

C-Bus Application Note

Hotel Room

Overview

Hotels range from budget to 5 Star luxury, all catering to various markets but all competing for guest occupancy and spend. Guest experience is a priority and the hotels reputation, brand and star rating sets a guest expectation.

Hotels strive for differentiation to stand out from the crowd and achieve this by providing a point of difference in service and facilities to guests. The inclusion of an automation solution within the hotel environment assists with these industry goals and market demands.

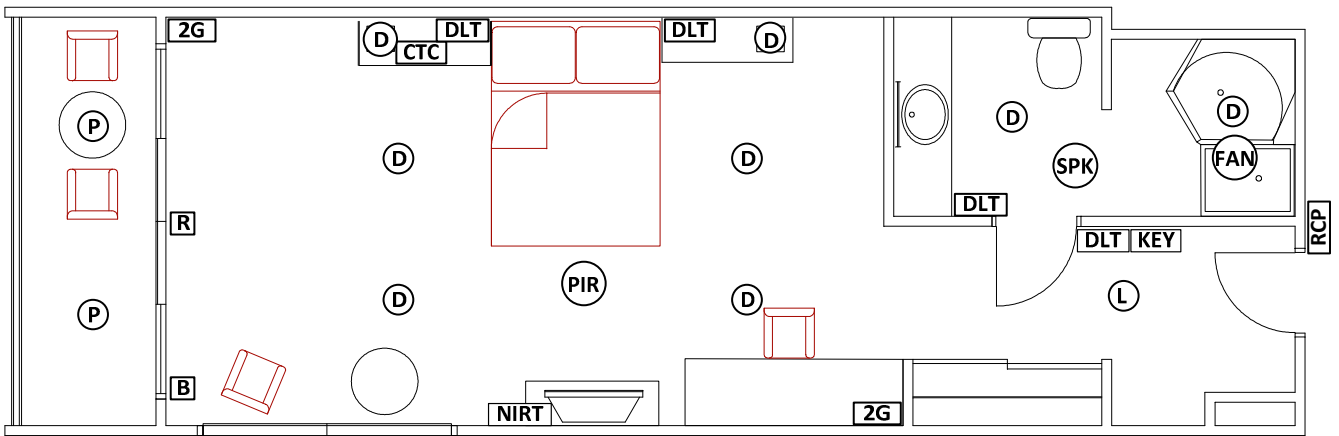
To reduce hotel running costs, conserve energy and provide an ambient venue for its guests, it is important for the facility to keep up to date with new integrated technologies that provide comfort, convenience, ease of use and genuine cost savings, for guests, staff and operations. Traditionally non integrated hotels rooms have higher power consumption which can often be attributed to electrical and mechanical services such as lighting and air-conditioning being left running for extensive periods whilst the room is left un-occupied.

Improving the energy efficiency of a hotel room can be simple and can have a flow on effect to the entire buildings energy consumption. Incorporating control strategies such as dimmable lighting, air-conditioning control and occupancy detection are examples of this. For instance, by automatically switching off or dimming, reduces the power consumption of the light fittings, the lamp life can be extended, assisting with cost savings associated with maintenance. Adjusting temperature set points depending on whether a room is occupied may also provide energy savings.

Automation benefits and control strategies can go beyond energy savings. A well planned automation system can provide the guest with a unique and intuitive experience, allowing them the ability to control services such as electrical, mechanical and audio visual systems within their own room from devices such as touch screens, local wall switches and even personal smart devices. The automation system can also assist hotel staff by integrating the automation solution to a centralised Property Management System within the hotel, updating current room status.

All of this can be achieved using a Clipsal C-Bus system.

