ListenPoint 2.0 Programming Guide

Listen Bus Control

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Introduction

Commonly used adjustments to a ListenPoint system can be performed remotely using simple text commands through a Serial RS485 Control Interface. This document provides the information necessary to interface with the ListenPoint Room Module through the ListenBus interface to control the system Any 3rd party control system that has a The control system for the interface can be a personal computer or a standalone third party controller used for AV system control.

Connecting to ListenPoint

Control of the ListenPoint system is done through the ListenBus port on the Room module. The connection is a custom pin out RJ45. Note there is power and other signals on the connection and care should be taken to insure connections are accurate in order to prevent possible damage to the equipment.

*The ListenBus can only be used for control or for system expansion modules such as the LPT-T216 ALS module. The system cannot support both at the same time.

The control interface is a half duplex, RS485 communication interface at 19200 baud rate. Each character consists of a start bit, 8 data bits and one stop bit with no parity bit. The electrical interface adheres to the EIA-485 standard.

Figure 1 below shows connector pin out and communications information for interfacing to the bus.

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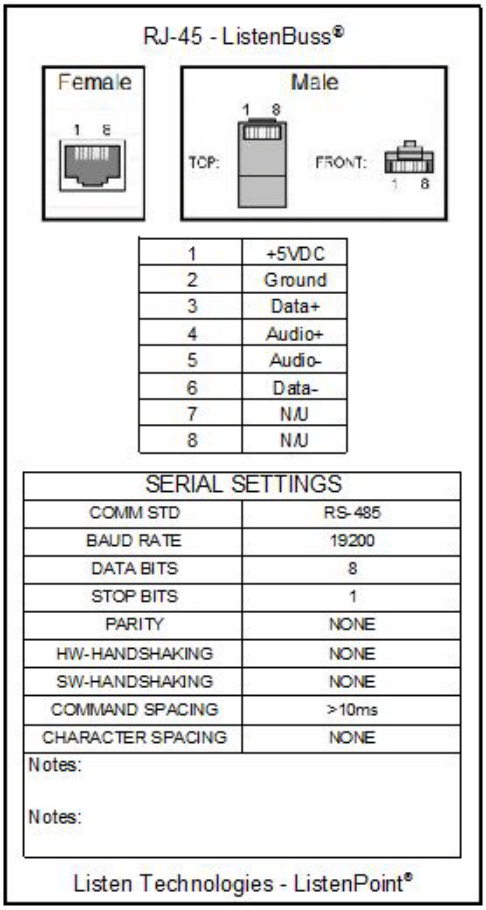

1	+5VDC
2	Ground
3	Data+
4	Audio+
5	Audio-
6	Data-
7	N/U
8	N/U

SERIAL SETTINGS	
COMM STD	RS-485
BAUD RATE	19200
DATA BITS	8
STOP BITS	1
PARITY	NONE
HW-HANDSHAKING	NONE
SW-HANDSHAKING	NONE
COMMAND SPACING	>10ms
CHARACTER SPACING	NONE
Notes:	
Notes:	

Listen Technologies - ListenPoint®

Figure 1

Control Connection Diagram

Figure 2 shows the basic connections required to control the ListenPoint system through the Listenbus interface. Any control system with a RS485 interface can be interfaced to the system. A RS485 to RS232 converter box can be used to interface from a control system or computer that only has a RS232 port available.

Description
Data +
Data -
Ground

Description	Pin number
Data +	3
Data -	6
Ground	2

Figure 2

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Power up

Once the ListenPoint system has powered up and is ready to begin communications, the room module will output the text "Ready" out the communications port. Any communication received by the room module during the power up sequence before the "Ready" text is sent will be discarded.

Command Syntax

Each command to the ListenPoint room module consists of optional arguments and a command character. Arguments are always numeric and separated by commas unless they are next to a command character. Decimal numbers may include minus sign for some commands. All characters that do not fit this syntax are considered illegal commands. They will return a question mark"?" and cancel the partial command that has been transmitted. Commands that set specific states or values may be issued multiple times without changing the behavior of the command. Hexadecimal numbers are indicated by the “0x” prefix.

Command Timing

Each command has to allow for a response on the bus prior to sending a subsequent command. The minimum wait time is 50 mS. This will allow enough time the command to process and the response to be generated. The device that generated the command should release the bus within 50 uS of end of transmission and begin listening for a response within 100 uS of end of transmission.

