

C-Bus Application Messages & Behaviour

Chapter 24 – Telephony Status & Control

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C-Bus Telephony Status & Control Application

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C-Bus Telephony Status & Control Application

24 TELEPHONY STATUS & CONTROL APPLICATION

24.1 Application ID

\$E0

24.2 Description

The Telephony Status & Control Application is used by C-Bus Telephone Devices to broadcast status onto C-Bus, and to enable other devices to control a C-Bus Telephone Device.

24.3 Document Convention

Numbers are shown in decimal (base ten) with no other special prefixes or indications.

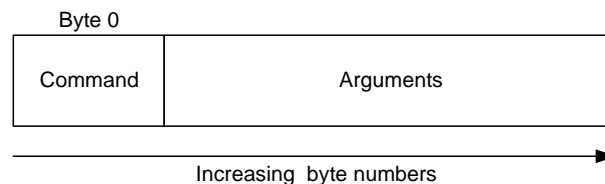
Binary numbers (base 2) are shown with the prefix %.

Hexadecimal numbers (base 16) are shown with the prefix \$.

Example: 157 = %10011101 = \$9D

24.4 Message Structure

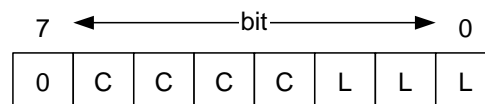
C-Bus messages can be up to 64 bytes long¹. Telephony Status & Control messages have the form:



The number of arguments is variable, and is dependent on the command.

The command byte is broken into bit-fields to support encoding of a command and the number of bytes following as parameters. There are two possible codings, to support a large number of commands with short arguments, and a small number of commands with long arguments.

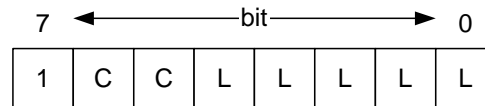
The short argument command form is:



¹ Due to a limitation in the C-Bus PC interface, the Application Data of a single message cannot be longer than 14 bytes. Where C-Bus no network routing information is present, up to 21 bytes can be transmitted.

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The long argument command form is:



Where “C” represents a bit of a command, and “L” represents a bit of the length.

This command format provides compatibility with the C-Bus lighting application, and is therefore suitable for backward compatibility with older devices and interoperability with lighting units.

The first parameter of all commands is a Message Type Code.

24.4.1 Commands

The following commands are supported:

Short argument form (binary):

EVENT %0 0001 LLL

All others reserved.

The length field reflects the number of arguments.

Long argument form (binary):

EVENT %1 01 LLLLLL

All others reserved.

The length field reflects the number of arguments.

24.4.2 Message Type Code

A C-Bus Telephony Status & Control Application Message Type Code² defines the type of information being transmitted into the C-Bus network.

The following convention is used:

Message Type Code:

Size: 8-bit byte

Range: \$00 .. \$FF

Special Cases: \$00 and \$FF are reserved for future expansion

Usage: \$01 .. \$05 used for status

 \$06 .. \$7F reserved for future expansion of status

 \$80 .. \$84 used for control

 \$85 .. \$FE reserved for future expansion of control

² The Message Type Code is in the same place and has a similar function to a Lighting Application Group Address

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24.5 Defined Commands

All commands provide a degree of compatibility with C-Bus Lighting Application commands. The length field of the command encodes the number of argument bytes that follow and apply to that command, including the Message Type Code. The command is followed by a Message Type Code, and then by any additional arguments.

All messages listed are mandatory for C-Bus Telephone Devices, unless explicitly stated otherwise.

24.5.1 Telephone Device Status Messages

Telephone Device Status Messages are emitted by a C-Bus Telephone Device in response to defined events. They are always sent to the Telephony Application Address as a SAL message.

24.5.1.1 Line On Hook

Command: \$09
Arguments: \$01
Meaning: The telephone line has just gone on-hook
Originator: C-Bus Telephone Device
Notes: Any device attached to the telephone line (and which had been using the line) can hang up and cause the line to go on-hook.

