MONOLITH™

HTP-1 16 Channel Dolby Atmos, DTS:X, Auro3D
HOME THEATER PROCESSOR W/ DIRAC & ALEXA COMPATIBILITY

P/N **37887**
User's Manual

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Safety

Caution: Do no remove the cover; there is a risk of electrical shock. There are no user serviceable parts inside the unit. Only qualified technicians should service the unit.

Warning: Do no expose the unit to rain or moisture. Do not allow liquids to spill inside the unit. Doing so will damage the unit and could result in personal injury, electrical shock, or fire.

The exclamation point within an equilateral triangle, printed on the back of the unit, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

This unit is supplied with a grounded, 3-pin, AC cord. The cord must always be used with a 3 prong, properly-grounded, outlet. Do not remove the 3rd prong (earth ground).

The HTP-1 should be disconnected from power while making connections to the back of the unit. There is a power switch on the back of the unit that can be used to disconnect the unit from AC power, or you can simply unplug the unit.

Do not use the unit if it becomes damaged.

There is a fuse in the power entry module. Only replace the AC fuse with the same value fuse. Never bypass the fuse. Unplug the power cable while changing the fuse. Do not, under any circumstances, remove the lid on the unit in order to gain access to the inside of the unit. There are no fuses on the inside of the unit.

Do not place the HTP-1 near heat sources such as radiators, furnaces, stoves, or any other heat producing equipment. Do not place it in direct sunlight.

In order to prevent overheating, allow at least 3 inches of space on all sides of the unit.

Do not place the HTP-1 on top of an amplifier. They produce a lot of heat.

If the AC cord becomes damaged do not use it; replace it.

Licenses

This product uses features licensed from several suppliers:

- Manufactured under license from Dolby Laboratories
- Manufactured under license from Xperi / DTS
- Manufactured under license from Auro Technologies
- Manufactured under license from Momentum Data Systems
- Manufactured under license from Dirac Research

Introduction to HTP-1

The Monolith HTP-1 is an "AVR" or "Pre-Processor" designed for use in home theaters. It supports Dolby Atmos®, DTS-X®, Auro-3D® and Dirac Live®.

The HTP-1 has eight HDMI Ultra High Definition (UHD) inputs and two HDMI UHD outputs. It supports up to sixteen balanced (XLR), analog outputs. It has seven digital audio inputs, two stereo analog inputs, and one secondary stereo analog output.

Monolith HTP-1 is designed to be configured from a web page that is accessible on a tablet, PC, laptop or smartphone.

The provided IR remote can be used to adjust the volume, change the upmix, select inputs, etc.

The system is designed for easy software updates over an ethernet connection.

In The Box

1. HTP-1
2. Remote Control
3. Power Cable
4. Quick Start Guide
5. Antenna

Requirements

A laptop or desktop personal computer, along with a calibrated microphone (not included), are required to perform a Dirac calibration of the HTP-1. A smartphone cannot be used to perform a Dirac calibration.

Other advanced features can be configured via a personal computer, tablet or smartphone using a web browser.

The HTP-1 must be connected to a home network, either wired or wireless. The computers, tablets and smartphones that are used to control the HTP-1 must be on the same network as the HTP-1.

A separate amplifier or powered speakers are required. The outputs of the HTP-1 must be amplified in order to drive speakers.

Basic Setup

The best way to become familiar with the HTP-1 is to start using it. Let's start simple. For this exercise, you will connect one HDMI source, a TV, your amplifier and get some sound to come out. Follow the steps below to get you started.

Step 1 : HTP-1 Network Connection

You will be using a personal computer, tablet or smartphone to setup the HTP-1. The initial setup will be easier using a device with a larger screen such as a tablet or laptop.

The HTP-1 supports both wireless and wired ethernet. For the initial setup it is recommended that you use a wired ethernet connection to the HTP-1. That will help to avoid some possible initial complications with WiFi.

Bluetooth and wireless ethernet use the same antenna on the back of the unit. This is a good time to check that the wireless antenna is attached to the back of the unit.

Connect your ethernet router or switch to the ethernet port on the back of the unit. The ethernet port on the HTP-1 supports Gigabit (1000Mbps) data rates. If you prefer to have the HTP-1 connect to your home network over WiFi then follow the WiFi set up instructions later in this document.

Step 2 : Amplifier

Connect the output of the HTP-1 to your amplifier(s). You can start off by simply connecting the amplifier to the 'LEFT' and 'RIGHT' (front left and front right channels) XLR outputs on the back of the HTP-1. For information on connecting the rest of the channels refer to the "Advanced Setup Topics,

Speaker Setup" section. For the best audio performance, the HTP-1 should be paired with an amplifier that has balanced inputs. An adapter cable can be used to connect to an amplifier with unbalanced (RCA) inputs with some loss of dynamic range. The adapter cable should leave the extra, unused signal output disconnected.

Step 3 : HDMI Source and TV

Connect a reliable HDMI source (cable box, Blu-ray player, AppleTV, etc). Plug the HDMI source into the HDMI Input 1 port.

Tip: using a Blu-ray setup disk with channel ID tracks will be quite helpful for troubleshooting and verifying the speaker setup.

Connect the primary television to the HDMI 1 output port. Only the HDMI output that is labeled, "ARC / eARC" is ARC / eARC-enabled; HDMI output 2 does not support it. ARC / eARC allows a digital audio signal to be sent from the TV to the HTP-1. This is essential if you plan on streaming video from the internet by using an application that runs on the television or if you plan on receiving over-the-air television broadcasts via an HD antenna that is connected to the television. Both HDMI outputs have the same video resolution capabilities.

Step 4 : Power on the Unit

Connect the provided power cable to the 120V/240V wall socket. Flip the switch on the back of the unit to the ON position; this will cause the unit to boot up. The HTP-1 has a slow boot/ eco mode and a fast boot mode. By default, the unit is set for slow boot, which takes a minute. Slow boot mode uses a lower power standby mode; below 500mW. Once the unit has finished booting the LCD will look as described in the following section. The unit can be setup for fast boot on the "System" tab in the web server. The power button on the front of the unit should be used to power on and off the unit during normal usage.

Step 5 : Get to Know the Front Panel
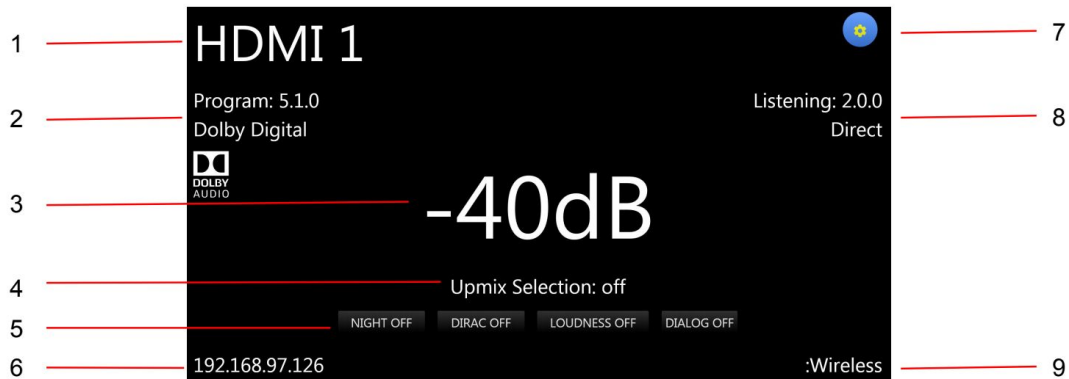
The LCD front panel provides a summary of the critical HTP-1 settings. Currently, the LCD touch screen interface is only used for WiFi setup and to mute the unit. See the WiFi setup section for more details. The user controls the HTP-1 with the remote control and through the web interface via a tablet, PC, laptop or smartphone.

1. The current input is displayed in the upper left corner. Here it says "HDMI 1." This text is configured on the Input Setup Tab detailed later in this document.
2. This section describes the format of the source. In this example, the "Program Format" is Dolby Digital 5.1.0. An appropriate icon is displayed. The "channel" format of the stream is described with three numbers and sometimes with a modifying letter. This is described in more detail in the subsequent section "About Speaker Layouts."
3. The volume is prominently displayed in the center of the screen. The "dB" value is relative to the amplifier input sensitivity setting that is configured on the "System Configuration" setup tab. When the system is muted the volume is displayed in red. The system can be muted by tapping the volume display area on the front panel, by pressing the mute button on the remote, or by clicking on the volume display area on the web page.
4. This is the current upmix setting. The upmix or "surround mode" is selected via the web page interface or the remote control. The selected mode only reflects the desired/requested upmix mode. The system will perform the requested upmix only if is supported. The listening format (number 8 in the illustration) displays which upmix mode algorithm is being utilized, which may not always match the requested mode. This is discussed in more depth in the subsequent section on "Using Surround Modes."
5. This is the current setting of the special listening modes. In this illustration, the Dirac room correction filter is disabled, night mode is off, loudness is off and dialog enhancement is off.
6. This is the current IP address of the HTP-1. To configure/control the HTP-1, navigate to this address using a web browser on a PC, tablet or smartphone. It may be necessary to enter "http://" before the IP address. For this example, the IP address of the unit is 192.168.97.126. The user would therefore enter either 192.168.97.126 or http://192.168.97.126 into the navigation window of the browser. Some browsers default to https. This will not work.
7. Touching the blue "gear" in the upper right corner brings up a display designed to help you connect the HTP-1 to your home WiFi network. Refer to the WiFi setup section later in this document. If the gear is yellow that means that there is an update available for the unit.
8. The right hand describes the format of the presentation. In this example, the "Listening Format" is configured for a "2.0.0" channel arrangement. An appropriate icon is displayed. No icon is displayed for "Direct" presentation.
9. When the HTP-1 is connected to a wireless network the IP address will be displayed in the lower right hand corner of the front panel. The HTP-1 will favor the wired connection if available.

Step 6 : Connect to the HTP-1 Web Server

If you connected the HTP-1 to your home network via a wired ethernet connection, after booting up the HTP-1, it will have acquired a local IP address, which will be displayed on the front panel of the unit, in the lower left hand corner.

Open a web browser on a tablet, laptop or PC that is connected to the same network as the HTP-1. In the web browser type the IP address that is displayed on the LCD panel of the HTP-1:
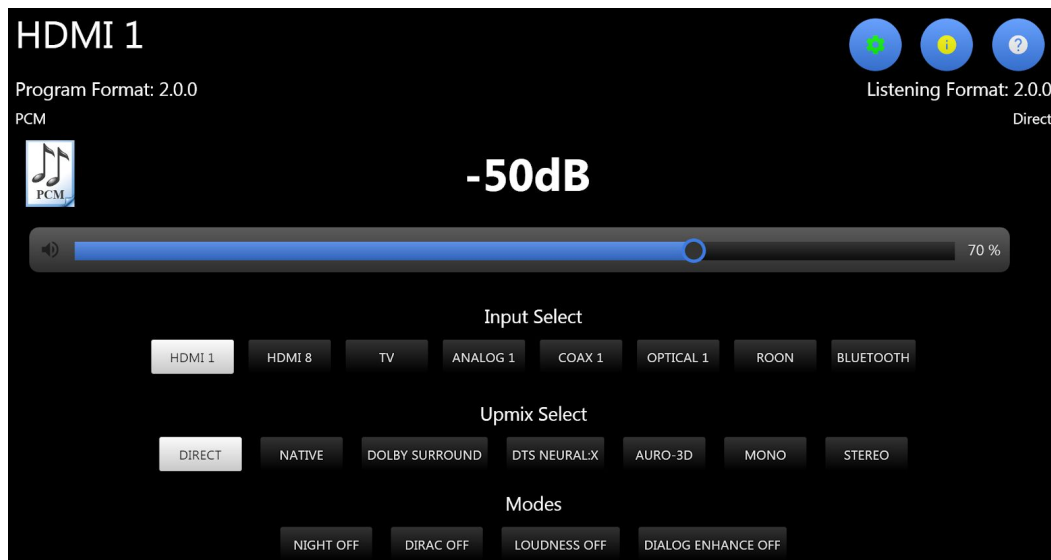
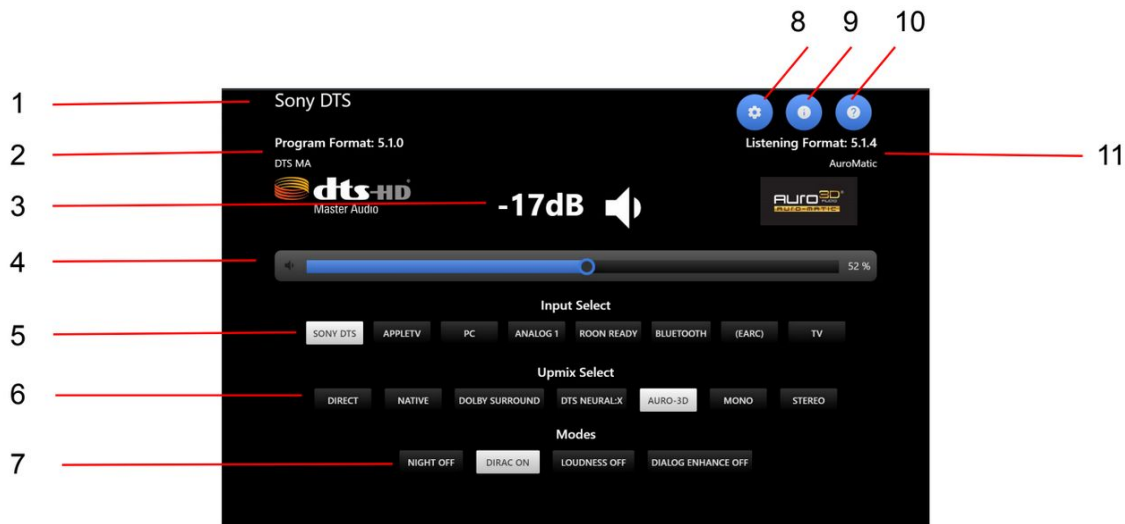http://xxx.xxx.x.x

Note: do not use "https."

Some browsers use http by default. If this is the case then you can simply type the IP address and not "http://."

Create a bookmark on your browser so that you can quickly access the unit.

The homepage of the HTP-1 should open up and look something like this:

Step 7 : Get to Know the Homepage

The homepage is the primary control and configuration interface for the HTP-1.

1. The current active input is displayed in the upper left corner. Here it says "Sony DTS." This text is configured on the Input Setup Tab detailed later in this document. Clicking on the active input in the upper left corner brings up a quick select to choose any input. Click on it and choose HDMI 1. If you have connected an HDMI source to input 1, and the source and TV are powered on, you should see video displayed on the television at this point.

2. The left hand side describes the format of the source. In this example, the "Program Format" is "5.1.0 DTS MA." An appropriate icon is displayed. The "channel" format of the stream is described with three numbers and sometimes with a modifying letter. This is described in more detail in the subsequent section "About Speaker Layouts."

3. The volume is displayed in the center of the screen. The "dB" value is relative to the amplifier input sensitivity setting that is configured on the "System Configuration" setup tab. When the system is muted the volume is displayed in red. The system can be muted by tapping the volume display area.

4. This is the volume slider. There is an option in the "System" tab to select either a slider or buttons for volume control.

5. This is the quick "Input Select" area. Up to 8 inputs can be configured to display in this area. Clicking on these buttons changes inputs. The inputs can also be named. Which inputs are displayed and how they are named are configured on the "Inputs" tab described later in this document.

