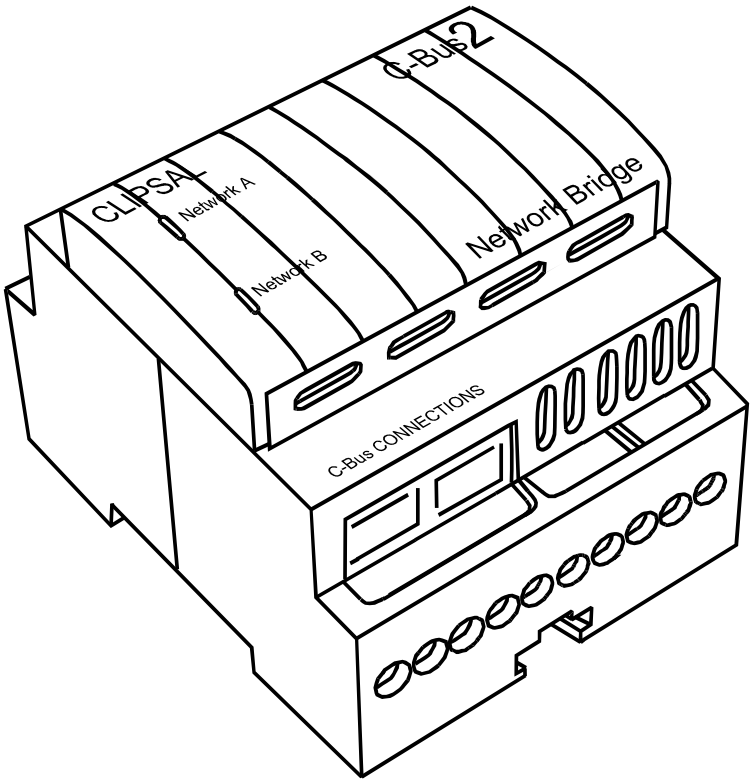
CLIPSAL®

CLIPSAL C-Bus2

C-Bus Network Bridge

Installation Instructions

5500NB Series



REGISTERED DESIGN

REGISTERED PATENT

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1.0 Product Range

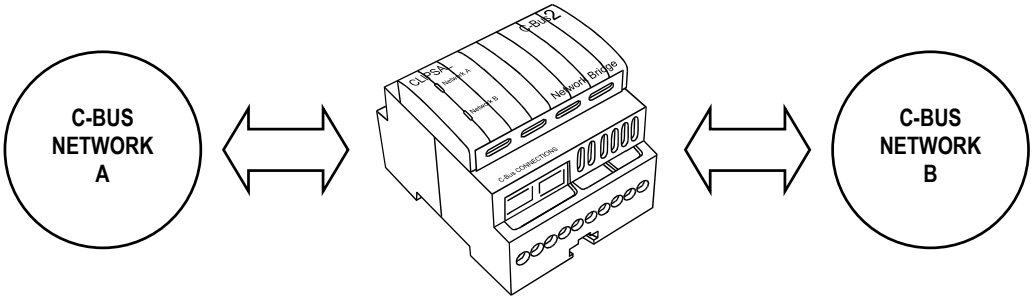
5500NB C-Bus Network Bridge

2.0 Description

The C-Bus Network Bridge is a System Support Module, which may be used to interconnect multiple C-Bus Networks. This may be required to overcome electrical constarints of any single C-Bus Network. The unit facilitates Network segregation, and may also be used to generate a clock signal on the C-Bus Network.

For ease of installation, the 5500NB C-Bus Network Bridge is DIN Rail mounted, measuring 4M (1M = 17.5 +0.5/-0.0 mm) wide.

The C-Bus Network Bridge does not support or participate in C-Bus2 Learn Mode operations.



