CLIPSAL
LIVING ELECTRICAL
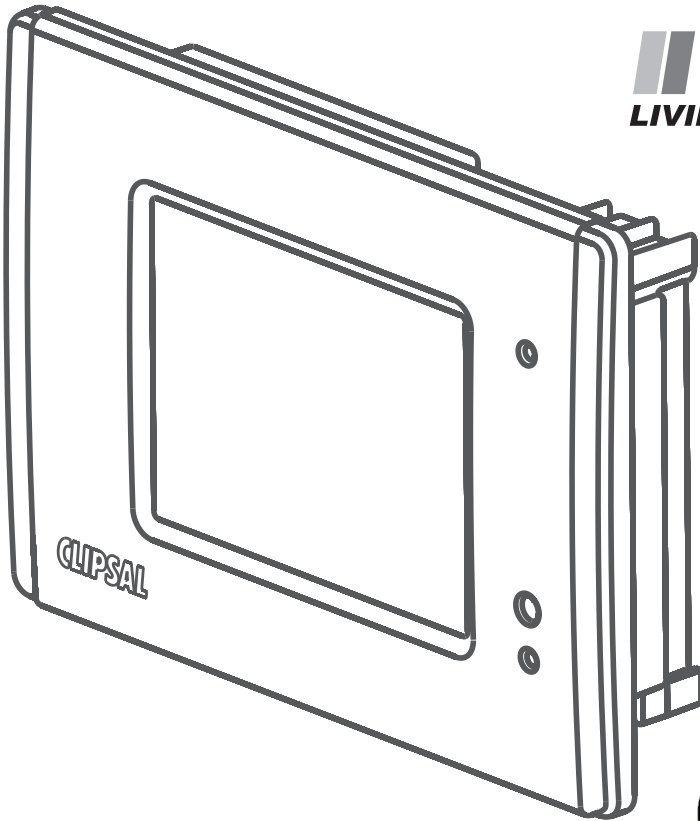
C-Bus

C-Bus Black & White MK II Touch Screen

5000CT2 Series

TWO YEAR 2 WARRANTY

FC C CE

Installation Instructions

Contents

1.0   Product Range

Product	Facia Style	Logic Engine	Catalogue Number
C-Bus Black & White MK II Touch Screen	Polished brass	No	BB5000CT2
		Yes	BB5000CTL2
	Brushed stainless steel	No	BS5000CT2
		Yes	BS5000CTL2
	Plastic	No	SC5000CT2
		Yes	SC5000CTL2
	Neo	No	5050CT2
		Yes	5050CTL2
	Saturn glass	No	5080CT2
		Yes	5080CTL2
Infrared Remote Control	—	—	5035TX
Wall Box	—	—	5000CT2WB
RS-232 Cable	—	—	5000CT2RS232

2.0   Important Notes

• Using any non-C-Bus software with C-Bus hardware without the written consent of Clipsal may void any hardware warranties.

• Changes or modifications not expressly approved by Clipsal could void the user's authority to operate the equipment (under FCC rules).

• To comply with EMC regulations the included ferrite filter must be fitted to the C-Bus cable connected to the C-Bus Black & White MK Touch Screen unit. Refer to Figure 10 on Page 15.

3.0   Description

The C-Bus Black & White Mk II Touch Screen allows sophisticated control of an entire C-Bus system from one location. Using appropriate software, the unit can be configured to look and operate in a manner convenient to the user. Refer to Section 12 on Page 17 for further details.

3.1   Packing List

Items[*] included with the C-Bus Black & White Mk II package are shown in Figure 1. They are:

- touch screen
- parts pack and stylus
- USB programming cable
- 1 × ferrite filter
- Installation Instructions (this booklet) and User's Guide
- installation template.
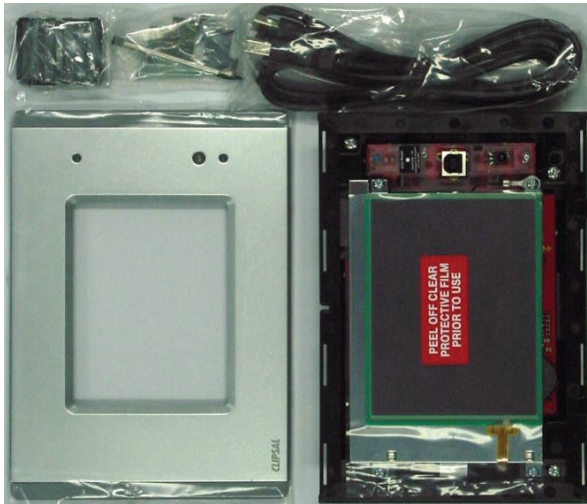
Figure 1 - Typical components packed with a 5050CT2 Neo unit

*Subject to change without notice.

