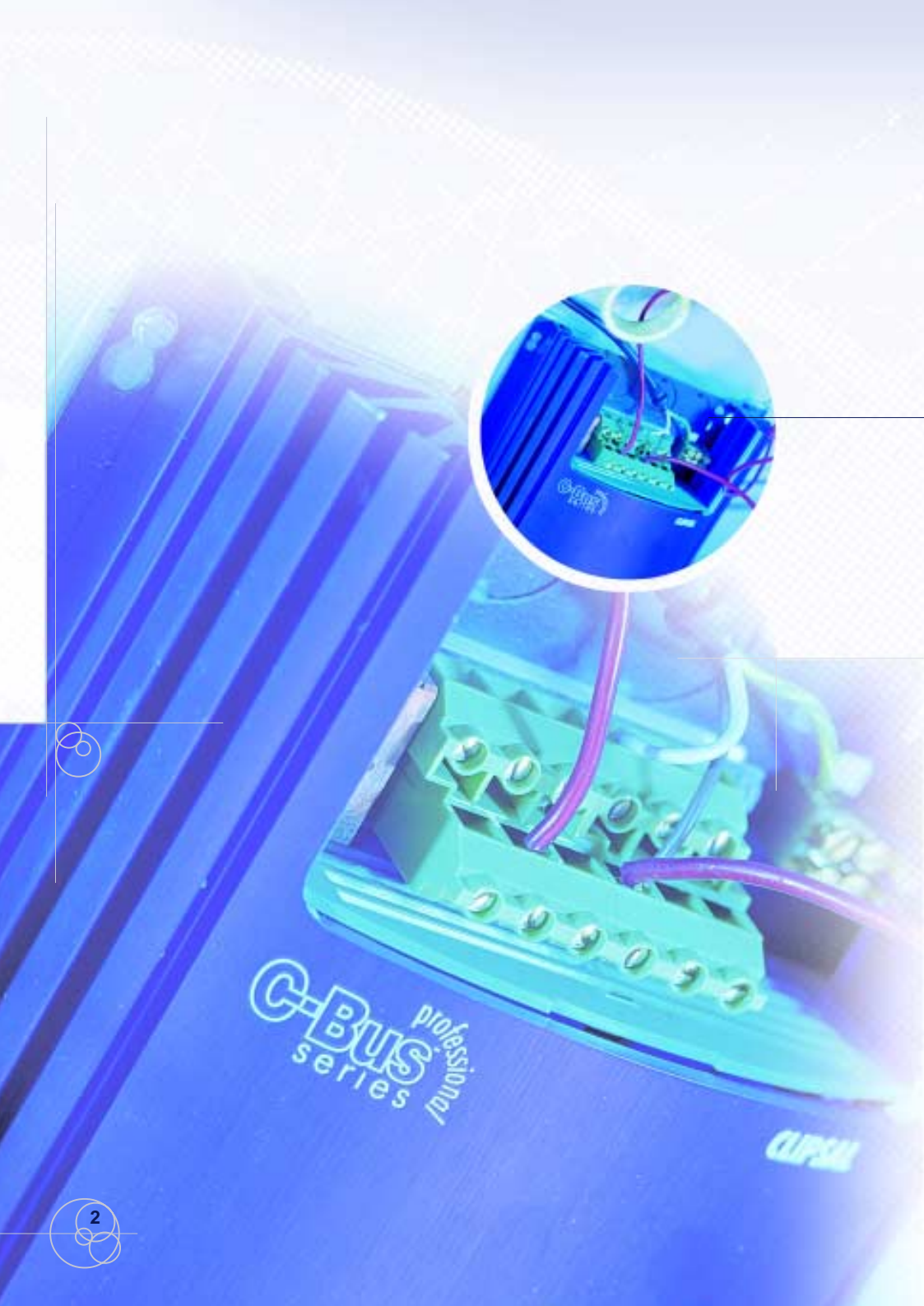


C-Bus

Energy Management System



*The intelligent choice for your
next building project*



What is C-Bus?

C-Bus is an Australian designed and manufactured, microprocessor controlled wiring system that offers complete control of lighting and other electrical services.

C-Bus will control virtually any type of electrical load with ease, whether it's simple digital control of a lighting circuit, or variable (analogue) type control, such as dimming of electronic fluorescent ballasts.

To ensure fast and reliable operation, each device has its own in-built microprocessor and can be individually programmed to integrate with other C-Bus devices.

C-Bus is a two-way communication system with closed loop control capabilities, so that each unit can communicate directly with any other unit on the network, even providing information about its own status.

Two-way communication means that information is held within individual C-Bus units rather than at a central point, hence the 'distributed intelligence' architecture. This also ensures system integrity and reliability.

Although a computer is not necessary for normal C-Bus operation, C-Bus End User Software has been developed using Java development tools, enabling it to run on any platform that supports the Java virtual machine, such as Windows™ 98/ME/NT/2000, Mac OS™, Unix™ and Linux™. This provides additional flexibility for Building Managers requiring this type of control, and can be easily integrated with other proprietary systems.

The End User software provides control and monitoring of every aspect of the C-Bus system from an easy-to-use, icon based interface.

The user interface can be customised to suit your requirements with an unlimited number of control screens and buttons. Special icons and pictures may also be added at any time, and changes are easily made.

In summary, C-Bus is by far the most cost effective, easy to install and user friendly control system available.



Why use C-Bus?

- C-Bus is a proven system, whose reliability has been demonstrated in projects throughout the world including, Australia, Malaysia, Japan, United Kingdom, South Africa and China.
- C-Bus core protocol is based on the internationally recognised ISO, 7 layer communications model, ensuring the C-Bus communications are extremely robust and reliable.
- The C-Bus has been designed to meet Australian and European directives and standards for electrical safety and EMC compliance.
- C-Bus is extremely simple to document at the project design stage. Switching and control circuits need not be decided until the time of commissioning, and changes can be made at any time without altering the schematics.
- C-Bus can control any type or size of load, whether digital or analogue.
- A single C-Bus cable connection can control an unlimited number of devices. For example, the main switch panel in a typical building could contain 200 switches and 100 dimmers (or even more), yet only one C-Bus twisted pair cable would be wired to the switch panel.
- Ultimate flexibility in switching and control. Functions can be changed, added, removed, moved or reprogrammed, at any time or at any position on the network, without any cumbersome hard-wiring.
- Extra Output Units can be added at any time. The only wiring that is required is to connect the mains supply to the devices and connect them to any point on the C-Bus network.
- C-Bus is simple to install and commission. Accredited C-Bus installers are available all over Australasia and other regions. Clipsal also offers training and certification to persons involved in C-Bus installations.
- C-Bus does not require a centralised computer or any other controller, however a PC can be used to add more features, if desired. This provides considerable cost, flexibility and reliability advantages over other systems.





C-Bus Light Level Sensors switch hibays to provide energy and cost savings in Spicers Paper Mill

Ultimate Control Flexibility

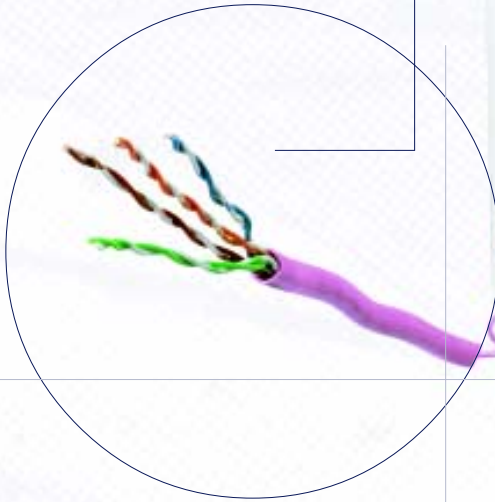
- The C-Bus system can carry out control in virtually unlimited ways, including: Centralised control, enabling override control of individual units, groups, zones, buildings and sites.
- Any input device can be programmed as a master control point. Overrides can be positioned anywhere on the network, and can control any other unit or units.
- The system allows unlimited switching configurations. Two, three, or in fact any number of switches can be set to toggle or control any C-Bus output device.
- There is no need for any direct mains voltage connection between any input and output device. Only the C-Bus cable links the units together. Any input can control any load, regardless of which circuit or phase the load is connected to.
- Overrides and scenarios can be easily reprogrammed at any time.
- C-Bus can fully integrate with virtually any Building Management, Emergency Lighting and other control systems.
- A computer is not required for normal C-Bus operation, but may be used to add features if desired.
- End User Software is powerful, flexible and able to be custom made to suit individual requirements.
- End user software supports a TCP/IP connection, meaning that C-Bus can be controlled over the local Intranet or Internet.