Network Connection with a 5500NB C-Bus Network Bridge

3.0 Capabilities

3.1 Network Expansion

As the number of units in any particular C-Bus Network approaches the maximum limitation (approximately 100 standard units), increased Network impedance begins to diminish Network performance. C-Bus Network Bridges can be used to split installations into multiple Networks, electrically isolating the Networks and increasing the total number of units configurable in an installation.

3.2 Transmission Distance and Signal Propagation

As the total distance of unshielded twisted pair (UTP) cable, approaches 1000 metres for a given Network, the Network's performance will be degraded by increased propagation delays. A C-Bus Network Bridge can be used as a repeater station for data communications, effectively increasing maximum transmission distances.

3.3 Network Segregation and Isolation

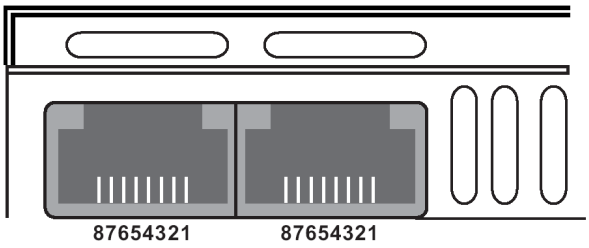
Irrespective of electrical limitations a C-Bus Network Bridge may be simply used to physically isolate one Network from another. For instance, a Network Bridge may be used to isolate floors in a multi-story building installation.

3.4 Network Burden and Clock Signal Generation

The Network Bridge features a software selectable C-Bus Network Burden and System Clock for each connected Network. These facilities may be used to ensure successful communications, eliminating the need for additional C-Bus System Support Modules.

4.0 Connection to the C-Bus Network

Installation 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 required that Category 5 data cable is used, Clipsal catalogue number 5005C305B.



RJ Pin	C-Bus Connection	Colour	5500NB
1	Remote ON	Green/White	Not Connected
2	Remote ON	Green	Not Connected
3	C-Bus Neg (-)	Orange/White	C-Bus Neg (-)
4	C-Bus Pos (+)	Blue	C-Bus Pos (+)
5	C-Bus Neg (-)	Blue/White	C-Bus Neg (-)
6	C-Bus Pos (+)	Orange	C-Bus Pos (+)
7	Remote OFF	Brown/White	Not Connected
8	Remote OFF	Brown	Not Connected

NOTE:

- The 5500NB does not have Remote Override (On/Off) functions, however these connections must be maintained for correct operation of these services across the C-Bus Network. Override connections are internally connected and looped through the Network Bridge.
- Rubber bungs are supplied (3 off) for unused RJ45 connectors, to stop foreign bodies from entering the unit. Always ensure these bungs are installed when the Network Bridge is to be mounted inside a mains rated enclosure.

5.0 Status Indicators

The 5500NB C-Bus Network Bridge incorporates two orange coloured status indicators located on the front of the unit. Each is intended to indicate communications traffic for the relevant Network connected.

Indicator Status	Meaning
On	Power on and functional
Flashing	C-Bus communications in progress
Off	Unit is not connected, or has insufficient power

6.0 C-Bus System Clock

The C-Bus Network Bridge incorporates two software selectable C-Bus System Clocks, one for each Network connected. The System Clock is used for synchronising data communications waveforms on the C-Bus Network. This feature may be enabled using the C-Bus Installation Software. At least one active C-Bus System Clock is required on each C-Bus Network for successful communications. No more than three units on any C-Bus Network should have Clock circuitry enabled, so this option should normally be disabled using the C-Bus Installation Software.

If a System Clock is required, it can be enabled from the 'Global Tab' on the Graphical User Interface (GUI) for the Network Bridge.

7.0 C-Bus Network Burden

The C-Bus Network Bridge incorporates two software selectable C-Bus Network Burdens, one for each Network connected. The Network Burden can be enabled using the C-Bus Installation Software. A Network Burden may or may not be required to ensure correct operation of the C-Bus Network. If in doubt, consult the C-Bus Calculator (Network Design Verification Software Utility) before proceeding with the hardware installation.