6. The upmix or "surround mode" is selected here or via the remote control. The selected mode only reflects the desired/requested upmix mode. The system will perform the requested upmix only if is supported. The listening format (number 8 in the illustration) displays which upmix mode algorithm is being utilized, which may not always match the requested mode. This is discussed in more depth in the subsequent section on "Using Surround Modes."

7. This is the current setting of the special listening modes. In this illustration, the Dirac room correction filter is enabled, night mode is off, loudness is off and dialog enhancement is off. The Dirac button is disabled unless a Dirac calibration has been performed.

8. The blue Gear button provides access to the setup tabs - "Speakers, Calibration, EQ, Inputs, Sound Enhancement, Connectivity and System."

9. Clicking on the blue Information button will bring up detailed status as well as access to in-field updates and the ability to roll-back the current software installation. If the button is yellow that means that there is an update available for the unit.

10. This is the Help button. Each section of the web interface (homepage or configuration tabs) will have a help button that provides useful information about the current tab or page. The user guide is also accessible via the Help button.

11. The top-right text describes the format of the presentation. The "Listening Format" is configured for a "5.1.4 AuroMatic" channel arrangement. An appropriate icon is displayed.

7a : Input Selection Alternative

Clicking on the active input in the upper left corner brings up the input selection buttons, which lists all possible inputs. The custom names of the inputs are not displayed here.

7b : System Configuration Tabs

Clicking on the blue Gear button brings up the "System Configuration" tabs, shown below. Details about each tab are addressed further down in this document.
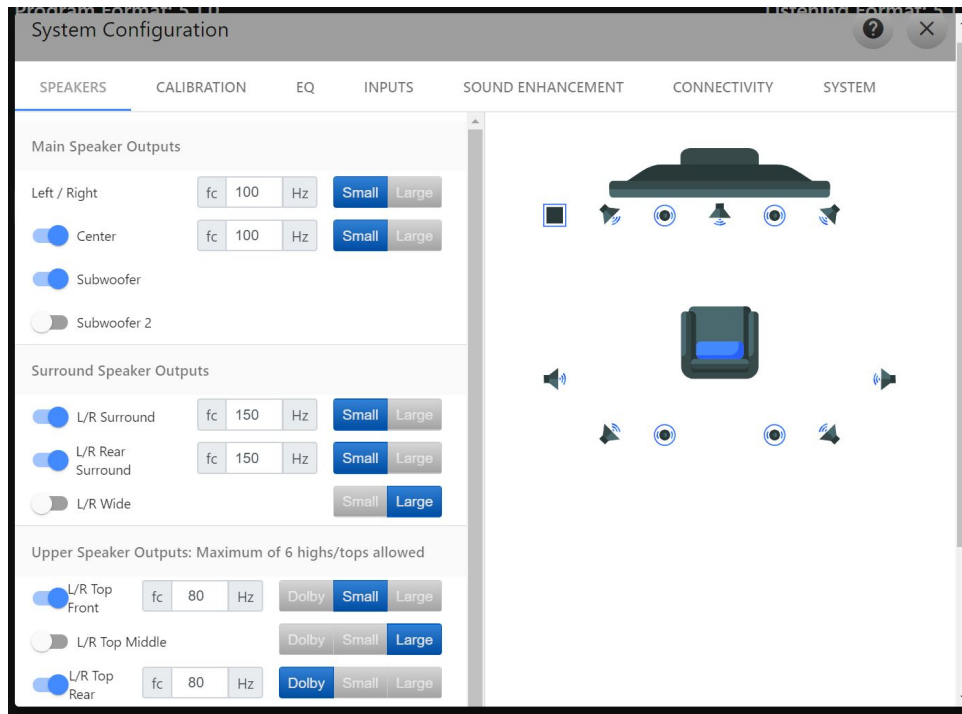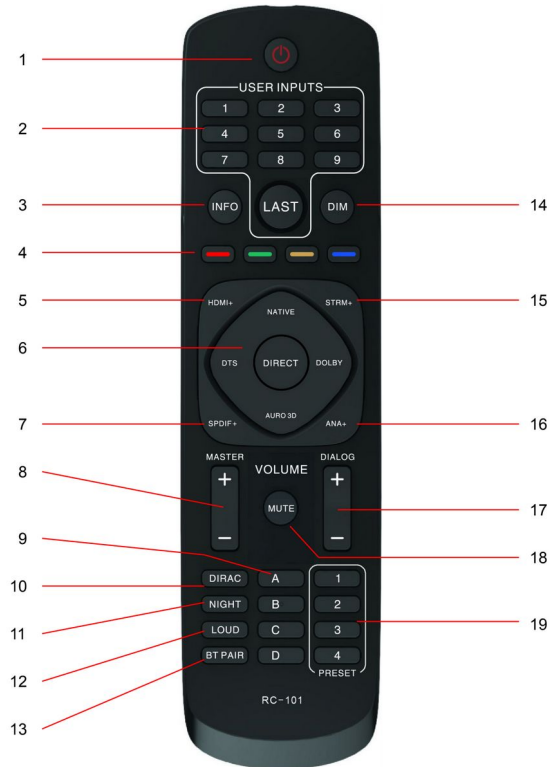

Step 8 : Listen to Audio

At this point, if the HDMI source device is playing, the amplifier is on, the volume is up, the HTP-1 is configured for the correct input, and the TV is set to the input that the HTP-1 is connected to, you should then be able to hear audio. If not, check the setup. Revisit the previous sections.

The Remote Control

The HTP-1 comes with an infrared (IR) remote control. The IR remote allows you to make the same selections that you can from the homepage and more.

1. Power - turns power on and off.
2. User Inputs - the numbers will map to the visible inputs, from left to right, that are displayed on the homepage; LAST selects the last input used
3. Info - displays relevant information on the HTP-1 LCD front panel
4. Red, Green, Yellow, Blue - to be defined
5. HDMI+ - toggles through all HDMI inputs 1-8 and TV
6. Surround Modes - select Native, DTS, Direct, Dolby or Auro 3D
7. SPDIF+ - toggles through digital inputs (coax 1-3 then optical 1-3, then AES)
8. Master Volume - changes the volume to all speakers
9. A, B, C, D - to be defined
10. Dirac - enables/disables Dirac
11. Night - enable/disable Night mode, for low volume movie watching

12. Loud - enable/disable Loudness mode, for low and high frequency boost, for low volume music listening
13. BT Pair - sets the HTP1 to Bluetooth pairing mode
14. Dim - toggles through different brightness settings on the HTP-1 LCD front panel
15. STRM+ - toggles through streaming inputs USB, Roon, Bluetooth
16. Analog+ - toggles through analog inputs
17. Dialog Volume - adjust the volume level of the dialog
18. Mute - mute all speakers
19. 1-4 User Assignable Presets - assignable via the web interface

Advanced Setup Topics

If you followed the Basic Connections instructions above you should be ready to use some of the more advanced features.
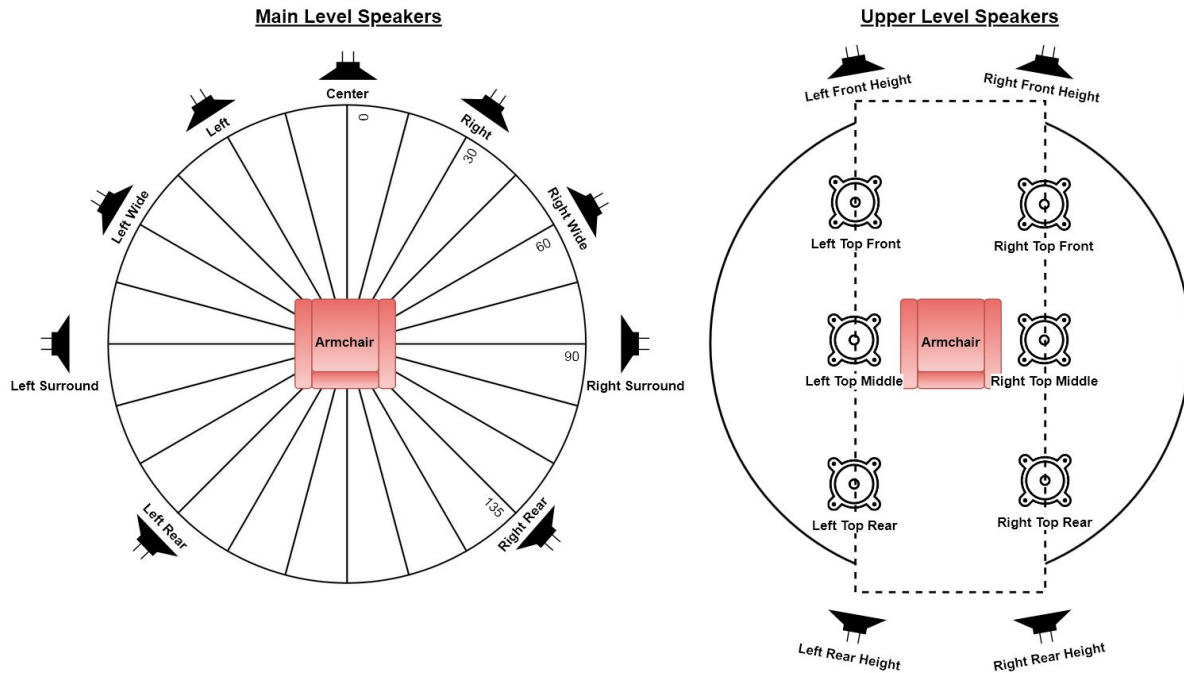
About Speaker Configurations

A speaker configuration (also called a listening mode) is described by three numbers and an optional letter. The first field is the number of speakers in the main listening level. These speakers would be arranged at the ear level of a seated listener. The second field describes the number of subwoofers. The third field describes the speakers above the listener. These are referred to as height speakers. For example, 5.1.4h indicates that there are 5 main level speakers (front left, front right, center, and left and right side surround) with 1 subwoofer, and 4 height (Atmos) speakers. The 'h' indicates that the height speakers are mounted high on the wall, as opposed to on the ceiling. A 7.1.4h system would add two additional surround speakers at the back of the listening area. A 9.1.4h system would have two additional "wide" surround sound speakers. See the following sections for examples of various speaker configurations.

It's common to describe speaker configurations with no upper speakers using only two fields. For example, 5.1 is the same as 5.1.0.

The speaker configuration tab, which is accessed by clicking on the blue Gear symbol on the homepage, is a great reference for understanding various speaker layouts.

Speaker Location Diagrams

These two diagrams illustrate the ideal placement of main level and upper level speakers. Real world rooms may not allow for ideal placement. This is just a guide. Do the best you can. The main level speakers should be placed at the ear level of the listener. The upper level speakers should be mounted high on the wall or on the ceiling. All speakers should be aimed in the direction of the listener.

Main Level Speakers

Upper Level Speakers

Valid Speaker Configurations

The HTP-1 can support up to 16 output channels. There can be up to 9 main level channels, 6 upper/height channels, and up to 3 subwoofers. These can be allocated in various ways. Some of the more complex ways are discussed in the following sections.

The speakers in the main and upper levels are restricted to the following configurations:

Main Level Speaker Count/Configuration	Upper Level Options*
2 Speakers: L/R Front	0 or 2 Speakers
3 Speakers: L/R Front + Center	0 or 2 Speakers
4 Speakers: L/R Front +L/R Surround	0, 2, or 4 Speakers
5 Speakers: L/R Front + Center + L/R Surround	0, 2, 4, or 6 Speakers
6 Speakers: L/R Front + L/R Surround + L/R Rear	0, 2, 4, or 6 Speakers
7 Speakers: L/R Front + Center + L/R Surround + L/R Rear/Back	0, 2, 4, or 6 Speakers
8 Speakers: Not Supported	0, 2, 4, or 6 Speakers
9 Speakers: L/R Front + Center + L/R Surround + L/R Rear + L/R Wide	0, 2, 4, or 6 Speakers

*Refer to the table below regarding upper level options.

The HTP-1 can support many different configurations of upper speakers. The upper speakers can be "high," which are mounted on the wall, or "top," which are on the ceiling firing down. "Dolby Enabled" speakers are also supported. Dolby Enabled speakers act like top speakers by bouncing the sound off of the ceiling. Dolby Enabled speakers are convenient in that they are integrated with typical front firing (front left and right) speakers. They work well when the ceiling is flat and reflective to sound.

Dolby content is typically authored with upper level speakers on the ceiling. DTS and Auro-3D content are typically authored with speakers high on the wall. The HTP-1 system "remaps" the source material to match the user-defined speaker configuration. The upper speakers are configured as follows:

Upper Level Speaker Count/Configuration	Details, Suggestions, and Restrictions
2 Top: middle or top front pair only	Dolby content is often authored assuming only the top middle speaker pair. If only two upper speakers are available, top middle is the best bet.
2 High: front pair only	If your speakers are here, then use this setting. But this is not a preferred speaker arrangement.
4 Top: 4 ceiling mounted (down firing speakers, front and rear left and right)	A Dolby-preferred speaker layout. Other formats also support this.
4 High: 4 wall mounted high speakers, front and rear, left and right	The DTS-preferred configuration.
4 Mixed: front high, rear top or front top and rear high	If your speakers are most easily set in such a mixed arrangement, HTP 1 can be configured to map the signal to these configurations.
6 Top: front, middle and rear	Best of both worlds.
6 High: front and rear are high on the wall	The signal for the upper middle pair is actually the "top middle." The Auro-3D "Voice of God" signal is routed to the top middle pair.
6 Mixed: top middle plus front high, rear top or front top and rear high	Not an ideal layout, but use it if this matches your system best.

Note: All top speakers can be "Dolby Enabled."

The status display will differentiate between "top" and "high" by appending an "h" when the uppers are high. The modifiers "/" and "\" are used to indicate the mixed configurations. "Top" is higher than "high" so "/" implies top in the rear and high in front.

The setup allows many choices so you can configure the decoders to drive the speakers that you have. But a few configurations are preferred:

- The HTP-1 supports up to 3 subwoofers depending on main and upper level channel allocation.
- 5.1.2 is a "minimum object audio" recommendation.
- 7.1.4 is a "normal object audio" configuration.
- Six upper speakers gives a clear advantage to match common source material exactly without remapping.
- More than one subwoofer can minimize dead spots in the low frequency material.

Mapping Channels to Speakers

There can be cases in which the channels found in the program material do not exactly match the speakers in the room. The various decoders apply "remap" algorithms to pan the source signal to the best available set of speakers. This is best illustrated with a set of examples:

1) DTS material is typically constructed with "high" channels, but a room may have only "top" speakers. DTS applies a "remapping" feature in this case and the resulting signal is heard both from the top speaker as well as from the matching main level speaker. The sound from the front left high speaker is hence panned between the top left high and the top left speaker so that it sounds like it is coming from the high speaker location between these two.
2) A 5.1 DTS stream is usually authored with the surround speakers at 110 degrees from the listening position (see the Speaker Location Diagrams on previous page). A 7.1 speaker setup places surrounds (sides) at 90 degrees and rear speakers at 135 degrees. Hence a 5.1 DTS signal is typically presented with the surround signal split between the side and rear speakers.
3) The full Auro-3D channel set includes the "Voice of God" (VoG) speaker located directly overhead and the "Front Center High" or "Center Vertical High" (CVH) speaker on the wall above the screen. These signals are not directly supported as they are not generated by the other decoders. Like all of the higher speaker modes, the available signals are mapped to the available speakers. The VoG signal is routed equally to the two "top middle" speakers, if available. In a ".4" configuration, the VoG signal will be routed to all 4 upper speakers. The CVH signal is split between the upper front signals.
4) The Auro-3D speaker set is in fact "high" channels, not top channels. If you choose to install top speakers, the Auro-3D high channels are mapped directly to the top speakers.