Example Area Layout & Features



Features:

- Intelligent Room Automation Customisable
- Welcome, Shutdown, Wake Up Scenes/Moods
- Courtesy Panel (Make Up Room, Do Not Disturb & Door Bell)
- Bedside Touch Screen console
- Master Lighting Control Key Tag
- Multiple dimming and switching of local lighting
- Dynamic Labelling of wall switches with multiple languages
- High Level Audio Visual control
- Bathroom Music Audio Control
- Blind and Curtain Control
- Smart device connectivity to room control
- Air-Conditioning Control
- Balcony Door Status A/C Shutdown
- Room Occupancy Status
- Access Control Integration
- High Level Building Management Integration (BMS)
- Property Management Services Integration (PMS)

LEGEND	
(L)	LED Light Fitting
(D)	Dimmable LED Light Fitting
(P)	Compact Fluorescent Light Fitting
—	Fluorescent Pelmet Light Fitting
CTC	C-Bus Spectrum Desktop Colour Touch Screen
DLT	C-Bus Dynamic Labelling Switch
RCP	C-Bus Room Courtesy Panel
NIRT	C-Bus Infra-red Transmitter
2G	C-Bus 2 Gang 'Saturn' Wall Switch
KEY	Key Tag
R	Reed Switch
B	C-Bus Blind & Shutter Relay
SPK	Audio Speaker
PIR	360 Degree Occupancy Sensor
FAN	Bathroom Fan

Control Strategy – Hotel Room

- **Local Lighting Control**

It is important to provide flexible multi way switching and dimming of lighting which a guest can easily adjust to create the desired ambiance. Having the ability to dim lights can not only provide a more comfortable environment, it provides for energy efficiency gains. A C-Bus lighting control system provides dimmer modules to control loads such as Low Voltage down lights (LV), Compact Fluorescent Light fittings (CFL) and LED lighting. Hotel room automation must be intuitive and functional for any guest to confidently operate. C-Bus Dynamic Labelling Technology (DLT) wall switches located around the room can control local lighting and provide scene setting control of the entire room. The switch also provides the ability to display labels for each function so the guest can easily interpret its functions. C-Bus DLT's have the ability to be configured in a variety of languages for international guests.

- **Touch Screen & Bedside Console**

A desk mount C-Bus colour touch screen located adjacent to the bed can be used to complement or control a C-Bus room automation system. Touch screens provide an intuitive and extensive range of advanced features for both guests and hotel staff. The flexibility of a touch screen caters for changes during the installation and for future which is a great benefit for hospitality designers.

A bedside touch screen console provides:

- Scene and mood control of lighting and climate
- Graphical buttons and text for control of lighting, blinds, A/C and AV
- Ability for multi-lingual pages for international guests
- Do Not Disturb and Make Up Room mode setting and status
- Time clock
- Alarm Clock wake up mood function such as dimming lighting up, opening blinds, switching TV/Music on.
- Local AV control of TV or audio
- Blind Control up / down
- Hotel staff pre-welcome room setup mode
- Flexibility for on-going changes without the need for switches or relabelling

- **Key Tag Switch**

A key tag inside the door at the entry to the hotel room can intuitively activate a lighting scene when a door card is inserted. When exiting the room, removal of the key card activates another scene which can shutdown A/C, TV and lighting proving energy savings. Status of the room can be monitored by the Property Management System (PMS) in conjunction with the key tag.

- **Courtesy Panel**

In a 5 Star hotel guest satisfaction is paramount, to the extent that any undesirable interruption by housekeeping or maintenance staff while a room is occupied must be avoided. A C-Bus Room Courtesy Panel (RCP), located in the corridor external to the room, provides a means for the guest to display a "Guest Mode" for the room such as "Do Not Disturb" or "Make Up Room". A C-Bus switch or touch screen within the room can set the desired guest mode. The courtesy panel can also provide a door bell into the room. This functionality can be muted by the guest

when “Do Not Disturb” is active. The courtesy panel has the additional ability to send the occupancy status to the Property Management System for further integration benefits, such as energy savings.

