DP569 Dolby Digital Encoder Quick Start Guide

Channel Mode

This parameter defines the number of full bandwidth audio channels being encoded. Available modes depend upon the selected Data Rate and Sample Rate parameters. The Data Rate parameter can be manually adjusted from 56 to 640 kbps, or if Automatic is selected, the appropriate data rate for the desired channel mode is automatically set.

The available parameters are:

- 1+1 Dual Mono (Ch. 1, Ch. 2 encoded)
  Note: 1+1 is not valid for DTV or DVD.
- 1/0 Mono (C encoded, *Auto = 96 kbps*)
- 2/0 Stereo (L/R or Lt/Rt; *Auto = 192 kbps*)
- 3/0 (L, C, R; *Auto = 256 kbps*)
- 2/1 (L, R, Ls; *Auto = 256 kbps*)
- 3/1 (L, C, R, Ls; *Auto = 320 kbps*)
- 2/2 (L, R ,Ls, Rs; *Auto = 320 kbps*)
- 3/2 (L, C, R, Ls, Rs; *Auto = 384 kbps or 448 kbps*)

Clock Source

Clock Source selects the reference clock source for the Dolby Digital encoding process as well as the clock reference for the output signal. The DP569 will not encode without a valid AES reference clock signal.

The available clock sources are:

- Digital Input: A valid AES/EBU signal must be present at the Digital input 1/2.
- Ref In: A valid AES/EBU signal must be present at the Ref In input.
- Internal (48 kHz, 44.1 kHz, or 32 kHz): always valid when selected.

Refer to the DP569 User's Manual, page 4–13 for more detailed information. *Note: Digital input 1/2 is the only input that functions as both an input source and a clock source.*

Surround Channel Processing

- A 90º phase shift can be applied to the surround channels during encoding. This is useful for generating multichannel bitstreams which, when downmixed, can create a true Dolby Surround compatible output (Lt/Rt). The effect of this parameter can be heard when decoding to a two-channel Lt/Rt signal and then with a Pro Logic decoder. Default setting is **ON**.
- –3 dB attenuation can be used to reduce the levels of the surround channels to compensate between the calibration of film dubbing stages and consumer replay environments. The surround channels in film studios are set 3 dB lower than the front channels (unlike consumer applications of 5.1), leading to the level on tape being 3 dB higher. Apply the 3 dB attenuation when using a master mixed in a film room.

Center/Surround Downmix Levels

These parameters indicate to the decoder the desired level shift for the surround and center channels during downmixing to stereo (Lt/Rt or Lo/Ro) or mono. These parameters should be adjusted while decoding and monitoring between full and stereo modes. The optional Extended Bitstream parameters provide a method to indicate a preferred stereo downmix mode as well as an added measure of precision over stereo and surround downmix level shifts. Refer to the Dolby Digital Professional Encoding Manual for more information *(www.dolby.com/tvaudio)*.

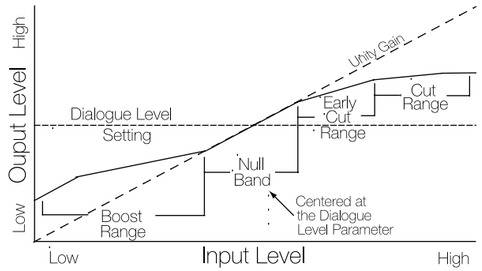
Dynamic Range Control (DRC)

Dynamic Range Presets allow the user to select the compression characteristic that is applied to the Dolby Digital bitstream during decoding. These compression presets aid playback in less-than-ideal listening environments. The DP569 includes five compression presets that correspond to commonly used compression settings. The proper setting of the dialnorm value determines the position of the Null Band where the signal is neither boosted nor attenuated.

Note: Each Dynamic Range Preset is applied using a modified B-weighted curve.

Setting RF Overmodulation Protection to enabled provides an additional measure of protection for bitstreams that are decoded in RF Compression mode and modulated (for example, in a set-top box). This parameter has no effect in Line Compression mode and is normally disabled.

Refer to the Dolby Digital Professional Encoding Manual for more detailed information *(www.dolby.com/tvaudio).*



