

Scalers and Signal Processors

DSC 301 HD

Digital Scaling Converter



Extron

Safety Instructions

Safety Instructions • English

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VCCI-A

Conventions Used in this Guide

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The following notifications are used in this guide:

ATTENTION:

- Risk of property damage.
- Risque de dommages matériels.

NOTE: A note draws attention to important information.

Software Commands

Commands are written in the fonts shown here:

```
^ARMerge Scene,,0p1 scene 1,1 ^B 51 ^W ^C.0
```

```
[01] R0004 00300 00400 00800 00600 [02] 35 [17] [03]
```

```
Esc [X1] * [X17] * [X20] * [X23] * [X21] CE ←
```

NOTE: For commands and examples of computer or device responses used in this guide, the character “0” is the number zero and “O” is the capital letter “o.”

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 208.132.180.48: bytes=32 times=2ms TTL=32
```

```
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx -t
```

```
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, www.extron.com.

Extron Glossary of Terms

A glossary of terms is available at <https://www.extron.com/technology/glossary.aspx>.

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Introduction

This guide contains information about the Extron DSC 301 HD Digital Scaling Converter with instructions on how to install, configure, and operate the equipment.

In this guide the terms digital scaler and scaler are used interchangeably and refer to the DSC 301 HD scaler.

This section gives a basic description and the key features of the DSC 301 HD scaler.

- [DSC 301 HD Description](#)
- [Key Features](#)

DSC 301 HD Description

The DSC 301 HD is a 1-inch high, half rack wide, three input, HDCP-compliant video scaler that includes an HDMI input, configurable high resolution analog, and composite video inputs, and a single HDMI output.

The DSC 301 HD accepts a wide variety of video formats including HDMI, HDTV, RGB, component, and standard definition video. It features advanced Extron video signal processing with 1080i deinterlacing, EDID Minder, Key Minder, and automatic input switching. Audio from any of three stereo inputs may be embedded onto the HDMI output. Front panel controls, an intuitive on-screen display, plus USB and RS-232 connections provide flexible control and monitoring.

The unit can be rack mounted or installed under a desk using the optional MBU 125 rack mounting brackets.

The DSC 301 HD features advanced video processing with the ability to scale HDMI, HDTV, RGB, and standard definition video signals to a common high resolution output. It accepts and outputs signals up to 1920x1200, including HDTV 1080p/60 and 2048x1080. The DSC 301 HD also features Deep Color processing and high performance deinterlacing of 1080i to deliver optimal image quality through advanced motion compensation. In addition, the color space and chroma subsampling of the HDMI output can be automatically set to ensure compatibility with a connected DVI or HDMI display.

Output scan rates are available from VGA (640x480) to 1920x1200 resolution, as well as HDTV at 720p, 1080i, 1080p/60 Hz, and 2k/60 Hz.

NOTE: See the [Resolutions and Refresh Rates table](#) on page 20 for a complete list.

The DSC 301 HD features automatic 3:2 and 2:2 pulldown detection, which maximizes the image detail and sharpness for content sources originating from film. The scaler also uses a digital 3D adaptive comb filter that optimizes decoding of NTSC, PAL, and SECAM sources for integration into systems worldwide.

Key Features

Inputs

- **Video** — The DSC 301 HD has the following connectors: one HDMI connector, one 15-pin HD connector for RGBHV or HD/SD component video, and one BNC connector for composite video.
- **Auto-Image setup** — When activated, the unit automatically detects the resolution of the incoming video signal and sets the total pixels, phase, active pixels, and active lines, as well as the horizontal and vertical starting points.
- **Auto Input memory** — When activated, the unit automatically saves input sampling and picture settings based on the incoming signal. When the same signal is detected again, these image settings are automatically recalled from memory.
- **Auto-switching between inputs** — Auto-switching allows for simple, unmanaged installation in locations such as in a lectern or under a conference table. When multiple inputs are active, the switching priority is configurable.
- **HDMI, RGB, HDTV, and video scaling to HDMI** — Digital and analog video sources can all be scaled to high resolution HDMI output.
- **Clean switching** — Clean cut through black and fade through black transition effects are available to enhance presentations by eliminating distractions during input switching.
- **Audio** — The DSC 301 HD has the following connectors: three 3.5 mm stereo mini jacks for analog audio input, and an embedded HDMI digital audio input.
- **HDMI audio embedding** — Analog input audio signals can be embedded onto the HDMI output signal.
- **Audio input gain and attenuation** — Gain or attenuation can be adjusted for each analog audio input to eliminate noticeable differences when switching between sources.
- **Audio input assignment** — Each video input can be assigned to any analog audio input. This enables all three video inputs to share a single analog audio input. The HDMI input can be set to pass incoming digital audio, embed the analog audio, or to automatically embed the analog audio when no digital audio is detected.

Outputs

- **Video and Audio** — The DSC 301 HD has one HDMI output.
- **Selectable output** — Available output rates include computer-video 640x480 up to 1920x1200, HDTV rates up to 1080p/60, and 2048x1080.
- **Output Standby Mode** — Can be set to automatically mute video and sync output to the display device when no active input signal is detected. This allows the projector or flat-panel display to automatically enter into standby mode to save energy and enhance lamp or panel life.
- **Aspect ratio control** — The aspect ratio of the video output can be controlled by selecting a Fill mode, which provides a full screen output, or a Follow mode, which preserves the original aspect ratio of the input signal.
- **HDCP authentication and signal presence confirmation** — Provides real-time verification of HDCP status for each digital video input and output. This allows for simple, quick, and easy signal and HDCP verification through front panel LEDs or RS-232, providing valuable feedback to a system operator or helpdesk support staff.

- **HDCP Visual Confirmation** — This provides a full screen green output signal when HDCP-encrypted content is transmitted to a non-HDCP compliant display, providing immediate visual confirmation that protected content cannot be viewed on the display.
- **HDMI to DVI Interface Format Correction** — Automatically enables or disables embedded audio and infoframes, and sets the correct color space for proper connection to HDMI and DVI displays.
- **AFL (Accu-RATE Frame Lock)** — A patented technology exclusive to Extron that locks the output frame rate to a designated input to eliminate stuttering caused by frame rate conversion.
- **Audio switching transitions** — The audio output level automatically ramps down and then ramps up during switching transitions.
- **Integrated audio delay** — The audio output is automatically delayed to compensate for latency introduced by the video processing.

General

- **Advanced scaling engine with 30-bit processing and 1080i deinterlacing** — Image scaling and video format conversion are performed at 30-bit precision for enhanced color accuracy and picture detail. High performance deinterlacing for 1080i signals from HD sources delivers optimized image quality.
- **HDCP compliant** — Fully supports HDCP-encrypted sources, with selectable authorization for unencrypted content.
- **Supported HDMI** — This features include data rates up to 6.75 Gbps, Deep Color, and HD lossless audio formats
- **Key Minder** — Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments.
- **EDID Minder** — EDID Minder automatically manages EDID communication and ensures that all sources power up properly and reliably output content for display.
- **Image freeze control** — A live image can be frozen using RS-232 serial control.
- **On-screen display** — Displays status information pertaining to the currently selected input, including resolution, format, and HDCP status, and facilitates easy system setup and troubleshooting.
- **Power Save Mode** — Can be placed in a low power standby state to conserve energy when not in use.
- **Picture control adjustment** — Used for brightness, contrast, color, tint, and detail settings, as well as horizontal and vertical positioning, and sizing.
- **Automatic 3:2 and 2:2 pulldown detection** — Advanced film mode processing techniques that help maximize image detail and sharpness for NTSC, PAL, and HDTV 1080i sources that originated from film.
- **Quad standard, 3D composite video decoding** — A temporal, 3D adaptive comb filter provides advanced decoding of composite NTSC 3.58, NTSC 4.43, PAL, and SECAM for integration into systems worldwide.
- **User presets** — Memory presets are available for each input to store and recall optimized image settings.
- **Internal test patterns for calibration and setup** — The DSC 301 HD offers a crop pattern, crosshatch, grayscale, color bars, alternating pixels, blue mode, and audio pink noise.

- **Front panel security lockout** — This feature can block all front panel control, or limit front panel to input selection only. All functions however, are available through RS-232 control.
- **RS-232 control port** — Enables the use of serial commands for complete control and configuration or integrated into a control system. Extron products use the SIS™ - Simple Instruction Set command protocol, a set of basic ASCII code commands that allow for quick and easy programming.
- **Front-panel USB configuration port** — Enables easy configuration without having to access the rear panel.
- 1 inch (2.5 cm) high, half rack width metal enclosure
- Includes LockIt HDMI cable lacing brackets
- **Energy-efficient external universal power supply included** — Provides worldwide power compatibility, low power consumption, and reduced operating costs.

ATTENTION:

- If not provided with a power supply, this product is intended to be supplied by a UL Listed power source marked Class 2 or LPS and rated output 12 VDC, minimum 1.0 A.
- Si ce produit ne dispose pas de sa propre source d'alimentation électrique, il doit être alimenté par une source d'alimentation certifiée UL de classe 2 ou LPS et paramétré à 12 V et 1,0 A minimum

Installation

This section provides a description of the DSC 301 HD rear panel connectors and instructions for cabling.

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- L'installation et l'entretien doivent être effectués uniquement par un électricien qualifié.

Rear Panel Connections

This section describes how to connect cables to a DSC 301 HD scaler.

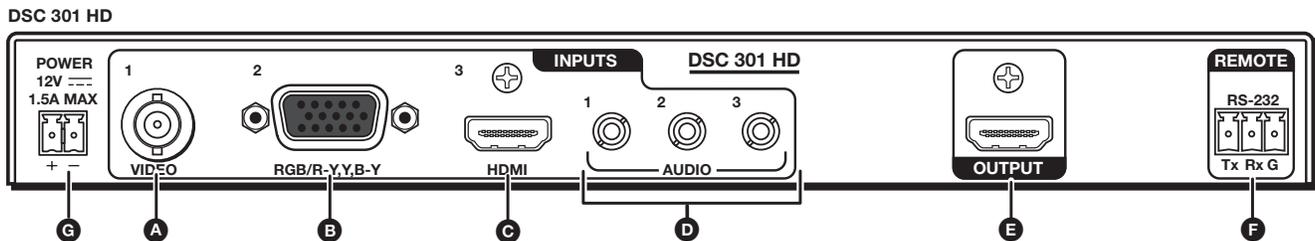
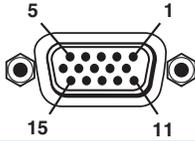


Figure 1. DSC 301 HD Rear Panel Features

Inputs and Outputs		Control and Power	
A	Input 1 (BNC connector)	E	HDMI output
B	Input 2 (15-pin HD connector)	F	Remote RS-232 control port
C	Input 3 (HDMI connector)	G	Power input
D	Audio inputs 1-3		

- A Input 1** — Connect a composite video input to this BNC connector.
- B Input 2** — Connect an input to this configurable analog 15-pin HD (VGA) connector for RGBHV, HD component video, or YUVi signals.

The analog input port can be configured to accept RGB (RGBHV, RGBs) or component video (bi- or tri-level) signals. The default setting is for RGB. The [table](#) on the next page shows the pinouts for each format type on the 15-pin HD (VGA) connector. The 15-pin HD supports EDID emulation.

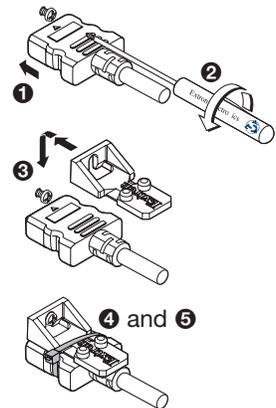
Pinout Table for 15-pin HD Connector			
Pin	RGBHV	RGBs	Component
1	Red	Red	R-Y
2	Green	Green	Y
3	Blue	Blue	B-Y
4	No Connection	No Connection	
5	No Connection	No Connection	
6	Red Return	Red Return	R-Y Return
7	Green Return	Green Return	Y Return
8	Blue Return	Blue Return	B-Y Return
9			
10	Ground	Ground	
11	No Connection	No Connection	
12	EDID/DDC	EDID/DDC	
13	H Sync	C Sync	
14	V Sync		
15	EDID/DDC	EDID/DDC	

C Input 3 — Connect an HDMI source to this HDMI connector (see **figure 1** on the previous page).

Audio from the HDMI input can be de-embedded from the HDMI source. This allows you to choose to select audio either from the HDMI input or the analog audio 3.5 mm TRS inputs. Default selection is 2-channel digital audio from the HDMI input.

Secure the HDMI input to the HDMI connector using the LockIt bracket as follows:

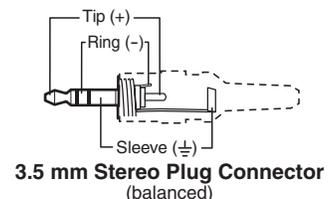
1. Plug the HDMI cable into the panel connection.
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it.
3. Place the LockIt lacing bracket onto the screw and slide it up against the HDMI connector. Tighten the screw to secure the bracket.
4. Loosely place the included tie wrap around the HDMI connector and LockIt lacing bracket.
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length.



ATTENTION:

- Do not overtighten the HDMI connection mounting screw. The shield it fastens to is very thin and can easily be stripped.
- Ne serrez pas trop la vis de montage du connecteur HDMI. Le blindage auquel elle est attachée est très fin et peut facilement être dénudé.

D Audio inputs 1-3 — Connect audio sources to these three 3.5 mm stereo mini jack TRS connectors (see connector image at right).



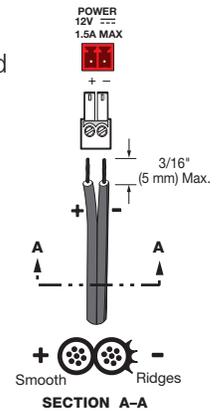
- E HDMI output** — Connect an HDMI display device to this HDMI connector. Secure the HDMI input to the HDMI connector using the LockIt bracket (see **Input 3** on the previous page for instructions).
- F RS-232 port** — For serial RS-232 control, connect a host computer or control system to the 3-pole captive screw connector (see the wiring in figure 2).



Figure 2. Wiring the RS-232 Port

NOTE: The default protocol is 9600 baud, 1 stop bit, no parity, 8 data bits, no flow control.

- G Power input** — Insert the cord from the supplied 12 V, 1.5 A power source into this 2-pole connector. The front panel control and input selection buttons light in sequence during power-up (see the wiring in the image at right).



Operation

This section of the manual discusses the operation of a DSC 301 HD device, and is divided into the following sections:

- [Front Panel Overview](#)
- [DSC 301 HD Menu System – Configuration and Adjustments](#)
- [Front Panel Lockout \(Executive Modes\)](#)

Front Panel Overview

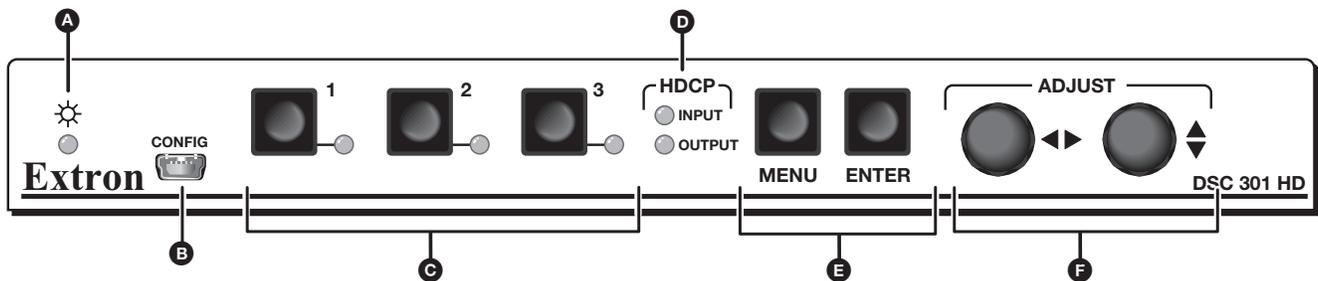


Figure 3. DSC 301 HD Front Panel Features

- A Status LED (power and signal)** — This LED lights amber when power is present but no signal is detected, and green when power and signal are both present.
- B USB mini-B configuration port** — Connect a computer to this USB mini-B port for device configuration, control, and firmware upgrades.
- C Input selection buttons and LEDs (1-3)** —
 - **Input LEDs** — The LED of the selected input lights when the button is pressed.
 - **Input 1 (composite video input button)** — Input 1 selects the composite video input.
 - **Input 2 (configurable input button)** — Input 2 selects the RGB (RGBHV, RGBS) or YUV (YUV-HD, YUVp, YUVi) input.
 - **Input 3 (HDMI/DVI button)** — Input 3 selects the HDMI or DVI input signal.
- D HDCP content LEDs** — These LEDs indicate HDCP status for inputs and output
 - Light green when the input or connected display is HDCP encrypted.
 - Remain unlit when the current input or HDMI output is not HDCP encrypted.
 - Blink amber when the video output has been disabled (such as when in sync mute or screen saver mode).
- E Menu Navigation buttons (Menu and Enter)** —
 - **Menu** — Press this button to access and move through the OSD menu system.
 - **Enter** — Press this button to step through the OSD submenus (see the [DSC 301 HD OSD Menu System – Configuration and Adjustments](#) section on the next page).
- F Adjustment knobs (horizontal ◀▶ and vertical ⬆⬇)** — When using the menu system, rotate either of these two knobs to scroll through the menu options and to make any adjustments.

DSC 301 HD OSD Menu System – Configuration and Adjustments

Scaler configuration and adjustments can be performed by using the On-screen Display (OSD) menu or the Extron SIS commands (see the [SIS Communication and Control](#) section, starting on page 22).

The OSD menu can be seen on the connected display device.

OSD Menu Navigation Using Front Panel Controls

- **Menu button** — Press the **Menu** button (see [figure 3](#), **E**) on the previous page) to activate or deactivate the main menu.
- **Enter button** — Press the **Enter** button (**E**) to move between the submenus of a selected main menu item and to exit and accept the setting.
- **Adjust (↕, ◀▶) knobs** — In the menu configuration mode, rotate the horizontal (◀▶) and vertical (↕) **Adjust** knobs (**F**) to scroll through submenu options and to make adjustment selections.

Menu Overview

The OSD menu has nine configuration submenus, two of which are read-only information pages.

Using each of the submenus, the video and audio inputs and the HDMI output of the DSC 301 HD can be configured. In addition, you can save and recall the input configuration as a user preset. The **Advanced** submenu allows you to choose a test pattern to aid in the system setup and to set up a screen saver display when there are no active input signals. Use the remote control port configuration to view the read-only **Communication** submenu. Use the read-only **Device Info** screen to view device status elements.

All submenu screens show the model name (DSC 301 HD) and firmware version in the header, and the input and output resolution information in the footer.

NOTES:

- Input x refers to the selected input, for example, Input 2.
- The **Device Info** menu and the **Communication** menu are read-only and give current device status.

