

# **C-BUS MODULE LINUX USAGE GUIDE**

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### **CHANGE HISTORY**

<b>Date</b>	<b>Issue</b>	<b>Comments</b>
29 Nov 04	1.0	Original
20 Jan 05	1.1	Updated for release 3.0-3
14 Feb 03	1.2	Updated for release 3.1
18 May 03	1.3	Updated for release 3.3
1 Aug 05	1.4	Updated for release 3.5
17 Nov 08	1.5	Update for release 3.20
18 Nov 08	1.6	Put number of networks back at 255

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### 1 PURPOSE

This document defines the use of the pre-compiled C-Bus Module Object Library for x86 Linux platforms.

The complete functions and interface to the C-Bus Module are defined in the C-Bus Module Interface Specification.

### 2 SCOPE

The contents of this document apply to version 3 of the C-Bus Module and C-Bus Module Linux library.

### 3 REFERENCES

C-Bus Module Interface Specification

CBUS-CBMIS

### 4 INTRODUCTION

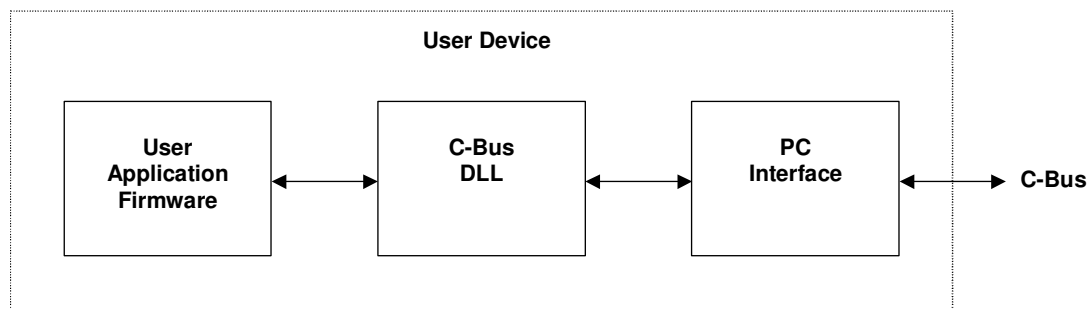
The C-Bus Module provides a general-purpose library for software that needs a C-Bus interface.

The C-Bus Module Linux Library is made by:

- adding a small number of additional services to support x86/Linux serial ports;
- compiling the C-Bus Module; and
- creating an object archive library of the resulting compiled object code.

The device in which the C-Bus Module Linux Library is used is generally an embedded system, communicating with C-Bus via a PC Interface as shown in Figure 1.

The C-Bus Module Linux Library provides a user-friendly interface between the User Application Firmware and the C-Bus PC Interface.



**Figure 1 User Device Configuration**

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### 5 INSTALLATION AND REMOVAL

#### 5.1 *Installing*

The C-Bus Module for Linux is supplied as an RPM:

```
cbm-3.20-0.i386.rpm
```

To install, enter the following from a shell prompt:

```
rpm -i cbm-3.20-0.i386.rpm
```

#### 5.2 *Removing*

To remove, enter the following from a shell prompt:

```
rpm -e cbm-3.20-0.i386.rpm
```

#### 5.3 *File locations*

The RPM installation places files into the following locations:

What	Where
Documentation (PDF and text format)	<code>/usr/local/doc/cbus</code>
C header files	<code>/usr/local/include/cbus</code>
Compiled library, used for linking to your application	<code>/usr/local/lib</code>
Source for the linux serial port driver	<code>/usr/local/src/cbus</code>
Sample programs for the command line and for GNOME / GTK+	<code>/usr/local/share/cbus/examples</code>

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## 6 C-BUS MODULE PROPERTIES

### 6.1 *Build Options*

The C-Bus Module for Linux is built from the C-Bus Module with the following properties defined:

- Default Mode of event handling operation
- 255 Networks
- 10 Applications
- 256 Group Addresses per Application
- C-Bus Enabled level 4
- Transmit Queue length = 200
- Receive Queue length = 50
- Tick rate = 100ms
- Process queues on every tick
- Labels Enabled
- Application support for:
  - Lighting
  - Trigger Control
  - Enable Control
  - Air Conditioning
  - Discovery
  - Error Reporting
  - Measurement
  - Security
  - Telephony
  - Time
- Time Application set for a Priority 1 Master, with user interface, and with reliable daylight saving

### 6.2 *Build Method*

The Linux Object Library has been compiled using GCC version 4.3 on a Fedora Core 9 system.

