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DSC 3G-HD A and DSC HD-3G A

Video Scalers



Extron

68-2261-01 Rev. F
11 21

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:

CAUTION: Risk of minor personal injury.
ATTENTION : Risque de blessure mineure.

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:

```
^AR Merge Scene,,0p1 scene 1,1 ^B 51 ^W^C.0
[01] R 0004 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 section provides an overview of the DSC 3G-HD A and DSC HD-3G A scalers, covering the following topics:

- **About this Guide**
- **About the DSC 3G-HD A and DSC HD-3G A**
- **Features**
- **Application Diagrams**

About this Guide

This guide describes the Extron DSC 3G/HD/SD SDI-to-HDMI and DSC HDMI-to-3G/HD/SD SDI Digital Scaling Converters and provides instructions for experienced installers to install, configure, and operate them.

In this guide the terms “scaler” and “DSC” are used interchangeably to refer to both DSC models.

About the DSC 3G-HD A and DSC HD-3G A

The DSC 3G-HD A and DSC HD-3G A are single-input scalers that accept multiple video resolutions and offer multiple output rates. They provide 30-bit processing and 1080i deinterlacing as well as embedded audio. Other features of both models include Auto Memory, Auto-Image, and internal test patterns. Setup and control are provided via front panel controls with an on-screen display (OSD), a front panel USB Config port, and a rear panel RS-232 port. SIS (Simple Instruction Set) commands and the Windows®-based Product Configuration Software (PCS) program can be used to configure and control the DSC via the Config and RS-232 ports.

Both models have compact 1U high by 1/2 rack wide by 8 1/2 inches (21.5 cm) deep enclosures and can be rack mounted.

- **DSC 3G-HD A** — The DSC 3G-HD A scaler converts 3G-SDI, HD-SDI, and SD-SDI signals to HDMI. It accepts and scales SMPTE video resolutions from 480i to 1080p @ 60 Hz and 2K (2048x1080), with output rates up to 1920x1200, including HDTV 1080p @ 60 Hz and 2K. It has one 3G-SDI/HD-SDI/SD-SDI input plus an SDI loop-through, and one HDMI output. It can embed analog audio input signals or up to four pairs of AES audio channels from the SDI input in the HDMI output. It provides gain and attenuation for analog stereo input and for each embedded SDI channel.
- **DSC HD-3G A** — The DSC HD-3G A scaler converts HDMI signals to 3G-SDI, HD-SDI, and SD-SDI formats. It accepts computer and SMPTE video resolutions up to 1920x1200 and 2K, with output rates from 480i to HDTV 1080p @ 60 Hz and 2K. It has one HDMI input and dual 3G-SDI/HD-SDI/SD-SDI outputs. It can embed analog or two-channel or multi-channel HDMI audio in the SDI outputs and provides gain and attenuation adjustments for analog stereo input.

Features

DSC 3G-HD A

- **3G-SDI, HD-SDI, and SD-SDI to HDMI video scaling** — Provides high quality conversion of signal format and video resolution with audio embedding.
- **Inputs** — One 3G-SDI/HD-SDI/SD-SDI on a BNC connector, and balanced and unbalanced stereo audio on a 5-pole captive screw connector
- **Outputs** — One HDMI and one buffered loop-through 3G-SDI/HD-SDI/SD-SDI on a BNC connector
- **Accepts 3G-SDI/HD-SDI/SD-SDI signals up to 2.97 Gbps** — Accepts data rates from standard definition to HDTV 1080p/60 and 2K. Complies with SMPTE 259M, 292M, 424M, and ITU digital video standards.
- **HDMI audio embedding** — Analog stereo audio or up to four pairs of AES audio channels from the SDI input can be embedded onto the HDMI output.
- **Input equalization and reclocking** — Automatically equalizes incoming signals and reshapes and restores signals on the buffered loop-through.
- **Selectable output color space** — The color space can be set to RGB or component video.
- **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.

DSC HD-3G A

- **HDMI to 3G-SDI, HD-SDI, and SD-SDI video scaling** — Provides high quality conversion of signal format and video resolution with audio embedding.
- **Inputs** — One HDMI connector, and balanced and unbalanced stereo audio on a 5-pole captive screw connector
- **Outputs** — Dual buffered 3G-SDI/HD-SDI/SD-SDI on BNC connectors. Simultaneous 3G-SDI/HD-SDI/SDI outputs are available for driving two sink devices.
- **Accepts multiple HDMI signals** — Accepts HDMI signals up to 1920x1200, 1080p @ 60 Hz, and 2K. Only unencrypted content can be sent to the output.
- **SDI audio embedding** — Analog stereo audio or HDMI two-channel LPCM or multi-channel PCM audio can be embedded onto the SDI outputs.
- **SMPTE compliance** — Complies with SMPTE 259M, 292M, 424M, and ITU digital video standards.
- **EDID emulation** — Provides selectable resolutions and refresh rates and a means for specifying the rate of the incoming signal, ensuring proper communication with the video source.
- **Genlock input with loop-through** — Allows for synchronization to an external reference signal and supports bi-level or tri-level sync for integration into broadcast and production applications.

Both Models

- **Advanced scaling engine** — 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.
- **Selectable output rates** — Available output rates include:
  - **DSC 3G-HD A:** Computer video from 640x480 to 1920x1080 (1080p) and 2048x1080 (2K)
  - **DSC HD-3G A:** HDTV rates from 480i to 1080p and 2K.
- **Supported HDMI formats** (on pass-through connectors)**:** LPCM up to 7.1/24-bit/192 KHz.
- **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.
- **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.
- **Front panel LED indicators** — Provides visual indication of system status for real-time feedback and monitoring of signal format, presence, and power.
- **Product Configuration Software** — The Windows-based PCS program is available to be downloaded from the Extron website. This program lets you configure the DSC from your computer via an RS-232 or a USB connection.
- **Image freeze control** — A live image can be frozen using RS-232 serial control or USB.
- **Auto Memory** — When activated, the unit automatically stores size, position, and picture settings based on the incoming signal. When the same signal is detected again, these image settings are automatically recalled from memory.
- **On-screen menus** — On-screen menus enable system setup using the front panel controls. Key parameters such as input and output video formats are grouped for convenience on the initial `Quick Setup` screen, while additional screens provide full control over the other functions and settings.
- **Output Standby Mode** — Automatically mutes the video and syncs 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.
- **Power Save Mode** — Places the unit in a low power standby state to conserve energy when not in use.
- **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
- **Picture controls** — Enable control of brightness, contrast, detail, horizontal and vertical positioning, overscan, and sizing.
- **User presets** — Memory presets are available for each input to store and recall optimized image settings.
- **LockIt HDMI cable lacing bracket provided**
- **Internal test patterns** — Offers a crop pattern, grayscale, color bars, alternating pixels, audio pink noise, and four aspect ratio patterns: 1.33, 1.78, 1.85, and 2.35.

- **Audio input gain and attenuation** — Gain and attenuation can be adjusted for the analog stereo input.
- **Integrated audio delay** — The audio output is automatically delayed to compensate for latency introduced by the video processing.
- **Signal presence confirmation** — Provides real-time verification of status for the digital video input and output through front panel LEDs or RS-232.
- **Input audio muting** — The analog stereo or digital audio input can be muted.
- **Front panel security lockout** — Locks out all front panel functions. All functions remain available through USB or RS-232 control.
- **Control ports** — The following ports enable complete control and configuration of the DSC via SIS commands and the PCS program.
  - **RS-232 Remote port** (rear panel)
  - **USB Config port** (front panel)
- **Rack mountable**
- **Internal universal power supply** — The 100-240 VAC, 50-60 Hz, international power supply provides worldwide power compatibility.

Application Diagrams

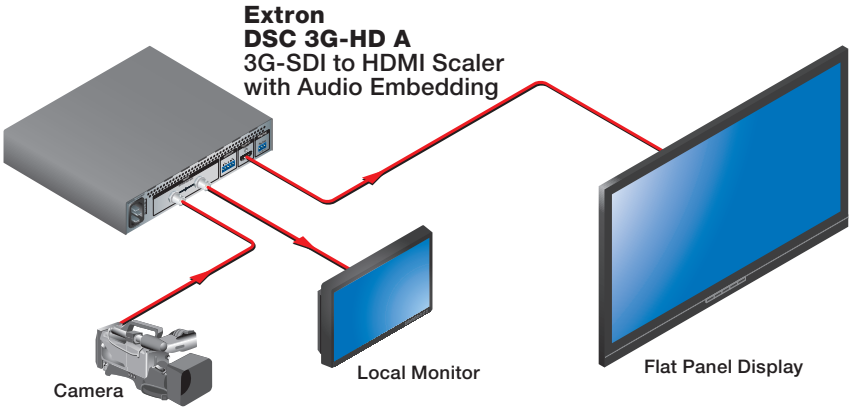


Figure 1. **DSC 3G-HD A Application Example**

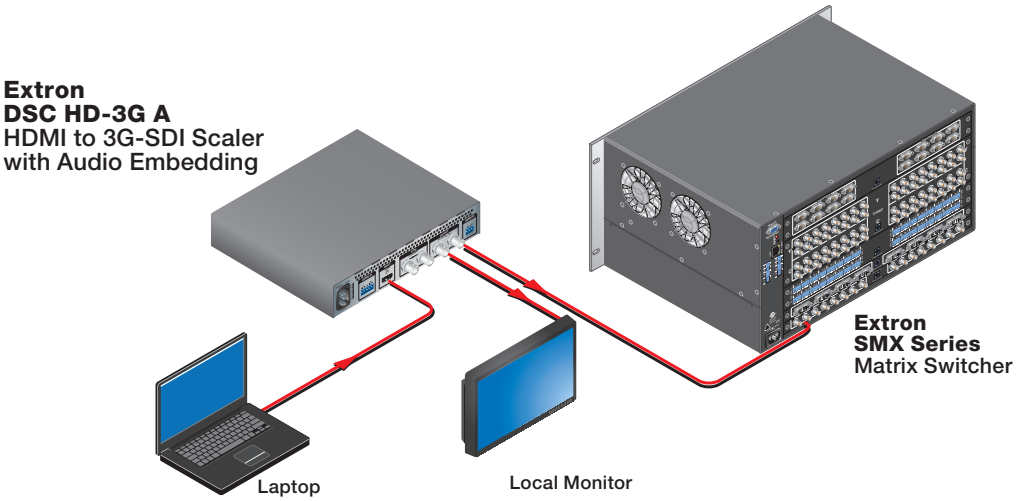


Figure 2. **DSC HD-3G A Application Example**

Installation

This section provides a description of the DSC 3G-HD A and DSC HD-3G A rear panel connectors and instructions for cabling. Topics include:

- **Rear Panel Connections**
- **Securing the HDMI Connector Using the LockIt Bracket**
- **Connecting for Remote Control**

ATTENTION:

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

Rear Panel Connections

Figures **3** and **4** on the next page show the rear panel features of the DSC 3G-HD A and DSC HD-3G A, respectively.

CAUTION: Remove power from the system before making any connections.

ATTENTION: Mettez le système hors tension avant d'effectuer tout raccordement.

ATTENTION:

- Use electrostatic discharge precautions (be electrically grounded) when making connections. Electrostatic discharge (ESD) can damage equipment, although you may not feel, see, or hear it.
- Prenez des précautions contre les décharges électrostatiques (soyez électriquement relié à la terre) lorsque vous effectuez des connexions. Les décharges électrostatiques (ESD) peuvent endommager l'équipement, même si vous ne pouvez pas le sentir, le voir ou l'entendre.

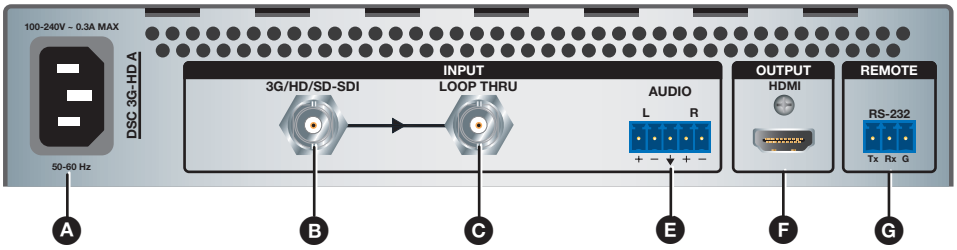


Figure 3. DSC 3G-HD A Rear Panel

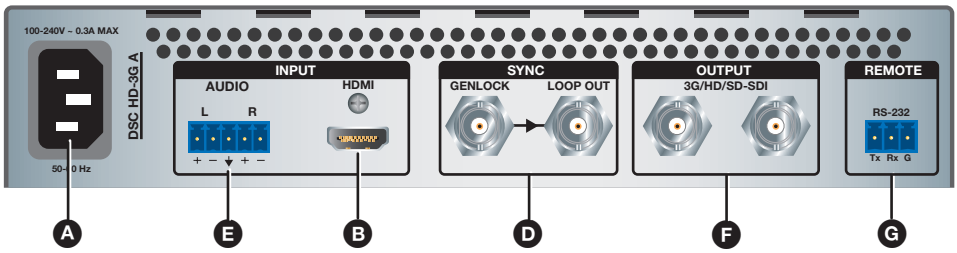


Figure 4. DSC HD-3G A Rear Panel

- **A AC power connector**
- **B Input connector**
- **C Buffered LOOP THRU input connector**
- **D GENLOCK and LOOP OUT sync connectors**
- **E AUDIO input connector**
- **F Output connectors**
- **G REMOTE RS-232 connector**

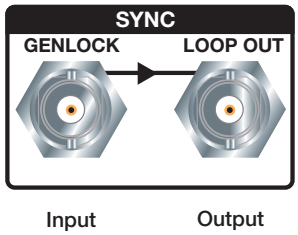
A AC power connector — Connect the supplied US standard IEC power cable between this IEC connector and a 110-220 V 50-60 Hz AC power source. The front panel control and input selection buttons light in sequence during power-up.

B Input connector —

- **DSC 3G-HD A** — Connect a 3G/HD/SD-SDI source to this SDI BNC input connector.
- **DSC HD-3G A** — Connect an HDMI source to this HDMI input connector, and secure it using the LockIt bracket (see **Securing the HDMI Connector using the LockIt Bracket** on page 8).

C Buffered LOOP THRU input connector (DSC 3G-HD only) — Connect a local monitor to this SDI BNC input connector. Buffered 3G/HD/SD-SDI signals are reclocked, reshaped, and restored when passed through this loop-through connector.

D GENLOCK and LOOP OUT sync connectors (DSC HD-3G A only) — The BNC input connector (left, labeled GENLOCK) syncs the video signal in broadcast or other sync-critical applications.



The BNC output connector (right, labeled LOOP OUT) routes the sync signal throughout the system in broadcast or other sync-critical applications. Bi-level and tri-level sync are supported.

Connect an external sync device to the GENLOCK input connector, and connect any downstream equipment that requires genlocking LOOP OUT connector

E AUDIO input connector —

- **DSC 3G-HD A** — Connect audio from the source to this 5-pole captive screw connector. Analog audio input can be embedded on the HDMI output. AES audio that is embedded on the SDI input can be identified and one to four pairs (8 channels) of the available 16 channels can be embedded on the HDMI output:
  - If eight-channel digital is selected, four of the eight available channel pairs are used.
  - If two-channel digital is selected, one of the eight pairs can be selected.
- **DSC HD-3G A** — If desired, connect analog audio input from the source to this 5-pole captive screw connector. HDMI or analog audio can be passed through to the SDI outputs as AES pairs.

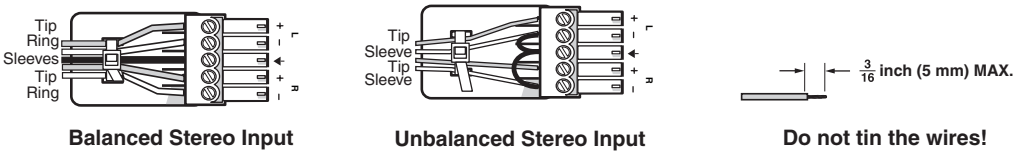


Figure 5. Wiring the Audio Input Connector

ATTENTION:

- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inch (5 mm). If the exposed portion is longer, the wires may touch, causing a short circuit between them. If the exposed wires are shorter, they can be easily pulled out, even if tightly fastened by the captive screws.
- La longueur des câbles exposés est primordiale lorsque l'on entreprend de les dénuder. La longueur idéale est de 5 mm (3/16 inches). S'ils sont un peu plus longs, les câbles exposés pourraient se toucher et provoquer un court circuit. S'ils sont un peu plus courts, ils pourraient sortir, même s'ils sont attachés par les vis captives.

- Do not tin the wires. Tinned wires are not as secure in the captive screw terminals and could pull out.
- Ne pas étamer les câbles. Les câbles étamés ne sont pas aussi bien fixés dans les terminaisons des à vis captives et pourraient sortir.

- For unbalanced audio, connect the sleeves to the ground contact. **Do not** connect them to negative (–) contacts.
- Pour l'audio asymétrique, connectez les manchons au contact au sol. Ne PAS connecter les manchons aux contacts négatifs (–).

F Output connectors —

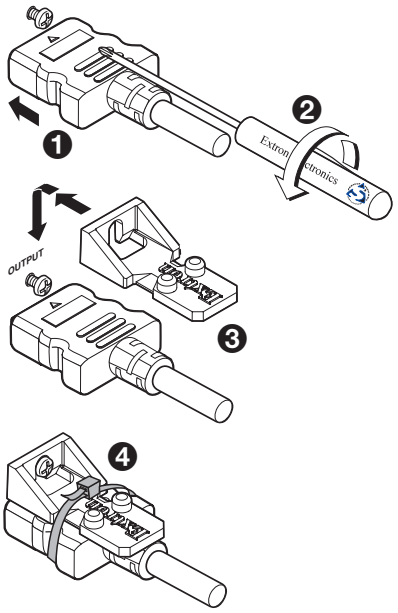
- **DSC 3G-HD A HDMI output** — Connect an HDMI display device to this HDMI connector, and secure it using the LockIt bracket (see **Securing the HDMI Connector using the LockIt Bracket** on the next page).