To navigate and use the OSD menu:

1. Press the **Menu** button (**E**) once to open the menu on the display. The menu opens with the **Quick Setup** submenu (see [figure 4](#) on the next page).
2. If the desired submenu is not showing, use the **Adjust** knobs (↕, ▶◀) (see [figure 3](#), **F**) to navigate to the desired menu.
3. Press the **Enter** button to access the submenu (**E**).
4. Rotate either **Adjust** knob to cycle through the submenu to the desired option.

NOTE: Default values are indicated on the OSD by an asterisk (*).

5. Press the **Enter** button to access the submenu item.
6. Rotate either **Adjust** knob to adjust the value as desired.
7. Press **Enter** to accept the new value. Press it again if action confirmation is required.
8. Press **Menu** to exit the submenu. Press it again to exit and close the main menu.

NOTE: In any submenu, values that do not apply to the current input are shown as N/A.

Quick Setup submenu

This submenu (see figure 4) allows you to make basic configuration adjustments to the DSC 301 HD.



Figure 4. OSD Menu – Quick Setup Submenu

The configurable variables are:

Auto-Image — Select this option (1) to start a one-time Auto-Image on the current input.

INx: Input Format — Select this option (2) to change the input format.

NOTES:

- INx refers to the selected input, for example, Input 2, as shown in figure 3.
- View only for inputs 1 (composite video) and 3 (HDMI), selectable for input 2 (RGB or YUV).

IN2: EDID — Select this option (3) to match the output rate or to set a discrete EDID (see the [Resolutions and Refresh Rates table](#) on page 20 on page 20 for EDID data).

IN3: EDID — Select this option (4) to match the output rate or to set a discrete EDID (see the [Resolutions and Refresh Rates table](#) for EDID data).

Output Resolution — Select this (5) to set the resolution and refresh rate for the output. There are a number of factory installed output resolutions and rates, plus three custom user defined blocks (see the [presets table](#) on the next page for details).

Audio Mute — Select this option (6) to turn the audio mute option on or off.

Test Pattern — Select this option (7) to choose a suitable test pattern when setting up the DSC 301 HD and the corresponding output display. Available patterns are: **Off** (no test pattern), **Crop**, **Alternating Pixels**, **Color Bars**, **Gray Scale**, **Blue Mode**, and **Audio Test** (pink noise).

User Preset submenu

This submenu allows you to save centering and sizing information and picture adjustments as a user preset for future recall (see figure 5).



Figure 5. OSD Menu – User Presets Submenu

Up to three user presets per input can be saved or recalled. The submenu also has a clear preset setting.

Select **Save**, **Recall**, or **Clear** and use the adjust knobs to select the applicable user preset. Press the **Enter** button (see [figure 3](#), **E**, on page 8) to recall, save or clear the preset as required. Press **Enter** again to confirm the chosen action.

A user preset can be saved on one input resolution (for example saved on 480p) and later recalled onto another resolution (for example, recalled onto 1080p).

NOTE: If an unsaved user preset is recalled, INVALID PRESET is displayed.

An additional 128 global input presets are available via SIS commands (see the [SIS Communication and Controls](#) section, starting on page 22, for commands), or PCS (see [Preset Management](#) on page 62).

A summary and comparison of the user and input presets stored values is shown below.

User Presets		Input Presets			
Color	H Image Size	Input Type	Color	H Start	H Image Size
Tint	V Image Size	Preset Name	Tint	V Start	V Image Size
Contrast	H Image Position	Audio Gain/Attenuation	Contrast	H Active	H Image Position
Brightness	V Image Position	Film Mode	Brightness	V Active	V Image Position
Detail	Preset Name		Detail	Phase	Total Pixels

Picture Controls submenu

This submenu allows the user to adjust all of the picture settings (see figure 6).



Figure 6. OSD Menu – Picture Controls Submenu

Image Position — Select this option (1) to adjust the horizontal and vertical position of the image (range depends on the current output rate).

Image Size — Select this option (2) to adjust the horizontal and vertical size of the image. The range is limited by the output resolution (the maximum size is two times the output resolution).

Brightness and Contrast — Select this option (3) to independently adjust brightness and contrast (the range is 0 to 127, the default is 64).

Color and Tint — Select this option (4) to adjust the color and tint (the range is 0 to 127, default is 64).

NOTE: Color and Tint only apply to NTSC inputs.

Detail — Select this option (5) to adjust the detail (the range is 0 to 127, the default is 64).

Input submenu

This submenu allows you to configure the active input (see figure 7).

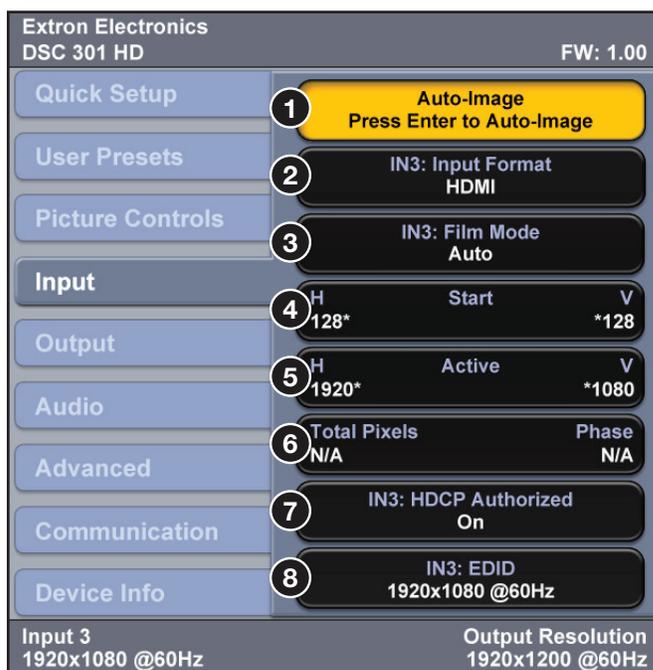


Figure 7. OSD Menu – Input Submenu

Auto-Image — Select this (1) to start a one-time Auto-Image on the active input.

Input x: Input Format — Select this (2) to change the active input format.

NOTE: Only input 2 can be changed (RGB or YUV). Input 1 is always composite video and input 3 is always HDMI.

Input x: Film Mode — Select this (3) to turn film mode on (auto detect mode) or off.

(Pixel) Start — Select this (4) to adjust the horizontal and vertical pixel start (range is 0 to +255, default is 128).

Active (pixels) — Select this (5) to adjust the horizontal and vertical active pixels (range is dependant on input).

Total Pixels and Phase — Select this (6) to set the number of active pixels and the phase value for RGB and YUV input signals.

Input x: HDCP Authorized — Select this (7) to turn the HDCP Authorized on (default) or off.

NOTE: Applies to HDMI input 3 only.

When disabled (off) the DSC 301 HD does not display content that requires HDCP, and displays either a blank screen or a warning message from the input source.

Input x: EDID — Select this (8) to change the EDID (resolution and refresh rate) for RGB, DVI or HDMI inputs. Set to either match output rate, or a custom user-defined EDID, or a factory setting (see [Resolutions and Refresh Rates table](#) on page 20 for EDID data).

Output submenu

This submenu allows you to configure the output (see figure 8).

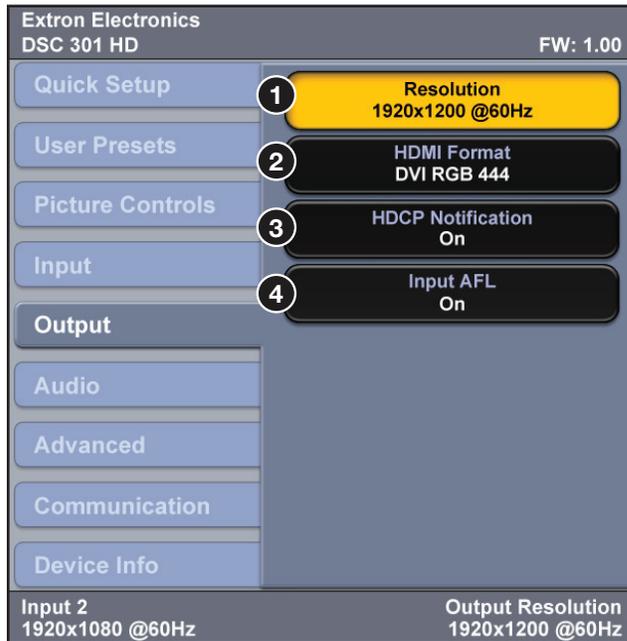


Figure 8. OSD Menu – Output Submenu

Resolution — Select this option (❶) to change the resolution and refresh rate for the connected output display (see the [Resolutions and Refresh Rates table](#) on page 20 for details).

HDMI Format — Select this option (❷) to set the HDMI output format. Choices are:

- **Auto** — (based on sink EDID), default
- **HDMI YUV 444 Full**
- **DVI RGB 444**
- **HDMI YUV 444 Limited**
- **HDMI RGB 444 Full**
- **HDMI YUV 422 Full**
- **HDMI RGB 444 Limited**
- **HDMI YUV 422 Limited**

HDCP Notification — Select this option (❸) to turn HDCP notification on (default) or off.

The HDCP Notification provides a means of determining if HDCP content restrictions are preventing a video signal from passing. The DSC 301 HD can notify the user that they are currently trying to view HDCP protected content through a non-HDCP compliant HDMI or DVI display. The options in this scenario include the ability to show a green screen with a moving OSD bug reading **HDCP CONTENT**, or to disable this message and instead output muted (black) video on non-HDCP compliant displays.



Figure 9. Green HDCP Notification Screen with OSD Bug

Input AFL — Select this option (see [figure 8](#), ④, on the previous page) to turn the Extron Accu-Rate Frame Lock (AFL) on or off.

When enabled, this mode locks the output vertical refresh rate to the vertical refresh rate of the currently selected input using Accu-Rate Frame Lock technology. This ensures no frames of the input are repeated or dropped due to frame rate conversion. Input AFL mode causes glitches, interruptions, or both in the output sync when a new input is selected, or when a new signal has been routed to the selected input, as the DSC 301 HD locks to the new vertical refresh rate.

If no input signal is detected (AFL is disabled), or if locking to the input signal is not possible, a free running pixel clock is generated by the DSC 301 HD.

Audio submenu

This submenu allows the user to configure the audio (see figure 10).



Figure 10. OSD Menu — Audio Submenu

NOTES:

- Multiple video inputs can share a single TRS audio input (see the [example of an audio setup](#) on the next page).
- HDMI input 3 can be set to use any analog TRS input, or to embedded digital, or to automatically use embedded digital audio when present or when not use analog TRS 3.

Audio Mute — Select this option (①) to turn global audio mute on or off

Input x: Audio Format — Select this option (②) to select the audio input format. Choices are:

Audio Input Format	Details	Inputs
None	Mutes all audio for selected input	All
Analog TRS 1	Sets selected input to analog TRS 1 (default for input 1)	All
Analog TRS 2	Sets selected input to analog TRS 2 (default for input 2)	All
Analog TRS 3	Sets selected input to analog TRS 3	All
LPCM-2Ch Digital	Sets selected input to 2Ch digital audio (default for input 3)	Input 3 only
Multi-Ch Digital	Sets selected input to Multi-Ch digital audio	Input 3 only
LPCM-2Ch Auto (TRS 3)	Sets selected input to use 2Ch digital audio (when present), else use analog TRS 3	Input 3 only
Multi-Ch Auto (TRS 3)	Sets selected input to use Multi-Ch digital audio (when present), else use analog TRS 3	Input 3 only

Input x: Gain/Attenuation — Select this option (see [figure 10](#), ③ on the previous page) to set the gain and attenuation for analog audio inputs (the range is -18 dB to +12 dB).

NOTE: For analog inputs TRS1, TRS2, and TRS3, or for digital auto modes only

Example of audio setup using an Extron Cable Cubby

- The Extron Cable Cubby has three video inputs (composite, RGB, and HDMI) that are connected to the DSC 301 HD, inputs 1 through 3.
- A single 3.5 mm TRS audio cable is connected to the analog TRS 3 input on the DSC 301 HD.
- Configure input 1 and input 2 to use audio from the analog TRS 3 input.
- Configure input 3 to LPCM-2Ch Auto to use digital audio when present, or when not present, to use analog TRS 3.

Advanced submenu

This submenu allows you to configure the global settings for the unit (see figure 11).



Figure 11. OSD Menu – Advanced Submenu

Test Pattern — Select this option (①) to use a test pattern during the setup of the system and checking the display device. Test pattern options are:

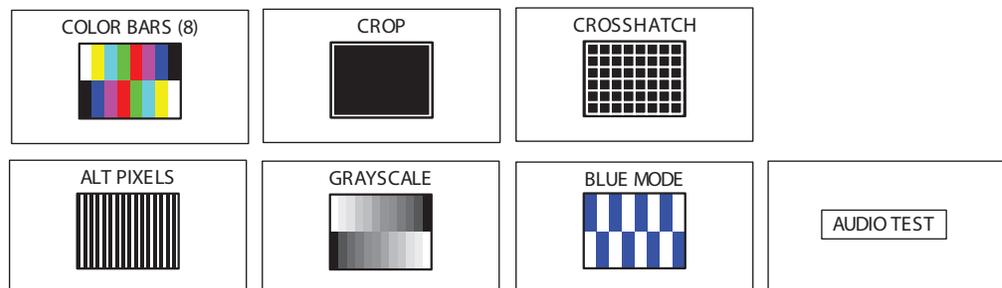


Figure 12. Test Pattern Options

NOTES:

- The audio test outputs pink noise on the embedded digital audio output (Ch 1 and 2, 48 kHz, 16 bit).
- All test patterns include a single pixel crop pattern line (except Blue mode).

Screen Saver and Timeout — Select the screen saver (see [figure 11](#), ② on the previous page) to mute the video output when no active video is detected. The screen saver can be set to a black (default) or a blue background for a specific (time-out) duration, before the output sync is disabled. The time-out duration can be set to Never (default), or to any duration from 1-500 seconds.

The screen saver option allows connected display devices to go into a low power standby mode when the DSC 301 HD has no active input.

Input x: Auto-Image — Select this options (③) to turn the per-input Auto-Image mode on or off. Auto-Image automatically attempts to size and position the image to **Fill** (or **Follow** to follow the native aspect ratio of the input) every time a new input signal is detected.

When enabled, Auto-Image mode is activated by switching physical inputs on the DSC (such as IN2 to IN3), or by any interruption in input sync, even if the same input resolution is detected (such as disconnecting and reconnecting the same input), or by a power cycle. Issuing an Auto-Image with overscan enabled, runs an auto phase routine (YUV and RGB only) and centers and sizes the input according to table values.

Input x: Aspect Ratio — Select this option (④) to set the per-input aspect ratio to **Fill** (fills the entire output raster) or to **Follow** (follows the native aspect ratio of the input).

When in Fill mode, if an Aspect Ratio adjustment for a single input rate is desired, the correct size and center can be manually set up under Picture Controls (Image Size and Position).

When in the Follow mode, each input rate is displayed with its native aspect ratio (4:3, 5:4, 15:9, 16:9, 16:10) with the correct letter box or pillar box settings visible under the **Image Size** and **Center** Picture Controls.

Input x: Auto Memory — Select this option (⑤) to turn the per-input Auto Memory on or off.

The DSC 301 HD has 32 auto memory locations per input, for RGB/YUV and HDMI inputs. YUV and RGB signals on the same input have unique auto memories; for example 720p YUV and 720p RGB are stored with unique Auto Memory settings.

Auto memory locations store the same Input Config and Picture Control values as an Input Preset, except for Input Type, Preset Name, Film Mode, or Audio Gain/Att.

Overscan — Select this option (⑥) to set the overscan mode (0%, 2.5% or 5.0%) per input type.

This zooms and crops SMPTE inputs to mask edge effects and ancillary data that are common in broadcast signals.

NOTE: Overscan is valid only on SMPTE input rates (NTSC, PAL, SECAM, 480p, 576p, 720p, 1080i, or 1080p, or 2k).

Auto Switch — Select this option (⑦) to turn the Auto Switch mode on or off, and to set the priority. The **Auto Switch** setting allows for basic, unmanaged, input switching based on the presence of active input signals. Auto Switch mode options are:

- Disabled (off)
- Setting priority to **High to low** (input 3 to input 1)
- Setting priority to **Low to high** (input 1 to input 3).

Factory Reset — This option (see [figure 11](#), ⑧ on page 16) resets the device back to factory defaults (retains current firmware).

NOTE: FACTORY RESET is displayed on the OSD for 1 minute after the reset to allow time for the display device to sync with the DSC 301 HD output.

To reset the DSC 301 HD to factory setting, including original shipped firmware, press and hold the Enter button for 20 seconds while applying power. The message **FIRMWARE RESET** is displayed on the OSD to indicate the reset is completed.

When a firmware reset is applied, the loaded current firmware is deleted and only the factory firmware remains on the device.

Communication submenu

This read-only submenu allows the remote port settings for the unit to be viewed. No adjustment is possible via the OSD menu (see [figure 13](#)).



Figure 13. OSD Menu — Communication Submenu

Device Info submenu

This read-only menu allows the user to view the current device status (see figure 14).



Figure 14. OSD Menu – Device Info Submenu

The viewable device status information is:

- Device internal temperature (in degrees F and C)
- The current active input details (resolution, signal format, and total lines)
- Output resolution and refresh rate and output format
- AFL status (locked or disabled)
- HDCP status (input status and HDMI output status)
- Display Info (resolution and refresh rate)
- Firmware build details

Resolutions and Refresh Rates

In addition to the 83 factory rates, there are also three custom, user-defined or captured rates available (C1 through C3). When no rate is captured or uploaded to any of the custom slots, they revert to the default setting — 720p/60 Hz.

Resolution	23.98 Hz	24 Hz	25 Hz	29.97 Hz	30 Hz	50 Hz	59.94 Hz	60 Hz	75 Hz
Custom 1 through 3	For captured or uploaded EDID tables								
640 x 480						X		X	X
800 x 600						X		X	X
852 x 480						X		X	X
1024 x 768						X		X	X
1024 x 852						X		X	X
1024 x 1024						X		X	X
1280 x 768						X		X	X
1280 x 800						X		X	X
1280 x 1024						X		X	X
1360 x 765						X		X	X
1360 x 768						X		X	X
1365 x 768						X		X	X
1366 x 768						X		X	X
1365 x 1024						X		X	X
1440 x 900						X		X	X
1400 x 1050						X		X	
1600 x 900						X		X	
1680 x 1050						X		X	
1600 x 1200						X		X	
1920 x 1200						X		X	
480p							X	X	
576p						X			
720p			X	X	X	X	X	X*	
1080i						X	X	X	
1080p	X	X	X	X	X	X	X	X	
2048 x 1080	X	X	X	X	X	X	X	X	

* = default value

Figure 15. Resolution and Refresh Rates

When a new custom rate is captured or uploaded, the On-screen Display (OSD) dynamically updates with the new rate for that custom slot. For example, if a custom 480p EDID is uploaded to slot C1, the LCD reads **C1: 720x480**. These three custom slots are shared between custom output resolutions (based on preferred timings 1 block) and custom EDID tables, which can be assigned to any input.

