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E.S.P

1-10 volt Fluorescent dimming using C-Bus products

The following page shows a detailed drawing showing the typical connections when using C-Bus products to dim fluorescent light fittings, using the 1-10 volt control method.

Some installation notes are:

- The C-Bus Analogue Output unit is limited to how many fittings it will control (DIM). Please read additional information in these notes referring to the limitations.
- Special Electronic control Gear (ECG) for 1-10 volt dimming control is required in each light fitting.
- DALI or DSI Electronic Control Gear is not compatible with 1-10 volt dimming.
- Standard ECG's are not suitable for 0-10 volt dimming.
- "Compact Fluorescent" lamps can only be dimmed if they are 4 pin type lamps.
- The Residual Current Device (RCD) / Miniature Circuit Breaker (MCB) shown on the drawing may possibly be replaced by other separate components. Whilst "Over Current Protection" is required on all installations, the requirement for RCD protection is dependant upon your country's wiring codes and standards. Please confirm with your "Electrical Governing Authority" regarding this matter.

1 -10 Volt Control Line specifications	
Max Distance	100 Metres
Number of Conductors	2 x 1.5mm^2
Minimum Conductor Size	1.5mm^2
Maximum Conductor Size	1.5mm^2
Cable Insulation Rating	Must be "Mains Voltage Rated"
Conductor Identification	Each conductor to use appropriate colour to indicate its polarity
The cable must be run as a 2 core cable, running 2 single conductors is not suitable.	

- Correct polarity must be maintained for all "Control Lines". Incorrect polarity will cause the control lines to sit at approximately 5 volt and result in erratic dimming or no dimming at all.
- Within Australia 150mm minimum separation is required between the low voltage "Control Line cables" and the "Mains Cabling" supplying the actual Control Gear with its power. For further information please consult your local "Electrical Governing Authority" for regulations relating to the cabling of Low-voltage cables and Mains voltage cables within close proximity of each other.

How the 1-10 volt dimming method works

Components used in the drawing

As per the attached drawing, the example Group Address 10 (GA10) is used. The 'GA10' is programmed by the installer into;

- The required channel on the relay unit - L5504RVF / L5512RVF, etc.
- The required channel on the Analogue Output unit - L5504AMP.
- The Key Input unit - 5052NL, 5031NL, etc.

ON / OFF control

The "Active" wire supplying power to the Electronic control Gear is routed through the C-Bus relay module.

When a single button C-Bus wall plate (configured as a Toggle dimmer) is pushed quickly, it transmits a TOGGLE command. The toggle command either turns the relay ON or OFF depending on the relay's current state.

The L5504AMP unit then responds to the same toggle command and causes the light fitting to go to either 100% or 10% (10% being a minimum achievable dimming level dictated by the design of the Electronic Control Gear itself).

The C-Bus relay channel is an integral part to the control process. If it is not used, your result will be a fitting that dims from 10% - 100%, but will not turn OFF.

Dimming Control

If the C-Bus button is long-pressed (*pressed for longer than 400ms*), it will cause the Analogue Output unit to ramp its output voltage between 1 and 10 Vdc. This change in control line voltage then results in the light fitting dimming up or down until it reaches minimum/maximum level or until you release your finger. Once you release your finger the C-Bus wall plate transmits an ENDRAMP command, this stops the Analogue output unit at it present voltage level, 7 Vdc for example.

When using a NEO, SATURN or REFLECTION style C-Bus wall plate with 2 or more buttons on it, 2 of the buttons can be configured to operate as "complimentary buttons".

This means that both buttons control the same Group Address (GA10), however the control method is;

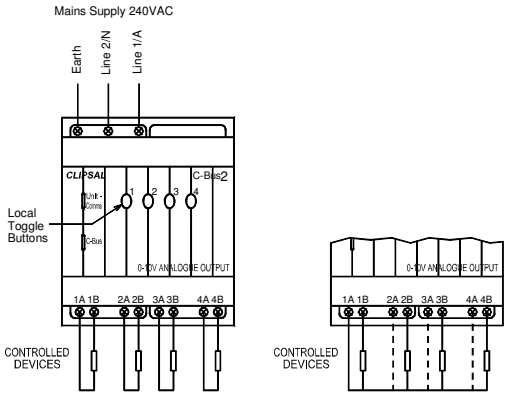
1st button - Short press =Off / Long Press= Dim Down

2nd button - Short press =On / Long Press= Dim Up

Electrical Specifications

Catalogue No.	L5504AMP
Nominal Supply Voltage	220-240V~
C-Bus Voltage	15-36V DC @ 22mA required for programming. Unit DOES NOT supply or /source power to the C-Bus Network.
Requires Mains Connection	YES, un-switched "Mains Power" connection is required to this unit
Electrical Isolation	3.75kV RMS from C-Bus to Mains
Output Voltage Range	0 to 10 Vdc
Output Rating – Sourcing - per channel	2.5mA (i.e. minimum of 4kΩ)
Output Rating – Sinking - per channel	15mA at Vout = 0V 8mA at Vout = 10V i.e. I = 15-(0.7*Vout)mA
Output Channels	4
Mains Terminals	Accommodates 2 x 1.5mm^2 or 1 x 2.5mm^2

Wiring Instructions



The diagram to the left, shows that terminals 1A, 2A, 3A, 4A are all common connections, thus allowing them to be connected together.

Note that transposed connections will adversely affect your dimming and cause the unit to provide approximately 5 Vdc constantly.

