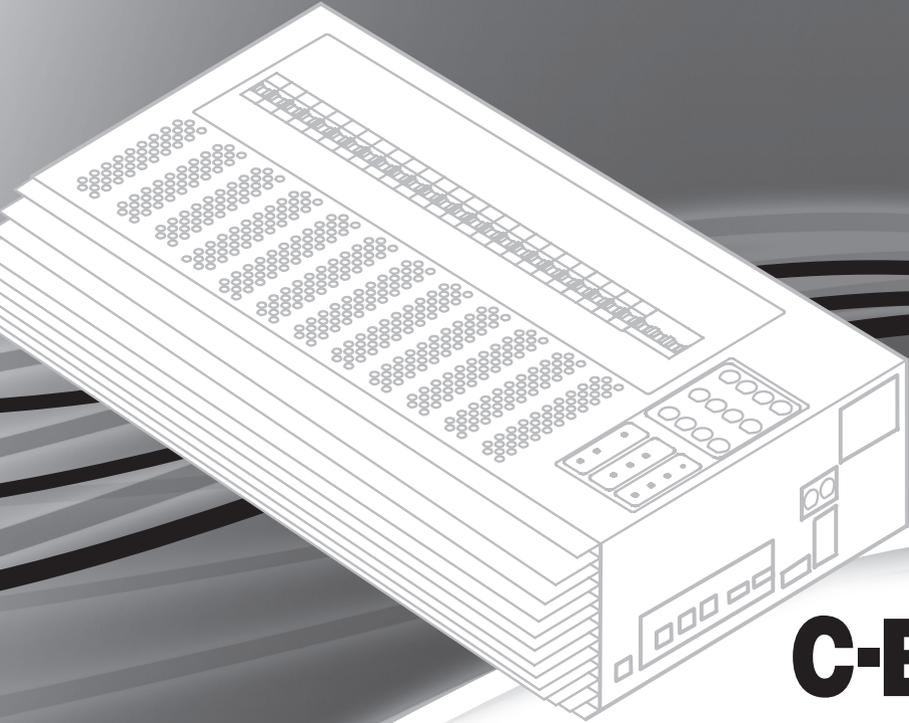


CLIPSAL[®]

by **Schneider Electric**



C-Bus[®]

Architectural Dimmer

L51xxDxxUA

Series



Installation Instructions

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1.0 Product Range

The C-Bus Architectural Dimmers are designed for high-power, universal dimming applications. You can specify 3, 6, or 12 dimmer channels, each with a specified current rating and lighting control type.

Optional variants with Residual Current Devices (RCDs/RCCBs) and 3-phase MCBs might be required for some applications. For the latest information, contact your Clipsal representative.

The catalogue number represents the configuration of your dimmer unit. The definitions of the fields in the number are shown below.

Product identifier	Number of channels	Dimmer unit	Current per channel	Universal	Architectural series	No. of RCDs/RCCBs	3-phase MCBs included
L51	xx	D	xx	U	A	Rxx	3M
L51	12	D	20	U	A	6	3M
	06		16			3	
	03		10			1	
			5				

Table 1 shows the nominal current per channel and supply phases and maximum load for dimmers containing any combination of channel modules (dimmer modules and ballast control modules).

Do not exceed the maximum load allowed for the dimmer unit.

Catalogue No.	Channels	Current per Channel	Supply phases	Maximum unit load
L5112D10UA	12	10A	3φ	120A
L5112D5UA	12	5A	3φ	60A
L5106D20UA	6	20A	3φ	120A
L5106D16UA	6	16A	3φ	96A
L5106D10UA	6	10A	3φ	60A
L5106D5UA	6	5A	1φ/3φ	30A
L5103D20UA	3	20A	3φ	60A
L5103D16UA	3	16A	3φ	48A
L5103D10UA	3	10A	1φ/3φ	30A
L5103D5UA	3	5A	1φ	15A

Table 1. Architectural Dimmer Unit channel phase and current characteristics

2.0 Description

The C-Bus Architectural dimmers are high-powered 3-, 6-, or 12-channel dimmers designed for commercial applications such as hotels, restaurants and office buildings. The Architectural dimmers are designed and tested for a wide range of international markets, with comprehensive EMC and electrical safety testing as well as ROHS compliance.

Either C-Bus or DMX512 protocols control the individual channels. The high power, multi-phase lighting control units are compatible with a wide range of load types, including neon. Advanced phase control techniques create a highly efficient range of dimmers. Electronic transformer loads need not be derated.

The Architectural dimmers provide on-board MCB protection, thermal overload protection, over-current protection and short circuit protection. They also accommodate the RCD requirements as per AS/NZS3000: 2007.

The dimmers contain modular, field replaceable, output channel modules of various ratings, allowing customisation to suit site needs. The 'Universal' dimmer modules use dual MOSFETs and have selectable mode switching. Contact the Clipsal sales organisation for details and product availability. A maintained active output is provided on each channel for emergency lighting.

In the event of an over-temperature condition, such as one where excessive load current is drawn, the dimmer channel reduces the output power as long as the condition exists.

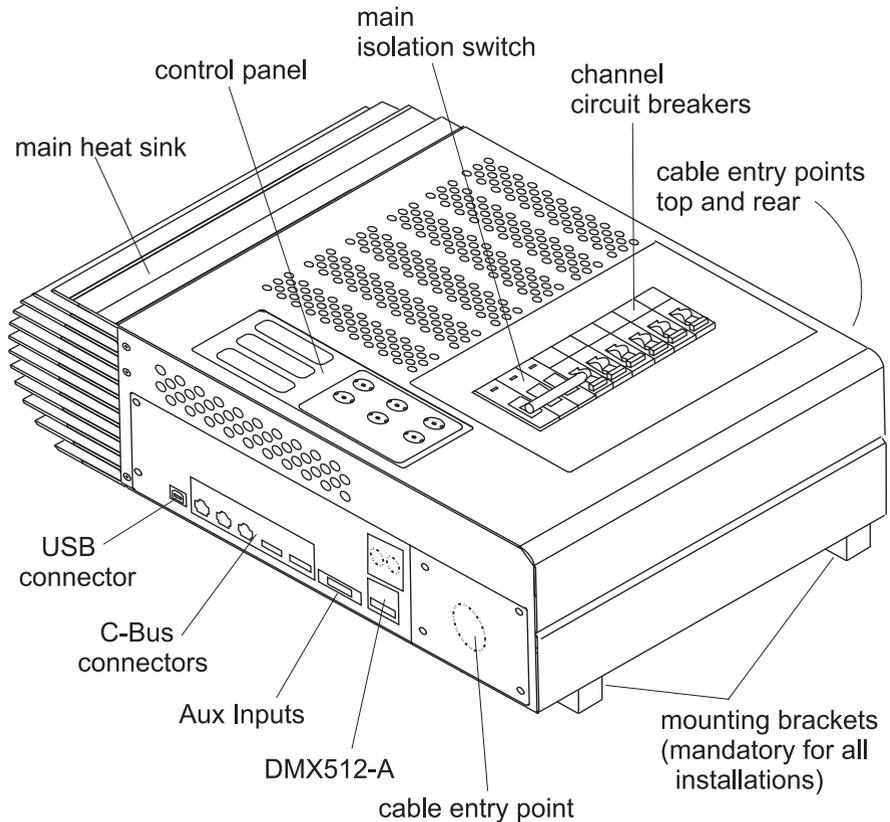


Figure 1. Architectural Dimmer unit (6-channel dimmer shown)

The main isolation switch disconnects all internal circuits from building power. In addition, each dimmer channel has a circuit breaker. Each channel also has a local toggle switch on the front control panel. The soft power on/off feature helps protect lamp filaments.

The Architectural Dimmer is programmed using C-Bus Toolkit software and also has ‘learn’ capability. The dimmer has software-enabled C-Bus clock and burden. When connected to mains power, the dimmer unit does not sink current from the C-Bus network.

Programmed dimmer channels, can be configured to return to their previously set lighting levels, in the event that AC power is lost and restored.