Custom EDIDs or Custom Output Resolution

The user can capture EDIDs or upload EDID files to make custom EDID available for emulation on inputs, or for the generation of custom output resolutions. The user can import a 128 or 256 byte EDID `.bin` file from a PC or can capture the EDID from an attached sink (display) device. This EDID can then be saved and stored in one of three custom EDID slots, which are then available for custom EDID emulation or custom output rate generation (custom rate based on the EDIDs preferred timings). These functions are available via SIS (see the [Resolutions and Refresh Rates table](#) on page 20).

Power Save

The DSC 301 HD has a power save mode that allows you to put the unit into a low power state, via SIS command (see [Power save mode](#) on page 33). This state effectively cuts the power consumption of the scaler. While in this mode, no audio or video input processing takes place, the HDMI output and all front panel LEDs are disabled.

Exit Power Save mode via any front panel button press, or by disabling Power Save via SIS command.

The scaler enters the Power Save state instantly after receiving the associated command, but requires 5-10 seconds to resume from the Power Save state.

Output Rate Reset

If an output image cannot be displayed due to an incompatible output rate, the DSC 301 HD can be reset via the front panel to either 1024x768 @ 60 Hz or 720p @ 60 Hz.

To set the rate or toggle between 1024x768 @ 60 Hz and 720p @ 60 Hz:

Press and hold inputs 1 and 3 simultaneously for approximately 3 seconds. The output rate becomes 1024x768 @ 60 Hz. Again, press and hold inputs 1 and 3 simultaneously for another 3 seconds and the output rate becomes 720p @ 60 Hz.

NOTE: The output rate subsequently toggles between 1024x768 @ 60 Hz and 720p @ 60 Hz each time inputs 1 and 3 are simultaneously pressed and held for 3 seconds.

Front Panel Lockout (Executive Modes)

The DSC 301 HD has three modes of front panel security lock that limit the operation of the unit from the front panel.

Executive mode 0 (disabled) — The front panel is fully unlocked. This is the default setting.

Executive mode 1 (enabled) — The front panel is completely locked. This mode can only be enabled and disabled using SIS commands.

NOTE: When Executive mode 1 is implemented and a front panel button is pressed, an OSD message indicates that Executive Mode 1 is enabled.

Executive mode 2 (enabled) — The front panel is locked except for input switching. This mode can be enabled and disabled using front panel buttons or SIS commands.

To prevent accidental changes to settings, press the Menu and Next buttons simultaneously for 2 seconds to enable front panel lockout mode (Executive Mode 2). An OSD message is displayed indicating Executive Mode 2 is enabled.

To unlock it via the front panel (mode 0), press the Menu and Next buttons simultaneously for 2 seconds. An OSD message is displayed indicating Executive Mode 2 is disabled.

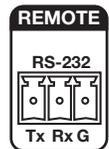
SIS Communication and Control

The DSC 301 HD can be configured and controlled via a host computer or other device (such as a control system) attached to the rear panel RS-232 connector or the front panel USB port. Control is made using the Extron SIS commands.

Commands can be entered using a Telnet application such as the Extron DataViewer, available at www.extron.com (see the DataViewer Help file for use).

This section describes SIS communication and control. Topics that are covered include:

- **Host to Scaler Communications**
- **Commands and Responses**
- **SIS Command and Response Table**



The scaler uses a protocol of 9600 baud, 1 stop bit, no parity, and no flow control and the rear panel remote port RS-232 captive screw connector has the pin assignments as shown at right.

Host-to-Scaler Communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the DSC 301 HD determines that a command is valid, it executes the command and sends a response to the host device. All responses from the scaler to the host end with a carriage return and a line feed (CR/LF = \leftarrow), indicating the end of the response character string (one or more characters).

Scaler-initiated Messages

When a local event such as a front panel selection or adjustment takes place, the DSC 301 HD scaler responds by sending a message to the host. No response is required from the host. Example scaler-initiated messages are listed here.

- In $\boxed{x1}$ A11 \leftarrow (where $\boxed{x1}$ is the input number during an input switch).
- Reconfig \leftarrow The DSC 301 HD sends this response when a new signal is detected.
- Hp1g0 $\boxed{x2}$ \leftarrow The DSC 301 HD sends this response when a hot plug event on output $\boxed{x2}$ is detected.

Copyright Information

\leftarrow © Copyright 2014, Extron Electronics, DSC 301 HD, Vn.nn, 60-1253-01 \leftarrow
The copyright message is displayed upon connecting to the product via USB or RS-232. Vn.nn is the firmware version number.

Error Responses

When the DSC 301 HD receives a valid command, it executes the command and sends a response to the host device. If the unit is unable to execute the command because the command contains invalid parameters, it returns an error response to the host.

Error numbers

E01 — Invalid input number	E14 — Not valid for this configuration
E10 — Invalid command	E17 — Invalid command for signal type
E11 — Invalid preset number	E22 — Busy
E13 — Invalid parameter	E25 — Device not present

Error response references

¹⁴ = Commands that give an E14 (invalid command for this configuration) error if sent to a product whose current configuration does not support the command.

Commands and Responses

Using the Command and Response Table

The **command and response table** (beginning on page 28) for SIS commands later in this chapter lists the commands that the DSC 301 HD scaler recognizes as valid, the responses that are returned to the host, a description of the function of the command or the results of executing the command, and an example of each command in ASCII (Telnet) and URL encoded (Web).

NOTE: Upper and lower case text can be used interchangeably.

ASCII to HEX Conversion Table										Esc 1B	CR 0D	LF 0A		
Space 20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27
(28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0 30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8 38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@ 40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H 48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P 50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X 58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
` 60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h 68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p 70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x 78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Figure 16. ASCII to Hexadecimal Character Conversion Table

Symbol Definitions

- = Space
 - ↵ = Carriage return with line feed
 - | or ← = Carriage return with no line feed
 - Esc or W = Escape
 - ¹⁴ = Superscripts indicate the error message displayed if the command is entered incorrectly or with invalid parameters (see [Error Response References](#) on the previous page).
 - x1 = Input selection, 1 = composite, 2 = RGB or YUV, 3 = HDMI
 - x2 = Output selection, 1 = HDMI
 - x3 = Input video format:
 - 1 = RGB
 - 2 = YUV
 - 3 = Composite
 - 4 = HDMI
 - x4 = Horizontal or vertical start — 0 to 255 (default midpoint = 128)
 - x5 = Pixel phase — 0 to 63 (default = 31)
 - x6 = Total pixels — (±512 of the default value)
 - x7 = Active pixels — (±512 of the default value)
 - x8 = Active lines — (±256 of the default value)
 - x9 = Enable or disable; 0 = Off or disable, 1 = On or enable
 - x10 = Input standard:
 - 0 = No signal detected 3 = NTSC 4.43
 - 1 = NTSC 3.85 4 = SECAM
 - 2 = PAL
 - = N/A (occurs when input is an active RGB, YUV [but not NTSC/PAL], or HDMI signal)
 - x11 = Internal temperature (in degrees Celsius)
 - x12 = Horizontal and vertical frequencies (format is three-digit with single decimal and leading zeros for example, 075.3)
 - x13 = Text label or preset name: up to 16 alphanumeric characters and minus sign/hyphen (-). No blank or space characters are permitted as part of a name. The first character must be a letter, and the last character must not be a minus sign/hyphen.
- NOTE:** User and input presets saved without a name are saved with the default names **User Preset xx** (for example, **User Preset 12**) or **Input Preset xxx** (for example **Input Preset 006**).
- x14 = Picture adjustment — 0 to 127 (default 64)
 - x15 = Horizontal and vertical position, range depends on resolution, with leading + or -, for example, -1075
 - x16 = Horizontal and vertical size, range depends on resolution
 - x17 = Scaler resolution or EDID emulation:
 - 0 = Automatic — Match current output resolution (default for EDID emulation) OSD displays **Match Output**.
 - 1 = Output #1 (HDMI connector — available for Export EDID commands only)
 - 2 = Custom EDID or output rate 1
 - 3 = Custom EDID or output rate 2
 - 4 = Custom EDID or output rate 3

See the [EDID resolutions and rates table](#) on the next page.

SIS Variables for EDID Resolution and Refresh Rate Combination (Where x17 = 10 through 92)									
Resolution	23.98 Hz	24 Hz	25 Hz	29.97 Hz	30 Hz	50 Hz	59.94 Hz	60 Hz	75 Hz
640x480						10		11	12
800x600						13		14	15
852x480						16		17	18
1024x768						19		20	21
1024x852						22		23	24
1024x1024						25		26	27
1280x768						28		29	30
1280x800						31		32	33
1280x1024						34		35	36
1360x765						37		38	39
1360x768						40		41	42
1365x768						43		44	45
1366x768						46		47	48
1365x1024						49		50	51
1440x900						52		53	54
1400x1050						55		56	
1600x900						57		58	
1680x1050						59		60	
1600x1200						61		62	
1920x1200						63		64	
480p							65	66	
576p						67			
720p			68	69	70	71	72	73*	
1080i						74	75	76	
1080p	77	78	79	80	81	82	83	84	
2048x1080 2k	85	86	87	88	89	90	91	92	

* Default output resolution

x18 = Test patterns:

0 = Off (default)

1 = Crop

2 = Alternating pixels

3 = Crosshatch

4 = Color bars

5 = Grayscale

6 = Blue mode

7 = Audio Test (crop pattern, OSD text "Audio Test", pink noise; Ch 1/2, 48 kHz, 24 bit)

x19 = User presets — 1 to 3 (for each input)

x20 = Input presets — 1 to 128 (global for device)

x21 = On-screen menu timeout or screen saver sync timeout, (default = 60 seconds)/output sync timeout (default = 501 = never)

0 = OSD never displayed or output sync is instantly disabled with no active input

1 through 500 = 1 second increments

501 = OSD and output sync never time out.

- x22** = Executive mode status:
 0 = Off or disable, (default)
 1 = Exec Mode 1 — Complete front panel lockout
 2 = Exec Mode 2 — Partial front panel lockout (only input selection available)
- x23** = Overscan (applied to SMPTE [NTSC, PAL, SECAM, 480p, 576p, 720p, 1080i, 1080p] input rates):
 0 = 0.0% (default for RGB, HDMI) — a true Auto-Image is executed on SMPTE inputs.
 1 = 2.5% (default for YUV, composite) — an Auto-Image command snaps to a 2.5% table: no true Auto-Image.
 2 = 5.0% an Auto-Image command snaps to a 5.0% table; no true Auto-Image.
- x24** = Aspect ratio:
 1 = Fill: each input rate will automatically fill the entire output raster (default)
 2 = Follow: each input rate will be displayed with its native aspect ratio
- x25** = Screen saver mode:
 1 = Black screen (default)
 2 = Blue output
- x26** = Video mute;
 0 = Off or disable
 1 = On or enable (mute to black)
 2 = mute all output sync and video
- x27** = Auto-Image threshold value, 0 (black) though 100 (white), default = 25
- x28** = HDCP status (valid only on TMDS inputs or outputs):
 0 = No sink or source detected
 1 = Sink or source detected with HDCP
 2 = Sink or source detected but no HDCP is present
- x29** = Video switching effect:
 0 = Cut (audio ramps-down and ramps-up between inputs)
 1 = Fade through black (default) (audio ramps-down and ramps-up between inputs)
- x31** = HDMI output format:
 0 = Auto (default), based on sink EDID
 1 = DVI
 2 = HDMI RGB Full
 3 = HDMI RGB Limited
 4 = HDMI 444 YUV Full
 5 = HDMI 444 YUV Limited
 6 = HDMI 422 YUV Full
 7 = HDMI 422 YUV Limited
- x32** = Auto switch mode:
 0 = Disable (default)
 1 = Gives priority to the highest input (3, then 2, then 1)
 2 = Gives priority to the lowest input (1, then 2, then 3)
- x33** = Audio gain and attenuation: -18 through +12 dB, (with leading + or -)
- x34** = Audio input type:
 0 = None, input is muted
 1 = Analog (TRS 1)
 2 = Analog (TRS 2)
 3 = Analog (TRS 3)
 4 = LPCM-2Ch (embedded in HDMI input, LPCM-2Ch audio requested from source via EDID)
 5 = LPCM Multi-Ch (embedded in HDMI input, all audio formats allowed via EDID)
 6 = -2Ch Auto (LPCM 2Ch audio requested from source via EDID).
 Scaler uses embedded digital audio when present, or defaults to TRS input 3
 7 = Multi-Ch Auto (Multi-Ch audio is requested from source via EDID).
 Scaler uses embedded digital audio when present, or defaults to TRS input 3

NOTE: Inputs 1 and 2 can be set only to **x34** = 0, 1, 2, or 3. Attempting to set these inputs to a digital format gives an E14 error message.

- x35** = Video signal status
 0 = Video / TMDS signal not detected
 1 = Video / TMDS signal detected
- x36** = Power Save mode
 0 = Full power mode (Default)
 1 = Low power state
- x37** = Screen saver status
 0 = Active input detected; timer not running
 1 = No active input; timer is running; output sync still active
 2 = No active input; timer has expired; output sync disabled
- x38** = Input AFL
 0 = Disabled; (default); free running pixel clock is generated internally
 1 = Input lock enabled; locks output vertical to the selected input vertical refresh rate.
- x39** = Input AFL status
 0 = Input signal AFL disabled
 1 = Input signal AFL enabled, but cannot lock to applied input signal. Device defaults to set output rate/refresh
 2 = Input signal AFL enabled, output locked to applied input signal
- x40** = HDMI input HDCP authorization status:
 0 = Block HDCP encryption
 1 = Allow HDCP encryption (default for input 3)
- x41** = HDCP mode:
 0 = Follow the input (default)
 1 = Always encrypt HDMI outputs
 2 = Follow the input with continuous DVI trials
 3 = Always encrypt the HDMI outputs with continuous DVI trials

NOTE:

When enabled, the HDCP mode can be set as follows:

- **Follow Input** — Encrypts the output only when required by the selected input source.
- **Always Encrypt Output** — Always encrypts the output, regardless of the HDCP status of the selected input source.
- **Follow Input (with continuous DVI trials)** — Encrypts the output only when required by the selected input source. Use this setting when DVI sink devices initially pass HDCP encrypted content, but intermittently display a green HDCP notification screen after a power cycle or resuming from sleep mode.
- **Always Encrypt Output (with continuous DVI trials)** — Always encrypts the output regardless of the HDCP status of the selected input source. Use this setting when DVI sink devices initially pass HDCP encrypted content, but intermittently display a green HDCP notification screen after a power cycle or resuming from sleep mode.

The Command and Response tables for SIS commands start on the next page.

SIS Command and Response Table

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Input Selection			
Video and audio	[x1]!	In[x1]•All←	Select video and audio from input [x1].
View current input	!	[x1]←	View current selected input [x1] (video only).
Input Video Format			
Set video format	[x1]*[x3]\	Typ[x1]*[x3]←	Set input [x1] to format [x3].
View set format	[x1]\	[x3]←	View set video format of input [x1].
Input EDID (VGA and HDMI)			
Assign EDID to input	[Esc]A[x1]*[x17]EDID←	EdidA[x1]*[x17]←	Assign EDID resolution and refresh rate [x17] for input [x1].
View assigned EDID data	[Esc]A[x1]EDID←	[x17]← EdidA[x1]*[x17]←	View assigned EDID resolution and refresh rate [x17] for input [x1]. (Verbose mode response)
Save an output EDID to custom slot	[Esc]S[x2]*[x17]EDID←	EdidS[x2]*[x17]←	Save output [x2] EDID to [x17]. (Valid when [x17] = 2, 3, or 4 only and [x2] = 1 only.)
Auto-Image			
Enable	[x1]*1A	Img[x1]*1←	Activate Auto-Image for input [x1].
Disable	[x1]*0A	Img[x1]*0←	Turn Auto-Image off for input [x1].
View	[x1]A	[x9]←	View Auto-Image setting [x9] for [x1].
Execute	A	Img←	Execute an Auto-Image to the selected input (follows current aspect setting).
Execute and Fill	1*A	Img1←	Execute an Auto-Image and fill entire output.
Execute and Follow	2*A	Img2←	Execute an Auto-Image and follow the aspect ratio of the input.
Auto-Image Threshold Value (luminosity value which the scaler defines as active video for Auto-Image)			
Set value	[Esc][x27]ALVL←	Alvl[x27]←	Set global Auto-Image luminosity value [x27].
View	[Esc]ALVL←	[x27]←	View global Auto-Image luminosity value [x27].

KEY: [x1] = Input number: 1 = composite, 2 = RGB/YUV, and 3 = HDMI
[x2] = Output selection: 1 = HDMI
[x3] = Input video format: 1 = RGB, 2 = YUV, 3 = Composite, 4 = HDMI
[x9] = Enable/Disable: 0 = Off or disable, 1 = On or enable
[x17] = Scaler resolution or EDID emulation, 0 = Automatic: match current output resolution (default),
2 = Custom EDID or output rate 1, 3 = Custom EDID or output rate 2, 4 = Custom EDID or output rate 3.
For variables 10-92, see the **SIS EDID table** on page 25.
[x27] = Auto-Image threshold value: 0 (black) though 100 (white), default = 25

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Horizontal Start			
Specify a value	Esc X4 HSRT ←	Hsrt X1 * X4 ←	Set horizontal location of first active pixel for current input.
Increment value	Esc +HSRT ←	Hsrt X1 * X4 ←	Increment horizontal start position.
Decrement value	Esc - HSRT ←	Hsrt X1 * X4 ←	Decrement horizontal start position.
View	Esc HSRT ←	X4 ←	Show horizontal location of first active pixel for current input.
Vertical Start			
Specify a value	Esc X4 VSRT ←	Vsrt X1 * X4 ←	Set vertical location of first active pixel for current input.
Increment value	Esc +VSRT ←	Vsrt X1 * X4 ←	Increase vertical start.
Decrement value	Esc - VSRT ←	Vsrt X1 * X4 ←	Decrease vertical start.
View	Esc VSRT ←	X4 ←	Show vertical location of first active pixel for current input.
Pixel Phase (Available only for RGB and YUV input signals)			
Specify a value	Esc X5 PHAS ←	Phas X1 * X5 ←	Adjust the pixel phase to specified value X5 for current input.
Increment value	Esc +PHAS ←	Phas X1 * X5 ←	Increase the pixel phase.
Decrement value	Esc - PHAS ←	Phas X1 * X5 ←	Decrease the pixel phase.
View	Esc PHAS ←	X5 ←	Show pixel phase for current input.
Total Pixels (Available only for RGB and YUV input signals)			
Specify a value	Esc X6 TPIX ←	Tpix X1 * X6 ←	Adjust the total pixels to specified value X6 for current input.
Increment value	Esc +TPIX ←	Tpix X1 * X6 ←	Increase the total pixels.
Decrement value	Esc - TPIX ←	Tpix X1 * X6 ←	Decrease the total pixels.
View	Esc TPIX ←	X6 ←	Show the total pixels for current input.
Active Pixels			
Specify a value	Esc X7 APIX ←	Apix X1 * X7 ←	Adjust the active pixels to a specified value X7 for current input.
Increment value	Esc +APIX ←	Apix X1 * X7 ←	Increase the active pixels.
Decrement value	Esc - APIX ←	Apix X1 * X7 ←	Decrease the active pixels.
View	Esc APIX ←	X7 ←	Show active pixels for current input.

