

Excellent study atmosphere in desert campus

In Saudi Arabia's university for women, building system technology controlled by KNX enables the university to operate efficiently



The campus of the Princess Noura University for Women is impressive due to its size, architecture, comprehensive teaching programme, social facilities – and due to its highly modern building system technology

The Princess Noura Bint Abdul Rahman University in Riyadh, Saudi Arabia is the largest and probably the most modern university for women in the world. The teaching and research establishment incorporates faculties for health, humanities, art, languages, geography, history and Islamic studies. The campus covers 800 hectares and has been conceived as an independent district. It has space for 40,000 female students and 12,000 employees and includes a library, a university clinic, research centres, halls of residence, social facilities such as kindergartens, schools, mosques and even its own automatic rail system. The installation with its impressive and stylish architecture began operations in 2012.

The best features of the complex can also be seen in the building system technology. The KNX building system technology ensures efficient lighting and air conditioning and provides protection against sun and heat in all the university buildings. The system integrator of the extensive KNX installation, "Modern Times Technical

Systems (MTTS)", was presented with the International Award for Asia for this project.

Sun protection supports the air conditioning

Strong sunlight and temperatures over 45 degrees Celsius – as is usual in desert regions – require reliable sun protection or shading technology for the large glass fronts of the building. A comfortable atmosphere in the lecture halls, seminar rooms, offices and in areas such as the library and cafeteria is a prerequisite for the efficient operation of the university. Thousands of blinds not only protect against glare but also prevent the high levels of solar heat from penetrating the building. The blind drive mechanisms on all four facades of the building are controlled via a KNX weather station (Somfy AS-513) dependent on the current position and intensity of the sun. The option to set the blind and the louvre positions manually via a bus push button meets any individual requirements. These settings are reset to automatic mode via presence detectors when people leave the room. The air conditioning is made

more efficient by the sun protection which is an important factor for operating costs and environmental protection.

Partition control divides room functions

The bus installation for the lighting control in the 3- to 4-storey university buildings is divided into zones, with a distribution of the corresponding switch actuators, dimming actuators and other KNX devices. Presence-dependent and daylight-dependent controllers or constant lighting controllers ensure efficient lighting in classrooms, laboratories, offices, toilets etc. Manual operation is possible via bus push buttons. During presentations in the lecture halls and classrooms for example, it is possible to simply call up brightness values for the lighting and to set the darkness level via scene buttons (bus push button or media control). The technical refinements of the system include intelligent partition wall controllers. If the large lecture rooms are divided into two rooms, the room functions for lighting, shading and operation are automatically divided into two independent units.

KNX MT-701 panels are used for local central operation such as emergency lighting functions. They also make logic, time switch and scene functions available. A visualisation of the central operation, monitoring and control of the entire KNX installation was implemented with the NETxAutomation software. KNX is also able to communicate with the campus management system via a KNX BACnet gateway. The presence status in the individual rooms is used for occupant-depend-

Winner
KNX Award 2012
Category
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ent setpoint adjustment of the climate control – a further contribution to increase building efficiency which is a mandatory requirement for the Princess Noura University due to the LEED standards (Leadership in Energy and Environmental Design).

Benefits provided by KNX in this project

- Sophisticated sun protection systems
- Energy-efficient lighting control
- Support for the air conditioning
- Automation with individual possibilities for operation
- Convenient scene control
- Central monitoring, operation and optimisation
- Flexible system for changes and extensions

Technical refinements

- Automatic shading with option of manual operation
- Presence-dependent and daylight-dependent lighting control
- Constant lighting control
- Retrievable scenes for projection mode
- Automatic partition wall control
- Communication with campus management
- Interfaces to BMS and to AMX media control

Companies involved

Services Engineers, Electrical Engineers, KNX System Integrator:
Modern Times Technical Systems (MTTS),
www.mtts.com

Area of application:
University

Functions:

Lighting, Sun protection system, Heating, ventilation, air conditioning, Technical monitoring, Energy management, Audio / video, Visualisation, Interfaces

Scope

Number of KNX devices: 6550, ABB, Gira, Somfy etc.

Costs:

3,200,000 US dollars