Cost savings in Melbourne's Rialto Tower, office accommodation under the control of C-Bus Occupancy Sensors

The C-Bus Network

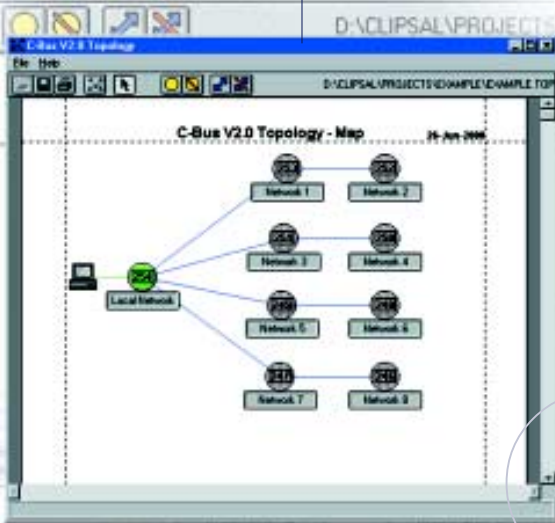
The C-Bus Network Bus communications medium is unshielded twisted pair (UTP) Category 5 cable. The Network Bus not only provides the means of communication between units, but also the small amount of power needed to operate the circuitry within most C-Bus units.

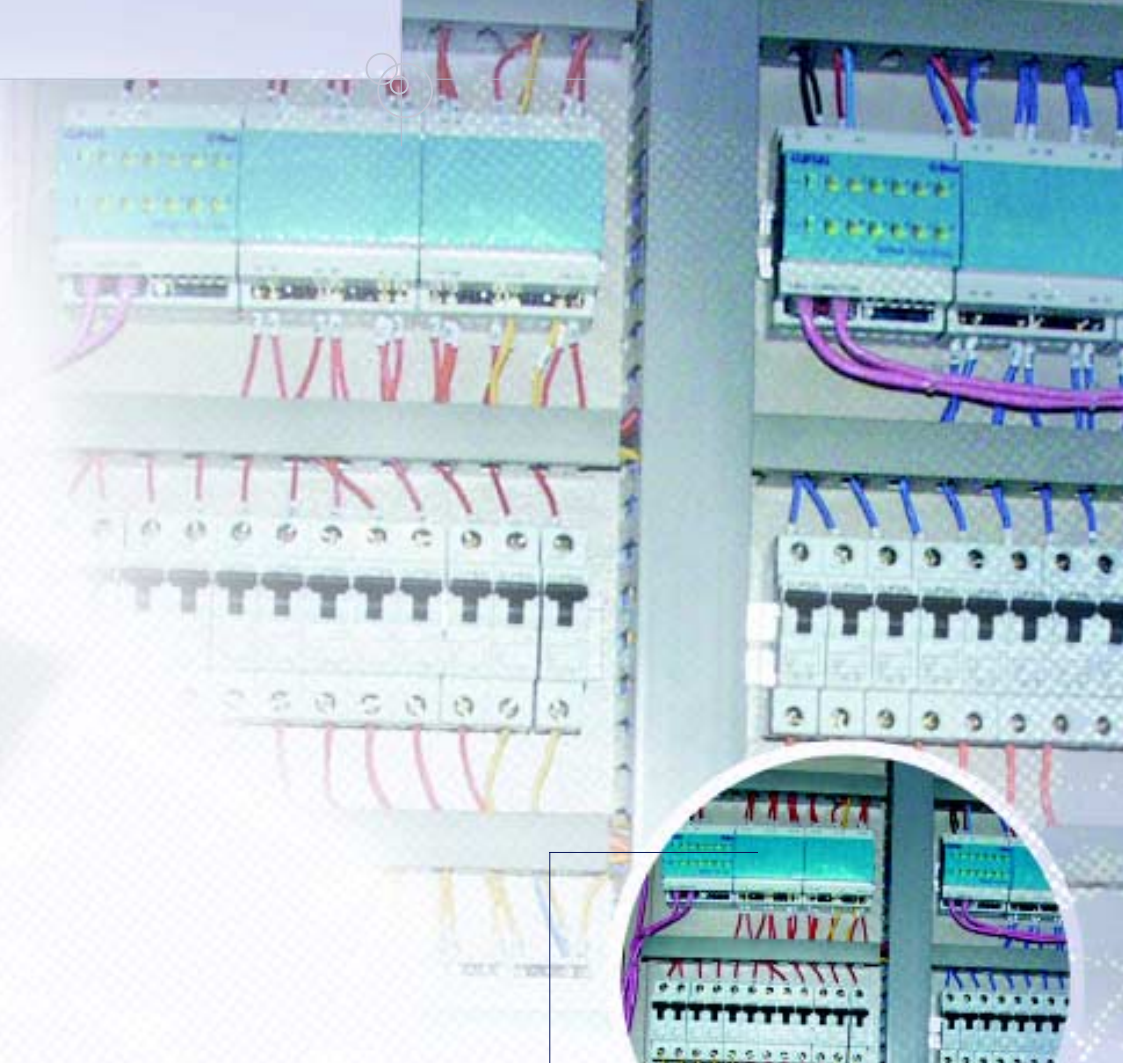
Electrically isolated from the mains power, C-Bus operates at safety, extra low voltage levels (36V DC).



Free Topology Structure

Input or output devices are connected to any point in the C-Bus Network by the Category 5 data cable, which carries all communications between the Units. The C-Bus connections may be looped from unit to unit, or a branch can be made at any point. This 'free topology' structure provides a flexible system layout. New units can be added anywhere, at any time, without system re-configuration. End of line terminations are not required with the C-Bus system, making C-Bus very easy to wire by the installer.





Easy to Design and Install

At the time of design, and upon installation, only a C-Bus Network connection is required for each unit.

During commissioning, the system is programmed so that specific C-Bus commands trigger specific responses in one (or more) devices on the C-Bus Network. The units' functionality can be re-programmed at any time, and the C-Bus units can also be added, moved or removed easily.

Reliable Communications

Unlike other systems, C-Bus allows multiple commands to be sent and received simultaneously at relatively high speeds (3500 bits/sec), with 2-way communications allowing devices to communicate status and command instructions between themselves.

C-Bus protocol employs synchronous carrier sense, multiple access with collision detection implemented with Collision Avoidance, resulting in near 100% communication reliability. This is further enhanced with multiple retries, message acknowledgement and built-in checksums.



