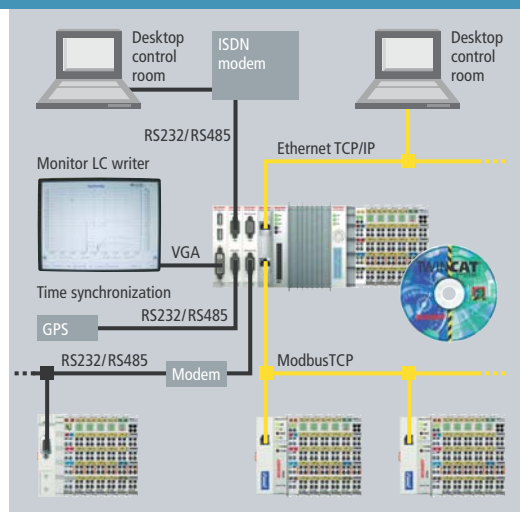


Optimized waterway management:  
Reliable recording  
and transmission of  
water levels



Flow measuring point Sulz – Berching, Germany: Ultrasonic probes determine the total runoff. A float system is used for measuring the water level. An Embedded PC collects, compares and stores the level and flow values and transfers them to the lock via radio modems and the Modbus protocol.

→ Ingenieurgesellschaft für Automation (IFA) mbH, based in Heddesheim, Germany, has been highly active in the area of waterway monitoring for many years. IFA is able to offer cost-effective, long-term solutions through adaptation of industrial equipment to water management applications. The company uses the CX10xx Embedded PC from Beckhoff for data logging and transfer.



More complex data acquisition systems use multi-level information processing. At the lowest level, Bus Terminal stations collect the measured data. A central Embedded PC is used for data processing.

The level, flow velocity and flow rate are displayed as a progressive curve on a TFT monitor via the IFA visualization system.



Applications such as shipping, hydropower plants and dams, waterway operators and residents of areas that are susceptible to flooding require reliable and current information about water levels in watercourses, flow velocity and flow rate. IFA provides complete solutions for sampling, recording and transferring such data. "The data have to be current and reliable," said IFA managing director Martin Weiniäder. "We achieve this by using a number of data sampling points along watercourses and through safe and fast data communication. Of key significance are data transfer systems that can be used independent of the location and environment while offering maximum reliability and safety. This is where automation technology from Beckhoff comes in."

#### The application of general standards enables integrated communication

In Germany, IFA has already installed more than 100 data logging stations with Beckhoff technology at locations such as the Elbe Seitenkanal (Elbe lateral canal), the Mittellandkanal (midland canal), the Moselle River, the Rhine-Main-Danube Canal and the Neckar River. Radar systems, hydrostatic immersion probes, floats with absolute encoders or ultrasonic measuring systems measure the water level and velocity. Beckhoff Bus Terminals pick up the measured data with high precision and link them with information processing systems. At the heart of the recording and transmission technology are Embedded PCs from the CX10xx series with Windows CE and TwinCAT as automation platform. This is where the data are collected, compared and stored. An internal Compact Flash card is used for data storage.

More complex data acquisition systems use multi-level information processing. At the lowest level, Bus Terminal stations collect the measured data and transfer them to the Embedded PC via Modbus TCP. The measured data are displayed as a progressive curve on a TFT monitor via the IFA visualization system. The system is programmed in C++ and is integrated in the TwinCAT-based process control system via ADS. The measured data are continuously available via WLAN, dedicated SDSL lines, ISDN, GSM/GPRS or ISM radio, or they can be retrieved as required.

"The solution offers clear advantages", said Martin Weiniäder. "We can use a standard product for a niche application and meet specific requirements through our own software. This ensures cost-effective and robust solutions. Depending on the application, we use different fieldbus systems such as PROFIBUS, CANopen, DeviceNet or Modbus and serial RS232/RS485 interfaces, which can be integrated easily and conveniently into the terminal system via the Bus Couplers and the system interfaces on the Embedded PCs. The device interfaces and protocols are based on general standards for convenient interfacing with automation and control systems."

→ IFA mbH – Ingenieurgesellschaft für Automation, Deutschland  
[www.ifa-mbh.de](http://www.ifa-mbh.de)