



Dolby Professional Reference Decoder DP580

User's guide

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1 Introduction to the Dolby Professional Reference Decoder DP580 documentation

This documentation provides functionality, installation, and operational information about the Dolby Professional Reference Decoder DP580.

- [Using this information](#)
- [Speaker name abbreviations](#)
- [Questions and feedback](#)

1.1 Using this information

The structure of this document emphasizes user goals and access to the information required to achieve them.

Use this list to locate specific information about the functionality of the Dolby Professional Reference Decoder DP580:

- *Overview of the Dolby Professional Reference Decoder DP580* summarizes the supported containers, content, and available tools for the unit.
- *Installation of the Dolby Professional Reference Decoder DP580* covers the installation process for the unit.
- *Dolby Professional Reference Decoder DP580 operations* covers the most important decoder functions of the unit, and provides instructions for completing associated tasks.
- *Dolby Professional Reference Decoder DP580 administration* covers the administrative control functions.
- *Event and system logs* covers the types and uses of available unit logs.

1.2 Speaker name abbreviations

Speaker names used for DP580 output include height speakers.

This table lists the names of speakers that receive output, as well as their abbreviations. In some outputs, the speaker abbreviations occur individually; in other outputs, the abbreviations occur in pairs.

Table 1: Speaker abbreviations

Speaker name	Abbreviation
Left	L
Right	R
Center	C
Low-Frequency Effects	LFE
Left surround	Ls
Right surround	Rs
Left rear surround	Lrs
Right rear surround	Rrs

Table 1: Speaker abbreviations (continued)

Speaker name	Abbreviation
Left top front	Ltf
Right top front	Rtf
Left top middle	Ltm
Right top middle	Rtm
Left top rear	Ltr
Right top rear	Rtr

1.3 Questions and feedback

Support services are available to address any questions about this hardware product.

For any questions regarding the described technology, contact broadcastsupport@dolby.com.

If you have comments or feedback about this documentation, send us an email at documentation@dolby.com.

2 Overview of the Dolby Professional Reference Decoder DP580

Use the DP580 to decode and monitor Dolby audio content in a broadcast environment, including pass-through of Dolby Digital or Dolby Digital Plus on an HDMI input. The DP580 supports Dolby technologies such as Dolby AC-4 and Dolby Digital Plus with Dolby Atmos content that are used to deliver personalized or immersive experiences at low bit rates.

- [Supported Dolby technologies](#)
- [New features](#)
- [Bill of materials](#)
- [DP580 front panel](#)
- [DP580 rear panel](#)
- [Specifications and requirements](#)

2.1 Supported Dolby technologies

The Dolby Professional Reference Decoder DP580 supports the Dolby technologies listed here. These technologies work in different combinations with one another to produce specific broadcast audio experiences. All Dolby codecs are designed for broadcast bit-rate efficiency and loudness management, and several offer immersive sound experience.

For immersive sound:

Dolby AC-4

The latest Dolby codec, which can provide enhanced audio with loudness management at 50-percent-lower bit rates than Dolby Digital Plus in broadcast environments, as well as immersive 5.1.2-channel output.

The DP580 is especially useful for confidence monitoring, checking and displaying metadata, and rendering to a given speaker configuration.

Dolby Digital Plus with Dolby Atmos content

A new version of the Dolby Digital Plus multichannel surround technology.

Dolby ED2

The latest iteration of the Dolby broadcast contribution format.

For home theater experience:

Dolby Digital Plus

The advanced Dolby 7.1-channel surround-sound codec.

Dolby Digital

The original Dolby 5.1-channel surround-sound codec.

Dolby E

The original Dolby broadcast contribution format.

Dolby TrueHD

The fully lossless 7.1-channel home theater format for Blu-ray Disc playback.

Dolby MAT

The Dolby TrueHD transmission format often used in PCM with metadata workflows.

2.1.1 Dolby AC-4 features

The key aspects of Dolby AC-4 highlight the improvements and expanded user experiences that the product brings to the broadcast environment. The list provided here does not cover all aspects of Dolby AC-4. For a complete description, refer to the respective specifications (ETSI TS 103 190-1 for channel-based audio and ETSI TS 103 190-2 for immersive and personalized audio).

Summary of Dolby AC-4 features:

- Improved compression efficiency

Compared to Dolby Digital and Dolby Digital Plus, Dolby AC-4 provides significantly better compression efficiency and better audio quality at a fixed bit rate or the same audio quality at a lower bit rate.

Dolby AC-4 provides the same industry-standard, multichannel 5.1 audio quality as Dolby Digital Plus at half the data rate, which means multichannel audio can be encoded using 96 kbps.

- Support for Dolby Atmos content

Provides tools to process the newest generation of object-based audio content.

- Personalization

Provides tools for users to personalize their listening experience.

- Built-in, metadata-based multichannel and multiband dynamic range and loudness control as well as integrated postprocessing

Advanced dynamic range compression is known from Dolby Digital and Dolby Digital Plus. Dolby AC-4 improves the audio quality further by using multiband and multichannel compression algorithms compared to the original method, which used a single wideband gain factor for all channels.

Dolby AC-4 dynamic range control supports the transmission of user-selectable dynamic compression parametric curves and compression gains for more flexibility and wider support.

- Support for the newest generation of consumer playback devices to adapt the content to specific listening environments and playback scenarios such as:

- Audio/video receiver and home theater
- Portable/mobile speakers
- Portable/mobile headphones
- Flat-panel TV

- Advanced dialogue enhancement

Provides a better experience to users with hearing impairments.

- Built-in audio/video (A/V) frame alignment

Dolby AC-4 supports frame sizes that enable alignment of audio frames with most popular video frame sizes. This feature can be used to circumvent one of the common sources for A/V synchronization problems (also referred to as digital turnaround).

- Excellent audio quality for legacy content configurations
- Integrated headphone virtualization and support for immersive stereo decoding
- Speaker virtualized output
- Immersive (5.1.2) channel-based output

2.1.2 Dolby Atmos

Dolby Atmos is an object-based audio technology for creating and reproducing spatial audio. The Dolby Atmos platform encompasses products, services, and technologies and includes authoring, distribution, and playback tools for both linear and nonlinear content.

