

A decorative horizontal band spanning the width of the page. It features a light beige section on the left with the text 'LIGHTING DESIGN SYSTEM CONTROL BRIEF'. The right side transitions into a dark green section with a white circuit-like line and three green dots. The overall design is modern and technical.

## LIGHTING DESIGN SYSTEM CONTROL BRIEF

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## C-BUS CONTROL AND MANAGEMENT SYSTEMS

The C-Bus solution is a high quality, simple to design and install control system suitable for lighting and power control. C-Bus is recognized world wide as being one of the most flexible and reliable systems. It can be configured without a PC. The C-Bus system is ideal for commercial and residential control applications. This building automation package offers a reliable solution which system seamlessly integrates to provide security, door access, lift control, HVAC control, giving a complete integrated building control package.

C-Bus is a microprocessor-based control and management system for Buildings and Homes. It is used to control lighting and other electrical services such as pumps, Audio Visual Devices, Motors, etc. Whether it is a simple ON/OFF control of a lighting circuit, variable (analogue) type control, such as electronic dimmable fluorescent ballasts, C-Bus can be used to easily control virtually any type of electrical load.

To ensure fast and reliable operation, each C-Bus device has its own in-built microprocessor and "intelligence", allowing units to be individually programmed.

C-Bus uses a patented method for updating the status of units. This method does not require a central computer or central controller to handle databases or lookup tables to operate. The status of each C-Bus unit is initiated at specific time intervals, without the need of a central controller. Each device is allocated a specific time frame to broadcast its status, synchronized by a self-generated system clock pulse. This allows large amounts of data to be transmitted in a very small time frame, effectively and reliably on the network, leading to low processing overheads and low bandwidth requirements.

### ***Overview of the C-Bus Control Systems***

- C-Bus is a microprocessor control wiring system to control lighting and other electrical services.
- Whether ON/OFF or variable type control, C-Bus is used to easily control virtually any type of electrical load.
- Control information is downloaded and held in C-Bus units, rather than all information kept on a central processing unit. Whilst a computer is unnecessary for normal C-Bus operation, there are several software-based tools available to provide additional flexibility to building managers requiring this type of control.

### ***The C-Bus Network***

A Network Bus is the communications wiring for the system, consisting of an unshielded twisted pair (UTP) 'Cat 5e' cable. The Network Bus also provides the small amount of power needed to operate the circuitry within C-Bus units. The C-Bus Network operates at safe extra low voltage levels (36V DC).

### ***Free Topology Structure***

The C-Bus connections may be looped from unit to unit, or a branched at any point. This 'free topology' structure provides a flexible system layout. New units can be added anywhere without system re-configuration.

### ***Distributed Intelligence***

All Units on the Network each have their own built-in microprocessor, non-volatile memory and operating program, allowing them to operate independently with "distributed intelligence". This provides reliable, high-speed communications and ensures that a malfunction in one unit will not affect the operation of any other Unit.

### ***Simple Control***

The size of a C-Bus Installation is practically unlimited. A large installation is usually divided into Networks of 100 C-Bus Units, with a total cable length of 1000m per Network. This allows a C-Bus system to be divided into manageable sections, simplifying design, limiting potential fault propagation and aiding in any troubleshooting.

### ***Multiple Events***

A C-Bus key Input switch maybe programmed so that the length of time the key is pressed determines what Command is issued - a short press could issue an on/off command and a long press can control a dimming command. Single input units may control a number of Output Devices, and multiple Input Units may also control a single Output Device.

### ***Logic***

Conditional (IF-THEN-ELSE) statements can be programmed into a C-Bus system, allowing events to be based upon the status of other devices, time of day and other situations.

## ***Ultimate Control Flexibility***

- The C-Bus system can carry out control in a number of ways, including;
- Centralised controls, via a PC or a C-Bus Touch Screen.
- Any input device can be programmed as a master control point.
- C-Bus has an over-ride control hierarchy allowing control of areas, buildings and sites.
- C-Bus allows practically unlimited switching configurations.
- There is no need for a mains voltage connection between any units.
- Any input can control any load, regardless of which circuit or phase.

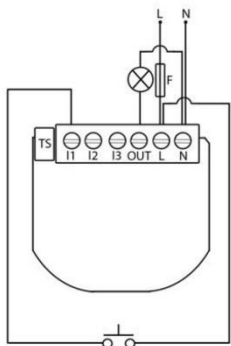
## ***Why use C-Bus?***

- C-Bus is simple to document at project design stage. Design changes can be made without changes to the wiring
- C-Bus can control many types of load, digital and/or analogue.
- A single C-Bus cable connection can control an unlimited number of devices.
- Control functions can be added, removed, moved or reprogrammed at any time without any hard wiring.
- Extra Output or Input Units can be added at any time.
- C-Bus is simple to install and commission.
- Powerful, flexible and fully customisable Software-based control and monitoring tools.

