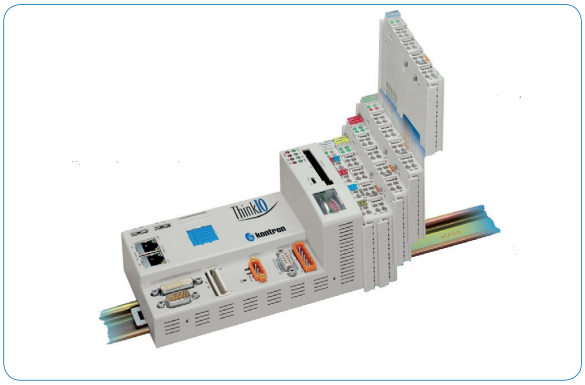
kontron

» Application Story «

ThinkIO in Automation

ThinkIO Top-Hat Rail PC Manages Giant Water Tap

Hell Uses Kontron System for Monitoring and Control of Water Facilities

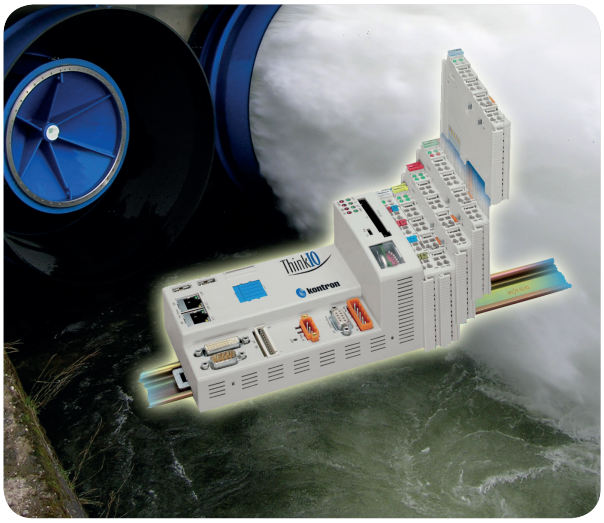


Every second, 100,000 liters of water roars through the two 22 metric ton valves of the Eifel Rurtalsperre Schwammenauel, the second largest reservoir in Germany with a capacity of 200 million cubic meters. The Rurtalsperre Schwammenauel belongs to the Wasserverband Eifel-Rur (WVER), which operates a total of six dams with a capacity of 300 million cubic meters in the northern Eifel. They serve primarily as flood control, but are also used for the drinking water supply and as a local recreation area.

The Rurtalsperre is the largest of the six reservoirs and, with the Urfttalsperre, forms a connected lake region which lies, for the most part, in the Eifel national park. And when it came time to update the electronics of this massive system, Kontron was chosen as a partner along with its Think IO system. The Kontron Think IO was chosen because it is a maintenance-free system with lots of connectivity potential. That, paired with Kontron's dedication to service, combined for a great fit to the WVER project.

How does the system work?

Overall, what happens in the pipes, valves, and burst pipe protections while the torrents of water churn through is illustrated in abstract form on a fl at-screen monitor with the Kontron logo, installed in the door of the control cabinet in the valve chamber. If the cabinet is opened, the intelligent "monarch" of the waters can be seen. The Kontron ThinkIO hides its PC functionality and everything that goes along with it in a compact housing suitable for control cabinets, just 224 x 100 x 70 mm. It controls, monitors, and visualizes all of the fittings in the valve chamber. In addition to the two pipes of the bottom outlet, there is a third which branches to a small hydroelectric station. It displays a real-time visualization of the entire facility on the fl at panel in the door. Furthermore, it is connected to the central monitoring of the dam in a neighboring building via an analog dedicated line; later, the connection will be realized via the Internet.



Major bottom outlet project

The pipes and valves of the bottom outlet in the valve chamber (this term is generally used to describe the buildings which house the pipes and fittings at water facilities) were already implemented in the fi rst building phase of the Rurtalsperre in 1936. After sixty years of service, they were worn out and could no longer be repaired, so the WVER had them replaced, a major project in construction and water technology that

was even presented by German television channel ZDF in its series Abenteuer Wissen. HELL is responsible for the electrical engineering of the entire dam association and thus also in the Rurtalsperren valve chamber. Each dam has its own central monitoring station, which has been equipped by the Krefeldbased engineers. With HELL-MDÜS the international, mid-sized company, which employs 230 people, has developed its own modular data transmission system, which also covers the communications for Eifel dam network. Computer protected, it reports malfunctions, captures measurement data, and offers full PLC functionality. Together with a partner, HELL specially developed the Webaqua visualization software for use on water facilities.

Kontron ThinkIO – the Better Sorcerer's Apprentice

In the future, HELL will rely primarily on PC technology for HELL-MDÜS in order to use the wide variety of connectivity and communication options. With their communications and device interfaces, PCs can be used in any infrastructure without diffi culty and controlled via the Internet. This is a crucial point, especially in remote systems, such as those represented by the electronics for the six WVER dams spread across more than 1000 square kilometers. That is why all 30 remote workstations, which so far have been connected via a dedicated line, will gradually be replaced and equipped with Kontron ThinkIOs. Then WVER can take its pick: DSL, ISDN, GSM, UMTS, LAN, or analog; every communication medium is possible with the Kontron PC.