Rather than require a content creator to downmix the individual elements (objects) of an audio scene to a fixed number of output channels prior to transmission and rendering, individual audio objects can be preserved, transmitted, and rendered individually. Key features of Dolby Atmos include:

- Object-based audio metadata encoded in the audio bitstream
- Three-dimensional audio rendering
- Device-independent audio bitstreams that can be faithfully rendered by any Dolby Atmos playback device
- A flexible rendering engine for Dolby Atmos playback devices that supports a wide range of loudspeaker layouts and room characteristics
- New speaker positions and designs

Dolby Atmos supports dynamic objects as well as traditional channel-based audio. Dynamic objects are used for discrete sound elements that can be precisely placed and moved through the playback environment, such as a helicopter that flies over the audience. Channel-based audio is often used for static ambient sounds, such as the music portion of a soundtrack. A typical Dolby Atmos soundtrack is a combination of dynamic objects and bed objects (channels) collectively referred to as object-based audio.

2.1.3 Dolby Digital Plus features

Dolby Digital Plus introduces a number of enhancements to Dolby Digital, including support for a wider range of data rates, increased channel count, multiple-program support, and additional tools for representing compressed data and eliminating artifacts. Dolby Digital Plus is backward compatible with Dolby Digital.

Dolby Digital Plus includes these features:

High data rate

Supports a maximum data rate of 6,144 kbps.

Uses a variable frame duration (one, two, three, or six audio blocks per frame) to accommodate high data rates.

Scalable bitstream structure

A flexible structure of multiple independent and dependent substreams supports additional programs and additional channels.

Multichannel support

Supports up to 7.1.4 channels in a single program and up to two independent Low-Frequency Effects (LFE) channels.

Multiple audio programs

A single bitstream can contain up to eight audio programs.

Mixing metadata

A bitstream can carry mixing metadata for receiver mixing of two streams (for example, to support service).

Encoding tool and conversion metadata

A bitstream contains metadata generated by coding tools as well as metadata values that enable a decoder to convert a Dolby Digital Plus bitstream to Dolby Digital without fully decoding it.

Multiple downmix options

A bitstream can carry downmix coefficients for stereo, Dolby Surround compatible, and Dolby Pro Logic II compatible downmixes.

2.1.4 Dolby Digital features

Because Dolby Digital Plus is built on Dolby Digital, they share a number of features.

These Dolby Digital features are also part of Dolby Digital Plus:

Dialogue normalization

Dialogue normalization is the process of aligning the average dialogue level of different programs to a consistent level (the dialogue reference level) so that a consumer does not have to constantly adjust the volume control of the playback system as programs change.

Dynamic range control

Dynamic range control compresses the dynamic range of a program by reducing (cutting) the level of the loudest sounds and increasing (boosting) the level of the quietest sounds to adjust the sound to the listening situation.

Audio production information

Audio production information is additional information about the audio production environment, such as the mixing level, recording room type, and copyright information.

Dolby Digital also supports two types of two-channel downmix: Dolby Surround compatible (Lt/Rt) and stereo (Lo/Ro). In Dolby Digital decoders, when 2.0 output is selected and LFE output is disabled, the LFE channel content is not reproduced.

2.1.5 Dolby ED2 features

Dolby ED2 extends Dolby E in many dimensions. The expanded capabilities enable greater broadcast flexibility and better end-user experiences.

Dolby ED2 includes these features:

Greater number of AES3 stereo pairs

The maximum number of pairs is increased from two to four.

Greater number of audio elements (channels or objects)

The maximum number of elements is increased from 8 to 16.

Different use for program configurations

Dolby E provides 24 channel-based configurations, whereas Dolby ED2 configurations are restricted for personalized and immersive use cases.

Dolby E and Dolby AC-3 metadata parity

Metadata for both the contribution format and the codec remain accessible.

2.2 New features

This release of the Dolby Professional Reference Decoder DP580 adds new functionality included with the latest Dolby codecs and contribution formats. Later releases may carry additional functionality for broadcast environments.

The Dolby Professional Reference Decoder DP580 includes these new features:

- Dolby AC-4 decoding on IP, serial digital interface (SDI), and Audio Engineering Society (AES) inputs
- Selection of language presentation (Dolby AC-4)
- Dynamic range control (Dolby AC-4)
- Dialogue enhancement (Dolby AC-4)
- Dolby Digital Plus with Dolby Atmos content decoding on IP, SDI, AES, and HDMI inputs
- Dolby ED2 decoding on SDI inputs
- Monitoring of each presentation from a Dolby ED2 or Dolby Digital Plus with Dolby Atmos content bitstream using the SDI, AES, or analog outputs

2.3 Bill of materials

These items are included in the box for the DP580.

- One Dolby Professional Reference Decoder DP580 unit
- One power cable
- Safety and regulatory guidelines
- Warranty information
- The *Dolby Professional Reference Decoder DP580 User's guide* (this document)

2.4 DP580 front panel

The front-panel components of the DP580 provide control and informational functions.

The DP580 front panel includes the components shown in this image.

Figure 1: DP580 front panel



1: Input LED

- Green indicates that there is a lock on an incoming audio signal.
- Red indicates that there is no lock on an incoming audio signal.
- Off indicates that no input is selected.

2: Audio LED

- Green indicates that audio data is detected on the input.
- Red for five seconds indicates that there are cyclic redundancy check (CRC) or Pa errors detected.
- Off indicates that no data is detected on the input.

3: Video LED

- Green indicates that the unit recognizes SDI, IP, or HDMI as the video format on the input.

- Red for five seconds indicates a video decoder error.
- Off indicates that the unit is acquiring an output lock or that the unit is receiving audio only.

4: Error LED

Red for five seconds indicates an audio or video decoding error. This parallels the behavior of the matching LEDs on the panel. Check the event logs for specific information.

5: User-control screen

Depending on the source, shows different combinations of information, which can include:

- Command interface IP addresses
- Media interface IP addresses
- Master volume
- Source bitstream
- Program number and packet identifier (PID)
- Codec in use
- Channel pair being monitored
- Channel configuration and bit or frame rate

6: Navigation keys

Used in configuring the DP580 ports and controlling the front-panel user interface (UI) loudness display. See *Configuring the command port*.

