

# CLOUD CDI-46

## Serial Control Protocol

CLOUD ELECTRONICS LIMITED

© Cloud Electronics Limited  
140 Staniforth Road,  
Sheffield S9 3HF,  
England  
Phone +44 (0)114 244 7051  
Fax +44 (0)114 242 5462

E-mail [technical@cloud.co.uk](mailto:technical@cloud.co.uk)

Website [www.cloud.co.uk](http://www.cloud.co.uk)

## UPDATES

6 February 2015

This document supersedes version 1.00.

- Source command corrected. Absolute type has no modifier; the previous document stated an "A" modifier is required.
- New System command to PING.
- New System command for pass word management (KEY/ PIN).
- New System command to enter BOOTLOADER mode.
- New variation of the Query command.
- Corrections to error messages.

## INTRODUCTION

This document describes the serial protocol used to communicate with the Cloud CDI-46 serial control card for the Cloud 46/120 mixer-amplifier. Details for configuring the Serial Interface are in the CDI-46 installation guide. This protocol may be used for sending commands to the RS232 interface or to the Ethernet interface on the port dedicated to the CDI-46 (default 4999).

Features of the CDI-46 may be accessed through the web interface to set the RS232 baud rate and network settings. Access to this interface is password protected and the CDI-46 comes with DHCP enabled by default. It is advisable to either reserve an IP address for the unit by setting up the DHCP server to do so or to set the unit for operation on a static IP address.

Throughout this document all message text is shown in a `mono spaced font`.

## MESSAGE STRUCTURE

There are three types of messages in the CDI-46 control protocol:-

- Control messages.
- Response messages.
- Error messages.

Control messages are sent to the CDI-46. Response and error messages are transmitted from the CDI-46 in reply to a control message.

All control messages use upper case letters; all response messages use lower case letters.

The message body is enclosed within a header character ( "<" ) and a terminator sequence ( ">" ). The CDI-46 will reset its message decoding software upon reception of a header character, discarding any previously un-decoded partial messages. The CDI-46 will start to decode a message upon reception of the terminator sequence. If the decoded message is valid it is executed and a response message returned. An error message is returned if the command message has been interrupted by a new command message, if it is too large, if it cannot be decoded or if the command cannot be executed.

## THE CONTROL MESSAGE

Control messages are sent to the CDI-46 in order to perform a function. The control message has two fields separated by a comma. They are called the destination field and the command field.

<DESTINATION , COMMAND />

### DESTINATION FIELD

The destination field is an abbreviated description of the mixer section the command is intended to affect. The field consists of an optional single character **default modifier**, the two character **main destination** and an optional two character **sub destination**. The sub destination is separated from the main destination by a full stop (period).

- **DEFAULT MODIFIER.** The character "D" is used to indicate the message is to set a default value.
- **MAIN DESTINATION.** The CDI-46 has five possible main destinations;
  1. The zones.
  2. The microphones.
  3. The global music channel.
  4. The system.
  5. External devices.
- **SUB DESTINATION.** The sub destination is used to address the message to a particular part of a main destination. Only the zone and system destinations have sub destinations.

#### Examples

1. <Z1.MU,L23/> MU is the sub destination of music in the main destination of zone 1.
2. <DZ1.MU,S3/> Default modifier applied. MU is the sub destination of music in the main destination of zone 1.
3. <Z1.M1,M/> M1 is the sub destination of microphone 1 in zone 1.

## COMMAND FIELD

The command field identifies the command to be performed on the destination. The command field may have up to three parts; the **command identifier**, the **command modifier** and the **command value**. No white space is permitted between these parts.

- **COMMAND IDENTIFIER.** This part is always required. It has a single alphabetic character to identify the command type.
- **COMMAND MODIFIER.** This part is optional depending on the command type. Some commands take no modifier, some commands always take a modifier and some commands can have the option of a modifier or none. The modifier is a single alphabetic character.
- **COMMAND VALUE.** This part is optional depending on the command type and modifier. Source and level commands require a decimal numeric value. The text field command takes up to 32 characters of text. Paging commands require a four digit value representing the state of microphone 1 in each of the four zones. An "X" represents microphone 1 routed to that zone; the letter "O" represents microphone 1 un-routed to that zone.

