“图尔高能源+”示范项目的一部分：位于Frauenfeld的工程培训中心
Part of the “Thurgau Energy+” pilot project: the Engineering Training Centre BZT in Frauenfeld.

案例精选

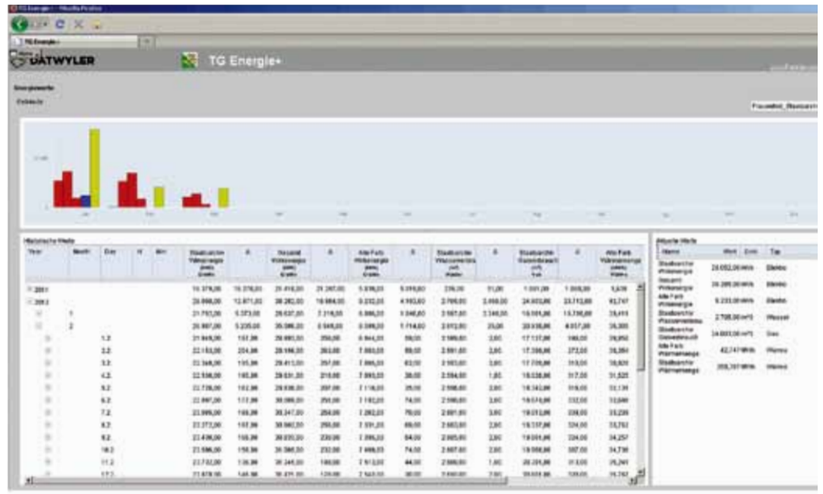
REFERENCE PROJECT

图尔高州的智能测量方案

SMART METERING IN THURGAU

作为弗劳恩费尔德一个示范性项目
的一部分，承担总体项目管理的
德特威勒公司成功地实施了一种智能测量
方案，覆盖了属于州不动产管理服务
部门的三座大厦。该州的更多大厦
正在安装使用这种技术的设备。

As part of a pilot project in Frauenfeld Datwyler, acting as overall project manager, has successfully implemented a smart metering solution covering three buildings belonging to the cantonal Property Management Service. More of the canton's buildings are currently being equipped with this technology.



国家档案馆里来自不同消费者的独立于协议的测量仪表读数的中央记录和显示
Protocol-independent central recording and display of meter readings from various consumers in the State Archive.

作为“图尔高能源+”示范性项目的一部分，智能仪表最初被用来记录三座州不动产管理部门的大厦的能源消耗数据。这些大厦即弗劳恩费尔德的BZT工程培训中心、州档案馆和长廊行政大楼。用于这些示范性项目的这一智能测量方案来自于德特威勒公司，德特威勒公司同时也被授予了总体项目管理的合同。

As part of the “Thurgau Energy+” pilot project intelligent meters are initially being used to record energy consumption data in three cantonal Property Management Service buildings. These are the Engineering Training Centre BZT, the State Archive and the Promenade administra-tion building in Frauenfeld. The smart metering solution for the pilot projects comes from Datwyler, which was awarded the contract for the overall project management at the same time.

德特威勒公司提议的解决方案所获得的最令人信服的评论就是它能够被灵活地整合到现有的建筑中去，并且提供了一个为将来扩充为设备管理系统所用的开放式平台。另一个重要的因素是，这个解决方案是来自于单个供应商的整体性方案。此合同最初包含了形成测量的概念、制定整合此解决方案的指导方针，以及与兼容数据总线的测量仪表和所需要的系统设备的安装、布线以及参数设定。

The most convincing argument for the solution proposed by Datwyler was that it can be flexibly integrated into existing buildings and provides an open platform for expansion of the facility management system. Not the least important factor was that the solution was supplied as one package from a single source. The contract initially covered the formulation of measurement concepts and guidelines for integrating the solution as well as installation, cabling and the parameterisation of BUS-compatible meters and the requisite system devices.

带有VaserControl MiniBox的系统装置在BZT里的表面固定盒中
System devices with VaserControl MiniBox in surface-mounted box in the BZT.

瑞士图尔高州在能源节约和气候保护方面为自己设立了雄心勃勃的目标 – 州能源政策从根本上聚焦于“2000瓦社会”的远景。这一目标计划最迟在2080年将人均二氧化碳排放量降低到年一吨的水平。第一步，州管理当局打算安装一种智能的测量方案以测量和分析它自己所在大厦和设施的能源消耗。与此同时，这一方案组成了未来所有不动产的集中设施管理的一部分，集中设施管理包含了其他大厦系统，并且会永久性地降低运行和管理成本。

The Swiss canton of Thurgau has set itself ambitious targets in the field of energy saving and climate protection, with cantonal energy policy fundamentally focussing on the vision of the “2000-Watt Society”. This aims to reduce CO_2 emissions to one tonne per person per year by 2080 at the latest. As a first step the cantonal administration wants to in-stall a smart metering solution to measure and analyse energy consumption in its own buildings and facilities. At the same time this solution forms part of the future central facility management of all real estate, which also encompasses other building systems and should permanently reduce operating and management costs.

在州档案馆中的可通讯燃气表
Communication-compatible gas meter in the State Archive.

除此之外，组件还被合并到州管理当局的标准IT网络，以使本地和远程中心同时收集和评价测量的数据成为可能。

In addition the components had to be incorporated into the cantonal administration's standardised IT net-work to enable local and central collection and evaluation of the measured data.