Dolby Atmos and DTS-X are object audio systems. This means that sound "objects" do not have to be located in a fixed channel but instead are decoded to match the available set of speakers. This makes it possible to move sounds around a room reliably with various speaker configurations. Auro-3D on the other hand is a channel-based system. The fixed speaker locations need to be rendered to the available speakers. This is also apparent when a stream is constructed with a mix of channels and objects.

Speaker Setup

Click on theGear icon in the lower left of the homepage to access speaker setup. Then choose the "Speakers" tab. The HTP speaker configuration is set by clicking on the toggle switches in the left-most column. Blue indicates that the speaker is enabled. When you have enabled a speaker, or set of speakers, they will appear in the illustration on the right hand side of the pane, which will help you place the speakers in the correct position in the room. In the graphic, squares represent subwoofers and circles represent height/upper speakers.

The speaker setup page guides you to enable speakers in supported configurations. This is discussed below.

The "Small" button in the second column enables a high pass filter with a user-selectable corner frequency. Blue indicates which option is chosen--"Large" or "Small" or "Dolby." The following sections contain some examples of speaker configurations.

Setting Speaker Size

Most speaker setups will use small speakers. If you are not sure if the speakers are small or large then they are probably small. A large, full-range speaker does not need a subwoofer to produce the lowest frequencies. Selecting the "Small" toggle switch means that the lowest frequencies are redirected to the subwoofer. This protects the small speaker and allows it to operate more efficiently. Many speaker manufacturers will provide the frequency response of their speakers. For example "60Hz to 18KHz" indicates that the speaker is not designed to produce sounds below 60Hz, or so. In this case you would want to set the corner frequency of the high pass filter to 60Hz or maybe 10Hz above the cutoff. Choosing a cutoff that is clearly in the linear region of the speaker ensures that the crossover operates as designed and is not affected by the natural filtering of the speaker. The HTP-1 uses a fourth-order Linkwitz-Riley crossover.

The settings of the speaker sizes do not affect the Dirac calibration. The bass manager runs before the Dirac filter. The Dirac calibration ensures that the signal sent to the speakers is reproduced as intended. After doing the Dirac calibration you can see the cutoff frequencies measured on your speakers and then complete the configuration of the "Speakers" page by filling the corner frequency for each pair of speakers. Ideally the corner frequency chosen on the speaker setup page is 5 or 10 hertz above the frequency at which the speaker begins to roll off. That way you use the fourth-order Linkwitz-Riley electronic crossover provided by the HTP-1 and don't rely on the less predictable behavior of the speakers.

A Dolby Enabled speaker behaves like a "small" speaker except when a Dirac calibration is performed. The calibration preserves the special filters used in Dolby Enabled speakers.

Enabling Speakers

When you first open the speakers configuration pane only the front left and right speakers are enabled. The sliders will not allow you to select an unsupported speaker configuration. Refer to the tables above for supported speaker configurations. HTP-1 follows rules set by the Dolby and DTS decoders. Some of the rules are:

- The L/R rear surround speakers cannot be enabled until the L/R surround speakers are enabled.
- The L/R wide speakers cannot be enabled until the L/R rear surround speakers are enabled.
- Subwoofer 3 cannot be enabled until subwoofer 2 is enabled.
- There is no "side middle high" configuration. You must first choose top front speakers to select the top middle.
- You cannot have only rear upper speakers. The first pair must be front or middle.
- There is no "high" middle speaker. If you want to have six upper speakers they must be configured as "top."

If you have only two upper speakers it is a good idea to choose the top middle pair. Many Dolby tracks are authored to favor this upper pair. The "5.1.2" Atmos configuration uses the top-middle pair. DTS-X streams are likely authored using four high speakers. The HTP-1 carefully "remaps" any source arrangement to match the speaker setup you choose. This is why you should describe/configure your speaker setup as accurately as possible, though few people will be able to tell the difference if a pair of speakers labeled "top front" are actually high on the wall in front.

Dolby Enabled Speakers

Dolby Enabled Speakers have two independent drivers with two independent inputs. One of them points up so that the sound will reflect off the ceiling and appear to be a speaker on top. A Dolby Enabled speaker must also include a filter to enhance the illusion of the sound coming from above.

Example Speaker Setups

The back panel of the unit is shown below along with a diagram of the XLR connectors on the back of the HTP-1. The diagram will be used in the following sections to show you how to connect an amplifier to the unit for various speaker configurations. In the diagram, the XLR connectors have been divided into two rows to make is easier to fit the information on a single page.

As you use all 16 channels, the order of channels assigned to the back panel varies with your choice of speakers. The actual assignment is displayed at the bottom of the speaker configuration page.
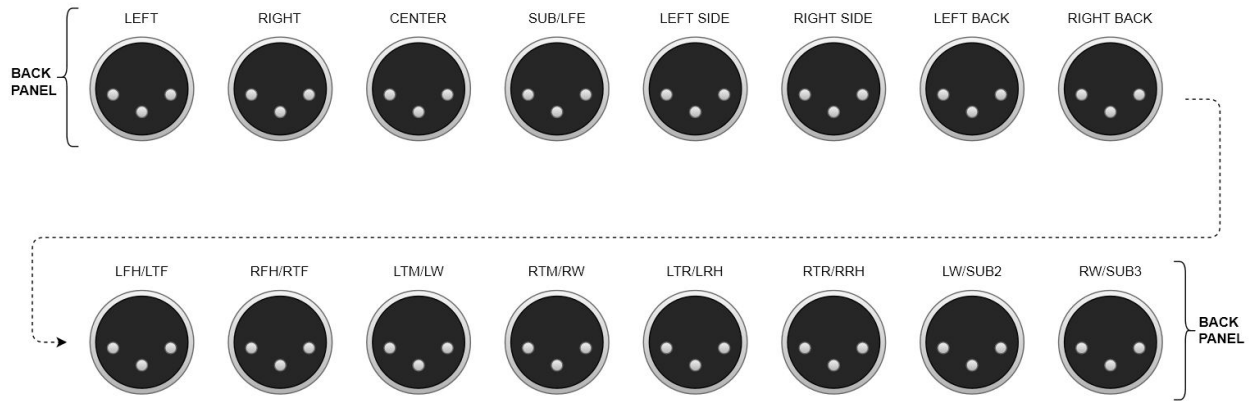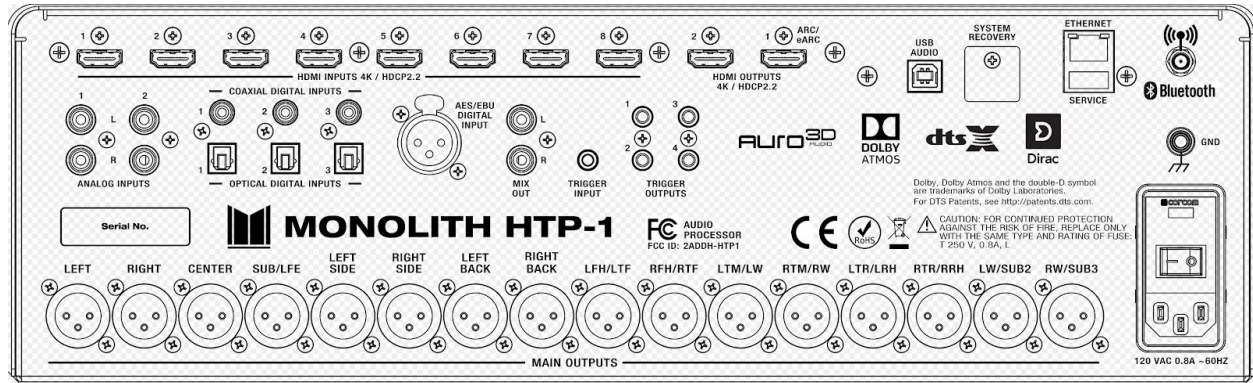
The actual assignment is displayed at the bottom of the speaker configuration page.

Upper Speaker Outputs: Maximum of 6 highs/tops allowed

L/R Top Front — fc 150 Hz — Dolby | Small | Large

L/R Top Middle — fc 150 Hz — Dolby | Small | Large

L/R Top Rear — fc 150 Hz — Dolby | Small | Large

L/R Front Height — fc 150 Hz — Small | Large

L/R Rear Height — fc 150 Hz — Small | Large

REINFORCE BASS OFF   adds subwoofer signal to large speakers

Speaker Map: ["Left front","Right front","Center","Subwoofer","Left Surround","Right Surround","Left Back","Right Back","Left High Front","Right High Front","Left Top Middle","Right Top Middle","Left Top Rear","Right Top Rear","Left Wide","Right Wide"]
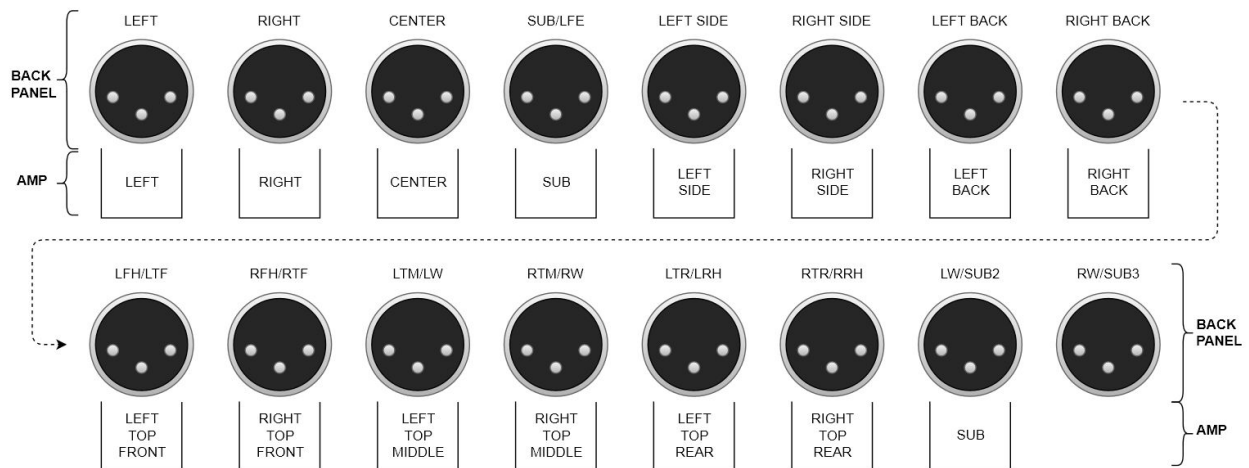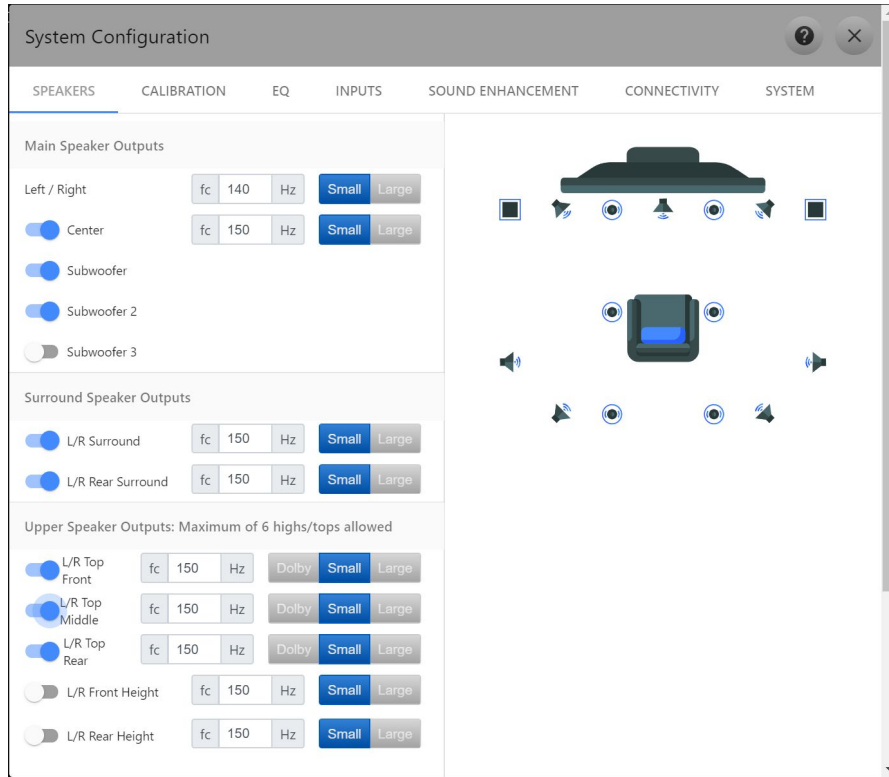
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Example 7.1.4h Speaker Configuration (Upper Level On the Wall)

This speaker configuration uses 7 surround sound speakers, 1 subwoofer and 4 height speakers. The height speakers are mounted high on the walls, in the corners of the listening area.
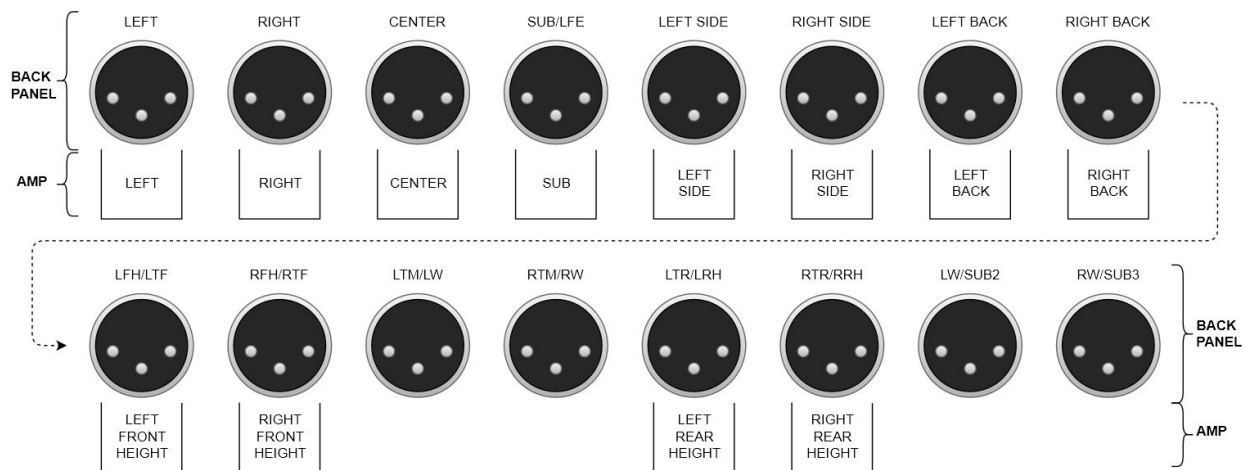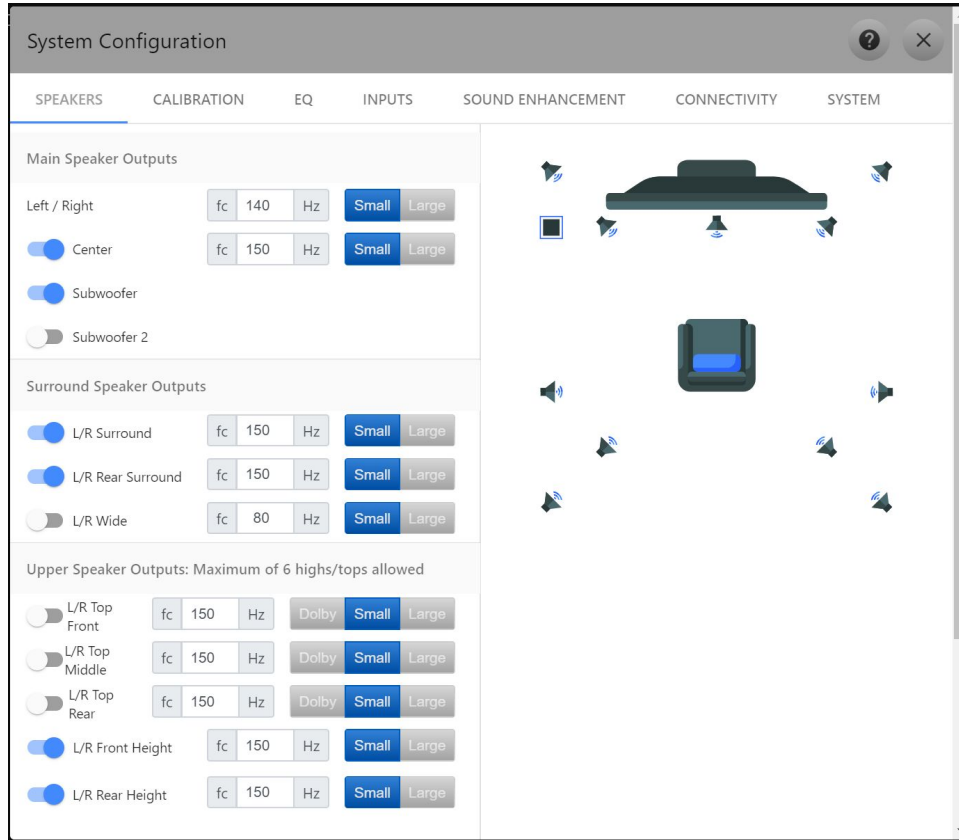
Example 7.2.6c Speaker Configuration (Upper Level On the Ceiling)

This speaker configuration uses 7 surround sound speakers, 2 subwoofers and 6 height speakers. The height speakers are mounted in the ceiling.