### Examples

1. <Z1 .MU ,M />                   The command identifier is "M".
2. <Z2 .MU ,SD />                   The command identifier is "S", the command modifier is "D".
3. <Z3 .MU ,L22 />                   The command identifier is "L", the command value is "22".
4. <M1 ,PAOXXX />                   The command identifier is "P", the command modifier is "A", the command value is "OXXX".
5. <M1 ,PR />                        The command identifier is "P", the command modifier is "R".

## DESTINATION FIELD IN DETAIL

### DEFAULT MODIFIER

The default modifier is used to indicate that the message is to set the default value of a parameter. Default values are loaded at start-up when the initialisation mode is set to default mode. If no default values have been set then the factory default values are used.

Defaults are available for the music destination to set the default level value and enable state, default source value and enable state, and the default mute or open state. Defaults are available to the microphone destination to set the default mute or open state.

Note that the last default setting sent may override any previous default settings. EG setting default level on global music overrides any previous sent default level on individual zones. Setting default level to music on an individual zone overrides in that zone a previous default level sent to global music.

### MAIN DESTINATIONS

#### MICROPHONE

Microphone does not take a sub destination. The global microphone main destination ( "MI" ) is used to set the mute or open state of both microphones in all zones. Either microphone ( "M1" , "M2" ) as a main destination can be individually set to the mute or open state in all zones. The paging command allows microphone 1 to be routed to zones. NB Microphone is also available as a sub destination of the zone destination so that the mute status can be set in each individual zone.

The identifiers are: MI , M1 , and M2 .

#### ZONE

The zone destination always takes a sub destination:-

- Music to set source, source enable status, level, level enable status, mute or open status.
- Global microphone to set mute or open status of both microphones in that zone.
- Individual microphones to set mute or open status of the microphone in that zone.

Valid identifiers are for the four zones are: Z1 , Z2 , Z3 and Z4 .

## **GLOBAL MUSIC**

Global music is used to set the source, source enable, level, level enable and mute or open state simultaneously in all zones. It is possible if using the up or down modifiers to set the level or source differently in each zone so the response message from level and source command to the global music destination contains a list of the value in each zone separated by a semicolon. Commands that change mute and enable states will affect all zones similarly so the response message returns a single value.

The identifier is: `MU`.

## **SYSTEM**

Used for setting the start up mode, text field, RS232 settings, query the music mute socket, query hardware and software versions, and to command a system reset.

The identifier is: `SY`.

## **EXTERNAL**

This destination is used to address peripheral equipment such as an attached PMSA microphone.

The identifier is: `EX`.

## **SUB DESTINATIONS**

The zone destination has two available sub destinations: music and microphone. The system destination has sub destinations to modify RS232, query the music mute socket, read and set the system text field, query software and hardware versions, and set power up or power down on the amplifier.

### **INDIVIDUAL MICROPHONE**

These sub destinations allow access to either microphone's mute or open state in each zone destination.

Example Identifiers combinations are `Z1.M1`, `Z2.M1`, `Z1.M2`.

### **MICROPHONES**

This sub destination allows access to both microphones' mute or open states in each zone destination.

Example identifiers are `Z1.MI` or `Z4.MI`.

### **MUSIC**

This sub destination allows access to the music section of each zone destination.

Example Identifiers combinations are `Z1.MU`, `Z2.MU`.

### **PARENT AMPLIFIER**

This sub destination is specific to the system destination. It is used to control the power down mode of the parent amplifier that the CDI-46 is fitted to.

Example identifier is `SY.PA`.

**RS232**

This sub destination is specific to the system destination. It is used to set the baud rate of RS232 communication.

Example identifier is SY.RS.

**TEXT FIELD**

This sub destination is specific to the system destination. It allows a 32 character ASCII label, free for any use. EG a description of the unit can be used to identify between units on a network.

Example identifier is SY.TX.

**HARDWARE VERSION "HV"****PARENT VERSION "PV"****SOFTWARE VERSION "SV"**

These sub destinations are specific to the system destination. They are used to identify the hardware version of the parent amplifier and the CDI-46's versions for hardware and software. These can be specified with the first character of the sub destination; the second character is always "V".