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Command List

The following table outlines the commands available through the ListenBus interface:

Name	Description	Command
Get Microphone Status	Returns microphone status for connection to system, mute, battery charge and volume	j
Query Microphone Soft Button Press	Get status of press of a soft button on a microphone	~
Query or Set Microphone Volume	Get the current microphone volume level or set a new level for the specified microphone	J
Query or Set Channel Volume	Get the current aux channel volume level / master level or set a new level for the specified Aux channel / master volume	V
Increment Channel/Microphone Volume	Increments or decrements the volume control for the specified channel or microphone control.	i
Query or Set Channel Mute state	Get the current aux channel mute / master mute or set the mute state for the specified Aux channel / master mute	u
Get Page audio present	Returns if the paging input detects audio	p
Query or Set Relay state	Get the current state of the relay or set the relay state	G
Query GPI State	Get the current state of the General purpose input	g
Query or Set active channel	Query the channel current selected for control or set the active channel	H
Get System Info	Get the serial numbers, and FW version	o
Reset	Reset the system	z

Commands

The detailed descriptions of the available commands are listed below. *Italicized* names indicate placeholders for values or characters and **bold** names indicate literal values or characters for that command. There is no carriage return required to execute commands. Once a command character is sent, the command is executed using the parameters that came before the command character.

Get Microphone Status

Function: Request that the CU send the microphone status of the microphone number specified in the command. If the command 10j is sent, ListenPoint will put the CU into a mode where it will automatically send the microphone status with the aux state.

Command Syntax: *microphone_num* **j**

where: *microphone_num* is the number representing the channel of the microphone to get the status and **j** is the command name. **j** must be lower case

Response Syntax: *microphone_num* **j** *mic_status, mic_volume, battery_charge*

where: *microphone_num* is the number representing the channel of the microphone returning status, **j** is the command name, *mic_status* returns the status as shown in the table below, and *battery charge* is the current battery state of charge.

microphone_num	**Description**
0	Channel 1 Microphone
1	Channel 2 Microphone

Mic_status	**Description**
0x00	No microphone detected
0x01	Mic linked and muted
0x02	Mic linked and un-muted
0x03	NA
0x04	NA
0x05	Mic linked , muted & volume up pressed
0x06	Mic linked , un-muted & volume up pressed
0x07	NA
0x08	NA
0x09	Mic linked , muted & volume down pressed
0x0A	Mic linked , un-muted & volume down pressed
0x0B	NA
0x0C	NA
0x0D	Mic linked , muted & volume up and down pressed
0x0E	Mic linked , un-muted & volume up and down pressed
0x0F	NA

Mic_ volume	**Description**

0x06	+6 dB
0x05	+5 dB
…	
0x01	+1 dB
0x00	0 dB
0xFF	-1 dB
…	
0xE3	-29 dB
0xE2	-30 dB

Battery charge*	**Description**
0x64	100% Charge
0x63	99% Charge
0x62	98% Charge
…	…
0x02	2% Charge
0x01	1% Charge
0x00	0% Charge

* Battery charge state changes in increments of 5%.

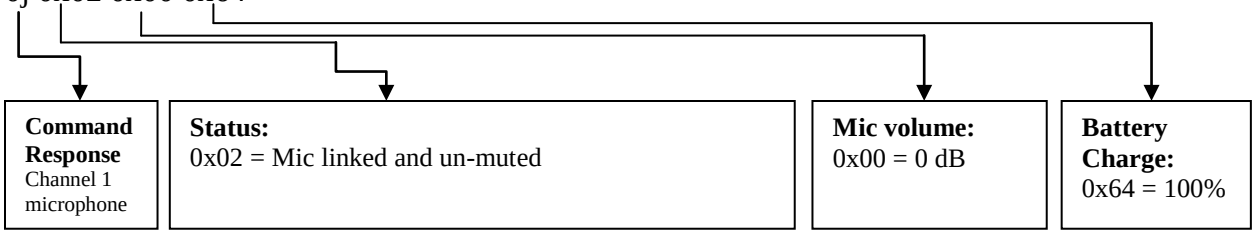
Example:

Request status of Channel 1 microphone

0j

Sample Response:

0j 0x02 0x00 0x64



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Query Microphone Soft Button Press

Function: Query if the soft button on a microphones has been pressed since last read using this command. If a press has occurred since the last time this command was issued, the type of press will be indicated, short, long or both.