The bottom panel has three RJ45 C-Bus connectors wired in parallel and a 4-pin C-Bus connector wired in parallel with them. A four-pin connector is provided for optional, independent remote on/off operation. DMX512 control connections, DMX in and DMX through connectors are also located on the bottom panel.

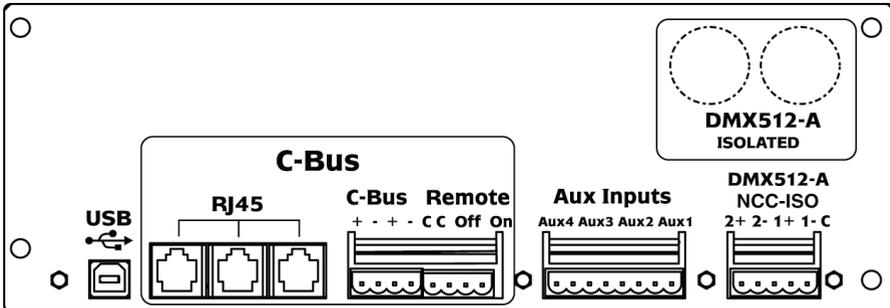


Figure 2. Bottom Connector Panel

Each dimmer channel card has an override switch for testing the connected lighting load at full power or isolating the electronics for Megger testing.

3.0 Important Safety Information

Only qualified personnel may install the dimmer units. The dimmer unit installation must meet all local safety requirements.

Read the following cautions before you install the unit:



CAUTION

Dimmer units weigh from 10kgs to 40kgs. Make certain that the mounting fixtures are secure before attaching the unit, and get assistance from another person when lifting and placing the dimmer.

Follow all cautions and safety instructions on the packaging materials and on the unit.

Never operate or service the dimmer unit with the front panel open. Always secure the panel with the locking screw before applying power.

The Architectural Series Dimmers are for indoor use only. Never allow liquids to spill or drip on the top of the unit. To prevent electrical shock, do not service the unit if it is wet. Do not stand on a wet surface when servicing the unit.

The total load on all dimmer channels must not exceed the rating of the main input isolator switch or the building circuit breaker protecting the dimmer unit. Do not exceed current ratings per channel or per input phase.

Connect only compatible load types to a module. If you are unsure about load or device compatibility with a channel module, contact Clipsal Technical Support.

Hazardous voltage is present at the dimmer channel outputs when building power is connected; this is a characteristic of dimmer products. Before servicing the equipment, the unit must be powered off and the main isolator must be padlocked. The Merlin Gerin padlocking device for the main input isolation switch is catalogue number 26970.

All connections must be tight to avoid risk of fire or damage to equipment.

The channel module T-brackets **do not use heat sink compound**. The bracket retainer screw-tightening torque specification is 0.7 Nm.

During normal operation, the heat sink can be hot to the touch. Do not block the ventilation holes at the top and bottom of the unit. Do not allow debris or dust to enter the unit.

For protection against fire and equipment damage, when upgrading a module, you must replace the associated MCB with one of the correct type and current rating.

Do not wire dimmer channels in parallel.

Do not short the dimmer channel outputs to neutral or earth.

Do not connect more than three MCBs downstream from a single RCD.

Do not Megger test channel modules. Isolate the dimmer or ballast module using the channel MCB before testing the lighting load wiring.

Using non C-Bus software might cause erratic equipment behaviour and voids the warranty.

Using Clipsal Toolkit software, you can program a dimmer channel to control 110-117 Volt lighting loads. Do not use the channel override switch on these channels. The switch will apply full mains voltage to the load.

4.0 Getting Started

4.1 Installation Requirements

- The dimmer unit must be connected to phases equipped with a protective device that has a short circuit withstand current rating of 6 kA.
- Use of the supplied mounting brackets is mandatory. Refer to Mounting Considerations.
- Airflow around the main heatsink and the ventilation holes must not be restricted. If an enclosure is used, it must provide adequate ventilation.
- Connect only compatible load types to the dimmer.
- Using non C-Bus software voids the warranty.
- Do not wire dimmer channels in parallel or short dimmer channel outputs to neutral or earth
- Isolate the dimmer channel cards using the circuit breakers before Megger testing the load wiring.
- Clipsal does not recommend soldered connections for mains, output or C-Bus wiring.
- Clipsal recommends the use of external protection against power surges.

4.2 What You Need to Install the Unit

When installing the dimmer unit on the wall, you need the following:

- Mounting template that is provided with the unit
- 2 Mounting brackets, provided with the unit
- 4 Mounting screws or anchors

Optional Items that might be helpful:

- Merlin Gerin padlocking device for the main input isolation switch; catalogue number 26970
- Clipsal 970 Series Surge suppression device
- Clipsal C-Bus Network Analyser tool (5100NA)

5.0 Installation

5.1 Installation Sequence

Use these steps to minimise the risk of personal injury or damage to the dimmer unit or lighting fixtures.

1. Check the unit for obvious physical damage before installation.
2. Choose a wall location for the dimmer where the unit will not interfere with normal business operations. Provide for adequate ventilation. See *Mounting the Dimmer on the Wall*.
3. Use the supplied template. Accurately drill the mounting holes. Install the mounting brackets securely to the wall.
4. Place the dimmer unit on the mounting brackets. Check that the unit is securely fastened to the wall.
5. Measure the hole size needed for cable entry. Drill holes in the cover plates so that there are no gaps larger than 10 mm around the cables. There must be no sharp edges around the cable entry holes. Insulated conductors must not rest against bare live parts at a different potential and shall be adequately supported. Then install the cable entry covers.
6. Connect the lighting load wiring. The dimmer is compatible with copper and aluminium conductors.
7. Connections can loosen during shipping. Make sure that all internal circuit breaker and terminal connections are tight.
8. Route the C-Bus network cables away from mains power conductors to comply with all local wiring regulations.
9. Set the channel override switches ON for testing, and then switch them OFF for normal operation.
10. Isolate the unit from building power before performing Megger testing. Do not Megger test the channel modules or the C-Bus network cables.
11. Double check all wiring connections before applying mains power to the unit.

5.2 Mounting the Dimmer on the Wall

When mounting the dimmer unit, follow these guidelines:

- You must use the supplied mounting brackets. Use the provided installation template to accurately drill the four required holes.
- The mounting bracket hole size is 10 mm. Use 8mm minimum diameter Dynabolts or similar, depending on the mounting surface. Use suitable washers. Bolts and washers are not provided.
- The mounting substrate must be reinforced to support the weight of the unit, up to 40 kg.

Providing Clearance for the Dimmer

Allow a minimum gap of 100 mm on each side of the dimmer to allow for adequate ventilation and access to wiring and connectors.

When installing the mounting brackets, refer to Figures 3 through 5 and Tables 2 and 3.