Example identifiers are SY.HV, SY.SV and SY.PV.

**COMMAND FIELD DETAIL**

Please see the examples table.

**BAUD "B"**

This command is only available to the RS232 sub destination of the system destination ( "SY.RS" ). It has no modifiers and takes a numeric value which must be one of the available baud rates on the CDI-46. The response is a lower case echo of the command sent. This command should be used with caution over RS232 since it will change the baud rate after the response has been transmitted.

Available baud rates are 4800, 9600, 19200, 38400, 57600, and 115200.

**BOOTLOAD MODE "B"**

This command is only available to the system destination ( "SY" ). The command is used to access the boot loader mode of the CDI-46. When boot loader is enabled the CDI-46 will enter boot loader at next power on or when reset. When boot loader is disabled the CDI-46 will enter the application mode (normal running) at power on or reset. The command must have a modifier. The modifier can be used to lock or unlock modifications to the boot loader mode, to enable, disable or query the boot loader mode, or reset the CDI-46 to enter boot loader. As a safety feature enabling or disabling is only available when unlocked, reset is only available when unlocked and enabled. As an extra safeguard the unlock modifier requires the four digit numeric password as a value. The unlock modifier is the only modifier that has a value. The only valid modifiers are; lock mode ( "L" ), unlock ( "U" ), enable ( "E" ), disable ( "D" ), query ( "Q" ) and reset ( "R" ). The response message is a lower case version of the control message followed by an equals character ( "=" ) and the lower case version of the lock or unlocked state followed by the lower case version of its enabled or disabled state.



**LEVEL "L"**

This command is used to set the level of line input selection in the music sub destination of a zone or to all zones if sent to the global music destination. The level command requires either a modifier or an absolute value. An absolute value is the attenuation required in one dB steps so an absolute value of 20 represents 20 dB attenuation or -20dB. The up and down modifiers also require a value for the change in level.

The minimum attenuation is 0dB, the maximum attenuation is 90dB.

The modifiers are:

- ( "U" ) for **Up**.  
The value is the dB change in music level.  
EG A value of 10 will increase the level by 10dB.
- ( "D" ) for **Down**.  
The value is the dB change in music level.  
EG A value of 10 will decrease the music level by 10 dB.
- ( "Q" ) for **Query**.  
Check the current value of music level. It takes no value.
- ( "X" ) for **Disable**.  
Disable CDI-46 control over music level.
- ( "E" ) for **Enable**.  
Enable CDI-46 control over music level.

NB Any attempt to change the level value will automatically enable level control.

The response message to any adjustment (up or down) when sent to a zone destination is a lower case version of an absolute level command.

An up or down level command sent to the global music destination will alter the music level in each zone by the up or down amount.

The response message to any adjustment (up or down) when sent to the global music destination is a lower case version of an absolute level command. The value in each zone is returned as a semicolon separated list.

**MUTE "M"****OPEN "O"**

These commands set ( "M" ) and clear ( "O" ) the mute status. They are available to the global music destination, global or individual microphone destinations, the music sub destination of a zone, and global or individual microphone sub destination of a zone. The command takes no modifier or value. The response message is a lower case version of the control message. NB to get the mute status use the query command.

**QUERY "Q"**

This command makes a general query for additional information that is not returned by any commands with a query modifier.

- When applied to a music destination or sub destination it returns a set of data as a comma separated list of the mute status, source enable status and level enable status; the global music destination returns the sets of data for all zones as a semicolon separated list.
- When applied to a microphone destination or sub destination it returns the mute status. If applied to the global microphone sub destination of zone it returns a comma separated dataset of the mute states of both microphones in that zone. If applied to an individual microphone main destination it supplies a semicolon separated list of the mute state in each zone. If applied to the global microphone as a main destination it supplies a semicolon separated list for each zone of comma separated dataset of the mute state of each microphone.  
See the examples.
- When applied to the text field sub destination of system it returns the text within the text field.
- When applied to the parent amplifier sub destination of system it returns the power control status.
- When applied to the software version, hardware version or parent version sub destination of system it returns a text value for the version.

