

DALIcontrol Application Note

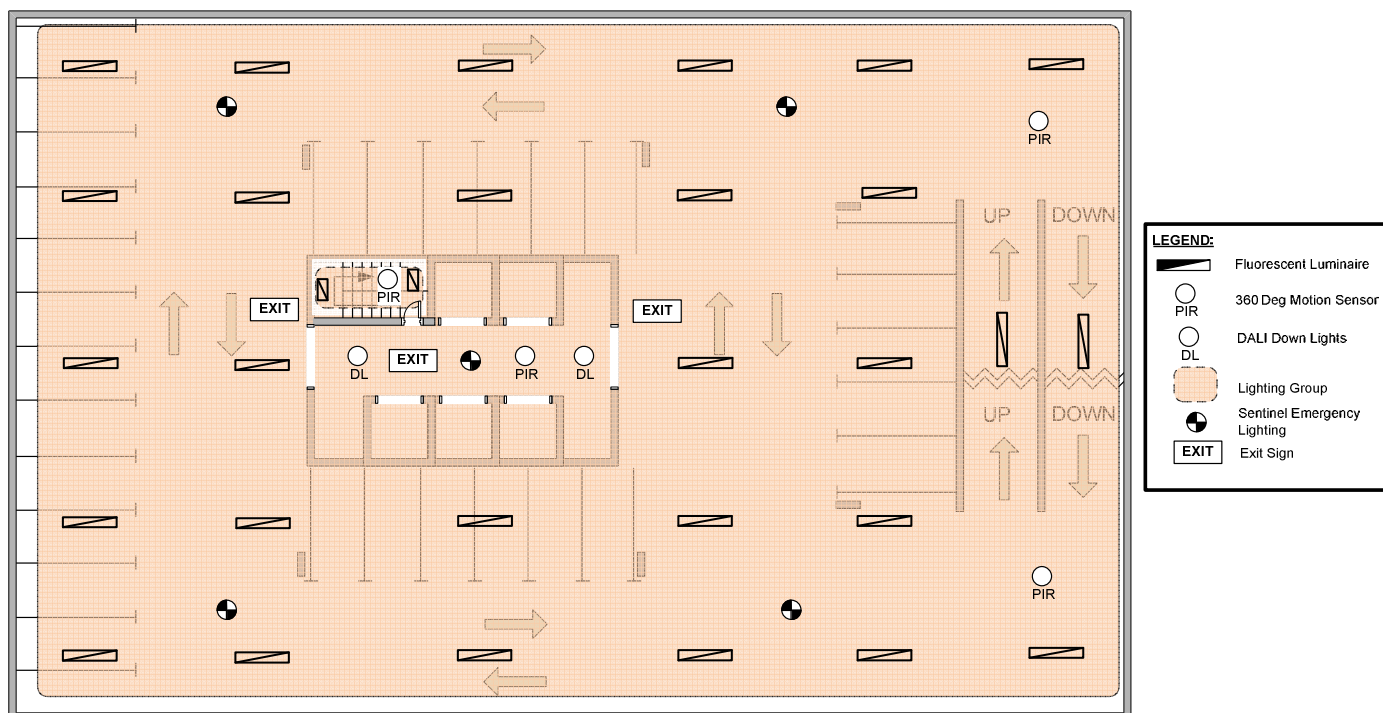
Multi Level Car Park

Overview

Multi level car parks are becoming a more popular solution as the congestion associated with car transportation and their parking becomes an issue in major metropolitan cities. Lighting plays a big role in ensuring the space is well lit and safe. Lighting control technologies fitted into a car park allows for more energy efficient control of lighting by only illuminating sections that are occupied rather than the entire car park complex all the time.

Devices commonly seen in today's multi level car parks include dimmable lighting and emergency lighting. A well planned and designed control system will also cater for a centralised point of control at the same time allowing for flexibility of layout changes in the future.

Example Area Layout & Features



Features:

- DALI Fluorescent Luminaire
- DALI Down Lights
- 360deg Motion Sensors
- DALI Emergency Exit Signs
- DALI Emergency Sentinel Lighting

Control Strategy – Multi Level Car Park

- **Front End Control (optional)**

A front end computer located in the communications room and connected to the buildings DALIcontrol system allows the building manager to have a centralised control of the DALI lights. Lamps status, fault reports and emergency lamp tests can be initiated via this front end computer.

- **Normal and After Hours**

To optimise the energy efficiency within the multi level car park, motion sensors can be fitted at entry and exit points, access ramps, lift lobbies, pay stations and stairwells to illuminate the space when presence is detected. These devices can provide different functionalities during normal and after-hours operation.

- **Occupancy Control**

All car park lighting on a particular level can be switched ON by the lift lobby motion sensor with the arrival of the first person and an override sequence is activated.

- If an area is left unoccupied and no movement is detected for a set period of time, lighting will be automatically set to a warning level (minimum level) before switching OFF after a preset period (Refer Device Functionality Table for details).