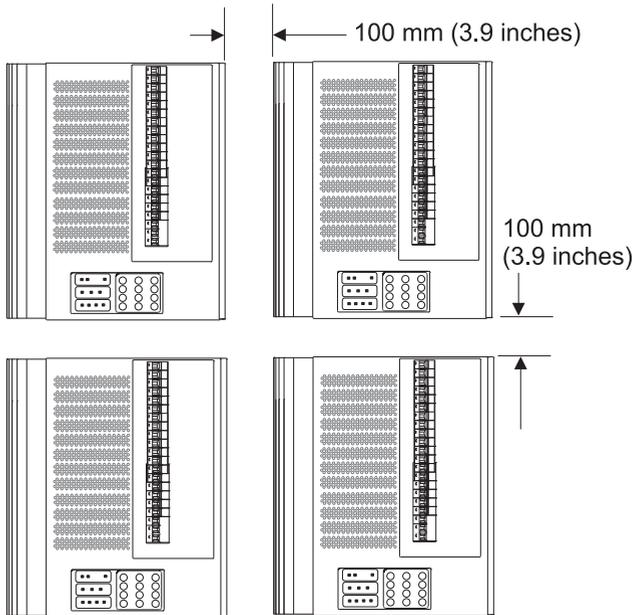


Figure 3. Clearance requirements for dimmer units

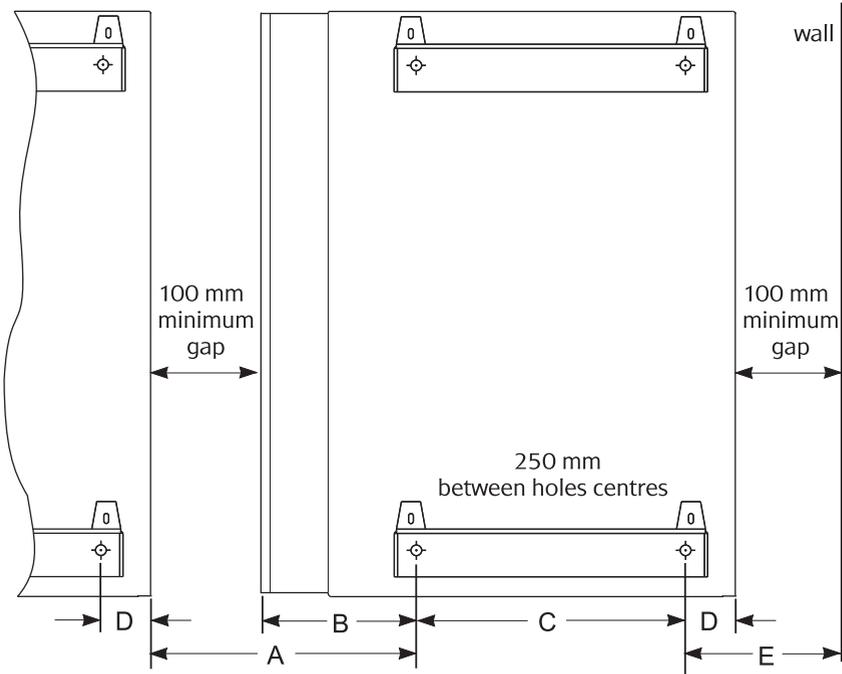


Figure 4. Side clearance requirements for Architectural Dimmers (Refer to Table 2 for exact dimensions)

Dimension		Value	
Dimmer width		455	412
A	Left side distance from the nearest wall or dimmer to the left-hand hole centres of the mounting brackets	250	207
B	Distance from the left side of the dimmer to the left-hand hole centres of the mounting brackets	150	107
C	Distance between mounting bracket hole centres	250	250
D	Distance from right-hand hole centres of the mounting brackets to the right side of the dimmer	55	55
E	Right side distance from the right-hand hole centres of the mounting brackets to the wall or the next dimmer	155	155

Table 2. Side clearance dimensions for Architectural Dimmers

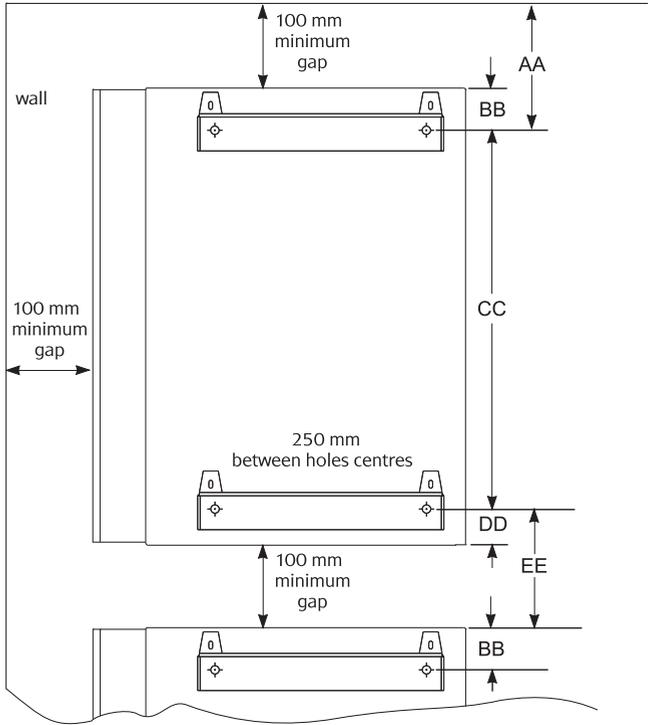


Figure 5. Vertical clearance requirements for Architectural Dimmers (Refer to Table 3)

Dimension	Value		
Dimmer height	713	451	289
AA Distance above from the nearest solid barrier or dimmer to the hole centres of the top mounting bracket	157	165	165.5
BB Distance from the top of the dimmer to the hole centres of the top mounting bracket	57	65	65.5
CC Vertical distance between mounting bracket hole centres	635	365	202.5
DD Distance from the hole centres of the bottom mounting bracket to the bottom edge of the dimmer	21	20	20.5
EE Distance below from the hole centres of the bottom mounting bracket to the nearest solid barrier or dimmer	121	120	120.5

Table 3. Vertical clearance dimensions for Architectural Dimmers

5.3 Connecting the Supply and Load Wiring

Mains input power enters the enclosure and is connected to the main isolation switch terminals. The bus bar distributes power to the channel MCBs. Neutral and earth connections branch out from main terminal blocks. Refer to Figure 6.

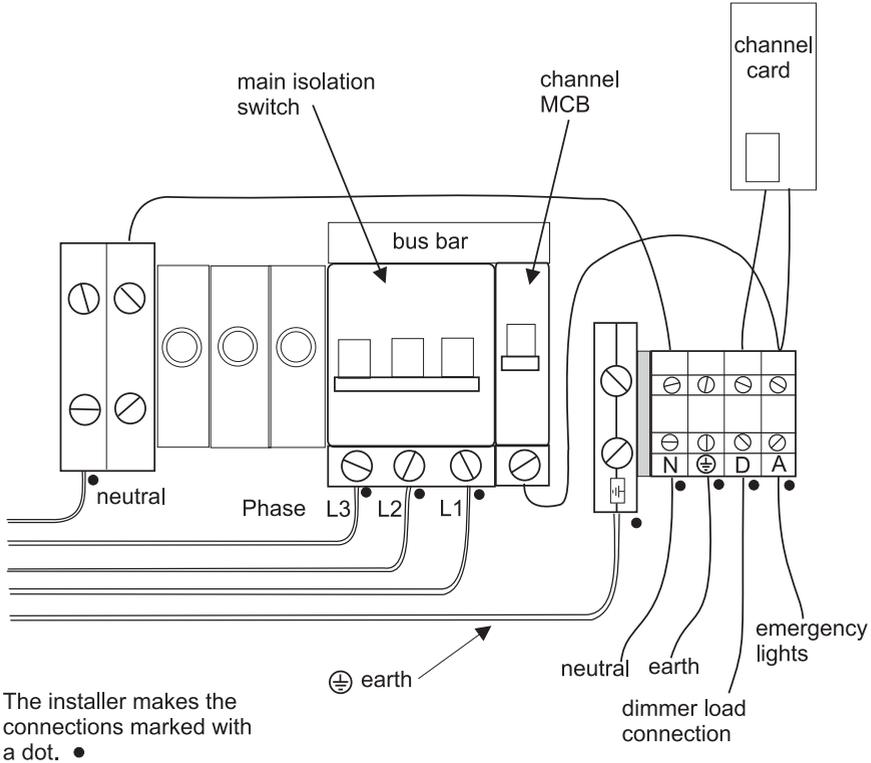


Figure 6. Basic wiring diagram for dimmer loads

5.4 Connecting Ballast Control Module Wiring

When using a DSI, DALI or 0-10V ballast channel module, use Figure 7. Be sure to use control cable that is suitable for line voltages. Do not use extra low voltage cable. Place the wires inside the dimmer unit where they will not touch hot components or mains voltage wiring.