7: Volume control knob (limited functionality)

This control and the master volume control in the decoder UI are currently in use only for volume control of headphones. See *Configuring DP580 output*.

8: Headphone jack

Available for headphone monitoring of the audio output separately from other speakers.

9: Dim button (nonfunctional)

This button is not currently functional.

10: Over-temperature indicator

Indicates that the unit temperature is higher than the recommended range for safe operation. If the indicator turns red, ensure that the unit front and rear air vents are not blocked, and that the ambient room temperature is not excessive.

11: Reset button

Reboots the unit when it is unresponsive, or following a software upgrade.

12: Power button

Powers up the unit at the end of the initial installation, and thereafter for continued use.

13: Two Universal Serial Bus (USB) ports

Used to load a software upgrade image.

Related information

[Checking event logs](#)

[Configuring the command port](#) on page 15

[Configuring DP580 output](#) on page 25

2.5 DP580 rear panel

The rear panel of the DP580 presents connectors, inputs, and outputs.

The DP580 rear panel includes the components shown in this image.

Figure 2: DP580 rear panel



1: AC power connector

Connects to the AC power cord provided with the unit.

2: AES input port

Receives PCM, Dolby Digital Plus with Dolby Atmos content, Dolby E, and Dolby ED2 signals. The system recognizes each signal type and processes the signal appropriately. This input is an unbalanced 75Ω female high-density BNC connector per AES3-4-2009.

3: Four AES output ports

Outputs PCM audio streams through four unbalanced, 75Ω female high-density BNC connectors. Signal levels per AES3-4-2009.

4: Multichannel analog output port

Requires a male 25-pin D-connector that is compliant to the TASCAM pinout standard.

5: Two USB ports

Inputs for external data resources.

6: Command port (Gigabit Ethernet)

Connects a network to administer the unit through a PC web-based user interface.

7: Media port (Gigabit Ethernet)

Connects a network to receive transport streams over User Datagram Protocol (UDP) and Real-time Transport Protocol (RTP).

8: SDI input port

Supports embedded audio/video and coded audio streams via SD-SDI (SMPTE 259M-2008), 1.5 Gbps HD-SDI (SMPTE 292M-2012), or 3 Gbps HD-SDI (SMPTE 424M-2012).

9: SDI output port

Outputs PCM and video in one of eight embedded channel pairs.

10: HDMI input port

Receives uncompressed video, and uncompressed or compressed audio.

11: HDMI output port

Sends uncompressed video, and uncompressed or compressed audio.

2.6 Specifications and requirements

Familiarity with the dimensions, environmental specifications, and power requirements of the DP580 promotes better operational success. We recommend that you review this information prior to first use of the component.

2.6.1 Dimensions

These are the physical dimensions of the DP580.

- Height: 44 mm (1.75 in)
- Width: 483 mm (19 in)
- Depth: 394 mm (15.5 in)
- Weight: 6.5 kg (14.5 lb)

2.6.2 Environmental specifications

These are the temperature and humidity operating ranges for the DP580.

The DP580:

- Operates at temperatures between 10° and 35°C
- Supports operation with relative noncondensing humidity levels between 5% and 90%

2.6.3 Power requirements

These are the DP580 power minimums and maximums.

The DP580 operates with a power input of between 100 and 240 VAC, 50–60 Hz, and 350 W.

3 Getting started

The installation procedures let you prepare the DP580 unit for usage.

- [Installation sequence](#)
- [Installing the hardware](#)
- [Network configuration](#)
- [Starting up or rebooting the system](#)
- [Upgrading the system software](#)
- [Configuring NTP](#)
- [Setting the system clock](#)

3.1 Installation sequence

Installing the DP580 requires that you complete these tasks.

1. Mount the DP580 in a rack to secure it in place.
2. Connect the power cable.
3. Connect the signal cables to inputs and outputs to ensure bitstream transmission.
4. Connect the network cables.
5. Start up the system.
6. Configure the network ports.

3.2 Installing the hardware

Install the DP580 unit using the components included with it, plus any other equipment you require for your intended use.

Procedure

1. Mount the DP580 unit in a rack that is at least 400 mm (16 in) deep.
 **Caution:** To ensure proper ventilation, do not block the front-panel ventilation area on the top surface at the front of the machine.
2. Connect the provided power cable to the AC connector.
3. Connect your audio and video inputs and outputs.
4. Connect an Ethernet cable from your network to the **Command** port.

3.3 Network configuration

You can set either a static IP address or use an automatic IP assignment using the Dynamic Host Configuration Protocol (DHCP) server.

3.3.1 Configuring the command port

The Command port connects the DP580 to a Gigabit Ethernet network.

About this task

Default factory settings configure the port to acquire an IP address via DHCP. Alternatively, you can configure a static IP address.

Procedure

1. Press the escape key in the front-panel navigation key set.
The DP580 menu is displayed.
2. Press the enter key three times to display the **IP Settings** menu.
Two options are displayed: **Command Interface** and **Media Interface**.
3. Press the right arrow to display the **Network Mode** menu for the **Command Interface**.
4. Press the right arrow to display **Static** or **DHCP**, depending on the network.
5. Press the down arrow to select **Apply**, and then press enter.
The selection corresponding to your choice is displayed.
6. Press the down arrow to select **Static IP Settings**, and then press enter to activate the corresponding field.
7. Use the arrow keys to enter a static IP address, and then press enter.
8. Press the down arrow again to select **Apply**, and then press enter.
The IP address is saved, and the **Command Interface** menu is displayed again.
9. Repeat steps 6 on page 16 through 8 on page 16 for the **Netmask** and **Gateway** settings.
10. At the **Command Interface** menu, press the down arrow to select **Host Name**, and then press enter.
The **Host Name** menu is displayed.
11. Press enter to activate the **Host Name** field.
12. Use the arrow keys to enter a host name.
13. Press the down arrow to select **Apply**, and then press enter.

3.3.2 Modifying network settings

The network settings specify the DP580 command IP configuration. If you need to change the settings at any time, you can do so using the **System** menu.

Procedure

1. In the **System** menu, select **Network**.
2. Check the **Network Interface Status** panel for current settings.
3. In the **Network Interface Configuration** panel, change the **Command** configuration settings as necessary.