- **Music Light** (No early cut range)
  Max Boost: 12 dB (below –65 dB)
  Boost Range: –65 to –41 dB (2:1 ratio)
  Null Band Width: 20 dB (–41 to –21 dB)
  Cut Range: –21 to +9 dB (2:1 ratio)
- **Music Standard**
  Max Boost: 12 dB (below –55 dB)
  Boost Range: 55 to –31 dB (2:1 ratio)
  Null Band Width: 5 dB (–31 to –26 dB)
  Early Cut Range: –26 to –16 dB (2:1 ratio)
  Cut Range: –16 to +4 dB (20:1 ratio)
- **Film Light**
  Max Boost: 6 dB (below –53 dB)
  Boost Range: –53 to –41 dB (2:1 ratio)
  Null Band Width: 20 dB (–41 to –21 dB)
  Early Cut Range: –26 to –11 dB (2:1 ratio)
  Cut Range: –11 to +4 dB (20:1 ratio)
- **Film Standard**
  Max Boost: 6 dB (below –43 dB)
  Boost Range: –43 to –31 dB (2:1 ratio)
  Null Band Width: 5 dB (–31 to –26 dB)
  Early Cut Range: –26 to –16 dB (2:1 ratio)
  Cut Range: –16 to +4 dB (20:1 ratio)
- **Speech**
  Max Boost: 15 dB (below –50 dB)
  Boost Range: –50 to –31 dB (5:1 ratio)
  Null Band Width: 5 dB (–31 to –26 dB)
  Early Cut Range: –26 to –16 dB (2:1 ratio)
  Cut Range: –16 to +4 dB (20:1 ratio)

Timecode

To control the encoder through the use of SMPTE timecode for DVD applications, work through the following steps:

- **Encoder Control** must be set to **Timecode Cntrl**
- Enable **Timestamp** under **I/O Control**
- Enter a start time as hours:minutes:seconds:frames (samples).
- Enter a stop time.

Note: DVD authoring systems use the timestamp for setting A/V sync. Not all systems utilize the (samples) field. The first valid timestamp is the first complete frame recognized.

- *The DP569 can convey delay information to a downstream device through the use of a **Time Stamp Delay Word**. This information is entered in milliseconds, where a positive value indicates an advance from the reference, while a negative value indicates a delay.*

Coding Delay

The **Coding Delay** parameter sets the internal encoding delay time to be internally or externally controlled. Any changes made to this parameter during encoding take effect immediately by deleting output frames or adding gaps to the output bitstream.

- Internal: The coding delay is selected internally from a minimum of 187 ms to a maximum of 450 ms
- External: The coding delay is determined automatically from a signal applied to the external TTL delay input connection

Refer to the DP569 User's Manual, page 4–21, for more detailed information.

Metadata Control Parameters

Metadata Source

Determines the metadata source to be included in the resulting Dolby Digital data stream. Can be selected to either **Internal** metadata based upon user selectable parameters, or be controlled through an external metadata program supplied by an upstream device.

Reversion Mode

Determines what happens when external metadata information is lost.

- **Last Used:** Encoding continues using the last valid set of external metadata parameters received.
- **Preset:** Missing metadata parameters are replaced using the preset selected in the **Reversion Preset** menu.
- **Adaptive:** If the metadata is completely lost, the encoder uses the Last Used method. If some parameters are missing, the **Preset** method is used.

Override Parameters

Determines which incoming metadata parameters are included in the resulting Dolby Digital data stream.

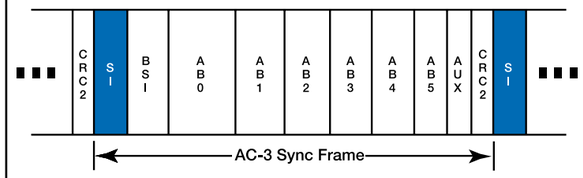
- **None:** All incoming metadata parameters are used.
- **Dialogue Level:** The Dialnorm parameter is replaced by the Dialnorm value set in the DP569.
- **Compression Pro:** The Compression Profile parameters are replaced by parameters generated within the DP569.
- **All:** All metadata is generated by the DP569.

Dialogue Level (dialnorm)

Dialogue Level (aka *dialogue normalization* or *dialnorm*) is the average dialogue level of a program over time, measured with an LAEq meter, referenced to 0 dBFS. Refer to the Dolby Digital Professional Encoding Manual for more detailed information *(www.dolby.com/tvaudio)*.

AC-3 Bitstream Basics

At the heart of the Dolby Digital (AC-3) bitstream is the synchronization frame. Each single sync frame is self-contained (that is, all data necessary to decode each frame is present within each frame), and it is the smallest component of the Dolby Digital bitstream capable of being decoded. Each sync frame is made up of a sync information header, a block of bitstream information, six blocks of audio data, a block of optional auxiliary data, and a redundancy check word. Each audio block represents 256 new PCM samples, thus each AC-3 sync frame represents 1,536 samples.



- Sync Information (SI) contains a sync word, the sampling frequency, and the frame size. These are needed to acquire and maintain bitstream sync.
- Bit Stream Information (BSI) data includes the number of channels coded, dialog level and service type information.
- Audio Block (AB) portion of the frame consists of the six blocks of audio data. Information needed to decode blocks can be shared among a number of blocks, and that information is only encoded in the first block where it is used. The decoder uses that same information again to decode later blocks as appropriate. Information which is shared within a frame is always included in the first block of the frame, allowing the decoder to begin decoding very quickly.
- AUX block data is used for any information remaining in the frame after the last audio block.
- Cyclical Redundancy Check (CRC) contains two CRC error check words. One for the first 5/8 of the frame, and a second for the entire frame.

