

SMP 111


Streaming Media Processor




Extron

Safety Instructions


Safety Instructions • English


WARNING: This symbol, , when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, , when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, www.extron.com.


Sicherheitsanweisungen • Deutsch


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Instrucciones de seguridad • Español


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ATENCIÓN: Este símbolo, , cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento estas están incluidas en la documentación proporcionada con el equipo.

Para obtener información sobre directrices de seguridad, cumplimiento de normativas, compatibilidad electromagnética, accesibilidad y temas relacionados, consulte la Guía de cumplimiento de normativas y seguridad de Extron, referencia 68-290-01, en el sitio Web de Extron, www.extron.com.


Instructions de sécurité • Français


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ATTENTION : Ce pictogramme, , lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec l'équipement.

Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, www.extron.com.


Istruzioni di sicurezza • Italiano


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Instrukcje bezpieczeństwa • Polska


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UWAGI: Ten symbol, , gdy używany na produkt, jest przeznaczony do ostrzegania użytkownika ważne operacyjne oraz instrukcje konserwacji (obsługi) w literaturze, wyposażone w sprzęt.

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Инструкция по технике безопасности • Русский


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安全说明 • 简体中文

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安全記事 • 繁體中文

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安全上のご注意 • 日本語

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안전 지침 • 한국어

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. This interference must be corrected at the expense of the user.

NOTES: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the [Extron Safety and Regulatory Compliance Guide](#) on the Extron website.

Battery Notice

This product contains a battery. **Do not open the unit to replace the battery.** If the battery needs replacing, return the entire unit to Extron (for the correct address, see the Extron Warranty section on the last page of this guide).

CAUTION: Risk of explosion. Do not replace the battery with an incorrect type. Dispose of used batteries according to the instructions.

ATTENTION : Risque d'explosion. Ne pas remplacer la pile par le mauvais type de pile. Débarrassez-vous des piles usagées selon le mode d'emploi.

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VCCI-A

Conventions Used in this Guide

Notifications

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.

TIP: A tip provides a suggestion to make working with the application easier.

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 used for 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 <http://www.extron.com/technology/glossary.aspx>.

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Introduction

This section gives an overview of the user guide and describes the SMP 111 and its features. Topics that are covered include:

- [About this Guide](#)
- [About the SMP 111](#)
- [General Product Overview](#)
- [Features](#)

About this Guide

This guide contains installation, configuration, and operating information for the SMP 111.

- “Codec” refers to the H.264 / MPEG-4 AVC codec.
- “Stream” can refer to audio, video, or both that is transmitted by the SMP.
- “UI” and “Web UI” refer to the web-based user interface.

About the SMP 111

The Extron SMP 111 is a compact, high performance H.264 recording and streaming processor that provides the ability to record a presentation and output an HDMI signal to a local display, and, if needed, stream the AV content live while recording.

See [figure 1](#) on page 2 for an example of a typical SMP 111 application.

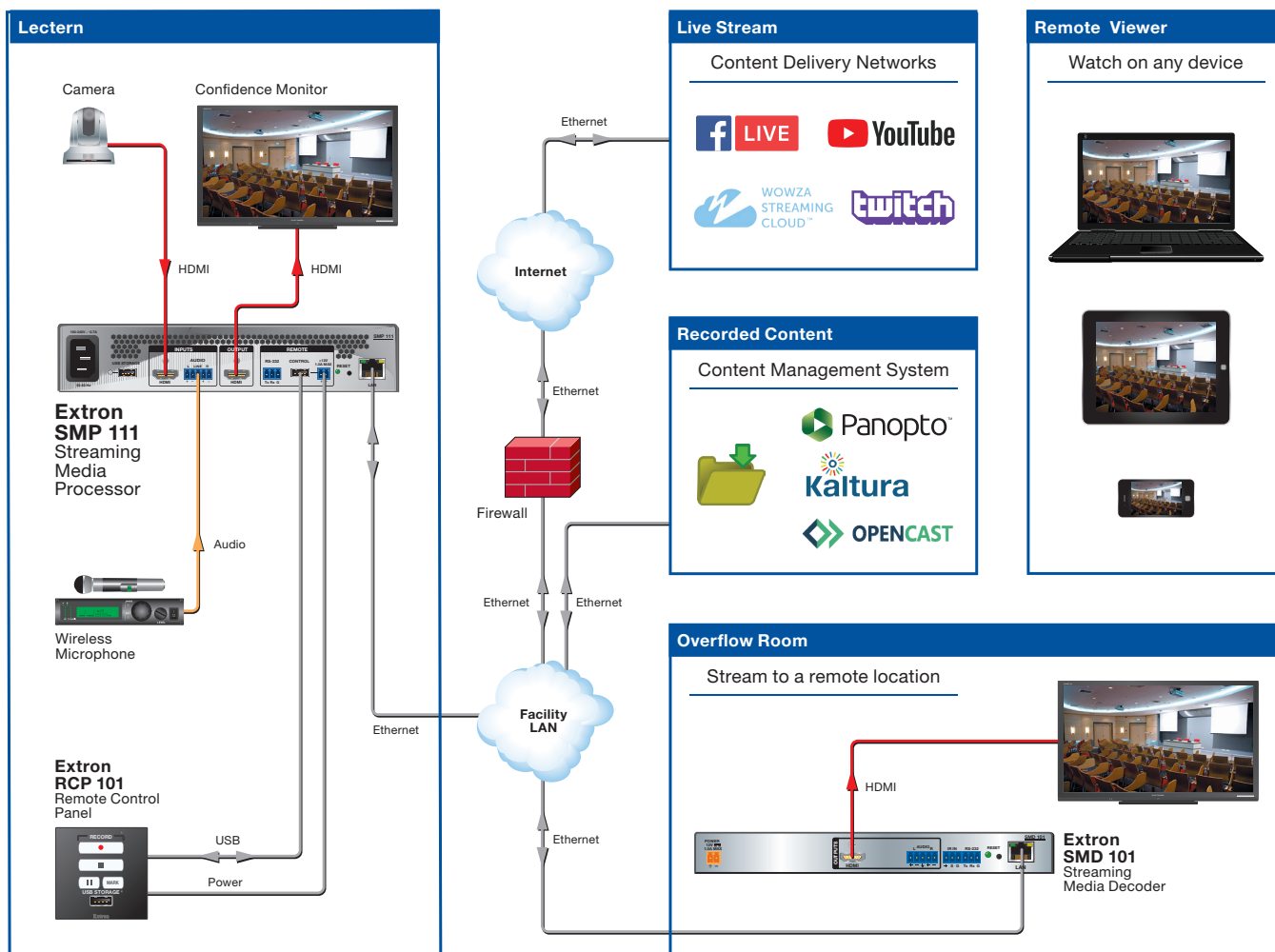


Figure 1. Typical SMP 111 Application

PC Requirements

Below are the PC requirements to access the default web pages of the SMP:

- **Hardware**
 - 2.0 GHz dual-core processor
- **Operating Systems**
 - Microsoft® Windows® XP or higher
 - Mac® OS® X® 10.6 or higher
- **Web Browsers**

NOTE: The preview video in the AV Controls panel of the SMP 111 uses an HTML5 player and is not supported by Microsoft Internet Explorer v.11, Microsoft Edge™, or Apple Safari. To see a preview of the current stream you can either:

- Use a different browser

or

- Open a standalone, third-party video player (such as VideoLAN™ opensource VLC™ media player) and connect to the SMP streaming file .

- Google® Chrome™ version 48 or higher
- Mozilla® Firefox® version 44 or higher
- Microsoft® Internet Explorer® (for Windows® operating systems)
- Apple® Safari® version 9 or higher (for macOS® operating systems)

NOTE: Safari is the preferred browser for macOS operating systems.

- Additionally, the device web UI is compliant, but not fully featured, with the internal browser client: QTWeb v4.x

Extron LinkLicense

An Extron LinkLicense unlocks features that add convenience, expand system options, and enhance the capabilities of Extron products. Each LinkLicense can be purchased separately from the SMP and activated as the need arises.

LinkLicense upgrades available for the SMP 111 include the following:

Enhanced Kaltura Features Upgrade —

- An annually-renewable support license.
- Enables the ability to schedule recordings directly from Kaltura.
- Enables the unit to stream live media to Kaltura using RTMP.

Horizontal Video Mirroring Upgrade —

- Enables the feature that flips the video horizontally before the encoding, allowing a presenter to stand behind a glass marker board and face the camera, while writing on the board. The image is flipped to allow the writing to be displayed correctly.
- Enables the user to adjust the minimum available recording time.
- Enables the user to set a delay to start recording after the record command is issued.

Enhanced Panopto Features Upgrade —

- An annually-renewable support license.
- Enables the ability to schedule recordings directly from Panopto.
- Enables the unit to stream live media to Panopto using RTMP or RTMPS.

For more information on each LinkLicense, see the *SMP 111 Embedded Web Pages Help File*.

Licensed Third-party Software

The following table lists the licensed third-party software used by the SMP models.

NOTE: Licensed third-party software used by the SMP models is subject to change without notice.

Licensed Third-party Software Used in the SMP 111			
Package	License	Package	License
ExtJS 4	Sencha Commercial License	Linux-PAM	BSD-3c
alsa-lib	LGPLv2.1	live555	LGPLv2.1+
alsa-utils	GPLv2	lm-sensors	libsensors LGPLv2.1, programs GPLv2
aufs2-util	GPLv2	lshw	GPLv2
avahi	LGPLv2.1	lsof	lsof license
bstrlib	BSD-3c	ltrace	GPLv2
busybox	GPLv2	lua	MIT
bzip2	bzip2 license	luaexpat	MIT
cjson	MIT	luasocket	MIT
dbus	AFLv2.1 GPLv2	luastruct	MIT
e2fsprogs	GPLv2, libuuid BSD-3c, libssGPLv2, libuuid BSD-3c, libss and libet MIT-like with advertising clause	lvm2	GPLv2 LGPLv2.1
ethtool	GPLv2	lzo	GPLv2
expat	MIT	mtd	GPLv2
fbdump	GPLv2	ncurses	MIT with advertising clause
fbset	GPLv2	neon	LGPLv2 (library), GPLv2 (manual and tests)
file	BSD-2c, one file BSD-4c, one file BSD-3c	netcat	GPLv2
fontconfig	fontconfig license	net-snmp	Various BSD-like
freetype	Dual FTL/GPLv2	nginx	nginx license
gdisk	GPL	nmap	GPLv2
gnupg	GPLv2	ntfs-3g	GPLv2 LGPLv2
gpgme	LGPLv2.1	ntp	ntp license
gst-plugins-base	LGPLv2 plus applicable external licenses	openssh	BSD
gst-plugins-good	LGPLv2.1 plus applicable external licenses	openssl	OpenSSL or SSLeay
gstreamer	LGPLv2	orc	BSD-2c, BSD-3c
heirloom-mailx	BSD-4c, Bellcore (base64), OpenVision (imap_gssapi), RSA Data Security (md5), Network Working Group (hmac), MPLv1.1 (nss)	pcre	BSD-3c
i2c-tools	GPLv2+, GPLv2 (py-smbus)	popt	MIT
ifplugd	GPLv2	procps	GPLv2, libproc and libps LGPLv2
iostat	GPL	psmisc	GPLv2
jpeg-turbo	jpeg-license (BSD-3c-like)	pv	Artistic-2.0

Licensed Third-party Software Used in the SMP 111			
Package	License	Package	License
kmod	LGPLv2.1	python	Python software foundation license v2, others
libassuan	LGPLv2.1	qjson	LGPLv2.1
libcgicc	LGPLv2.1	qt	LGPLv2.1 with exceptions
libcurl	ICS	qwt	LGPL
libdaemon	LGPLv2.1	sdl	LGPLv2.1
libdnet	BSD-3c	smartmontools	GPLv2
libelf	LGPLv2+	socat	GPLv2
libfcgi	fcgi license	spawn-fcgi	BSD-3c
libffi	MIT	sqlite	Public domain
libglib2	LGPLv2	strace	BSD-3c
libgpg-error	LGPLv2.1	sudo	ICS BSD-3c
libmpeg2	GPLv2	sysstat	GPLv2
libogg	BSD-3c	tcpdump	BSD-3c
libpcap	BSD-3c	tiff	tiff license
libpng	libpng license	tzdata	Public domain
libsync	LGPLv2.1	udev	GPLv2
libssh2	BSD	usbutils	GPLv2
libungif	MIT	util-linux	GPLv2, BSD-4c, libblkid and libmount LGPLv2.1, libuuid BSD-3c
libusb	LGPLv2.1	vsftpd	GPLv2
libv4l	GPLv2	xinetd	xinetd license
lighttpd	BSD-3c	zlib	zlib license

General Product Overview

Input

The SMP 111 has one HDMI input and one analog audio captive screw input.

Signals from the input channel and metadata (descriptive information about data content) are combined in a user-configurable layout and encoded into streams.

Encoding and Output

The SMP 111 supports simultaneous streaming and recording, with one HDMI output. The record and stream encoder settings can be configured as different bit rates, resolutions, and frame rates. The HDMI output defaults to the record settings.

See [An overview of encoding](#) on page 44 for a comparison of the two encoding types. The video output can be scaled and its aspect ratio modified. The SMP 111 also outputs high quality encoded HDMI video with embedded audio on a single output for display on any HDMI display, supporting resolutions up to 1920x1080 at 60 Hz.

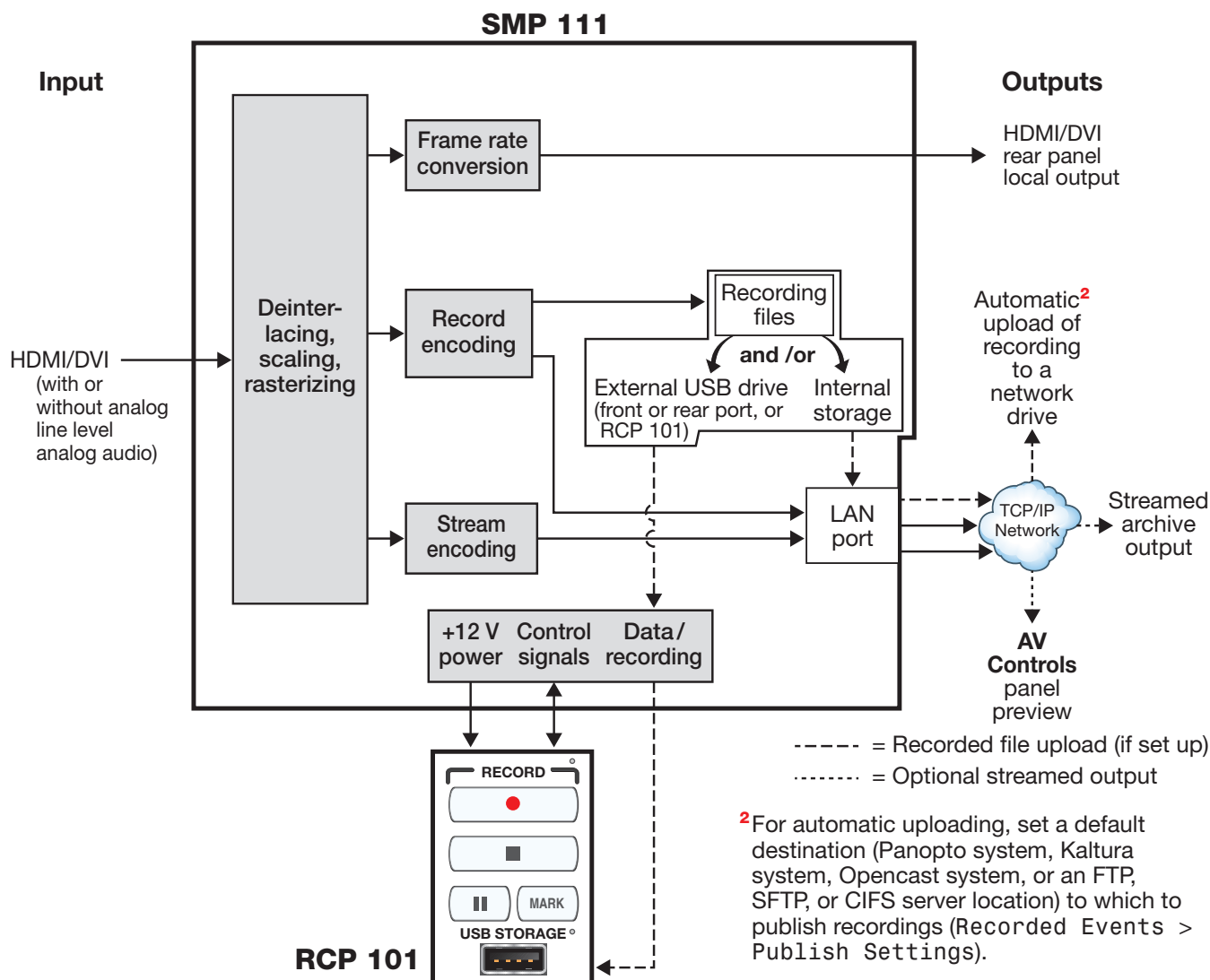


Figure 2. SMP 111 Block Diagram

File Storage

Internal storage is available for storing recordings to be uploaded to a file server. The SMP 111 has a 32 GB SD card internally, which is field upgradable to different storage sizes (see [Upgrading the SD Card](#) on page 110). View the total storage size in the storage information table found on the **File Management** embedded web page (see **Storage Information** in the Help file).

Two USB ports (one on the front panel, one on the rear panel) for portable, user-provided USB drives for storing recordings. The optional RCP 101 also has a USB port to connect a user-provided USB drive for storing recordings.

Control Options

The SMP 111 can be controlled using the following:



- Front panel controls.
- Simple Instruction Set (SIS) commands sent over Ethernet via the LAN connection, over RS-232 via the rear panel Remote captive screw connector, or over USB via the front panel Config port.
- Ethernet connection to the SMP 111 embedded web pages.
- Front and rear USB ports provide for direct connection of a keyboard and mouse to permit the use of an internal browser client. This allows limited web page configuration of the network settings for the device.
- The optional Extron RCP 101 remote control panel connected through the rear panel Remote Control port.

Recordings

The core function of the SMP 111 is to create recording files from connected audio and video input sources.

Start a recording

Recordings are initiated manually in one of several ways:

- Press the **Record** () button on the front panel of the SMP 111 or the RCP 101 remote control panel.
- Click the **Record** () button in the AV Controls panel of the SMP 111 embedded web pages (see [Ad Hoc Recording](#) on page 28) and set the options in the **Encoding & Metadata** window.
- Tap a control button on a configured record control panel (such as an Extron RCP 101).

Make a recording

The SMP 111 creates recordings by:

- Encoding the content into stream (see [Encoding & Metadata](#) on page 43).
- **Creating a set of files** — one or more .m4v, .mp4, or .m4a files and other files containing metadata, thumbnail images, and optional chapter markers. These files are stored either within the unit (the internal, default location), or on an optional USB drive (see [Setting the Default Recording Media](#) on page 52 for how to set the default recording storage location).

The SMP 111 creates a set of the same types of files for every recording, regardless of how a recording is initiated. Default file names are specified within the System Settings page (see [System Settings](#) on page 51 for details).

Output and share recordings

Recording files can be saved in the SMP 111 internal memory and on an optional connected USB drive. Recordings stored internally (not on a USB drive) can also be automatically uploaded to a network server folder.

Uploading recordings to a server allows you to archive or share files with others who are authorized to access that folder or to use tools such as Opencast.

NOTES:

- When integrated with Opencast, Panopto, or Kaltura, recordings are automatically uploaded to the server location defined.
- To upload recordings for other scheduling or integration methods, specify a publishing destination during system setup (FTP, SFTP, or CIFS/Windows Net Share server folder).

Features

- **Process live, high resolution HDMI video and audio with metadata** — Combine high quality video and audio with supporting data for cataloging and indexing to produce an enhanced presentation experience.
- **Record and stream simultaneously** — Document presentations, view confidence streaming, or extend live media to overflow destinations without the need for a computer or additional equipment.
- **High quality scaling with aspect ratio control, size, and position** — Configurable aspect ratio control allows selection of FILL, FOLLOW, or FIT modes as well as zoom and position settings.
- **Produce MP4 media files that are compatible with virtually any media player** — Use recordings produced by the SMP 111 directly with any software media player, computer or mobile device.
- **Automatic file uploading** — Manage the transfer of recordings automatically using defined workflows to Hosting Services, FTP, Secure FTP, and CIFS network shares.
- **RTMP streaming protocol supports popular third party hosting services** — Supports RTMP push streaming with stream name or key, and user authentication for services like YouTube Live, Wowza, Twitch, IBM Cloud, and more.
- **RTMPS support for Facebook Live** — Stream encrypted data to Facebook Live, preventing third parties from intercepting the live stream.
- **Connect High Definition sources up to 1920x1200, including HDTV 1080p** — The SMP 111 supports a wide range of source resolutions, from standard definition up to the high resolutions commonly used for computer video and HDTV.
- **Stream at resolutions from 512x288 to 1080p/30** — High resolutions deliver superior quality images for overflow applications and lower resolutions are more efficient for streaming distribution and confidence viewing applications.
- **HDMI output with audio** — Presents a preview of the presentation with mixed, HDMI-embedded stereo audio.
- **Record audio, video, and data** — The SMP 111 produces a folder that contains a standard MP4 recording, an optional M4A file, and metadata with fields such as Title, Subject, Description, Presenter, Date etc.
- **Save recordings to internal storage, external USB storage, or network storage** — Configure the SMP 111 to save recordings to internal storage and external USB drives simultaneously. Permits the creation of both an archive copy, and a portable USB copy.
- **Easy to operate front panel controls** — Control basic recording functions and monitor video and audio signal status. Four convenient buttons allow a recording to be started, stopped and paused, and chapter marks to be inserted.
- **Embedded Web interface** — The SMP 111 provides an intuitive Web interface with an embedded video window for viewing the live stream, as well as complete configuration, setup, and operation.
- **Support for HDMI with embedded and analog audio** — Facilitates the mixing of embedded AV audio with analog stereo audio for compatibility with AV presentation systems.
- **Mark Chapters for quick selection** — Events or chapters can be marked, both periodically, time based, or manually by front panel, or a control system. Chapter marks permit directly jumping to those indicated points of the recording during playback.

- **Capture thumbnails** — Thumbnails are captured at native resolution or set to 848x480, defined by the archive encoder settings. Periodic capture of images during the recording facilitates rapid scanning to desired visual section during playback.
- **Record at 480p, 720p, or 1080p, 1024x768, 1280x1024, or custom resolution** — Use standard video resolutions or computer resolutions and user-defined custom rates based on content or viewing requirements.
- **Audio mixing and DSP functionality** — Produce a quality audio experience without requiring the use of external mixing and DSP equipment.
- **Audio Delay processing** — Audio processing is zero timed with the HDMI video, but adjustment is available to accommodate upstream processes causing lip sync errors.
- **Directly compatible with Opencast** — Integrate publishing of recorded media directly to the Opencast Video Solution for lecture capture and distribution.
- **Direct compatibility with Kaltura Hosted Video Platform** — Integrate publishing of recorded media directly to the Kaltura Hosted Video Platform.
- **Compatible with third party content management systems** — Manually upload recordings to systems such as iTunes-U, Blackboard LMS, SharePoint, CaptionSync, YouTube, Moodle, and RSS feed.
- **Flexible plugin applications for advanced AV system management** — Install Extron FlexOS applications onto the SMP 111 that interface with control ports and automate system operation.
- **RS-232 and Ethernet control** — The SMP 111 interfaces with AV control systems via serial or Ethernet. Using Extron SIS - Simple Instruction Set command protocol allows for quick and easy control.
- **USB remote control port** — Configure communication settings of the SMP 111 using a keyboard and mouse viewing the embedded webpage. Connect the optional RCP 101 Series remote control panel for extended front panel operation and convenient thumb drive access, or the vRCP FlexOS App to remotely control the SMP 111 on any device, using any browser.
- **Standards-based H.264 / MPEG-4 AVC video compression** — The SMP 111 supports use of the Baseline, Main, or High Profiles at Levels 4.x, or 3.x providing the ability to optimize video coding for use with various types of applications and decoding devices.
- **Encoding presets for quick recall of compression settings** — The SMP 111 provides 16 customizable presets for specific encoding and streaming parameters. Users can quickly switch between these encoder presets to support different applications.
- **License-free operation for a low cost of ownership** — With no licensing or support fees, the SMP 111 is a cost-effective solution for AV recording and streaming.
- **Push streaming transport protocols** — Native RTP, MPEG-2 Transport Streams - TS, or RTMP may be applied in unicast or multicast streaming applications.
- **Pull streaming transport protocols** — RTP/RTSP, RTSP interleaved, and HTTP tunneled streaming transport protocols may be configured, based on the application, various network conditions or to aid in firewall navigation.
- **Video encoding quality adjustments** — In addition to resolution, video bit rate, and frame rate, fine tuning adjustments for constant or variable bit rate control, GOP length, and audio bit rate are available to adjust encoding quality.
- **On screen display information** — Present device information and status of the encoder to aid in troubleshooting and fault finding activities.

- **Onscreen display video time reference** — Text displaying a time and date reference can be presented within the onscreen display in the top left corner of the output signal.
- **User configurable recording file size** — Depending upon the storage format, recordings can be split into specified files sizes, or recorded as one large continuous file.
- **Automatic file space management for internal storage** — Storage space is automatically managed when additional space is required. Files are deleted in the background, on a first-in, first-out basis. Important recordings can be locked and retained indefinitely until they are manually deleted.
- **Recording metadata** — Metadata can be assigned to make indexing and searching of recordings simple including: Title, Creator, Subject, Description, Publisher, Contributor, and Date.
- **Record Duration Limiter** — Ad hoc recordings can be limited from 0 to 24 hours, or left unlimited. This function allows for recordings to stop automatically if the operator forgets to stop the recording.
- **System workflow alarms** — Notify monitoring systems or support staff if disk space is low, encrypted signals are detected, AV signal errors occur, or other error conditions exist.
- **Alarm reporting** — Automate communication with monitoring systems or support staff using email, SNMP traps, or Simple Mail Transfer Protocol - SMTP messages.
- **AAC audio encoding** — Standards-based audio compression is used to provide compatibility with many devices. The bit rate can be adapted to different application requirements.
- **EDID Minder automatically manages EDID communication between connected devices** — EDID Minder automatically manages EDID communications between devices, ensuring use of optimal signal formats.
- **Picture controls for brightness, contrast, position, and size** — Sixteen user memory presets permit quick recall of configured settings.
- **Aspect ratio control** — The aspect ratio of a source window can be controlled by selecting a FILL mode, which provides a full screen output, FOLLOW mode, which preserves the aspect ratio, or FIT mode, which maintains image uniformity and zooms into the source.
- **HDCP encryption and signal presence confirmation** — Provides real-time verification of HDCP status for the video input signal. This allows for easy signal and HDCP verification through RS-232 or Ethernet, providing valuable feedback to a system operator or helpdesk support staff.
- **Internal test patterns for setup** — The SMP 111 offers test patterns as well as on-screen display - OSD data overlay including timestamp, number of connected users, CPU usage, network status, disk free file space, audio level, and system information to aid in calibration and setup.
- **Front panel lockout** — This feature allows the front panel to be locked out from operation. All functions are available through Ethernet, USB, and RS-232 control.
- **Metadata text overlay** — Data concerning the recording can be burned into the presentation and be presented on screen.
- **LinkLicense for Live Streaming to Kaltura** — Stream live media to Kaltura using RTMP.
- **LinkLicense for Live Streaming to Panopto** — Stream live media to Panopto using RTMP or RTMPS.

- **LinkLicense for Horizontal Video Mirroring Upgrade** — Streamlines recording by automatically flipping video horizontally to support lightboard or other applications that require reversal of the video image.
- **Panopto publishing using Panopto FlexOS App** — Publish recordings to Panopto using the Panopto FlexOS App.
- **Kaltura publishing using Kaltura FlexOS App** — Publish recordings to Kaltura using the Kaltura FlexOS App
- **Option to enable auto start and stop of RTMP stream with recording** — Enable the auto start and stop of an RTMP PUSH stream with recording by changing the WebUI setting.
- **Secure Sockets Layer (SSL) certificates support** — View and upload SSL certificates for the SMP using the WebUI setting.
- **Includes LockIt HDMI cable lacing brackets**
- **Rack-mountable 1U, half rack width metal enclosure**
- **Internal Extron Everlast power supply** — Provides worldwide power compatibility, with high-demonstrated reliability and low power consumption for reduced operating cost.
- **Extron Everlast Power Supply is covered by a 7-year parts and labor warranty**

Installation

This section provides information on:

- [Mounting the SMP 111](#)
- [Rear Panel Overview](#)
- [SMP 111 Rear Panel Reset](#)

Mounting the SMP 111

The SMP 111 is housed in a 1U high, half rack width, two piece metal enclosure that can sit on a table with the provided rubber feet or can be mounted using the attached rack mounts. Select a suitable mounting location, (see [Mounting the SMP 111](#) on page 90) then choose an appropriate mounting option.

- Disconnect power from all external devices before connecting to the SMP 111.
- Do not apply power to the SMP before connecting external devices.

Rear Panel Overview

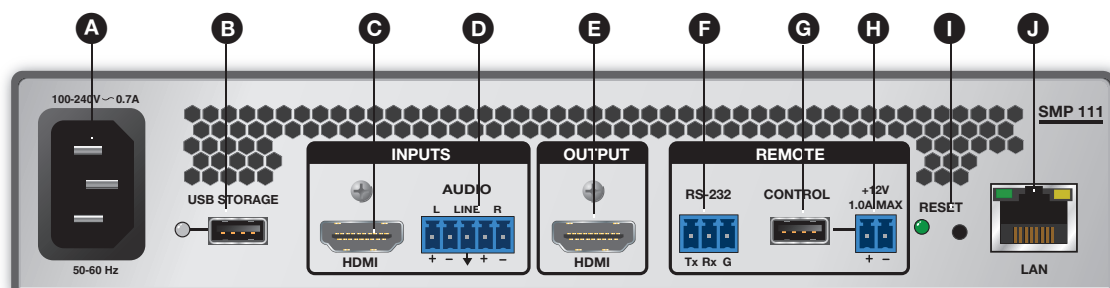


Figure 3. SMP 111 Rear Panel

- | | |
|---|--|
| A 100-240 VAC IEC connector for power input | F 3.5 mm, 3-pole captive screw connector for Simple Instruction Set (SIS) control over RS-232 |
| B USB type A receptacle for external storage device and activity LED | G USB type A receptacle for remote control panel RCP 101 |
| C HDMI input (Input) | H 12V, 2-pole captive screw external power output to RCP 101 |
| D 3.5 mm, 5-pole captive screw connector for analog stereo audio input | I Reset button and LED |
| E HDMI preview output | J RJ-45 Ethernet connector for LAN connection |

Power Connection

- A** **100-240 VAC power input** — Connect the provided IEC cord. Verify the front panel buttons and LCD illuminate (see [Front Panel Features](#) on page 17).

NOTE: Make all external device connections to the SMP before applying power.

Control System and External Device Connections

The SMP 111 can be configured and controlled from the rear panel RS-232 captive screw port (see [figure 3, F](#) on page 12), the front panel mini USB B Config port (see [figure 7, C](#) on page 17), or the LAN port (see [figure 3, J](#)) using SIS commands and DataViewer via Telnet port 23. It can also be configured and controlled using a standard web browser from the LAN port. Because the LAN port must be connected for streaming output, Extron recommends using it for configuration, control, and firmware upgrades.

- B USB storage device** — You can attach an optional external USB storage device to the front or rear USB ports to save recorded files. The storage device can be any standard external hard drive or USB flash drive formatted with a compatible file system.

NOTE: The SMP 111 can detect and record to USB storage devices using FAT32, VFAT long file name extensions, EXT2, EXT3, EXT4 file systems, or NTFS-formatted storage volumes.

- F Remote RS-232 port** — You can configure and control the SMP 111 using SIS commands. Connect the host RS-232 cable to the rear panel with a 3-pole captive screw connector for bidirectional serial host control (see [figure 4](#) for wiring).



Figure 4. RS-232 Wiring Diagram

- G Remote Control connector** — You can control the SMP 111 using an optional RCP 101, Flex55, AAP, or decorator-style wallplate.
- H 12V external power output** — The SMP can provide external power to the optional RCP 101 EU/MK, AAP, or wallplate through this 2-pole captive screw connector. The 12 V power is required to power up an RCP 101 remote control panel.
- J RJ-45 Ethernet connector (LAN)** — You can configure and control the SMP 111 using SIS commands with a control system or PC connected to the same LAN or WAN. Connect a standard Ethernet cable to a network.
- IP Address: 192.168.254.254
 - Subnet Mask: 255.255.0.0
 - Default Gateway: 0.0.0.0
 - DHCP: OFF

Input Connections

The SMP 111 has one HDMI digital video and audio input and one 3.5 mm, 5-pole captive screw connector for analog stereo audio input.

- C HDMI input** — Connect an HDMI (or DVI with suitable adapter) source device to input (see [figure 3](#) on page 12).
- D Analog audio input** — Connect a balanced or unbalanced stereo line level audio device to this 5-pole, 3.5 mm captive screw connector. Analog audio can be selected for output with the HDMI input instead of the embedded audio. Wire the connector as shown in figure 5.

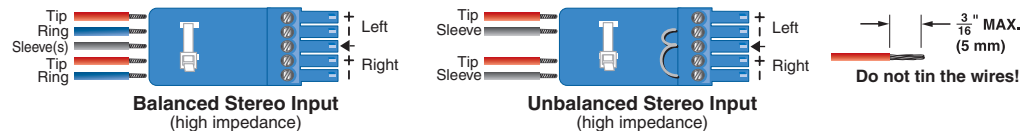


Figure 5. Audio Input Captive Screw Connector Wiring

ATTENTION:

- Do not tin the wires. Tinned wires are not as secure in the connector and could be pull out.
- Ne pas étamer les câbles. Les câbles étamés ne sont pas aussi bien fixés dans le connecteur des à vis captives et pourraient être tirés.
- The length of the exposed wires in the stripping process is important. The ideal length is 3/16 inch (5 mm). If longer, the exposed wires may touch, causing a short circuit between them. If shorter, the wires can be easily pulled out even if tightly fastened by the captive screws.
- La longueur des câbles exposés est importante lorsque l'on entreprend de les dénuder. La longueur idéale est de 5 mm (3/16 inches). S'ils sont trop longs, les câbles exposés pourraient se toucher et provoquer un court-circuit. S'ils sont trop courts, ils peuvent être tirés facilement, même s'ils sont correctement serrés par les borniers à vis.

Output Connection

- E HDMI output** — Connect an HDMI (or DVI with suitable adapter) display device to the HDMI output connector. The preview output switches between the record preview content and the internal browser using an attached USB keyboard and mouse.

SMP 111 Rear Panel Reset

The **Reset** button on the rear panel of the SMP 111 (see [figure 3](#), ❶ on page 12) returns the SMP 111 to various modes of operation. There are three unit reset modes (numbered 1, 4, and 5) that are initiated from the rear panel reset button. To select different reset modes, use a pointed stylus or small screwdriver to press and hold the **Reset** button while the SMP 111 is powered or press and hold the **Reset** button while applying power to the SMP 111.

NOTES:

- The reset modes listed in the [SMP 111 Series Reset Modes](#) table on page 16 close all open IP and Telnet connections and all sockets.
- Each reset mode is a separate reset (not a continuation from mode 1 to mode 5).
- Reset modes 2 and 3 are not available for the SMP 111.
- The SMP 111 can also be reset using the web-based user interface [System Resets](#) on page 63.
- The SMP 111 can also be reset using SIS commands, see [Resets](#) on page 74.
- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

ATTENTION:

- Review the reset modes carefully. Some reset modes delete all user loaded content and revert the device to default configuration.
- Analysez minutieusement les différents modes de réinitialisation. Certains modes de réinitialisation suppriment l'intégralité du contenu chargé de l'utilisateur et remettent l'appareil au mode de configuration par défaut.

See figure 6 for simple reset instructions and the [SMP 111 Series Reset Modes](#) table for a summary of the reset modes.

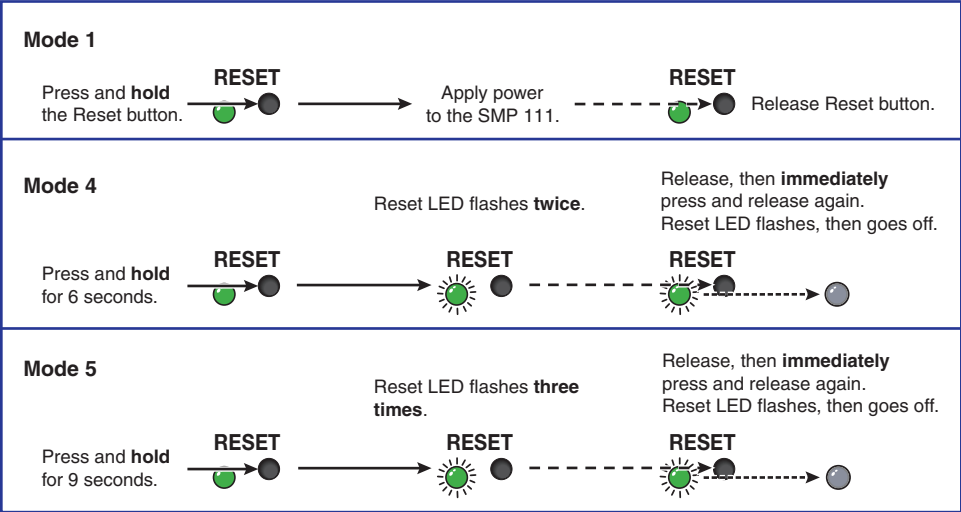


Figure 6. Resetting the SMP 111

SMP 111 Series Reset Modes				
	Mode	Activation	Result	Purpose and Notes
Factory Firmware	1	Hold in the recessed rear panel Reset button while applying power to the unit.	The SMP 111 reverts to the factory default firmware for a single power cycle.	Use mode 1 to revert to the factory default firmware for a single power cycle if incompatibility issues arise with user-loaded firmware. All user files and settings are maintained.
		NOTE: Do not operate with the default firmware loaded by a mode 1 reset. Use it only to load the most current firmware to the device.		
Reset All IP Settings	4	Hold in the Reset button until the reset LED blinks twice (once at 3 seconds, again at 6 seconds). Then, release and press Reset again within 1 second*.	<ul style="list-style-type: none"> Sets port mapping back to factory default. Sets the IP address back to factory default (192.168.254.254). Sets the subnet mask address back to the factory default (255.255.0.0). Sets the gateway IP address to the factory default (0.0.0.0). Turns DHCP off. The reset LED on the rear panel of the unit flashes four times in succession. 	Mode 4 is used to set IP address information using ARP and the MAC address. Resetting IP Settings appears on a connected display.
Reset to Factory Defaults	5	Hold in the Reset button until the reset LED blinks three times (once at 3 seconds, again at 6 seconds, again at 9 seconds). Then, release and press Reset again within 1 second*.	<ul style="list-style-type: none"> Performs a complete reset to factory defaults (except the firmware). Does everything mode 4 does. Clears port configurations. Resets all IP options. Clears all user settings. Clears all files from the unit. The reset LED on the rear panel of the unit flashes four times in succession. 	Mode 5 is useful to start over with default configuration and uploading. Resetting SMP 111 appears on a connected display. Mode 5 is equivalent to SIS command ZQQQ (see Absolute reset on page 74).
NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see Users and Roles on page 47 to change a password).				
NOTE: *For modes 4 and 5, nothing happens if the momentary press does not occur within 1 second.				