3.4 Starting up or rebooting the system

You can start up or reboot the DP580 using the designated buttons or UI control.

About this task

Make sure that the system connections are complete before starting up.

- To start up the system, press and release the power button.
The unit starts up in approximately one minute, and when the boot process is complete, the front-panel screen displays information about the input source and mode.

- To reboot the system at any time, press the reset button on the front panel of the unit or, in the web client graphical user interface (GUI), select **System > Admin > Reboot**, and then click **Reboot**.

3.5 Upgrading the system software

Use the .dlb file to install the new software version on the DP580 unit.

Prerequisites

The upgrade procedure clears the event log, therefore we recommend saving it on your hard drive before you start the upgrade.

About this task

Do not reboot or remove power to the DP580 while upgrading.

Procedure

1. Obtain the upgrade .dlb file from Dolby Laboratories, and then copy it to your hard drive.
2. On the web UI, under **System** on the navigation bar, select **Admin**.
3. Click **Browse** to locate the upgrade file on your hard drive.
4. Click **Upload** to upload the file to the DP580.
5. When the file upload completes, click **Upgrade**.
6. When you see the message **Upgrade Completed. Please Press Reboot.**, click the **Reboot** button.

3.6 Configuring NTP

Configure the Network Time Protocol (NTP) to ensure that the unit can access the time synchronization server and, if available, a backup server.

Procedure

1. In the **System** menu, select **Administration**.
2. In the **NTP Configuration** panel:
 - a) Check the **Enable NTP** box.
 - b) Enter the IP address or name of the NTP server.
 - c) If available, enter the IP address or name of the NTP backup server.
 - d) If you are satisfied with your entries, click **Apply**. If you make an error in the address or name, correct the error or click **Discard** to delete all entries and start over.

3.7 Setting the system clock

Set your system clock to the local date and time to ensure that the unit reflects the correct time frame for operations and logs.

About this task

The unit may or may not be correctly set for your locality. This procedure ensures that the setup is complete and correct for time stamps.

Procedure

1. Under the **System** menu, click **Administration** and then scroll to the **System clock** panel.
2. Check the **Current Date/Time** setting:
 - If it does not reflect the exact local date and time, proceed to the next step.
 - If the date and time are correct, installation and setup are complete and you can proceed to other operations.
3. In the **Time Zone** field, click the drop-down menu, select a description for the time zone that includes your locality, and then click the **Set Time Zone** button.
4. In the **Date/Time** field:
 - a) Click in the first (date) field, and then select the current date from the calendar that is displayed.

You can move the calendar back and forth to other months or years by clicking the double-carat symbols to the right or left of the year and month displayed.
 - b) Click in the second (hour) field, and then select the current hour from the drop-down list of times. The times are based on a 24-hour clock.
 - c) Click in the last (minute) field, select the current minute from the drop-down list, and then click the **Set Date/Time** button.

4 Dolby Professional Reference Decoder DP580 operations

Use the Dolby Professional Reference Decoder DP580 to monitor inputs, and to configure decoding and output.

- [DP580 display bar](#)
- [Bitstream decoding and monitoring](#)
- [Decoder configuration options](#)
- [Configuring DP580 output](#)
- [HDMI tab](#)
- [Selecting loudness setup options](#)

The general sequence for decoding operations is:

1. Select the input, presentation (if available), source, and channel pair.
2. Configure the decoder for the required Dolby codec or contribution format:
 - Dolby Digital Plus
 - Dolby Digital Plus with Dolby Atmos content
 - Dolby Digital
 - Dolby AC-4
 - Dolby E
 - Dolby ED2
3. Configure the appropriate output.

4.1 DP580 display bar

The DP580 display bar provides a visual reference for the statuses of the active input stream.

This figure shows the DP580 display bar, which provides:

1. Input source information
2. Loudness correction information
3. Audio output meter levels
4. Loudness level displays

Figure 3: DP580 display bar



4.1.1 Input source display

This section of the display bar shows the current input source (for example, IP, SDI, or AES), and the selected audio and video streams.

A green dot indicates that the decoder is receiving the signal for that source; a red dot indicates that no signal is available for that source.

4.1.2 Loudness settings display

This section of the display bar shows the current loudness practice from Dolby Intelligent Loudness in use, the dialogue normalization value applied to the incoming bitstream, and the applied loudness measurement.

A green dot indicates that the selected practice type is in use; a red dot indicates that no practice type is selected.

4.1.3 Audio output meter

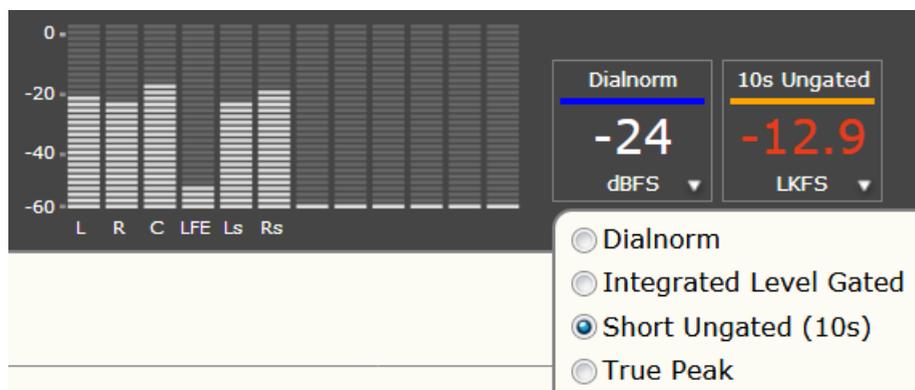
This meter shows the audio levels for each output channel.

The meter can show levels for up to 7.1.4 audio channel configurations.

4.1.4 Loudness displays

The display boxes at the upper-right corner of the display bar show the current values for specific loudness parameters.

You can change the currently displayed loudness parameter by clicking the small inverted triangle at the lower-right corner of each box, and then selecting a different parameter, as shown in this figure.



For more details on the loudness parameters, see *Loudness parameters*.