Refer to the Dolby Digital Professional Encoding Manual for more information *(www.dolby.com/tvaudio).*

Output Mode

Output Mode is a control parameter that defines one of four output data formats of the AES/EBU bitstream:

- Pro 32-bit: professional mode, 32-bit (using both Ch. 1 and Ch. 2) data packing. This is the Default.
- Pro 16-bit Ch. 1: professional mode, 16-bit (using only Ch. 1) data packing.
- Pro 16-bit Ch. 2: professional mode, 16-bit (using Ch. 2) data packing.
- Consumer Mode.

Note: "Bit 0" is set at "0" (zero) for consumer bitstreams and "1" for professional. Additionally, Consumer Mode is always sent in 32-bit data streams, similar to the Pro 32-bit Mode. "Bit 1" (audio/non-audio bit) when set to "1" is used to indicate that the IEC958 data stream (the Dolby Digital encoded bitstream) does not contain PCM audio data. Refer to the ATSC Document A/52, Annex B, Section 4 for more information on consumer and professional bitstreams.

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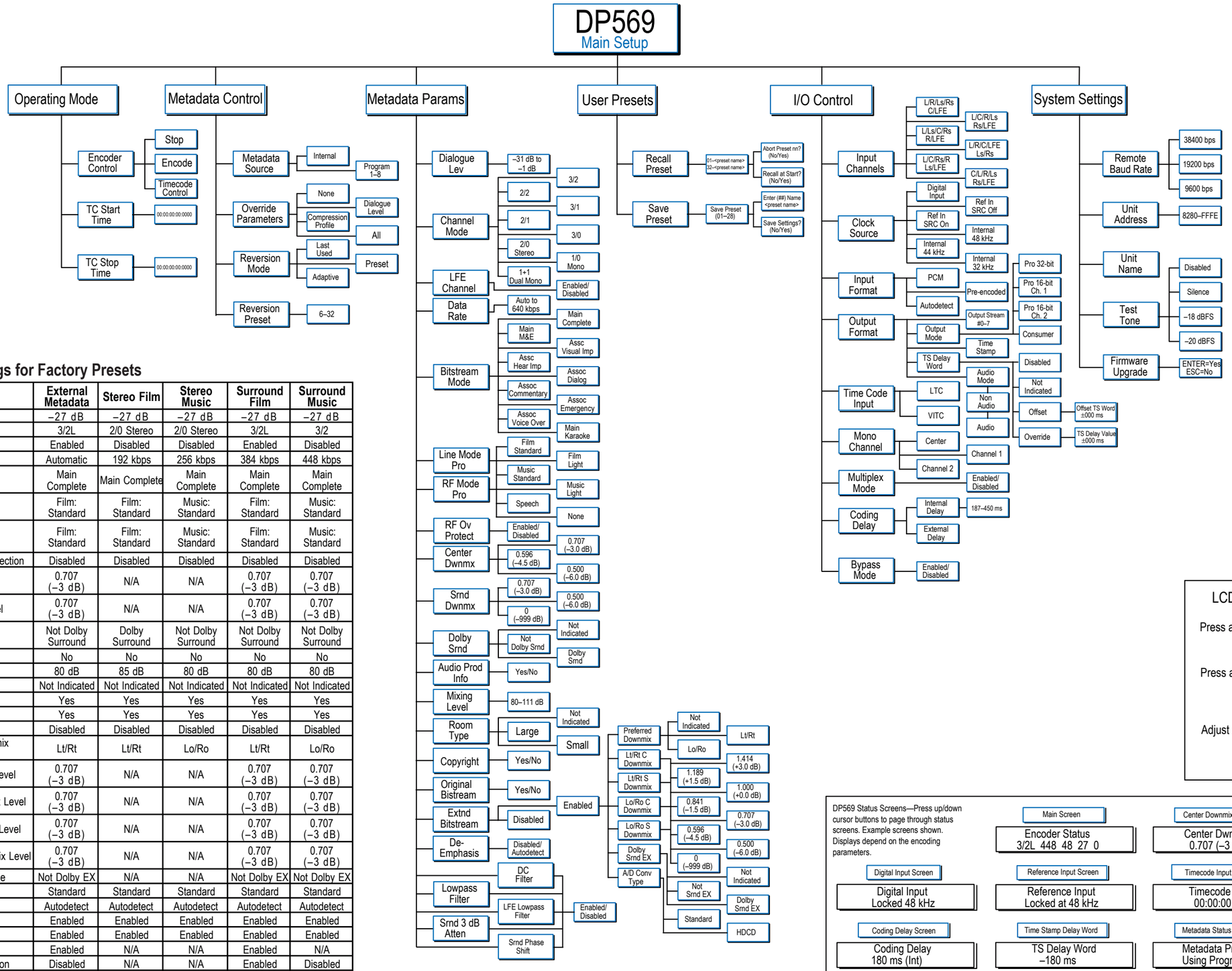
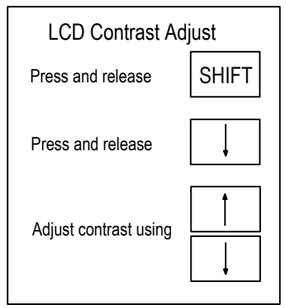
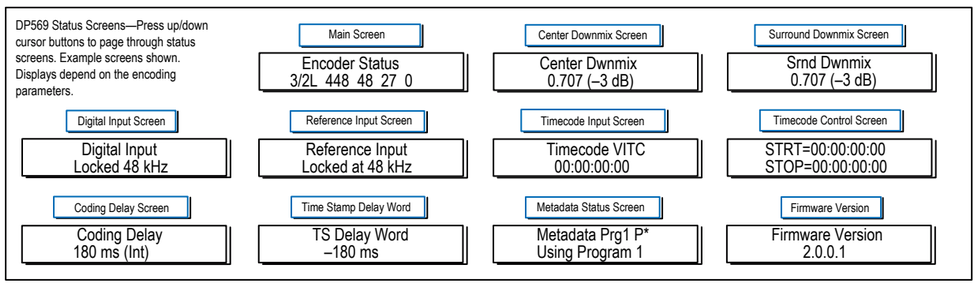