3.2   Features

The C-Bus Black & White Mk II's features include:

- a touch sensitive 4.7 inch active black & white LCD screen
- real time clock for automatic scheduling of events
- logic engine (specified models only), providing the ability to perform control functions based on programmed algorithms
- in-built infrared (IR) receiver
- in-built light level sensor
- 1 × USB programming port
- 1 × RS-232 serial port* (logic engine models only)
- 1 × C-Bus connection.

4.0   Definitions

Term	Definition
load	An electrical device (such as a light) connected to a C-Bus output unit (such as a dimmer).
scene	A series of actions across multiple outputs, triggered by a single button. For example, on arrival home you could use a scene to switch on lights in the hallway, kitchen and lounge, and switch on a heater.
schedule	A sequence of events to occur at particular instances in the future.
backlight	The light behind the LCD screen providing visibility in varying lighting conditions.

Note: The serial port is used to interface to third party products using the logic engine. It is not used for programming the unit.

5.0   Installation Procedure

5.1   Location

It is important to select the right location to install the C-Bus Black & White Mk II. Some considerations:

- The unit has a typical viewing angle of 45° to the left and right, 50° up and 30° down (illustrated in Figure 2). Take this into account when choosing the mounting height.
- Provide easy access to the unit for switching lights and selecting scenes.
- Keep the C-Bus Black & White Mk II clear of places subject to water, humidity, direct sunlight and heavy dust.
- Avoid obstruction to the reception of infrared signals from a remote control.
- The C-Bus Black & White Mk II is designed for indoor use only.
- Do not mount opposite windows or other sources of bright light, as the reflections make viewing difficult.
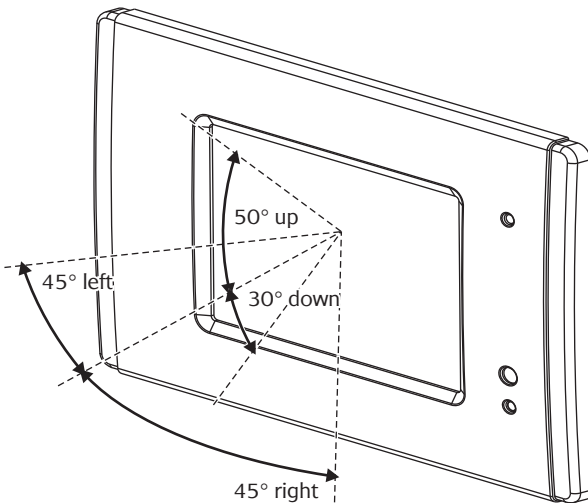
Figure 2 - Consider the unit's viewing angle when mounting

5.2   Multiple Units

Multiple touch screens can be installed on a C-Bus network. These units may be programmed to operate cooperatively or independently of each other. Take care not to mount units where a single IR remote control transmission can be received by multiple units (illustrated in Figure 3). Otherwise, multiple units may trigger a scene, with unpredictable results.

Good placement   **Poor placement**

Figure 3 - Take care not to overlap IR transmission/reception zones

6.0   Mounting Instructions

There are two options for mounting the C-Bus Black & White Mk II:

- in stud/plasterboard walls (such as timber frame internal walls) using the built-in mounting flaps
- in solid walls (such as brick or stone) or stud walls using a wall box.

Descriptions of both methods are shown on the following pages.

