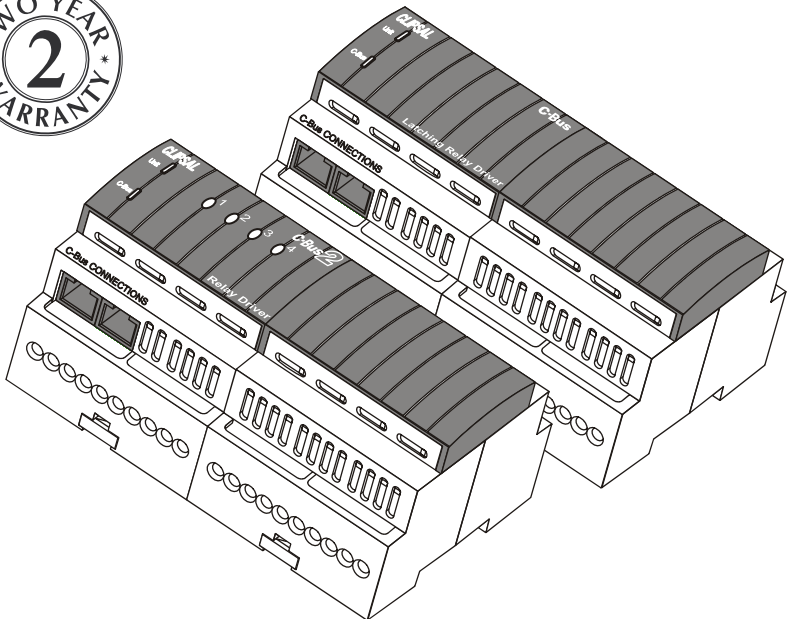


C-Bus Four Channel Latching Relay Driver

Installation Instructions

5504RD Series



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Contents

1.0	Product Range	5
2.0	Important Note	5
3.0	Description	5
4.0	Capabilities	5
5.0	Compatible Loads	6
6.0	Wiring Instructions	6
7.0	C-Bus Network Connection	8
8.0	Remote Override	9
9.0	Priority of Operating Modes	10
10.0	Status Indicators	11
	10.1 C-Bus Indicator	11
	10.2 Unit Indicator	11
11.0	C-Bus System Clock	12
12.0	C-Bus Network Burden	12
13.0	Power-Up Load Status	12
14.0	C-Bus Power Requirements	13
15.0	Power Surges	13
16.0	Megger Testing	13
17.0	Programming	14
18.0	Electrical Specifications	15
19.0	Mechanical Specifications	16
20.0	Standards Complied	17
21.0	Warranty	18

1.0 Product Range

Catalogue No.	Channels	On-Board Power Supply	Learn Mode
5504RDP	4	×	×
L5504RD		✓	✓
L5504RDP		×	✓

2.0 Important Note

The use of any software not provided by Clipsal Integrated Systems (CIS) in conjunction with the installation of these products may void any warranties applicable to the hardware.

3.0 Description

C-Bus 5504RD Series Four Channel Latching Relay Drivers are C-Bus output devices designed to be used in a switchboard distribution application. Four independent relay driver channels are provided for driving specified latching relay coils. These units are DIN rail mounted, measuring 8 modules wide (1 module = 17.5 mm). C-Bus connection is achieved through the use of RJ45 connectors, allowing similar units to be quickly looped together.

4.0 Capabilities

Each relay driver channel issues a 20 ms 24 V DC pulse whenever its state is toggled. The polarity of the output signal is reversed for an Off operation. Refer to Figure 1.

The C-Bus L5504RD has an internal C-Bus power supply capable of supporting a number of other C-Bus units (200 mA capacity). Units with a suffix of "P" do not have a C-Bus power supply, but consume no current from the C-Bus network during normal operation.

