



LONWORKS Delivers Energy Savings to Sweden's Post Office HQ



The Swedish Post Office, Posten, which is one of Sweden's largest corporations, provides postal services to four and half million homes and 900,000 businesses daily. Employing more than 30,000 employees, the Swedish Post Office

underwent considerable changes during the late nineties. A key part of this process included the concentration of the organization in a new head office.

Posten was looking for a building to serve as the shaping force for future operations in an environment designed to stimulate communication and creativity. Eight architectural firms were invited to compete to design the headquarters in Solna in Stockholm, Sweden. BSK Architects won the competition with a design for a building that preserved the landscape by following the natural terrain. The building is known as the "Thinktank" because of the series of small protruding rooms in the glass façade, the "think boxes", which are lit up at night. An intervening atrium separates two parallel office floor plates which are joined by footbridges and cocoons (secluded meeting rooms for up to 10 people).

More than 1000 people work in the building, which has a total floor area of 58,000 square meters. There are 1100 workstations on six floors providing a total of 25,000 square meters of open plan offices and the building also has parking for 450 cars. The project cost approximately SEK 800 million (EUR 84 million - US\$ 135 million). It also includes a gym, a swimming pool, and several shops and restaurants.

The building is completely glazed from floor to roof with 10,200 square meters of glass, which provides an ideal opportunity to save energy by dimming the lights depending on the level of the daylight. The overall open office plan inspired many energy saving solutions and gave the opportunity to make the building "alive" during darkness by illuminating coloured walls inside. Systems

integrator, Energo, was given overall responsibility for both design and programming of the building automation systems.

Challenges

Posten wanted a networked solution using LONWORKS technology giving the possibility for cooperation between different subsystems such as the lighting system, alarm handling, HVAC, sun shading, and scheduling. The most interesting part was the energy saving possibilities for the open plan office area. This included the use of movement detection for both lighting and HVAC and daylight dependent illumination. The goal was to use as few on/off light switches as possible because of the wear and tear on the fluorescent lamps and to decrease the number of lamp changes necessary.

Solution

LONWORKS technology was used to provide a complex lighting solution. At 7:00 a.m. the lights come on, brightening from 10% to 100%. At the same time, the movement detectors are turned off and the light sensors are turned on. During daytime the zones closest to the windows are daylight dependent, meaning that they dim or brighten based on the amount of natural light coming into the offices to provide a constant light level that is comfortable for the staff as well as energy efficient. At 7:00 p.m. the lights turn off, dimming to 10%. At the same time, the movement detectors are activated and the light sensors are deactivated. During night time, movement detectors turn on the lights in zones that are occupied. The lights remain on for an hour and then, if no one is present, dim down to 10% again.

All conference rooms have movement detectors for air handling and also turn off the lights if the room has been empty for 30 minutes. Most importantly, once the light has been turned off it is necessary to manually switch on the light. This saves additional energy since the light does not turn on if someone just quickly enters the room.

Being familiar with LONWORKS as a tool, Energo was confident with the way it works. Its open architecture allows devices from multiple manufacturers to be incorporated into one unified system for better control and

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efficiency. Some 3000 nodes were used, including LONMARK certified Tridonic FTTTLS and Capelon/CeTeLab Focus 1575 movement detectors. Other products incorporated were from Somfy as well as Time2Lon, Lexel/Gira push buttons, Liwo nanonode and Compwell AM2002-3106.

Benefits

The building contains 4100 luminaries and therefore any change in brightening or dimming the lights generates large savings. During the light times of the year the brightening of the lights is changed from 7:00 a.m. to 7:30 a.m. and the dimming time is changed from 7:00 p.m. to 5:00 p.m. due to Posten's shorter summer working hours. The movement detectors brighten the lights in occupied rooms if anyone works later than 5:00 p.m. These alternating brightening and dimming times provide energy savings of up to 14%.



The daylight dimming function generates savings that vary at different times of the year, especially so in the Nordic countries. Just changing the lighting level to 10% for as little as two hours a day makes a saving of 31,000 kWh per year. This translates into huge energy bill savings, especially with today's increasing energy prices.

The solution was created with a minimum of on/off switching, which increases the service life of the fluorescent lamps. The combination of a daylight-dependent office lighting system for the daytime and movement detection lighting during the night provides better lighting conditions for the staff as well as greater control over energy consumption. Fewer spare parts will be required due to the use of the same movement detectors for both lighting and HVAC. Furthermore, the lighting scheme has made the Posten Headquarters building a landmark in Sweden.

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