- **DSC HD-3G A 3G/HD/SD-SDI outputs** — Connect one or two SDI output devices to one or both of these BNC connectors. These output ports transmit signals that follow SMPTE standards 259M, 292M, and 424M.

G REMOTE RS-232 port — For serial RS-232 control, connect a host computer or control system to the 3-pole captive screw connector (see **Connecting for Remote Control** on the next page).

Securing the HDMI Connector Using the LockIt Bracket

After connecting an input or output device to an HDMI connector, secure the connector in place with the provided LockIt bracket as follows (see the illustration at right):

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



Connecting for Remote Control

Both DSC models have two control ports through which they can be connected to your computer for configuration and control: the rear panel RS-232 port and the front panel USB port.

Connecting to the RS-232 Port

To connect your computer or control system to the DSC RS-232 port, you can use an Extron Universal Control cable (UC50' or UC100') or other female 9-pin-to-bare-wire RS-232 cable.

1. Wire the unterminated end of the RS-232 cable to the provided 3-pole captive screw connector as follows (see **figure 6** on the next page):
   a. Connect the transmit wire to the left pin, which plugs into the `Tx` (transmit) port.
   b. Connect the receive wire to the third pin, which plugs into the `Rx` (receive) port.
   c. Connect the ground wire to the last pin, which plugs into the ground port, marked with `G`.
2. Plug the captive screw connector into the rear panel RS-232 port.
3. Connect the 9-pin connector end of the RS-232 cable to the serial port of your computer or control system. Tighten the captive screws to securely fasten the wires in the connector.

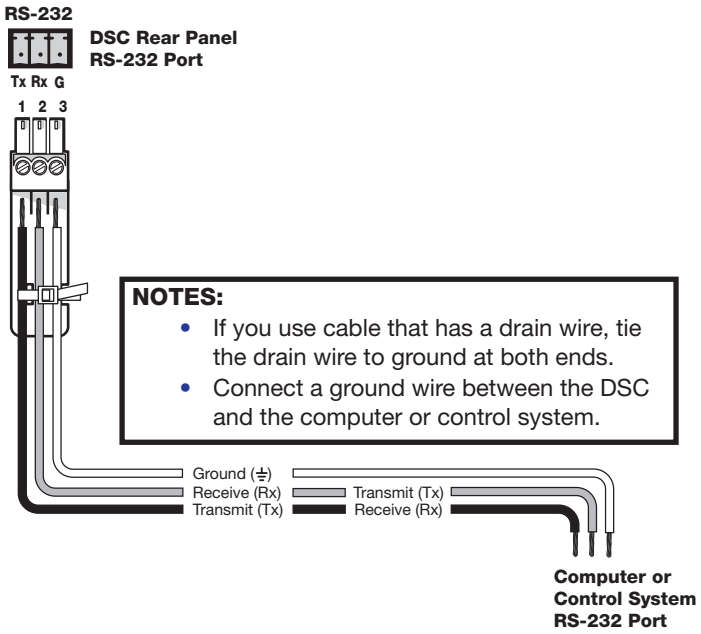


Figure 6. Connecting to the RS-232 Port

See **SIS Commands** on page 40 for information on sending SIS commands to this port.

Connecting to the USB Config Port

The USB-mini B `CONFIG` port is located on the DSC front panel. Use a USB-A to USB-mini B cable to connect the DSC USB `CONFIG` port to a USB port on your computer.

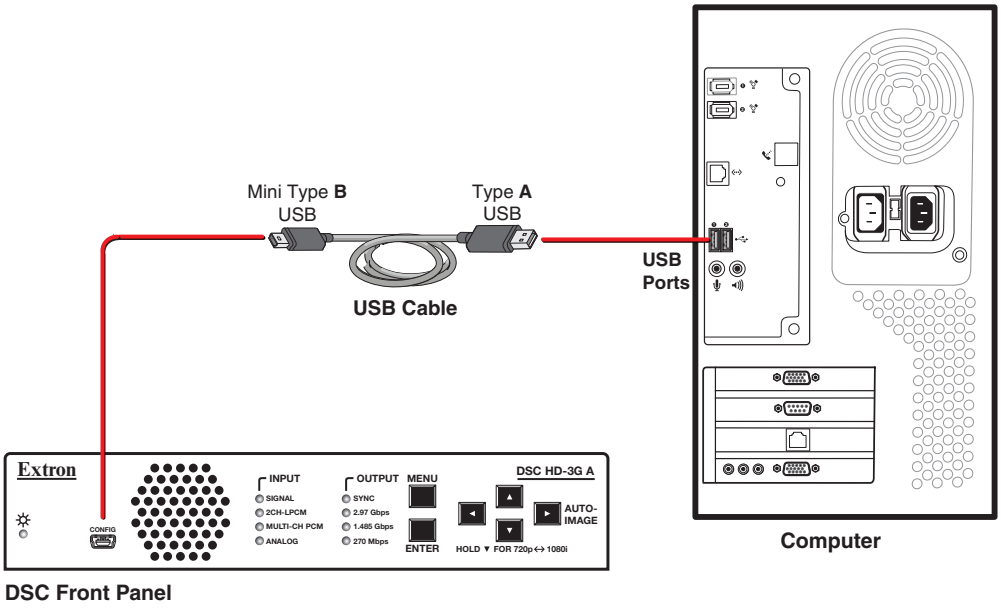


Figure 7. Connecting to the Front Panel USB Config Port

Operation

This section discusses the functions available through the front panel and the on-screen display (OSD) to configure and operate the DSC. Topics include:

- **Front Panel Features**
- **On-screen Display**
- **Auto-Image**
- **Changing the Output Resolution and Refresh Rate**
- **Power Save Mode**
- **Presets**
- **Locking the Front Panel (Executive Mode)**
- **Resetting**

Front Panel Features

Figures 8 and 9 show the front panel features of the DSC 3G-HD A and DSC HD-3G A, respectively.

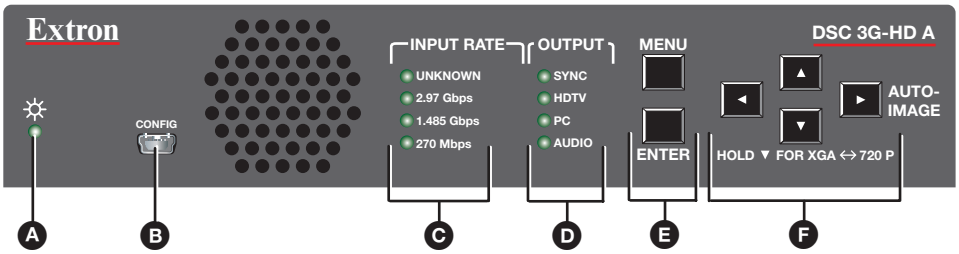


Figure 8. DSC 3G-HD A Front Panel

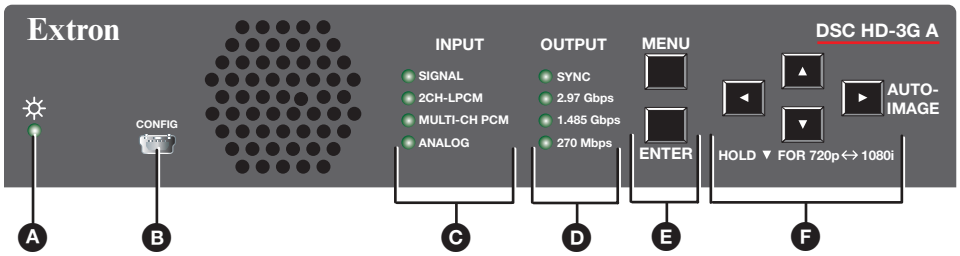


Figure 9. DSC HD-3G A Front Panel

A Status LED (power and signal)
B USB CONFIG port
C Input signal information LEDs
D Output signal information LEDs
E MENU and ENTER buttons
F Navigation buttons

A Status LED (power and signal) —

- Lights steadily amber when the unit is powered on but no signal is present.
- Blinks amber every 3 seconds when the unit is in standby mode.
- Lights steadily green when both power and an input signal are present.

B **USB CONFIG port** (see **figures 8 and 9** on the previous page) — Connect a control system or computer to this mini USB port for device configuration, control, and firmware upgrades.

C **Input signal information LEDs**

- **DSC 3G-HD A INPUT RATE LEDs** — One of these four green LEDs lights when the unit is powered on, indicating the type of input signal that is present.
  - **UNKNOWN** — The signal does not reference SMPTE 259M, 292M, or 424M.
  - **2.97 Gbps:** SMPTE 424M — 1080p @ 50 Hz and higher or 2K @ greater than 30 Hz
  - **1.485 Gbps:** SMPTE 292M — 720p or 1080i, 1080p @ up to 30 Hz, 1080PsF @ 23.98, 24, 25, 29.98, and 32 Hz
  - **270 Mbps:** SMPTE 259M — 480i or 576i
- **DSC HD-3G A INPUT LEDs** — These four green LEDs light to indicate presence of a video input signal and the type of audio signal if one is also present.
  - **SIGNAL** — An input signal is present.
  - **2CH-LPCM** — Two-channel LPCM audio signal is present.
  - **MULTI-CH PCM** — Multi-channel PCM audio signal is present.
  - **ANALOG** — Analog audio signal is present.

D **Output signal information LEDs**

- **DSC 3G-HD A OUTPUT LEDs** — These four green LEDs light to indicate the presence of sync and other information about the signal being output.
  - **SYNC** — Sync is present. (If the video is muted, this LED does not light.)
  - **HDTV** — 2K, 1080p, 1080i, 720p, 480p, 576p rates, or custom HDTV rates
  - **PC** — VESA standard or custom computer rates
  - **AUDIO** — Embedded audio is present.
- **DSC HD-3G A OUTPUT LEDs** — These four green LEDs light to indicate the presence of sync and the output rate specified for the output (output rates can be specified using SIS commands, the PCS program, or the OSD).
  - **SYNC** — Sync is present. (If the video is muted, this LED does not light.)
  - **2.97 Gbps** — SMPTE 424M
  - **1.485 Gbps** — SMPTE 292M
  - **270 Mbps** — SMPTE 259M

E **MENU and ENTER buttons** — These buttons let you access and make selections from the on-screen display menus (see **Using the Front Panel Buttons with the OSD Menus** on page 15 for detailed explanations of these buttons and the arrow buttons.

F **Navigation buttons** — These left ◀, right ▶, up ▲, and down ▼ arrow buttons enable you to step through the OSD submenus. You can also press them to **lock the front panel controls** (executive mode, see page 39), perform **Auto-Image** (see page 34), and **reset the output rate** (see page 36).

On-screen Display

The on-screen display (OSD) enables you to configure and adjust the DSC from menus displayed on a monitor or other display device connected to a rear panel output.

NOTE: The settings available through these menus can also be selected via SIS commands (see the **Remote Configuration and Control** section, beginning on page 40).

Menu Overview

The OSD main menu has seven configuration submenus and two read-only information screens. The two DSC models have the same items on their main menus. However, some of the submenus differ between products. The **DSC 3G-HD A** and **DSC HD-3G A** OSD menu tables on the next two pages show the submenus and their items for each DSC.

NOTE: The `Device Info` and `Communication` screens are read-only and give current device status.

The menu screen always displays the following items, regardless of which submenu is displayed.

- **Company name and product name** are in the upper-left corner.
- **Firmware version number** is in the upper-right corner.
- **Current input resolution and refresh rate** are in the lower-left corner.
- **Current output resolution and refresh rate** are in the lower-right corner.

OSD Menus Summary Tables

The next two pages contain tables that summarize the submenus and their options on the DSC 3G-HD A and the DSC HD-3G A.

OSD Menus — DSC 3G-HD A							
Submenu	**Submenu Items**						
Quick Setup	Auto-Image (Start)	Output Resolution	Auto Memory (Status)	Aspect Ratio	Input Audio format	Test Pattern	
User Presets	Recall	Save	Clear				
Picture Controls	Image Position (H and V)	Image Size (H and V)	Brightness --- Contrast	Detail			
Input	Auto-Image	Film Mode	Active (Pixels) (H and V)	Total (Pixels) (H and V)	Start (Pixel) (H and V)		
Output	Output Resolution	HDMI Format	AFL				
Audio	Input Audio Format	Audio Mute	Input Gain/ Attenuation	SDI Audio Decode			
Advanced	Test Pattern	Screen Saver --- Timeout	Aspect Ratio	Auto Memory (Status)	Overscan	Temperature	Factory Reset
Communication (Read-only)	Remote Port						
Device Info (Read-only)	Temperature	Input (Resolution, Type, Rate, Total Lines, and Total Pixels)	AFL (Status)	Output (Resolution and Rate)	Format (Output)	Display Info (Resolution and Rate)	Firmware (Version and Build)

OSD Menu — DSC HD-3G A							
Submenu	**Submenu Items**						
Quick Setup	Auto-Image (Start)	Input EDID	Output Resolution	Auto Memory (Status)	Aspect Ratio	Input Audio Format	Test Pattern
User Presets	Recall	Save	Clear				
Picture Controls	Image Position (H and V)	Image Size (H and V)	Brightness --- Contrast	Detail			
Input	Auto-Image	Input EDID	Film Mode	Active Pixels) (H and V)	Total (Pixels) (H and V)	Start (Pixel) (H and V)	
Output	Output Resolution	Genlock/AFL	Genlock Offset (H and V)				
Audio	Input Audio Format	Audio Mute	Input Gain/Attenuation				
Advanced	Test Pattern	Screen Saver --- Timeout	Aspect Ratio	Auto Memory (Status)	Overscan	Temperature	Factory Reset
Communication (Read-only)	Remote Port						
Device Info (Read-only)	Temp	Input (Resolution, type, rate, total lines, and total pixels)	Output (Resolution and Rate)	Format (Output)	Genlock/AFL (Status)	Firmware (Version and Build)	

Using the Front Panel Buttons with the OSD Menus

The front panel navigation buttons enable you to access the OSD and make selections from its menus.

- **MENU** — Press this button to open and close the OSD. Pressing it from within a submenu or a submenu item returns you to the next higher menu level.

  For example, if you select and highlight a submenu item you did not want, pressing **MENU** changes the highlighting of the item to an outline. From there, you can use the up and down arrow buttons to move the outline to the desired item.

- **ENTER** — Press this button to access the items on the displayed submenu (moves a yellow outline to the first submenu item in the right column). Press this button again to select the outlined submenu item. You can also press the **ENTER** button to open the OSD, but not to close it.

- **Left arrow** ◀ — Press this button to adjust settings on screens displayed as a result of selecting submenu items. For `Picture Controls` submenu items with (for example, **Brightness** and **Contrast** or **H** and **V**) press this button to select the sub-item on the **left**, then use the ▲ and ▼ buttons to adjust the sub-item settings.

- **Right arrow** ▶ — Press this button adjust settings on screens displayed as a result of selecting submenu items. For `Picture Controls` submenu items, press this button to select the sub-item on the **right**, then use the ▲ and ▼ buttons to adjust the sub-item settings.

  When the OSD is closed, pressing this button performs an Auto-Image (see **Auto-Image** on page 34).

- **Up arrow** ▲ — Press this button to move upward through main menu and submenu items. This button also adjusts settings on screens displayed as a result of selecting submenu items.

- **Down arrow** ▼ — Press this button to move downward through main menu and submenu items. This button also adjusts settings on screens displayed as a result of selecting submenu items.

  You can also use this button to reset the output rate (see **Resetting the Output Rate** on page 36 and in conjunction with the **Menu** button to lock the front panel (see **Locking the Front Panel (Executive Mode)** on page 39).

Using the OSD Menus

To access and use the OSD menus:

1. Press the **Menu** button once to open the main menu on the display. The menu opens with the Quick Setup submenu displayed and the menu name bolded (see figure 10).

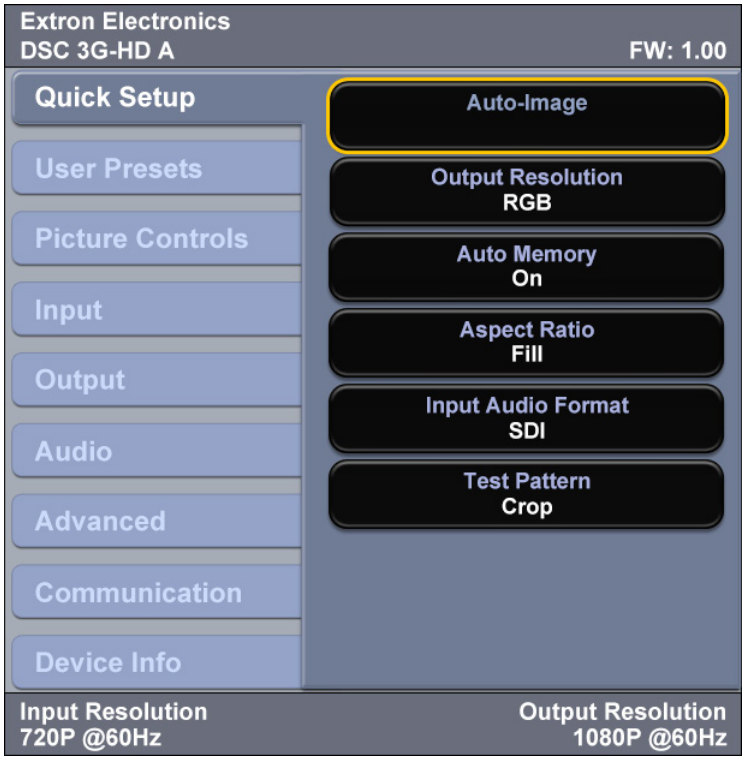


Figure 10. OSD Main Menu, Initial View

2. If the desired submenu does not appear, press the ▼ or ▲ button to move to the desired item.
3. Press the **Enter** button to access the submenu items. A yellow outline appears around the first item.
4. Press the ▼ or ▲ button to cycle through the submenu until the desired item is outlined.
5. Press the **Enter** button to select the outlined submenu item. The selected item is highlighted in yellow.

   When you select a Picture Controls submenu item, the OSD shrinks to display only the settings currently being adjusted (see figure 11).



