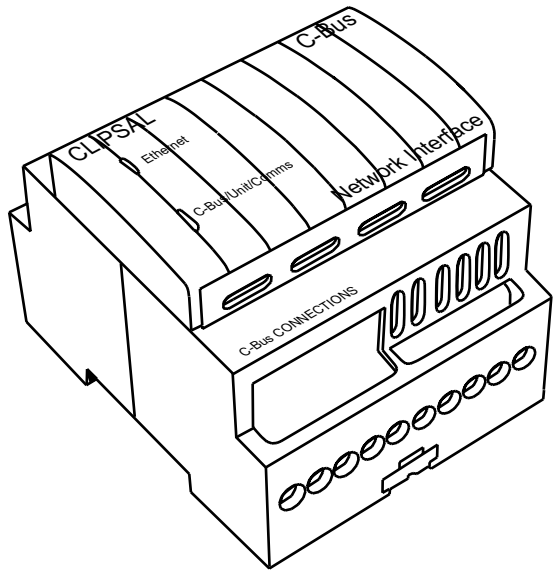
CLIPSAL®
INTEGRATED SYSTEMS

CLIPSAL
C-Bus™
Energy Management System

C-Bus Network Interface

Installation Instructions

5500CN Series



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1.0 Product Range

5500CN C-Bus Network Interface

2.0 Description

The Network Interface is a C-Bus system support device designed to provide an isolated communications path between an Ethernet 10BaseT Network and a C-Bus Network. For ease of installation the unit is DIN rail mounted measuring 4M wide (1M = 17.5 +0.5/-0.0mm)

3.0 Capabilities

The Network Interface provides the gateway between an Ethernet Network and a C-Bus Network. Through this interface the following functions can be achieved:

1. Programming C-Bus Units,
2. Issuing commands to a C-Bus Network, including scheduled activities,
3. Monitoring and Data Logging of activities on a C-Bus Network

The Network Interface may also generate the system clock for communications data synchronisation on the C-Bus Network and provide a software selectable Network Burden.

NOTE: When using C-Bus Installation software V2.20 or earlier, additional 'Com Port Redirector' software will be required.

4.0 Indicators

4.1 Ethernet LED

This indicator shows the status of the Ethernet side of the Network Interface.

Indicator Status	Meaning
Red	Link bad
Red Flash (5 times)	No DHCP Server found + link bad
Orange	Link good
Orange/Green Flashing	Link good and session active

4.2 C-Bus / Unit / Comms LED

This indicator shows the status of the C-Bus side of the Network Interface.

Indicator Status	Meaning
Red	No C-Bus connection
Red flash	No C-Bus connection, active comms to Ethernet side
Red/Orange flash	C-Bus clock present, C-Bus voltage marginal
Orange	C-Bus clock present, C-Bus voltage good
Orange/Green flash	C-Bus clock present, C-Bus voltage good, active comms to Ethernet side

5.0 Clock Signal Generation

The Network Interface incorporates a software selectable C-Bus System Clock, used for synchronising data communications waveforms on the C-Bus Network. Selecting this option on the 'Global Tab' of the Graphical User Interface (GUI) will enable this unit to generate a C-Bus system clock signal on the network (if one is not detected).

6.0 Network Burden

The software selectable Network Burden can only be enabled on a unit with an address of 001. The Burden can be enabled from the 'Global Tab' within the GUI for the Network Interface, which is the same as the PC Interface Module.

Caution: The GUI software is designed to prevent accidental selection of the Burden.

The following steps are required to correctly enable the Network Burden from the GUI:

1. Select the Network Burden check box (cross inside box for ON),
2. Click OK button,
3. Select 'Save to Network' and/or 'Save to Database',
4. Click OK button, then,
5. Repeat steps 3 and 4 within 20 seconds, to save your selection.

To disable the Network Burden the same process applies except the Burden selection check box is cleared (remove cross). The Network Burden will be automatically disabled if the Unit Address is changed from 001.

7.0 Connection to the C-Bus Network

Installation of the Network Interface on to a C-Bus Network requires connection to the unshielded twisted pair C-Bus Network Cable. The illustration below shows the recommended technique for cable termination giving the best electrical performance. It is recommended that Category 5 data cable is used, Clipsal catalogue no. 5005C305B.

RJ Pin	C-Bus Connection	Colour
1	Remote ON *	Green/White
2	Remote ON *	Green
3	C-Bus Neg (-)	Orange/White
4	C-Bus Pos (+)	Blue
5	C-Bus Neg (-)	Blue/White
6	C-Bus Pos (+)	Orange
7	Remote OFF *	Brown/White
8	Remote OFF *	Brown

* The Network Interface does not have Remote Override (ON/OFF) functions, however correct connections must be maintained for these services across the C-Bus Network. They are looped between the two C-Bus connections on the unit.

Note the mutual twist of solid and dotted conductors of opposing coloured conductors. This ensures a good electrical termination, with favourable common mode noise characteristics.

NOTE: Rubber bungs are supplied (3 off) for unused RJ45 connectors, to stop foreign bodies from entering the units.

8.0 Communications Protocol

Start Bits	: 1
Data Bits	: 8
Stop Bits	: 1
Parity	: None
Baud Rate	: 9600

Default settings

9.0 C-Bus Side Programming Requirements

This Network Interface product incorporates a C-Bus PC Interface Module for communications to the C-Bus Network. Programming of the C-Bus side of the Network Interface can be done in the same manner as programming a standard PC Interface.