Front Panel Operation

This section of the manual discusses the operation of the SMP 111 front panel.

Topics covered include:

- [Front Panel Features](#)
- [SMP 111 Power Up Procedure](#)
- [Record a File](#)
- [Front Panel Lockout \(Executive Mode\)](#)

Front Panel Features

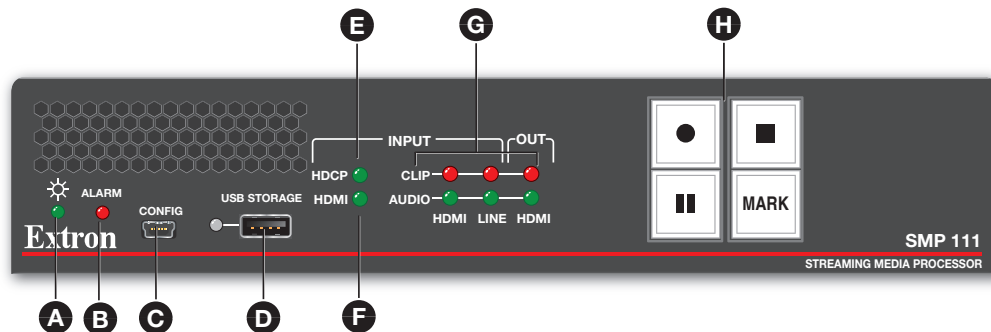


Figure 7. SMP 111 Front Panel

- | | |
|---|--|
| A Power LED | E HDCP Input LED |
| B Alarm LED | F HDMI LED |
| C USB mini-B port for Configuration | G Audio Signal and Clip LEDs |
| D USB type A port for external storage | H Record controls with LED indicators |

A Power LED –

- **Green** – The power is on and the unit is operational.
- **Blinking Green** – The power is on but the unit is still booting (not operational).

B Alarm LED — Lights up red when one or more alarms are triggered (see [Alarm](#) on page 50 for more information on the types of alarms and how to clear them).

C USB mini-B port for Configuration — Connect a control device to this port with a USB mini-B cable (not supplied). Use this port to send SIS commands to the SMP 111 for device configuration and control (see [Remote Communication and Control](#) starting on page 65).

Configuration and adjustments can be performed using the embedded web pages (see [Web-Based User Interface](#) on page 20), and the SIS commands (see [Remote Communication and Control](#) starting on page 65).

- D USB type A port for external storage** (see [figure 7](#) on page 17)— Connect a USB compatible media device to this port. The green LED blinks during both reading and writing of data. The storage device can be any standard external hard drive or USB flash drive formatted with a compatible file system.

NOTE: The SMP 111 can detect and record to USB storage devices using FAT32, VFAT long file name extensions, EXT2, EXT3, EXT4 file systems, or NTFS-formatted storage volumes.

ATTENTION:

- Disconnecting a USB device while recording to it may result in corrupt or lost data.
- Déconnecter un périphérique USB alors qu'un enregistrement y est effectué, peut engendrer une altération ou une perte de données.

- E HDCP LED** — Lights green when HDCP content is detected.





- F HDMI LED** — Lights green when HDMI video input sync is detected.

- G Audio Signal and Clip LEDs** —

- **Audio Input indicators** — Red (signal clipping) and green (signal present) LEDs for HDMI and line input channels.
- **Audio Output indicators** — Red (clipping) and green (signal present) LEDs for the output channel.

For both the Audio Input and Audio Output indicators, the green signal LED varies in brightness corresponding to the input signal level. It begins to light at -60 dBFS, increasing to full intensity corresponding to signal level increases. When the signal level reaches -3 dBFS or above, the red clipping LED lights and remains lit as long as the signal remains about -3 dBFS. When it falls below that level, the red LED remains lit for 200 milliseconds, after which the display resumes real-time monitoring of the signal level.

- H Record controls with LED indicators** — Press the **Record**, **Stop**, **Pause**, and **Mark** buttons to perform the operation. The buttons light to indicate the current state of record operation.

- **Record** — Press  to record the input. The record button lights solid red during active recording. When a recording is initializing, the Record LED blinks red.
- **Stop** — Press  to stop the active recording. When pressed during a recording, the stop button blinks green while the recorded file is being finalized, then lights solid green when the file is finalized.
- **Pause** — Press  to pause recording. When pressed, the **Pause** button blinks green to indicate recording is paused. Press **Record** or press **Pause** again to resume recording, or press **Stop** to halt the recording.
- **Mark** — Press  to place a chapter marker in the recorded file. When pressed during recording, the button illuminates green momentarily to indicate a chapter marker is inserted. The button also illuminates when JPEG thumbnails are automatically created at a fixed interval (default: 5 minutes).

NOTE: When a chapter mark is created using the front panel or RCP 101 **Mark** button, the SMP returns an unsolicited response, **RcdrB** ← when verbose mode is enabled (see [Set verbose mode](#) on page 73).

SMP 111 Power Up Procedure

NOTE: Before powering the SMP 111, ensure that all necessary devices are connected properly. Devices do not need to be powered.

Connect the power cord to a 100 to 240 VAC supply (see [Power Connection](#) on page 12).

Record a File

The SMP 111 creates MP4, M4V, and M4A media files. Recordings are stored to the 32GB internal storage or to storage media connected to the front, rear, or RCP 101 USB ports. The recording location defaults to the internal storage.

The internal 32GB SD card is field upgradable to different storage sizes. For instructions to replace the SD card, see [Upgrading the SD Card](#) on page 110.

To configure an ad hoc recording:

1. Press the front panel **Record** button.
2. Monitor the record time and remaining time on the embedded web page.
3. Press **Pause** to temporarily suspend recording. Press **Pause** again or **Record** to resume the recording and place a chapter marker in the file.
4. Press **Mark** to create a chapter marker and a thumbnail if desired.
5. Press **Stop** to cease recording and place an end of file maker on the recording.

Front Panel Lockout (Executive Mode)

To prevent accidental changes to front panel menu settings, enable executive mode. Executive mode can be enabled and disabled from the front panel. Press the **Stop** and **Mark** buttons simultaneously for 5 seconds. It can also be enabled or disabled from the web pages (see [System Settings](#) on page 51) or using SIS (see [Front Panel Lock \(Executive Mode\)](#) on page 74).

When executive mode is enabled, any attempts to utilize the front panel buttons triggers the Record, Pause, Stop and Mark LEDs to blink 3 times.

When executive mode is active, all functions and adjustments can still be made via USB, RS-232, or Ethernet control (see [Remote Communication and Control](#) starting on page 65).

NOTE: Control buttons indicate the current recording or streaming status regardless of executive mode.

Web-Based User Interface

This section provides information about:

- [Overview of the Web-Based User Interface](#)
- [Accessing the Web-Based User Interface](#)
- [Logging Out and Logging In](#)
- [AV Controls](#)
- [Device Status](#)
- [Recorded Events](#)
- [Configuration](#)
- [File Management](#)
- [Troubleshooting](#)

Overview of the Web-Based User Interface

The SMP 111 embedded web pages provide the software user interface for operating and configuring the SMP 111 via a control PC on the same network.

NOTES:

- Preview video for the web pages is disabled in Internet Explorer 11.
- In figure 8, the home page for a standard SMP 111 device is shown. If the Horizontal Video Mirroring LinkLicense is purchased, there is an additional **Mirroring LinkLicense** tab and Horizontal Video Mirroring Status section.

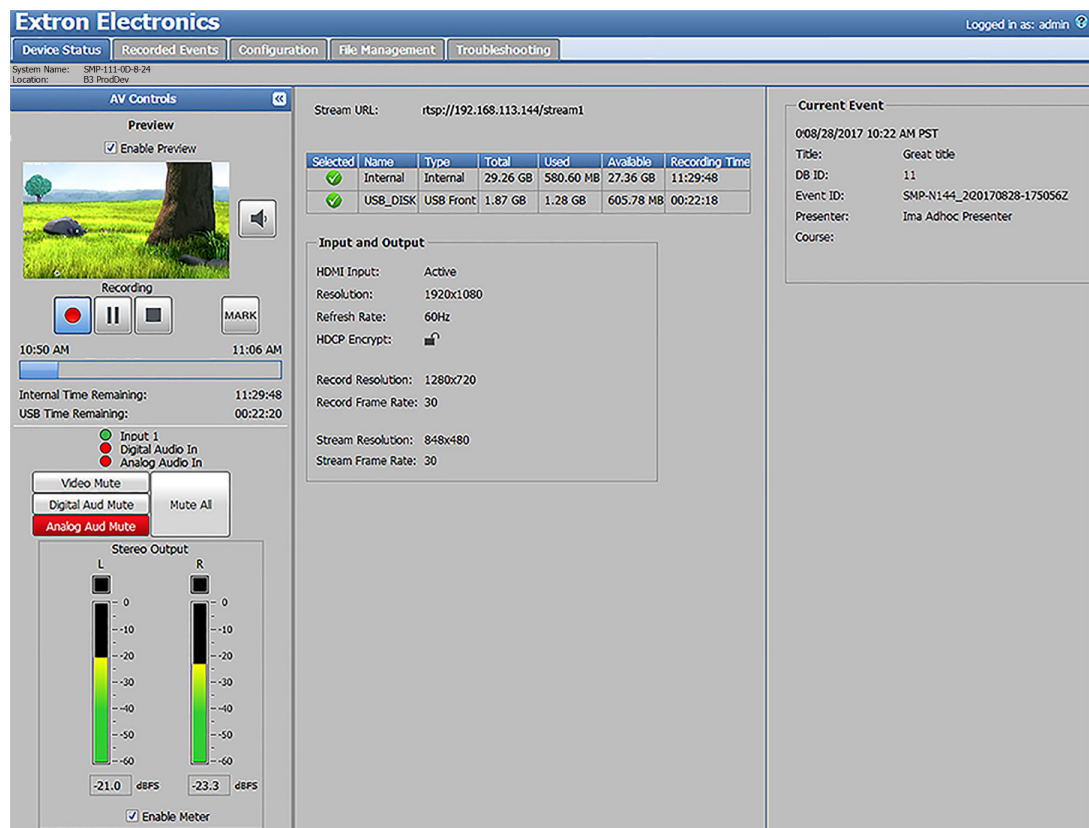


Figure 8. SMP 111 Embedded Web Pages

These web pages provide the following features:

- Ability to fully configure the SMP
- Ability to create ad hoc recordings
- Ability to configure automatic uploads (publishing) of completed recordings to a designated server or video publishing system
- Remote control and active monitoring of the SMP
- A small embedded video window to view the AV content that is being recorded and streamed
- Access to upload files to and download or transfer presentation recordings from the SMP
- Ability to display alarm history and allow administrators to clear active alarms
- Ability to update firmware

Web Browser Requirements

In order to view the SMP 111 embedded web pages, use one of the supported web browsers (see [PC Requirements](#) on page 3).

Turning Off Compatibility Mode

The SMP 111 embedded web pages do not support compatibility mode in Microsoft Internet Explorer.

To check compatibility view settings:

- From the browser, select **Tools > Compatibility View Settings**. The **Compatibility View Settings** dialog box opens.
- Be sure the **Display intranet sites in Compatibility View** checkbox is cleared and the IP address of the SMP 111 is not in the list of compatibility view sites.

Web-based User Interface Help Files

The SMP 111 web-based user interface contains an extensive set of help files to assist with the connection, configuration, monitoring, and operation of the SMP 111. The following sections contain an overview of those files and also includes information not contained in the help files.

Accessing the Web-Based User Interface

To access the embedded web page user interface:

1. Connect a control PC to the LAN port of the SMP 111, or to the same network shared by the SMP.
1. Open a web browser.
2. Enter the IP address of the SMP 111 (the default IP address is 192.168.254.254) into the browser address field.
3. Enter the username and password to log in.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

4. Click **Log In** or **OK**.

The main user interface opens to the **Device Status** page (see figure 9).

Extron Electronics Logged in as: admin

System Name: SMP-111-00-B-24
Location: B3 ProdDev

AV Controls

Preview
☒ Enable Preview

Recording

10:50 AM 11:06 AM

Internal Time Remaining: 11:29:48
USB Time Remaining: 00:22:20

Input 1
Digital Audio In
Analog Audio In

Video Mute
Digital Aud Mute
Analog Aud Mute

Stereo Output
L R
0 -10 -20 -30 -40 -50 -60
-21.0 dBFS -23.3 dBFS
☒ Enable Meter

Stream URL: rtsp://192.168.113.144/stream1

Selected	Name	Type	Total	Used	Available	Recording Time
<input checked="" type="checkbox"/>	Internal	Internal	29.26 GB	580.60 MB	27.36 GB	11:29:48
<input checked="" type="checkbox"/>	USB_DISK	USB Front	1.87 GB	1.28 GB	605.78 MB	00:22:18

Input and Output

HDMI Input: Active
Resolution: 1920x1080
Refresh Rate: 60Hz
HDCP Encrypt: ☒

Record Resolution: 1280x720
Record Frame Rate: 30

Stream Resolution: 848x480
Stream Frame Rate: 30

Current Event

008/28/2017 10:22 AM PST
Title: Great title
DB ID: 11
Event ID: SMP-N144_20170828-175056Z
Presenter: Ima Adhoc Presenter
Course:

Figure 9. SMP 111 Embedded Web Page

NOTE: In figure 9, the home page for a standard SMP 111 device is shown. If the Horizontal Video Mirroring LinkLicense is purchased, there is an additional **Mirroring LinkLicense** tab and **Horizontal Video Mirroring Status** section displaying the status of horizontal mirroring.

Page Overview

The SMP 111 pages are organized by function and further organized within those main functions. Click the tabs to open the pages. The pages in the SMP 111 are grouped within five main tabs at the top of the screen. If the Horizontal Video Mirroring LinkLicense is purchased, there will be six tabs:

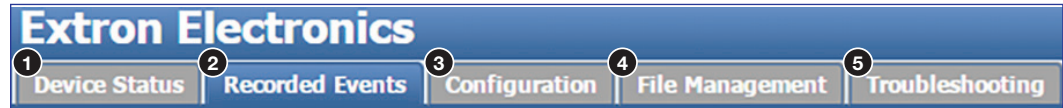


Figure 10. Five Main Function Tabs

- 1 Device Status** (see page 30) — View the status of the input and outputs, along with details of the active recording and stream or streams (the current event). The URLs of the stream or streams are also displayed on this page.
- 2 Recorded Events** (see page 31) — Two pages provide a calendar view of previous and current recording events, as well as publishing configuration options.
- 3 Configuration** (see page 33) — The core controls in the eight pages within this tab contain typically needed during initial setup, or for upgrading the unit, or restoring a configuration. They make it possible for an administrator to:
 - Configure basic AV input settings.
 - Output video test patterns for setup.
 - Save or apply EDID settings.
 - Configure output stream image settings and presets.
 - Set up AV encoding and presets.
 - Configure metadata and create recording profiles.
 - Set passwords.
 - Set up notices and alarms.
 - Configure basic communication, identity, time, data storage, and recording location settings.
 - Update firmware, save a configuration, or restore a configuration from a saved file.
- 4 File Management** (see page 55) — View folders and files on the internal drive and any attached external drive or drives. Also, connect the SMP to shared network drives, and upload fonts to the SMP.
- 5 Troubleshooting** (see page 58) — Factory-defined and user-defined information is displayed or can be configured on the five pages within this tab:
 - Detailed system status and encoder status.
 - A log of events and a log of alarms with their status, which can be exported to a CSV file.
 - Three simple diagnostic tools for checking network connections.
 - Options to perform many types of resets on the SMP.

NOTE: If the unit has been upgraded with the Horizontal Video Mirroring LinkLicense, there is a sixth tab with two panels (see [Mirroring LinkLicense](#) on page 64). This page allows the user to enable horizontal video mirroring on the input, adjust the minimum available recording time available on a storage device, and set a delay to start the recording.

Pages Within Tabs

The **Recorded Events**, **Configuration**, and **Troubleshooting** tabs each include several pages. To access each page, click the corresponding function within the second tier of tabs (sub-tabs) located below the main tabs near the top of the screen (**Configuration > Input/Output Settings** is shown selected in figure 11).

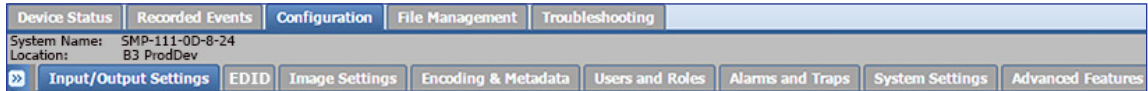


Figure 11. Pages Within Tabs (Subtabs)

Panels and Screen Sections

Each SMP 111 web page contains at least one panel and a main window with sections that group the controls and information for each page. Most panels include controls and a variety of adjustments and settings. Specific sections can include controls or simply display information. Sections or panels can include tabs with additional selections and options.

All SMP 111 web pages include the **AV Controls** panel at the left of the screen (see **AV Controls** on page 26). The **Device Status** page is the main page. It contains one panel and three sections.

Collapse and Expand Panels

Click the blue panel name bar or the **Expand** arrow button (see figure 12, ①) on the right side of a panel. The panel opens to a full view, or as much as possible with the current display settings.

Click the blue panel name bar or the **Collapse** arrow button (②) at the top corner of a panel to collapse it. This hides the controls and provides additional room for other panels.

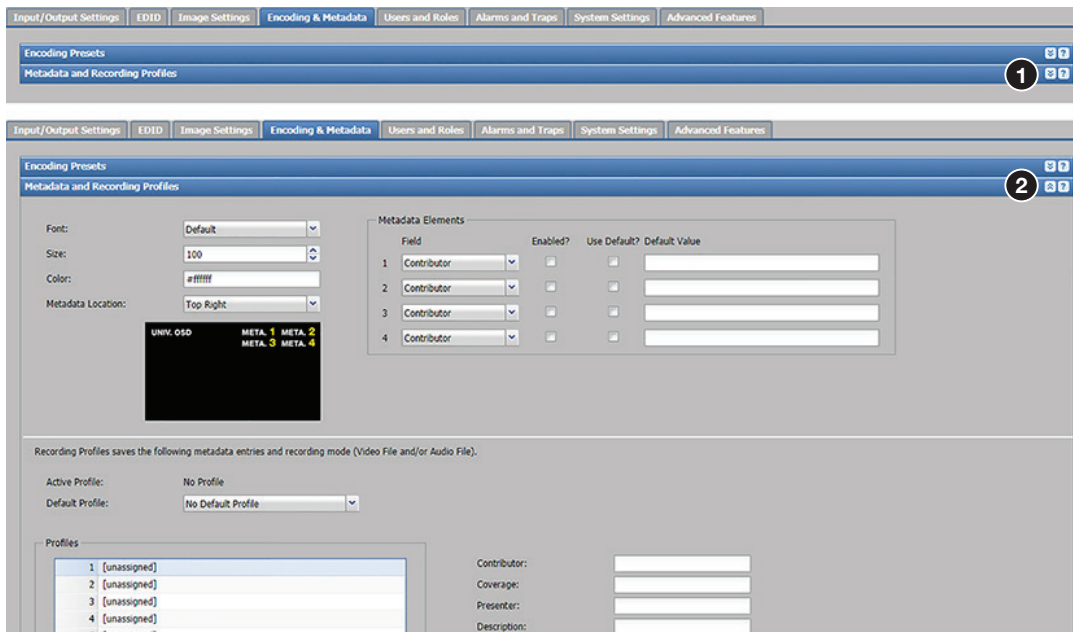


Figure 12. Collapsed and Expanded Panels

NOTE: For some pages, the last-selected view is maintained for each page within the SMP 111 web pages. If the user navigates away from one page to a different tab or page, then returns to the page, the display appears as it did before the page was left. For pages with many panels, the panels automatically collapse each time the user leaves and returns to the page.

Web Page Idle (Timeout)

To conserve resources (memory, bandwidth) on the PC, if the web browser is idle for more than about an hour, the SMP 111 web page enters idle mode. During idle mode, status updates and video confidence (preview) display image updates are suspended, and the following message is displayed in front of the page:

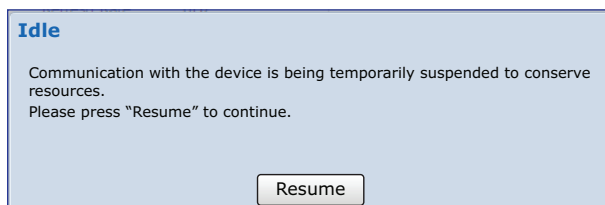


Figure 13. Communication Suspended Notification

The idle status does not affect the recording or the output AV streams, which continue unaffected no matter what state (active or idle) the web pages are in.

To reconnect the web page to the live feed from the SMP 111, click **Resume**. The browser refreshes the view, and the status updates and video confidence display resume.

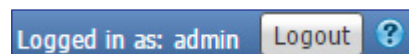
NOTE: If the SMP 111 loses the network connection, the connection to the embedded web pages is also lost. A notice of the connection failure may be sent, but there is no specific status indication for disconnection.

Logging Out and Logging In

Before changing roles (from administrator to user, or user to administrator) or to change user accounts, log out of the embedded web pages. The user or administrator status is displayed in the upper-right corner of all web pages.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

The **Logout** button shows only if one or more passwords is active.



To log out of the web pages:

NOTE: The **Logout** button appears only if one or more passwords is active.

1. From any embedded web page, click the **Logout** button at the upper-right of the browser page.
A **Logout** dialog box opens.
2. Click **OK** to log out of the SMP web pages, or click **Cancel** to remain logged on using the same account.

The **Logout** dialog closes and returns to the embedded web pages.

NOTE:

- If **Cancel** is clicked, the user remains logged in and the embedded web pages continue to function as they did before **Logout** was clicked.
- If **OK** is clicked, the controls are replaced by a message confirming that the user is logged out and asking to close the browser. Close the browser completely. If only a tab within the browser is closed, the logout process does not complete. Some browsers, such as Google Chrome, include an option to continue running in the background after closing.

To log in to an SMP 111:

1. Open a web browser.
2. Enter the IP address of the SMP into the address field and navigate to that unit. The **Authentication Required** (Chrome or Firefox) or **Windows Security** (Internet Explorer) login dialog box appears.
3. Enter the appropriate user or administrator user name and corresponding password into the fields.
4. Click **Log In** or **OK**. The embedded web page opens.

AV Controls

The **AV Controls** panel is available on every page and within all tab views. Located along the left side of the pages, this panel makes it possible to easily control a recording, see a thumbnail view of the recorded and output video, along with the stereo output levels, and mute or unmute the AV output. The browser always opens with the **AV Controls** panel expanded and both users and administrators have access.

AV Controls Panel Features

The **AV Controls** panel includes the following features:

Preview video panel

This area (see figure 14, ❶) provides a small, live stream of the output video to view what is being recorded. To make the embedded web pages faster to refresh, the stream for this live view can be disabled. The recording and output streams continue to be streamed when this preview is disabled. Select (check) the **Enable Preview** checkbox (❷) above the preview window to enable or disable the live feed. The live preview stream is independent of the streaming settings configured on the **Encoding Presets** page.

NOTE: The preview video in the AV Controls panel of the SMP 111 uses an HTML5 player and is not supported by Microsoft Internet Explorer v.11, Microsoft Edge, or Apple Safari. To see a preview of the current stream you can either:

- Use a different browser
- or
- Open a standalone, third-party video player (such as VideoLAN™ opensource VLC media player) and connect to the stream from the SMP.

To display the preview in full screen, double-click the preview image in the **AV Controls** panel. To exit full screen view, press the keyboard <Esc> key.

NOTE: The preview video is delayed 5 seconds from the actual live stream.

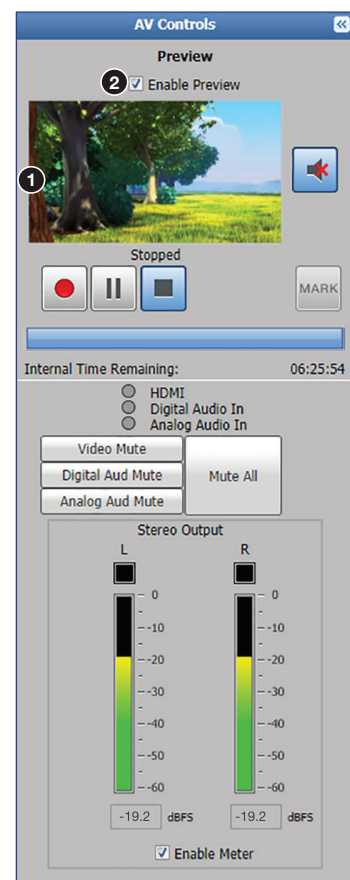


Figure 14. Controls Panel

Preview Mute

By default, the audio portion of the preview is muted. This does not affect audio to the recording and web stream. To listen to the audio in the preview, click the preview audio **Mute** button to change from muted to unmuted (see figure 15).

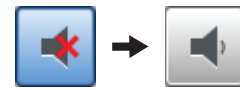


Figure 15. Mute Button

Recording controls

Recording control buttons function the way controls do on a DVR or other recording device. Buttons include (see figure 16).



Figure 16. Recording Controls

- **Record** — Set up an ad hoc* recording session and start or resume recording.
- **Pause** — Pause recording
- **Stop** — Stop recording and end the recording session.
- **Mark** — This button works like the **Mark** button on the front panel of the SMP. It is grayed out and inaccessible when the unit is not recording, and becomes accessible once a recording starts. When this button is clicked during a recording, a time-referenced chapter marker is created to make it easy to find content at that point in the recording during playback. When the button is clicked, it becomes unavailable (grays out for about five seconds), while unit stores the marker information, and then the button reactivates.

NOTE: When a chapter mark is created using the front panel or RCP 101 Mark button, the SMP returns an unsolicited response, `RcdrB←` when verbose mode is enabled (see [Set verbose mode](#) on page 73).

*An ad hoc recording session is one that has been set up for a specific occasion without being scheduled. By default, Ad hoc recordings are set at unlimited time, but the user can limit the duration under the **Recording Media Selection** at a maximum of eight hours (see [Setting the Default Recording Media](#) on page 52).

Text above the buttons confirms the state of the recording: **Recording**, **Paused**, or **Stopped**. A button is blue when selected (active or on) and gray when deselected (inactive or off).

NOTE: The front panel buttons also indicate the recording state, mirroring the AV Controls panel indicators (see [Front Panel Features](#) on page 17).

Progress bar

A progress bar (see figure 17, ①) below the recording control buttons is a horizontal bar graph that shows how much recording time has elapsed. Initially, the progress bar shows a five minute duration. The displayed duration increases in five-minute increments as the ad hoc recording progresses.

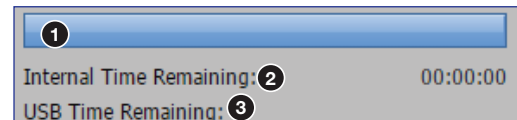


Figure 17. Progress Bar and Record Time Available

Recording time remaining

Recording time remaining (②) is indicated below the progress bar in the format `HHH:MM:SS`. The estimate of how much time remains available is based on the combination of available storage space and the current stream resolution and bit rate. During an ad hoc recording, the calculated time is displayed.

If secondary recording mode is enabled, the remaining time is listed first for the internal storage drive and then for the selected secondary external USB drive (③, `132:46:27*00:03:44`, for example).

Mute controls, video and audio indication LEDs

HDMI video can be configured for digital audio (embedded in HDMI) or a shared analog input.

- **LEDs** — Indicate the presence, absence, and status of an HDMI signal and the audio types selected (see figure 18, ①).
- **Mute buttons** — Click the desired button (②) to mute video only (**Video Mute**), digital audio only (**Digital Aud Mute**), analog audio only (**Analog Aud Mute**), or both audio and video (**Mute All**).

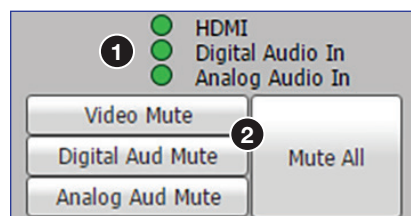


Figure 18. Active Inputs, Mute, Audio, and Auto-image

When a mute mode is selected (active), the corresponding button or buttons are red. Click the buttons or send SIS commands to the unit via RS-232 or USB control to toggle mute status (see **Command and Response Tables** starting on page 72).

When unmuted, the button changes from red to gray.

Audio Output Meter

Left and right channel indicators display the audio output level (in dBFS) of the encoded output stream when there is an active audio output. The boxes at the top of the meters are red when audio clipping occurs and black when audio is not clipped. To enable the meters, select (check) the **Enable Meter** checkbox (see figure 19, ①) below the meters.

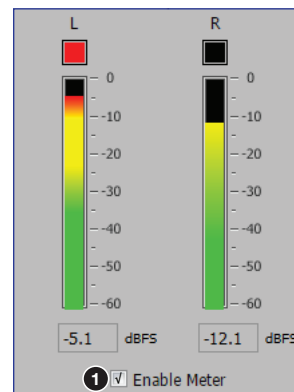


Figure 19. Audio Output Meter

Ad Hoc Recording

A user logged on to the SMP, either at the user level or the administrator level, can initiate an ad hoc (unscheduled) recording.

NOTES:

- See **Setting the Default Recording Media** on page 52 within **Configuration > System Settings** for more information about single and secondary storage modes.
- If the unit is set for recording destination limiting, users do not have the option to select a different storage location. The storage location or locations are preselected and cannot be changed from the **Start an Adhoc Recording** dialog box.
- If the recording is restricted to a USB device with multiple partitions, then partition selection within the USB drive is still available.
- Ad hoc recordings are set at unlimited time, but the user can limit the duration under **Recording Media Selection** at a maximum of 24 hours.

Recording Destination Options

Start an ad hoc recording from the **AV Controls** panel (for additional recording information, see the *SMP 111 Embedded Web Pages Help File*).

If the unit is set for single storage mode (recordings are saved to only one storage drive), choose a recording destination from the **Recording Destination** drop-down list found in the **Start an Adhoc Recording** dialog box (see figure 20).

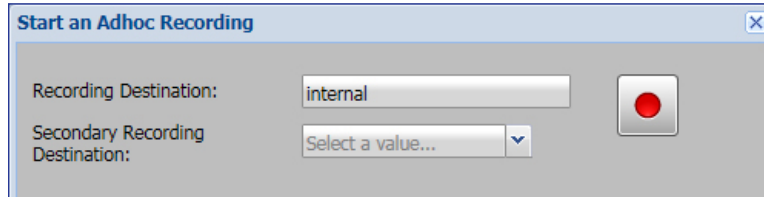


Figure 20. Recording Destination Drop-down, Single Recording Destination

If the unit **is not set** to limit the recording destination, recording destination options are:

- **auto** — The recording is saved to the first available storage location that is not full. The user sets the priority for storage location in the **Destination Recording Priority** field (go to **Configuration > System Settings > Recording Media Selection**).
 - If a USB drive has more than one logical volume, only the volume with the largest free space for that port in the **Recording Destination** drop-down list is used to store content. All other volumes on that drive are ignored.
 - To record to another volume on the device, the target location must be manually selected rather than using the auto option.
- **internal** — The recording is saved on the internal 32 GB SD card.
- **usbfront/volume1, usbfront/volume2, usbfront/volume3, usbrear/volume1, usbrcp/volume1**, and so forth — The recording is stored to the indicated external USB drive connected to the front panel, rear panel, or recording control panel USB storage port on the SMP.

If the unit **is set** to limit the recording destination, the storage location (internal, front USB, rear USB) cannot be changed. However, if the unit is set to store recordings to one of the USB ports, and if the connected drive contains more than one volume, a volume from the **Recording Destination** drop-down list can be selected.

If the unit is set for secondary storage mode, the file is saved to two storage drives simultaneously. By default, the recording is always saved to the Internal Drive as the primary storage location, and only the secondary location is configurable.

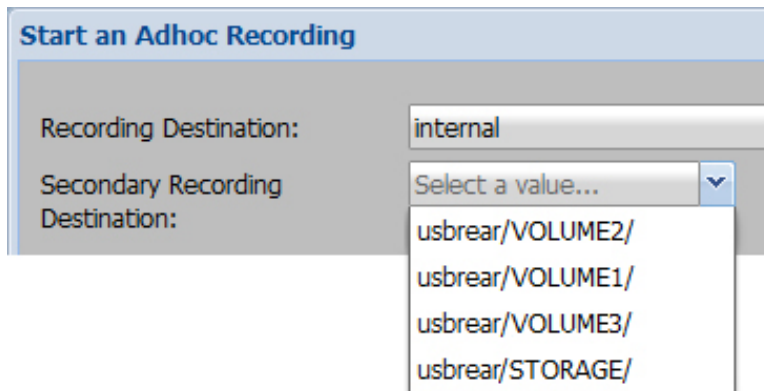


Figure 21. Ad Hoc Recording, Secondary Recording Destination Selection

Select the secondary storage location from the drop-down list (see [figure 21](#) on page 29).

- The secondary recording is created in a separate thread from the primary recording, to ensure any corruption of a single recording does not affect both recordings.
- If the unit is set to use a front panel USB drive for the secondary storage location but a drive is connected to the rear panel USB port instead of the front panel port, the **Secondary Recording Location:** drop-down list displays n/a (not available or not applicable) as the only option.
- If no USB drive is attached to a particular port, the option for that port is not shown.

Device Status

The **Device Status** page (see figure 22) displays read only information about the presentation currently in progress. This page contains five panels:

- ❶ **Stream URL** — The URL for the unicast and multicast streams currently in progress.
- ❷ **Storage Information** — The location and size of the stored file.
- ❸ **Input and Output** — The input and output signal parameters.
- ❹ **Current Event** — The presentation currently in progress.

For information on the **AV Controls** panel (❺) or to control an in-progress recording, see [AV Controls](#) on page 26 and see the *SMP 111 Embedded Web Pages Help File*.

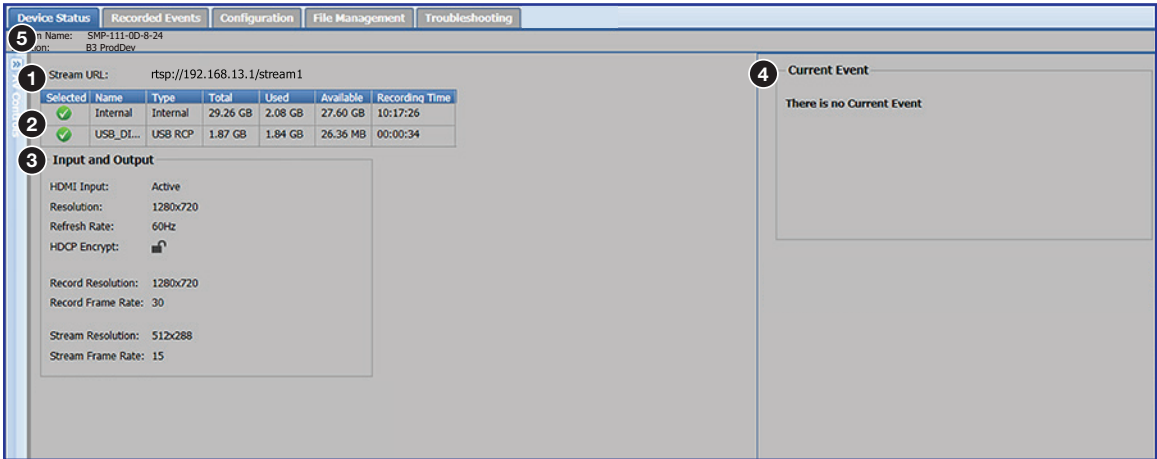


Figure 22. Device Status Page

Storage Information

The storage information table (see figure 22, ❶, also available in [File Management](#) on page 55) displays the names of the available connected storage devices, their locations (internal, USB front panel port, USB rear panel port, USB RCP), total capacity, and amount of used and available storage space. It also provides an estimate of remaining recording time for each drive and indicates (with a check mark) which drive is selected as the only or primary recording location. If the SMP is set for secondary storage mode, a second check mark symbol indicates the drive selected as the secondary location.

NOTE: The SMP 111 ships with an internal 32 gigabyte SD card (to upgrade to a larger size, see [Upgrading the SD Card](#) on page 110).

Selected	Name	Type	Total	Used	Available	Recording Time
✓	Internal	Internal	29.26 GB	740.97 MB	27.60 GB	08:34:32

Figure 23. Storage Information Table

NOTE: Recordings stored on the internal drive can be automatically uploaded to a network server (see **Publish Settings** on page 32). If internal storage space is nearly full and the SMP is set up to automatically upload recordings to a server, the SMP uses an automatic disk cleanup feature to make room for new recordings. It deletes recordings previously uploaded to a server, starting with the oldest recordings, until there is enough free space on the disk.

For details on recording deletion, see **Deleting Recordings** in the *SMP 111 Embedded Web Pages Help File*. To lock a recording to prevent it from being automatically deleted, see **Locking and Unlocking a Recording Package Folder** in the *SMP 111 Embedded Web Pages Help File*.

Recorded Events

The **Recorded Events** page has two secondary pages, **Recording Calendar** (see figure 24, ①) and **Publish Settings** (②). These pages allow administrators to view past and present recordings, publish (upload) recordings, and review the status of recordings.