Command Syntax: *microphone_num* **~**

where : *microphone_num* is the number representing the microphone to get the soft button status press from as defined below and **~** is the command name.

Response Syntax: *microphone_num* **~** *press_val*

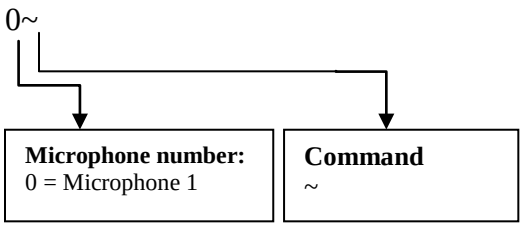
where : *microphone_num* is the microphone get the soft button status press from as defined below and **~** is the command name.

microphone_num	**Description**
0	Channel 1 Microphone
1	Channel 2 Microphone

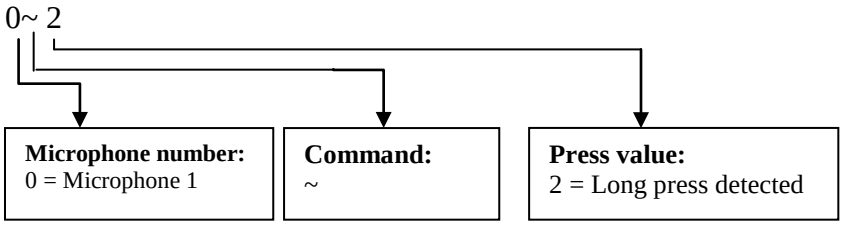
Press_val	**Description**
0	No presses since last Microphone Soft Button Press query
1	Short Press Detected
2	Long Press Detected
3	Both a Long Press and Short Press detected

Example :

Get if the soft button has been pressed of Microphone 1



Sample Response:



Query or Set Microphone Volume

Function: Sets or queries the volume control for the specified microphone. This command does nothing if the microphone isn't linked. The valid range for this value is from 0xE2-0x06.

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Command Syntax: mic_*volume*, *microphone_num* **J**

where : mic_*volume* is in hexadecimal value to set the volume, *microphone_num* the number representing the channel of the microphone to adjust the volume and **J** is the command name. **J** must be capitalized

Response Syntax: *microphone_num* **J** mic_*volume*

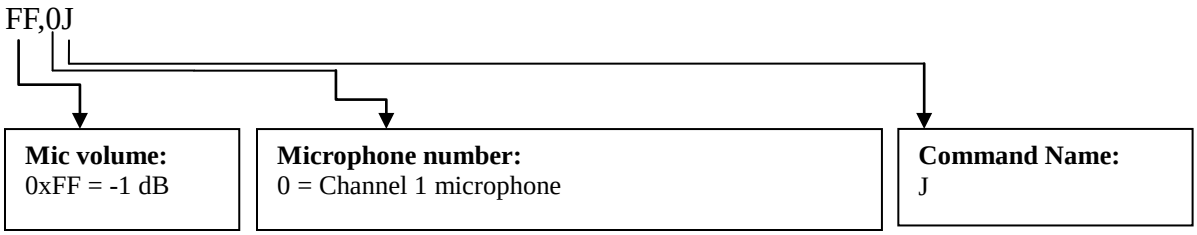
where : *microphone_num* is the number representing the channel of the microphone, **J** is the command name, and *mic_volume* is the resulting volume level.

microphone_num	**Description**
0	Channel 1 Microphone
1	Channel 2 Microphone

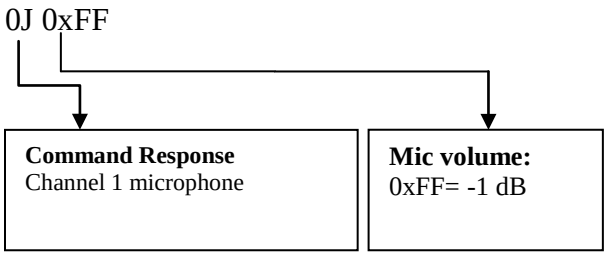
Mic_ volume	**Description**
Null	Returns current volume level
0x06	+6 dB
0x05	+5 dB
…	…
0x01	+1 dB
0x00	0 dB
0xFF	-1 dB
…	…
0xE3	-29 dB
0xE2	-30 dB

Example 1:

Set channel 1 microphone volume to -1dB.