6.1　　Mounting in Stud Walls

To mount the C-Bus Black & White Mk II in a stud/plasterboard wall:

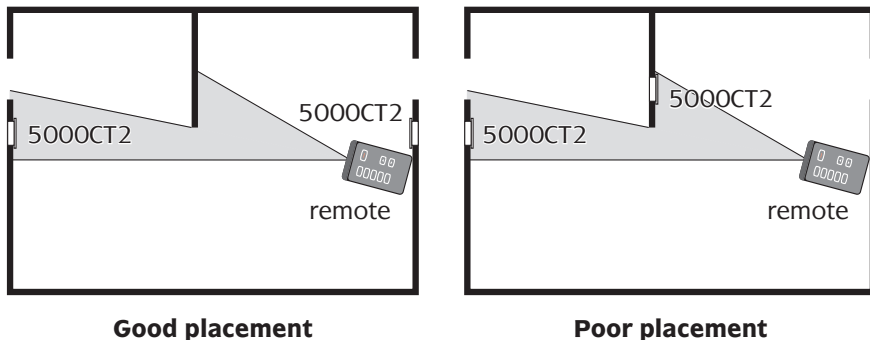1) Cut an appropriately sized hole using the provided template. Ensure you leave sufficient clearance from studs and other obstructions.

2) Remove the green Phoenix connector and wire to C-Bus.

3) Hold the touch screen up to the wall and plug the connectors into the unit (C-Bus and RS-232 if used).

4) Place the touch screen in the wall.

5) Tighten the four mounting screws to rotate and tighten the mounting flaps.
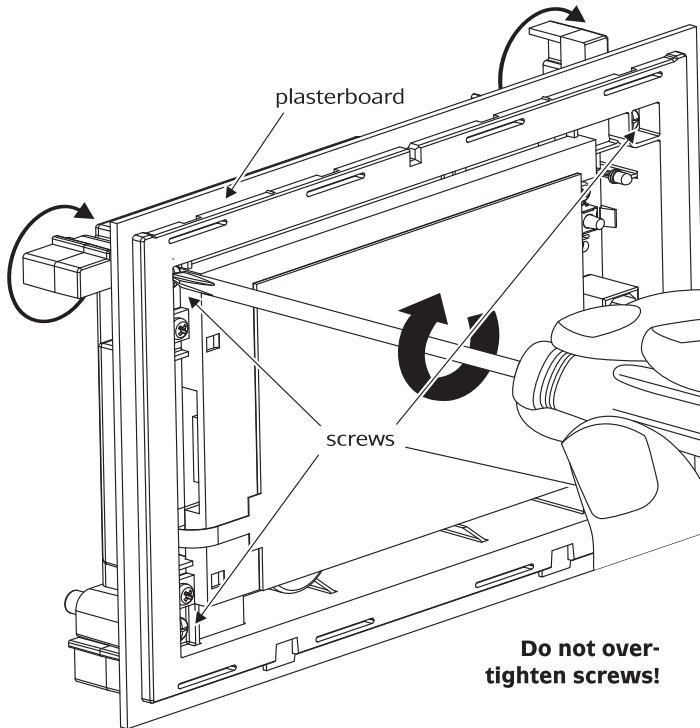
Figure 4 – Tighten the screws and the mounting flaps rotate and clamp the wall

NOTE　　To release the mounting flaps apply forward pressure whilst loosening the screws.

6.2   Wall Box

The C-Bus Black & White Mk II Wall Box (catalogue number 5000CT2WB) allows the C-Bus Black & White Mk II unit to be mounted within a solid wall construction such as brick or stone. The wall box (illustrated in Figure 5) may also be used to mount a unit in timber or metal-framed stud walls.
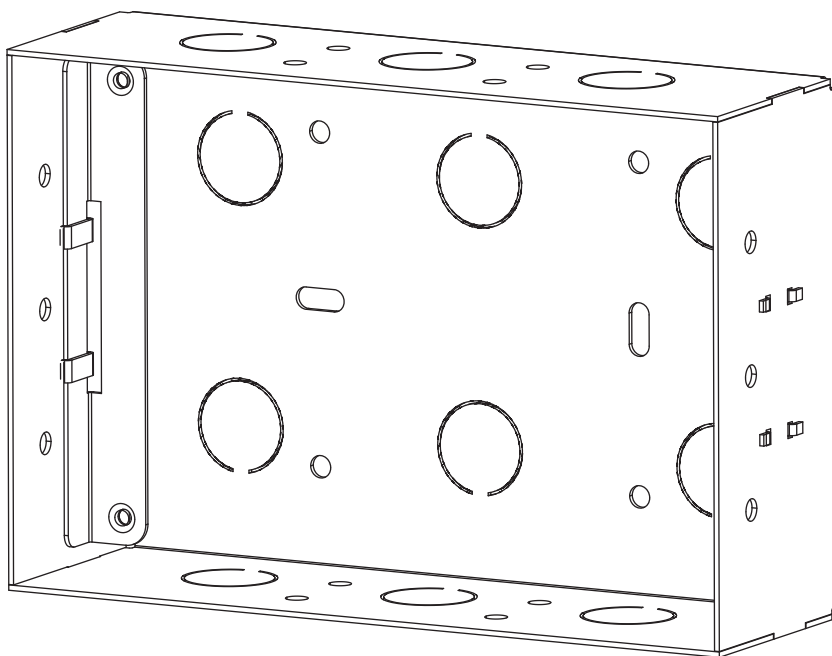
Figure 5 - The C-Bus Black & White Mk II Wall Box