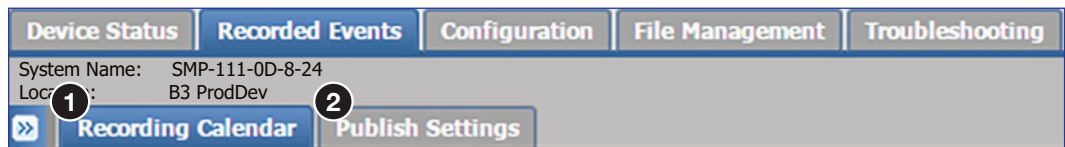


Figure 24. Recorded Events Page and Subtabs

Recording Calendar

The **Recording Calendar** page within the **Recording Events** tab allows administrators to view current and past recordings and the event details for each recording. The page features two different views (calendar or list) of all recordings (in-progress events and recordings that have already taken place):

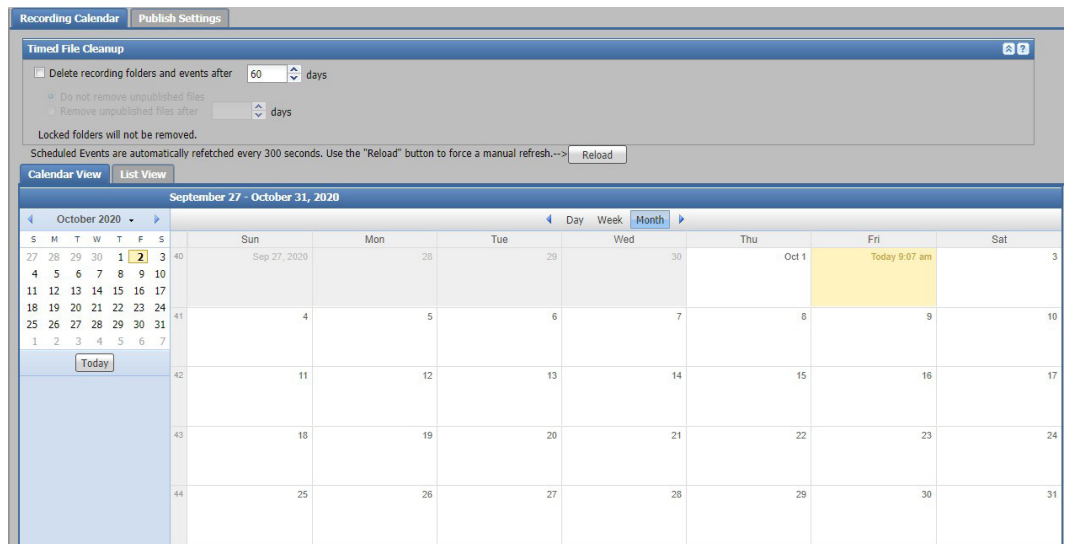


Figure 25. Calendar View Page

- **Calendar View** displays past and present recordings in a calendar format. Access a detailed view dialog box about each specific event from this page. Configure file cleanup. Also, if a recording does not transfer to the designated network server or if the user needs to upload the files again, a re-upload can be initiated from the detail view.

- **List View** shows recording events in a list table format. Recordings are listed by DB ID, starting time, title, relation, presenter, state, media present, lock and event ID. Entries can be sorted or searched in this view (see figure 26).

Calendar View		List View						
Search <input type="text"/> < > <input type="checkbox"/> Regular expression <input type="checkbox"/> Case sensitive Nothing Found								
DB ID	Start Time	Title	Relation	Presenter	State	Media Present	Lock	Event ID
1	2017-08-01 09:54:21 AM				Recording Deleted	Yes	No	SMP1-N82_20170801-165421Z
2	2017-11-06 09:45:48 AM				Recording Deleted	Yes	No	SMP1-N82_20171106-174548Z
3	2019-08-05 08:24:49 AM			CA Voelkl	Recording Deleted	Yes	No	SMP1-N82_20190805-152449Z

Figure 26. Calendar List View

Publish Settings

The **Publish Settings** page has three panels: **File Transfer Schedule** (see figure 27, ①), **Active Profiles** (②), and **Publishing Destination Configuration** (③), with controls to specify the server destination to upload completed recordings and to configure and test protocols and settings to enable publication (uploading).

Recording Calendar
Publish Settings

File Transfer Schedule ①

☒ Upload Files immediately after recording is completed
☐ Upload File at specific time only
Start Time: 00 : 00
End Time: 01 : 00
Day: Sunday

Active Profiles ②

Step 1: Select Active PUBLISHING Destination
None

To activate publishing:
- Download the desired FlexOS app from www.extron.com and install it on this unit.
- Ensure the installed FlexOS app is enabled.

Step 2: Select Active SCHEDULE Source
None

To activate scheduling:
- Download the desired FlexOS app from www.extron.com and install it on this unit.
- Ensure the installed FlexOS app is enabled.
A scheduling LinkLicense may be required.

Publishing Destination Configuration ③

No publishing apps are active.

Figure 27. Publish Settings Page

To designate a publishing destination and a schedule source, a FlexOS app must be downloaded from www.extron.com and installed on the SMP. For scheduling, a LinkLicense may also be required.

See the *SMP 111 Embedded Web Pages Help File* for additional information and details on how to configure settings for each publishing option and scheduling option.

NOTE: The publishing destination cannot be changed while a recording is in the process of being uploaded to a server. When the upload is complete, the destination can be changed.

Configuration

The eight pages within the **Configuration** tab contain the core controls needed during initial setup or for upgrading the unit and restoring a configuration.

Using these pages, an administrator can:

- Configure basic AV input settings.
- Configure digital Input and Output ports.
- Output video test patterns for setup.
- Configure output stream settings and presets.
- Set up AV encoding and metadata.
- Set passwords.
- Set up notices and alarms.
- Configure basic communication, identity, time, data storage, and recording location settings.
- Upgrade the unit by updating firmware.
- Save configurations or restore a configuration from a saved file.

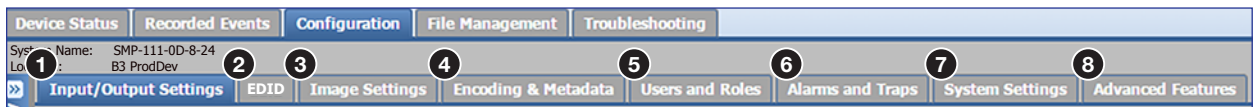


Figure 28. Configuration Tab and Subtabs

Configuration Tab Features

The pages within **Configuration** include the following (see figure 28):

- 1 Input/Output Settings** (see page 34) — Change the name for the input, select an aspect ratio type, and enable or disable **Auto-Image**, **Auto Memory**, and **HDCP Authorized**. This page includes audio configuration controls to adjust audio levels.
It also allows the user to output one of several video test patterns for use during display setup, select the refresh rate for the local HDMI output, configure the universal OSD content, and select HDCP Notification.
- 2 EDID** (see page 40) — Choose the resolution and refresh rate for the HDMI input, from a selection of common settings, as well as configure custom EDID.
- 3 Image Settings** (see page 41) — Configure video input sampling and sizing, set up overscanning of SMPTE input signals, and adjust picture controls (brightness, contrast, and the like). It also allows the user to save or recall input presets.

- 4 Encoding & Metadata** (see page 43) —

The first expandable panel, **Encoding Presets**, allows the user to:

- Set up AV encoding.
- Configure the streaming method, protocol, and settings.
- Create, save, and recall encoder and streaming presets.

The second panel, **Metadata and Recording Profiles**, contains controls that allow the user to:

- Select fonts for metadata information.
- Configure metadata elements.
- Create, save, and recall recording profiles.
- Designate a default recording profile.

⑤ **Users and Roles** (see page 47) — Set administrator and user passwords.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see **Users and Roles** on page 47 to change a password).

⑥ **Alarms and Traps** (see page 49) — Set up the e-mail server and the sender and recipient e-mail addresses for notifications within this page. Select the alarm "priority" level for each of several types of errors or conditions monitored by the unit (see **figure 28** on the previous page).

⑦ **System Settings** (see page 51) —

Contains an assortment of settings in ten expandable panels. In this page an administrator can configure settings for:

- Unit identity (unit name and network location)
- Network and serial communication
- Storage
- Date and time

It also makes it possible to:

- Update firmware
- Upload a license
- Upload an SSL certificate
- Save configurations or restore a configuration from a saved file

⑧ **Advanced Features** (see page 54) — Enable a web browser client option on the unit or to upload new plug-in applications.

See the *SMP 111 Embedded Web Pages Help File* for additional information.

Input/Output Settings

The controls within the **Input/Output Settings** page within the **Configuration** tab allow an administrator to select a number of settings in the five panels:

- **Video Configuration** — Name the Input, select an aspect ratio, and enable or disable Auto-Image, auto memory and HDCP authorization.
- **Audio Configuration** — Make adjustments to audio levels, and select options for audio mute.
- **HDMI Output Configuration** — Select output refresh rate, mute video out, audio out, or both video and audio out, and enable the status OSD on the HDMI output.
- **OSD Configuration** — Select test patterns and the Universal OSD, as well configure the Universal OSD.
- **HDCP Notification** — Select the color to display (green or black) when High-bandwidth Digital Content Protection (HDCP) content is detected.

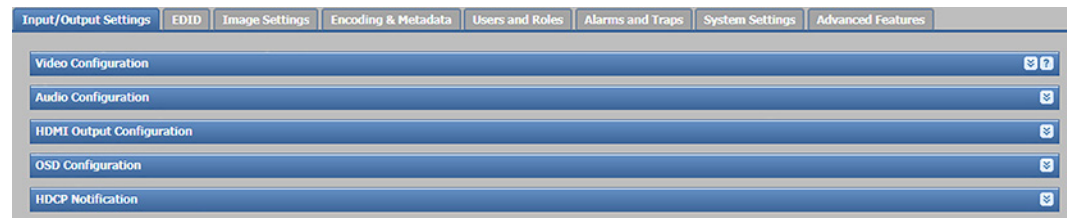


Figure 29. Input/Output Settings Panels

Aspect Ratio

The **Aspect Ratio** adjustment (see figure 30, ❶) allows the user to select between input rates to fill the entire window for that channel (**FILL**), scale up to fit the channel window and keep the original aspect ratio (**FIT**), or to allow each input rate to display in its native aspect ratio with respect to the channel window (**FOLLOW**).

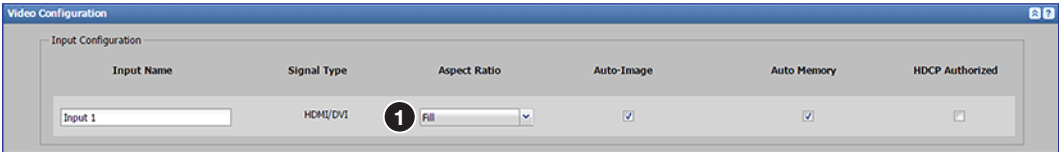





Figure 30. Video Configuration Aspect Ratio

Aspect Ratio	Screen Appearance	Description
FOLLOW		The input format passes unchanged. A 4x3 format (represented by the red block on the left) remains at its original aspect ratio. The vertical dimension fills, but not the horizontal dimension of the output or recording. Letter box or pillar bars can be applied based on the horizontal and vertical size settings.
FIT		The input format is zoomed to fill the output with top and bottom or left and right information cropped out in order to fit the screen without letter boxing or adding pillars. Some loss of image occurs, represented by the dimmed image outside the red box.
FILL		The input format is non-uniformly scaled to fill the 16x9 output. A 4x3 input fills the horizontal and vertical screen of the output or recording with some distortion of the input (default).

NOTE: The selected input aspect ratio setting is applied to both the recording and streaming outputs. If the streaming resolution is different, the applied aspect ratio cannot be maintained. For example, if the recording resolution is 1080p with an aspect ratio of 16:9, and the streaming display is 1024x768 with an aspect ratio of 4:3, the input aspect ratio selection cannot be maintained for both.

Auto Memory and Auto-Image

Select the checkbox to enable **Auto-Image** (see figure 31, **1**). Auto-Image simplifies setup by executing image sizing, centering, and filtering adjustments with a single button push.

Select the checkbox to enable **Auto Memory** (**2**). Auto Memory recalls input and image settings for signals that have previously been applied. When Auto Memory is disabled, the SMP 111 treats every new input as a new source.

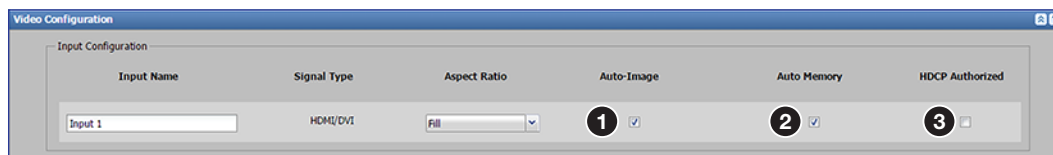


Figure 31. Video Configuration Auto-Image and Auto Memory

These two features can work together depending on the configuration the user chooses. See the table below for more information on the settings.

Auto Memory and Auto-Image Features		
Auto Memory	Auto-Image	Information
On	On	"New" signals or rates not previously detected by the device are initially set up using default parameters. Then, Auto-Image is automatically applied and those values are stored. The next time that signal is detected, the stored values in the auto memory location are applied.
On	Off	"New" signals or rates not previously detected by the device are set up using default parameters. If changes are made manually to the input and picture settings, an Auto Memory location is created and then recalled each successive instance that the input is detected.
Off	On	When Auto Memory is disabled, each change in the input sync is treated as a new signal, and Auto-Image is triggered automatically. Any changes that are made manually to the image and picture controls are lost each time a new refresh rate is detected.
Off	Off	Each change in the input sync causes default values to be applied to the rate. Any changes that are made manually to the image and picture controls are lost when a new rate is applied.

HDCP Authorization

Select this checkbox to turn the HDCP **Authorized** on or off (③). When disabled (Off) the SMP 111 does not display content that requires HDCP, and displays a green screen.

HDMI Output Configuration

HDMI Output Configuration

① Resolution: 1280x720 HDMI output resolution follows the selected recording resolution.

② Refresh Rate: 60 ▾

③

④ ☒ Enable Status OSD on HDMI output

Figure 32. HDMI Output Configuration Pane

- ① The Resolution of the HDMI output can be viewed in this panel. It is configured in the [Encoding & Metadata](#) page (see page 43).
- ② The Refresh Rate for the output of the SMP can be selected from the drop-down list. Choose **50** Hz or **60** Hz.
- ③ The HDMI mute output options can be selected in this pane. Choose one of the three options: **Mute HDMI Video Out**, **Mute HDMI Audio Out**, or **Mute HDMI A/V Out**.
- ④ The Status OSD will be displayed on the top left corner of the HDMI preview output. By default, **Enable Status OSD on HDMI output** is enabled. Deselect the checkbox to disable.

NOTES:

- The resolution of the local (preview) output follows (is based on) the recording encoder resolution.
- If the selected recording resolution is under 720 lines (for example, encoding is set as 848x480 or 512x288), the HDMI preview output is set to 1280x720, with the video content centered in the 720p window.
- The Status OSD does not display in the stream or recording outputs.

OSD Configuration

The **OSD Configuration** panel in the **Input/Output Settings** page allows selection and immediate output of one of seven internally stored test patterns or a universal OSD to the HDMI output from the SMP as well as to the recording and output stream.

Video test patterns are helpful for calibrating connected displays or projectors for color, convergence, focus, resolution, contrast, and aspect ratio. The audio test option is useful for testing audio output.

Outputting and using a video test pattern

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

To select and output a test pattern:

1. Open the **Input/Output Settings** page.
2. Expand the **OSD Configuration** panel.

3. Select a pattern from the **Test Patterns** drop-down list. A preview of the test pattern appears above the drop-down list.

Available test patterns include the following:

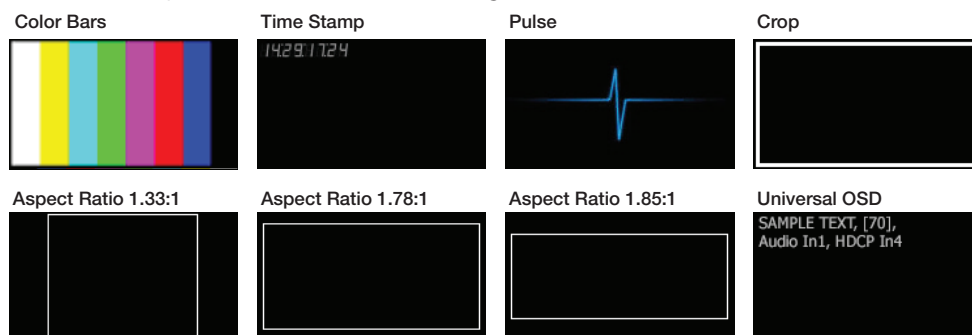


Figure 33. Test Patterns

- **Color Bars** — Standard full screen color bars overlaid on top of the current layout.
- **Time Stamp** — Displays white text with the unit date and time (for example: **Fri Apr 18 HH:MM:SS**) in the top left corner of the display window. It updates every second.
- **Pulse** — Select **Pulse** to output an audio pulse of 400 Hz at -10 dBu for audio output testing.
- **Crop** — Outlines the active picture area.
- **Aspect Ratio** — Three patterns with screen outlines in 1.33:1, 1.78:1, and 1.85:1 for centering and size adjustment.
- **Universal OSD** — This pattern consists of white text overlaid atop the source video content. By default, it appears in the upper left corner of the screen. The location of the universal OSD is dependant on the position selected for the metadata OSD. The text includes brief custom text followed by three selectable elements separated by commas (see [Setting up the universal OSD test pattern](#)).

The universal OSD pattern can be displayed together with the main AV content because it overlays the video rather than replacing it. The universal OSD pattern can be used at any time, not just during setup. It can also serve as an on screen label for presentations, in addition to metadata labels (see [Encoding & Metadata](#) on page 43 for more information on metadata within screen layouts).

The selected test pattern is immediately output to the display and reflected in the preview in the **AV Controls** panel. The test pattern displays until another pattern, or **Off** is selected from the **Test Patterns** drop-down list, or until unit power is recycled.

NOTE: When a test pattern is selected, the test pattern is streamed to the display, stream, and recording, overlaid atop the source AV material. If **Off** is selected from the **Test Patterns** drop-down list, the test pattern is turned off.

Setting up the universal OSD test pattern

The **Font**, **Size**, **Color**, and **Location** are read only in this panel. To change these variables, see [Changing the Font Used for the Metadata Overlay](#) on page 46.

To set up the universal OSD test pattern:

1. Open the **Input/Output Settings** page.
2. Expand the **OSD Configuration** panel at the bottom of the page.
3. Select **Universal OSD** from the **Test Patterns** drop-down list. The fields and drop-down menus in the Universal OSD section become accessible.

4. Enter the text (up to 16 characters) into the **Display Text** field within the universal OSD area. This is the first text that appears in the universal OSD.
5. Select an information category from the **Information 1** drop-down list. If desired, select from the **Information 2** and **Information 3** drop-down lists.

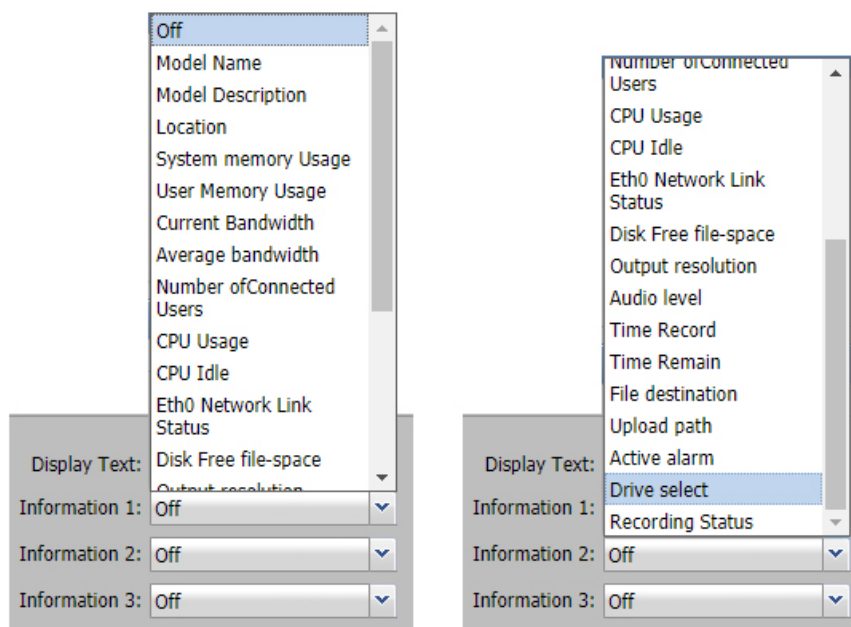


Figure 34. Universal OSD Information Selection

As an example, when **File destination** is selected, the OSD text might be **Front USB** or **Internal Drive Only**, depending on the current system settings.

The categories are identical to those used in the SIS information commands (such as **1i**, **2i**, **3i**, and so forth). For reference, see the [Command and Response Tables](#) starting on page 72.

Changes are saved automatically and applied shortly after being selected. The universal OSD text appears on-screen in this format:

Display Text, Information 1, Information 2, Information 3.

See figure 35 for examples of how the configuration settings (on the left) translate to the universal OSD (on the right).

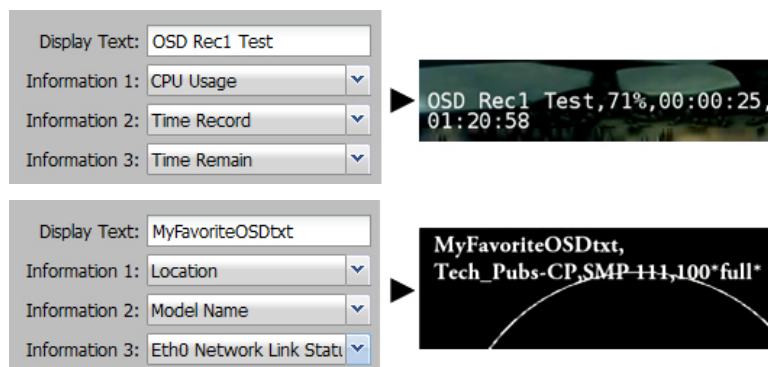


Figure 35. Universal OSD Information Selection

Disable the "No Source" OSD

Select the **Display "No Source" OSD to indicate no video input** checkbox to remove the check mark and disable this OSD.

By default, the SMP 111 will display a "No Source" OSD when there is not an active video input.

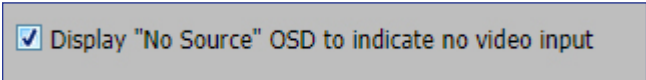


Figure 36. "No Source" OSD Selection

See **Input/Output Settings** in the *SMP 111 Embedded Web Pages Help File* for more control options.

HDCP Notification

At the bottom of the **Input/Output Settings** page, select the color to present on the output display when HDCP content is detected (see figure 37). The options are:

- **Black**
- **Green**

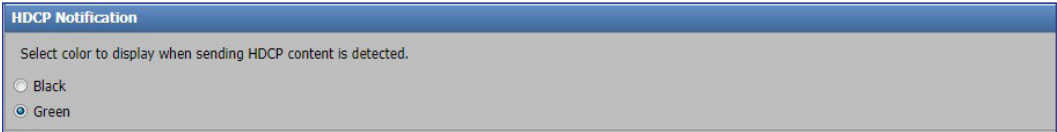


Figure 37. HDCP Notification Panel

EDID

The **EDID** page within the **Configuration** tab makes it possible to manage the EDID information (resolution and refresh rate) between the HDMI input and the output source. The SMP uses EDID Minder, which ensures that a source device connected to the SMP 111 input continuously sees the EDID of a sink device.

This page allows the user to select from 38 factory-loaded EDIDs or create up to three custom EDIDs (see **EDID Values** on page 89 for a complete list of available EDIDs).

The default EDID for the SMP 111 is **720p @ 60 Hz**.

To open this page, click the **Configuration** tab at the top of the SMP 111 embedded web pages and then click the **EDID** tab on the second tier of tabs.

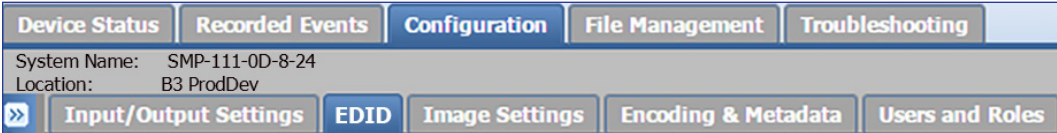


Figure 38. Configuration Tab, EDID Subtab

The EDID Minder page opens (see **figure 39** on page 41).

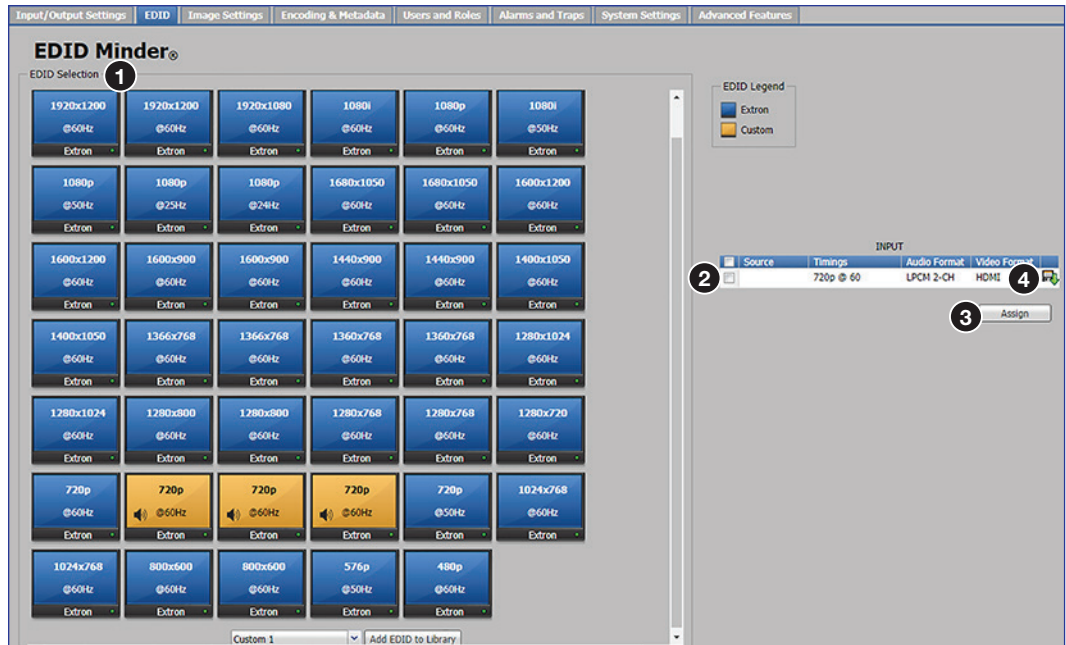


Figure 39. EDID Minder Page

To select an EDID:

1. Open the EDID Minder page (see figure 39).
2. Select the resolution and refresh rate from the **EDID Selection** panel (1).
3. Click the **Source** radio button (2) in the **INPUT** panel.
4. Click the **Assign** button (3) in the **INPUT** panel.
5. To save the selected EDID to a PC, click the download icon (4) in the **INPUT** panel.

See the *SMP 111 Embedded Web Pages Help File* for additional information.

Image Settings

The controls within the **Image Settings** page within the **Configuration** tab provide options to configure video input sampling and sizing, set up overscanning of SMPTE input signals, and adjust picture controls (brightness, contrast, and similar). This page also allows the user to save or recall input presets. A user must be logged in as an administrator to see or change these settings.

To open this page, click the **Configuration** tab at the top of the SMP 111 embedded web pages and then click the **Image Settings** tab on the second tier of tabs.

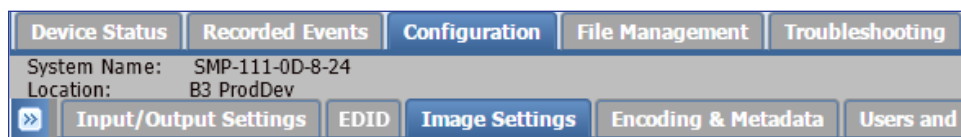


Figure 40. Configuration Tab, Image Settings Subtab

The Image Settings page opens (see figure 41 on page 42).

Image Configuration

1 Input Signal Sampling

Horizontal Start: 128

Vertical Start: 128

Total Lines: 1125

Total Pixels: 2200

Active Pixels: 1920

Active Lines: 1080

2 Picture Controls

Brightness: 64

Contrast: 64

H Position: 0

V Position: 0

H Size: 1280

V Size: 720

Auto-Image

Auto-Image & Fill

Auto-Image & Follow

3 Overscan

This setting applies to SMPTE inputs (480p, 576p, 720p, 1080i, and 1080p).

HDMI: 0.0%

4 Input Presets

Input Presets saves Picture Controls and Audio Gain Settings

1	[unassigned]
2	[unassigned]
3	[unassigned]
4	[unassigned]
5	[unassigned]
6	[unassigned]
7	[unassigned]
8	[unassigned]
9	[unassigned]
10	[unassigned]
11	[unassigned]
12	[unassigned]
13	[unassigned]

Save Preset Recall Preset Clear

Figure 41. Image Settings Page

This page has four panes (see figure 41):

- 1 Input Signal Sampling** – This is a read-only panel, which displays the **Horizontal Start**, **Vertical Start**, **Total Lines**, **Total Pixels**, **Active Pixels**, and **Active Lines**.
- 2 Picture Controls** – Alter the quality of the image by changing brightness and contrast, or select **Auto-Image**, **Auto-Image & Fill**, or **Auto-Image & Follow** buttons (see figure 41).
- 3 Overscan** – Set the amount (0, 2.5%, or 5%) of picture enlargement applied to the HDMI video signal for any SMPTE standard input.
- 4 Input Presets** – Save up to 128 presets or recall one of those presets, each with a combination of signal type, signal sampling, picture controls, and audio gain settings.

See the *SMP 111 Embedded Web Pages Help File* for additional information.

Encoding & Metadata

The controls within the **Encoding & Metadata** page configure signal streaming and encoding and also permit configuration of an on-screen display and selection or configuration of metadata and recording profiles. A user must be logged in as an administrator to see or change these settings.

To open this page, click the **Configuration** tab at the top of the SMP 111 embedded web pages and then click the **Encoding & Metadata** tab on the second tier of tabs.

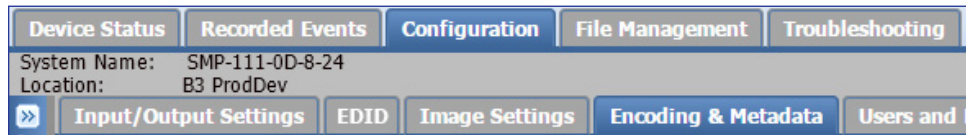


Figure 42. Configuration Tab, Encoding & Metadata Subtab

The **Encoding & Metadata** page opens. It features two expandable panels:

- **Encoding Presets** – Configure audio encoding, video encoding, recording and streaming parameters, then create and save or recall presets of those settings.
- **Metadata and Recording Profiles** – Change the OSD font, enter metadata elements, and create, save, recall, and delete Recording Profiles.

Some of the encoder settings can also be set using Extron SIS commands (see the [Encoder Presets](#) on page 81).

See the *SMP 111 Embedded Web Pages Help File* for additional information.

Encoding Presets

Encoder Presets and **Streaming Presets** are combinations of settings for audio and video encoding.

NOTES:

- An administrator can see or change these settings.
- **Encoder Presets** and **Streaming Presets** must be selected prior to the start of a recording. Encoding or streaming settings cannot be changed during an active recording.

Encoder presets save the following parameters:

ENCODER PRESETS		
Video resolution	Audio bitrate	Profile level
Video bitrate	Audio delay	Profile type
Frame rate	Record mode	Preset name
Bitrate control	IDR Interval	GOP Length

Default encoder presets

Any of the default encoder presets or user-created presets can be recalled and applied to a recording session (recording encoder) and stream. Presets can also be recalled using SIS Commands (see the [Encoder Presets](#) on page 81).

SMP 111 supports up to two encodes (recording, streaming), one recording, one local output, and live streams simultaneously.

The first eight encoder presets are predefined, with the GOP at 30 and the Audio delay set at 0 milliseconds. These encoder presets can be overwritten. Presets 9 through 16 are unassigned and unconfigured. All **Encoder Presets** and **Streaming Presets** can be configured on the **Encoding & Metadata** page. Preset 3 is the default value for the Archive Encoder.

Preset #	Preset Name	Resolution	Video Bit Rate (kbps)	Frame Rate (fps)	Audio Bit Rate (kbps)	Bit Rate Control	GOP Length	H.264 Profile	H.264 Level
1	1080p High	1920x1080	8000	30	320	VBR	30	High	4.1
2	1080p Low	1920x1080	6000	15	128	CVBR	30	Main	3.2
*3	720p High	1280x720	5000	30	192	VBR	30	High	3.1
4	720p Low	1280x720	3000	15	128	CVBR	30	Main	3.1
5	480p High	848x480	2500	30	128	VBR	30	High	3.1
6	480p Low	848x480	1500	15	96	CVBR	30	Main	3.1
7	VGA High	1280x1024	3500	30	128	VBR	30	High	4.1
8	VGA Low	1024x768	2500	15	128	VBR	30	High	3.1
9-16	User Defined								

NOTES:

- *Audio settings are determined by the encoding recording. Audio for streaming monitoring is not re-encoded. Therefore, by default, the recording uses encoder preset 3, and the audio bit rate is 192 kbps. Default audio sample rate is 48 kHz for encoder presets 1 to 8.
- Default recording mode is video and audio.
- The predefined **Encoder Presets** can be modified by the user. If necessary, a factory reset returns all settings to the above table values.

An overview of encoding

Each of the two encoding presets can be used for multiple purposes. It can be useful to understand how each encoder is typically used and the differences.

Encoding Stream	Usage	Conditions or Differences
Recording Encoding	Recording	Refresh rate: 5 to 30 fps
	Local HDMI output through the rear panel Output port	Refresh rate: 50 or 60 Hz. Does not use the compression settings specified in the archive encoder preset. This output bypasses compression and encoding.
Streaming Encoding	Live stream via the LAN port and network if using a decoder application	

See the *SMP 111 Embedded Web Pages Help File*, for details about the operation of the encoding controls.

Streaming Presets

Streaming Presets allow the user to quickly switch between various streaming options. There are 16 encoder presets that can be saved or recalled.

Streaming presets save the following parameters:

STREAMING PRESETS	
Preset name	Multicast IP/destination (for multicast only)
Streaming method and protocol	QoS (for push streaming only)
Stream port	SAP setting (for push streaming only)
MTU	RTMP publish URL (for RTMP push only)
TTL	Advanced section of RTMP, such as the RTMP port, username, and password (for RTMP push only)
RTSP over HTTP port (for pull streaming only)	
RTMPS (RTMP over SSH)	

Audio Encoding

Audio Encoding is configured in the **Recording** pane. The streaming signal uses the configuration set up in **Recording**, and reflects the same settings in the read-only **Streaming Audio Encoding** pane.

To configure **Audio Encoding**, go to **Recording > Encoding Presets > Encoding & Metadata**. Configure the four audio variables:

- 1 **Sample Rate** — From the drop-down list, choose the audio sample rate (**44100** or **48000** Hz [default]).
- 2 **Audio Bitrate** — From the drop-down list, choose the audio bit rates (**80, 96, 128, 192, 256**, or **320** kbps stereo).
- 3 **Audio Output** — From the drop-down list, choose the audio output type (**HDMI, Analog, Mixed, Analog Dual Mono**, or **Dual Mono + HDMI**).
- 4 **Audio Delay** — Click on the **Up** and **Down** arrows or enter a value in the field to choose the time in milliseconds for audio delay.

Audio Encoding

Sample Rate: 1 48000 Hz

Audio Bitrate: 2 320 Kbps stereo

Audio Output: 3 Mixed

Audio Delay: 4 0 msec

See the *SMP 111 Embedded Web Pages Help File* for more audio processing information.

Metadata and Recording Profiles

NOTE: A user must be logged in as an administrator to see or change these settings.

Configuring Metadata Elements

Select and specify the metadata text content (see figure 43, 2) that is incorporated into the video and used for other purposes, and select the font (1) and appearance of text that is used for that text overlay within the video.

1 Font: Default

Size: 100

Color: #ffffff

Metadata Location: Top Right

UNIV. OSO META. 1 META. 2
META. 3 META. 4

2 Metadata Elements

	Field	Enabled?	Use Default?	Default Value
1	Contributor	<input type="checkbox"/>	<input type="checkbox"/>	
2	Contributor	<input type="checkbox"/>	<input type="checkbox"/>	
3	Contributor	<input type="checkbox"/>	<input type="checkbox"/>	
4	Contributor	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 43. Metadata Elements Pane

Changing the Font Used for the Metadata Overlay

If optional fonts are uploaded to the SMP, the user can select and use one for displaying metadata text instead of the default font. Size and color can be selected for the OSD text. Optional fonts must be uploaded to the fonts folder within the SMP from the **File Management** page or by using an STP client program before selecting it in this page.

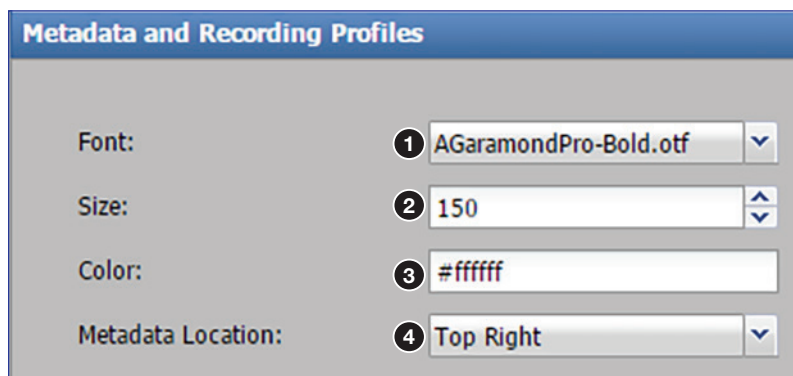
NOTES:

- The SMP supports TrueType™(.ttf) and OpenType® (.otf) fonts.
- To upload a font file, use the file upload utility within the **File Management** page.
- The user is responsible for obtaining any necessary font licenses before uploading fonts to the SMP 111.
- After changing the font, some text can appear truncated in the on-screen text because characters can be wider in the selected font than in the system default font.
- These settings also control the Universal OSD settings (font, size, color, and location).

