Bespoke system control technology for Uniklinik Wuerzburg
(Wuerzburg university hospital)

Data display for more safety

In hospitals increased attention is paid to the safety of people and installations. Any technical malfunction could place lives at risk. The safety of the building services forms the basis for the safety of the medical technology used to care for the patients. Due to the university's very good experience with OPC* technology from *esb* elektro systembau bender in the new centre for operative medicine, a modernised fault management system has been implemented in the entire hospital, also using products from *esb*.

* Standardised software interface that makes it possible to exchange data
  between applications from different manufacturers in automation technology.

The Uniklinikum Wuerzburg with its 5,337 staff has a total of 1,433 beds and provides complete medical care at a trans-regional level. In 19 clinics with outpatient departments and three independent outpatient departments, almost 200,000 outpatients and over 50,000 inpatients are treated annually. Such a large and complex array of buildings can only be effectively managed centrally.

Proven technology ...

The first central fault management system was set up decades ago to monitor refrigerators and incubators containing important scientific results. Based on the ATARI ST, which appeared for the first time in 1992, a cross-building control system was set up. Fault indicator contacts from a wide range of electrotechnical plant were gradually connected to this system, as were the contacts from the Bender IT systems. The information was combined in the control room and used for the coordination of technicians to rectify faults and document the operating states via a log printer.

... with new tasks

In 2005 it was clear that this technology, proven but outdated for new technical requirements, had reached its limits and needed to be replaced.

As each new building is equipped with more and more technology that is also increasingly sensitive, it was necessary to plan and install a more powerful system. During the construction of the new centre for operative medicine (ZOM) a PC-based notification system was planned and set up by *esb*. Due to the operator's good experience with this initial island solution, the Staatliche Bauamt Wuerzburg (Wuerzburg State Construction Office) developed, together with the hospital's technical department and esb, a concept for a new fault management system with central control room.

The task was to include the old system with all its signals, as well as to implement additional signals and fully integrate existing Bender installations.

The following requirements were placed on the new system:

- graphic display of data in schematics and floor plans,
- display of the information in a hierarchical form,
- features for forwarding events,
- permanent storage of log book files so that operating states at any time can be verified,
- support for condition-orientated maintenance by means of the transmission of analogue values,
- evaluation of the utilisation of individual parts of the plants by means of the transmission of load states,
- possibility for the operator to modify and expand the system at any time,
- universal alarm modules so that other electrical plants can be integrated,
- specific management of the control personnel by means of the storage of event-dependent priorities for the rectification of faults,
- usage of existing infrastructure (LAN) for cross-site systems,
- management of control personnel by means of prioritised event-dependent instructions in the case of a fault and
- generation of a technician's control slip.

The requirements on planning and installation were therefore much higher than for the previous new buildings, as to connect together the individual buildings the related Bender bus systems in the individual buildings had to be expanded to form one large bus system. For this purpose the indicator and operator panel addresses and programming had to be modified; the firmware in all the indicator and operator panels also had to be updated. Thanks to consistent and sustained product updating, it was even possible to integrate first generation indicator and operator panels in the new system by using updated firmware.

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the decentral computers only display the related signals from the specific related Bender bus systems, all signals are passed to the main computer. The OPC servers installed on the computers are able to poll all Bender bus system lines simultaneously and to make available all data for display.

Help with self-help

For system maintenance and to be able to independently expand the system as necessary, several employees from the hospital's technical department were trained in our seminar rooms in Gruenberg. As a result the hospital is able to support and expand the system on its own. The integration of the data as well as the design of the user interface and overviews were realised by *esb* in close collaboration with the technical department.

Thanks to the OPC solution from *esb* the hospital is now able to utilise the existing personnel resources in the technical department even more effectively. At the same time the availability of the technical plant is better, as degradation in insulation values is detected immediately and can be rectified as quickly as necessary to suit the hazard involved.

The example of the Uniklinikum Wuerzburg impressively shows how with *esb*, a partner for bespoke data display systems, significantly more complex and state-of-the-art system control technology can be realised without additional effort on the part of the personnel responsible for operation and maintenance. The customer obtains solutions exactly tailored to the related needs – all from a single source. ∎

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Installation with the buildings in use

The company Elektro Pixis, Gerbrunn configured the existing power system between the individual buildings and installed the cables that were missing. Due to careful planning and meticulous implementation, it was possible to carry out the installation work with the buildings still in use and without major interruption.

Using the proven indicator and operator panel assemblies BM400 from esb it was possible to integrate the fault information into the Bender bus system at the related points and provide the information on both the external and internal bus. Depending on the requirements profile, the alarm modules were integrated into a surface mounted housing or directly in the existing switch cabinets on DIN rails. Here the issue time and again was to find customer-specific and application-specific solutions.

Full control

The main control room computer currently displays 5,239 data points, expansion to up to 10,000 data points is possible without problems.

Dedicated decentral data displays are installed in three buildings and are linked to the main control computer via the TCP-IP network. While

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THE *esb*-DATA DISPLAY IN FIGURES:

- 78 TM indicator and operator panels
- 80 alarm modules
- 170 IT systems
- 85 SMI472
- 188 switches
- 5,658 data points
- 5,239 data points displayed
- 6 external BMS buses
- 3 software OPC servers
- 1 hardware OPC server (FTC).