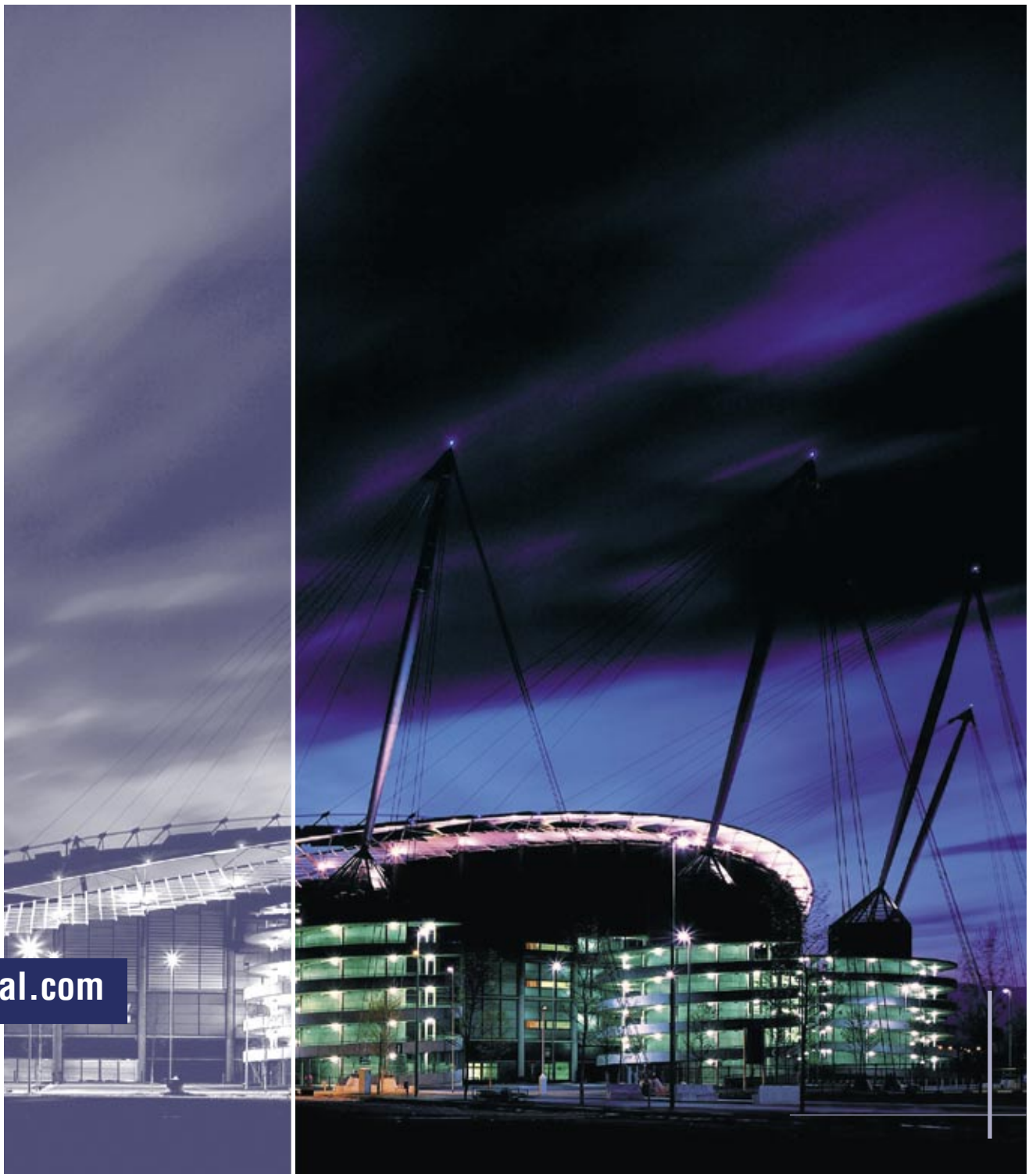


City of Manchester Stadium UNITED KINGDOM

C-Bus Control and Management System

Case Study ¹⁶



clipsal.com

C-Bus Throws Light on Hi-Tech Stadium

The UK arm of Clipsal Integrated Systems (CIS) has taken the capabilities of C-Bus to new levels supplying the Control and Management System to the new City of Manchester Stadium.