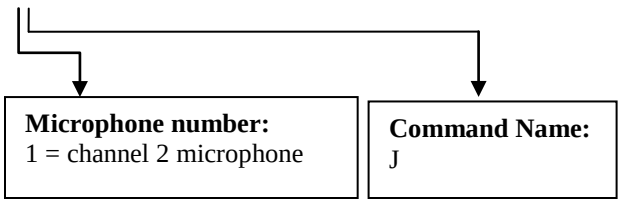
Sample Response:



Example 2:

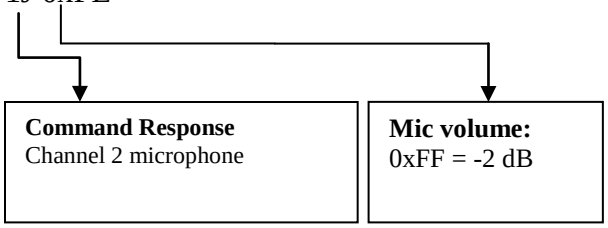
Get channel 2 microphone volume.

1J



Sample Response:

1J 0xFE



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Query or Set Audio Channel Volume

Function: Sets the volume control for the specified audio channel control. The valid range for this value varies per volume control. (see table below)

Command Syntax: *volume*, *volume_control_num* **V**

where : *volume* is in hexadecimal value to set the volume , *volume_control_num* is the audio channel to adjust the volume and **V** is the volume command name. **V** must be capitalized

Response Syntax: *volume_control_num* **V** *volume*

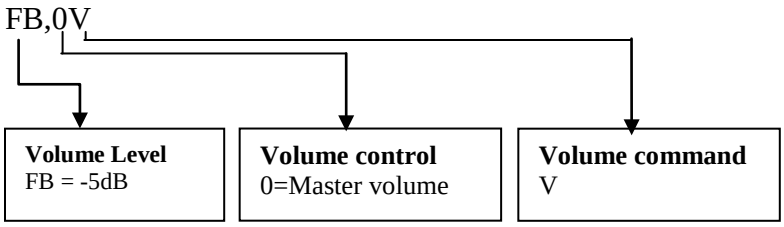
where : *volume_control_num* is the audio channel that was adjusted, **V** is the volume command name and *volume* is in hexadecimal value of the resulting volume

Volume_control_num	Description	*Volume* Range
0	Master Volume	0xD8-0x06 (-40 - +6 dB)
1	User Volume[0] - Aux-1	0xE2-0x07 (-30 - +7 dB)
2	User Volume[1] - Aux-2	0xE2-0x07 (-30 - +7 dB)
3	User Volume[2] - Aux-3	0xE2-0x07 (-30 - +7 dB)
4	User Volume[3] - Aux-4	0xE2-0x07 (-30 - +7 dB)
5	User Volume[4] - Teleconference	0xE2-0x07 (-30 - +7 dB)
6	User Volume[5] - Balanced	0xE2-0x07 (-30 - +7 dB)
7	Page Volume	0xED-0x06 (-19 - +6 dB)

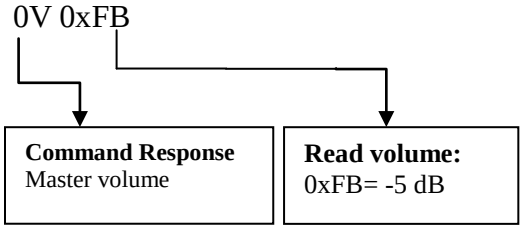
Note: The valid range for the *volume* value varies depending upon the range

Example 1:

Set the master volume to -5 dB



Sample Response:



NOTE: The volume control ranges represent the volume in dB. These numbers are signed hexadecimal.