To mount the touch screen using the wall box:

1) Prepare a hole in the wall or place the wall box against a beam of the wall frame (in stud walls).
2) Fix the wall box into the wall or frame, in an appropriate manner.
3) Feed the cable(s) through to the wall box.
4) Remove the green Phoenix connector and wire to C-Bus.
5) Remove the four mounting flaps and fixing screws from the touch screen (these are not required).

6) Insert the screws provided in the parts pack through the holes identified in Figure 6.

7) Hold the touch screen up to the wall box and plug the cables into the connectors (C-Bus and RS-232 if used).

8) Tighten the screws to fix the touch screen to the wall box.
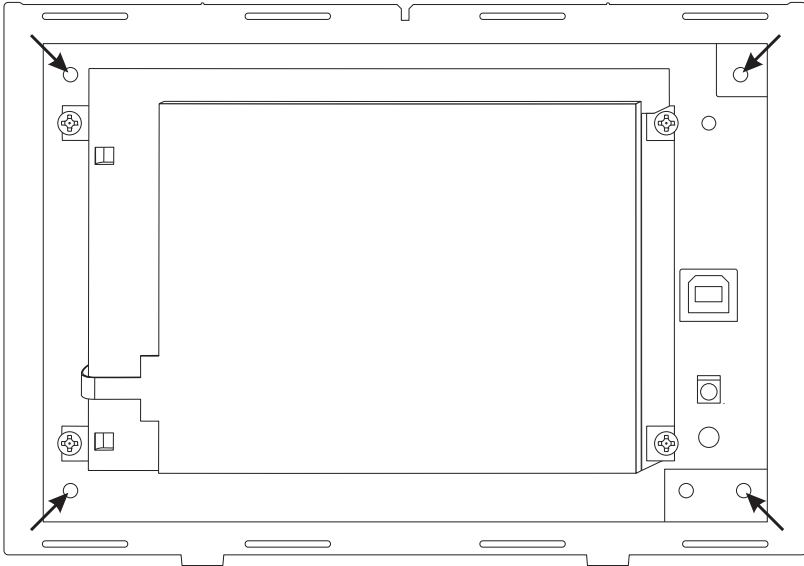
Figure 6 - Remove the flaps and insert the screws into the identified holes

6.3   Attaching the Facia

The following steps are illustrated in Figure 7. To attach the facia:

1) Position the facia over the touch screen, with the indicator window on the right hand side. Press the top of the facia against the wall just above the touch screen.
2) Slide the facia down over the top of the touch screen so it clips behind it.
3) Press the bottom of the facia, on each side, so it snaps into place.
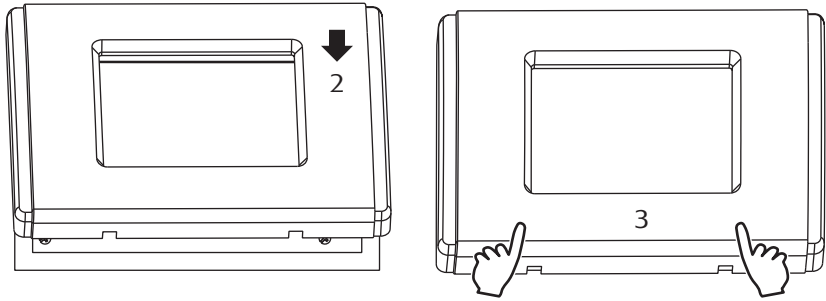
Figure 7 - Attaching the facia

To remove the facia, insert the head of a flat head screwdriver into each slot at the base of the facia, and twist.