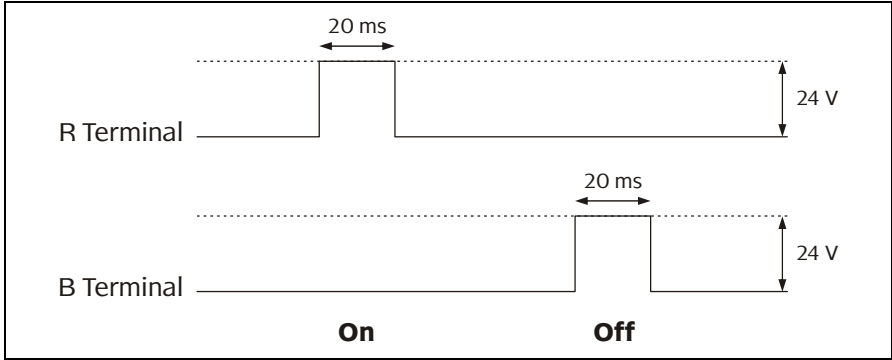


Figure 1 – Output signal in response to an On and Off control

The L5504RD and L5504RDP variants contain a C-Bus network burden, and are capable of generating a C-Bus system clock signal, providing all the support necessary for a simple C-Bus network. Local toggle buttons are provided on these units to allow individual channels to be switched locally (overriding the current C-Bus state). These are not present on the 5504RDP variant.

All 5504RD Series units have remote On and Off facilities, permitting all channels to be turned on or off without C-Bus network communication. These units isolate mains power from the extra low voltage C-Bus network.

5.0 Compatible Loads

The 5504RD Series units are suitable for use with the 5000RL20 or 5002RL20 Latching Relay modules.

6.0 Wiring Instructions

A wiring diagram for the 5504RD Series Latching Relay Driver is provided in Figure 2. Consider the following points when installing these units:

- Units are capable of handling up to four channels of external latching relay loads. Ensure you consider the total current consumption when selecting power feed cables, and allow for multiple feed cables.

- A maximum of 10 L5504RD units (with 200 mA power supplies) can be connected to a single C-Bus network. A maximum of 100 “P” suffix units may be connected.
- The wires between the driver and relay coil are at C-Bus potential and therefore require appropriate isolation from the mains.
- Fix mains cables in the distribution board using cable ties or trunking as required by local wiring rules. Take care not to allow copper strands to enter the DIN unit’s apertures.
- Apply a maximum torque of 1.4 Nm to the mains rated screw terminals.
- Rubber bungs are supplied (×3) for unused RJ45 connectors, to stop foreign bodies from entering the unit. Always install these bungs when the unit is mounted inside a mains rated enclosure.

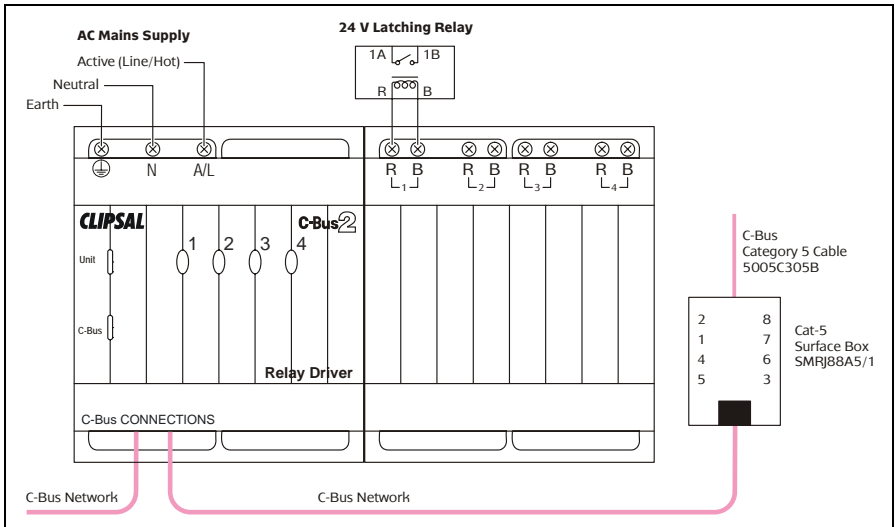


Figure 2 – 5504RD Series wiring (L5504RDP shown)

7.0 C-Bus Network Connection

Connection to the C-Bus network is made via one of the RJ45 sockets. Use Cat-5 Unshielded Twisted Pair (UTP) C-Bus cable, and an appropriately wired RJ45 plug. Pinouts and cable conductor assignments are provided in Figure 3 and Table 1. The RJ45 sockets are internally connected. The Clipsal catalogue number for the C-Bus Cat-5 UTP cable is 5005C305B.

It is recommended that the Remote Override (On/Off) connections be maintained for correct operation of these services across the C-Bus network, even if they are not intended to be used. Remote Override services may be disabled in software if necessary.

A Clipsal RJ5CB300PL Cat-5 UTP patch cord is included with the unit for easy interconnection. No more than 10 × L5504RD products should be connected to one physical C-Bus network. This may be extended to 100 for “P” suffix units.