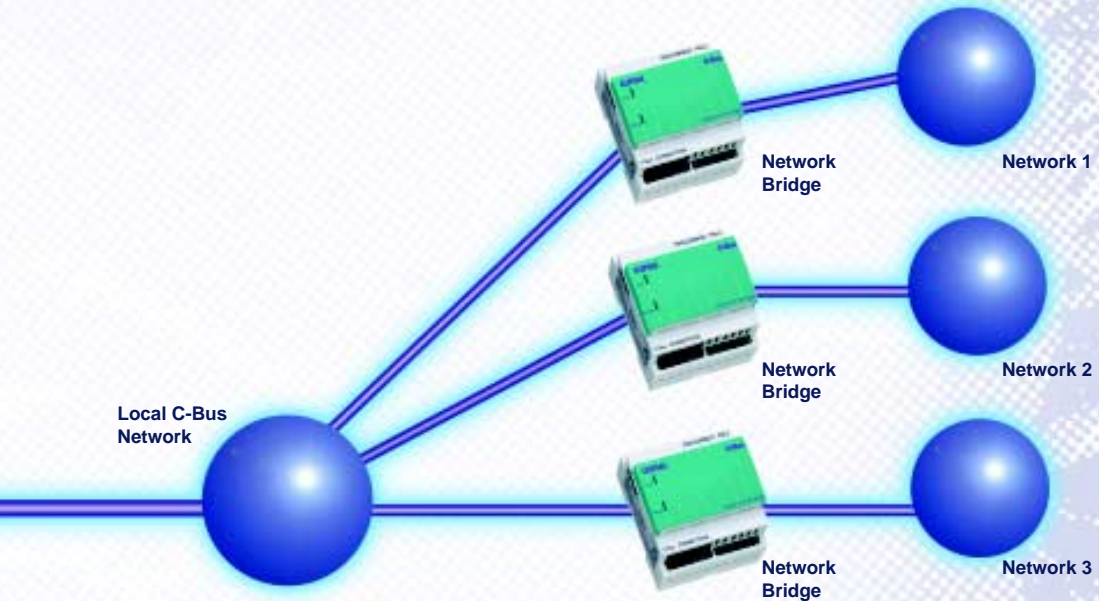
PC Interface



Peer to Peer Communications

Every C-Bus unit is assigned a unique code, so that all devices on the C-Bus network can be identified and programmed individually.

Since C-Bus uses 'peer to peer' communication, every device on the C-Bus Network issues and responds to commands directly from the network, rather than requiring a central computer or controller.



Distributed Intelligence

Each unit on the C-Bus Network has its own built-in microprocessor, allowing it to operate independently with 'distributed intelligence'.

The distributed intelligence provides extremely reliable high-speed communications, and ensures that a malfunction in one unit will not affect the operation of any other Unit on the Network.

Simple Control

Each C-Bus device is programmed to issue and respond to certain commands. The number of commands that can be programmed into the C-Bus system is almost limitless.

Active Feedback to the Network

Due to C-Bus' 2 way communications and distributed intelligence, Output Devices also send information back to the Network regarding their current status, which facilitates system monitoring.



Multiple Functions

Single C-Bus units support multiple functions. For example, you can program an Input Switch so that the length of time that the key is pressed determines the command that is issued - a short press could issue an On/Off command and a long press of the same button could issue a dimming command.

Logic and Scenarios

Conditional (IF-THEN-ELSE) statements can be programmed using the C-Bus End User Software packages such as Schedule Plus and C-Lution, allowing events to be conditional upon the status of other devices, time of day, and other situations.

For example, a Key Input Unit could issue an instruction to a certain Relay Unit to switch 'On' - but only if it was after 12:00 noon and before 6:00 pm. The possibilities for this type of control are virtually limitless.




C-Bus Project Example

Within the boardroom of a large building, a Key Input Unit is pressed, issuing a unique Command onto the C-Bus Network.

Each C-Bus command is uniquely named - in this case we have programmed the command switch as 'Relay A1 - Toggle On and Off.'

Rigoursly tested and independantly accredited by NATA laboratories ensures product compliance to international standards.



The command from the Key Input Unit is sent onto the C-Bus Network, for every C-Bus unit in the building to read. However, only the C-Bus Units programmed to respond to that specific message will react to the command.

The first relay circuit 'Relay Unit A1' is connected to the main lights within the boardroom and is set to respond to the Command 'Relay A1 - Toggle On and Off.'

To provide further flexibility, comfort and energy savings, a C-Bus Occupancy Sensor is added to also control Relay Unit A1 in the boardroom. We then set up the system so there is a logical relationship between the switch and the movement sensor.

For example, if the Occupancy Sensor is On, the Key Input Unit could be set to disable the Sensor and Toggle the lighting Off when pressed (ie. 'Presentation Mode'). The lighting could manually be switched back On again from the Key Input Unit. The Occupancy Sensor takes care of automatically switching the lights Off when the room is unoccupied.

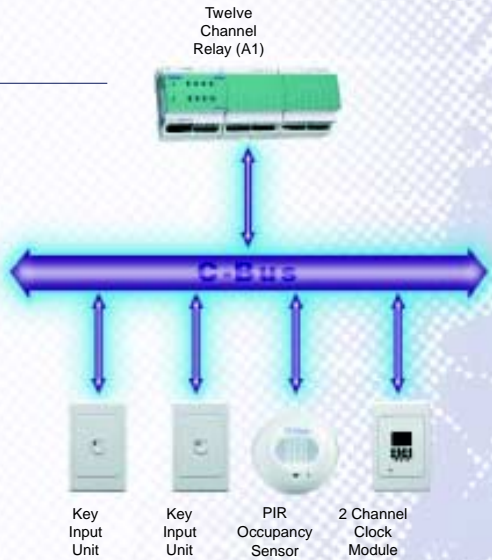
The LED indicator on the Key Input Unit has been programmed to illuminate if Relay A1 is switched On, irrespective of whether that command was originally issued by the Key Input Unit or any other device on the Network (eg: the PIR Occupancy Sensor).

We have also programmed the C-Bus system so that if it is later than 5:30pm, and nobody is detected by the Occupancy Sensor, then the lights will switch Off automatically.

The original Key Input Unit now functions as an Override Button. A quick press of the button will provide an extra period with the lights On.

Another Key Input Unit in a different section of the building has been programmed as a 'Master Switch' to turn Off all lights in any area that are On, irrespective of commands issued by other control devices. Remember that there does not need to be a direct wiring connection between any of these units.

This simple example only gives you an overview of the control flexibility of the C-Bus system. C-Bus can be programmed to suit any project's requirements. The system can then be re-configured at any time in the future without wiring modifications.



Australian Designed

The C-Bus product development area in Adelaide, South Australia, features the latest engineering tools, including CAD systems such as Unigraphics and Autocad for solids modelling.

Local design and engineering expertise in areas like mechanical design, plastics, tooling, printed circuit board layout and environmental proofing, ensures product reliability which meets Australian and International Standards.

Environmental proofing includes in-house Electro-magnetic Compatibility (EMC) testing to Australian and European Standards.

All C-Bus equipment is therefore compatible with other electronic equipment that may be in the building, including personal computers, mobile phones and data equipment.

C-Bus software, a crucial part of the system, is also wholly designed in Australia and is very easy to use.

Local support ensures that software can be easily tailored to specific projects, including those in which high level interfaces are developed for the C-Bus system.

This local engineering and manufacturing know-how has led to an extensive C-Bus range to suit the Australian and world markets, meeting the requirements of the lighting and building industry.





Australian Made

C-Bus is wholly manufactured by Clipsal Integrated Systems, a subsidiary of Gerard Industries located at Bowden, South Australia, a complex that occupies some 7,500 square metres of floor space and employs over 270 people.



**Quality
Endorsed
Company**

ISO 9002 Lic 934
Brisbane Australia

Software Solutions

The flexibility and functionality of C-Bus can be further enhanced by incorporating End-User Software Suites developed by Clipsal Integrated Systems.

These application suites provide the facilities for real time monitoring and control, data logging, reports, logic functions and scheduling of events from a local or remote terminal, connected via the Local Area Network, Internet or the Intranet. Password protection and authentication assures security of the network.

The application software supports serial drivers such as RS232, RS485 and TCP/IP, which can form a gateway to C-Bus. With the use of terminal servers it is possible to extend the networking of C-Bus while at the same time providing a high speed backbone, which may be facilitated on fibre optic or coaxial cable medium.

