

# TCP/IP API – Control Protocol



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*Immersive Sound Processor*

TCP/IP API – Control Protocol

ISP firmware version: 4.3r0 and beyond

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## 1 Purpose

### 1.1 Documentation description

This document describes the TCP/IP API Protocol for the ISP family of StormAudio Immersive Sound Processors.

## 1.2 Intended audience

This manual is intended for anyone developing a device driver or application that needs to communicate with the ISP Audio Processor, such as automation or control systems or mobile applications. This document does not go into detail about how to write TCP/IP drivers, but rather explains the syntax and flow specific to the ISP family TCP/IP API.

For detailed information about the different features of the ISP Audio Processor family, please refer to the corresponding Product Reference Manual.

## 2 ISP TCP Connection overview

### 2.1 Connecting to ISP


Any device capable of opening a TCP connection and sending character string data can communicate with the processor through the TCP API. The ISP listens to port 23 (Telnet) for incoming connections.

### 2.2 Message format

Commands are sent/received as ASCII strings, and must be terminated by <LF> ("`\x0A`" is the escaped hexadecimal Line Feed, the equivalent of "`\n`"). Refer to section 3 for available commands.

### 2.3 Message responses

Any valid command will be confirmed with a reply from the ISP. See section 3 below for details on the exact format of reply messages for each command.

 **NOTE:** Any command not recognized by the ISP, or that is out of range will result in the text string "error" being returned.

If any parameter accessible by the API is changed by another process or interface, the new value will be broadcasted to all connected devices (e.g. turning on the mute by pressing the ISP front panel knob will send "ssp.mute.on" to all connected devices). This message is sent in the same format as the "read" commands described in the next section.

### 2.4 Initial values

When a connection is first established, the current values of all parameters are sent to the device initiating the connection. Each value is sent as an individual message in the same format as a "read" command as described in the next section.

## 3 API Commands

API commands are divided into 8 groups.

### 3.1 Control Group

Commands of this group are accessible when the ISP is in sleep mode and on mode.

#### 3.1.1 Ping

You can send at any time a keepalive command in order to check if the server is still alive.

Command	Description	Response
ssp.keepalive	Check if server is still alive.	ssp.keepalive

#### 3.1.2 Processor States

Command	Description	Response
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<b>ssp.procstate</b>	Read current processor status. This value will be updated if value is changed.	ssp.procstate.[xx], where: <ul style="list-style-type: none"> <li>• 0: processor is off (sleep mode)</li> <li>• 1: processor is initialising or shutting down if ssp.power is on, initialising if ssp.power is off, shutting down</li> <li>• 2: processor is on (out of sleep)</li> </ul>
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### 3.1.3 Power

Sleep mode power command.

Command	Description	Response
<b>ssp.power</b>	Read current power status.	ssp.power.xx, where "xx" is "on" or "off".
<b>ssp.power.on</b>	Take processor out of sleep mode.	ssp.power.on <b>NOTE:</b> processor is fully operational when "ssp.procstate.[2]" command has been received.
<b>ssp.power.off</b>	Put processor into sleep mode.	ssp.power.off
<b>ssp.power.toggle</b>	Toggle sleep mode state.	ssp.power.xx, where "xx" is the result of the toggle operation – either "on" or "off".

### 3.1.4 Reset

Reset command.

Command	Description	Response
<b>ssp.reset</b>	Execute processor reset. Processor will reboot, TCP connection will be lost.	n/a

### 3.1.5 Close Connection

Closing a connection will terminate the TCP connection to the ISP.

**NOTE:** This will not shutdown the API application. Upon reestablishing a TCP connection, all current values will be transmitted to the connecting device, and all groups will be enabled.

Command	Description	Response
<b>ssp.close</b>	Close TCP connection.	ssp.close

### 3.1.6 Version

Send the firmware version.

Command	Description	Response
<b>ssp.version</b>	Read the firmware version.	ssp.version.[xx], where "xx" is the current version number.

### 3.1.7 Brand

Command	Description	Response
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<b>ssp.brand</b>	Read current brand	ssp.brand.["BRAND"], where "BRAND" is the brand. <ul style="list-style-type: none"> <li>• BRAND <ul style="list-style-type: none"> <li>• StormAudio</li> <li>• Bryston</li> <li>• FOCAL</li> </ul> </li> </ul>
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### 3.1.8 Processor Model

Command	Description	Response
<b>ssp.model</b>	Read current model	ssp.model.["MODEL"], where "MODEL" is the model. <ul style="list-style-type: none"> <li>• MODEL <ul style="list-style-type: none"> <li>• IISP</li> <li>• Astral 16</li> <li>• ISP Elite MK1</li> <li>• SP4</li> <li>• ISP Elite MK2</li> <li>• ISP Core 16</li> </ul> </li> </ul>

## 3.2 Message Status group

The message status group is only accessible while the ISP in active mode. Any attempts to read or write to this group while the ISP is in sleep mode will return the message "**ssp.power.off**".

Messages table :

Id	Message
0	""
1	"Backup parameters in progress"
2	"Restore parameters in progress"
3	"Selective parameters in progress"
4	"Reset parameters in progress"
5	"Firmware upgrade in progress"
6	"Loading Dirac room calibration"
98	"msg" where msg is the string message, max length 256 characters
99	""

Command	Description	Response
<b>ssp.msgstatus</b>	Return current state message.	ssp.msgstatus.[xx], where "xx" is the Id of the message (see the messages table above)

Command	Description	Response
<b>ssp.msgstatusTxt</b>	Return current state message.	ssp.msgstatusTxt.[xx, "msg"], where "xx" is the Id of the message and msg the message (see the messages table above)

## 3.3 Audio Configuration Group

Audio configuration group is only accessible while the ISP in active mode. Any attempts to read or write to this group while the ISP is in sleep mode will return the message "**ssp.power.off**".

### 3.3.1 Input

### 3.3.1.1 Inputs

Select a pre-configured input.

