

Lighting Control System

Base Building Application Guide

Overview

Base Building refers to the core areas of a multi-tenanted commercial building. These core areas directly serve and affect all tenants. Core areas include lift lobbies, common amenities such as toilets, service corridors, stores, plant rooms and carparks.

Base Building infrastructure and services are typically designed and constructed by commercial developers, leaving choice and responsibility for the remainder of the building to the future tenants during the fit-out phase.

Lighting has been estimated to account for about one third of electricity use in a commercial building, although energy savings have been realised in recent years, through the installation of more efficient light sources and luminaires.

Including a Base Building control strategy can be a way to demonstrate to future tenants the requirement and commitment for a level of energy efficiency within the building. The design of the control strategy needs to be simplistic, flexible and functional to achieve current and future building service requirements.

The investment in creating an energy efficient and sustainable control solution is still of paramount importance to all commercial building stakeholders in further reducing a buildings energy consumption.

System Outline & Features

Base Building

- ❖ Headend PC Supervisory Control
- ❖ Dimmable fittings
- ❖ Time scheduled events
- ❖ Occupancy detectors
- ❖ High level building management integration

Lighting Control Strategies

❖ **General lighting dimming**

Dimmer modules are available to control loads such as LED, Fluorescent, Low Voltage down lights and Compact Fluorescent Light fittings. Having the ability to dim lights not only provides a more suitable working environment, it provides for energy efficiency gains.

❖ **Headend PC Supervisory Control**

A Supervisory control PC installed in an easy to access area for maintenance purposes or connected to a services building LAN, enables the user to control the entire lighting control system from one point. This PC can provide a graphical interface to the control system allowing for switched zones and loads to be easily labelled, along with a real time clock option for automatic scheduling of events. The software also allows the setup of password protection to restrict user access.

❖ **Occupancy detection**

Presence Detection control philosophy describes when motion detectors are used as the primarily lighting control device within a space and switch lighting ON/OFF based on detection of movement. Occupancy detectors can be configured to timeout lighting to a minimum level before switching OFF. Timeout can be set between 1 minute and 4 hours after motion is no longer detected.

