

This application guide contains information on:

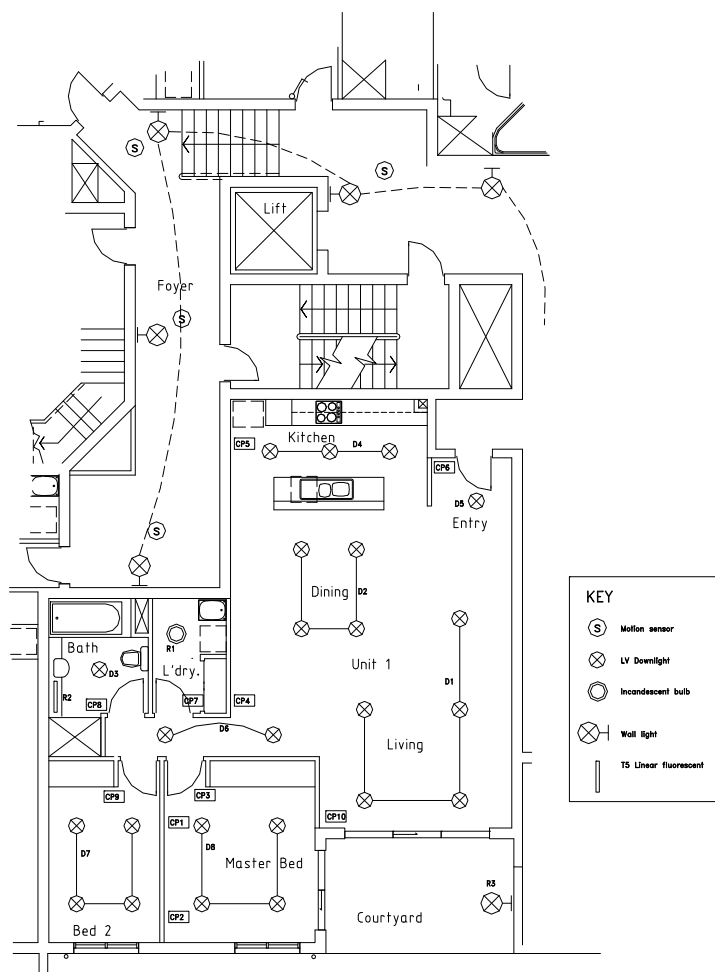
- Designing a lighting control system for a residence within a multi-dwelling environment •
- Basic lighting control functionality •
- Integration with access control •
- Considerations for common area lighting •

From an aesthetic and lifestyle perspective, lighting control allows the homeowner to present their residence in the best possible light, to create a feeling to suit any occasion; from intimate late-night dining to celebratory drinks with friends, to quietly reading a book on a rainy Sunday afternoon – no two moods are the same.

On a practical & environmental level, one of the major features of a lighting control system in a simple residential application is that lights can be dimmed to near full brightness (95% rather than 100%) without any discernable difference to the human eye. The immediate benefit is a significant saving, as that lamp life is extended and energy reduced.

This document describes basic lighting control system design for an apartment in a multi-dwelling development. It also incorporates general notes on integration with a keyless access system and lighting in the common areas of the building. For further information on Home Automation, or to learn more about integration with other services in a residential environment, see Dynalite Application Design Guide – The Luxury Home.

## typical layout



## system outline

All of the main areas of the apartment; living, dining, master bed and bathroom, have dimmed lighting circuits. Light fitting numbers are kept low (around 5-6 low-voltage downlights per group), as smaller groups allow for more effective and efficient lighting design and control (i.e. D1, D2 etc).