Command	Description	Response
<b>ssp.input</b>	Read active input number.	ssp.input.[xx], where "xx" is the current input ID.
<b>ssp.input.[xx]</b>	Select input "xx". This value will be updated if value changed.	ssp.input.[xx], where "xx" is the active input ID after the operation.
<b>ssp.inputZone2.[xx]</b>	Select Audio Zone2 IN "xx". This value will be updated if value changed.	ssp.inputZone2.[xx], where "xx" is the active input ID after the operation. Or "0" if input ID have no Zone2 Audio IN.
<b>ssp.input.list</b>	List the attribute of all configured inputs. This list is also changed when any field of an input changes.	<p>This command will start by sending "ssp.input.start" and then will generate the following message for each configured input:</p> <p>ssp.input.list.["NAME", ID, VIDEO IN ID, AUDIO IN ID, AUDIO ZONE2 IN ID, RESERVED, DELAY, RESERVED], where:</p> <ul style="list-style-type: none"> <li>• "NAME" is the user readable name</li> <li>• ID is the input reference number (as used with ssp.input.[xx] and ssp.inputZone2.[xx] above)</li> <li>• VIDEO IN ID <ul style="list-style-type: none"> <li>• 0: None</li> <li>• 1: HDMI 1</li> <li>• 2: HDMI 2</li> <li>• 3: HDMI 3</li> <li>• 4: HDMI 4</li> <li>• 5: HDMI 5</li> <li>• 6: HDMI 6</li> <li>• 7: HDMI 7</li> <li>• 8: HDMI 8</li> </ul> </li> <li>• AUDIO IN ID <ul style="list-style-type: none"> <li>• 0: None</li> <li>• 1: HDMI 1</li> <li>• 2: HDMI 2</li> <li>• 3: HDMI 3</li> <li>• 4: HDMI 4</li> <li>• 5: HDMI 5</li> <li>• 6: HDMI 6</li> <li>• 7: HDMI 7</li> <li>• 8: HDMI 8</li> <li>• 9: Coax 4</li> <li>• 10: Coax 5</li> <li>• 11: Coax 6</li> <li>• 12: RESERVED don't care</li> <li>• 13: Optical 1</li> <li>• 14: Optical 2</li> <li>• 15: Optical 3</li> <li>• 16: 16ch AES</li> <li>• 17: Roon Ready</li> <li>• 18: Stereo 1 RCA</li> <li>• 19: Stereo 2 RCA</li> <li>• 20: Stereo 3 RCA</li> <li>• 21: Stereo 4 RCA</li> <li>• 22: Stereo 7+1 RCA</li> <li>• 23: ARC/eARC</li> <li>• 24: Stereo 5+1 RCA</li> <li>• 25: Stereo XLR In</li> <li>• 26: 32ch AES67</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>• AUDIO ZONE2 IN ID <ul style="list-style-type: none"> <li>• 0: None</li> <li>• 1: HDMI 1</li> <li>• 2: HDMI 2</li> <li>• 3: HDMI 3</li> <li>• 4: HDMI 4</li> <li>• 5: HDMI 5</li> <li>• 6: HDMI 6</li> <li>• 7: HDMI 7</li> <li>• 8: Not available</li> <li>• 9: Coax 5</li> <li>• 10: Coax 6</li> <li>• 11: Coax 7</li> <li>• 12: Not available</li> <li>• 13: Optical 1</li> <li>• 14: Optical 2</li> <li>• 15: Optical 3</li> <li>• 16: Not available</li> <li>• 17: Not available</li> <li>• 18: Stereo 1 RCA</li> <li>• 19: Stereo 2 RCA</li> <li>• 20: Stereo 3 RCA</li> <li>• 21: Stereo 4 RCA</li> <li>• 22: Not available</li> <li>• 23: Not available</li> <li>• 24: Not available</li> <li>• 25: Stereo XLR In</li> <li>• 26: Not available</li> <li>• 27: ARC 2</li> </ul> </li> <li>• RESERVED don't care</li> <li>• DELAY value defined by installer in Inputs page</li> <li>• RESERVED don't care</li> </ul> <p>It will finish with the message "ssp.input.end".</p>
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### 3.3.1.2 Inputs HDMI

Select a pre-configured input HDMI. This feature is only available with 7+2 eARC board.

Command	Description	Response
<b>ssp.inputHdmiMatrixMode</b>	Read Hdmi Matrix mode state.	ssp.inputHdmiMatrixMode.[xx], where "xx" <ul style="list-style-type: none"> <li>• 0: Mirror</li> <li>• 1: Zone2 A/V</li> <li>• 2: Pass Through</li> </ul> "error" if HdmiMatrix license not activated.
<b>ssp.inputHdmiPassThru.[xx]</b>	Select the input that will be used for HDMI Pass Through. xx is the ID of the input, as returned by ssp.input.list or 0.	ssp.inputHdmiPassThru.[xx] "error" if HdmiMatrix license not activated. "error" if Matrix mode state is not corresponding to Pass Through.

### 3.3.2 Preset

Select a pre-configured preset.

Command	Description	Response
<b>ssp.preset</b>	Read active preset number.	ssp.preset.[xx], where "xx" is the current preset ID.
<b>ssp.preset.[xx]</b>	Select preset "xx".	ssp.preset.[xx], where "xx" is the active preset ID after the operation.