- **AV Equipment**

Audio Visual devices such as televisions, DVD players and Stereos can be controlled by a C-Bus system. This allows a guest a variety of ways to control their hotel room experience. AV devices may be used within a Welcome or Wake Up mode, or even when selecting a TV or Movie mode switching on the TV, DVD and dimming lights accordingly.

- **Bathroom Audio**

For greater guest experience and ambiance, music/audio can be provided into the bathroom. The volume can be adjusted from a C-Bus DLT switch which also provides lighting control. The source of the audio can be from the line output of the TV in the room or a device such as an iPod docking station.

- **Blind and Curtain Control**

Automated control of blinds and curtains can provide the guest with a level of flexibility and comfort. It can also enhance energy efficiency by limiting the external environment thermal transfer heating/cooling load affect of the room when unoccupied. Further to this, it can reduce reliance on artificial heating and cooling methods to bring the room climate back to a comfortable level when reoccupied.

The Clipsal system provides intuitive control from switches or touch screens via C-Bus blind control relays connected to motorised blinds allowing control from any location. Blinds can be controlled manually or automatically and used in conjunction with scenes, sensors and time schedules.

- **Air-conditioning**

Air-conditioning can contribute 30-40% towards a hotels energy costs. Reducing air-conditioner energy consumption without impacting guests comfort is an achievable control strategy.

Monitoring the room occupancy via a C-Bus motion detector can turn off the air conditioner when the room is unoccupied for a timed period. A Room Key tag can allow A/C operation when inserted into a Key Tag switch, and turn off A/C and lighting when removed. In some hotel environments it is important to monitor the state of the balcony door and turn off A/C if the door is opened.

To prevent a guest from walking into an uncomfortable environment upon arrival the air-conditioning can be preset ON from the Property Management System at check in. This would require the hotel room A/C to be connected via a common Ethernet or C-Bus network.

Alternatively a high level interface to the Building Management System (BMS) can be used (i.e. BACnet, OPC) to integrate with the buildings A/C system. The BMS can monitor an occupancy sensor and control the A/C accordingly; this can provide energy efficiency gains. Alternately a low level contact output from a C-Bus relay can be used for integration to the A/C system input.

- **Smart Device Connectivity**

More people are requiring connectivity from their personal smart devices, such as smart phones, while in their accommodation room. An automated room can be setup to provide the ability to connect a guest’s smart device to various devices in the room. Connectivity can also be achieved from a hotel supplied tablet such as an iPad, to control the room.

- **Energy Monitoring**

Businesses and guests are becoming more conscious of their energy consumption at work, home or away, with various applications allowing the monitoring of their own power and utility usage.

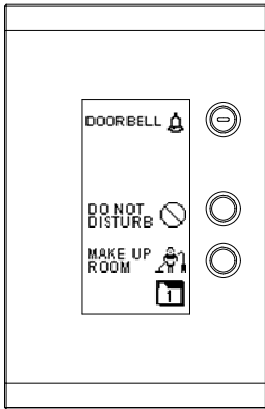
A guest staying at a hotel with a C-Bus room automation system can display the hotel room’s energy usage on a smart device, web page or in a room display. The guest can then monitor their in room energy consumption and to have a more sustainable focus on the rooms behaviour.

Typical Scene Configuration

SCENE	<i>Lounge</i>	<i>Bed Side</i>	<i>Bathroom</i>	<i>TV GPO</i>	<i>Lamp GPO</i>	<i>Blinds</i>	<i>A/C</i>
Welcome	ON	ON	OFF	OFF	OFF	Open	ON
Night	0-25% 1mins	0-25% 1mins	50%	OFF	ON	Closed	ON
Wake Up	0-50% 5mins	0-80% 5mins	OFF	ON	OFF	Open	ON
Goodnight	OFF	OFF	OFF	OFF	OFF	Closed	ON
TV/Movie	25%	25%	OFF	ON	OFF	Closed	ON
Housekeeping	ON	ON	ON	OFF	ON	Open	OFF
Shutdown	OFF	OFF	OFF	OFF	OFF	Closed	OFF