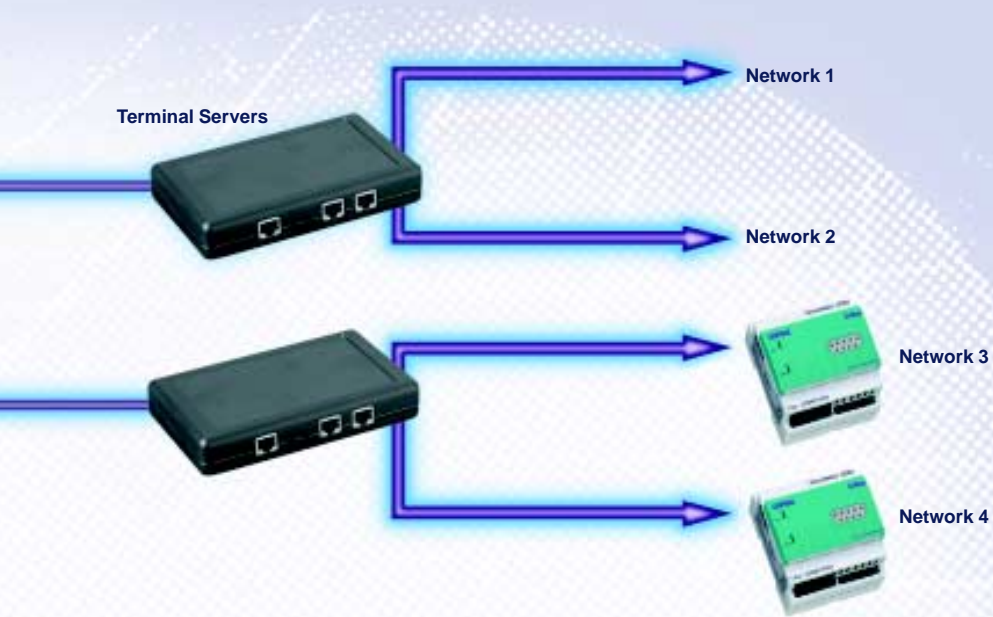
Ethernet

Fibre or Coax Cable



HUB





Schedule Plus - Time Management

Schedule Plus is a software application that provides time management, monitoring and basic logic control of the devices that make up a C-Bus network.

The package has been designed to enable relatively skilled people to create macros to initiate events from customised screens. The flexibility of the system and the simple to use tab based menu structure allows the user to create virtually unlimited operating scenarios. Simple logic support, conditional events and scheduled events may also be setup by the user on these customised screens. All setup functions are password protected for added security.

Events may be scheduled and activated on specific days and dates. The user may also select recurring events for weekdays and weekends, or on any date. Events may be logged to a history file, and the application may be used to create periodic reports.

The application supports the real time monitoring and control of devices on the C-Bus network. Devices can be represented by user defined icons on the screen which change colour when the device state changes.

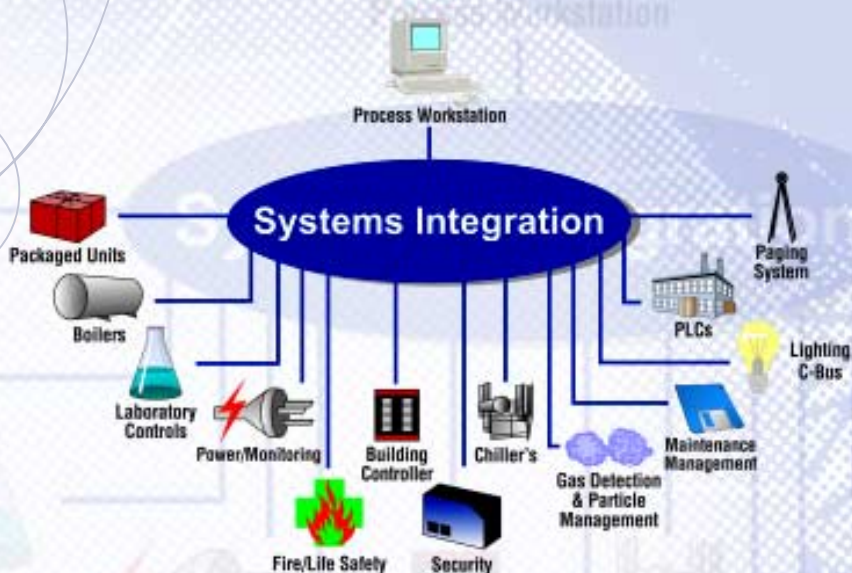
C-Gate - C-Bus Server Software

The C-Gate Software package is a framework (server and support applications) for anyone who wants to develop C-Bus compatible application software and/or interfaces to other building management systems.

C-Gate provides a portable server application, which makes it simple for experienced software developers to create C-Bus compatible software without a detailed knowledge of C-Bus protocol.

Basically, the product consists of a run-time package that includes the server, support applications and documentation (including example code). The server is written with a strong emphasis on portability to maximise its use on both Windows™ and non-Windows™ platforms such as Unix™, Mac OS™ and Linux™.





Systems Integration

The flexibility and 'open systems' approach of the C-Bus system makes it easy to integrate with other equipment, including Building Management Systems (BMS). This has seen its large scale use and application in a number of significant building projects.

Landis and Staefa, Vector International and Johnson Controls have all developed interfaces to the C-Bus system.

This integration allows the total electrical package, including HVAC and lighting provided by C-Bus, to be controlled via the BMS system.

Clipsal C-Bus has also been successfully integrated with the AMX and Creston controllers as well as the Phast controller for use in luxury homes, conference rooms and entertainment centres.

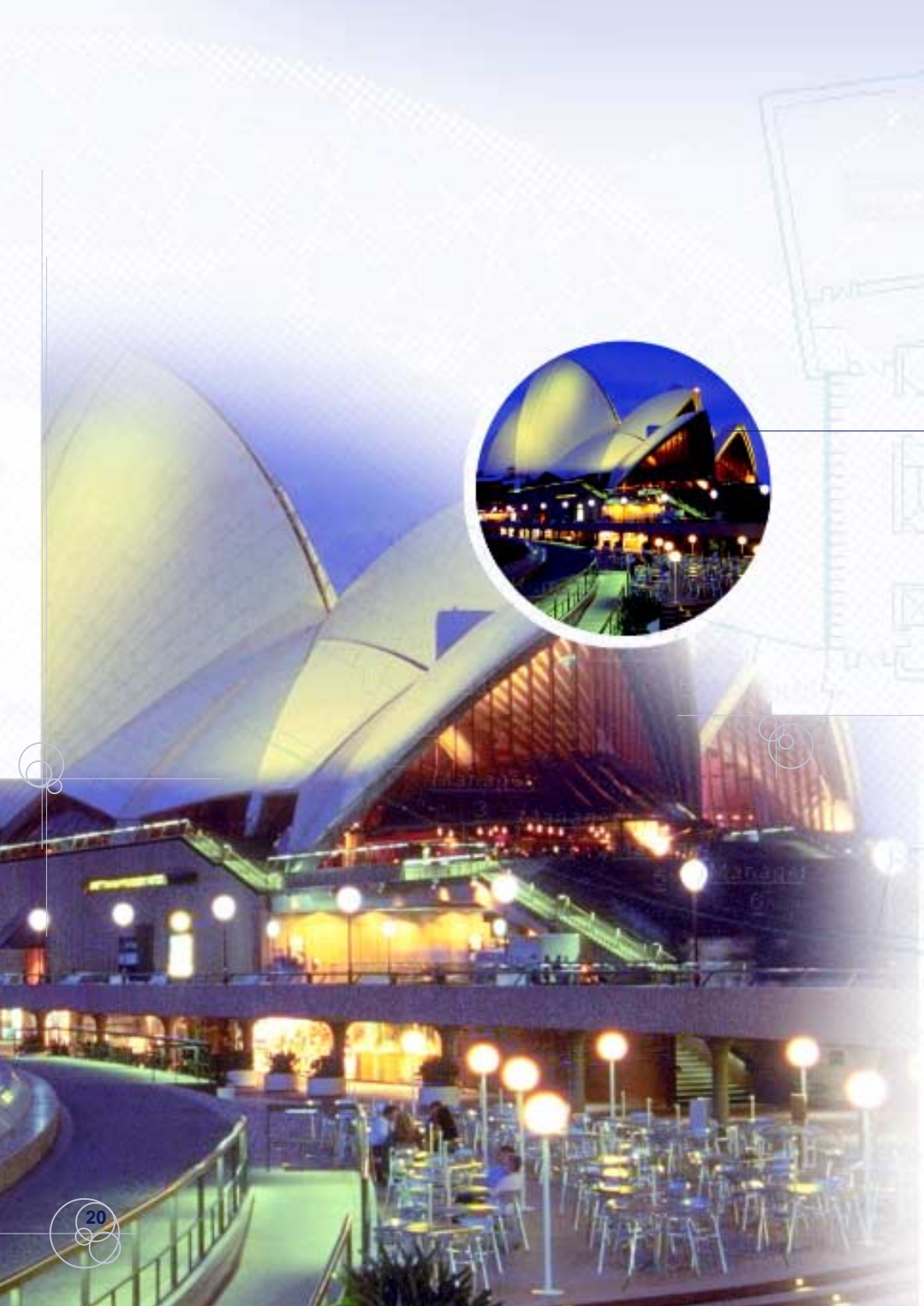
The successful integration of systems provides the owner with a 'seamless' solution, to realise ease of use and convenience.