The magnificent City of Manchester Stadium was the centrepiece of the XVII Commonwealth Games 2002, hosting the athletics and rugby sevens competition as well as the spectacular Opening and Closing Ceremonies. Following the games, the stadium became home to Manchester City FC for the 2003/4 Premier League season and beyond.

The new stadium provides seating for 48,000 people and state-of-the-art corporate entertainment facilities. The unique bowl design means that every spectator will be within 100 metres of the centre spot.

As one of the world's most flexible and comprehensive building automation solutions, C-Bus was selected.

The flexibility of the system allows it to control lighting, door access, lift control, security, heating and ventilation packages in homes, offices, warehouses and of course stadiums.

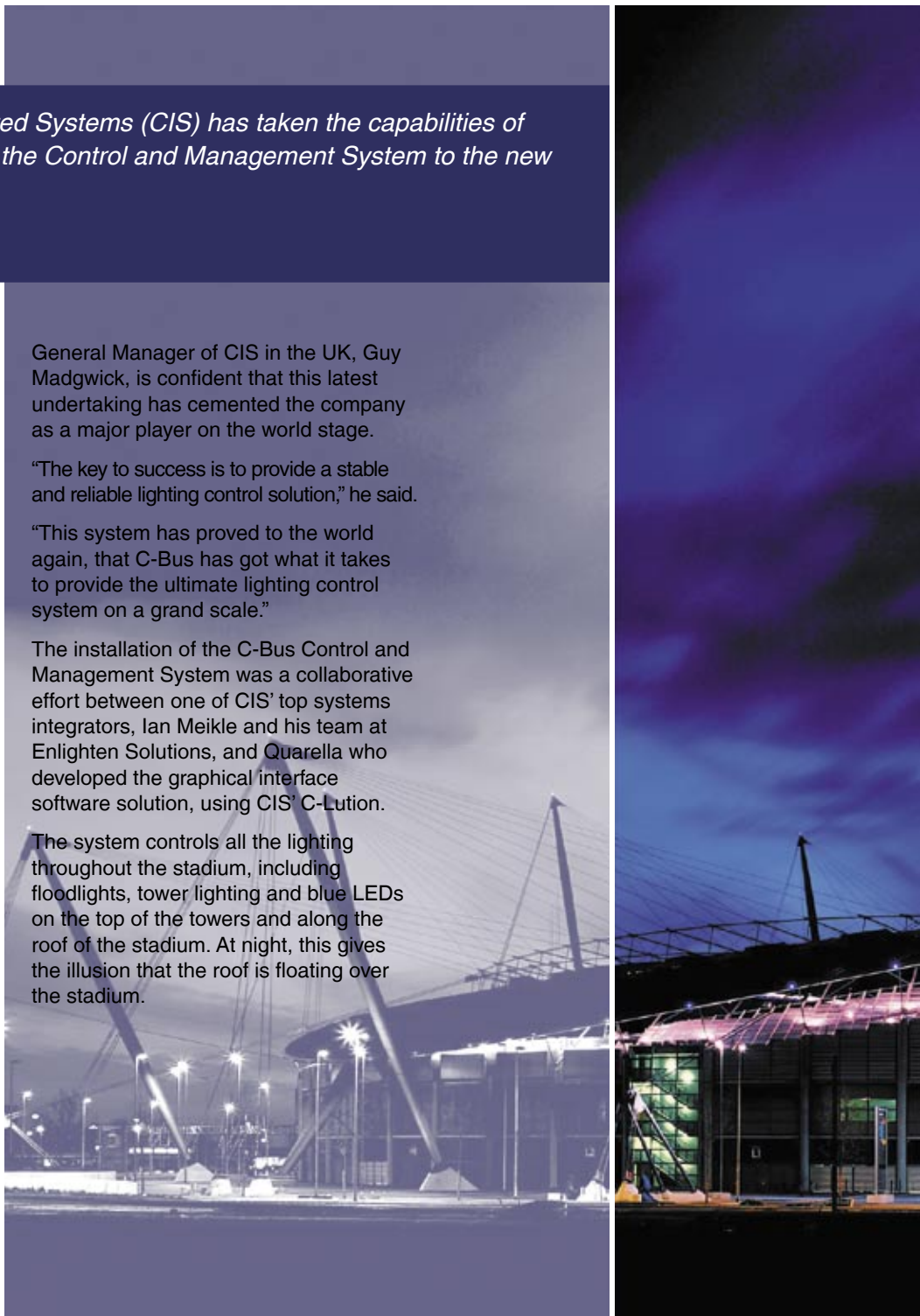
General Manager of CIS in the UK, Guy Madgwick, is confident that this latest undertaking has cemented the company as a major player on the world stage.