If a Network Burden is required, it can be enabled from the 'Global Tab' on the Graphical User Interface (GUI) for the Network Bridge.

CAUTION:
The Graphical User Interface (GUI) software is designed to prevent the Burden from accidental selection. The following steps are required to correctly enable the Network Burden from the GUI:

1. Set the Unit Address as required;
2. Turn to the 'Global Tab' of the GUI;
3. Select the Network Burden check box (cross inside box for ON);
4. Click the OK button;
5. Select 'Save to Network' and/or 'Save to Database';
6. Click the OK button; then
7. 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).

Note that the software selectable Network Burden and System Clock can be enabled on any 5500NB C-Bus Network Bridge, regardless of the Unit Address. This differs from many other C-Bus devices which require a Unit Address of '001' for these features to be enabled.

8.0 C-Bus Power Requirements

The 5500NB C-Bus Network Bridge draws 18mA from each C-Bus Network connected. Adequate C-Bus Power Supply Units must be installed to support the connected devices. If in doubt, consult the C-Bus Calculator (Network Design Verification Software Utility) before proceeding with the hardware installation.

9.0 Power Surges and Short Circuit Conditions

The C-Bus Network Bridge is not directly connected to mains, however the mains voltage that is used to supply power to the C-Bus Network must be limited to the range specified. Each Unit incorporates transient protection circuitry and 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.

10.0 Megger Testing

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

Megger testing of mains wiring of an electrical installation that has C-Bus Units connected will not cause any damage to 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.

11.0 Standards Complied

Standard/Directive	Title
AS/NZS 3548:1995 Inc A1, A2; IEC/CISPR22:1993 Inc A1, A2	Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment
EN55022:1994 Inc A1, A2; IEC/CISPR22:1993 Inc A1, A2	Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment
AS/NZS 61000-3-2:1998; IEC 61000-3-2:1995; EN 61000-3-2:1996 Inc A12	Electromagnetic Compatibility (EMC) Part 3 Limits Section 2: Limits for Harmonic Current Emissions
CISPR 24:1997; EN55024:1998	Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement

12.0 Programming Requirements

The 5500NB C-Bus Network Bridge must be programmed to set a unique identification (Unit Address) and the mode of operation on the C-Bus Network. C-Bus Installation Software v2.3.0 (or higher) can be used to configure the:

- Project Name
- Part Name
- Unit Address
- Application Connection to Adjacent and/or Remote Networks
- Application Address Message Filters
- Clock (Enable/Disable)
- Network Burden (Enable/Disable)

NOTE:

- Both sides of the Network Bridge must be programmed for correct operation.
- The Network Bridge requires two Unit Addresses, one for each connected Network. The Unit Address of each side of the Bridge must match the Network Address of the adjacent Network. The Network Bridge has a ‘Near Side’ and a ‘Far Side’ as viewed from the locally connected PC Interface (or CNI). The Unit Address of the Near Side must match the Network Address of the Far Side Network. The Unit Address of the Far Side of the Bridge must match the Network Address of the Near Side Network.

For further information about the programming of the Network Bridge or configuring Multi-Network Topologies, please to the C-Bus Technical Manual (5000S/2, 5000M/2).