Systems Integration diagram

The C-Bus Open Processor Drive was produced in Melbourne, Australia by Landis & Staefa Integration Solutions as a seamless integration to the C-Bus architecture. This was achieved by modifying the existing firmware of their Open Processor Controller to allow for communication to the C-Bus PC Interface.

With the pursuit of excellence in mind, the user has complete control over both HVAC and Lighting from the one technically advanced, state-of-the-art Integrated System.





C-Lution - Seamless Integration

C-Lution is a complete end-user software application which provides the complete solution for real time control and monitoring of C-Bus, using clear and concise graphic images.

The user can create sophisticated animation to display the operating status and performance of the electrical services in the premises. A history log ensures that specified parameters and events are logged with historical and real time trending available in graphical form. C-Lution can be used to produce periodic and event driven reports.

C-Lution can be used to monitor, control and log all alarms. The integrity of the installation may be tested by C-Lution. An alarm can be programmed to alert the user if a C-Bus device is removed or added to the system.

The user can also program a multi-layered security system that allows personal access to the areas of a building's electrical services within their control.

The C-Lution package includes a driver library to interface with proprietary equipment such as Building Management Systems or other Bus platforms, such as LonWorks, BacNet, RS232, RS422, RS485 and TCP/IP interfaces. Other interfaces are available on request.





The EDS building, Adelaide, uses C-Bus to realise energy and cost savings.



With Clipsal C-Bus, Everyone Benefits

Sophisticated Lighting Systems

C-Bus offers lighting engineers the flexibility to realise sophisticated lighting systems which would be difficult and costly using conventional techniques and equipment.

The planning process is significantly reduced and the engineer is in a position to respond more rapidly to the ever changing and increasing demand of modern buildings.

Simplified Installation

For the electrical contractor, installation time is dramatically reduced with cost savings in labour and material.

With the reduced bulk of switch wiring, the installer finds that wiring is simpler and requires less space to accommodate the same functions.

The installer, using a personal computer, can easily program and commission the system. The same software also enables changes to be made at any time to meet new demands.

Inexpensive Alterations

The investor is concerned with minimising initial costs, ongoing running costs, pay back periods and having the flexibility to change building layouts to accommodate tenants' needs, C-Bus satisfies each goal.

Whereas the office plan may alter for new tenants, the lighting system can simply be reprogrammed to satisfy each client, saving the investor rewiring costs.

Reduced Electricity Costs

The benefits to the user are reduced operating costs and the ability to make changes using the graphical user interface software.

Encompassed as part of a building management system, the user of the building can program specific lighting and climate control sequences, automatically operating lights and air-conditioning at certain times, or program the system to use off-peak electricity.





C-Bus, Building for the New Century

In just a few short years, C-Bus has become the best known and most widely respected lighting and energy management system.

The system's reputation for reliability has seen it used in some of Australia's most prestigious and demanding projects.

SOCOG Headquarters, Sydney, NSW

Clipsal C-Bus was selected as the official building management system of the Sydney 2000 Olympic Games, a project that demanded reliable performance and realistic energy savings.

Clipsal's local base ensured that product was available on time, every time, and that support would be available well after the Olympic Games were over.





Local and International Success

C-Bus has also met with a great deal of international success, installations having been completed in the United Kingdom, South Africa, Taiwan, Hong Kong, Indonesia and New Zealand.

Recent C-Bus projects in Australia and overseas include:

AIPO Building, Canberra, ACT

The new, government owned Australian Industrial Property Organisation (AIPO) Building in Canberra consists of 10 floors, each of which has been fitted with C-Bus to control all lighting circuits and realise energy savings.

When an energy management system was specified for the building in the construction stage, specifiers were impressed with the proven performance of C-Bus.

C-Bus motion detectors are used in offices and bathrooms to ensure lights remain on while these areas are occupied.

The system also logs the running time of lamps, enabling the building manager to accurately predict when maintenance will be required.

A scheduler program also controls the building's electrical services for added energy savings.

From the outset, the anticipated payback period for the C-Bus system was less than 2 years.



State Education Building, Sydney, NSW

When the government decided to completely refurbish the heritage listed Education Building in Sydney, energy management was a number one priority.

The engineering consultant was strongly in favour of C-Bus, not only for its energy saving capabilities but also for its flexibility.

The building basically consists of two 8 storey sandstone sections, C-Bus Light Level and Passive Infrared Sensors operate to switch lights on and off automatically.

All lights in offices are manually switched On when people arrive at work and automatically turn Off at the end of the day for increased energy savings.

If offices are occupied after hours, local movement sensors override the shut down sequence.

State Education Building, Sydney, makes extensive use of C-Bus Occupancy and Light Level Sensors.





Convenient C-Bus lighting is a feature of St. Basil's Aged care Complex

St Basil's Aegean Village Aged Care Complex, Christie Downs, SA

During the planning stage of the St Basil's Aged Care Complex, C-Bus was selected for control of all lighting loads within the complex due to its cost savings, convenience and ease of installation and programming.

The complex consists of four separate hostels that are each wired as separate networks all configured to a Local Network. The networking is such that any unit can be programmed from a single location.

The designers of the system specified Clipsal Prestige P2000 switches for ease of use by the aged residents. These switches were simply interfaced to C-Bus Auxiliary Input Units to provide the features of C-Bus from a Prestige P2000 switch.

Additional energy savings were also achieved by placing all bathroom lights on timers, with bathroom heaters also controlled by C-Bus. In the planning stages, it was estimated that C-Bus would realise 25% energy savings over conventional wiring, a target that is now being easily achieved.