Note: You can reset the the timing for loudness display under **Setup > Loudness** by clicking the **Reset Measurements** button in the lower panel of the page,

Related information

[Loudness parameters](#) on page 28

4.2 Bitstream decoding and monitoring

Using the DP580 to decode and monitor incoming bitstreams begins with the selection of the input signal type. The type of bitstream coming from a source determines the available configuration and output options. In most scenarios, the DP580 monitors the output of an encoded bitstream to ensure that the intended codec or contribution format is correctly output throughout the broadcast stream.

4.2.1 Decoding and monitoring AES input

Selecting the AES option as the input on the DP580 enables decoding and monitoring of PCM, Dolby AC-4, Dolby Digital Plus, Dolby Digital Plus with Dolby Atmos content, Dolby Digital, and Dolby E bitstreams. The DP580 functions as a monitoring decoder to ensure the integrity of an encoded bitstream.

About this task

The steps included here represent the workflow for a general example of an input. There may be cases in which the outcomes are similar but different in their details.

Procedure

1. On the DP580 web client UI, select the **Input** tab.
2. From the **Input** drop-down list, select **AES**.
A single AES input can transmit only two PCM channels or one Dolby Digital Plus bitstream. The channel pair details are displayed in the bottom-left panel below the drop-down list.
3. Double-click an input name to see the stream type that the combined input pair is receiving (for example, 1.0 or 5.1 Complete Main).
4. View details about all characteristics of the channel pair by monitoring the panels on the right-most side of the page.

The panels provide information about:

- The bitstream on the channel pair (including the codec), the presence of Dolby Atmos content, the dialogue normalization setting, and other similar data
- Downmixing information, including the preferred downmix setting and accompanying downmix level settings
- General information, including the stream type, bitstream mode, and similar data when present
- Mixing metadata information, including whether it exists, the program and external program scale factors, and the mix control, as well as related settings

4.2.2 Decoding and monitoring IP input

Decode and monitor the channels and presentations associated with the IP input. The DP580 functions as a monitoring decoder when used to ensure the integrity of an encoded bitstream.

Procedure

1. On the DP580 web client UI, under **Setup**, select the **IP Bookmarks** tab.
2. In the **Bookmarks** panel, check whether the IP source input you want to monitor is available.
3. Optional: If the IP source input you prefer does not appear in the list, add a bookmark in the **Add Bookmark** panel for a new IP input source:

- a) In the **Name** field, enter a name for your media source.
 - b) From the **Mode** menu, select a mode (**Multicast** or **Unicast**).
 - c) For a multicast group enter the appropriate group IP address and, if required, the IP address of the source device in the **IGMPv3 Source IP** field.
 - d) In the Port field, enter a port for your source.
 - e) Click **Save**.
A new bookmark is added to the **Bookmarks** panel list.
4. Select the **Input** tab.
 5. From the **Input** drop-down list, select **IP**.
 6. From the **Source IP** drop-down list, select the IP bookmark you want.
 7. If you are decoding Dolby AC-4, select one of the presentations (if available) from the **PA Presentation** drop-down list.
The decoded bitstream is rendered to the outputs.
 8. Optional: To check the parameters of the IP input, click a component.
The parameters are displayed in the lower-right panel of the **Input** tab.

4.2.3 Decoding and monitoring SDI input

Monitor and control the channels and language presentation associated with the SDI input. The DP580 functions as a monitoring decoder to ensure the integrity of an encoded bitstream.

About this task

The steps included here represent the workflow for a general example of an SDI input. There may be cases in which the outcomes are similar but different in their details.

Procedure

1. On the DP580 web client UI, select the **Input** tab.
2. From the **Input** drop-down list, select **SDI**.
A list of channel pairs is displayed below the drop-down lists.
3. To decode a channel pair (two channels), double-click one of the named pairs.
The chosen channel pair status is displayed in the right-most panel of the page, and any alternative presentations detected in the incoming bitstream are displayed in the **PA Presentation** field drop-down list.
4. From the **PA Presentation** drop-down list, select one of the presentations (if available).
Language presentation metadata must be included in the bitstream to enable exposure in the **PA Presentation** field. If metadata for only one language is present in the bitstream,

that language name is displayed in the field; if metadata for more than one language is present in the bitstream, you can select from those options.

5. Confirm the input source, the audio channel selection, and the presence of a video stream in the upper panel of the UI with the panel LEDs.
6. Monitor the individual channel outputs in the output meter in the upper-right panel of the UI.
7. Select loudness settings in the **Status > Loudness** tab. For more information, see *Loudness parameters*.
8. Monitor the event logs in the **Status > Event Logs** tab to see any unusual activity in the stream. The most common issues are due to CRC errors or Pa spacing errors. For more information, see *Event log browsing options*.

4.3 Decoder configuration options

You can configure the DP580 decoding and output options that are available depending on the type of input bitstream.

Some of the configurable options on the DP580 are limited to certain bitstream types, for example, Dolby Digital Plus with Dolby Atmos content or Dolby AC-4, whereas others are available to all bitstream types.

4.3.1 Configuring speakers, decoding mode, and mixing options on the DP580

When you have selected a bitstream for decoding, you can then set options for specific decoder functions associated with the bitstream. Some options apply only to certain types of bitstreams.

Procedure

1. From the **Setup** menu, select **Decoder Configuration**.
2. In the **Decoder Configuration** panel, set the available options, as follows:

Option	Description
Speaker Configuration	Select an option from the drop-down list. The setting defines the output speaker configuration in a range from 2.0 to 7.1.4. This setting is reflected in channel descriptions of the audio level meters. Speakers that receive no content from the input source are silent.
Stereo Downmix Mode	Provides a choice between Auto , LtRt , or LoRo downmix modes.
Dolby Atmos Decode (for Dolby Digital Plus bitstreams only)	Enable Dolby Atmos content decoding with the Dolby Atmos Decode option. Clear the check box to disable Dolby Atmos support. Dolby Digital Plus with Dolby Atmos content is then decoded as Dolby Digital Plus.
Dolby Surround Upmix (for Dolby Digital Plus bitstreams only)	With the Dolby Atmos Decode option selected, you can also enable the Dolby Surround Upmix feature. This feature upmixes only channel-based content and does not apply to audio objects.