GCC compilation used the following flags:

```
gcc -Wall -std=gnu99 -pedantic
```

Following compilation, the object files have been placed into the library `libcbm.a`, using the command:

```
ar -r libcbm.a *.o
```

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### 7 ADDITIONAL FUNCTIONS SUPPLIED WITH THE LINUX OBJECT LIBRARY

A series of additional functions are provided to ease use with X86 Linux.

Use of these functions is optional<sup>1</sup>.

#### 7.1 *Open Serial Port and Start Updates*

```
int linux_cbus_if_open_port(char *cp_port_name
                           cbus_boolean b_use_timer)
```

This function opens the serial port and optionally starts a regular timer to run the update process.

Some run-time environments need their own timer system (for example, GTK+), so they should set the option `b_use_timer` to `cbus_false`.

Calling this function:

- Opens the selected serial port;
- Configures the port for 9600 baud, 8 bits per char, no parity and 1 stop bit;
- Registers a serial transmit handler;
- Initialises the C-Bus Module; and
- OPTIONALLY starts a 100ms timer that is used to implement the `cbus_ef_update` call

The serial port needs to be the full path name, such as `"/dev/ttyS0"` or `"/dev/ttyS1"`, or similar.

If any of these processes fails the function fails and returns 0. If everything succeeds this returns 1.

The interval timer is implemented using SIGALRM. If this is not appropriate, you will need to implement your own interval timing system.

#### 7.2 *Closing the Serial Port*

```
void linux_cbus_vf_close_port()
```

When called, this function closes the serial port if open, and stops the 100ms timer. This effectively shuts down the C-Bus Module.

#### 7.3 *Standard Timer Handler*

```
void linux_cbus_vf_timer_handler(int i_dummy)
```

This function is a timer handler for the Linux hosted C-Bus module. It will push any received characters in to be processed, and run a regular update cycle.

This handler expects to run every 100ms, normally as part of a timer service.

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<sup>1</sup> If these functions are not used, then equivalents will need to be written and used instead.

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This timer handler should only be called if the option to use the timer was `cbus_false` in the call to `linux_cbus_if_open_port`.

The parameter is unused, but must be present. Use a value of 0.

## 8 USING THE C-BUS MODULE LINUX LIBRARY

The C-Bus Module Linux library includes all of the functions defined in the C-Bus Module Interface Specification, and the extra functions defined in section 7.

### 8.1 Samples / Examples

The installation includes examples showing:

- use of the C-Bus Module for a simple command-line based program that uses the supplied timer option;
- use of the C-Bus Module with the GTK+ / GNOME graphical operating environment.

### 8.2 Compiling and Linking

#### 8.2.1 Compiler Compatibility

The object library supplied should be compatible with all compilers that can call and link code compiled with GCC 4.3 on the x86 platform.

#### 8.2.2 Compiling

Ensure that the location of the C-Bus Module header files is in your compiler include path. Normally the option `-I` is used to introduce a search path for include files. For example:

```
gcc ... -I/usr/local/include/cbus ...
```

#### 8.2.3 Linking

Ensure that the location of the C-Bus Module object archive is in your compiler library search path, and at link time be sure to specify `-lcbm` as part of the linking step. Normally the option `-L` is used to introduce a search path for libraries. For example:

```
gcc ... -o something -L/usr/local/lib -lcbm ...
```

## 9 COPYRIGHT

The C-Bus Module is NOT free software, and is NOT open source. The C-Bus Module is copyright (c) 2005, 2008 Clipsal Australia Pty Ltd.