

DALIcontrol Application Note

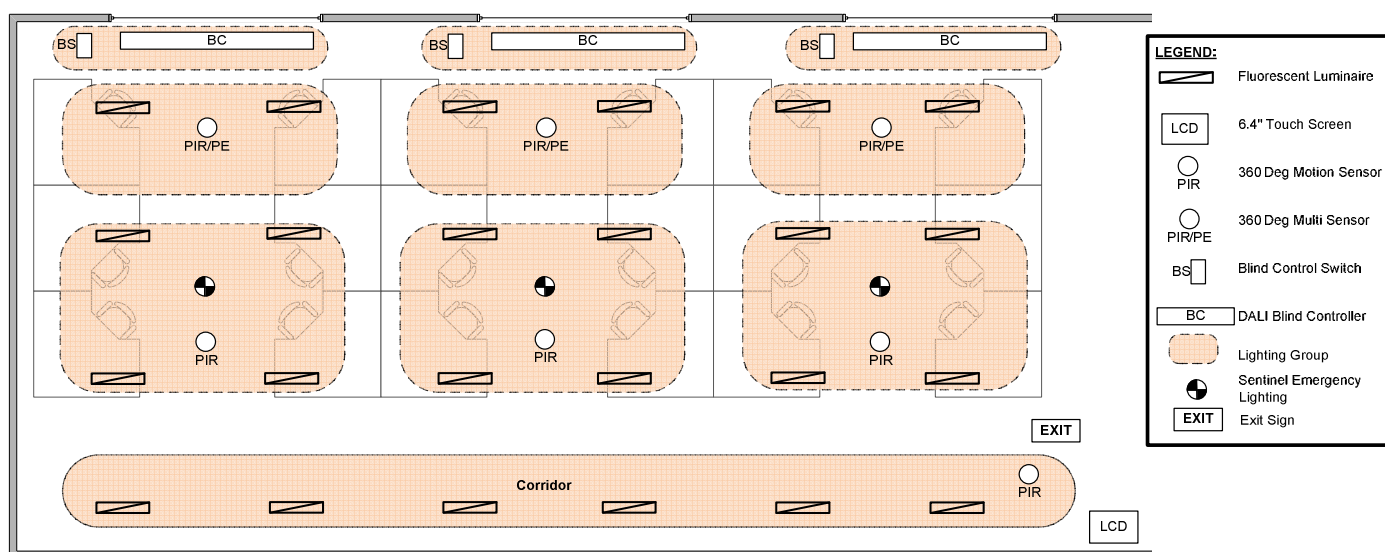
Open Plan Office

Overview

Lighting control plays a vital role in today's operation of modern office environment. It ensures that the visual needs of the occupants are met with the appropriate control of lighting equipment, while at the same time conserving energy. Illumination levels can be maintained dynamically throughout the day, to comply with both the relevant lighting and energy codes and to optimise the performance of the occupants. Furthermore higher energy savings can be achieved after-hours, without compensating the needs of maintenance and security staff including late night workers. Having all lighting on throughout the day and for half the night is no longer socially or financially acceptable.

Devices commonly seen in today's open plan offices and corridor areas include dimmable lighting, motorised blinds and emergency lighting. A well planned and designed control system can integrate all these equipment into one 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 Blind Controllers (by others)
- 360deg Motion Sensor
- 360deg Multi Sensor
- 6.4" Colour Touch Screen
- DALI Emergency Exit Signs
- DALI Emergency Sentinel Lighting
- A/C After Hours ON/OFF control
- Blind Control Switch (optional)

Control Strategy – Open Plan Office

- **Zone Control**

A 6.4" colour touch screen conveniently located near the front end of the corridor leading to the open plan office allows for the switching ON and OFF of lighting groups at workstations.

- **Business and After Hours**

Luminaires above workstations can be controlled with motion sensors, multi sensors or a 6.4" colour touch screen. These devices provide different functionalities for business-hours and after-hours operation. The DALIcontrol line controller determines the time of day with its onboard real time clock and applies the appropriate input profile. During business-hours, the control buttons on the touch screen perform as an ON or OFF switch to the lighting groups. After hours these buttons switch ON and OFF with an override sequence that ensures lights are never left ON.

- **Occupancy Control and Daylight Harvesting**

During business-hours, the corridor lights and associated work station lights can be switched ON by motion sensors with the arrival of the first person. The window row lights can then be adjusted automatically by light level sensors over the business-hours. Light level sensors can be disabled after-hours. During this time, motion sensors detect when an area is unoccupied and an override sequence is activated.