<b>ssp.preset.list</b>	List the attribute of all configured presets.  This list is also send when either the name or the active state of a preset changes.	This command will start by sending "ssp.preset.start" and then will generate the following message for each configured preset:  ssp.preset.list.["NAME", ID, "["ID of zone", "ID of zone", "..."]", SPHEREAUDIO, RESERVED, RESERVED, RESERVED, RESERVED], where:  <ul style="list-style-type: none"> <li>• NAME is the user readable name</li> <li>• ID is the preset reference number (as used with preset.[xx] above)</li> <li>• ID of zone <ul style="list-style-type: none"> <li>• see section <b>Zones</b></li> </ul> </li> <li>• SPHEREAUDIO THEATER <ul style="list-style-type: none"> <li>• 0: off</li> <li>• 1: on</li> </ul> <p>Similarly, with the WebUI, when a preset whose the theater is SphereAudio is selected, parameters below shall be grayed (Master Volume, Mute, Vol Dim, Center Enhance, Surround Enhance, Sub Enhance, Bass, Treble, Brightness, Lipsync and LFE Dim). Furthermore, this will active SphereAudio Effect parameter.</p> </li> <li>• RESERVED don't care</li> <li>• RESERVED don't care</li> <li>• RESERVED don't care</li> <li>• RESERVED don't care</li> </ul> <p>It will finish with the message "ssp.preset.end".</p>
<b>ssp.preset.custom</b>	Read the status of the preset, if the preset selected matches the current speaker and EQ selected.	ssp.preset.custom.xx, where "xx" is "on" when the preset selected does not match the current speaker and EQ selected or Speaker or EQ is in edit mode, and "off" if it matches.

### 3.3.3 Surround Mode

Apply surround mode on active Theater.

Command	Description	Response
<b>ssp.surroundmode</b>	Read preferred upmix /surround processing	ssp.surroundmode.[xx], where "xx" is the current preferred upmix/surround processing ID.
<b>ssp.surroundmode.[xx]</b>	Select surround mode "xx".	Set preferred upmix.
<b>ssp.surroundmode.list</b>	List all available surround modes.	This command will generate the following message for each preferred umpix/surround processing mode available:  ssp.surroundmode.list.["NAME", ID], where :  <ul style="list-style-type: none"> <li>• NAME is the user readable name</li> <li>• ID is the reference number (as used with ssp.surroundmode.[xx] above) <ul style="list-style-type: none"> <li>• 0: Native</li> <li>• 1: Stereo Downmix</li> <li>• 2: Dolby Surround</li> <li>• 3: DTS Neural:X</li> <li>• 4: Auro-Matic</li> </ul> </li> </ul> <p>The response starts with "ssp.surroundmode.start" and end with "ssp.surroundmode.end".</p>
<b>ssp.allowedmode</b>	Read active surround modes.	ssp.allowedmode.[xx], where "xx" is the active upmix/surround mode:  <ul style="list-style-type: none"> <li>• 0: Native</li> <li>• 1: Stereo Downmix</li> <li>• 2: Dolby Surround</li> <li>• 3: DTS Neural:X</li> <li>• 4: Auro-Matic</li> </ul>

Immersive Sound can't be upmixed. That is why we have **ssp.surroundmode** and **ssp.allowedmode** commands.

Each time where **ssp.surroundmode** value is different than **ssp.allowedmode** value, you shall displayed and grayed the text linked with value coming from **ssp.surroundmode**.

That's means surround mode selected by user is not engaged. Real active surround is define by **ssp.allowedmode**.

i.e: If you play DTS:X content you can't engaged Dolby Surround or Auro-Matic upmixer.

- If **ssp.surroundmode** returned a value equal to **ssp.allowedmode** equal to "0". You shall displayed "Native"
- If **ssp.surroundmode** returned a value equal to **ssp.allowedmode** equal to "1". You shall displayed "Stereo Downmix"
- If **ssp.surroundmode** returned a value different than **ssp.allowedmode**. You shall displayed and grayed "Dolby Surround"
- If **ssp.surroundmode** returned a value equal to **ssp.allowedmode** equal to "3". You shall displayed "DTS Neural:X"
- If **ssp.surroundmode** returned a value diferent than **ssp.allowedmode**. You shall display and grayed "Auro-Matic"

### 3.3.4 Active Speaker

Command	Description	Response
<b>ssp.speaker</b>	Read current unique speaker config ID. This value will be updated if value changed.	ssp.speaker.[xx], where "xx" the unique speaker config ID. <ul style="list-style-type: none"> <li>• 0 means preset without Theater</li> </ul>

## 3.4 Theater control group

Theater control group is only accessible while the ISP in in active mode. Any attempts to read or write to this group while the ISP is in sleep mode will return the message "**ssp.power.off**".

### 3.4.1 Mute

Apply audio mute on active Theater.

Command	Description	Response
<b>ssp.mute</b>	Read current mute status.	ssp.mute.xx, where "xx" is "on" or "off".
<b>ssp.mute.on</b>	Turn on mute (outputs are off).	ssp.mute.on
<b>ssp.mute.off</b>	Turn off mute (outputs are on).	ssp.mute.off
<b>ssp.mute.toggle</b>	Toggle mute state.	ssp.mute.xx, where "xx" is the result of the toggle operation – either "on" or "off".

### 3.4.2 Dim

Apply volume dimming based on the Dim Level setting on active Theater.

Command	Description	Response
<b>ssp.dim</b>	Read current dim status.	ssp.dim.xx, where "xx" is "on" or "off".
<b>ssp.dim.on</b>	Turn on dim (volume is reduced)	ssp.dim.on
<b>ssp.dim.off</b>	Turn off dim (volume is not reduced).	ssp.dim.off
<b>ssp.dim.toggle</b>	Toggle dim state.	ssp.dim.xx, where "xx" is the result of the toggle operation – either "on" or "off".

### 3.4.3 Volume

Apply audio volume on active Theater.

Command	Description	Response
<b>ssp.vol</b>	Read current volume level.	ssp.vol.[-xx], where "xx" is the current volume level.

		Range value from -0 to -100.
<b>ssp.vol.up</b>	Add 1.0dB to the current volume level. If the volume is less than 1.0dB from the maximum volume, the volume will be set to maximum.	ssp.vol.[-xx], where "xx" is the volume level after the operation.
<b>ssp.vol.down</b>	Subtract 1.0dB from the current volume level. If the volume is less than 1.0dB from the minimum volume, the volume will be set to minimum.	ssp.vol.[-xx], where "xx" is the volume level after the operation.
<b>ssp.vol.[-xx]</b>	Set volume to "xx".	ssp.vol.[-xx], where "xx" is the volume level after the operation.

#### 3.4.4 Bass

Apply Bass tone control on active Theater.

Bass control limitation is depending on WebUI Settings, Audio Control Range MAX.

