CLIPSAL
INTEGRATED SYSTEMS

**NOTE #:** 06-006-1

**DATE:** 25 January 2006

**KEY WORDS:**

# APPLICATION NOTE

## *SHARING INTELLIGENT SOLUTIONS*

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| **Title:** | C-Bus Network Interface Bandwidth Usage |
| **Products Applicable:** | 5500CN |

The amount of bandwidth on an Ethernet network that would be used by a CNI is very small. The CNI protocol is similar to a telnet protocol. Every single character sent to a CNI is placed into its own Ethernet packet and sent off. This means there is lots of overhead (about 50 bytes for every packet).

This means that the Ethernet bandwidth used is roughly about 50 times that of C-Bus. The C-Bus PC Interface will send out characters at a baud rate of 9600 bits / second or 960 characters / second. This will create about 960 packets / sec on Ethernet, at roughly 50 bytes per packet. Therefore: -

**(50 bytes per packet) * (960 packets / second) = 48,000 bytes / second.**

C-Bus itself is only 4000 bits per second, which equates to approximately 400 characters per second. The rate through the PCI won't exceed this by much.

On Ethernet, we have 3 common standards measured in bits / second:

- 10 Mb
- 100 Mb
- 1,000 Mb

**On Ethernet you cannot get the quoted rates because of the collision detection system used. The maximum utilisation is about 20% of the theoretical speed.**

Converting to bytes (assuming 10 bits / character), and scaling by the typical max usage, this gives capacities respectively of: -

- 200k bytes / second
- 2MB / second
- 20 MB / second

So the bandwidth used for a C-Bus Network Interface (CNI) in the absolute worst case where everything is going full speed will be: -

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|---|---|
| **For a 10 Mb network bandwidth** | 48,000 (bytes) / 200,000 (bytes) * 100<br>**= 24%** |
| **For a 100 Mb network bandwidth** | 48,000 (bytes) / 2,000,000 (bytes) * 100<br>**= 2.4%** |
| **For a 1000 Mb network bandwidth** | 48,000 (bytes) / 20,000,000 (bytes) * 100<br>**= 0.24%** |

If using more than one CNI, the figures above need to be multiplied by the number of CNI's.

**Note: -** This is not a sustained bandwidth. It is assumed that it is a worst case burst on an already congested Ethernet network. In practice it will be less than this.

## Technical Support and Troubleshooting

For technical assistance call: 1300 722 247 (Australia)
0800 888 219 (New Zealand)

CIS web site: http://www.clipsal.com/cis/