# C-Bus Application Messages & Behaviour

# Chapter 11 – Access Control

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# 11 ACCESS CONTROL APPLICATION

## *11.1 Application ID*

$D5

## *11.2 Description*

The Access Control Application is used to control and monitor an access control system.

An access control system usually makes use of proprietary devices such as card sensors, and a monitor/control interface, but can also respond to C-Bus messages and announce status onto C-Bus for other devices to use if they desire.

## *11.3 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 $.

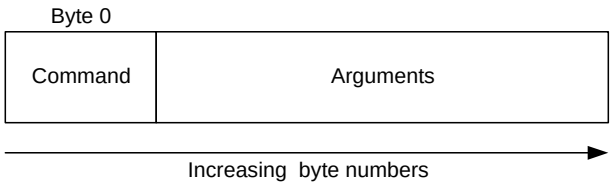
Example: 157 = %10011101 = $9D

## *11.4 Definitions*

Access Point — This is a single node in an Access Control System including a door, door sense, request reader and controller.

## *11.5 Message Structure*

C-Bus messages can be up to 64 bytes long[1], though for Access Control Application they range from 3 to 14 Bytes. Access Control Application 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.

[1] Due to a limitation in the C-Bus PC interface, the Application Data of a single message cannot be longer than 14 bytes.

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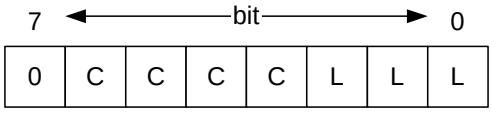
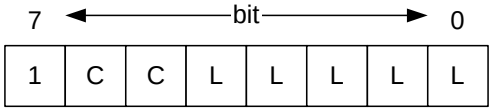
The short argument command form is:




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.

### *11.6 Defined Commands*

***All messages listed are mandatory for C-Bus access control systems, unless explicitly stated otherwise. Deviation from these messages will cause C-Bus devices to be incompatible. Consult Clipsal Integrated Systems before deviating from these messages.***

#### *11.6.1 Access Control System Activity Messages*

Access Control System Activity Messages are emitted by an Access Control system in response to events determined by the system. They are always sent to the Access Control Application Address as a SAL message.

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#### *11.6.1.1 Valid Access Request*

Command: %101LLLLL

Arguments: <Network ID>,<Access Point ID>,<Direction>,<Requesting ID>

Meaning: A valid request for access has been received at an access point.

Originator: Access Control system

Notes: OPTIONAL MESSAGE

The “L” bits of the command shall be set according to the number of argument bytes (in the range 3 to 13).

<Network ID>: Identifies the Access Control System Network in the range $00 - $FE

<Access Point ID>: Identifies the Access Point within the Access Control System in the range $00 $FE

<Direction> must be filled even if not currently being used. The byte is encoded as follows:

$00 = Not Used

$01 = In

$02 = Out

The <Requesting ID> may range from 0 to 10 bytes as required by the installation. The size of this field is set in the command as described above.

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#### *11.6.1.2 Invalid Access Request*

Command: %110LLLLL

Arguments: <Network ID>,<Access Point ID>,<Direction>,<Requesting ID>

Meaning: An invalid request for access has been received at an access point.

Originator: Access Control system

Notes: OPTIONAL MESSAGE

The “L” bits of the command shall be set according to the number of argument bytes (in the range 3 to 13).

<Network ID>: Identifies the Access Control System Network in the range $00 - $FE

<Access Point ID>: Identifies the Access Point within the Access Control System in the range $00 $FE

<Direction> must be filled even if not currently being used. The byte is encoded as follows:

$00 = Not Used

$01 = In

$02 = Out

The <Requesting ID> may range from 0 to 10 bytes as required by the installation. The size of this field is set in the command as described above.

#### *11.6.1.3 Access Point Left Open*

Command: $12

Arguments: <Network ID>,<Access Point ID>

Meaning: An access point remains in the open state

Originator: Access Control system

Notes: OPTIONAL MESSAGE

#### *11.6.1.4 Access Point Forced Open*

Command: $1A

Arguments: <Network ID>,<Access Point ID>

Meaning: An Access Point has changed state from closed to open indicating that it has be forced open.