24.5.1.2 Line Off Hook

Command: %101LLLLL (range limited to \$A2 .. \$B2)
Arguments: \$02, <reason>, <number>
Meaning: The telephone line has just gone off-hook
Originator: C-Bus Telephone Device
Notes: Any device attached to the telephone line can take the line off hook, including the C-Bus Telephone Device.
<reason> shall be:
 \$01 = incoming voice call, answered by C-Bus Telephone Device
 \$02 = incoming data call, answered by C-Bus Telephone Device
 \$03 = incoming call, answered by some other telephone device
 \$10 = outgoing voice call, initiated by C-Bus Telephone Device
 \$20 = outgoing data call, initiated by C-Bus Telephone Device
 \$30 = outgoing call, initiated by some other telephone device
 \$40 = CBTI is setting a call diversion
 \$50 = CBTI is clearing a call diversion
<number> shall be the ASCII coded telephone number, between 0 and 16 characters long, and selected from either:

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- a. (For incoming calls) The telephone number of the calling party (where Caller ID can be used to obtain this number) truncated to the rightmost 16 digits (characters) if applicable

Or:

- b. (For outgoing calls) The telephone number of the called party, truncated to the rightmost 16 digits (characters) if applicable.

Or:

- c. (For diversions) The number being diverted to (when setting a diversion). When clearing a diversion, the number shall not be present.

This message has a variable length, and can be between 3 and 19 bytes long (including the command byte).

Where Caller ID is supported, unlisted (private) numbers are often presented as the single character "P".

24.5.1.3 Dial Out Failure

Command: \$0A
Arguments: \$03, <reason>
Meaning: The previous dial out attempt failed
Originator: C-Bus Telephone Device
Notes: This message shall only be generated due to failure of an outgoing call initiated by the C-Bus Telephone Device.

<reason> shall be:

- \$01 = no dial tone
- \$02 = no answer
- \$03 = no valid acknowledgment of prompts
- \$04 = number was unobtainable / does not exist
- \$05 = number was busy
- \$06 = internal failure

24.5.1.4 Dial In Failure

Command: \$0A
Arguments: \$04, <reason>
Meaning: The previous dial in attempt failed
Originator: C-Bus Telephone Device
Notes: This message shall only be generated due to failure of an incoming call.

<reason> shall be:

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\$01 = phone stopped ringing without being answered (by any device on this line)

24.5.1.5 Ringing

Command: %101LLLLL (range limited to \$A2 .. \$B2)
Arguments: \$05, \$01, <number>
Meaning: The telephone is ringing
Originator: C-Bus Telephone Device
Notes: This message shall be generated when the telephone starts ringing.

The second argument (\$01) is included to allow a possible future enhancement whereby this number is incremented with each ring burst.

<number> shall be the ASCII coded telephone number, between 0 and 16 characters long, corresponding to the telephone number of the calling party (where Caller ID can be used to obtain this number) truncated to the rightmost 16 digits (characters) if applicable.

24.5.1.6 Recall Last Number - Response

Command: %101LLLLL (range limited to \$A2 .. \$B2)
Arguments: \$06, <type>, <number>
Meaning: Returns the telephone number of the last outgoing or incoming call
Originator: C-Bus Telephone Device
Notes: This message shall be generated only after receipt of a Recall Last Number Request message (refer section 24.5.2.2).

<type> shall be:

\$01 = This is the number of the last outgoing call made
\$02 = This is the number of the last incoming call received

<number> shall be the ASCII coded telephone number, between 0 and 16 characters long truncated to the rightmost 16 digits (characters) if applicable.

24.5.1.7 Internet Connection Request Made

Command: \$09
Arguments: \$07
Meaning: The telephone interface device has had a request to initiate an internet connection
Originator: C-Bus Telephone Device
Notes: OPTIONAL MESSAGE

The telephone interface device does not have to make the internet connection itself. Rather, it has just processed a request to make such a connection and is informing other devices on the C-Bus that they should start the connection process.