Figure 11. Example of a Selected Picture Controls Submenu Item

6. Press the ◀ or ▶ button to adjust the value as desired.

   For Picture Controls submenu items:

   a. Press the right or left arrow button to select the sub-item on the right or the left.
   b. Use the ▲ and ▼ buttons to adjust the settings of the selected sub-item.
   c. Repeat steps 6a and 6b for the other sub-item.

7. Press **Enter** to confirm your new values. Press it again if action confirmation is required. The yellow highlighting is replaced by the yellow outline on the menu screen.
8. Do any of the following:
   - Press the ◀ or ▶ button to move to another item on the submenu and repeat steps 5 through 7.
   - Press **Menu** to exit the submenu.
   - Press **Menu** twice to exit the submenu and close the main menu.

NOTES:
- Values in submenus that do not apply to the current input are shown as N/A.
- An asterisk following an item indicates that it is the default.
- The OSD times out and closes after 1 minute if no buttons are pressed.

Quick Setup Submenu

This submenu (see figure 12) contains a selection of menu items that are also available on other OSD menus. It allows you to make several basic configuration adjustments to the DSC from the same menu screen.

NOTE: On this submenu, the DSC HD-3G A has an Input EDID item, which is not on the DSC 3G-HD A Quick Setup submenu (see **figure 10** on page 16).

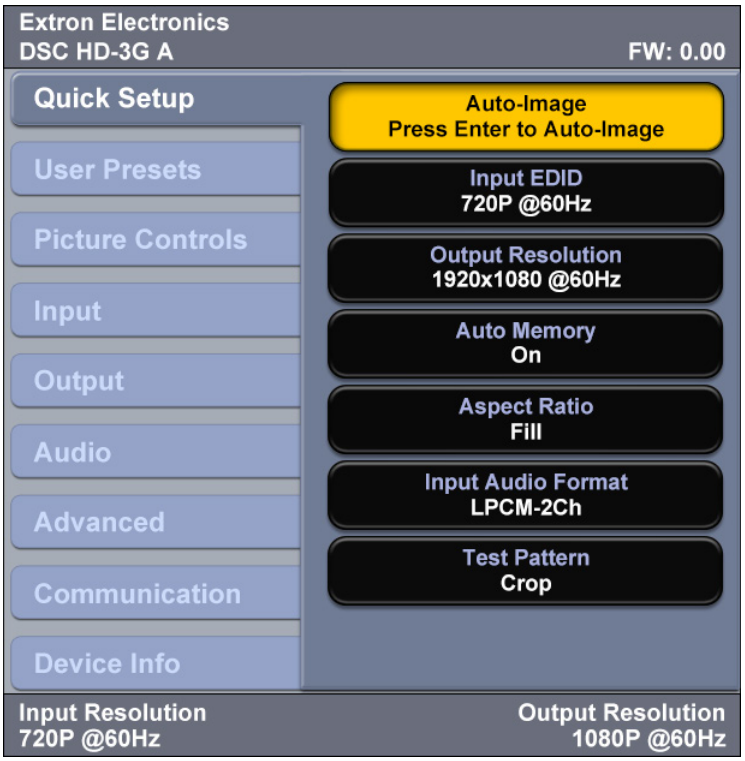


Figure 12. Quick Setup Submenu — DSC HD-3G A

From this menu, you can configure the following:

- **Auto-Image** — Select this item, then press **Enter** to perform a one-time Auto-Image on the video input (see **Auto-Image** on page 34 for more information about this function).
- **Input EDID** — (DSC HD-3G A only) Select this item to match the input EDID to the output rate or to set a discrete EDID (see the **input EDID table** on page 23 for EDID data). The default is **720P @ 59.94 Hz**.
- **Output Resolution** — This item lets you set the resolution and refresh rate for the current output. The DSC 3G-HD A has 42 factory installed output resolutions and rates and 3 custom user defined blocks for new resolutions (see the **DSC 3G-HD A output resolutions table** on page 25). The DSC HD-3G A has 30 factory output resolutions and rates (no custom rates) (see the **DSC HD-3G A output resolutions table** on page 27).
- **Auto Memory** — Select this item to enable or disable Auto Memories. When you select **On**, the DSC automatically stores the current input configuration and picture control values as an input preset in one of its 32 Auto Memory locations (see **Auto Memories** on page 37 for more information).
- **Aspect Ratio** — This item lets you specify how much of the display the image will fill. The sub-items are **Fill** (fills the entire screen) and **Follow** (displays with the aspect ratio of the input).
- **Input Audio Format** — This item enables you to select the format of the audio (if any) that will be embedded in the output (see the **audio formats table** on page 29 for more information). Selecting **None** mutes the audio.
- **Test Pattern** — This item lets you choose a test pattern to aid in setting up the DSC and the corresponding output display. Available patterns are: Off (no test pattern), Crop, Alternating Pixels, Crosshatch, Color Bars, Grayscale, Blue Mode, and Audio Test (displays a crop pattern with OSD text AUDIO TEST and outputs 48 kHz, 24 bit pink noise).

User Presets Submenu

This submenu (see figure 13) allows you to save positioning and sizing information and picture adjustments as a user preset. You can recall saved presets, easily applying their settings to frequently used sources. Presets can also be overwritten or cleared via this menu. (The `User Presets` submenu is the same on both DSC models.)

- Up to three user presets per input can be saved or recalled.
- A user preset can be saved with one input resolution and later recalled with another resolution. For example, you could save a preset at 720p and recall it at 1080p.



Figure 13. User Presets Submenu

In addition to the user presets, 128 global input presets are available via SIS commands (see the **Presets commands** on page 52). A summary and comparison of the values stored in user and input presets is shown in the table below.

User Presets		Input Presets		
Contrast	Horizontal image size (Width in pixels)	Contrast	Horizontal start	Horizontal image size
Brightness	Vertical image size (Height in lines)	Brightness	Vertical start	Vertical image size
Detail	Horizontal image position	Detail	Active pixels (Horizontal active)	Horizontal image position
Preset name	Vertical image position	Preset name	Active lines (Vertical active)	Vertical image position
		Audio gain/ attenuation	Total pixels	Film mode

Saving a user preset

To save the current configuration as a preset:

1. From the main menu, select **User Presets**. The User Presets submenu appears in the right column.
2. From the User Presets submenu, select **Save**. The Save item is highlighted.
   - If no preset has been assigned, the preset item field contains the text 0n:(unassigned), where ***0n*** is the preset number (**01** through 03). By default, preset 01 is displayed when the screen is opened.
   - If a preset has been assigned (saved) to a number (01, 02, or 03), the **Save** item field displays USER PRESET *0N*.
3. Press any of the arrow buttons to step through the three preset slots and press **Enter** when the desired preset number is displayed.
4. The selected preset field displays PRESS ENTER TO CONFIRM. Press **Enter** again to confirm your preset selection.

To overwrite a preset with new settings:

1. Change the settings as desired using the other submenus.
2. Save the preset again. The new settings replace the previous ones in the preset.

Recalling a user preset

To recall a saved preset:

1. Select **Recall** from the User Presets submenu.
2. Use the arrow keys to display the preset name that you want to recall.
3. Press **Enter** to select the preset.
4. Press **Enter** again when prompted in the Recall panel to confirm your selection.

NOTE: If you select an unassigned preset number to recall, the message INVALID PRESET is displayed.

Clearing a user preset

To clear settings assigned to a preset:

1. Select **Clear** from the User Presets submenu.
2. Use the arrow keys to navigate to and highlight the preset name that you want to clear.
3. Press **Enter** to select the preset.
4. Press **Enter** again to confirm your selection when prompted. When cleared, the preset again appears as 0n: unassigned.

Picture Controls Submenu

This submenu lets you adjust the horizontal and vertical positions, height and width, brightness and contrast, and sharpness (`Detail`) of the image on the display. (The `Picture Controls` submenu is the same on both DSC models.)



Figure 14. Picture Controls Submenu

The following picture settings can be adjusted:

- **Image Position** — This item lets you adjust the horizontal and vertical position of the image on the display (the available range depends on the current output rate).
- **Image Size** — This item lets you adjust the horizontal size (width) and vertical size (height) of the image. The range is limited by the output resolution (the maximum size is two times the output resolution).
- **Brightness and Contrast** — This item lets you adjust the intensity of video light (brightness) and increase or decrease the range of image light and dark values (contrast) independently. The range is **`0`** through **`127`**. The default is **`64`**.
- **Detail** — This item lets you adjust the image sharpness. The range is **`0`** to **`127`**. The default is **`64`**).

NOTE: An asterisk (*) following a value indicates that it is the default.

Adjusting picture controls

1. From the `Picture Controls` submenu, select the control item that you want to adjust. The selected item field appears alone on the display (the rest of the menu is hidden).



Figure 15. Example of a Selected Picture Control Field

2. Use the arrow buttons to change the value:
   - Press the ▲ or ▼ button to adjust the **`V`** (vertical) or **`Contrast`** value.
   - Press the ◀ or ▶ button to adjust the **`H`** (Horizontal) or **`Brightness`** value.
   - For the **`Detail`** value, press either ▲ or ▶ to **increase** the sharpness. Press ▼ or ◀ to **decrease** it.

   To rapidly increment or decrement the values, press and hold the arrow button.
3. When finished adjusting the selected control, press the **`Menu`** button to return to the `Picture Controls` submenu.

Input Submenu

This submenu allows you to perform certain input adjustments and to **view** the active, total, and start of lines and pixels. (The **`Input EDID`** item is available only on the DSC HD-3G A.)

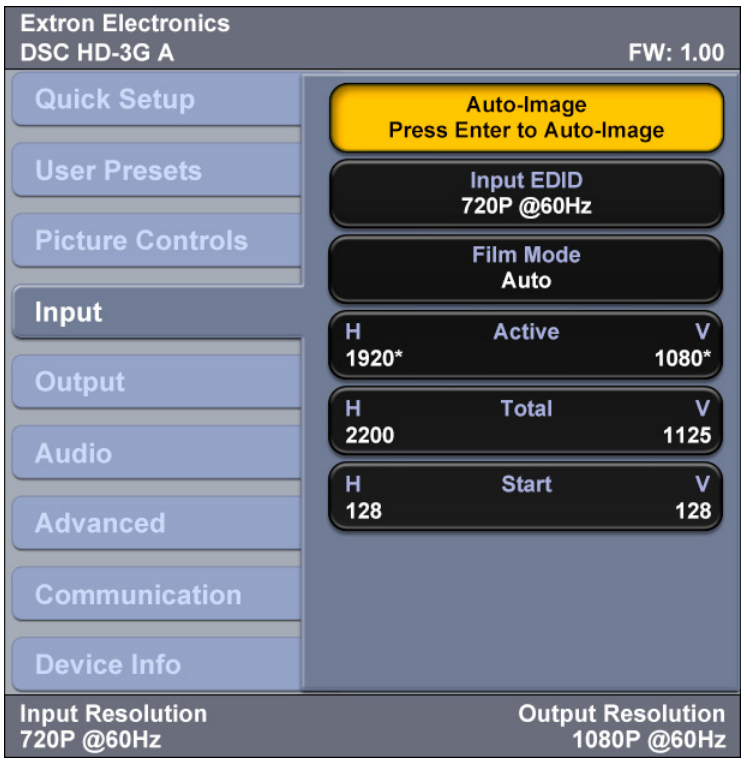


Figure 16. Input Submenu (DSC HD-3G A)

- **Auto-Image** — Select this item, then press **`Enter`** to perform a one-time Auto-Image on the video input (see **Auto-Image** on page 34 for more information about this function).

- **Input EDID** — (DSC HD-3G A only) This item lets you select an EDID (resolution and refresh rate) emulation for the HDMI input. You can match the input EDID to the output rate or set a discrete EDID. The default is **`720P @ 59.94 Hz`**. The table below shows the available EDID selections for the **DSC HD-3G A**.

Resolution	23.98 Hz	24 Hz	25 Hz	29.97 Hz	30 Hz	50 Hz	59.94 Hz	60 Hz
`C1:` *nnnn*X*nnnn* @*nn*Hz	Custom EDID 1							
`C2:` *nnnn*X*nnnn* @*nn*Hz	Custom EDID 2							
`C3:` *nnnn*X*nnnn* @*nn*Hz	Custom EDID 3							
640 x 480								X
800 x 600								X
852 x 480								X
1024 x 768								X
1024 x 852								X
1024 x 1024								X
1280 x 768								X
1280 x 800								X
1280 x 1024								X
1360 x 765								X
1360 x 768								X
1365 x 768								X
1366 x 768								X
1440 x 900								X
1400 x 1050								X
1600 x 900								X
1680 x 1050								X
1600 x 1200								X
1920 x 1200								X
480i (NTSC)							X	
576i (PAL)						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
2K (2048 x 1080)	X	X	X	X	X	X	X	X

***Default resolution and rate

Selecting an input EDID

To select a resolution and rate for input emulation:

1. From the **`Input`** submenu, select **`Input EDID`**.
2. Press the ◀ or ▶ button to select a resolution.
3. Press the ▲ or ▼ button to select a rate for the resolution.
4. When finished, press **`Menu`** to return to the **`Input`** submenu or wait for the DSC to time out (approximately 1 minute). Your selections are saved and appear next time you open the OSD.

- **Film Mode** — This item lets you enable and disable Film Mode. After selecting the item, press any arrow button to toggle between **Auto** (the default) and **Off**.

  If **Auto** is selected, the DSC detects:

  - 3:2 pull-down for NTSC and 1080i @ 60 Hz
  - 2:2 and 24:1 pull-down for PAL and 1080i @ 50 Hz
- **Active** — This view-only field shows the width in pixels (the H value) and the height in lines (the V value) of the active video area.
- **Total** — This view-only field shows the width in pixels (the H value) and the height in lines (the V value) of the total video display area.
- **Start** — This view-only field shows the distance in pixels from the left edge of the total video display to the left edge of its active area (H value) and the distance in lines from the top edge of the total video display to the top edge of its active area.

Output Submenu — DSC 3G-HD A

This submenu allows you to configure the output of the DSC 3G-HD A.

NOTE: The DSC 3G-HD A has some different items on this submenu from DSC HD-3G A (see **Output Submenu — DSC HD-3G A** on page 26).

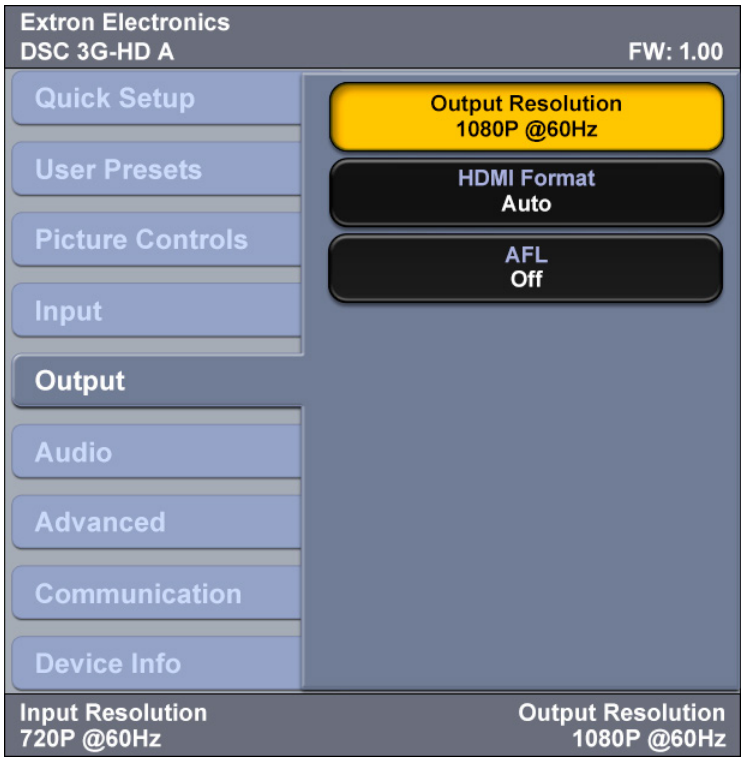


Figure 17. Output Submenu — DSC 3G-HD A

- **Output Resolution** — This item lets you select the resolution and refresh rate for the connected output display. The DSC 3G-HD A has a range of resolutions from which to choose (see the **Resolutions and Refresh Rates for the DSC 3G-HD A** table on the next page for the settings that are available for this model). The available refresh rates depend on the selected resolution.

  1. Select **Output Resolution** from the Output submenu.
  2. Press the ◀ or ▶ button to select a resolution.

3. Press the ▲ or ▼ button to select a rate for the resolution.
4. When you enter a new resolution, a message appears on the display, prompting you to press **Enter** to confirm your selection.

> **NOTE:** If you do not confirm your resolution and rate selection within 15 seconds, the scaler returns to the previously selected resolution and rate.

The following resolutions and refresh rates are available for the **DSC 3G-HD A**:

Resolution	23.98 Hz	24 Hz	25 Hz	29.97 Hz	30 Hz	50 Hz	59.94 Hz	60 Hz
Match Input Rate	Sets the output rate to match the signal of the connected input.							
640 x 480								X
800 x 600								X
1024 x 768								X
1280 x 768								X
1280 x 800								X
1280 x 1024								X
1360 x 768								X
1366 x 768								X
1440 x 900								X
1400 x 1050								X
1600 x 900								X
1680 x 1050								X
1600 x 1200								X
1920 x 1200								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
2K (2048 x 1080)	X	X	X	X	X	X	X	X
Custom 1	New resolution 1							
Custom 2	New resolution 2							
Custom 3	New resolution 3							

- **HDMI Format** — This item lets you set the HDMI output format.

  To select the format, select **HDMI Format** from the **Output** submenu, then press any of the arrow buttons to step through the items. The choices are:

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

  All output rates include their correct H/V sync polarity per VESA or SMPTE specs, along with VIC codes for SMPTE resolutions.

- **Input AFL** — This item lets you turn the Extron Accu-RATE Frame Lock (AFL) on and off. The default is `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 can cause glitches or interruptions 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 locks to the new vertical refresh rate.

  NOTE: AFL locks the output refresh rate to similar input rates. If the input signal is locked on a rate that is not considered a standard HDMI output or that is very different from the current output setting, the DSC may not output a signal. The image may not display or may blink.

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

Output Submenu — DSC HD-3G A

This submenu allows you to configure the output of the DSC HD-3G A.