**PAGE "P"**

This command is only available to the microphone 1 destination. It is used to set the access state of zones. The command always takes a modifier. Modifiers are access ( "A" ), release ( "R" ) and query ( "Q" ). The release modifier releases all accessed zones, no value is required. The access modifier can access or release zones. The access modifier requires a value in the form of a character list. The list is one to four characters long. The position of each character represents the zone that the character is acting on. IE the first character represents zone 1, the second character represents zone 2 etc. An "X" character sets the zone as accessed; an "O" character sets the zone as released. Note that the list can be truncated after the highest value zone asserted; any subsequent zones are considered released. IE if only zone 2 is to be accessed then the list can be "OX", zones 3 and 4 are set to released regardless of their state before the command. The response message is a lower case version of the control message, access and query commands are then followed by a list of access states of all the zones.

**POWER CONTROL "P"**

This command is only available to the parent amplifier sub destination of the system destination ( "SY.PA" ). It has modifiers of up ( "U" ) for power on, ( "D" ) down for power off. This directly controls and overrides power settings for the power amplifier section. Setting power down puts the parent amplifier in standby; audio to all amplifier outputs will be muted and the amplifier will have low power consumption. Line level aux outputs on the parent amplifier will not be affected. The query command ( "Q" ) sent to the parent amplifier sub destination returns the status.

**PASSWORD "K"**

This command is only available to the system destination. It has no modifiers. It is used to change the four digit numeric password. Its value field has exactly eight numeric characters; the first four are the old password, the second four are the new password.

**PING "?"**

This command is only available to the system destination. It has no modifiers. It has no effect other than to trigger a response message.

**SET TEXT "S="**

This command is available to the text field sub destination of the system destination. It is used to set up to 32 characters of text in the text field.

**SPOT ANNOUNCER "SA"**

This command is only available to the external destination ( "EX" ). The command is used to trigger the playing of a recorded message on a Cloud PM-SA connected to the CDI-46

**SOURCE "s"**

The command is used to set the line input selection in the music sub destination of a zone or to all zones if sent to the global music destination. The source command requires either a modifier or an absolute value. An absolute value is the line input number from "1" to "6" or "0" for no line input selected.

The up or the down modifier requires no value as the increment or decrement step is always 1.

An up or down command sent to the global music destination will alter the music source in each zone by the up or down amount.

The modifiers are:-

- ( "U" ) for **Up**.  
Each step moves up to the next available line input.
- ( "D" ) for **Down**.  
Each step moves down to the previous available line input.
- ( "Q" ) for **Query**.  
Check the current value of the Input Source.
- ( "X" ) for **Disable**.  
Disable CDI-46 control over Input Source.
- ( "E" ) for **Enable**.  
Enable CDI-46 control over Input Source.

NB Any attempt to change the source value will automatically enable source control.

The response message to any adjustment (up or down) when sent to the music sub destination in a zone destination is a lower case version of an absolute source command.

An up or down command sent to the global music destination will alter the music selection in each zone.

The response message to any adjustment (up or down) when sent to the global music destination is a lower case version of an absolute source command. The value in each zone is returned as a semicolon separated list.

**SYSTEM INITIALISATION MODE "I"**

This command is only available to the system destination ( "SY" ). The command is used to set the initialisation mode of the CDI-46 i.e. the settings at start up. The command must take a modifier. They are to set the initialisation mode to default mode ( "D" ), last configuration mode ( "P" for previous) or factory mode ( "F" ). The response message is a lower case version of the control message.

**SYSTEM MUSIC MUTE SOCKET "MQ"**

This command is specific to the system destination. It is used to query the status of the parent amplifier's music mute socket.

**SYSTEM RESET "R"**

This command is only available to the system destination ("SY"). It has no modifiers and takes no value. The command causes the CDI-46 to reset all of its parameters to factory settings and then reset the CDI-46 software. All zones' music level is set at -90dB and disabled, and their music source is set at Line 1 and disabled, muting is set to open. Microphones are set to muting open in all zones. The system key is set to "1234"; initialisation mode is set to default.

