




Future-oriented and seamless integration

The Altenkirchen district water supply association (WKA) and the Wissen municipal utility (SWW) are expanding their water supply, disposal, and gas infrastructures with SIMATIC ET 200SP

Water for 100 000 residents: the Altenkirchen district water supply association (WKA) supplies the Altenkirchen district with fresh drinking water. With a total of six collective municipalities (Altenkirchen-Flammersfeld, Betzdorf-Gebhardshain, Hamm (Sieg), Kirchen (Sieg), Herdorf-Daaden and Wissen), it serves around 100 000 residents. It must monitor 9 of its own elevated tanks, 50 elevated tanks of municipalities, 18 pump stations, and 120 transfer points (e.g., measurement counters).

Automation task

Much of the installed automation infrastructure at WKA is based on hard-wired control (VPS) and, thus, on wired logic. These pure hardware controllers were only able to transfer the most essential measured values, which was all that was needed in the past to ensure the water supply in the district. A changeover to programmable logic controllers (PLCs) has already taken place in recent years due to the ever increasing degree of automation together with the significant increase in the number of process values monitored. These controllers can be adapted much more flexibly to changes in the automation process. In the past, some parts of the plant were changed over to the SIMATIC S7-300 family of controllers and corresponding remote terminal units (RTUs) for automation and remote control purposes. While PLCs implement local automation such as the interconnection of control signals, RTUs are used for connection to the central control system and ensure secure and reliable monitoring and control of process data. STEP 7 V5.x with the SINAUT ST7 Engineering add-on for remote terminal units was used for programming and configuration. The existing ST7 plant consists of approximately 80 remote stations with SIMATIC S7-300 PLCs with TIM 3V-IE remote terminal units. Communication is over DSL with private copper cables or via mobile radio. Data is connected to a redundant ST7CC control center (based on WinCC) via a total of 4 central TIM 4R-IE units.

In addition, a powerful S7-319 CPU is used in parallel with the redundant ST7CC in the control room for further local processing of process data.

Nevertheless, the requirements for automation and performance of the process control system continue to increase, for example as a result of ever increasing configuration limits. In order to remain state-of-the-art in the future, the association looked for a solution that would allow it to successively expand other parts of the plant and seamlessly integrate these expansions into the existing plant network. This must not jeopardize the ongoing process at any time. Once again, Siemens provided the solution for this in the form of the modern SIMATIC ET 200SP control system along with the CP 1542SP-1 IRC remote terminal unit – all configured with the modern TIA Portal engineering framework. The strengths of this combination are optimally proven in this case.

Through use of the latest controller family based on SIMATIC ET 200SP, complex functions that are programmed in STL can be migrated from STEP 7 V5.x to TIA Portal with little effort. For the remote control portion the user also has all the advantages with the CP 1542SP-1 IRC remote terminal unit in combination with TIA Portal. All engineering for the remote control portions can now be implemented in TIA Portal instead of in a separate tool such as STEP 7 V5.x. The special telecontrol connection editor in TIA Portal enables convenient connection to an existing remote control network. Likewise, new stations can also easily be added through an automatic route search.

The data point editor – central management of process data

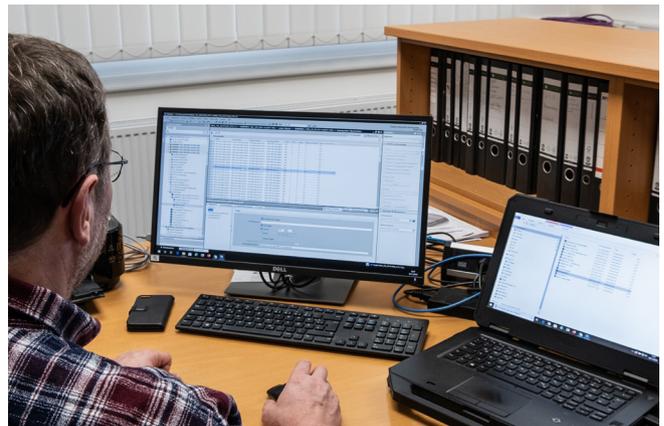
Special attention must be given here to the data point editor. With the latest generation of telecontrol modules, special programming of program blocks is no longer needed in order to transfer remote control user data between the RTU and the associated remote control center. Instead, the data areas in the memory of the CPU that are intended for communication of the communication partner are simply configured in the editor. In this process, each remote control data point is linked with a PLC tag or an element of a data block. The data point editor is particularly impressive in water utility plants due to its ability to handle larger quantities of data points. Telecontrol-relevant process data can be created and edited in a straightforward way in columns and rows as well as rotated, exported, or imported, like in Excel. This greatly simplifies handling, prevents errors, and saves money through shorter commissioning.