KEY: **X1** = Input selection: 1 = composite, 2 = RGB or YUV, 3 = HDMI
X4 = Horizontal or vertical start: 0 to 255 (default midpoint = 128)
X5 = Pixel phase: 0 to 63 (default = 31)
X6 = Total pixels: ±512 of the default value
X7 = Active pixels: ±512 of the default value

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Active Lines			
Specify a value	Esc [x8] ALIN←	Alin[x1]*[x8]←	Adjust the active lines to a specified value [x8] for current input.
Increment value	Esc +ALIN←	Alin[x1]*[x8]←	Increase the active lines.
Decrement value	Esc -ALIN←	Alin[x1]*[x8]←	Decrease the active lines.
View	Esc ALIN←	[x8]←	Show the active lines for current input.
3:2, 2:2, and 24:1 Film Mode Detect			
Enable auto detection	Esc [x1]*1FILM←	Film[x1]*1←	Enable Auto Film Mode detection.
Disable	Esc [x1]*0FILM←	Film[x1]*0←	Disable Film Mode detection.
View	Esc [x1]FILM←	[x9]←	View the current Film Mode setting.
Picture Adjustments			
Video Mute			
Mute output to black	1B	Vmt1←	Mutes video and displays black video on output.
Mute all sync and video	2B	Vmt2←	Mutes sync and video output.
Unmute output	0B	Vmt0←	Unmutes output.
View	B	[x26]←	View the mute status [x26].
Color			
Set a specific value	Esc [x14]COLR←	Colr[x1]*[x14]←	Set color level to [x14] for current input.
Increment value	Esc +COLR←	Colr[x1]*[x14]←	Increment color level.
Decrement value	Esc -COLR←	Colr[x1]*[x14]←	Decrement color level.
View	Esc COLR←	[x14]←	View current setting for current input.
Tint			
Set a specific value	Esc [x14]TINT←	Tint[x1]*[x14]←	Set tint level to [x14] for current input.
Increment value	Esc +TINT←	Tint[x1]*[x14]←	Increment tint level.
Decrement value	Esc -TINT←	Tint[x1]*[x14]←	Decrement tint level.
View	Esc TINT←	[x14]←	View current setting for current input.
Contrast			
Set a specific value	Esc [x14]CONT←	Cont[x1]*[x14]←	Set contrast level to [x14] for current input.
Increment value	Esc +CONT←	Cont[x1]*[x14]←	Increment contrast level.
Decrement value	Esc -CONT←	Cont[x1]*[x14]←	Decrement contrast level.
View	Esc CONT←	[x14]←	View current setting for current input.

KEY: [x1] = Input selection: 1 = composite, 2 = RGB or YUV, and 3 = HDMI

[x8] = Active lines: ±256 of the default value

[x9] = Enable or disable: 0 = Off or disable, 1 = On or enable (default)

[x14] = Picture adjustment – 0 to 127 (default 64)

[x26] = Video mute: 0 = Off or disable, 1 = On or enable (mute to black), 2 = mute all output sync and video

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Picture Adjustments			
Brightness			
Set a specific value	Esc <u>X14</u> BRIT ←	Brit <u>X1</u> * <u>X14</u> ←	Set brightness level to <u>X14</u> for current input.
Increment value	Esc + BRIT ←	Brit <u>X1</u> * <u>X14</u> ←	Increment brightness level.
Decrement value	Esc - BRIT ←	Brit <u>X1</u> * <u>X14</u> ←	Decrement brightness level.
View	Esc BRIT ←	<u>X14</u> ←	View current setting for current input.
Detail Filter			
Set detail level	Esc <u>X14</u> HDET ←	Hdet <u>X1</u> * <u>X14</u> ←	Specify detail level to <u>X14</u> for current input.
Increment value	Esc + HDET ←	Hdet <u>X1</u> * <u>X14</u> ←	Increase the detail level.
Decrement value	Esc - HDET ←	Hdet <u>X1</u> * <u>X14</u> ←	Decrease the detail level.
View detail value	Esc HDET ←	<u>X14</u> ←	Show detail setting for current input.
Horizontal Position (Image)			
Specific value	Esc <u>X15</u> HCTR ←	Hctr <u>X15</u> ←	Set horizontal position to <u>X15</u> .
Increment value	Esc + HCTR ←	Hctr <u>X15</u> ←	Shift image right.
Decrement value	Esc - HCTR ←	Hctr <u>X15</u> ←	Shift image left.
View	Esc HCTR ←	<u>X15</u> ←	View the horizontal position value <u>X15</u> .
Vertical Position (Image)			
Specific value	Esc <u>X15</u> VCTR ←	Vctr <u>X15</u> ←	Set vertical position to <u>X15</u> .
Increment value	Esc + VCTR ←	Vctr <u>X15</u> ←	Shift image down.
Decrement value	Esc - VCTR ←	Vctr <u>X15</u> ←	Shift image up.
View	Esc VCTR ←	<u>X15</u> ←	View the vertical position value <u>X15</u> .
Horizontal Size (Image)			
Specific value	Esc <u>X16</u> HSIZ ←	Hsiz <u>X16</u> ←	Set horizontal sizing to <u>X16</u> .
Increase size	Esc + HSIZ ←	Hsiz <u>X16</u> ←	Widen the image.
Decrease size	Esc - HSIZ ←	Hsiz <u>X16</u> ←	Make the image narrower.
View	Esc HSIZ ←	<u>X16</u> ←	View horizontal sizing value <u>X16</u> .
Vertical Size (Image)			
Specific value	Esc <u>X16</u> VSIZ ←	Vsiz <u>X16</u> ←	Set vertical sizing to <u>X16</u> .
Increase size	Esc + VSIZ ←	Vsiz <u>X16</u> ←	Make the image taller.
Decrease size	Esc - VSIZ ←	Vsiz <u>X16</u> ←	Make the image shorter.
View	Esc VSIZ ←	<u>X16</u> ←	View vertical sizing value <u>X16</u> .
Compound Image Position and Size			
Specific value	Esc <u>X15</u> * <u>X15</u> * <u>X16</u> * <u>X16</u> XIMG ←	Ximg <u>X15</u> * <u>X15</u> * <u>X16</u> * <u>X16</u> ←	Set x, y position and x, y size for image.
View	Esc XIMG ←	<u>X15</u> * <u>X15</u> * <u>X16</u> * <u>X16</u> ←	View x, y position and x, y size for image.

KEY: X1 = Input selection: 1 = composite, 2 = RGB.YUV, and 3 = HDMI
X14 = Picture adjustment — 0 to 127 (default 64)
X15 = Horizontal or vertical position: -2200 to +2200
X16 = Horizontal or vertical size: 0000 to 4400

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description																																						
Presets																																									
User Presets																																									
Recall preset	1 * <u>X19</u> .	1Rpr <u>X19</u> ↵	Recall user preset <u>X19</u> for selected input.																																						
Save preset	1 * <u>X19</u> ,	1Spr <u>X19</u> ↵	Save user preset <u>X19</u> for selected input.																																						
Delete or clear preset	EscX1 * <u>X19</u> PRST ←	PrstX1 * <u>X19</u> ↵	Clears user preset <u>X19</u> , and sets user preset <u>X19</u> name to [unassigned].																																						
User Preset Name																																									
Write name	Esc1 * <u>X19</u> , <u>X13</u> PNAM ←	Pnam1 * <u>X19</u> , <u>X13</u> ↵	Set the user preset <u>X19</u> to <u>X13</u> .																																						
Read name	Esc1 * <u>X19</u> PNAM ←	<u>X13</u> ↵	Read the name for user preset <u>X19</u> .																																						
NOTE: Unassigned presets = “[unassigned]”. To restore a default user preset name, enter a single space character for <u>X13</u> . Valid only for previously saved presets.																																									
Input Presets																																									
Recall preset	2 * <u>X20</u> .	2Rpr <u>X20</u> ↵	Recall input preset <u>X20</u> for selected input.																																						
Save preset	2 * <u>X20</u> ,	2Spr <u>X20</u> ↵	Save input preset <u>X20</u> for selected input.																																						
Delete/clear preset	EscX2 * <u>X20</u> PRST ←	PrstX2 * <u>X20</u> ↵	Clears input preset <u>X20</u> , and sets input preset <u>X20</u> name to [unassigned].																																						
Input Preset Name																																									
Write name	Esc2 * <u>X20</u> , <u>X13</u> PNAM ←	Pnam2 * <u>X20</u> , <u>X13</u> ↵	Set the input preset <u>X20</u> to <u>X13</u> .																																						
Read name	Esc2 * <u>X20</u> PNAM ←	<u>X13</u> ↵	Read the name for input preset <u>X20</u> .																																						
NOTE: Unassigned presets = [unassigned]. To restore a default user preset name, enter a single space character for <u>X13</u> . Valid only for previously saved presets.																																									
<table border="1"> <thead> <tr> <th colspan="2">User Presets</th> <th colspan="4">Input Presets</th> </tr> </thead> <tbody> <tr> <td>Color</td> <td>H/V Image Position</td> <td>Color</td> <td>H/V Image Position</td> <td>Input Type</td> <td>H Start</td> </tr> <tr> <td>Tint</td> <td>H/V Image Size</td> <td>Tint</td> <td>H/V Image Size</td> <td>Audio Gain/Attenuation</td> <td>V Start</td> </tr> <tr> <td>Contrast</td> <td>Preset Name</td> <td>Contrast</td> <td>Preset Name</td> <td>Film Mode</td> <td>H Active</td> </tr> <tr> <td>Brightness</td> <td></td> <td>Brightness</td> <td></td> <td>Total Pixels</td> <td>V Active</td> </tr> <tr> <td>Detail</td> <td></td> <td>Detail</td> <td></td> <td></td> <td>Phase</td> </tr> </tbody> </table>		User Presets		Input Presets				Color	H/V Image Position	Color	H/V Image Position	Input Type	H Start	Tint	H/V Image Size	Tint	H/V Image Size	Audio Gain/Attenuation	V Start	Contrast	Preset Name	Contrast	Preset Name	Film Mode	H Active	Brightness		Brightness		Total Pixels	V Active	Detail		Detail			Phase				
User Presets		Input Presets																																							
Color	H/V Image Position	Color	H/V Image Position	Input Type	H Start																																				
Tint	H/V Image Size	Tint	H/V Image Size	Audio Gain/Attenuation	V Start																																				
Contrast	Preset Name	Contrast	Preset Name	Film Mode	H Active																																				
Brightness		Brightness		Total Pixels	V Active																																				
Detail		Detail			Phase																																				

KEY: X13 = Text label or preset name, up to 16 characters
X19 = User preset, 1-3 for each input
X20 = Input presets, 1-128 (global)

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Presets (continued)			
Auto Memories (per input)			
Enable	<code>[Esc][X1]*1AMEM←</code>	<code>Amem[X1]*1↵</code>	Set auto memory on. Previous settings for incoming signal are auto recalled.
Disable	<code>[Esc][X1]*0AMEM←</code>	<code>Amem[X1]*0↵</code>	Set auto memory off. Manual recall of input presets needed to configure input.
View setting	<code>[Esc][X1]AMEM←</code>	<code>[X9]↵</code>	View current auto memory for input <code>[X1]</code> .
Output Configuration			
Output Scaler Rate			
Set output rate	<code>[Esc][X17]RATE←</code>	<code>Rate[X17]↵</code>	Select output resolution and refresh rate.
View output rate	<code>[Esc]RATE←</code>	<code>[X17]↵</code>	Show selected output rate.
HDMI Output Format			
Set format	<code>[Esc][X31]VTPO←</code>	<code>Vtpo[X31]↵</code>	Set output color space/format for the HDMI output <code>[X31]</code> .
View setting	<code>[Esc]VTPO←</code>	<code>[X31]↵</code>	Show current HDMI format.
Power Save Mode			
Power save off	<code>[Esc]0PSAV←</code>	<code>Psav0↵</code>	DSC runs in full power mode (default).
Power save on	<code>[Esc]1PSAV←</code>	<code>Psav1↵</code>	DSC enters low power mode. Can only be exited using <code>[Esc]0PSAV←</code> command or front panel button press.
View setting	<code>[Esc]PSAV←</code>	<code>[X36]↵</code>	View power save status.

KEY:

- `[X1]` = Input selection: 1 = composite, 2 = RGB.YUV, and 3 = HDMI, 720p/60, 1080p/60, 1920x1200/60.
- `[X9]` = Enable or disable: 0 = Off or disable, 1 = On or enable. See the [SIS command EDID table](#) on page 25 for full details.
- `[X17]` = Scaler resolution or EDID emulation, 0 = Automatic: match current output resolution (default), 2 = Custom EDID or output rate 1, 3 = Custom EDID or output rate 2, 4 = Custom EDID or output rate 3. For variables 10-92, see the [SIS EDID table](#).
- `[X31]` = HDMI output format:
0 = Auto (default), 1 = DVI, 2 = HDMI RGB Full, 3 = HDMI RGB Limited, 4 = HDMI 444 YUV Full,
5 = HDMI 444 YUV Limited, 6 = HDMI 422 YUV Full, 7 = HDMI 422 YUV Limited.
See the [command description](#) on page 26.
- `[X36]` = Power save mode: 0 = Full power mode (default), 1 = Low power state

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Output Configuration, continued			
Screen Saver Mode (action that takes place when no signal is detected on the selected input)			
Set mode	Esc M $\overline{x25}$ SSAV ←	SsavM $\overline{x25}$ ←	Sets the screen saver mode to $\overline{x25}$ (default: 1 = black)
View mode	Esc MSSAV ←	$\overline{x25}$ ←	View the current screen saver mode.
Set sync time out duration	Esc T $\overline{x21}$ SSAV ←	SsavT $\overline{x21}$ ←	Sets sync time out duration to $\overline{x21}$ seconds (default: 501 = never).
View sync time out duration	Esc TSSAV ←	$\overline{x21}$ ←	View sync time out duration $\overline{x21}$.
View screen saver status	Esc SSSAV ←	$\overline{x37}$ ←	View the screen saver status $\overline{x37}$.
Audio Configuration			
Audio Mute (global setting)			
Mute on	1Z	Amt1 ←	Mute audio output.
Mute off	ØZ	AmtØ ←	Unmute audio output.
View status	Z	$\overline{x9}$ ←	View mute status.
Audio Gain and Attenuation (per analog input)			
Set gain and attenuation	$\overline{x33}$ G	Aud $\overline{x33}$ ←	Set gain and attenuation on current input to $\overline{x33}$ dB.
Increment	+G	Aud $\overline{x33}$ ←	Increment audio level (up).
Decrement	-G	Aud $\overline{x33}$ ←	Decrement audio level (down).
View	G	$\overline{x33}$ ←	View current audio level.
Audio Input Format			
NOTES:			
<ul style="list-style-type: none"> • Selects between analog (3.5 mm TRS) or digital (embedded in HDMI input) audio sources. • Inputs 1 and 2 $\overline{x34}$ can be set only to 0, 1, 2, or 3. Attempting to set these inputs to a digital format yields an E14 error response. • Digital auto modes (6 or 7) detect and use embedded audio when present, or use TRS 3 if digital audio is not detected 			
Set None	Esc I $\overline{x1}$ *ØAFMT ←	AfmtI $\overline{x1}$ *Ø ←	Mutes all audio for input $\overline{x1}$.
Set Analog TRS 1	Esc I $\overline{x1}$ *1AFMT ←	AfmtI $\overline{x1}$ *1 ←	Select analog audio for input $\overline{x1}$ (default for input 1).

KEY:	$\overline{x1}$ = Input selection: 1 = composite, 2 = RGB.YUV, and 3 = HDMI
	$\overline{x9}$ = Enable or disable: 0 = Off or disable, 1 = On or enable
	$\overline{x21}$ = On-screen menu timeout: (default = 60 seconds), output sync timeout (default = 501 - never) 0 = OSD never displayed or output sync is instantly disabled with no active input, 1 to 500, in 1 second increments, 501 = OSD never times out/output sync never times out
	$\overline{x25}$ = Screen saver mode: 1 = Black screen (default), 2 = Blue screen with OSD text
	$\overline{x33}$ = Audio gain and attenuation: -18 through + 12 dB, (with leading "+" or "-")
	$\overline{x34}$ = Audio Input type: 0 = None, 1 = Analog TRS 1, 2 = Analog TRS 2, 3 = Analog TRS 3, 4 = LPCM-2Ch, 5 = Multi-Ch, 6 = LPCM-2Ch Auto, 7 = Multi-Ch Auto. See the command description on page 26 for variable details.
	$\overline{x37}$ = Screen saver status: 0 = Active input detected, timer is not running. 1 = No active input, timer is running, output sync is still active. 2 = No active input, timer has expired, output sync is disabled.

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Audio Configuration (continued)			
Set Analog TRS 2	<code>Esc I [X1] * 2 AFMT ←</code>	<code>Afmt I [X1] * 2 ↵</code>	Select analog audio for input [X1] (default for input 2).
Set Analog TRS 3	<code>Esc I [X1] * 3 AFMT ←</code>	<code>Afmt I [X1] * 3 ↵</code>	Select analog audio for input [X1].
Set LPCM-2Ch	<code>Esc I [X1] * 4 AFMT ←</code>	<code>Afmt I [X1] * 4 ↵</code>	Select LPCM-2Ch audio for input [X1] (default for input 3).
Set Multi-Ch	<code>Esc I [X1] * 5 AFMT ←</code>	<code>Afmt I [X1] * 5 ↵</code>	Select Multi-Ch audio for input [X1].
Set LPCM-2Ch Auto	<code>Esc I [X1] * 6 AFMT ←</code>	<code>Afmt I [X1] * 6 ↵</code>	Select auto detect audio for input [X1] (valid for input 3 only — EDID set to LPCM-2Ch).
Set Multi-Ch Auto	<code>Esc I [X1] * 7 AFMT ←</code>	<code>Afmt I [X1] * 7 ↵</code>	Select auto detect audio for input [X1] (valid for inputs 3 only — EDID set to Multi-Ch).
View audio type	<code>Esc I [X1] AFMT ←</code>	<code>[X34] ↵</code>	View the audio input type [X34] for input [X1].
Advanced Configuration			
Test Pattern			
Set test pattern	<code>Esc [X18] TEST ←</code>	<code>Test [X18] ↵</code>	Set the test pattern to [X18].
View test pattern	<code>Esc TEST ←</code>	<code>[X18] ↵</code>	View the current test pattern.
Freeze			
Enable	1F	<code>Frz 1 ↵</code>	Freeze selected input.
Disable	ØF	<code>Frz Ø ↵</code>	Unfreeze selected input.
View	F	<code>[X9] ↵</code>	Show the freeze status.
Input Aspect Ratio (per input)			
Enable Fill mode	<code>Esc [X1] * 1 ASPR ←</code>	<code>Aspr [X1] * 1 ↵</code>	Sets input [X1] to always fill the entire raster (default).
Enable Follow mode	<code>Esc [X1] * 2 ASPR ←</code>	<code>Aspr [X1] * 2 ↵</code>	Sets input [X1] to preserve its native aspect.
View aspect ratio	<code>Esc [X1] ASPR ←</code>	<code>[X24] ↵</code>	View aspect ratio for input [X1].
Auto Switch Mode			
Disable	<code>Esc Ø AUSW ←</code>	<code>Ausw Ø ↵</code>	Manual switching only (default).
Priority to highest active	<code>Esc 1 AUSW ←</code>	<code>Ausw 1 ↵</code>	Gives priority to the highest numbered active input.
Priority to lowest active	<code>Esc 2 AUSW ←</code>	<code>Ausw 2 ↵</code>	Gives priority to the lowest numbered active input.
View setting	<code>Esc AUSW ←</code>	<code>[X32] ↵</code>	View current auto switch mode.