Command	Description	Response
<b>ssp.bass</b>	Read current bass (tone) level.	ssp.bass.[xx], where "xx" is the current bass level.  Range value from -6 to 6. Step 1 dB.
<b>ssp.bass.up</b>	Add 1.0dB to the current bass level. If the bass level is less than 1.0dB from the maximum value, the control will be set to maximum.	ssp.bass.[xx], where "xx" is the bass level after the operation.
<b>ssp.bass.down</b>	Subtract 1.0dB from the current bass level. If the bass is less than 1.0dB from the minimum value, the control will be set to minimum.	ssp.bass.[xx], where "xx" is the bass level after the operation.
<b>ssp.bass.[xx]</b>	Set bass tone control to "xx".	ssp.bass.[xx], where "xx" is the level after the operation.

#### 3.4.5 Treble

Apply Treble tone control on active Theater.

Treble control limitation is depending on WebUI Settings, Audio Control Range MAX.

Command	Description	Response
<b>ssp.treb</b>	Read current treble (tone) level.	ssp.treb.[xx], where "xx" is the current treble level.  Range value from -6 to 6. Step 1 dB.
<b>ssp.treb.up</b>	Add 1.0dB to the current treble level. If the treble level is less than 1.0dB from the maximum value, the control will be set to maximum.	ssp.treb.[xx], where "xx" is the treble level after the operation.
<b>ssp.treb.down</b>	Subtract 1.0dB from the current treble level. If the treble is less than 1.0dB from the minimum value, the control will be set to minimum.	ssp.treb.[xx], where "xx" is the treble level after the operation.
<b>ssp.treb.[xx]</b>	Set treble tone control to "xx".	ssp.treb.[xx], where "xx" is the level after the operation.

#### 3.4.6 Brightness

Apply Brightness on active Theater.

Center Brightness limitation is depending on WebUI Settings, Audio Control Range MAX.

Command	Description	Response
<b>ssp.brightness</b>	Read current brightness level.	ssp.brightness.[xx], where "xx" is the current brightness level.  Range value from -6 to 6. Step 1 dB.
<b>ssp.brightness.up</b>	Add 1.0dB to the current brightness level. If the brightness is less than 1.0dB from the maximum value, the control will be set to maximum.	ssp.brightness.[xx], where "xx" is the current brightness level.

<b>ssp.brightness.down</b>	Subtract 1.0dB from the current brightness level. If the brightness is less than 1.0dB from the minimum value, the control will be set to minimum.	ssp.brightness.[xx], where "xx" is the current brightness level.
<b>ssp.brightness.[xx]</b>	Set brightness control to "xx".	ssp.brightness.[xx], where "xx" is the level after the operation.

### 3.4.7 Center Enhance

Apply Center Enhance on active Theater.

Center Enhance control limitation is depending on WebUI Settings, Audio Control Range MAX.

Command	Description	Response
<b>ssp.c_en</b>	Read current center enhance level.	ssp.c_en.[xx], where "xx" is the current center enhance level.  Range value from -6 to 6. Step 1 dB.
<b>ssp.c_en.up</b>	Add 1.0dB to the current center enhance level. If the center enhance level is less than 1.0 dB from the maximum value, the control will be set to maximum.	ssp.c_en.[xx], where "xx" is the current center enhance level.
<b>ssp.c_en.down</b>	Subtract 1.0dB from the current center enhance level. If the center enhance is less than 1.0 dB from the minimum value, the control will be set to minimum.	ssp.c_en.[xx], where "xx" is the current center enhance level.
<b>ssp.c_en.[xx]</b>	Set center enhance control to "xx".	ssp.c_en.[xx], where "xx" is the level after the operation.

### 3.4.8 Surround Enhance

Apply Surround Enhance on active Theater.

Surround Enhance control limitation is depending on WebUI Settings, Audio Control Range MAX.

Command	Description	Response
<b>ssp.s_en</b>	Read current surround enhance level.	ssp.s_en.[xx], where "xx" is the current surround enhance level.  Range value from -6 to 6. Step 1 dB.
<b>ssp.s_en.up</b>	Add 1.0dB to the current surround enhance level. If the surround enhance level is less than 1.0dB from the maximum value, the control will be set to maximum.	ssp.s_en.[xx], where "xx" is the current surround enhance level.
<b>ssp.s_en.down</b>	Subtract 1.0dB from the current surround enhance level. If the surround enhance is less than 1.0dB from the minimum value, the control will be set to minimum.	ssp.s_en.[xx], where "xx" is the current surround enhance level.
<b>ssp.s_en.[xx]</b>	Set surround enhance control to "xx".	ssp.s_en.[xx], where "xx" is the level after the operation.

### 3.4.9 Sub Enhance

Apply Sub Enhance on active Theater.

Sub Enhance control limitation is depending on WebUI Settings, Audio Control Range MAX.

Command	Description	Response
<b>ssp.sub_en</b>	Read current sub enhance level.	ssp.sub_en.[xx], where "xx" is the current sub enhance level.  Range value from -6 to 6. Step 1 dB.
<b>ssp.sub_en.up</b>	Add 1.0dB to the current sub enhance level. If the sub enhance level is less than 1.0dB from the maximum value, the control will be set to maximum.	ssp.sub_en.[xx], where "xx" is the current sub enhance level.
<b>ssp.sub_en.down</b>	Subtract 1.0dB from the current sub enhance level. If the sub enhance is less than 1.0dB from the minimum value, the control will be set to minimum.	ssp.sub_en.[xx], where "xx" is the current sub enhance level.

<b>ssp.sub_en.[xx]</b>	Set sub enhance control to "xx".	ssp.sub_en.[xx], where "xx" is the level after the operation.
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### 3.4.10 Lip Sync

Apply Lip Sync on active Theater.