## ***Applications for C-Bus***

- Commercial office lighting control.
- Stadium lighting.
- Architectural dimming.
- Smart home controls.
- Hotel lobbies.
- Hotel room control.
- Demand scheduling.
- Power device switching.
- Scheduling of switching.
- Factory and warehouse lighting.
- Boardroom presentation system.

## EQUIPMENT SCHEDULE



**NERO-RELAY**

This module is used for switching on or off an electrical device (e.g. light or fan). The module can be controlled either through a NEXUS-NERO Communications Gateway or through a wall switch.

- NERO-RELAY supports momentary switches (push button) and toggle switches. The module is factory set to operate with toggle switches.
- NERO-RELAY must be protected by an over current protection fuse not rated any higher than 10A as illustrated in the wiring diagram.

### WIRING DIAGRAMS

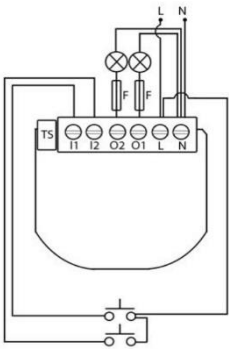
N Neutral  
L Live  
OUT Output for electrical device  
I3 Optional switch input  
I2 Optional switch input  
I1 Input for switch to control OUT  
TS Terminal for digital temperature sensor

#### Maximum Ratings 240VAC

Output current (resistive load) 10A  
Output power (resistive load) 2300W

### Technical Specifications

Power supply	110 - 230 VAC $\pm 10\%$ 50/60Hz, 24-30VDC
Rated load current of AC output (resistive load)*	1 X 10A / 230VAC
Rated load current of DC output (resistive load)**	1 X 10A / 30VDC
Output circuit power of AC output (resistive load)	2300W (230VAC)
Output circuit power of DC output (resistive load)	240W (24VDC)
Power measurement accuracy	P=5-50W, $\pm 3\%$ P>50W, $\pm 3\%$
Digital temp. sensor range (must be ordered separately)	-50 ~ +125°C
Operation temperature	-10 ~ +40°C
Distance	Up to 20m indoors
Dimensions (WxHxD)	41.8x36.8x15.4mm
Weight	28g
Electricity consumption	0.4W
For installation in boxes	$\varnothing \geq 60\text{mm}$ or 2M



This module is used for switching on or off two electrical devices (e.g. lights or fans). The module can be controlled either through a NEXUS-NERO Communications Gateway or through wall a wall switch.

## NERO-2RELAY

- NERO-RELAY supports momentary switches (push button) and toggle switches. The module is factory set to operate with toggle switches.
- NERO-RELAY must be protected by an over current protection fuse not rated any higher than 10A as illustrated in the wiring diagram.

## WIRING DIAGRAMS

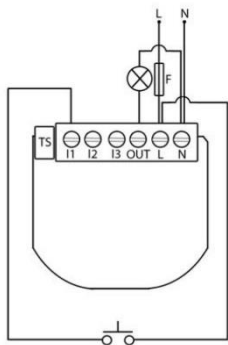
N	Neutral
L	Live
O1	Output for electrical device no.1
O2	Output for electrical device no.2
I2	Input for switch to control M2
I1	Input for switch to control M1
TS	Terminal for digital temperature sensor

### Maximum Ratings 240VAC

Output current (resistive load)	4A
Output power (resistive load)	920W

### Technical Specifications

Power supply	110 - 230 VAC $\pm 10\%$ 50/60Hz, 24-30VDC
Rated load current of AC output (resistive load)*	2 X 4A / 230VAC
Rated load current of DC output (resistive load)**	2 X 4A / 30VDC
Output circuit power of AC output (resistive load)	2 X 920W (230VAC)
Output circuit power of DC output (resistive load)	2 X 96W (24VDC)
Power measurement accuracy	P=0-200W, $\pm 2\%$ P>200W, $\pm 3\%$
Digital temperature sensor range (sensor must be ordered separately)	-50 ~ +125°C
Operation temperature	-10 ~ +40°C
Distance	Up to 20 m indoors
Dimensions (WxHxD)	41.8x36.8x16.9mm
Weight	28g



This module is used for dimming lights. The module can be controlled either through a NEXUS-NERO Communications Gateway or through a wall switch.

## NERO-DIM

- NERO-DIM module only supports 3-wire installations, active, load and neutral.
- NERO-DIM supports momentary switches (push button) and toggle switches. The module is factory set to operate with momentary switches.
- NERO-DIM has maximum load of 0.6A, that equates to 140W. The NERO-DIM has been designed specifically as a universal LED dimmer for the residential market with the assumption that the total LED lighting circuit load will not exceed 140W. For this reason, if other loads such as halogen are used, take special note of the total power consumption of the circuit.
- NERO-DIM must be protected by an over current protection fuse not rated any higher than 1A as illustrated in the wiring diagram.