7.0   Wiring Details

7.1   Rear Panel Connectors

Two connectors are provided on the rear of the C-Bus Black & White Mk II. These are the C-Bus and RS-232 connectors (Figure 8). The USB programming connector is located on the front of the unit, behind the facia.
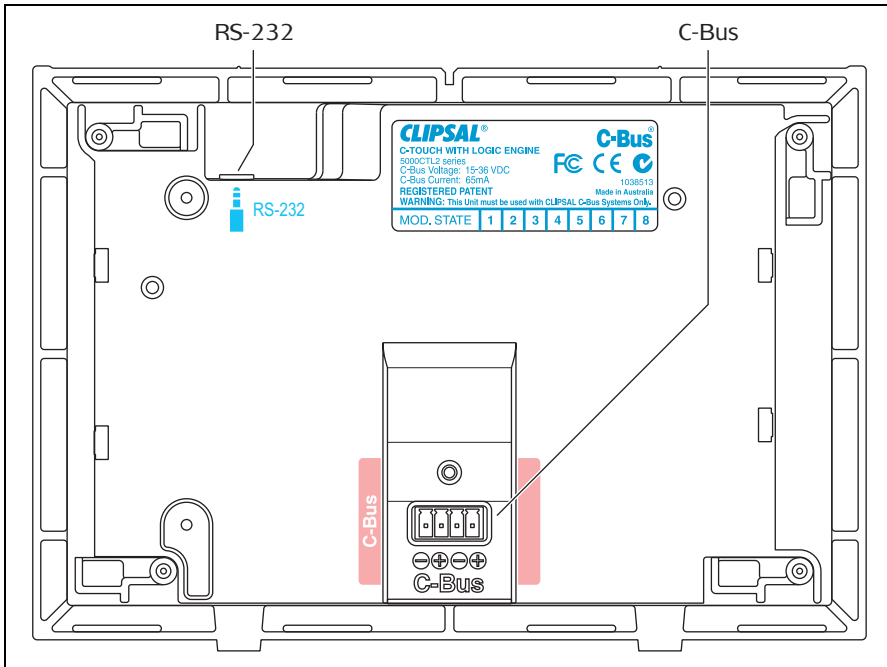
Figure 8 - Rear panel connector identification

7.2   C-Bus Network Connection

Connection to the C-Bus network is made via the removable green Phoenix connector on the rear of the C-Bus Black & White Mk II unit. Use Cat-5 Unshielded Twisted Pair (UTP) C-Bus cable, and an appropriately wired 4-pin Phoenix plug. The use of bootlace ferrules (crimps) is recommended for a reliable connection.

C-Bus cable conductor assignments are provided in Figure 9. The Clipsal catalogue number for the C-Bus Cat-5 UTP cable is 5005C305B.

|	
C-Bus Positive:	blue + orange
C-Bus Negative:	blue & white + orange & white
Remote OFF:	brown + brown & white
Remote ON:	green + green & white
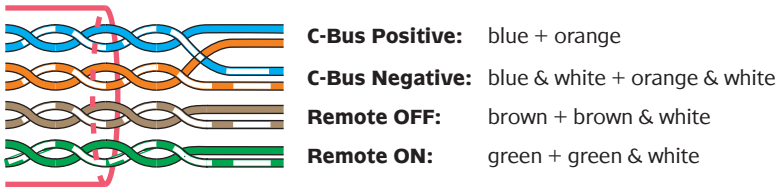
Figure 9 - C-Bus cable conductor assignments

Pinouts are provided in Table 1. The C-Bus Black & White Mk II does not have Remote Override functions (Remote ON/Remote OFF). However, if more than one C-Bus cable is connected to the unit, the Remote Override connections should be maintained across the cables to ensure correct operation of these services.