Originator: Access Control system

Notes: OPTIONAL MESSAGE

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#### *11.6.1.5 Access Point Closed*

| | |
|---|---|
| Command: | $22 |
| Arguments: | <Network ID>,<Access Point ID> |
| Meaning: | An Access Point has changed state from open to closed. |
| Originator: | Access Control system |
| Notes: | OPTIONAL MESSAGE |

#### *11.6.1.6 Request to Exit*

| | |
|---|---|
| Command: | $32 |
| Argument: | <Network ID>,<Access Point ID> |
| Meaning: | An Access Point is being requested to open to allow an unidentified exit to occur |
| Originator: | Access Control system |
| Notes: | OPTIONAL MESSAGE |

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### *11.6.2 Access Control System Request Messages*

Access Control System Request Messages are emitted by any device in a C-Bus network, and sent to the Access Control Application address as a SAL message. They are only ever accepted by an Access Control System, and cause the system to perform a specified function.

#### *11.6.2.1 Close Access Point*

| | |
|---|---|
| Command: | $02 |
| Arguments: | <Network ID>,<Access Point ID> |
| Meaning: | Request that Access Control system close the door associated with the indicated access point. |
| Originator: | Anywhere |
| Notes: | OPTIONAL MESSAGE<br>Access Point ID = $FF indicates every access point on the defined network.<br>Network ID = $FF indicates every network in the access control system. |

#### *11.6.2.2 Lock Access Point*

| | |
|---|---|
| Command: | $0A |
| Arguments: | <Network ID>,<Access Point ID> |
| Meaning: | Request that Access Control system block all further entry or exit from the indicated access point |
| Originator: | Anywhere |
| Notes: | OPTIONAL MESSAGE<br>Access Point ID = $FF indicates every access point on the defined network.<br>Network ID = $FF indicates every network in the access control system. |

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### *11.7 Message Priority*

C-Bus Access Control Application messages shall always be transmitted at the lowest priority (Class 4), unless otherwise noted.

Message priority is part of the C-Bus message header (refer to the C-Bus PC Interface documentation), and is set by the two most significant bits of the C-Bus header field, as follows:

00 = Class 4, lowest priority
01 = Class 3, Medium low priority
10 = Class 2, Medium high priority, this is not for use by this application
11 = Class 1, High priority, this is not for use by this application

Thus, to send a Class 3 message, use a message header of (for example) $45 instead of $05 for a Class 4 message.

### *11.8 Internetwork Routing*

C-Bus Access Control Applications may receive request messages that have been routed via one or more C-Bus bridges or gateway devices. Such messages will be received with a message type indicating point-multipoint, but will have a non-zero Network routing.

### *11.9 Application Behaviour*

#### *11.9.1 Concatenated Commands*

An Access Control Application device may receive 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 Access Control Application messages must process all received bytes. This can be 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 11.4).
    Process the first (command) byte and its arguments
    Once processed, remove the command and argument bytes
    from the buffer
END LOOP
```

#### *11.9.2 State*

C-Bus access control systems shall maintain sufficient internal state to support the mandatory messages.

### *11.10 Status Reporting*

C-Bus Access Control Applications shall not respond to C-Bus status request (MMI) messages.

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### *11.11 Limitations*

Access Control systems need to map their network and access point IDs in a manner that ensures every access point can be uniquely identified, so that multiple access control systems connected to a single C-Bus network can be uniquely addressed.

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### *11.12 Examples*

These examples assume the Access Control System 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.

#### *11.12.1 Access Control System Emits "Valid Access Request"*

Refer to section 11.6.1.1 (Page 5). The access control system could issue:

To PCI: \05D500A4010300017D

This indicates that a valid access request has occurred at access point 3 on network 1 by requesting ID 1.

#### *11.12.2 Access Control System Requested to "Close Access Point"*

Refer to section 11.6.2.1 (Page 8). The access control system could be sent:

To PCI: \05D5000201FF24

This would cause the access control system to close all access points on network 1.

#### *11.12.3 Access Control system Requested to "Lock Access Point"*

Refer to section 11.6.2.2 (Page 8). To Lock all access points of the access control system on the local network, a device would issue:

To PCI: \05D5000AFFFF1E

To lock all access points of the access control system on a remote network (through a single C-Bus bridge with unit address $92 on the side of the sending device, and unit address $43 on the side of the security system), a device would issue:

To PCI: \03**9209**D50AFFFF85

The internetwork routing bytes ($9209D5) would be modified by the bridge as the message passed through, to construct the reverse route ($43D501).

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