与当地合作伙伴一起实施
Implementation with local partners

该方案从2011年6月开始按三个建设阶段安装。对于系统的整合、电气的安装、燃气、水以及采暖、通风和空调等子系统，德特威勒公司分别召集了当地的专业规划公司和安装公司。每一阶段的启动以及数据点的可视化在每一个建设阶段完成后立即投入使用。此项工作在2011年底完成，管理当局已经能够开始运行这一安装项目。

The solution was installed in three construction phases from June 2011 onwards. For system integration, electrical installation, gas/water and HVAC Datwyler called in specialist local planners and installers. Start-up of each installation and visuali-sation of the data points took place immediately after each construction phase. The work was completed at the end of 2011, and the administration was able to start operating the installation.

带有系统装置和KNX三相变压器表的表面固定框架
Surface-mounted frame with system devices and KNX electrical 3-phase transformer meter.

在州档案馆中的主配电板
Main electric distribution board with transducer in the State Archive.

德特威勒公司提供的软件解决方案
Software solution by Datwyler

德特威勒公司的VaserControl软件在项目实施过程中扮演了重要的作用。安装的用于测量电量、燃气、燃油、水和供热的仪表以及测量太阳能的仪表所产生的数据通过各种现场总线系统定向传输到对应的IP路由。本地安装的VaserControl小型服务器采集每个数据点传来的数据，然后将它们发送到安装在位于魏恩费尔登的IT部门所属数据中心内的中央VaserControl服务器上。被用作数据记录器的本地小型服务器与中央服务器之间的通信基于握手协议，因此不会丢失数据。VaserControl服务器负责数据的可视化处理，并且将数据储存在一个独立的MS SQL数据库中。可视化软件能够实现通过网页浏览器来调用每座大厦的能量消耗数据。

Datwyler's VaserControl software plays a central role in the project implemented. Both the meters in- stalled for electricity, gas, oil, water and heat as well as the meters for the solar energy produced deliver their data points to corresponding IP routers via various fieldbus systems. Locally installed VaserControl mini-servers collect the data points transmitted and send them to the central VaserControl server in the IT Department's data centre in Weinfelden. Communication between the local mini-servers, which are used as data loggers, and the central server is based on the Handshake protocol, so that no data can get lost. The VaserControl server is responsible for processing the data for visualisation and stores them in a separate MS SQL database. The visualisation software can be used to call up the consumption data of each building by web browser.

在19英寸机柜中的系统装置
System devices in 19-inch cabinet.

为了详细分析采集到的数据，州管理当局安装了另外的能源管理软件。德特威勒公司则为VaserControl软件编写了一个接口的程序，以便使采集到的数据能够转送到上述软件中去。

The cantonal administration installed additional energy management software for detailed analysis of the data collected. Datwyler programmed an interface for VaserControl so that the data collected could be forwarded to this software.

在Promenade管理大厦中的带有通讯界面的热量表
Heat meter with communications interface in the Promenade administration building.

密切的协作
Close cooperation

德特威勒公司能按时并且在成本限额之内完成整个项目，离不开下列三方所提供的极其密切的协作：电力、燃气和水供应商，以及八个合作伙伴公司。一项额外的挑战是每一个大厦的现有安装系统都不相同，具有不同的标准和各种总线系统。不过，得益于所有各相关方之间的密切协作，这些已经预先被精确地设定的新仪表在安装时免去了二次设定的关键步骤，并且现有的装置，例如来自于西门子公司的带有S0接口和热测量功能的EVU电量表，被成功地整合到新安装的系统中。这一切完全得益于德特威勒公司提供的智能测量解决方案所具有的开放式接口界面，VaserControl不仅能够在本地操控这个系统，而且能够从外部控制它。最后，很重要的一点，IT部门的支持保证了所有的网络参数在安装之前都已经被设定。这意味着小型服务器的启动也是“即插即用”的。

For Datwyler to complete the whole project on time and below cost ceiling, extremely close coordination was necessary with the three departments involved, the electricity, gas and water suppliers, and eight partner companies. An additional challenge was that each building had a different existing installation, with different standards and various BUS systems. Thanks to close collaboration between all concerned, however, the new meters, which had been precisely defined in advance, were installed without the need for major reconstruction, and existing devices – EVU electricity meters with an S0 interface and heat meters from Siemens, for example – were successfully integrated in the installation. An advantage here was that the smart metering solution supplied by Datwyler has open interfaces. It also allows VaserControl both to operate the system locally and host it externally. And, not least, the IT Department’s support ensured that all the network parameters were already set prior to installation. This meant that mini-server start-up was also “plug-and-play“.

今天，州不动产管理服务部门有了一个可自主处理且可无缝升级的解决方案，对能源消耗数据进行持续地评估，以作为大厦优化的一个基础。它能够可视化地揭示大厦的薄弱之处并实施提高效率和节省能源的措施。

Today cantonal Property Management Service has at its disposal a scaleable solution which allows the continuous evaluation of consumption data, thereby serving as a basis for building optimisation. It can use visualisation to reveal weak points and implement efficiency-boosting and energy-saving measures.

在成功地完成了这一示范性项目之后，德特威勒公司正在其他两个大厦中安装此种技术 – IT部门数据中心和新的Eschlikon Werkhof大厦。

Following successful completion of the pilot project Datwyler is currently installing this technology in two further buildings – the IT Department’s data centre and the new Eschlikon Werkhof building.

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