NOTE: The DSC HD-3G A has some different items on this submenu from DSC 3G-HD A (see **Output Submenu — DSC 3G-HD A** on page 24).

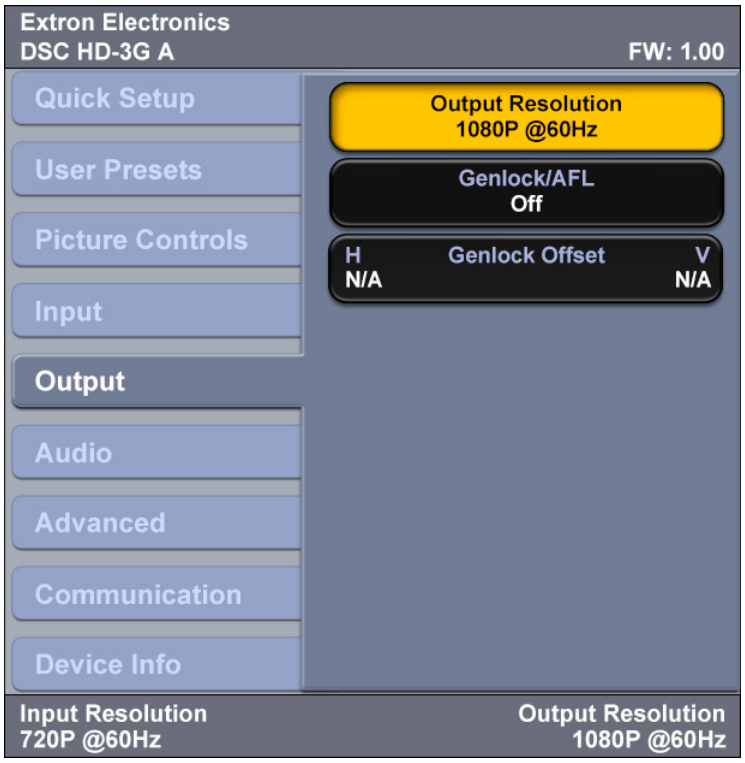


Figure 18. Output Submenu — DSC HD-3G A

- **Output Resolution** — This item lets you select the resolution and refresh rate for the connected output display. The DSC HD-3G A has a range of factory-loaded resolutions and rates from which to choose (see the resolutions table below for the available resolutions and rates). Different refresh rates are available depending on the selected resolution.

1. Select **`Output Resolution`** from the `Output` submenu.
2. Press the ◀ or ▶ button to select a resolution.
3. Press the ▲ or ▼ button to select a rate for the resolution.
4. When you enter a new resolution, a message appears on the display, prompting you to press **`Enter`** to confirm your selection. If you do not confirm it within 15 seconds, the scaler returns to the previously selected resolution and rate.

The following resolutions and rates are available for the **DSC HD-3G A**:

Resolution	23.98 Hz	24 Hz	25 Hz	29.97 Hz	30 Hz	50 Hz	59.94 Hz	60 Hz
Match Input Rate	Sets the output rate to match the signal of the connected input.							
480i							X	
576i						X		
720p	X	X	X	X	X	X	X*	X
1080i						X	X	X
1080p	X	X	X	X	X	X	X	X
2K (2048x1080)	X	X	X	X	X	X	X	X

- **Genlock/AFL** —
  - **AFL** (Accu RATE Frame Lock) locks the output vertical refresh rate to be to that of the applied HDMI input signal.
  - **Genlock** locks the output vertical refresh rate to that of an applied reference sync signal.

NOTE: Genlock and AFL lock the output refresh rate to *similar* reference or input rates. If the input reference or the vertical refresh rate of the HDMI input signal do not adhere to SMPTE frequencies, the DSC may not output a signal, or the image may blink.

To select the genlock or AFL mode, select `Genlock/AFL` from the `Output` submenu, then press any of the arrow buttons to step through the items. The choices are:

- **Off** — The output runs at the selected output frame rate using an internally generated clock. This selection is the default.
- **Input AFL** — The output is locked to the vertical sync of the HDMI input signal. This is valid only if HDMI input frame rate matches that of the DSC scaled output rate.
- **SDI Genlock** — The genlock input and loop-out are used for sync reference. The Genlock input supports bi-level and tri-level sync.

  SDI Genlock locks the output vertical refresh rate to the applied analog genlock input on the DSC HD-3G A. In the SDI Genlock mode, the output resolution and refresh rate of the scaler must be set to exactly match the applied analog genlock signal to ensure a true genlock to the applied SDI Genlock signal.

  If the applied SDI Genlock signal does not exactly match the resolution and refresh rate of the DSC HD-3G A output resolution, the scaler locks its output vertical refresh to that of the applied SDI reference (frame lock), which may result in more jitter and may not work for some interlaced signals.

  If no SDI Genlock signal is detected, or if the detected SDI Genlock signal would result in a greater than 165 MHz pixel clock, the DSC generates a free running pixel clock.

The Genlock and AFL status can be queried via SIS command (see the **Genlock Offset** and **Input Lock (Accu-Frame Lock [AFL])** commands on page 55) or via PCS (see the *DSC 3G-HD A and DSC HD-3G A Help File*).

NOTE: If the applied Genlock reference signal differs in resolution or refresh rate from the DSC scaled output resolution, then proper genlock cannot be guaranteed.

- **SDI Genlock Offset** — This item lets you adjust the horizontal and vertical offset of the genlock signal. (This feature can be adjusted only if the DSC is set for SDI Genlock and actively locked to a reference input.)

  Use the ◀ or ▶ button to adjust the horizontal (**H**) offset value. Use the ▲ or ▼ button to adjust the vertical (**V**) offset value.

Audio Submenu

This submenu allows you to configure the audio that is processed through the DSC. (The **SDI Audio Decode** item is available only on the DSC 3G-HD A **Audio** submenu.)



Figure 19. Audio Submenu — DSC 3G-HD A

To use this submenu, select the desired item, then press any arrow button to step through the selections.

- **Input Audio Format** — This item lets you select the audio format for the input. The first item on the **Audio** submenu shows the selected format of the audio.

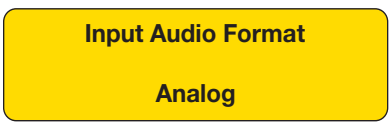


Figure 20. Input Audio Format Field with Selected Audio Format

The audio format options are listed in the table below.

Audio Format Selection	Details	Model
None	Mutes all audio for the input.	Both
Analog	The audio from the 5-pole captive screw input port is embedded in the HDMI output.	DSC 3G-HD A
Analog	The audio from the 5-pole captive screw input port is embedded in the SDI output.	DSC HD-3G A
2CH Digital (Default)	Lets you select one pair of AES channels from the available eight pairs. If a format other than two-channel digital is selected for the audio format, the menu to select the pair is disabled (see "Audio channels").	DSC 3G-HD A
LPCM-2Ch (Default)	Displays the selected HDMI input with a PCM two-channel EDID.	DSC HD-3G A
8CH Digital	Lets you select up to four pairs (eight channels) of AES audio to be embedded in the HDMI output (see "Audio channels").	DSC 3G-HD A
Multi-Ch	Displays the HDMI input with a multi-channel EDID (supports only multi-channel PCM audio).	DSC HD-3G A
SDI Audio Decode	Lets you select a pair of audio channels to decode from a selected group.	DSC 3G-HD A

- **Audio Mute** — This item lets you mute and unmute global audio. Press any arrow key to toggle between **Off** (default) and **On**.
- **Input Gain / Attenuation** — Select this item to set the gain and attenuation for **analog** audio inputs **only**. The range is -18 dB to +12 dB. The decibel level can be adjusted in increments of 1.0 dB. The default is 0 dB.
- **SDI Decode Audio** — (DSC 3G-HD A only) Select this item to select which pair of audio channels to decode and embed. Using this item or SIS commands (see the **AES Audio Channel Selection** and **AES Audio Channel Group Selection** commands on page 57), you can pick a group and a channel pair within that group.

Audio channels

On the DSC 3G-HD A you can select channel pairs to embed, in addition to the audio input format. On the DSC HD-3G A, input format selection is available, but channel selection is not.

DSC 3G-HD A: Selecting audio channel pairs

The available formats (modes) for the DSC 3G-HD A are analog, two-channel digital, and eight-channel digital. In two-channel mode, one of the eight channel pairs is embedded in the HDMI output. In eight-channel mode, four pairs are embedded.

The 16 channels are divided into four groups, each consisting of two channel pairs (four channels). The table below shows the channels contained within each group.

Group 1				Group 2				Group 3				Group 4			
Ch Pair 1		Ch Pair 2		Ch Pair 1		Ch Pair 2		Ch Pair 1		Ch Pair 2		Ch Pair 1		Ch Pair 2	
Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8	Ch 9	Ch 10	Ch 11	Ch 12	Ch 13	Ch 14	Ch 15	Ch 16

- **Two-channel Digital Mode:** In this mode, you can select a channel group, then one pair of AES channels from that group to embed, using either the `SDI Audio Decode` item of the `Audio` submenu or SIS commands (see the **Audio Input Format commands** on page 56. To select a channel pair:

  1. Press the ◀ and ▶ buttons to select the group number (`1` through `4`).
  2. Press the ▲ and ▼ buttons to select the channel pair number (`1` or 2).

- **Eight-channel Digital (Full Digital) Mode:** In this mode, the first four pairs (eight channels, groups 1 and 2) are embedded (see the table below). You are not able to select a channel pair.

Group	SDI Embedded Audio	HDMI Audio Signal
1	Pair 1 — Channel 1	L – Left speaker
	Pair 1 — Channel 2	R – Right speaker
	Pair 2 — Channel 1	LFE – Low frequency extension (woofer)
	Pair 2 — Channel 2	C – Center
2	Pair 1 — Channel 1	LS – Left surround
	Pair 1 — Channel 2	RS – Right surround
	Pair 2 — Channel 1	SBL – Surround back left
	Pair 2 — Channel 2	SBR – Surround back right
3	Pair 1 — Channel 1	Reserved for future use
	Pair 1 — Channel 2	Reserved for future use
	Pair 2 — Channel 1	Reserved for future use
	Pair 2 — Channel 2	Reserved for future use
4	Pair 1 — Channel 1	Reserved for future use
	Pair 1 — Channel 2	Reserved for future use
	Pair 2 — Channel 1	Reserved for future use
	Pair 2 — Channel 2	Reserved for future use

DSC HD-3G A: Audio embedding

In PCM multi-channel mode, the DSC HD-3G A embeds up to eight channels of PCM HDMI audio onto the first four pairs of AES channels on the SDI output, in sequential order. In LPCM two-channel mode, the first pair of SDI audio channels is used (you cannot select a channel pair on the DSC HD-3G A).

All audio inputs on the DSC HD-3G A are automatically delayed to compensate for internal video processing.

The table below shows the channel pair mapping for the DSC HD-3G A.

SDI Embedded Audio	HDMI Audio Signal
Pair 1 – Channel 1	L – Left speaker
Pair 1 – Channel 2	R – Right speaker
Pair 2 – Channel 1	LFE – Low frequency extension (woofer)
Pair 2 – Channel 2	C – Center
Pair 3 – Channel 1	LS – Left surround
Pair 3 – Channel 2	RS – Right surround
Pair 4 – Channel 1	SBL – Surround back left
Pair 4 – Channel 2	SBR – Surround back right

Advanced Submenu

This submenu allows you to configure the global settings for the unit. The `Advanced` submenu is the same on both DSC models.

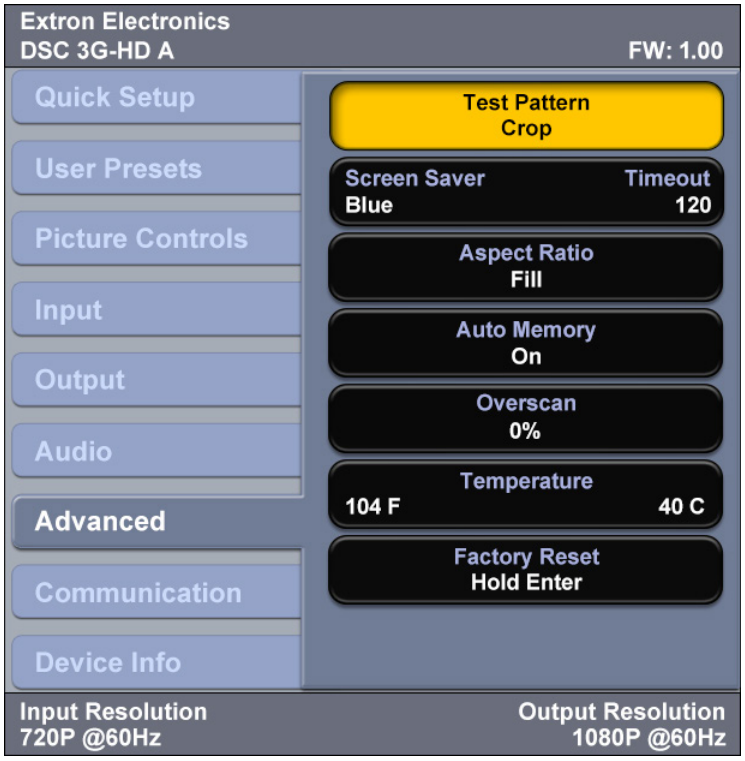


Figure 21. Advanced Submenu

The following items are available on the `Advanced` submenu:

- **Test Pattern** — This item lets you select a test pattern to use in setting up a display when outputting different resolutions. The following test patterns are available:

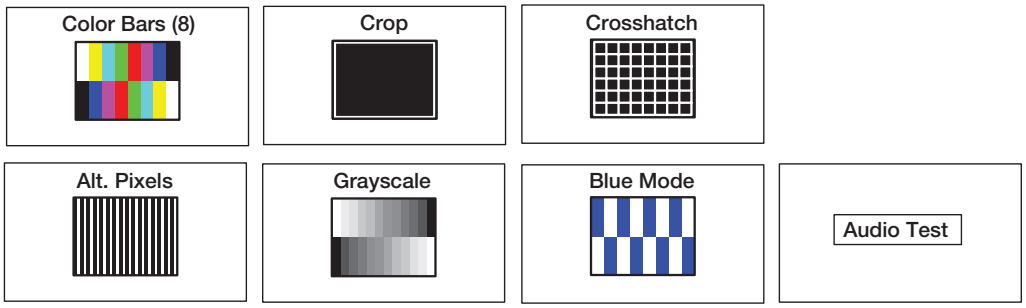


Figure 22. Test Pattern Items

NOTES:

- The Audio Test pattern displays a crop pattern with OSD text `AUDIO TEST`. It also outputs pink noise at 48 kHz, 24 bit.
- By default all test patterns except Blue Mode include a single pixel wide crop pattern line.

- **Screen Saver and Timeout** — This item lets you enable screen saver mode, in which the video output is muted to black or blue if there is no active input video signal. It also lets you specify the output sync timeout. Screen saver mode allows display devices (such as an LCD panel, plasma screen, or projector) to enter low power or standby state to increase panel or lamp life.
  - To select the screen saver color, press the ◀ or ▶ button. The options are **`Black`** (default) or **`Blue`**.
  - To set the sync timeout, press the ▲ or ▼ button. You can select a duration of 1 through 500 seconds before the output sync times out. The default is `Never`, meaning that the sync does not time out.

  NOTE: The DSC exits screen saver mode when a front panel button is pressed or an active input is detected. If the unit is in front panel lock (executive) mode (see **Locking the Front Panel (Executive Mode)** on page 39), front panel button presses have no effect on screen saver mode.

- **Aspect Ratio** — This item lets you set the aspect ratio to **`Fill`** (fills the entire output screen) or **`Follow`** (follows the native aspect ratio of the input).
  - **In fill mode**, if you want to set an aspect ratio adjustment for a single input rate, you can select the correct size and position manually from the `Picture Controls` submenu (**`Image Size`** and **`Position`**) (see **Picture Controls Submenu** on page 21).
  - **In 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 **`Image Position`** items on the `Picture Controls` submenu.

    If you want a single input to fill the screen in follow mode, you can manually set the **`Image Position`** item on the `Picture Controls` submenu to **`0,0`** and set the **`Image Size`** to match the current output rate ***`X,Y`***.
- **Auto Memory** — This item lets you enable or disable Auto Memory. When Auto Memory is enabled, the DSC stores the current input configuration and picture control values as an input preset. All values are stored except preset name, film mode, and audio gain or attenuation (see **Auto Memories** on page 37 for more information).
- **Overscan** — This item lets you select a default overscan mode to apply to SMPTE input rates (480i, 576i, 480p, 576p, 720p, 1080i, 1080p, and 2K). This zooms and crops SMPTE inputs to mask edge effects and ancillary data that may occur in broadcast signals. The selections are **`0%`** (the default), **`2.5%`**, and **`5%`**.

  NOTE: If the overscan mode is not 0%, when Auto-Image is performed on an SMPTE input rate, it refers to the default input values for sizing and centering instead of performing a true Auto-Image.

- **Temperature** — This read-only field shows the internal temperature of the unit in Fahrenheit (left value) and Celsius (right value).
- **Factory Reset** — This item lets you reset the unit to its factory-installed values (removing any user-defined values) while retaining the current firmware version.

  To reset using the OSD, press and hold the **`Enter`** button until **`Factory Reset`** is displayed. The message remains for approximately 1 minute after the reset is complete to allow time for the display device to sync with the DSC output. (The equivalent SIS command is <**`ESC`**> `ZXXX` <**`]`**>.) For other reset methods, see **Resetting** on page 39.

Communication Screen

This read-only screen enables you to **view** the RS-232 remote port baud rate (left) and port type (right). The protocol for this port is 9600 baud, eight data bits, no stop bits, and no parity. You cannot change any of these port parameters. (This screen is the same on the DSC 3G-HD A and the DSC HD-3G A.)



Figure 23. Communication Screen

Device Info Screen

This read-only screen provides a quick view of certain selections, parameters, and status information for the DSC. All these items are also on other DSC screens. However, the `Device Info` screen provides them all on a single screen for a system overview. This screen differs between the two DSCs as follows:

- The DSC 3G-HD A `Device Info` screen (see figure 23) shows the AFL On and Off status and the display resolution and refresh rate (no genlock information).