Example DLT Switch Function and Labelling

External Door



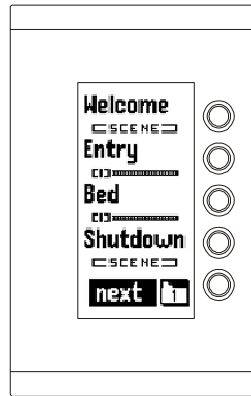
Page 1 Functions

- Button 1: Door Bell
- LED 1: Do Not Disturb
- LED 2: Make Up Room

Clipsal Room

Courtesy Panel

Internal Entry



Page 1 Functions

- Button 1: Welcome
- Button 2: Entry Light
- Button 3: Bed Light
- Button 4: Shutdown
- Next Page Button

Clipsal DLT

Glass Facia Switch

Bedside



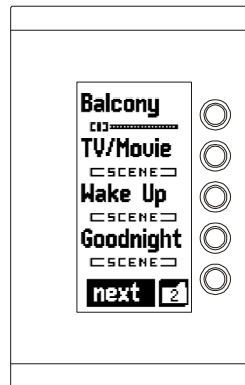
Page 1 Functions

- Button 1: Bed LH
- Button 2: Night
- Button 3: Do Not Disturb
- Button 4: Make Up room
- Next Page Button

Clipsal DLT

Glass Facia Switch

Bedside



Page 2 Functions

- Button 1: Balcony
- Button 2: TV/Movie
- Button 3: Wake Up
- Button 4: Goodnight
- Previous Page Button

Clipsal DLT

Glass Facia Switch

*Note: Labelling and functionality is customisable to suit the project and client