Command	Description	Response
<b>ssp.lipsync</b>	Read current lip sync level.	ssp.lipsync.[xx], where "xx" is the current lip sync delay level.  From -(WebUI Inputs page, AV Delay param + WebUI Settings page, AV Zone Delay param) to 100ms. Step 1 ms.
<b>ssp.lipsync.up</b>	Add 5 ms to the current lip sync level. If the lip sync level is less than 5 ms from the maximum value, the control will be set to maximum.	ssp.lipsync.[xx], where "xx" is the current lip sync delay level.
<b>ssp.lipsync.down</b>	Subtract 5 ms from the current lip sync level. If the current lip sync level is less than 5ms from the minimum value, the control will be set to minimum.	ssp.lipsync.[xx], where "xx" is the current lip sync delay level.
<b>ssp.lipsync.[xx]</b>	Set lip sync delay to "xx".	ssp.lipsync.[xx], where "xx" is the level after the operation.

### 3.4.11 Upmixer Adjustment

#### 3.4.11.1 Auro Strength

Auro Strength shall be visible only if "allowed" field is set to Auro-Matic.

The following table indicate when Auro Strength parameter is Visible or Not Visible.

Active Surround (allowed)	Preset without SphereAudio	Preset with SphereAudio
Native	Not Visible	Not Visible
Stereo Downmix	Not Visible	Not Visible
Dolby Surround	Not Visible	Not Visible
DTS Neural:X	Not Visible	Not Visible
Auro-Matic	Visible	Visible

Command description.

Command	Description	Response
<b>ssp.aurostrength</b>	Read active Auro strength setting.	ssp.aurostrength.[xx], where "xx" is the current strength.  Value from 0 to 15.
<b>ssp.aurostrength.[xx]</b>	Set Auro strength to "xx".	ssp.aurostrength.[xx], where "xx" is the active strength after the operation.

#### 3.4.11.2 Auro Preset

Auro Preset shall be visible only if "allowed" field is set to Auro-Matic.

The following table indicate when Auro Preset parameter is Visible or Not Visible.

Active Surround (allowed)	Preset without SphereAudio	Preset with SphereAudio

Native	Not Visible	Not Visible
Stereo Downmix	Not Visible	Not Visible
Dolby Surround	Not Visible	Not Visible
DTS Neural:X	Not Visible	Not Visible
Auro-Matic	Visible	Visible

Command description.

Command	Description	Response
<b>ssp.auropreset</b>	Read active Auro preset mode.	ssp.auropreset.[xx], where "xx" is the current mode.
<b>ssp.auropreset.[xx]</b>	Set Auro preset "xx".	ssp.auropreset.[xx], where "xx" is the active preset after the operation.
<b>ssp.auropreset.list</b>	List the attribute of all Auro presets.	<p>This command will generate the following message for each preset.</p> <p>ssp.auropreset.list.[NAME", ID], where:</p> <ul style="list-style-type: none"> <li>• NAME Auro preset</li> <li>• ID is the reference number (as used with ssp.auropreset.[xx] above) <ul style="list-style-type: none"> <li>• 0: Small</li> <li>• 1: Medium</li> <li>• 2: Large</li> <li>• 3: Speech</li> </ul> </li> </ul> <p>The response starts with "ssp.auropreset.start" and ends with "ssp.auropreset.end".</p>

### 3.4.11.3 DRC

DRC shall be visible only if "allowed" field is set to Native or Stereo Downmix or Dolby Surround or DTS Neural:X or Auro-Matic.

The following table indicate when DRC parameter is Visible or Not Visible.

Active Surround (allowed)	Preset without SphereAudio	Preset with SphereAudio
Native	Visible	Visible
Stereo Downmix	Visible	Visible
Dolby Surround	Visible	Visible
DTS Neural:X	Visible	Visible
Auro-Matic	Visible	Visible

Command description.

Command	Description	Response
<b>ssp.drc</b>	Read current DRC status.	ssp.drc.xx, where "xx" is "on" or "off" or "auto".
<b>ssp.drc.on</b>	Turn on DRC.	ssp.drc.on.
<b>ssp.drc.off</b>	Turn off DRC.	ssp.drc.off.
<b>ssp.drc.auto</b>	Turn auto DRC.	ssp.drc.auto.

### 3.4.11.4 Center Spread

The following table indicate when Center Spread parameter is Visible or Not Visible.

Active Surround (allowed)	Preset without SphereAudio	Preset with SphereAudio
Native	Not Visible	Not Visible

Stereo Downmix	Not Visible	Not Visible
Dolby Surround	Visible	Visible
DTS Neural:X	Not Visible	Not Visible
Auro-Matic	Not Visible	Not Visible

Command description.

Command	Description	Response
<b>ssp.cspspread</b>	Read current center spread status.	ssp.cspspread.xx, where "xx" is "on" or "off".
<b>ssp.cspspread.on</b>	Turn off center spread.	ssp.cspspread.on.
<b>ssp.cspspread.off</b>	Turn auto center spread.	ssp.cspspread.off.
<b>ssp.cspspread.toggle</b>	Toggle center spread state.	ssp.cspspread.xx, where "xx" is the result of the toggle operation – either "on" or "off".

### 3.4.11.5 Dialog Control

The following table indicate when Dialog Control parameter is Visible or Not Visible. Works only when DTS:X stream indicates dialog control is available (i.e DTS 2016 DEMO DISC Holly Miranda track).

Active Surround (allowed)	Preset without SphereAudio	Preset with SphereAudio
Native	Not Visible	Not Visible
Stereo Downmix	Not Visible	Not Visible
Dolby Surround	Not Visible	Not Visible
DTS Neural:X + dialog control is available	Visible	Visible
DTS Neural:X + dialog control is not available	Not Visible	Not Visible
Auro-Matic	Not Visible	Not Visible

Command description.

Command	Description	Response
<b>ssp.dialogcontrol</b>	Read current Dialog Control status.	ssp.dialogcontrol.[0/1, X], where: <ul style="list-style-type: none"> <li>"0": means dialog control not available.</li> <li>"1": means dialog control available.</li> <li>"X": current level of dialog control, from 0 to 6 dB. Step 1 dB.</li> </ul>
<b>ssp.dialogcontrol.[X]</b>	Set Dialog Control Level in dB.	ssp.dialogcontrol.[X] set dialog level in dB only is available otherwise error

### 3.4.11.6 Dialog Norm

DTS Dialog Norm is visible when "ssp.stream.[x]", with "x" contains "DTS".