- The DSC HD-3G A `Device Info` screen shows the Genlock/AFL On and Off status (no separate items for AFL or the display rate).

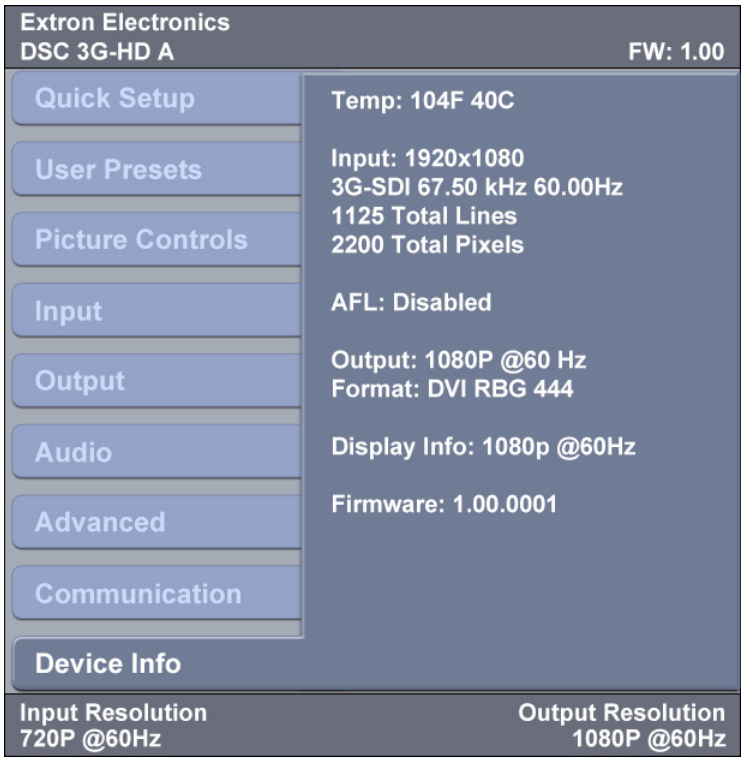


Figure 24. Device Info Screen — DSC 3G-HD A

Auto-Image

When Auto-Image is performed, the DSC attempts to size and position the image to fill the display screen (fill mode) or use the native aspect ratio of the input (follow mode). Using SIS commands or the OSD submenus, you can perform a one-time Auto-Image on the current input.

Only the horizontal and vertical positioning and the horizontal and vertical size are adjusted by the Auto-Image. All other controls are left unchanged.

- If the aspect ratio has been set to Fill, the H and V position returns to 0,0, and the H and V Size is set to match the current output rate.
- If the aspect ratio has been set to Follow, the H and V position and size are set to maintain the native aspect ratio of the input rate with respect to the current output resolution.

Auto-Image is useful in applications in which a variety of new input sources may be encountered (such as when a matrix switcher is connected). It is also useful for centering and sizing an image that has been adjusted out of default settings.

You can perform a one-time Auto-Image by the following methods:

- **Front panel:** While the OSD is not displayed, press the **`Auto-Image`** (▶) button twice. (The first press displays the message `Press Auto` to `Confirm` on the OSD. The second press initiates the Auto-Image.)
- **OSD submenus:** Select the **`Auto-Image / Press Enter to Auto-Image`** item from the **Quick Setup Submenu** (see page 17) or the **Input Submenu** (see page 22).
- **SIS commands** (see the **Auto-Image commands** on page 48).

Changing the Output Resolution and Refresh Rate

In addition to the `Output` submenus (see pages **24** and **26**), other options for setting the output resolution and refresh rate include resetting the output rate using the front panel ▼ button (see **Resetting the Output Rate** on page 36), SIS commands (see the **Output Configuration commands** beginning on page 53, and the PCS Configuration Program (see the program help file).

Custom Rates — DSC 3G-HD A Only

In addition to the 42 factory output resolutions, 3 custom user-defined rates are available for the DSC 3G-HD A via SIS commands (see the **Output Scaler Rate commands** on page 53 for the command format) or PCS (see the program help file). When no custom EDIDs are defined, these three resolutions and rates default to 720p @ 60 Hz. The OSD dynamically updates itself based on the current file stored in the custom EDID slot. For example, if a custom 720p EDID has been uploaded, the OSD would read `C1: 720P @ 60 Hz`.

Importing an HDMI EDID — DSC 3G-HD A Only

You can also import the EDID of a connected HDMI sink to use as a custom rate. This EDID can 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) (see the **Output EDID command** on page 53).

NOTE: If an imported or custom rate is not a valid output resolution, the output reverts to the default (720p @ 60 Hz).

Changing the Output Resolution from the Front Panel — DSC HD-3G A Only

Depending on which Output LED is lit (2.97 Gbps for 3G-SDI, 1.485 Gbps for HD-SDI, or 270 Mbps for SD-SDI) you can press a combination of front panel buttons to cycle through the different levels of output signal format and change the resolution. This is helpful if you are not able to display an image on the screen.

To change the resolution using the front panel buttons:

1. With the scaler powered on, press and hold the **`Menu`** and **`Auto-Image`** (▶) buttons until the 1.485 Gbps (HD-SDI) LED lights (approximately 5 seconds), indicating that the unit is now outputting 720p @ 59.94 Hz. If a screen is connected, the following message is displayed:

   `Press Enter to confirm the new resolution. Unit will return to previous resolution in 15 seconds if not confirmed.`

2. Press the ▲ or ▼ button repeatedly to cycle through the output resolutions typically associated with the HD-SDI output format.

   NOTE: If you do not press a button within 15 seconds, the DSC reverts to the previous output rate and you must return to step 1 to select another resolution.

While the DSC is in resolution change mode, some of the front panel buttons have different functionality. The following table shows which buttons change function:

Front Panel Button	Function
Menu	Cancel and exit. Returns to previous output resolution.
Enter	Confirm and exit. Sets the selected new resolution.
▲	Step through rates incrementally starting with 720p @ 59.94 Hz.
▼	Step through rates decrementally, starting with 720p @ 59.94 Hz.

3. To access more resolutions, continue pressing either **arrow** button. After you have stepped through the 1.485 Gbps resolutions, the unit moves to the next level (either the 270 Mbps or the 2.97 Gbps LED lights, depending on which arrow button you are pressing) and continues cycling through the available resolutions.

   The following table shows the resolutions associated with each SDI signal type:

SDI Signal Type	Resolutions
2.97 (3G-SDI)	1080p @ 60 Hz
	1080p @ 59.94 Hz
	1080p @ 50 Hz
1.485 (HD-SDI)	1080i @ 60 Hz
	1080i @ 59.94 Hz
	1080i @ 50 Hz
	720p @ 60 Hz
	720p @ 59.94 Hz
	720p @ 50 Hz
270 Mbps (SD-SDI)	480i @ 59.94 Hz
	576i @ 50 Hz

4. When you have arrived at the desired resolution, press **Enter** to confirm it.

Resetting the Output Rate

If an output image cannot be displayed due to an incompatible output rate, you can use the front panel buttons to toggle the output rate between 1024x768 @ 60 Hz and 720p @ 60 Hz for the DSC 3G-HD A or 1080i @ 59.94 Hz and 720p @ 59.94 Hz for the DSC HD-3G A.

To set the rate or toggle between the two available rates:

1. Ensure that the OSD is closed by pressing and holding **Menu** for 3 seconds.
2. Press and hold the ▼ button for approximately 5 seconds to toggle between the VESA and SMPTE rates (DSC 3G-HD A) or the 720p and 1080i rates (DSC HD-3G A).

NOTE: On the front panels, the ▼ button is labeled as follows:

- DSC 3G-HD A: **Hold ▼ for XGA ↔ 720p**.
- DSC HD-3G A: **Hold ▼ for 720p ↔ 1080i**.

Power Save Mode

In power save (standby) mode, all non-essential hardware is shut down in order to conserve power.

- To enable power save mode, enter the `Power Save On` SIS command (see the **Power Save Mode commands** on page 54).
- To exit power save mode, either enter the Power Save Off SIS command or press any front panel button. If the front panel is locked, this method does not work.

NOTE: The backup and restore functions available through the PCS control software are not accessible while the unit is in power save mode.

Presets

A preset is a set of input parameters that are either saved by you or automatically by the DSC as a files in DSC memory. Saved presets can be recalled and their settings implemented at any time. A preset saves time by enabling you to apply a group of settings to the DSC at one time.

The DSCs have three types of presets: Auto Memories, user presets, and global input presets.

Auto Memories

The DSC has 32 memory locations in which the current input configuration and picture control values are automatically stored as an input preset, when Auto Memory is enabled. An Auto Memory preset is recalled when an identical input resolution and rate is applied to the input.

Each Auto Memory preset is stored with a time stamp that is incremented each time its stored rate is detected. If all Auto Memory slots are occupied and a new rate is applied, the Auto Memory with the oldest time stamp is overwritten.

Auto memory can be enabled using the OSD (see the **Auto Memory item** of the `Advanced` submenu on page 32) and by SIS commands (see the **Auto Memories** commands on page 52).

The following information is stored in an Auto Memory preset:

- Contrast
- Brightness
- Detail
- Horizontal start
- Vertical start
- Active pixels (Horizontal Active)
- Active lines (Vertical Active)
- Horizontal image position
- Vertical image position
- Horizontal image size (width)
- Vertical image size (height)
- Total pixels

User Presets

Three memory slots are available for you to store certain input settings as a preset. You can then recall a saved preset and apply it to the current input.

NOTE: A user preset can be saved at one input resolution, then recalled at another.

User presets can be saved, recalled, and cleared via the OSD (see **User Presets Submenu** on page 19) or SIS commands (see the **User Presets commands** on page 52). The following values are saved in a user preset:

- Contrast
- Brightness
- Detail
- Preset name
- Vertical start
- Active lines (Vertical Active)
- Horizontal image position
- Vertical image position
- Horizontal image size (width)
- Vertical image size (height)

NOTE: You can change the picture and image settings using the **Picture Controls Submenu** (see page 21) and **Input Submenu** (see page 22) or SIS commands (see the **Presets commands** on page 52). The preset name can be assigned only via SIS commands.

Input Presets

The DSC has 16 memory slots in which you can save input presets that are global to the HDMI or SDI input. These presets allow a matrix switcher with multiple types of video inputs (such as an Extron SMX) to be placed upstream from the DSC to expand the number of video sources. Input presets can be saved and recalled only through SIS commands (see the **Input Presets commands** on page 53).

Values for the following settings are saved in input presets:

- Contrast
- Brightness
- Detail
- Film Mode
- Audio gain and attenuation
- Horizontal start
- Vertical start
- Active pixels (Horizontal Active)
- Active lines (Vertical Active)
- Horizontal image position
- Vertical image position
- Horizontal image size (width)
- Vertical image size (height)
- Total pixels
- Preset name

Saving a preset when using a matrix switcher

When using the DSC with a matrix switcher, do the following to save a preset:

1. Switch each input of the matrix to the input of the DSC.
2. Configure each input: size, position, detail, brightness, and contrast. (The remaining settings — horizontal start, vertical start, active pixels and lines, and total pixels — are not user-configurable, but are stored automatically as part of the preset.)
3. Save the settings to a preset for recall by the control system when that matrix input is routed to the HDMI or SDI input.

Locking the Front Panel (Executive Mode)

To prevent access by unauthorized users or accidental changes to the DSC settings, you can lock the front panel controls by placing the DSC in executive mode. In this mode, all front panel buttons are disabled and control is available only by SIS commands.

To lock the front panel, do either of the following:

- Press and hold the front panel **Menu** and ▼ buttons until the OSD displays the message `Executive Mode Enabled` (approximately 5 seconds). The message remains on the OSD approximately 2 seconds.
- Enter the **Enable** SIS command (see the **Front Panel Lock (Executive Mode) commands** on page 58).

To unlock the front panel, do either of the following:

- Press and hold the front panel **Menu** and ▼ buttons again until the OSD displays the message `Executive Mode Disabled` (approximately 5 seconds). The message remains on the OSD approximately 2 seconds.
- Enter the **Disable** SIS command (see the **Front Panel Lock (Executive Mode) commands**).

Resetting

Resetting the unit causes various settings to revert to the defaults that were set at the factory. Resets can be performed from the front panel buttons, the OSD, or SIS commands. The following resets are available:

- **Factory defaults:** This reset clears all user-specified settings but retains the latest firmware version. You can perform this reset by:
  - Selecting `Factory Reset` from the `Advanced` submenu of the OSD (see the **Factory Reset item** on the `Advanced` submenu on page 32)
  - Entering the **Reset all device settings to factory default** SIS command (see the **Reset command** on page 59)

  When the reset is complete, the message `Factory Reset` is displayed on the OSD.
- **Factory firmware:** This reset returns the unit to its factory default settings, including the original firmware with which it was shipped. All user settings are cleared.

  To perform this reset, press and hold the **Enter** button for 20 seconds while applying power to the unit. When the reset is completed, the message `Firmware Reset` appears on the OSD.

NOTE: The `Firmware Reset` and `Factory Reset` messages are displayed for 1 minute after the reset to allow time for the display device to sync with the DSC output.

Remote Configuration and Control

This section describes the connections through which the DSC can be configured and controlled remotely via SIS commands and describes the commands that are available. It also provides the procedure for accessing the PCS configuration software. Topics include:

- **SIS Commands**
- **Product Configuration Software**

SIS Commands

The DSC can be configured and controlled via a host computer or other device (such as a control system) attached to the front panel USB port or the rear panel RS-232 connector. Enter SIS commands using an application such as the Extron DataViewer, available at **https://www.extron.com** (see the *DataViewer Help* file to use this program).

For the RS-232 connection the scaler uses a protocol of 9600 baud, 1 stop bit, no parity, and no flow control.

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 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 = ↵), indicating the end of the response character string (one or more characters).

Copyright Information

The DSC sends the following copyright message upon connection to the host if the DSC is already connected via RS-232. (This message is displayed only with an RS-232 connection).

↵ (c) Copyright 20*nn*, Extron Electronics, DSC *XX-XX* A, V*n.nn*, 60-130*n*-01↵

(20*nn* is the year, DSC *XX-XX* A is the model name, V*n.nn* is the firmware version number, and 60-130*n*-01 is the unit part number.)

DSC-initiated Messages

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

- `Reconfig` ↵

  The DSC sends this response when a change in the input frequency is detected.

- `HplgO` ↵

  The DSC 3G-HD A sends this response when a hot plug event on the output is detected (for example, when the unit is unplugged and reconnected).

Error Responses

When the DSC 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 one of the following error responses to the host.

`E01` — Invalid input number
`E06` — Invalid switch attempt in this mode
`E10` — Invalid command
`E11` — Invalid preset number
`E12` — Invalid port number
`E13` — Invalid parameter
`E14` — Invalid command for this configuration
`E17` — Invalid command for signal type
`E22` — Busy

Using the Command and Response Table

The **Command and Response Table for SIS Commands**, beginning on page 48, lists the commands that the DSC scaler recognizes as valid, the responses that are returned to the host, a description of the command function or the results of executing the command, and an example of each command in ASCII.

NOTE: Unless otherwise stated, upper- and lowercase text can be used interchangeably in the commands.

ASCII to HEX Conversion Table																Esc 1B		CR ØD		LF ØA	
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27						
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F						
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37						
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F						
@	4Ø	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	5Ø	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						
`	6Ø	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	7Ø	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 25. 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

[24] = Superscripts indicate the error message displayed if the command is entered incorrectly or with invalid parameters (see **Error Responses** on the previous page).

***NOTE:** Values with an asterisk (*) depend on the resolution.

X2 = Input video format for DSC 3G-HD A:
0 = No signal detected on the current input
1 = SD – 480i
2 = SD – 576i
3 = HD – 480p, 576p, 720p, 1080i, 1080p (up to 30 Hz)
4 = 3G – 1080p (@ 50, 59.94, and 60 Hz), 2K
5 = Unknown

X3 = Input video format for DSC HD-3G A:
0 = No signal detected on the current input
1 = HDMI
2 = DVI
3 = Invalid signal

X4 = Horizontal or vertical start — 0 through 255 (default midpoint = 128)
Response is three digits, padded with zeros.

X6 = Total lines:*
DSC 3G-HD A: View only
DSC HD-3G A: ±512 of the default value
Response is four digits, padded with zeros.

X7 = Total pixels:*
DSC 3G-HD A: View only
DSC HD-3G A: ±512 of the default value
Response is four digits, padded with zeros.

X8 = Active pixels:*
DSC 3G-HD A: View only
DSC HD-3G A: ±512 of the default value
Response is four digits, padded with zeros.

X9 = Active lines:*
DSC 3G-HD A: View only
DSC HD-3G A: ±256 of the default value
Response is four digits, padded with zeros.

X10 = On or off (enable or disable)
0 = Off or disable
1 = On or enable

X12 = Internal temperature (in degrees Celsius)
Response is two digits, padded with a zero.

X13 = Horizontal and vertical frequencies
Format is three digits with a single decimal place and leading zeros. Example: 075.3

X14 = Text label or preset name (up to 16 characters)

NOTE: User and input presets saved without a name are given the default names User Preset *nn* (for example, User Preset 11) or Input Preset *nnn* (for example, Input Preset 005).

X15 = Picture adjustment — 0 to 127 (default 64)
Response is three digits, padded with zeros.

X16 = Horizontal and vertical position

- H range: -02048 through +02048
- V range:
  DSC 3G-HD A: -01200 through +01200
  DSC HD-3G A: -01080 through +01080

Response is five digits with leading + or - and padded with zeros. Example: -01075

X17 = Horizontal and vertical size

- H range: 00010 through 04096
- V range:
  DSC 3G-HD A: 00010 through 02400
  DSC HD-3G A: 00010 through 02160

Response five digits, padded with zeros. (Example: -01075)

X20 = Output resolution

DSC 3G-HD A:

1 = EDID of the connected HDMI display. Holds last connected display EDID until a new display is attached or a power cycle occurs. Valid for EDID export only.