The Network Interface must be supplied with power at the 9-12VAC/DC terminal for programming of either the C-Bus or Ethernet sides of the unit. **NOTE:** Connection is not polarity sensitive, pure pack is not supplied.

The PC Interface Module must be programmed to set a unique identification (Unit Address) and mode of operation on the C-Bus network. The C-Bus Installation Software can be used to configure all operational parameters.

The PC Interface Module must be programmed using 5000S/2 C-Bus Installation Software v2.1.3 (or higher). C-Bus Service Pack v2.1.3 is a software plug-in designed to upgrade your existing C-Bus Installation Software v2.0 to the current build standard. Many new features and enhancements are added, including programming support for latest release C-Bus products.

C-Bus Service Pack v2.1.3 is available for download from the Clipsal Integrated Systems web site 'www.clipsal.com/cis'. If web access is not available, simply complete the software coupon included. Forward the coupon to us and we will mail a CD-ROM containing the Service Pack to you.

Further information about the programming of the PC Interface Module can be found in the C-Bus Manual (5000S/2).

10.0 Ethernet Side Programming Requirements

This Network Interface product when connected to an Ethernet Network, may be configured with standard TCP/IP commands. The default configuration of the unit uses a DHCP server to assign it with an IP address. However the 'arp' command may be used with the unit's MAC address (available from the sticker on the unit) to define a particular IP address.

If the Network Interface has no address, it will set its address from the first directed TCP/IP packet it receives. The arp method is available under Windows based systems.

In order for the arp command to work on Windows, the arp table on the PC must have at least one IP address defined other than its own. If the arp table is empty the command will return an error message. Type 'arp –a' at the DOS prompt to verify that there is at least one entry in the arp table.

If the local machine is the only entry, ping another IP address on your network to build a new entry in the arp table; the IP address must be a host other than the machine on which you are working. Once there is at least one additional entry in the arp table, use the following command to arp an IP address to the Network Interface.

```
arp -s 191.12.3.77 00-20-4a-xx-xx-xx
```

Now open a Telnet connection on port 1. The connection will fail quickly, but the Network Interface will temporarily change its IP address to the one designated in this step.

```
telnet 191.12.3.77 1
```

Finally, open a Telnet connection to port 9999 and set all required parameters, or the browser connection.

```
telnet 191.12.3.77 9999
```

NOTE: This IP address is temporary and will revert to the default value when the Network Interface power is reset, unless you log into the Network Interface and store the changes permanently.

Use a cross over cable for a point to point connection, i.e. NIC to Network Interface.
Use a standard patch cable for a network, i.e. NIC to HUB to Network Interface.

Using a Web browser

If your Network Interface already has an IP address you can log into it using a standard Web browser with Java enabled.
Type the Network Interface IP address into the Web browser's URL (address/location) field.

Select 'connect' to login and gain access to the configuration menu.

11.0 Power Surges

The Network Interface is not directly connected to the mains, however voltage surges applied to the AC/DC input should be avoided. Each unit incorporates transient protection circuitry, but additional external power surge protection devices should be used to enhance system immunity to power surges. It is strongly recommended that over-voltage equipment such as the Clipsal 970 series is installed at the switchboard.

12.0 Megger Testing

Megger testing of an electrical installation that has C-Bus units connected will not cause any damage to the C-Bus units. Since C-Bus units contain electronic components, the installer should interpret megger readings with due regard to the nature of the circuit connection.

Megger testing must never be performed on the C-Bus data cabling or terminals as it may degrade the performance of the network.

13.0 Important Warning

The use of any non C-Bus Software in conjunction with the hardware installation without the written consent of Clipsal Integrated Systems may void any warranties applicable to the hardware.

14.0 Standards Complied

The units have been designed to meet Australian and European standards for EMC Compliance and Safety.

AS/NZS3548:1992	Limits and Methods of Measurement of Radio Interference of Information Technology Equipment
IEC61000-6-3:1996	Generic Emission

15.0 Product Specifications

Electrical Specifications

Catalogue Number	5500CN
C-Bus Input Voltage	15 - 36VDC
Current Drawn	0mA

Ambient Conditions

Operating Temperature	0 - 45°C
Operating Humidity Range	10 – 95% RH

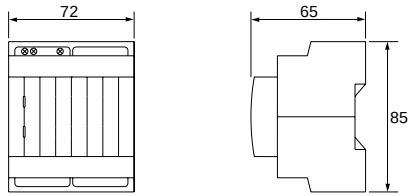
Terminals

C-Bus Side	RJ45 Connectors (2 off)
Ethernet Side	RJ45 Connector

Size

Dimensions	72 x 85 x 65 (L x W x D in millimetres)
Weight	130gm

16.0 Mechanical Specifications



Dimensions in millimetres
NOTE: No user serviceable parts inside.

17.0 Technical Support and Troubleshooting

For further assistance in using the C-Bus Network Interface, 5500CN, please consult your nearest Clipsal Integrated Systems Sales Representative or Technical Support Officer.

Technical Support Email techsupport.cis@clipsal.com.au

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Clipsal Integrated Systems Website

Please visit the Clipsal Integrated Systems Website for information on new product developments, online software registration, software upgrades, plus much more.

Website clipsal.com/cis

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