Commercial Lighting Control Case Study

Legoland

Günzburg, Germany

LEGO

LEGOLAND
DEUTSCHLAND

❖LUTRON®

In May 2002, the Lego Company opened the world's fourth Legoland theme park in Günzburg, Bavaria. The lighting for the park's shops, restaurants and pathways is controlled by seven Lutron® GRAFIK 5000™ systems. The processor panel of each system is linked to Lutron Floorplan software by fiber-optic cables and thus can be centrally controlled by a single server.

THE CHALLENGE › Develop a user-friendly lighting control system for the 33-acre Legoland site, with lighting of buildings and pathways controlled by a central server.

THE APPROACH › The first phase saw the GRAFIK 5000™ system installed in each of the seven themed areas that make up Legoland. For each area, a high-performance data bus links the GRAFIK 5000 systems with handheld programmers, dimming and switching panels, interfaces and the local wallstations, which are installed in each building.

In the second phase these seven GRAFIK 5000 systems were linked to Floorplan, a Lutron® control software for complex systems and applications. All the systems can be controlled by a central server over an Ethernet, allowing a clear overview of the status of zones, scenes and every single lighting source for the entire park at all times.

PROJECT REPORT › The Floorplan software allows the entire architectural and exterior lighting system for the 33-acre park to function as one "Super Area". All the lights in Legoland can be switched on and off at the touch of a button. It is just as simple to change individual scenes, timeclocks and wallstations, as it is to centrally reprogram scenes for each shop or pathway. In this way, attractive lighting effects can be created quickly and

easily even in the dreary autumn and winter months; for example, warm light when snow is falling, or a very bright light for gloomy or foggy weather.

The Ethernet was installed by laying fiber-optic cabling throughout the whole park. Lutron worked with building management contractor Pro Systems to draw up specifications for control systems software, and used these to produce user-friendly, on-screen menus. Once Lutron's application technicians had thoroughly tested the software, this was connected to the server in Legoland's Service and Administration

building, which is situated outside the park itself.

Legoland Deutschland is divided into seven themed areas, including the ultra-modern "Lego City", the hands-on "Imagination" zone, and the thrilling "Adventure Land."

Lighting designs for the numerous shops and restaurants were implemented using the GRAFIK 5000 lighting control system. Staff can use wallstations to manually dim or brighten a certain lighting scene at any time, without permanently changing the basic settings. The lighting can then be controlled and dimmed separately for each building, saving money along the way. The system also illuminates the pathways that take visitors around the park's 33 acres, and provides suitably festive lighting for the period leading up to Christmas.

Together with the architecture and light fittings, lighting is a key element in creating an appropriate ambience for each themed area. For example, in the souvenir shop in Castleland, low lighting levels are used to create a dungeon effect. Low-voltage spotlights mounted on electric rails provide the basic lighting and draw attention to the goods on display, from medieval garments to knight's swords. The low-level ambient lighting from dimmed bulbs mounted in lanterns gives the store a real feel of the Middle Ages.

In the Big Shop—at nearly 6,500 sq. ft, the biggest Lego store in the world— the light sources in the store and storefront windows are divided into several lighting areas, with
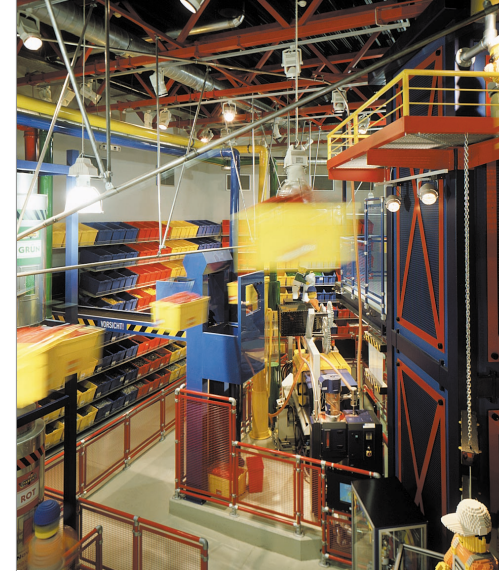
the brightness of the low-voltage, regular, fluorescent and energy-saving light bulbs adjusted to complement the interior and purpose of that particular area.

Lighting design also plays an important role in the Lego Mindstorms Centre, where children can join workshops to program robots and then send them into battle against their playmates' creations. The action has a dramatic beginning, as the workshop leaders dim the lights by remote control; this is to avoid confusing the light-sensitive robots and ensure everyone's full attention is directed towards the robot ring. Then the fanfare sounds and the battle of the Lego giants begins.

Exterior and path lighting is controlled by an astronomic timeclock. This uses the precise latitude and longitude of the park to calculate sunrise/sunset times, automatically switching to nighttime light settings at sunset and switching back again at daybreak. The device's programming also takes into account daylight saving time.

› Project Name:
Legoland
Günzburg, Germany

› Architects:
Forrec Ltd.,
Toronto, Ontario

› Lighting Designer:
Gallegos Lighting
Design, Northridge, CA

› Electrical Contractor:
ARGE Elektro
ABB & Cegelec,
Böblingen, Germany

› Project Development:
Pro Systems, Wolfegg

› Construction Period:
Phase 1: Sept. '99–May '02
Phase 2: Sept. '02–Dec. '02

› Opening:
May 17, 2002

› Lutron Products:
› GRX 5000/6000 hand
held programmer [1]
› GRX 5000 panels [7]
› LB6 keypads [25]
› LP dimming panels [15]
› XP switching panels [30]
› GP panels [3]

Light sensors mean that the lighting can be adjusted to allow for gloomy autumn and winter conditions as well as snow or fog.

In the Jungle X-Pedition log flume ride, the GRAFIK 5000™ System is linked to sound systems and special lighting effects. In the world of the "Torrential Waterfall", riders experience a perfect interactive display of sound, light and water effects. These scenes are activated in the middle of the mountain by a motion sensor: the light dims, the boat suddenly comes to a standstill, the music gets dramatically louder and a magnificent waterfall, illuminated by multicolored halogen spotlights, cascades down right in front of the bow of the boat. After a few seconds the drama is over, the initial fright overcome, and the boat continues on its way.

There are other benefits to lighting control systems. Dimming and switching technologies are highly energy-efficient, bringing both cost and environmental benefits. For example,
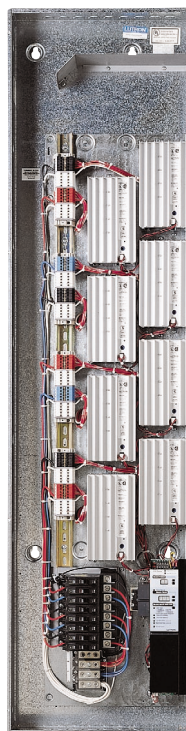

LP Panel

lighting in the restaurants and shops is dimmed by ten percent—a reduction in light that cannot be detected by the human eye, and yet reduces electricity consumption by ten percent. Moreover, reducing the voltage to the 6,000 bulbs also has the effect of doubling their lifetime, meaning the amount of maintenance work Legoland's technicians have to carry out is much less, because the bulbs have to be changed only half as often.
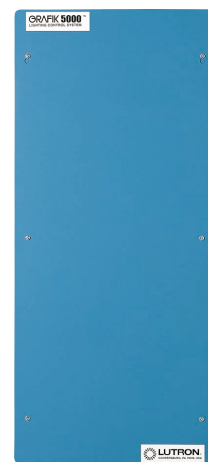
Grafik 5000
Processor Panel

GRAFIK Eye