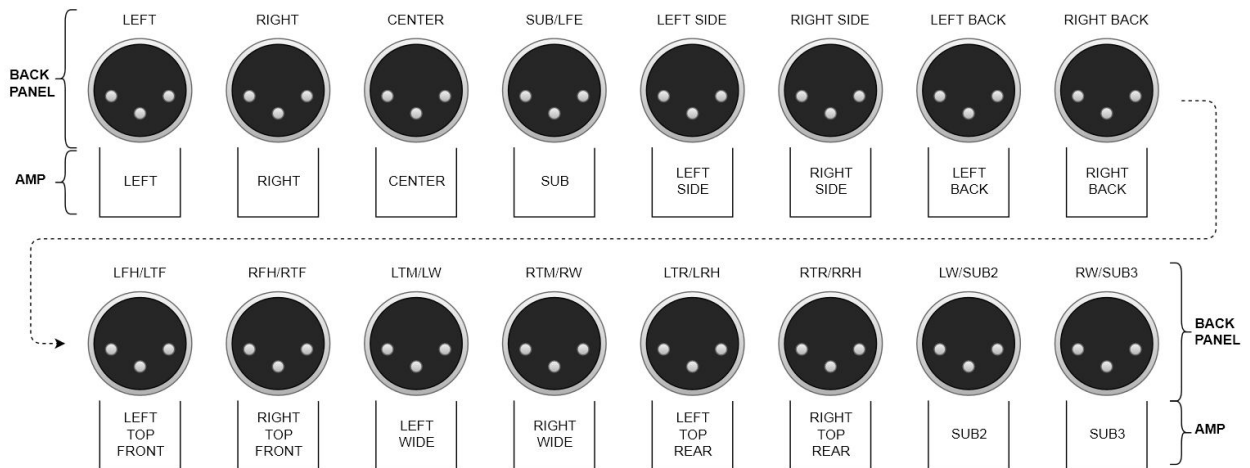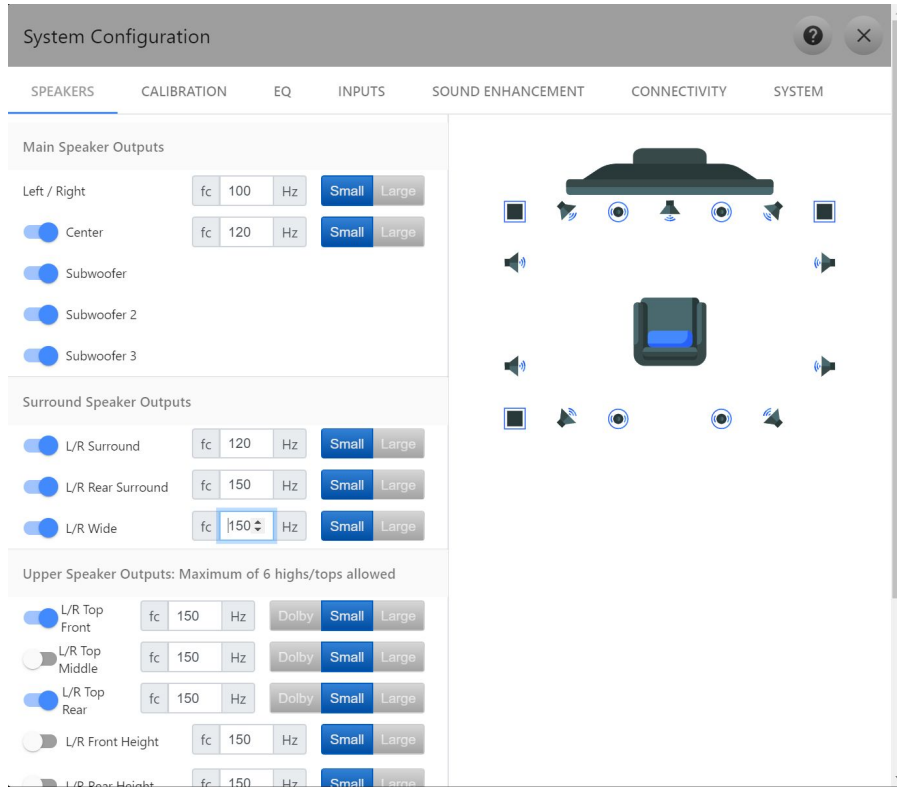## Example 9.3.4c Speaker Configuration (Upper Level On the Ceiling)

This speaker configuration uses 9 surround sound speakers, 3 subwoofers and 4 height speakers. The height speakers are mounted in the ceiling.

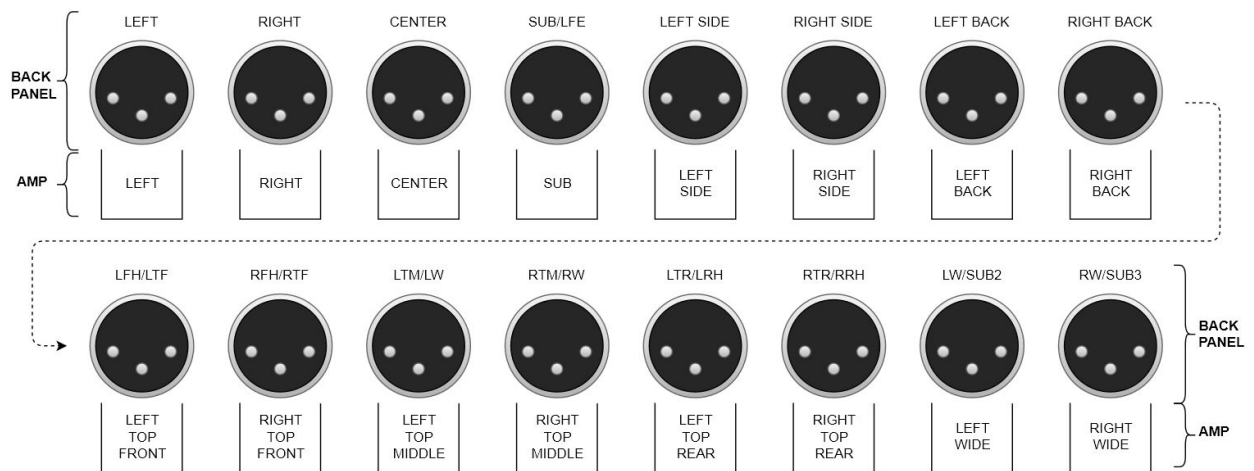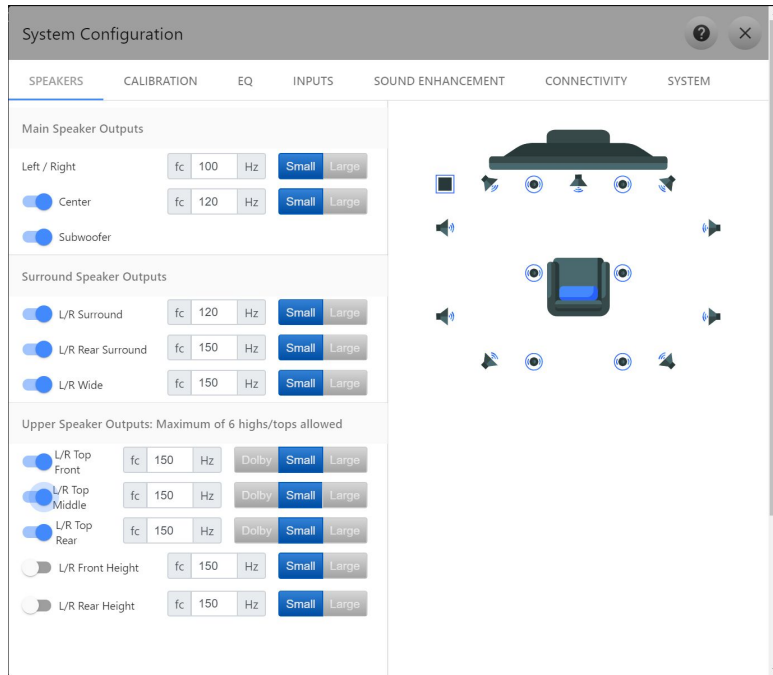## Example 9.1.6c Speaker Configuration (Upper Level On the Ceiling)

This speaker configuration uses 9 surround sound speakers, 1 subwoofer and 6 height speakers. The height speakers are mounted high on the walls, in the corners of the listening area.

Volume Range and Amplifier Input Sensitivity

The HTP-1 uses a sophisticated mixture of analog and digital volume controls. The analog volume control is used as much as possible. The digital volume control is adjusted to provide for headroom. An "amplifier sensitivity" control is provided on the calibration page so that this control can be matched to your amplifier. Amplifiers typically have a sensitivity between 1 and 2 volts. When this control is set correctly, the amplifier should clip before the HTP-1 clips. This should of course only happen at loudest volume that your amplifiers and speakers support. That might be painfully loud with the potential to induce system or hearing damage.

To avoid the volume being set to a painful and/or damaging level and to optimize the range of the volume control, users are allowed to set the maximum and minimum volumes. These will correspond to the range of the volume bar--if you enable the volume bar. These volumes function as stops or limits. Typically the lower limit is set so that you can barely hear it in your listening room and the upper limit is set by your comfort level with your speakers and amps.

If the sensitivity of your amplifier is unknown, begin by setting HTP-1 to 1 volt. Set the max volume to zero. Run the volume up and see if it gets as loud as you want it to be. If you think it should be louder, increase the amplifier sensitivity. Setting the amplifier sensitivity to 2V allows you to set the max volume to 6dB with a full scale signal clipping at 2V RMS into a balanced load. You can repeat this procedure, increasing the sensitivity until the system is as loud as you want it and as loud as your amps and speakers can sustain. The amplifier sensitivity setting is calibrated for a balanced amplifier. If you are using an unbalanced amplifier then you should set the amplifier sensitivity to twice the value specified in the specifications of the unbalanced amplifier.

Recommendations on setting the amplifier sensitivity:

1 . If you continually listen at very low volumes (like -40 or -50) you are giving up dynamic range and operating closer to the noise floor of the system. This may be OK, but it may be better to lower the amplifier sensitivity.

2. If you run the max volume above the amplifier sensitivity you make it possible for loud material to distort (clip). It would be better to raise the amplifier sensitivity, or invest in larger amps and speakers.

Dirac Calibration

The Monolith HTP-1 supports DiracLive™ room correction. Using a calibrated microphone, the system listens to the response of your room and your speakers and applies corrections to make the system more linear and hence more correct.

The calibration system addresses several aspects of the system:

1) It set the delays on the speakers. Sound travels about one foot per millisecond. The delays are designed to ensure that sound from all speakers reaches your ears at the same time. If the delays are not set correctly you are likely to perceive a sound in the center as coming from one side or the other.
2) It sets the trims on the speakers. Different speakers and amplifiers produce a different sound level for a given amplifier power. Distance also plays a role. Speaker trims are included so that the same sound from each speaker reaches your ears with the same loudness.
3) It corrects the frequency response of the system. The frequency response of speakers is often not flat. The DiracLive system measures the frequency response and renders it flatter.
4) It provides measurements of the frequency response of each of your speakers, allowing you to set up the crossovers in the bass manager. The frequency response measurement reveals the low frequency performance (the cutoff frequency) of each speaker. This is the information you need to set up bass management.

The Monolith HTP-1 system makes it easy to do a Dirac calibration, and we expect all users to perform such a calibration. Setting up your speakers correctly is a key part of getting the best sound out of your system. The Dirac Live room correction features make this easy to do using HTP-1, but you still have to follow the right steps. In outline form:

- Turn off tone controls and equalizers (PEQ). These run after the Dirac filter and running a calibration with these enabled will cause the Dirac filter to attempt to nullify the equalizers to a flat response. Some advanced users might wish to enable the equalizers during calibration so that the calibration will have a negative image of the equalizer setting. This is a very advanced topic. Don't start with it.
- Use the "Speakers" tab on the System Configuration dialog to enable the speakers you have. You should accurately enable all of the speakers you have.
- Perform a Dirac calibration. A calibrated USB microphone is recommended for this purpose. Using an uncalibrated mic will skew the frequency response of your system.
- Determine the cutoff frequency of each of your speakers by reference to the frequency response graphs produced by the Dirac tool.

Currently, Dirac calibration requires a PC or Mac Laptop running Dirac Live with an external mic attached to the laptop. Dirac recommends using the MiniDSP UMIK-1. Note that the Dirac smartphone app does not support running a calibration either with the internal mic or with a mic attached to the smartphone. That could change in the future, but for now, that is the case.
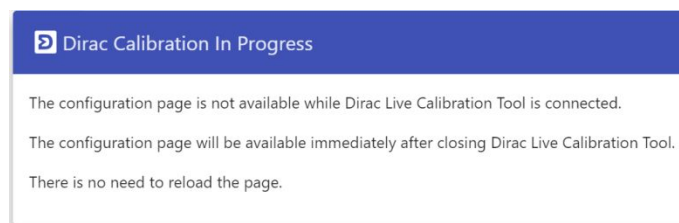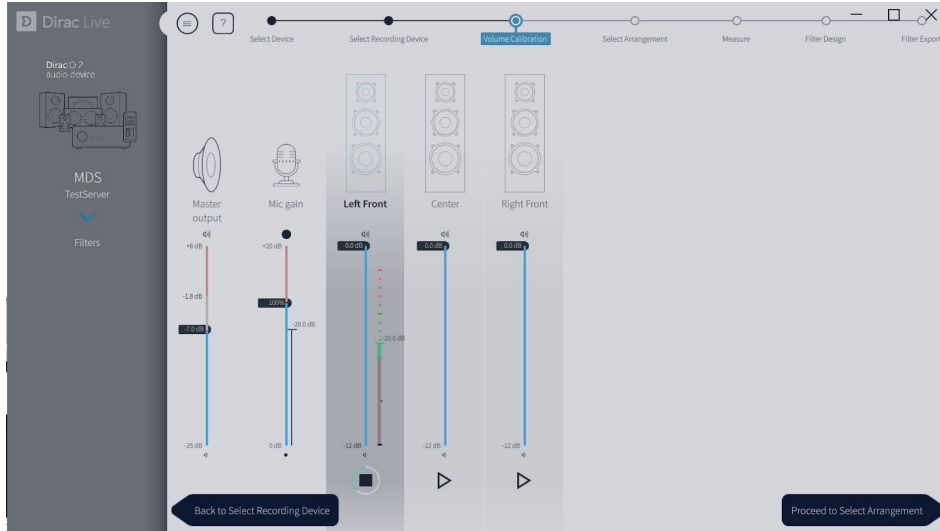
Calibration Steps

Complete the basic setup. Be able to play sound through your speaker set.