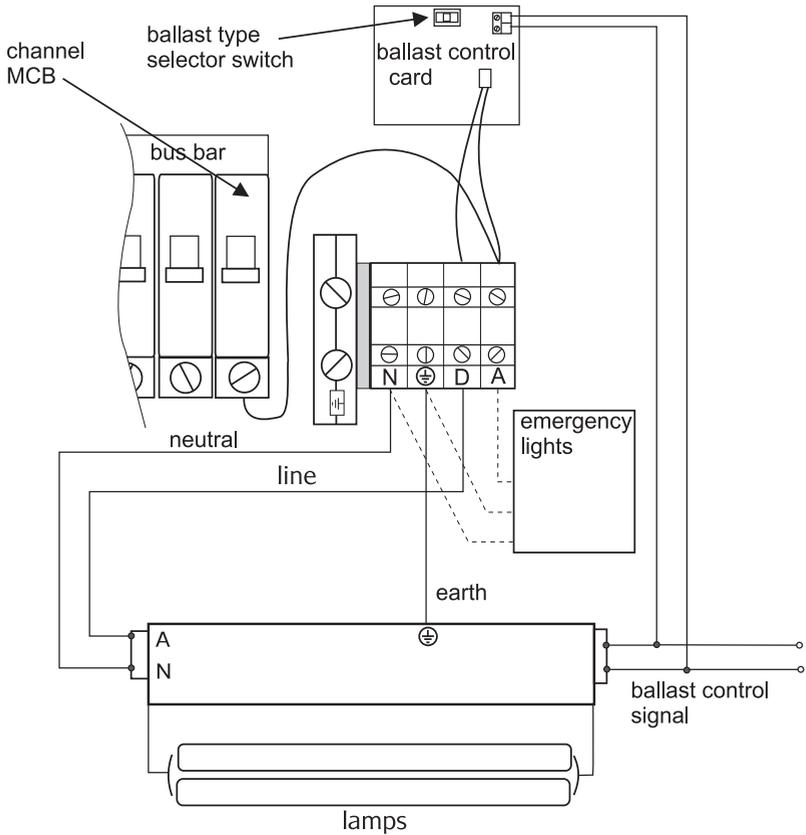


Figure 7. Wiring diagram for Ballast Control Modules

5.5 C-Bus Network Connections

Use the RJ45 sockets or the C-Bus four-pin connector (all wired in parallel) for the C-Bus Network connection. Use Cat5.e Unshielded Twisted Pair (UTP) C-Bus cable.

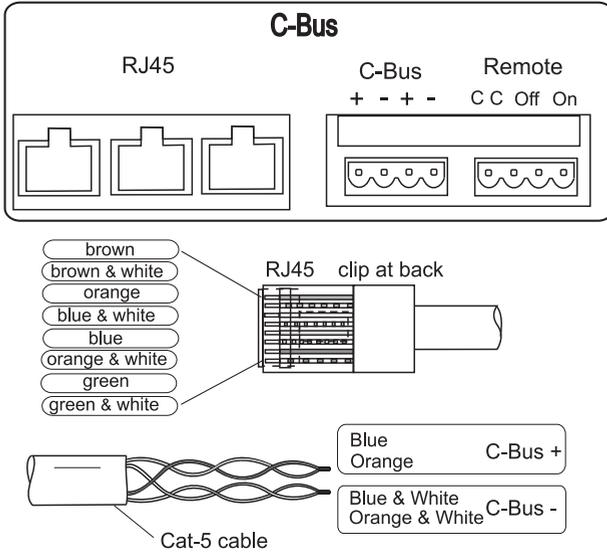


Figure 8. C-Bus connection details

5.6 DMX512 Connections

Connect the DMX512 control wiring to the 5 terminal block and slide it onto the dimmer unit pins.

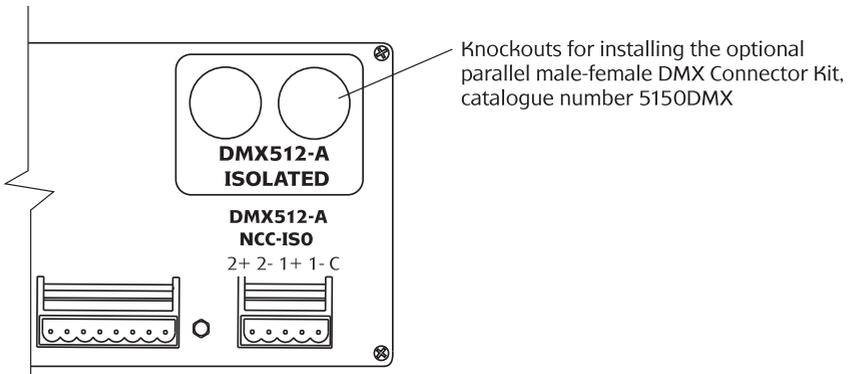


Figure 9. DMX512 control connections

5.7 Auxiliary Input Connections

There are four TTL dry contact auxiliary connections.

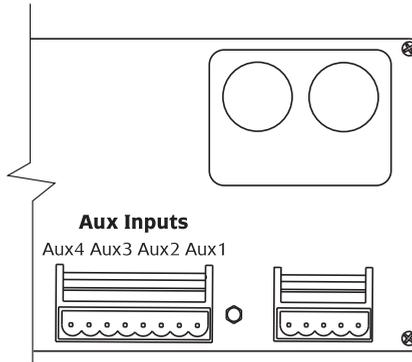


Figure 10. Auxiliary Input logic connections

Input	Function	Priority
Aux 1	Emergency Panic 1	Highest
Aux 2	Emergency Panic 2	
Aux 3	Emergency Panic 3	
Aux 4	Backup Generator/Load Shed	Lowest

Table 4. Auxiliary input priority

5.8 Setting the Dimmer Channel Override Switches

Dimmer Channel Override Switch

The dimmer channel override switch, shown in Figure 11, allows you to test or override the lighting load at full power.



The override switch does not control the emergency lighting terminal output. To isolate the channel load and emergency lighting load use the channel MCB.

CAUTION

The operating modes of the override switch are as follows:

- I = Dimmer module is in override mode for isolation or testing.
- O = Dimmer module is set for normal dimming operation.

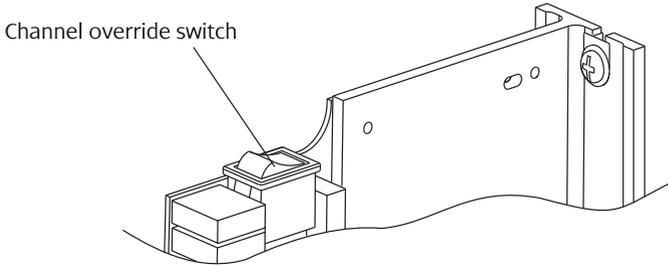


Figure 11. Dimmer Channel override switch location

Universal Dimmer Module Mode Selection Switch

The universal dimmer module has a three-position switch (AUTO, TE or LE) that you set for correct mode for the lighting load.

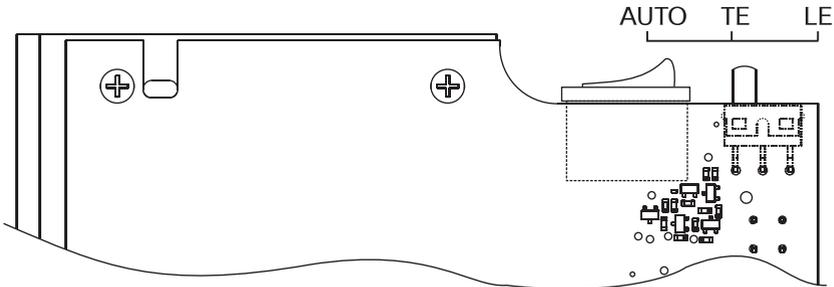


Figure 12. Universal Dimmer Module mode selection switch

AUTO mode

Use the AUTO setting when all loads connected to the channel are of the same type. Upon channel activation, the dimmer channel starts in TE mode. If inductive loading is detected, such as iron core transformers, the mode dynamically changes to LE mode prior to ramping up to the selected brightness level.