Command description.

Command	Description	Response
<b>ssp.dialognorm</b>	Read current Dialog Norm status.	ssp.dialognorm.xx, where "xx" is "on" or "off"
<b>ssp.dialognorm.on</b>	Turn on Dialog Norm.	ssp.dialognorm.on.
<b>ssp.dialognorm.off</b>	Turn off Dialog Norm.	ssp.dialognorm.off.

<b>ssp.dialognorm.toggle</b>	Toggle Dialog Norm Dim state.	ssp.dialognorm.xx, where "xx" is the result of the toggle operation – either "on" or "off".
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### 3.4.11.7 IMAX Mode

IMAX Mode shall be always visible.

Command description.

Command	Description	Response
<b>ssp.IMAXMode</b>	Read current IMAX Mode status.	ssp.IMAXMode.xx, where "xx" is "on" or "off" or "auto".
<b>ssp.IMAXMode.on</b>	Turn on IMAX Mode.	ssp.IMAXMode.on.
<b>ssp.IMAXMode.off</b>	Turn off IMAX Mode.	ssp.IMAXMode.off.
<b>ssp.IMAXMode.auto</b>	Turn auto IMAX Mode.	ssp.IMAXMode.auto.

### 3.4.11.8 StormXT

Apply StormXT.

Command description.

Command	Description	Response
<b>ssp.stormxt</b>	Read current StormXT status.	ssp.stormxt.xx, where "xx" is "on" or "off". or "error" if StormXT license not activated.
<b>ssp.stormxt.on</b>	Turn on StormXT.	ssp.stormxt.on or "error" if StormXT license not activated.
<b>ssp.stormxt.off</b>	Turn off StormXT.	ssp.stormxt.off or "error" if StormXT license not activated.
<b>ssp.stormxt.toggle</b>	Toggle StormXT state.	ssp.stormxt.xx, where "xx" is the result of the toggle operation – either "on" or "off". or "error" if StormXT license not activated.

### 3.4.12 SphereAudio Effect

The following table indicate when SphereAudio Effect parameter is Visible or Not Visible (see § 3.3.2 Preset, param SPHEREAUDIO THEATER)

Active Surround (allowed)	Preset without SphereAudio	Preset with SphereAudio
Native	Not Visible	Visible
Stereo Downmix	Not Visible	Visible
Dolby Surround	Not Visible	Visible
DTS Neural:X	Not Visible	Visible
Auro-Matic	Not Visible	Visible

Command description.

Command	Description	Response
<b>ssp.sphereaudioeffect</b>	Read current SphereAudio effect status	ssp.sphereaudioeffect.[X], where : <ul style="list-style-type: none"> <li>• "0" : means ByPass</li> <li>• "1" : means Lounge</li> <li>• "2" : means Home Cinema</li> </ul>



		<ul style="list-style-type: none"> <li>• "3" : means Concert</li> <li>• "4" : means Cinema</li> </ul> or "error" if SphereAudio license not activated.
<b>ssp.sphereaudioeffect.[X]</b>	Set SphereAudio effect	ssp.sphereaudioeffect.[X] set SphereAudio effect only if available otherwise error. or "error" if SphereAudio license not activated.

### 3.4.13 LFE Dim

Apply LFE Dim on active Theater.

Command	Description	Response
<b>ssp.lfedim</b>	Read current LFE Dim status.	ssp.lfedim.xx, where "xx" is "on" or "off".
<b>ssp.lfedim.on</b>	Turn on LFE Dim.	ssp.lfedim.on
<b>ssp.lfedim.off</b>	Turn off LFE Dim.	ssp.lfedim.off
<b>ssp.lfedim.toggle</b>	Toggle LFE Dim state.	ssp.lfedim.xx, where "xx" is the result of the toggle operation – either "on" or "off".

### 3.5 Zones Control Group

Zones control group is only accessible while the SSP in in active mode. Any attempts to read or write to this group while the SSP is in sleep mode will return the message "**ssp.power.off**".

The table below will highlight what parameters should be accessible by the user, depending on the Zone type.

As there is also the "Downmix" Zone which is always defined, it is also added to the table.



Zone Type	Volume	Mute	EQ	Balance	Bass	Treble	Audio Mode	LipSync
<b>Mono</b>	X	X	X		X	X		
<b>Stereo</b>	X	X	X		X	X		
<b>Stereo AV</b>	X	X	X		X	X		X
<b>Headphone</b>	X	X	X		X	X	X (only if SPHEREAUDIO THEATER == 1)	X
<b>Downmix</b>	X	X			X	X	X (only if SPHEREAUDIO THEATER == 1)	X (only if AVZONES ==1)

