



PC-based control automates production building of AEC Pole Division

Efficient LED lamps and intelligent lighting control reduce average power consumption by 30 percent

The factory built by AEC Pole from 2012: An automatic twilight function is used to switch the external lighting on or off, depending on the available daylight.

Just in time for the Expo 2015 trade show, which took place under the motto, "Feeding the Planet, Energy for Life", the city of Milan converted its street lighting to modern LED technology and is now a pioneer in Italy in terms of energy- and cost-efficient lighting. The contract to convert more than 100,000 lamps was awarded to AEC Illuminazione, a well-known company in the field of outdoor lighting (streets, urban, tunnels, architectural) and indoor lighting (commercial and industrial). Sustainability and energy efficiency are part of the corporate philosophy of AEC, so when it came to designing a new production building it was only logical that the focus was on reducing power consumption through advanced LED lamps and intelligent lighting control. The project was implemented by systems integrator LedControl, based on Beckhoff building automation components.

AEC Illuminazione, with corporate headquarters in Arezzo, Italy, has been active in the field of public lighting equipment for more than sixty years, and is today regarded as the Italian market leader in LED street lighting. Since 2012, the company has also been producing lamp posts under the name of AEC Pole Division. A new production plant was built for this purpose with a total area of 30,000 m², 7,000 m² of which is indoors. The building is not just architecturally sophisticated; it also follows an advanced technological concept with regard to building automation.

CX-series Embedded PCs provide an integrated platform for lighting control and energy measurement

The company LedControl, based in Lentate sul Seveso, Italy and an established software developer and system integrator, was commissioned to handle the implementation of an energy-efficient lighting control system. The decision in favor of Beckhoff technology hinged on the high level of integration in the solution, which enables lighting control via DALI, and the control of power measuring devices, brightness sensors, and EnOcean switches on the same hardware platform.



AEC Pole Division produces and stores poles for street lights on a 7,000 m² production area.

The production building is illuminated by 300 75-Watt LED lamps, which AEC custom-designed for this purpose. The control system consists of a CX1010 Embedded PC with directly connected I/O modules:

- 4 KL3062 analog input terminals, 0 to 10 V, for connecting the brightness sensors
- 1 KL1889 high-density Bus Terminal with 16 digital inputs, 24 V DC, for connecting conventional pushbuttons
- 1 KL6581 EnOcean master terminal for connecting the KL6583 EnOcean module and integrating the EnOcean radio switches
- 6 KL6811 DALI master terminals for controlling the DALI lamps

The CX1010 is connected to the company IT network via an Ethernet interface. A BC9050 Ethernet Bus Terminal Controller is used to integrate remote inputs. The communication between the BC9050 and the control system also takes place via the Ethernet interface. The KL3404 power measurement terminals for measuring power consumption are directly attached to the Bus Terminal Controller.

Light intensity is kept constant at the workplaces, regardless of fluctuating daylight, by means of a constant light control system. The target light levels for the constant light control are specified for individual sections via a time-based (daily/hourly) switching schedule. Outside, an automatic twilight function is used to switch the lighting on or off, as a function of the available daylight. Manual interventions to override the automatic functions with conventional buttons or EnOcean devices are also possible.

Convenient remote monitoring

In addition to local monitoring, the PC-based control system enables remote operation of all components as well as modification of the operating parameters by the user, in addition to displaying power consumption and any device malfunctions. The DALI technology not only enables selective control of each individual lamp, but also monitoring of all DALI devices in terms of their function and display of lamp failures. The installation effort for the lighting system is minimized by using a standard cable for up to 64 lights on a DALI strand.

Access rights tailored to the needs of the user

The application software developed by system integrator, LedControl enables control of the lighting system via a simple and intuitive graphic user interface. The application runs via the web server integrated in the CX1010 and enables access to the HTML control pages for all devices that feature a web browser. The functions made available to different users are specified based on categories, i. e. maintenance specialists, installers or general users, depending on their responsibilities. The power consumption data is saved and exported in a format that is compatible with Microsoft Excel and can be accessed remotely.

PC Control reduces power consumption and enhances application flexibility

The light management system offers significant energy saving potential, compared with a conventional installation. During much of the day, the total capacity of approx. 22 kW can be limited through the daylight-dependent lighting control. Average energy savings of 30 percent can be achieved, with peak values of more than 50 percent at certain times of the day. In addition to energy and cost savings, the system also offers significant benefits in terms of functionality: with DALI technology, the working areas can be configured in software, i. e. it is possible to create lighting function groups, which are controlled with a homogeneous brightness level. Suitable light intensity values are determined for each working area, for example, manual or automatic production or warehouse, and so on. Thus, any modifications in the plant utilization layout do not necessitate recabling measures, which would be very costly and complicated in view of the large number of operations carried out in the plant, instead requiring only a software update.

Further information:

www.aecilluminazione.com/pole-division

www.ledcontrol.it

www.beckhoff.it