



PROJECT AT A GLANCE

Project Type:
Energy, Security, Integration

Location:
Klagshamn, Sweden

Number of Buildings: 1

TAC Equipment Installed:
TAC Vista Server
87 - TAC Xenta Controllers
2 - TAC I/SITE Controllers

Number of Nodes: Approx. 160

Other Equipment Installed:
73 - Motion Detectors
91 - Window Contacts
22 - Door Controllers
7 - Card Readers
13 - Door Processing Units
20 - DIU (Digital Input Unit)
1 - Alarm Transceiver
44 - Room Regulators
12 - Pressure Regulators (e.r.i.c.)
10 - Clocks (LON® controlled)
1 - Energy Display

Applications:
Energy Conservation
Indoor Climate
Carbon Monoxide Regulation
Lighting Control
Access Control
Intrusion Detection

The Strand School at Klagshamn

TAC Sweden initiated a dialogue with Malmö Municipality about what to expect from a supplier of building management systems and solutions. The initiative led to a vision document describing key areas to be focused upon during the next few years. The most important priority was the energy efficiency of existing buildings, owned and managed by Malmö Municipality.

THE CHALLENGE

Energy costs in Sweden had increased by 40% during the previous four years and in light of the EU directive on energy conservation it was crucial to become pro-active in this area. The second priority identified was how to create a school environment for the future and how these new schools could be optimized both in terms of energy efficiency and indoor climate, security and safety.

TAC proved to be a strong partner for both these priorities. The Strand School in Klagshamn, just outside Malmö city center, is the first project where systems and solutions for energy conservation, indoor climate and security issues were considered as opportunities to take building management systems to a new level.

MALMÖ MUNICIPALITY & TAC ENERGYEDGE

Malmö is Sweden's second largest city, and is located in the expansive Öresund region, which includes Copenhagen on the Danish side of the strait.

TAC and Malmö Municipality have implemented an ongoing TAC EnergyEdge program that includes more than 100 buildings across the city. The aim is to create significant energy conservation throughout the buildings' life cycle through continuous energy inspections and optimizations.

CUSTOMER BENEFITS

- Streamlined planning and construction for new facilities
- Co-utilization of equipment
- Increased operational efficiency
- Increased energy conservation

An integrated approach:

- Motion detection for intrusion and climate control
- Window-contact co-used for intrusion and energy savings
- Lighting control through motion detection
- Climate quality through carbon monoxide monitoring devices
- Scheduled energy savings modes for the whole facility
- Access control in zones and coordinated with lighting systems



Access control and intrusion alarm is an integral part of TAC's delivery



Integration and communication between climate and security systems is made possible through the Xenta 527

Clear conservation targets have been defined and agreed upon by both parties. After these target goals are met, any additional savings realized are subject to a profit sharing plan between Malmö and TAC. This establishes a clear intention to continue to save costs even after the targets are reached. All buildings included in the project are connected to TAC by the web, enabling staff to monitor and optimize the management of the building systems remotely.

The school in Klagshamn will be connected in the same manner once opened. It is worth noting that the Strand School is not considered to be a pilot project, but rather a part of Malmö's vision of how school environments are to be created in this century.

THE SOLUTION

The general concept behind the technical installations at the Strand School is that traditional building management systems for regulating heating and ventilation are closely integrated to, and communicating with, the technical systems for lighting, access control and security, thereby creating increased efficiency in terms of operations and possibilities for energy conservation.

One of the main benefits created through this coordinated approach is that components, (e.g., for motion detection), can be co-utilized by the security system as well as by the technical systems controlling the indoor climate.

Additionally, the fact that one supplier provides all the technical systems in the building leads to improved coordination during the planning and construction phase.

An open communication between the existing systems also enables further benefits by sharing vital information that traditionally resided in closed and separate systems. For example, the security system informs the ventilation system that a window in a classroom is open, which consequently signals the ventilation system in that particular room to switch to stand-by mode, thereby saving energy.

ACCESS CONTROL AND SECURITY

The school in Klagshamn is equipped with an access control system based on TAC's I/NET solution. During after-school hours, students and staff can enter the building by using their access card together with an individual PIN-code. The school is divided in such a way that the alarm system for each zone can be individually activated or de-activated. At 4 p.m., all main doors in the hallways are closed by automatic release of the magnetic contacts holding them. This ensures that the building is ready to be locked down completely without having to manually close doors in order to avoid alarms. At 6 p.m., a voice message is broadcast throughout the building via the PA system, announcing that the building is about to be closed and the alarm is being turned on.

Staff remaining in the building can prolong their stay by entering their individual PIN-code at the closest card reader. Motion detectors used to operate the ventilation system during the day are used by the intrusion alarm system to monitor movement in the building after hours.



User-friendly interface improves efficiency

When a zone's alarm system has been activated, the lighting in that section is automatically turned off in order to save energy. If an alarm is activated, the lighting turns on for the whole zone to ensure that guards and/or police have easy access to the premises. This co-utilization of components traditionally reserved for the security system, such as motion detectors and magnetic door and window contacts, makes for efficient, intelligent building management.

A TYPICAL ROOM AND ITS FEATURES

The benefits of an integrated and coordinated approach for the building systems become clearly evident when looking at the features and functionality of a typical room in the school. All areas throughout the building operate in the same manner, with the co-utilization of components and sharing of vital information.

During nights and weekends, when the building is locked down and the alarm system is activated, a typical room is set to stand-by mode. At 7:30 a.m., all rooms are automatically set to economy-mode, which means 19° C and minimal airflow. Once someone enters the room, it goes "live": the motion detection device activates the room and sets it to comfort-mode. Temperature is increased to 21° C and airflow is increased.

As more people enter the room, the temperature and carbon monoxide monitoring devices continuously measure and optimize the airflow and radiators to constantly keep a pre-set temperature and a safe level of carbon monoxide.

On a sunny day when students want to listen to birdsong outside the window, integration is evidenced again. Once a window is opened, it is indicated by the intrusion alarm system through the magnetic contacts in all windows. This

is communicated simultaneously to the heating and ventilation system and the room switches to stand-by mode after one minute; ventilation and radiators turn off automatically, to conserve energy. When the window is closed again, the system resets to comfort-mode.

When everyone has left the room, the lights are automatically turned off after 20 minutes, thanks to the integration between the security system (motion detectors) and the lighting system.

THE BOTTOM LINE

The highly integrated building management system makes it possible to conserve energy and ensure optimized operation of the building's technical systems. This is made possible through the tight integration between the lighting, indoor climate and security systems. Management is made easy through a single user interface with TAC Vista. Users can access the system on site, or via a web interface where both TAC engineers and the technical staff at Malmö Municipality can monitor and optimize the solution. Energy efficiency is also something that will impact the daily life of the students who will be able to monitor current energy usage on a central display in the cafeteria.



Climate controllers are activated by motion detection system



Security system window-contacts are co-utilized by the climate system



Input from room devices is handled by computerized regulators

EDUCATION PROFILE

For schools and other government facilities, a building solution that delivers energy efficiency, comfort and security is critical and necessary. TAC's proven solutions and ongoing service commitment provide municipalities with integrated, intelligent building management solutions that conserve energy and optimize operational efficiency, thus protecting taxpayers' investments.

TAC has proven experience with public schools, private schools and higher education facilities in providing building management solutions that maximize energy efficiency, security and performance. This leads to a reduction in operating costs and enables the reallocation of saved resources to new programs for students within the same budget.

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