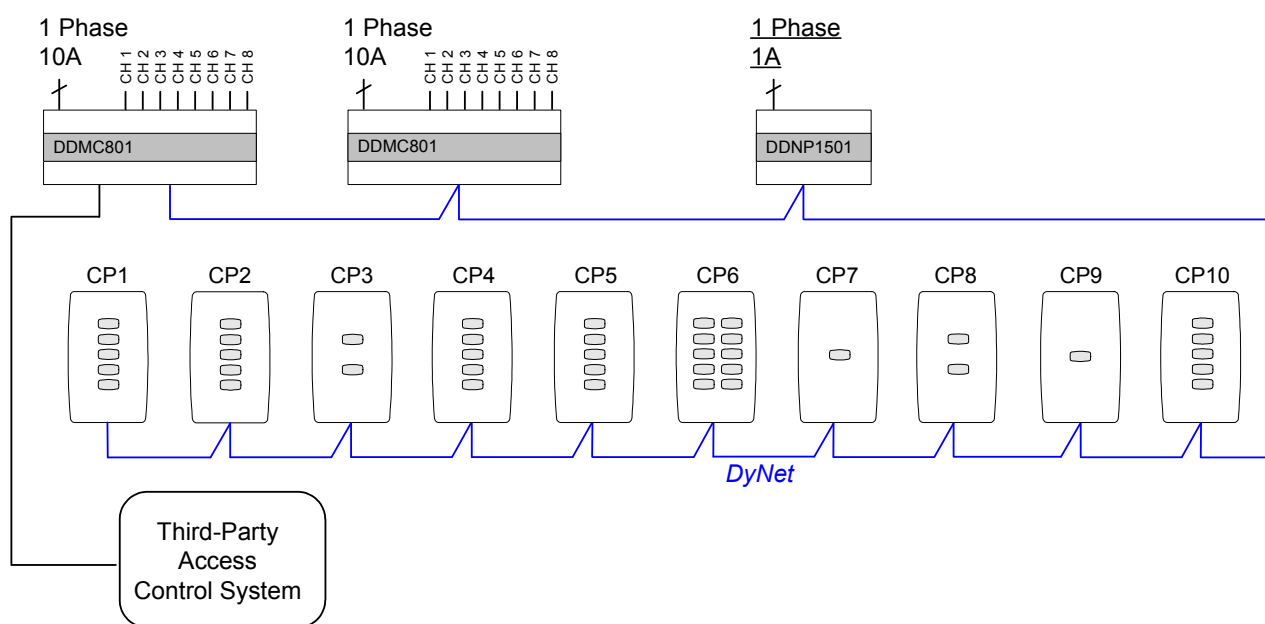
In addition to dimming incandescent fittings in the main living areas, on/off switched lighting control is applied in utility areas such as the laundry (i.e. R1). The bathroom exhaust fan shares a circuit with a linear fluorescent fitting, ensuring it does not remain on when lighting has been turned off and the bathroom unoccupied.

A basic design with small lighting loads is particularly well suited to the use of the economical Dynalite DIN series controllers, which occupy a smaller footprint than traditional wall-mounted dimmers. This series of dimmers is designed for installation into a switchboard, next to the circuit breaker that is supplying power to the controlled lighting circuit.

Lighting control panels are positioned throughout the apartment, providing multiple control points. Each can be fitted with an infra-red receiver, which allows the use of remote controls to activate any of the stored presets, removing the need for physical contact with the panel.

Hallway lighting in common areas outside the apartment is being controlled via motion sensors located adjacent to the elevator and fire exit on each level of the building. The access control system is interfaced to both the common area lighting and the individual apartment lighting control system, meaning local apartment settings can be altered even before the occupant reaches the front door. Simply accessing the building's elevator, or even the main entry of the apartment complex can trigger an event within the apartment itself.

## the equipment



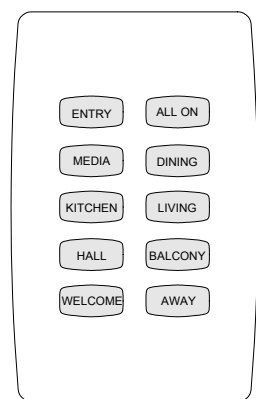
## the system in operation

### Control Panels

Lighting control panels located around the apartment generally provide local control of lighting groups in the immediate area. Buttons can be programmed to execute 'one-touch press and hold' light level control or toggle functionality, from 'ON' to 'OFF' at a nominated fade rate.

The building's access control system is connected to the lighting control system in the apartment via the auxiliary (AUX) input in one of the load controllers. It places the apartment into a 'WELCOME' setting when activated which, at it's most basic level, would typically trigger appropriate lighting levels required to enter the apartment safely and to create an inviting environment; setting entry, kitchen & dining levels to 70% and master bedroom & living to 80%, for example.

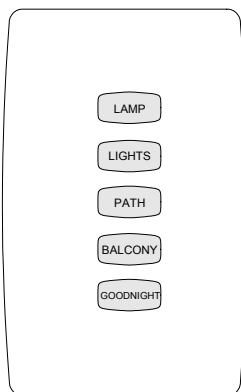
The 'WELCOME' setting can also be initiated manually from the lighting control panel situated at the front door (CP6, right). This panel typically performs control functions for immediate areas and features custom engraving detail to clearly identify each button function. In addition to the 'Welcome' setting, some examples of illustrated functionality on CP6;



**CP6**

**ALL ON** All lights in the area come on to full, providing total illumination when required, including in times of duress or emergency.