Typical Touch Screen Layouts



Timeout Page



Main Menu



Do Not Disturb Active



Alarm Settings



Lighting Control



Lighting Scenes

Typical Touch Screen Layouts



TV Control



Audio Control



Air Conditioning Control



Fan Control

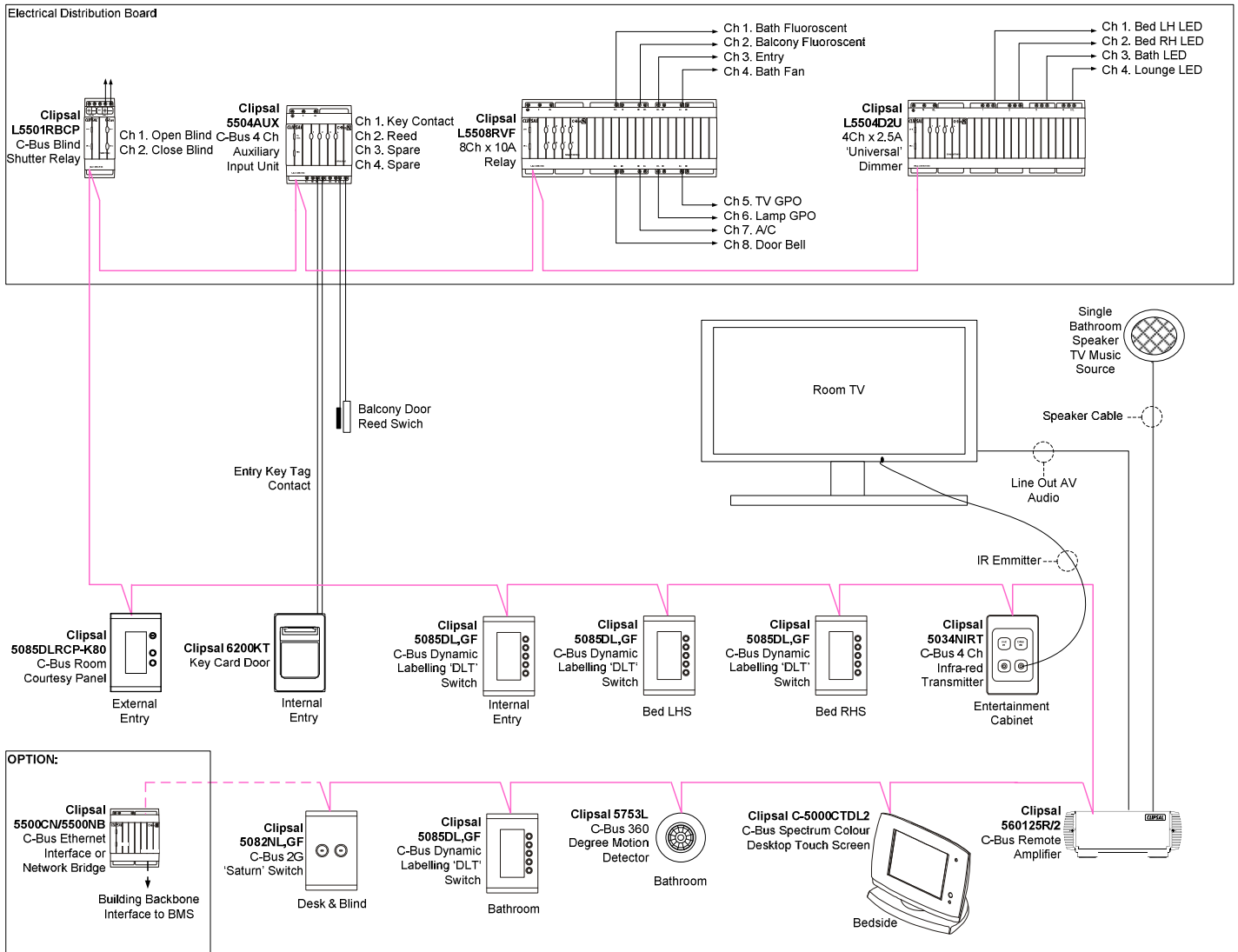


Help Screen / Language Options



Main Menu-Chinese (Example)

Hotel Room Single Line Diagram



NOTES:

*Alternately DALI florescent light fittings can be controlled using a C-Bus/DALI gateway (5502DAL2PS) or if required DSI dimmable lighting fittings using C-Bus DSI (L5508DSI) output modules. C-Bus can also provide analogue 0-10v output modules (L5504AMP) if 0-10v dimmable ballasts are used.

** If LED lighting is not 240v dimmable (Phase Control) then other common methods of control can be used including 0-10v/DSI/DALI/DMX provided that the LED controller type is compatible.

Third Party Integration

- **Building Management Systems (BMS)** can be integrated to the C-Bus system at a low level using simple contact closures to communicate a state change. High level integration can be offered using a BACnet gateway (5000BACNET) or OPC server software license (5000SDINST/*) allowing multiple software applications to share C-Bus data, and achieve a high level interface between the C-Bus Lighting Control System and Building Management System (BMS). The synergy of both C-Bus and BMS systems can provide energy efficiency gains when scheduling services such as HVAC and lighting.
- **Property Management System (PMS)** can be integrated to the C-Bus room automation system at a high level for check in/checkout functionality. The C-Bus building backbone room system can be integrated using a BACnet gateway (5000BACNET) or OPC Server software license (5000SDINST/*) allowing multiple software applications to share C-Bus data, and achieve a high level interface between C-Bus automation system and Property Management System. The synergy of both C-Bus and PMS systems can provide energy efficiency gains when pre-welcoming or shutdown room HVAC and lighting.
- **Third Party Audio Visual Systems** - AMX & Crestron AV equipment can communicate with C-Bus via a Clipsal PC Interface (PCI) using the RS232 protocol or a Clipsal Network Interface (CNI) using TCP/IP. This connection will allow the third party AV equipment to control C-Bus Group Addresses at a high level. This functionality maybe utilised in Penthouse suites or function rooms.
- **Third Party Air-conditioning Systems** - Where BMS systems are not in place or the A/C system is not capable of integration, traditional third party a/c units can be controlled on/off with the use of a C-Bus relay.
- **TCP/IP** is a standard Ethernet protocol which can be used for integration using a Clipsal Network Interface (5500CN2).
- **RS232** is a common protocol used when integrating third party products. RS232 integration can be achieved using a Clipsal PC Interface (5500PC), C-Bus touch screens and the Pascal Automation Controller (5500PACA).
- **Infra-red Control** can be achieved using a C-Bus NIRT 5034NIRT transmitter which maps C-Bus Group Addresses to IR commands.