4.3.2 Setting associated audio parameters

Set the mixing, audio type, and metadata source options for DP580 decoding of bitstreams that include associated audio streams. These can be single- or dual-PID stream types.

Procedure

1. From the **Setup** menu, select **Decoder Configuration**.
2. In the **Associated Audio** panel, set the available options, as follows:

Option	Description
Associated Audio Mixing	Select On or Off depending on whether an associated audio stream is being decoded.
Associated Audio Types	Select the type that corresponds to your associated audio stream: <ul style="list-style-type: none"> • Undefined: Associated stream has no transport stream descriptor tag to identify its type. • Main: Selects a stream from among all associated streams that has a designation of main (a complete main, independent stream) • Description: Includes spoken description of scene content for visually impaired users. • Clean: Provides enhanced intelligibility (that is, dialogue concentrated in the Center channel) for hearing impaired users. • Subtitles: Provides spoken subtitles for visually impaired users.
Mixing Metadata Source	If Associated Audio Mixing is enabled, select Bitstream or Transport (transport stream) as the source of the mixing metadata.

4.3.3 Configuring bass management

Set the bass management options for the DP580, including the bass management mode, LFE boost, and cut-off frequency for height channels and non-height channels.

Procedure

1. From the **Setup** menu, select **Decoder Configuration**.
2. In the **Bass Management** panel, set the available options, as follows:

Option	Description
Bass Management Mode	Set this option to Off if you do not want it to be functional; otherwise, leave the default Bass Extraction selection in effect.
LFE Boost	Select the check box to apply an LFE boost of 10 dB to the decoded bitstream.
Non-height Channel Cut-off Frequency	Set the point at which non-height channels are silenced. These channels do not include Dolby Atmos signals for immersive sound. The range is 45-200 Hz. The default setting is 120 Hz.
Height Channel Cut-off Frequency	Set the point at which height channels are silenced. These channels include Dolby Atmos signals for immersive sound. The range is 45-200 Hz. The default setting is 120 Hz.

4.3.4 Configuring Dolby Digital Plus decoding

If the input bitstream is Dolby Digital Plus, configure the compression options that are appropriate to your decoding environment.

Procedure

1. From the **Setup** menu, select **Decoder Configuration**.
2. In the **Dolby Digital Plus Configuration** panel, set the available options, as follows:

Option	Description
Compression Mode	Setting a compression mode is not required. If you do not need or want to set the mode, leave the default selection as None . Otherwise, select the Line or RF mode as appropriate to your decoding requirements.
Dynamic Range Control Compression Cut (for Line Mode only)	If you have selected a Line mode compression, optionally set the dynamic range control cut rate in the range from 0 to 1, in increments of 0.1. The default setting is 1.
Dynamic Range Control Compression Boost (for Line Mode only)	If you have selected a Line mode compression, optionally set the dynamic range control boost rate in the range from 0 to 1, in increments of 0.1. The default setting is 1.

4.3.5 Configuring the Dolby AC-4 decoder

If your input is from a Dolby AC-4 source, configure the dialogue enhancement and dynamic range control options that are best for your decoding environment.

Procedure

1. From the **Setup** menu, select **Decoder Configuration**.
2. In the **AC-4 Decoder Configuration** panel, set the available options, as follows:

Option	Description
Dialogue Enhancement	You can increase or decrease the dialogue level in a range from -12 to +12 dB. The default setting is 0.
Dynamic Range Control Mode	<p>You can select from the following dynamic range control modes based on the target device for the decoding operation:</p> <ul style="list-style-type: none"> • Home Theater • Flat Panel TV • Portable Speakers • Portable Headphones <p>You also have the option of not setting the dynamic range control mode by using the default setting of None.</p>
Reference Level (available only if Dynamic Range Control Mode is selected)	<p>If you choose to apply a dynamic range control mode, set the reference output level from -31 to -7 dB for the selected mode. The default settings for each mode are:</p> <ul style="list-style-type: none"> • Home Theater: -27 • Flat Panel TV: -17 • Portable Speakers: -7 • Portable Headphones: -7

4.4 Configuring DP580 output

Set the output options and master volume setting on the DP580 to respond to the received input type.

Procedure

1. From the **Setup** menu, select **Output Configuration**.
2. In the **Output Configuration** panel, set the appropriate options, as follows:

Option	Description
Output Interface (for HDMI input)	<p>If the selected input is HDMI, you can output to either HDMI or SDI (exclusively, not concurrently). The HDMI output is enabled by default.</p> <p>For HDMI output, you can select either PCM or a pass-through of Dolby Digital Plus.</p> <p>For SDI output, you can select either PCM or a pass-through of Dolby Digital or Dolby Digital Plus.</p>
SDI	<p>When the input is HDMI, you can set the SDI output to be either PCM or a pass-through of Dolby Digital or Dolby Digital Plus.</p> <p>For all other input types, this output selection is nonfunctional.</p>
HDMI	For the HDMI connection, the output can be either PCM or a pass-through of a Dolby Digital Plus HDMI signal.
Headphone	The output headphone signal can be either stereo channels or any individual channel available from the decoded stream.
AES Output Channels	<p>The number of output channels matches the number of channels from the input settings. For this setting, select either channels 1 through 8, or channels 9 through 16.</p> <p> Note: Independent of these and the Analog Output Channel settings, all output content is transmitted through SDI.</p>
Analog Output Channels	For this setting, select the channel group that is not used for the AES output channels, that is, either channels 1 through 8, or channels 9 through 16.

3. In the **Volume Configuration** panel, use the up or down arrows to set the **Master Volume** level at any point from 0 to -90 dB.

The **Master Volume** setting applies to headphone and analog outputs for all available codecs.

4.5 HDMI tab

The **HDMI** tab on the DP580 is a tool for content creators to monitor the behavior of their upstream devices and for all users to monitor the audio capabilities of HDMI-enabled downstream receivers.

4.5.1 HDMI sink device panel

Use this panel to confirm the status of an HDMI-enabled sink device, such as an audio/video receiver (AVR), in your broadcast stream.

