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Optimum control for all areas –

Installation of a professional lighting control system at the comprehensive school in Blaubeuren

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The Blautopf School, which takes its name from the famous "blue pot" karst spring (limestone) in Blaubeuren, opened in time for the 2017/18 school year. Blaubeuren's new comprehensive school was built in a central position in the park between a swimming pool and a high school. The Braunschweig architecture practice, "Dohle+Lohse" won the contract for the well-arranged and simple new build, which has been carefully planned down to the smallest detail. The 400m² learning centre is the core element, allowing individual or group study using the latest media.

Building costs came in at almost 1 million euros below the budgeted 11.5 million euros, not always a given when it comes to public buildings. Part of the package was the flexible, powerful but economical DALISYS® lighting control system from B.E.G.

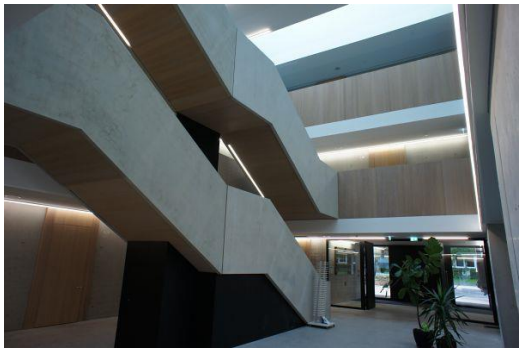
The quality of the Blaubeuren educational site was brought to the fore with this new build, and the highest architectural demands were met by the lighting installation. Needless to say, Herr Werner Scheck from the Conplaning design office planned dimmable DALI lighting in almost all areas. But it was only by the use of DALISYS® lighting control from B.E.G. that a high-performance, efficient lighting system could be achieved that met the students' needs. Collaboration with the building authorities, represented by Frau Barbara Blasi-Fiesel, and the electrical company Özbek proceeded without problems. All stakeholders were impressed by the commissioning of the DALISYS® system – as only then did the advantages of DALISYS® become apparent.

A solution for tricky situations

The central teaching unit of the school building is the "Lernbüro", or learning centre, at over 400m². Desks, chairs and shelving can be rearranged at will, and all students can use this learning centre individually. For the most part, students carry out their studies independently while the teachers stand by in a supporting role. "Chalk and talk" is no longer the order of the day. To emphasise the unity of the learning centre over and above the various individual and group work areas, the entire learning centre is controlled as one lighting group.

This resulted in a technical problem, in that over 64 lights had to be controlled. But the DALI standard allows no more than 64 lights on one line. This was a deciding factor for DALISYS®, since DALISYS® provides a quick remedy for this problem. The DALISYS® lighting control system from B.E.G. is scalable – everything is possible, from fitting out single rooms to lighting control for a complete building complex. The components are addressable and work on the principle of distributed intelligence, which means a high level of operational reliability can be achieved. The flexible configuration allows two lines to be simply connected together and controlled as one large group. This has enabled the light to be regulated to the required level only in areas where there are students, while in the remaining parts of the learning centre, the light is dimmed to orientation lighting levels.

Corridors to catch the eye



Normally, school buildings rely on long corridors to classrooms. This is not the case in Blaubeuren's comprehensive school: the learning groups are in an outer ring, and the corridors run along a inner rectangle to reach two atriums and a toilet area: everything can be reached quickly. In the breaks between lessons, corridors are full of people for short periods, but during lessons they are deserted – so here, the lighting has to be switched on only as required.

This is the showcase application for the DALISYS® system's "Guided Light" function. Conventional occupancy detectors generally switch or dim the entire corridor or staircase to the light level set. But with "Guided Light", the respective section and the adjacent sections can be regulated to full brightness. More distant sections remain dimmed to orientation light levels.

"Guided Light" leads people through the building in a "pool of light" – combining optimum energy efficiency with maximum convenience. And with DALISYS®, the whole system works not just on one level, but also vertically in the entire atrium on different floors. DALISYS® can be distributed over several routers, connecting the light across subdivisions.

Learning under uniform lighting conditions

An essential requirement is the uniform illumination of the learning groups. Since these modern spaces have no fixed location for the blackboard, the decision was made to illuminate the space without separate blackboard lighting. The B.E.G. LUXOMAT® PD4-M-DALI detectors are uncomplicated control devices which switch on the lights when occupancy is detected and dim them to the required lux level according to how much daylight is falling. Naturally, the lighting arrangement can be overridden at any time by push buttons (e.g. for films), so that teachers and students still have control over the space.

Since light measurement takes place at the ceiling, but 300 lux must be maintained at the workstation, the LUXOMAT® detectors have both sophisticated regulation algorithms and an external light sensor, which minimises the disruptive effect of reflections from the window side. Hence the desired lighting level is guaranteed no matter how the space is being used.

Connecting to other systems

An important component of every public building is safety lighting. At many points along the corridors of the Blautopf School, there are rows of lights. Some of the lights in these rows are installed as emergency lights, which are connected to a central battery and a separate DALI line. How could these emergency lights also be controlled as part of the intelligent lighting system?

Here too, the B.E.G. experts found a solution. Each SIBELON CPS central battery system was connected via a DALISYS® router to a separate DALI bus. Using "event routing", the DALI dimming value from the normal lights is transmitted to the emergency lights via the router and the central battery. Normal lights and safety lights are therefore in sync and the architect's vision is shown to its full advantage. In an emergency, only the safety lights are illuminated, fed by the emergency power supplies.

Three DALISYS® binary inputs provide a simple connection to the caretaker's Building Management System (BMS). For example, through the caretaker's PC, scenes from an external BMS via the potential-free input can be activated in B.E.G. DALISYS®. There is no need for expensive and elaborate interface programming.

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Captions:

1) Exterior view of Blautopf School, a comprehensive school in Blaubeuren, Baden-Württemberg, Germany
2) View of the Blautopf School's learning centre
3) Not just an architectural highlight – the atrium provides light for each part of the building.