The response message is "<SY,r/>".

**THE RESPONSE MESSAGE**

The response message is the CDI-46's reply to a valid message. Response messages are always in lower case. For mute, open and commands sent to the system destination the response messages are a lower case version of the message sent. The response message confirms the new state. For level and source commands the response message confirms the new value set; the response message is always a lower-case message of the absolute value resulting from the command.

The response message from the global music destination has a list of the value in each zone separated by a semicolon.

**Examples**

- <Z1.MU,L12/>                      Set the music level in zone 1 to 12.  
   <z1.mu,112/>                      Response returns the new value of level in zone 1.
- <Z1.MU,LU3/>                      Increment the music level in zone 1 by  
   <z1.mu,19/>                      Response returns the new value of level in zone 1.
- <MU,LQ/>                              Query level in global music (All zones)  
   <mu,112;45;9;22/>                Return levels in semicolon separated list



## INTERRUPTED ERROR

This error is generated when a header character ( "<" ) is detected in the middle of a message. It is identified by the sequence ( "!I" ). It is used to indicate that the interrupted message has been abandoned and that the CDI-46 has started to receive a new message. An interruption is detected when the opening angle bracket of the new message is received; the Interrupted Error message is transmitted immediately.

### Example

```
<Z1.MU<<!I Message Interrupted/>Z2.MU,L23/><z2.mu,l23/>
```

NB the interrupting message is preserved and processed normally.

## NVM NOT READY ERROR

This error is generated if a control message is sent before the start up parameters have been read from Non Volatile Memory. It is identified by the sequence ( "!N NVM not ready, please wait" ). This error will clear shortly after power on; it is provided to acknowledge a message has been received but not acted upon.

## OVERRUN ERROR

This error is identified by the sequence ( "!A" ). This indicates a fault condition within the software and should not be encountered during normal operation.

## PARSE ERROR

This error is generated when a message is correctly formatted but the destination or command field cannot be decoded as valid. It is identified by the sequence ( "!P" ). Its return message is an upper case copy of the sent message.

### Example

```
<Z1.MY,L8/><!P Z1.MY,L8 Parse error/>
```

NB "MY" is not a valid sub destination.

## TOKEN ERROR

This error is generated when there is a problem with the format of the message so that it cannot be decoded into its destination and command tokens. It is identified by the sequence ( "!T" ). Its return message is an upper case copy of the sent message up to the point of the detected error.

### Example

```
<Z1;MU,L9/><!T Z1; Token error/>
```

NB The semicolon is not a valid sub destination separator.

**TABLE OF ERRORS**

Error Type	ID	Fault Condition	Example Message	
			Faulty Message	Response
Buffer Full	B	Message too long.	<GGGGGGGGG...>	<!B Message Buffer Full/>
Execution	E	The execute function fails.	<SY.RS,B2345/>	<!E SY.RS,B2345 Execution error/>
Interrupted	I	Message interrupted before complete.	<Z1.MU<	<!I Message Interrupted/>
NVM	N	Waiting to finish reading Non Volatile Memory.	Any	<(!N NVM not ready, please wait/>
Overrun	A	Internal fault.	Any	<!A/>
Parser	P	Error decoding message.	<Z1.MU,K89/>	<!P Z1.MU,K89 Parse error/>
Token	T	Error in message format.	<Z1M/>	<!T Z1M Token error/>