Rubber bungs are supplied (×3) for unused RJ45 connectors, to stop foreign bodies from entering the unit. Always ensure these bungs are installed when the unit is mounted inside a mains rated enclosure.

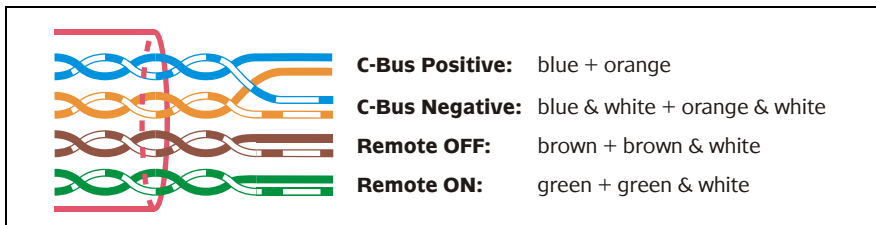


Figure 3 – C-Bus cable conductor assignments

Pin	C-Bus Connection	Colour
1	Remote ON	green & white
2	Remote ON	green
3	C-Bus Negative (-)	orange & white
4	C-Bus Positive (+)	blue
5	C-Bus Negative (-)	blue & white
6	C-Bus Positive (+)	orange
7	Remote OFF	brown & white
8	Remote OFF	brown

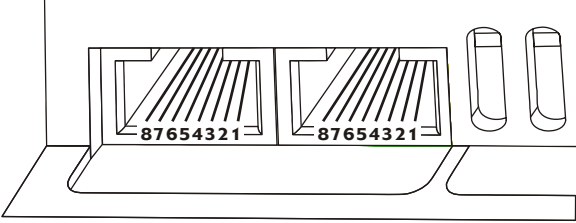


Table 1 – RJ45 sockets and C-Bus pinouts

8.0 Remote Override

Remote control of all channels on a unit can be achieved via the extra pairs of conductors on the C-Bus connector. Figure 4 illustrates how switches may be connected to these conductors. Green + green & white conductors are used for the Remote ON function. Brown + brown & white are used for Remote OFF. The Remote Override is triggered by connecting the relevant conductors to C-Bus negative. A Clipsal 30/1/2LM mechanism makes an ideal remote input switch.



C-Bus is a balanced network and therefore at any point where C-Bus negative (-) is taken, C-Bus positive (+) must also be present. For this reason both conductor pairs must be looped through all remote input switches on the network.

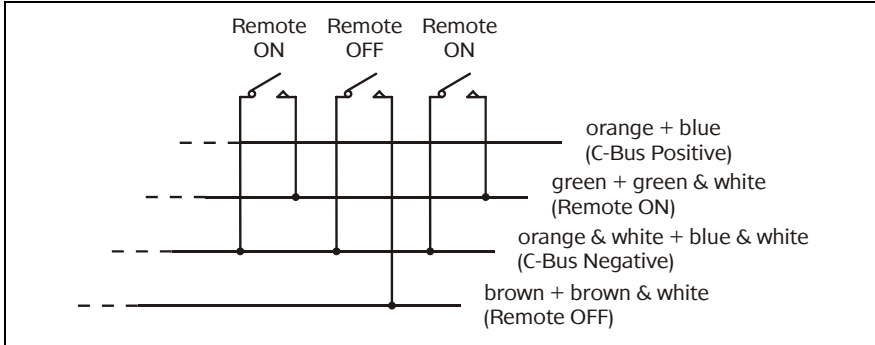


Figure 4 – Remote Override connections

9.0 Priority of Operating Modes

The output status of C-Bus 5504RD Series Four Channel Latching Relay Drivers can be changed by:

- pressing a C-Bus button
- activating any of the local toggle buttons (local override, L' Series variants only)
- using the Remote Override facility.

Table 2 shows the priority ranking of these control inputs,

Mode	Priority	Function
Remote Off	1 (highest)	All channels off
Remote On	2	All channels on
Local override	3*	Toggles the channel
C-Bus input unit (Neo, PIR, etc.)	4* (lowest)	Controls the channel

Table 2 – Control input priority ranking

*Using local toggle buttons overrides the normal C-Bus commands such as those issued by input units. By default, once a channel is in local override mode, further relevant C-Bus commands issued by input and control units will override the local override state. This feature can be disabled in software so that all relevant C-Bus commands are ignored by the unit when it is in local override mode.

