Delhi International Airport with Efficient Lighting

KNX shows world class format at the new Terminal 3

At the new terminal of Delhi Airport, 100,000 light fittings and KNX provide an efficient lighting system.

With 27 million passengers a year, Indira Gandhi International Airport in New Delhi is the busiest airport in India. The airport handles about 100 domestic flights and is a destination for 70 airlines worldwide. As a gateway between agricultural land and the highly developed industrial region, it is of great commercial importance. As one of the fastest growing airports, Delhi Airport opened its new Terminal 3 in June this year. The 111,600 m² large building complex was designed especially with the Commonwealth Games in mind – an important international sports event taking place in October 2010. Visitors from all over the world will be welcomed in worldclass style at Terminal 3, which has a handling capacity of over 10,000 passengers per hour. This is supported by a lighting system with about 100,000 light fittings which ensures passengers' well-being and safety, and helps them to find their way. The control system is based on ABB I bus KNX technology and designed by Entelechy Systems. The hitherto largest KNX reference in Asia, with 11,000 components, has been selected for the International Award Asia.

Comfort lighting only in active zones

Where there is daytime and nighttime public circulation, such as in an airport building, the lighting must be switched on 24 hours a day. Nevertheless, there is scope for energy-conserving lighting management – brightness can be reduced, and automatic dimming and switching can follow patterns of demand; it is possible to make maximum use of daylight, and systems can be automated using timing and occupation programs.

The public areas were divided into zones in order to facilitate implementation. In the busy areas, lighting remains switched on continually at full brightness. In areas which are only frequented during certain hours, for example Arrivals and Departures, the lighting is controlled according to whether the zone is activated or deactivated. In deactivated zones, the light fittings are operated with a preset dimmed value of 10 percent whereas in activated zones, the lighting is on continually at 100 percent brightness. For example, in vacant sanitary facilities, presence sensors will reduce the lighting brightness from 100 to 50 percent, whereas full lighting levels are reactivated when someone enters. Likewise, lighting and HVAC in the offices and service rooms can be controlled by presence sensors to suit demand. This means that comfort and personal needs are fully catered for; certain lighting in deactivated zones can also be switched on manually. Operating and setting the lighting functions is possible from the workstation of the CMS management system.

Complex integration of building services

The Delhi Airport project represents an outstanding reference for KNX in India and Asia. The flexibility of the system, its connectivity with other standards and the option of combining decentralized functions to one central building management hub were decisive factors in its favor. This latter function is performed using IP routers, KNXnet/IP and Ethernet network. This allows central control of the lighting system and connection of error messaging via interfaces with the Building Management System. Presence sensor signals are evaluated by the Control Monitoring System of the heating, ventilation and air conditioning installation in order to establish the correct room temperatures. Alarm messages from the fire alarm system activate emergency lighting and the lighting on escape routes and, last but not least, the consumption data computed by KNX can be used for cost control purposes.

Benefits provided by KNX in this project

- KNX provides the ideal basis for energy-conserving lighting control systems.
- The communication between KNX and the Building Management System (BMS, Honeywell), the heating, ventilation and air conditioning system (HVAC, ETA), the fire alarm system (Fire CMS, Minimax), a Network Management System, the Energy Management System (Electrical CMS, ABB) and the integration of visualization software provide the basis for complex applications involving energy conservation, safety and comfort.

Technical refinements

- The capability of the KNX system is demonstrated by the fact that it can cope with 100,000 light fittings which are switched and dimmed, and by its perfect coordination of functions such as switching and dimming, lighting control, light sensors, brightness sensors, presence sensors, logic control components and central management with visualization.
- The creation of interfaces to six different Control Monitoring Systems with international standards.

Companies involved

Building owner:
Delhi International Airport Ltd (DIAL)
Architects and Electrical Engineers:
GMR, New Udhan Bhawan
HVAC contractor:
ETA, ETA Consortium, Delhi
Electrical contractor:
ABB, New Delhi

In public areas, KNX controls the lighting according to demand.