"The key to success is to provide a stable and reliable lighting control solution," he said.

"This system has proved to the world again, that C-Bus has got what it takes to provide the ultimate lighting control system on a grand scale."

The installation of the C-Bus Control and Management System was a collaborative effort between one of CIS' top systems integrators, Ian Meikle and his team at Enlighten Solutions, and Quarella who developed the graphical interface software solution, using CIS' C-Lution.

The system controls all the lighting throughout the stadium, including floodlights, tower lighting and blue LEDs on the top of the towers and along the roof of the stadium. At night, this gives the illusion that the roof is floating over the stadium.





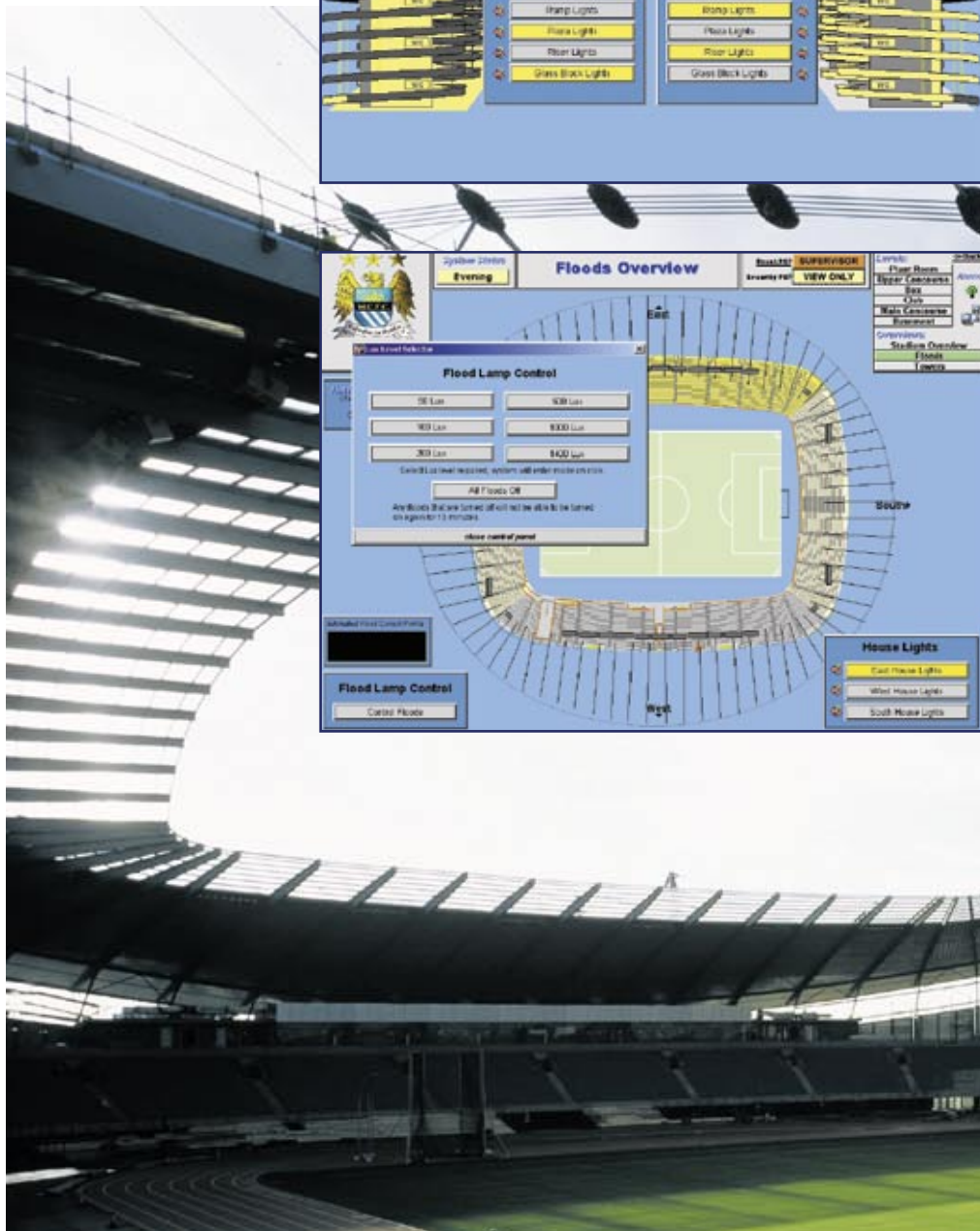
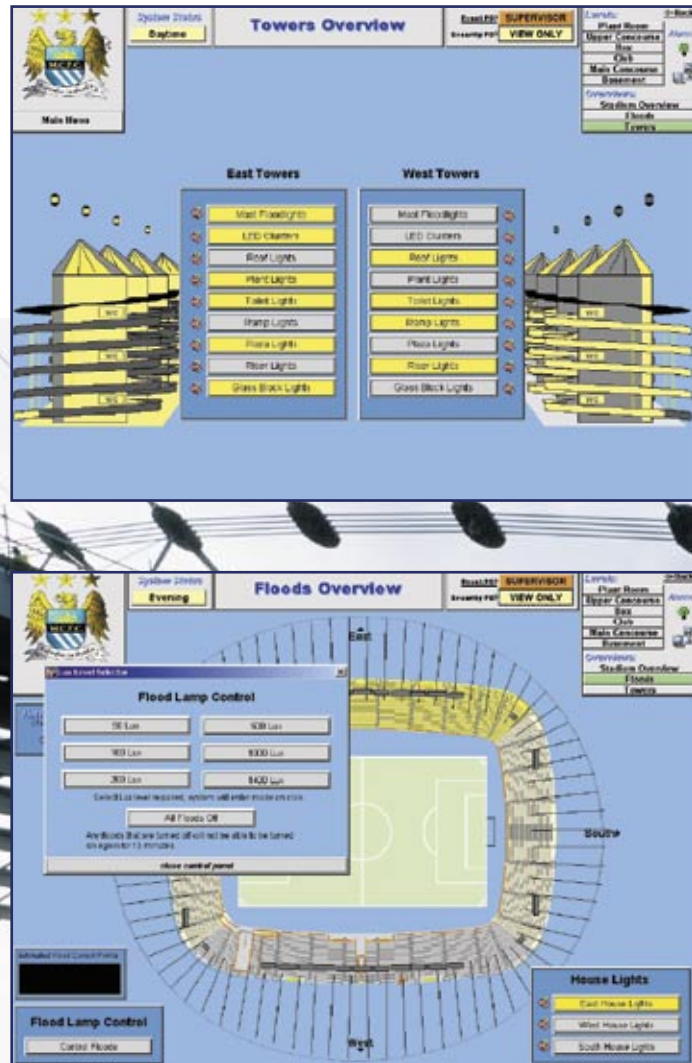
C-Bus Controls