1) Download and install the Dirac Live tool. https://live.dirac.com/download/. The current version is 2.2.3, but the exact version is not critical.
2) Launch DiracLive and log in. You may need to create your login. The ownership of the HTP-1 conveys a license for Dirac usage.
3) Attach an appropriate and hopefully calibrated USB microphone to the PC being used to make the measurement. Using the built-in mic of a PC is not recommended.
4) Open DiracLive and connect to the Monolith HTP-1.
5) Choose a microphone.
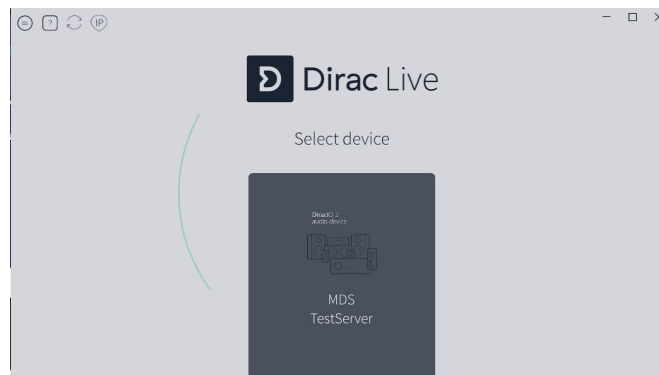
6) Notice that interaction with the UI of the Monolith HTP-1 is blocked while you are doing a Dirac calibration.

7) Set the volumes for calibration. Begin by setting the mic gain to full (100%). Then press the play arrow under the left front speaker and adjust the master volume to reach approximately -20dB on the scale for the channel. Note that the noise plays for about 30 seconds. Press play again if you need to. Repeat this for each channel. The volumes don't have to be all the same, but they should be close. If several amps are involved, like with a powered subwoofer, it's better to get the volumes about even using the amp volumes. If the volume is too low the calibration will fail for "missing samples." If the volume is too high the calibration will fail with clipping. If the calibration clips, go back to the volume page and lower the master volume.

8) Proceed to measurement and hear the sweeps. When a measurement is successfully completed you'll see the frequency response displayed. You can notice here that this left channel speaker isn't much good below 100Hz. The stuff down below 10Hz is apparently rumble or noise. It's not coming from the speakers.

9) The Dirac tool encourages you to run sweeps at multiple locations. We suggest you first try a calibration with one location, just to see how it goes. Then do a calibration with a full set of measurement locations for better correction.

10) Proceed to filter design and see the correction that Dirac suggests. You can drag the left and right endpoints. You can investigate the right cutoff frequency for your speakers.

11) While the left channel looks good down to 100Hz, the center channel here is having trouble below 150Hz. These are small, cheap speakers.
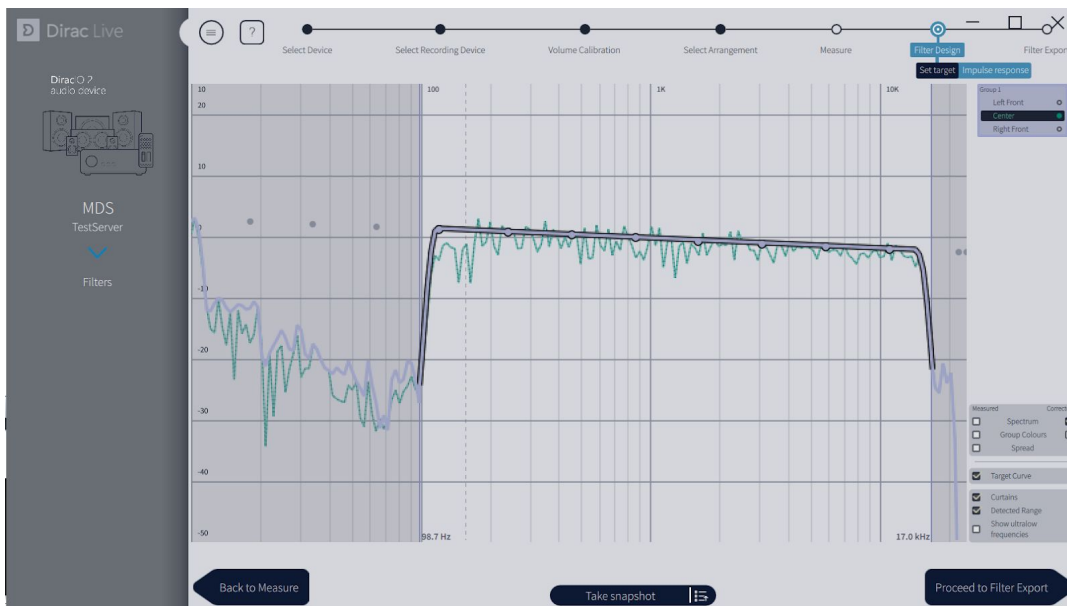
12) Choose a slot in which to store this calibration. The system gives you six slots. You can store calibrations for different room configurations, like curtains open and closed. You might also calibrate for different speaker configurations. The system calibrates the channels that were configured on the speaker page. Dirac suggests the names of interesting physicists and

philosophers. This name will be visible in the Monolith HTP-1 UI, so choose something meaningful to you. The description is not visible in the Monolith HTP-1 UI.
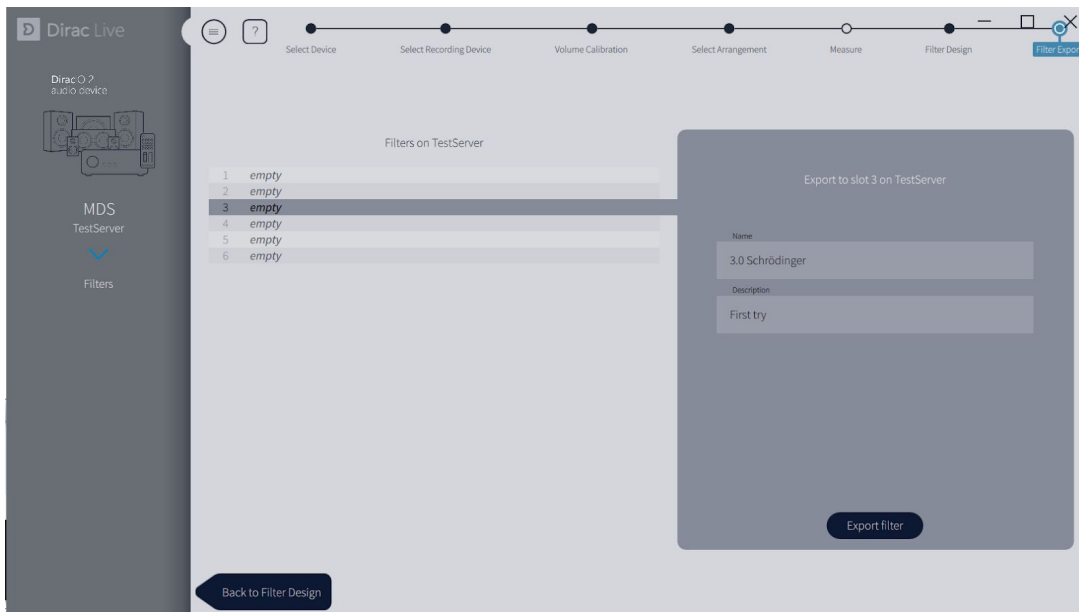
13) Export the filter. This takes a minute or two. In the end the resulting filter is installed and enabled on Monolith HTP-1. You can inspect it using the "calibration" page from the Gear icon.
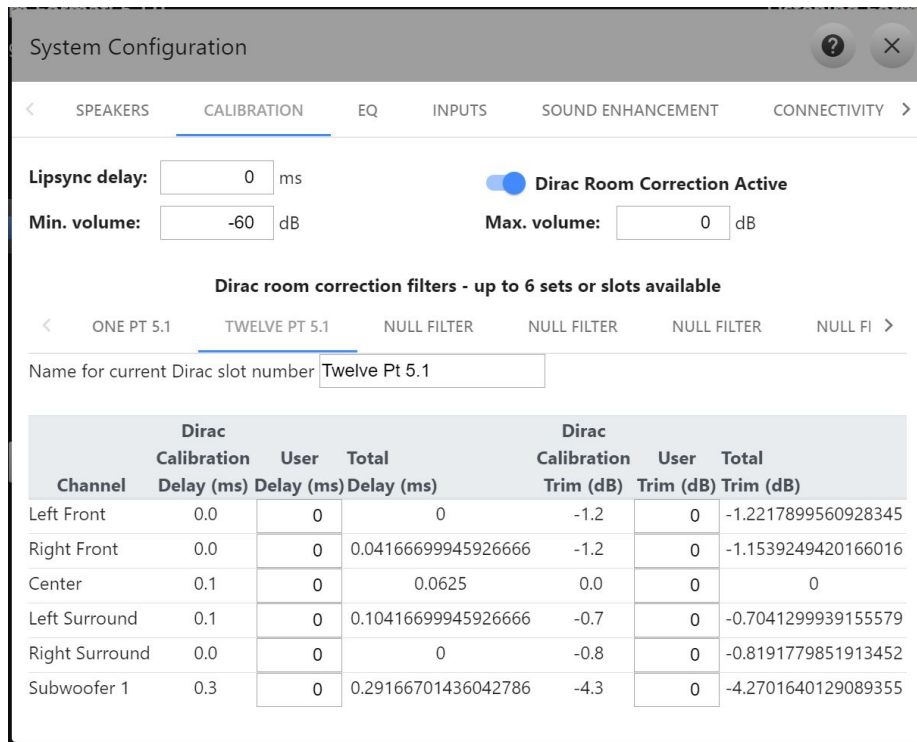
Q: *What if the calibration dialog is not cleared on Monolith HTP-1?*

A: *The dialog box should close when you exit the Dirac Live tool. If it does not close, re-open the Dirac Live tool, connect, then exit again.*

14) Now open the calibration tab on Monolith HTP-1. Here Monolith HTP-1 is set up for a 5.1 configuration and a 5.1 calibration is chosen. If a calibration is for less speakers than the current configuration, the uncalibrated channels will then be passed without any filtering.

15) The "calibration" delay and trim values are as determined by Dirac and they are applied when Dirac Room Correction is active. Notice that the delay and trim on the right channel are zero. This indicates that the right speaker was farthest from the microphone.

You can modify the Dirac calibration values with user values. You can also supply user values that are applied even when Dirac calibrations are not enabled. The user delays and trims add with the Dirac delays and trims. Delay cannot go below zero. Setting trim to high values can work but it sacrifices the headroom that you may want for other filters.

System Configuration

SPEAKERS   CALIBRATION   EQ   INPUTS   SOUND ENHANCEMENT   CONNECTIVITY

Lipsync delay: 0 ms   ⬤ Dirac Room Correction Active

Min. volume: -60 dB   Max. volume: 0 dB
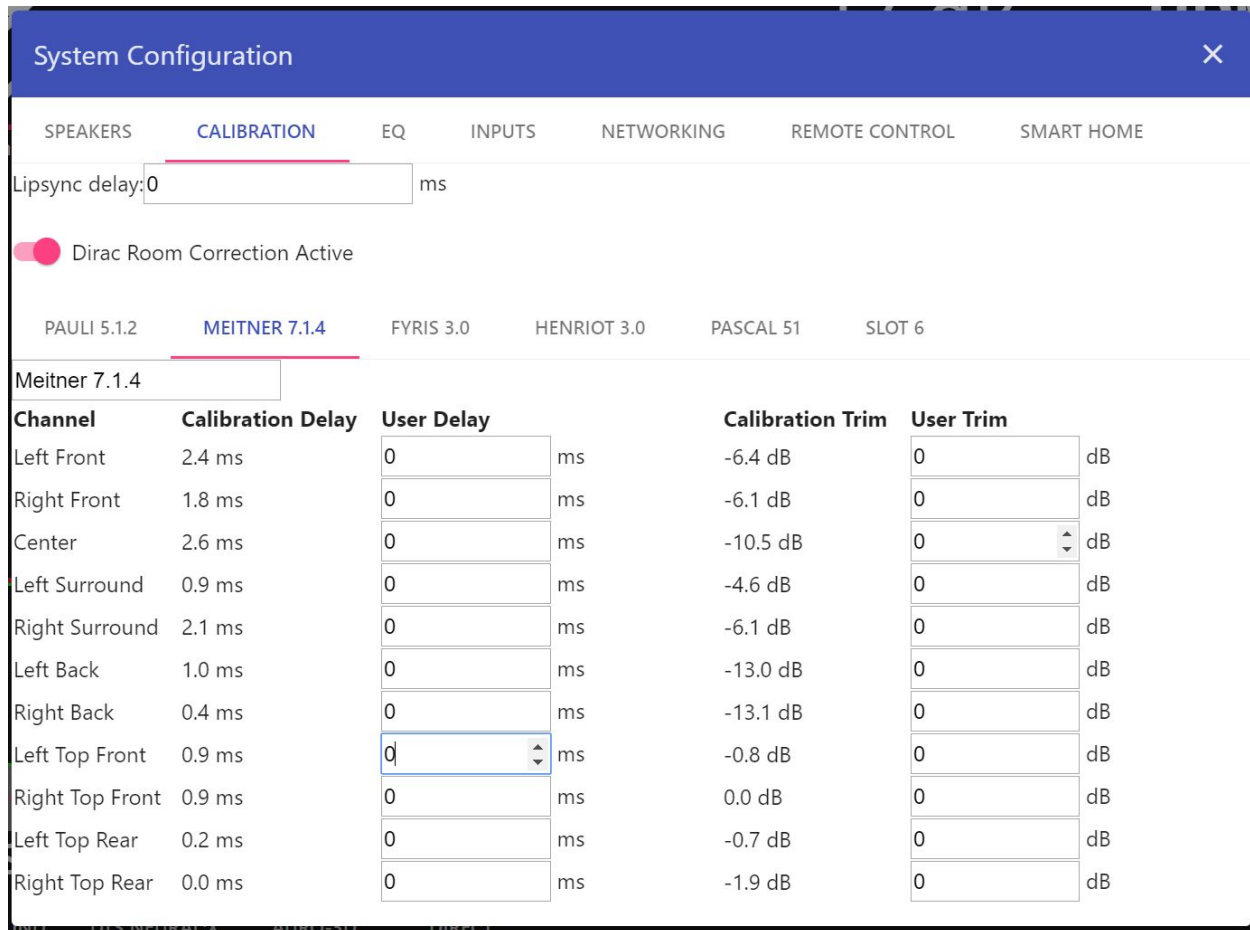
Dirac room correction filters - up to 6 sets or slots available

< ONE PT 5.1   TWELVE PT 5.1   NULL FILTER   NULL FILTER   NULL FILTER   NULL FI >

Name for current Dirac slot number Twelve Pt 5.1

Channel	Dirac Calibration Delay (ms)	User Delay (ms)	Total Delay (ms)	Dirac Calibration Trim (dB)	User Trim (dB)	Total Trim (dB)
Left Front	0.0	0	0	-1.2	0	-1.2217899560928345
Right Front	0.0	0	0.04166699945926666	-1.2	0	-1.1539249420166016
Center	0.1	0	0.0625	0.0	0	0
Left Surround	0.1	0	0.10416699945926666	-0.7	0	-0.7041299939155579
Right Surround	0.0	0	0	-0.8	0	-0.8191779851913452
Subwoofer 1	0.3	0	0.29166701436042786	-4.3	0	-4.2701640129089355

Here is an earlier calibration page for the 7.1.4 setup. Notice the wide variation in trims. This might be better corrected with the volume on the amplifiers, but the calibration tool handles it without any problems.