#### 3.5.1 Zones Control

Command	Description	Response
<b>ssp.zones.list</b>	List the attribute of all zones configured. This list is also changed when any field of an zone changes.	<p>This command will start by sending "ssp.zones.start" and then will generate the following message for each configured input:</p> <pre>ssp.zones.list.[ID of zone, "NAME", LAYOUT, TYPE, USE ZONE2 SOURCE, VOLUME, DELAY, EQ, LIPSYNC, MODE, MUTE, RESERVED, AVZONES, BASS, TREBLE, RESERVED, RESERVED, RESERVED],</pre> <p>where:</p> <ul style="list-style-type: none"> <li>• ID of zone unique row ID</li> <li>• NAME is the user readable name</li> <li>• LAYOUT type of zone <ul style="list-style-type: none"> <li>• 2000: Downmix Zones</li> <li>• 2001: Mono Zones</li> <li>• 2002: Stereo and Stereo AV Zones</li> <li>• 2003: Headphone Zones</li> <li>• other value: don't care</li> </ul> </li> <li>• TYPE <ul style="list-style-type: none"> <li>• 0: Main Speakers</li> <li>• 1: Alternate Speakers</li> </ul> </li> <li>• USE ZONE2 SOURCE <ul style="list-style-type: none"> <li>• 0: No</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>• 1: Yes</li> <li>• VOLUME <ul style="list-style-type: none"> <li>• value from -0 to -100</li> </ul> </li> <li>• DELAY value defined by installer in Settings page</li> <li>• EQ On/Off of zone <ul style="list-style-type: none"> <li>• 0: No</li> <li>• 1: Yes</li> </ul> </li> <li>• LIPSYNC value of zone</li> <li>• MODE (Binaural) <ul style="list-style-type: none"> <li>• 0: Stereo</li> <li>• 1: Binaural</li> </ul> </li> <li>• MUTE <ul style="list-style-type: none"> <li>• 0: No</li> <li>• 1: Yes</li> </ul> </li> <li>• RESERVED don't care</li> <li>• AVZONES Lipsync available for Downmix AV zone <ul style="list-style-type: none"> <li>• 0: Audio Zone</li> <li>• 1: AV Zone</li> </ul> </li> <li>• BASS</li> <li>• TREBLE</li> <li>• RESERVED don't care</li> <li>• RESERVED don't care</li> <li>• RESERVED don't care</li> </ul> <p>It will finish with the message "ssp.zones.end".</p>
<b>ssp.zones.lipsync. [ID of zone, yy]</b>	Set lipsync to "yy". This value will be updated if value changed.	ssp.zones.lipsync.[ID of zone, yy], where "yy" is the lipsync after the operation.  From -(Inputs AV Delay + Settings AV Zone Delay) to 100ms.
<b>ssp.zones.volume. [ID of zone, yy]</b>	Set volume to "yy". This value will be updated if value changed.	ssp.zones.volume.[ID of zone, yy], where "yy" is the volume after the operation.  Range value from -0 to -100.
<b>ssp.zones.volume. up.[ID of zone]</b>	Add 1.0dB to the current volume level.	ssp.zones.volume.[ID of zone, yy], where "yy" is the volume after the operation.
<b>ssp.zones.volume. down.[ID of zone]</b>	Subtract 1.0dB from the current bass level.	ssp.zones.volume.[ID of zone, yy], where "yy" is the volume after the operation.
<b>ssp.zones.eq.[ID of zone, yy]</b>	Set eq to "yy". This value will be updated if value changed.	ssp.zones.eq.[ID of zone, yy], where "yy" is the eq after the operation.
<b>ssp.zones.eq. toggle.[ID of zone]</b>	Toggle EQ state for ID of zone.	ssp.zones.eq.[ID of zone, yy], where "yy" is the eq after the operation.
<b>ssp.zones.mute.[ID of zone, yy]</b>	Set mute to "yy". This value will be updated if value changed.	ssp.zones.mute.[ID of zone, yy], where "yy" is the mute after the operation.
<b>ssp.zones.mute. toggle.[ID of zone]</b>	Toggle mute state for ID of zone.	ssp.zones.mute.[ID of zone, yy], where "yy" is the mute after the operation.
<b>ssp.zones.bass.[ID of zone, yy]</b>	Set bass to "yy". This value will be updated if value changed.	ssp.zones.bass.[ID of zone, yy], where "yy" is the bass after the operation. Step 1 dB.
<b>ssp.zones.treble. [ID of zone, yy]</b>	Set treble to "yy". This value will be updated if value changed.	ssp.zones.treble.[ID of zone, yy], where "yy" is the treble after the operation. Step 1 dB.
<b>ssp.zones.mode. [ID of zone, yy]</b>	Set binaural mode to "yy". This value will be updated if value changed.	ssp.zones.mode.[ID of zone, yy], where "yy" is the mode after the operation.  or "error" if SphereAudio license not activated.
<b>ssp.zones.mode. toggle.[ID of zone]</b>	Toggle mode state for ID of zone.	ssp.zones.mode.[ID of zone, yy], where "yy" is the mode after the operation.  or "error" if SphereAudio license not activated.
<b>ssp.zones. useZone2.[ID of zone, yy]</b>	Set use Zone2 to "yy". This value will be updated if value changed.	ssp.zones.useZone2.[ID of zone, yy], where "yy" is the use Zone2 status after the operation.
	Toggle use Zone2 state for ID of zone.	

<b>ssp.zones.useZone2.toggle.</b> <b>[ID of zone]</b>	ssp.zones.useZone2.[ID of zone], where "yy" is the use Zone2 status after the operation.
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### 3.6 System Configuration Group

The system configuration group is only accessible while the ISP in in active mode. Any attempts to read or write to this group while the ISP is in sleep mode will return the message "**ssp.power.off**".

#### 3.6.1 Front Panel

Command	Description	Response
<b>ssp.frontpanel.color</b>	Get the front panel color.	ssp.frontpanel.color.xx, where "xx" is the currently displayed color, where: <ul style="list-style-type: none"> <li>• blue</li> <li>• red</li> <li>• green</li> <li>• white</li> <li>• magenta</li> <li>• orange</li> </ul> <i>Not available for Bryston and Focal.</i>
<b>ssp.frontpanel.color.[xx]</b>	Set the frontpanel color to "xx".	ssp.frontpanel.color.[xx] where "xx" is the name of the color applied. <i>Not available for Bryston and Focal.</i>
<b>ssp.frontpanel.stbybright</b>	Get the frontpanel standby brightness.	ssp.frontpanel.stbybright.[xx] where "xx" is the current standby brightness level.  Value from 0 to 100. Step 10.
<b>ssp.frontpanel.stbybright.[xx]</b>	Set the frontpanel standby brightness to "xx".	ssp.frontpanel.stbybright.[xx] where "xx" is the new standby brightness.
<b>ssp.frontpanel.actbright</b>	Get the frontpanel active brightness.	ssp.frontpanel.actbright.[xx] where "xx" is the current active brightness level.  Value from 0 to 100. Step 10.
<b>ssp.frontpanel.actbright.[xx]</b>	Set the frontpanel active brightness to "xx".	ssp.frontpanel.actbright.[xx] where "xx" is the new active brightness level.
<b>ssp.frontpanel.stbytime</b>	Get the frontpanel standby delay.	ssp.frontpanel.stbytime.[xx] where "xx" is the current standby delay.  Allowed value 2, 5, 10, 20, 30, 60sec.
<b>ssp.frontpanel.stbytime.[xx]</b>	Set the frontpanel standby delay to "xx".	ssp.frontpanel.stbytime.[xx] where "xx" is the new standby delay.