Project splitting capabilities unite the new world with the existing world

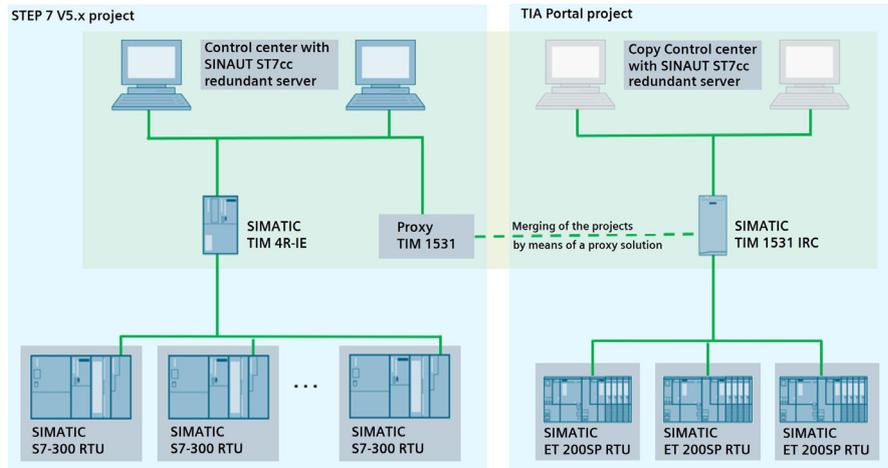
In order to make as few changes as possible to the existing plant network when expanding the water infrastructure, WKA used the so-called project splitting approach. This guarantees interaction between the existing STEP 7 V5.x environment and the TIA Portal. Here, a so-called proxy connection, which forms the interface to the newly expanded plant network, is added in the existing STEP 7 project in just a few steps. The engineering workload for this is minimal and entails little risk. Since direct intervention in the ongoing process is not required, it can also be ensured that no plant-related standstills or other disruptions occur during ongoing operation.



Control cabinet of a remote pump station of the Wissen municipal utility with SIMATIC ET 200SP Distributed Controller



Bulk data engineering in the data point editor makes it very advantageous to use, especially for very large numbers of data points.



Bringing STEP 7 V5.x and TIA Portal together through use of project splitting and proxy connections via the TIM 1531 IRC remote terminal unit

Wissen municipal utility and Siemens – a proven partnership

Staff at the Wissen municipal utility are extremely satisfied with the solution offered by Siemens. The utilized SIMATIC ET 200SP controller in combination with the CP 1542SP-1 IRC communications processor was seamlessly integrated in the existing plant network with minimal engineering workload. The staff also greatly appreciates the new TIA Portal engineering framework, which provides a more straightforward and convenient work environment in comparison with STEP 7 V5.x. In combination with the advanced project splitting approach, the water utility was able to implement fast and, above all, low-risk integration in the existing water infrastructure network. Overall, this allowed the commissioning time to be significantly reduced.

For this reason, WKA Wissen is also planning to convert other parts of the plant to the latest generation of Siemens remote terminal units in the future. A total of 27 stations are to be added for drinking and wastewater as well as for gas supply. With the TIA Portal, the water utility considers itself to be well prepared for further expansion.

Security information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept. For additional information on industrial security measures that may be implemented, please visit <https://www.siemens.com/industrialsecurity>

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Solution

Once again, the leading SIMATIC S7 automation system has proven to be the optimal platform for low-cost and low-risk modernization of existing plants during ongoing operation. The Wissen municipal utility can thus benefit from the latest technology and still continue to make use of its existing capital investments in the future.