System Configuration

| SPEAKERS | CALIBRATION | EQ | INPUTS | NETWORKING | REMOTE CONTROL | SMART HOME |

Lipsync delay: 0   ms

🔘 Dirac Room Correction Active

| PAULI 5.1.2 | MEITNER 7.1.4 | FYRIS 3.0 | HENRIOT 3.0 | PASCAL 51 | SLOT 6 |

Meitner 7.1.4

| Channel	Calibration Delay	User Delay		Calibration Trim	User Trim	
Left Front	2.4 ms	0	ms	-6.4 dB	0	dB
Right Front	1.8 ms	0	ms	-6.1 dB	0	dB
Center	2.6 ms	0	ms	-10.5 dB	0	dB
Left Surround	0.9 ms	0	ms	-4.6 dB	0	dB
Right Surround	2.1 ms	0	ms	-6.1 dB	0	dB
Left Back	1.0 ms	0	ms	-13.0 dB	0	dB
Right Back	0.4 ms	0	ms	-13.1 dB	0	dB
Left Top Front	0.9 ms	0	ms	-0.8 dB	0	dB
Right Top Front	0.9 ms	0	ms	0.0 dB	0	dB
Left Top Rear	0.2 ms	0	ms	-0.7 dB	0	dB
Right Top Rear	0.0 ms	0	ms	-1.9 dB	0	dB

Manual Calibration

The system can be calibrated manually. The Dirac calibration is preferred as it is very accurate and quite simply executed. Users who are familiar with the manual calibration process are directed to the calibration page where delay and trim values can be entered. The details of a manual calibration are not covered here.

Set delay using 1 millisecond per foot.

Set trim using an SPL meter and a pink noise source from a common blue ray disk.

Adjust the Bass Manager
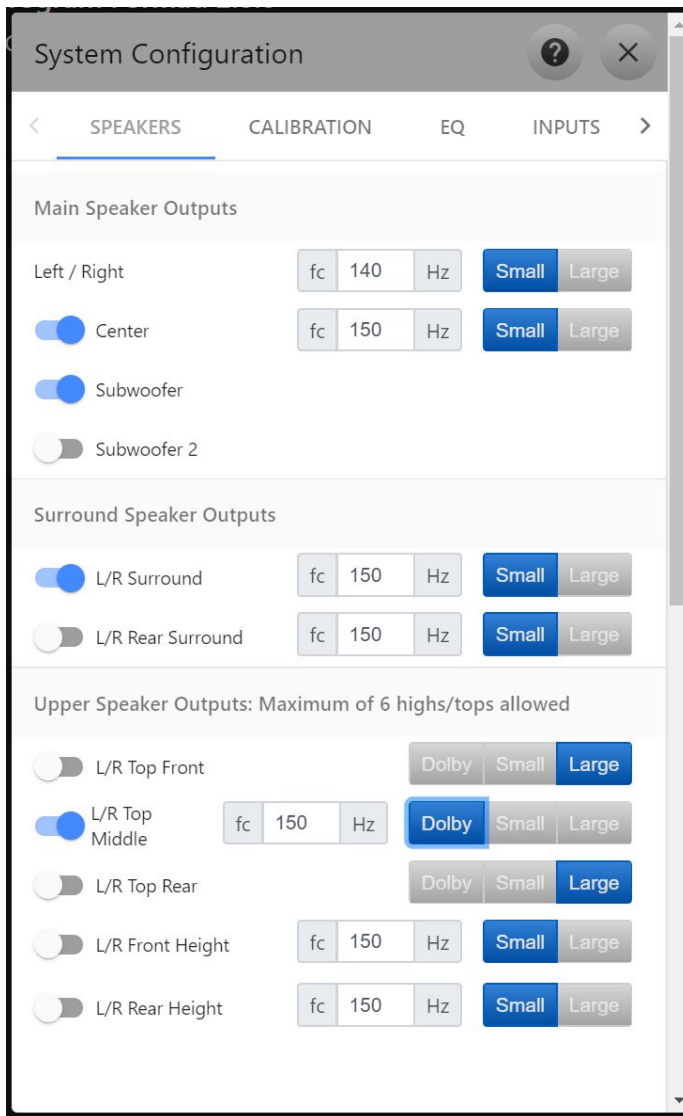
Now that your Dirac calibration shows the useful range of your speakers you can adjust the bass management cutoff frequencies. Unless you really have "large" full-range speakers, select "small" and set the cutoff frequency to something within the effective range of the speaker.

The bass management system acknowledges that many speakers cannot reproduce low frequency sound. It requires a physically large device to produce 30 Hz audio. Subwoofers are optimized for this use. Since low frequency sound is non-directional, the bass manager collects all of the low frequency energy to be reproduced by the subwoofer.

Audio systems support multiple subwoofers because low frequencies can produce standing waves in a room which causes dead spots. Using several subwoofers is a common technique to minimize this effect.

Dolby Enabled speakers point up toward the ceiling to reflect the sound down. They act as "top" speakers. Dolby enabled speakers have a cutoff frequency like small speakers.

Naming the Audio/Video Sources

The input setup page allows you to assign "human readable" names for each source. From the homepage, click on the blue Gear icon and select the "Inputs" tab. In the "Labels" column type in the name that you would like to see displayed on the front panel for a given input. You can choose to make up to nine inputs available for quick selection from the homepage. To make an input visible on the homepage select the "Visible on Home Page" toggle switch. The first nine selections will be visible on the homepage.

The "USER INPUTS" on the remote control will map to the visible inputs on the homepage. For example, for the setup shown below, the user input buttons on the remote control would be as follows:

(1) Satellite (2) Streaming Stick (3) Cable Box (4) Blu-ray (5) Game Console (6) CD Player (7) Roon
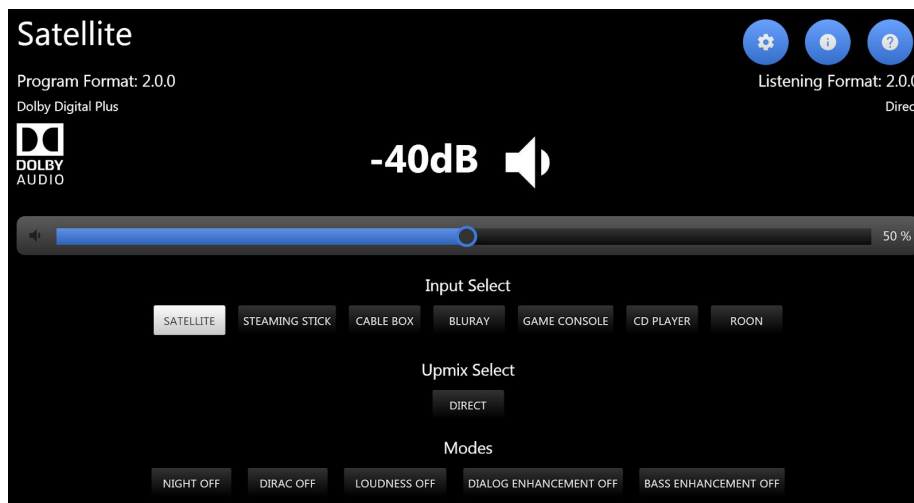
Setting up ARC/eARC and CEC

The HTP-1 supports "ARC" (Audio Return Channel) and the newer "eARC" (Enhanced Audio Return Channel). The ARC/eARC channel is used to return audio from the TV to the amplifier. The main difference between ARC and eARC is that eARC can support the transport of higher fidelity audio formats such as Dolby TrueHD and DTS-HD Master Audio. eARC can also support Dolby Digital Plus while only some ARC implementations will support this format. The CEC communications protocol (Consumer Electronic Control) is a key part of ARC while eARC is not dependent on CEC (but some TV vendors require CEC support to be enabled in the Amp (like HTP-1) in order for eARC to be used). At this time eARC is not a feature that is very common, mostly found on a TV manufacturer's higher end TV lineup (if at all).

Most system setups will include a 4k UHD TV as well as one or more 4k sources. Most "smart" TVs will have a 4k source via built-in apps such as Netflix. This is the most common reason for using an

ARC/eARC path to get audio from the TV to the HTP-1. Also, some sources will be connected directly to the TV's HDMI input presenting another reason to use ARC/eARC as the audio path to the HTP-1.

The implementation of CEC and ARC varies with TV models. Some work better than others. It's quite common to have to try a few things before settling on a CEC/ARC configuration that satisfies. The HTP-1 has a lot of options for this purpose.

Connecting HTP-1 to TV for ARC/eARC

Your TV likely has only one input that supports ARC/eARC. Be sure to connect the output of the HTP-1 marked ARC/eARC to that ARC or ARC/eARC-capable input. Failure to use this connection is the most common problem with ARC/eARC setup.

CEC Settings

CEC settings are on the Connectivity page as shown below. By default CEC should be off. The button next to the CEC label shows the current state of CEC on/off (see screen capture below).
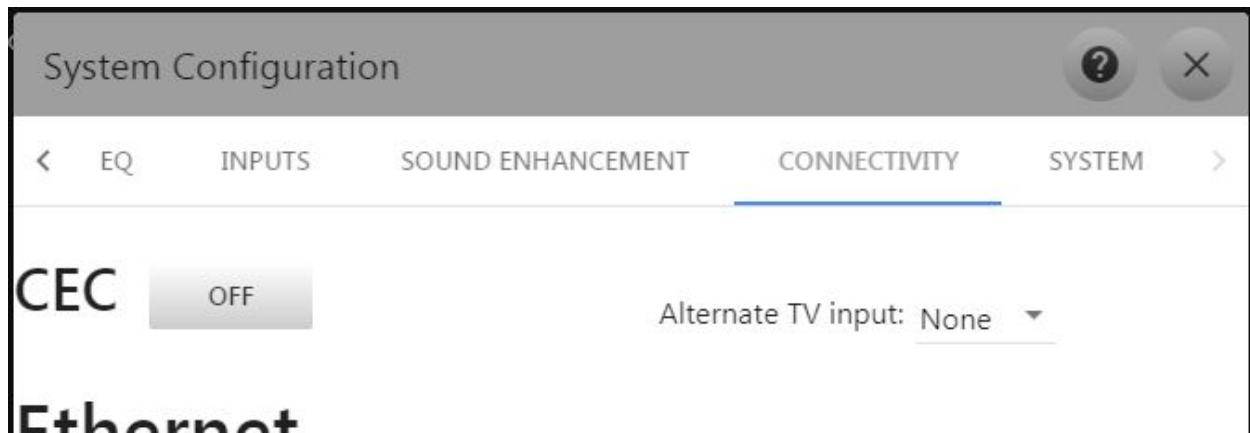
Begin by turning on CEC, press the button next to the CEC label and it should change to ON. Then a list of CEC options is shown below the button. All options should be enabled (switch set to the right, color is blue) to start with. If they are not all enabled, enable them now (see screen capture below).
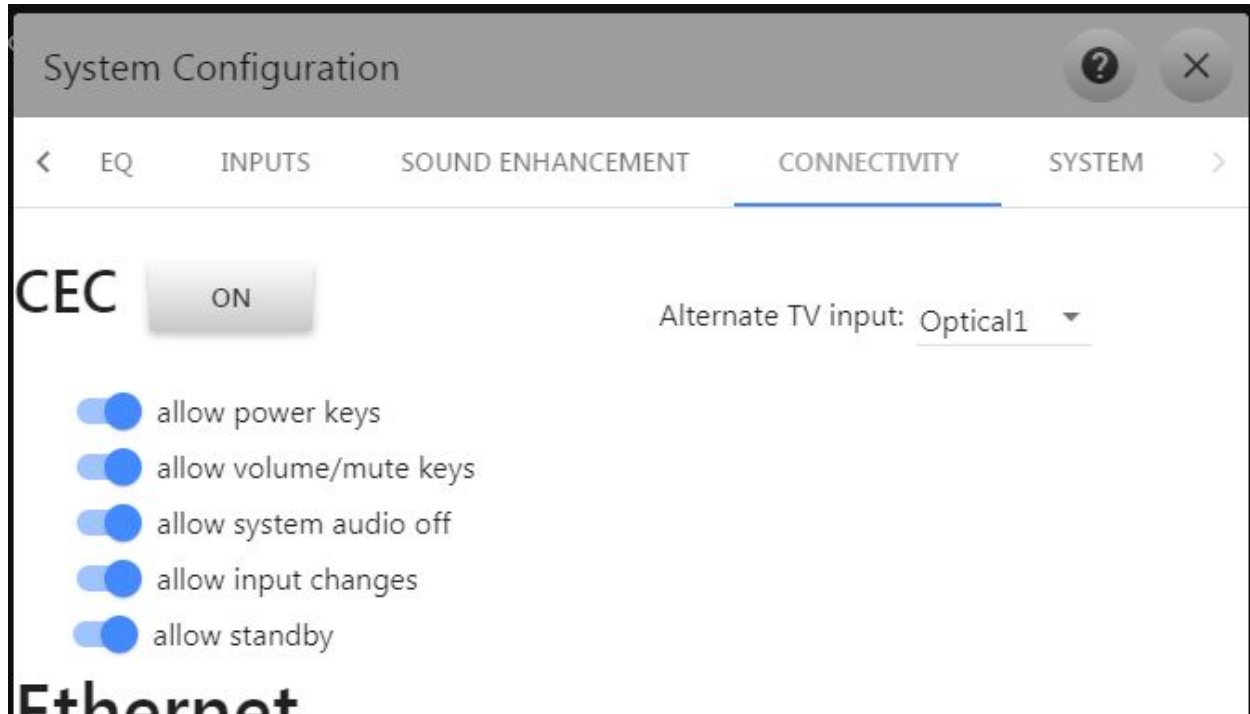
The options should remain enabled unless needed to disable specific actions of the HTP-1 in response to requests from other devices on the CEC network.

Next you must configure your TV to enable CEC and ARC (if not already enabled). These may have other names, such as "HDMI control" or… there are too many names for them all to be listed. The ARC on/off setting is often found under the Speaker or Audio settings. Many TVs will allow at least a basic selection between TV Speakers and ARC HDMI.

CEC Control Options
CEC implementations by other devices can vary enough that sometimes not all devices work well together. The various options allow you to selectively disable HTP-1 CEC controls which may help eliminate undesirable control issues. Note that disabling these controls may result in other possible side effects.