2 = Custom output rate 1
3 = Custom output rate 2
4 = Custom output rate 3
9 = Match the input rate. (If the current input is not a valid output resolution, the output rate defaults to 720p @ 60 Hz.)

SIS Variables for DSC 3G-HD A Resolutions and Refresh Rates (X20 = 11 through 92)

Resolution	23.98 Hz	24 Hz	25 Hz	29.97 Hz	30 Hz	50 Hz	59.94 Hz	60 Hz
640x480								11
800x600								14
1024x768								20
1280x768								29
1280x800								32
1280x1024								35
1360x768								41
1366x768								47
1440x900								53
1400x1050								56
1600x900								58
1680x1050								60
1600x1200								62
1920x1200								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**

DSC HD-3G A:

0 = Automatic: matches the current scaler output resolution
2 = Custom output rate 1
3 = Custom output rate 2
4 = Custom output rate 3
9 = Match the input rate. (If the current input is not a valid output resolution, the output rate defaults to 720p @ 59.94 Hz.)

SIS Variables for DSC HD-3G A Resolutions and Refresh Rates (X20 = 68 through 94)								
Resolution	**23.98 Hz**	**24 Hz**	**25 Hz**	**29.97 Hz**	**30 Hz**	**50 Hz**	**59.94 Hz**	**60 Hz**
480i							93	
576i						94		
720p	95	96	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**

X21 = EDID emulation for DSC HD-3G A (Response is two digits padded with a zero.)
0 = Automatic: matches the current scaler output resolution
1 = Custom EDID 1
2 = Custom EDID 2
3 = Custom EDID 3

SIS Variables for EDID Resolution and Refresh Rates (X21 = 11 through 96)								
Resolution	**23.98 Hz**	**24 Hz**	**25 Hz**	**29.97 Hz**	**30 Hz**	**50 Hz**	**59.94 Hz**	**60 Hz**
640x480								11
800x600								14
1024x768								20
1280x768								29
1280x800								32
1280x1024								35
1360x768								41
1366x768								47
1440x900								53
1400x1050								56
1600x900								58
1680x1050								60
1600x1200								62
1920x1200								64
480i							93	
576i						94		
480p						65	66	
576p						67		
720p	95	96	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 EDID value**

X22 = Test patterns:
0 = Off (default)
1 = Crop
2 = Alternating pixels
3 = Crosshatch
4 = Color bars
5 = Grayscale
6 = Blue mode (no crop pattern)
7 = Audio Test (Crop pattern, OSD text Audio Test. Outputs pink noise at 48 kHz, 24 bits, channels 1/2.)

X25 = User presets — 1 to 3
Response is two digits padded with a zero.

X26 = Input presets — 1 to 128 (global for device)
Response is three digits padded with a zero.

X28 = Output sync timeout — 1 to 500 in 1-second increments
0 = The output sync is instantly disabled with no active input.
501 = The output sync never times out (default).

X29 = Front panel lock (executive mode) status
0 = Disabled (default)
1 = Enabled (front panel locked)

X30 = OSD menu system status
0 = Off
1 = On

X31 = Verbose mode
0 = None
1 = Verbose mode is on (default for RS-232 and USB connections).
2 = Verbose mode is off, tagged responses are sent for queries (tagged responses are enabled).
3 = Verbose mode is on (enabled) and tagged responses are enabled and sent for queries.

NOTES:

- In verbose response mode, the DSC responds with more information than it usually would. For example, the DSC can send out a notice of a change in some setting without receiving a query via your PC. That change could have been a result of an internal process (a script execution), a selection made using a touchpanel or keypad, a change made using GV or a web page, or input from a connected sensor or switch.

  That is an example of a verbose (wordy) relationship between the DSC and a connected device. Verbose mode creates more network traffic than usual, which can slow down network performance.
- If tagged responses are enabled, all read or view commands return the constant string plus the data. For example:

  Command: Esc M SSAV ←
  Response: SsavM X40 ↵ (tagged mode)
  or X40 ↵ (untagged mode)

X32 = Unit name — A text string of up to 24 characters (A-Z, 0-9, and the hyphen (-) are permitted.
- The first character must be a letter.
- The last character **cannot** be a hyphen.
- No blank or space characters are permitted as part of the name.
- No distinction is made between uppercase and lowercase letters.

X33 = Default name — DSC 3G-HD A or DSC HD-3G A

X34 = Model description — Digital Scaling Converter

X37 = Overscan — DSC 3G-HD A
Applied only to SMPTE input rates (480i, 576i, 720p, 1080i, 1080p, and 2K)
0 = 0.0% — A true Auto-Image is executed on SMPTE inputs (default for SDI).
1 = 2.5% — An Auto-Image command snaps to a 2.5% table (no true Auto-Image is performed).
2 = 5.0% — An Auto-Image command snaps to a 5.0% table (no true Auto-Image is performed).

X39 = 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

X40 = Screen saver mode
1 = Black screen (default)
2 = Blue output with OSD text

X42 = Video mute
0 = Off (unmute) (default)
1 = On (mute to black screen)
2 = On (mute all output sync and video)

X44 = HDCP status (DSC 3G-HD A only)
0 = No sink device detected
2 = Sink detected

X48 = HDMI output format (DSC 3G-HD A only)
0 = Auto (default). (HDMI – RGB Full to a CEA sink or DVI to a non-CEA sink).
OSD reads **Auto**.)
1 = DVI (RGB 444, 0-255, no audio, no InfoFrames)
OSD reads **DVI RGB 444**.)
2 = HDMI RGB Full (RGB 444, 0-255, audio, InfoFrames.
OSD reads **RGB Full**.)
3 = HDMI RGB Limited (RGB 444, 16-235, audio, InfoFrames.
OSD reads **RGB Limited**.)
4 = HDMI YUV Full (YUV 444, 0-255, audio, InfoFrames.
OSD reads **YUV 444 Full**.)
5 = HDMI YUV Limited (YUV 444, 16-235, audio, InfoFrames.
OSD reads **YUV 444 Limited**.)
6 = HDMI YUV Full (YUV 422, 0-255, audio, InfoFrames.
OSD reads **YUV 422 Full**.)
7 = HDMI YUV Limited (YUV 422, 16-235, audio, InfoFrames.
OSD reads **YUV 422 Limited**.)

X51 = SDI audio channels — AES channel pair 1 or 2 of the selected group (DSC 3G-HD A only).
1 = Channel pair 1
2 = Channel pair 2

X52 = SDI audio group — AES channel pair group 1 through 4 (DSC 3G-HD A only).
1 = Group 1 3 = Group 3
2 = Group 2 4 = Group 4

X54 = Audio gain and attenuation
-18 through +12 dB. (For DSC 3G-HD A, this applies to analog input.)
Response is two digits with leading + or – and is padded with a zero.

X58 = Audio input type — DSC 3G-HD A
0 = None: input is muted.
1 = Analog (on 5-pole captive screw connector)
2 = Two-channel digital (2CH audio, one channel pair SDI selected) (default)
3 = Eight-channel digital (8CH audio, pairs 1 through 4 SDI. Audio delay is applied and the signal is re-embedded in the SDI output.)

X59 = Audio input type — DSC HD-3G A
- 0 = None: input is muted.
- 1 = Analog (on 5-pole captive screw connector)
- 2 = LPCM two-channel digital (embedded in the HDMI input) (default). LPCM-2CH audio is requested from the source via EDID.
- 3 = Multi-channel digital (via EDID). Allows any digital audio format from the source. Audio delay is applied and the signal is re-embedded into the HDMI output.
- 4 = (Unsupported input audio format)

X60 = EDID file data block, 128 or 256 bytes of binary data (machine-readable only).

X61 = Video signal status
- 0 = Video (DSC 3G-HD A) or TMDS (DSC HD-3G A) signal not detected
- 1 = Video or TMDS signal detected.

X62 = Power save mode
- 0 = Full power mode (default)
- 1 = Low power mode

X63 = Screen saver status
- 0 = Active input detected, timer not running
- 1 = No active input detected, timer running, output sync active
- 2 = No active input detected, timer expired, output sync disabled

X64 = Input lock (AFL) — DSC 3G-HD A only
- 0 = Disable input lock. Free running pixel clock is generated internally. (Default)
- 1 = Enable input lock. Locks output vertical to vertical refresh rate of the selected input.

X65 = Input lock (AFL) status — DSC 3G-HD A only
- 0 = Input lock (AFL) is disabled.
- 1 = Input lock (AFL) is enabled, but cannot lock to applied input signal. The DSC 3G-HD A defaults to the set output rate.
- 2 = Input lock (AFL) is enabled. The output is locked to the applied input signal (AFL).

X66 = Input lock (AFL) / SDI genlock — DSC HD-3G A only
- 0 = Disable input lock/genlock. Free running pixel clock is generated internally. (Default)
- 1 = Enable input lock (AFL). Locks the output vertical to the vertical refresh rate of the selected input.
- 2 = Enable SDI genlock. Locks output vertical to selected genlock input.

X67 = Input lock (AFL) / genlock status — DSC HD-3G A only
- 0 = Input lock (AFL) / SDI genlock is disabled.
- 1 = Input lock (AFL) is enabled, but cannot lock to the applied input signal. The DSC 3G-HD A defaults to the set output rate.
- 2 = Input lock (AFL) /SDI genlock is enabled. The output is locked to the applied input signal (AFL).

Command and Response Table for SIS Commands

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Input Configuration			
Input Video Format			
View video format: DSC 3G-HD A	1 * \	X2 ↵ *In verbose modes 2 and 3:* Vtyp 1 * X2 ↵	View the detected input video format X2 of DSC 3G-HD A.
View video format: DSC HD-3G A	1 * \	X3 ↵ *In verbose modes 2 and 3:* Vtyp 1 * X3 ↵	View the detected input video format X3 of DSC HD-3G A.
Input EDID (DSC HD-3G A Only)			
Assign EDID to input	Esc A 1 * X21 EDID ←	Edid A 1 * X21 ↵	Assign EDID resolution and refresh rate X21 to the DSC HD-3G A input.
View assigned EDID data	Esc A 1 EDID ←	X21 ↵ *In verbose modes 2 and 3:* Edid A 1 * X21 ↵	View assigned EDID resolution and refresh rate X21 for the DSC HD-3G A input.
Auto-Image			
Execute	A	Img ↵	Perform an Auto-Image on the current input (follows current aspect ratio setting).
Execute and Fill	1*A	Img1 ↵	Perform an Auto-Image and fill entire display screen.
Execute and Follow	2*A	Img2 ↵	Perform an Auto-Image and follow the aspect ratio of the input.
Active Pixels			
View	Esc APIX ←	X8 ↵ *In verbose modes 2 and 3:* Apix1 * X8 ↵	Show active pixels X8 for the input. X8 is four digits padded with zeros.
Active Lines			
View	Esc ALIN ←	X9 ↵ *In verbose modes 2 and 3:* Alin1 * X9 ↵	Show active lines X9 for the input. X9 is four digits padded with zeros.

KEY:
- X2 = Input video format for DSC 3G-HD A: 0 = No signal, 1 = SD: 480i, 2 = SD: 576i, 3 = HD: 480p, 576p, 720p, 1080i, 1080p (up to 30 Hz), 4 = 3G: 1080p (@50, 59.94, and 60 Hz), 2K
- X3 = Input video format for DSC HD-3G A: 0 = No signal, 1 = HDMI, 2 = DVI, 3 = Invalid signal
- X8 = Active pixels: For DSC HD-3G A, ±512 of the default value.
- X9 = Active lines: For DSC HD-3G A, ±256 of the default value.
- X21 = EDID emulations for DSC HD-3G A: 0 = Automatic: matches current output resolution (default), 1 = Custom EDID 1, 2 = Custom EDID 2, 3 = Custom EDID 3, 9 = Match the input rate. For variables 11-96, see the **SIS EDID table** on page 44.

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Input Configuration (continued)			
Total Lines			
View total lines	Esc TLIN ←	X6 ↵ *In verbose modes 2 and 3:* Tlin 1 * X6 ↵	Show total number of lines for the input.
Total Pixels			
View total pixels	Esc TPIX ←	X7 ↵ *In verbose modes 2 and 3:* Tpix 1*X7 ↵	Show the total number of pixels (X7) for the input.
Horizontal or Vertical Start			
View horizontal start	Esc HSRT ←	X4 ↵ *In verbose modes 2 and 3:* Hsrt 1*X4 ↵	Show the horizontal location of the first active pixel (X4) of the input.
View vertical start	Esc VSRT ←	X4 ↵ *In verbose modes 2 and 3:* Vsrt 1*X4 ↵	Show the vertical (line) location of the first active pixel (X4) of the input.
3:2, 2:2, and 24:1 Film Mode Detection			
Enable auto detection	Esc 1 FILM ←	Film 1*X10 ↵	Enable automatic detection of film mode (3:2, 2:2, and 24:1 pull-down) (default).
Disable auto detection	Esc Ø FILM ←	Film 1*X10 ↵	Disable automatic film mode detection.
View setting	Esc FILM ←	X10 ↵ *In verbose modes 2 and 3:* Film 1*X10 ↵	View the current film mode setting.
Picture Adjustments			
Video Mute (Defaults to unmuted after a power cycle.)			
Mute video to black	1*1B	Vmt 1*1↵	Mute video, displaying black video on output.
Mute all sync and video	1*2B	Vmt 1*2 ↵	Mute all of the signal on the SDI output or all TMDS on the HDMI video output.
Unmute video and output sync	1*ØB	Vmt 1*Ø ↵	Display the input signal on the output.
View	1B	X42 ↵ *In verbose modes 2 and 3:* Vmt 1*X42 ↵	View output mute status X42.

KEY:
- X4 = Horizontal or vertical start: 0 to 255 (default midpoint = 128)
- X6 = Total lines: ±512 of the default value
- X7 = Total pixels: ±512 of the default value
- X10 = Film mode automatic detection status: 0 = disabled, 1 = enabled
- X42 = Video mute status: 0 = unmuted (default), 1 = muted, 2 = all output sync and video muted

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Picture Adjustments (continued)			
Contrast			
Set a specific value	Esc X15 CONT ←	Cont 1 * X15 ↵	Set the range of image light and dark values (contrast level) to X15 for the input.
Increment contrast value	Esc + CONT ←	Cont 1 * X15 ↵	Increase the contrast level by 1.
Decrement value	Esc - CONT ←	Cont 1 * X15 ↵	Decrease the contrast level by 1.
View	Esc CONT ←	X15 ↵ *In verbose modes 2 and 3:* Cont 1 * X15 ↵	View the current contrast level for the input.
Brightness			
Set a specific value	Esc X15 BRIT ←	Brit 1 * X15 ↵	Set the intensity of video light on the screen (brightness level) to X15 for the input.
Increment value	Esc + BRIT ←	Brit 1 * X15 ↵	Increase the brightness level by 1.
Decrement value	Esc - BRIT ←	Brit 1 * X15 ↵	Decrease the brightness level by 1.
View	Esc BRIT ←	X15 ↵ *In verbose modes 2 and 3:* Brit 1 * X15 ↵	View the current brightness level for the input.
Detail Filter			
Set detail level	Esc X15 HDET ←	Hdet 1 * X15 ↵	Set the sharpness (detail) level to X15 for the input.
Increment value	Esc + HDET ←	Hdet 1 * X15 ↵	Increase the detail level by 1.
Decrement value	Esc - HDET ←	Hdet 1 * X15 ↵	Decrease the detail level by 1.
View detail value	Esc HDET ←	X15 ↵ *In verbose modes 2 and 3:* Hdet 1 * X15 ↵	Show the detail level for the input.
Horizontal Position (Image)			
Specific value	Esc X16 HCTR←	Hctr X16 ↵	Set the horizontal position of the image in relation to the center of the screen to X16.
Increment value	Esc + HCTR ←	Hctr X16 ↵	Shift image right 1 pixel.
Decrement value	Esc - HCTR ←	Hctr X16 ↵	Shift image left 1 pixel.
View	Esc HCTR←	X16 ↵ *In verbose modes 2 and 3:* Hctr X16 ↵	View horizontal position value X16.

KEY:
X15 = Picture adjustment: 0 through 127 (default = 64)
X16 = Horizontal or vertical position. Response is five digits with leading + or - and padded with zeros.
- For DSC 3G-HD A: H range = -02048 – +02048, V range = -01200 – +01200
- For DSC HD-3G A: H range = -02048 – +02048, V range = -01080 – +01080

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Picture Adjustments (continued)			
Vertical Position (Image)			
Specific value	Esc X16 VCTR ←	Vctr X16 ↵	Set the vertical position of the image in relation to the center of the screen to X16.
Increment value	Esc + VCTR ←	Vctr X16 ↵	Shift the image down by 1 line.
Decrement value	Esc - VCTR ←	Vctr X16 ↵	Shift the image up by 1 line.
View	Esc VCTR ←	X16 ↵	View vertical position value X16.
Horizontal Size (Image)			
Specific value	Esc X17 HSIZ ←	Hsiz X17 ↵	Set the horizontal size (width) of the image to X17.
Increase horizontal size	Esc + HSIZ ←	Hsiz X17 ↵	Widen the image by 1 pixel.
Decrease horizontal size	Esc - HSIZ ←	Hsiz X17 ↵	Make the image narrower by 1 pixel.
View	Esc HSIZ ←	X17 ↵ *In verbose modes 2 and 3:* Hsiz X17 ↵	View horizontal size X17.
Vertical Size (Image)			
Specific value	Esc X17 VSIZ ←	Vsiz X17 ↵	Set the vertical size (height) of the image to X17.
Increase vertical size	Esc + VSIZ ←	Vsiz X17 ↵	Make the image taller by 1 line.
Decrease vertical size	Esc -V SIZ ←	Vsiz X17 ↵	Make the image shorter by 1 line.
View	Esc VSIZ ←	X17 ↵ *In verbose modes 2 and 3:* Vsiz X17 ↵	View vertical size X17.
Compound Image Position and Size			
Specific value	Esc X16 * X16 * X17 * X17 XIMG ←	Ximg X16 * X16 * X17 * X17 ↵	Set the horizontal and vertical position (X16) and horizontal and vertical size (X17) for the image.
View	Esc XIMG ←	X16 * X16 * X17 * X17 ↵ *In verbose modes 2 and 3:* Ximg X16 * X16 * X17 * X17 ↵	View x, y position and x, y size for image.