- All stadium floodlights, including the main lighting towers. C-Bus also offers several lighting modes, from training levels right through to television coverage level.
- All Metal Halide Floodlights that provide lighting for the spectator areas, corridors, lobbies, access ramps, and concourse lighting over six levels. These levels are represented in C-Lution as the Plant Room, Upper Concourse, Box, Club, Main Concourse and Basement.
- Lighting in the car park, changerooms, toilets and all access areas.
- Administration offices and function rooms.
- Ticketing, signage and turnstile lighting.
- Perimeter and landscape lighting.

To provide the client with total control and reliability, Clipsal provided its own PC based graphical interface platform called C-Lution. C-Lution was programmed to run over two separate PCs, one in parallel, that can automatically take over if the other PC fails for any reason. This solution has allowed the stadium controller to pre-program events on a number of graphical screens, so that the lighting can be automatically sequenced. Pre-programming also allows the floodlights to be switched on prior to the event, to ensure that they have reached maximum output in time to provide adequate lighting.

All lighting networks within the stadium are connected by C-Bus Ethernet Network Interfaces, providing electrical isolation, while at the same time allowing messages to travel between the networks. This provides the flexibility to control and monitor any circuit from a central location.

Typical screens from the C-Lution windows interface.



C-Lution Software



C-Lution is linked up through two PCs, one being the main 'controller' in the main security centre and the other as a backup, located six floors below in the Control Centre. The system also has "Auto Switch" if there is a PC failure.

The C-Lution software monitors and controls the following:

- Complete overview of the site
- Room level control of lighting
- Individual floodlight control with phased start up
- Password control in secure areas on the screen
- Redundancy feature for 2 PCs
- Daytime and night-time program sequence
- Lamp life monitoring
- Communication debugging / system monitoring
- Fire alarm integration

Operator Control Functions

The application software was designed for ease of use by a relatively skilled person. The C-Bus software enables:

- The operator to dim or switch loads on/off.
- The operator, via a series of on-screen 'buttons', to control devices connected to the system. It is possible to assign 'macro functions' to each of these 'buttons' from the software's user interface. Each of these macro functions corresponds to a particular user defined function of the lighting control system.
- Assigning of automatic scheduling or manual control of multiple loads located everywhere in the system by way of a grouping function.
- Control buttons to be configured to each of the unlimited number of tab based menus, thereby providing an unlimited number of control functions.
- Controlled C-Bus output addresses to be grouped together and user 'Areas' created. These output addresses can also be linked to multiple Areas. For example, an address called 'Lobby Lights Level 1' could be included in an Area called 'All Lighting Level 1' and also in another called 'Lobby Lights All Levels'.
- The ability to able and disable manual control of individual buttons by mouse clicking in check boxes within the user interface.
- Full customisation of the control buttons, by importing bitmaps from applications such as a Paintbrush.

Such automatic control avoids the risk of human error in forgetting to activate the lighting at critical times and prevents the operator from accidentally switching off the lighting during the event.

Additional cutting edge features include the system's ability to vary the lighting intensity in line with ambient light and interface with the fire alarm system to ensure safety lighting in the event of evacuation. The system has also been designed for ease of maintenance, alerting the user to the need for lamp replacement to minimise the risk of lamp failure during an event.