TIP: Many free, open source fonts are available at <https://fonts.google.com/>.

To select a different font and change the size and color:

1. Open the Encoding & Metadata page.
2. Expand the **Metadata and Recording Profiles** panel.
3. From the first panel in the left corner, select an available font from the **Font** drop-down list (see figure 44, ❶). The selected font is immediately applied to both the input switching OSD and the universal OSD.



The screenshot shows a web interface titled "Metadata and Recording Profiles". It contains four settings:

- Font:** A drop-down menu with "AGaramondPro-Bold.otf" selected, marked with a circled ❶.
- Size:** A numeric input field with "150", marked with a circled ❷. It has up and down arrows on the right.
- Color:** A text input field with "#ffffff", marked with a circled ❸.
- Metadata Location:** A drop-down menu with "Top Right" selected, marked with a circled ❹.

Figure 44. Change Font in Metadata and Recording Files

4. To change the size, click the **Up** and **Down** arrows (❷) to adjust the value. The number is a percentage of the baseline font height, from 80 to 200%, with 100 being the default.
5. To change the font color, enter a six-character hexadecimal color value into the **Color** field (❸). The default color is #ffffff (white).

NOTE: Consult a hex color table, if needed. Each pair of characters represents the bits for the percentage of red, green, and blue, respectively. For example, red is represented by #FF0000, which is 100% red, 0% green, 0% blue.

6. To change the location of the universal on-screen display (OSD), select a location from the **Metadata Location** drop-down list (❹). This metadata location also affects the location of the universal on-screen display (OSD).

See the *SMP 111 Embedded Web Pages Help File* for more information on metadata.

Configuring and Saving Recording Profiles

Recording Profiles can be configured, saved, and recalled in the **Metadata and Recording Profiles** drop-down panel in the **Encoding & Metadata** page. Fill in the appropriate fields with the desired metadata text content to be associated with an individual Recording Profile. There are 16 unassigned profiles to be configured, saved, and recalled for future use.

Recording Profiles saves the following metadata entries and recording mode (Video File and/or Audio File).

Active Profile: RECORD PROFILE 01
Default Profile: RECORD PROFILE 01

Profiles

1	RECORD PROFILE 01
2	[unassigned]
3	[unassigned]
4	[unassigned]
5	[unassigned]
6	[unassigned]
7	[unassigned]
8	[unassigned]
9	[unassigned]
10	[unassigned]
11	[unassigned]
12	[unassigned]
13	[unassigned]
14	[unassigned]
15	[unassigned]
16	[unassigned]

Save Profile Recall Profile Delete Profile

Contributor: J Smith
Coverage: Biblical Theology
Presenter: J Smith
Description:
Format:
Language: English
Publisher:
Course:
Relation:
Copyright: 2015
Source:
Subject:
Title:
Type/License:
Recording Files: Video+Audio

Figure 45. Recording Profiles Pane

NOTE: See the *SMP 111 Embedded Web Pages Help File* for additional information.

Users and Roles

In the **Users and Roles** page within **Configuration**, an administrator can set up both administrator and user level passwords. Passwords are not required, though they are recommended for controlling access to configuration functions.

NOTES:

- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password.
- If only an administrator password is set, only administrators are able to log in to the SMP 111 pages. Users have no access.
- To allow user access to a password-protected unit, set both an administrator password and a user password, and users must log in using the user password.
- An administrator password is required before a user password can be set.

Passwords can be set up only via this page or using SIS commands (see **Password and Security Settings** on page 78).

To open this page, click the **Configuration** tab (see figure 46) at the top of the SMP 111 embedded web pages and then click the **Users and Roles** tab on the second tier of tabs.

Device Status Recorded Events Configuration File Management Troubleshooting

System Name: SMP-111-0D-8-24
Location: B3 ProdDev

Input/Output Settings EDID Image Settings Encoding & Metadata Users and Roles

Figure 46. Configuration Tab, Users and Roles Subtab

The **Users and Roles** page opens, showing the **Password** panel (see figure 47).

The image shows a 'Password' panel with two sections. The top section is for 'admin' and the bottom for 'user'. Each section has a 'Login ID' label, a password field, a 'Confirm Password' field, a 'Show Password' checkbox, and a 'Clear' button. The 'admin' section also has a 'Save' button. Numbered callouts are: 1 points to the 'admin' Login ID, 2 points to the 'user' Login ID, 3 points to the 'Save' button, and 4 points to the 'Clear' buttons in both sections.

Figure 47. Password Panel

Setting Passwords

If no passwords are set, anyone who opens the internal web pages is connected with administrator-level access and can make changes to all settings. To limit access and prevent changes to system configuration, the following options are available:

- **Set an administrator level password only** — This option allows only administrators to access the SMP 111 web pages. End users cannot log in and use the web pages.
- **Set both an administrator level password and a user level password** — This allows administrators to log in and manage all aspects of the SMP 111. Users can log in to use just the **AV Controls** panel and the **Device Status** page.

To set passwords:

1. Enter the desired password, at least four characters long, into the **Administrator Password** field in the **Login ID: admin** panel (see figure 47, ①).
 - Passwords must consist of up to 128 characters. The pipe character (|) is not allowed.
 - Passwords are case-sensitive and cannot be a single space character.
2. Enter the same password into the **Confirm Password** field directly below the **Administrator Password** field. Once a password is entered, the fields in the **Login ID: user** panel (②) are accessible.
3. If no user password is set, click **Save** (③) in the upper right of the **Password** panel. To set a user password, complete steps 4 through 6.
4. To set a user level password, type a desired password into the **User Password** field in the **Login ID: user** panel (②).
5. Type the same password into the **Confirm Password** field directly below the **User Password** field.
6. Click **Save** (③). Both the administrator and user passwords are saved.

Clearing Passwords

To remove (clear) a password, click **Clear** (④) corresponding to the administrator or user password and click **Save** (③) to remove.

NOTE: When the administrator password is cleared, the user password is also cleared.

Alarms and Traps

In the **Alarms and Traps** page within **Configuration** there are two panels: **Alarm Notifier Destinations** and **Alarm Message List**. An administrator can configure e-mail account and communication settings to send notification e-mails in **Alarm Notifier Destinations**. Choose to log, display a message about, or send an e-mail about various conditions and errors experienced by the SMP 111 in the **Alarm Message List** panel.

To open this page, click the **Configuration** tab (see figure 48) at the top of the web pages and then click the **Alarms and Traps** tab on the second tier of tabs.

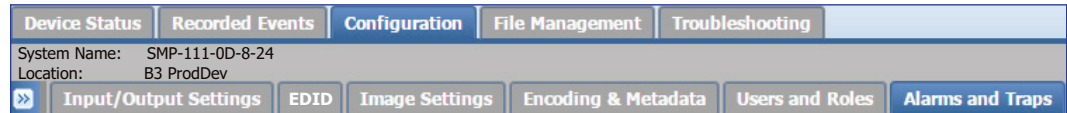


Figure 48. Configuration Tab, Alarms and Traps Subtab

The **Alarms and Traps** page opens, showing the two panels (see figure 49):

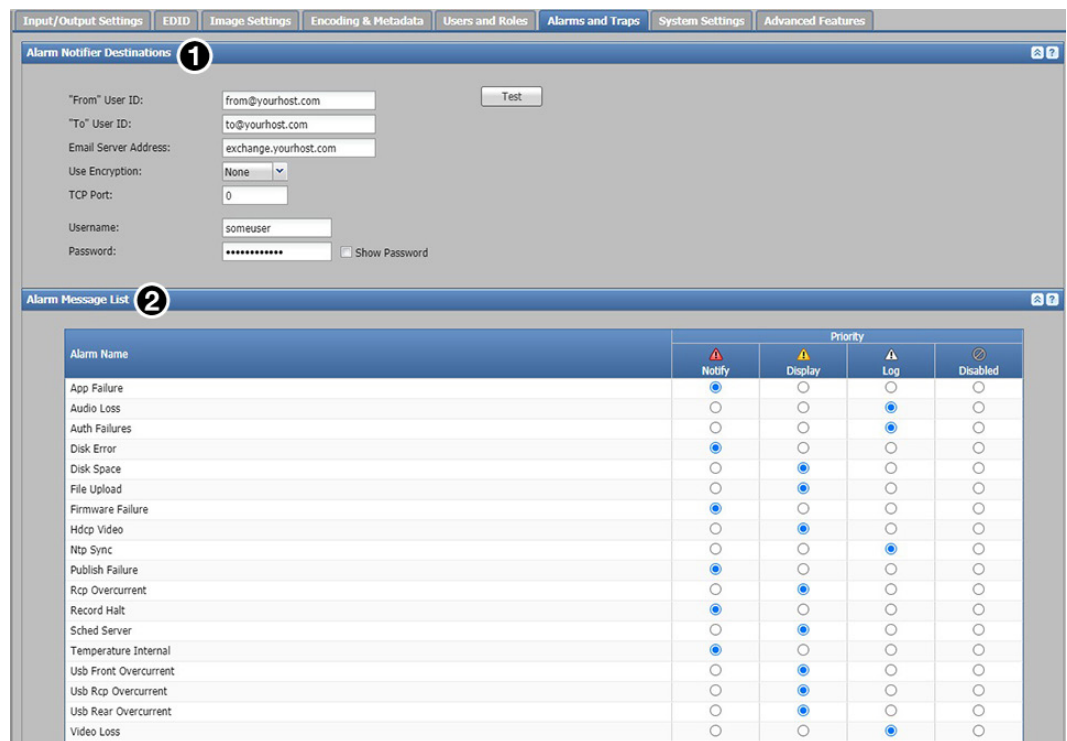


Figure 49. Alarms and Traps Page

- 1 Alarm Notifier Destinations** — Enter e-mail sender and receiver information for alarm notification.
- 2 Alarm Message List** — Choose the level of urgency for a given alarm on the SMP 111, or disable the alarm. The options to choose for an alarm are:
 - **Notify** — The SMP sends an e-mail and unsolicited SIS response.
 - **Display** — The indicate alarm LED is active on the front panel, AAP or wallplate, and web page. The event is also logged.
 - **Log** — The SMP records the alarm in the events log only.
 - **Disabled** — The alarm is disabled.

See the **Alarm** table on page 50 for the list of alarms generated by the SMP 111.

NOTE: All active alarms can be manually cleared by an administrator via the web page.

Alarm	Alarm Generated	Alarm Cleared
App Failure	<ul style="list-style-type: none"> A drop in communication between firmware and enabled FlexOS app. It is a Notify alarm by default. 	Reinstall the FlexOS app.
Audio Loss	<p>One of these occurs during a recording:</p> <ul style="list-style-type: none"> Audio signal is at or below -60 dBFS before a recording starts, an alarm triggers after 5 minutes of the start of the recording. Alarm triggers after 10 seconds of audio loss. 	<ul style="list-style-type: none"> The audio signal is maintained above -60 dBFS for a contiguous period of 10 seconds The recording session ends.
Auth Failures	Any combination of access interfaces (web page, Telnet, API, SFPT, SIS via SSH) that require authentication, with 20 failed login attempts within 20 seconds on any combination of user IDs (including non-existent user IDs), or 10 failed logins by the same user in 20 seconds.	Can only be cleared by an administrator via the web page (see Alarms and Traps on page 49) or SIS commands (see Clear active alarms on page 73).
Disk Error	<ul style="list-style-type: none"> A read or write error is detected on the selected storage volume. The target storage volume is not found (for example: Front USB is selected but the SMP does not detect any external storage). 	<ul style="list-style-type: none"> Replace the affected storage. Choose a different target storage volume. Remove the write protection from the volume.
Disk Space	<ul style="list-style-type: none"> The SMP is recording and the external USB storage volume drops to <10 minutes of recording time. The target volume does not have sufficient space to record, at the start of an event. 	<ul style="list-style-type: none"> Replace the affected storage. Choose an alternate target storage volume with adequate space. Stop recording.
File Upload	The file transfer method is configured and the SMP fails to upload files after five sequential attempts.	<ul style="list-style-type: none"> The file transfer method is updated. The next automatic or manual file transfer is successful.
Firmware Failure	<ul style="list-style-type: none"> Indicates a failure to start a critical portion of the operation of the device. It is a Notify alarm by default. 	Contact Extron Support when this alarm is triggered.
HDCP Video	If the signal is HDCP protected and the SMP cannot negotiate HDCP for any reason.	The HDCP source is no longer active or is taken off the input.
NTP Sync	<ul style="list-style-type: none"> The SMP attempts to automatically sync with the configured NTP server and fails the primary and retry attempts. The SMP fails multiple manual sync attempts. 	The NTP sync succeeds without retries for a period of five synchronization attempts.
Publish Failure	A file transfer method is configured but the unit fails to upload files after 5 sequential retries.	Can only be cleared by an Administrator via the web page (see Alarms and Traps or Clear active alarms).
RCP Overcurrent	A RCP current draw exceeds the 1.5 A limit of the port.	The RCP is removed from the SMP.
Record Halt	A recording is terminated without a command to stop.	Can only be cleared by an Administrator via the web page (see Alarms and Traps).
Sched Server	There is an error communicating with the scheduling server.	The connection to the server is restored or an alternative scheduling configuration is set.
Temperature Internal	The SMP internal temperature exceeds 60° C for 2 minutes.	The SMP temperature drops below 50° C.
USB Overcurrent (Front, RCP, and Rear)	A USB port current draw exceeds the 1.5 A limit of the ports.	The offending device is removed from the SMP.
Video Loss	Video sync is lost during a recording for a period of 2 seconds.	Video sync is detected for 6 seconds.

NOTE: If internal storage space is nearly full and the SMP 111 is set up to automatically upload recordings to a server (see [Publish Settings](#) on page 32), the SMP uses an automatic disk cleanup feature to make room for new recordings. The SMP automatically deletes previous recordings that have been uploaded to a server, starting with the oldest recordings, until there is enough free space on the disk.

System Settings

Controls within seven of the eleven panels in the **System Settings** page within **Configuration** are essential during initial setup of the unit. The four other panels contain features that are used infrequently for updating the unit, restoring a configuration, or limiting access to front panel controls.

NOTE: A user must be logged in as an administrator to see or change these settings.

To open this page, click the **Configuration** tab (see figure 50) at the top of the SMP 111 embedded web pages and then click the **System Settings** tab on the second tier of tabs.

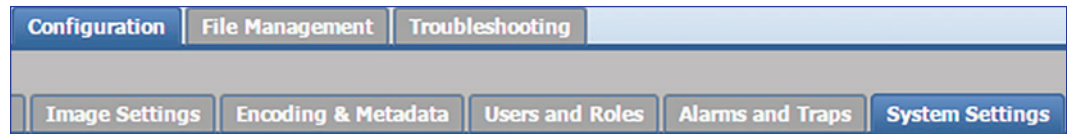


Figure 50. Configuration Tab, System Settings Subtab

The **System Settings** page opens (see figure 51).



Figure 51. System Settings Page

The panels are:

- ❶ **Unit Identification** — Set the system (unit) name and a descriptive name for its location. This is also the read only location of the model name, description, part number, serial number, firmware version, overall unit temperature, remote panel connection, remote panel firmware, and enabled feature licences.
- ❷ **Date and Time** — Set the date, time, time zone, and settings for syncing with one or more NTP (network time protocol) servers.
- ❸ **Networking** — Set the IP address, subnet mask, gateway, and DNS server, as well as the port information for a variety of port types, or enable or disable SNMP.
- ❹ **Recording Media Selection** — Set and save recording parameters, such as recording size and destination (see [Setting the Default Recording Media](#) on page 52).
- ❺ **Default Recording File Names** — Choose what type of information will be used to compose names of recordings and what type of file extension (m4v and mp4).
- ❻ **Marks and Thumbnails** — Choose whether to have the SMP produce normal (small) size thumbnail images of the recorded video or to make thumbnail images the same size (resolution) as the recording encoder settings and the frequency.
- ❼ **Serial** — Set the baud rate and protocol for the rear panel remote control serial port.
- ❽ **Firmware and License Loader** — Initiate Firmware and LinkLicense uploads .

- ⑨ **Backup and Restore** — Back up current SMP or IP configuration settings, or restore a previously saved configuration file to the unit from this panel (see [figure 51](#) on page 51).
- ⑩ **Executive Mode** — Enable or disable front panel lock-out to limit access to the controls and functions of the SMP.
- ⑪ **SSL Certificate** — Import user supplied SSL certificates.

See the *SMP 111 Embedded Web Pages Help File* for additional information.

Setting the Default Recording Media

To choose where a recording is saved during its creation:

1. In the **System Settings** page, click the **Recording Media Selection** panel bar to expand it.

Figure 52. Recording Media Selection Panel

2. Set the **Destination Recording Priority** (see figure 52, ①) to designate where the SMP 111 stores recordings when it is configured for single store mode.
3. Select (check) the **Record Destination Limiter** checkbox (②) to limit users to the storage drive location selected in step 4 or the Secondary storage drives specified in step 5.
4. To save recordings to a single location (single storage mode):
 - a. Verify that the **Enable Secondary Recording** checkbox (③) is disabled (unchecked).
 - b. In the **Recording Destination** drop-down list (④), select where recordings should be stored during recording.
 - **Auto** — The SMP stores the recording to available locations in the order of priority set in the **Destination Recording Priority** drop-down lists (①).
 - **Internal Drive** — This forces the unit to store recordings only in its internal storage, even if USB drives are attached to the front and rear panel ports.
 - **Front USB, Rear USB, RCP USB** — These options force the unit to record to a USB drive connected to the corresponding port.

NOTE: The SMP can automatically upload recorded files to a network server only for files that are recorded to and stored on the **internal drive**. Files cannot be auto-uploaded to a server, if one of the USB-only options is selected.

5. To save recordings to two locations at once (**Secondary Recording Destination**):
 - a. Select (check) the **Enable Secondary Recording** checkbox (see [figure 52](#), **3** on page 52).
 - The selection in the **Recording Destination** field (**4**) changes to **Internal Drive**. This cannot be changed while secondary recording mode is enabled. The recording is always stored to the internal drive.
 - The **Secondary Recording Destination** drop-down list (**5**) is enabled.
 - b. Select an option (**Auto**, **Front USB**, **Rear USB**, or **RCP USB**) from the **Secondary Recording Destination** drop-down list. This designates which connected storage drive is used to store a second copy of the recording.
 If **Auto** is selected, the **USB port with higher current limit** drop-down list becomes active. A USB port must be designated to receive a 1.5 A maximum current from the unit. The other USB ports receive a lower current.

NOTE: If the recording destination limiter is enabled, any destination settings or enable or disable secondary storage mode cannot be changed until the record destination limiter is disabled and that change is saved.

Click the **Record Destination Limiter** checkbox to select or deselect the setting. The **Save** button within the **Recording Media Selection** panel must be clicked to enable selection.

6. Recording files can be limited (portions of long recordings) to a specific size. If enabled (default), each time a recording file reaches the specified size, the file is saved and the SMP creates a new file (of up to the specified size) for the next portion of the recording, and so on until the recording event ends or the SMP runs out of storage space.

Figure 53. Limit Recording Size

To set a recording file size limit:

- a. Select (check) the **Limit Recording Size** checkbox (see [figure 53](#), **1**).
- b. Enter a number into the **Max file size limit (MB)** field or use the **Up** and **Down** arrows (**2**) next to the field to select a number. The file size can be limited to any size between 100 MB to 3.8 GB (3800 MB).
 - The default is 3584 MB.
 - If the **Limit Recording Size** checkbox is deselected, the size limit function is disabled, and the entire recording is stored in a single file.
7. Recordings can be limited to a specific duration. If this feature is enabled, the SMP stops recording an event after the specified number of hours.

Figure 54. Limit Recording Duration

To limit the recording duration:

- a. Select (check) the **Limit Ad hoc Recording Duration** checkbox (see [figure 54](#), **1**).
- b. Enter a number into the **Maximum Recording Duration (Hours)** field or use the **Up** and **Down** arrows (**2**) next to the field to select a number from 0 to 24 hours.
 - By default the **Limit Recording Duration** checkbox is not checked and there is no limit on duration.
 - Enter time in full hours only. Fractions of time will not be saved.

8. Click **Save**, or click **Cancel** to discard the changes.

NOTE: For a SMP 111 set for secondary storage mode with unlimited file size selected, the recording saved on the internal storage drive is saved in a single file. If the recording is saved to a USB storage device with FAT32 formatting, recording creates multiple 3.6 GB files as a result of the FAT32 size limit. Use a USB drive formatted for NTFS in order to avoid the file size limit.

Advanced Features

In the **Advanced Features** page within **Configuration**, an administrator can do the following things:

- Set the SMP 111 to run a web browser client application for direct control on site for limited network (IP) configuration when a network-connected computer is not available.
- Upload a FlexOS plugin application to add functions and configuration options, then use the plugin to configure features of the SMP.

These settings are available only via this page.

To open this page, click the **Configuration** tab (at the top of the SMP 111 embedded web pages) and then click the **Advanced Features** tab on the second tier of tabs (see figure 55).

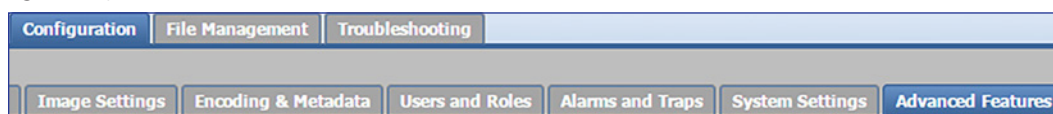


Figure 55. Configuration Tab, Advanced Features Subtab

The **Advanced Features** page opens (see figure 56), to the **Browser Client** (1) and **FlexOS Apps** (2) panels.

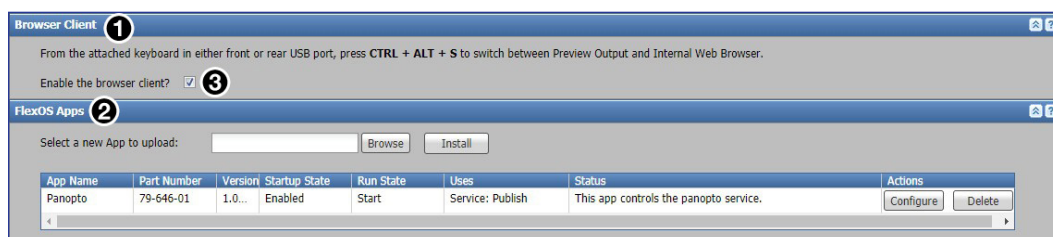


Figure 56. Advanced Features Page

Control the SMP 111 Using an Internal Browser Client

The SMP 111 can be configured to run a web browser client application for direct control if a standalone computer is not available on site. If enabled, the internal browser provides access to a subset of the **Network (IP) Settings** configuration panel.

To set up the SMP 111 for local control using its internal browser client:

1. On a computer connected to the same network as the SMP, open a browser, enter the IP address of the unit into the address field, and connect to the SMP web pages.
2. Click the **Configuration** tab at the top of the SMP web pages and then click the **Advanced Features** tab on the second tier of tabs.
3. Select (check) the **Enable the browser client?** checkbox (3) in the **Browser Client** panel.

NOTE: The following steps do not require a computer and do not require the SMP to be connected to a network.

4. Connect a monitor and a keyboard and mouse directly to the SMP 111 (see **Control System and External Device Connections** on page 13).
 - Connect the keyboard to either the front or the rear USB port.
 - Connect the mouse to the other (rear or front) USB port.
 - Connect a display to the local HDMI Out port on the rear panel.
5. By default, the local output shows the preview (streaming) image on the connected monitor or display. To switch between viewing the preview and viewing the network configuration page, press **<Ctrl+Alt+S>** on the keyboard connected to the SMP.

NOTE: The default web page allows configuration of the network settings.
6. Use the mouse and keyboard to navigate in the network configuration page and make changes as needed.
7. When all the changes have been completed, press the **<Ctrl+Alt+S>** keys on the keyboard to switch back from the browser client to the preview display.

Uploading a FlexOS Application to the SMP 111

Occasionally Extron develops supplemental applications or plug-ins to enhance or add functions or control options to the product. The controls in the **Advanced Features** page upload the application (app) to the SMP 111.

NOTE: Log into the [Extron website](#) with Extron Insider account information in order to download the software.

Available applications

Panopto app — This optional application enables importing Panopto Schedules and file publishing to Panopto. The Panopto app requires firmware v3.00 or newer. Scheduling and RTMP/RTMPS streaming to Panopto are enabled by Enhanced Panopto Features LinkLicense.

Kaltura app — This optional application enables importing Kaltura Schedules, RTMP streaming, and file publishing to Kaltura. The Kaltura app requires firmware v3.00 or newer.

Additional applications may become available in the future for download from the Extron website (see the *SMP 111 Embedded Web Pages Help File* to upload a FlexOS application).

File Management

The **File Management** page contains a directory of files stored in the SMP 111 and of any connected shared drives on the network, and a file upload utility so that new files can be added to the SMP. It also provides a way to connect the SMP to shared network drives and lists the URL available to upload or download files from the SMP through an SFTP client.

Within the file directory, many files or folders can be deleted, renamed, or locked. However, recordings cannot be deleted from the file directory. Only Users logged into the SMP 111 with administrator privileges can see and make changes.

NOTES:

- See **Deleting Recordings** in the *SMP 111 Embedded Web Pages Help File* for details on deleting recordings.
- See **Locking and Unlocking a Recording Package Folder** in the *SMP 111 Embedded Web Pages Help File* to prevent a recording from being automatically deleted.

To open the File Management page, click the **File Management** tab:

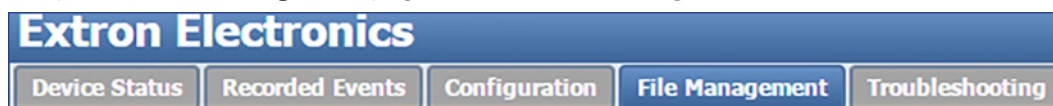


Figure 57. File Management Tab

The File Management page opens showing the File Directory (see figure 58, ❶), File Upload Utility (❷), and Accessing Internal Filesystem panes (❸):

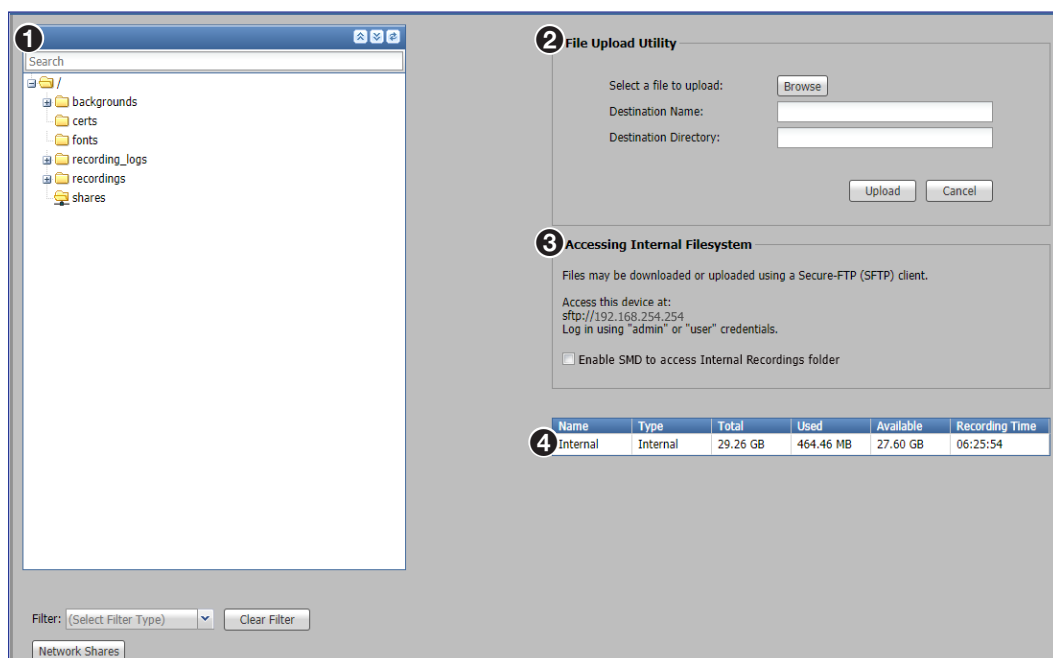


Figure 58. File Management Page

The storage information table (❹) (also displayed in **Device Status** on page 30) displays the names of the available connected storage devices, their locations (internal, USB front panel port, USB rear panel port, RCP USB), total capacity, and amount of used and available storage space. It also provides an estimate of remaining recording time for each drive. If a USB drive has more than one volume, the volumes are listed in the table.

Name	Type	Total	Used	Available	Recording Time
Internal	Internal	29.26 GB	736.97 MB	27.60 GB	08:34:32

Figure 59. Storage Information Table

This list can be sorted. Click on any of the table headings or click the arrow that appears when the user hovers the pointer over a table heading and select a sort order from the drop-down list.

See the *SMP 111 Embedded Web Pages Help File* for more information.

NOTE: Recordings stored on the internal drive can be automatically uploaded to a network server (configured in **Recorded Events > Publish Settings**). If internal storage space is nearly full and the SMP is set up to automatically upload recordings to a server, the SMP uses a disk cleanup feature to make room for new recordings. The unit automatically deletes old recordings that have already been uploaded to a server, starting with the oldest recordings, until there is enough free space on the SD card. If a recording is locked, it is not automatically deleted.

Add a Network Share

Network servers or network-attached storage drives (network shares) can be added to the file list so the SMP 111 can access files and folders stored on shared network resources.

NOTE: The size of network shares is initially unknown and there can be significant performance issues if the entire contents of every network share is indexed on every filter or search request. To provide the best performance with available resources, the searches and filtering for network shares is limited to the layer immediately below the level that the user manually expands. If the user fully expands the share, then it is fully indexed, searched, and filtered.

See the *SMP 111 Embedded Web Pages Help File* to add a network share.

Upload and Download Files Using an SFTP Client

NOTE: Recordings can be downloaded from SFTP client but recordings **cannot** be deleted from client

Automatic file uploading to a network location (see [Publish Settings](#) on page 32), the recording re-transfer (re-upload) option within the **Recording Calendar** page, and the file upload option with this **File Management** page satisfy most file transfer needs. However, if there is a need to transfer files in to or out of the SMP 111 outside of those controls, use an SFTP client utility.

To use an SFTP client utility to transfer files:

1. Click the **File Management** tab.
2. Copy the URL from the **Accessing Internal Filesystem** panel. The URL includes the SFTP protocol name (sftp), the address of the SMP 111, and also the logical port number (default: 22022) of the LAN port. For example, `sftp://192.168.194.28:22022`.
3. Open an SFTP client program.
4. Paste the URL from the SMP 111 into the host name or host address field of the SFTP client program. If necessary, delete "sftp" from the URL and select SFTP from a different field or menu and remove the port number from the URL and paste it into a port number field.
5. If an administrator password is set for the unit, enter the username and password in the appropriate fields in the SFTP client.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

6. Log into or connect to the SMP 111.
7. Use the SFTP client software to copy files (recordings, logs, images) to and from the internal storage folders on the SMP 111.
8. Disconnect from the SMP 111 (close the SFTP session).

Troubleshooting

NOTE: Only administrators have access to the **Troubleshooting** tab and can see and make changes to all settings.

The five pages within the **Troubleshooting** tab contain controls typically used during initial setup to test connections, and then later if a product support issue arises. They make it possible for an administrator to:

- View current system conditions and connections.
- View event logs and alarms.
- Test network connections.
- Reset the unit.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

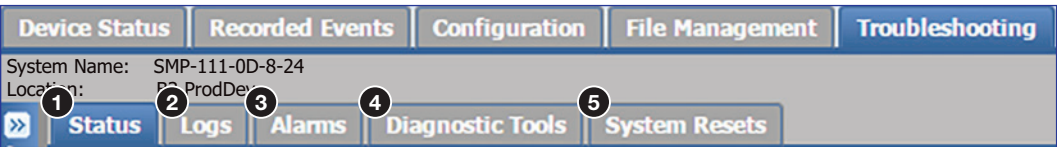


Figure 60. Troubleshooting Tab and Subtabs

The pages within **Troubleshooting** include:

- ❶ **Status** (see page 59) — Displays information about the firmware and web page versions, system and component temperatures, Ethernet connection, MAC address, date and time, as well as details about the bit rates for audio and both the recording and streaming encoder streams.
- ❷ **Logs** (see page 60) — Displays a list (log) of alerts and notices for any event set up for any status other than **Disabled** in **Configuration > Alarms and Traps > Alarm Message List**. The log can be sorted by date and time, priority, DB ID, or message. It can also be filtered, or exported to a CSV file.
- ❸ **Alarms** (see page 61) — Similar to Logs, this page displays a list of the more severe events that trigger alarms. The list can be sorted, filtered, or exported to a CSV file. Individual alarms can be cleared. Only active and recently active alarms are displayed.
- ❹ **Diagnostic Tools** (see page 62) — Provides a convenient way to test network connections using a ping utility, a route (tracert) function, or Nmap test. It also includes a feature to run other diagnostic tests that generate a debugging log.
- ❺ **System Resets** (see page 63) — Allows the user to initiate a unit reboot, delete all stored content and format the internal storage, or perform one of five different types of reset.

Status

The **Status** page within the **Troubleshooting** page displays factory-defined and user-defined information about the unit. This page contains the firmware version, MAC address, and related information about the unit. It also displays the current audio and video bit rates for all encoding streams.

Some of the information in this page can also be found using SIS commands (see the [Command and Response Tables](#) starting on page 72).

To open this page, click the **Troubleshooting** tab (see figure 61) at the top of the SMP 111 embedded web pages and then click the **Status** tab on the second tier of tabs.

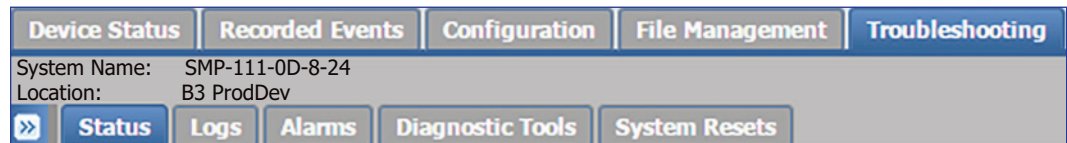


Figure 61. Troubleshooting Tab, Status Subtab

The **Status** page opens, showing the **Detailed System Status** (see figure 62, ❶) and **Encoder Status** (❷) panels.

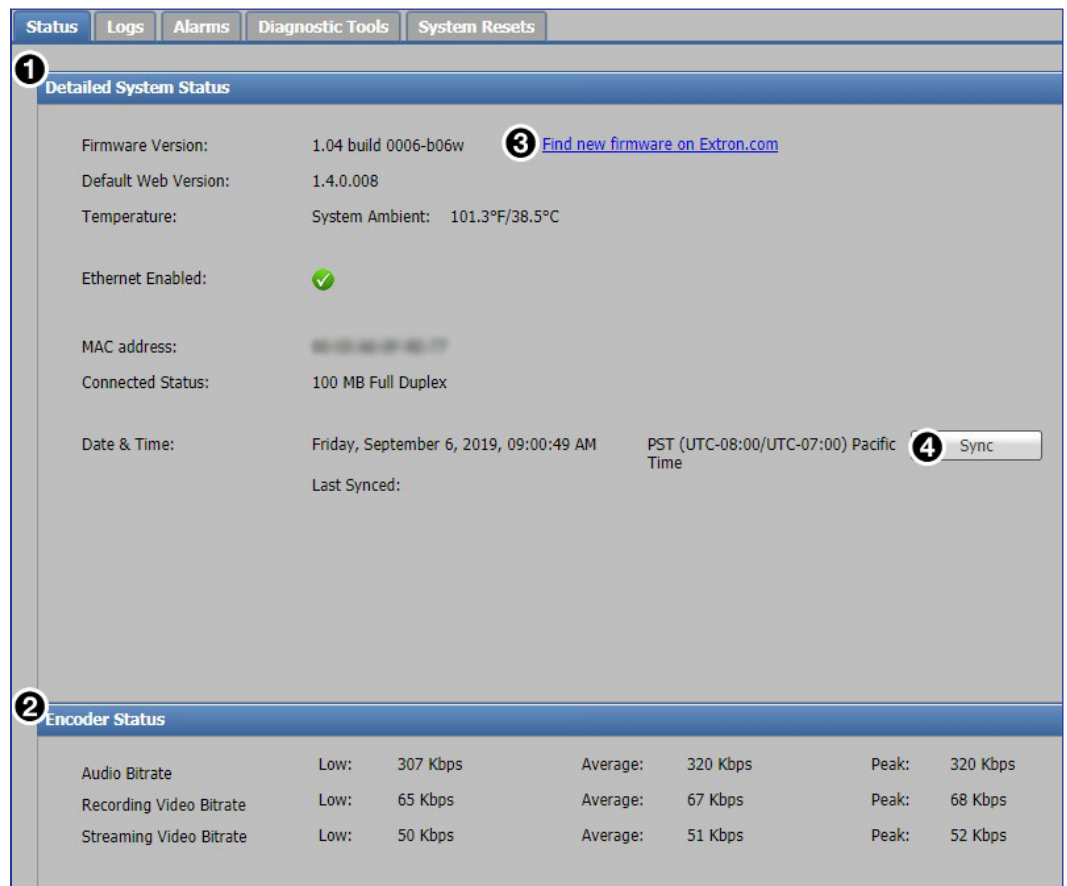


Figure 62. Troubleshooting, Status Page

All of the items on this page are read-only except the hyperlink to the Extron website **Find new firmware on Extron.com** (❸) where updated firmware for the unit is located, and the **Sync** button (❹) which commands the unit to sync its internal clock time and date with the settings from an NTP server.

Logs

The **Logs** page within **Troubleshooting** displays a list (log) of alerts and notices for any event set up for any status other than **Disabled** in **Configuration > Alarms and Traps > Alarm Message** pane. All log entries are read-only. The logs can be sorted, filtered, searched, or exported to a comma-separated values (CSV) file.

To open this page, click the **Troubleshooting** tab (see figure 63) at the top of the embedded web pages, then click the **Logs** tab on the second tier of tabs.