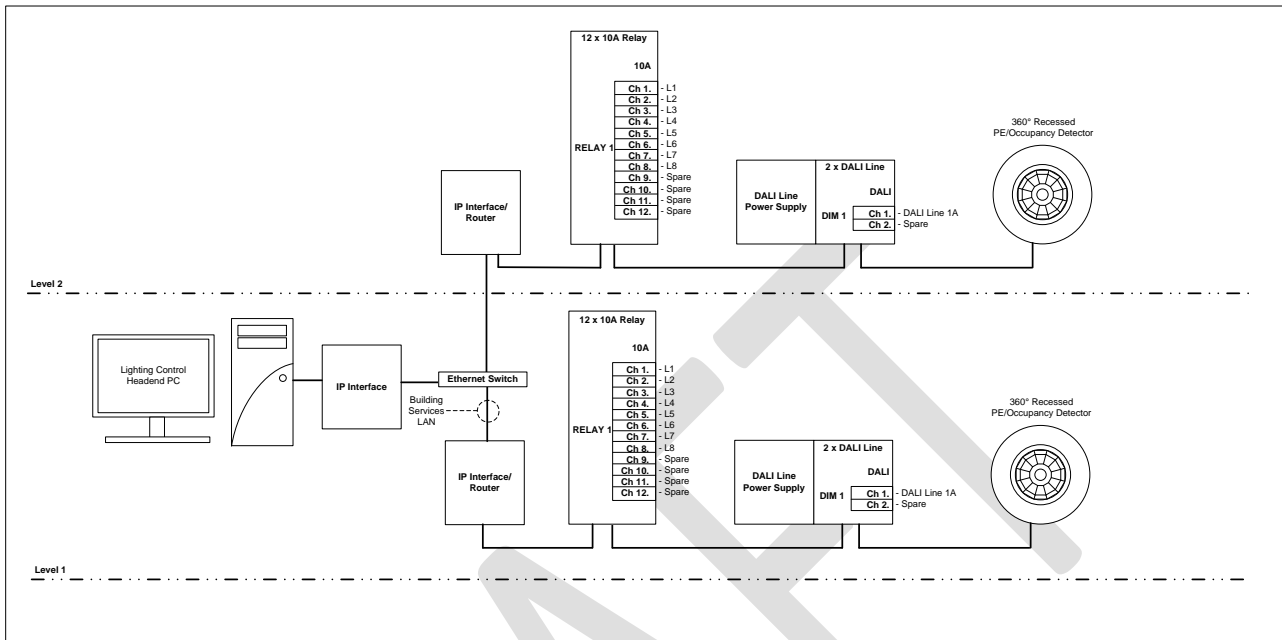
❖ **Lift Lobby Zone Latching**

This control philosophy is based on the first movement detected and requires correct positioning of motion detectors to detect movement when entering or exiting lift lobbies, removing the need of automatic scheduling each morning. This can have energy efficiency gains as occupant working times can often be staggered. Using this control philosophy, lighting is only switched on as occupants enter the building rather than a set time via an automatic time schedule. When an entry motion detector is activated during nominated work hours, the lift lobby area or corridor is switched on and motion detectors are then disabled. Motion detectors are re-enabled at a nominated after hour time, allowing for normal presence detection throughout the evening.

❖ **Time Schedules**

Devices such as touch screens or lighting control software configured on a PC include real time astronomical clocks for automatic scheduling of events. Schedules can be based on the time of day, week, month or year, sunrise, sunset and daylight savings. A Schedule may include an after hour "all lighting off" function or control of external lighting. Time Schedules can be modified easily by a user at a device. To prevent unauthorised access, devices can be configured with password restrictions.

Typical Lighting Control Single Line Diagram



NOTES

- If LED lighting is not DALI dimmable then other common methods of control can be used including 240V Leading Edge/Trailing Edge/0-10v provided that the LED controller type is compatible.
- A TCP/IP Interface can also be used for third part integration Third Party Integration

Third Party Integration

- ❖ **DALI** light fittings are almost a standard inclusion to any modern energy conscious office design. Lighting control DALI gateways enable the mapping of control system messages to DALI groups allowing for lighting control devices to control DALI light fittings. The maximum number of DALI devices per DALI line is 64. Best practice is to design with a maximum of 55 DALI devices per DALI line to allow for future light fitting additions.
- ❖ **Building Management Systems (BMS)** can be integrated to the lighting control system at either a low level using simple contact closures to communicate a state change, or via high level using industry standard protocols such as BACnet, OPC, LON and Modbus. This integration allows for further energy efficiency gains when integrating to the buildings mechanical services such as air-conditioning.
- ❖ **Security** systems are commonly interfaced to a control system enabling security events such as armed, disarmed and alarm to trigger lighting events. An event can be when the alarm is triggered activating an All ON lighting scene to provide the security cameras a clearer view of the area.

Typical C-Bus Equipment

Part Number	Description	Datasheet Link
5502DAL	C-Bus DALI Gateway	View
DCDALCIP250-2	DALI Dual Power Supply	View
L5512RVF	C-Bus 12 Ch Relay	View
5753L	C-Bus 360° PE/Motion Detector	View
5500PACA	C-Bus Pascal Automation Controller	View
5500CN	C-Bus Network Interface (TCP/IP)	View
MPM-NW-000-5045	C-Bus BACnet Gateway	View

Typical KNX Equipment

Part Number	Description	Datasheet Link
DG/S 1.16.1	KNX DALI Gateway, 1-fold, Group Control	View
SA/S 12.10.2.1	KNX Switch Actuator, 12-fold, 10A	View
6131/20-24-500	KNX 360° Occupancy Detector mini	View
ABL/S 2.1	KNX Application Unit, Logic	View
IPR/S 2.1	KNX IP Router	View
ZN1RX-SKXOPEN	KNX RS232 Interface	View
IBOX-BAC-KNX-100	KNX BACnet Interface 100 points	View