Taronga Park Zoo, Sydney, NSW

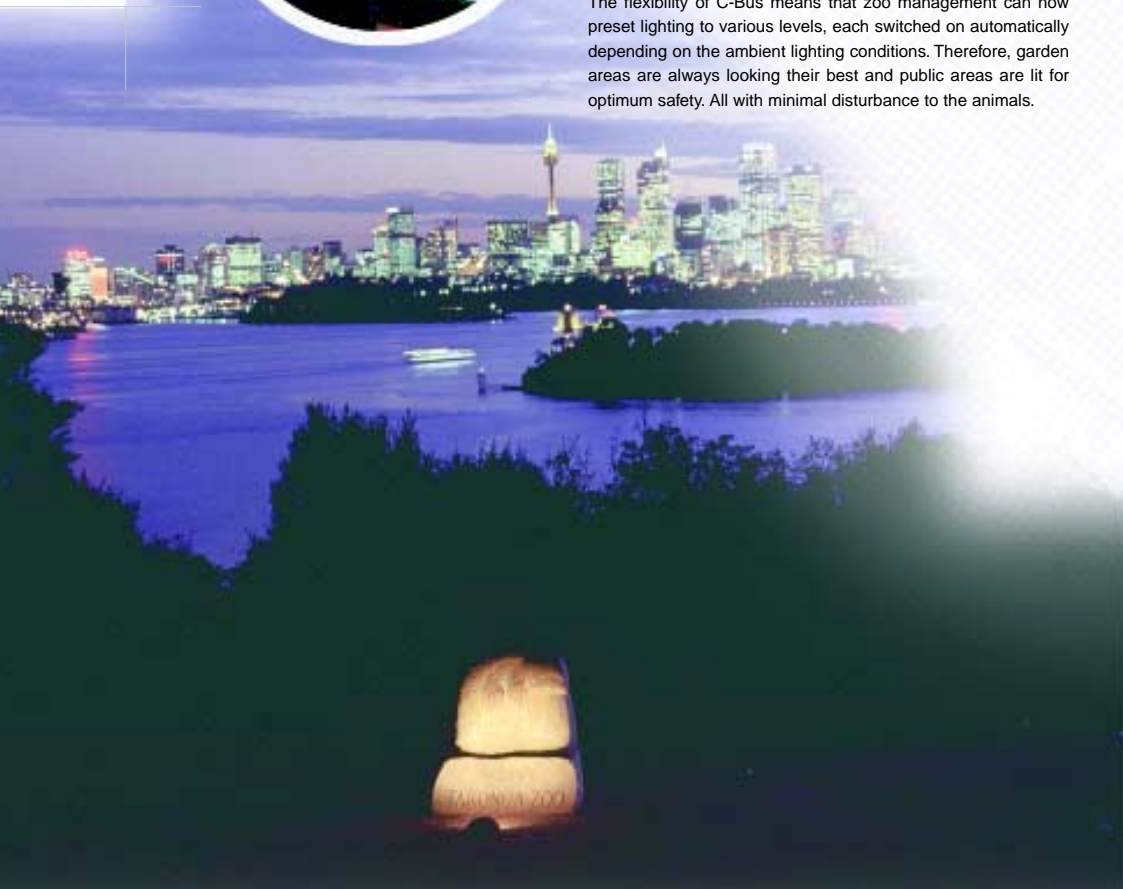
Taronga Zoo is recognised as one of the world's leading zoos. This is not only due to its extensive collection of Australian and exotic fauna, but also for its superb location on Sydney Harbour overlooking the Harbour Bridge and Opera House.

As many of the animals in the zoo are nocturnal, zoo officials wanted to be able to extend open hours to give visitors a chance to see these animals when they are most active. Therefore, a lighting system needed to be installed to highlight the garden areas and provide pathway illumination.

C-Bus was installed in various locations around the zoo. Each set of equipment consisted of C-Bus dimmers which were powered by local generator sets.

The flexibility of C-Bus means that zoo management can now preset lighting to various levels, each switched on automatically depending on the ambient lighting conditions. Therefore, garden areas are always looking their best and public areas are lit for optimum safety. All with minimal disturbance to the animals.

Taronga Zoo's lighting is switched automatically depending on ambient light conditions.





The Swinburne College of TAFE incorporates the benefits of both C-Bus and Clipsal HomeMinder.

Swinburne College of TAFE, Melbourne, VIC

The Swinburne College of TAFE is a three level building which consists of classrooms, laboratories, staff rooms, conference rooms, welding shops and administration areas.

Once again, C-Bus was selected for the project due to its flexibility and potential energy savings.

C-Bus controls all lighting on each of the three levels via a backbone cable and three network bridges per floor.

There are also two Clipsal HomeMinder systems connected to the C-Bus backbone cable, which control lighting when set to 'After Hours, Weekend or Holiday Mode'.

Clipsal HomeMinder also has a 'Cleaning Mode' which automatically provides half light for the cleaners, resulting in additional energy savings.



The Mercedes Benz Headquarters has been completely refurbished and now includes C-Bus lighting control throughout.

Mercedes Benz National Headquarters and Engineering Department, Mulgrave, Melbourne, VIC

The Mercedes Benz Headquarters in Mulgrave, Victoria, is a new building that contains offices, a training room, boardroom and vehicle display area. The site's existing engineering department has been completely refurbished.

Both buildings utilise C-Bus throughout, with all offices, corridors, toilets and training rooms using Movement Sensors. Lighting loads are mainly fluorescent and dichroic, with electronic ballasts used for dimming features.

The boardroom and training rooms feature preset lighting levels, while C-Bus is also used to illuminate outside pond and water features. The installation incorporates multiple networks integrated with T&A's BMS System and Security. This enables card swipe illumination for areas with limited access.



Stadium Australia, Sydney, NSW

Stadium Australia is the centrepiece of the massive construction program at Homebush Bay in Sydney. A design and construct project, the stadium will hold 110,000 screaming, cheering spectators for the 2000 Sydney Olympic and Paralympic Games.

When the stadium's lighting management system was put out to tender, the consultants specified 20 ampere mechanically latched relays with an override function, suitable for fluorescent loads.

One constraint was that each relay module had to fit into a limited space within a switchboard enclosure. Of course, proven reliability was also of paramount importance.

Clipsal's local design and manufacturing expertise shone through, developing a custom C-Bus relay module that met and exceeded all of the project's specifications.

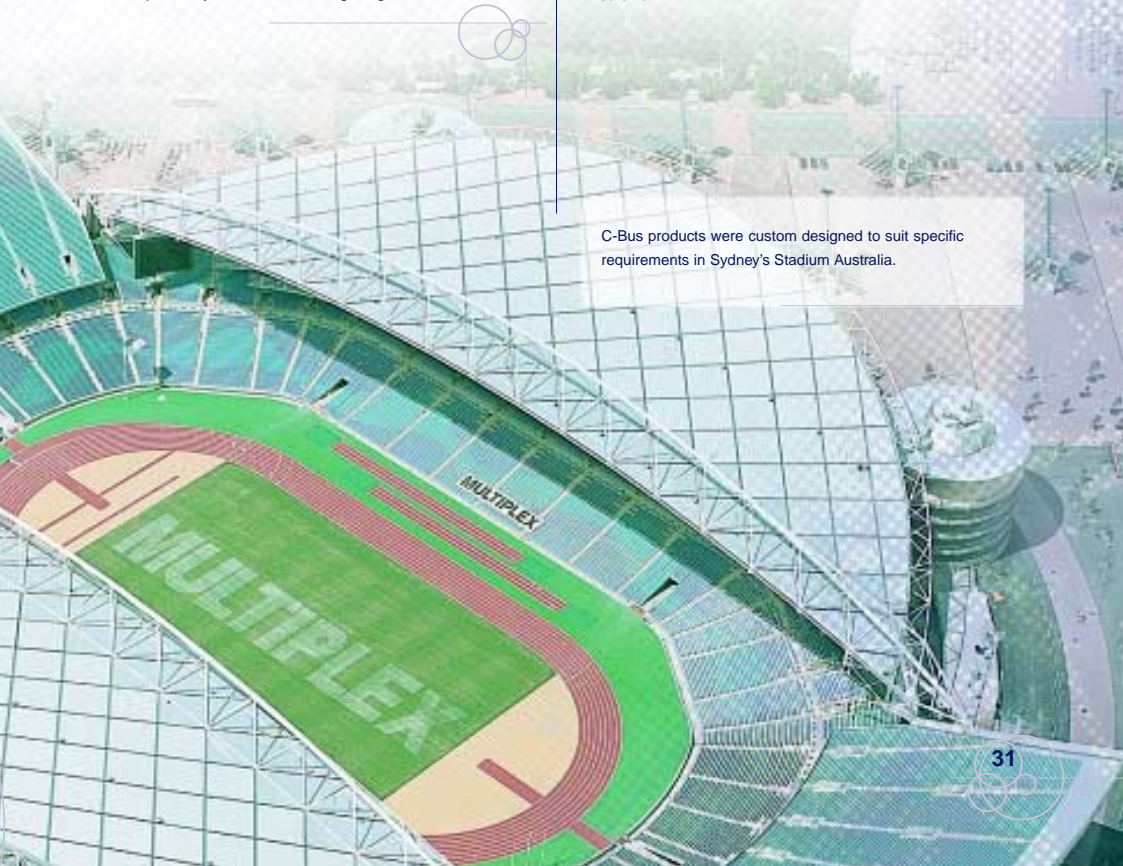
C-Bus will now be used to control all internal stadium lighting, including common areas, banquet rooms, offices, toilets, stairways, and most importantly, the arena floodlighting.