### 3.7 Trigger Group

The trigger group is only accessible while the SSP in in active mode. Any attempts to read or write to this group while the SSP is in sleep mode will return the message "**ssp.power.off**".

#### 3.7.1 Trigger

Trigger output control.

Command	Description	Response
<b>ssp.trigX</b>	Read current status of trigger number "X".	ssp.trigX.xx, where "X" is the trigger number and "xx" is "on" or "off".
<b>ssp.trigX.on</b>	Turn on trigger "X".	ssp.trigX.on, where "X" is the trigger number.
	Turn off trigger "X".	ssp.trigX.off where "X" is the trigger number.

<b>ssp.trigX.off</b>		
<b>ssp.trigX.manual</b>	Reports if trigger "X" is manual toggle.	ssp.trigX.manual.xx, where "X" is the trigger number, and "xx" is "on" if the trigger is manual, and "off" if the trigger is automatic.
<b>ssp.trigX.toggle</b>	Toggle trigger "X" state.	ssp.trigX.xx, where "X" is the trigger number and "xx" is the result of the toggle operation – either "on" or "off".
<b>ssp.trigger.list</b>	Read the triggers name list. This list is also send when the name of a trigger changes.	This command will generate the following message for each trigger: ssp.trigger.list["NAME"], where: <ul style="list-style-type: none"> <li>• NAME is the user readable name</li> </ul> The response starts with "ssp.trigger.start" and ends with "ssp.trigger.end".

### 3.8 Stream Info Group

Stream info group is only accessible while the SSP in in active mode. Any attempts to read or write to this group while the SSP is in sleep mode will return the message "**ssp.power.off**".

#### 3.8.1 Input Stream Sample Rate

Command	Description	Response
<b>ssp.fs</b>	Read current sample rate.	ssp.fs.[xx], where "xx" is the current sample rate code.

#### 3.8.2 Input Stream Type

Command	Description	Response
<b>ssp.stream</b>	Read incoming stream type.	ssp.stream.[xx], where "xx" is the current input stream value.

#### 3.8.3 Input Channel Configuration

Command	Description	Response
<b>ssp.format</b>	Read input channel configuration.	ssp.format.[xx], wherer "xx" is the current input format code.

### 3.9 HDMI Info Group

Stream info group is only accessible while the SSP in in active mode. Any attempts to read or write to this group while the SSP is in sleep mode will return the message "**ssp.power.off**".

#### 3.9.1 Video Info

Command	Description	Response
<b>ssp.hdmiX.input</b>	Read the current "Video in" info.	ssp.hdmiX.input.[yy], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the "Video in" info. example : ssp.hdmi1.input.[ "HDMI 1" ]
<b>ssp.hdmiX.sync</b>	Read the sync info.	ssp.hdmiX.sync.[yy], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the sync info. example : ssp.hdmi1.sync.[ "Detected" ]
<b>ssp.hdmiX.timing</b>	Read the timing info.	ssp.hdmiX.timing.[yy], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the timing info. example : ssp.hdmi1.timing.[ "1920x1080@60Hz" ]
<b>ssp.hdmiX.hdr</b>	Read the HDR info.	ssp.hdmiX.hdr.[yy], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the dynamic range info. example : ssp.hdmi1.hdr.[ "SDR" ]

<b>ssp.hdmiX.cp</b>	Read the copy protection info.	ssp.hdmiX.cp.["yy"], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the copy protection info. example : ssp.hdmi1.cp. [ "Off" ]
<b>ssp.hdmiX.colorspace</b>	Read the color space info.	ssp.hdmiX.colorspace.["yy"], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the color space info. example : ssp.hdmi1.colorspace. [ "ITU-R BT.709" ]
<b>ssp.hdmiX.colordepth</b>	Read the color depth info.	ssp.hdmiX.colordepth.["yy"], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to the copy depth info. example : ssp.hdmi1.colordepth. [ "8 bit" ]
<b>ssp.hdmiX.mode</b>	Read the mode info.	ssp.hdmiX.mode.["yy"], where "X" is corresponding to output "1" or "2" and "yy" is corresponding to mode info. example : ssp.hdmi1.mode. [ "RGB" ]

### 3.10 OSD

OSD commands are only accessible while the processor is in active mode. Any attempts to read or write to this group while the SSP is in sleep mode will return the message "**ssp.power.off**".

#### 3.10.1 Info panel

Following commands are only available for HMC HDMI boards.

Command	Description	Response
ssp.osd.info	Turn extended OSD to on or off.	ssp.osd.info or "error".

### 3.11 Front Panel Group

Front panel commands are only accessible while the processor is in active mode. Any attempts to read or write to this group while the SSP is in sleep mode will return the message "**ssp.power.off**".

#### 3.11.1 Status

Following commands are only available for ISP Core and ISP mk3 (or superior).

Command	Description	Response
ssp.display.toggle	Turn display to on or off.	ssp.display.toggle or "error".

#### 3.11.2 Navigation

Following commands are only available for ISP Core and ISP mk3 (or superior).

Command	Description	Response
<b>ssp.nav.up</b>	Move cursor to the up.	ssp.nav.up or "error".
<b>ssp.nav.down</b>	Move cursor to the down.	ssp.nav.down or "error".
<b>ssp.nav.left</b>	Move cursor to the left.	ssp.nav.left or "error".
<b>ssp.nav.right</b>	Move cursor to the right.	ssp.nav.right or "error".
<b>ssp.nav.ok</b>	Enter menu.	ssp.nav.ok or "error".
<b>ssp.nav.back</b>	Back menu.	ssp.nav.back or "error".