The dimmer channel will operate in **Trailing Edge** mode for incandescent lamps, halogen lamps and for *most* electronic low-voltage lighting transformers.

The dimmer channel will operate in **Leading Edge** mode for magnetic low-voltage lighting transformers, magnetic neon lighting transformers and fan motor loads.

TE mode

Use the TE setting for loads known to be compatible with trailing edge mode, including compatible mixed load types. The channel remains in TE mode unless excessive inductive loading is present. This operating mode is suitable for incandescent/halogen lamps and most electronic low voltage lighting transformers.

Use the TE mode for compatible mixed load types. For example, if the connected load includes a *low* percentage of iron core transformers, where ratio of electronic to iron core transformers is *marginal or unknown* and operation in TE mode is appropriate.

LE mode

Use this setting when the load is known to be compatible with leading edge mode, including mixed mode types. Upon channel activation, the channel starts in TE mode and dynamically changes to LE mode regardless of load type, prior to ramping up to selected brightness level. This operating mode is suitable for incandescent/halogen lamps, magnetic low voltage lighting transformers, magnetic neon lighting transformers and fan motor loads.

Use the LE mode for compatible mixed load types. For example, if the connected load has a *low* percentage of electronic transformers, where ratio of iron core to electronic transformers known to be *high* and operation in LE mode is appropriate.

Ballast Control Module Ballast Type Switch

The Ballast Control module has a three-position switch (DALI, DSI or 0-10V) that you set for the ballast type during installation.

Set the switch before installing the Ballast Control module in the dimmer unit. When the unit is powered on, the LEDs indicate which setting is in use.

DALI ballasts connected to a Ballast Control module cannot be individually controlled. Be sure to pre-program all ballasts on a channel identically to ensure consistent lighting levels.

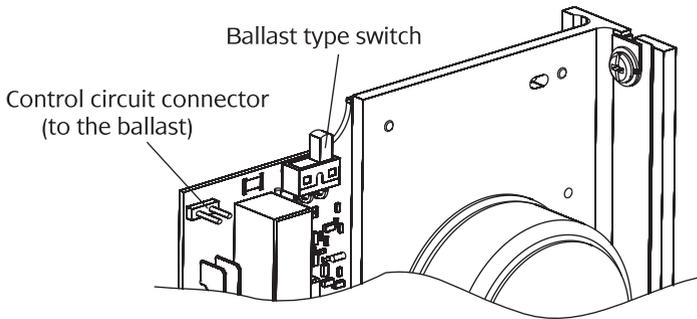


Figure 13. Ballast Control module ballast type switch

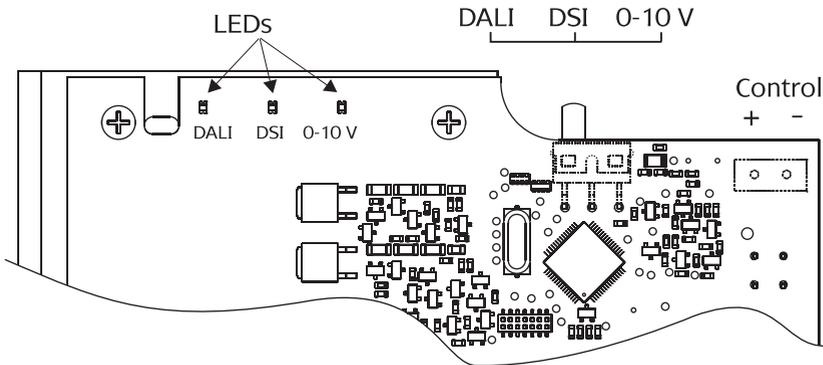


Figure 14. Configuring the Ballast Control Module

5.9 C-Bus Remote On/Off and Override (options)

Remote On/Off

Remote On/Off connections are optional. If you intend to use this feature, connect the green/green&white and brown/brown&white pairs across the network during installation. Otherwise tie back the unused wire pairs.

On the C-Bus network, when one of the remote inputs is enabled (active low referenced to C-Bus negative), all dimmer channels are set to either ON or OFF. In the event that the Remote On and Remote Off functions are activated simultaneously, Remote Off has priority.

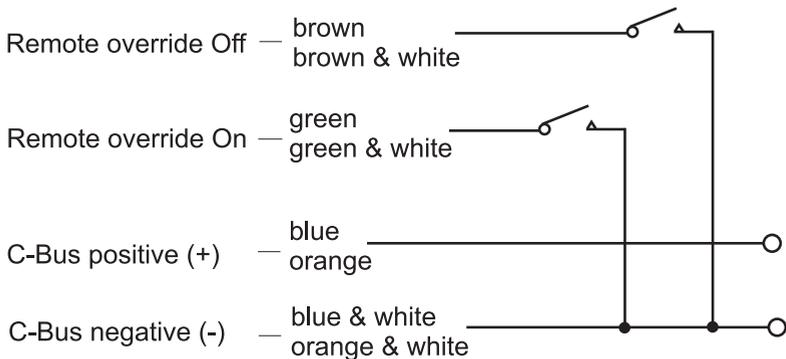


Figure 15. C-Bus Network Remote On/Off wiring diagram

Remote Override

The Remote Override on the dimmer unit is capable of working independently of the C-Bus network. There are several methods of wiring, depending on how the Remote Override is to be used.

Note: The REMOTE 'C' terminals are connected together. The extra 'C' connection is provided to connect REMOTE 'C' to C-Bus '-'.

Figure 16 shows the wiring of a dimmer unit where the Remote Override circuit is connected to the C-Bus network. In this configuration, the C-Bus network controls the Remote On/Off function of the dimmer unit.

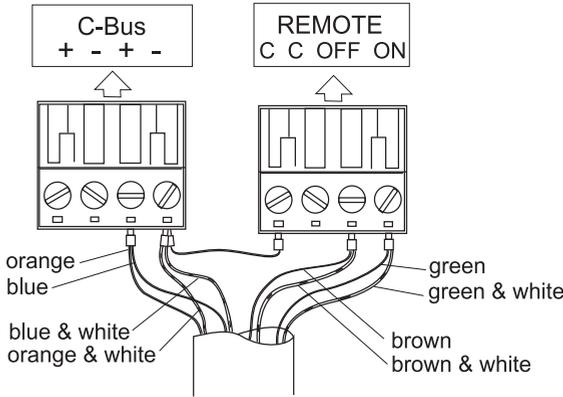


Figure 16. Standard C-Bus connection with Remote Override connected to C-Bus

The Remote Override for the dimmer unit can function independently of the C-Bus network. Figure 15 shows the wiring for independent unit operation. In this alternate Remote Override mode, the Remote terminals are NOT connected to the C-Bus cable.

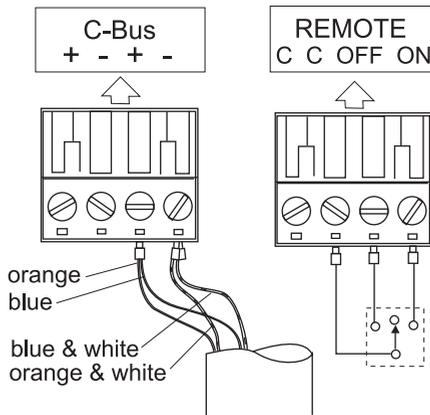


Figure 17. Dimmer unit Remote Override independent of the C-Bus network

6.0 Controls and Indicators

The C-Bus indicators, Phases indicators and channel buttons are located on the front panel. The channel buttons provide local on/off switching, mode and fault status.

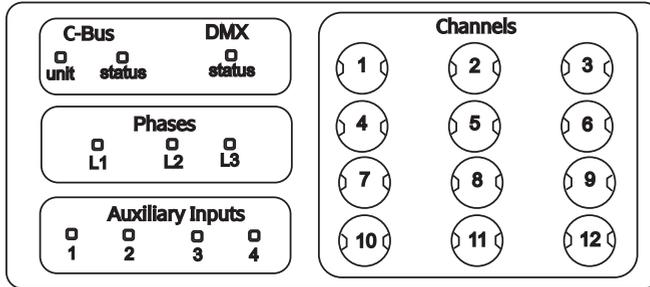


Figure 18. Front Control Panel

6.1 C-Bus Unit and Status Indicators

The 'unit' indicator shows the status of the C-Bus network operation inside the dimmer. The unit indicator modes are shown in Table 5.