KEY: [X1] = Input selection: 1 = composite, 2 = RGB or YUV, and 3 = HDMI
[X9] = Enable or disable: Ø = Off/ or disable, 1 = On or enable
[X18] = Test patterns:
Ø = Off (default), 1 = Crop, 2 = Alternating pixels, 3 = Crosshatch, 4 = Color bars, 5 = Grayscale
6 = Blue mode, 7 = Audio Test (crop pattern, OSD text **Audio Test**, pink noise. Ch 1/2, 48 kHz, 24 bit)
[X24] = Aspect ratio:
1 = Fill: each input rate automatically fills the entire output raster (default)
2 = Follow: each input rate is displayed with its native aspect ratio
[X32] = Auto switch mode:
Ø = Disable (default), 1 = Priority to highest numbered input, 2 = Priority to lowest numbered input
[X34] = Audio Input type: Ø = None, 1 = Analog TRS 1, 2 = Analog TRS 2, 3 = Analog TRS 3, 4 = LPCM-2Ch, 5 = Multi-Ch, 6 = LPCM-2Ch Auto, 7 = Multi-Ch Auto (see the [command description](#) on page 26 for variable details).

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Advanced Configuration, continued			
Video Effect			
Cut	Esc 0SWEF ←	Swef0 ←	Sets the switch to cut.
Fade through black	Esc 1SWEF ←	Swef1 ←	Sets the switch to fade through black.
View setting	Esc SWEF ←	x29 ←	View setting.
Front Panel Security Lockout (Executive Mode)			
Enable Executive mode 1	1X	Exe1 ←	Lock entire front panel.
Enable Executive mode 2	2X	Exe2 ←	Limited front panel adjustments (input selection) can be made.
Disable Executive mode	ØX	ExeØ ←	Unlock front panel controls. All front panel adjustments can be made.
View Executive mode status	X	x22 ←	View the current status.
Overscan Mode (applies only to SMPTE [NTSC, PAL, SECAM, 480p-1080p 50/60] input rates)			
Set value	Esc x3 * x23 OSCN ←	0scn x3 * x23 ←	Set input format x3 to overscan mode x23 .
View status	Esc x3 OSCN ←	x23 ←	Show overscan mode status for input format x3 .
HDCP Notification (green screen with message)			
Enable notification	Esc N1HDCP ←	HdcpN1 ←	Enable the HDCP notification.
Disable notification	Esc NØHDCP ←	HdcpNØ ←	Disable the HDCP notification; instead mute output.
Query notification	Esc NHDCP ←	x9 ←	Query the HDCP notification.
HDCP Status (valid for HDMI input and HDMI output only)			
Query input	Esc I x1 HDCP ←	x28 ← HdcpI x1 * x28 ←	Query the HDCP status of the current input x1 . (verbose mode response)
Query output	Esc O x2 HDCP ←	x28 ← HdcpO x2 * x28 ←	Query the HDCP status of the HDMI output x2 . (verbose mode response)

KEY:

- x1** = Input selection: 1 = composite, 2 = RGB or YUV, and 3 = HDMI
- x2** = Output selection: 1 = HDMI
- x3** = Input video format: 1 = RGB, 2 = YUV, 3 = Composite, 4 = HDMI
- x9** = Enable or disable: 0 = Off or disable, 1 = On or enable
- x22** = Executive mode: 0 = Off or disable (default), 1 = Exec mode 1 (complete panel lockout), 2 = Exec mode 2 (partial lockout- input switching only).
- x23** = Overscan (applied to SMPTE [NTSC, PAL, SECAM, 480p, 576p, 720p, 1080i, 1080p] input rates):
 - 0 = 0.0% (default for RGB, HDMI) — a “true” Auto-Image will be executed on SMPTE inputs.
 - 1 = 2.5% (default for YUV, composite) — an Auto-Image command snaps to a 2.5% table; no true Auto-Image.
 - 2 = 5.0% — an Auto-Image command snaps to a 5.0% table; no true Auto-Image.
- x28** = HDCP status (valid only on TMDS inputs or outputs):
 - 0 = No sink or source detected
 - 1 = Sink or source detected with HDCP
 - 2 = Sink or source detected but no HDCP is present
- x29** = Video switching effect:
 - 0 = Cut, 1 = Fade through black (default)

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Advanced Configuration, continued			
HDCP Input Authorization (valid for HDMI input only)			
Enable HDCP encryption support	<code>[Esc]E[x1]*1HDCP←</code>	<code>HdcpE[x1]*1←</code>	Enable HDCP encryption support for input <code>[x1]</code> (default).
Disable HDCP encryption support	<code>[Esc]E[x1]*0HDCP←</code>	<code>HdcpE[x1]*0←</code>	Disable HDCP encryption support for input <code>[x1]</code> .
Query encryption support status	<code>[Esc]E[x1]HDCP←</code>	<code>[x40]←</code>	Query HDCP encryption support status for input <code>[x1]</code> .
HDCP Mode (valid for HDMI outputs only) (see page 27 for details)			
Set HDCP mode	<code>[Esc]S[x41]HDCP←</code>	<code>HdcpS[x41]←</code>	Set the HDCP mode to <code>[x41]</code> .
View HDCP mode setting	<code>[Esc]SHDCP←</code>	<code>[x41]←</code> <code>HdcpS[x41]←</code>	View the HDCP mode. Verbose modes 2 and 3.
AFL			
Disable AFL	<code>[Esc]0GLOK←</code>	<code>Glok0←</code>	Disables global input lock/AFL (default).
Enable input lock	<code>[Esc]1GLOK←</code>	<code>Glok1←</code>	Locks the output refresh rate to the refresh rate of the selected input.
View AFL setting	<code>[Esc]GLOK←</code>	<code>[x38]←</code>	View the current input lock/AFL setting.
View AFL status	<code>[Esc]41STAT←</code>	<code>[x39]←</code> <code>41Stat•[x39]←</code>	View the current input lock/AFL status. (<i>verbose mode response</i>)
Video Signal Presence			
View signal presence	<code>[Esc]0LS←</code>	<code>[x35]*[x35]*[x35]←</code>	Input 1*2*3.

KEY:

- `[x1]` = Input selection: 1 = composite, 2 = RGB or YUV, 3 = HDMI
- `[x35]` = Video signal status: 0 = Video or TMDS not detected, 1 = Video/TMDS detected
- `[x38]` = Input AFL: 0 = Disabled (default), 1 = Input signal AFL enabled. See [command description](#) on page 27 for variable details.
- `[x39]` = Input AFL status: 0 = Input signal lock disabled, 1 = Input signal lock enabled, but cannot lock to applied input signal, 2 = Input signal lock enabled, output locked to applied input signal. See [command description](#) on page 27 for variable details.
- `[x40]` = HDMI input HDCP authorization status: 0 = Block HDCP encryption, 1 = Allow HDCP encryption (default for input 3)
- `[x41]` = HDCP mode (see [page 27](#) for details): 0 = Follow the input (default), 1 = Always encrypt HDMI outputs, 2 = Follow the input with continuous DVI trials, 3 = Always encrypt HDMI outputs with continuous DVI trials

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
On Screen Menu Configuration			
Menu Timeout			
NOTE: Setting the timeout to 501 disables the OSD timeout (never times out). Setting the timeout to 0 disables the OSD.			
Set menu timeout	Esc [x21]MDUR ←	Mdur[x21]↵	Set the OSD to [x21] seconds
View timeout	Esc MDUR ←	[x21]↵	View timeout settings
Reset Commands			
Reset all device settings to factory default settings ²⁴	Esc ZXXX ←	Zpx↵	
Information Requests			
General information	I/i	Vid[x1]•Typ[x3]•Std[x10]•Blk[x26]•Hrt[x12]•Vrt[x12]↵	
Query firmware version	Q/q	x.xx↵	View firmware version.
Query full firmware version	*Q/*q	x.xx.xxxx↵	View full firmware version details.
Query Boot Loader version, factory firmware version, and current firmware version.	0Q	x.xx-x.xx.xxxx-x.xx.xxxx↵	View boot loader version, view factory firmware version, view current firmware version.
Query part number	N/n	60-1253-01↵	View part number.
View internal temperature	Esc 20STAT ←	Stat20•[x11]↵	Temperature in degrees Celsius.

KEY:

- [x1] = Input selection: 1 = composite, 2 = RGB or YUV, 3 = HDMI
- [x3] = Input video format: 1 = RGB, 2 = YUV, 3 = Composite, 4 = HDMI
- [x10] = Input standard output selection: 0 = No signal detected, 1 = NTSC 3.85, 2 = PAL, 3 = NTSC 4.43, 4 = SECAM
- = N/A (occurs when input is an active RBG, YUV [but not NTSC/PAL], or an HDMI signal)
- [x11] = Internal temperature (in degrees Celsius)
- [x12] = Horizontal and vertical frequencies (format is three-digit with single decimal and leading zeros. Example: 075.3)
- [x21] = On-screen menu timeout: (default = 60 seconds), output sync timeout (default = 501 - never),
1 to 500, in 1-second increments
0 = OSD never displayed and output sync is instantly disabled with no active input
501 = OSD or output sync never times out
- [x26] = Video mute, 0 = Off or disable
1 = On or enable (mute to black)
2 = Mute all output sync and video
3 = Always encrypt HDMI outputs with continuous DVI trials

Product Configuration Software

The Extron Product Configuration Software (PCS), available on the Extron [website](#), offers another way to control the DSC 301 HD via USB connection. This section describes the software installation and communication (see the *DSC 301 HD Product Configuration Software* help file for detailed control information). Topics include:

- [Downloading and Installing PCS](#)
- [Starting the Software](#)
- [Using the Software](#)

The graphical interface includes the same functions as those on the device front panel with additional features that are available only through the software. The control software is compatible with Microsoft Windows operating systems.

Downloading and Installing PCS

To download PCS from the [Extron website](#), locate it on the Download Center page or go to the PCS product page.

1. On the Extron website, select the **Download** tab (see figure 17, **1**), then click the **Software** button (**2**). Alternatively, hover the mouse pointer over the **Download** tab, then move the pointer to the **Software** link in the **Downloads** column and click it.

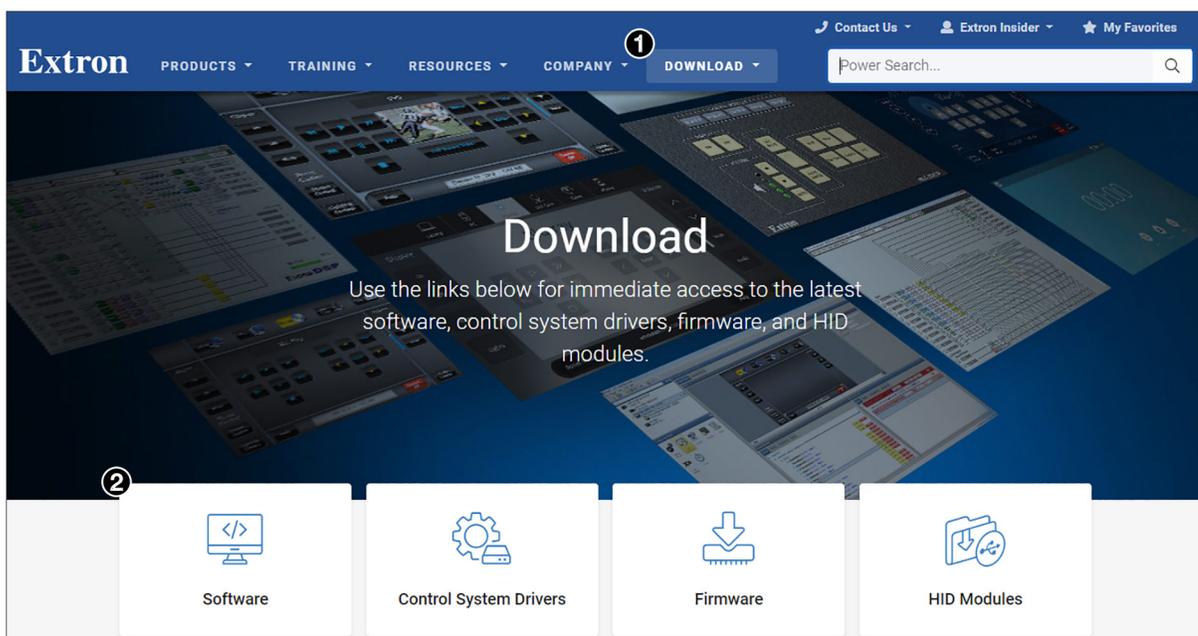


Figure 17. Download Tab and Software Button on the Download Screen

2. Click the **P** link (see figure 18, ①).

Download Center
Software (83 files)

NEW

VCS

Dante Controller

Global Configurator

Global Configurator Plus and Global Configurator Professional

GUI Configurator

ALL # A B C D E F G H I J K L M N O **P** Q R S T U V W X Y Z

Archives

Please consult Release Notes for important compatibility information and history.

Description	Part Number	Version	Date	Size	
PCS Updated Product Configuration Software for a variety of standalone products. Learn more Release Notes	79-562-01	4.3.0	Jul. 9, 2018	162.5 MB	Download
PIP 422 & 444 Control Software for PIP 422 & 444. Release Notes	79-522-01	1.0	Jan. 12, 2007	8.9 MB	Download

Figure 18. PCS Link on Download Center Screen

3. Locate PCS on the list of available software programs and click the **Download** link (②) to the right of the name.
4. On the login page that appears next, fill in the required information to log into the <https://www.extron.com> website (if you need an ID number, see your Extron representative).
5. Follow the instructions on the subsequent screens to complete the software program installation.
6. Submit any required information to start the download. Note where the file is saved.
7. Open the executable (.exe) file from the save location.
8. Follow the instructions that appear on the screen to install the program.

Starting the Software



Open the Product Configuration Software program from the **Start** menu or the desktop PCS icon (see the image at right).

The Product Configuration Software window opens at the **Device Discovery** panel (see figure 19).

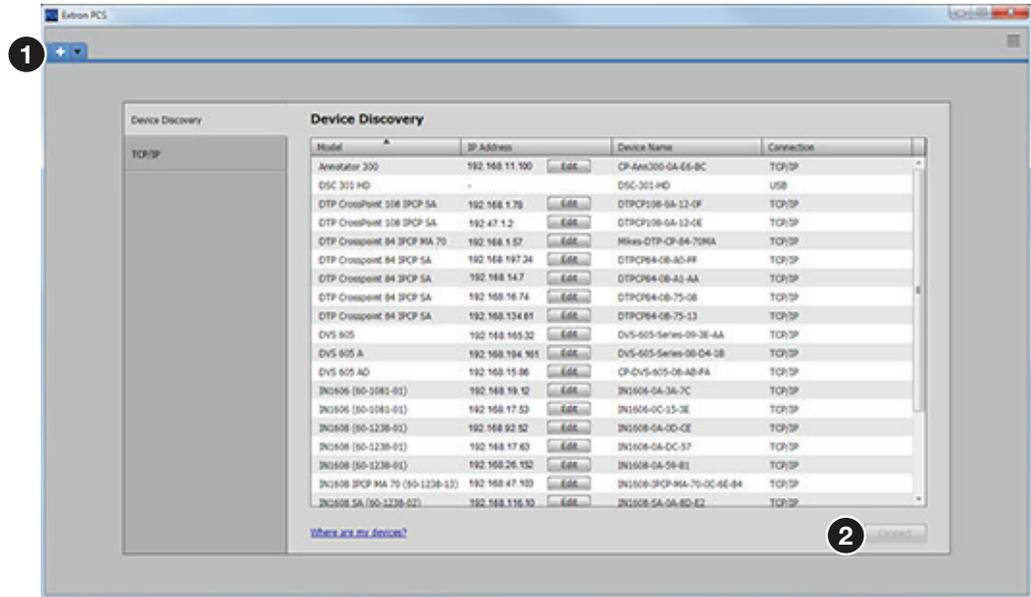


Figure 19. Start-up Window (Device Discovery)

If the **Device Discovery** panel is not showing, click on the white plus sign in the top left corner to open it (see figure 19, **1**).

Device Discovery Panel

The **Device Discovery** panel displays accessible Extron devices connected directly to the PC using the software through a LAN or WAN, or via a USB connection. Devices can be identified and sorted by model, IP address, device name, or connection method.

To sort the list of available devices, click the desired column heading to sort the category in ascending or descending order.

To connect to a device, select the desired listed device and click the **Connect** button (**2**). The device configuration page opens. Alternatively, double click on the desired device name to connect and open to the configuration page.

TCP/IP Panel

The **TCP/IP** panel contains a means of connecting to a specific IP addressable device through Ethernet, if that IP address is known.

NOTE: This feature is not applicable to DSC 301 HD devices.

Offline Device Preview

It is possible to open the DSC 301 HD pages to be viewed without connecting directly to a device, but the settings cannot be changed or saved.

To open as an offline device, click on the drop-down arrow and select **New Configuration File** (see figure 20, ❶).

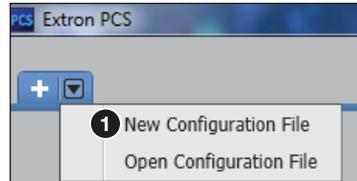


Figure 20. Start-up Drop-down list

The New Configuration File dialog box opens.

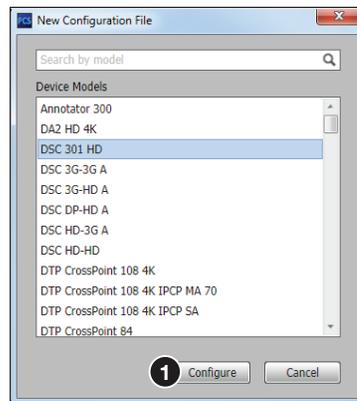


Figure 21. New Configuration File Dialog Box

1. Select the DSC 301 HD device model from the **Device Models** list.
2. Click the **Configure** button (see figure 21, ❶). A new offline device configuration tab opens.