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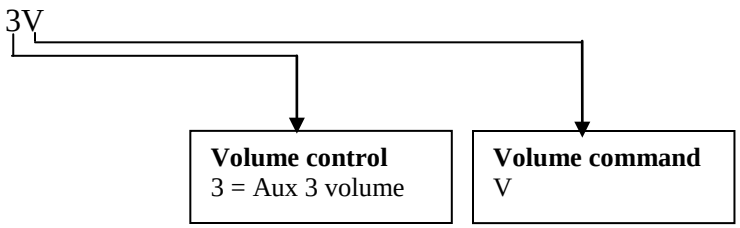
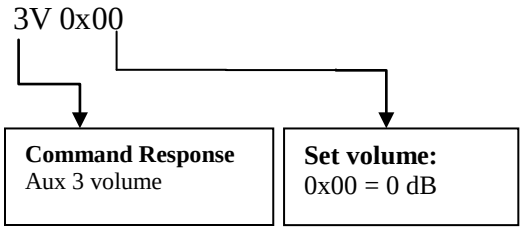
Example 2:

Get the current volume level for Aux 3



Sample Response:



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Increment/Decrement Audio Channel/Microphone Volume

Function: Increments or decrements the volume control for the specified audio channel or microphone control by 1 dB. If the volume is already at the limit of it range, the return value will be the limit value.

Command Syntax: *inc_dec*, *volume_control_num* **i**

where : *inc_dec* sets whether to increment or decrement the volume control , *volume_control_num* is the channel to adjust the volume and **i** is the increment/decrement command name. **i** must be lower case

Response Syntax: *volume_control_num* **i** *volume*

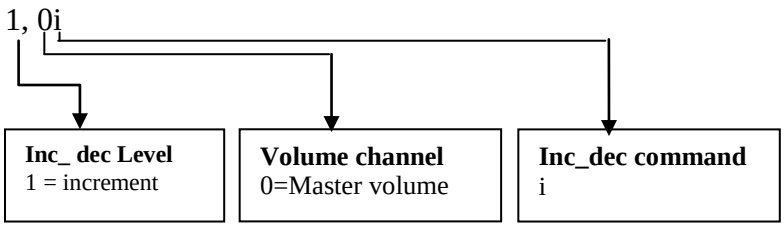
where : *volume_control_num* is the channel that had the adjustment or query, **i** is the increment/decrement command name and *volume* is the resulting volume setting.

inc_dec	Description
0	Decrement current value by 1
1	Increment current value by 1

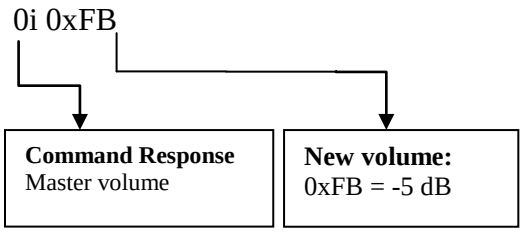
Volume_control_num	Description	*Volume* Range	
0	Master Volume	0xD8-0x06	(-40 - +6 dB)
1	User Volume[0] - Aux-1	0xE2-0x07	(-30 - +7 dB)
2	User Volume[1] - Aux-2	0xE2-0x07	(-30 - +7 dB)
3	User Volume[2] - Aux-3	0xE2-0x07	(-30 - +7 dB)
4	User Volume[3] - Aux-4	0xE2-0x07	(-30 - +7 dB)
5	User Volume[4] - Teleconference	0xE2-0x07	(-30 - +7 dB)
6	User Volume[5] - Balanced	0xE2-0x07	(-30 - +7 dB)
7	Page Volume	0xED-0x06	(-19 - +6 dB)
8	Microphone 1 volume	0xE2-0x06	(-30 - +6 dB)
9	Microphone 2 volume	0xE2-0x06	(-30 - +6 dB)

Example 1:

Increment the master volume 1 dB



Sample Response:



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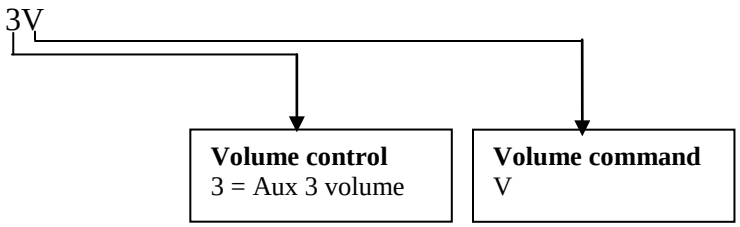
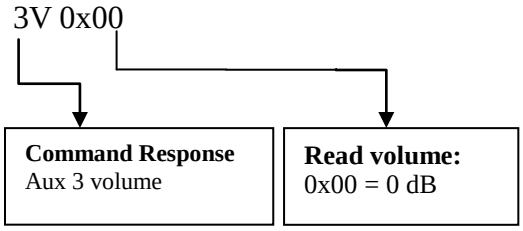
NOTE: The volume control ranges represent the volume in dB. These numbers are signed hexadecimal.