10.0 Status Indicators

10.1 C-Bus Indicator

The “C-Bus” indicator shows the status of the C-Bus network at the unit. If sufficient network voltage and a valid C-Bus clock signal are present, the indicator illuminates (as a continuous green light). If a network is connected which has a higher current load than the power supplies support, the indicator flashes to show a marginal network voltage. If no C-Bus clock is present, or if the unit is powered by C-Bus only (for stand-alone programming), the indicator remains off.

Indicator Status	Meaning
On	Power is on and functional
Flashing	There is insufficient power to support the C-Bus network
Off	No C-Bus clock signal is present and/or mains power is not connected

Table 3 – The “C-Bus” indicator

Further debugging of possible network problems can be achieved using the Clipsal C-Bus Network Analyser tool (5100NA).

10.2 Unit Indicator

The “Unit” indicator shows the status of the individual unit. When mains power is supplied, the indicator illuminates (as a continuous green light). If a local toggle button has been used to perform a local override, or if a Remote Override is active, the indicator flashes with a 90% duty cycle. The Unit indicator does not function when the unit is powered by C-Bus only (for stand-alone programming).

Indicator Status	Meaning
On	Normal operation
Flashing	Unit is in override mode
Off	No mains power is connected

Table 4 – The “Unit” indicator

11.0 C-Bus System Clock

Learn Mode capable versions (the L5504RD and L5504RDP) 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.

12.0 C-Bus Network Burden

Learn Mode capable versions (the L5504RD and L5504RDP) 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 1.

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.



WARNING

Disable the network burden on all 5100PC Interface units before installing C-Bus DIN range products which include a power supply. (The 5100PC is a superseded non-DIN rail unit). If a burden is required, use the built-in burden on the DIN rail unit only.

13.0 Power-Up Load Status

C-Bus output units have on-board non-volatile memory, which is used to store the operating state of the unit in case of power loss. On restoration of power 5504RD Series products initiate a short power-up diagnostic routine, which lasts approximately 5 seconds. Channels are then restored according to their previous states, and according to the unit's recovery and restrike delay settings.

14.0 C-Bus Power Requirements

C-Bus 5504RD Series Four Channel Latching Relay Drivers are available in several configurations. All variants draw 18 mA from the C-Bus network when mains power is not connected, but draw no current from the network when mains is present.

In addition, the L5504RD supplies up to 200 mA to the network when connected to the mains. "P" suffix variants (the 5504RDP and L5504RDP) do not include the 200 mA power supply.

Adequate C-Bus Power Supply Units must be installed to support connected devices. 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 the power supply requirements of a particular network.

15.0 Power Surges

Each unit incorporates circuitry to provide protection from C-Bus network transients. External power surge protection devices should be used to enhance system immunity to mains power surges. It is strongly recommended that overvoltage equipment such as the Clipsal 970 be installed at the switchboard.

16.0 Megger Testing

Important points when megger testing an electrical installation:

- Only megger test when mains cabling is disconnected from C-Bus output units.
- Do not megger test the C-Bus cable.

17.0 Programming

As with other C-Bus units, a 5504RD Series Latching Relay Driver must be programmed before it will function as part of a C-Bus network. In the case of the L5504RD and L5504RDP, this can be accomplished using Learn Mode. However, using the C-Bus Toolkit software provides a greater level of flexibility and customisation.

Units do not need a mains connection in order to be programmed via C-Bus Toolkit. They can be connected to any operational C-Bus network that is capable of supporting one or more extra C-Bus units (18 mA current required). Units can then be configured using the Toolkit software. Indicators and outputs will only function when a mains connection is established.

The C-Bus Toolkit 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.