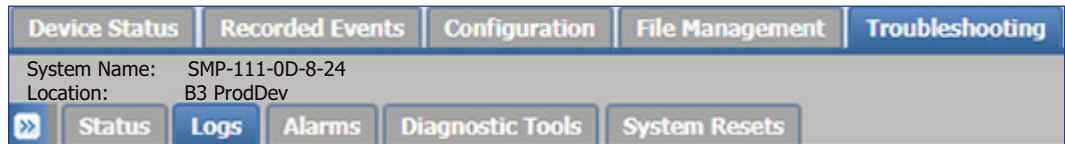


Figure 63. Troubleshooting Tab, Logs Subtab

The **Logs** page opens, showing filtering controls and the log list (see figure 64).

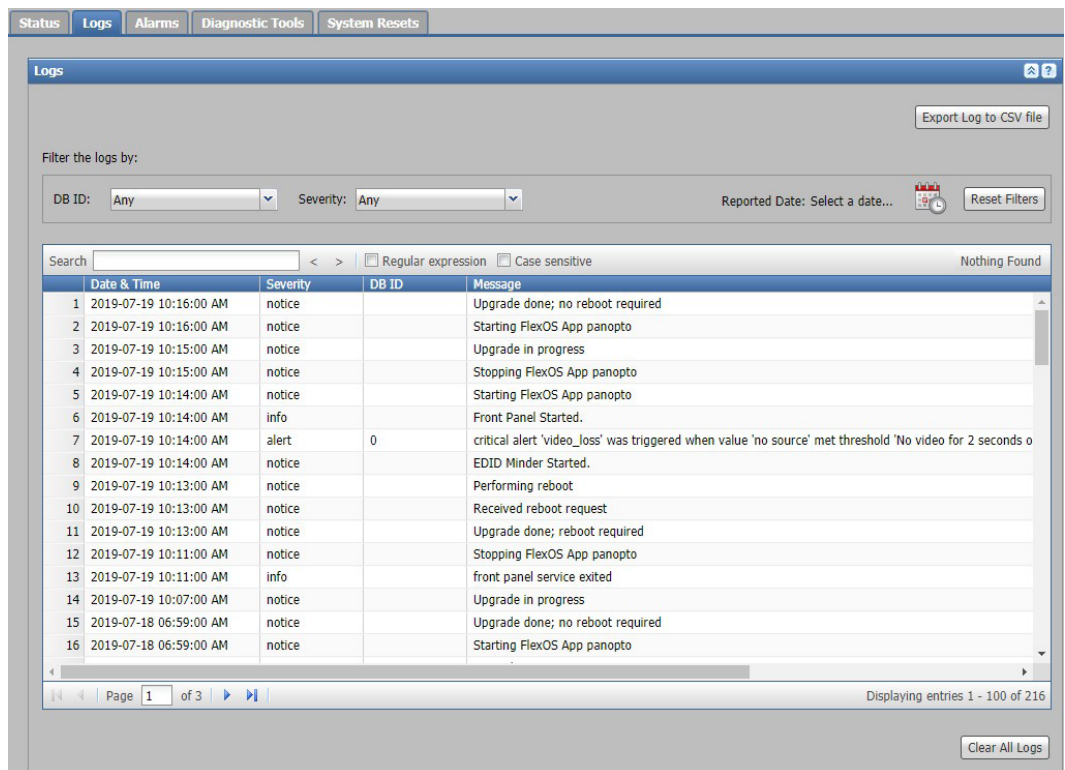


Figure 64. Troubleshooting, Logs Page

See the *SMP 111 Embedded Web Pages Help File* to for further information.

Alarms

The **Alarms** page within **Troubleshooting** displays a list of alerts for events as determined in **Configuration > Alarms and Traps > Alarm Message List**. Alarm list entries here are read-only, but alarms can be muted or cleared. The alarm list can be sorted, filtered, searched, or exported to a comma-separated values (CSV) file.

To open this page, click the **Troubleshooting** tab (see figure 65) at the top of the SMP 111 embedded web pages, then click the **Alarms** tab on the second tier of tabs.

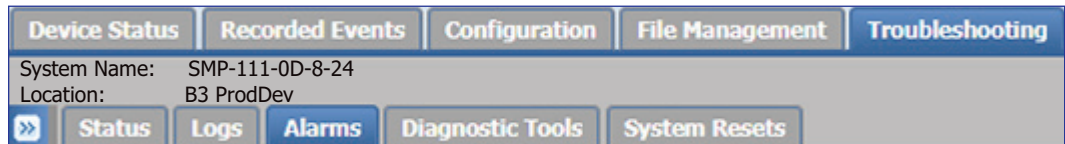


Figure 65. Troubleshooting Tab, Alarms Subtab

The **Alarms** page opens, showing filtering controls and the alarm history list.

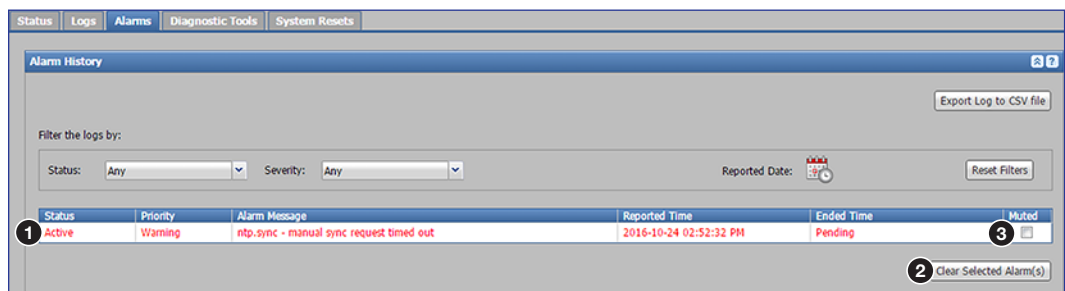


Figure 66. Troubleshooting, Alarms>Alarm History

- Active, unresolved alarms are displayed as red text (see figure 66, ❶).
- To clear or remove an alarm, click the row it is listed in and click **Clear Selected Alarm(s)** (❷).
- To mute an alarm, so that it does not appear in the alarm list again the next time it is triggered, select the **Muted** checkbox (❸) for that alarm.

See the *SMP 111 Embedded Web Pages Help File* for further information about the **Alarms** page.

Diagnostic Tools

The **Diagnostic Tools** page within **Troubleshooting** provides a convenient way to test network connections using a ping utility, a trace route (tracert) function, and an Nmap network discovery tool. It also allows the user to generate a log file that can be sent to Extron support staff to aid in troubleshooting problems with the unit or the system.

To open this page, click the **Troubleshooting** tab (see figure 67) at the top of the embedded web pages and then click the **Diagnostic Tools** tab on the second tier of tabs.

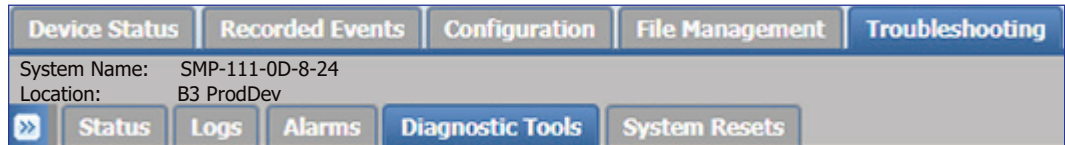


Figure 67. Troubleshooting Tab, Diagnostic Tools Subtab

The Diagnostic Tools page opens.

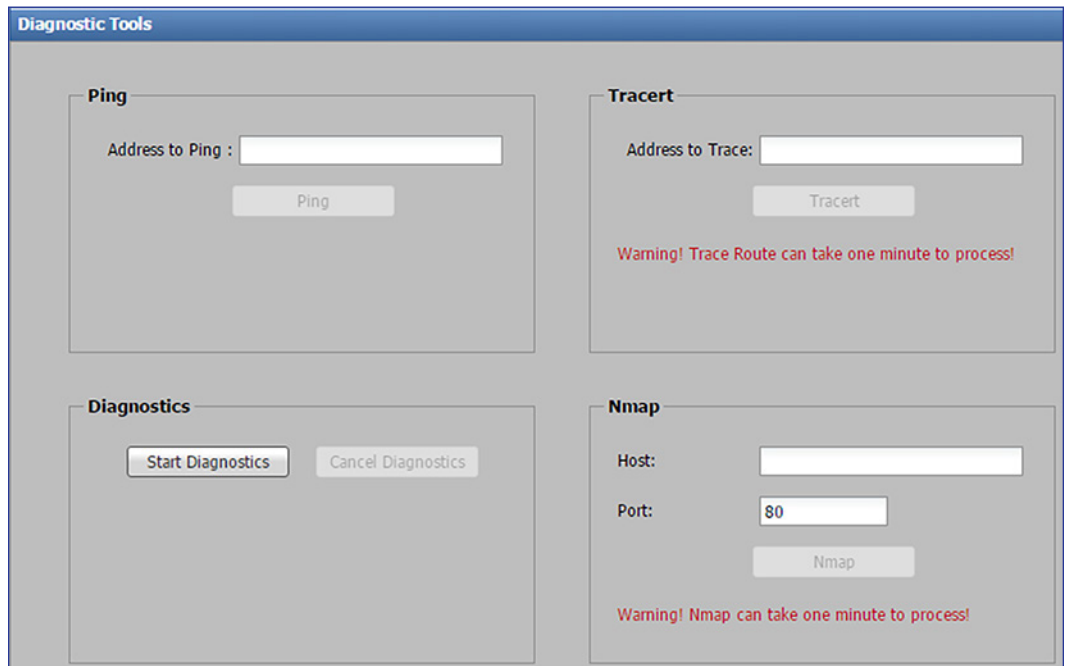


Figure 68. Troubleshooting, Diagnostic Tools

See the *SMP 111 Embedded Web Pages Help File* for further information about the Diagnostic Tools page.

System Resets

The **System Resets** page within **Troubleshooting** contains options to initiate a unit reboot, delete all stored content and format the internal storage, or perform one of five different types of reset. Some of the reset options offered here can also be performed using SIS commands.

To open this page, click the **Troubleshooting** tab (see figure 69) at the top of the embedded web pages and then click the **System Resets** tab on the second tier of tabs.

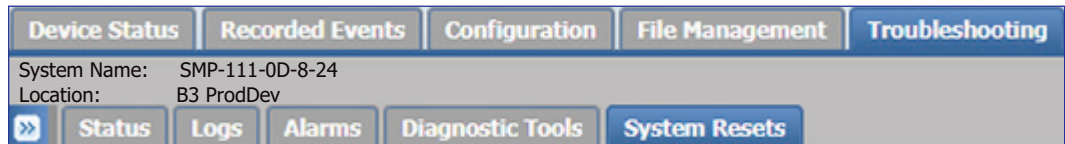


Figure 69. Troubleshooting Tab, System Resets Subtab

The **System Resets** page opens to the **Reset** panel.

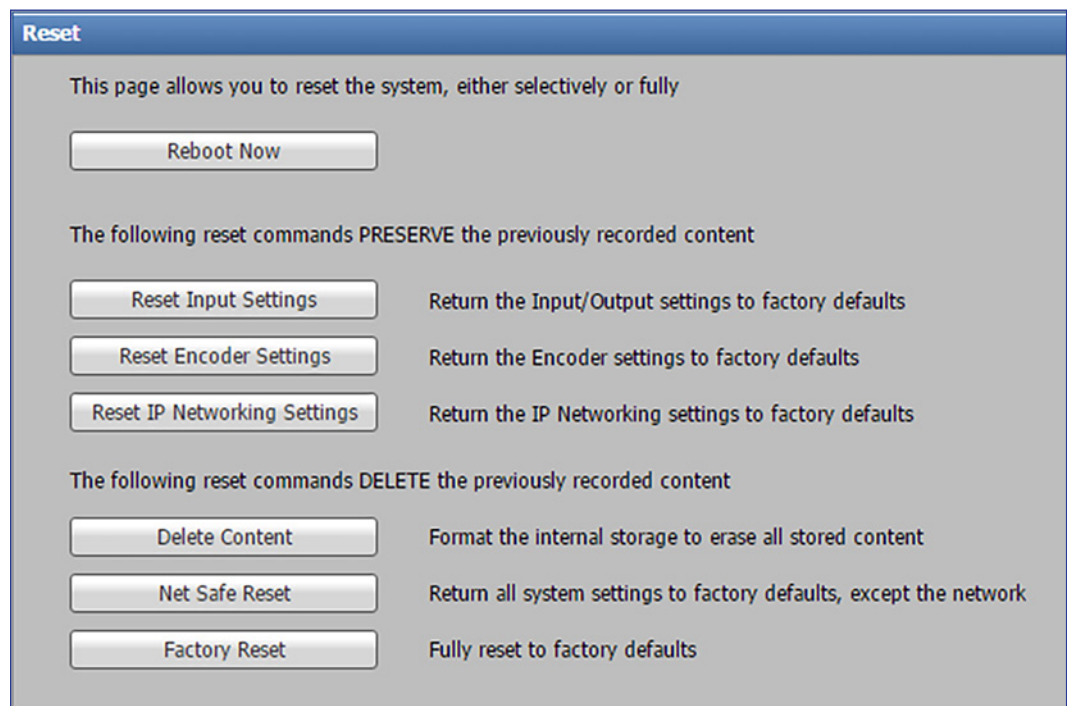


Figure 70. System Resets Page

Each option within this page includes a description of its function. To perform a reboot, reset, or content deletion (storage reformatting), click the button for the desired option.

When a reset or reboot is performed, the unit reboots and loses its network connection.

- After a reset or reboot, it may take a few minutes for the SMP to restart and connect to the network. Refresh the browser window to reconnect to the unit.
- For **Reset IP Networking Settings** and **Factory Reset**, all IP addresses and network settings are reset to factory defaults. Connect again using the default addresses.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

See the *SMP 111 Embedded Web Pages Help File* for information about the system resets.

Mirroring LinkLicense

If the SMP has been upgraded with the Horizontal Video Mirroring LinkLicense, the web UI has a **Mirroring LinkLicense** tab. The **Mirror LinkLicense** page has two panels:

- Recording Settings
- Horizontal Video Mirroring Settings

These panels are used to configure the SMP for one button recording.

To open this page, click the **Mirroring LinkLicense** tab at the top of the embedded web pages (see figure 71).

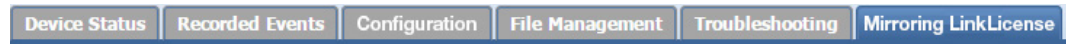


Figure 71. Mirroring LinkLicense Tab

The **Mirroring LinkLicense** page opens with two expandable panels (see figure 72).

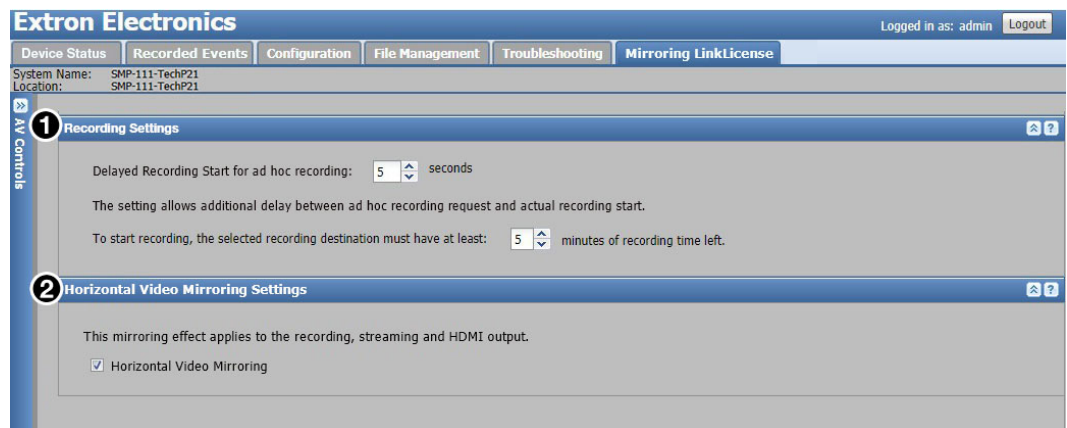


Figure 72. Mirror LinkLicense Page

The panels in the **Mirror LinkLicense** page are:

1 Recording Settings —

- Set the delay time to start recording after the record command has been issued (default is 5 seconds).
- Set the minimum recording time on a recording destination (default is 5 minutes).

2 Horizontal Video Mirroring Settings — Enable **Horizontal Video Mirroring** for one input. This feature shows the video or stream as a reflected image on the central vertical axis, as the SMP flips the video horizontally, to allow the notes to be displayed correctly, if the presenter is standing behind a glass marker board, facing the camera to address the audience while writing notes on the board.

For detailed information on configuring the **Mirroring LinkLicense** page settings, see the *SMP 111 Embedded Web Pages Help File*.

Remote Communication and Control

This section describes Simple Instruction Set (SIS) command programming and control of the SMP 111, including:

- **Connection Options**
- **Host-to-device Communications**
- **Command and Response Tables**

The SMP 111 Streaming Media Processor can be configured and controlled using SIS commands or embedded web pages. SIS commands can be executed using the Extron DataViewer program, found on the Extron website at www.extron.com.

Connection Options

The SMP 111 can be remotely connected via a host computer or other device (such as a control system) to the rear panel RS-232 port, the LAN port, or the front panel USB Config port.

RS-232 Port

The SMP 111 has a rear panel serial port (see [figure 3](#), **F** on page 12) that can be connected to a host device such as a computer running a HyperTerminal utility, or the Extron DataViewer utility, making serial control of the SMP possible. Use the protocol defaults to make the connection.

RS-232 protocol defaults:

- 9600 baud
- no parity
- 1 stop bit
- 8 data bits
- no flow control

Front Panel Configuration Port

The mini type B USB port is located on the front panel (see [Front Panel Features](#) on page 17). It connects to a host computer for configuration using SIS commands with DataViewer, available at www.extron.com.

USB port details:

The Extron USB driver must be installed before use.

NOTE: If an Extron USB device has never been connected to the host computer, prior to connecting the SMP 111 Config (USB) port for the first time, the USB driver must be installed and activated. The simplest way to do this is to install Dataviewer (see [DataViewer](#) on page 92).

Ethernet (LAN) Port

The rear panel LAN connector on the device can be connected to an Ethernet LAN or WAN. Communication between the device and the control system or PC is via Telnet (a TCP socket using port 23). The Telnet port can be changed, if necessary, via SIS or using the SMP 111 web user interface. This connection makes SIS control of the device possible using a control system or PC connected to the same LAN or WAN. The SIS commands and behavior of the product are common to the commands and behavior the product exhibits when communicating by serial port or USB.

LAN port defaults:

- DHCP: off
- SMP 111 IP address: 192.168.254.254
- Subnet mask: 255.255.0.0
- Gateway IP address: 0.0.0.0

Ethernet Connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for the specific application.

- **Crossover cable** — Direct connection between the computer and the SMP.
- **Patch (straight) cable** — Connection of the SMP to an Ethernet LAN.

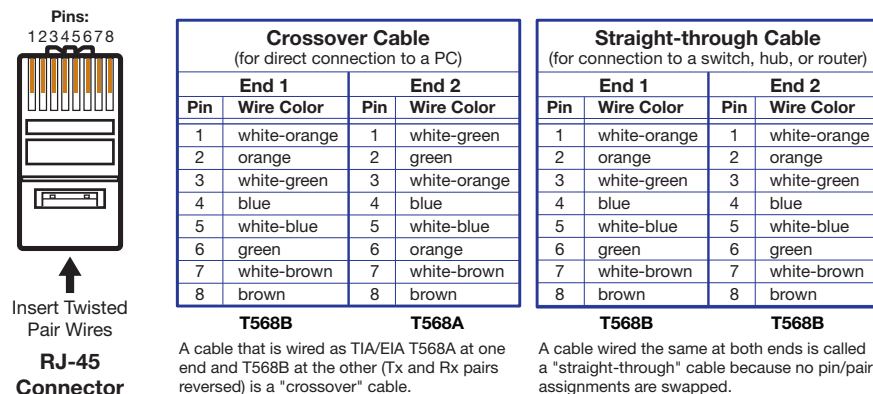


Figure 73. RJ-45 Ethernet Connector Pin Assignments

To establish a network connection to the SMP:

1. Open a TCP socket to port 23 using the SMP 111 IP address.

NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.

2. The SMP responds with a copyright message including the name of the product, firmware version, part number, and the current date and time. A Password prompt appears below the copyright message.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

3. Enter the appropriate administrator or user password.
 - If the password is accepted, the device responds with Login User or Login Administrator.
 - If the password is not accepted, the Password prompt reappears.

Connection Timeouts

The Ethernet link times out after a designated period of time with no communication. By default, this timeout value is 5 minutes, but the value can be changed (see [Set current port timeout](#) on page 77).

NOTE: Extron recommends leaving the default timeout at 5 minutes and periodically issuing the Query (Q) command to keep the connection active. If there are long idle periods, disconnect the socket and reopen the connection when another command must be sent.

Verbose Mode

Telnet connections can be used to monitor for changes that occur, such as SIS commands from other Telnet sockets or serial port changes. For a Telnet session to receive change notices, the Telnet session must be in verbose mode 1 or 3. In verbose mode 1 or 3, the Telnet socket reports changes in messages that resemble SIS command responses.

Host-to-device Communications

The SMP 111 accepts SIS commands through the rear panel Remote RS-232 port, the front panel Config port, and the rear panel Ethernet (LAN) port. SIS commands consist of one or more characters per command field. They do not require special characters to begin or end the command character sequence. Each response to an SIS command ends with a carriage return and a line feed (CR/LF = `↵`), which signals the end of the response character string. A string is one or more characters.

SMP 111 - Initiated Messages

The SMP 111 initiates messages under specific conditions. No response is required from the host. The SMP 111 initiated message is as follows:

```
↵@ Copyright 2014-2016, Extron Electronics, SMP 111, Vn.nn, 60-1594-01↵  
Day, DD MMM YYYY HH:MM:SS↵
```

The SMP sends the copyright messages under the following circumstances:

- If the SMP is off and an RS-232 connection is already set up (the PC is cabled to the SMP and a serial communication program such as DataViewer is open), the connected unit sends these messages via RS-232 when first powered on.
- If the SMP is on, it sends the copyright message when a Telnet connection to the SMP is first opened. The day of the week, date, and time are shown when the SMP is connected via Telnet, but not via RS-232. If using a Telnet connection, the copyright message, date, and time may be followed by a password prompt.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

Password Information

The `↵Password:` prompt requires a password (administrator level or user level) followed by a carriage return. The prompt is repeated if the correct password is not entered.

If the correct password is entered, the unit responds with `↵Login Administrator↵` or `↵Login User↵`, depending on the password entered. If passwords are the same for both administrator and user, the unit will default to administrator privileges.

Error Responses

When the SMP is unable to execute the command, it returns an error response to the host. The error response codes and their descriptions are as follows:

- | | |
|--|---------------------------------------|
| E10 – Unrecognized command | E22 – Busy |
| E12 – Invalid port number | E24 – Privilege violation |
| E13 – Invalid parameter (number is out of range) | E25 – Device not present |
| E14 – Not valid for this configuration | E26 – Maximum connections exceeded |
| E17 – Invalid command for signal type | E28 – Bad file name or file not found |
| E18 – System timed out | |

Using the Command and Response Tables

The **Command and Response Tables** begins on page 72. Symbols used in the table represent variables in the command and response fields. Command and response examples are shown throughout the table. The SIS commands are not case sensitive. The ASCII to Hex conversion table below is for use with the command and response table.

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

Figure 74. ASCII to Hex Conversion

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

Symbol definitions

- ↵ = CR/LF (carriage return/line feed)
- | or = Pipe character or carriage return (no line feed, hex 0D)
- = Space
- Esc** = Escape
- or W
- X1** = Mode
 - 1 = Record
 - 2 = Stream
- X2** = Audio Channels
 - 40000 = Analog audio left
 - 40001 = Analog audio right
 - 40002 = HDMI audio left
 - 40003 = HDMI audio right
 - 60000 = Output (Left, for audio mute control only)
 - 60001 = Output (Right, for audio mute control only)
- X3** = Horizontal and Vertical start — 0 to 255
Default = 128 (Read only command)
- X4** = Total lines
- X5** = Total pixels — Up to ± 512 of the default value for the detected rate
- X6** = Active pixels — Up to ± 512 of the default value for the detected resolution (range varies based on input resolution)
- X7** = Active lines — Up to ± 256 of the default value for the detected resolution (range varies based on input resolution)
- X8** = On/Off:
 - 0 = Off
 - 1 = On
- X9** = HDCP status
 - 0 = No sink/source undetected
 - 1 = HDCP detected
 - 2 = Sink/source detected but no HDCP
- X10** = Input and preset names, up to 16 characters
- X11** = Brightness/contrast — 1 to 127
- X12** = Horizontal and vertical position — The range varies such that the window never goes completely off-screen (5-digit response).
- X13** = Horizontal and vertical size — 00120 to 04096 (5-digit response)
- X14** = Test pattern
 - 0 = Off (default)
 - 1 = Colorbars
 - 2 = Aspect ratio 1.33
 - 3 = Aspect ratio 1.78
 - 4 = Aspect ratio 1.85
 - 5 = Crop
 - 6 = Pulse (audio test pattern)
 - 7 = Timestamp
 - 8 = Universal OSD
- X15** = Output Resolution
 - 0 = 512x288
 - 1 = 480p
 - 2 = 720p (Default)
 - 3 = 1080p
 - 4 = 1024x768
 - 5 = 1280x1024
- X16** = Output refresh rate
 - 1 = 60 Hz
 - 2 = 50 Hz
- X17** = Input presets — 1 to 128 (two digit response — 0 padding)
- X18** = Aspect ratio
 - 1 = Fill (the input automatically fills the entire output raster; default)
 - 2 = Follow (the input is displayed in its native aspect ratio)
 - 3 = Fit (the input is zoomed in to fill the entire output raster while maintaining its aspect ratio)
- X19** = Metadata parameter
 - 0 = Contributor
 - 1 = Coverage
 - 2 = Presenter
 - 3 = Date (view only)
 - 4 = Description
 - 5 = Format
 - 6 = Identifier (view only)
 - 7 = Language
 - 8 = Publisher
 - 9 = Relation
 - 10 = Rights
 - 11 = Source
 - 12 = Subject
 - 13 = Title
 - 14 = Type
 - 15 = SystemName
 - 16 = Course

NOTE: The "view only" values return a response only while recording.

- X20** = Metadata value — 127 alpha-numerical characters
- X21** = Record status
 - 0 = Stop
 - 1 = Record
 - 2 = Pause
 - 3 = Finalizing
- X22** = Audio delay — 0 to 999 milliseconds
- X23** = Front panel audio level indication
-1500 to 0 (in .01 dBfs step)
- X24** = Output frame rate
 - 1 = 30
 - 2 = 25
 - 3 = 24
 - 4 = 15
 - 5 = 12.5
 - 6 = 12
 - 7 = 10
 - 8 = 5
- X25** = Output mode
 - 1 = Video and audio
 - 2 = Audio only
 - 3 = Video/audio + audio only
 - 4 = Analog Dual Mono
 - 5 = Dual Mono + HDMI
- X26** = Bit rate control and type
 - 0 = VBR
 - 1 = CVBR
 - 2 = CBR
- X27** = Video bit rate target — 200 to 10000
Default = 5000
- X28** = Audio input gain in 0.1 dB steps
(-180 to 240 = -18.0 to +24.0 dB)
- X29** = GOP length — 1 to 300 (Default = 30)
- X30** = Audio format
 - 0 = Disable audio
 - 1 = Analog
 - 2 = PLCM 2 CH (Default)
- X31** = Presets — 1 to 16
(Two digit response — 0 padding)
- X32** = Audio bit rate — 80, 96, 128, 192 (Default), 256, 320 kbps
- X33** = Mute status
 - 0 = Off (unmuted)
 - 1 = On (muted)
- X34** = EDID numbers — 1 to 38
- X35** = Overscan
 - 0 = 0 % (Default)
 - 1 = 2.5 %
 - 2 = 5.0 %
- X36** = Encode profile
 - 0 = Base
 - 1 = Main
 - 2 = High
- X37** = Audio output
 - 1 = HDMI only
 - 2 = Analog only
 - 3 = HDMI and Analog
 - 4 = Analog Dual Mono
 - 5 = Dual Mono + HDMI
- X38** = Record mode
 - 0 = Off
 - 1 = Single
 - 2 = Secondary
- X39** = EDID user slots — 1 to 3
- X40** = Streaming method
 - 0 = Disabled
 - 1 = RTMP
 - 2 = RTSP
 - 3 = Push RTP
- X41** = RTMP URL (String)
- X42** = Json string of recording profile parameters —
Example: {"id":1,"name":"RECORD PROFILE 01",
"mode":"audio and video",
"contributor":"Contributor1",
"coverage":"Coverage1",
"presenter":"Presentor1",
"description":"Description1",
"format":"Format1",
"language":"Language1",
"publisher":"Publisher1",
"course_id":"Course1",
"copyright":"Copyright1",
"source":"Source1",
"subject":"Subject1",
"title":"Title1",
"license":"License1"}
- X43** = Recording destination
 - 0 = Auto
 - 1 = Internal
 - 2 = Front USB
 - 3 = Rear USB
 - 4 = RCP USB
 - 11 = Internal and auto
 - 12 = Internal and Front USB
 - 13 = Internal and Rear USB
 - 14 = Internal and RCP USB
- X44** = Configuration type
 - 0 = IP Config (ip.cfg)
 - 2 = Box specific parameters (box.cfg)
- X45** = Firmware version number

- X46** = Device name (63 characters, max)
Must comply with internet host name standards.
- X47** = Day, date, and time
(Day,•MM•DD•YY-HH:MM:SS)
- X48** = Time zone acronym (2 to 6 letters)
- X49** = Greenwich Mean Time (GMT) offset value:
-12:00 to 14:00. Represents hours and minutes (HH:MM) offset from GMT including the time zone name.
- X50** = IP address in dotted decimal notation (xxx.xxx.xxx.xxx)
Default IP address: 192.168.254.254 (no padding)
Default gateway IP address: 0.0.0.0
Default DNS server IP address: 0.0.0.0
- X51** = Subnet mask
Default: 255.255.0.0 (no padding)
- X52** = Hardware MAC address
(00-05-A6-NN-NN-NN)
- X53** = Delay duration in seconds — 5 to 60.
- X54** = Status
0 = Offline
1 = live
- X55** = Valid DB_ID number (integer). Enter 0000 to delete all.
- X56** = Eject USB Storage
0 = All USB storage
2 = USBFront
3 = USBRear
4 = USBRCP
- X57** = RS-232 baud rate: 9600 (Default), 19200, 38400, 57600, 115200
- X58** = RS-232 parity: Single letter:
Odd, Even, None (Default), Mark, Space.
- X59** = RS-232 data bits: 7, 8 (Default)
- X60** = RS-232 stop bits: 1 (Default), 2
- X61** = Password: Maximum length 128 characters. All alpha-numeric characters and ASCII symbols permitted except |, and "single space". Passwords are case-sensitive.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see **Password and Security Settings** on page 78 to change a password).

- X62** = Port timeout in tens of seconds (zero padded.
Default: 00030 = 300 seconds)
 - X63** = Default name: Combination of model name and last three pairs of MAC address (example: SMP-111-07-8C-EC)
 - X64** = SNMP contact name text, up to 64 characters
(Default = "Not Specified").
 - X65** = SNMP location, up to 64 characters (Default = "Not Specified").
 - X66** = SNMP public community string, up to 64 characters (Default = "public").
 - X67** = SNMP private community string, up to 64 characters (Default = "private")
- NOTE:** SNMP names and community strings can be up to 64 alphanumeric characters including hyphens, underscores, and periods.
- X68** = Verbose mode
0 = Clear/none (Default for Telnet connections)
1 = Verbose mode (Default for USB and RS-232 host control)
2 = Tagged responses for queries
3 = Verbose mode and tagged responses for queries
 - X69** = Extend scheduled recording: 0 to 99 minutes
 - X70** = RTSP Stream name (string)
 - X71** = Stream destination: The destination IP address or host name (determines unicast or multicast operation)
 - X72** = Stream port number
 - X73** = Horizontal Video Mirroring
0 = Off/disabled
4 = On/enabled

Command and Response Tables

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Information Requests			
NOTE: An asterisk (*) after the version number indicates the currently running version. Question marks (? . ? ?) indicate that only factory firmware is loaded. A caret (^) indicates the firmware version that should be running, but a Mode 1 reset (see SMP 111 Rear Panel Reset on page 15) was executed and the default factory firmware is running. An exclamation point (!) indicates corrupted firmware. These apply to 0Q-4Q.			
Firmware version	Q or 1Q	[X45]↵	Firmware version to 2 decimal places (1.00).
Firmware and build version	*Q/q	[X45]↵	Firmware version to 2 decimal places plus build number to 4 decimal places (1.12.1234).
Verbose version info	0Q	Sum of 2Q-3Q-4Q↵	Show bootstrap, factory-installed, and updated firmware version.
Bootstrap Version	2Q	[X45]↵	The bootstrap firmware is not user replaceable but this information may be needed for troubleshooting.
Factory Firmware Version	3Q	[X45] plus web ver.-desc-UL date/time↵	Factory installed firmware is not user replaceable. This firmware is the version the SMP reverts to after a Mode 1 reset.
Example:	3Q	1.00.0000-b2325(1.81LX-SMP 111 -Sat, 01 Nov 2014 20:10 UTC)↵	
Updated firmware version	4Q	[X45] plus web ver.-desc-UL date/time↵	Use this command to find out which version of firmware has been uploaded into the SMP 111.
Example:		1.00.0004-b2635*(1.81LX-SMP 111 -Sun, 02 Nov 2014 00:12 UTC)↵	
KEY: [X45] = Firmware version number			
Query part number	N	60-1594-01↵	
Query model name	1I	Example: SMP•111↵	
Query model description	2I	Streaming•Media•Processor↵	
Query system memory usage	3I	#Bytes used out of #KBytes↵	
Query location	5I	<Location>↵	
Query internal drive free space	15I	internal*xx.xxGB↵	
Query USB drive free space	16I	<drive volume>*xx.xxMB,<drive volume>*xx.xxMB↵	
View stream resolution and frame rate	31I	<Stream resolution>*<Frame rate>↵	
Example:		1280x720*30	
View record resolution and frame rate	33I	<Stream resolution>*<Frame rate>↵	
Example:		1280x720*30	
Query selected storage (single recording)	37I	<Stream resolution>*<Frame rate>↵	
Query selected storage (secondary recording)	37I	<internal*Selected USB Storage>↵	
Query MAC address	98I	Example: 00:05:A6:HH:HH:HH↵	Returns MAC address.
Query serial number	99I	Example: A13VE3R↵	Returns the serial number.
Query LinkLicense	[Esc]LELIC↵	<LinkLicense Name>,<79-xxx-xx>↵↵	Returns ↵↵↵, if license not installed.