Example 2:

Get the current volume level for Aux 3



Sample Response:



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Query or Set Channel Mute State

Function: Gets or sets the state of mute for the specified channel. 1 is muted and 0 is not muted.

Command Syntax: *mute_state,mute_channel_num* **u**

where : *mute_state* is the state of the mute to set, *mute_channel_num* is the channel to query the mute and **u** is the command name. **u** must be lower case. If *mute_state* is omitted, mute state is queried.

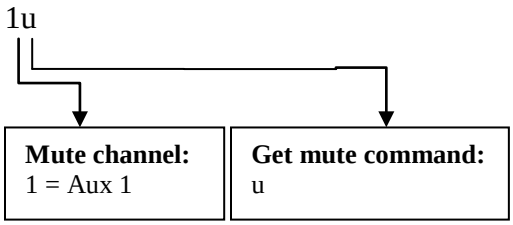
Response Syntax:*mute_channel_num* **u** *mute_state*

where : *mute_channel_num* is the channel to query the mute and **u** is the command name. and *mute_state* is the status of the mute state for the channel

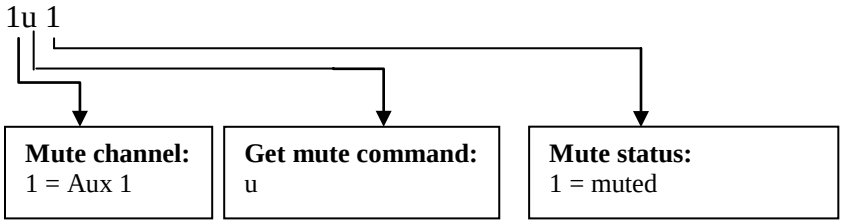
Mute_channel_num	**Description**	***mute_state***
0	Master output	0 = not muted, 1 = muted
1	Aux 1	0 = not muted, 1 = muted
2	Aux-2	0 = not muted, 1 = muted
3	Aux-3	0 = not muted, 1 = muted
4	Aux-4	0 = not muted, 1 = muted
5	Teleconference	0 = not muted, 1 = muted
6	Balanced	0 = not muted, 1 = muted

Example 1:

Get the status of aux 1 mute



Sample Response:



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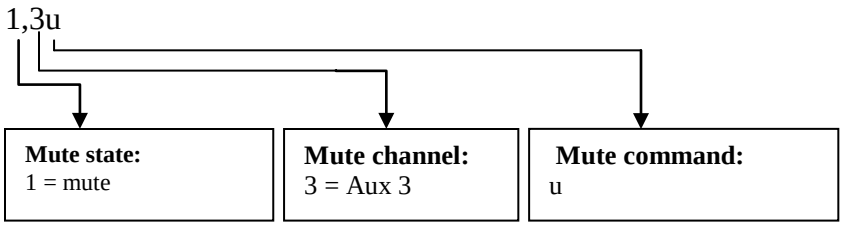
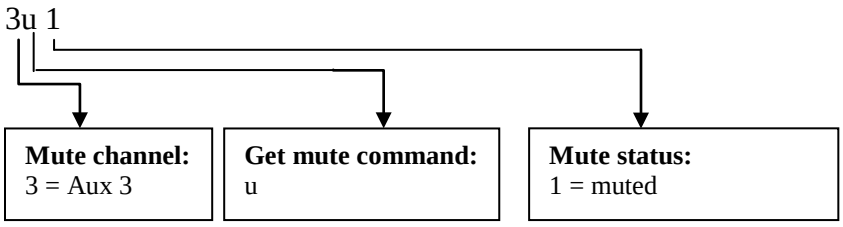
Example 2:

Set the state of aux 3 to muted



Sample Response:



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Query Page Audio Present

Function: Gets the current state of the Page input detection

Command Syntax: p

where : **p** is the command name. **p** must be lower case

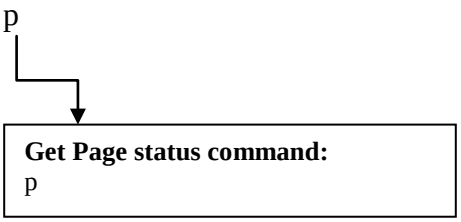
Response Syntax: p *page_status*

where : **p** is the command name. *page_status* is the current state of the page detection.