Metadata Settings for Factory Presets

Preset Name	External Metadata	Stereo Film	Stereo Music	Surround Film	Surround Music
Dialogue Level	–27 dB	–27 dB	–27 dB	–27 dB	–27 dB
Channel Mode	3/2L	2/0 Stereo	2/0 Stereo	3/2L	3/2
LFE Channel	Enabled	Disabled	Disabled	Enabled	Disabled
Data Rate	Automatic	192 kbps	256 kbps	384 kbps	448 kbps
Bitstream Mode	Main Complete	Main Complete	Main Complete	Main Complete	Main Complete
Line Mode Profile	Film: Standard	Film: Standard	Music: Standard	Film: Standard	Music: Standard
RF Mode Profile	Film: Standard	Film: Standard	Music: Standard	Film: Standard	Music: Standard
RF Overmodulation Protection	Disabled	Disabled	Disabled	Disabled	Disabled
Center Downmix Level	0.707 (–3 dB)	N/A	N/A	0.707 (–3 dB)	0.707 (–3 dB)
Surround Downmix Level	0.707 (–3 dB)	N/A	N/A	0.707 (–3 dB)	0.707 (–3 dB)
Dolby Surround Mode	Not Dolby Surround	Dolby Surround	Not Dolby Surround	Not Dolby Surround	Not Dolby Surround
Audio Prod Info	No	No	No	No	No
Mixing Level	80 dB	85 dB	80 dB	80 dB	80 dB
Room Type	Not Indicated	Not Indicated	Not Indicated	Not Indicated	Not Indicated
Copyright	Yes	Yes	Yes	Yes	Yes
Original Bitstream	Yes	Yes	Yes	Yes	Yes
Extended Bitstream	Disabled	Disabled	Disabled	Disabled	Disabled
Preferred Stereo Downmix Mode	Lt/Rt	Lt/Rt	Lo/Ro	Lt/Rt	Lo/Ro
Lt/Rt Center Downmix Level	0.707 (–3 dB)	N/A	N/A	0.707 (–3 dB)	0.707 (–3 dB)
Lt/Rt Surround Downmix Level	0.707 (–3 dB)	N/A	N/A	0.707 (–3 dB)	0.707 (–3 dB)
Lo/Ro Center Downmix Level	0.707 (–3 dB)	N/A	N/A	0.707 (–3 dB)	0.707 (–3 dB)
Lo/Ro Surround Downmix Level	0.707 (–3 dB)	N/A	N/A	0.707 (–3 dB)	0.707 (–3 dB)
Dolby Surround EX Mode	Not Dolby EX	N/A	N/A	Not Dolby EX	Not Dolby EX
A/D Converter Type	Standard	Standard	Standard	Standard	Standard
Digital De-emphasis	Autodetect	Autodetect	Autodetect	Autodetect	Autodetect
DC Filter	Enabled	Enabled	Enabled	Enabled	Enabled
Lowpass Filter	Enabled	Enabled	Enabled	Enabled	Enabled
LFE Lowpass Filter	Enabled	N/A	N/A	Enabled	N/A
Surround 3 dB Attenuation	Disabled	N/A	N/A	Enabled	Disabled
Surround Phase Shift	Enabled	N/A	N/A	Enabled	Enabled





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