Typical Equipment

Part Number	Description	Quantity
L5504D2U	Clipsal 4 Ch Universal Dimmer	1
L5508RVF	Clipsal 8 Ch Voltage Free Relay	1
L5501RBCP	Clipsal Shutter Relay Unit	1
C-5000CTDL2	Clipsal Spectrum Colour Desktop Touch screen	1
5753L	Clipsal 360 Degree Occupancy Detector	1
560125R/2	Clipsal C-Bus Remote Amplifier	1
5600K03-WE	Clipsal Ceiling Mount Speaker (Bathroom)	1
5085DL,GF	Clipsal LCD Dynamic Labelling Switch	4
5085DLRCP-K80	Clipsal C-Bus Room Courtesy Panel	1
5082NL,GF	Clipsal 2 Gang 'Saturn' Wall Switch	2
6200KT	Clipsal Key Tag Card Switch	1
5500AUX	Clipsal C-Bus 4 Ch Auxiliary Input Unit	1
5034NIRT	Clipsal IR Transmitter Unit	1

DB Output Channel Schedule

Output unit	Channel Number	Description	Load Type	Control Gear	Number of Light Fittings
Universal Dimmer	1	Bed LH LED	LED	Dim Phase Control	1
	2	Bed RH LED	LED	Dim Phase Control	1
	3	Bath LED	LED	Dim Phase Control	2
	4	Lounge LED	LED	Dim Phase Control	4
C-Bus Relay	1	Bath Fluorescent	Fluorescent	ON/OFF	1
	2	Balcony Fluorescent	Fluorescent	ON/OFF	2
	3	Entry	LED	ON/OFF	1
	4	Bath Fan	Fan	ON/OFF	
	5	TV GPO	GPO	ON/OFF	
	6	Lamp GPO	GPO	ON/OFF	
	7	A/C	A/C	ON/OFF	
	8	Door Bell	Chime	ON/OFF	
Auxiliary Input Unit	1	Key Tag Card	Contact Input		
	2	Balcony Reed	Contact Input		
	3				
	4				
Shutter Blind Relay 2	1	Open Blind/ Curtain	Motor	ON/OFF	
	2	Close Blind/ Curtain	Motor	ON/OFF	

Resource Links

For further information including Product Datasheets, Installation Instructions and Downloads visit

<http://www.clipsal.com/cis>

It is recommended that a Clipsal C-Bus trained specialist is engaged for large integration projects for design, programming and commissioning. This should be a C-Bus Approved installer, Clipsal PointOne Integrator or a Clipsal Platinum partner depending on the size of the project and level of integration required.

Clipsal Platinum partners are skilled in commercial projects covering areas such as TCP/IP, lighting control design, building management systems, lighting principles, as well as sound understandings of Building Code of Australia Section J, Australian Standards, NABERS and Green Star Ratings.

In addition, Clipsal Platinum members will provide professional detailed documentation and specifications for projects including handover training to the client.

Engaging a Clipsal Platinum Partner provides key benefits to the contractor, consultant and the end user including the manufacturers support from project design through to completion.

A Clipsal Platinum Partner can also offer extended C-Bus product warranty from the standard 2 years to 4 years subject to the site being inspected and becoming a certified C-Bus Approved site.

For further information on the Clipsal Platinum Partner program visit

<http://www.clipsal.com/platinum>

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