Colour	Condition	Description
Green	On	Normal operation
Green	Flashing	Unit is in override mode

Table 5. C-Bus Unit Indicator LED modes

The 'status' indicator shows the status of the C-Bus network. If sufficient network voltage and a valid C-Bus clock signal are present, the indicator illuminates (as a continuous green light).

Colour	Condition	Description
Green	On	Normal operation
Green	Flashing	The network voltage is marginal; above 15 V, but less than 20 V
Green	Off	No C-Bus clock is present, or network voltage is below 15 V

Table 6. C-Bus Status Indicator LED modes

6.2 DMX Status Indicator

Colour	Condition	Description
Blue	On	Normal operation, other card type
Blue	Off	No DMX signal detected
Blue	Flashing	Signal detected with errors

Table 7. DMX Indicator LED

6.3 Phases Indicators

The 'Phases' indicators provide a visual check on the presence of input voltage phases inside the dimmer unit. The main input isolation switch must be ON for the indicators to light.



Be aware that dangerous voltages might be present inside the unit even when the indicators are not lit.

Colour	Condition	Description
Orange	On	Normal operation, phase voltage present
Orange	Off	Phase not present

Table 8. C-Bus Status Indicator LED modes

6.4 Auxiliary Input Indicators

The red auxiliary input indicators show the state of the dry contact inputs. The indicators are labelled from 1 to 4 and correspond to the input terminals on the bottom connector panel. When an indicator is on, the dry contact is activated. Refer to Section 5.7 for input descriptions and priorities.

6.5 Channel Toggle and Indicator Buttons

The channel buttons control the local override function. The buttons allow you to toggle each channel on and off. Each button LED illuminates when its respective channel is in the ON state. The local override option can be disabled using C-Bus Toolkit software.

Button Operation	Function
Quick-press	A single quick-press toggles the state of a channel
Double quick-press	Two quick-presses in quick succession returns the channel to the C-Bus network level
Long press	Pressing any of the buttons for 1 second or more returns all channels to the C-Bus network level

Table 9. Channel toggle button functions

Depending on how they are pressed, the buttons perform different functions. The double quick-press and long press operations only apply when the unit/channel is in local override mode.

Source Indicators

A source indicator is located on the left side of each of the channel toggle buttons.

Colour	Condition	Description
Pink	On	Normal operation, C-Bus
Blue	On	Normal operation, DMX
Pink	Flashing	C-Bus interface failed
Blue	Flashing	DMX interface failed

Table 10. Channel Source Indicator LED modes

Mode Indicators

A mode indicator is located on the right side of each of the channel toggle buttons.

Colour	Condition	Description
Green	On	Normal operation,
Orange	On	Normal operation,
Green	Flashing	Phase Failure Breaker Trip / Off
Orange	Flashing	Thermal Overload
Green/Orange	Flashing	Universal channel card over temperature protection tripped
Red/Green Red/Orange	Flashing	Internal error

Table 11. Channel Mode Indicator LED modes

Note: If an error condition persists, call Technical Support.

6.6 Priority of Control Modes

Because a channel may be controlled by various means, there is a priority of control modes. Table 12 provides the priority information.

Mode	Priority	Function
Current overload	1 (highest)	Channel off (MCB trips)
Electronic cutout (i.e., short circuit)	2	Universal channels off (MCB on)
Thermal shutdown	3	Channel power ramps down
Remote off (option)	3	All channels off
Remote on (option)	4	All channels on
Channel buttons and C-Bus Toolkit software	5	Toggle the channel and provide programming control

Table 12. Priority of Control Modes

7.0 C-Bus Requirements

7.1 C-Bus Power Requirements

C-Bus Architectural Series Dimmers sink current from the C-Bus network when mains power is not connected. Dimmer units do not need a mains connection during programming.

Parameter	Description
C-Bus supply voltage	20 V to 36 V DC
Maximum units per network	100
Unit input current	0 mA (mains connected) 18 mA (no mains connected)
Unit output current (onto C-Bus)	0 mA
Connection type	RJ45 (3 locations) 4-pin female (wired in parallel with RJ45)
Network clock	Software selectable
Network burden	Software selectable (unit address 001 only)

Table 13. Architectural Dimmer C-Bus power parameters.

The C-Bus Toolkit software provides a summary of a C-Bus network project. This can be helpful in determining the power supply requirements of a particular network.

7.2 C-Bus Programming

The C-Bus Architectural Series Dimmer must be programmed before it will function as part of a C-Bus network. This can be accomplished using Learn Mode. However, using the C-Bus Toolkit software provides a greater level of flexibility and customisation. The software can be downloaded from the Clipsal Integrated Systems web site (www.clipsal.com/cis). Further information about programming C-Bus units is provided at this site.

C-Bus Toolkit software helps you to configure all operating parameters, including the setting of control sources and power-up options. Indicators and dimmers function only when mains are connected.

Network Burden

C-Bus Architectural Series Dimmers incorporate a software selectable network burden. The network burden can be enabled from the unit's 'Global' tab in the C-Bus Toolkit software, but only if the C-Bus system clock is enabled, and the Unit Address is set to 001.

One network burden is normally required to ensure correct operation of each C-Bus network. The Network window of a C-Bus Toolkit project provides a summary of a C-Bus network according to the units added to the Database. This can be helpful in determining whether or not a burden is required on a particular network.

Network Clock

C-Bus Architectural Series Dimmers incorporate a software selectable C-Bus system clock. The system clock is used to synchronise data communication over a C-Bus network. At least one active C-Bus system clock is required on each C-Bus network for successful communication. No more than three units on a C-Bus network should have their clock enabled, so this option is normally disabled using the C-Bus Toolkit software.

If a system clock is required, it can be enabled from the unit's 'Global' tab in the C-Bus Toolkit software.

8.0 Compatible Loads

The leading edge dimmer channels can supply power to a wide range of load types. Refer to Wiring Instructions for diagrams and best practices. Dimmer channel loading is limited by two factors:

- Maximum load on any input phase
- Rated value of the channel overload MCB

Never exceed these values. Refer to Electrical Specifications.

Incandescent and 240V halogen lamps

The minimum load requirement can be found in Electrical Specifications. When using several channels, distribute the load as evenly as possible among the channels.

Electronic transformer

Be sure to use transformers that are compatible with the dimmer module. Check with the manufacturer of the transformer for compatibility information.

Neon lighting with iron core transformers

Clipsal recommends using an appropriately rated circuit breaker between the dimmer unit and each iron-core transformer. The dimmer channel overload MCB might have too high a current rating to protect an individual transformer.

Low voltage lighting with iron core transformers

There are no special wiring considerations.

Note: Only iron core transformers compatible with electronic switches may be used to ensure compliance to IEC 60669-2-1.

Fan Motor and Ceiling Sweep Fan speed control

The motor running current total and all other connected lighting loads must not exceed the channel card load rating.

DALI, DSI, 0-10 V Electronic Ballast

Do not mix ballast types on a channel.

Multiple Ballast Control modules must not be connected to the same control circuit.

For DALI installations, all ballasts on a control circuit connected to a single module operate together, you cannot control individual ballasts. A separate DALI power supply is not required

AC (mains) power for the connected ballasts can be provided by the channel module, or from a separate power source.

9.0 Troubleshooting

At installation, before calling technical support, please check your unit for obvious problems.