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Information Requests (continued)			
View number of connected users	10I	N←	Number of users.
View system processor usage	11I	NN←	Returns a percentage of total.
View system processor idle	12I	NN←	Returns a percentage of total.
View Eth0 network link status	13I	Current link state (up/down)* speed in MB (10/100/1000)*mode (full/half)←	
View file transfer config	38I	Example: \\Network_Storage\Folder, cifs←	
Clear active alarms	[Esc]CALRM←	Alrm C←	Clear all active alarms.
View active alarms	39I	<name:alarm_name>,<level:alarm_level>...<← If no active alarms: None active←	
Set unit name	[Esc][X46]CN←	Ipn[X46]←	
Set unit name to default	[Esc]•CN←	Ipn[X63]←	
View unit name	[Esc]CN←	[X46]←	
View Telnet connections	[Esc]CC← Verbose mode 2/3	N← Icc N←	N = Number of active IP connections.
Set verbose mode	[Esc][X68]CV←	Vrb[X68]←	
View verbose mode	[Esc]CV←	[X68]←	
NOTE: If tagged responses is enabled, all read commands return the data, the same as setting the value does (Example: command: [Esc]CV← Response: Vrb3←)			
KEY: [X46] = Unit name Unit name is a text string of up to 63 characters from the alphabet (A-Z), digits (0-9), and the minus sign/hyphen (-). The first character must be an alpha character. The last character must not be a minus. [X63] = Default name Combination of model name and last three pairs of MAC address (Example: SMP-111-07-8C-EC) [X68] = Verbose/Response mode 0 = Clear/none (Default for Telnet connections) 1 = Verbose mode (Default for USB and RS-232 host control) 2 = Tagged responses for queries 3 = Verbose mode and tagged responses for queries			
Query RCP	50I	<model name>*<part number>*<firmware>←	
View information of the attached wallplate or AAP	Verbose mode 2/3	Inf50*<model name>*<part number>*<firmware>←	
Query installed FlexOS app or apps (firmware v3.00 or newer)	60I	<app name>*<ver#>*<enable/disable>← <app name>*<ver#>*<enable/disable>← <app name>*<ver#>*<enable/disable>←← Example: Panopto*1.03.0001*1← Kaltura*1.02.0001*1←←	1= run state enabled 0= run state disabled
Storage Information			
Query internal	55I	Internal*<used>*<total>*<free>*<recording_time>*<active>←	
Query Front USB	56I	<name>*<used>*<total>*<free>*<recording_time>*<active>,<name>*<used>*<total>*<free>*<recording_time>*<active>...←	
Query Rear USB	57I	<name>*<used>*<total>*<free>*<recording_time>*<active>,<name>*<used>*<total>*<free>*<recording_time>*<active>...←	
Query RCP USB	58I	<name>*<used>*<total>*<free>*<recording_time>*<active>,<name>*<used>*<total>*<free>*<recording_time>*<active>...←	

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Backup/Restore			
Save configuration	[Esc] 1* [X44] XF ←	Cfg1* [X44] ↵	Save configuration to file location (/nortxe-backup).
Restore configuration	[Esc] 0* [X44] XF ←	Cfg0* [X44] ↵	Load configuration from file location (/nortxe-backup).
Front Panel Lock (Executive Mode)			
Enable	1X	Exe1 ↵	Disable all front panel controls.
Disable	0X	Exe0 ↵	Enable all front panel controls.
View status	X Verbose mode 2/3	[X8] ↵ Exe [X8] ↵	Show executive mode status.
KEY: [X8] = Executive mode 0 = Off 1 = Complete lockout (no front panel control); [X44] = Configuration type 0 = IP config (ip.cfg) 2 = Box specific parameters (box.cfg)			
Resets			
NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password.			
Reboot system	[Esc] 1BOOT ←	Boot1 ↵	Complete system reboot.
Restart the network	[Esc] 2BOOT ←	Boot2 ↵	
Reset flash	[Esc] ZFFF ←	Zpf ↵	Reset flash memory (excludes recording files).
System Reset (factory defaults)	[Esc] ZXXX ←	Zpx ↵	Resets device to default and deletes recorded files.
Reset all device settings and delete recording files	[Esc] ZY ←	Zpy ↵	Reset to default except IP address, delete all user and recorded files.
NOTE: This reset excludes IP settings such as IP address, subnet mask, gateway IP address, unit name, DHCP setting and port mapping (Telnet/web/direct access) in order to preserve communication with the device.			
Absolute reset	[Esc] ZQQQ ←	Zpq ↵	Same as System Reset , plus resets the IP address and subnet mask to defaults.
File Commands			
Change directory	[Esc] path/directory/CJ ←	Dir1 path/directory/ ↵	
Return to root directory	[Esc] /CJ ←	Dir1/ ↵	
Up one directory	[Esc] ..CJ ←	Dir1 path/directory/ ↵	
View current directory	[Esc] CJ ←	path/directory/ ↵	
Erase current directory and included files	[Esc] /EF ←	Dd1 ↵	Also deletes files inside directory.
Erase current directory and sub-directories	[Esc] //EF ←	Dd1 ↵	
List files from current directory and below	[Esc] LF ←	path/filename•date/ time•length ↵ path/filename•date/ time•length ↵ path/filename•date/ time•length ↵ ... space_remaining•Bytes Left ↵ ↵	filename/date/time/bytes left

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Port Assignment			
NOTES: <ul style="list-style-type: none"> Duplicate port# assignments are not permitted (for example, the Telnet and web port assignment cannot be the same) and will return the E13 error. Remapping of port# assignments must be to ports 1024 or higher (unless resetting to the default port number or disabling the port by setting it to 0). 			
Telnet Port			
Set Telnet port map	[Esc] [port#]MT ←	Pmt[port#]↵	
Reset Telnet port map	[Esc] 23MT ←	Pmt00023↵	Reset the Telnet port to the default value (23).
Disable Telnet port	[Esc] 0MT ←	Pmt00000↵	
View Telnet port map	[Esc] MT ←	[port#]↵	
Web Port			
Set web port map	[Esc] [port#]MH ←	Pmh[port#]↵	
Reset web port map	[Esc] 80MH ←	Pmh00080↵	Reset the web port to the default value (80).
Disable web port	[Esc] 0MH ←	Pmh00000↵	
View web port map	[Esc] MH ←	[port#]↵	
SNMP Port			
Set SNMP port map	[Esc] A[port#]PMAP ←	PmapA[port#]↵	
Reset SNMP port map	[Esc] A161PMAP ←	PmapA00161↵	Reset the SNMP port to the default value (161).
Disable SNMP port	[Esc] A0PMAP ←	PmapA00000↵	
View SNMP port map	[Esc] A PMAP ←	[port#]↵	
SSH Port			
Set SSH port map	[Esc] B[port#]PMAP ←	PmapB[port#]↵	
Reset SSH port map	[Esc] B 22023PMAP ←	PmapB 22023↵	Reset the SSH port to the default value (22023).
Disable SSH port	[Esc] B 0PMAP ←	PmapB 00000↵	
View SSH port map	[Esc] B PMAP ←	[port#]↵	
SSL Port			
Set SSL port map	[Esc] S[port#]PMAP ←	PmapS[port#]↵	
Reset SSL port map	[Esc] S 443PMAP ←	PmapS 00443↵	Reset the SSL port to the default value (443).
Disable SSL port	[Esc] S 0PMAP ←	PmapS 00000↵	
View SSL port map	[Esc] S PMAP ←	[port#]↵	
Import/Remove Certificate			
Import certificate	[Esc] I1*<filename>CERT ←	CertI1↵	
Import certificate (If passphrase needed)	[Esc] I1*<filename>*<passphrase>CERT ←	CertI1↵	
Delete user-supplied certificate	[Esc] X1CERT ←	CertX1↵	
View current certificate	[Esc] V1CERT ← Verbose mode 2/3	{"C";"US",...}↵ CertV1{"C";"US",...}↵	Multiple information fields in a JSON format

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
SNMP (Simple Network Management Protocol)			
SNMP Unit Contact			
Set unit contact	[Esc] C [X64] SNMP ←	SnmpC* [X64] ↵	Set the unit contact to [X64] .
Set unit contact to default	[Esc] C •SNMP ←	SnmpC*Not•Specified↵	
View unit contact	[Esc] CSNMP ←	[X64] ↵	
KEY: [X64] = SNMP contact name text, up to 64 alphanumeric characters, hyphens, underscores and period. (Default = "Not Specified")			
SNMP Unit Location			
Set unit location	[Esc] L [X65] SNMP ←	SnmpL* [X65] ↵	Set the unit location to [X65] .
Set unit location to default	[Esc] L •SNMP ←	SnmpL*Not•Specified↵	
View unit location	[Esc] LSNMP ←	[X65] ↵	
KEY: [X65] = SNMP location, up to 64 alphanumeric characters, hyphens, underscores and period.(Default = "Not Specified")			
SNMP Community Strings			
Set public community string	[Esc] P [X66] SNMP ←	SnmpP* [X66] ↵	Set public community string to [X66] .
Set public community string to default	[Esc] P •SNMP ←	SnmpP*public↵	
View public community string	[Esc] PSNMP ←	[X66] ↵	
Set private community string	[Esc] X [X67] SNMP ←	SnmpX* [X67] ↵	Set private community string to [X67] .
Set private community string to default	[Esc] X •SNMP ←	SnmpX*private↵	
View private community string	[Esc] XSNMP ←	[X67] ↵	
NOTE: Community strings are referred to as passwords in the web-based user interface.			
KEY: [X66] = SNMP public community string, up to 64 alphanumeric characters, hyphens, underscores and period. (Default = "public") [X67] = SNMP private community string, up to 64 alphanumeric characters, hyphens, underscores and period. (Default = "private")			
SNMP Access Enable			
Enable SNMP access	[Esc] E1SNMP ←	SnmpE*1↵	
Disable SNMP access	[Esc] E0SNMP ←	SnmpE*0↵	
View SNMP state	[Esc] ESNMP ←	[X8] ↵	
KEY: [X8] = 0 = Off or disable (Default) 1 = On or enable			
Execute Auto-Image			
Execute	A	Img0↵	Follow current aspect setting.
Execute and fill	1*A	Img1↵	Fill the entire output.
Execute and follow	2*A	Img2↵	Follow the input aspect ratio.

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
IP Setup Commands			
Set date/time	[Esc] MM/DD/YY-HH:MM:SS CT ←	Ipt • [X47] ↵	
View date/time	[Esc] CT ←	[X47] ↵	
Set time zone	[Esc] [X48] *TZON ←	Tzon • [X48] * [X49] ↵	
Example:	[Esc] PST*TZON ←	Tzon • PST*(UTC-08:00/UTC-07:00)•Pacific Time ↵	
View time zone	[Esc] TZON ←	[X48] * [X49] ↵	
Verbose mode 2/3		Tzon • [X48] * [X49] ↵	
Example:		PST*(UTC-08:00/UTC-07:00) •Pacific Time ↵	
View all time zones	[Esc] *TZON ←	[X48] * [X49] ↵ ... [X48] * [X49] ↵ ↵ ↵	Repeat for all time zones Verbose mode 2/3 adds Tzon • to start of string.
Set DHCP on	[Esc] 1DH ←	Idh1 ↵	
Set DHCP off	[Esc] 0DH ←	Idh0 ↵	
View DHCP mode	[Esc] DH ←	[X8] ↵	0 = off (Default), 1 = on.
Set IP address, subnet mask, gateway	[Esc] 1* [X50] * [X51] * [X50] CISG ←	Cisg1*IP/subnet bits*gateway ↵	
NOTE: The CISG command resets the network immediately without the need for a BOOT command.			
KEY: [X8] = On/off 0 = Disabled/unassigned/off/unmuted (Default) 1 = Enabled/assigned/on/muted [X47] = Local date/time Set: MM/DD/YY-HH:MM:SS Read: day of week, date, month, year HH:MM:SS (for example: Fri, 21 Jun 2002 10:54:00) [X48] = Time zone Acronym (2 to 6 letters). Example: PST for Pacific Standard Time [X49] = Time zone offset GMT offset value (-12:00 to 14:00) representing hours and minutes (HH:MM) local time is offset from GMT time and includes the time zone name. Example: PST*(UTC-08:00) Pacific Time			
View IP address, subnet mask, gateway	[Esc] 1CISG ← Example:	IP/subnet bits*gateway ↵ 192.168.254.254/16*0.0.0.0 ↵	
Set IP address	[Esc] [X50] CI ←	Ipi • [X50] ↵	
View IP address	[Esc] CI ←	[X50] ↵	
View hardware MAC address	[Esc] CH ← Verbose mode 2/3.	[X52] ↵ Iph • [X52] ↵	View the hardware MAC address.
Set subnet mask	[Esc] [X51] CS ←	Ips • [X51] ↵	
View subnet mask	[Esc] CS ←	[X51] ↵	
Set gateway IP address	[Esc] [X50] CG ←	Ipg • [X50] ↵	Set the gateway IP address.
View gateway IP address	[Esc] CG ←	[X50] ↵	View the gateway IP address.
Set DNS server IP address	[Esc] [X50] DI ←	Ipd • [X50] ↵	Set the DNS server IP address (Default: 0.0.0.0).
View DNS server IP address	[Esc] DI ←	[X50] ↵	View the DNS server IP address.
Set current port timeout	[Esc] 0* [X62] TC ←	Pti 0* [X62] ↵	
KEY: [X50] = IP address Default IP address: 192.168.254.254, Default Gateway: 0.0.0.0, Default DNS: 0.0.0.0 [X51] = Subnet mask Default: 255.255.0.0 [X52] = Hardware MAC address 00-05-A6-xx-xx-xx [X62] = Port timeout Port timeout in tens of seconds (zero padded. Default: 00030 = 300 seconds)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
IP Setup Commands (continued)			
View current port timeout	[Esc] 0 TC ←	[X62] ↵	
Set global IP port timeout	[Esc] 1 * [X62] TC ←	Pti1 * [X62] ↵	
View global IP port timeout	[Esc] 1 TC ←	[X62] ↵	
KEY: [X62] = Port timeout Port timeout in tens of seconds (zero padded. Default: 00030 = 300 seconds)			
RS-232 Port			
Configure serial port parameters	[Esc] 1 * [X57] , [X58] , [X59] , [X60] CP ←	Cpn01 • Ccp [X57] , [X58] , [X59] , [X60] ↵	
Reset serial port	[Esc] 1 * 9600, n, 8, 1 CP ←	Cpn01 • Ccp [X57] , [X58] , [X59] , [X60] ↵	
View serial port settings	[Esc] 1 CP ←	[X57] , [X58] , [X59] , [X60] ↵	
KEY: [X57] = RS-232 baud rate 9600 (Default), 19200, 38400, 57600, 115200 bps [X58] = RS-232 parity Odd, Even, None (Default), Mark, Space [X59] = RS-232 data bits 7, 8 (Default) [X60] = RS-232 stop bits 1 (Default), 2			
Password and Security Settings			
NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password.			
Set administrator password	[Esc] [X61] CA ←	Ipa • [X61] ↵	
View administrator password	[Esc] CA ←	**** ↵	If no password is set, the response is ↵ (no ****).
Reset (clear) administrator password	[Esc] • CA ←	Ipa • ↵	
Set user password	[Esc] [X61] CU ←	Ipu • [X61] ↵	
View user password	[Esc] CU ←	**** ↵	If no password is set, the response is ↵ (no ****).
Reset (clear) user password	[Esc] • CU ←	Ipu • ↵	
View session security level	[Esc] CK ←	n ↵	Security level of connection 11 = User, 12 = Administrator.
KEY: [X61] = Password Maximum length 128 characters. All alpha-numeric characters and ASCII symbols permitted except | and "single space".			
Safely Eject USB Storage			
Eject USB Storage	[Esc] [X56] USB E ←	Usbe [X56] ↵	
KEY: [X56] = Eject USB storage 0 = All USB storage 2 = USBFront 3 = USBRear 4 = USBRCP			
Input Name			
Set input name	[Esc] [X10] NI ←	Nmi [X10] ↵	Set the name [X10] .
View input name	[Esc] NI ←	[X10] ↵	
NOTE: To clear an input name, a single space character should be entered for [X10] . The name resets back to the default setting.			
KEY: [X10] = Preset name Up to 16 characters			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Input Video Aspect Ratio			
Set to fill	[Esc] 1ASPR ←	Aspr1↵	
Set to follow	[Esc] 2ASPR ←	Aspr2↵	
Set to fit (zoom)	[Esc] 3ASPR ←	Aspr3↵	
View aspect ratio setting	[Esc] ASPR ←	[X18] ↵	
KEY: [X18] = Aspect ratio 1 = Fill (the input automatically fills the entire output raster; default) 2 = Follow (the input is displayed in its native aspect ratio) 3 = Fit (the input is zoomed in to fill the entire output raster while maintaining its aspect ratio)			
Metadata Setup			
Set record metadata	[Esc] M [X19] * [X20] RCDR ←	RcdrM [X19] * [X20] ↵	
Example:	[Esc] M2*ProfessorX RCDR ←	RcdrM2*ProfessorX ↵	
View record metadata	[Esc] M [X19] RCDR ←	[X20] ↵	
Example:	[Esc] M2 RCDR ←	ProfessorX ↵	
KEY: [X19] = Metadata parameters 0 = Contributor 1 = Coverage 2 = Presenter, 3 = Date (view only) 4 = Description 5 = Format 6 = Identifier (view only) 7 = Language 8 = Publisher 9 = Relation 10 = Rights 11 = Source 12 = Subject 13 = Title 14 = Type 15 = SystemName. [X20] = Metadata value 16 = Course 127 alpha-numerical characters			
RCP 101 Executive Mode			
Executive mode on	99*1X	Exe99*1↵	
Executive mode off	99*0X	Exe99*0↵	
Query status	99*X	[X33] ↵	
KEY: [X33] = On/Off Status 0 = Off (Default) 1 = On			
SMP Recording Folder Shared on SMD			
Enable folder share	[Esc] E1*1SHRF ←	ShrfE1*1↵	
Disable folder share	[Esc] E1*0SHRF ←	ShrfE1*0↵	
Query folder share setting	[Esc] E1SHRF ←	[X8] ↵	
Query path	[Esc] P1SHRF ← Verbose mode 2/3.	<SMP IP>:/var/uf/recordings↵ ShrfP1*<SMP IP>:/var/uf/recordings↵	
KEY: [X8] = Enabled/Disabled 0 = Disabled/unassigned/off/unmuted (Default) 1 = Enabled/assigned/on/muted			
Horizontal Video Mirroring			
Enable mirroring	[Esc] 1*4ROTA ←	Rota1*4↵	Turn on mirroring.
Disable mirroring	[Esc] 1*0ROTA ←	Rota1*0↵	Turn off mirroring.
View setting	[Esc] 1ROTA ← Verbose mode 2/3.	[X73] ↵ Rota1* [X73] ↵	
NOTE: The purchase and download of the Horizontal Mirroring LinkLicense is required to enable this feature.			
KEY: [X73] = Horizontal Video Mirroring 0 = Off/disabled (Default) 4 = On/enabled			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Recording Enable and Disable			
Enable recording	[Esc] X1 RCDR ←	RcdrX1 ←	
Disable recording	[Esc] X0 RCDR ←	RcdrX0 ←	
View status	[Esc] X RCDR ←	[X8] ←	
KEY: [X8] = On/off 0 = Disabled/unassigned/off/unmuted (Default) 1 = Enabled/assigned/on/muted			
Recording Controls			
Stop recording	[Esc] Y0 RCDR ←	RcdrY0 ←	
Start recording	[Esc] Y1 RCDR ←	RcdrY1 ←	
Pause recording	[Esc] Y2 RCDR ←	RcdrY2 ←	
Extend recording	[Esc] E [X69] RCDR ←	RcdrE [X69] ←	
KEY: [X69] = Extend scheduled recording 0 to 99 minutes			
View record status	[Esc] Y RCDR ←	[X21] ←	
Add chapter marker	[Esc] B RCDR ←	RcdrB ←	Manually insert chapter marker.
NOTE: When a chapter mark is created using the front panel or RCP 101, the SMP returns an unsolicited response, RcdrB ← when verbose mode is enabled (see Set verbose mode on page 73).			
Recording status (secondary I recording disabled)		<ChA1>* [X21] *<record destination>*<free space in KBytes>*<time record>*<time remain> ←	
Recording status (secondary I recording enabled)		<ChA1>* [X21] *<internal*secondary destination>*<internal free space*external free space>*<time record>*<time remain_internal*time external> ←	
KEY: [X21] = Record status 0 = Stop 1 = Recording 2 = Pause 1 = Finalizing			
View recording duration/ elapsed time of recording	35I Verbose mode 2/3.	HH:MM:SS ← Inf35*HH:MM:SS ←	Displays 00:00:00 when not recording.
View record time remaining (Internal + Secondary recording)	36I	internal•HH:MM:SS*usbstorage•HH:MM:SS ← Inf36*Internal•HH:MM:SS*usbstorage•HH:MM:SS ←	
View record time remaining (Single recording)	36I Verbose mode 2/3.	SelectedStorage•HH:MM:SS ← Inf36*SelectedStorage•HH:MM:SS ←	
Set Record Destination	[Esc] D [X43] RCDR ←	RcdrD [X43] ←	Select record destination for recording or recordings.
View record destination	[Esc] D RCDR ←	[X43] ←	View recording destination for next recording.
KEY: [X43] = Recording destination 0 = Auto 1 = Internal 2 = Front USB 3 = Rear USB 4 = RCP USB 11 = Internal and Auto 12 = Internal and Front USB 13 = Internal and Rear USB 14 = Internal and RCP USB			
Input Presets			
Recall preset	2* [X17] .	2Rpr [X17] ←	
Save preset	2* [X17] ,	2Spr [X17] ←	
Delete/Clear preset	[Esc] X2* [X17] PRST	PrstX2* [X17] ←	
KEY: [X17] = Input preset number 1 to 128			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Input Preset Name			
Set preset name	[Esc] 2* [X17] , [X10] PNAME ←	Pnam2* [X17] , [X10] ↵	
View preset name	[Esc] 2* [X17] PNAME ←	[X10] ↵	
KEY: [X10] = Preset name Up to 16 characters [X17] = Input preset number 1 to 128			
Encoder Presets			
Recall preset	4* [X1] * [X31] .	4Rpr [X1] * [X31] ↵	Recall Encoder preset [X31] for [X1] .
Save preset	4* [X1] * [X31] ,	4Spr [X1] * [X31] ↵	Save Encoder preset [X31] for selected channel.
Delete/clear preset	[Esc] X4* [X31] PRST ←	PrstX4* [X31] ↵	Clear Encoder preset [X31] , and set Encoder preset name to [unassigned].
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X31] = Presets 1 to 16 (two digit response — 0 padding)			
Encoder Preset Name			
Write name	[Esc] 4* [X31] , [X10] PNAME ←	Pnam4* [X31] , [X10] ↵	Set the name [X10] for [X31] .
View name	[Esc] 4* [X31] PNAME ←	[X10] ↵	View name of Encoder preset [X31] .
KEY: [X10] = Preset name Up to 16 characters [X31] = Presets 1 to 16 (two digit response — 0 padding)			
Streaming Presets			
Recall preset	3* 1* [X31] .	3Rpr1* [X31] ↵	Recall Streaming preset [X31] .
Save preset	3* 1* [X31] ,	3Spr1* [X31] ↵	Save Streaming preset [X31] for selected channel.
Delete/clear preset	[Esc] X3* [X31] PRST ←	PrstX3* [X31] ↵	Clear Streaming preset [X31] , and set Streaming preset name to [unassigned].
Streaming Preset Name			
Write name	[Esc] 3* [X31] , [X10] PNAME ←	Pnam3* [X31] , [X10] ↵	Set the name [X10] for streaming preset [X31] .
View name	[Esc] 3* [X31] PNAME ←	[X10] ↵	
KEY: [X10] = Preset name Up to 16 characters [X31] = Presets 1 to 16 (two digit response — 0 padding)			
Stream Type			
Set stream control	[Esc] 1* [X40] STRC ←	Strc1* [X40] ↵	Select a streaming method. Response will have leading 0.
View stream control	[Esc] 1STRC ←	[X40] ↵	View current streaming method.
Stream Destination			
Set stream destination	[Esc] D [X40] * [X71] STRC ←	Strcd [X40] * [X71] ↵	
View stream destination	[Esc] D [X40] STRC ←	[X71] ↵	
KEY: [X40] = Streaming method 2 = RTSP (Default) 3 = Push RTP (Response will have leading 0) [X71] = Stream destination The destination IP address or host name (determines unicast or multicast operation)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Stream Port			
Set stream port	[Esc] P [X40] * [X72] STRC ←	StrcP[X40] * [X72] ↵	
NOTE: The RTMP destination port should be set by using the RTMP URL, if necessary.			
View stream port	[Esc] P [X40] STRC ←	[X72] ↵	
KEY: [X40] = Streaming method 2 = RTSP (Default) 3 = Push RTP (Response has leading 0) [X72] = Stream port number			
RTSP Stream Name			
Set RTSP stream name	[Esc] N1 [X70] STRC ←	StrcN1* [X70] ↵	Enter RTSP stream name.
View RTSP stream name	[Esc] N1 STRC ← Verbose mode 2/3.	[X70] ↵ StrcN1* [X70] ↵	View RTSP stream name.
KEY: [X70] = RTSP Stream name (string)			
RTMP (primary) Destination URL			
Set RTMP URL	[Esc] U1* [X41] RTMP ←	RtmpU1* [X41] ↵	
View RTMP URL	[Esc] U1 RTMP ←	[X41] ↵	
KEY: [X41] = RTMP URL (String)			
RTMP Stream Enable/Disable			
Enable RTMP push stream	[Esc] E1* [X8] RTMP ←	RtmpE1* [X8] ↵	
View RTMP push stream	[Esc] E1 RTMP ←	[X8] ↵	
KEY: [X8] = On/off 0 = Disabled (Default) 1 = Enabled			
Recording Profiles			
Recall recording profile	[Esc] R5* [X31] PRST ←	PrstR5* [X31] ↵	
Query active profile	[Esc] L5 PRST ←	[X31] ↵	
View selected profiles	[Esc] V5* [X31] PRST ←	[X42] ↵	
Delete recording profiles	[Esc] X5* [X31] PRST ←	PrstX5* [X31] ↵	
KEY: [X31] = Presets 1 to 16 (two digit response — 0 padding) [X42] = Json string of recording profile parameters Example: {"id":1,"name":"RECORD PROFILE 01","mode":"audio and video","contributor":"Contributor1","coverage":"Coverage1","presenter":"Presenter1","description":"Description1","format":"Format1","language":"Language1","publisher":"Publisher1","course_id":"Course1","copyright":"Copyright1","source":"Source1","subject":"Subject1","title":"Title1","license":"License1"}			
Encode Profile Type			
Set encode profile	[Esc] [X1] * [X36] EPRO ←	Epro[X1] * [X36] ↵	Set encode profile to [X36].
View encode profile	[Esc] [X1] EPRO ←	[X36] ↵	View encode profile [X36].
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X36] = Encode profile 1 = Base 2 = Main 3 = High			
Record Mode			
Set record mode	[Esc] [X25] RMOD ←	Rmod [X25] ↵	Set recording mode to [X25].
View output mode	[Esc] RMOD ←	[X25] ↵	View recording mode [X25].
KEY: [X25] = Recording mode 1 = Video and audio 2 = Audio only 3 = Video/audio and audio only (Default)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Delete Recording Event and Files by DB_ID			
Delete recording event and file	[Esc] Z [X55] RCDR ←	RcdrZ [X55] ←	Delete recording event and files with DB_ID [X55].
KEY: [X55] = Valid DB_ID number (integer). Enter 0000 to delete all.			
HDMI Output Mute			
Enable video mute	99*1B	Vmt99*1 ←	Blanks HDMI video output.
Disable video mute	99*0B	Vmt99*0 ←	Displays HDMI video output.
View video mute	99B	[X8] ←	View the video mute status of HDMI output.
Enable audio mute	99*1Z	Amt99*1 ←	Mutes HDMI audio output.
Disable audio mute	99*0Z	Amt99*0 ←	Plays HDMI audio output.
View audio mute	99Z	[X8] ←	View the HDMI audio mute status.
KEY: [X8] = On/off 0 = Disabled (Default) 1 = Enabled			
Bit Rate Control/Type			
Set value	[Esc] [X1]* [X26] BRCT ←	Brct [X1]* [X26] ←	Set bit rate type to [X26].
View bit rate control type	[Esc] [X1] BRCT ←	[X26] ←	View current set output bit rate type.
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X26] = Bit rate control and type 0 = VBR (Default) 1 = CVBR 2 = CBR			
Video Bit Rate			
Set video bit rate	[Esc] V [X1]* [X27] BITR ←	BitrV [X1]* [X27] ←	Set video bit rate to [X27].
View video bit rate	[Esc] V [X1] BITR ←	[X27] ←	View video bit rate setting.
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X27] = Video bit rate target 200 to 10000 kbps (Default = 5000)			
Audio Bit Rate			
Set audio bit rate	[Esc] A [X1]* [X32] BITR ←	BitrA [X1]* [X32] ←	Set audio bit rate to [X32].
View audio bit rate	[Esc] A [X1] BITR ←	[X32] ←	View audio bit rate setting.
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X32] = Audio bit rate 80, 96, 128, 192 (Default), 256, 320 kbps			
Group of Pictures (GOP) Length			
Set GOP length	[Esc] [X1]* [X29] GOPL ←	Gopl [X1]* [X29] ←	Set GOP length to [X29].
View GOP length	[Esc] [X1] GOPL ←	[X29] ←	View GOP length.
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X29] = Audio bit rate 80, 96, 128, 192 (Default), 256, 320 kbps			
Video Resolution			
Set resolution	[Esc] [X1]* [X15] VRES ←	Vres [X1]* [X15] ←	Set resolution to [X15].
View resolution	[Esc] [X1] VRES ←	[X15] ←	View set resolution.
KEY: [X15] = Output resolution 0 = 512x288 1 = 480p 2 = 720p 3 = 1080p 4 = 1024x768 5 = 1280x1024			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Video Frame-rate			
Set frame-rate	[Esc] [X1]* [X24] VFRM ←	Vfrm [X1]* [X24] ←	Set frame-rate value of the output to [X24] for Channel A/B.
View frame-rate	[Esc] [X1] VFRM ←	[X24] ←	View set output frame-rate.
KEY: [X1] = Encode mode 1 = Record 2 = Stream [X24] = Output frame-rate 1 = 30 2 = 25 3 = 24 4 = 15 5 = 12.5 6 = 12 7 = 10 8 = 5			
Output Scaler Rate			
Set output rate	[Esc] [X16] RATE ←	Rate [X16] ←	Set refresh rate value of the output to [X16] for Channel A/B.
View output rate	[Esc] RATE ←	[X16] ←	View set output refresh rate.
KEY: [X16] = Output refresh rate 1 = 60 Hz 2 = 50 Hz			
Horizontal Start			
View horizontal start	[Esc] HSRT ← Verbose mode 2/3.	[X3] ← Hsrt [X3] ←	Show the horizontal location of first active pixel in input.
Vertical Start			
View vertical start	[Esc] VSRT ← Verbose mode 2/3.	[X3] ← Vsrt [X3] ←	Show vertical location of first active pixel in input.
KEY: [X3] = Horizontal and vertical start 0 to 255 (Default: 128, read only command)			
Total Pixels			
View total pixels	[Esc] TPIX ← Verbose mode 2/3.	[X5] ← Tpix [X5] ←	Show total pixels for input.
KEY: [X5] = Total pixels Up to +512 of the default value for the detected range			
Total Lines			
View total lines	[Esc] TLIN ← Verbose mode 2/3.	[X4] ← Tlin [X4] ←	Show total lines for input.
KEY: [X4] = Total lines Up to +256 of the default value for the detected resolution			
Active Pixels			
View active pixels	[Esc] APIX ← Verbose mode 2/3.	[X6] ← Apix [X6] ←	Show active pixels for input.
KEY: [X6] = Active pixels Up to +512 of the default value for the detected resolution			
Active Lines			
View active lines	[Esc] ALIN ← Verbose mode 2/3.	[X7] ← Alin [X7] ←	Show active lines for input.
KEY: [X7] = Active lines Up to +256 of the default value for the detected resolution			
Contrast			
Specify a value	[Esc] [X11] CONT ←	Cont [X11] ←	Sets contrast level to [X11].
Increment value	[Esc] + CONT ←	Cont [X11] ←	Increases contrast level.
Decrement value	[Esc] - CONT ←	Cont [X11] ←	Decreases contrast level.
View	[Esc] CONT ←	[X11] ←	View current setting.
KEY: [X11] = Brightness and contrast 1 to 127, 3-digit response (Default: 064)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Brightness			
Specify a value	Esc X11 BRIT ←	Brit X11 ↵	Sets brightness level to X11 .
Increment value	Esc + BRIT ←	Brit X11 ↵	Increments brightness level.
Decrement value	Esc - BRIT ←	Brit X11 ↵	Decrements brightness level.
View	Esc BRIT ←	X11 ↵	View current setting.
KEY: X11 = Brightness and contrast 1 to 127, 3-digit response (Default: 064)			
Horizontal Shift (Position)			
Specific value	Esc X12 HCTR ←	Hctr X12 ↵	Set horizontal centering to X12 .
Increment value	Esc + HCTR ←	Hctr X12 ↵	Shift window right.
Decrement value	Esc - HCTR ←	Hctr X12 ↵	Shift window left.
View	Esc HCTR ←	X12 ↵	View current setting.
NOTE: Horizontal shift values are adjusted in multiples of 8. If a value is entered that is not a multiple of 8, the closest acceptable value is applied and returned.			
KEY: X12 = Horizontal and vertical position The range varies such that the window never goes completely off-screen (5-digit response).			
Vertical Shift (Position)			
Specific value	Esc X12 VCTR ←	Vctr X12 ↵	Set vertical centering to X12 .
Increment value	Esc + VCTR ←	Vctr X12 ↵	Shift window down.
Decrement value	Esc - VCTR ←	Vctr X12 ↵	Shift window up.
View	Esc VCTR ←	X12 ↵	View current setting.
NOTE: Vertical shift values are adjusted in multiples of 2. If a value is entered that is not a multiple of 2, the closest acceptable value is applied and returned.			
KEY: X12 = Horizontal and vertical position The range varies such that the window never goes completely off-screen (5-digit response).			
Horizontal Size			
Specific value	Esc X13 HSIZ ←	Hsiz X13 ↵	Set horizontal size to X13 .
Increment value	Esc + HSIZ ←	Hsiz X13 ↵	Increase the width of the window.
Decrement value	Esc - HSIZ ←	Hsiz X13 ↵	Decrease the width of the window.
View	Esc HSIZ ←	X13 ↵	View current setting.
NOTE: Horizontal size values are adjusted in multiples of 8. If a value is entered that is not a multiple of 8, the closest acceptable value is applied and returned.			
KEY: X13 = Horizontal and vertical size 00120 to 04096 (5-digit response).			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Vertical Size			
Specify a value	[Esc] [X13] VSIZ ←	Vsiz [X13] ↵	Set vertical size to [X13] .
Increment value	[Esc] + VSIZ ←	Vsiz [X13] ↵	Increase the height of the window.
Decrement value	[Esc] - VSIZ ←	Vsiz [X13] ↵	Decrease the height of the window.
View	[Esc] VSIZ ←	[X13] ↵	View current setting.
NOTE: Vertical size values are adjusted in multiples of 2. If a value is entered that is not a multiple of 2, the closest acceptable value is applied and returned.			
KEY: [X13] = Horizontal and vertical size 00120 to 04096 (5-digit response).			
Video Mute			
Enable blanking	1B	Vmt1 ↵	Blanks video output.
Disable blanking	0B	Vmt0 ↵	Displays video output.
View	B	[X33] ↵	View the blanking status.
KEY: [X33] = Mute status 0 = Unmuted (Default) 1 = Muted			
Test Pattern			
Select test pattern	[Esc] [X14] TEST ←	Test [X14] ↵	
Turn test pattern off	[Esc] 0TEST ←	Test0 ↵	
View test pattern	[Esc] TEST ←	[X14] ↵	
KEY: [X14] = Test patterns 0 = Off (Default) 1 = Colorbars 2 = Aspect ratio 1.33 3 = Aspect ratio 1.78, 4 = Aspect ratio 1.85 5 = Crop 6 = Pulse (audio test pattern) 7 = Timestamp 8 = Universal OSD			
Overscan Mode (applies only to SMPTE [480p - 1080p] input rates)			
Set overscan mode	[Esc] [X35] OSCN ←	Oscn [X35] ↵	
View overscan mode	[Esc] OSCN ←	[X35] ↵	
KEY: [X35] = Overscan 0 = 0% (Default) 1 = 2.5% 2 = 5.0%			
HDCP Settings			
View HDCP status	[Esc] IHDCP ←	[X9] ↵	View HDMI input status.
Set input HDCP authorization on	[Esc] E1HDCP ←	HdcpE1 ↵	Turn HDCP authorized device on for input. HDCP off = default.
Set input HDCP authorization off	[Esc] E0HDCP ←	HdcpE0 ↵	Turn HDCP authorized device off for input. HDCP off = default.
View input HDCP authorization	[Esc] EHDCP ←	[X8] ↵	
Enable HDCP notification	[Esc] N1HDCP ←	HdcpN1 ↵	Enable green screen (Default).
Disable HDCP notification	[Esc] N0HDCP ←	HdcpN0 ↵	Disable green screen and mute output.
View HDCP notification	[Esc] NHDCP ←	[X8] ↵	
KEY: [X8] = On/off 0 = Disabled (Default) 1 = Enabled [X9] = HDCP status 0 = No sink/on/source detected 1 = Sink/source detected with HDCP 2 = Sink/source detected but no HDCP			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Delayed Recording Start for Ad hoc			
Delay duration	[Esc] P [X53] RCDR ←	Rcdr P [X53] ←	Delay ad hoc recording start for [X53] seconds.
View delay duration	[Esc] PRCDR ←	[X53] ←	Query original setting.
View recording start countdown	Example	RecStart [X53] ← RecStart12, RecStart11, RecStart10 ...	Unsolicited response to display recording start countdown.
NOTE: The purchase and download of the Horizontal Mirroring LinkLicense is required to enable this feature.			
KEY: [X53] = Delay duration in seconds 5 to 60 seconds (Default = 10).			
EDID Minder			
Assign EDID to specific input	[Esc] A [X34] EDID ←	EdidA [X34] ←	
View EDID assignment	[Esc] AEDID ←	[X34] ←	View EDID resolution and refresh.
Import EDID to user location	[Esc] I [X39], [filename.bin] EDID ←	EdidI ←	Import a 128 or 256-Byte binary EDID file to the user slot [1 to 3].
Export EDID in binary format	[Esc] E [X34], [filename.bin] EDID ←	EdidE ←	Export a 128 or 256-Byte binary EDID file from EDID location [X34]. [filename] can optionally carry a full path name. The EDID file is a .bin file.
KEY: [X34] = EDID number See EDID Values on page 89 [X39] = EDID user slot 1 to 3			
Audio Output			
Recall Preset	[X37].	Rpr [X37] ←	Recall audio output preset [X37].
KEY: [X37] = Audio output 1 = HDMI only 2 = Analog only 3 = HDMI and Analog 4 = Analog Dual Mono 5 = Dual Mono + HDMI			
Audio Gain and Attenuation			
Set gain and attenuation	[Esc] G [X2]*[X28]AU ←	DsG [X2]*[X28] ←	Set audio gain and attenuation of audio channel [X2] to [X28].
View gain and attenuation	[Esc] G [X2]AU ←	[X28] ←	View audio level of audio channel [X2].
KEY: [X2] = Audio channels 40000 = Analog audio left 40001 = Analog audio right 40002 = HDMI audio left 40003 = HDMI audio right 60000 = Output (Left, audio mute control only) 60001 = Output (Right, audio mute control only) [X28] = Audio input gain Audio level in 0.1 dB steps (-180 to 240 = -18.0 to +24.0 dB)			
Audio Delay			
NOTE: Set the audio delay to zero to disable it.			
Set audio delay	[Esc] [X22]ADLY ←	Adly [X22] ←	Set audio delay to [X22].
View delay	[Esc] ADLY ←	[X22] ←	View audio delay.
KEY: [X22] = Audio delay 000 to 999 ms (Default 0 ms, 3-digit response)			

Command Function	SIS Command (Host to Device)	Response (Device to Host)	Additional Description
Audio Mute			
Mute audio channel	[Esc] M [X2]*1AU ←	DsM [X2]*1 ←	Mute audio channel.
Unmute audio channel	[Esc] M [X2]*0AU ←	DsM [X2]*0 ←	Unmute audio channel.
View mute status	[Esc] M [X2]AU ←	[X33] ←	View audio mute status.
KEY: [X2] = Audio channels 40000 = Analog audio left 40001 = Analog audio right 40002 = HDMI audio left [X33] = Mute status 40003 = HDMI audio right 0 = Unmuted (Default), 1 = Muted			
Audio Output Level			
View level	34I Verbose mode 2/3.	[X23]*[X23] ← Inf34*[X23]*[X23] ←	Left*right channel of the output audio.
KEY: [X23] = Audio level -1500 to 0 (in 0.1 dBfs step)			

EDID Values					
X34	Resolution	Refresh	Rate Type	Video Format	Audio
01	800 x 600	60 Hz	PC	DVI	N/A
02	1024 x 768	60 Hz	PC	DVI	N/A
03	1280 x 720	60 Hz	PC	DVI	N/A
04	1280 x 768	60 Hz	PC	DVI	N/A
05	1280 x 800	60 Hz	PC	DVI	N/A
06	1280 x 1024	60 Hz	PC	DVI	N/A
07	1360 x 768	60 Hz	PC	DVI	N/A
08	1366 x 768	60 Hz	PC	DVI	N/A
09	1400 x 1050	60 Hz	PC	DVI	N/A
10	1440 x 900	60 Hz	PC	DVI	N/A
11	1600 x 900	60 Hz	PC	DVI	N/A
12	1600 x 1200	60 Hz	PC	DVI	N/A
13	1680 x 1050	60 Hz	PC	DVI	N/A
14	1920 x 1080	60 Hz	PC	DVI	N/A
15	1920 x 1200	60 Hz	PC	DVI	N/A
16	800 x 600	60 Hz	PC	HDMI	2-Ch
17	1024 x 768	60 Hz	PC	HDMI	2-Ch
18	1280 x 768	60 Hz	PC	HDMI	2-Ch
19	1280 x 800	60 Hz	PC	HDMI	2-Ch
20	1280 x 1024	60 Hz	PC	HDMI	2-Ch
21	1360 x 768	60 Hz	PC	HDMI	2-Ch
22	1366 x 768	60 Hz	PC	HDMI	2-Ch
23	1400 x 1050	60 Hz	PC	HDMI	2-Ch
24	1440 x 900	60 Hz	PC	HDMI	2-Ch
25	1600 x 900	60 Hz	PC	HDMI	2-Ch
26	1600 x 1200	60 Hz	PC	HDMI	2-Ch
27	1680 x 1050	60 Hz	PC	HDMI	2-Ch
28	1920 x 1200	60 Hz	PC	HDMI	2-Ch
29	480p	60 Hz	HDTV	HDMI	2-Ch
30	576p	50 Hz	HDTV	HDMI	2-Ch
31	720p	50 Hz	HDTV	HDMI	2-Ch
32*	720p	60 Hz	HDTV	HDMI	2-Ch
33	1080i	50 Hz	HDTV	HDMI	2-Ch
34	1080i	60 Hz	HDTV	HDMI	2-Ch
35	1080p	25 Hz	HDTV	HDMI	2-Ch
36	1080p	50 Hz	HDTV	HDMI	2-Ch
37	1080p	24 Hz	HDTV	HDMI	2-Ch
38	1080p	60 Hz	HDTV	HDMI	2-Ch
39	User Loaded Slot 1				
40	User Loaded Slot 2				
41	User Loaded Slot 3				
* Default					

Reference Information

This section provides information about:

- [Mounting the SMP 111](#)
- [Supported File Types, Drive Formats, and Browsers](#)
- [DataViewer](#)
- [Streaming Method Overview](#)
- [Estimating Storage Requirements for a Recording](#)
- [Glossary](#)

Mounting the SMP 111

The 1U high, half rack width, 9.5 inch deep SMP 111 Streaming Media Processor can be:

- Set on a table
- Mounted on a rack shelf
- Mounted under a desk or tabletop
- Mounted on a projector bracket

See the SMP 111 product page at www.extron.com for compatible mounting kits.