- allow power keys - Key commands involving Power (on, off, toggle) are enabled.
- allow volume/mute keys - Key commands involving Volume and Mute are enabled.
- allow system audio off - Allows HTP-1 to be commanded to the off state of System Audio (see System Audio section below).
- allow input changes - Allows the HTP-1 to follow input change requests.
- allow standby - Allows the HTP-1 to be commanded into standby mode (different from power keys).

Alternate TV Input
If your TV does not support ARC/eARC or you must connect the HTP-1 HDMI output to an HDMI TV input that does not support ARC/eARC, you may use the "Alternate TV input" pop-up menu to specify an

audio connection to the TV using one of the input ports listed in the pop-up. You may choose between any of the Analog, Coaxial or Optical inputs. Associating one of these inputs with the HTP-1 TV input allows the HTP-1 to know how to pick up audio from the TV when it receives instructions over the CEC network to do so. In the screen capture above, we have selected Optical1 as the input to be used when ARC and eARC are not available. If this alternate TV input is going to be used, be sure to connect up the proper cable from the TV audio output to the desired HTP-1 input that is selected here.

TV Audio Priority

The HTP-1 has three ways to pick up audio from the TV: eARC, ARC or the Alternate user-defined input. The priority of using these three options is: eARC, ARC, Alternate. When TV is shown as the current input on the HTP-1 home page, the actual input being used to receive audio is shown on the Info screen next to the label "TV Sound Source."

System Audio

CEC has a feature called System Audio. When System Audio is On, the Amplifier (such as HTP-1) is asked to render the audio for the system. When Off, the TV is asked to render audio for the system. The HTP-1 will always turn on System Audio when it is first powered on and attempt to determine where it should pick up audio from. If there is an "Active Source" in the system then it will configure itself to pick up audio from that device. If no active source can be discovered, it will stay on the last input used.

Most TVs have a setting to allow the user to select the audio rendering device (such as TV Speakers or Amp). When the HTP-1 (or Amp) is de-selected as the audio rendering device, the TV will send a command setting System Audio to the Off state. When the HTP-1 receives this command it will stop rendering audio and configure the HDMI board to pass through audio from its inputs to outputs. While making this transition, the video on the TV will be blanked out while the EDIDs provided by the HTP-1 are updated with the TV(s) audio capabilities so the source devices will provide audio that the TVs can render. The home page and front panel will replace their display of the HTP-1 volume setting to the message "TV Audio." Also, all HTP-1 audio settings/status will be removed from these displays.

To get back to having the HTP-1 render audio, there are three options:

- Use the TV speaker settings to select the Amplifier to render audio. This will result in the TV sending a command to the HTP-1 to turn on System Audio and informs the HTP-1 where to pick up audio from.
- On the HTP-1 home page, below the "TV Audio" message is a button that has the text "CLICK TO RETURN TO HTP-1 AUDIO." Pressing this will trigger the HTP-1 turn on System Audio.
- Selection of an audio only source, such as Coax, Optical, USB, etc. will trigger the HTP-1 to turn on System Audio.

Audio Features

The HTP-1 includes a full range of audio features. These are utilities that "make it sound better." As such their application may be a matter of taste, but they all prove useful in certain situations.

Using Surround Modes

The Monolith HTP-1 system supports a number of "surround modes." These control how the input material is mapped to the current set of speakers. A number of surround modes use proprietary algorithms to spread sound to more speakers. You are encouraged to listen to them and choose which one you like best for a given soundtrack or piece of music. While "direct", "Atmos" and "DTS-X" are by definition as the producer intended, the other modes are purely a matter of personal taste.

You are requesting a surround mode through the user interface. The requested surround mode may not be possible. The audio status shows the current sound mode on the front panel display. This is most often noticed when you request something like Auro-3D but the source is Dolby Atmos. Only the mono and stereo modes can override Atmos and DTS-X content.

The following table gives some description of each surround mode:

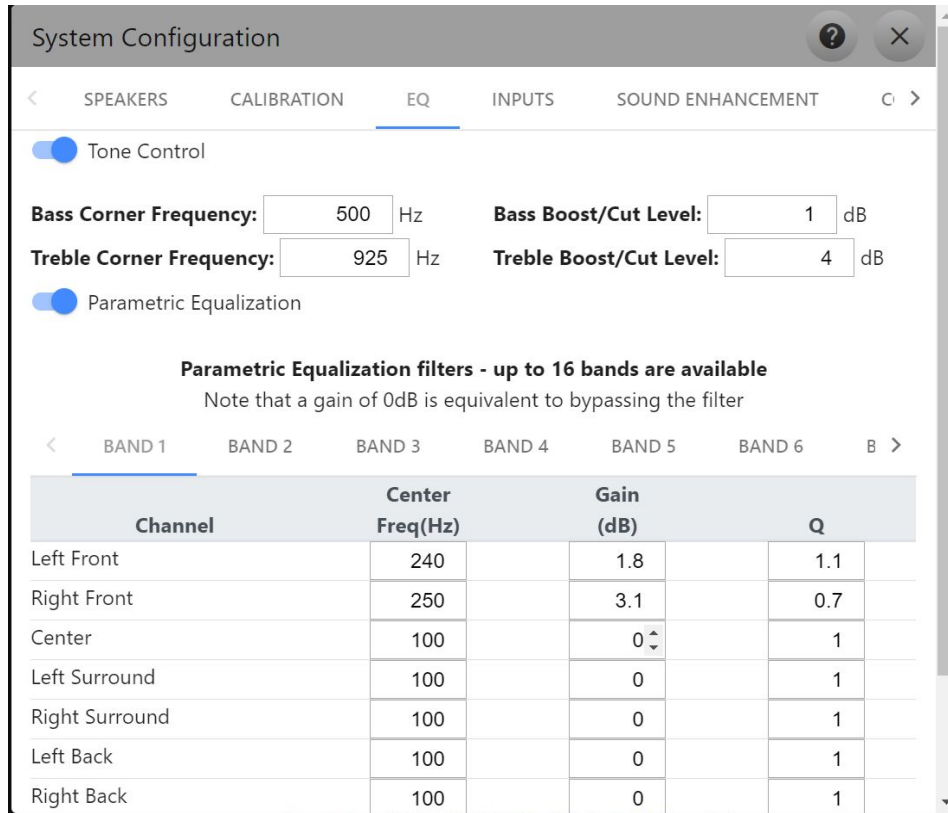| Surround Mode Name	Description
Direct	The input stream is presented without modification. This is appropriate if you have a stereo source and you want to hear it through the two front speakers only. Whether or not the subwoofer is engaged depends on the configuration of the bass management on the speaker setup page.
Dolby Atmos	A Dolby Atmos stream is presented in its native format. Proprietary surround modes cannot be applied to an Atmos stream. "mono" and "stereo" can be. This mode cannot be requested.
DTS-X	A DTS-X stream is presented in its native format. Proprietary surround modes cannot be applied to a DTS-X stream. "mono" and "stereo" can be. This mode cannot be requested.
Auro-3D	An Auro-3D encoded stream is detected and decoded. The channels present in the stream are mapped to the available speakers. See the discussion about "mapping channels to speakers," above.
Dolby Surround	Dolby's proprietary "Dolby Surround®" algorithm is applied to the input signal. Dolby Surround® is an evolution of the ProLogic® algorithms used in older systems. It uses various cues in the signal to route sound to the speaker set according to rules known only to Dolby. An obvious rule is that material common to the left and right channels is extracted and routed to the center channel. When the setup parameter for "center spread" is engaged, the center signal is also spread to the left and right channels. Dolby Surround can be applied to any signal having 8 or less channels. There is no point in applying it to signals that have more channels.
DTS Neural-X	DTS's proprietary "Neural-X®" algorithm is applied to the input signal. Neural-X® is an evolution of the Neo® algorithms used in older systems. It uses various cues in the signal to route sound to the speaker set according to rules

	known only to DTS. An obvious rule is that material common to the left and right channels is extracted and routed to the center channel. Neural-X can be applied to any signal having 8 or less channels. There is no point in applying it to signals that have more channels. The Sound Enhancement setup page allows you to enable "wide synth." When this is enabled the 12 channel/ 7.1.4 output of the DTS system is used to "synthesize" wide and "top middle" channels in a 9.1.6 mode.
Auro-Matic	Auro Technology's proprietary "Auro-Matic®" algorithm is applied to the input signal. Auro-Matic uses various cues in the signal to route sound to the speaker set according to rules known only to Auro Tech. An obvious rule is that material common to the left and right channels is extracted and routed to the center channel. The Sound Enhancement setup page allows you to set three different parameters affecting Auro-Matic. The "size" sets a sort of reverb time. The "strength" determines how much of the AuroMatic signal is mixed into the original signal. The defaults are medium and 13 (0dB). The "auro listening mode" is set automatically by your speaker layout.
Native	This is a requested mode. It will result in one of the other modes being selected. The applied surround mode depends on the input signal. Dolby signals will be processed with Dolby Surround. DTS signals will be processed with Neural-X. Auro-3D encoded signals will be decoded. PCM, Atmos and DTS-X signals will be passed through.
All channel mono	The input signal is mixed down to mono and the same mono mix is applied to all speakers.
All channel stereo	The input signal is mixed down to stereo and the same left and right channels are applied to all of the speakers on the left and right, respectively. A mono mix is routed to the center channel.

The Sound Enhancement panel of the system configuration give access to these settings.
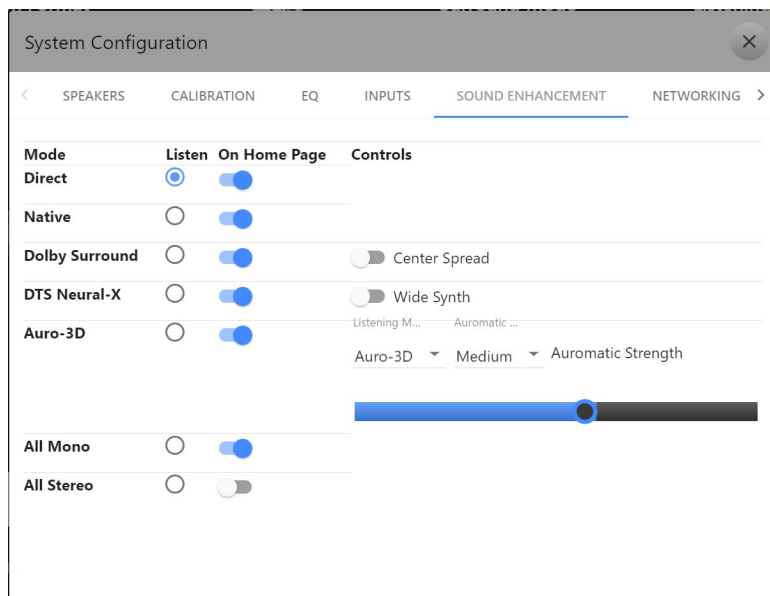
Equalization

The equalization page presents tone controls and parametric EQ. The HTP-1 includes a simple interface to these features. Up to 16 bands of parametric EQ are supported with settings per channel. This fine-grained control can be used to tune a room.

You can set the cutoff frequency of the bass and treble shelf filters as well as the gain. The following plots show the sort of adjustment achieved by the tone control..
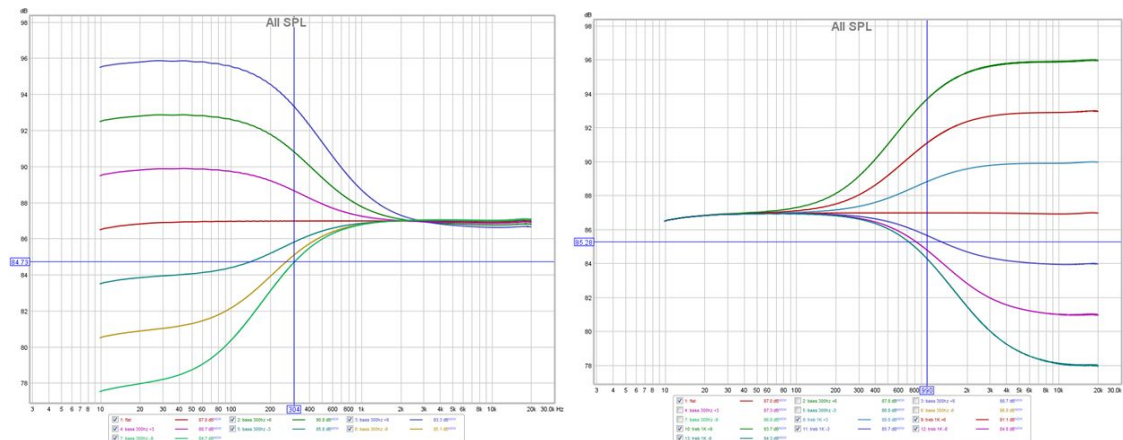
Night Mode

Action movies are notorious for wide dynamic range. At times the dialog is very quiet. At other times explosions can rock the house. Night mode is designed to reduce the difference between loud and soft, as one might wish to do if the children are sleeping. Night mode, also known as Dynamic Range Control, uses features of the Dolby and DTS coding systems. This means it has little effect on PCM streams. The subwoofer is also attenuated when night mode is engaged, regardless of the stream type.

Night mode is engaged or disengaged using one of the indicator buttons at the bottom of the homepage. There are three modes:

Night Mode Auto	This is the recommended operating mode. Dolby streams specify dynamic range parameters and auto mode means they are followed. The subwoofer is not attenuated.
Night Mode On	The Dolby and DTS decoders are configured to enable their dynamic range compression. The subwoofer is attenuated.
Night Mode Off	The Dolby and DTS decoders are configured to disable all of their dynamic range compression features giving the most contrast between loud and soft. The subwoofer is not attenuated.

Dialog Enhancement

Some users enjoy movies more if they can hear the dialog better. The DTS-X coding system includes a means to control the dialog explicitly. The DTS Dialog indicator is displayed when this feature is available. When the content does not have DTS Dialog control the dialog enhancement feature uses a simpler method. It simply adjusts the center speaker volume, as most dialog comes from the center speaker. You can adjust the dialog between 0dB (as authored) and +6dB. Some users might wish to boost the center channel further using the user trim on the calibration page.

Loudness

Human hearing is non-linear. When the volume is turned down, listeners report that the bass goes away before the midrange. This phenomenon was first described by Fletcher and Munson in the 1930's. The "equal loudness" curves have been repeatedly measured with greater sophistication and are standardized as ISO 226:2003. Wikipedia has a good article on the equal loudness contours. Older audio receivers often included a "loudness" button that simply boosted the bass. The HTP-1 uses a six pole filter carefully designed to match the equal loudness contours. It is calibrated against the volume bar so that 90% volume represents "natural" loudness. Bass boost matching the known curve is added slowly as you lower the volume. Hence there will be no effect at high volumes with more and more bass added as you lower the volume. This graph shows the frequency response at various levels:
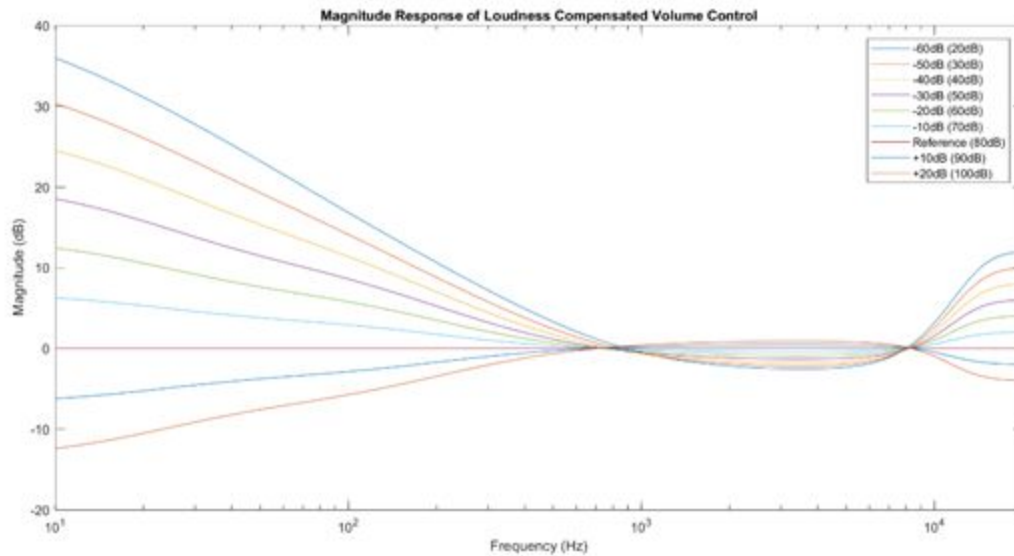
A high-pass filter is also included to avoid boosting the region below 20Hz. The relatively large bass boost applied when the volume is low means that it is often possible to hear a thump or a tick when turning the loudness on or off.