Security was an important consideration. The C-Lution Software includes password protection to prevent unauthorized personnel making changes to the program or accessing the menu selections. The application software is designed to run on a PC with Windows 95, 98 or NT, providing:

- The ability to use the PC's real-time clock to facilitate a master scheduler for events.
- A Graphical User Interface (GUI), which allows scenarios and modes of operation to be programmed.
- Configurable screens that enable the user to issue commands to C-Bus controlled lighting loads throughout the stadium.
- A History File that logs every event.
- Password Protection, which protects all setup functions.
- The Graphical User Interface is a 'tab' based multi-menu structure, which enables an unlimited number of menus, control buttons, modes, event schedules, and user configurable control screens to be programmed.
- There is also the facility for generating, viewing and printing a series of reports, which provide full details of the system's control setups.

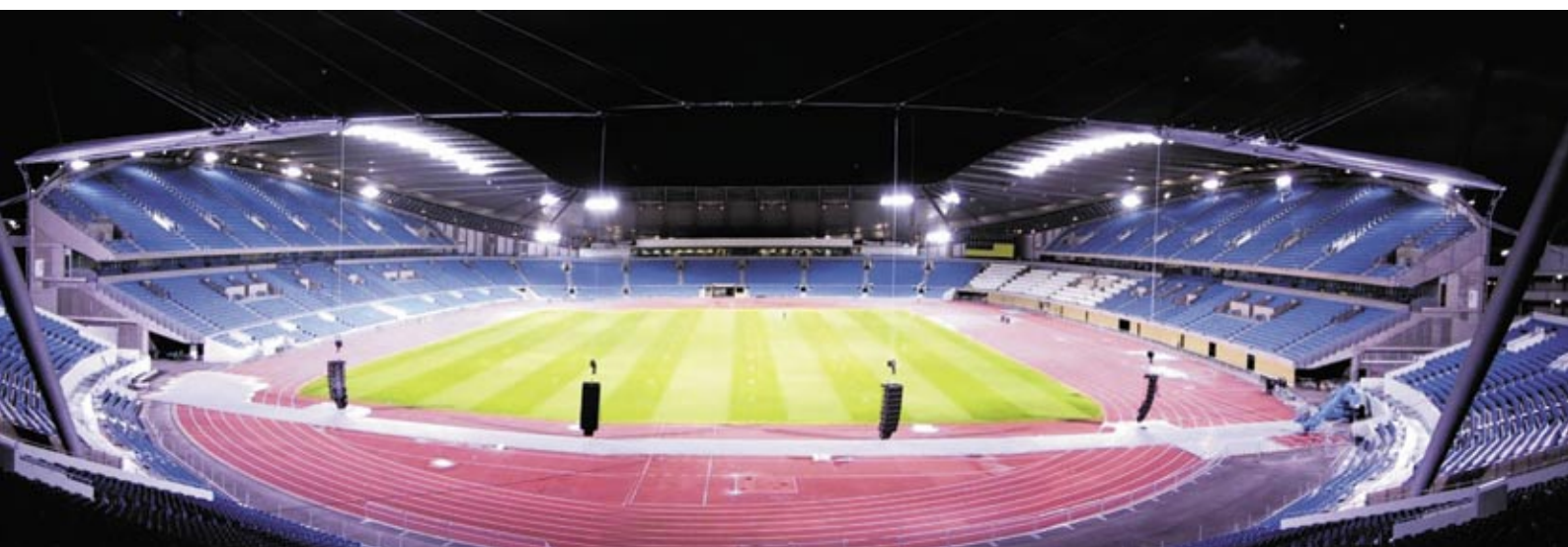
For further information on Clipsal UK, visit their website at www.clipsal.co.uk or call Guy Madgwick on +44 7976 287 668.

C-Bus DIN Rail mounted equipment provides the output control.