Terminal		C-Bus Connection	Colour
C-Bus	−	C-Bus Negative (−)	blue & white
	+	C-Bus Positive (+)	blue
	−	C-Bus Negative (−)	orange & white
	+	C-Bus Positive (+)	orange
Not connected		Remote OFF	brown + brown & white
		Remote ON	green + green & white

Table 1 - C-Bus Black & White Mk II C-Bus pinouts

Loop the C-Bus cable through the provided ferrite filter. This applies an additional level of filtering in order to comply with EMC regulations. Refer to Figure 10.

Figure 10 – Loop the C-Bus cable through the ferrite filter

7.3   RS-232 Connection

The RS-232 serial port connection consists of a 3.5 mm stereo socket with pinouts for RxD, TxD and GND. It is useable on logic engine models only. A special RS-232 cable is available (Clipsal cat. number 5000CT2RS232). Pinouts are provided in Table 2. The RS-232 port allows you to connect external devices to the C-Bus Black & White Mk II, such as security and control equipment.

> **NOTE** If using the RS-232 port to connect to external devices, ensure you use a suitable shielded data cable. Cable length should be limited to 15 metres for communication at up to 19,200 bps, or 7.5 metres at 38,400 bps.
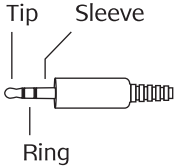
Pin	Name	Description
Tip	TxD	Transmit Data
Ring	RxD	Receive Data
Sleeve	GND	Ground

Table 2 - C-Bus Black & White Mk II RS-232 pinouts

8.0   C-Bus System Clock

The C-Bus Black & White Mk II incorporates 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. It is recommended that three units on a particular C-Bus network have clock circuitry enabled, to provide redundancy.

The touch screen's C-Bus system clock is enabled as default. Its state can be changed from the unit's "Global" tab in the C-Bus Toolkit software.

9.0   C-Bus Power Requirements

The C-Bus Black & White Mk II draws 65 mA from the C-Bus network. The unit does not supply power to the C-Bus network.

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.

10.0 Power Surges

Each unit incorporates transient protection circuitry. Additional external power surge protection devices should be used to enhance system immunity to power surges. It is strongly recommended that overvoltage equipment such as the Clipsal 970 be installed at the switchboard.

11.0 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.

12.0 Programming Requirements

Unit Address

The C-Bus Black & White Mk II must be programmed with a unique unit address. This is accomplished using C-Bus Toolkit software, available from the downloads section of the Clipsal Integrated Systems (CIS) web site (http://www.clipsal.com/cis). C-Bus Toolkit is also used to change the state of the C-Bus system clock and burden if required.

C-Bus Project

The C-Bus Black & White Mk II must be configured with a software project that has been customised for a particular C-Bus installation. Such a project is produced using the Programming Interface for C-Bus Embedded Devices (PICED) software. The PICED software is available from the Downloads section of the CIS web site (http://www.clipsal.com/cis). Documentation and help files are included with the software.

Once you have produced a project using the PICED software, connect the USB programming cable from the touch screen to your PC. Use the 'Transfer Project to unit' option to upload the project to the touch screen. This option is located in the PICED software Transfer menu.

Both the touch screen and C-Bus Toolkit project files should be saved to disk and kept in an archive at your premises. It is also recommended to give a copy to the customer.

12.1 Unit Reset

⚠ **CAUTION** This button will erase **all** firmware and project data in the C-Bus Black & White Mk II. The unit will cease to operate until firmware and project data are reloaded.

The C-Bus Black & White Mk II has a button that can be used to recover the unit if the firmware becomes corrupt. The Unit Reset button is located on the front of the unit, under the facia, immediately above the USB connector. The button is pressed when the unit is powered, using a pin or paper clip to break the sticker through the white dot.

It is not necessary to use this button if the unit is operating normally. The Unit Reset button should only be pressed after contacting Tech Support.

Pressing this button will erase ALL firmware and project data in the unit and reset it. Once pressed, the unit will cease operating and display a blank (black) screen. The blue power LED will remain on. Firmware can then be reloaded using the 'Recover C-Bus 2' option from the Transfer menu in PICED.