### TABLE OF COMMANDS

Command		Identifier	Example Message		
			Zone	Microphone	Global Music
Mute		M	<Z1.MU,M/> <Z1.M1,M/>	<MI,M/>	<MU,M/>
Open		O	<Z3.MU,O/> <Z2.M1,O/>	<M2,O/>	<MU,O/>
Query		Q	<Z1.MU,Q/> <Z1.M1,Q/>	<MI,Q/> <M2,Q/>	<MU,Q/>
Source Select	Up	SU	<Z1.MU,SU/>	<b>NA</b>	<MU,SU/>
	Down	SD	<Z2.MU,SD/>		<MU,SD/>
	Absolute	S	<Z1.MU,S5/>		<MU,S3/>
	Enable	SE	<Z1.MU,SE/>		<MU,SE/>
	Disable	SX	<Z1.MU,SX/>		<MU,SX/>
	Query	SQ	<Z1.MU,SQ/>		<MU,Q/>
Level	Up	LU	<Z1.MU,LU10/>	<b>NA</b>	<MU,LU10/>
	Down	LD	<Z2.MU,LD8/>		<MU,LD10/>
	Absolute	L	<Z1.MU,L22/>		<MU,L32/>
	Enable	LE	<Z1.MU,LE/>		<MU,LE/>
	Disable	LX	<Z1.MU,LX/>		<MU,LX/>
	Query	LQ	<Z1.MU,LQ/>		<MU,LQ/>
Page	Access	PA	<b>NA</b>	<M1,PAOXXO/>	<b>NA</b>
	Release	PR		<M1,PR/>	
	Query	PQ		<M1,PQ/>	
<b>Default Commands</b>					
Level		D[dst],L	<DZ2.MU,L10/>	<b>NA</b>	<DMU,L32/>
Source		D[dst],S	<DZ1.MU,S4/>		<DMU,S4/>
Mute		D[dst],M	<DZ3.MU,M/> <DZ1.M1,M/>	<DMI,M/>	<DMU,M/>
Open		D[dst],O	<DZ3.MU,O/> <DZ2.M1,O/>	<DM2,O/>	<DMU,O/>
Enable	Level	D[dst],LE	<DZ4.MU,LE/>	<b>NA</b>	<DMU,LE/>
	Source	D[dst],SE	<DZ1.MU,SE/>		<DMU,SE/>
Disable	Level	D[dst],LX	<DZ3.MU,LX/>		<DMU,LX/>
	Source	D[dst],SX	<DZ3.MU,SX/>		<DMU,SX/>

<b>External Commands</b>			
			<b>External Destination</b>
Message	Trigger	SA	<EX, SA2/>
<b>System Commands</b>			
			<b>System Destination</b>
Reset		R	<SY, R/>
Initialisation mode	Previous	IP	<SY, IP/>
	Default	ID	<SY, ID/>
	Factory	IF	<SY, IF/>
RS232	Baud	B	<SY.RS, B9600/>
Password	Set	K	<SY, K12345678/>
PING		?	<SY, ?/>
System music mute socket	Query	MQ	<SY, MQ/>
Software version	Query	SV, Q	<SY. SV, Q/>
Hardware version	Query	HV, Q	<SY. HV, Q/>
Parent amplifier version	Query	PV, Q	<SY. PV, Q/>
Parent amplifier power control	Power down	PA, PD	<SY. PA, PD/>
	Power up	PA, PU	<SY. PA, PU/>
	Query	PA, Q	<SY. PA, Q/>
Text Field	Set	TX, S	<SY.TX, S=[Up to 32 characters]/>
	Query	TX, Q	<SY. TX, Q/>
Boot Load	Unlock	BU	<SY, BU1234/>
	Enable	BE	<SY, BE/>
	Reset	BR	<SY, BR/>
	Lock	BL	<SY, BL/>
	Query	BQ	<SY, BQ/>

## EXAMPLES

Each example has a typical CDI-46 reply in red.

### MUSIC COMMANDS

#### Music Level

Set the music level.

<Z1.MU,L12/><z1.mu,112/>	(* Zone 1 music level to -12dB.
<Z1.MU,LU7/><z1.mu,15/>	(* Zone 1 music level up by 7dB to -5dB.
<Z1.MU,LD3/><z1.mu,18/>	(* Zone 1 music level down by 3dB to -8dB.
<Z3.MU,LQ/><z3.mu,190/>	(* Zone 3 music level query.
<Z1.MU,LE/><z1.mu,1e/>	(* Zone 1 music level enable.
<Z1.MU,LX/><z1.mu,1x/>	(* Zone 1 music level disable.

<MU,LQ/><mu,18;90;90;90/>	(* Global music query.
<MU,LU3/><mu,15;87;87;87/>	(* Global music up 3dB.
<MU,L12/><mu,112;12;12;12/>	(* Global music level to -12dB.
<MU,LE/><mu,1e/>	(* Global music level enable.
<MU,LX/><mu,1x/>	(* Global music level disable.