Tabletop Use

The SMP 111 includes rubber feet (not installed). For tabletop use, attach a self-adhesive rubber foot to each corner on the bottom of the unit.

Furniture Mounting

Furniture mount the SMP 111 using an optional under-desk or through-desk mounting kit. Follow the instructions included with the mounting kit.

Table or Wall Mounting

Extron table or wall mounting brackets extend approximately 1/4 inch (6.4 mm) above the top surface of the SMP 111 enclosure. This design allows an air space between the mounting surface and the enclosure. Follow the instructions included with the mounting kit.

Rack Mounting

For rack mounting using the included rack mounts, do not install the rubber feet. Mount the SMP 111 on a 19 inch universal or basic rack shelf.

UL Rack Mounting Guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the SMP 111 in a rack.

- 1. Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment can be greater than room ambient temperature. Therefore, install the unit in an environment compatible with the maximum ambient temperature ($T_{ma} = +122^{\circ}\text{F}$, $+50^{\circ}\text{C}$) specified by Extron.
- 2. 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.
- 3. Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
- 4. Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- 5. 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).

Supported File Types, Drive Formats, and Browsers

File Formats

The SMP 111 creates *.m4v and mp4 video and audio files, and *.jpg thumbnail and chapter marker images. Optional fonts can be used for on-screen displays.

Recording File Types

- mp4 (as m4v)
- m4a

Still Image File Types

- jpg (for SMP-created thumbnails and chapter markers)

Font File Types

- TrueType™ (.ttf)
- OpenType® (.otf)

NOTE: To upload a font file, use the **File Upload Utility** within the **File Management** page. The user is responsible for obtaining any necessary font licenses before uploading fonts to the SMP.

Drive Formats

The SMP 111 supports FAT32, NTFS, and VFAT long file names, EXT2, EXT3 and EXT4 formats for USB drives that are used for file storage.

Browsers

In order to view the SMP 111 embedded web pages, use one of the supported web browsers (see **PC Requirements** on page 3).

DataViewer

DataViewer is an enhanced terminal emulation program that facilitates analysis of RS-232, USB, and TCP/IP communication with Extron devices. The software allows users to send commands to a device and view the responses in ASCII or hexadecimal format. Command and response logs can be saved in text or HTML format.

Dataviewer is available at www.extron.com. Download the installation file and load the program on the PC connected to the SMP 111.

Start the Dataviewer program

1. Click the desktop icon.
2. The **Communication Setup** dialog box opens. Select a **Communication** tab (see figure 75).
 - a. Select the **Comm Port** (RS-232) tab (shown with the correct protocol settings below) if using the rear panel RS-232 port (❶).
 - b. Select the **TCP/IP** tab if using a network connection (❷).
 - c. Select the **USB** tab if using the front panel config port (❸).

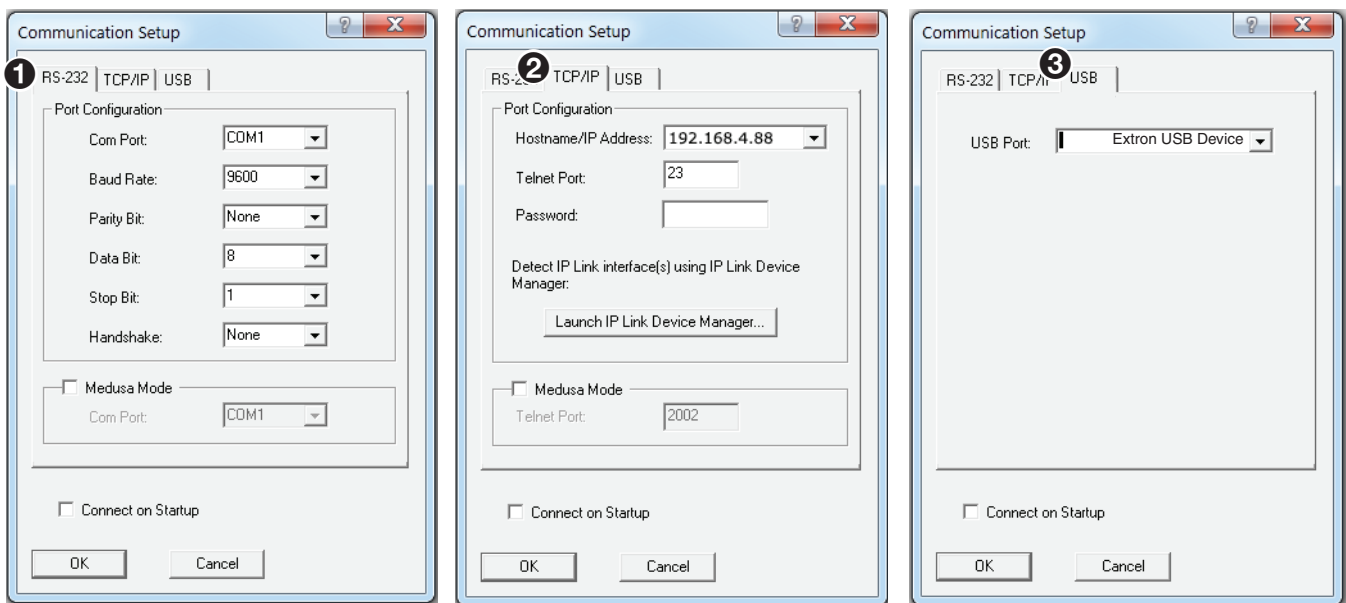


Figure 75. Communication Dialogs

3. Select the startup options:
 - a. If RS-232 is selected (❶), configure the port settings.
 - b. If TCP/IP is selected (❷), configure the IP address and Telnet port. Enter a password.

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).

- c. If USB is selected (❸), choose **Extron USB Device** in the drop-down window.

NOTE: To automatically connect to the SMP 111, select **Connect on Startup**.

4. Click **OK** to connect to the SMP 111 and start using the program.

You are now ready to begin entering commands.

Open the *DataViewer Help File* from the toolbar for more information on the program.

Sending commands using a TCP/IP connection

1. Configure the network settings of a control PC so that it can be connected to the same network as the SMP 111. Use an RJ-45 cable to connect the control PC to the network.
2. Start the DataViewer program (see [Start the Dataviewer program](#) on page 92) and follow the steps to connect to the SMP 111 via TCP/IP.
3. On the **Communication Setup** window (see figure 75):
 - a. Select the **TCP/IP** tab.
 - b. Enter the IP address of the SMP 111 into the **Hostname/IP Address** field.
 - c. In the **Telnet Port** field, enter the port number for the connection.

NOTE: The default telnet port to send SIS commands to the SMP 111 is port 23.

4. Click **OK**. The **Communication Setup** dialog closes.
5. The main **DataViewer** dialog opens and the SMP 111 responds with a copyright statement containing the model number, part number, and current firmware version of the connected SMP 111, along with the date (see figure 76, ②).

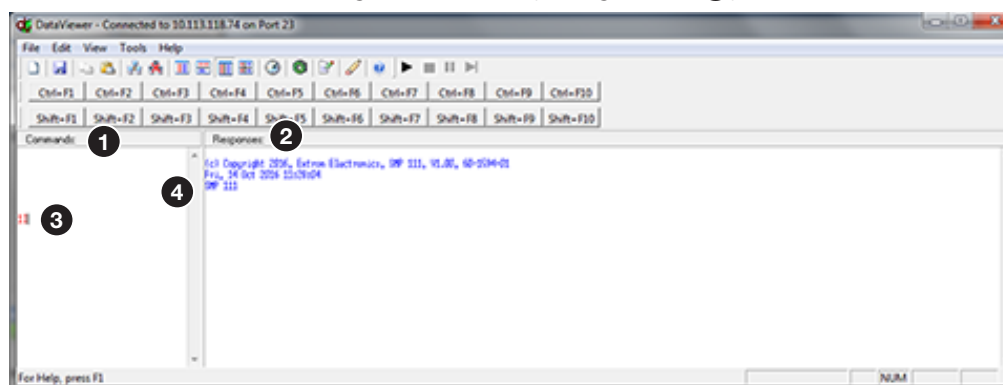


Figure 76. Enter Commands and View Responses

6. Use the **Commands** field to enter SIS commands (see figure 76, ①). View the responses in the **Responses** field (②).

For example, enter **1I**, the command to display the model name, in the **Commands:** field (③). The **Responses:** field (④) returns the model number of the connected device.

What is an IP Address?

A full explanation of IP addressing is beyond the scope of this user guide. However, the following information is enough to get started.

An IP address is a 32-bit binary number that is used to identify each device on an Ethernet network. This number is usually represented by four decimal numbers (each in the range 0 to 255) separated by dots, (for example, **198.123.34.240**). This is called "dotted decimal notation".

An IP address is divided into two parts:

- The network identifier
- The host identifier

On a given network, each address must have the same network identifier value, but have a unique host identifier. There are, therefore, different classes of addresses that define:

- The range of valid addresses.
- The parts of the address used to identify the network and host.

The most common IP address classes are:

Class	Valid Address Range	Identifier Arrangement
Class A	0.0.0.1 to 127.255.255.254	NNN.HHH.HHH.HHH
Class B	128.0.0.1 through 191.255.255.254	NNN.NNN.HHH.HHH
Class C	192.0.0.1 through 223.255.255.254	NNN.NNN.NNN.HHH

NOTES:

- NNN = Network identifier
- HHH = Host identifier

Private and Public Address Ranges

Within each of the classes are a range of addresses designated as "private" addresses. These are addresses that should only be used on private local networks and intranets and cannot be accessed directly from the Internet.

- 10.0.0.0 – 10.255.255.255
- 172.16.0.0 – 172.31.255.255
- 169.254.0.0 – 169.254.255.255
- 192.168.0.0 – 192.168.255.255

Addresses outside these ranges are considered "public".

Multicast Address Range

A further range of addresses is available for multicast use:

- 224.0.0.0 – 239.255.255.255

These addresses (also known as class D addresses) are used to allow several devices to be part of the same multicast group. Each device in the group has the same multicast address and can effectively send data to all other devices in the same group simultaneously.

The SMP uses 235.111.3.1 as the default multicast address for the RTSP Pull stream.

Subnet Mask

The subnet mask is a 32-bit binary number used to "mask" certain bits of the IP address. It extends the number of network options available for the IP address. The subnet mask does this by allowing part of the host identifier to be used as a subnetwork identifier.

It is important that the correct value is used for the subnet mask. The value of the subnet mask is dependent on the IP address class being used. Use the table below and the table in [What is an IP Address?](#) on page 93 to select the subnet mask class that matches the IP address class.

Class	Subnet Mask
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

Port Number

A port number is combined with the IP address to create an application-specific or process-specific address. The port number can uniquely identify an application or process on a computer and thereby enable the computer to share a single Ethernet connection for multiple requirements. A port number is always associated with the IP address of the computer, as well as the type of protocol used for network communication.

The SMP uses specific ports, but can be configured to meet most requirements. In addition to the default ports, any port in the available range (1024 to 65535) can be used.

NOTE: Ports previously assigned and currently in use by the SMP cannot be used again.

All streaming methods (except TS/UDP push) use multiple port numbers. The following table shows the number of ports used by each streaming method. Recording and streaming streams have different port numbers.

	RTSP (Pull)	TS/UDP (Push)	TS/RTP (Push)	ES/RTP (Push)
Unicast (per stream)	4*	1	2	4*
Multicast	4*	1	2	4*
* 4 ports for "Audio/Video", or 2 ports for "Video only"				

When the SMP 111 ports are configured, only the initial port is entered by the user. The SMP 111 firmware then assigns the multiple port numbers based on the initial port number.

Choosing an IP Address

If the SMP 111 and other devices are connected via an independent network, then follow the guidelines below when choosing IP addresses. However, if the SMP 111 and other devices are being connected to an existing network, advise the network administrator and ask them to assign suitable addresses.

On an independent network, nearly any type of address can be used (in theory). However, it is generally recommended that class C addresses are used (192.0.0.1 through 223.255.255.253).

There are two rules for choosing IP addresses:

- The network identifier must be the same for each address.
- The host identifier must be unique for each address.

Applying these rules to class C addresses, the first three decimal values of the IP addresses must all be the same, while the last value is used to uniquely identify each device.

The table below shows an example of a valid class C addressing scheme.

Device	IP Address	Subnet Mask
Device 1	208.132.180.41	255.255.255.0
Device 2	208.132.180.42	255.255.255.0
Device 3	208.132.180.43	255.255.255.0

NOTE: The host identifiers (41, 42, and 43 in the example above) do not need to be in sequential or in any particular order. However, it is recommended that the numbers are grouped for simplicity.

The table below shows an example of an invalid class C addressing scheme.

Device	IP Address	Subnet Mask
Device 1	208.132.180.41	255.255.255.0
Device 2	192.157.180.42	255.255.255.0
Device 3	208.132.180.41	255.255.255.0

Assuming the IP address for device 1 is valid, the IP address for device 2 is invalid because the network identifier for each address must begin with **208.132.180.xxx**. The IP address for device 3 is invalid because it is using the same IP address as device 1.

The ping command can be used from a computer (see below) or from the web interface to ensure that a device at an IP address is responding correctly.

Using the Ping Utility to Test Communications

Use the ping command to test communications between a Windows-based computer and another device on the same network.

1. From the desktop, select **Start > Run**.
2. The Run dialog box displays. In the **Open** field, enter **ping nnn.nnn.nnn.nnn -t** (where **nnn.nnn.nnn.nnn** is the IP address of the device to test).
3. Click **OK** or press the **<Enter>** key. A window opens showing a series of response messages (explained below).
4. To stop the ping utility, press **<Ctrl+C>** on the keyboard.

NOTE: The embedded web page includes a ping utility (see [Diagnostic Tools](#) on page 62).

Response Messages

While running the ping utility, a series of response messages are displayed that are used to determine the status of the communications link. For example, pinging a device with the IP address **208.132.180.48** replies with a message similar to the following:

Reply from 208.132.180.48: bytes=32 time=2ms TTL=32

This is the correct response which indicates that the device at the specified address is communicating correctly. The response time value may vary according to network traffic. If one of the following messages are received:

- **Request timed out** — There has been no response from the specified address. Either the processor is not receiving data (from the computer) or is not sending data back. Check that the device is powered on and set to the same address that was pinged. Also, check that the device is correctly connected to the network.
- **Reply from 208.132.180.48: Destination host unreachable** — The IP address of the computer is not in the same class as the device being pinged. Check that the subnet mask on both the computer and the device are set to the same value. Also check that both IP addresses are within the correct range for the chosen class and are compatible (see [Subnet Mask](#) on page 94 and [What is an IP Address?](#) on page 93 to select the subnet mask class that matches the IP address class).

Multicast IP Addressing for Multiple SMP 111 Installations

When multiple SMP 111 devices are installed in a system (when the multicast address is used for push or pull streaming), the streams are managed by the SMP 111 to avoid conflicts.

Pull streaming (RTSP)

The SMP 111 can use one of two multicast streaming IP address assignment methods.

If multicast IP addresses for a network are limited, the SMP 111 devices can use unassigned port numbers within the available range (1024 to 65436).

NOTE: To prevent conflicts, always check to see if other devices using the same IP address have already used a port number before using it in the SMP 111.

The following table shows a typical port assignment for multiple SMP 111 devices using a single multicast IP address (RTSP pull streams require four sequential ports).

Device	SMP IP	Multicast IP	Multicast Port
SMP1	192.168.254.10	239.199.188.138	7000 to 7003
SMP2	192.168.254.11	239.199.188.138	7004 to 7007
SMP3	192.168.254.12	239.199.188.138	7008 to 7011

When there are different multicast IP addresses available, there is no need for multiple port numbers and the port number can remain at the default (7000) as shown in the next table.

Device	SMP IP	Multicast IP	Multicast Port
SMP1	192.168.254.10	239.199.188.138	7000
SMP2	192.168.254.11	239.199.188.139	7000
SMP3	192.168.254.12	239.199.188.140	7000

NOTE: The SMP 111 automatically inserts the ending port number when the initial port number is entered.

Push streaming (TS/UDP, TS/RTP, ES/RTP)

Push streams to a multicast address generally require only two ports, except for ES/RTP which requires four. When push streaming from multiple SMP 111 devices to multicast addresses, the same IP address rules apply as with pull streaming.

For push streaming, the destination IP and port number are adjusted using the encoder presets page.

Streaming Method Overview

The streaming method used by the SMP 111 should be considered carefully. Multicast is typically used for live multicasting a "one-to-many" session when it is known there will be multiple viewers of a stream. Unicast streaming is used for on-demand video where the network infrastructure does not support multicast traffic. Typically, unicast streaming is used for a point-to-point (one-to-one) connection.

Protocols Used for Streaming

Streaming protocols must be selected based on the streaming method and the SMP 111 capability. The following transport layer protocols can be used for SMP streaming.

Pull		Push	
Unicast	Multicast	Unicast	Multicast
RTP (RTP over UDP)	RTP (RTP over UDP)	TS/UDP	TS/UDP
		TS/RTP	TS/RTP
		ES/RTP (Native RTP)	ES/RTP (Native RTP)

The transport protocols are summarized in this section. For information on how to change the SMP 111 transport protocol, see the *SMP 111 Embedded Web Pages Help File*.

Multicast Streaming Method – an overview

This streaming method is used for live video multicasting with low latency in a "one-to-many" streaming session. The SMP 111 uses a variety of streaming protocols to send data to a multicast group. Using multicasting, the SMP 111 does not need to know the IP address of the devices viewing the stream. This allows a large number of users to view the data simultaneously while using bandwidth efficiently. The maximum number of connected users is dependent on the type of distribution network used.

NOTE: To use this streaming method, each network must be configured to pass multicast broadcasts.

Multicast streaming can use push or pull streaming. It can push the data to a network for broader distribution, or to many individual viewing devices. It can also use pull streaming, where the SMP 111 waits for viewing devices to request the stream before broadcasting.

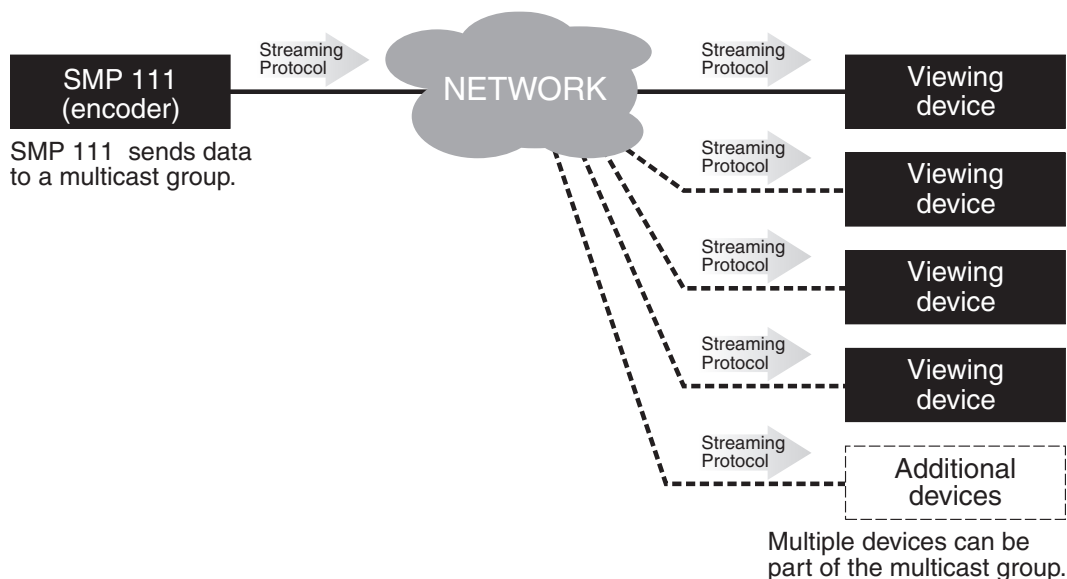


Figure 77. Multicast Streaming

NOTE: IGMP multicast protocol is used by routers and switches to deliver streams to subscribing endpoints. The SMP 111 delivers packets and frames onto the network that are identified as multicast.

An IGMP multicast conserves network bandwidth because the SMP 111 will only send data when a connection is made by a user. All network switches and routing equipment must be properly configured to support IGMP snooping and IGMP query to avoid flooding all endpoints with unnecessary streaming traffic.

Unicast Streaming Method – an overview

This streaming method is used for on-demand video with low latency and uses a variety of streaming protocols. It can be used where the network infrastructure does not support multicast traffic. Typically, unicast streaming is used for a point-to-point (one-to-one) connection (SMP 111 to single viewing device), but can be configured to use multiple active connections.

Unicast Push streaming can push exactly one (1) stream. Unicast Pull streaming can pull as many streams as the SMP can handle. Unicast streaming can Push the data to individual or multiple viewing devices, or it can use Pull streaming, where the SMP 111 waits for an individual viewing device to request the stream before broadcasting.

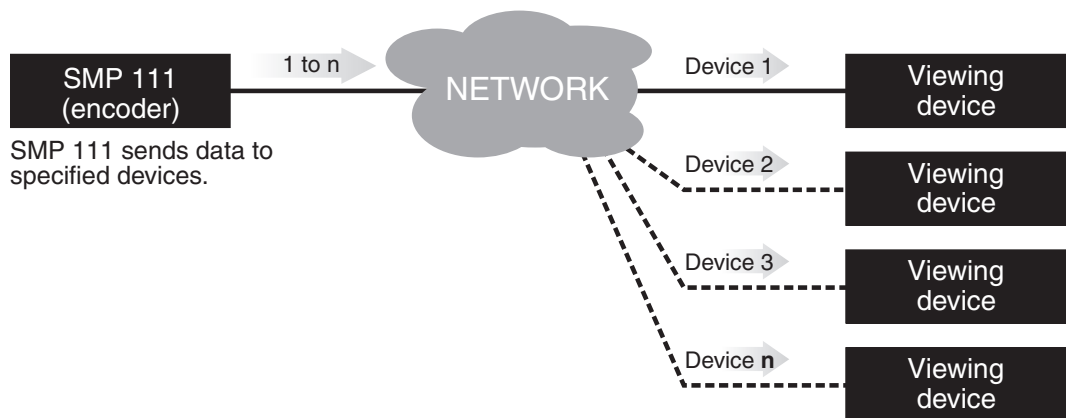


Figure 78. Unicast Streaming

NOTES:

- When unicast streaming, the SMP 111 sends an individual stream to each viewing device. This means that the total bandwidth increases as the number of actively connected viewing devices increases and the total bandwidth decreases as the number of actively connected viewing devices decreases.
- In the figure above, *n* represents an unspecified number of additional streams.

Streaming Playback Methods

Streams from the SMP 111 can be viewed using various playback methods.

NOTE: The procedures presented in the following sections use a Microsoft Windows operating system and version 2.0.2 of VLC media player. These procedures may vary when a different operating system is used or when different versions of the VLC media player are used.

The following streaming playback methods are discussed:

- Push and Pull Streaming
- Playing a Push or Pull Stream Using VLC media player

Push and Pull Streaming

The client computer or media player can either search the network for active streams (push streaming from the encoder) and select the desired video, or send a request to the encoder to begin streaming a video to it (pull streaming).

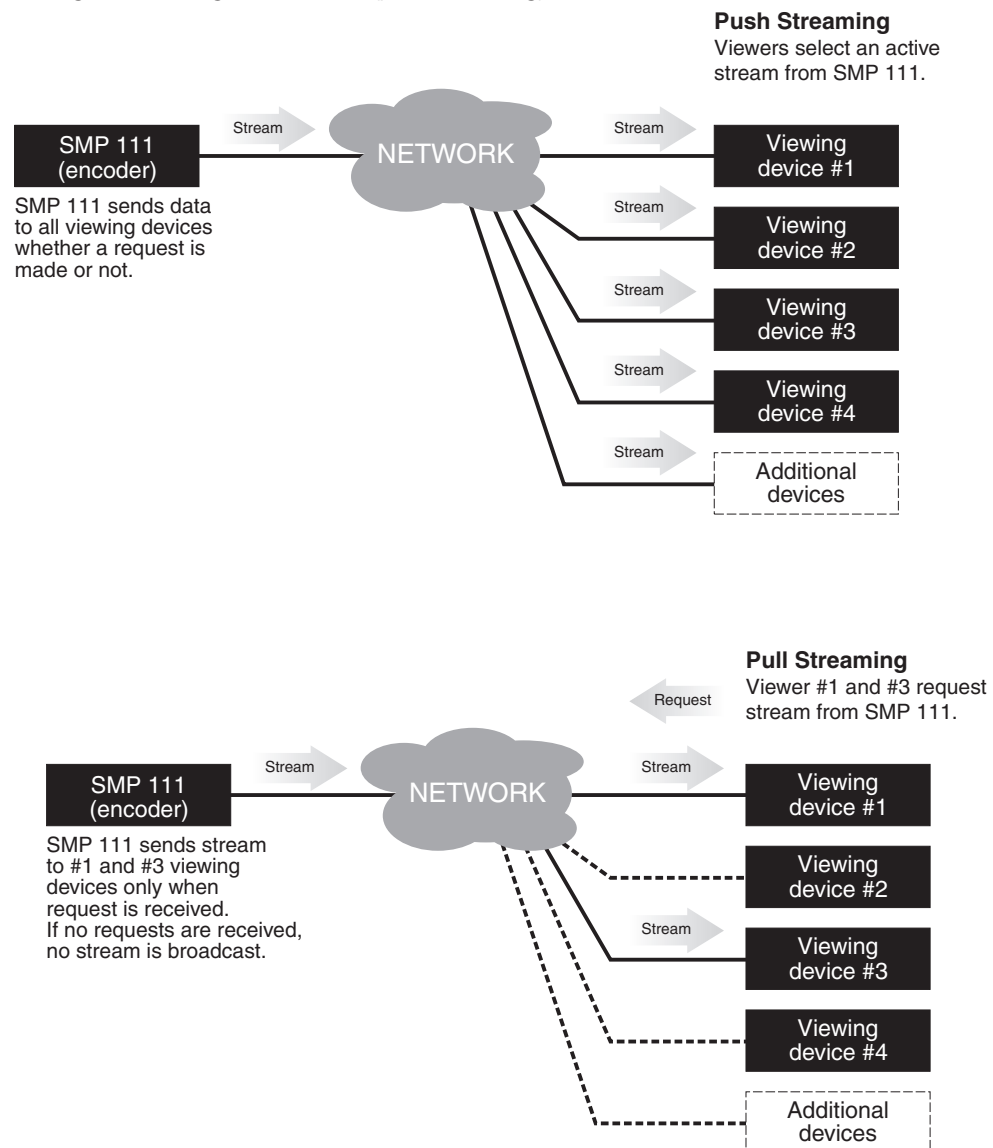


Figure 79. Push and Pull Streaming

Push Stream and Pull Stream Playback URLs

To verify a running stream, use the templates below to place the stream into the VLC "Open Network Stream" dialog (see step 5 of [Playing a Pull Stream Using VLC Media Player](#) on page 103).

Pull Stream URLs	
PULL Streaming:	URL
RTSP Unicast	rtsp://<SMP111_IP>/<stream name>
RTSP Multicast	rtsp://<SMP111_IP>/<stream name>/multicast or HTTP://<SMP111_IP>/live/pull/multicast.sdp

Push Stream URLs	
PUSH Streaming:	URL
Unicast (Destination IP must be set to the location where the stream is played)	
TS/UDP	UDP://@:<Destination_Port>
TS/RTP	RTP://@:<Destination_Port>
ES/RTP	HTTP://<SMP111_IP>/live/push/s3.sdp
Multicast (Destination IP must be multicast IP address)	
TS/UDP	UDP://@<Destination_IP>:<Destination_Port>
TS/RTP	RTP://@<Destination_IP>:<Destination_Port>
ES/RTP	HTTP://<SMP111_IP>/live/push/s3.sdp

NOTES:

- <SMP111_IP> is the IP address of the SMP 111.
- <DESTINATION_IP>:<DESTINATION_PORT> are the IP address and port number of the destination.
- <stream name> is the file name.
- Some dependencies may apply with certain versions of VLC. For ES/RTP push streams, SAP is available in "video Only" stream mode.

Streaming Capabilities and System Scalability

The following tables detail the streaming capabilities of the SMP 111. Data for the tables was obtained through laboratory testing using optimal bandwidth conditions and can vary depending on the selected video bit rate.

NOTE: Testing to determine the approximate maximum number of pull streams was done on the encoder with one pull unicast Streaming stream. Recording while streaming does **not** reduce the maximum number of pull streams.

Available Unicast Streams

Video resolution and bit rate affect the total number of unicast streams the SMP 111 can broadcast. The following table compares the selected resolution and bit rate with the approximate number of unicast streams that will be available. Changing the resolution or using higher or lower bit rates may increase or decrease the available number of streams.

Unicast Pull Stream Method

Unicast Pull streams max at 20 streams:

Unicast		
Resolution (Pixels x Lines @ frame rate)	Video Bit Rate (Kbps)	Approximate Number of Pull Streams
848x480 @ 15	1500	20
1024x768 @ 15	2500	20
1280x1024 @ 30	3500	20
1280x720 @ 30	5000	18
1920x1080 @ 30	8000	14

NOTE: The following configuration options were set on the SMP:

- Stream Type = VBR
- GOP Length = 30
- Streaming Pull Streaming Method = Unicast RTP

Unicast Push Stream Method

The SMP 111 supports one push unicast stream.

Available Multicast Streams

The SMP 111 uses the IGMP multicast protocol to push or pull streams. The IGMP multicast protocol provides increased bandwidth efficiency because the SMP 111 only sends data when a connection is made by the user. All network switches and routing equipment must be properly configured to support IGMP snooping and IGMP query to avoid flooding all endpoints with unnecessary streaming traffic.

The table below indicates the approximate number of multicast streams supported by the SMP 111 using the IGMP multicast protocol. Operating at different resolutions using higher or lower bit rates can increase or decrease the scalability of the streaming system.

NOTE: For networks not configured to use the IGMP multicast protocol, consider using a media server to deliver multiple unicast streams to control PCs and viewing devices.

Multicast Pull Stream Method

Multicast		
Resolution (Pixels x Lines @ frame rate)	Recommended Video Bit Rate (Kbps)	Approximate Number of Pull Streams
1920 x 1080 @ 30	8000	>180

NOTE: The number of available pull streams is dependent on bandwidth and content (high motion or static content).

The following configuration options were set on the SMP:

- Stream Type = VBR
- GOP Length = 30
- Streaming Pull Streaming Method = Unicast RTP at default settings

If more streams are required, setting up a media server is the next step in expanding the streaming architecture. A media server provides a scalable live streaming media solution.

Multicast Push Stream Method

The number of multicast push streams is not limited.

Playing a Pull Stream Using VLC Media Player

Use the following procedure to play and view an SMP 111 stream using the VLC media player.

1. If you know the stream URL, go to **step 4** on page 104. Otherwise, to obtain the stream URL, access the web-based user interface of the SMP 111 (see [Accessing the Web-Based User Interface](#) on page 22).

NOTES:

- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see [Users and Roles](#) on page 47 to change a password).
- If no password is set, anyone can view the stream URL. If a password is set, you must be logged in to view the URL.

The **Device Status** page opens. In **Stream URL** line, if the recording and streaming streams are set to **Pull** (see [Push Stream and Pull Stream Playback URLs](#) on page 101) the box displays the URL necessary to request a stream from the SMP 111. Note the full URL for later reference in figure 80.

Extron Electronics Logged in as: admin

Device Status | Recorded Events | Configuration | File Management | Troubleshooting

AV Controls

Preview

☒ Enable Preview

Recording

10:50 AM 11:06 AM

Stream URL: rtsp://192.168.113.144/stream1

Selected	Name	Type	Total	Used	Available	Recording Time
<input checked="" type="checkbox"/>	Internal	Internal	29.26 GB	580.60 MB	27.36 GB	11:29:48
<input checked="" type="checkbox"/>	USB_DISK	USB Front	1.87 GB	1.28 GB	605.78 MB	00:22:18

Input and Output

HDMI Input: Active

Resolution: 1920x1080

Refresh Rate: 60Hz

HDCP Encrypt:

Current Event

008/28/2017 10:22 AM PST

Title: Great title

DB ID: 11

Event ID: SMP-N144_2Q0170828-175056Z

Presenter: Ima Adhoc Presenter

Course:

Figure 80. Device Status Page

2. Run the VLC media player.
The media player opens.
3. Select **Media > Open Network Stream** (see [figure 81](#) on page 104).

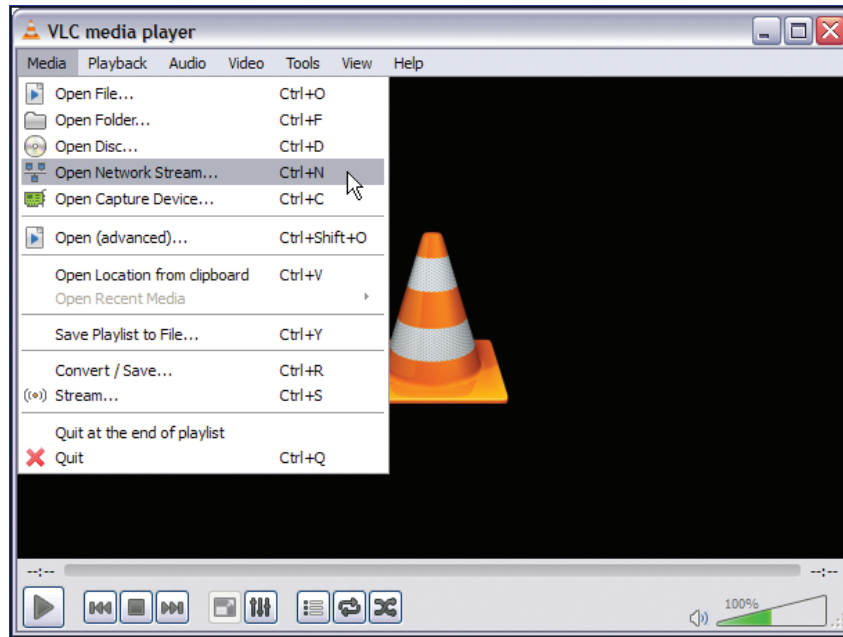


Figure 81. VLC Media Player — Open a Network Stream

The Open Media dialog box opens (see figure 82).

4. Using the stream URL that was noted in **step 1** on page 103 (`rtsp://192.168.13.1/stream1`), enter it into the **Please enter a network URL :** field (see figure 82, ❶).

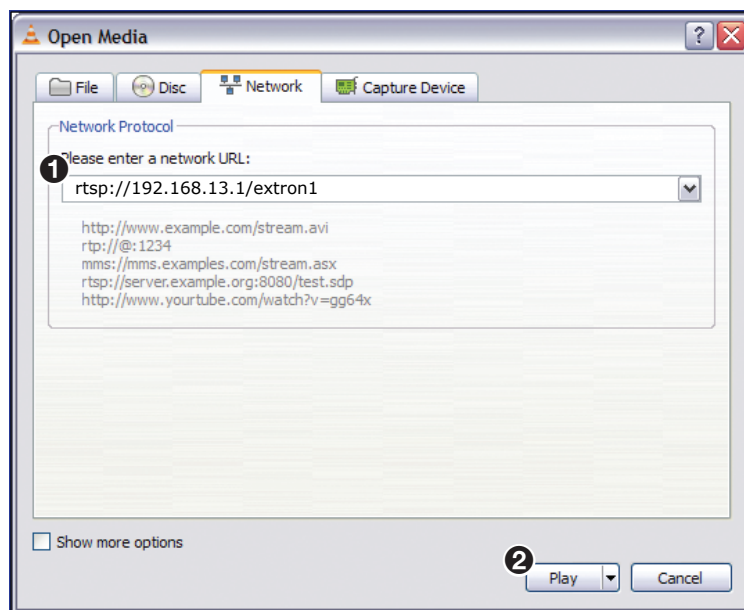


Figure 82. Enter Stream URL Information and Play

5. Click **Play** (❷). After a few seconds, the media streaming from the SMP 111 plays on the VLC media player.

NOTE: The VLC media player image settings can now be changed if desired. For information on adjusting the image settings, see the VLC media player help file.

