

Rundle Mall

ADELAIDE

C-Bus Energy Management System

Case Study ⁴



Lighting control in Australia's most concentrated shopping area

Rundle Mall in Adelaide, South Australia is the most concentrated retailing shopping area in Australia. Each day, up to 100 000 shoppers visit the mall's 700 shops and four major department stores, all packed in between a mere 520 metres. In recent times, Friday night shopping has intensified while the Mall has become the crossroad to Adelaide's popular cafes and late night entertainment areas, drawing attention to the need for improved public lighting. The Adelaide City Council embarked on a \$7.1 million, three stage program to revitalise the Mall including new lighting, paving, street furniture, and food stalls. Clipsal C-Bus was incorporated into the (\$300 000) lighting component, providing reduced installation costs and impressive lighting control.

Provision for manual control is located in the Mall Manager's office.



Lighting Towers Specification

To provide an adequate level of public lighting, architect Steve Grieve and consulting engineering firm Connell Wagner, custom designed 21 lighting towers, each 7 metres in height with two 400 watt metal halide lights. These were custom designed for added strength and for the need to include a service platform to support static and moving displays during Christmas and other festivities. In between each tower is a steel multi-strand cable to support additional decorative lighting.

PLCs vs C-Bus

Initially, the engineers considered Programmable Logic Controllers (PLC) to control the lighting towers. However, this would have required a multiple run of no less than 84 cables, each in excess of 1.5mm² in thickness. The expense of so many cables combined with trenching costs in the vicinity of \$100 per metre, made Clipsal C-Bus a far more attractive option.

C-Bus simply replaces all these cables with one low cost Unshielded Twisted Pair (UTP) Cable for the control and monitoring of installations. Even conduit requirements were reduced. The added bonus with C-Bus was the flexibility of the system when decorative lights are added to the towers and during maintenance.



Due to size restraints inside each tower, four channel relay units were customised.

Simple Installation

The C-Bus UTP cable was simply looped to each of the poles. A four channel voltage free relay unit (5104RVF) was placed into the base of each of the poles in order to perform the switching required. Power outlets were also located at the top of each pole. These are used to accommodate decorative lighting and are also controlled by C-Bus. No reconfiguration of the system or reprogramming is necessary for this lighting addition. When all the hard-ware was installed, commissioning of the system was straightforward, requiring less than a day to complete.

PE Sensors

On automatic mode, the lighting towers are illuminated every sunset via PE Cells. C-Bus enabled this project to reduce the number from 21 to a mere two. One PE Cell could have sufficed, but because of the different light levels along the Mall, due to buildings casting shadows, it was decided a second PE Cell would help to overcome any dark spots. Each PE Cell was installed one third of the way from each end of the Mall and programmed to switch on each lighting tower one at a time, at two second intervals. This ensured that there would be no current surge upon initiation of the lights.



One of two PE Sensors that automatically operate all 21 towers at sunset.

Each lighting tower is 7 metres in height with two 400 watt metal halide lights.



C-Bus requires no reprogramming to accommodate displays and additional decorative lighting.



Each tower is programmed to switch on consecutively at two second intervals.

The Benefits of C-Bus Control

Customised Product

Due to the size restraints of the poles, it was necessary to produce special four channel relay units to accommodate these restraints. With the relay units controlling both power and lighting systems, the voltage free set-up enabled the connection of different circuits to the relay channels.

Size restraints for the PE Cells meant a special enclosure (with an IP56 rating) had to be used. It was possible to put the C-Bus PE Cell into the 31VSSWP plate to keep the IP integrity.

Manual Control

Whilst the lights are usually set on automatic mode, there is also the provision to control the lights manually via switches located in the Mall Manager's office. These switches can override the PE Cells to switch the lights on, however, they can not override the PE Cell to switch the light off. This was done deliberately so that the lights could not be affected if someone was to tamper with the switches.

During maintenance, each tower can be operated individually to check the status of the lamps and to isolate a circuit.

Future Upgrades

With the requirements in the Mall changing, provision has been made for the C-Bus system to change with it. An extra relay channel is provided in each of the light poles so that any future additions can be easily accommodated.

Features	Benefits
Towers wired with C-Bus UTP Cable	Used in place of 84 conventional cables, reducing installation time and expense
'Automatic Mode' configured with two PE sensors to cover all lighting towers	Conventional installation would require 21 PE sensors
Central control including manual override	Prevents tampering and assists maintenance procedures
Each tower incorporates additional relay channel	Lighting can be altered and upgraded in the future

Installation Data

Project	Rundle Mall Lighting Upgrade, Adelaide, SA
Client	Adelaide City Council
Consulting Engineer	Connell Wagner
Electrical Contractor	PRA Electrical
C-Bus Products Used	5034N Four Gang Key Input 5104RVF Four Channel Voltage Free Relay 5100PC PC Interface 5100PS Power Supply, 320mA 5031PE Photo Electric Cell
C-Bus Costs	\$6,000
Total Lighting Costs	\$300,000
Total Project Value	\$7.1 million

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