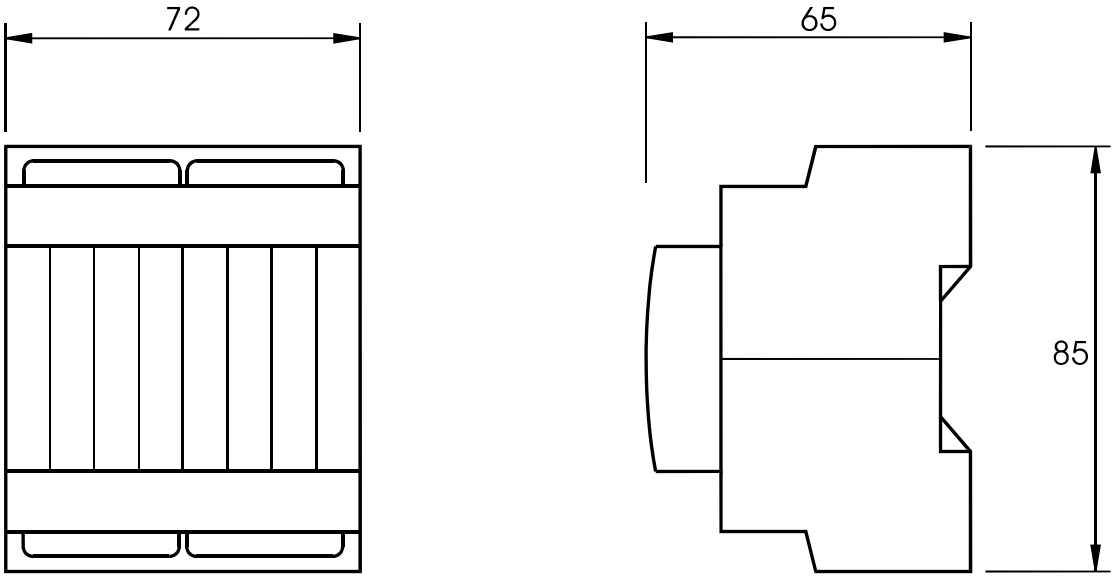
13.0 Important Warning

The use of any non-approved 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 Electrical Specifications

Catalogue No.	5500NB
C-Bus Supply Voltage	15-36Vdc
Current Drawn	18mA (Per Network Connected)
AC Input Impedance	50kΩ @ 1kHz
Electrical Isolation Rating	3.5kV RMS for 1 minute (between Networks)
Maximum Number of Units on a Single C-Bus Network	50 Units
Propagation Delay	250ms (minimum delay for message transfer between two adjacent C-Bus Networks)
Interconnect Capacity	Topology Width - 50 Networks (50 parallel Bridges) Topology Depth - 7 Networks (6 Bridges in series)
Communications Capacity	1 Network per Bridge 2 Applications per Bridge (Unit allows for communication with one or two other Networks only per Bridge, in each direction)
C-Bus Unit Type	BRIDGE2N (Near Side) BRIDGE2F (Far Side)
C-Bus System Clock	Software Selectable
C-Bus Network Burden	Software Selectable
C-Bus Input Terminals	RJ45 Connectors (2 off per Network)
Shipping Weight	95g
Storage Temperature Range	-10 – 60°C
Operating Temperature Range	0 – 45°C
Operating Humidity Range	10 – 95% RH
Dimensions (L x W x H)	72 x 85 x 65mm

15.0 Mechanical Specifications



All dimensions are in millimeters.
No user serviceable parts inside.

Further Information

For further information about configuring this product and other C-Bus devices, please consult the documentation supplied. Further assistance can be obtained as follows:

- **C-Bus Manuals**
  The 5000M/2 C-Bus Technical Manual provides a comprehensive and definitive guide to Clipsal C-Bus. Includes hardware and software specifications, product datasheets, system design and installation guides, and software overview with fully worked programming examples.

- **C-Bus Installation Software**
  The 5000S/2 C-Bus Installation Software (includes 5000M/2 C-Bus Technical Manual) may be used to unlock the power and flexibility of Clipsal C-Bus. Unit operation may be completely customised to suit user requirements. Advanced control functions may be programmed.

- **C-Bus Installer Training Courses**
  Contact your nearest Clipsal Integrated Systems Sales or Technical Support Officer and enquire about Clipsal C-Bus Installer Training and Certification Programs today !!

- **Technical Support and Troubleshooting**
  For further assistance, please consult your nearest Clipsal Integrated Systems Sales Representative or Technical Support Officer.

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Clipsal Integrated Systems Website	clipsal.com/cis

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