A motion sensor located at an access ramp leading to the level above or below when triggered will switch ON all the lights on the level the motion sensor is located and also the lights the level above or below. This is so that when a car is moving upwards, the lights on the level above will be enabled just before the car reaches the next level. After the lights are brought ON by these motion sensors, an override sequence will be activated.

- If an area is left unoccupied and no movement is detected for a set period of time, lighting will be automatically set to a warning level (minimum level) before switching OFF after a preset period (Refer Device Functionality Table for details).

Lighting within a stairwell is best to be fitted on a separate DALI line running vertically along the stairwell. When any of the motion sensors within the stairwell is triggered, it will turn ON all lights for the stairwell at the same time enabling an override sequence.

- If no movement is detected by any of the motion sensors within the stairwell for a set period of time, lighting will be automatically set to a warning level (minimum level) before switching OFF after a preset period (Refer Device Functionality Table for details).

- **Sequences**

To ensure any occupant is never plunged into immediate darkness, sequences are used to gradually reduce the amount of light before switching OFF. Lights are restored by a triggering of motion sensors.

- **Dimming of General Lighting**

Having the ability to dim lights not only prevents the car park from plunging into darkness, it also provides greater energy efficiency. DALI light fittings have logarithmic dimming curve that suits the human eye, to further conserve energy and increase the lifespan of lamps, DALI ballasts can be set to a maximum of 85% without much compensation to the ambient lux.

Control Strategy – Multi Level Car Park

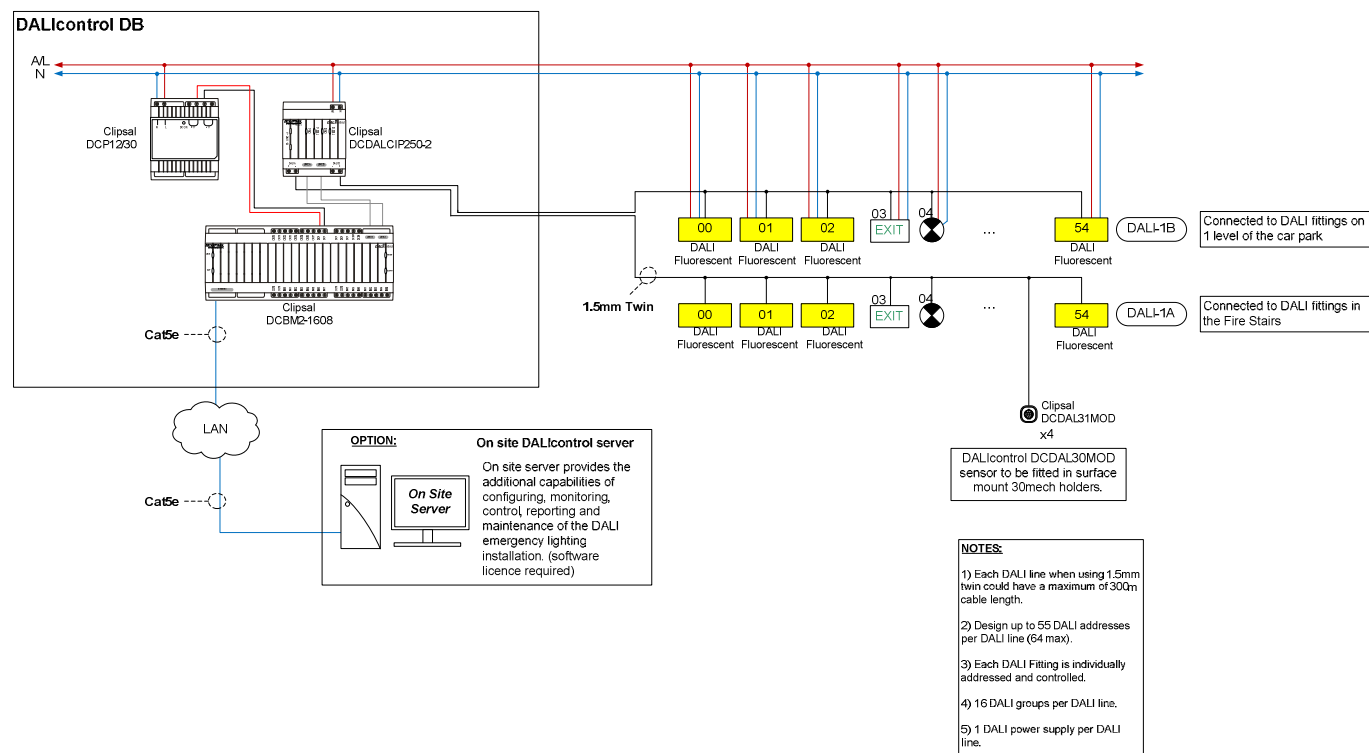
- Emergency Lighting

All emergency and exit lights in the building are required to comply with the DALI Emergency Lighting Standard and should be incorporated into the DALIcontrol system. This alleviates the need to wire an additional system to monitor and maintain emergency lighting. DALIcontrol software can be used to report on the status of all fittings including emergency lights.