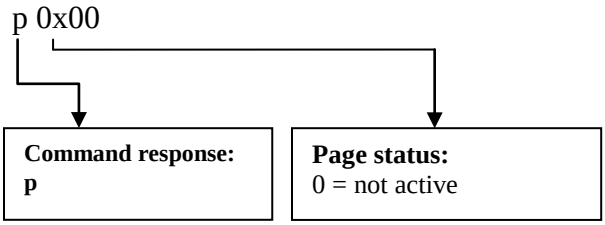
Page_status	Description
0	Page not active
1	Page active

Example :

Get the page status



Sample Response:



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Query or Set Relay state

Function: Gets or sets the state the relay.

Command Syntax: *Relay_state*, **G**

where : *Relay_state* state to set the relay in and **G** is the command name. **G** must be upper case

Response Syntax: G *Relay_state*

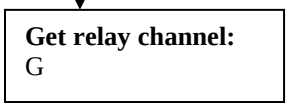
where : **G** is the command name and *Relay_state* state to set the relay in.

Relay_state	**Description**
Null	Query relay state
0	Relay Inactive
1	Relay Active

Example 1:

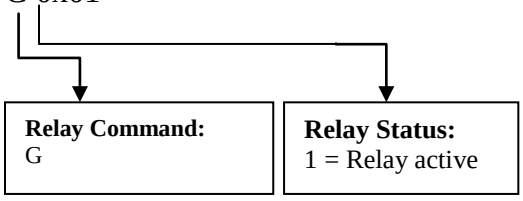
Get the state of the Relay

G



Sample Response:

G 0x01



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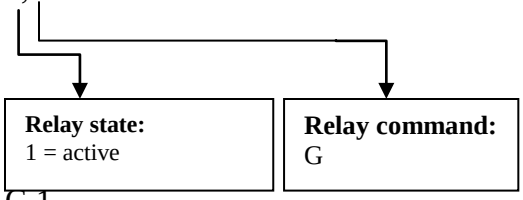
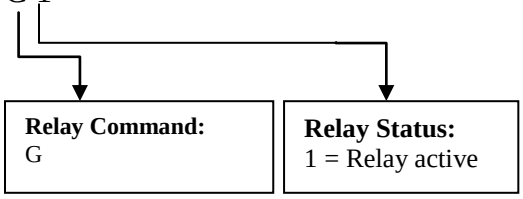
Example 2:

Set the relay state to active

1,G



G 1



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Query 6-12 VDC Input State

Function: Gets the current state 6-12 VDC input

Command Syntax: g

where : **g** is the command name. **g** must be lower case

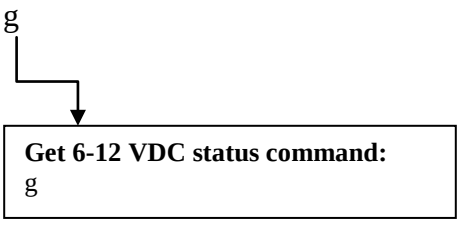
Response Syntax: g *6-12VDC_status*

where : **g** is the command name and *6-12VDC_status* is the state of the 6-12 VDC input.

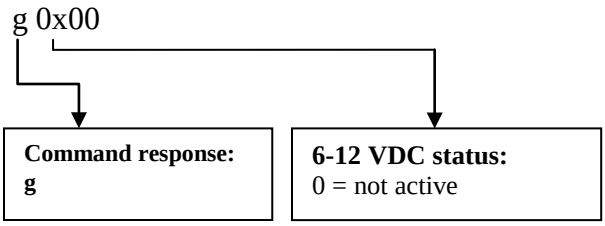
6-12VDC_status	**Description**
0	No voltage present on 6-12 VDC input (not active)
1	Voltage present on 6-12 VDC input (active)

Example :

Get 6-12 VDC input status



Sample Response:



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Query or Set Active channel

Function: Gets or sets active channel for volume control.