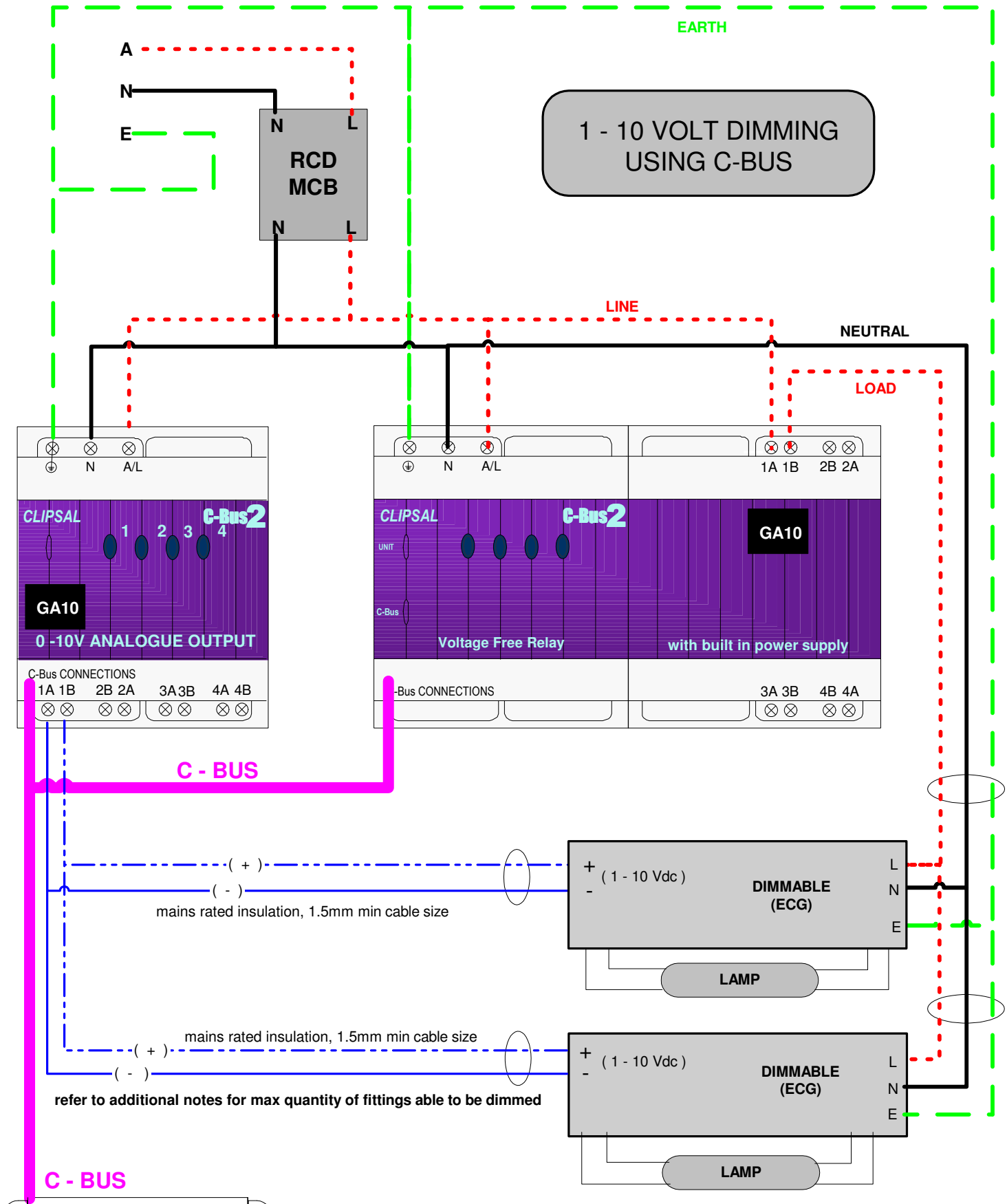
Limitations on how many fittings can be dimmed per channel using L5504AMP

Depending on the manufacturer of the dimmable control gear, the control gear may require either a "Sinking" Control or alternatively a "Sourcing" control. The C-Bus L5504AMP is able to perform either of these functions automatically; they are referred to in the table above as;

- Output rating sourcing
- Output rating sinking

As an example: OSRAM Quiktronic dimmable "Electronic Control Gear (ECG)" is listed in the OSRAM manual as a "Sinking" ECG and consuming 0.6mA per ECG. Therefore at maximum dimming level (10 Vdc sinking), the L5504AMP will supply (8mA). 8mA divided by 0.6mA = 13 ECG's per channel on a 4 channel C-Bus Analogue Output unit (L5504AMP).

To be conservative we would normally recommend 10 OSRAM ECG's maximum per channel. Please confirm with your ECG's manufacturer to determine its requirements.



NEO using complimentary keys

	Key 1	Key 2
Short Press	IDLE	IDLE
Short Release	RAMPOFF	UPKEY
Long Press	DNKEY	UPKEY
Long Release	ENDRAMP	ENDRAMP

Using 5031NL series

	Key 1
Short Press	IDLE
Short Release	TOGGLE
Long Press	DNCYCLE
Long Release	ENDRAMP

Keys 1	2	3	4	Timer Hrs	Min	Sec	Expiry Command	Store % 1	2	Indicators 1	2	3	4	<<<< Groups
✔	✔			0	0	0	IDLE	100	100	2	2			10
				0	0	0	IDLE	100	100					Unused