Device Functionality Table

Devices	Normal Hours Operation	After Hours Operation
Motion Sensors (Lift Lobby)	- MAX if unoccupied (delay 20min >> MIN >> delay 5 min >> OFF)	- MAX if unoccupied (delay 20min >> MIN >> delay 5 min >> OFF)
Motion Sensors (Car Ramp to Level Above)	- MAX if unoccupied with override sequence (delay 20min >> MIN >> delay 5 min >> OFF) <i>* For both the current level and the level above</i>	- MAX if unoccupied with override sequence (delay 20min >> MIN >> delay 5 min >> OFF) <i>* For both the current level and the level above</i>
Motion Sensors (Car Ramp to Level Below)	- MAX if unoccupied with override sequence (delay 20min >> MIN >> delay 5 min >> OFF) <i>* For both the current level and the level below</i>	- MAX if unoccupied with override sequence (delay 20min >> MIN >> delay 5 min >> OFF) <i>* For both the current level and the level below</i>
Motion Sensors (Stairwell)	- MAX if unoccupied (delay 20min >> MIN >> delay 5 min >> OFF)	- MAX if unoccupied (delay 20min >> MIN >> delay 5 min >> OFF)

Multi Level Car Park Single Line Diagram



*Note: DCBM2-1608 shown above allows for the control of 2 DALI lines with up to 128 DALI fittings. If only 1 DALI line (max 64 fittings) needs to be controlled, the DCBM1-1608 (Single line DALIcontrol line controller) can be used.

*Note: A UDP Interface can be used for third party integration with the DALIcontrol line controller.

Typical Equipment

Part Number	Description	Quantity
DCBM2-1608	DCBM DALI Line Controller, 16-Input, 8-Output, 2 DALI Lines, Din Rail Mount	1
DCP12/60	BM Power Supply, Din Rail Mount, 12V, 60W	1
DCDALCIP250	DALIcontrol Intelligent Dual Power Supply and Dual Serial Interface	1
DCDAL30MOD	DALIcontrol 30 Mechanism Sensor, 360Deg	4
EXITREC	Exit / Emergency Lighting, Wafer Recessed Edgelite Exit - Suits Single or Double sided applications.	3
EMG DALI	Exit / Emergency Lighting, Sentinel Emergency	5

Third Party Integration

- **PUSH Control by Schneider Electric and 3rd Party AV equipment** can communicate with DALIcontrol line controller using UDP. This connection will allow the third party AV equipment to control DALI fittings at a high level.
- **Building Management Systems (BMS)** can be integrated to the DALIcontrol system by;
 - low level contact closures to communicate a state change
 - or a high level interface using DALIcontrol OPC Server software
- **UDP** is a standard Ethernet protocol which can issue commands to the DALIcontrol line Controller (DCBMx-1608) and Tunnel Monitor Controller.
- **Infrared** integration can be achieved using 3rd party DALI IR controllers.

DCBM2-1608 Line Controller Input and Output Channel Schedule

DCBM2-1608	Channel Number	Description	Normal Hour Profile	After Hour Profile
INPUT	1	Spare	-	-
	2	Spare	-	-
	3	Spare	-	-
	4	Spare	-	-
	5	Spare	-	-
	6	Spare	-	-
	7	Spare	-	-
	8	Spare	-	-
	9	Spare	-	-
	10	Spare	-	-
	11	Spare	-	-
	12	Spare	-	-
	13	Spare	-	-
	14	Spare	-	-
	15	Spare	-	-
	16	Spare	-	-
OUTPUT	1	Spare	-	-
	2	Spare	-	-
	3	Spare	-	-
	4	Spare	-	-
	5	Spare	-	-
	6	Spare	-	-

	7	Spare	-	-
	8	Spare	-	-

Resource Links

For information including Product Datasheets, Installation Instructions and Downloads visit

<http://www.clipsal.com/dalicontrol>

It is recommended that a Clipsal DALIcontrol System Partner be engaged on projects involving integration for design, programming and commissioning.

Clipsal DALIcontrol System Partner have undertaken specialist training so they are equipped to provide the technical services and support to help you successfully implement a DALIcontrol lighting system.

In addition, Clipsal DALIcontrol System Partner will provide professional detailed documentation and specifications for projects including handover training to the client.

Engaging a Clipsal DALIcontrol System Partner provides key benefits to the contractor, consultant and the end user including the manufacturers support from project design through to completion. A Clipsal DALIcontrol System Partner will also be able to educate the Building manager on how to run reports on the fittings for an installation.

A major advantage of the DALIcontrol system is the ease of installation and commissioning. The five-pin 'soft-wiring' system reduced labour costs and the distributed architecture enabled sections to be tested and commissioned ready for the tenant as each area is installed.

For further information:

Clipsal DALIcontrol M3 Soft Wiring Solutions:

www.clipsal.com/cablemanagement

DALIcontrol:

www.clipsal.com/dalicontrol

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