KEY:

X16 = Horizontal or vertical position. Response is five digits with leading + or - and padded with zeros.
- For DSC 3G-HD A: H range = -2048 – +2048, V range = -01200 – +01200.
- For DSC HD-3G A: H range = -02048 – +02048, V range = -01080 – +01080.

X17 = Horizontal or vertical size. Response is five digits with leading + or - and padded with zeros.
- For DSC 3G-HD A: H range = 00010 – 04096, V range = 00010 – 02400.
- For DSC HD-3G A: H range = 00010 – +04096, V range = -00010 – +02160.

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Presets			
Auto Memories			
Enable	Esc 1*1 AMEM ←	Amem 1*1 ↵	Set Auto Memory to On (default). Settings are automatically stored as presets. Previous settings for the incoming signal are recalled.
Disable	Esc 1*0 AMEM ←	Amem 1*0 ↵	Set Auto Memory to Off. Manual recall of input presets is required to configure the input.
View setting	Esc 1 AMEM ←	X10 ↵ *In verbose modes 2 and 3:* Amem 1*X10 ↵	View current Auto Memory status X10.

Settings Saved in User and Input Presets:

User Presets		Input Presets		
Contrast	Horizontal image size (width in pixels)	Contrast	Horizontal start	Horizontal image position
Brightness	Vertical image size (height in lines)	Brightness	Vertical start	Vertical image position
Detail	Horizontal image position	Detail	Active pixels (Horizontal Active)	Horizontal image size
Preset Name	Vertical image position	Film mode	Active lines (Vertical Active)	Vertical image size
		Audio gain/attenuation	Total pixels	Preset name

User Presets			
Recall preset	1*X25 .	1 Rpr X25 ↵	Recall user preset X25 for the selected input.
Save preset	1*X25 ,	1 Spr X25 ↵	Save user preset X25 for the selected input.
Delete (clear) preset	Esc X 1*X25 PRST ←	Prst X 1*X25 ↵	Clear user preset X25 and set its name to [unassigned].
User Preset Name			
Write name	Esc 1* X25 , X14 PNAM ←	Pnam 1* X25 , X14 ↵	Set the name of user preset X25 to X14.
Read name	Esc 1*X25 PNAM ←	X14 ↵ *In verbose modes 2 and 3:* Pnam 1 * X25 , X14 ↵	View the name of user preset X25.

NOTE: Unnamed presets are shown as [unassigned]. To restore a default user preset name, enter a single space character for X14. These entries are valid only for previously saved presets.

KEY:
X10 = Enable or disable Auto Memory: 0 = Off or disable, 1 = On or enable (default)
X14 = Preset name, up to 16 characters
X25 = User preset number: 1 – 3
Response is two digits padded with a zero.

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Presets (continued)			
Input Presets			
Recall preset	2 * X26 .	2 Rpr X26 ↵	Recall input preset X26 for selected input.
Save preset	2 * X26 ,	2 Spr X26 ↵	Save input preset X26 for selected input.
Delete/clear preset	Esc X 2 * X26 PRST ←	Prst X 2 * X26 ↵	Clear input preset X26 and set its name to [unassigned].
Input Preset Name			
Write name	Esc 2 * X26 , X14 PNAM ←	Pnam 2 *X26 , X14↵	Set the name of input preset X26 to X14.
Read name	Esc 2 * X26 PNAM ←	X14 ↵ *In verbose modes 2 and 3:* Pnam 2 * X26 , X14 ↵	View the name of input preset X26.

NOTE: Unsaved presets are shown as [unassigned]. To restore a default input preset name, enter a single space character for X14. These entries are valid only for previously saved presets.

Output Configuration			
Output EDID (DSC 3G-HD A only)			
Save output EDID	Esc S 1 * X21 EDID ←	Edid S 1 * X21 ↵	Save the EDID of the current DSC 3G-HD A output to X21.
Output Scaler Rate			
Set output rate	Esc X20 RATE ←	Rate X20 ↵	Select the DSC 3G-HD A output resolution and refresh rate.
View output rate	Esc RATE ←	X20 ↵ *In verbose modes 2 and 3:* Rate X20 ↵	Show selected output rate.

KEY:

X14 = Preset name, up to 16 characters

X20 = Output resolution and refresh rate:

- **DSC 3G-HD A:** 1 – 92.
  1 = EDID of connected HDMI display, 2 = Custom rate 1, 3 = Custom rate 2, 4 = Custom rate 3, 9 = Match the input rate. If the current input is not a valid output rate, defaults to 720p @ 660 Hz (73).
  For variables 11 – 92, see the **DSC 3G-HD A variables table** on page 43.
- **DSC HD-3G A:** 0 – 96.
  0 = Automatic: matches current output resolution (default), 1 = Custom rate 1, 2 = Custom rate 3, 3 = Custom rate 3, 9 = Match the input rate.
  For variables 65 – 96, see the **DSC HD-3G A variables table** on page 44.

X21 = Custom EDID emulations: 0 = Automatic: matches current output resolution (default), 1 = Custom EDID 1, 2 = Custom EDID 2, 3 = Custom EDID 3, 9 = Match the input rate.
For variables 11 – 96, see the **SIS EDID table** on page 44. Response is two digits padded with a zero.

X26 = Input preset number: 1 – 128. Response is three digits, padded with zeros.

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Output Configuration (continued)			
HDMI Output Format (DSC 3G-HD only)			
Set format	Esc X48 VTPO ←	Vtpo X48 ↵	Set output format X48 for the HDMI output.
View setting	Esc VTPO ←	X48 ↵	Show current HDMI output format.
Power Save Mode			
Power save off	Esc Ø PSAV ←	Psav Ø ↵	Set the DSC to run in full power mode (default).
Power save on	Esc 1 PSAV ←	Psav 1 ↵	Place the DSC in low power mode.
View setting	Esc PSAV ←	X62 ↵ *In verbose modes 2 and 3:* Psav X62 ↵	View power save status X62.
Screen Saver Mode (Activated when no signal is detected on the input)			
Set screen saver mode	Esc M X40 SSAV←	Ssav M X40 ↵	Sets the screen saver mode to X40 (default = 1= black).
View mode	Esc M SSAV ←	X40 ↵ *In verbose modes 2 and 3:* Ssav M X40 ↵	View current screen saver mode X40.
Set sync time out duration	Esc T X28 SSAV←	Ssav T X28 ↵	Set the time before sync timeout to X28 seconds. Default = 501 seconds (never).
View sync timeout duration	Esc T SSAV ←	X28 ↵ *In verbose modes 2 and 3:* Ssav T X28 ↵	View amount of time X28 before sync timeout.
View screen saver status	Esc S SSAV ←	X63 ↵ *In verbose modes 2 and 3:* Ssav S X63 ↵	View the screen saver status X63.

KEY:

X28 = Output sync timeout — 1 through 500, in 1-second increments (default = 501 seconds = never)
0 = The output sync is instantly disabled with no active input.
501 = Output sync never times out (default).

X40 = Screen saver mode: 1 = black screen (default), 2 = blue output with OSD text

X48 = HDMI output format:
0 = Auto (default). (HDMI – RGB Full to a CEA sink or DVI to a non-CEA sink). OSD reads Auto.)
1 = DVI (RGB 444, 0-255, no audio, no InfoFrames). OSD reads DVI RGB 444.)
2 = HDMI RGB Full (RGB 444, 0-255, audio, InfoFrames. OSD reads RGB Full.)
3 = HDMI RGB Limited (RGB 444, 16-235, audio, InfoFrames. OSD reads RGB Limited.)
4 = HDMI YUV Full (YUV 444, 0-255, audio, InfoFrames. OSD reads YUV 444 Full.)
5 = HDMI YUV Limited (YUV 444, 16-235, audio, InfoFrames. OSD reads YUV 444 Limited.)
6 = HDMI YUV Full (YUV 422, 0-255, audio, InfoFrames. OSD reads YUV 422 Full.)
7 = HDMI YUV Limited (YUV 422, 16-235, audio, InfoFrames. OSD reads YUV 422 Limited.)

X62 = Power saver mode: 0 = full power mode (default), 1 = lower power mode

X63 = Screen saver status:
0 = active input detected, timer not running
1 = No active input detected, timer running, output sync active
2 = No active input detected, timer expired, output sync disabled

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Output Configuration (continued)			
HDCP Status (DSC 3G-HD A only)			
Query output	Esc O 1 HDCP ←	X44 ↵ *In verbose modes 2 and 3:* Hdcp O 1 * X44 ↵	View HDCP status X44 of the digital output.
Input lock (Accu-Frame Lock [AFL]) or SDI Genlock			
Disable genlock or Input AFL	Esc Ø GLOK ←	Glok 0 ↵	Disable global input lock (AFL) or genlock (default).
Enable input AFL	Esc 1 GLOK ←	Glok 1 ↵	Lock the output refresh rate to the rate of the selected input.
Enable SDI genlock (DSC HD-3G A only)	Esc 2 GLOK ←	Glok 2 ↵	Lock the output refresh rate to the applied genlock signal.
View the genlock or AFL setting	Esc GLOK ←	X64 ↵ *In verbose modes 2 and 3:* Glok X64 ↵	View the current global input lock (AFL) or genlock setting.
View genlock or AFL status	Esc 41 STAT←	X65 ↵ *In verbose modes 2 and 3:* 41 Stat • X65 ↵	View the current global input lock (AFL) or genlock status.
Genlock Offset (DSC HD-3G A only)			
NOTES: • Genlock offset commands return an error code unless SDI genlock is currently enabled and genlock is currently locked to an applied genlock reference. • Genlock offsets apply only to the current output resolution and reset to 0,0 when the output resolution is adjusted. • If the applied Genlock reference signal differs in resolution or refresh rate from the DSC scaled output resolution, then proper genlock cannot be guaranteed.			
Set horizontal offset	Esc H *x* GLOF ←	Glof H *x* ↵	Set the horizontal genlock offset to *x* pixels. The *x* value (genlock pixel offset) range is ± the current output resolution total pixel value -1. **Example:** -2199 – +2199 for 1080p
View horizontal offset	Esc H GLOF ←	*x* ↵ *In verbose modes 2 and 3:* Glof H *x* ↵	View the horizontal genlock offset (default = 0).
Set vertical offset	Esc V *y* GLOF ←	Glof V *y* ↵	Set the vertical genlock offset to *y* pixels. The *y* value (genlock pixel offset) range is ± the current output resolution total pixel value -1. **Example:** -1124 – +1124 for 1080p
View vertical offset	Esc V GLOF ←	*y* ↵ *In verbose modes 2 and 3:* Glof V *y* ↵	View the vertical genlock offset (default = 0).

KEY:
X44 = HDCP status: 0 = no sink device detected, 2 = sink detected
X64 = Input lock (AFL) status:
0 = Input lock disabled (default)
1 = Input lock is enabled but cannot lock to applied input signal (defaults to the set output rate).
2 = Input lock is enabled. The output is locked to the applied input signal (AFL).
X65 = SDI genlock status:
0 = Disable (default), 1 = Priority to highest numbered input, 2 = Priority to lowest numbered input

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Audio Configuration			
Audio Mute (Global setting — persists after a power cycle)			
Mute on	1 Z	Amt 1 ↵	Mute the selected audio input.
Mute off	Ø Z	Amt Ø ↵	Unmute the selected audio input.
View mute status	Z	X10 ↵ *In verbose modes 2 and 3:* Amt X10 ↵	View audio mute status X10.
Audio Gain and Attenuation			
NOTE: On the DSC 3G-HD A, these commands apply to analog audio.			
Set audio gain and attenuation	X54 G	Aud X54 ↵	Set the audio gain or attenuation on the current input to X54 dB.
Increment	+G	Aud X54 ↵	Increment (raise) the audio level by 1 dB.
Decrement	-G	Aud X54 ↵	Decrement (lower) the audio level (down) by 1 dB.
View	G	X54 ↵ *In verbose modes 2 and 3:* Aud X54 ↵	View the current audio level.
Audio Input Format			
NOTE: • **DSC 3G-HD A:** Selects between analog (5-pole captive screw audio input connector) and digital (embedded in the SDI input) audio sources. • **DSC HD-3G A:** Selects between analog (5-pole captive screw audio input connector) and digital (embedded in the HDMI input) audio sources.			
Set to None	Esc I 1 * Ø AFMT ↵	Afmt I 1 * Ø ↵	Mute all audio for the input.
Set to Analog	Esc I 1 * 1 AFMT ↵	Afmt I 1 * 1 ↵	Select analog audio for the input.
Set to 2CH digital **or** Set to LPCM-2CH digital	Esc I 1 * 2 AFMT ↵	Afmt I 1 * 2 ↵	**DSC 3G-HD A:** Select two-channel digital audio for the input (default). **DSC HD-3G A:** Select LPCM two-channel digital audio for the input (default).
Set to 8CH digital **or** Set to Multi-CH digital	Esc I 1 * 3 AFMT ↵	Afmt I 1 * 3 ↵	**DSC 3G-HD A:** Select eight-channel digital audio for the input. **DSC HD-3G A:** Select PCM multi-channel (eight-channel) digital audio for the input.

KEY: X10 = Mute or unmute audio: 0 = Unmute (default), 1 = Mute
X54 = Audio gain and attenuation: -18 through +12 dB (For DSC 3G-HD this applies only to analog input.) Response is two digits with leading + or – and padded with a zero.

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Audio Configuration (continued)			
Audio Input Format (continued)			
View audio type: DSC 3G-HD A	Esc I 1 AFMT ←	X58 ↵ *In verbose modes 2 and 3:* Afmt I 1 * X58 ↵	View audio input type X58 for the SDI input.
View audio type: DSC HD-3G A	Esc I 1 AFMT ←	X59 ↵ *In verbose modes 2 and 3:* Afmt I 1 * X59 ↵	View audio input type X59 for the HDMI input.
AES Audio Channel Selection (DSC 3G-HD A only)			
Select channel	Esc X51 AESC ←	Aesc X51 ↵	Select channel pair X51 to be decoded and embedded.
View channel	Esc AESC ←	X51 ↵ *In verbose modes 2 and 3:* Aesc X51 ↵	View selected channel pair X51.
AES Audio Channel Group Selection (DSC 3G-HD A only)			
Select channel group	Esc X52 AESG ←	Aesg X52 ↵	Select channel group X52 to be decoded and embedded.
View channel group	Esc AESG ←	X52 ↵ *In verbose modes 2 and 3:* Aesg X52 ↵	View selected channel group X52.
Advanced Configuration			
Test Pattern			
Set test pattern	Esc X22 TEST ←	Test X22 ↵	Select test pattern X22.
View test pattern	Esc TEST ←	X22 ↵ *In verbose modes 2 and 3:* Test X22 ↵	View the current test pattern.
Freeze			
Enable	1 F	Frz 1 ↵	Freeze the input.
Disable	Ø F	Frz Ø ↵	Unfreeze the input.
View	F	X10 ↵ *In verbose modes 2 and 3:* Frz X10 ↵	View the freeze status.

KEY:

X10 = Freeze or unfreeze the input: 0 = Unfreeze, 1 = Freeze

X22 = Test pattern:
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, channels 1 and 2, 48 kHz, 24 bit)

X51 = SDI audio channels — AES channel pair 1 or 2 (DSC 3G-HD A only):
1 = Channel pair 1, 2 = Channel pair 2

X52 = SDI audio channel group — AES channel group 1-4
1 = Channel group 1 (default), 2 = Channel group 2, 3 = Channel group 3, 4 = Channel group 4. (Groups 3 and 4 are reserved for future use.)

X58 = Audio input type — DSC 3G-HD A
0 = None (muted), 1 = Analog, 2 = 2-channel digital, 3 = 8-channel digital

X59 = Audio input type — DSC HD-3G A
0 = None (muted), 1 = Analog, 2 = LPCM 2-channel digital, 3 = Multi-channel digital, 4 = (Unsupported input audio format)

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Advanced Configuration (continued)			
Input Aspect Ratio			
Set to Fill mode	Esc 1*1 ASPR ←	Aspr 1*1 ↵	Set the input to always fill the entire output raster (default).
Set to Follow mode	Esc 1 * 2 ASPR ←	Aspr 1*2 ↵	Set the input to preserve its native aspect ratio.
View aspect setting	Esc 1 ASPR ←	X39 ↵ *In verbose modes 2 and 3:* Aspr 1 * X39 ↵	View input aspect ratio X39.
Front Panel Lock (Executive Mode)			
Enable lock mode	1 X	Exe 1 ↵	Lock the entire front panel.
Disable lock mode	Ø X	Exe Ø ↵	Unlock front panel controls. All front panel adjustments can be made.
View lock mode status	X	X29 ↵ *In verbose modes 2 and 3:* Exe X29 ↵	View current lock mode status X29.
Overscan Mode — DSC 3G-HD A (Applies only to SMPTE input rates: 480i, 576i, 720p, 1080i, 1080p, and 2K.)			
Set value	Esc 1*X37 OSCN ←	Oscn 1*X37 ↵	Set the SDI input to overscan mode X37.
View status	Esc 1 OSCN ←	X37 ↵ *In verbose modes 2 and 3:* Oscn 1*X37 ↵	Show overscan mode status X37 for the SDI input.
Overscan Mode — DSC HD-3G A (Applies only to SMPTE input rates: 480i, 576i, 720p, 1080i, 1080p, and 2K.)			
Set value	Esc 1*X38 OSCN ←	Oscn 1*X38 ↵	Set the HDMI input to overscan mode X38.
View status	Esc 1 OSCN ←	X38 ↵ *In verbose modes 2 and 3:* Oscn 1*X38 ↵	Show overscan mode status X38 for the HDMI input.
Video Signal Presence			
View signal presence	Esc ØLS ←	X61 ↵ *In verbose modes 2 and 3:* InØØ • X61 ↵	View input signal status X61.

KEY:

X29 = Front panel lock mode (executive mode):
Ø = Unlock front panel (default), 1 = Lock front panel

X37 = Overscan — DSC 3G-HD A:
Ø = 0.0% — A true Auto-Image is executed on SMPTE inputs (default for SDI).
1 = 2.5% — An Auto-Image command snaps to a 2.5% table (no true Auto-Image is performed).
2 = 5% — An Auto-Image command snaps to a 5% table (no true Auto-Image is performed).

