Refurbishment of 63 George Street, Brisbane

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Project Background

The construction of office buildings in current times presents a challenge to the project designer. On one hand, rooms must provide minimum levels of lighting (AS/NZS1680); on the other hand, the lighting must meet maximum energy consumption levels as per Section J of the Building Code of Australia (BCA). The refurbishment project at 63 George Street uses a combination of sensible layout and C-Bus lighting control to meet the building’s lighting requirements.

The project consists of two adjoining buildings connected at each level. Both buildings are served by the same lift group. Turn left when you exit a lift and you will arrive at the access-controlled door for the offices of the main building. Turn right and you will be lead to the offices of the adjoining building.

There are two stages to the project’s electrical refurbishment. The main building was fitted with C-Bus in the recently completed Stage 1. The adjoining building will be fitted in Stage 2.

The main building at 63 George Street stands eight storeys tall. The seven upper office levels are identical in layout and use a red or green colour scheme depending on the floor. Each level consists of a large open office, several breakout rooms, a modern kitchen/dining area and toilet facilities. Decorative frosted glass partitioning is used extensively to create a more open feel and enhance the distribution of light.

The T-bar ceiling houses prismatic troffer lighting and a series of C-Bus Multi Sensors. A combination of DALI ballasts, C-Bus DALI Gateways and Multi Sensors is used to maintain the lighting at optimum levels. This is particularly useful on the upper levels which receive more sunlight during the day. Here the lights near the windows are dimmed low and progressively brighten as you move toward the building interior.

As no windows are present in the kitchen and toilets, these areas use constant lighting during office hours. The breakout areas consist of separate offices with one or more windows, a door and frosted glass wall. A wall switch is used to control the lights in these areas. Multi Sensors switch the lights off if no occupancy is detected for thirty continuous minutes.

The Ground Floor consists of a main lobby area with a security reception at one side. Next to the lifts a corridor leads to conference rooms and an outside patio area. Multi Sensors are used to detect occupancy in the conference rooms. If a conference room is occupied the Ground Floor lighting will remain on indefinitely.

The site uses the TAC Vista Building Management System (BMS), which integrates with C-Bus via C-Bus OPC Server software. The BMS communicates with the OPC Server via Ethernet. The OPC Server is connected to C-Bus via a series of C-Bus Network Interfaces (CNIs) on an Ethernet backbone.
On workdays the BMS switches the lights on in the morning. In the evening it sets the lights to 70% brightness and switches them off 10 minutes later.

After hours, the lights are switched on using an access card. This provides two hours of lighting after which the lights are dimmed to 70% brightness. During non-standard hours, the kitchen area lighting operates via an occupancy sensor (built into the Multi Sensors), with a 15 minute shut-off timer. During 70% brightness either an access card is reswiped to provide an additional two hours of full light, or the lights switch off after a further 10 minutes.

C-Bus integration in the George Street project is not limited to the OPC Server’s connection to the BMS. The access control card entry system interfaces with C-Bus via Auxiliary Input units. A card swipe closes one or more connections depending on the zone access level of the card. The connections are interfaced with an Auxiliary Input Unit which communicates with a Pascal Automation Controller (PAC). The PAC uses logic to determine which lighting zone to switch on, and which sensors to activate, taking into account any existing zone activations. A sample of the logic used during after hours access is shown in the diagram below.

Once Stage 2 of the project is complete, the George Street premises will provide office facilities capable of servicing over 350 people. The building’s design and services will go a long way in providing these people with a comfortable and convenient working environment.
Benefits of C-Bus® Control

Scene control  
Scenes are used throughout the building to set the lighting to 70% brightness, full brightness with light level management, and off as appropriate. Scenes are also used during after hours operation to enable and disable occupancy sensors as required.

Scheduling and timers  
Scheduling is managed by the building management system. Timers are used to switch off lighting in breakout areas and kitchens (after hours) either 15 or 30 minutes after last movement is detected.

Light level management  
Lighting is maintained at a constant level using C-Bus Multi Sensors and DALI Gateways. This enables the lighting system to compensate for the lumen output reduction experienced by fluorescent tubes over time, providing a consistent optimised level of lighting for the building occupants.

Daylight harvesting  
C-Bus takes advantage of natural light which enters the building by sensing the ambient lighting level, and dimming the fluorescent lighting when sufficient natural light is present. This saves energy while enhancing the comfort of building occupants.

PIR occupancy sensing  
Lights in breakout areas and conference rooms are switched on by a wall switch and off by occupancy sensors when the room is no longer occupied. The lights may also be switched off manually using a wall switch.

Corridor linking  
The operation of corridor lighting on the Ground Floor is linked to the conference rooms, ensuring the corridor remains lit if a conference room is in use. This provides a safe environment for staff and guests.

Summary

Project  
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Location  
63 George Street, Brisbane, Queensland, Australia

Building contractor  
Watpac Limited

Electrical contractor  
KLM Group

C-Bus products used  
5500PACA Pascal Automation Controllers, 5753L C-Bus Multi Sensors, L5504RVF, L5508RVF, L5512RVF 4, 8 and 12 Channel Voltage Free Relays, L5504AUX C-Bus 4 Channel Auxiliary Switch Input, 5502DAL C-Bus DALI Gateways, Standard C-Bus Wall Switches, 5500CN C-Bus Network Interfaces, C-Bus OPC Server

C-Bus project value  
Approximately $150,000 worth of C-Bus equipment (Stages 1 and 2)

Clipsal Australia Pty Ltd
A member of Schneider Electric

Head Office  
12 Park Terrace, Bowden  
South Australia 5007  
Telephone (08) 8269 0511  
Facsimile (08) 8340 1724  
Internet clipsal.com/platinum  
E-Mail cbusplatinum@clipsal.com.au

CIS Technical Support Hotline:  
1300 722 247 (Australia only)

National Customer Service Enquiries:  
1300 2025 25  
National Customer Service Facsimile:  
1300 2025 56

New Zealand  
Schneider Electric (NZ) Ltd  
Telephone + 64 9 829 0490  
Facsimile + 64 9 829 0491  
E-Mail headoffice@clipsal.co.nz

ClipsalCustomer Service  
Free Phone (0508) CLIPSAL 2547725  
Free Fax (0508) 250 305  
Email sales@clipsal.co.nz  
Website www.clipsal.co.nz

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