## WIRING DIAGRAMS

N Neutral  
 L Live  
 OUT Output for electrical device  
 I3 Optional switch input  
 I2 Optional switch input  
 I1 Input for switch to control OUT  
 TS Terminal for digital temperature sensor

### Maximum Ratings 240VAC

Output current (resistive load) 0.6A  
 Output power (resistive load) 140W

## Technical Specifications

Power supply	110 - 230 VAC $\pm 10\%$ 50Hz, 24-30VDC
Rated load current of AC output	0.6A / 230VAC
Rated load current of DC output*	0,85A / 30VDC
Output circuit power of AC output (resistive load)	140W (230VAC)
Output circuit power of DC output (resistive load)	15W (24VDC)
Power measurement accuracy	$\pm 2W$
Digital temperature sensor range (sensor must be ordered separately)	-50 ~ +125°C
Operation temperature	-10 ~ +40°C
Distance	Up to 20 m indoors
Dimensions (WxHxD)	41.8x36.8x15.4mm
Weight	28g
Electricity consumption	0.7W
For installation in boxes	$\varnothing \geq 60\text{mm}$ or 2M



## NERO BY ENVIRONEXUS

A truly intelligent home is one that can be programmed to suit your customers' lifestyles, while understanding that their needs will change. A NERO Smart Home offers all that and more, by enabling devices to communicate with each other, giving users comfort, convenience, and peace of mind.

NERO, by Environexus, is an affordable, scalable, retrofit and wireless automation solution that allows you to build a dream smart home, one switch at a time. Your customer's smart phone or tablet becomes the control interface for all connected devices, seamlessly merging lifestyle and technology into one.

NERO's Australian designed wizard-based operating system offers guaranteed interoperability of all NERO devices, with advanced settings that allow you to completely customise each installation.

The NERO platform offers a range of innovative connected devices, such as dimmers, relays, dry contact, plug packs, security and sensors.

### NEXUS-NERO

The NEXUS-NERO is a communications gateway that allows connected devices to talk to each other over a home wireless network. Designed to plug directly into a Wi-Fi router, the NEXUS-NERO enables advanced scenes, schedules, triggers and general device control to be accessed through a smart phone or tablet.

- Connects up to 230 devices via NEXUS Mesh Network
- Works with Android and IOS devices for remote access
- Includes Ethernet cable and power supply
- Access to all Environexus software plug-ins





Environexus Pro

Available for both iOS and Android, simply open your device's APP store and search "ENVIRONEXUS PRO". The ENVIRONEXUS PRO application allows users to completely customize their NERO experience by offering dashboard views and interchangeable icons.

All PRO applications also include integrated voice control and easy setup of composite devices for group control. ENVIRONEXUS PRO allows multiple sites to be controlled on one interface, and works with the NERO OS as well as the NEXUS OS.



My Nero

Available for both iOS and Android, simply open your device's APP store and search "MY NERO". The MY NERO application is the easiest way to access all your devices directly from your smart phone or tablet. Features include auto-populate list views, ability to toggle between modes and easy setup of scenes, triggers and advanced automation such as geo-fencing.

## **NERO-DIM**

The NERO-DIM is a small retrofit 240v module that can be installed behind an existing light switch to provide smart control of LED down lights. It offers energy monitoring, multiple switching inputs, and variable configuration settings

- 0.65A, 140W electronic dimmer
- 3 switch inputs with optional temperature sensor
- Requires active and neutral
- Energy monitoring of connected load



## **NERO-RELAY**

The NERO-RELAY is a small retrofit 240v module that can be used to enable switching of an electrical device, such as lights, fans and appliances. It offers energy monitoring, multiple switch inputs and carriable configuration settings.

- 10A, 2400W relay
- 3 switch inputs with optional temperature sensor
- Requires active and neutral
- Energy monitoring of connected load



### **NERO-2RELAY**

Similar to the NERO-RELAY, the NERO-2RELAY is a small retrofit module that can be used to enable on/off control capability of two connected circuits. It offers energy monitoring of each circuit, multiple switching inputs, and variable configuration settings.

- 4A, 920W relay switching (x2)
- 2 switch inputs with optional temperature sensor
- Requires active and neutral
- Energy monitoring of connected load



### **NERO-BLIND**

The NERO-BLIND is a small retrofit module used to enable 240v switched motor control of blinds, roller shades and Venetian slats. It offers energy monitoring, multiple switch inputs and custom blind positioning.

- 4A, 920W blind controller
- 2 switch inputs with optional temperature sensor
- For use with existing 240V motorised blinds
- Also supports Venetian Blinds