NOTE: Until a connection to an online device is made, all the pages are not available for selection.

Using the Software

NOTE: For general software navigation, see the *DSC 301 HD Product Configuration Software Help* file, embedded in the PCS software.

When connected to an online device, a connection status icon shows green on the device name tab.

The configuration page has a global navigation bar (see figure 22, ①), from which each of the individual configuration pages can be accessed. These pages are:

- Input/Output Config
- EDID Minder
- Image Settings
- Size and Position
- Audio Config
- Preset Management
- General Settings

On the left side of the tab is the AV Controls panel, which can be used to switch inputs, view active input and output status, execute an Auto-Image, freeze the displayed image, and mute or unmute video and audio signals.

There is also a Device drop-down list on the Device tab (②) for device-specific configuration options.

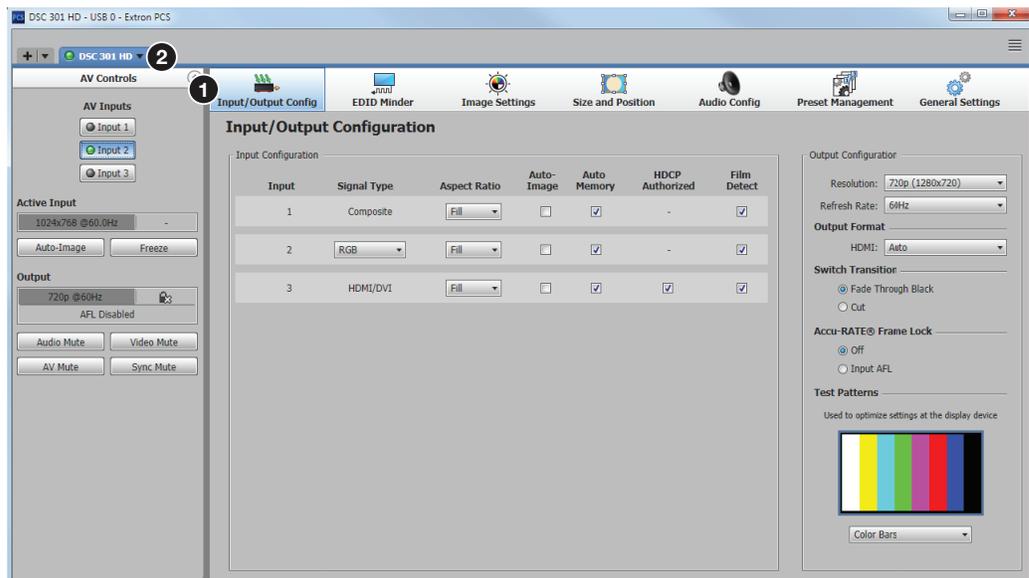


Figure 22. Device Configuration Pages

Device Menu

The **Device** drop-down list (see figure 23) contains options for disconnecting, viewing hardware settings, resetting the device, backing up and restoring device configurations, updating firmware, accessing help file, and viewing software module information.

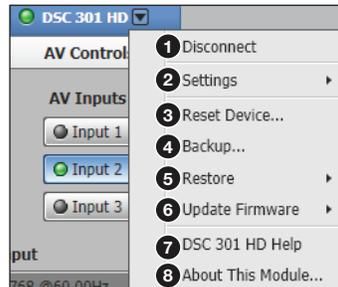


Figure 23. Device Menu

Disconnect

This option disconnects the PCS program from the connected device and closes the device tab. From the **Device** drop-down list, select **Disconnect** (1).

Settings

Hardware Settings dialog box

This dialog box (see figure 24) allows users to view unit information, such as part number, model name, model description, current firmware version, device internal temperature, and device name.

NOTE: This information cannot be changed in this screen.

From the **Device** drop-down list, select **Settings** (see figure 23, 2) > **Hardware Settings**.... The **Hardware Settings** dialog box opens showing **Unit Information**.

For configuration details, see the *DSC 301 HD PCS Help File*.

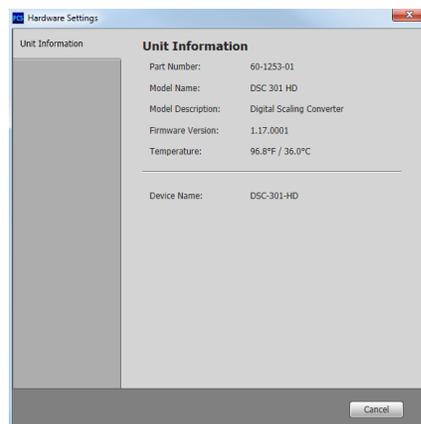


Figure 24. Hardware Settings Dialog Box

Reset Device

This option allows the user to reset the connected device.

From the **Device** drop-down list (see [figure 23](#), ③, on the previous page), select **Reset Device...** The **Reset Device** dialog box opens (see [figure 25](#)).

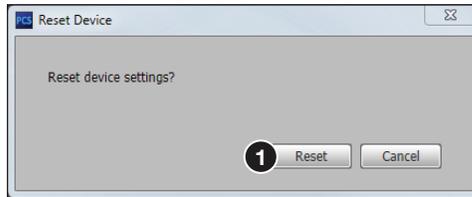


Figure 25. Reset Device Dialog Box

To reset the device click the **Reset** button (①). The device resets, and a **Reset Confirmation** window is shown.

Clicking the **Cancel** button closes the dialog box without resetting the device.

Backup

This menu option allows the user to save all audio and video settings from a DSC 301 HD to a connected PC. This exported configuration is saved as a backup which can later be restored to a single connected device if desired.

To backup a configuration:

1. Select **Backup...** from the **Device** drop-down list (see [figure 23](#), ④). A **Backup** window opens (see [figure 26](#)).

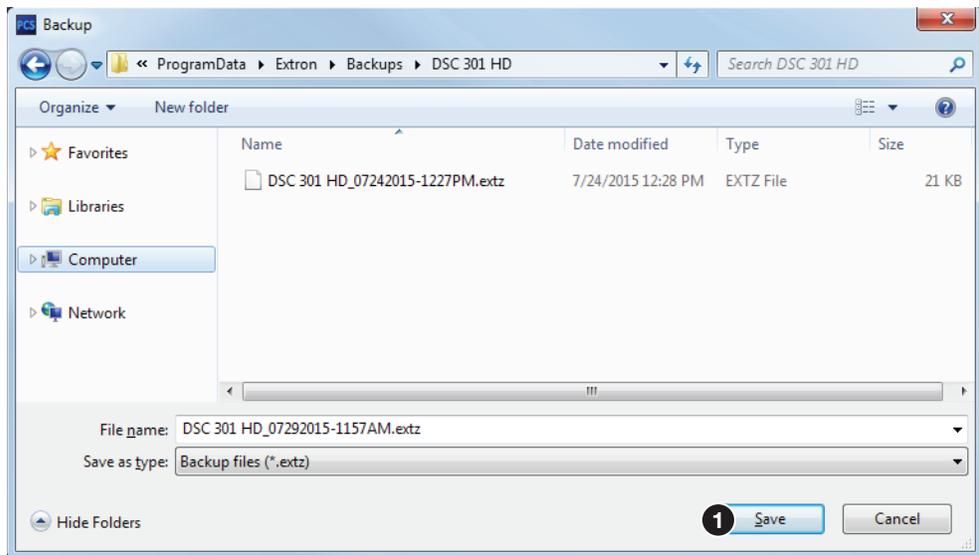


Figure 26. Backup Window

2. In the **Backup** window, browse to a location on the connected PC in which to save the configuration. Alternatively, allow the device to save the file to the default folder.
3. Rename the file as desired, and click **Save** (①) and allow the process to complete. The file is saved with a .extz extension.

NOTE: The default name includes the model, current date, and time as the file name.

The window closes after saving and a confirmation pop-up is shown briefly to indicate the save has been successful.

Restore

The saved configuration can be restored to a single device.

To restore a configuration to a single device:

1. Connect to the DSC 301 HD device via front panel USB to a PC where the backup configuration file resides.
2. Select **Restore...** from the Device menu (see [figure 23](#), ⑤ on page 44) and then **Restore This Device** from the device drop-down list. A **Restore This Device** dialog box opens.
3. Click the **Open Backup File** button on the **Restore This Device** dialog box. An **Open Backup File** window opens (see [figure 27](#)).

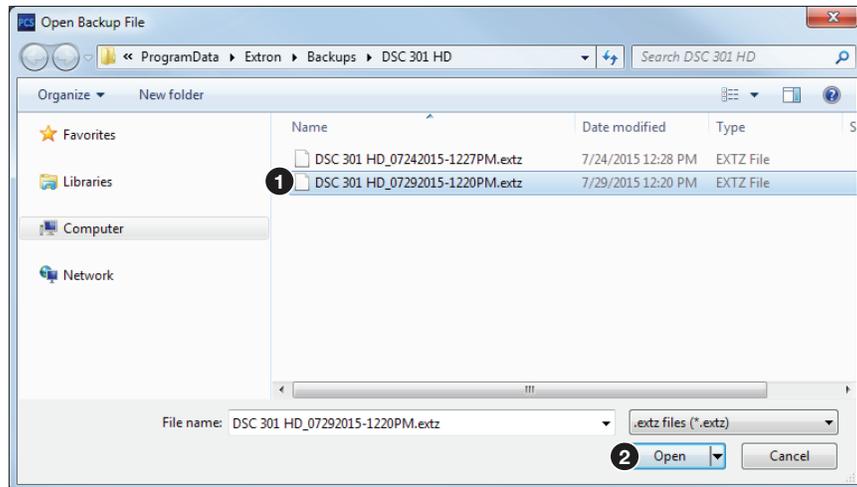


Figure 27. Open Backup File Window

4. In the **Open Backup File** window (see [figure 27](#)), browse to where the saved backup configuration is stored.
5. Select the applicable configuration file (with a .extz extension, ①) and click **Open** (②).
6. On the **Restore This Device** dialog box, click **Restore** to upload the file to the connected DSC 301 HD.

The window closes after restoring, and a confirmation pop-up is shown briefly to indicate the process is complete.

Update Firmware

This menu option (see [figure 23](#), ⑥) uploads firmware from the host device to a single connected device.

NOTES:

- If necessary, download new firmware from the Extron website.
- Firmware can only be updated via the front panel USB connection.

1. Connect to the DSC 301 HD device via USB to the PC where the firmware file is saved.
2. Select **Update Firmware** (⑥), then **Update Firmware to this Device....** A dialog box opens asking permission to disconnect from the device.
3. Click the **Continue** button to disconnect from the device and continue with the firmware update process. The **Update Firmware to This Device** dialog box opens.
4. Click the **Open Firmware File** button. An explorer window opens.

5. Navigate to the desired firmware file and select the device-specific firmware file. Valid firmware files for the DSC 301 HD have an .S19 file extension.
6. Click the **Open** button. This returns you to the **Update Firmware** dialog box.
7. In the **Update Firmware** dialog box, click **Update**. The progress bar shows the progress of the firmware upload to the device. After uploading is completed, the device restarts. Reconnection to the device must be made to enable live configuration.

Help

This option contains a link to the device-specific help file.

From the **Device** drop-down list, select device specific **Help** (see [figure 23](#), 7 on page 44). The help file opens in a separate window.

About This Module

This option contains the device module part number, version, and build number.

From the **Device** drop-down list, select **About This Module...** (see [figure 23](#), 8). The **About This Module** dialog box opens (see [figure 28](#)).

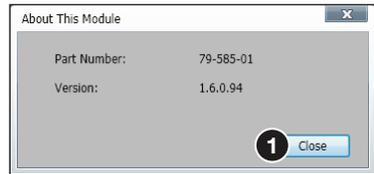


Figure 28. About This Module Dialog Box

Click the **Close** button (1) to close the dialog box.

Software Menu

The **Software** menu (accessible at the top right corner of the PCS window, see [figure 29](#), 1) contains options to display device connection methods in the device tabs, re-enable confirmation dialogs, view tutorial, help files, view software information, and exit PCS.

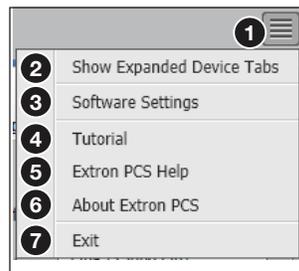


Figure 29. Software Menu

Show Expanded Device Tabs

This option displays the device IP address or connection method on the **Device** tab (see [figure 30](#)).

From the **Software** menu, select **Show Expanded Device Tabs** (see [figure 29](#), 2).



Figure 30. Expanded Device Tab (Connected through USB)

Software Settings

This option resets all disabled confirmation dialogs to the default settings.

1. From the **Software** menu, select **Software Settings** (see [figure 29](#), [③](#), on the previous page). The **Software Settings** dialog box opens.

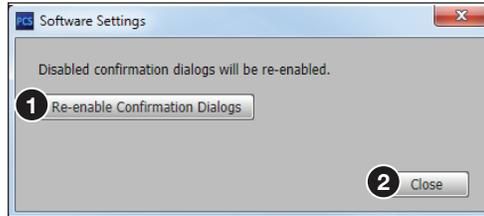


Figure 31. Software Settings Dialog Box

2. Click the **Re-enable Confirmation Dialogs** button (see [figure 31](#), [①](#)). The dialog box closes and the reset is complete. Click the **Close** button ([②](#)) to close the dialog box without re-enabling the confirmation dialogs.

Tutorial

This option displays a general overview of where to find features in the PCS framework.

1. From the **Software** menu, select **Tutorial** (see [figure 29](#), [④](#)). The **Tutorial** dialog box opens.
2. Click the **I Get It!** or the **OK** button to close the dialog box.

Extron PCS Help

This options opens the **PCS Help** file ([⑤](#)) for general PCS operations. For product-specific help files, see [Help](#) on the previous page.

From the **Software** menu, select **Extron PCS Help**.

About Extron PCS

This option contains information about the current PCS version.

1. From the **Software** menu, select **About Extron PCS** (see [figure 29](#), [⑥](#)). The **About Extron PCS** dialog box opens (see [figure 32](#)).



Figure 32. About - Extron PCS Dialog Box

2. Click the **Details** button ([①](#)) for more information about the software and embedded modules.
3. Click the **OK** button ([②](#)) to close the dialog box.

Exit

This option disconnects PCS from connected devices and closes the application.

1. From the **Software** menu, select **Exit** (see [figure 29](#), [7](#), on page 47). If device tabs are open, the **Exit** dialog box opens (see [figure 33](#)).

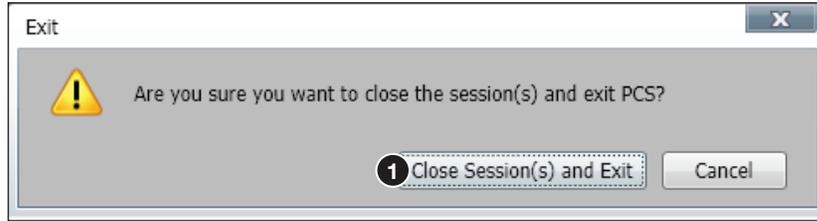


Figure 33. Exit Dialog Box

2. If necessary, click the **Close Session(s) and Exit** button ([1](#)) to disconnect the software from connected devices, close all offline device tabs, and close the software. Click the **Cancel** button to leave the software open.

AV Controls Panel

The **AV Controls** panel (see [figure 34](#)) can be used to switch inputs, view active input and output status, initiate an Auto-image, freeze the displayed image, and mute or unmute video and audio signals.

Included in the panel is a summary of the current active input and output status, including signal format and HDCP status, as well as AFL status.

NOTE: This panel can be hidden or revealed on any page by clicking on the arrow button on the top right of the panel.



Figure 34. AV Controls Panel

NOTE: An open lock icon indicates that an input or output is not HDCP-encrypted. A closed lock with a check mark icon indicates that an input or output is HDCP-encrypted.

AV Input Buttons

Click an **AV Input** button (1 through 3) to select that input (see [figure 34](#), ① on the previous page). As the new input is selected, the summary within the panel changes to reflect the new input and output status.

NOTE: The signal status indicators on the AV input buttons display green when a signal is present on the corresponding input or gray when there is no signal present.

Auto-Image button

Click the **Auto-Image** button (②) to start a one-time Auto-Image on the selected input.

Freeze button

Click the **Freeze** button (③) to freeze the current displayed video frame for the selected input. When the button is blue the image is frozen. Click the button again to unfreeze the image.

Audio, Video, AV, and Sync Mute buttons

- Click the **Audio Mute** button (④) to globally mute only the audio. The button turns red.
- Click the **Video Mute** button (⑤) to mute only the video signal. The button turns red.
- Click the **AV Mute** button (⑥) to mute both video and audio simultaneously. The button turns red, along with the **Video Mute** and **Audio Mute** buttons.
- Click the **Sync Mute** button (⑦) to mute video and sync. The button turns red.

To unmute any signal, click the appropriate button. The button reverts to the default color, indicating the signal has been unmuted.

Configuration Pages

The configuration pages contain options for input and output configuration, EDID management, image settings, image size and position, audio configuration, preset management, and general settings. Each page is accessible via the global navigation bar (see [figure 35](#)).

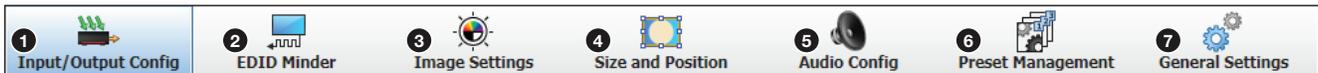


Figure 35. Global Navigation Bar

Input and Output Configuration Page

Click the **Input/Output Config** icon (see [figure 35](#), ①, on the previous page) to open this page. It contains panels for input configuration and output configuration.

Input Configuration panel

The Input Configuration panel (see [figure 36](#)) consists of user configurable fields for each input. These include Input, Signal Type, Aspect Ratio, Auto-Image, Auto Memory, HDCP Authorized, and Film Detect.

The screenshot shows the 'Input/Output Configuration' window with a sub-panel for 'Input Configuration'. It contains a table with columns for Input, Signal Type, Aspect Ratio, Auto-Image, Auto Memory, HDCP Authorized, and Film Detect. Input 1 is Composite, Input 2 is RGB, and Input 3 is HDMI/DVI. All inputs have 'Fill' selected for Aspect Ratio and 'Auto Memory' checked. Input 3 also has 'HDCP Authorized' checked. Input 2 has 'Signal Type' highlighted with a circled 1, and 'Aspect Ratio' is highlighted with a circled 2. 'Auto-Image' is highlighted with a circled 3, 'Auto Memory' with a circled 4, 'HDCP Authorized' with a circled 5, and 'Film Detect' with a circled 6.