Bass Enhancement (AKA Bass Reinforcement)

The bass reinforcement feature routes the subwoofer signal not only to your sub but also to any large speakers in the system. It does nothing unless there are large speakers. The switch to enable it is found on the speaker configuration page.

For Highest Quality Audio

There are a number of guidelines that users should be aware of to achieve the highest possible audio quality.

1) Engaging any of the surround modes results in the sample rate being limited to 48kHz by a high quality sample rate convertor. Avoid the surround modes if you wish to take advantage of high sample rates.
2) The Dirac room correction filter limits the sample rate to 48kHz. Turn off Dirac filtering if you wish to take advantage of high sample rates.
3) Ensure that the amplifier sensitivity (max volume) on the calibration page is set correctly. The best dynamic range (SNR) will be achieved when the output is set to match the amplifier and the HTP-1 volume is at maximum for the amplifier. The HTP-1 uses a high quality analog volume control. It also reserves some of its digital dynamic range using a small amount of digital attenuation. This digital attenuation (and hence your headroom) is at a minimum when the volume is at its maximum level as set on the calibration page. Remember that if there is no headroom, then adding gain in equalizers (Dirac, PEQ, tone) and trim controls can result in clipping.

Connectivity

The wired ethernet address of the HTP-1 is displayed in the lower left corner of the front panel display. You can type this into the address bar of a browser and access the web interface. The system has been tested and worked well with Chrome, Firefox, and Safari. Edge has shown some problems.

Using WiFi

After you have set up a wired Ethernet connection following the steps above, you can switch over to wireless connection. Make sure that the antenna that came with the unit is fastened to the gold antenna connector on the back of the unit. Power up the unit. After it boots note the IP address listed on the front panel display. On a laptop, tablet, or PC navigate to the HTP-1 IP address by entering it into your browser's address field. On the HTP-1 homepage, select the blue gear icon to pull up the setup tabs. Navigate to the 'Connectivity' tab and select the 'Enable Wi-Fi' toggle switch. Enter in the network name and password or scan for networks, select the network and enter the password. Once you have joined the WiFi network you can unplug the wired connection and use the WiFi IP address to access the HTP-1 homepage.

You must press the the "Apply Network Settings" button for these changes to take effect.

When you change from DHCP to static address the machine will have two IP addresses until you reboot. This makes it so your connection doesn't drop when it changes, but it's confusing.

BlueTooth

HPT-1 can function as a BlueTooth receiver. Go to the input setup page and ensure that the device is discoverable.
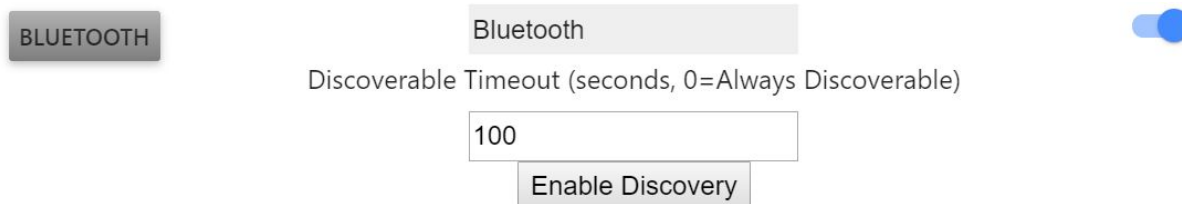
Click "Enable Discovery." Now your phone should be able to see HTP-1 and pair. The typical pairing dialog comes up. If you are pairing your phone with HTP-1 and at the same time using the phone's web browser to control HTP-1 you'll find that switching back and forth clears the pairing dialog and aborts pairing. Try it again and accept the pairing dialog as soon as you see it.

Video Features

The video system of the HTP-1 supports HDMI 2.0 and HDCP 2.3 on all ports. It is the job of the HDMI "repeater" inside of the HTP-1 to pass video according to the rules of HDMI while extracting the audio for local decoding. It has two HDMI output ports that output the same content, so the current HDMI input video content is sent to both output ports. During normal operation, audio is extracted and not passed through. Selecting a non-video input (audio-only input) will leave the current HDMI input selected to continue to pass video but the HTP-1 will render audio from the selected audio source.

At system startup (cold start, not the quick start), there will be no video passed through the HTP-1 until the HTP-1 control system is up and running.

The current video status can be found on the Info screen (blue circle i) next to the label "video status:." Optionally, the video status can be displayed on the bottom of the Home page by enabling its display from the System settings page. Just check the box next to "Display Video Status on Home Page:."

UHD Support

By default, all HDMI inputs have Ultra High Definition (UHD) support enabled. There are some legacy (older) devices that may have problems with the HTP-1 indicating support for UHD. A problematic source device might be identified by seeing discolored video on the TV all the time, horrible looking video on the TV all the time, never getting audio from the source all the time, etc. On the Inputs settings web page there is a switch setting for every HDMI input titled "UHD Capable." Setting a switch to the off position will remove information from the EDID that can cause problems for these legacy devices. In technical terms, the HDMI Forum Vendor Specific Data Block is removed along with video timing formats defined in HDMI 2.0 that are found in the Short Video Descriptor block.

This change in the EDID takes effect immediately upon changing the setting on the Inputs page. There will be a momentary disruption in the video passing to the TV while the EDIDs are being reconfigured.

EDID Management

The HTP-1 will read and parse the downstream EDIDs and populate an internal data structure with the capabilities of each display device connected to the 2 output ports. It then creates a combined EDID from this data to present to upstream devices (devices connected to the HDMI inputs). The EDIDs are created with a logical AND approach, meaning that both downstream devices must support a capability in order for that capability to be enabled in the upstream EDID.

At startup of the HTP-1 (cold start, not the quick start), the EDIDs will not be made available to the upstream devices until the control system is up and running and can load the audio descriptors with the correct audio support. After this is completed, the EDID will be presented to the upstream devices.

Turning off a downstream device will NOT result in its EDID capabilities being removed from the "combined" EDID that is created and presented to upstream devices. In order for HTP-1 to "forget" an

output port EDID, the HDMI cable must be disconnected from the output port and the HTP-1 power cycled (full power cycle, not the quick start).

Dolby Vision

Dolby Vision® is the one exception to the AND rule for capabilities found in the downstream EDIDs. The Dolby Vision descriptor found in the EDID of the downstream device connected to Output 1 is the only Dolby Vision descriptor that will be used and provided in the upstream EDID. If only one downstream device supports Dolby Vision, it must be connected to HTP-1 Output port 1 to have Dolby Vision recognized.

When Dolby Vision content is received, the EDID of the downstream device connected to Output 2 will be examined for Dolby Vision support. If supported, Dolby Vision will be allowed to pass to this output. If not supported, the output port will be disabled. When Dolby Vision content is no longer being received, it may take up to 10-12 seconds for this output to be enabled again--the HTP-1 is making sure that Dolby Vision content really has stopped before re-enabling the output port.

Triggers

Triggers are typically used to cause the amplifiers to turn on when the HTP-1 turns on. The HTP-1 has four 3.5mm trigger out jacks to drive up to four amplifiers. The HTP-1 also has one trigger input that can be used to turn on the HTP-1.

The trigger input is designed to turn on the HTP-1. Applying 12V to the trigger in will cause HTP-1 to turn on. If you use the trigger input you should not use the remote or the front panel to turn the unit on or off as the trigger input takes precedence.

The trigger outputs can source 50mA at 12V. They are enabled when the HTP-1 is turned on. The trigger outputs are over-current protected by a thermistor.

Using Roon

The HTP-1 directly supports Roon. It is a "Roon Ready" device. Roon provides a music service designed to support a locally stored archive of music which includes high quality formats like 96kHz-24 bit and 192kHz. Roon is a service that you must subscribe to. The HTP-1 takes the role of an output device in your Roon system. You can play stereo audio through Roon.

Please refer to the release notes found in the help section of the web server for the latest information about the status of Roon.

When you have a Roon subscription, there is a device known as a Roon Server in the system. This can be a program on your PC. The Roon Server knows where your music is. There must also be a device that can navigate your music collection and press the play button. The HTP-1 does not perform this role. The Roon program on a PC can take on this role. The Roon app on your phone can also take on this role.

With your Roon controller ready, select the Roon input on the HTP-1. With the Roon input selected, the Roon audio is routed through the HTP-1. You can enable upmixing as you desire, or enjoy the pure 192k sample rate (as available) if preferred.

Firmware Upgrades

The Monolith HTP-1 software may see periodic improvements and it is easy to install an update from the network when one becomes available. Click on the "Info" button in the lower left of the homepage to access the update page. The Info icon on the homepage, and the Gear icon on the front panel, will turn yellow when there is an update available.
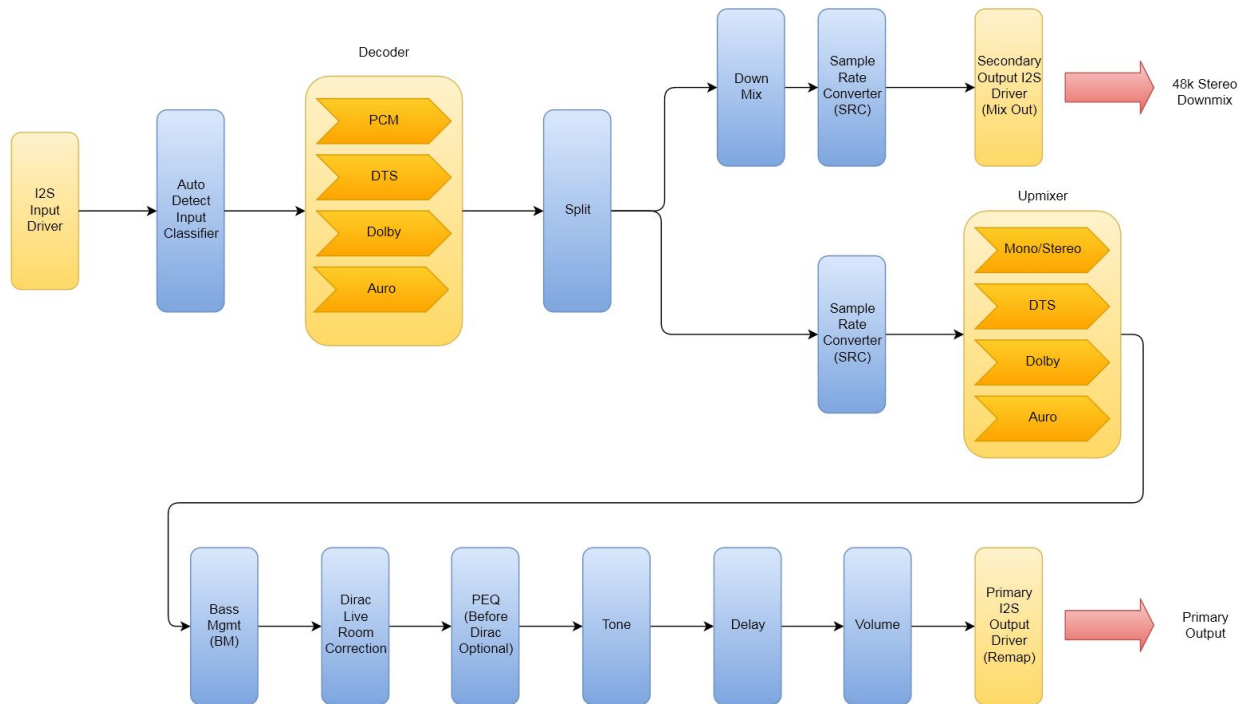

Selecting "Update the system" will start the sequence. The web interface will show you the progress of the update. The unit will reboot at the end of the process but user settings are preserved.

Specifications

Forthcoming

Signal Processing Flow

This diagram gives a rough idea of the signal flow inside of the HTP-1.

IR Code Table

The tables below illustrate the entire set of supported IR codes. The HTP-1 accepts NEC format remote codes at address 0x36C9. The first table lists the codes sent by the remote.

Function	NEC Code	Function	NEC Code	Function	NEC Code
Power Toggle	02fd	User Input 1	609f	Red	51ae
Vol Down	09f6	User Input 2	619e	Green	52ad
Mute Toggle	0af5	User Input 3	629d	Yellow	53ac
Vol Up	0bf4	User Input 4	639c	Blue	54ab
Mode None	1be4	User Input 5	649b	A	55aa
Mode Dolby Sur	1ce3	User Input 6	659a	B	56a9
Mode Neural-X	1de2	User Input 7	6699	C	57a8
Mode Native	1ee1	User Input 8	6798	D	58a7
Mode Auro	1fe0	User Input 9	6897	Preset 1	03fc
Night Toggle	40bf	Last Input	44bb	Preset 2	04fb
Dialog Up	41be	BT Pair	59a6	Preset 3	05fa
Dialog Down	42bd	HDMI+	4db2	Preset 4	06f9
Dirac Toggle	47b8	SPDIF+	4eb1	Info	43bc
BT Pair	59a6	Analog+	4fb0	Dim	45ba
Loudness Toggle	5aa5	Stream+	50af		

Note that only the Volume Up and Down keys support the standard NEC repeat code for repeating these keys. All other keys do not support key repeat.

The second table lists other codes recognized by the HTP-1.

Function	NEC Code	Function	NEC Code	Function	NEC Code
Power Off	25da	TV Input	0ef1	In Analog 1	27d8
Power On	26d9	In HDMI 1	0ff0	In Analog 2	28d7
Mute On	4bb4	In HDMI 2	10ef	In Optical 1	29d6
Mute Off	4cb3	In HDMI 3	11ee	In Optical 2	2ad5
Loud On	3ac5	In HDMI 4	12ed	In Optical 3	49b6
Loud Off	3bc4	In HDMI 5	13ec	In Coaxial 1	2bd4
Night On	3cc3	In HDMI 6	14eb	In Coaxial 2	2cd3
Night Off	3dc2	In HDMI 7	15ea	In Coaxial 3	48b7
Dirac On	3ec1	In HDMI 8	17e8	In Roon	4ab5
Dirac Off	3fc0			In Bluetooth	46b9
				In USB	2dd2
				In AES	5ba4

Revision History

v0.1:   Initial version provided from the help menu.

v0.4:   Second version provided from the help menu.

v0.5   Beta release for review.

Important Information

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