



LONWORKS Control Technology Keeps Stadium Visitors Comfortable While Managing Operating Costs



Completed in a record-setting construction time of less than 2 years, the LTU Arena, is a new multi-purpose stadium in Düsseldorf, completed in January 2005. Soccer, American Football, sporting events, concerts and exhibitions are just some of the events that take place in this world-class venue, which holds 61,000 spectators.

The Challenge

Whether they're attending a soccer match or a rock concert, guests at an indoor stadium event shouldn't be distracted by uncomfortable temperatures, poorly ventilated air, or other environmental concerns. The owners of the LTU Arena sought a building solution that would keep visitors comfortable operating costs manageable and be easy to implement.

The Solution

Thanks to Echelon's LONWORKS control network technology, the stadium now boasts completely automated and intelligent HVAC and lighting systems that

everyone can cheer about. Building automation management company ABB Gebäudetechnik AG, Langenfeld, Germany, developed the heating, ventilation, and air-conditioning (HVAC) system, and programmed and commissioned the lighting application. HGI GmbH, a system integrator in North Rhine, Westphalia, Germany, configured and implemented the control network infrastructure. Together, the two companies implemented the project within a year.

The LTU Arena is a showcase for Echelon's LONWORKS control networking technology – an open, extensible architecture that lets control devices from multiple manufacturers interact with each other. The arena's HVAC system keeps visitors comfortable year-round through a large network of central units and decentralized LONWORKS components that control, sense, and monitor over 20,000 I/O points. A combination of gas heaters, ventilators, and industrial heating panels – all enabled with LONWORKS technology – makes sure the indoor temperature never falls below 15°C in winter. To keep the stadium air healthy, more than 100 ventilators extract smoke and circulate over 900,000 cubic meters of fresh air per hour.

The lighting system integrates over 600 LONWORKS devices from multiple manufacturers – everything from controllers that can be programmed over the input-output port to touch panels that control lighting in the business clubhouse. The panels, which function as remote clients, are integrated with the BMS servers over the fiber optic backbone.

To keep summer events well lit, dome lights in the outer ring of the stadium roof are equipped with automatic sun-drapes that open and close based on the brightness of the sun. During winter, operators adjust the lighting manually.

Visit our website for more case studies: www.lonmark.org/connection/case

75 single-room LONWORKS based controllers offer individual climate control for the arena's 50 private suites. This lets the stadium save energy by circulating air only to occupied suites. In addition, more than 200 water and electricity meters equipped with LONWORKS technology monitor how much energy is consumed by the HVAC and lighting systems. The meters transmit invoicing and optimization data to the BMS server, where it's recorded, archived, and evaluated.

At the core of the arena's control system are two Intranet-enabled BMS servers equipped with RAID system USV, a redundant power supply unit. The network is divided among five Echelon LNS databases. Global data, such as from a weather station, is sent over the domain coupler to all areas. A fiber optic Ethernet backbone provides fast and stable communication as intelligent IP routers connect LONWORKS FTT 10 components with the IT network. The entire arena is controlled and monitored through 20 technical centers; arena operators can easily access all data points via LAN or WAN.



HGI staff designed, manufactured, and assembled 150 switch cabinets and delivered them as ready-to-use product to ABB. More than 80 LONWORKS Direct Digital Control controllers (with the capacity to include 10 additional modules) manage the entire facility.

Results

The LTU Arena now has completely automated, intelligent HVAC and lighting systems that keep visitors comfortable and optimizes costs. Only an open system was able to meet all of these demands. The ability to easily integrate devices from multiple suppliers kept the project on schedule, and offers flexible options for future upgrades. The LONWORKS system also ensures optimal facility operation: Users can quickly access all systems and data via LAN or WAN, and intelligent metering manages energy use.

Contact:

www.echelon.com