X38 = Overscan — DSC HD-3G A:
Ø = 0.0% — A true Auto-Image is executed on SMPTE inputs (default for HDMI and DVI).
1 = 2.5% — An Auto-Image command snaps to a 2.5% table (no true Auto-Image is performed).
2 = 5% — An Auto-Image command snaps to a 5% table (no true Auto-Image is performed).

X39 = Aspect ratio:
1 = Fill: The input rate fills the entire output raster (default).
2 = Follow: The input rate is displayed with its native aspect ratio.

X61 = View video signal status:
Ø = No input signal detected, 1 = Input signal detected

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
On-Screen Menu Configuration (Front Panel Control Button Emulation)			
NOTES: • An E13 error code is returned if a navigation button command other than R MENU (right arrow button) is sent while the OSD menu system is off. • The right arrow command can be used to initiate an Auto-Image, therefore, it does not return an error code. • An E14 error code is returned if a menu emulation command is sent while the unit is in front panel lock mode. • The unit exits power save mode if a menu emulation command is sent while the DSC is in power save mode.			
Toggle menu on and off	Esc M MENU ←	Menu*M ↵	Emulate the **Menu** button: Toggle the OSD menu on and off.
Enter menu system	Esc A MENU ←	Menu*A ↵	Enter the OSD menu system.
Enter menu system	Esc X MENU ←	Menu*X ↵	Exit the OSD menu system.
Enter (select)	Esc E MENU ←	Menu*E ↵	Emulate the **Enter** button (select a submenu or item)
Up arrow	Esc U MENU ←	Menu*U ↵	Emulate the ▲ button.
Down arrow	Esc D MENU ←	Menu*D ↵	Emulate the ▼ button.
Left arrow	Esc L MENU ←	Menu*L ↵	Emulate the ◀ button.
Right arrow	Esc R MENU ←	Menu*R ↵	Emulate the ▶ button.
View menu status	Esc MENU ←	X30 ↵ *In verbose modes 2 and 3:* Menu*X30 ↵	View the OSD menu On/Off status.
Reset			
Reset all device settings to factory default settings[24]	Esc ZXXX ←	Zpx ↵	
Information Requests			
General Information			
DSC 3G-HD A	I	Vid 1•Typ X2•Amt X10•Blk X42•Hrt X13•Vrt X13 ↵	
DSC HD-3G A	I	Vid 1•Typ X3•Amt X10•Blk X42•Hrt X13•Vrt X13 ↵ (Responses are the same in verbose modes 2 and 3.)	View video input signal type, audio mute status, video mute status, and horizontal and vertical frequencies.

KEY:
- X2 = Input video format for DSC 3G-HD A: 0 = No signal, 1 = SD: 480i, 2 = SD: 576i, 3 = HD: 480p, 576p, 720p, 1080i, 1080p (up to 30 Hz), 4 = 3G: 1080p (@50, 59.94, and 60 Hz), 2K
- X3 = Input video format for DSC HD-3G A: 0 = No signal, 1 = HDMI, 2 = DVI, 3 = Invalid signal
- X10 = Audio mute status: 0 = Unmuted (audio on = default), 1 = Muted
- X13 = Horizontal and vertical frequencies. Response is three digits with a single decimal place and padded with zeros.
- X30 = OSD menu system status: 0 = Menu off, 1 = Menu on (displayed)
- X42 = Video mute (blanking) status: 0 = Off (unmuted), 1 = On (muted to black screen), 2 = On (all output sync and video muted)

Command	ASCII Command (Host to Scaler)	Response (Scaler to Host)	Additional Description
Information Requests (continued)			
Query firmware version	Q	*n.nn* ↵ *In verbose modes 2 and 3:* VerØ1 * *n.nn* ↵	View firmware version to the second decimal place.
Query firmware build version	*Q	*n.nn.nnnn* ↵ *In verbose modes 2 and 3:* Bld *n.nn.nnnn* ↵	View full firmware version details.
Query boot loader version, factory firmware version, and current firmware version.	0 Q	*n.nn-n.nn.nnnn-n.nn.nnnn* ↵ *In verbose modes 2 and 3:* VerØØ *n.nn-n.nn.nnnn-n.nn.nnnn* ↵	View boot loader firmware version, factory firmware version, and current firmware version.
Query part number	N	60-130*n*-01 ↵ *In verbose modes 2 and 3:* Pno 60-130*n*-01 ↵	View the unit part number: **DSC 3G-HD A:** 60-1303-01 **DSC HD-3G A:** 60-1304-01
View internal temperature	Esc 20STAT ←	X12 ↵ *In verbose modes 2 and 3:* Stat20 • X12 ↵	View unit internal temperature X12 in degrees Celsius.
Set verbose mode	Esc X31 CV ←	X31 ↵	Set the verbose mode for SIS command responses.
View verbose mode	Esc CV ←	X31 ↵ *In verbose modes 2 and 3:* Vrb X31 ↵	View the current verbose mode.
Set unit name	Esc X32 CN ←	Ipn • X32 ↵	Specify a name for the unit.
Set unit name to factory default	Esc • CN ←	Ipn • X33 ↵	Reset the unit name to the factory default name.
View unit name	Esc CN ←	X32 ↵ *In verbose modes 2 and 3:* Ipn • X32 ↵	View the name of the unit.
View unit description	2i	X34 ↵ *In verbose modes 2 and 3:* InfØ2 * X34 ↵	View the model description.

KEY:
- X12 = Internal temperature in degrees Celsius. Response is two digits, padded with a zero.
- X31 = Verbose mode: 0 = None, 1 = Verbose mode (default), 2 = Tagged response for queries, 3 = Verbose mode and tagged response for queries
- X32 = Unit name: A text string of up to 24 characters (A-Z, 0-9, and the hyphen [-] are permitted.
  - The first character must be a letter.
  - The last character cannot be a hyphen.
  - No blank or space characters are permitted.
  - No distinction is made between uppercase and lowercase letters.
- X33 = Factory default name: DSC 3G-HD A or DSC HD-3G A
- X34 = Model description: Digital Scaling Converter

Product Configuration Software

The Extron Product Configuration Software (PCS) is a Windows-based program for the DSC that provides a convenient way to configure the input and output, audio, and image settings. It also lets you save and recall presets and perform nearly all the other functions that can be accomplished via the front panel controls or SIS commands.

To download PCS from the Extron website, locate it on the `Download Center` page or go to the `PCS` product page.

Software Download Center Page

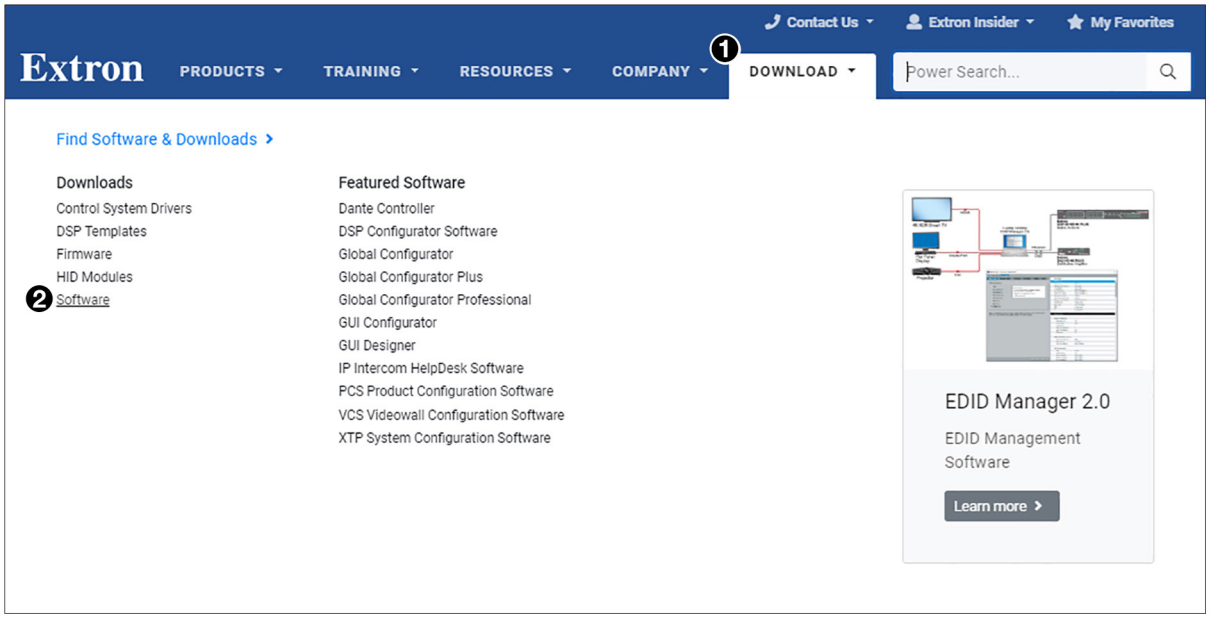


Figure 26. Download Center Page on the Extron Website

1. On the Extron website, select the **`Download`** tab (see figure 26, ❶).
2. Move the pointer to the **`Software`** link (❷) in the `Downloads` column and click it.

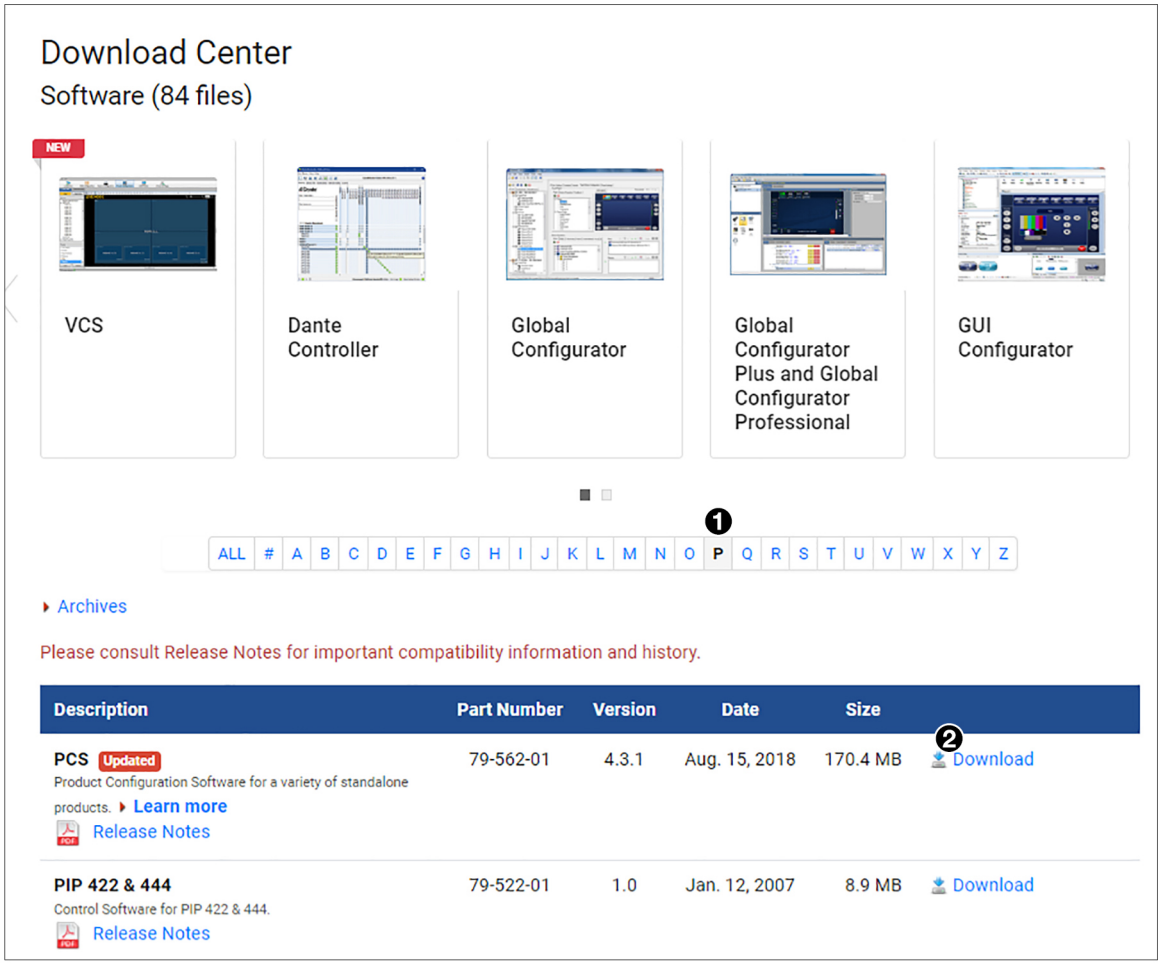


Figure 27. PCS Download Link

3. On the `Download Center` page, click the **`P`** link (see figure 27, ❶).
4. If necessary, scroll to locate PCS from the list of available software programs and click the **`Download`** link to the right of the name (❷).
5. On the login page that appears next, fill in the required information to log in to **https://www.extron.com** (if you need an ID number, see your Extron representative).
6. Follow the instructions on the subsequent screens to complete the software program installation. By default, the configuration program files are stored on your computer at: `C:\Program Files (x86) \ Extron \ DSC CrossPoint 82`.

   If there is not already an Extron folder in your Program Files (x86) folder, the installation program creates it as well.

Software Connection

Open the PCS program from the Start menu or desktop shortcut. The Extron Product Configuration Software window opens with the Device Discovery panel open. Connect to the switcher using the Device Discovery panel or the TCP/IP panel.

Starting the Configuration Program

1. To run the PCS control program, do either of the following:
   - Double-click on the EAF.exe file, located on your computer at c:\Program Files [or Program Files(x86)]\Extron\Extron PCS.
   - Access the program from the Start menu on your computer as follows:
     a. Click **Start** on your computer screen.
     b. Select **All Programs** from the Start menu.
     c. From the All Programs menu, select **Extron Electronics**.
     d. From the Extron Electronics drop-down submenu, select the **Extron Product Configuration Software** folder.
     e. From the folder submenu, select **Extron Product Configuration Software**. The Extron Product Configuration Software window opens.
2. On the PCS main window, click the **PCS** menu icon in the upper-right corner (see figure 28, ❶).
3. From the drop-down menu select **Extron PCS Help** (❷) for the procedures for connecting to the DSC and configuring it.

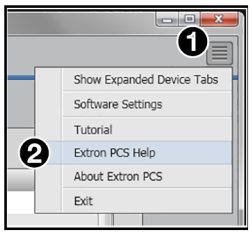


Figure 28. New PCS Software Window

TCP/IP Panel

The TCP/IP panel connects PCS to a specific device through Ethernet.

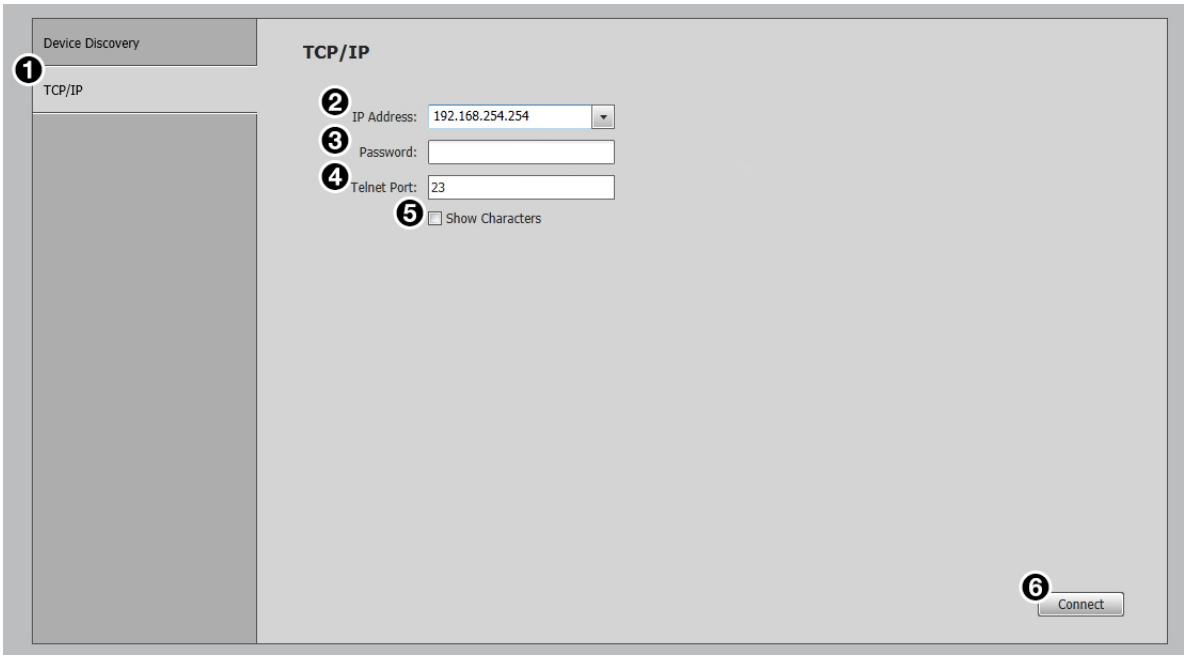


Figure 29. TCP/IP Panel

1. Click the **TCP/IP** tab (see figure 29, ❶).
2. In the **IP Address** field (❷), enter the IP address of the desired device.
3. If required, enter the device password in the **Password** field (❸).

NOTES:

- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of an absolute system reset, these passwords convert to the default, which is no password. Passwords are case sensitive.
- Select the **Show Characters** checkbox (❺) to display the password characters.

4. In the **Telnet Port** field (❹), enter the Telnet port of the desired device.
5. Click the **Connect** button (❻). A new device tab opens.

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 3G-HD A and DSC HD-3G A scalers can be mounted by any of the methods described below. To mount the DSC using an Extron mounting kit, see the instructions provided with the kit.

Rack Mounting

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

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the DSC 3G-HD A or DSC HD-3G A 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 3G-HD A ou DSC HD-3G A :

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 (Tma) 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).

Furniture Mounting

- **Under-furniture mounting** — Mount the DSC under the surface of a desk, table, or podium.
- **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 four rubber feet to the bottom of the DSC at the four corners and place the unit where desired.

Extron Warranty

Extron Electronics 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 Electronics 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 Electronics
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 Electronics, 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.

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