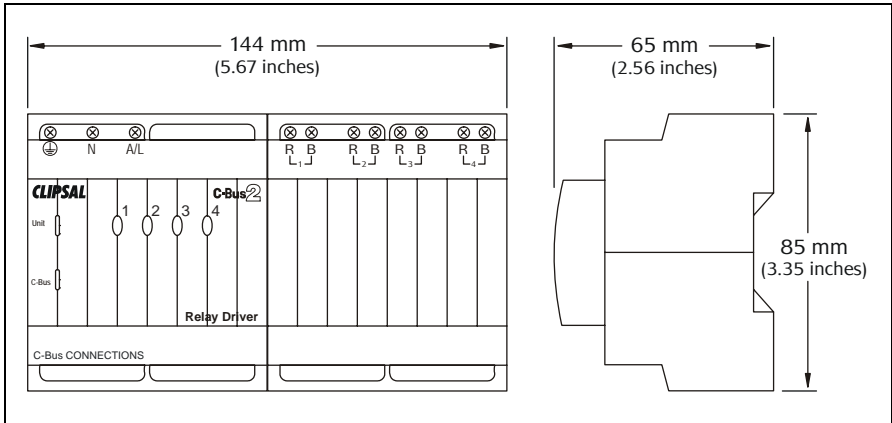
18.0 Electrical Specifications

Parameter	Description	
	L5504RD	5504RDP, L5504RDP
Nominal supply voltage	220 to 240 V AC	
Frequency range	47 to 53 Hz and 57 to 63 Hz	
C-Bus supply voltage	15 to 36 V DC @ 18 mA required for programming when mains is not connected. Supplies 200 mA to the C-Bus network when mains is connected.	15 to 36 V DC @ 18 mA required for programming when mains is not connected. 15 to 36 V DC @ 0 mA required for programming when mains is connected. Does not supply current to the C-Bus network.
C-Bus AC input impedance	50 k Ω @1 kHz	100 k Ω @1 kHz
Electrical isolation	3.75 kV RMS from C-Bus to mains	
Max. units per network	10	100
Load rating	Latching relay coil voltage 24 V (5000RL20 or 5002RL20)	
Relay drive pulse time	20 ms	
Quiescent power	4 Watts	
Warm up time	5 seconds	
Network clock and burden	Software selectable (L5504RD, L5504RDP) Not available in 5504RDP	
Operating temperature	0 to 45 °C (32 to 113 °F)	
Operating humidity	10 to 95% RH	

19.0 Mechanical Specifications

Parameter	Description		
	5504RDP	L5504RD	L5504RDP
Dimensions (W×H×D)	144 × 85 × 65 mm (5.67 × 3.35 × 2.56 inches)		
Weight	349 g	328 g	TBA
Mains terminals	Accommodates 2 × 1.5 mm ² or 1 × 2.5 mm ² (2 × 16 AWG or 1 × 13 AWG)		
C-Bus connections	RJ45 sockets		

All variants have the same dimensions (L5504RD is shown). No user serviceable parts inside.



20.0 Standards Complied

DECLARATIONS OF CONFORMITY

Australian/New Zealand EMC & Electrical Safety Frameworks and Standards

Model 5504RD Series products comply with the following:



Regulation	Standard	Title
EMC (C-Tick)	AS/NZS 1044, CISPR14	RFI Emissions Standard
Electrical Safety	AS/NZS 3100	General Requirements for Electrical Equipment

European Directives and Standards

Model 5504RD Series products comply with the following:



European Council Directive	Standard	Title
EMC Directive 89/336/EEC	EN 55014	RFI Emissions Standard
	EN 61000-4-2	Immunity to ESD
	EN 61000-4-3	Immunity to RFI
	EN 61000-4-4	Immunity to EFT
	EN 61000-4-5	Immunity to Surge Voltages
	EN 61000-4-11	Immunity to Voltage Dips & Interruptions
	EN 60669-2-1	Switches for Household Fixed Electrical Installations Part 2-1

Other International Directives and Standards

Model 5504RD Series products comply with the following:

Regulation	IEC Standard	Title
EMC	60669-2-1	Switches for Household Fixed Electrical Installations Part 2-1

21.0 Warranty

The 5504RD Series Four Channel Latching Relay Driver carries 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 Clipsal Integrated Systems Product, which the consumer has under the Commonwealth Trade Practices Act or any other similar State or Territory Laws.
- 2) The warrantor is Clipsal Australia Pty Ltd of 12 Park Terrace, Bowden, South Australia, 5007. Telephone (08) 8345 9500. With registered offices in all Australian States.
- 3) This Clipsal Integrated Systems Product is guaranteed against faulty workmanship and materials for a period of two (2) years from the date of installation.
- 4) Clipsal Australia Pty Ltd 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 Clipsal Integrated Systems 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 Clipsal Australia Pty Ltd, 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 Clipsal Integrated Systems Product to the nearest office of Clipsal Australia Pty Ltd 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 (refer to the back page).



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: techsupport.cis@clipsal.com.au

Sales support email: sales.cis@clipsal.com.au

Worldwide contacts are provided at <http://www.clipsal.com/locations/>

Information and resources are provided at <http://www.clipsal.com/cis/>

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