- Isolate the problem, as much as possible, to a single circuit or function.
- Disconnect mains power at the panel. Check for loose input or load wiring.
- Recheck all wiring connections. Check for correct wiring of the C-Bus cables and connectors.
- Decode any channel indicator messages. A label with mode and status information is located inside the front cover.
- Make sure that any local or remote overrides are turned off.
- Verify C-Bus operating requirements such as voltage, clock and burden.
- Refer to the Toolkit online HELP for assistance.
- Further debugging of possible network problems can be achieved using the Clipsal C-Bus Network Analyser tool (5100NA).

10.0 Replacing a Channel Module

Replacing a channel module should only be attempted under the guidance of Clipsal Technical Support personnel.

10.1 Removing a Channel Module

Before starting, make certain that you have a screwdriver and materials to label the module after removing it from the unit.

1. Identify the channel module to be replaced before powering off the unit.
2. Power off the unit and disconnect mains power using the main isolation switch. Do not rely on the 'Phases' indicators on the front display panel to tell you if power is present inside the unit.
3. Open the front cover panel and disconnect the earth wire connection from the door to the chassis.
4. Disconnect the power cable from the channel module to be removed. Slide the connector from the terminals. Do not pull on the brown and white wires.
5. Remove the machine screw that fastens the channel module T-bracket to the main heat sink.
6. Pull the channel module out of the card connector.
7. When it is free from the unit, label the module and put it in a safe place. If you are returning a module to Clipsal, label it and pack it properly. Be sure to label the module with the following information:

Dimmer unit catalogue and serial numbers
Channel module location and serial number
Date the part was removed
Reason for removal from the unit.

10.2 Installing a Channel Module

1. Remove the new channel module from the package. Save the package to return the original module to Clipsal.
2. Examine the module carefully for any damage from shipping.
3. Connect the channel module power cable to the circuit board by sliding the connector onto the terminals. Make certain that the connector is fully seated on the terminals.
4. Slide the channel card into the connector in the unit. Make sure the card is fully seated.
5. Install the retainer screw to secure the channel card heat sink to the main heat sink. The torque specification is 0.7 Nm.
6. Check the position of the channel module. Be sure to connect the earth wire and close the front cover before operating the unit.

10.3 Replacing an MCB

When replacing an MCB, do the following:

1. Remove mains power by shutting off the unit at the main isolation switch.
2. Open the front cover.
3. Loosen the 2 screws that hold the MCB on the bus bar and disconnect the load wiring.
4. Carefully pull the DIN rail retainer clip away from the body of the MCB with a flat screwdriver blade.
5. Rock the MCB loose from the DIN rail and bus bar.
6. Remove the old part and install a new MCB of the correct rating.
7. Be sure that the new circuit breaker is properly fastened to the DIN rail and bus bar. Connect the load wiring.
8. Check that all connections are tight.
9. Attach the cover panel earth wire and close the cover before powering on the unit.

11.0 Definitions and Acronyms

C-Bus network

The programmable logic control system for the dimmer unit.

MCB

Miniature circuit breaker

Megger testing

A device applies a DC voltage (typically 600 to 2500 volts) for several minutes. While the voltage is applied, the device measures the current 'leaking' through the insulation and displays the resistance in Megohms.

RCCB

Residual current circuit breaker

RCD

Residual current device

RJ45

A connector type commonly used in network cabling and telephony applications. Typically, four twisted pairs are used.

toroidal choke

An inductive component constructed around a ring-shaped core.

12.0 Electrical Specifications

12-Channel Models: L5112D10UA / L5112D5UA

Parameter	Description	
Model number	L5112D10UA	L5112D5UA
AC supply voltage	415V AC	415V AC
AC supply frequency	47-53 Hz	47-53 Hz
Number of Input phases	3	3
Warm up time	5 sec	5 sec
Max load per phase	40 A	20 A
Maximum load RMS current per channel	10 A	5 A
Minimum load per channel	20 W for incandescents	20 W for incandescents
Compatible Loads	Incandescent, 240V Halogen, Electronic transformer, Neon with iron-core transformer and Low-voltage lighting with electronic transformer, iron-core transformer, fan motor speed control, DALI, DSI and 0-10 V.	
Soft-start ramp up time	0.5 sec	0.5 sec
Load current risetime	200μ sec	200μ sec
Power control range	1.5 % to 95 %	1.5 % to 95 %
Standby AC supply current	See Note 1	See Note 1
Load terminal Standby leakage current	< 1 mA	< 1 mA
Short circuit withstand strength	6kA See Note 2	6kA See Note 2
Rated insulation voltage	500 V	500 V
Dialectric test voltage	2500 V	2500 V

Note 1: The standby current for the basic unit is 90mA; add 15mA for each channel.

Note 2: The installer must connect the dimmer to mains with protection rated at 20A with 6kA short circuit withstand strength.

6-Channel Models: L5106D20UA / L5106D16UA

Parameter	Description	
Model number	L5106D20UA	L5106D16UA
AC supply voltage	415V AC	415V AC
AC supply frequency	47-53 Hz	47-53 Hz
Number of Input phases	3	3
Warm up time	5 sec	5 sec
Max load per phase	40 A	40A
Maximum load RMS current per channel	20 A	16A
Minimum load per channel	20 W for incandescents	20 W for incandescents
Compatible Loads	Incandescent, 240V Halogen, Electronic transformer, Neon with iron-core transformer and Low-voltage lighting with electronic transformer, iron-core transformer, fan motor speed control, DALI, DSI or 0-10 V.	
Soft-start ramp up time	0.5 sec	0.5 sec
Load current risetime	200 μ sec	200 μ sec
Power control range	1.5 % to 95 %	1.5 % to 95 %
Standby AC supply current	See Note 1	See Note 1
Load terminal Standby leakage current	< 1 mA	< 1 mA
Short circuit withstand strength	6kA See Note 2	6kA See Note 2
Rated insulation voltage Dielectric test voltage	500 V 2500 V	500 V 2500 V

Note 1 : The standby current for the basic unit is 90mA; add 15mA for each channel.

Note 2: The installer must connect the dimmer to mains with protection rated at 20A with 6kA short circuit withstand strength.

6-Channel Models: L5106D10UA / L5106D5UA

Parameter	Description	
Model number	L5106D10UA	L5106D5UA
AC supply voltage	415V AC	240V AC
AC supply frequency	47-53 Hz	47-53 Hz
Number of Input phases	3	1
Warm up time	5 sec	5 sec
Max load per phase	20 A	30 A
Maximum load RMS current per channel	10 A	5 A
Minimum load per channel	20 W for incandescents	20 W for incandescents
Compatible Loads	Incandescent, 240V Halogen, Electronic transformer, Neon with iron-core transformer and Low-voltage lighting with electronic transformer, iron-core transformer, fan motor speed control, DALI, DSI or 0-10 V.	
Soft-start ramp up time	0.5 sec	0.5 sec
Load current risetime	200μ sec	200μ sec
Power control range	1.5 % to 95 %	1.5 % to 95 %
Standby AC supply current	See Note 1	See Note 1
Load terminal Standby leakage current	< 1 mA	< 1 mA
Short circuit withstand strength	6kA See Note 2	6kA See Note 2
Rated insulation voltage Dialectric test voltage	500 V 2500 V	500 V 2500 V

Note 1: The standby current for the basic unit is 90mA; add 15mA for each channel.

Note 2: The installer must connect the dimmer to mains with protection rated at 20A with 6kA short circuit withstand strength.

3-Channel Models: L5103D20UA / L5103D16UA

Parameter	Description	
Model number	L5103D20UA	L5103D16UA
AC supply voltage	415V AC	415V AC
AC supply frequency	47-53 Hz	47-53 Hz
Number of Input phases	3	3
Warm up time	5 sec	5 sec
Max load per phase	20 A	20 A
Maximum load RMS current per channel	20 A	16 A
Minimum load per channel	20 W for incandescents	20 W for incandescents
Compatible Loads	Incandescent, 240V Halogen, Electronic transformer, Neon with iron-core transformer and Low-voltage lighting with electronic transformer, iron-core transformer, fan motor speed control, DALI, DSI or 0-10 V.	
Soft-start ramp up time	0.5 sec	0.5 sec
Load current risetime	200 μ sec	200 μ sec
Power control range	1.5 % to 95 %	1.5 % to 95 %
Standby AC supply current	See Note	See Note
Load terminal Standby leakage current	< 10 mA LE < 1 mA TE	< 10 mA LE < 1 mA TE
Short circuit withstand strength	6kA See Note 2	6kA See Note 2
Rated insulation voltage Dialectric test voltage	500 V 2500 v	500 V 2500 V

Note 1: The standby current for the basic unit is 90mA; add 15mA for each channel.