The Benefits of C-Bus Control

Features	Benefits
Scene Control	Can provide specific lighting for different events (eg. Concert, Football, Track and Field) without additional wiring. Can be performed by Building Manager.
Central Control	Control buttons can be made 'on the fly' from a PC. Individual buttons can be password protected, eg. General Control.
Local Scene Control in specific areas	Local control of toilets out of event mode. Local control of PIRs out of event mode. (Areas that are only occupied for short periods of time.) eg. Banquet Halls.
Control can be duplicated	Control can be provided from several locations – eg. Security room, event control room and facility manager's room for added convenience.
PIRs, PE cells and push-buttons	Greatly reduced energy costs.
Load sequencing	Ensures peak current reduction.
PC controlled switching of any lighting	Enables automatic lighting (external security, landscape, office) to be programmed for set times and for a set duration.
Local overrides	Provides fail-safe modes/overrides of system.



**Products of
Clipsal Integrated Systems Pty Ltd**

ABN 15 089 444 931

Head Office12 Park Terrace, Bowden
South Australia 5007PO Box 103 Hindmarsh
South Australia 5007Telephone (08) 8269 0560
International +61 8 8269 0560Facsimile (08) 8346 0845
International +61 8 8346 0845Internet www.clipsal.com/cis
E-Mail cis@clipsal.com.au**CIS Technical Support Hotline**

1300 722 247

Offices in all States

NSW	Sydney	(02) 9794 9200
	Albury	(02) 6041 2377
VIC	Melbourne	(03) 9207 3200
	Country areas	1800 653 893
QLD	Brisbane	(07) 3244 7444
	Townsville	(07) 4729 3333
SA	Adelaide	(08) 8268 0400
WA	Perth	(08) 9442 4444
TAS	Launceston	(03) 6343 5900
NT	Darwin	(08) 8947 0278

International Enquiries**Head Office Export Department**Telephone +61 8 8269 0587
Facsimile +61 8 8340 7350
E-Mail export@clipsal.com.au**New Zealand**Clipsal Industries (NZ) Ltd (Auckland)
Telephone +64 9 576 3403
Facsimile +64 9 576 1015
E-Mail headoffice@clipsal.co.nz**Customer Service**Free Facsimile (0508) 250 305
Auckland/
Mobile Phone (09) 572 0014
Free Phone (0508) CLIPSAL
2547725**Malaysia**Clipsal Integrated Systems (M) Sdn Bhd
Unit 3-2, Level 3, C P Tower
No 11, Jalan 16/11, Pusat Dagang Seksyen 16
46350 Petaling Jaya
Selangor Darul Ehsan, Malaysia
Telephone +60 3 7665 3555
Facsimile +60 3 7665 3155
E-Mail clipsal@clipsaltech.com.my**Singapore**CIS Pte Ltd (Singapore)
No. 8, Jurong Town Hall Road
#24-05-06 The JTC Summit
Singapore 609434
Telephone +65 266 1998
Facsimile +65 266 3922
E-Mail clipsal@clipsaltech.com.sg**International Representatives****China**Clipsal China Ltd
Telephone +86 755 246 1122**Greece**Clipsal Hellas S.A.
Telephone +30 1 0993 9165**Hong Kong**Clipsal Integrated Systems (HK) Limited
Telephone +852 2 487 0261**South Africa**Clipsal South Africa (Pty) Ltd
Telephone +27 11 314 5200**Taiwan**Clipsal (Taiwan) Co Ltd
Telephone +886 2 2558 3456**Thailand**Clipsal Thailand Ltd
Telephone +66 2 952 5338**United Kingdom**Clipsal Ltd (UK)
Telephone +44 1494 521 111You can find this brochure and many others
online in PDF format at:**clipsal.com**Follow the links off the home page or
access the following page directly:
clipsal.com/wat_lib_pdf.cfm**clipsal.com/cis**Clipsal Integrated Systems Pty Ltd reserves the right
to change specifications, modify designs and
discontinue items without incurring obligation and
whilst every effort is made to ensure that descrip-
tions, specifications and other information in this
catalogue are correct, no warranty is given in respect
thereof and the company shall not be liable for any
error therein.© Copyright Clipsal Integrated Systems Pty Ltd
Printed by Custom Press Pty Ltd (08) 8346 7999