Command Syntax: *Channel_Sel* **H**

where : *Channel_Sel* is the channel to set active in and **H** is the command name. **H** must be upper case

Response Syntax: H *Channel_Sel*

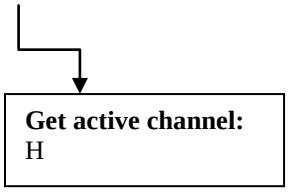
where : *Channel_Sel* is the channel that is currently active and **H** is the command name. **H** must be upper case

Channel_Sel	**Description**
Null	Query channel
0	Master output
1	Aux 1
2	Aux-2
3	Aux-3
4	Aux-4
5	Teleconference
6	Balanced

Example 1:

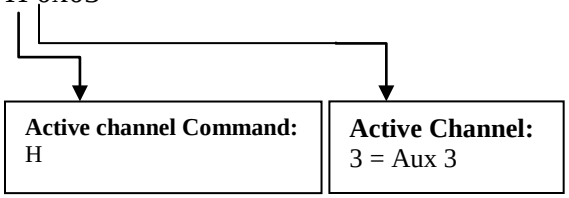
Get the active channel for control

H



Sample Response:

H 0x03



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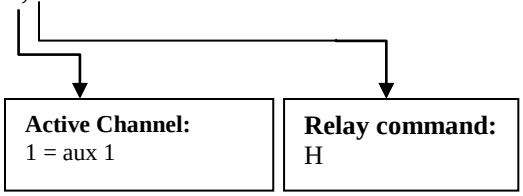
Example 2:

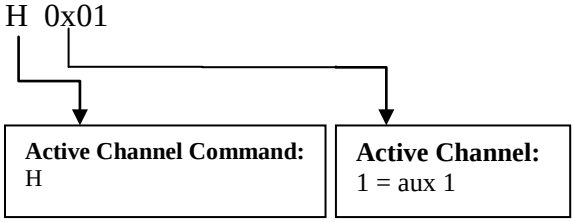
Set the Active Channel for control

1,H



Sample Response:

H 0x01



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Query System Information

Function: Gets the serial and model numbers for Listenpoint system

Command Syntax: o

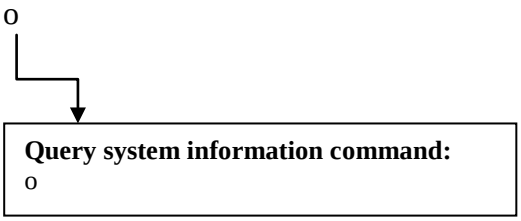
where : **o** is the command name. **o** must be lower case

Response Syntax: o *cu_model_num cu_ser_num rm_model_num rm_ser_num*

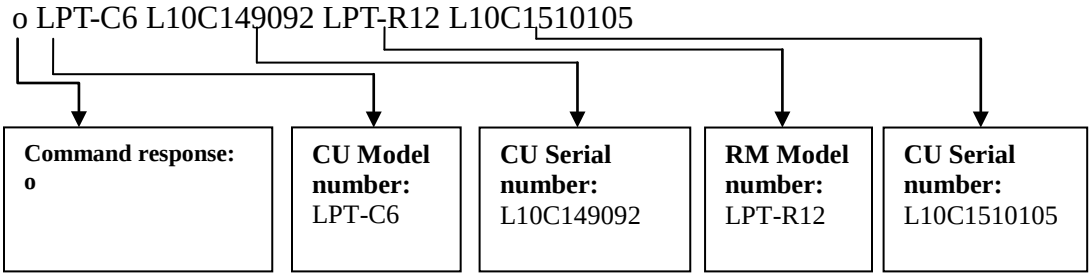
where : **o** is the command name, *cu_model_num* is the model number of the control unit, *cu_ser_num* is the serial number for the control unit, *rm_model_num* is the model number of the room module, and *rm_ser_num* is the serial number of the room module. All retuned values are separated by a space.

Example :

Get system information



Sample Response:



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Reset

Function: Performs a system reset. No parameters are changed

Command Syntax: Z

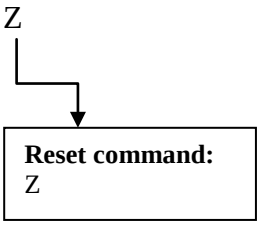
where : **Z** is the command name. **Z** must be upper case

Response Syntax: None

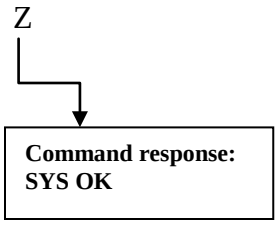
System reset will execute immediately. Reset duration is approximately 3 seconds. "Ready" will be sent out the communications port when commands are ready to be accepted.

Example :

Reset system



Sample Response:



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