Sporting Arena Specialists

C-Bus has also been selected for use in the new Colonial Stadium, Melbourne, Millennium Park in Wales, and Eden Park, New Zealand.


C-Bus products were custom designed to suit specific requirements in Sydney's Stadium Australia.






New Technological Inroads in Asia

C-Bus features prominently in some outstanding projects in Cyberjaya, Malaysia's new hi-tech community. The aim of this project is to create a technology hub in South East Asia, providing commercial and residential tenants with the world's most advanced technology.



Residential home recently fitted out with
C-Bus by Clipsal Technologies







C-Bus is providing commercial and residential tenants in Cyberjaya with advanced technology.


The most recent project comprises 5 buildings, each incorporating the latest C-Bus products for superior lighting control and energy management. Products used include C-Bus Din Rail Series product, C-Gate high speed Ethernet backbone, C-Lution front end software, and a variety of other Clipsal electrical accessories.


More detailed C-Bus case studies are also available. Please consult your C-Bus specialist.

Typical C-Bus Applications

 = Power Saving

 = Building Automation

 = Special Control

 = Special Effect

Time Based Scheduling

Output units can be programmed to switch loads or dim lights automatically depending on the time of day, week or year. Scheduling can also take into consideration 'special days' such as Public Holidays, Easter and Christmas.

Constant Illumination Control

Maintaining a constant target level within the area, with automatic compensation for changing light levels, as well as the gradual reduction in light output (lumen depreciation) of fluorescent and discharge lamps.

Occupancy Sensors

C-Bus Occupancy Detectors use Infrared, Ultrasonic, or a combination of detection methods can be software programmed to control any output devices on the network.



Relay Control



There is no limit to the overall handling capacity of the C-Bus control system. For maximum control flexibility and energy savings, individual zones should be made as small as possible, and in many applications it may be preferable for each luminaire or device to have an individual relay. Loads of all currents can be easily accommodated with the C-Bus system. The most commonly specified relay devices are 10A normally open and 20A mechanically latched. Special relay ratings can be ordered.

Incandescent and ELV Dimming



C-Bus is supremely flexible, allowing dimming of mains powered lamps and transformers with pre-set levels, scene setting, and manual dimming. Override controls for conference rooms, entertainment areas, are easily accommodated.

Fluorescent Dimming



C-Bus is capable of dimming fluorescent lamps using a variety of methods. The most reliable system uses 0 - 10V controllable electronic ballasts. Daylight linking, constant light level control and lecture theatre dimming are typical examples of fluorescent dimming applications. C-Bus also has an interface to the DALI compatible electronic ballasts.

Local Control



Manual override, localised or group control, using either C-Bus intelligent switches or standard switches. C-Bus can accommodate Switching, Dimming, Scene Setting, Pre-sets and Time Delays - in virtually any combination.



Power-Up Conditions



Following a power failure, each C-Bus unit may be programmed to always re-start in a certain specified status, or to resume operation at the same status as prior to the event.

Interfaces to Building Management and other Control Systems



The flexibility and 'open systems' approach of C-Bus makes it easy to integrate with other equipment, including Building Management Systems. Landis and Staefa, Vector International, TA Australasia and Johnson Controls are just some of the companies that have standard interfaces with C-Bus. C-Bus has also been successfully integrated with AMX and Creston control systems. This simple integration provides the total electrical package, including HVAC and lighting, to be controlled by the BMS, and provides the owner with a 'seamless' solution to all control requirements.

Logic Based Control



The C-Bus End User Software has the ability to produce specific reactions in response to specific events, and to schedule and run control scenarios whenever specific events occur. The End User Software can also monitor and control the C-Bus system, and allow the owner to remotely access the electrical system from a remote PC (by modem), or even using a mobile phone.

Hand-Held Remote Control



For the ultimate in ease of use, the C-Bus Remote Controller can be used in multiple areas without any re-programming.

Logic Based Control



Power savings of up to 70% are possible in industrial applications, dimming with discharge lamps, using dimming in conjunction with ambient light level and occupancy sensing.





C-Gate Gateway



The C-Gate Gateway Program has been specifically developed to allow third parties to develop interfaces into the C-Bus system. C-Gate supports serial interfaces such as RS232 and RS485 as well as protocols such as TCP/IP.

End User Software



C-Lution is a complete end user software application, which is bundled with C-Gate to provide the complete packaged solution for real time control and monitoring of the C-Bus, using clear and concise graphics images. C-Lution allows the user to create sophisticated animation to display the operating status and performance of the electrical services in the premises. A history log ensures that user specific parameters and events are logged with historical and real time trending available in graphical form. C-Lution may be used to produce periodic and event driven reports.



The C-Bus Product Range

The C-Bus product range has been designed to suit a range of markets and regions. Units are available in 120V and 240V nominal operating voltage and 50-60Hz operating frequency ranges. Input units such as Key Inputs are available in 2000, C2000 and Metal Plate Series, which are suitable for the Australian, New Zealand and South and North American markets. E2000 British Standard Series are suitable for most European countries and most regions within Asia. S2000 Series products are compatible with electrical accessories on the African Continent.

Output units are available in a number of configurations including DIN Rail Mount, which achieves a high switching density in a small volume, and the Professional Series, designed to be panel mounted and used for high power switching and dimming applications. The high power dimmers incorporate smart algorithms to ensure flicker free operations, with the unit automatically compensating for fluctuations in the line voltage and frequency. Professional Series Dimmers are designed for architectural dimming applications.

Programmable Key Input Units

- 1, 2 or 4 gang switches suitable for standard mounting accessories.
- Programmable LED status indicators.
- Wide range of styles & finishes including metallic, with plain or engraved face plates.
- Only requires the 2 conductor C-Bus cable - mains power is not required.
- 4 gang 'Scene Setting' version also available for multiple scene set-up.
- 4 gang switch with built-in infrared receiver also available (for use with Remote Controller).
- Metal Plate, up to 132 Gang available.