Input	Signal Type	② Aspect Ratio	③ Auto-Image	④ Auto Memory	⑤ HDCP Authorized	⑥ Film Detect
1	Composite	Fill	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>
2	① RGB	Fill	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>
3	HDMI/DVI	Fill	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 36. Input Configuration panel

Signal type

From the Signal Type drop-down list, select the signal type (**RGB** or **YUV**) for input 2 (①). For input 1, **Composite**, and for input 3, **HDMI/DVI** are the only available signal types.

Aspect ratio

From the Aspect Ratio drop-down list (②) select **Fill** or **Follow**.

- **Fill** — Scales the input signal to fill the entire video output.
- **Follow** — Follows the signal aspect ratio, with respect to the current output resolution setting. Black letter box or pillar box bars may be applied for aspect ratio compensation.

Auto-Image

Select the **Auto-Image** checkbox (③) for inputs 1-3 to enable an automatic Auto-Image to an input. When enabled, Auto-Image is applied whenever there is a change in the input sync. Auto-Image attempts to size and center the input signal based on the aspect ratio setting.

By default, the Auto-Image threshold is 25% brightness. Analog video signals greater than the threshold are considered active video. To change the threshold value, use SIS commands.

Auto Memory

Select the **Auto Memory** checkbox (④) of the desired input to enable the Auto Memory. Auto Memory recalls input and image settings for signals that have previously been applied. When Auto Memory is disabled, the scaler treats every newly applied input as a new source.

HDCP Authorized

Select the **HDCP Authorized** checkbox (see [figure 36](#), ⑤ on the previous page) to enable or disable the HDCP Authorized feature for input 3. This feature determines if a digital input reports as an HDCP authorized sink to a source.

NOTE: This option is not available for analog inputs 1 and 2.

For source devices that require encryption, enable **HDCP Authorized**. If HDCP Authorized is disabled for sources that require encryption (for example, a Blu-ray player), the output is muted or a warning message is displayed.

Some source devices may encrypt their output even if the source material does not require HDCP encryption, preventing content from being displayed on a non-HDCP compliant display. Disable HDCP Authorized to allow the output of the scaler to remain unencrypted.

Film Detect

Select the **Film Detect** checkbox (⑥) of the desired input to enable automatic 3:2, 2:2, and 24:1 film pulldown detection for NTSC, PAL, SECAM, and 1080i input signals.

Output Configuration panel

The **Output Configuration** panel (see [figure 37](#)) contains controls for output resolution and rate, output format settings, switch transitions, Accu-RATE frame lock (AFL) settings, and available test pattern selection.

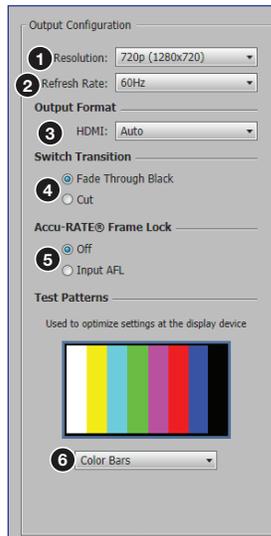


Figure 37. Output Configuration

Resolution

From the **Resolution** drop-down list, select the applicable output resolution (①). Default setting is **720p/60 Hz**. The selectable resolutions include three user customizable slots: C1-C3.

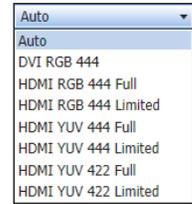
Refresh rate

From the **Refresh Rate** drop-down list, select the applicable output refresh rate (②).

Output format

From the Output Format drop-down list (see [figure 37](#), [3](#) on the previous page) select the applicable digital signal format (see the image at right for format selection).

The default setting is **Auto**. This setting detects the display device capabilities and outputs DVI RGB 444 for DVI sinks, or HDMI RGB 444 Full for HDMI sinks.



Switch transitions

In the Switch Transitions panel ([4](#)), select one of the following radio buttons:

- **Fade Through Black** — Fades video to a black screen before switching to the newly selected video.
- **Cut** — Switches video directly to the newly selected input.

Accu-RATE frame lock (AFL)

From the Accu-RATE Frame Lock section ([5](#)), select one of the following radio buttons:

- **Off** — Frame lock is disabled.
- **Input AFL** — Frame lock is enabled.

NOTE: AFL is a patented technology exclusive to Extron that locks the output frame rate to a designated input to eliminate stuttering caused by frame rate conversion.

Test patterns

To aid display device setup and optimization, select a test pattern from the drop-down list ([6](#)) under the preview window.

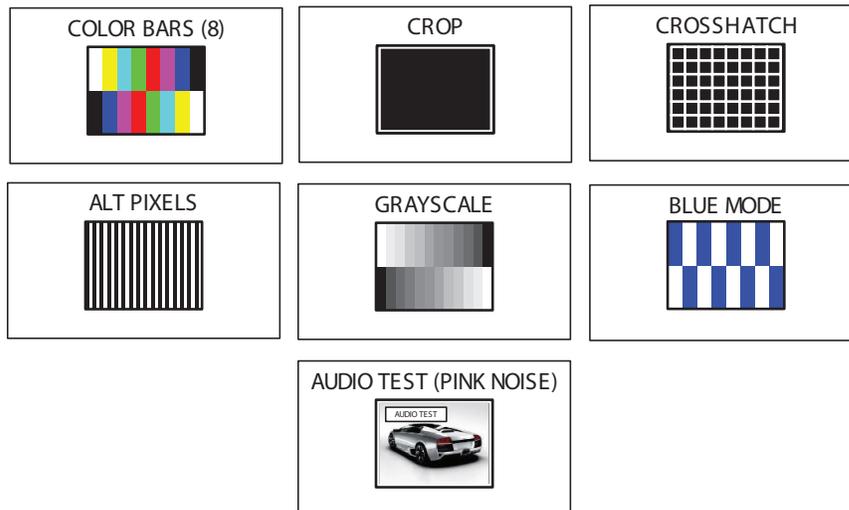


Figure 38. Available Test Patterns

NOTE: No input signal is needed when using a test pattern for display device setup.

EDID Minder page

EDID Minder is an EDID management process that manages the EDID information between the scaler and one or more input sources. Click the **EDID Minder** icon (see [figure 35, 2](#), on page 50) on the global navigation bar to open the EDID Minder page (see figure 39).

The EDID properties currently assigned to each input are displayed in the table of inputs (4). The audio input format listed in an EDID is determined by the audio input format selected on the **Input Configuration** page.

Up to three EDIDs can be stored on the device as custom EDID files. Audio settings from custom EDID files take priority over current settings on the input.

NOTE: If an analog custom EDID file is assigned to a digital input or a digital custom EDID file assigned to an analog input, the display may not appear correctly.

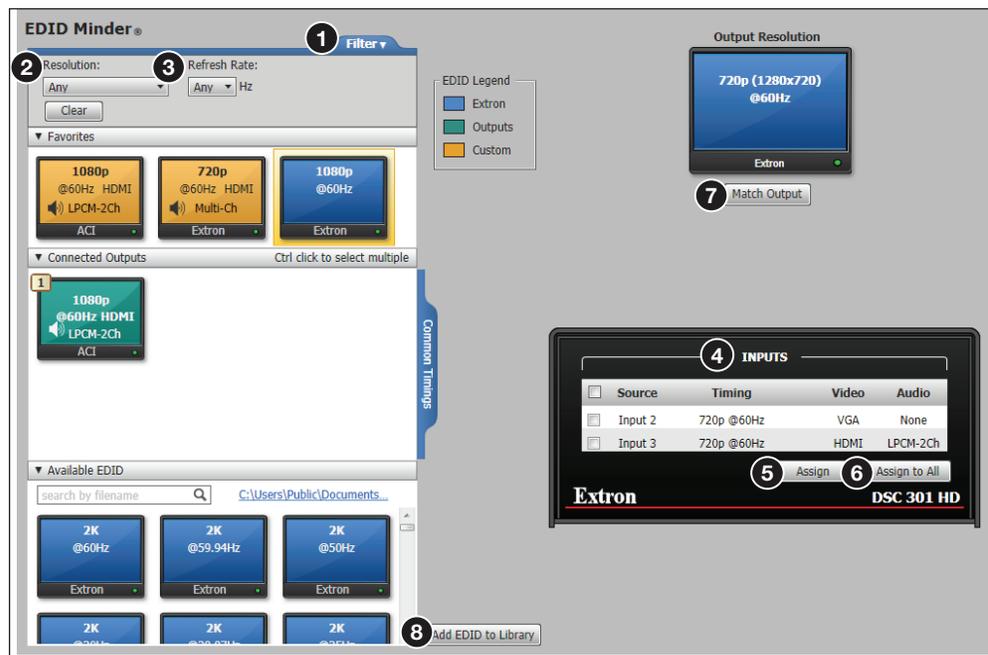


Figure 39. EDID Minder Screen

Filtering available EDID

Use the **Filter** tab (1) to limit the number of available EDID displayed in the Favorites, Connected Outputs, and Available EDIDs panels.

1. From the **Resolution** drop-down list (2) select a specific resolution or **Any**.
2. From the **Refresh Rate** drop-down list (3) select a specific refresh rate or **Any**.

Assigning EDID

To assign EDID to selected inputs:

1. In the **Inputs** panel (table of inputs, 4) on the right, select the checkboxes for the desired inputs
2. In the **Favorites**, **Available EDIDs**, or **Connected Outputs** panel on the left, select the desired EDID.

3. Do either of the following:
 - In the **Inputs** panel (see **figure 39**, **4** on the previous page), click the **Assign** button (**5**) to assign EDID to one or more selected inputs, or
 - Drag and drop EDID image from the **Favorites**, **Available EDIDs**, or **Connected Outputs** panels to one or more selected inputs.

To assign EDID to all inputs:

1. In the **Favorites**, **Available EDIDs**, or **Connected Outputs** panel (**1**), select an EDID.
2. In the **Inputs** panel, click the **Assign to All** button (**6**).

NOTE: Unchecked inputs are ignored when assigning an EDID to all inputs.

To match the selected inputs to the current output resolution:

Matching the output resolution is the default value for all inputs.

1. In the **Inputs** panel (**4**) on the previous page, select the checkboxes for the desired inputs.
2. In the **Output Resolution** panel, click the **Match Output** button (**7**).

Adding EDID to the EDID library

1. Click the **Add EDID to Library** button (**8**). The **Browse Add EDID to Library** window opens (see figure 40).

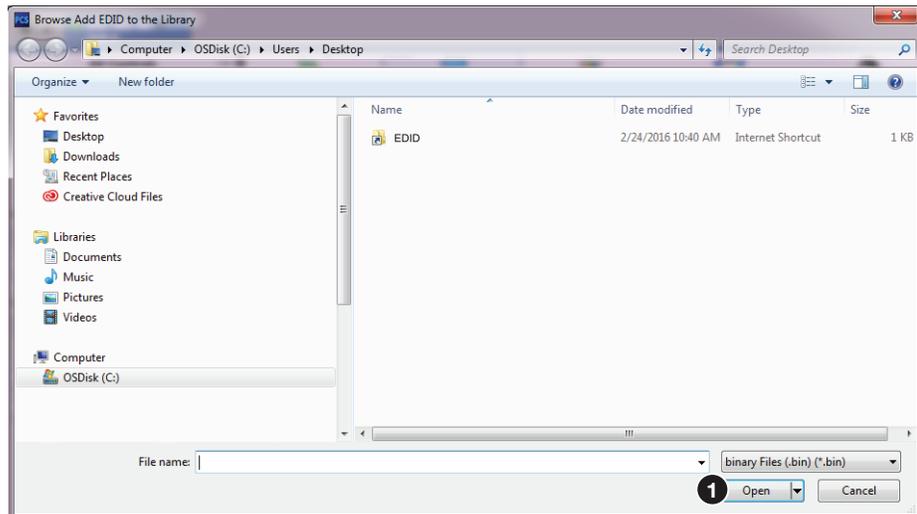


Figure 40. Browse Add EDID to the Library Window

2. Navigate to the desired EDID file location and select it.

NOTE: Valid EDID files have a .bin file extension.

3. Click the **Open** button (**1**). The EDID is added to the **Available EDIDs** panel.

Saving EDID to the EDID library

1. From the Favorites, Connected Outputs, or Available panel right-click on an EDID (see [figure 39](#), ① on page 54).
2. Select **Save to EDID Library**.
3. Click the **OK** button to save the file.

NOTE: Saving a factory EDID exports an HDMI, LPCM-2Ch EDID to the PC. The file is saved as a .bin file.

Image Settings Page

From this page, signal sampling and picture control settings can be adjusted, user and input presets can be saved and recalled, and overscan settings can be applied. Click the **Image Settings** icon on the global navigation bar to open the **Image Settings** page (see [figure 35](#), ③ on page 50).

The screenshot shows the 'Image Settings' interface with four numbered callouts:

- 1 Signal Sampling:** A table for adjusting signal parameters. The table has columns for the parameter name, its current value, and its minimum and maximum values. The parameters are Active Lines (768, 512-1024), Active Pixels (1024, 512-1536), Horizontal Start (128, 0-255), Vertical Start (128, 0-255), Total Pixels (1344, 832-1856), and Pixel Phase (31, 0-63). Below the table are three buttons: 'Auto-Image', 'Auto-Image & Fill', and 'Auto-Image & Follow'.
- 2 Picture Controls:** A section for adjusting picture quality. It includes sliders and numeric input fields for Brightness (0-127, current 64), Contrast (0-127, current 64), Color (N/A), Tint (N/A), and Detail (0-127, current 64). A note states '*Denotes default value'.
- 3 Overscan:** A section for adjusting overscan. It includes dropdown menus for HDMI/DVI (0%), RGB (0%), YUV (2.5%), and Composite (2.5%).
- 4 Input Presets:** A section for managing input presets. It includes a list of 'Saves' (Signal type, Signal sampling, Picture controls) and a list of 'User Presets' (Input 1, Input 2, Input 3). Each input has a list of picture controls (P1-P9) that are currently '[unassigned]'. Buttons for 'Save Preset', 'Recall Preset', and 'Clear' are provided for each section.

Figure 41. Image Settings Page

Signal Sampling panel

Signal sampling optimizes the input signal to the scaler for the currently selected input (see [figure 41](#), **1** on the previous page).

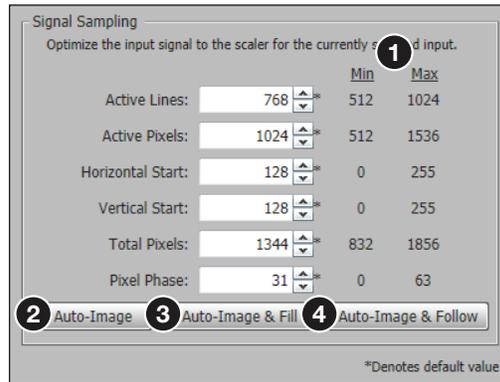


Figure 42. Signal Sampling Panel

To manually adjust signal sampling settings, enter a value within the **Min** and **Max** values displayed to the right of each adjustable setting, or click the **Up** or **Down** arrows (see [figure 42](#), **1**). An asterisk beside a chosen value for a signal sampling setting indicates that it is a default value for the applied video signal.

To automatically adjust these settings, perform one of the following:

- Click the **Auto-Image** button (**2**) to perform a one-time Auto-Image.
- Click the **Auto-Image & Fill** button (**3**) to perform a one-time Auto-Image and fill the entire video output (ignores aspect ratio setting).
- Click the **Auto-Image & Follow** button (**4**) to perform a one-time Auto-Image and to maintain the aspect ratio of the input signal (ignores aspect ratio setting).

Picture Controls panel

The **Picture Controls** panel shows adjustable image settings for the selected input (see [figure 41](#), **2**, on the previous page).

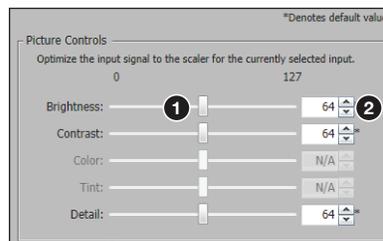


Figure 43. Picture Controls Panel

To adjust the picture settings, click and drag the associated slider for any image setting (brightness, contrast, color, tint, or detail) to the desired value (see [figure 43](#), **1**).

Alternatively, enter a value within the field associated with the image setting, or click the **Up** and **Down** arrows (**2**) to change the value in the field.

Overscan

Overscan is specific to each input signal type (see [figure 44](#) on the next page). This mode zooms and crops SMPTE inputs to mask edge effects and ancillary data that are common in broadcast signals.

Issuing an Auto-Image with overscan enabled, runs an Auto Phase routine (YUV and RGB only) and centers and sizes the input according to table values.

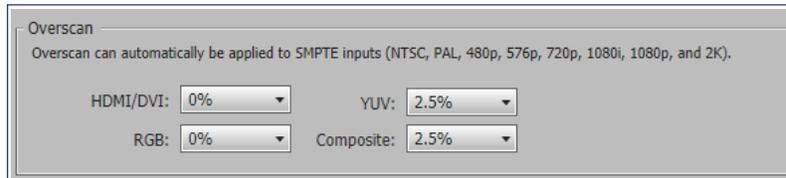


Figure 44. Overscan Panel

To adjust overscan settings, choose **0%**, **2.5%**, or **5%** from the drop-down list specific to each signal type.

Presets panel

When configuring the DSC 301 HD, a total of 128 global input presets and up to 3 user presets per input channel are available (see figure 45).

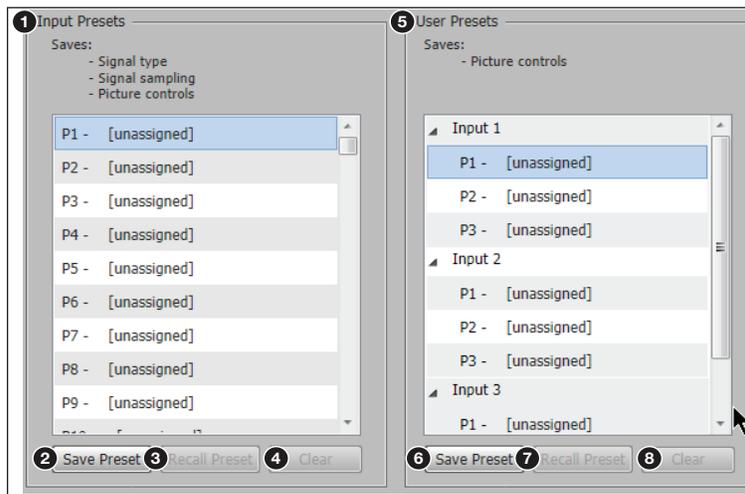


Figure 45. Input and User Presets Panel

Settings Included Within Presets			
Setting	Input Preset	User Preset	Auto Memory
Horizontal and Vertical Start	Yes		Yes
Active Pixels	Yes		Yes
Active Lines	Yes		Yes
Total Pixels	Yes		Yes
Phase	Yes		Yes
Brightness and Contrast	Yes	Yes	Yes
Color and Tint	Yes	Yes	Yes
Detail	Yes	Yes	Yes
Input Type	Yes		
Audio Input Gain and Attenuation	Yes		
Image Size and Position	Yes	Yes	Yes
Preset Name	Yes	Yes	
Film Mode	Yes		
Presets Available	128 global	3 per input channel	32 per input channel
Recall Location	Any input supporting input type saved in preset	Current input	Automatically recalled based on incoming signal

Input Presets

An input preset is a user-defined set of input and picture control settings that can be saved for each source within a system so that they can be recalled whenever the source is applied (see [figure 45](#), ❶ on the previous page). Input presets are unique to the signal that was applied when the preset was initially saved.