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24.5.2 Telephone Device Control Messages

24.5.2.1 Isolate Secondary Outlet

Command: \$0A
Arguments: \$80, <isolate status>
Meaning: Sets the isolation state of any secondary outlet
Originator: Anywhere
Notes: This message can be used to override the normal behaviour of the secondary outlet of the Clipsal 5500TAU Telephone Interface.
<isolate status> shall be:
\$00 = Secondary outlet to behave according to normal specification
\$01 = Secondary outlet to be isolated (switched out)

24.5.2.2 Recall Last Number - Request

Command: \$0A
Arguments: \$81, <type>
Meaning: Request the last incoming or outgoing telephone number be returned
Originator: Anywhere
Notes: The last incoming or outgoing number will be returned in a Recall Last Number Response message (refer section 24.5.1.6).
<type> shall be:
\$01 = This is the number of the last outgoing call made
\$02 = This is the number of the last incoming call received

24.5.2.3 Reject Incoming Call

Command: \$09
Arguments: \$82
Meaning: The incoming call is to be rejected
Originator: Anywhere
Notes: The Telephone Device shall answer the incoming call, play a message indicating the call has been rejected, and then hang up.

24.5.2.4 Divert

Command: %101LLLLL (range limited to \$A1 .. \$B1)
Arguments: \$83, <number>
Meaning: The telephone line is diverted to another number
Originator: Anywhere
Notes: OPTIONAL MESSAGE

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The Telephone Device takes the line off hook, plays whatever sequence of DTMF tones is needed to set up a diversion to the given number, and then hangs up.

24.5.2.5 Clear Diversion

Command: \$09
Arguments: \$84
Meaning: Any set telephone line diversion is removed
Originator: Anywhere
Notes: OPTIONAL MESSAGE

The Telephone Device takes the line off hook, plays whatever sequence of DTMF tones is needed to clear any diversion, and then hangs up.

24.6 Message Priority

C-Bus Telephony Application messages shall always be transmitted at the lowest priority (Class 4). The C-Bus message header for transmission shall therefore always be \$05.

24.7 Internetwork Routing

C-Bus Telephone Devices shall not transmit status messages into remote C-Bus networks. (In other words, the Network Routing shall be zero).

24.8 Application Behaviour

24.8.1 Concatenated Commands

A C-Bus Telephone Device may receive or transmit a message containing more bytes than a single command. This permits a single C-Bus transmission to contain multiple commands for a single application.

Devices using C-Bus Telephony Application messages must process all received bytes. This is achieved by placing the received bytes in a buffer, and using the following simple algorithm:

```
WHILE the buffer contains bytes LOOP  
    The first byte defines the command type and argument  
    count (refer section 24.4).  
    Process the first (command) byte and its arguments  
    Once processed, remove the command and argument bytes  
    from the buffer  
END LOOP
```

24.9 Status Reporting

C-Bus Telephone Devices shall not respond to C-Bus status request (MMI) messages.

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24.10 Limitations

It is preferred that a single C-Bus network should not contain more than 1 Telephone Device.

If multiple Telephone Devices are used, receiving units can separate the source of the messages by the source unit address field of each received message.

24.11 Examples

These examples assume the Telephone Device interfaces to C-Bus using the C-Bus Serial Interface, which is described in more detail in CBUS-SIUG.

The examples assume the Serial Interface SRCHK option is set, so data transfer both to and from the Serial Interface uses a checksum.

24.11.1 Telephone Device Emits “Line On Hook”

Refer to section 24.5.1.1 (Page 5). The Telephone Device could issue:

To PCI: \05E000090111

24.11.2 Telephone Device Emits “Link Off Hook”

Refer to section 24.5.1.2 (Page 5).

In this case, assume the line has gone off hook because the C-Bus Telephone Device answered an incoming call, determined that this was a voice call, and has begun running its voice prompting system. The call originated from telephone number 03 9527 4321.

The Telephone Device could issue:

To PCI: \05E0002C020230333935323734333231FD