Switching lighting ON by the motion sensor during business-hours will enable the light level sensor. Light level sensor will continue to operate until after-hours is scheduled or when the lighting group is manually set to OFF from the touch screen.

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

The use of the DALIcontrol 30mech light level sensor or motion sensor allows the sensor to be installed into the light fitting resulting in savings on installation time and enhancing the architectural aesthetics.

- **Sequences**

To ensure a person 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 or touch screen.

- **Corridor Linking**

Corridor linking can also be configured into the line controller to keep corridor lighting ON when the workstations are occupied anytime of the day. Once the workstations are unoccupied, the corridor lighting automatically switches OFF according to the associated sequence (Refer Device Functionality Table for details).

Control Strategy – Open Plan Office

- **Security Input (optional)**

Corridor lights to be connected to the security system. When the security system is disarmed, the corridor lights can come ON and can be sequenced to switch OFF when the security system is armed (delay 1 minute set to MINIMUM, delay further 1 minute set to OFF).

- **Dimming of General Lighting**

Having the ability to dim lights greater energy efficiency and a more suitable working environment as 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 dim to a maximum dim level of 85% without much compensation to the ambient lux. The use of DALIcontrol 30mech rotary knob or up/down button can provide the user with a more intuitive dimming control.

- **Air Conditioning**

A high level interface to the BMS can be used (i.e BACnet, OPC) to integrate with the buildings A/C system. An input on the touch screen can be configured as a timer to provide manual after-hour control of the A/C to provide energy efficiency gains.

- **Blind Control (optional)**

Third party DALI blind controller can be controlled from DALIcontrol switches. Blinds help reduce the thermal heating of the room.

- **Emergency Lighting**

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

Device Functionality Table

| Devices | Business Hours Operation | After Hours Operation |
|------------------------------|--|---|
| Motion Sensors (Workstation) | - MAX if unoccupied | - MAX if unoccupied with override sequence (delay 20min >> MIN >> delay 5min >> OFF) |
| Motion Sensors (Corridor) | - MAX if unoccupied | - MAX if unoccupied with override sequence (delay 15min >> MIN >> delay 5min >> OFF) - Corridor linking when any workstation is occupied (MAX >> delay 15min >> OFF) |
| Light Level Sensor | - When light group near window is ON, enable daylight harvesting. | - Disabled |
| 6.4" Colour Touch Screen | - ON and OFF lighting groups above workstations. | - ON and OFF lighting groups above workstations. - Allow time extension to A/C (ON >> delay 30min >> OFF) |
| Blind Control Switches | - Dimmer function to control blinds (function may change depending on required command for blind controller) | - Dimmer function to control blinds (function may change depending on required command for blind controller) |