This type of preset saves specific settings for size, centering, contrast, brightness, color and tint (if applicable), detail, and input configuration.

NOTE: An input preset can be recalled on any input supporting the input type that was active when the preset was saved.

To save an input preset:

1. From the **Input Presets** list, (❶) select the desired preset.
2. Click the **Save Preset** button (❷). If the selected preset already has stored information on it, the **Presets** dialog box opens. Click the **Overwrite** button to erase the previous data and save the new settings. Click the **Cancel** button to return to the **Image Settings** page.

To rename a preset:

1. In the **Input Preset Name** column, double-click an **Input Preset Name**.
2. Change the name as desired.
3. Press the <Enter> key to save the new name.

To recall an input preset:

1. From the **Input Presets** list, select the desired preset.
2. Click the **Recall Preset** button (❸). The **Presets** dialog box opens.
3. Click the **Recall** button to recall the preset. Click the **Cancel** button to return to the **Image Settings** page.

To clear a preset:

1. From the **Input Presets** list (see (❶) select the desired preset.
2. Click the **Clear** button (❹). The **Presets** dialog box opens.
3. Click the **Clear** button to erase saved data. Click the **Cancel** button to return to the **Image Settings** page (see [figure 41](#) on page 56).

User Presets

There are three user presets per input to save picture control settings only (see [figure 45](#), ❺).

To save a user preset:

1. From the **User Presets** list (❺), select the desired preset.
2. Click the **Save Preset** button (❻). If the selected preset already has stored information on it, the **Presets** dialog box opens. Click the **Overwrite** button to erase the previous data and save the new settings. Click the **Cancel** button to return to the **Image Settings** page (see [figure 41](#)).

To rename a preset:

1. In the **User Preset Name** column, double-click a **User Preset Name** (see [figure 45](#), ❺).
2. Change the name as desired.
3. Press the <Enter> key to save the new name.

To recall a user preset:

1. From the User Presets list, select the desired preset.
2. Click the **Recall Preset** button (see figure 45, 7 on page 58). The Presets dialog box opens.
3. Click the **Recall** button to recall the preset. Click the **Cancel** button to return to the Image Settings page (see figure 41 on page 56).

To clear a preset:

1. From the User Presets list, select the desired preset.
2. Click the **Clear** button (see figure 45, 8). The Presets dialog box opens.
3. Click the **Clear** button to erase saved data. Click the **Cancel** button to return to the Image Settings page (see figure 41).

Size and Position Page

The Size and Position page (see figure 47) provides three methods of adjusting image output size and position: graphically, numerically, or automatically with Auto-Image. Click the **Size and Position** icon on the global navigation bar to open the Size and Position page (see figure 35, 4, on page 50).

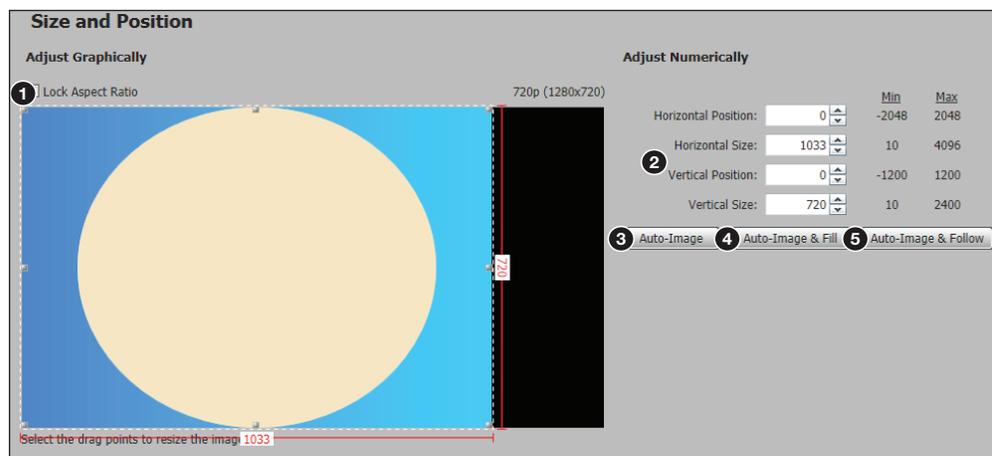


Figure 46. Size and Position Page

To adjust the size and position graphically:

If desired, click the **Lock Aspect Ratio** checkbox (see figure 46, 1) to constrain proportions.

1. Click and drag the drag points of the sample image to resize the image within the designated space (defined by the black area in figure 46 above).
2. Click anywhere inside the sample image (see the blue rectangle with a circle inside in figure 46) and drag it anywhere within the designated space to reposition the image.

To adjust the size and position numerically:

1. Enter a value or click the **Up** or **Down** arrow (2) in the **Horizontal Size** and **Vertical Size** fields.
2. Enter a value or click the **Up** or **Down** arrow (2) in the **Horizontal Position** and **Vertical Position** fields.

To adjust the size and position automatically:

To automatically adjust these settings, perform one of the following:

- Click the **Auto-Image** button (see [figure 46](#), [3](#), on the previous page) to perform a one-time Auto-Image.
- Click the **Auto-Image & Fill** button ([4](#)) to perform a one-time Auto-Image and fill the entire video output (ignores aspect ratio settings).
- Click the **Auto-Image & Follow** button ([5](#)) to perform a one-time Auto-Image and to maintain the aspect ratio of the input signal (ignores aspect ratio settings).

Audio Configuration Page

On the **Audio Configuration** page (see [figure 47](#)), you can configure audio inputs and outputs.

Click the **Audio Configuration** icon on the global navigation bar to open the **Audio Configuration** page (see [figure 35](#), [5](#), on page 50).

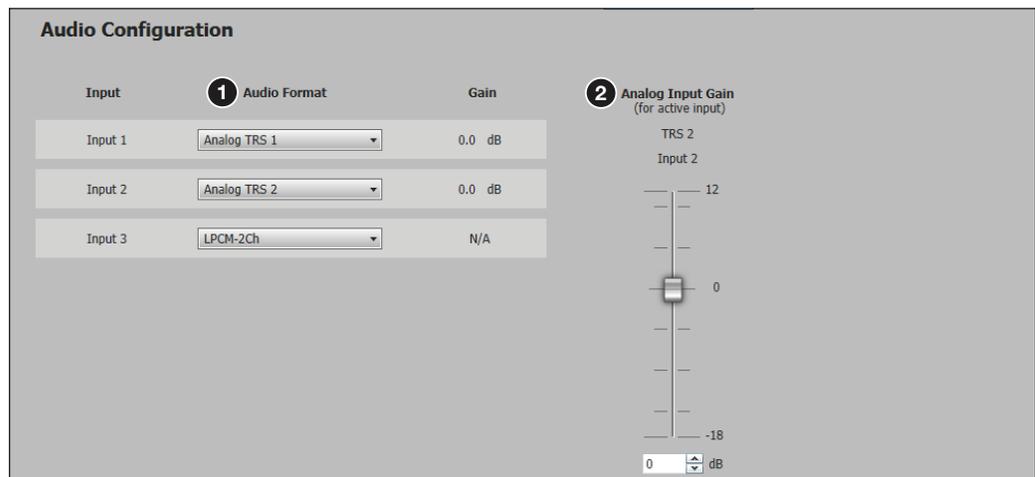


Figure 47. Audio Configuration Page

Audio input configuration

Audio Format

From the **Audio Configuration** panel, select the input **Audio Format** from the drop-down lists (see [figure 47](#), [1](#)), then set the input gain to optimal settings.

For inputs 1 and 2, available formats include:

- **None** — Audio is not sent to the output.
- **Analog** — Analog TRS 1 (default for input 1), TRS 2 (default for input 2), and TRS 3 audio is sent to the output.

For input 3, available formats include:

- **None** — Audio is not sent to the output.
- **Analog** — Analog TRS 1, TRS 2, and TRS 3 audio from the corresponding analog input is sent to the output.
- **LPCM-2Ch** — The digital input is configured to receive 2-channel LPCM audio.
- **Multi-Ch** — The digital input is configured to receive multi-channel audio. If multi-channel audio is not available, 2-channel LPCM audio is passed to the digital outputs.

- **LPCM-2Ch Auto (TRS 3)** — The digital input is configured to receive 2-channel LPCM audio. If 2-channel LPCM audio is not detected, the input switches to the corresponding analog input to send to the output.
- **Multi-Ch Auto (TRS 3)** — The digital input is configured to receive multi-channel audio, but will pass 2-channel LPCM if multi-channel audio is not available. If neither multi-channel audio nor 2-channel LPCM audio is detected, the input switches to the corresponding analog input to send to the output.

Analog Input Gain

The **Analog Input Gain** fader (see [figure 47](#), ② on the previous page) has a gain range of -18 dB to +12 dB. Adjustments are applied in 1 dB increments. The default setting is 0 dB. The current Gain level for each input is displayed to the right of the corresponding **Audio Format** drop-down list.

NOTE: Analog input gain adjustment applies only to analog signals. The **Input Gain** fader is available for analog gain only when the audio format is set to **Analog**, **LPCM-2Ch Auto**, or **Multi-Ch Auto**.

Preset Management

On the **Preset Management** page (see [figure 48](#)), the user can save centering and sizing information and picture adjustments as a User preset for future recall.

Click the **Preset Management** icon on the global navigation bar to open the **Preset Management** page (see [figure 35](#), ⑥, on page 50).

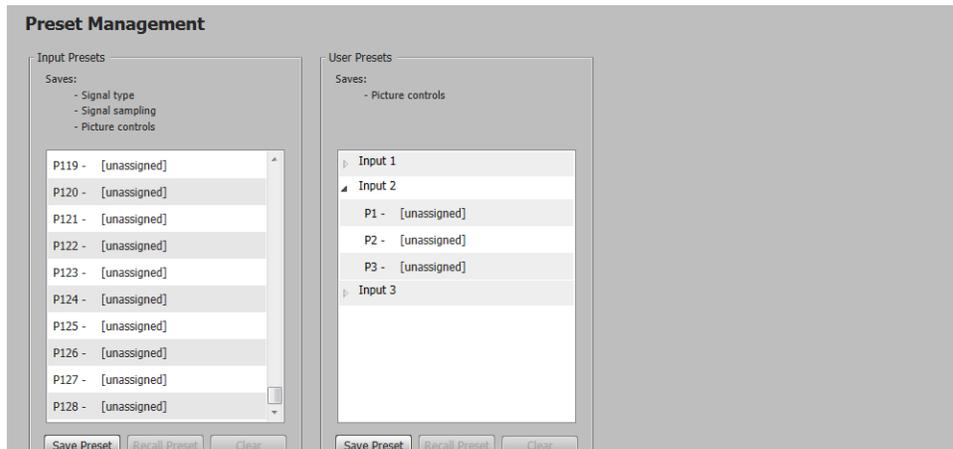


Figure 48. Preset Management Page

There are 128 global Input presets available to configure on this page or via SIS commands (see the [SIS Communication and Control](#) section, starting on page 22).

In addition, up to three user presets per input can be saved or recalled. A user preset can be saved on one input resolution (for example saved on 480p) and later recalled onto another resolution (for example, recalled onto 1080p).

Select **Save Preset**, **Recall Preset**, or **Clear** to select the applicable input preset or user preset.

General Settings Page

The **General Settings** page (see figure 50) allows the user to set a screen saver, select HDCP notification and HDCP Mode options, set the front panel lockout mode (**Exec Mode**), enable OSD Configuration information, and enable or disable auto switch. In addition, it gives access to the **Hardware Settings** page.

Click the **General Settings** icon on the global navigation bar to open the **General Settings** page (see figure 35, 7, on page 49).

The screenshot shows the 'General Settings' window with the following sections and callouts:

- 1 Hardware Settings:** A button at the top left.
- 2 Screen Saver:** A section with radio buttons for 'Black' (selected) and 'Blue with On Screen Display (OSD) Bug', and a checkbox for 'Disable Sync After' with a spinner set to 'N/A'.
- 3 HDCP Notification:** A section with radio buttons for 'Black' and 'Green' (selected).
- 4 OSD Configuration Menu:** A section with a checked checkbox 'Enable On Screen Display (OSD)' and a spinner for 'Duration On Screen' set to '60'.
- 5 Front Panel Lockout (Exec Mode):** A section with radio buttons for 'Unlock Front Panel' (selected), 'Mode 1: Lock Front Panel', and 'Mode 2: Limit Front Panel to Input Selection'.
- 6 Auto Switch:** A section with a checkbox 'Enable Auto Switch' and two radio buttons: 'Priority to the highest active input number' and 'Priority to the lowest active input number'.
- 7 HDCP Mode:** A section with radio buttons for 'Follow Input', 'Always Encrypt Output', 'Follow Input (with continuous DVI trials)', and 'Always Encrypt Output (with continuous DVI trials)' (selected).

Figure 49. General Settings Page

To open the **Hardware Setting page**, click the **Hardware Settings** button (1). The **Hardware Settings** page opens (see figure 50) with the unit information including **Part Number**, **Model Name**, **Model Description**, **Firmware Version**, **Temperature**, and **Device Name**.

The screenshot shows the 'Hardware Settings' window with the following information:

Unit Information	
Part Number:	60-1253-01
Model Name:	DSC 301 HD
Model Description:	Digital Scaling Converter
Firmware Version:	1.17.0001
Temperature:	75.2°F / 24.0°C
Device Name:	DSC-301-HD

There is a 'Cancel' button at the bottom right.

Figure 50. Hardware Settings Page

To set the **Screen Saver**, click the desired radio button (black or blue with an OSD bug, see figure 49, 2). To disable sync after a specified time, select the checkbox, and set the duration in seconds (0-500). To do this, either enter a new value in the field or click on the up or down arrows to increase or decrease the time duration. Then, press the **<Enter>** or **<Tab>** key to apply the changes.

To set **HDCP Notification**, click the desired radio button (**Black** or **Green**, 3).

To set the **OSD (On-Screen Display) Configuration Menu**, select the checkbox (4), and set the duration in seconds (0-500) to determine the time allotment for an OSD message to display on the screen.

To set the Front Panel Lockout mode, click the applicable **Front Panel Lockout (Exec Mode)** radio button as desired (see [figure 49](#), [5](#), on the previous page).

- **Unlock front panel.**
- **Mode 1: Lock front panel.**
- **Mode 2: Limit front panel to input selection.**

To enable Auto Switch, check the **Auto Switch** checkbox ([6](#)) and then click the applicable radio button.

- Priority to the highest active input number
- Priority to the lowest active input number

To disable auto input selection, uncheck the **Auto Switch** checkbox.

To set HDCP Mode, click the desired radio button ([7](#)) as desired, from:

- **Follow Input** — Encrypts the output only when required by the selected input source.
- **Always Encrypt Output** — Always encrypts the output, regardless of the HDCP status of the selected input source.
- **Follow Input (with continuous DVI trials)** — Encrypts the output only when required by the selected input source. Use this setting when DVI sink devices initially pass HDCP encrypted content, but intermittently display a green HDCP notification screen after a power cycle or resuming from sleep mode.
- **Always Encrypt Output (with continuous DVI trials)** — Always encrypts the output regardless of the HDCP status of the selected input source. Use this setting when DVI sink devices initially pass HDCP encrypted content, but intermittently display a green HDCP notification screen after a power cycle or resuming from sleep mode.

Mounting

This section contains information on mounting the DSC scaler. See <https://www.extron.com> for available Extron mounting kits and ordering information.

The DSC 301 HD scaler can be mounted by any of the methods listed below. Follow the instructions provided with the mounting kit (see <https://www.extron.com> for available Extron mounting kits and ordering information).

Rack Mounting

Attach the DSC to a standard 19-inch rack shelf.

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the DSC 301 HD in a rack.

CAUTION:

- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (TMA = +122 °F, +50 °C) specified by Extron.
- **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — When mounting the equipment in the rack, ensure that uneven mechanical loading does not cause a hazardous condition.
- **Circuit overloading** — When connecting the equipment to the supply circuit, consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

Consignes UL pour le Montage en Rack

Les consignes UL (« Underwriters Laboratories ») suivantes concernent l'installation en rack d'un boîtier DSC 301 HD :

ATTENTION :

- **Température ambiante élevée** — En cas d'installation de l'équipement dans un rack fermé ou composé de plusieurs unités, la température du rack peut être supérieure à la température ambiante. Par conséquent, il est préférable d'installer l'équipement dans un environnement qui respecte la température ambiante maximale (T_{ma}) spécifiée par Extron.
- **Réduction du flux d'air** — Si l'équipement est installé dans un rack, veillez à ce que le flux d'air nécessaire pour un fonctionnement sécurisé de l'équipement soit respecté.
- **Charge mécanique** — Installez l'équipement en rack de manière à éviter toute situation dangereuse causée par le déséquilibre de la charge mécanique.
- **Surcharge électrique** — Lorsque vous connectez l'équipement au circuit d'alimentation, observez la connexion de l'équipement et étudiez les effets possibles d'une surcharge du circuit sur les protections contre les surintensités et les conducteurs d'alimentation. Consultez à cet égard les indications de la plaque d'identification de l'équipement.
- **Mise à la terre** — Assurez-vous que l'équipement est correctement mis à la terre. Accordez une attention particulière aux connexions électriques autres que les connexions directes au circuit de dérivation (ex. : les multiprises).

Under-furniture Mounting

- Mount the DSC under the surface of a desk, table, or podium.

NOTE: Ensure that none of the vents on the unit are blocked.

- **Through-furniture mounting** — Mount the DSC through a table or desk in which a hole has been cut to enable access to the front panel.
- **Free-standing** — Attach the included four rubber feet to the bottom of the DSC in the four corners and place the unit on furniture as desired.

Extron Warranty

Extron warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,
and Central America:**

Extron
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Asia:

Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Japan:

Extron Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:

Extron Middle East
Dubai Airport Free Zone
F13, PO Box 293666
United Arab Emirates, Dubai

Africa:

Extron South Africa
3rd Floor, South Tower
160 Jan Smuts Avenue
Rosebank 2196, South Africa

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876

Asia: 65.6383.4400

Europe: 31.33.453.4040 or 800.3987.6673

Japan: 81.3.3511.7655

Africa: 27.11.447.6162

Middle East: 971.4.299.1800

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.