**AWAY** All lights are dimmed to 'off' over 10 minutes. Subsequently, a random sequence of varying light levels is activated in the living areas of the house, giving the illusion of occupancy & providing a preventative security measure when the house is unoccupied.



**CP1-CP2**

Lighting control panels CP1 and CP2 (*left*) are located bedside in the master bedroom and provide the user with global control functions. For instance, the 'GOODNIGHT' preset could turn off all house lights over a period of one or two minutes, ensuring that no lights are left on overnight, while giving other members of the house time to get to bed before lights reach 0%. The 'PATH' preset illuminates a pathway from bedroom to bathroom that varies depending on the time of day. For example, when this preset is used between 10pm and 6am, ceiling lights in the bathroom turn on to 40%, ensuring that a late-night visit to the bathroom does not disrupt sleeping members of the household. At all other times both ceiling and vanity lights are turned on to 90% and 100% respectively, providing near-full illuminance for clear visibility.

Lighting control panels in the remaining areas around the apartment are similarly configured to provide both ambiance and functionality. For example, in the toddler's bedroom, a button is programmed to dim lights down to 'off' over a one-hour period. This is achieved with a staggered approach; first dimming the lights in the bedroom down to 40% over 2 seconds, then to 20% over 20 minutes and finally to off, over the remaining 40 minutes.

## Load Controllers

Apartment-wide lighting control in this scenario is achieved using 2 x DDMC801 Multipurpose Controllers. The first (Box #1), contains two 4 x 1A dimming module cards (LSDM401), for control of the low voltage incandescent fittings contained throughout the living areas.

The second DDMC801 (Box #2) has been fitted with a 4 x 1A relay module card (LSRM401) for switched on/off control of lighting in utility areas; bathroom, laundry and courtyard. A vacant slot in Box #2 has been allowed for future requirement, provisioning for an additional four channels of dimming, relay or fan control at a later stage, should the homeowner desire.

Integration with the building access control system is easily achieved through a dry contact output connected to the AUX input of any Dynalite controller; in this case, either of the two DDMC801 Multipurpose Controllers being employed. This device also features an in-built timeclock, providing time-based event control such as programming bedroom lights to turn on at 7:00am each day, Monday through to Friday.

The DDNP1501 Power Supply (Box#3) is used to supplement power being provided to the network by the load controllers (about 50mA per DDMC801). It is commonly used in situations where low capacity load controllers are used in combination with a high number of user control panels.

## Load Schedule

Load Controller	Cct Capacity	Drawing Designator	Fixture	Qty	Load
DDMC801 Box 1 Ch1	240W*	D1	LV Downlight 50W	5	250W
DDMC801 Box 1 Ch2	240W	D2	LV Downlight 50W	4	200W
DDMC801 Box 1 Ch3	240W	D3	LV Downlight 50W	1	50W
DDMC801 Box 1 Ch4	240W	D4	LV Downlight 50W	3	150W
DDMC801 Box 1 Ch5	240W	D5	LV Downlight 50W	1	50W
DDMC801 Box 1 Ch6	240W	D6	LV Downlight 50W	2	100W
DDMC801 Box 1 Ch7	240W	D7	LV Downlight 50W	4	200W
DDMC801 Box 1 Ch8	240W	D8	LV Downlight 50W	4	200W
DDMC801 Box 2 Ch1	240W	R1	Incandescent 60W	1	60W
DDMC801 Box 2 Ch2	240W	R2	Linear fluorescent 18W T5	1	18W
DDMC801 Box 2 Ch3	240W	R3	CFL 15W	1	15W
DDMC801 Box 2 Ch4	240W		Future capacity		
DDMC801 Box 2 Ch5	Future expansion slot for further plug-in module				
DDMC801 Box 2 Ch6					
DDMC801 Box 2 Ch7					
DDMC801 Box 2 Ch8					

\*The maximum load current for any one DDMC801 output is 2A. Each plug-in module, such as the LSDM401, should *never exceed* a 5A total load. Where 2 x LSDM401 modules are used with a DDMC801 controller base/motherboard, the total load current should not exceed 10A. It is strongly recommended that each such controller be protected with a dedicated circuit breaker.