Occupancy Sensors

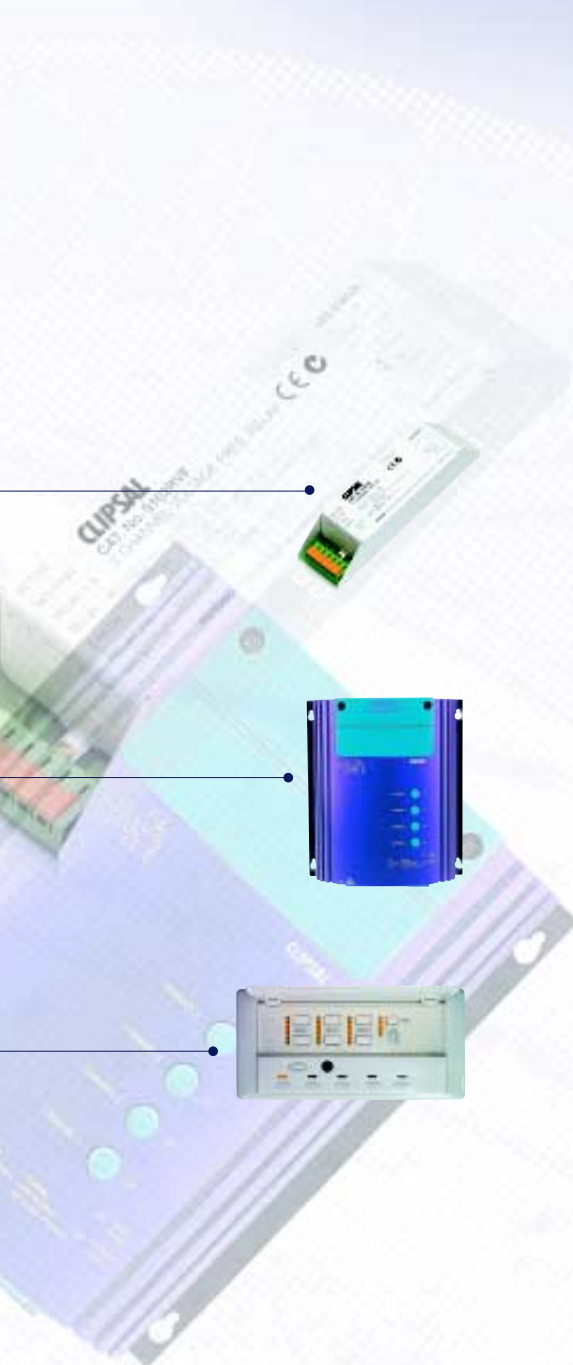
- Indoor and outdoor passive infrared (IP66) models.
- Integral light level sensor and sunset switch - all functions separately adjustable and programmable.
- Programmable LED indicators.



Light Level Sensor

- Measures from 40 to 1600 Lux, with programmable margin.
- Programmable hysteresis about target level.
- Suitable for bank dimming or switching.





Single and Two Channel Devices

- Compact modules for integration within other equipment (eg. luminaires).
- 0 - 10V output compatible with dimmable electronic ballasts.
- Two channel relay for independently switching adjacent luminaires.
- Integrated power supplies, override switches and LED status indicators.

Professional Series Dimmers

- Available in 5A, 10A and 20A per channel versions.
- MCB protection on certain models.
- Current sensing on each channel to 5% accuracy.
- Voltage and frequency stability algorithms.
- Over-temperature and over-current protection.
- Emergency lighting interface.

Scene Master Controller

- Up to 5 preset levels may be set from a single control unit.
- Programmable fade rates.
- Infrared control of preset levels.
- LED level indication.
- Attractive finish and presentation.



Touch Screen

- Low cost touch screens, with the functionality of 100 standard Key Input Units.
- Incorporates a Real Time Clock for scheduling functions and events

Time Clock Module

- Supplements normal C-Bus time functions, and allows user override for special events and situations.
- Controls two separate C-Bus channels and includes battery back-up.

Relay and Dimmer Units

- Based on 35mm Din Rail Standard, these units are available to fit standard switchboards.
- Relays are available as 4 and 12 channel devices, dimmers are available as 4 and 8 channel devices.

Temperature Sensor

- Measures from 0° to 50°C, accurate within 0.5°C, with adjustable hysteresis.
- Programmable hysteresis about the target temperature.





Output and Network Devices

Power Supplies and Network Bridges

- Power supplies are used to provide 36V DC to the C-Bus Network.
- Network Bridges allow isolation of Networks whilst maintaining all communications, and are also used to amplify the control signals in large installations.

C-Bus Installation Software

- Extremely easy to operate.
- Supplements normal C-Bus functions, and allows additional control of the system.
- Ability to group loads in any required switching combinations.
- Provides manual and automatic (time based) control for users who want control of the system via a PC.
- Runs under Microsoft Windows™ 95/98 and NT.

DIN Rail Range

- Dimmer and relay switching units available.
- Compact size, high switching density.
- Local and remote overrides.
- Built-in power supplies that source current to the C-Bus Network.
- Specialist interfaces in DIN Rail available on request.

Channel 0 - 10V Analogue Output

- Controls third-party devices that use industry standard 0 - 10V DC control voltage (eg. electronic controllable fluorescent ballasts).
- Output voltage for each channel is individually controllable.
- Rate of change (ramp time) is independently programmable.

RS232 Computer Interface

- Allows connection of a Personal Computer to the C-Bus Network for programming the system, using a standard RS232 serial port connection.
- Whilst a computer is not required for C-Bus operation, one may be added at any time, at any point on the Network.
- Allows any external device with RS232 output to be interfaced to a C-Bus system (protocol documentation available, please contact Clipsal for details).





CLIPSAI
Energy Management System

2014-10-10 14:00:00

See connectivity supported
See it also Working System

Signal: [unclear]

Site: [unclear]

Site No: [unclear]

CLIPSAI
Energy Management System



C-Bus Accredited Training Programs

In response to electrical industry demands for accreditation, Clipsal Integrated Systems has formed a technical support and training division, whose role it is to offer training and certification to individuals or companies involved with our new electronic technologies.

The training program teaches technical aspects of C-Bus, including system design, installation, programming and commissioning.

Clipsal offers accreditation to graduates of the training, to acknowledge that they have achieved an acceptable level of competence with C-Bus.

Documentation is available to support these training programs, including detailed specifications of the individual modules, technical manuals and system design guides.

In addition, Clipsal Certified Installers have available to them design assistance, technical support and the ability to offer their customers the warranty and guarantee provisions under the agreement.

Please contact your local C-Bus specialist to enrol in the C-Bus training program.

C-Bus is part of the Intelligent Building Series



A product of Clipsal Integrated Systems Pty Ltd

ACN 089 444 931 ABN 15 089 444 931

Head Office

12 Park Terrace, Bowden South Australia 5007

PO Box 103, Hindmarsh, South Australia 5007

Telephone (08) 8269 0560

International +61 8 8269 0560

Facsimile (08) 8346 0845

International +61 8 8346 0845

Internet clipsal.com/cis

E-Mail cis@clipsal.com.au

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) 8269 0555
WA	Perth	(08) 9442 4444
TAS	Hobart	(03) 6272 3177
	Launceston	(03) 6331 6951
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 (09) 576 3403

Facsimile (09) 576 1015

E-Mail headoffice@clipsal.co.nz

Customer Service

Free Fax (0508) 250 305

Auckland/Mobile Phone (09) 572 0014

Free Phone (0508) CLIPSAL

0 5 0 4 7 7 2 5

Malaysia

Clipsal Integrated Systems Sdn Bhd

Lot 26, Jalan Pengapit 15/19

Shah Alam Industrial Estate

40000 Shah Alam

Selangor Darul Ehsan

West Malaysia

Telephone (3) 5519 1111

Facsimile (3) 5512 3155

E-Mail clipsal@clipsaltech.com.my

Singapore

Clipsal Integrated Systems Pte Ltd

No. 5 Fourth Chin Bee Road

Singapore 619699

Telephone (65) 266 1998

Facsimile (65) 266 3922

E-Mail clipsal@clipsaltech.com.sg

International Representatives

Argentina

Controles Tecnova S.A. Telephone (114) 207 9534

China

Clipsal (China) Ltd Telephone (755) 246 1122

Greece

Clipsal Hellas S.A. Telephone (1) 600 3718

Middle East

Clipsal Middle East Telephone (6) 557 0777

South Africa

Clipsal South Africa (Pty) Ltd Telephone (11) 314 5200

Taiwan

Clipsal (Taiwan) Co Ltd Telephone (2) 2558 3456

Thailand

Clipsal Thailand Ltd Telephone (2) 952 5338

United Kingdom

Clipsal Ltd (UK) Telephone (44) 1494 521111

Vietnam

Clipsal - VTEC Telephone (8) 856 3002