Playing a Push Stream Using Stream Announcement Protocol (SAP)

In order to play a push stream, the VLC media player uses SAP to identify streams:

1. Open VLC media player.
2. From the **View** menu, select **Playlist** (see figure 83, ①).

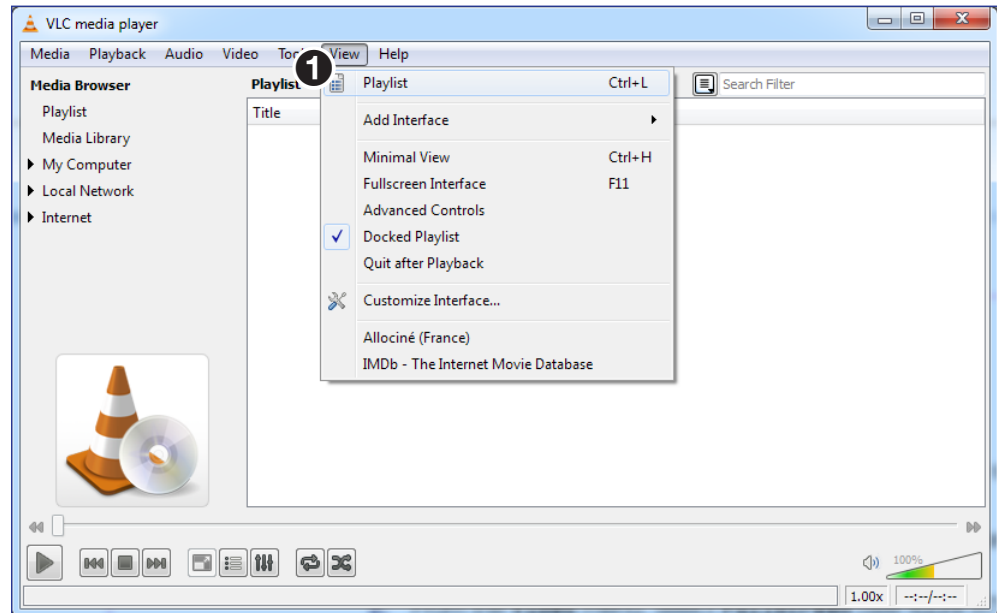


Figure 83. VLC Playlist

3. From the left menu column, select **Local Network** (see figure 84, ②).
4. Select **Network streams (SAP)** (③).

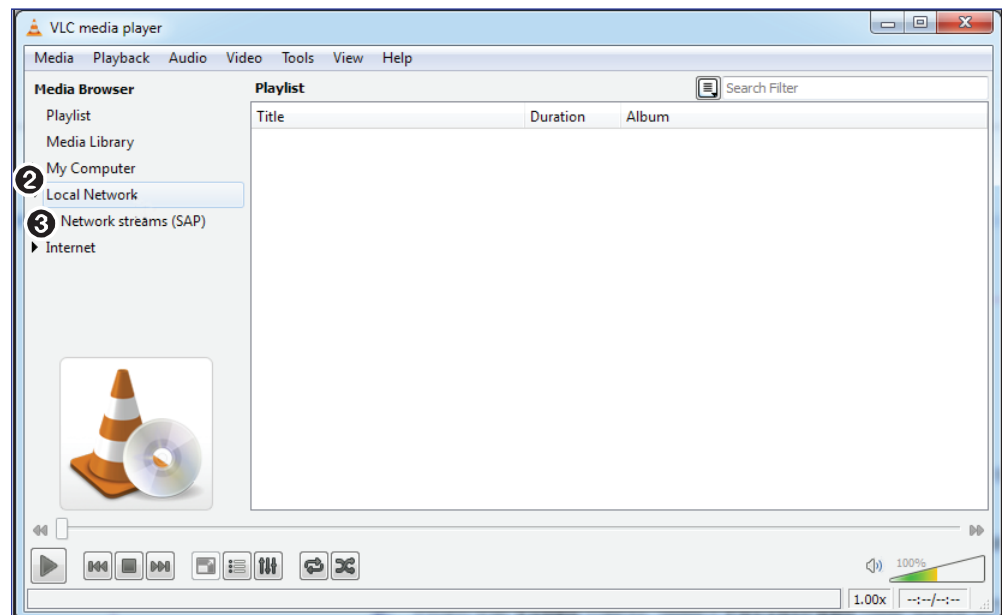


Figure 84. Select Local Network Streams

VLC populates the playlist with all streams that contain SAP information.

5. If a folder is shown, open it to view the SAP streams inside (see figure 85, ❶).

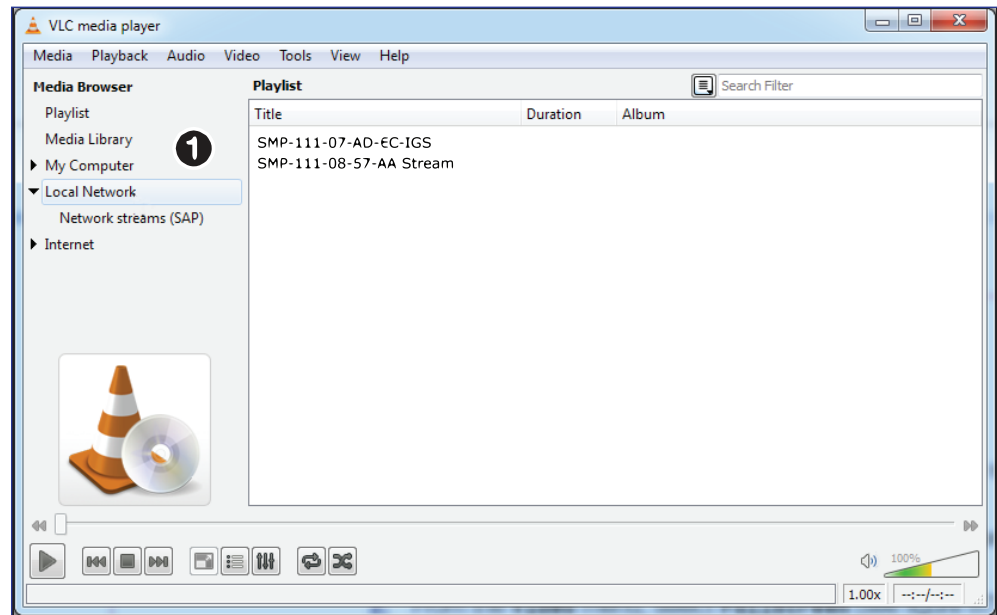


Figure 85. VLC - Select a Stream

6. Either double-click the desired stream to begin playback, or single-click, then use the VLC player controls at the bottom of the window to view and control the stream.

NOTE: Depending on the announcement frequency, it may take several moments before the SAP streams appear.

Playing a Pull Stream Using QuickTime Media Player

Use the following procedure to playback and view SMP 111 streams on the QuickTime player program.

NOTE: Only QuickTime 7 is able to play streams. QuickTime 10 does not support stream playback.

1. If you know the stream URL, go to **step 5** on page 108. Otherwise, to obtain the stream URL, access the Web-based User Interface of the SMP 111 (see **Accessing the Web-Based User Interface** on page 22).

NOTES:

- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password (see **Users and Roles** on page 47 to change a password).
- If no password is set, anyone can view the stream URL. If a password is set, you must be logged in to view the URL.

The Device Status page opens (see figure 86).

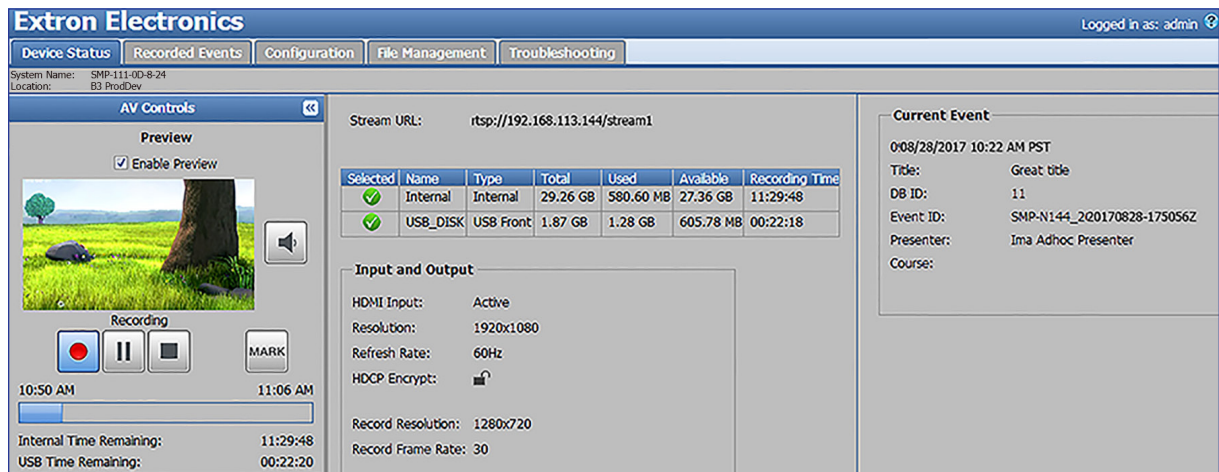


Figure 86. Device Status Page

2. Note the **Streaming URL Unicast** URL in the Stream URL line.
3. Open QuickTime player. From the desktop, select:
Start > All Programs > QuickTime > QuickTime Player.

The QuickTime media player opens (see figure 87).



Figure 87. QuickTime Player Main Screen

4. From the **File** menu, select **Open URL** (see figure 88, ❶).

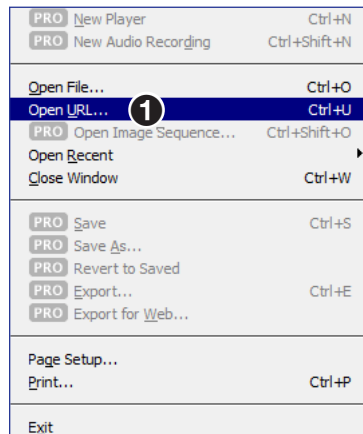


Figure 88. QuickTime Player Menu — Open URL

The Open URL dialog opens (see figure 89).

5. In the **Enter an Internet URL to open** field, enter the stream URL that was noted in **step 1** on page 107 (❶).

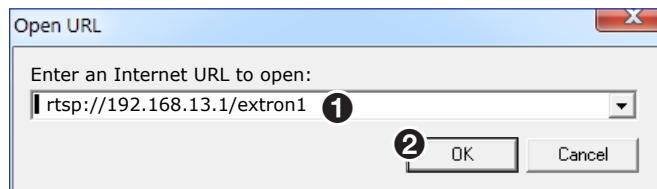


Figure 89. Enter Stream URL Information

6. Click **OK** (❷).

After a few seconds, the media stream from the SMP 111 plays on the QuickTime player.

If QuickTime player fails to play the stream:

1. From the QuickTime player menu, select:
Edit > Preferences > QuickTime Preferences.
2. Click the **Advanced** tab and select **Safe mode (GDI only).**
3. Click **Apply**, then **OK** to save the settings.
4. Close the player window and do this procedure again.

The QuickTime player image settings can now be changed if desired.

NOTE: The QuickTime player does not display closed caption information.

Estimating Storage Requirements for a Recording

Estimating Storage per Recording Hour

You need to know video and audio bit rates configured in your Extron SMP 111. For these examples, the calculations assume that the bit rates remain constant during the recording. If you are using VBR (variable bit rate, which is the default) then the actual bit rates are often slightly lower than this estimate. In some cases they can be higher.

To estimate storage per recording hour:

1. Find the SMP 111 video bit rate and audio bit rate (in the web UI go to **Configuration > Encoding & Metadata > Encoding Presets**), which are in kbps (kilobits per second).
2. Insert those bit rates into the following equation:
$$[(\text{video bit rate} + \text{audio bit rate}) * 3600 \text{ seconds per hour}] / 8 \text{ bits per byte} * 1000 = x \text{ MBph (megabytes per hour)}$$

Example:

Using the default “720p High” encoder preset, with:

- Video bit rate = 5000 kbps
- Audio bit rate = 192 kbps

For a 1-hour recording (3600 seconds),

- $[(5000 + 192) * 3600] / 8000 = 2336.4 \text{ MBph or } 2.34 \text{ GBph}$

For the default encoder presets of an SMP 111, the following are the estimated storage requirements for each hour of recording:

Estimated Storage Requirements				
Encoder Preset	Video bit rate (kbps)	Audio bit rate (kbps)	MB per hour	GB per hour
1080p High	8000	320	3744.0	3.74
1080p Low	6000	128	2757.6	2.76
720p High	5000	192	2336.4	2.34
720p Low	3000	128	1470.6	1.41
480p High	2500	128	1182.6	1.18
480p Low	1500	80	711.0	0.71
VGA High	3500	128	1632.6	1.63
VGA Low	2500	128	1182.6	1.18
SMP 111 max. rates	10000	320	4644.0	4.64
SMP 111 min. rates	200	80	126.0	0.13

NOTE: If you choose from one of several encoding rates, do the above calculation for each of the possible rates. You will also need to estimate how often each of the encoding rates is selected.

To estimate the number of hours of recordings that can be stored on a specific size of hard drive:

1. Determine the SMP 111 video bit rate and audio bit rate, in kbps (kilobits per second).
2. Insert those bit rates into the following equation:
$$[(\text{hard drive size in GB} * 8,000,000) / (\text{video bit rate} + \text{audio bit rate})] / 3600 = x \text{ hours}$$

Upgrading the SD Card

The internal 32 GB SD card in the SMP 111 is field changeable. Before upgrading the SD card in the SMP, read the requirements and recommendations for the SD card and the safety instructions for changing the card.

SD Card Requirements

- Form factor — SD
- Supported card types — SDSC, SDHC, and SDXC
- Minimum speed class — 10
- Minimum recommended write endurance — 50 TBW (terabytes written)
- Minimum operating temperature range — 0°C to 70°C

SD Card Recommendations

- Replacement SD cards should be specified for continuous recording (write/erase) applications.
- Always replace the existing card with a new unused card as the remaining write endurance on a used card can be unpredictable.
- Use extended or industrial temperature SD cards to insure the specified minimum operating temperature range (listed above) is met.

SD Card Installation

To safely field change the SD card in the SMP 111 follow these safety steps:

1. Unplug the AC cable before removing the cover.

NOTE: The AC cable must never be connected to the SMP while the cover is removed.

2. Disconnect all cables and remove the SMP from any rack or other installation option.
3. Use proper ESD (electrostatic discharge) procedures and grounding techniques to avoid damage to the unit when removing or installing the SD card.

CAUTION:

- Use proper grounding techniques during installation.
- Utilisez des techniques de mise à la terre correctes pendant l'installation.
- A grounding wrist strap is recommended.
- Un bracelet de mise à la terre est recommandé.
- Do not touch the electronic components or the connectors on the circuit boards without being electrically grounded. Doing so could damage the SMP 111.
- Ne pas toucher les composants électroniques ou les connecteurs sur les circuits imprimés sans être électriquement relié à la terre. Cela pourrait endommager le SMP 111.

4. Remove and retain the screws (thirteen screws, five on each side and three on top) securing the cover to the SMP. Slide the cover forward slightly and lift it off the unit (see figure 90).

Slide cover forward and lift straight up.

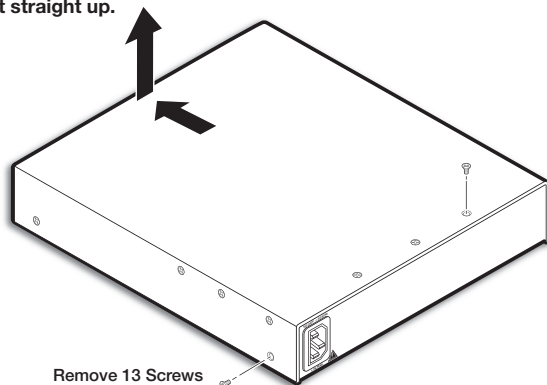


Figure 90. Removing the Cover

5. Locate, remove and replace the SD card, near the front panel control buttons (see figure 91).

Front of
SMP 111

**Remove
SD Card**

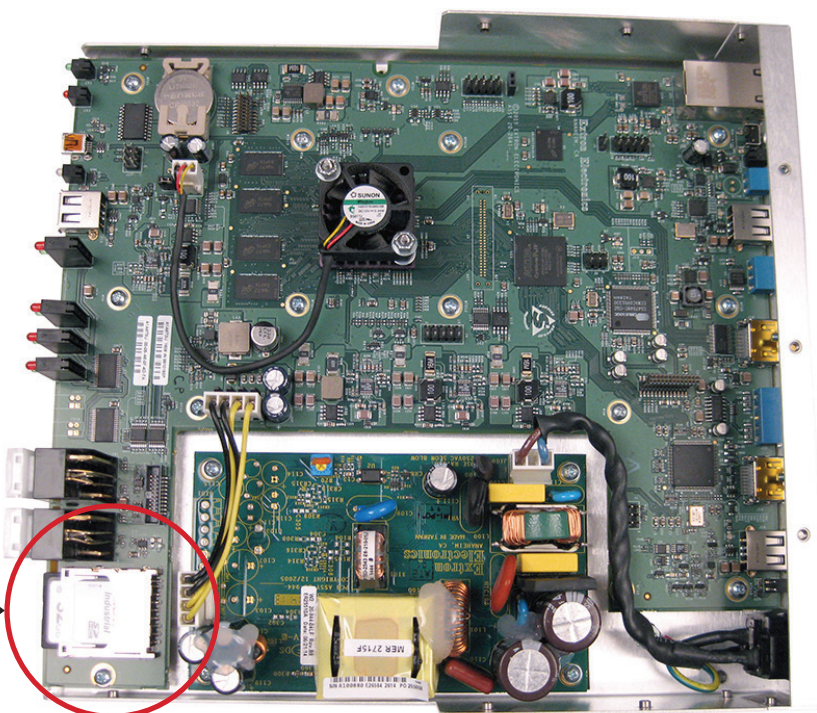


Figure 91. SD Card Location

6. Reinstall the SMP cover, securing it in place with the thirteen screws removed in step 4.
7. Reinstall the SMP in the rack or other installation option.

SD Card Formatting

All data will be erased as part of the card initialization, so Extron recommends that any data on the old card be backed up before the new card is installed.

Once the new card is installed the user must format the card via the embedded web page: **Troubleshooting > System Resets > Reset > Delete Content**

The unit will reboot after formatting. The SD card is ready for recording after the reboot.

Alternatively, the user can initiate a **Delete Content** from the Front Panel by following these steps:

1. Press the **Stop** and **Pause** buttons simultaneously for 5 seconds.
Mark button will blink red for 3 seconds awaiting confirmation to **Delete Content**.
2. Press **Mark** button within 3 seconds to confirm the **Delete Content** command.
If the **Mark** button is not pressed, the request is cancelled.

The SMP 111 automatically reboots after card formatting is completed.

Glossary

Ad hoc recording — An ad hoc recording session is one that has been set up for a specific occasion or task without being previously scheduled.

Advanced Audio Coding (AAC) — A standardized compression and encoding scheme for lossy (low quality) digital audio. Higher bit rates provide higher quality. Part of the MPEG-2 and MPEG-4 specifications. The SMP 111 supports AAC-LC (MPEG-2 part 7, MPEG-4 part 3, sub-part 4 and part 14, MP4 audio).

Advanced Video Coding (AVC) — Video compression format, H.264/MPEG-4 part 10 (see the [H.264 \(MPEG-4 AVC\)](#) definition on page 115).

Address Resolution Protocol (ARP) — A protocol for assigning an [IP address](#) (see page 116) to a device based on the device [MAC \(Media Access Control\)](#) (see page 116) address or physical machine address, that maintains a table showing the correlation between the two.

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.

Auto-Image — An Extron technology for scan converters and signal processors that simplifies setup by executing image sizing, centering, and filtering adjustments with a single button push.

Auto Memory — Auto memory recalls input and image settings for signals that have previously been applied. If this feature is disabled, the device treats every newly applied input as a new source.

B-frames — Bidirectionally predictive coded picture. Contains predictive, difference information from the preceding and following I- or P-frame within a [GOP](#) (see page 115). Data preceding or following the B-frame are required to recreate video information in a B-frame. They offer significantly better compression than I or P frames, but are not available in Baseline profile.

Bandwidth — The total range of frequencies required to pass a specific signal without significant distortion or loss of data. In analog terms, the lower and upper frequency limits are defined as the half power, or -3 dB signal strength drop, compared to the signal strength of the middle frequency, or the maximum signal strength of any frequency, expressed as xx Hz to xx kHz (or MHz) @ -3 dB. In digital terms, it is the maximum bit rate at a specified error rate, expressed in bits per second (bps). The device bandwidth should be wider than the highest possible bandwidth of the signals it may handle. (In general, the wider the bandwidth, the better the performance. However, bandwidth that is too wide can pass excessive noise with the signal.)

Baud — The speed of data transmission, often in bits per second or megabits per second.

Bit rate — The number of bits that are conveyed or processed per unit of time. Bit rate is quantified using the bits per second (bit/s) unit, often in conjunction with an SI prefix such as kilo- (kbit/s or kbps), mega- (Mbit/s or Mbps), or giga- (Gbit/s or Gbps).

Codec — (1) Coder/decoder: A device that converts analog video and audio signals into a digital format for transmission over telecommunications facilities and also converts received digital signals back into analog format. It may also dial up the connection, like a modem for teleconferencing. (2) Compressor/decompressor. Codecs can be implemented in software, hardware, or a combination of both.

Compression — The art and science of reducing the amount of data required to represent a picture or a stream of pictures and sound before sending or storing it. Compression systems are designed to eliminate redundant or repeated information to the desired data level while allowing the original information to be reproduced to the desired quality.

Constant Bit Rate (CBR) — Constant bit rate encoding means that the rate at which codec output data is consumed is constant. CBR is useful for streaming multimedia content on data communication channels which operate more efficiently or require the bit rate to remain within a tight tolerance. Typically the constant bit rate is created by stuffing bits into a variable bit rate signal which has a defined peak or maximum limit.

Constrained Variable Bit Rate (CVBR) — This scheme is similar to **Variable Bit Rate (VBR)**, (see page 119) but sets a maximum allowed bit rate that the encoder cannot exceed.

Darwin Streaming Server (DSS) — Darwin Streaming Server is software developed by Apple that provides a high performance media streaming server for delivering content. The software is used to simultaneously stream to a broad range of screens and devices (including computers, televisions, smartphones, and tablets).

Data bits — The number of bits used to represent one character of data. Data bits can be 7, 8, or 16, but most serial devices use 8 bits for ASCII characters.

DB ID — DB ID is the database identification number of a scheduled recording event. The number appears in the event details within the Scheduled Events page.

To determine the event ID for a recording event, click on the Scheduled Events tab, locate and click on the event in the calendar. The ID number appears in the Event Details dialog box. Troubleshooting logs can be sorted or filtered by the event ID number.

DDC — Display Data Channel (DDC) is a bidirectional communications standard developed by VESA (Video Electronics Standards Association) that defines a universal data transmission standard for the connectivity between display devices and computers.

Decoder — 1) In analog video, a device used to separate the RGBS (red, green, blue and sync) signals from a composite video signal. Also known as an NTSC decoder. 2) In digital systems, a device which does the reverse of an encoder, undoing the encoding so that the original information can be retrieved. The same method used to encode is usually just reversed in order to decode. Video over IP decoders accept IP data streams and output an analog or digital video signal. 3) In control systems, the device in a synchronizer or programmer which reads the encoded signal and turns it into a form of control.

Dynamic Host Configuration Protocol (DHCP) — A network protocol that enables a server to automatically assign unique network addresses (IP address, subnet mask, gateway) to a device using a defined range of numbers configured for the network.

DiffServe (Differentiated Services) — DiffServ specifies a scalable, coarse-grained mechanism for classifying and managing network traffic and providing quality of service (QoS).

Domain Name System (DNS) — A database system that translates domain names (such as www.extron.com) into IP addresses.

Dynamic IP address — An IP address that is automatically assigned to a client device in a TCP/IP network, typically by a DHCP server. Network devices that serve multiple users, such as servers and printers, are usually assigned a static (unchanging) IP address.

Extended Display Identification Data (EDID) — A data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device over the Display Device Channel (DDC). The source device outputs the optimal video format for the display based on the provided EDID, ensuring proper video image quality.

EDID Minder — Automatically manages EDID communication between connected devices.

Elementary Stream — Raw **H.264 (MPEG-4 AVC)** (see page 115) video or raw **AAC** audio (see page 113), not wrapped by additional headers.

Encoder — A hardware device or software program used to compress (encode) or change a signal from one format to another or convert an analog signal into a digital data stream. The SMP 111 is an encoder that converts analog audio and video into digital streams.

Ethernet — A Local Area Network (LAN) standard officially known as IEEE 802.3. Ethernet and LAN technology are used for interconnecting computers, printers, workstations, terminals, services, and similar devices, within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10 Mbps. For LAN interconnectivity, Ethernet is a physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.

File Transfer Protocol (FTP) — A protocol that is used to transfer files from one host to another host over a TCP-based network (such as the Internet). Also see **Secure File Transport Protocol (SFTP)** on page 118 for more information.

Gateway — A router or proxy server between networks, or a network node equipped to interface with another network that uses different protocols (an entrance and exit into a communications network).

Group of Pictures (GOP) — A group of successive pictures within a coded video stream. A GOP begins with an Intraframe (**I-frame**) (see page 116) containing the full spatial resolution and data of a video frame. Predictive frames (**P-frames**) (see page 117) follow I-frames and contain data that has changed from the preceding I-frame. Bi-predictive frames (**B-frames**) (see page 113) reference frames before and after the current frame.

H.264 (MPEG-4 AVC) — H.264/MPEG-4 Part 10. A block oriented, motion-compression-based codec standard developed by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC Moving Picture Experts Group (MPEG).

HDCP — High-bandwidth Digital Content Protection. HDCP is a digital rights management scheme developed by Intel® to prevent the copying of digital video and audio content. HDCP is mandatory for the HDMI interface, optional for DVI. HDCP defines three basic system components: source, sink, and repeater.

HDMI — High-Definition Multimedia Interface (HDMI®): an interface for the digital transmission of high definition video, multi-channel audio, and control signals, over a single cable.

NOTE: The SMP transmits 2-channel digital audio only.

HDTV — High definition television with a resolution of 1080p (1920x1080p), 720p (1280x720p), or 1080i (1920x1080i).

HDTV 1080p/60 — High definition television displayed at 1920x1080 resolution (1080p; 2,073,600 pixels) with a refresh rate of 60 Hz.

Hop — In a packet-switching network, a hop is the trip a data packet takes from one router (or intermediate point) to another in the network.

Host name — This is a unique name by which a device is known on a network. It identifies a particular host in electronic communication.

Hypertext Transfer Protocol (HTTP) — A network protocol based on TCP/IP that is used to retrieve hypertext objects from remote web pages and allows servers to transfer and display web content to users.

Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS) — A networking protocol that allows web servers to transfer and display web content to users **securely**. All transferred data is encrypted so that only the recipient is able to access and read the content. It is not a protocol itself, but rather a combination of Hypertext Transfer Protocol (HTTP) on top of the SSL/TLS protocol, which adds the security capabilities of SSL/TLS to standard HTTP communications.

iCalendar file — An iCalendar file is a file containing schedule, task, or meeting information in a standard format. iCalendar files work independent of transport protocol and can be used cross-platform to share calendar data.

Internet Group Management Protocol (IGMP) — A TCP/IP communications protocol used by hosts and adjacent routers on a network to establish multicast group memberships.

When the SMP 111 is connected to a streaming media server, the IGMP multicast protocol is used to pull RTSP streams. The IGMP multicast protocol conserves network bandwidth because the streaming media server only connects to the SMP 111 when the connection to the streaming media server is made by the user. All network switches and routing equipment must be properly configured to support IGMP snooping and IGMP query to avoid flooding all endpoints with unnecessary streaming traffic.

Internet Protocol (IP) — The primary protocol that establishes the Internet. It defines addressing methods and structures for datagram encapsulation, allowing delivery of packets from a source to a destination across an internetwork based purely on addressing.

Intraframe (I-frame) — In video compression schemes, intraframes (I-frames) are primary frames that contain the full spatial resolution and data of a video frame.

IP address — A numerical label using the Internet Protocol assigned to devices in a network. The IP address for the source and destination are included in an IP datagram. A unique, 32-bit binary number (12-digit dotted decimal notation — xxx.xxx.xxx.xxx) based on version 4 of the Internet Protocol (IPv4) that identifies each sender and each receiver of information connected to a LAN, WAN, or the Internet. IP addresses can be static (see [Static IP](#) on page 118) or dynamic (see [DHCP](#) on page 114).

Java™ — A class-based, object oriented programming language developed at Sun Microsystems®, Inc. (merged with Oracle® Corporation). Programs written in Java can run on multiple platforms.

JavaScript® — A scripting programming language adding interactive features to web pages.

LAN — Local Area Network. A computer network that connects devices in a limited area, such as a building or campus, using network equipment that does not include leased communications lines.

Maximum Transmission Unit (MTU) — The maximum packet size allowed in a network data packet.

Media Access Control (MAC) — A unique hardware number given to devices that connect to the Internet. When your computer or networking device (such as a router, hub, or interface) is connected to the Internet, a table (see [ARP](#) on page 113) relates the IP address of the device to its corresponding physical address on the [LAN](#) on page 116. This protocol allows for several terminals or network nodes to communicate within a multi-point network, typically a local area network.

Metadata — A metadata record consists of attributes to describe another object. The Dublin Core Metadata Element Set contains 15 generic elements for describing resources: Creator, Contributor, Publisher, Title, Data, Language, Format, Subject, Description, Identifier, Relation, Source, Type, Coverage, and Rights.

MPEG-2 — The video compression algorithm used for DVD-Video, Digital Broadcast Satellite (DBS), and Digital TV (including HDTV) delivery systems.

MPEG-4 — A patented collection of methods defining compression of audio and visual (AV) digital data. MPEG-4 allows higher amounts of data compression and encoding efficiency than MPEG-2. It also includes support for digital rights management and for interactive multimedia applications.

MPEG-4 uses include compression of AV data for streaming media on the web; CD, HD DVD, or Blu-Ray Disc distribution; voice (telephone, videophone) distribution; and broadcast television applications.

Multicast — A network technology for the delivery of information to a group of destinations simultaneously. A single stream is sent from the source to a group of devices at the same time in one transmission. Delivery is managed by network switches using the most efficient strategy to deliver the messages over each link of the network only once, and creating copies only when the links to the group of destinations split.

Network Address Translation (NAT) — A network protocol that allows multiple devices to have their own, individual, private addresses, but they share one public IP address (IPv4) for connection to the internet or other networks.

Network Time Protocol (NTP) — A protocol used for synchronizing the clocks of computer systems over networks.

Opencast Server — An Opencast server is an open-source platform to support the management of audio and video content in the education market. Institutions can use an Opencast server to produce, manage, and distribute lecture recordings.

Overscan — An applied "zoom" on SMPTE inputs (NTSC, PAL, 480p, 576p, 720p, 1080i, 1080p) to hide closed caption/ancillary data, edge effects, or other video artifacts.

Parity (or Parity checking) — An error detection technique that tests the integrity of the digital data being sent. Parity can be set to None, Even, or Odd.

Predictive frame (P-frame) — In video compression schemes, predictive frames follow I-frames and contain data that has changed from the preceding **I-frame** (see page 116).

Presenter — A person who makes recordings using the SMP, regardless of their login role (user or administrator).

When the **Record** button is pressed in the **AV Controls** panel, the **Start an Adhoc Recording** pop-up window opens, where you can enter the name of the presenter in the **Presenter** field. The name of the presenter is stored with the metadata for the recording, and it appears in the Creator column of the **Scheduled Events > Recording Calendar > List View** table. If recordings are uploaded from the SMP to an Opencast or Kaltura system, and if that presenter is a user of that publishing system, the presenter or creator name is used to sort or tag that recording.

Pull streaming — Streaming method that allows users to search for content. Users specify a content source and initiate a download or view the stream. The content streaming is initiated by the end user (at the decoder rather than at the encoder).

Push streaming — A streaming method where the encoder sends content out to one (unicast) or more (multicast) decoders using one of the transport protocols. Content streaming is initiated at the encoder.

Quality of Service (QoS) — The grade of performance, such as transmission rates and error rates, of a communications channel or system. QoS provides a level of predictability and control beyond the best-effort delivery that the router provides by default (best-effort service provides packet transmission with no assurance of reliability, delay, jitter, or throughput).

Real-time Messaging Protocol (RTMP) — An application level protocol, owned by Adobe, designed for transmission of audio, video, and data over TCP.

Real-time Streaming Protocol (RTSP) — A network control protocol designed for use in audio visual and communications systems to control streaming media.

Real-time Transport Protocol (RTP) — An Internet Engineering Task Force (IETF) standard for streaming real-time multimedia over IP in packets.

Recording stream or streams — The primary encoding streams are used to create recordings, and they can also be used for streaming. Recording streams are typically higher resolution than Streaming streams.

Router — A network device that forwards packets from one network to another.

Secondary Storage Mode — The SMP setting in which recordings are saved to two storage drives rather than one. This is the alternative to single storage mode (see [Single Storage Mode](#) below).

Secure File Transfer Protocol (SFTP) — Similar to FTP, this protocol adds encryption and requires credentials for file transfers.

Secure Shell (SSH) — A network protocol that creates a secure channel used for secure communication between two computers on a network. SSH is typically used for data communication, remote shell (login) services, or command execution.

Secure Sockets Layer (SSL) — A protocol used by web servers and web browsers that creates a uniquely encrypted channel for private communications over the public Internet.

Session Announcement Protocol (SAP) — Used by source devices (encoders or servers) in conjunction with SDP to publicize the availability of a stream to decoders and players. The SAP periodically broadcasts session description information on an industry standard multicast address and port. When received by remote clients, these announcements can be used to facilitate the viewing of streams, eliminating the need for user configuration.

Session Description Protocol (SDP) — This protocol is used to describe streaming media initialization parameters. It covers session announcement, session invitation, media type and format, and other forms of multimedia session initiation (as defined in RFC 2327). SDP does not deliver media itself. It simply details the stream parameters and how the stream will be started.

Simple Instruction Set (SIS) — A set of commands developed by Extron that allows for RS-232, USB, and TCP/IP control of certain Extron products. A command is sent from the control device to the product (using a minimal number of characters) and a response is received from the product and shown on the display of the control device.

Simple Network Management Protocol (SNMP) — An application-layer protocol that facilitates the exchange of management information between network devices. This protocol collects (and configures) information from network devices (such as servers, hubs, switches, and routers) on an Internet Protocol (IP) network.

Single storage mode — The SMP setting in which recordings are saved to only one storage drive. This is the alternative to secondary storage mode (see [Secondary Storage Mode](#) above).

Static IP address — An IP address specifically assigned to a device or system in a network configuration. This type of address requires manual configuration of the network device or system and can only be changed manually or by enabling [DHCP](#) (see page 114).

Stop bits — The bit or bits transmitted that signal the end of a character. Typically set to 1.

Streaming Media Player (SMP) web browser plugin — The Extron SMP web browser plugin (V1.0) provides the best streaming features to display from Extron streaming media devices.

Streaming media (stream) — Multimedia that is constantly received by (and normally presented to) an end-user while being delivered by a streaming provider. Internet television is a commonly streamed medium.

Streaming stream — The streaming stream used for video previews, as in the AV Controls panel, and also for streaming. Signals for the streaming stream are encoded at or below the resolution or refresh rate of the recording encoding stream. The recording stream uses the same audio settings as the recording stream, but the video encoding differs.

Switch — A network switch enables communication between devices in a network by routing data between ports at the data link layer (layer 2 of the OSI model). A managed switch can be configured to transmit data only to the specific device for which the data was meant.

Telnet port — Most controllers support Telnet and use port 23 as the communication port

to receive or issue commands.

Transmission Control Protocol (TCP) — A protocol developed for the Internet that provides reliable end-to-end data packet delivery from one network device to another.

Transmission Control Protocol/Internet Protocol (TCP/IP) — The communication protocol of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP program to allow them to send and receive information in an understandable form.

Time To Live (TTL) — A value that specifies the number of router hops multicast traffic can make between routed domains when it exits a source.

TMDS — Transition Minimized Differential Signaling. An all-digital video transmission standard developed by Silicon Image, Inc. TMDS is the core technology used in DVI and HDMI.

Transport Streams (TS) — A form of media wrapped in MPEG-2 transport stream headers. The MPEG-2 transport headers contain information about the media.

The SMP is compatible with transport streams that contain H.264 encoded video and AAC encoded audio. Transport streams containing MPEG-2 video and AC3 audio are not supported.

- **TS/UDP** — (Unicast or multicast) An MPEG-2 transport stream containing the elementary streams for the audio and video. It is sent using UDP packets.
- **TS/RTP** — (Unicast or multicast) Transport stream that is sent using RTP/UDP. RTP provides sequencing information; if the sequencing information is reordered by the network, RTP reorganizes and processes the information in the correct order. UDP would process the sequencing information out of order, making RTP performance better on larger, many hop networks.

Unicast — Sending messages from one device to a single network destination on a network. Having N clients of a unicast stream requires the server to produce N streams of unicast data.

User Datagram Protocol (UDP) — A connectionless, transport layer protocol that sends packets (datagrams) across networks using "best-effort" delivery. It is a relatively simple protocol that does not include handshaking.

Variable Bit Rate (VBR) — A compression scheme that adjusts the output bit rate around a specified target bit rate depending on the audio or image complexity. More bandwidth is used when the video frame is more complex and less bandwidth is used when the video frame is simple.