Note 2: The installer must connect the dimmer to mains with protection rated at 20A with 6kA short circuit withstand strength.

3-Channel Models: L5103D10UA / L5103D5UA

Parameter	Description	
Model number	L5103D10UA	L5103D5UA
AC supply voltage	415V AC	240V AC
AC supply frequency	47-53 Hz	47-53 Hz
Number of Input phases	3	1
Warm up time	5 sec	5 sec
Max load per phase	30 A 1 phase 10 A 3 phase	15 A
Maximum load RMS current per channel	10 A	5 A
Minimum load per channel	20 W for incandescents	20 W for incandescents
Compatible Loads	Incandescent, 240V Halogen, Electronic transformer, Neon with iron-core transformer and Low-voltage lighting with electronic transformer, iron-core transformer, fan motor speed control, DALI, DSI or 0-10 V.	
Soft-start ramp up time	0.5 sec	0.5 sec
Load current risetime	200µ sec	200µ sec
Power control range	1.5 % to 95 %	1.5 % to 95 %
Standby AC supply current	See Note 1	See Note 1
Load terminal Standby leakage current	< 1 mA	< 1 mA
Short circuit withstand strength	6kA See Note 2	6kA See Note 2
Rated insulation voltage Dielectric test voltage	500 V 2500 V	500 V 2500 V

Note 1: The standby current for the basic unit is 90mA; add 15mA for each channel.

Note 2: The installer must connect the dimmer to mains with protection rated at 20A with 6kA short circuit withstand strength.

13.0 Environmental and Mechanical Specifications

13.1 Environmental Specifications

Parameter	Description
EMC Environment	Environment A Environment 1 (see Note 1)
IP Rating	2XB (see Note 2)
Operating ambient temperature	0–45 degrees C (32–113 degrees F)
Minimum space between units	vertical: 100 mm; horizontal: 100 mm
Operating relative humidity	10% to 90%, non-condensing
Mounting mode	wall
Mounting bracket hole size	10 mm diameter
Types of electrical connection (Suitable for copper or aluminium conductors)	Fixed supply terminal for 1 x 25mm ² wire per phase Fixed load terminal for 1 x 6mm ² wire or 2 x 2.5mm ² wires Disconnectable aux (C-Bus) connectors for 3 x RJ45 2 x 4-pin female

Note1: Environment A and Environment 1 mainly relate to low-voltage residential, commercial and light industrial locations and installations.

Note 2: To ensure compliance with IP rating 2XB, the installer must be sure that there is no opening greater than 10mm around either mains or lighting load cables entering the dimmer chassis. Refer to Wiring Instructions.

13.2 Mechanical Specifications

Model	Dimensions in mm (H x W x D)	Weight in Kg
L5112D10UA	713 x 455 x 164	25
L5112D5UA	713 x 412 x 164	24
L5106D20UA	713 x 455 x 164	18
L5106D16UA	713 x 455 x 164	18
L5106D10UA	451 x 455 x 164	18
L5106D5UA	451 x 412 x 164	18
L5103D20UA	451 x 455 x 164	11
L5103D16UA	451 x 455 x 164	11
L5103D10UA	289 x 455 x 164	10
L5103D5UA	289 x 412 x 164	10

14.0 Standards Complied

Declarations of Conformity

Australian/New Zealand EMC & Electrical Safety Frameworks and Standards



The C-Bus Architectural Series Dimmer units comply with the following:

Regulation	Standard	Title
EMC	AS/NZS CISPR 14-1	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission
	AS/NZS CISPR 15	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
Electrical Safety	AS/NZS 3439-1	Low-voltage switchgear and control gear assemblies. Part 1: Type-tested and partially type-tested assemblies
	IEC 60669-2-1	Switches for household and similar fixed electrical installations – Part 2: Particular requirements – section 1: Electronic switches

European Council Directives and Standards



The C-Bus Architectural Series Dimmer units comply with the following:

Directive	Standard	Title
EMC Directive 2004/108/EC	EN 60669-2-1 Clause 26.1	Immunity to ESD, RFI, EFT, Surge Voltages, Voltage Dips and Interruptions
	EN 60669-2-1 Clause 26.2	RF and Low Frequency Emissions
	EN 55014-1	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus - Emission
	EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
	EN 61000-3-2 *	Electromagnetic compatibility (EMC) – Part 3-2: Limits for harmonic current emissions (equipment input current up to and including 16A per phase)

Directive	Standard	Title
EMC Directive 2004/ 108/ EC	EN 61000-3-3 *	Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage systems, for equipment with rated current less or equal to 16A per phase and not subject to conditional connection
Low Voltage Directive 2006/95/EC	EN 60439-1	Low-voltage switchgear and control gear assemblies. Part 1: Type-tested and partially type-tested assemblies
	EN 60669-2-1	Switches for household and similar fixed electrical installations – Part 2: Particular requirements – section 1: Electronic switches
RoHS Directive 2002/95/EC		Restriction of Hazardous Substances

* Also applies to 20A channels.

Additional Standards

The C-Bus Architectural Series Dimmer units comply with the following:

Regulation	Standard	Title
Electrical Safety	IEC 60439-1	Low-voltage switchgear and control gear assemblies. Part 1: Type-tested and partially type-tested assemblies
	IEC 60669-2-1	Switches for household and similar fixed electrical installations – Part 2: Particular requirements – section 1: Electronic switches

15.0 Two-Year Warranty

The C-Bus Architectural Series Dimmers carry a two-year warranty against manufacturing defects.

Warranty Statement

- 1) The benefits conferred herein are in addition to, and in no way shall be deemed to derogate; either expressly or by implication, any or all other rights and remedies in respect to this Schneider Electric product, which the consumer has under the Commonwealth Trade Practices Act or any other similar State or Territory Laws.
- 2) The warrantor is Schneider Electric, with offices worldwide.
- 3) This Schneider Electric product is guaranteed against faulty workmanship and materials for a period of two (2) years from the date of installation.
- 4) Schneider Electric reserves the right, at its discretion, to either repair free of parts and labour charges, replace or offer refund in respect to any article found to be faulty due to materials, parts or workmanship.
- 5) This warranty is expressly subject to the Schneider Electric product being installed, wired, tested, operated and used in accordance with the manufacturer's instructions.
- 6) All costs of a claim shall be met by Schneider Electric, however should the product that is the subject of the claim be found to be in good working order, all such costs shall be met by the claimant.
- 7) When making a claim, the consumer shall forward the Schneider Electric product to the nearest Clipsal office with adequate particulars of the defect within 28 days of the fault occurring. The product should be returned securely packed, complete with details of the date and place of purchase, description of load, and circumstances of malfunction.

For all warranty enquiries, contact your local Clipsal sales representative. The address and contact number of your nearest Clipsal Australia office can be found at <http://www.clipsal.com/locations> or by telephoning Technical Support.

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Technical Support and Troubleshooting

For further assistance in using this product, consult your nearest Clipsal Integrated Systems (CIS) Sales Representative or Technical Support Officer.

Technical Support Contact Numbers	
Australia	1300 722 247 (CIS Technical Support Hotline)
New Zealand	0800 888 219 (CIS Technical Support Hotline)
Northern Asia	+852 2484 4157 (Clipsal Hong Kong)
South Africa	011 314 5200 (C-Bus Technical Support)
Southern Asia	+603 7665 3555 Ext. 236 or 242 (CIS Malaysia)
United Kingdom	0870 608 8 608 (Schneider Electric Support)

Technical Support Email: cis.support@clipsal.com.au

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