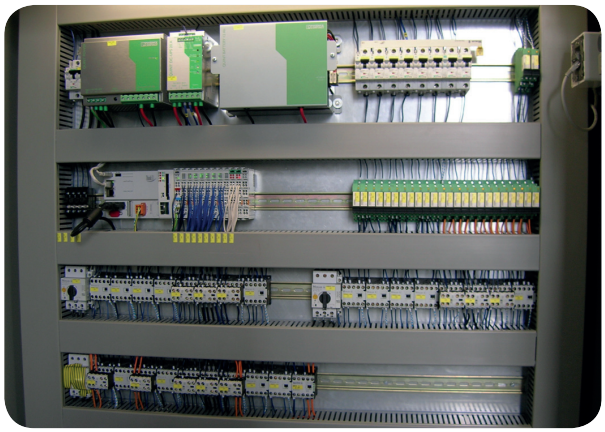
Kontron ThinkIO Facts

Besides its appropriate technical specifi cations, the Kontron ThinkIO offers a complete bundle of qualities and functions: first of all, the top-hat rail PC is only 70 mm deep, which makes it slimmer than most competing systems, and it also finds plenty of room in a 90 mm control cabinet. Inside the robust, heat-dissipating aluminum housing, there are no moving or active parts like rotating fans or hard drives that are subject

to deterioration or failure. Thus, the Kontron ThinkIO is failproof and maintenance-free – also an absolute must for geographically widely distributed systems. Also very practical for HELL: with four spring-loaded quick-locks, the control cabinet PC can be clicked onto the top-hat rails without tools. With I/O module clamps, and a form-fitting and industrially tight connection to the computer via the WAGO-I/O system, the Kontron ThinkIO is adaptable and expandable to all applications. Up to 64 clamps can be added directly and up to 252 are possible with an extension clamp. There are well over 100 WAGO clamp versions on the market, including interface modules for ASI, SSI, incremental decoder, RS232 or RS485. The Kontron ThinkIO also earned points on the HELL evaluation checklist with its software configuration: it is equipped with a real-time Linux operating system, a web server, and a CoDeSys runtime environment for executing applications programmed with the l IEC-61131-3-compliant, SOFTPLC development environment of the same name.

Harmonizing partners

Just as the Kontron ThinkIO fi ts perfectly in the Theo Hell Industrieelektrik applications, Theo Hell Industrieelektrik and Kontron work well together. The partners have been working together for ten years. “Kontron is far ahead in both product quality and support service,” explains Richard van den Ven, who is responsible for the WVER project. “We did not find a similar combination with any other providers.” Reason enough to use the Kontron ThinkIO not just in the Eifel dams. Thus, HELL also currently equips the 40 remote workstations



of the Kempen city drainage system with the Kontron top-hat rail PCs. The control cabinet computers already control the water flow for the drainage operators in Düsseldorf and the Linksniederrheinischen Entwässerungs-Genossenschaft drainage cooperative.

About the Kontron ThinkIO

For the WVER, HELL uses the “small” ThinkIO-C. Its 266MHz Geode processor is powerful enough to handle the physically sluggish processes in the pipes and valves. For more complex or time-critical computations, Kontron offers the ThinkIO-P, which goes to work with Intel® Pentium® M processors up to 1.4GHz. It is currently the fastest top-hat rail PC on the market, particularly since the 1.4GHz of the “mobile” Pentium® processor corresponds to approximately 2.2GHz in a normal desktop PC. And if the Kontron ThinkIO is to be used in situations where it gets really hot or cold, there is the extended-temperature version. The Intel Celeron® M processor in this control cabinet PC performs its duties on the top-hat rail faultlessly in a temperature range from -40 to +70 degrees Celsius. The Kontron ThinkIO communicates via two Ethernet interfaces with RJ45 plugs and 100 Mb/s, one RS232 interface, a Profi bus-Master connection, and two optional USB ports. More I/Os can be connected via the WAGO-I/O system. The processor of the Kontron ThinkIO-C has 128MB of RAM available. The internal mass storage comes on a CompactFlash card with the same volume. An additional CompactFlash can be added externally. The Kontron ThinkIO works with a choice of Linux and Windows CE 5.0. A CoDeSys runtime system is included in the delivery as an IEC-61131-3-compliant Soft-PLC. Thus all applications programmed in the development environment can be run on the Kontron ThinkIO.

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About Kontron

Kontron is a global leader in embedded computing technology. With more than 40% of its employees in research and development, Kontron creates many of the standards that drive the world's embedded computing platforms. Kontron's product longevity, local engineering and support, and value-added services, helps create a sustainable and viable embedded solution for OEMs and system integrators.

Kontron works closely with its customers on their embedded application-ready platforms and custom solutions, enabling them to focus on their core competencies. The result is an accelerated time-to-market, reduced total-cost-of-ownership and an improved overall application with leading-edge, highly-reliable embedded technology.

Kontron is listed on the German TecDAX stock exchanges under the symbol "KBC". For more information, please visit: **www.kontron.com**

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