13.0 Electrical Specifications

Parameter	Description
AC input impedance	13 kΩ @1 kHz
Display type	4.7 inch (119 mm) active black & white LCD
Display resolution	320 × 240 pixels
Display luminance	120 cd/m^2
Viewing angle	Left, right: 45°; up: 50°; down: 30°
Backlight type	White LED
Touch surface durability	1 million presses (typical)
Maximum number of controlled loads	255 group addresses on each of 10 applications
Third party interface	RS-232 port (logic engine models only)
Programming port	USB type B (front of unit, behind facia)
C-Bus supply voltage	15 to 36 V DC @ 65 mA required for normal operation. Does not provide current to the C-Bus network.
Network clock	Software selectable
Network burden	Software selectable
Processor	ARM7TDMI, 40 MHz
Warm up time	< 10 seconds
Operating temperature	0 to 45 °C (32 to 113 °F)
Operating humidity	10 to 95% RH

14.0 Mechanical Specifications

Parameter	Description
Dimensions (W × H × D)	194 × 138 × 35 mm (excluding facia, flaps extended)
Facia dimensions (W × H)	Plastic: 193.4 × 134.4 mm Neo: 192.0 × 137.0 mm Saturn: 195.0 × 136.0 mm Stainless steel: 193.4 × 134.4 mm
C-Bus connection type	4 way removable terminal block (Phoenix)
RS-232 connection type	3.5 mm stereo socket
Weight	370 g (without facia)
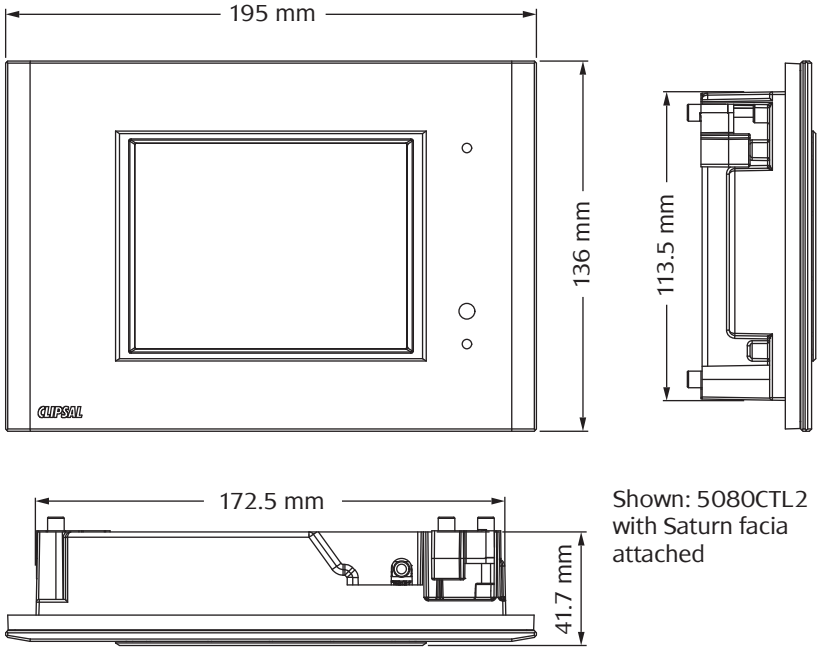
Shown: 5080CTL2 with Saturn facia attached

15.0 Standards Complied

DECLARATIONS OF CONFORMITY

Australian/New Zealand EMC & Electrical Safety Frameworks and Standards

5000CT2 Series C-Bus Black & White Mk II products comply with the following:

Standard	Title
AS/NZS CISPR22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

European Standards

5000CT2 Series C-Bus Black & White Mk II products comply with the following:

Standard	Title
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
EN 55024	Information technology equipment – Immunity characteristics – Limits and methods of measurement

USA Standards

5000CT2 Series C-Bus Black & White Mk II products comply with the following:

Standard
FCC Part 15 Radio Frequency Devices, Subpart B for unintentional radiators.

Other International Standards

5000CT2 Series C-Bus Black & White Mk II products comply with the following:

Standard	Title
CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
CISPR 24	Information technology equipment – Immunity characteristics – Limits and methods of measurement

16.0 Warranty Statement

The 5000CT2 Series C-Bus Black & White Mk II Touch Screens 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 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 Pty Ltd, 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 1300 722 247 (CIS Technical Support Hotline).

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: tech.training@clipsal.com.au

clipsal.com