Example 6.4” Colour Touch Screen Function and Labelling



6.4” Colour Touch Screen

Page 1 Functions

Button 1: Workstation NW ON/OFF

Button 2: Workstation SW ON/OFF

Button 3: Workstation Mid N ON/OFF

Button 4: Workstation Mid N ON/OFF

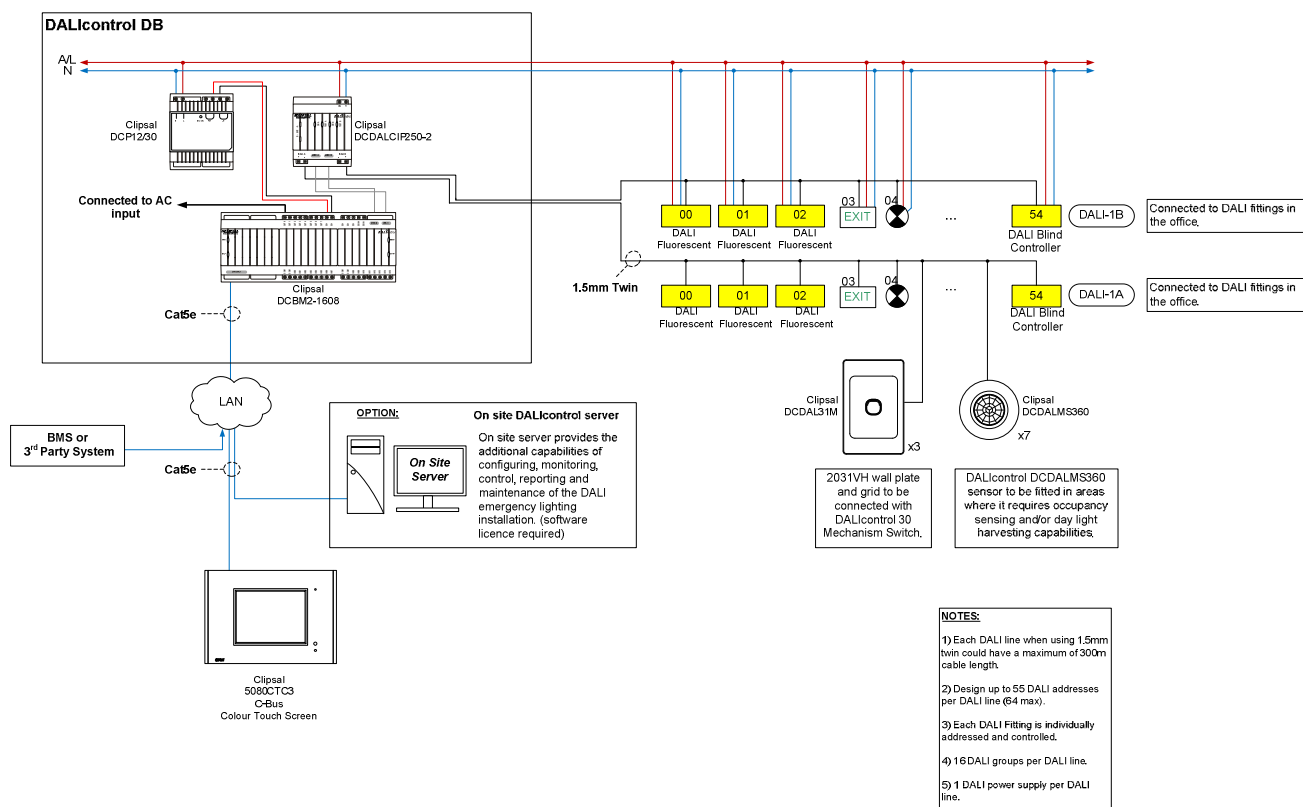
Button 5: Workstation NE ON/OFF

Button 6: Workstation SE ON/OFF

Button 7: AC Extend ON

*Note: Screen layouts, labelling and functionality are fully customisable to suit each project and client

Open Plan Office 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.

*Note: DCDALMS360 DALIcontrol sensor shown above is a recessed mount unit. Alternatively, a DCDAL31MOD DALIcontrol sensor fitted in surface mount 30mech holders could be used for surface mount applications.

*Note: DCDALM31M DALIcontrol switch mechanism shown above could be added with 30mech rotary knob or up/down button to provide the user with a more intuitive dimming control.

Typical Equipment

| Part Number | Description | Quantity |
|---------------|--|----------|
| DCBM2-1608 | DCBM DALI Line Controller, 16-Input, 8-Output, 2 DALI Lines, Din Rail Mount | 1 |
| DCP12/30 | BM Power Supply, Din Rail Mount, 12V, 30W | 1 |
| DCDALCIP250-2 | DALIcontrol Intelligent Dual Power Supply and Dual Serial Interface | 1 |
| DCDALMS360 | DALIcontrol Digital Motion Detector, 360Deg. | 7 |
| 5080CTC3 | 6.4" Colour Touch Screen | 1 |
| EXITREC | Exit / Emergency Lighting, Wafer Recessed Edgelite Exit - Suits Single or Double sided applications. | 1 |
| EMG DALI | Exit / Emergency Lighting, Sentinel Emergency | 2 |
| | | |
| (OPTIONAL) | | |
| DCDAL31M | DALIcontrol 30 Mechanism Switch | 3 |
| 2031VH | Clipsal 2000 Series, Flush Surrounds and 1 Gang Grids | 3 |
| DCDAL31MOD | DALIcontrol 30 Mechanism Sensor, 360Deg | 7 |
| DCDAL31MPE | DALIcontrol 30 Mechanism Light Level Sensor | 1 |
| DCDAL31SROKUD | DALIcontrol 30 Mechanism Rocker Up/Down Switch (Slave) | 3 |
| DCDAL31SPBUD | DALIcontrol 30 Mechanism Push Button Up/Down Switch (Slave) | 3 |
| DCDAL31SROT | DALIcontrol 30 Mechanism Rotary Knob (Slave) | 3 |
| | | |

*Note: The number of DALIcontrol 30 Mechanism Switch (DCDAL31M) may vary depending on the commands required by DALI Blind Controller (by others).

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 | Business Hour Profile | After Hour Profile |
|------------|----------------|---------------------|-----------------------|--------------------|
| INPUT | 1 | Security (optional) | MAX | Override sequence |
| | 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 | A/C After Hours Control | Disabled | Timer |
| | 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, the 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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