If you want to monitor a destination device, you can use this option to determine:

- Whether the device is connected and can be detected by other devices in the stream
- The number of PCM channels supported
- The number and types of codecs supported by the device
- The number of speakers supported by the device

4.5.2 EDID configuration panel

Your selections in the Extended Display Identification Data (EDID) configuration panel of the DP580 indicate to an upstream device (such as a Blu-ray player) the Dolby codecs and the number of channels that a downstream receiver is capable of processing.

Use the panel to configure settings for EDID information provided to those devices that use an HDMI connection. You can select these options:

Number of Channels

Two-, six-, or eight-channel decoding. The DP580 can verify that the upstream source device is transmitting the number of channels that the downstream receiver has indicated in its EDID information. The actual number of decoded channels is determined by your speaker configuration setting.

Dolby Digital, Dolby Digital Plus, and Dolby TrueHD

The DP580 can verify whether your upstream device is transmitting bitstreams in the Dolby codecs that the downstream receiver has indicated in its EDID information.

 **Note:** The DP580 can decode any bitstream encoded in these Dolby codecs over HDMI, as determined by the decoder configuration.

Dolby Atmos

Selecting this option indicates to the upstream device that the downstream receiver is capable of receiving Dolby Digital Plus with Dolby Atmos content. The DP580 can verify whether the source device is transmitting Dolby Digital Plus with Dolby Atmos content.

 **Note:** To ensure Dolby Atmos decoding over HDMI, you must select **Dolby Atmos** in the EDID configuration panel, as well as the **Dolby Atmos Decode** flag in the **Decoder Configuration** panel of the **Decoder Configuration** tab.

Each time you make or change a selection or group of selections in this panel, you must click **Apply** for your configuration to take effect.

4.6 Selecting loudness setup options

The loudness panel provides options to control loudness correction, including Dolby Dialogue Intelligence and loudness metering in decoded bitstreams.

Procedure

1. From the **Setup** menu, select **Loudness**.
2. In the **Loudness Setup** panel, set these available options, as applicable:

Option	Description
Preset	Select the broadcast type from the drop-down list. The available types are: <ul style="list-style-type: none"> ATSC For broadcasts originating in North America ARIB For broadcasts originating in Japan EBU R128 For broadcasts originating in Europe Free TV For broadcasts originating in Australia
Dialogue Intelligence	Select the check box to apply Dolby Dialogue Intelligence if applicable for the broadcast stream.

Option	Description
Loudness Metering Mode	The applied metering mode is ITU-R BS.1770-4, with or without Dolby Dialogue Intelligence, depending on whether you have applied Dialogue Intelligence to the broadcast stream.
Speech Threshold	Set the loudness speech threshold to any setting between 1 and 100 percent. The default setting is 20 percent.

4.6.1 Loudness parameters

The selectable loudness parameters on the DP580 provide a view of the decoded bitstream responses to the application of loudness control.

This table lists the available parameters and their characteristics.

Table 2: Loudness parameters

Parameter	Description
dialnorm	The dialogue normalization metadata parameter, as contained within the input bitstream
Short Ungated (10 s)	A ten-second sliding window measurement, as per ITU-R BS.1770
Integrated Level Gated	A cumulative loudness value measured according to ITU-R BS.1770-4
Sample Peak	The maximum absolute PCM sample value
True Peak	The peak value, oversampled four times, as calculated per ITU-R BS.1770-4

On the front-panel UI of the DP580, you can find an abbreviated description of the type of loudness measurement that is currently being applied when **Dialogue Intelligence** is selected in the **Loudness Setup** panel of the **Loudness** web client page. The abbreviations and their meanings are listed here.

Abbreviation	Full form
Int Lvl	Integrated level gated
Int Sp	Integrated speech ungated
Int Ung	Integrated ungated
Shrt Lvl	Short-term level
Shrt Sp	Short-term speech ungated
Shrt Ung	Short-term ungated

At boot up, or when **Dialogue Intelligence** is not selected, the default modes are **Int Lvl** and **Shrt Ung**.

5 Dolby Professional Reference Decoder DP580 administration

The **Network** and **Administration** web UI pages of the DP580 provide information and controls that apply to the entire unit. Use these pages to verify or change settings according to your decoding requirements.

5.1 Administrative functions

The administrative pages of the DP580 enable control of network and system settings for both initial setup and subsequent changes in the unit environment.

On the **Network** page, you can verify or change the network interface status and configuration.

On the **Administration** page, you can:

- Upgrade the system software
- Reboot the unit
- Reset the system settings
- Enable and configure NTP connections
- Set the system clock
- Download the system logs
- Verify system information such as the FPGA and Microblaze versions in use

Related information

[Upgrading the system software](#) on page 17

[Starting up or rebooting the system](#) on page 16

[Resetting the system settings](#) on page 30

[Configuring NTP](#) on page 17

[Setting the system clock](#) on page 17

[Downloading system logs](#) on page 33

5.1.1 Checking the system information

From the **Admin** page of the DP580, you can get complete information about the current system settings.

About this task

Most system settings are determined at the time of installation and setup. As configurations change, however, you may need to check the validity or compatibility of the system information.

Procedure

1. On the DP580 web client UI, under **System**, select the **Network** page.
2. Verify that the network interface status and configuration settings are valid for your current decoding environment, and make changes as necessary.
3. Select the **Admin** page, and then verify that the remaining system settings are acceptable. Make changes as necessary.

5.1.2 Resetting the system settings

You can reset the DP580 to its original settings at any time on the **Admin** page.

Procedure

1. From the web interface home page, under **System**, select **Admin**.
The administration page is displayed.
2. Scroll down to the **Reset System Settings** section, and then click the **Reset** button.
The unit reverts to its original default settings.

6 Event and system logs

You can view or download event logs or system logs to obtain specific data.

- [Event and system log descriptions](#)
- [Opening the event logs view](#)
- [Event log browsing options](#)
- [Downloading event logs](#)
- [Downloading system logs](#)

6.1 Event and system log descriptions

The DP580 logs provide a record of unit operations and behavior.

Event logs

The device generates an event log entry for every change initiated by the user, every change in input or processing status, and every error state. This provides a picture of the device operation, and is very useful for monitoring and troubleshooting. You can download the .csv log files from the UI.