#### Music Source

Set the music source.

<Z1.MU,S2/><z1.mu,s2/>	(* Zone 1 source to 2.
<Z1.MU,SD/><z1.mu,s1/>	(* Zone 1 source down.
<Z1.MU,SU/><z1.mu,s2/>	(* Zone 1 source up.
<Z1.MU,SE/><z1.mu,se/>	(* Zone 1 source enable.
<Z1.MU,SX/><z1.mu,sx/>	(* Zone 1 source disable.
<MU,SU/><mu,s3;6;6;4/>	(* Global music source up.
<MU,SQ/><mu,s3;6;6;4/>	(* Global music source query.
<MU,S2/><mu,s2;2;2;2/>	(* Global music source to 2.
<MU,SE/><mu,se/>	(* Global music source enable.
<MU,SX/><mu,sx/>	(* Global music source disable.

#### Mute/ Open

<Z1.MU,M/><z1.mu,m/>	(* Zone 1 music mute on.
<Z1.MU,O/><z1.mu,o/>	(* Zone 1 music mute off.
<MU,M/><mu,m/>	(* Global music mute on.
<MU,O/><mu,o/>	(* Global music mute off.

#### Query

<MU,Q/><mu,q = o,sx,le;m,sx,le;o,sx,le;o,sx,le/>	(* Global music query.
<Z1.MU,Q/><z1.mu,q = o,sx,1x/>	(* Zone 1 music query.

## Defaults

<DZ1.MU,S3/><dz1.mu,s3/>	(* Default zone 1 music source set to 3.
<DZ2.MU,L12/><dz2.mu,l12/>	(* Default zone 2 music level set to -12dB.
<DZ3.MU,M/><dz3.mu,m/>	(* Default zone 3 music mute state set to on.
<DZ3.MU,O/><dz3.mu,o/>	(* Default zone 3 music mute state set to off.
<DZ1.MU,LE/><dz1.mu,le/>	(* Default zone 1 music level enable.
<DZ1.MU,LX/><dz1.mu,lx/>	(* Default zone 1 music level disable.
<DZ2.MU,SE/><dz2.mu,se/>	(* Default zone 2 music source enable.
<DZ2.MU,SX/><dz2.mu,sx/>	(* Default zone 2 music source disable.
<DZ1.M1,O/><dz1.m1,o/>	(* Default zone 1 microphone 1 mute off.
<DZ1.MI,M/><dz1.mi,m/>	(* Default zone 1 all microphones mute on.
<DMU,L2/><dmu,l2;2;2;2/>	(* Default global music level set to -2dB.
<DMU,S3/><dmu,s3;3;3;3/>	(* Default global music source set to 3.
<DMU,M/><dmu,m/>	(* Default global music mute state set to on.
<DMU,O/><dmu,o/>	(* Default global music mute state set to off.
<DMU,LX/><dmu,le/>	(* Default global music level enable.
<DMU,LX/><dmu,lx/>	(* Default global music level disable.
<DMU,SE/><dmu,se/>	(* Default global music source enable.
<DMU,SX/><dmu,sx/>	(* Default global music source disable.

## MICROPHONE COMMANDS

### Mute/ Open

<MI,M/><mi,m/>	(* Both microphones mute on.
<MI,O/><mi,o/>	(* Both microphones mute off.
<M1,M/><m1,m/>	(* Microphone 1 mute on.
<M1,O/><m1,o/>	(* Microphone 1 mute off.
<M2,M/><m2,m/>	(* Microphone 2 mute on.
<M2,O/><m2,o/>	(* Microphone 2 mute off.
<Z2.M1,M/><z2.m1,m/>	(* Microphone 1 in zone 2 mute on.
<Z2.M1,O/><z2.m1,o/>	(* Microphone 1 in zone 2 mute off.
<Z3.M2,M/><z3.m2,m/>	(* Microphone 2 in zone 3 mute on.
<Z4.MI,O/><z4.mi,o/>	(* Both microphones in zone 4 mute off.