Each logged event includes:

- Date
- Level (type of log information):
 - General information
 - Warnings (marked in yellow)
 - Errors (marked in red)
- Category
- Input type
- Message

The device stores the event log locally. To prevent overrunning the disk space, the logs remain available until one of the following conditions occurs:

- The number of log entries exceeds 1,000,000.
- A log entry is older than two months.

A periodic backup of the event log will ensure that you retain this information.

System logs

System logs include detailed technical information about the DP580 unit processes. In the event of a system failure, users must send the logs to Dolby Laboratories for analysis and support.

6.2 Opening the event logs view

Open the event logs view to check the unit status and behavior.

- Under **Status** on the navigation bar, select **Event Logs** to open the event logs view.

6.3 Event log browsing options

Use the event log browsing options to manage the log and filter out different types of messages.

Table 3: Browsing options and message filters

Label	Options	Description
Show All	-	Clears all filters, and shows all messages.
Level	All Levels (default)	Shows messages of all types.
	Info	Shows information type messages only.
	Warning	Shows warning messages only.
	Error	Shows error messages only.
Category	All Categories (default)	Shows messages of all categories.
	UI	Not in use.
	System	Not in use.
	Storage	Not in use.
	Transport	Shows transport errors.
	Audio	Events related to audio content including encoded formats.
	Video	Shows video errors.
	File Capture	Not in use.
	Loudness	Not in use.
	I/O	Events related to physical input and output interfaces.
	Clock	Events related to clock and synchronization mechanism.
Start time	Date and time	Defines the start date and time of events you want to track.
End time	Date and time	Defines the end date and time of events you want to track.
Clear Events	-	Clears the event logs only. (The system logs remain unchanged.)

6.4 Downloading event logs

Archive the event logs available in the **Event Logs** view to your hard disk, and use them for further analysis.

Procedure

1. On the web UI, under **Status** on the navigation bar, select **Event Logs**.
2. Click **Download** to save the event logs available in the **Event Logs** view to a file on your hard disk.

6.5 Downloading system logs

Save the system logs to your hard disk, and send them to Dolby Laboratories for detailed analysis and response.

About this task

System logs include detailed information required by Dolby Laboratories for support when system failures occur.

Procedure

1. Under **System** on the navigation bar, select **Admin**.
2. In the **System Logs** panel, click **Download** to save the system logs file to your hard drive.
3. Send the system logs file to Dolby Laboratories for detailed analysis and response.

Glossary

AAC

Advanced Audio Coding. A perceptual audio coding system that is described by ISO/IEC 14496-3.

AES

Audio Engineering Society. An international organization that promotes advances in audio and disseminates new knowledge and research.

AES3

A standard jointly developed by the Audio Engineering Society (AES) and the European Broadcasting Union (EBU) that specifies serial transmission of two-channel linearly represented digital audio data on various media.

ARC

Audio Return Channel. A feature of HDMI that enables audio to be sent through the HDMI cable from the sink to the source.

ASI

Asynchronous serial interface. A streaming format that often carries an MPEG transport stream. It can contain a single program or be a multiplex of multiple programs, each consisting of video and audio.

associated audio

An audio program designed to be decoded simultaneously with another (main) program and then mixed into the main program to produce a single output.

ATSC

Advanced Television Systems Committee. An international standardization organization for digital television; also refers to a set of standards for transmission of digital television over terrestrial, cable, and satellite networks.

AVR

Audio/video receiver. An audio amplifier and audio/video (A/V) switching combination device for a home theater. It contains inputs for all of the audio and video sources and outputs to one or more sets of speakers and one or more monitors or TVs.

CRC

Cyclic redundancy check.

dBFS

Decibels full scale. The amplitude of a signal relative to a digital full-scale signal.

DHCP

Dynamic Host Configuration Protocol.

dialnorm

Dialogue normalization value.

dialogue enhancement

A feature that detects the presence of dialogue, and dynamically applies processing to improve the intelligibility of the spoken portion of an audio program.

DTV

Digital television.

DVB

Digital Video Broadcasting. A consortium for designing open technical standards for the global delivery of digital television and data services.

dynamic range control

An audio compression metadata parameter applied to audio to limit the dynamic range.

EBU

European Broadcasting Union. An alliance of public service media entities, based mainly in Europe.

EDID

Extended Display Identification Data. A data structure, standardized by the Video Electronics Standards Association, which enables a sink device to inform the host device about its identity and capabilities.

GUI

Graphical user interface.

HDMI

High-Definition Multimedia Interface. A high-speed, high-capacity format for transferring digital information and the specific hardware interface for the format.

IP

Internet Protocol.

IP address

Internet Protocol address. A numerical identifier assigned to a device that is a member of a network that uses the IP for communication.

ITU

International Telecommunication Union.

kbps

Kilobits per second.

LED

Light-emitting diode.

LFE

Low-Frequency Effects. A band-limited channel specifically intended for deep, low-pitched sounds.

NTP

Network Time Protocol. A network protocol for clock synchronization on computers.

object-based audio

Consists of one or more audio signals and associated metadata. Object-based audio can contain bed objects (channel-based audio) with a fixed nominal playback position, dynamic objects with explicit positional metadata that can change with time, and/or intermediate spatial format objects. Object-based audio is closely linked to auditory image position rather than assumed loudspeaker positions.

Pa

The name of a start-of-frame marker defined in SMPTE 337-2008.

PCM

Pulse code modulation. A method that is used to convert analog signals into digital, binary, coded pulses by sampling the analog signal, quantizing each sample independently, and converting the resulting quantized values into a digital signal.

PID

Packet identifier. A unique code that identifies a packetized elementary stream (PES) within a transport stream. The PID is contained in the transport stream packet header and is listed in the service information (SI) for a transport stream.

RTP

Real-time Transport Protocol. An IP network audio and video protocol.

SDI

Serial digital interface.

SMPTE

Society of Motion Picture and Television Engineers.

transport stream

As defined in ISO/IEC 13818-1, a packetized bitstream that is used to transmit audio and video information. A transport stream is made up of multiplexed program elementary streams.

UDP

User Datagram Protocol. A communications protocol that uses no handshaking dialogues to establish a connection with the remote host. UDP is a member of the IP suite.

UI

User interface.

USB

Universal Serial Bus. A standard that defines the cables, connectors, and communications protocols used in connections between computers and electronic devices.