### Microphone 1 Paging

<M1,PAOXXO/><m1,paooxo/>	(* Page zones 2 and 3.
<M1,PAXXOO/><m1,paxxoo/>	(* Page zones 1 and 2.
<M1,PR/><m1,pr/>	(* Release paging.
<M1,PQ/><m1,pqoooo/>	(* Query paging.

### Defaults

<DMI,M/><dmi,m/>	(* Default microphone mute state set to on.
<DMI,O/><dmi,o/>	(* Default microphone mute state set to off.
<DM1,M/><dm1,m/>	(* Default microphone 1 mute state set to on.
<DM1,O/><dm1,o/>	(* Default microphone 1 mute state set to off.
<DM2,M/><dm2,m/>	(* Default microphone 2 mute state set to on.
<DM2,O/><dm2,o/>	(* Default microphone 2 mute state set to off.

### Query

<Z1.M1,Q/><z1.m1,q = o/>	(* Zone 1 microphone 1 query.
<Z1.MI,Q/><z1.mi,q = o,o/>	(* Zone 1 all microphones query.
<MI,Q/><mi,q = o,o;o,o;o,o;o,o/>	(* Global microphones query.
<M1,Q/><m1,q = o;o;o;o/>	(* Microphone 1 query.
<M2,Q/><m2,q = o;o;o;o/>	(* Microphone 2 query.

## **SYSTEM COMMANDS**

### **Initialisation**

<SY, ID/><sy, id/> (\* Set power up mode to default.  
 <SY, IP/><sy, ip/> (\* Set power up mode to last ( previous hence the 'P' ).  
 <SY, IF/><sy, if/> (\* Set power up mode to factory defaults.

### **Reset**

<SY, R/><sy, r/> (\* Reset to factory settings.

### **Ping**

<SY, ?/><sy, ?/> (\* No effect. Trigger a response message.

### **Baud**

<SY, RS, B4800/><sy, rs, b4800/> (\* Set RS232 Baud rate to 4800.  
 <SY, RS, B9600/><sy, rs, b9600/> (\* Set RS232 Baud rate to 9600.

### **Version**

<SY, HV, Q/><sy, hv, q = V1.2/> (\* Hardware version for CDI module.  
 <SY, SV, Q/><sy, sv, q = V1.00/> (\* Software version for CDI module.  
 <SY, PV, Q/><sy, pv, q = 1.3/> (\* Hardware version for parent (46/120).

### **Power Control**

<SY, PA, PU/><sy, pa, pu/> (\* Release amp from forced power down mode.  
 (\* NB amp may still be in auto power down.  
 <SY, PA, PD/><sy, pa, pd/> (\* Force the amp into power down mode.  
 <SY, PA, Q/><sy, pa, q = pd/> (\* Query state of forced power down.

### **System Boot Load Mode**

<SY, BU1234/><sy, bu = ud/> (\* Unlock boot loader. NB PIN required.  
 <SY, BE/><sy, be = ue/> (\* Enable boot loader.  
 <SY, BR/><sy, br/> (\* Boot loader system reset. Boot loader now active.  
 <SY, BL/><sy, bl = ld/> (\* Lock boot loader. NB boot loader is also disabled.  
 <SY, BD/><sy, bd = ld/> (\* Disable boot loader.  
 <SY, BQ/><sy, bq = ld/> (\* Query boot loader.  
 <SY, BR/><!E SY, BR Execution error/> (\* System reset with boot loader disabled.

### **Password**

<SY, K12345678/><sy, k12345678/> (\* Set password. Old password = 1234, new password = 5678.

### **Text Field**

<SY, TX, S=Label Text/><sy, tx, s=Label Text/> (\* Set text field to "Label Text"  
 <SY, TX, Q/><sy, tx, q = Label Text/> (\* Query text field.

### **System Music Mute Socket Query**

<SY, MQ/><sy, mq = o/> (\* System music mute socket query, mute off.  
 <SY, MQ/><sy, mq = m/> (\* System music mute socket query, mute on.

## **EXTERNAL COMMANDS**

### **Trigger PMSA**

<EX, SA2/><ex, sa2/> (\* Trigger PMSA message group 2.

